U. S. DEPARTMENT OF LABOR
BUREAU OF LABOR STATISTICS
ROYAL MEEKER, Commissioner

BULLETIN OF THE UNITED STATES BUREAU OF LABOR STATISTICS . . . . . No. 238

WAGES AND HOURS OF LABOR SERIES

WAGES AND HOURS OF LABOR IN WOOLEN AND WORSTED GOODS MANUFACTURING, 1916

JUNE, 1918

WASHINGTON
GOVERNMENT PRINTING OFFICE
1918

CONTENTS.

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WAGES AND HOURS OF LABOR IN WOOLEN AND WORSTED GOODS MANUFACTURING, 1916.

INTRODUCTION AND SUMMARY.

Rates of wages per hour, hours of labor per week, and full-time and actual weekly earnings in the woolen and worsted goods industry of the United States in the year 1916 are presented in this report. Comparable figures for 1914, and summaries for each year from 1907 to 1916, except 1915, are also shown. Data were not collected for 1915.[1]

An extended description of the processes, of the machines used, and of the work done by the employees engaged in the several occupations appears in the latter part of this report, pages 84 to 154.

The average full-time weekly earnings of the employees in this industry in 1916 were 27 per cent higher than in 1913 and 1914, 23 per cent higher than in 1912, and 37 per cent higher than in 1910 and 1911.

The average full-time hours of labor per week in 1916 were the same as in 1914, 2 per cent lower than in 1912 and 1913, and 4 per cent lower than in 1910 and 1911.

The average rate of wages (or earnings) per hour in 1916 was 27 per cent higher than in 1914, 30 per cent higher than in 1913, 28 per cent higher than in 1912, and 43 per cent higher than in 1910 and 1911. Owing to the reduction of hours, the increase in full-time weekly earnings was not quite so much as in rates of wages per hour.

In 1916 the average full-time weekly earnings of male employees in the selected occupations shown varied from $7.96 for doffers to $20.72 for loom fixers.

The full-time weekly earnings of female employees varied from $6.98 for doffers to $14.72 for weavers.

A summary of the rates of wages and hours of labor from 1910 to 1916, inclusive, in the principal occupations of the industry, is presented in Table 1. This table shows very clearly the general reduction of hours and increase of wages between 1907 and 1916, as well as the prevailing rates and hours of labor in 1916.

[1] Previous reports of wages and hours of labor in woolen and worsted goods manufacturing have been published by the Bureau, as follows: Nineteenth Annual Report, covering 1890 to 1903; Bulletin No. 59 (July, 1905), covering 1903 and 1904; Bulletin No. 65 (July, 1906), covering 1904 and 1905; Bulletin No. 71 (July, 1907), covering 1905 and 1906; Bulletin No. 77 (July, 1908), covering 1906 and 1907; Bulletin No. 128 (August, 1913), covering 1907 to 1912; Bulletin No. 150 (May, 1914), covering 1912 and 1913, and Bulletin No. 190 (May, 1916), covering 1913 and 1914.

TABLE 1.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS IN THE PRINCIPAL OCCUPATIONS, 1907 TO 1916.

[The figures opposite each group of years are for identical establishments. When a second line is shown for 1916 it contains all data secured for 1916 whether or not comparable data for 1914 were available.]

Occupation, sex, and number of establishments.	Year.	Number of employees.	Average full-time hours per week.	Per cent of employees whose full-time hours per week were—				Average rate of wages per hour.	Per cent of employees whose rates of wages per hour were—									Average full-time weekly earnings.
				54 and under.	Over 54 and under 57	57 and under 60	60 and over.		Under 10 cents.	10 and under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 cents and over.	
Wool sorters, male:																			
11 establishments	1907	184	58.0	.....	9	79	12	$0.233	.....	.....	2	3	3	8	45	39	2	.....	$13.51
	1908	164	57.8	.....	13	78	9	.223	.....	.....	1	5	10	7	68	10	.....	.....	12.89
	1909	186	57.9	.....	8	84	8	.239	.....	.....	.....	1	1	3	63	33	.....	.....	13.84
	1910	193	56.5	.....	84	5	11	.246	.....	1	.....	4	1	3	24	65	3	.....	13.90
18 establishments	1910	289	56.3	.....	88	4	8	.247	.....	1	.....	3	(1)	3	22	69	2	.....	13.86
	1911	335	56.3	.....	89	4	7	.249	.....	.....	.....	2	1	1	23	73	1	.....	14.03
19 establishments	1911	444	56.4	.....	83	12	5	.241	.....	.....	.....	1	7	4	29	58	1	.....	13.54
	1912	471	55.2	61	21	14	3	.267	.....	.....	.....	.....	.....	4	17	73	5	.....	14.72
	1913	246	55.0	65	21	14	.....	.281	.....	.....	.....	(1)	.....	2	5	78	14	.....	15.43
14 establishments	1913	246	55.0	65	21	14	.....	.281	.....	.....	.....	(1)	.....	2	5	78	14	.....	15.42
	1914	372	54.2	83	17	1	.....	.276	.....	.....	.....	1	1	5	12	61	21	(1)	14.96
15 establishments	1914	381	54.2	83	17	(1)	.....	.276	.....	.....	.....	(1)	1	4	12	62	21	(1)	14.97
	1916	385	54.1	81	18	1	.....	.326	.....	.....	.....	1	(1)	1	6	7	86	.....	17.67
21 establishments	1916	421	54.1	82	18	1	.....	.328	.....	.....	.....	(1)	(1)	1	6	7	86	(1)	17.77
Card tenders, male:																			
19 establishments	1907	145	58.6	.....	9	48	43	.126	10	19	55	17	.....	.....	.....	.....	.....	.....	7.38
	1908	136	58.6	.....	10	47	43	.121	11	25	51	13	1	.....	.....	.....	.....	.....	7.09
	1909	134	58.4	.....	10	55	35	.124	7	23	54	16	.....	.....	.....	.....	.....	.....	7.24
	1910	133	57.3	.....	52	26	22	.125	5	29	49	17	1	.....	.....	.....	.....	.....	7.16
26 establishments	1910	201	56.9	.....	66	20	14	.127	3	24	49	23	(1)	(1)	.....	.....	.....	.....	7.25
	1911	196	56.9	.....	68	18	14	.141	3	31	42	17	7	.....	.....	.....	.....	.....	8.02
40 establishments	1911	320	57.1	.....	55	35	10	.136	2	36	38	20	4	.....	.....	.....	.....	.....	7.73
	1912	412	56.4	36	18	33	13	.135	(1)	18	41	36	4	(1)	.....	.....	.....	.....	7.64
	1913	329	56.3	32	24	36	8	.142	1	7	32	52	8	(1)	(1)	.....	.....	.....	8.01

38 establishments	1913	333	56.5	30	22	38	10	.144	1	6	31	50	10	2	(1)			8.11
	1914	371	55.9	49	17	19	15	.147		3	40	37	17	2	1			8.20
41 establishments	1914	398	56.1	46	18	19	18	.147		4	37	37	17	3	1			8.26
	1916	468	56.0	45	19	18	19	.186			2	3	39	35	17	3		10.38
51 establishments	1916	538	55.8	46	22	16	16	.186			2	3	38	3				10.39
Card strippers, male:																		
18 establishments	1907	89	58.2		19	43	38	.145		3	34	45	18					8.44
	1908	79	58.1		19	49	32	.145		1	39	46	13	1				8.42
	1909	80	58.1		16	53	31	.151			29	43	24	5				8.77
	1910	88	57.7		36	34	30	.151		1	26	47	20	5	1			8.71
27 establishments	1910	162	57.0		64	20	16	.153		1	15	57	23	4	1			8.69
	1911	155	56.9		65	21	15	.153			13	59	22	5	1			8.71
42 establishments	1911	223	57.1		52	37	11	.151		4	15	57	21	3	(1)			8.62
	1912	240	56.9	29	15	39	17	.163			2	33	57	5	3			9.29
	1913	238	56.4	29	24	43	4	.167				22	61	16	1			9.41
42 establishments	1913	236	56.5	27	23	45	5	.168				21	60	17	1			9.46
	1914	245	55.7	49	21	20	10	.169		1	1	12	73	9	4			9.42
43 establishments	1914	250	55.7	48	20	20	12	.169		1	1	12	72	10	4			9.44
	1916	269	55.6	53	16	21	11	.205				1	2	27	67	3		11.42
50 establishments	1916	311	55.4	52	21	18	9	.211				1	2	24	66	8		11.68
Comber tenders, male:																		
4 establishments	1907	52	58.5			75	25	.133		2	69	29						7.78
	1908	29	58.6			72	28	.131			72	24	3					7.68
	1909	29	58.6			72	28	.137			66	34						8.03
	1910	42	57.2		69		31	.140			33	67						8.01
6 establishments	1910	106	56.5		88		12	.139			55	45						7.87
	1911	124	56.5		87		13	.138		1	60	40						7.82
9 establishments	1911	188	56.5		82	10	9	.141		6	57	27	10					7.94
	1912	181	55.1	72	8	12	8	.156			11	64	12	13				8.56
	1913	115	54.8	77	6	17		.156			8	55	35	3				8.51
5 establishments	1913	112	54.8	79	4	17		.156			7	55	35	3				8.52
	1914	215	55.5	68	8		24	.162			(1)	54	31	14				9.01
6 establishments	1914	228	55.8	64	7		28	.161			(1)	57	29	14				9.00
	1916	268	56.3	60	1		38	.199					22	41	37	(1)		11.20
9 establishments	1916	281	56.3	60	1	2	37	.198					25	40	35	(1)		11.14

[1] Less than 1 per cent.

TABLE 1.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS IN THE PRINCIPAL OCCUPATIONS, 1907 TO 1916—Continued.

Occupation, sex, and number of establishments.	Year.	Number of employees.	Average full-time hours per week.	Per cent of employees whose full-time hours per week were—				Average rate of wages per hour.	Per cent of employees whose rates of wages per hour were—										Average full-time weekly earnings.
				54 and under.	Over 54 and under 57	57 and under 60	60 and over.		Under 10 cents.	10 and under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 cents and over.	
Comber tenders, female:																			
4 establishments	1907	101	55.7	.....	78	18	4	$0.099	58	24	8	10	.....	.....	.....	.....	.....	.....	$5.51
	1908	117	55.8	.....	78	17	5	.099	56	27	16	.....	.....	.....	.....	.....	.....	.....	5.52
	1909	111	55.8	.....	77	20	4	.102	42	38	20	.....	.....	.....	.....	.....	.....	.....	5.69
	1910	110	55.4	.....	96	.....	4	.110	22	60	.....	18	.....	.....	.....	.....	.....	.....	6.09
6 establishments	1910	129	55.5	.....	97	.....	3	.111	25	53	6	16	.....	.....	.....	.....	.....	.....	6.13
	1911	118	55.4	.....	97	.....	3	.109	12	76	9	3	.....	.....	.....	.....	.....	.....	6.02
7 establishments	1911	139	55.8	.....	82	15	3	.109	10	80	8	2	.....	.....	.....	.....	.....	.....	6.10
	1912	150	55.8	.....	82	13	5	.116	9	66	15	10	.....	.....	.....	.....	.....	.....	6.47
	1913	163	56.1	1	75	15	8	.117	9	53	30	9	.....	.....	.....	.....	.....	.....	6.57
6 establishments	1913	161	56.1	.....	76	16	8	.117	9	53	30	8	.....	.....	.....	.....	.....	.....	6.56
	1914	162	54.7	25	75	.....	.....	.119	18	43	13	25	1	.....	.....	.....	.....	.....	6.53
6 establishments	1914	162	54.8	25	75	.....	.....	.119	18	43	13	25	1	.....	.....	.....	.....	.....	6.52
	1916	149	53.5	61	39	.....	.....	.175	.....	.....	1	11	58	11	19	.....	.....	.....	9.37
11 establishments	1916	182	53.6	68	32	.....	.....	.177	.....	.....	3	13	50	16	16	2	.....	.....	9.47
Drawing-frame tenders, male:																			
7 establishments	1916	257	55.0	72	3	7	18	.181	.....	.....	(1)	1	67	19	9	2	1	.....	9.93
Drawing-frame tenders, female:																			
17 establishments	1916	1,773	53.7	78	21	2	.....	.169	.....	1	7	11	64	9	8	(1)	.....	.....	9.10
Spinners, mule, male:																			
19 establishments	1907	384	58.6	.....	13	38	49	.219	.....	1	1	3	11	19	45	20	1	.....	12.83
	1908	267	58.2	.....	18	43	39	.215	.....	1	3	6	9	18	37	25	1	.....	12.51
	1909	297	58.2	.....	16	47	37	.223	.....	.....	1	3	14	16	34	30	2	(1)	12.98
	1910	320	57.5	.....	38	40	22	.223	.....	(1)	(1)	3	8	18	41	27	2	.....	12.82
26 establishments	1910	529	57.0	.....	61	26	13	.224	.....	(1)	(1)	2	8	15	47	25	2	.....	12.75
	1911	454	56.9	.....	63	22	15	.231	.....	(1)	(1)	1	7	12	47	30	4	.....	13.16
40 establishments	1911	638	57.3	.....	49	38	13	.224	.....	(1)	(1)	2	9	15	53	18	3	.....	12.81
	1912	719	56.5	35	15	38	11	.240	.....	.....	(1)	1	5	10	42	34	8	.....	13.56
	1913	759	56.4	34	17	42	7	.238	.....	(1)	1	1	9	10	39	29	10	(1)	13.39

42 establishments	1913	828	56.5	30	21	41	8	.239	.....	(1)	1	1	8	10	38	31	10	(1)	13.45
	1914	856	55.8	50	18	19	13	.252	.....	(1)	.....	1	4	8	39	32	15	1	14.03
42 establishments	1914	897	56.0	48	17	19	17	.249	.....	(1)	.....	1	4	12	37	31	14	1	13.88
	1916	1,164	55.4	57	16	19	8	.319	.....	.....	.....	(1)	(1)	(1)	20	19	49	12	17.70
47 establishments	1916	1,224	55.3	56	17	18	8	.317	.....	.....	.....	(1)	(1)	(1)	20	21	47	11	17.51
Spinners, frame, male:																			
2 establishments	1910	114	56.0	.....	100	.....	.....	.125	.....	58	26	15	.....	1	.....	.....	.....	.....	7.01
	1911	134	56.0	.....	100	.....	.....	.129	4	34	36	24	1	.....	.....	.....	.....	.....	7.21
3 establishments	1911	194	56.0	.....	100	.....	.....	.132	3	27	33	36	1	.....	.....	.....	.....	.....	7.37
	1912	244	54.0	100	.....	.....	.....	.158	.....	.....	3	83	14	.....	.....	.....	.....	.....	8.53
	1913	115	54.0	100	.....	.....	.....	.136	.....	1	75	24	.....	.....	.....	.....	.....	.....	7.33
3 establishments	1913	115	54.0	100	.....	.....	.....	.136	.....	1	75	24	.....	.....	.....	.....	.....	.....	7.33
	1914	282	53.9	100	.....	.....	.....	.145	.....	3	36	57	4	(1)	.....	.....	.....	.....	7.80
3 establishments	1914	267	53.9	100	.....	.....	.....	.144	.....	3	39	54	4	(1)	.....	.....	.....	.....	7.75
	1916	266	53.9	100	.....	.....	.....	.191	.....	.....	.....	3	21	27	48	.....	.....	.....	10.30
5 establishments	1916	268	53.9	99	(1)	(1)	.....	.191	.....	.....	(1)	3	21	28	48	.....	.....	.....	10.29
Spinners, frame, female:																			
5 establishments	1907	323	57.6	.....	15	79	5	.127	5	36	24	36	.....	.....	.....	.....	.....	.....	7.32
	1908	284	57.5	.....	21	73	6	.122	3	32	65	.....	.....	.....	.....	.....	.....	.....	7.02
	1909	295	57.5	.....	20	75	4	.124	3	20	77	.....	.....	.....	.....	.....	.....	.....	7.13
	1910	286	56.0	.....	94	.....	6	.128	(1)	19	67	14	.....	.....	.....	.....	.....	.....	7.17
8 establishments	1910	578	56.0	.....	97	.....	3	.122	5	47	41	7	.....	.....	.....	.....	.....	.....	6.85
	1911	683	56.0	.....	98	.....	2	.127	1	30	58	11	(1)	.....	.....	.....	.....	.....	7.17
10 establishments	1911	1,002	56.4	.....	80	19	1	.126	1	39	47	13	(1)	.....	.....	.....	.....	.....	7.07
	1912	1,070	55.2	53	32	14	1	.144	1	3	34	53	8	.....	.....	.....	.....	.....	7.92
	1913	751	55.5	43	34	23	.....	.140	(1)	2	42	54	2	(1)	.....	.....	.....	.....	7.78
9 establishments	1913	742	55.5	43	34	23	.....	.140	(1)	2	41	54	2	(1)	.....	.....	.....	.....	7.79
	1914	970	54.2	75	25	.....	.....	.147	.....	1	28	54	16	1	.....	.....	.....	.....	7.95
9 establishments	1914	970	54.2	75	25	.....	.....	.147	.....	1	28	54	16	1	.....	.....	.....	.....	7.99
	1916	1,011	53.9	76	24	.....	.....	.184	.....	(1)	1	7	30	46	17	.....	.....	.....	9.93
16 establishments	1916	1,278	53.9	79	19	2	.....	.176	.....	3	10	8	26	40	14	.....	.....	.....	9.51
Doffers, male:																			
8 establishments	1916	329	51.1	79	15	7	.....	.156	.....	2	17	63	2	5	5	3	2	.....	7.96
Doffers, female:																			
15 establishments	1916	748	52.2	70	28	1	.....	.134	2	9	42	44	1	2	(1)	.....	.....	.....	6.98
Twister tenders, female:																			
7 establishments	1907	186	57.2	.....	42	36	22	.112	10	65	18	7	.....	.....	.....	.....	.....	.....	6.41
	1908	138	57.6	.....	32	41	28	.114	3	54	38	4	.....	.....	.....	.....	.....	.....	6.57
	1909	223	58.0	.....	22	42	36	.112	8	55	31	5	1	.....	.....	.....	.....	.....	6.50
	1910	216	57.2	.....	56	13	31	.114	13	46	31	6	1	1	1	.....	.....	.....	6.52

[1] Less than 1 per cent.

TABLE 1.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS IN THE PRINCIPAL OCCUPATIONS, 1907 TO 1916—Continued.

Occupation, sex, and number of establishments.	Year.	Number of employees.	Average full-time hours per week.	Per cent of employees whose full-time hours per week were—				Average rate of wages per hour.	Per cent of employees whose rates of wages per hour were—									Average full-time weekly earnings.
				54 and under.	Over 54 and under 57	57 and under 60	60 and over.		Under 10 cents.	10 and under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 cents and over.	
Twister tenders, female—Concluded.																			
10 establishments	1910	332	56.9	.....	68	9	23	$0.123	8	47	27	7	1	1	9	.....	.....	.....	$7.16
	1911	342	56.8	.....	75	.....	25	.124	(1)	43	44	7	2	2	2	.....	.....	.....	7.03
12 establishments	1911	600	56.7	.....	76	10	14	.131	1	32	27	34	3	2	2	(1)	.....	.....	7.40
	1912	751	55.7	51	28	5	16	.137	1	22	23	47	6	1	(1)	.....	.....	.....	7.62
	1913	598	55.4	45	38	8	9	.135	1	12	47	34	4	1	1	.....	.....	.....	7.50
11 establishments	1913	578	55.5	43	41	8	9	.136	1	12	46	35	4	1	1	.....	.....	.....	7.55
	1914	884	54.3	74	26	.....	.....	.144	(1)	19	18	51	7	2	1	1	(1)	.....	7.80
11 establishments	1914	884	54.3	74	26	.....	.....	.144	(1)	19	18	51	7	2	1	1	(1)	.....	7.81
	1916	749	54.1	84	16	.....	.....	.177	.....	.....	1	15	35	42	7	1	.....	.....	9.56
28 establishments	1916	1,108	54.2	85	11	5	.....	.173	.....	.....	7	17	35	32	7	1	.....	.....	9.33
Spooler tenders, female:																			
61 establishments	1916	1,683	54.1	81	14	6	.....	.174	(1)	5	7	31	29	7	13	5	3	(1)	9.42
Dresser tenders, male:																			
19 establishments	1907	119	58.8	.....	5	48	47	.224	.....	.....	.....	1	3	6	81	9	.....	.....	13.17
	1908	97	58.4	.....	7	62	31	.225	.....	.....	.....	.....	2	10	74	13	.....	.....	13.14
	1909	126	58.3	.....	13	52	34	.224	.....	.....	.....	.....	10	2	74	15	.....	.....	13.06
	1910	126	57.9	.....	36	29	35	.228	.....	.....	.....	.....	6	1	78	15	.....	.....	13.26
27 establishments	1910	214	57.1	.....	61	18	21	.242	.....	.....	.....	.....	6	2	50	41	2	.....	13.80
	1911	215	57.1	.....	63	16	20	.239	.....	.....	.....	.....	7	4	46	42	1	.....	13.65
46 establishments	1911	337	57.1	.....	58	28	14	.243	.....	.....	.....	.....	4	3	45	46	1	.....	13.85
	1912	384	56.4	28	35	26	11	.262	.....	.....	.....	.....	.....	3	37	51	10	.....	14.71
	1913	346	56.2	28	37	30	5	.261	.....	.....	.....	.....	2	2	35	53	9	.....	14.66
46 establishments	1913	347	56.3	26	37	30	7	.263	.....	.....	.....	.....	1	1	34	55	9	.....	14.80
	1914	356	55.1	64	18	12	7	.274	.....	.....	.....	.....	1	1	25	40	33	.....	15.04
47 establishments	1914	363	55.2	63	17	11	9	.273	.....	.....	.....	.....	1	1	26	40	32	.....	15.03
	1916	374	54.9	67	17	10	6	.317	.....	.....	.....	.....	1	.....	5	25	69	1	17.36

57 establishments	1916	426	55.0	64	19	12	5	.319					(1)		4	24	70	2	17.42
Drawers-in, female:																			
54 establishments	1916	426	54.7	63	25	12		.251	1	1	3	4	5	10	25	29	20	2	13.72
Loom fixers, male:																			
19 establishments	1907	223	58.0		14	63	23	.267					(1)	1	23	70	6		15.49
	1908	218	57.9		15	69	16	.262					(1)	1	22	72	5		15.17
	1909	242	58.1		12	66	22	.263						2	17	77	5		15.28
	1910	260	57.0		66	13	20	.270					1	1	10	82	6		15.39
27 establishments	1910	429	56.6		79	9	12	.279					(1)	1	6	76	17		15.76
	1911	390	56.6		79	9	11	.278					(1)	1	6	77	15		15.70
46 establishments	1911	569	56.7		68	24	8	.275						1	17	63	20		15.59
	1912	589	55.9	38	32	21	9	.308							8	50	38	5	17.13
	1913	578	55.7	40	31	25	3	.298					(1)		9	54	36	(1)	16.56
47 establishments	1913	581	55.8	39	31	26	4	.297					(1)		9	56	35	(1)	16.55
	1914	642	55.0	60	27	7	6	.313							6	45	45	4	17.22
47 establishments	1914	651	55.1	58	27	7	7	.312							6	46	44	4	17.18
	1916	682	54.9	59	28	9	4	.377							(1)	7	59	34	20.66
61 establishments	1916	809	54.8	61	25	10	4	.378							1	6	55	38	20.72
Weavers, male:																			
19 establishments	1907	1,653	58.5		11	45	44	.203	1	4	5	9	13	17	36	11	4	(1)	11.88
	1908	1,409	58.6		3	60	37	.196	1	3	7	13	15	18	32	9	3	(1)	11.49
	1909	1,589	58.6		3	63	34	.199	1	4	7	12	13	16	31	11	4	(1)	11.66
	1910	1,716	57.8		41	27	32	.199	(1)	1	5	10	17	23	33	9	2	(1)	11.50
27 establishments	1910	2,907	57.1		65	17	19	.207	(1)	2	4	9	15	19	33	14	4	(1)	11.79
	1911	2,563	57.1		64	14	21	.210	1	2	4	10	14	15	33	18	4	(1)	11.97
46 establishments	1911	4,049	57.1		60	25	14	.210	1	2	4	9	13	15	35	17	4	(1)	11.97
	1912	4,476	56.3	33	28	24	15	.237	(1)	1	2	5	8	11	34	26	13	(1)	13.30
	1913	3,845	56.1	32	32	32	5	.232	(1)	1	2	5	9	12	33	24	11	1	13.03
47 establishments	1913	3,834	56.3	28	32	34	6	.232	(1)	1	2	5	9	12	33	24	11	1	13.06
	1914	4,312	55.2	61	20	11	8	.238	(1)	1	2	4	7	10	34	29	12	(1)	13.10
48 establishments	1914	4,336	55.2	60	19	11	9	.238	(1)	1	2	4	7	10	34	29	12	(1)	13.10
	1916	4,859	54.9	65	18	13	4	.308	(1)	(1)	1	1	2	3	17	25	41	11	16.86
62 establishments	1916	5,450	54.9	66	17	14	4	.304	(1)	(1)	1	1	2	3	17	26	40	10	16.68
Weavers, female:																			
19 establishments	1907	1,873	58.0		15	63	22	.188	1	4	8	12	16	22	31	6	1		10.90
	1908	1,882	57.7		18	70	12	.166	2	9	14	20	21	17	16	1	(1)	(1)	9.58
	1909	1,807	57.6		22	65	13	.166	3	12	14	17	20	15	16	2	1		9.56
	1910	2,116	56.4		80	8	12	.174	3	8	11	15	17	20	23	2	1	(1)	9.81
27 establishments	1910	2,855	56.3		84	7	9	.180	2	7	10	14	17	19	25	5	1	(1)	10.14
	1911	2,366	56.4		81	6	12	.178	1	8	11	16	18	17	23	5	1	(1)	10.06

[1] Less than 1 per cent.

TABLE 1.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS IN THE PRINCIPAL OCCUPATIONS, 1907 TO 1916—Concluded.

Occupation, sex, and number of establishments.	Year.	Number of employees.	Average full-time hours per week.	Per cent of employees whose full-time hours per week were—				Average rate of wages per hour.	Per cent of employees whose rates of wages per hour were—										Average full-time weekly earnings.
				54 and under.	Over 54 and under 57	57 and under 60	60 and over.		Under 10 cents.	10 and under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 cents and over.	
Weavers, female—Concluded.																			
46 establishments	1911	3,384	56.8	.....	63	28	9	$0.184	1	8	12	16	16	15	23	6	1	(1)	$10.47
	1912	3,586	55.9	39	28	25	8	.206	1	4	5	9	14	17	32	14	5	(1)	11.48
	1913	3,481	55.9	31	32	35	2	.197	(1)	4	9	11	16	18	27	12	3	(1)	11.00
47 establishments	1913	3,493	56.0	30	32	36	2	.197	(1)	4	8	11	16	18	27	12	3	(1)	11.03
	1914	3,789	54.8	53	39	8	.....	.202	1	5	6	9	13	16	30	15	4	(1)	11.06
48 establishments	1914	3,862	54.7	54	39	8	.....	.203	1	5	6	9	13	16	30	15	4	(1)	11.08
	1916	4,021	54.5	57	36	7	.....	.273	(1)	(1)	1	2	4	6	26	29	27	5	14.84
62 establishments	1916	4,641	54.5	61	31	7	.....	.270	(1)	(1)	1	2	4	6	26	30	26	4	14.72
Burlers, female:																			
18 establishments	1907	611	58.3	.....	9	61	30	.122	15	49	18	9	5	3	2	(1)	.....	.....	7.11
	1908	494	58.0	.....	12	69	19	.116	13	52	23	8	3	1	1	.....	.....	.....	6.73
	1909	582	58.0	.....	13	68	20	.123	14	45	18	12	5	2	4	(1)	.....	.....	7.13
	1910	598	56.9	.....	68	16	17	.124	9	48	19	16	4	3	2	.....	.....	.....	7.06
26 establishments	1910	1,034	56.5	.....	81	9	10	.130	8	35	27	14	10	4	2	(1)	.....	.....	7.33
	1911	1,010	56.6	.....	79	8	13	.127	10	34	32	12	8	3	2	(1)	.....	.....	7.20
43 establishments	1911	1,516	56.8	.....	65	27	9	.130	11	31	28	14	9	4	2	(1)	(1)	.....	7.36
	1912	1,471	55.9	48	17	28	7	.147	4	10	44	13	12	7	10	1	(1)	.....	8.22
44 establishments	1912	1,562	55.9	46	17	30	7	.145	5	12	42	13	11	7	9	1	(1)	.....	8.25
	1913	1,635	55.6	45	28	24	2	.146	4	14	39	13	14	8	8	1	(1)	.....	8.13
44 establishments	1913	1,643	55.6	52	20	26	2	.146	4	15	38	13	14	8	8	1	(1)	.....	8.14
	1914	1,755	54.6	55	40	5	.....	.154	3	14	32	12	12	12	12	3	(1)	.....	8.41
44 establishments	1914	1,756	54.6	55	40	4	.....	.155	3	14	32	12	12	12	12	3	(1)	.....	8.47
	1916	1,617	54.6	62	30	8	.....	.189	(1)	2	7	23	18	13	26	12	1	.....	10.32
59 establishments	1916	1,946	54.6	66	25	9	.....	.186	(1)	2	8	24	17	15	24	10	1	.....	10.13
Menders, female:																			
18 establishments	1907	403	58.5	.....	14	39	47	.145		17	30	20	9	8	8	1	.....	.....	8.48
	1908	341	58.4	.....	18	33	49	.148	0	21	18	17	11	10	10	3	.....	.....	8.64

	1909	583	58.8	.....	13	31	57	.137	24	20	14	15	8	7	10	2	.....	.....	8.06
	1910	498	58.0	.....	34	23	43	.148	12	25	16	12	6	16	9	3	1	.....	8.58
25 establishments	1910	1,196	56.8	.....	73	10	18	.160	9	16	14	9	16	17	16	3	(1)	.....	9.09
	1911	1,115	56.9	.....	72	7	21	.159	6	16	13	15	15	20	13	1	(1)	.....	9.05
44 establishments	1911	1,623	56.8	.....	72	14	15	.160	5	15	15	16	14	20	12	1	(1)	.....	9.07
	1912	1,668	55.7	53	20	14	12	.189	2	7	9	11	11	17	34	7	2	(1)	10.50
42 establishments	1912	1,589	55.6	56	20	11	13	.193	1	5	8	11	12	18	36	8	2	(1)	10.71
	1913	1,388	55.3	57	23	16	4	.183	2	5	12	12	15	18	27	7	1	.....	10.11
42 establishments	1913	1,363	55.4	55	23	18	4	.181	2	5	13	12	15	19	27	6	1	.....	10.02
	1914	1,494	54.4	83	8	9	.....	.195	1	4	11	11	11	14	38	9	2	.....	10.56
43 establishments	1914	1,501	54.4	83	8	9	.....	.195	1	4	11	11	10	14	38	9	2	.....	10.57
	1916	1,481	54.2	87	6	6	.....	.245	(1)	1	2	2	5	10	41	22	15	1	13.28
58 establishments	1916	1,916	54.4	82	9	9	.....	.242	(1)	1	1	3	5	12	42	22	13	1	13.13
Laborers, dyehouse, male:																			
19 establishments	1907	434	58.1	.....	12	65	23	.144	.....	.....	41	55	4	(1)	.....	.....	.....	.....	8.37
	1908	385	57.8	.....	16	68	16	.140	.....	.....	71	24	4	(1)	(1)	.....	.....	.....	8.09
	1909	514	57.9	.....	16	63	21	.137	.....	.....	71	23	5	(1)	(1)	.....	.....	.....	7.93
	1910	570	56.5	.....	78	12	10	.142	.....	.....	35	59	5	1	(1)	.....	.....	.....	8.02
27 establishments	1910	837	56.3	.....	85	9	7	.143	.....	(1)	36	52	11	1	(1)	.....	.....	.....	8.06
	1911	877	56.5	.....	82	7	11	.145	.....	(1)	30	59	10	1	(1)	.....	.....	.....	8.16
45 establishments	1911	1,116	56.6	.....	74	17	9	.145	.....	(1)	32	51	15	1	(1)	.....	.....	.....	8.22
	1912	1,093	55.5	51	25	17	7	.157	.....	(1)	7	62	28	2	1	(1)	.....	.....	8.72
	1913	1,033	55.5	46	29	22	2	.159	.....	.....	5	61	27	5	1	.....	.....	.....	8.81
46 establishments	1913	1,041	55.6	45	29	24	3	.159	.....	.....	5	61	28	5	1	.....	.....	.....	8.84
	1914	1,415	54.8	70	18	7	6	.160	.....	(1)	8	54	27	9	1	(1)	.....	.....	8.74
47 establishments	1914	1,427	54.9	69	18	7	7	.160	.....	(1)	8	54	28	9	1	(1)	.....	.....	8.75
	1916	1,560	55.1	60	25	10	5	.196	.....	(1)	(1)	1	5	56	36	1	(1)	.....	10.82
57 establishments	1916	1,651	55.0	60	25	10	5	.197	.....	(1)	(1)	(1)	5	55	37	2	(1)	.....	10.85
Other employees, male:																			
47 establishments	1914	13,947	55.7	61	18	7	14	.180	1	6	13	26	16	9	15	10	3	1	10.03
	1916	13,503	55.7	58	20	9	13	.223	(1)	(1)	2	5	16	27	25	12	12	2	12.43
65 establishments	1916	17,163	55.8	52	26	8	14	.225	(1)	(1)	2	5	13	23	31	13	11	2	12.52
Other employees, female:																			
46 establishments	1914	7,781	54.2	72	24	4	.....	.139	7	19	32	25	7	5	5	2	1	(1)	7.54
	1916	4,242	54.1	72	24	3	(1)	.170	1	3	12	23	34	10	13	2	1	(1)	9.16
63 establishments	1916	6,403	53.9	63	33	4	(1)	.168	1	3	14	23	32	10	13	2	1	(1)	9.04

[1] Less than 1 per cent.

As wages and hours differ in different establishments, the inclusion or exclusion of any establishment in a group may raise or lower the average for the group, so that exact comparisons can be made between the actual wages and hours shown for different years only where the data for the several years are from identical establishments. To illustrate: In the last column of Table 1 it is seen that in 43 establishments the full-time weekly earnings of burlers increased from $7.36 in 1911 to $8.22 in 1912. In 44 establishments there was a decrease from $8.25 in 1912 to $8.13 in 1913. It would not be a proper comparison, however, to state that weekly earnings had increased from $7.36 in 1911 to $8.13 in 1913, because of the change in the number of establishments and of the difference in the average for 1912 in the two groups of establishments.

To aid in making comparisons where the establishments change more or less from year to year, relative or index numbers have been computed for full-time hours per week, rates of wages per hour, and full-time weekly earnings for each selected occupation and for the industry, for the years 1910 to 1916, inclusive. These relative numbers, which are based on the averages in Table 1, are shown in Table 2, and are simply percentages in which the figures for 1916 are taken as the base, or 100 per cent. Thus the facts in percentage form for each preceding year are brought into direct comparison with the facts for the latest year available, namely, 1916. The index numbers for the industry as a whole appear at the end of the table.

TABLE 2.—RELATIVE FULL-TIME HOURS PER WEEK, RATES OF WAGES PER HOUR, AND FULL-TIME WEEKLY EARNINGS, 1910 TO 1916, TOGETHER WITH PER CENT OF INCREASE OR DECREASE IN SPECIFIED YEARS, IN THE PRINCIPAL OCCUPATIONS AND IN THE INDUSTRY.

Occupation, sex, and year.	Hours per week.			Wages per hour.			Weekly earnings.		
	Relative full-time hours per week (1916=100).	Per cent of increase (+) or decrease (−) in—		Relative rate of wages per hour (1916=100).	Per cent of increase (+) or decrease (−) in—		Relative full-time weekly earnings (1916=100).	Per cent of increase (+) or decrease (−) in—	
		1916 as compared with each specified year.	Each specified year as compared with year preceding.		1916 as compared with each specified year.	Each specified year as compared with year preceding.		1916 as compared with each specified year.	Each specified year as compared with year preceding.
Wool sorters, male:									
1910	104	−4	.....	73	+37	.....	76	+32	.....
1911	104	−4	(1)	74	+35	+ 1	77	+30	+ 1
1912	102	−2	−2	82	+22	+11	83	+20	+ 8
1913	102	−2	(1)	86	+16	+ 5	87	+15	+ 5
1914	100	(1)	−2	85	+18	− 1	85	+18	− 2
1916	100	.....	(1)	100	.....	+18	100	.....	+18
Card tenders, male:									
1910	103	−3	.....	67	+49	.....	69	+45	.....
1911	103	−3	(1)	74	+35	+10	76	+32	+10
1912	101	−1	−2	74	+35	(1)	75	+33	− 1
1913	101	−1	(1)	77	+30	+ 4	79	+27	+ 5
1914	100	(1)	−1	79	+27	+ 3	80	+25	+ 1
1916	100	.....	(1)	100	.....	+27	100	.....	+25
Card strippers, male:									
1910	103	−3	.....	74	+35	.....	76	+32	.....
1911	103	−3	(1)	74	+35	(1)	76	+32	(1)
1912	103	−3	(1)	80	+25	+ 8	82	+22	+ 8
1913	102	−2	−1	82	+22	+ 3	83	+20	+ 1
1914	100	(1)	−2	82	+22	(1)	83	+20	(1)
1916	100	.....	(1)	100	.....	+22	100	.....	+20
Comber tenders, male:									
1910	101	−1	.....	71	+41	.....	71	+41	.....
1911	101	−1	(1)	70	+43	− 1	71	+41	(1)
1912	98	+2	−3	78	+28	+11	76	+32	+ 7
1913	98	+2	(1)	78	+28	(1)	76	+32	(1)
1914	99	+1	+1	81	+23	+ 4	80	+25	+ 5
1916	100	.....	+1	100	.....	+23	100	.....	+25
Comber tenders, female:									
1910	105	−5	.....	63	+59	.....	66	+52	.....
1911	104	−4	−1	62	+61	− 2	65	+54	− 2
1912	104	−4	(1)	66	+52	+ 6	69	+45	+ 6
1913	105	−5	+1	67	+49	+ 2	70	+43	+ 1
1914	102	−2	−3	68	+47	+ 1	70	+43	(1)
1916	100	.....	−2	100	.....	+47	100	.....	+43
Spinners, mule, male:									
1910	104	−4	.....	68	+47	.....	70	+43	.....
1911	104	−4	(1)	70	+43	+ 3	72	+39	+ 3
1912	103	−3	−1	75	+33	+ 7	76	+32	+ 6
1913	102	−2	−1	74	+35	− 1	75	+33	− 1
1914	101	−1	−1	78	+28	+ 5	78	+28	+ 4
1916	100	.....	−1	100	.....	+28	100	.....	+28
Spinners, frame, male:									
1910	104	−4	.....	66	+52	.....	69	+45	.....
1911	104	−4	(1)	69	+45	+ 5	71	+41	+ 3
1912	100	(1)	−4	82	+22	+19	82	+22	+15
1913	100	(1)	(1)	71	+41	−13	71	+41	−13
1914	100	(1)	(1)	75	+33	+ 6	75	+33	+ 6
1916	100	.....	(1)	100	.....	+33	100	.....	+33
Spinners, frame, female:									
1910	105	−5	.....	66	+52	.....	69	+45	.....
1911	105	−5	(1)	68	+47	+ 3	72	+39	+ 4
1912	102	−2	−3	78	+28	+15	80	+25	+11
1913	103	−3	+1	76	+32	− 3	79	+27	− 1
1914	101	−1	−2	80	+25	+ 5	81	+23	+ 3
1916	100	.....	−1	100	.....	+25	100	.....	+23
Twister tenders, female:									
1910	105	−5	.....	76	+32	.....	79	+27	.....
1911	105	−5	(1)	75	+33	− 1	78	+28	− 1
1912	103	−3	−2	78	+28	+ 4	80	+25	+ 3
1913	103	−3	(1)	77	+30	− 1	79	+27	− 1
1914	100	(1)	−3	81	+23	+ 5	82	+22	+ 4
1916	100	.....	(1)	100	.....	+23	100	.....	+22

[1] No change.

TABLE 2.—RELATIVE FULL-TIME HOURS PER WEEK, RATES OF WAGES PER HOUR, AND FULL-TIME WEEKLY EARNINGS, 1910 TO 1916, TOGETHER WITH PER CENT OF INCREASE OR DECREASE IN SPECIFIED YEARS, IN THE PRINCIPAL OCCUPATIONS AND IN THE INDUSTRY—Concluded.

Occupation, sex, and year.	Hours per week.			Wages per hour.			Weekly earnings.		
	Relative full-time hours per week (1916=100).	Per cent of increase (+) or decrease (−) in—		Relative rate of wages per hour (1916=100).	Per cent of increase (+) or decrease (−) in—		Relative full-time weekly earnings (1916=100).	Per cent of increase (+) or decrease (−) in—	
		1916 as compared with each specified year.	Each specified year as compared with year preceding.		1916 as compared with each specified year.	Each specified year as compared with year preceding.		1916 as compared with each specified year.	Each specified year as compared with year preceding.
Dresser tenders, male:									
1910	104	−4	.....	78	+28	.....	81	+23	.....
1911	104	−4	(1)	77	+30	− 1	80	+25	− 1
1912	103	−3	−1	83	+20	+ 8	85	+18	+ 6
1913	103	−3	(1)	83	+20	(1)	85	+18	(1)
1914	101	−1	−2	86	+16	+ 4	87	+15	+ 2
1916	100	.....	−1	100	.....	+16	100	.....	+15
Loom fixers, male:									
1910	104	−4	.....	73	+37	.....	76	+32	.....
1911	104	−4	(1)	73	+37	(1)	75	+33	− 1
1912	102	−2	−2	81	+23	+11	83	+20	+11
1913	102	−2	(1)	79	+27	− 2	80	+25	− 4
1914	100	(1)	−2	83	+20	+ 5	83	+20	+ 4
1916	100	.....	(1)	100	.....	+20	100	.....	+20
Weavers, male:									
1910	104	−4	.....	67	+49	.....	70	+43	.....
1911	104	−4	(1)	68	+47	+ 1	71	+41	+ 1
1912	103	−3	−1	77	+30	+13	79	+27	+11
1913	103	−3	(1)	75	+33	− 3	77	+30	− 3
1914	101	−1	−2	77	+30	+ 3	78	+28	+ 1
1916	100	.....	−1	100	.....	+30	100	.....	+28
Weavers, female:									
1910	104	−4	.....	69	+45	.....	71	+41	.....
1911	104	−4	(1)	68	+47	− 1	71	+41	(1)
1912	103	−3	−1	76	+32	+12	78	+28	+10
1913	103	−3	(1)	73	+37	− 4	74	+35	− 5
1914	100	(1)	−3	74	+35	+ 1	75	+33	+ 1
1916	100	.....	(1)	100	.....	+35	100	.....	+33
Burlers, female:									
1910	104	−4	.....	70	+43	.....	73	+37	.....
1911	104	−4	(1)	68	+47	− 3	71	+41	− 3
1912	102	−2	−2	77	+30	+13	80	+25	+13
1913	102	−2	(1)	78	+28	+ 1	79	+27	− 1
1914	100	(1)	−2	82	+22	+ 5	82	+22	+ 4
1916	100	.....	(1)	100	.....	+22	100	.....	+22
Menders, female:									
1910	105	−5	.....	66	+52	.....	69	+45	.....
1911	105	−5	(1)	66	+52	(1)	69	+45	(1)
1912	103	−3	−2	78	+28	+18	80	+25	+16
1913	102	−2	−1	74	+35	− 5	76	+32	− 5
1914	100	(1)	−2	80	+25	+ 8	80	+25	+ 5
1916	100	.....	(1)	100	.....	+25	100	.....	+25
Laborers, dyehouse, male:									
1910	103	−3	.....	73	+37	.....	75	+33	.....
1911	103	−3	(1)	74	+35	+ 1	76	+32	+ 1
1912	101	−1	−2	80	+25	+ 8	81	+23	+ 7
1913	101	−1	(1)	81	+23	+ 1	82	+22	+ 1
1914	100	(1)	−1	82	+22	+ 1	81	+23	− 1
1916	100	.....	(1)	100	.....	+22	100	.....	+23
Other employees, male:									
1914	100	(1)	.....	81	+23	.....	81	+23	.....
1916	100	.....	(1)	100	.....	+23	100	.....	+23
Other employees, female:									
1914	100	(1)	.....	82	+22	.....	82	+22	.....
1916	100	.....	(1)	100	.....	+22	100	.....	+22
The industry:									
1910	104	−4	.....	70	+43	.....	73	+37	.....
1911	104	−4	(1)	70	+43	(1)	73	+37	(1)
1912	102	−2	−2	78	+28	+11	81	+23	+11
1913	102	−2	(1)	77	+30	− 1	79	+27	− 2
1914	100	(1)	−2	79	+27	+ 3	79	+27	(1)
1916	100	.....	(1)	100	.....	+27	100	.....	+27

[1] No change.

The relative number for each year preceding 1916 is the per cent that the average for that year is of the average for 1916. For example, Table 2 shows that relatively the full-time weekly earnings of wool sorters in 1910 were but 76 per cent of their weekly earnings in 1916. In 1911 they had increased to 77 per cent, in 1912 to 83 per cent, in 1913 to 87 per cent, and in 1914 they had fallen back to 85 per cent of their earnings in 1916.

In addition to the relative numbers, which are shown in boldfaced type, Table 2 shows the per cent of increase or decrease in 1916 as compared with each preceding year back to 1910, and also the per cent of increase or decrease in each year as compared with the year immediately preceding.

The method used in computing the relative or index numbers may best be explained by an illustration. Take the rates of wages per hour of male card tenders, for example:

	Number of identical establishments.	Year.					
		1910	1911	1912	1913	1914	1916
Rate of wages per hour	26	$0.127	$0.141				
	40		.136	$0.135			
	40			.135	$0.142		
	38				.144	$0.147	
	41					.147	$0.186
Relative rates of wages per hour		67	74	74	77	79	100

The rate per hour for 1916 is taken as the base (100), then $0.147 divided by $0.186 equals 79.03, or, expressed as a whole number percentage, 79, which becomes the relative number for 1914. The ratio of 1913 to 1914 is $0.144 to $0.147. The relative for 1914, just determined (79), multiplied by .$0.144 and the result divided by $0.147, equals 77, the relative for 1913. The ratio of 1912 to 1913 is $0.135 to $0.142. The relative for 1913, just determined (77), multiplied by $0.135 and the result divided by $0.142 equals 74, the relative for 1912. In like manner the relative numbers are computed for the preceding years. For greater accuracy the relative numbers were carried to one decimal place in the process of computation, but are entered in the table to the nearest whole number.

The reasons for using the data for the most recent year available as the base for relative numbers are: First, the most recent data are believed to be the most accurate and representative; second, comparisons are more often made between recent years than between any others; and, third, this method permits the inclusion of new or additional occupations that it may be found desirable to introduce, and the computing of relatives for such occupations for the years

for which data are available on the same base as that upon which the relatives for other occupations are computed. Thus relative numbers can be shown for "Other employees" for 1914 and 1916, which could not be done if 1910 were taken as the base year, no data being available for that year.

Table 3 is a summary showing, by States, the number and per cent of employees working certain classified percentages of full time during the period for which data were obtained.

This table is divided into two sections, one relating to employees whose time was reported for one week and the other relating to those whose time was reported for two weeks in such a way that it could not be divided. In a majority of establishments a part of the force is on a one-week pay roll and a part on a two-week pay roll, hence such plants have a representation in each section of the table.

A few employees, data concerning whom were incomplete, are omitted from this table.

TABLE 3.—NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED PER CENT OF FULL TIME IN 1916, BY STATES.

One-week pay rolls.

State.	Number of establishments.	Number of employees.	Number and per cent of employees working each classified per cent of full time.									
			100 per cent and over.		Under 100 per cent.		Under 75 per cent.		Under 50 per cent.		Under 25 per cent.	
			Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Connecticut	6	750	579	77	171	23	79	11	31	4	12	2
Maine	12	1,412	972	69	440	31	193	14	98	7	31	2
Massachusetts	12	14,906	11,139	75	3,767	25	1,352	9	648	4	250	2
New Hampshire	7	1,337	800	60	537	40	164	12	78	6	33	2
New Jersey	3	7,106	5,673	80	1,433	20	495	7	263	4	92	1
New York	3	1,758	1,215	69	543	31	314	18	138	8	72	4
Pennsylvania	9	1,967	1,428	73	539	27	163	8	54	3	13	1
Rhode Island	5	4,424	3,470	78	954	22	384	9	213	5	92	2
Vermont	3	1,350	823	61	527	39	298	22	181	13	74	5
Total	60	35,010	26,099	75	8,911	25	3,442	10	1,704	5	669	2

Two-week pay rolls.

Connecticut	6	468	251	54	217	46	72	15	30	6	9	2
Maine	12	827	171	21	656	79	221	27	86	10	36	4
Massachusetts	10	4,292	2,054	48	2,238	52	846	20	410	10	77	2
New Hampshire	6	3,755	1,931	51	1,824	49	575	15	280	7	115	3
New Jersey	3	1,551	1,305	84	246	16	107	7	56	4	17	1
New York	2	158	77	49	81	51	12	8	5	3	.....	.....
Pennsylvania	11	2,745	1,632	59	1,113	41	263	10	120	4	58	2
Rhode Island	5	1,406	963	68	443	32	169	12	60	4	23	2
Vermont	3	406	34	8	372	92	129	32	70	17	19	5
Total	58	15,608	8,418	54	7,190	46	2,394	15	1,117	7	354	2

According to the first section of this table 75 per cent of the employees worked full time or over during the period covered by the pay rolls, and 25 per cent did not work full time. Ten per cent

worked under 75 per cent of full time, and by deduction it is seen that 15 per cent of the employees worked 75 per cent and under 100 per cent of full time. The pay-roll period of the second section being two weeks the proportion of employees making full time is much lower, 54 per cent. Relatively, however, the figures are nearly the same, for if 75 per cent of the force began the second week with a clear record and 75 per cent of this number made full time the second week then 56 per cent ($75 \times .75 = 56$) would work full time in the two weeks.

Table 4 is a summary of General Table D, page 62, showing for each occupation the average full-time hours per week of the establishments in comparison with the average hours actually worked in the pay-roll period reported, and comparing the average full-time weekly earnings with the average amount actually earned in the week. Like Table 3 this table also is divided into two sections, one representing one-week pay rolls, and the other two-week pay rolls. As in Table 3, a few employees have been omitted from Table 4 on account of incomplete data.

TABLE 4.—AVERAGE FULL-TIME HOURS, HOURS ACTUALLY WORKED, FULL-TIME WEEKLY EARNINGS, AND AMOUNTS ACTUALLY EARNED DURING ONE PAY ROLL PERIOD, BY OCCUPATION AND SEX, 1916.

One-week pay rolls.

Occupation and sex.	Number of establishments.	Number of employees.	Average full-time hours per week of establishments.	Average hours actually worked per employee during one week.	Average full-time weekly earnings.	Average amount actually earned per employee during one week.
Wool sorters, male	16	360	54.0	52.7	17.61	17.22
Card tenders, male	44	448	55.8	54.5	10.40	10.15
Card strippers, male	44	261	55.4	56.6	11.46	11.73
Comber tenders, male	9	281	56.3	53.3	11.14	10.63
Comber tenders, female	7	138	53.3	50.0	9.31	8.74
Drawing-frame tenders, male	7	257	55.0	52.8	9.93	9.55
Drawing-frame tenders, female	12	1,477	53.6	49.8	9.17	8.53
Spinners, mule, male	24	636	54.9	51.9	17.54	15.96
Spinners, frame, male	4	267	53.9	50.2	10.30	9.59
Spinners, frame, female	11	974	53.9	50.6	9.73	9.16
Doffers, male	8	329	50.8	44.6	7.96	6.86
Doffers, female	10	483	51.3	47.7	7.14	6.58
Twister tenders, female	23	889	54.2	50.7	9.44	8.83
Spooler tenders, female	54	1,534	54.3	48.2	9.63	8.51
Dresser tenders, male	57	426	55.0	53.1	17.48	16.85
Drawers-in, female	54	426	54.7	47.1	13.72	11.87
Loom fixers, male	53	617	54.9	52.6	20.20	19.41
Burlers, female	54	1,612	54.6	49.2	10.07	9.10
Menders, female	50	1,032	54.7	50.7	12.53	11.66
Laborers, dyehouse, male	52	1,502	55.0	61.4	10.83	12.14
Other employees, male	58	15,415	55.7	55.6	12.73	12.65
Other employees, female	56	5,646	53.9	49.7	9.07	8.39

TABLE 4.—AVERAGE FULL-TIME HOURS, HOURS ACTUALLY WORKED, FULL-TIME WEEKLY EARNINGS, AND AMOUNTS ACTUALLY EARNED DURING ONE PAY ROLL PERIOD, BY OCCUPATION AND SEX, 1916—Concluded.

Two-week pay rolls.

Occupation and sex.	Number of establishments.	Number of employees.	Average full-time hours per two weeks of establishments.	Average hours actually worked per employee during two weeks.	Average full-time biweekly earnings.	Average amount actually earned per employee during two weeks.
Wool sorters, male	5	61	109.3	104.1	37.39	35.57
Card tenders, male	6	90	111.6	104.4	20.65	19.21
Card strippers, male	6	50	111.1	108.8	25.55	24.93
Comber tenders, female	4	44	109.0	105.1	19.94	19.26
Drawing-frame tenders, female	5	296	108.3	100.9	17.42	16.35
Spinners, mule, male	21	485	111.2	98.4	35.28	31.45
Spinners, frame, female	5	304	108.0	98.9	17.60	16.17
Doffers, female	5	265	108.0	92.2	13.57	11.62
Twister tenders, female	5	219	107.9	99.1	17.99	16.77
Spooler tenders, female	7	149	106.5	87.2	14.41	11.94
Loom fixers, male	7	185	109.0	105.2	45.08	43.79
Weavers, male	58	5,100	103.6	94.4	33.54	29.73
Weavers, female	58	4,489	108.9	98.1	29.44	26.64
Burlers, female	5	334	109.3	98.6	20.81	18.81
Menders, female	7	856	108.0	95.8	27.35	24.44
Laborers, dyehouse, male	5	149	110.1	110.8	22.06	22.17
Other employees, male	7	1,685	111.0	98.1	23.64	22.56
Other employees, female	7	757	108.9	95.5	17.56	15.46

EXPLANATION OF SCOPE AND METHOD.

This report includes data from establishments making woolen and worsted materials for ladies' wear, including dress goods and cloakings; materials for men's wear, including suitings and overcoatings; goods for uniforms; flannels; and blankets. All data were secured from pay rolls of the various establishments by agents of the bureau. The number of establishments included or summarized in the report has varied considerably since 1907, as follows:

Identical establishments.

1907 to 1910	19
1910 and 1911	27
1911, 1912, and 1913	46
1913 and 1914	47
1914 and 1916	48

In addition to the 48 establishments from which data were secured for both 1914 and 1916, data were secured from 17 establishments for 1916 only, making a total of 65 establishments from which data for 1916 are presented.

In selecting establishments from which to secure data the bureau undertook to represent all States in which woolen and worsted manufacturing is of material importance, the measure of importance being the number of employees as reported by the United States Census of Manufactures. Table 5 shows, by States, the number of employees in this industry as reported by the United States Census, 1910; the number of establishments from which the bureau secured data for 1916; and the number of employees in such establishments:

TABLE 5.—TOTAL NUMBER OF EMPLOYEES IN WOOLEN AND WORSTED GOODS MANUFACTURING, AND NUMBER OF EMPLOYEES IN ESTABLISHMENTS FOR WHICH DATA ARE SHOWN FOR 1916.

State.	Number of employees reported by United States Census, 1910.	Establishments and employees for which data are shown for 1916 in this report.	
		Number of establishments.	Number of employees.
Massachusetts	53,783	12	19,417
Pennsylvania	27,409	14	4,712
Rhode Island	24,924	5	5,855
New Jersey	12,652	3	8,685
New Hampshire	9,486	7	5,180
New York	9,460	3	2,170
Maine	8,754	12	2,239
Connecticut	7,789	6	1,218
Vermont	2,294	3	1,756
Other States	12,171	.....	.....
Total	168,722	65	51,232

According to the census of 1910, nearly 93 per cent of the total number of employees in the industry are found in the States in which the establishments furnishing information to the Bureau of Labor Statistics are located. The number of employees for which the bureau secured 1916 data and for which detailed information for 1916 is presented in this report is more than 30 per cent of the total in the industry in 1910.

Full-time hours per week are the regular hours during which, under normal conditions, employees in an occupation are on duty. Full-time hours do not in any way indicate the extent of unemployment. Employees may work overtime, or broken time, or be laid off, or a temporary reduction may be made in working hours without affecting the full-time hours as here presented.

The rates of wages per hour appearing in the tables include the wages of timeworkers and the earnings of pieceworkers. All time rates not already on an hourly basis have been reduced to rates per hour, and the earnings of pieceworkers and of persons working at both time and piece rates have been reduced to rates per hour by dividing the earnings by the hours worked. For 1916 the pieceworkers and timeworkers of each occupation are shown separately and also combined as one group.

Where there was no record regularly kept of the actual time worked by employees, the establishments, at the request of the bureau, kept a record for the pay-roll period selected.

The full-time weekly earnings are the earnings of employees working full time, or the earnings on broken time reduced to equivalent earnings for a full week. The actual earnings of employees during one pay-roll period are shown in Table D. In this table low earnings may be due either to a low rate or to broken time.

The averages of full-time hours per week, rates of wages per hour, full-time weekly earnings, and actual earnings are computed by adding the data for each employee and dividing the totals by the number of employees.

Descriptions of all the operations in a representative woolen mill are given later (see p. 84). Figures relating to wages and hours are shown separately for 17 of the more important occupations. The sex of employees is shown for each occupation. Of the 17 occupations tabulated, data are shown for males alone in 7 occupations, for females alone in 5 occupations, and for both males and females in 5 occupations. The occupations, which are arranged in order of manufacture, are as follows:

Wool sorters.
Card tenders.
Card strippers.
Comber tenders.
Drawing frame tenders.
Spinners, mule.
Spinners, frame.
Doffers.
Twister tenders.
Spooler tenders.
Dresser tenders.
Drawers-in.
Loom fixers.
Weavers.
Burlers.
Menders.
Laborers, dyehouse.

All employees not included under any of the above selected occupations are combined and shown under "Other employees."

GENERAL TABLES.

In addition to the text tables already shown four general tables are produced, as follows:

Table A.—Average and classified full-time hours per week and rates of wages per hour, and average full-time weekly earnings, in the United States, by years, 1907 to 1916.

In this table the figures opposite each group of years are for identical establishments. When a second line is shown for 1916 it contains all data secured for 1916, whether or not comparable data for 1914 were available.

Table B.—Average and classified full-time hours per week and rates of wages per hour, and average full-time weekly earnings, in each State, by years, 1914 and 1916.

In this table the figures for both years are for identical establishments, and do not include data from establishments furnishing information for 1916 only.

Table C.—Average and classified full-time hours per week and rates of wages per hour, and average full-time weekly earnings, for pieceworkers and timeworkers, by States, 1916.

This table includes all data secured for 1916, whether or not comparable data for 1914 were available.

Table D.—Average full-time hours, hours actually worked, full-time earnings, and amounts actually earned, and number of employees working each classified per cent of full time and earning each classified amount, during one pay-roll period, for pieceworkers and time-workers, by States, 1916.

This table includes data from all establishments from which information was secured for 1916. The table is divided into two sections, one relating to employees whose time and earnings were reported for one week, and the other relating to those whose time and earnings were reported for two weeks in such a way that they could not be divided. A few employees have been omitted from this table, owing to incomplete data.

The purpose of this table is to compare the time actually worked by employees with the full working time of the establishments, and the average amount actually earned with more or less broken time of some employees, with the possible full-time earnings.

TABLE A.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK, AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS, IN THE UNITED STATES, BY YEARS, 1907 TO 1916.

[In this table the figures opposite each group of years are for identical establishments. When a second line is shown for 1916 it contains all data secured for 1916, whether or no comparable data for 1914 were available.]

Occupation, sex, and number of establishments.	Year.	Number of employees.	Average full-time hours per week.	Average rate of wages per hour.	Average full-time weekly earnings.	Employees whose full-time hours per week were—						Employees whose rates of wages per hour were—										
						Under 54	54	Over 54 and under 57	57 and under 60	60	Over 60	Under 8 cts.	8 and under 9 cts.	9 and under 10 cts.	10 and under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 cts. and over.
Wool sorters, male:																						
11 establishments	1907	184	58.0	$0.233	$13.51	.....	.....	17	145	22	.....	.....	.....	.....	.....	3	5	6	14	82	71	3	.....
	1908	164	57.8	.223	12.89	.....	.....	22	128	14	.....	.....	.....	.....	.....	1	8	16	12	111	16	.....	.....
	1909	186	57.9	.239	13.84	.....	.....	15	156	15	.....	.....	.....	.....	.....	.....	2	1	5	117	61	.....	.....
	1910	193	56.5	.246	13.90	.....	.....	162	9	22	.....	.....	.....	.....	1	.....	7	1	6	47	125	6	.....
18 establishments	1910	289	56.3	.247	13.86	.....	.....	255	12	22	.....	.....	.....	.....	2	.....	10	1	8	63	198	7	.....
	1911	335	56.3	.249	14.03	.....	.....	299	13	23	.....	.....	.....	.....	.....	.....	6	2	3	77	243	4	.....
19 establishments	1911	444	56.4	.241	13.54	.....	.....	369	52	23	.....	.....	.....	.....	.....	.....	5	33	16	128	258	4	.....
	1912	471	55.2	.267	14.72	.....	289	101	66	15	.....	.....	.....	.....	.....	.....	.....	.....	21	82	346	22	.....
	1913	246	55.0	.281	15.43	.....	159	52	35	.....	.....	.....	.....	.....	.....	.....	1	.....	6	12	193	34	.....
14 establishments	1913	246	55.0	.281	15.42	.....	159	52	35	.....	.....	.....	.....	.....	.....	.....	1	.....	6	12	193	34	.....
	1914	372	54.2	.276	14.96	.....	307	63	2	.....	.....	.....	.....	.....	.....	.....	2	3	17	43	228	78	1
15 establishments	1914	381	54.2	.276	14.97	.....	317	63	1	.....	.....	.....	.....	.....	.....	.....	1	3	17	45	235	79	1
	1916	385	54.1	.326	17.67	4	308	70	3	.....	.....	.....	.....	.....	.....	.....	2	1	3	23	26	330	.....
21 establishments	1916	421	54.1	.328	17.77	4	340	74	3	.....	.....	.....	.....	.....	.....	.....	2	1	3	24	30	360	1
Card tenders, male:																						
19 establishments	1907	145	58.6	.126	7.38	.....	.....	13	70	62	.....	1	3	10	27	80	24	.....	.....	.....	.....	.....	.....
	1908	136	58.6	.121	7.09	.....	.....	13	64	59	.....	.....	5	10	34	69	17	1	.....	.....	.....	.....	.....
	1909	134	58.4	.124	7.24	.....	.....	13	74	47	.....	1	3	5	31	73	21	.....	.....	.....	.....	.....	.....
	1910	133	57.3	.125	7.16	.....	.....	69	35	29	.....	.....	1	5	38	65	23	1	.....	.....	.....	.....	.....
26 establishments	1910	201	56.9	.127	7.25	.....	.....	132	40	29	.....	.....	1	5	49	98	46	1	1	.....	.....	.....	.....
	1911	196	56.9	.141	8.02	.....	.....	133	36	27	.....	.....	2	3	60	83	34	14	.....	.....	.....	.....	.....
40 establishments	1911	320	57.1	.136	7.73	.....	.....	176	112	32	.....	.....	2	5	115	122	63	13	.....	.....	.....	.....	.....
	1912	412	56.4	.135	7.64	.....	147	76	137	52	.....	.....	.....	2	76	167	148	18	1	.....	.....	.....	.....
	1913	329	56.3	.142	8.01	.....	106	79	119	25	.....	.....	1	2	22	105	170	27	1	1	.....	.....	.....

38 establishments	1913	333	56.5	.144	8.11	.....	100	73	128	32	.....	.....	1	2	20	102	168	34	5	1	.....	.....	.....
	1914	371	55.9	.147	8.20	.....	182	63	72	44	10	.....	.....	.....	12	149	138	64	6	2	.....	.....	.....
41 establishments	1914	398	56.1	.147	8.26	.....	182	70	76	60	10	.....	.....	.....	16	149	149	69	13	2	.....	.....	.....
	1916	468	56.0	.186	10.38	.....	210	88	82	88	.....	.....	.....	.....	.....	8	15	184	164	81	16	.....	.....
51 establishments	1916	538	55.8	.186	10.39	.....	249	116	85	88	.....	.....	.....	.....	.....	9	17	207	171	118	16	.....	.....
Card strippers, male:																							
18 establishments	1907	89	58.2	.145	8.44	.....	.....	17	38	34	.....	.....	.....	.....	3	30	40	16	.....	.....	.....	.....	.....
	1908	79	58.1	.145	8.42	.....	.....	15	39	25	.....	.....	.....	.....	1	31	36	10	1	.....	.....	.....	.....
	1909	80	58.1	.151	8.77	.....	.....	13	42	25	.....	.....	.....	.....	.....	23	34	19	4	.....	.....	.....	.....
	1910	88	57.7	.151	8.71	.....	.....	32	30	26	.....	.....	.....	.....	1	23	41	18	4	1	.....	.....	.....
27 establishments	1910	162	57.0	.153	8.69	.....	.....	104	32	26	.....	.....	.....	.....	1	24	93	37	6	1	.....	.....	.....
	1911	155	56.9	.153	8.71	.....	.....	100	32	23	.....	.....	.....	.....	.....	20	92	34	8	1	.....	.....	.....
42 establishments	1911	223	57.1	.151	8.62	.....	.....	116	82	25	.....	.....	.....	.....	8	33	127	47	7	1	.....	.....	.....
	1912	240	56.9	.163	9.29	.....	69	37	94	40	.....	.....	.....	.....	.....	4	79	137	13	7	.....	.....	.....
	1913	238	56.4	.167	9.41	.....	69	58	102	9	.....	.....	.....	.....	.....	.....	53	145	37	3	.....	.....	.....
42 establishments	1913	236	56.5	.168	9.46	.....	63	54	107	12	.....	.....	.....	.....	.....	.....	50	142	41	3	.....	.....	.....
	1914	245	55.7	.169	9.42	.....	119	51	50	24	1	.....	.....	.....	2	2	30	180	21	10	.....	.....	.....
43 establishments	1914	250	55.7	.169	9.44	.....	119	51	50	29	1	.....	.....	.....	2	2	30	180	26	10	.....	.....	.....
	1916	269	55.6	.205	11.42	1	141	42	56	29	.....	.....	.....	.....	.....	.....	2	5	72	181	9	.....	.....
50 establishments	1916	311	55.4	.211	11.68	1	160	65	56	29	.....	.....	.....	.....	.....	.....	2	5	74	206	24	.....	.....
Comber tenders, male:																							
4 establishments	1907	52	58.5	.133	7.78	.....	.....	.....	39	13	.....	.....	.....	.....	1	36	15	.....	.....	.....	.....	.....	.....
	1908	29	58.6	.131	7.68	.....	.....	.....	21	8	.....	.....	.....	.....	.....	21	7	1	.....	.....	.....	.....	.....
	1909	29	58.6	.137	8.03	.....	.....	.....	21	8	.....	.....	.....	.....	.....	19	10	.....	.....	.....	.....	.....	.....
	1910	42	57.2	.140	8.01	.....	.....	29	.....	13	.....	.....	.....	.....	.....	14	28	.....	.....	.....	.....	.....	.....
6 establishments	1910	106	56.5	.139	7.87	.....	.....	93	.....	13	.....	.....	.....	.....	.....	58	48	.....	.....	.....	.....	.....	.....
	1911	124	56.5	.138	7.82	.....	.....	108	.....	16	.....	.....	.....	.....	1	74	49	.....	.....	.....	.....	.....	.....
9 establishments	1911	188	56.5	.141	7.94	.....	.....	154	18	16	.....	.....	.....	.....	11	108	50	19	.....	.....	.....	.....	.....
	1912	181	55.1	.156	8.56	.....	130	14	22	15	.....	.....	.....	.....	.....	20	116	21	24	.....	.....	.....	.....
	1913	115	54.8	.156	8.51	.....	89	7	19	.....	.....	.....	.....	.....	.....	9	63	40	3	.....	.....	.....	.....
5 establishments	1913	112	54.8	.156	8.52	.....	89	4	19	.....	.....	.....	.....	.....	.....	8	62	39	3	.....	.....	.....	.....
	1914	215	55.5	.162	9.01	.....	147	17	.....	51	.....	.....	.....	.....	.....	1	116	67	31	.....	.....	.....	.....
6 establishments	1914	228	55.8	.161	9.00	.....	147	17	.....	64	.....	.....	.....	.....	.....	1	129	67	31	.....	.....	.....	.....
	1916	268	56.3	.199	11.20	.....	161	4	.....	103	.....	.....	.....	.....	.....	.....	.....	60	109	98	1	.....	.....
9 establishments	1916	281	56.3	.198	11.14	.....	169	4	5	103	.....	.....	.....	.....	.....	.....	.....	71	111	98	1	.....	.....
Comber tenders, female:																							
4 establishments	1907	101	55.7	.099	5.51	.....	.....	79	18	4	.....	13	20	26	24	8	10	.....	.....	.....	.....	.....	.....
	1908	117	55.8	.099	5.52	.....	.....	91	20	6	.....	2	30	34	32	19	.....	.....	.....	.....	.....	.....	.....
	1909	111	55.8	.102	5.69	.....	.....	85	22	4	.....	.....	20	27	42	22	.....	.....	.....	.....	.....	.....	.....
	1910	110	55.4	.110	6.09	.....	.....	106	.....	4	.....	.....	9	15	66	.....	20	.....	.....	.....	.....	.....	.....

TABLE A.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK, AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS, IN THE UNITED STATES, BY YEARS, 1907 TO 1916—Continued.

Occupation, sex, and number of establishments.	Year.	Number of employees.	Average full-time hours per week.	Average rate of wages per hour.	Average full-time weekly earnings.	Employees whose full-time hours per week were—						Employees whose rates of wages per hour were—											
						Under 54	54	Over 54 and under 57	57 and under 60	60	Over 60	Under 8 cts.	8 and under 9 cts.	9 and under 10 cts.	10 and under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 cts. and over.
Comber tenders, female—Con.																							
6 establishments	1910	129	55.5	$0.111	$6.13	.....	.....	125	.....	4	.....	.....	9	23	69	8	20	.....	.....	.....	.....	.....	.....
	1911	118	55.4	.109	6.02	.....	.....	114	.....	4	.....	.....	.....	14	90	11	3	.....	.....	.....	.....	.....	.....
7 establishments	1911	139	55.8	.109	6.10	.....	.....	114	21	4	.....	.....	.....	14	111	11	3	.....	.....	.....	.....	.....	.....
	1912	150	55.8	.116	6.47	.....	.....	123	20	7	.....	.....	.....	13	99	23	15	.....	.....	.....	.....	.....	.....
	1913	163	56.1	.117	6.57	.....	2	123	25	13	.....	.....	.....	14	86	49	14	.....	.....	.....	.....	.....	.....
6 establishments	1913	161	56.1	.117	6.56	.....	.....	123	25	13	.....	.....	.....	14	86	48	13	.....	.....	.....	.....	.....	.....
	1914	162	54.7	.119	6.53	.....	40	122	.....	.....	.....	.....	.....	29	70	21	41	1	.....	.....	.....	.....	.....
6 establishments	1914	162	54.8	.119	6.52	.....	40	122	.....	.....	.....	.....	.....	29	70	21	41	1	.....	.....	.....	.....	.....
	1916	149	53.5	.175	9.37	34	57	58	.....	.....	.....	.....	.....	.....	.....	1	17	87	16	28	.....	.....	.....
11 establishments	1916	182	53.6	.177	9.47	34	90	58	.....	.....	.....	.....	.....	.....	.....	6	23	91	30	29	3	.....	.....
Drawing-frame tenders, male:																							
7 establishments	1916	257	55.0	.181	9.93	24	162	8	17	46	.....	.....	.....	.....	.....	1	3	173	50	24	4	2	.....
Drawing-frame tenders, female:																							
17 establishments	1916	1,773	53.7	.169	9.10	223	1,155	367	28	.....	.....	.....	.....	.....	13	131	190	1,127	161	150	1	.....	.....
Spinners, mule, male:																							
19 establishments	1907	384	58.6	.219	12.83	.....	.....	48	147	189	.....	.....	.....	.....	3	3	10	41	73	173	78	3	.....
	1908	267	58.2	.215	12.51	.....	.....	48	116	103	.....	.....	.....	.....	4	7	15	24	48	99	67	3	.....
	1909	297	58.2	.223	12.98	.....	.....	48	140	109	.....	.....	.....	.....	.....	3	10	42	47	100	89	5	1
	1910	320	57.5	.223	12.82	.....	.....	122	127	71	.....	.....	.....	.....	1	1	8	27	59	132	87	5	.....
26 establishments	1910	529	57.0	.224	12.75	.....	.....	322	136	71	.....	.....	.....	.....	2	2	12	43	81	248	133	8	.....
	1911	454	56.9	.231	13.16	.....	.....	286	101	67	.....	.....	.....	.....	1	2	5	30	53	212	135	16	.....
40 establishments	1911	638	57.3	.224	12.81	.....	.....	315	242	81	.....	.....	.....	.....	1	3	11	55	95	335	118	20	.....
	1912	719	56.5	.240	13.56	.....	255	107	275	82	.....	.....	.....	.....	.....	2	5	38	75	300	245	54	.....
	1913	759	56.4	.238	13.39	.....	259	132	315	53	.....	.....	.....	.....	1	7	8	68	79	295	223	77	1
42 establishments	1913	828	56.5	.239	13.45	.....	248	171	342	67	.....	.....	.....	.....	1	7	10	68	85	317	260	79	1
	1914	856	55.8	.252	14.03	.....	429	150	166	96	15	.....	.....	.....	1	.....	6	36	67	334	276	127	9

42 establishments	1914	897	56.0	.249	13.88	.....	427	150	166	139	15	.....	.....	.....	1	.....	6	36	110	332	276	127	9
	1916	1,164	55.4	.319	17.70	21	638	184	224	97	.....	.....	.....	.....	.....	.....	1	2	3	231	220	569	138
47 establishments	1916	1,224	55.3	.317	17.51	21	669	213	224	97	.....	.....	.....	.....	.....	.....	1	2	3	246	255	578	139
Spinners, frame, male:																							
2 establishments	1910	114	56.0	.125	7.01	.....	.....	114	.....	.....	.....	.....	.....	.....	66	30	17	.....	1	.....	.....	.....	.....
	1911	134	56.0	.129	7.21	.....	.....	134	.....	.....	.....	.....	.....	6	46	48	32	2	.....	.....	.....	.....	.....
3 establishments	1911	194	56.0	.132	7.37	.....	.....	194	.....	.....	.....	.....	.....	6	53	64	69	2	.....	.....	.....	.....	.....
	1912	244	54.0	.158	8.53	.....	244	.....	.....	.....	.....	.....	.....	.....	.....	7	202	35	.....	.....	.....	.....	.....
	1913	115	54.0	.136	7.33	.....	115	.....	.....	.....	.....	.....	.....	.....	1	86	28	.....	.....	.....	.....	.....	.....
3 establishments	1913	115	54.0	.136	7.33	.....	115	.....	.....	.....	.....	.....	.....	.....	1	86	28	.....	.....	.....	.....	.....	.....
	1914	282	53.9	.145	7.80	3	279	.....	.....	.....	.....	.....	.....	.....	8	101	160	12	1	.....	.....	.....	.....
3 establishments	1914	267	53.9	.144	7.75	3	264	.....	.....	.....	.....	.....	.....	.....	8	103	144	11	1	.....	.....	.....	.....
	1916	266	53.9	.191	10.30	2	264	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	57	73	128	.....	.....	.....
5 establishments	1916	268	53.9	.191	10.29	2	264	1	1	.....	.....	.....	.....	.....	.....	1	8	57	74	128	.....	.....	.....
Spinners, frame, female:																							
5 establishments	1907	323	57.6	.127	7.32	.....	.....	50	256	17	.....	.....	12	3	116	77	115	.....	.....	.....	.....	.....	.....
	1908	284	57.5	.122	7.02	.....	.....	60	208	16	.....	.....	4	4	90	186	.....	.....	.....	.....	.....	.....	.....
	1909	295	57.5	.124	7.13	.....	.....	60	222	13	.....	.....	6	2	59	228	.....	.....	.....	.....	.....	.....	.....
	1910	286	56.0	.128	7.17	.....	.....	269	.....	17	.....	.....	1	.....	53	193	39	.....	.....	.....	.....	.....	.....
8 establishments	1910	578	56.0	.122	6.85	.....	.....	561	.....	17	.....	.....	9	22	269	239	39	.....	.....	.....	.....	.....	.....
	1911	683	56.0	.127	7.17	.....	.....	671	.....	12	.....	.....	.....	4	206	395	75	3	.....	.....	.....	.....	.....
10 establishments	1911	1,002	56.4	.126	7.07	.....	.....	801	189	12	.....	.....	.....	10	390	469	130	3	.....	.....	.....	.....	.....
	1912	1,070	55.2	.144	7.92	.....	567	345	151	7	.....	.....	.....	15	36	365	564	90	.....	.....	.....	.....	.....
	1913	751	55.5	.140	7.78	.....	325	252	174	.....	.....	.....	.....	1	16	315	404	14	1	.....	.....	.....	.....
9 establishments	1913	742	55.5	.140	7.79	.....	316	252	174	.....	.....	.....	.....	1	16	306	404	14	1	.....	.....	.....	.....
	1914	970	54.2	.147	7.95	11	721	238	.....	.....	.....	.....	.....	.....	8	274	524	159	5	.....	.....	.....	.....
9 establishments	1914	970	54.2	.147	7.99	11	721	238	.....	.....	.....	.....	.....	.....	8	274	524	159	5	.....	.....	.....	.....
	1916	1,011	53.9	.184	9.93	64	702	245	.....	.....	.....	.....	.....	.....	1	6	69	299	461	175	.....	.....	.....
16 establishments	1916	1,278	53.9	.176	9.51	92	915	245	26	.....	.....	.....	.....	.....	36	123	99	328	514	178	.....	.....	.....
Doffers, male:																							
8 establishments	1916	329	51.1	.156	7.96	126	133	48	22	.....	.....	.....	.....	.....	8	57	207	7	18	17	10	5	.....
Doffers, female:																							
15 establishments	1916	748	52.2	.134	6.98	191	336	210	11	.....	.....	.....	9	4	64	316	328	6	18	3	.....	.....	.....
Twister tenders, female:																							
7 establishments	1907	186	57.2	.112	6.41	.....	.....	78	67	41	.....	.....	12	7	120	34	13	.....	.....	.....	.....	.....	.....
	1908	138	57.6	.114	6.57	.....	.....	44	56	38	.....	.....	4	.....	75	53	6	.....	.....	.....	.....	.....	.....
	1909	223	58.0	.112	6.50	.....	.....	50	93	80	.....	11	1	5	123	69	11	3	.....	.....	.....	.....	.....
	1910	216	57.2	.114	6.52	.....	.....	120	29	67	.....	23	.....	5	99	67	14	2	3	3	.....	.....	.....
10 establishments	1910	332	56.9	.126	7.16	.....	.....	227	29	76	.....	23	.....	5	156	90	23	2	3	30	.....	.....	.....
	1911	342	56.8	.124	7.03	.....	.....	258	.....	84	.....	.....	.....	1	148	149	23	7	7	7	.....	.....	.....

TABLE A.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK, AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS, IN THE UNITED STATES, BY YEARS, 1907 TO 1916—Continued.

Occupation, sex, and number of establishments.	Year.	Number of employees.	Average full-time hours per week.	Average rate of wages per hour.	Average full-time weekly earnings.	Employees whose full-time hours per week were—						Employees whose rates of wages per hour were—											
						Under 54	54	Over 54 and under 57	57 and under 60	60	Over 60	Under 8 cts.	8 and under 9 cts.	9 and under 10 cts.	10 and under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 cts. and over.
Twister tenders, female—Con.																							
12 establishments	1911	600	56.7	$0.131	$7.40	.....	.....	456	60	84	.....	.....	2	5	190	160	205	18	10	9	1	.....	.....
	1912	751	55.7	.137	7.62	.....	385	209	36	121	.....	.....	.....	11	162	175	352	44	6	1	.....	.....	.....
	1913	598	55.4	.135	7.50	.....	272	227	47	52	.....	.....	.....	4	73	284	202	26	5	4	.....	.....	.....
11 establishments	1913	578	55.5	.136	7.55	.....	246	235	45	52	.....	.....	.....	4	71	264	204	26	5	4	.....	.....	.....
	1914	884	54.3	.144	7.80	.....	652	232	.....	.....	.....	.....	.....	1	170	159	451	64	18	10	8	3	.....
11 establishments	1914	884	54.3	.144	7.81	.....	652	232	.....	.....	.....	.....	.....	1	170	159	451	64	18	10	8	3	.....
	1916	749	54.1	.177	9.56	5	627	117	.....	.....	.....	.....	.....	.....	.....	5	110	261	314	55	4	.....	.....
28 establishments	1916	1,108	54.2	.173	9.33	11	930	117	50	.....	.....	.....	.....	.....	.....	81	191	392	360	76	8	.....	.....
Spooler tenders, female:																							
61 establishments	1916	1,683	54.1	.174	9.42	70	1,288	230	95	.....	.....	1	3	.....	83	115	524	489	123	211	89	44	1
Dresser tenders, male:																							
19 establishments	1907	119	58.8	.224	13.17	.....	.....	6	57	56	.....	.....	.....	.....	.....	.....	1	4	7	96	11	.....	.....
	1908	97	58.4	.225	13.14	.....	.....	7	60	30	.....	.....	.....	.....	.....	.....	.....	2	10	72	13	.....	.....
	1909	126	58.3	.224	13.06	.....	.....	17	66	43	.....	.....	.....	.....	.....	.....	.....	12	2	93	19	.....	.....
	1910	126	57.9	.228	13.26	.....	.....	45	37	44	.....	.....	.....	.....	.....	.....	.....	8	1	98	19	.....	.....
27 establishments	1910	214	57.1	.242	13.80	.....	.....	131	39	44	.....	.....	.....	.....	.....	.....	.....	12	4	106	87	5	.....
	1911	215	57.1	.239	13.65	.....	.....	136	35	44	.....	.....	.....	.....	.....	.....	.....	15	8	99	90	3	.....
46 establishments	1911	337	57.1	.243	13.85	.....	.....	196	94	47	.....	.....	.....	.....	.....	.....	.....	15	10	152	155	5	.....
	1912	384	56.4	.262	14.71	.....	108	136	98	42	.....	.....	.....	.....	.....	.....	.....	.....	11	141	194	38	.....
	1913	346	56.2	.261	14.66	.....	98	129	103	16	.....	.....	.....	.....	.....	.....	.....	6	7	120	183	30	.....
46 establishments	1913	347	56.3	.263	14.80	.....	91	129	104	23	.....	.....	.....	.....	.....	.....	.....	5	3	117	192	30	.....
	1914	356	55.1	.274	15.04	.....	227	63	41	25	.....	.....	.....	.....	.....	.....	.....	3	4	88	144	117	.....
47 establishments	1914	363	55.2	.273	15.03	.....	227	63	41	32	.....	.....	.....	.....	.....	.....	.....	3	4	95	144	117	.....
	1916	374	54.9	.317	17.36	.....	251	63	39	21	.....	.....	.....	.....	.....	.....	.....	2	.....	17	93	257	5
57 establishments	1916	426	55.0	.319	17.48	.....	271	82	52	21	.....	.....	.....	.....	.....	.....	.....	2	.....	17	102	298	7

Drawers-in, female:																						
54 establishments	1916	426	54.7	.251	13.72	.....	267	106	53	.....	.....	1	1	1	4	13	18	23	43	107	122	85	8
Loom fixers, male:																						
19 establishments	1907	223	58.0	.267	15.49	.....	.....	31	140	52	.....	.....	.....	.....	.....	.....	.....	1	2	51	135	14	.....
	1908	218	57.9	.262	15.17	.....	.....	32	151	35	.....	.....	.....	.....	.....	.....	.....	1	3	47	157	10	.....
	1909	242	58.1	.263	15.28	.....	.....	29	160	53	.....	.....	.....	.....	.....	.....	.....	.....	4	41	186	11	.....
	1910	260	57.0	.270	15.39	.....	.....	172	35	53	.....	.....	.....	.....	.....	.....	.....	2	3	27	212	16	.....
27 establishments	1910	429	56.6	.279	15.76	.....	.....	338	38	53	.....	.....	.....	.....	.....	.....	.....	2	3	27	326	71	.....
	1911	390	56.6	.278	15.70	.....	.....	309	37	44	.....	.....	.....	.....	.....	.....	.....	1	4	24	301	60	.....
46 establishments	1911	569	56.7	.275	15.59	.....	.....	389	136	44	.....	.....	.....	.....	.....	.....	.....	.....	3	98	357	111	.....
	1912	589	55.9	.308	17.13	.....	222	191	125	51	.....	.....	.....	.....	.....	.....	.....	.....	.....	46	292	222	29
	1913	578	55.7	.298	16.56	.....	234	182	142	20	.....	.....	.....	.....	.....	.....	.....	1	.....	50	315	210	2
47 establishments	1913	581	55.8	.297	16.55	.....	224	182	151	24	.....	.....	.....	.....	.....	.....	.....	1	.....	50	325	203	2
	1914	642	55.0	.313	17.22	.....	382	175	48	37	.....	.....	.....	.....	.....	.....	.....	.....	.....	40	291	287	24
47 establishments	1914	651	55.1	.312	17.18	.....	380	175	48	48	.....	.....	.....	.....	.....	.....	.....	.....	.....	42	298	287	24
	1916	682	54.9	.377	20.66	5	398	188	61	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	49	399	231
61 establishments	1916	809	54.8	.378	20.72	5	488	206	80	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	51	443	310
Weavers, male:																						
19 establishments	1907	1,653	58.5	.203	11.88	.....	.....	185	743	725	.....	.....	4	10	70	82	148	221	281	588	185	60	4
	1908	1,409	58.6	.196	11.49	.....	.....	43	849	517	.....	2	6	9	38	101	177	208	254	445	120	43	6
	1909	1,589	58.6	.199	11.66	.....	.....	49	1,001	539	.....	4	5	9	62	113	193	213	247	497	172	68	6
	1910	1,716	57.8	.199	11.50	.....	.....	704	468	544	.....	.....	1	4	25	79	175	288	393	562	160	27	2
27 establishments	1910	2,907	57.1	.207	11.79	.....	.....	1,880	483	544	.....	.....	3	10	52	124	249	443	552	956	393	117	8
	1911	2,563	57.1	.210	11.97	.....	.....	1,653	361	549	.....	.....	6	14	48	102	248	352	383	834	471	101	4
46 establishments	1911	4,049	57.1	.210	11.97	.....	.....	2,430	1,032	587	.....	.....	8	27	85	170	358	509	619	1,411	703	154	5
	1912	4,476	56.3	.237	13.30	.....	1,494	1,257	1,057	668	.....	.....	2	6	50	104	202	336	474	1,528	1,184	574	16
	1913	3,845	56.1	.232	13.03	.....	1,227	1,213	1,220	185	.....	.....	.....	7	53	87	206	355	460	1,281	942	434	20
47 establishments	1913	3,834	56.3	.232	13.06	.....	1,072	1,213	1,316	233	.....	.....	.....	7	57	86	202	352	463	1,280	939	428	20
	1914	4,312	55.2	.238	13.10	.....	2,617	845	487	363	.....	.....	5	11	41	100	185	303	450	1,450	1,230	520	17
48 establishments	1914	4,336	55.2	.238	13.10	.....	2,617	845	487	387	.....	.....	5	11	42	100	185	303	452	1,464	1,237	520	17
	1916	4,859	54.9	.308	16.86	87	3,066	894	617	195	.....	.....	.....	2	12	28	50	77	123	823	1,221	1,968	555
62 establishments	1916	5,450	54.9	.304	16.68	87	3,497	929	742	195	.....	.....	1	2	16	35	61	92	156	931	1,408	2,177	571
Weavers, female:																						
19 establishments	1907	1,873	58.0	.188	10.90	.....	.....	280	1,186	407	.....	.....	4	13	72	148	225	300	419	572	109	11	.....
	1908	1,882	57.7	.166	9.58	.....	.....	343	1,314	225	.....	.....	14	18	174	256	370	402	312	305	27	3	1
	1909	1,807	57.6	.166	9.56	.....	.....	406	1,168	233	.....	4	11	36	215	252	302	362	274	298	38	15	.....
	1910	2,116	56.4	.174	9.81	.....	.....	1,697	161	258	.....	4	7	49	168	234	311	364	428	494	44	11	2
27 establishments	1910	2,855	56.3	.180	10.14	.....	.....	2,411	186	258	.....	6	8	54	200	293	387	489	542	704	131	39	2
	1911	2,366	56.4	.178	10.06	.....	.....	1,924	148	294	.....	.....	7	18	188	255	379	435	402	540	121	20	1

TABLE A.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK, AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS, IN THE UNITED STATES, BY YEARS, 1907 TO 1916—Concluded.

Occupation, sex, and number of establishments.	Year.	Number of employees.	Average full-time hours per week.	Average rate of wages per hour.	Average full-time weekly earnings.	Employees whose full-time hours per week were—						Employees whose rates of wages per hour were—											
						Under 54	54	Over 54 and under 57	57 and under 60	60	Over 60	Under 8 cts.	8 and under 9 cts.	9 and under 10 cts.	10 and under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 cts. and over.
Weavers, female—Concluded.																							
46 establishments	1911	3,384	56.8	$0.184	$10.47	.....	.....	2,146	944	294	.....	.....	7	40	267	420	553	557	518	788	195	38	1
	1912	3,586	55.9	.206	11.48	.....	1,390	1,002	909	285	.....	.....	.....	41	130	175	317	505	595	1,135	496	190	2
	1913	3,481	55.9	.197	11.00	.....	1,096	1,111	1,219	55	.....	.....	1	4	130	299	388	563	620	948	422	102	4
47 establishments	1913	3,493	56.0	.197	11.03	.....	1,054	1,111	1,273	55	.....	.....	1	4	129	295	391	562	624	954	426	103	4
	1914	3,789	54.8	.202	11.06	.....	1,998	1,487	304	.....	.....	1	5	49	183	225	344	497	622	1,150	558	149	6
48 establishments	1914	3,862	54.7	.203	11.08	.....	2,071	1,487	304	.....	.....	1	5	49	183	225	348	508	631	1,175	577	154	6
	1916	4,021	54.5	.273	14.84	178	2,106	1,452	285	.....	.....	.....	1	1	14	35	85	161	244	1,032	1,175	1,076	197
62 establishments	1916	4,641	54.5	.270	14.72	178	2,668	1,452	343	.....	.....	.....	1	1	14	40	100	194	279	1,220	1,393	1,198	201
Burlers, female:																							
18 establishments	1907	611	58.3	.122	7.11	.....	.....	57	372	182	.....	6	40	46	297	107	53	29	20	11	2	.....	.....
	1908	494	58.0	.116	6.73	.....	.....	60	342	92	.....	3	39	22	255	114	38	14	6	3	.....	.....	.....
	1909	582	58.0	.123	7.13	.....	.....	73	394	115	.....	2	43	38	259	105	68	31	11	23	2	.....	.....
	1910	598	56.9	.124	7.06	.....	.....	404	95	99	.....	1	19	34	286	113	93	23	18	11	.....	.....	.....
26 establishments	1910	1,034	56.5	.130	7.33	.....	.....	839	96	99	.....	2	29	54	365	275	145	100	38	25	1	.....	.....
	1911	1,010	56.6	.127	7.20	.....	.....	799	79	132	.....	6	27	68	345	320	118	76	29	20	1	.....	.....
43 establishments	1911	1,516	56.8	.130	7.36	.....	.....	979	405	132	.....	6	49	116	471	431	209	138	56	37	2	1	.....
	1912	1,471	55.9	.147	8.22	.....	712	243	412	104	.....	.....	12	47	148	640	191	173	100	145	14	1	.....
44 establishments	1912	1,562	55.9	.145	8.25	.....	724	268	466	104	.....	.....	16	63	190	659	197	175	102	145	14	1	.....
	1913	1,635	55.6	.146	8.13	.....	733	464	398	40	.....	3	5	53	225	634	209	230	136	126	12	2	.....
44 establishments	1913	1,643	55.6	.146	8.14	.....	856	321	426	40	.....	3	5	53	240	620	209	235	138	126	12	2	.....
	1914	1,755	54.6	.154	8.41	21	942	707	85	.....	.....	2	4	40	245	563	210	219	213	208	50	1	.....
44 establishments	1914	1,756	54.6	.155	8.47	21	950	707	78	.....	.....	2	4	40	238	563	210	219	213	216	50	1	.....
	1916	1,617	54.6	.189	10.32	12	995	488	122	.....	.....	.....	.....	3	25	111	365	286	205	421	189	12	.....
59 establishments	1916	1,946	54.6	.186	10.13	12	1,263	488	183	.....	.....	.....	.....	3	34	149	471	337	288	460	191	13	.....

Menders, female:																						
18 establishments	1907	403	58.5	.145	8.48	.....	.....	57	158	188	.....	.....	2	27	68	119	81	37	34	31	4	.....	.....
	1908	341	58.4	.148	8.64	.....	.....	61	112	168	.....	3	8	22	71	61	57	39	35	35	10	.....	.....
	1909	583	58.8	.137	8.06	.....	.....	73	179	331	.....	3	44	91	117	82	86	49	42	58	11	.....	.....
	1910	498	58.0	.148	8.58	.....	.....	170	116	212	.....	1	14	44	125	81	58	30	82	43	16	4	.....
25 establishments	1910	1,196	56.8	.160	9.09	.....	.....	868	116	212	.....	3	25	78	190	168	113	188	200	194	32	5	.....
	1911	1,115	56.9	.159	9.05	.....	.....	801	75	239	.....	1	13	52	179	149	165	168	227	140	16	5	.....
44 establishments	1911	1,623	56.8	.160	9.07	.....	.....	1,161	223	239	.....	1	13	74	237	243	264	228	332	200	23	8	.....
	1912	1,668	55.7	.189	10.50	.....	892	339	236	201	.....	.....	4	27	120	144	180	184	284	572	124	27	
42 establishments	1912	1,589	55.6	.193	10.71	.....	892	314	182	201	.....	.....	.....	11	81	133	174	183	282	572	124	27	2
	1913	1,388	55.3	.183	10.11	.....	797	314	221	56	.....	3	9	15	72	168	170	208	253	377	95	18	.....
42 establishments	1913	1,363	55.4	.181	10.02	.....	749	314	244	56	.....	3	9	15	73	171	170	208	253	363	84	14	.....
	1914	1,494	54.4	.195	10.56	13	1,231	119	131	.....	.....	2	4	6	56	161	161	157	212	569	134	32	.....
43 establishments	1914	1,501	54.4	.195	10.57	13	1,238	119	131	.....	.....	2	4	6	56	161	161	157	212	575	135	32	.....
	1916	1,481	54.2	.245	13.28	12	1,281	96	92	.....	.....	.....	.....	1	18	23	37	67	151	613	332	217	22
58 establishments	1916	1,916	54.4	.242	13.13	12	1,552	181	171	.....	.....	.....	.....	1	18	23	50	98	225	809	421	249	22
Laborers, dyehouse, male:																							
19 establishments	1907	434	58.1	.144	8.37	.....	.....	50	283	101	.....	.....	.....	.....	.....	177	237	19	1	.....	.....	.....	.....
	1908	385	57.8	.140	8.09	.....	.....	63	260	62	.....	.....	.....	.....	.....	273	94	16	1	1	.....	.....	.....
	1909	514	57.9	.137	7.93	.....	.....	82	324	108	.....	.....	.....	.....	.....	367	118	25	2	2	.....	.....	.....
	1910	570	56.5	.142	8.02	.....	.....	444	70	56	.....	.....	.....	.....	.....	199	338	27	5	1	.....	.....	.....
27 establishments	1910	837	56.3	.143	8.06	.....	.....	708	73	56	.....	.....	.....	.....	1	305	436	88	6	1	.....	.....	.....
	1911	877	56.5	.145	8.16	.....	.....	719	60	98	.....	.....	.....	.....	1	260	517	89	9	1	.....	.....	.....
45 establishments	1911	1,116	56.6	.145	8.22	.....	.....	821	193	102	.....	.....	.....	.....	1	360	573	170	11	1	.....	.....	.....
	1912	1,093	55.5	.157	8.72	.....	551	272	185	75	.....	.....	.....	.....	3	74	678	309	18	10	1	.....	.....
	1913	1,033	55.5	.159	8.81	.....	475	302	231	25	.....	.....	.....	.....	.....	54	635	281	52	11	.....	.....	.....
46 establishments	1913	1,041	55.6	.159	8.84	.....	464	302	245	30	.....	.....	.....	.....	.....	54	633	291	52	11	.....	.....	.....
	1914	1,415	54.8	.160	8.74	.....	985	255	93	82	.....	.....	.....	.....	1	114	768	385	131	15	1	.....	.....
47 establishments	1914	1,427	54.9	.160	8.75	.....	985	255	93	94	.....	.....	.....	.....	1	114	768	395	133	15	1	.....	.....
	1916	1,560	55.1	.196	10.82	.....	935	383	157	68	17	.....	.....	.....	1	1	8	82	881	562	23	1	.....
57 establishments	1916	1,651	55.0	.197	10.85	.....	997	411	158	68	17	.....	.....	.....	1	2	8	82	913	612	32	1	.....
Other employees, male:																							
47 establishments	1914	13,947	55.7	.180	10.03	232	8,212	2,543	1,011	1,443	506	44	45	119	846	1,877	3,563	2,265	1,219	2,048	1,395	451	75
	1916	13,503	55.7	.223	12.43	190	7,697	2,701	1,164	1,330	421	14	2	5	33	274	638	2,112	3,612	3,370	1,568	1,574	301
65 establishments	1916	17,163	55.8	.225	12.52	384	8,556	4,450	1,349	1,847	577	19	5	26	85	385	791	2,227	3,890	5,250	2,217	1,910	358
Other employees, female:																							
46 establishments	1914	7,781	54.2	.139	7.54	290	5,312	1,842	307	.....	.....	199	102	260	1,452	2,452	1,915	514	358	359	128	41	1
	1916	4,242	54.1	.170	9.16	185	2,881	1,036	133	7	.....	25	8	23	125	507	972	1,443	428	557	93	52	9
63 establishments	1916	6,403	53.9	.168	9.04	570	3,460	2,137	229	7	.....	32	19	26	195	900	1,488	2,079	615	834	128	74	13

TABLE B.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK, AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS, IN EACH STATE, BY YEARS, 1914 AND 1916.

[In this table the figures for both years are for identical establishments.]

WOOL SORTERS: Male.

State, and number of establishments.	Year.	Number of employees.	Average full-time hours per week.	Average rate of wages per hour.	Average full-time weekly earnings.	Employees whose full-time hours per week were—						Employees whose rates of wages per hour were—											
						Under 54	54	Over 54 and under 57	57 and under 60	60	Over 60	Under 8 cents.	8 and under 9 cents.	9 and under 10 cents.	10 and under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 cents and over.
Massachusetts:																							
6 establishments	1914	249	54.0	$0.268	$14.47	.....	249	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2	9	33	193	11	.....
	1916	235	54.0	.322	17.40	1	234	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	14	209	.....
New Hampshire:																							
3 establishments	1914	34	54.9	.296	16.23	.....	3	31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	11	21	.....
	1916	39	54.9	.335	18.38	.....	3	36	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	3	34	.....
New Jersey:																							
2 establishments	1914	31	55.5	.238	13.21	.....	.....	31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	12	11	1	1
	1916	36	54.2	.283	15.34	3	.....	33	.....	.....	.....	.....	.....	.....	.....	.....	2	1	1	7	8	17	.....
Rhode Island:																							
2 establishments	1914	65	54.0	.316	17.08	.....	65	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	45	.....
	1916	71	54.0	.361	19.50	.....	71	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	69	.....
Other States:																							
2 establishments	1914	2	56.5	.258	14.41	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	.....
	1916	4	57.3	.263	14.96	.....	.....	1	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2	.....	1	.....
Total:																							
15 establishments	1914	381	54.2	.276	14.97	.....	317	63	1	.....	.....	.....	.....	.....	.....	.....	1	3	17	45	235	79	1
	1916	385	54.1	.326	17.67	4	308	70	3	.....	.....	.....	.....	.....	.....	.....	2	1	3	23	26	330	.....

CARD TENDERS: Male.

Connecticut:																							
5 establishments	1914	29	57.4	$0.152	$8.73	.....	4	10	.....	15	.....	.....	.....	.....	.....	.....	5	13	11	.....	.....	.....	.....
	1916	29	56.0	.180	10.01	.....	7	15	.....	7	.....	.....	.....	.....	.....	.....	3	4	4	15	3	.....	.....
Maine:																							
11 establishments	1914	63	58.2	.140	8.16	.....	.....	.....	56	7	.....	.....	.....	.....	.....	5	30	24	4	.....	.....	.....	.....
	1916	70	58.1	.178	10.32	.....	.....	.....	67	3	.....	.....	.....	.....	.....	.....	3	9	21	33	4	.....	.....
Massachusetts:																							
9 establishments	1914	157	54.6	.144	7.86	.....	140	.....	6	11	.....	.....	.....	.....	.....	.....	107	23	22	.....	.....	.....	.....
	1916	187	55.2	.182	10.06	.....	145	.....	8	34	.....	.....	.....	.....	.....	.....	.....	.....	95	70	22	.....	.....

New Hampshire:																							
6 establishments	1914	45	55.0	.160	8.79		8	35		2						28	10	7					
	1916	67	55.7	.188	10.48		23	30		14							24	18	25				
New Jersey:																							
2 establishments	1914	25	55.4	.147	8.14			25							7	4	1	8	3	2			
	1916	43	55.0	.227	12.47			43										4	2	21	16		
New York:																							
2 establishments	1914	25	60.0	.149	8.94					25							20	5					
	1916	30	60.0	.170	10.18					30								28	2				
Rhode Island:																							
4 establishments	1914	30	54.0	.147	7.93		30								4	3	20	3					
	1916	35	54.0	.180	9.74		35									2	2	8	21	2			
Vermont:																							
2 establishments	1914	24	59.7	.158	9.43				14		10						15	6	3				
	1916	7	57.6	.199	11.48				7										3	4			
Total:																							
41 establishments	1914	398	56.1	.147	8.26		182	70	76	60	10				16	149	149	69	13	2			
	1916	488	56.0	.186	10.38		210	88	82	88						8	15	184	164	81	16		

CARD STRIPPERS: Male.

Connecticut:																							
5 establishments	1914	11	57.6	$0.165	$9.51		1	4		6							2	9					
	1916	16	55.2	.206	11.36		7	7		2									4	12			
Maine:																							
11 establishments	1914	38	58.2	.169	9.81				34	4							1	37					
	1916	48	58.1	.207	12.00				45	3									14	34			
Massachusetts:																							
10 establishments	1914	88	54.3	.169	9.18		82		3	3							5	77	4	2			
	1916	108	54.5	.204	11.14	1	97		1	9							2		17	89			
New Hampshire:																							
7 establishments	1914	51	55.2	.166	9.14		19	26		6							12	35	4				
	1916	52	55.3	.194	10.72		22	23		7								5	24	23			
New Jersey:																							
2 establishments	1914	21	55.3	.169	9.32			21							2	2	5	3	3	6			
	1916	12	55.0	.237	13.03			12											4	1	7		
New York:																							
2 establishments	1914	10	60.0	.171	10.28					10							2	3	5				
	1916	8	60.0	.194	11.66					8									4	4			
Rhode Island:																							
4 establishments	1914	17	54.0	.184	9.96		17										3	5	7	2			
	1916	15	54.0	.217	11.72		15												5	8	2		
Vermont:																							
2 establishments	1914	14	58.2	.174	10.11				13		1							11	3				
	1916	10	57.7	.221	12.73				10											10			
Total:																							
43 establishments	1914	250	55.7	.169	9.44		119	51	50	29	1				2	2	30	180	26	10			
	1916	269	55.6	.205	11.42	1	141	42	56	29							2	5	72	181	9		

TABLE B.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK, AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS, IN EACH STATE, BY YEARS, 1914 AND 1916—Continued.

COMBER TENDERS: Male.

State, and number of establishments.	Year.	Number of employees.	Average full-time hours per week.	Average rate of wages per hour.	Average full-time weekly earnings.	Employees whose full-time hours per week were—						Employees whose rates of wages per hour were—											
						Under 54	54	Over 54 and under 57	57 and under 60	60	Over 60	Under 8 cents.	8 and under 9 cents.	9 and under 10 cents.	10 and under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 cents and over.
Massachusetts:																							
3 establishments	1914	187	55.4	$0.164	$9.06	.....	143	.....	.....	44	.....	.....	.....	.....	.....	.....	99	57	31	.....	.....	.....	.....
	1916	191	55.0	.208	11.45	.....	158	.....	.....	33	.....	.....	.....	.....	.....	.....	.....	.....	92	98	1	.....	.....
Other States:																							
3 establishments	1914	41	57.3	.152	8.72	.....	4	17	.....	20	.....	.....	.....	.....	.....	1	30	10	.....	.....	.....	.....	.....
	1916	77	59.5	.178	10.58	.....	3	4	.....	70	.....	.....	.....	.....	.....	.....	.....	60	17	.....	.....	.....	.....
Total:																							
6 establishments	1914	228	55.8	.161	9.00	.....	147	17	.....	64	.....	.....	.....	.....	.....	1	129	67	31	.....	.....	.....	.....
	1916	268	56.3	.199	11.20	.....	161	4	.....	103	.....	.....	.....	.....	.....	.....	.....	60	109	98	1	.....	.....

COMBER TENDERS: Female.

Total:																							
6 establishments	1914	162	54.8	$0.119	$6.52	.....	40	122	.....	.....	.....	.....	.....	29	70	21	41	1	.....	.....	.....	.....	.....
	1916	149	53.5	.175	9.37	34	57	58	.....	.....	.....	.....	.....	.....	.....	1	17	87	16	28	.....	.....	.....

SPINNERS, MULE: Male.

Connecticut:																							
5 establishments	1914	47	58.1	$0.194	$11.23	.....	5	12	.....	30	.....	.....	.....	.....	1	.....	1	16	12	13	4	.....	.....
	1916	60	56.2	.280	15.62	.....	14	29	.....	17	.....	.....	.....	.....	.....	.....	1	2	.....	22	13	21	1
Maine:																							
11 establishments	1914	123	58.3	.224	13.06	.....	.....	.....	107	16	.....	.....	.....	.....	.....	.....	.....	5	22	70	23	3	.....
	1916	166	58.1	.290	16.84	.....	.....	.....	160	6	.....	.....	.....	.....	.....	.....	.....	.....	3	55	44	56	8
Massachusetts:																							
10 establishments	1914	327	54.1	.268	14.48	.....	318	.....	9	.....	.....	.....	.....	.....	.....	.....	2	1	11	114	118	73	8
	1916	471	54.4	.335	18.25	.....	432	.....	9	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	32	93	293	53
New Hampshire:																							
7 establishments	1914	116	54.9	.239	13.14	.....	42	68	.....	6	.....	.....	.....	.....	.....	.....	1	4	3	70	30	8	.....
	1916	126	54.7	.307	16.76	.....	57	64	.....	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	21	47	46	12

New Jersey:																							
2 establishments	1914	70	55.3	.292	16.14			70										1	1	54	14		
	1916	112	54.1	.372	20.15	21		91												2	77	33	
New York:																							
2 establishments	1914	87	60.0	.236	14.15					87								45	10	12	20		
	1916	89	56.6	.300	17.31		50			39									51	1	8	29	
Rhode Island:																							
3 establishments	1914	62	54.0	.254	13.74		62										1	7	6	13	31	3	1
	1916	85	54.0	.323	17.46		85													15	10	59	1
Vermont:																							
2 establishments	1914	65	58.8	.221	13.01				50		15						1	3	10	41	4	6	
	1916	55	57.8	.264	15.25				55											35	10	9	1
Total:																							
42 establishments	1914	897	56.0	.249	13.88		427	150	166	139	15				1		6	36	110	332	276	127	9
	1916	1,164	55.4	.319	17.70	21	638	184	224	97							1	2	3	231	220	569	138

SPINNERS, FRAME: Male.

Massachusetts:																							
2 establishments	1914	263	53.9	$0.144	$7.76	3	260								8	101	142	11	1				
	1916	260	53.9	.192	10.35	2	258										3	56	73	128			
Other States:																							
1 establishment	1914	4	54.0	.138	7.43		4									2	2						
	1916	6	54.0	.153	8.28		6										5	1					
Total:																							
3 establishments	1914	267	53.9	.144	7.75	3	264								8	103	144	11	1				
	1916	266	53.9	.191	10.30	2	264										8	57	73	128			

SPINNERS, FRAME: Female.

Massachusetts:																							
3 establishments	1914	553	53.8	$0.145	$7.81	11	542								4	179	339	31					
	1916	529	53.9	.188	10.11	8	521										3	101	329	96			
New Jersey:																							
2 establishments	1914	80	55.4	.142	7.86			80							1	22	50	7					
	1916	136	52.9	.194	10.27	56		80									9	56	16	55			
Rhode Island:																							
3 establishments	1914	179	54.0	.145	7.80		179								1	36	132	10					
	1916	181	54.0	.172	9.30		181									1	24	141	8	7			
Other States:																							
1 establishment	1914	158	55.0	.155	8.55			158							2	37	3	111	5				
	1916	165	55.0	.178	9.77			165							1	5	33	1	108	17			
Total:																							
9 establishments	1914	970	54.2	.147	7.99	11	721	238							8	274	524	159	5				
	1916	1,011	53.9	.184	9.93	64	702	245							1	6	69	299	461	175			

TABLE B.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK, AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS, IN EACH STATE, BY YEARS, 1914 AND 1916—Continued.

TWISTER TENDERS: Female.

State, and number of establishments.	Year.	Number of employees.	Average full-time hours per week.	Average rate of wages per hour.	Average full-time weekly earnings.	Employees whose full-time hours per week were—						Employees whose rates of wages per hour were—											
						Under 54	54	Over 54 and under 57	57 and under 60	60	Over 60	Under 8 cents.	8 and under 9 cents.	9 and under 10 cents.	10 and under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 cents and over.
Massachusetts:																							
3 establishments	1914	432	54.0	$0.149	$8.04	.....	432	.....	.....	.....	.....	.....	.....	.....	3	71	331	26	1	.....	.....	.....	.....
	1916	438	53.9	.182	9.78	4	434	.....	.....	.....	.....	.....	.....	.....	1	20	103	289	25	.....	.....	.....	.....
New Jersey:																							
2 establishments	1914	188	55.2	.127	7.02	.....	.....	188	.....	.....	.....	.....	.....	1	77	67	35	7	1	.....	.....	.....	.....
	1916	94	54.9	.163	8.93	1	.....	93	.....	.....	.....	.....	.....	.....	.....	.....	26	60	8	.....	.....	.....	.....
Rhode Island:																							
4 establishments	1914	136	54.0	.165	8.88	.....	136	.....	.....	.....	.....	.....	.....	.....	4	20	76	8	7	10	8	3	.....
	1916	129	54.0	.184	9.93	.....	129	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	97	8	17	4	.....	.....
Other States:																							
2 establishments	1914	128	54.3	.130	7.07	.....	84	44	.....	.....	.....	.....	.....	1	86	1	9	23	9	.....	.....	.....	.....
	1916	88	54.3	.158	8.60	.....	64	24	.....	.....	.....	.....	.....	.....	.....	1	64	1	9	13	.....	.....	.....
Total:																							
11 establishments	1914	884	54.3	.144	7.81	.....	652	232	.....	.....	.....	.....	.....	1	170	159	451	64	18	10	8	3	.....
	1916	749	54.1	.177	9.56	5	627	117	.....	.....	.....	.....	.....	.....	.....	5	110	261	314	55	4	.....	.....

DRESSER TENDERS: Male.

Connecticut:																							
6 establishments	1914	29	56.1	$0.261	$14.62	.....	4	18	.....	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	13	4	.....
	1916	28	55.4	.294	16.29	.....	4	21	.....	3	.....	.....	.....	.....	.....	.....	.....	1	.....	1	12	14	.....
Maine:																							
11 establishments	1914	31	58.2	.228	13.23	.....	.....	.....	28	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	30	1	.....	.....
	1916	32	58.0	.276	16.02	.....	.....	.....	32	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	28	2	.....
Massachusetts:																							
12 establishments	1914	147	54.0	.280	15.13	.....	147	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	83	44	.....
	1916	158	54.0	.332	17.92	.....	158	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	14	136	5

New Hampshire:																						
7 establishments	1914	38	54.7	.269	14.72		11	27											10	18	10	
	1916	38	54.6	.300	16.37		14	24									1		1	16	20	
New York:																						
2 establishments	1914	22	60.0	.278	16.69					22									8	6	8	
	1916	18	60.0	.266	15.97					18									3	14	1	
Rhode Island:																						
5 establishments	1914	65	54.0	.294	15.89		65												4	21	40	
	1916	75	54.0	.338	18.25		75													4	71	
Other States:																						
4 establishments	1914	31	56.4	.251	14.14			18	13										11	2	11	
	1916	25	55.7	.295	16.43			18	7										7	5	13	
Total:																						
47 establishments	1914	363	55.2	.273	15.03		227	63	41	32							3	4	95	144	117	
	1916	374	54.9	.317	17.36		251	63	39	21							2		17	93	257	5

LOOM FIXERS: Male.

Connecticut:																						
6 establishments	1914	20	56.7	$0.298	$16.81		1	12		7									3	9	8	
	1916	20	55.7	.354	19.60		2	15		3										3	17	
Maine:																						
11 establishments	1914	36	58.2	.258	15.02				32	4									15	21		
	1916	43	58.0	.311	18.06				42	1										10	33	
Massachusetts:																						
11 establishments	1914	280	54.0	.326	17.60		280												3	148	112	17
	1916	286	54.0	.410	22.13		286													2	160	124
New Hampshire:																						
7 establishments	1914	83	54.9	.272	14.92		12	71											13	58	12	
	1916	80	54.8	.315	17.27		15	65												16	64	
New Jersey:																						
3 establishments	1914	92	55.8	.334	18.62			92											6	17	62	7
	1916	113	54.8	.387	21.21	5		108											1	8	40	64
New York:																						
2 establishments	1914	37	60.0	.278	16.65					37									2	33	2	
	1916	26	60.0	.302	18.11						26								2	9	15	
Rhode Island:																						
5 establishments	1914	87	54.0	.329	17.78		87													1	86	
	1916	95	54.0	.387	20.92		95													1	56	38
Vermont:																						
2 establishments	1914	16	57.8	.288	16.66				16											11	5	
	1916	19	57.8	.332	19.16				19												19	
Total:																						
47 establishments	1914	651	55.1	.312	17.18		380	175	48	48									42	298	287	24
	1916	682	54.9	.377	20.66	5	398	188	61	30									3	49	399	231

TABLE B.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK, AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS, IN EACH STATE, BY YEARS, 1914 AND 1916—Continued.

WEAVERS: Male.

State, and number of establishments.	Year.	Number of employees.	Average full-time hours per week.	Average rate of wages per hour.	Average full-time weekly earnings.	Employees whose full-time hours per week were—						Employees whose rates of wages per hour were—											
						Under 54	54	Over 54 and under 57	57 and under 60	60	Over 60.	Under 8 cents.	8 and under 9 cents.	9 and under 10 cents.	10 and under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 cents and over.
Connecticut:																							
6 establishments	1914	315	56.5	$0.241	$13.53	.....	10	210	.....	95	.....	.....	.....	.....	2	5	9	22	30	109	103	33	2
	1916	321	55.5	.311	17.22	.....	29	253	.....	39	.....	.....	.....	.....	2	1	1	3	5	39	78	174	18
Maine:																							
11 establishments	1914	326	58.3	.221	12.87	.....	.....	.....	282	44	.....	.....	.....	1	4	16	21	33	34	122	72	23	.....
	1916	432	58.0	.303	17.57	.....	.....	.....	423	9	.....	.....	.....	2	2	4	10	4	12	82	113	157	46
Massachusetts:																							
12 establishments	1914	1,887	54.0	.248	13.41	.....	1,887	.....	.....	.....	.....	.....	2	4	11	23	63	85	174	580	648	286	11
	1916	2,133	54.0	.318	17.15	.....	2,133	.....	.....	.....	.....	.....	.....	.....	2	7	16	24	48	282	506	965	283
New Hampshire:																							
7 establishments	1914	440	54.6	.215	11.74	.....	155	285	.....	.....	.....	.....	.....	4	7	7	22	38	78	206	61	16	1
	1916	475	54.6	.294	16.04	.....	207	260	.....	8	.....	.....	.....	.....	3	2	2	4	7	87	183	161	26
New Jersey:																							
3 establishments	1914	350	55.6	.214	11.86	.....	.....	350	.....	.....	.....	.....	.....	.....	9	33	30	42	38	90	87	21	.....
	1916	468	54.1	.270	14.59	87	.....	381	.....	.....	.....	.....	.....	.....	2	6	10	23	29	123	122	129	24
New York:																							
2 establishments	1914	248	60.0	.225	13.52	.....	.....	.....	.....	248	.....	.....	.....	1	3	.....	5	40	34	123	37	4	1
	1916	139	60.0	.241	14.44	.....	.....	.....	.....	139	.....	.....	.....	.....	.....	.....	1	2	3	84	43	6	.....
Rhode Island:																							
5 establishments	1914	565	54.0	.249	13.45	.....	565	.....	.....	.....	.....	.....	3	1	6	13	31	32	40	145	168	124	2
	1916	697	54.0	.320	17.28	.....	697	.....	.....	.....	.....	.....	.....	.....	1	7	6	13	13	100	146	294	117
Vermont:																							
2 establishments	1914	205	57.8	.235	13.61	.....	.....	.....	205	.....	.....	.....	.....	.....	.....	3	4	11	24	89	61	13	.....
	1916	194	57.8	.330	19.07	.....	.....	.....	194	.....	.....	.....	.....	.....	.....	1	4	4	6	26	30	82	41
Total:																							
48 establishments	1914	4,336	55.2	.238	13.10	.....	2,617	845	487	387	.....	.....	5	11	42	100	185	303	452	1,464	1,237	520	17
	1916	4,859	54.9	.308	16.86	87	3,066	894	617	195	.....	.....	.....	2	12	28	50	77	123	823	1,221	1,968	555

WEAVERS: Female.

Connecticut:																							
6 establishments	1914	47	54.8	$0.212	$11.64	.....	9	38	.....	.....	.....	.....	.....	.....	.....	1	2	7	9	22	5	1	.....
	1916	48	54.7	.336	18.36	.....	15	33	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	10	33	4
Maine:																							
11 establishments	1914	228	58.0	.193	11.21	.....	.....	.....	228	.....	.....	.....	.....	1	8	17	26	32	49	73	19	3	.....
	1916	215	58.0	.272	15.77	.....	.....	.....	215	.....	.....	.....	.....	.....	6	5	5	9	20	45	48	62	15
Massachusetts:																							
12 establishments	1914	1,374	54.0	.228	12.30	.....	1,374	.....	.....	.....	.....	.....	1	5	18	29	82	127	186	447	362	112	5
	1916	1,395	54.0	.298	16.08	.....	1,395	.....	.....	.....	.....	.....	1	.....	.....	5	10	29	56	292	337	531	134
New Hampshire:																							
7 establishments	1914	734	54.9	.193	10.60	.....	57	677	.....	.....	.....	.....	1	8	21	27	53	142	191	244	36	10	1
	1916	576	54.9	.267	14.65	.....	62	514	.....	.....	.....	.....	.....	.....	1	4	7	7	32	143	266	104	12
New Jersey:																							
3 establishments	1914	772	55.2	.168	9.26	.....	.....	772	.....	.....	.....	.....	.....	22	109	110	128	112	107	139	40	5	.....
	1916	1,083	54.2	.252	13.65	178	.....	905	.....	.....	.....	.....	.....	1	5	11	46	79	77	309	315	232	8
New York:																							
2 establishments	1914	179	54.0	.215	11.59	.....	179	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	25	42	76	26	5	.....
	1916	130	54.0	.234	12.61	.....	130	.....	.....	.....	.....	.....	.....	.....	1	.....	1	2	2	82	38	4	.....
Rhode Island:																							
5 establishments	1914	452	54.0	.195	10.52	.....	452	.....	.....	.....	.....	1	3	13	27	41	49	59	40	139	64	16	.....
	1916	504	54.0	.249	13.42	.....	504	.....	.....	.....	.....	.....	.....	.....	1	10	16	34	53	153	147	83	7
Vermont:																							
2 establishments	1914	76	57.9	.234	13.56	.....	.....	.....	76	.....	.....	.....	.....	.....	.....	.....	3	4	7	35	25	2	.....
	1916	70	57.9	.337	19.51	.....	.....	.....	70	.....	.....	.....	.....	.....	.....	.....	.....	1	3	8	14	27	17
Total:																							
48 establishments	1914	3,862	54.7	.203	11.08	.....	2,071	1,487	304	.....	.....	1	5	49	183	225	348	508	631	1,175	577	154	6
	1916	4,021	54.5	.273	14.84	178	2,106	1,452	285	.....	.....	.....	1	1	14	35	85	161	244	1,032	1,175	1,076	197

BURLERS: Female.

Connecticut:																							
6 establishments	1914	54	54.9	$0.166	$9.11	.....	5	49	.....	.....	.....	.....	.....	.....	11	6	11	9	4	11	2	.....	.....
	1916	47	54.8	.196	10.73	.....	8	39	.....	.....	.....	.....	.....	.....	.....	7	3	5	9	18	5	.....	.....
Maine:																							
9 establishments	1914	50	58.0	.109	6.32	.....	.....	.....	50	.....	.....	.....	.....	15	26	6	3	.....	.....	.....	.....	.....	.....
	1916	63	58.0	.152	8.81	.....	.....	.....	63	.....	.....	.....	.....	.....	2	13	34	3	4	7	.....	.....	.....
Massachusetts:																							
10 establishments	1914	739	53.8	.149	8.08	21	718	.....	.....	.....	.....	2	2	6	54	319	122	107	61	63	3	.....	.....
	1916	714	54.0	.191	10.29	2	712	.....	.....	.....	.....	.....	.....	1	3	28	192	169	68	166	79	8	.....
New Hampshire:																							
7 establishments	1914	358	55.0	.171	9.42	.....	14	344	.....	.....	.....	.....	1	2	5	116	24	34	85	80	11	.....	.....
	1916	263	54.9	.188	10.33	.....	30	233	.....	.....	.....	.....	.....	.....	.....	5	79	16	44	102	17	.....	.....
New Jersey:																							
3 establishments	1914	314	55.8	.134	7.49	.....	.....	314	.....	.....	.....	.....	.....	12	102	93	41	30	19	16	1	.....	.....
	1916	226	54.8	.180	9.84	10	.....	216	.....	.....	.....	.....	.....	.....	2	17	30	77	42	45	12	1	.....

TABLE B.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK, AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS, IN EACH STATE, BY YEARS, 1914 AND 1916—Continued.

BURLERS: Female—Concluded.

State, and number of establishments.	Year.	Number of employees.	Average full-time hours per week.	Average rate of wages per hour.	Average full-time weekly earnings.	Employees whose full-time hours per week were—						Employees whose rates of wages per hour were—											
						Under 54	54	Over 54 and under 57	57 and under 60	60	Over 60.	Under 8 cents.	8 and under 9 cents.	9 and under 10 cents.	10 and under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 cents and over.
New York:																							
2 establishments	1914	68	54.0	$0.193	$10.40	.....	68	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18	30	20	.....	.....	.....
	1916	64	54.0	.205	11.07	.....	64	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	23	40	.....	.....	.....
Rhode Island:																							
5 establishments	1914	145	54.0	.185	9.97	.....	145	.....	.....	.....	.....	.....	1	4	23	22	8	19	12	22	33	1	.....
	1916	181	54.0	.215	11.64	.....	181	.....	.....	.....	.....	.....	.....	2	13	16	12	12	10	40	73	3	.....
Vermont:																							
2 establishments	1914	28	57.7	.134	7.73	.....	.....	.....	28	.....	.....	.....	.....	1	17	1	1	2	2	4	.....	.....	.....
	1916	59	57.8	.152	8.76	.....	.....	.....	59	.....	.....	.....	.....	.....	5	25	14	4	5	3	3	.....	.....
Total:																							
44 establishments	1914	1,756	54.6	.155	8.47	21	950	707	78	.....	.....	2	4	40	238	563	210	219	213	216	50	1	.....
	1916	1,617	54.6	.189	10.32	12	995	488	122	.....	.....	.....	.....	3	25	111	365	286	205	421	189	12	.....

MENDERS: Female.

Connecticut:																							
6 establishments	1914	60	54.9	$0.201	$11.04	.....	6	54	.....	.....	.....	.....	.....	.....	3	2	3	5	12	32	3	.....	.....
	1916	53	54.8	.256	14.05	.....	8	45	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	3	23	21	1	3
Maine:																							
10 establishments	1914	109	58.0	.144	8.37	.....	.....	.....	109	.....	.....	.....	.....	.....	2	59	26	22	.....	.....	.....	.....	.....
	1916	82	58.0	.185	10.74	.....	.....	.....	82	.....	.....	.....	.....	.....	1	.....	2	16	55	8	.....	.....	.....
Massachusetts:																							
11 establishments	1914	848	53.9	.197	10.63	13	835	.....	.....	.....	.....	2	4	4	33	76	99	78	111	344	82	20	.....
	1916	880	53.9	.249	13.37	12	868	.....	.....	.....	.....	.....	.....	1	14	16	27	43	69	308	241	146	15
New Hampshire:																							
6 establishments	1914	51	54.6	.179	9.76	.....	19	32	.....	.....	.....	.....	.....	1	7	3	.....	16	3	20	1	.....	.....
	1916	42	54.5	.215	11.75	.....	19	23	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	10	29	2	.....	.....
New York:																							
2 establishments	1914	138	54.0	.196	10.60	.....	138	.....	.....	.....	.....	.....	.....	.....	3	5	11	23	34	51	11	.....	.....
	1916	82	54.0	.214	11.54	.....	82	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	70	2	1	.....

Rhode Island:																						
5 establishments	1914	240	54.0	.205	11.06	.....	240	.....	.....	.....	.....	.....	.....	1	4	11	12	17	46	121	25	3	.....
	1916	304	54.0	.256	13.83	.....	304	.....	.....	.....	.....	.....	.....	.....	3	5	5	6	5	171	59	46	4
Other States:																							
3 establishments	1914	55	56.2	.219	12.20	.....	.....	33	22	.....	.....	.....	.....	.....	4	5	10	1	6	7	13	9	.....
	1916	38	55.7	.301	16.68	.....	.....	28	10	.....	.....	.....	.....	.....	.....	.....	3	1	.....	4	7	23	.....
Total:																							
43 establishments	1914	1,501	54.4	.195	10.57	13	1,238	119	131	.....	.....	2	4	6	56	161	161	137	212	575	135	32	.....
	1916	1,481	54.2	.245	13.28	12	1,281	96	92	.....	.....	.....	.....	1	18	23	37	67	151	613	332	217	22

LABORERS, DYEHOUSE: Male.

Connecticut:																						
5 establishments	1914	44	56.5	$0.161	$9.11	.....	3	27	.....	14	.....	.....	.....	.....	.....	.....	20	24	.....	.....	.....	.....	.....
	1916	55	55.5	.198	10.98	.....	8	40	.....	7	.....	.....	.....	.....	.....	.....	.....	7	20	28	.....	.....	.....
Maine:																							
11 establishments	1914	59	58.2	.160	9.28	.....	.....	.....	54	5	.....	.....	.....	.....	.....	1	30	26	2	.....	.....	.....	.....
	1916	58	58.0	.194	11.25	.....	.....	.....	58	.....	.....	.....	.....	.....	.....	.....	.....	3	51	4	.....	.....	.....
Massachusetts:																							
12 establishments	1914	701	54.0	.158	8.51	.....	701	.....	.....	.....	.....	.....	.....	.....	.....	.....	517	157	18	.....	.....	.....	.....
	1916	791	54.1	.194	10.52	.....	774	.....	.....	17	.....	.....	.....	.....	.....	.....	.....	1	584	205	1	.....	.....
New Hampshire:																							
7 establishments	1914	122	54.8	.178	9.78	.....	23	99	.....	.....	.....	.....	.....	.....	.....	1	4	45	70	1	1	.....	.....
	1916	143	54.9	.201	11.00	.....	20	123	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	31	108	.....	.....	.....
New Jersey:																							
3 establishments	1914	129	55.3	.173	9.53	.....	.....	129	.....	.....	.....	.....	.....	.....	.....	2	26	54	36	11	.....	.....	.....
	1916	237	55.7	.213	11.89	.....	.....	220	.....	.....	17	.....	.....	.....	1	.....	1	.....	49	163	22	1	.....
New York:																							
2 establishments	1914	75	60.0	.141	8.47	.....	.....	.....	.....	75	.....	.....	.....	.....	.....	50	13	10	2	.....	.....	.....	.....
	1916	44	60.0	.174	10.41	.....	.....	.....	.....	44	.....	.....	.....	.....	.....	1	.....	30	9	4	.....	.....	.....
Rhode Island:																							
5 establishments	1914	258	54.0	.155	8.35	.....	258	.....	.....	.....	.....	.....	.....	.....	1	50	139	61	4	3	.....	.....	.....
	1916	209	55.8	.188	10.50	.....	133	.....	76	.....	.....	.....	.....	.....	.....	1	7	37	114	50	.....	.....	.....
Vermont:																							
2 establishments	1914	39	57.8	.160	9.24	.....	.....	.....	39	.....	.....	.....	.....	.....	.....	1	19	18	1	.....	.....	.....	.....
	1916	23	57.8	.190	10.98	.....	.....	.....	23	.....	.....	.....	.....	.....	.....	.....	.....	.....	23	.....	.....	.....	.....
Total:																							
47 establishments	1914	1,427	54.9	.160	8.75	.....	985	255	93	94	.....	.....	.....	.....	1	114	768	395	133	15	1	.....	.....
	1916	1,560	55.1	.196	10.82	.....	935	383	157	68	17	.....	.....	.....	1	1	8	82	881	562	23	1	.....

TABLE B.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK, AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS, IN EACH STATE, BY YEARS, 1914 AND 1916—Concluded.

OTHER EMPLOYEES: Male.

State, and number of establishments.	Year.	Number of employees.	Average full-time hours per week.	Average rate of wages per hour.	Average full-time weekly earnings.	Employees whose full-time hours per week were—						Employees whose rates of wages per hour were—											
						Under 54	54	Over 54 and under 57	57 and under 60	60	Over 60	Under 8 cents.	8 and under 9 cents.	9 and under 10 cents.	10 and under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 cents and over.
Connecticut:																							
6 establishments	1914	366	56.8	$0.205	$11.61	.....	78	178	3	96	11	1	6	5	12	10	56	72	39	67	66	22	10
	1916	382	55.9	.232	12.97	.....	107	231	1	28	15	1	2	.....	8	17	5	25	76	119	73	46	10
Maine:																							
11 establishments	1914	591	59.5	.193	11.46	.....	.....	.....	471	86	34	1	6	3	18	35	122	145	52	141	28	26	14
	1916	673	59.1	.228	13.46	.....	.....	.....	635	5	33	4	.....	.....	4	19	29	35	280	130	82	55	35
Massachusetts:																							
12 establishments	1914	7,104	54.4	.178	9.67	217	6,473	12	38	189	175	3	2	4	511	1,263	1,937	985	436	934	817	199	13
	1916	6,327	54.7	.226	12.33	174	5,583	1	48	336	185	4	.....	2	6	22	326	990	1,828	1,405	727	907	110
New Hampshire:																							
7 establishments	1914	1,650	55.8	.183	10.20	.....	237	1,248	1	128	36	7	4	2	85	[illegible]	325	420	249	283	95	52	6
	1916	1,827	55.5	.218	12.09	1	391	1,265	2	145	23	.....	.....	1	1	33	73	311	513	505	226	125	39
New Jersey:																							
2 establishments	1914	1,255	57.1	.170	9.69	.....	.....	1,105	.....	99	51	8	7	26	73	164	352	205	137	188	60	31	4
	1916	1,280	55.8	.214	11.95	13	.....	1,202	.....	21	44	3	.....	1	4	28	49	176	367	405	156	81	10
New York:																							
2 establishments	1914	912	60.7	.168	10.20	15	.....	.....	.....	830	67	.....	3	7	44	93	352	132	89	120	48	21	3
	1916	854	60.9	.211	12.86	.....	.....	.....	.....	789	65	.....	.....	.....	.....	29	32	320	116	225	46	55	31
Rhode Island:																							
5 establishments	1914	1,508	54.9	.194	10.66	.....	1,424	.....	.....	.....	84	22	15	71	78	173	189	219	169	215	249	85	23
	1916	1,687	54.7	.228	12.50	.....	1,616	2	11	6	52	1	.....	.....	7	126	100	240	244	470	196	261	42
Vermont:																							
2 establishments	1914	561	58.4	.178	10.39	.....	.....	.....	498	15	48	2	2	1	25	17	230	87	48	100	32	15	2
	1916	473	58.0	.231	13.40	2	.....	.....	467	.....	4	1	.....	1	3	.....	24	15	188	111	62	44	24
Total:																							
47 establishments	1914	13,947	55.7	.180	10.03	232	8,212	2,543	1,011	1,443	506	44	45	119	846	1,877	3,563	2,265	1,219	2,048	1,395	451	75
	1916	13,503	55.7	.223	12.43	190	7,697	2,701	1,164	1,330	421	14	2	5	33	274	638	2,112	3,612	3,370	1,568	1,574	301

OTHER EMPLOYEES: Female.

Connecticut:																						
6 establishments	1914	125	54.9	$0.155	$8.52	.....	15	110	.....	.....	.....	.....	13	17	17	9	12	11	17	23	3	2	1
	1916	79	54.9	.168	9.20	.....	9	70	.....	.....	.....	.....	.....	.....	8	12	26	12	3	7	9	2	.....
Maine:																							
10 establishments	1914	196	58.0	.133	7.70	.....	.....	.....	196	.....	.....	.....	6	3	101	31	14	22	7	9	3	.....	.....
	1916	91	58.1	.152	8.80	.....	.....	.....	88	3	.....	.....	.....	.....	5	25	31	24	1	3	2	.....	.....
Massachusetts:																							
12 establishments	1914	3,917	53.4	.139	7.49	281	3,636	.....	.....	.....	.....	.....	56	31	37	576	1,608	1,078	182	122	135	74	18	.....
	1916	1,953	53.5	.172	9.23	120	1,833	.....	.....	.....	.....	.....	3	4	13	18	86	375	1,031	176	177	30	34	6
New Hampshire:																							
7 establishments	1914	1,040	54.9	.141	7.74	3	81	956	.....	.....	.....	.....	6	4	55	250	214	308	87	62	39	13	2	.....
	1916	566	54.9	.165	9.06	.....	57	509	.....	.....	.....	.....	.....	.....	.....	51	134	89	67	89	129	6	1	.....
New Jersey:																							
2 establishments	1914	776	55.8	.135	7.54	.....	.....	776	.....	.....	.....	.....	4	7	91	230	171	105	90	29	34	13	2	.....
	1916	504	54.5	.174	9.48	46	.....	457	.....	1	.....	.....	3	.....	1	6	78	125	85	91	89	25	1	.....
New York:																							
2 establishments	1914	327	53.8	.145	7.81	6	321	.....	.....	.....	.....	.....	2	6	2	90	52	83	25	32	34	1	.....	.....
	1916	180	54.1	.153	8.26	.....	177	.....	.....	3	.....	.....	.....	.....	6	27	44	46	19	10	25	3	.....	.....
Rhode Island:																							
5 establishments	1914	1,289	54.0	.139	7.52	.....	1,289	.....	.....	.....	.....	.....	114	31	51	175	360	299	87	79	64	16	13	.....
	1916	824	53.9	.171	9.22	19	805	.....	.....	.....	.....	.....	7	2	2	10	113	277	201	53	126	17	14	2
Vermont:																							
2 establishments	1914	111	57.9	.157	9.08	.....	.....	.....	111	.....	.....	.....	17	4	4	13	7	16	10	10	21	5	4	.....
	1916	45	57.9	.127	7.35	.....	.....	.....	45	.....	.....	.....	12	2	1	.....	15	3	4	5	1	1	.....	1
Total:																							
46 establishments	1914	7,781	54.2	.139	7.54	290	5,342	1,842	307	.....	.....	.....	199	102	260	1,452	2,452	1,915	514	358	359	128	41	1
	1916	4,242	54.1	.170	9.16	185	2,881	1,036	133	7	.....	.....	25	8	23	125	507	972	1,443	428	557	93	52	9

TABLE C.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK, AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS, FOR PIECEWORKERS AND TIMEWORKERS, BY STATES, 1916.

WOOL SORTERS: Male.

State.	Piece-workers or time-workers.	Number of establishments.	Number of employees.	Average full-time hours per week.	Average rate of wages per hour.	Average full-time weekly earnings.	Employees whose full-time hours per week were—						Employees whose rates of wages per hour were—										
							Under 54	54	Over 54 and under 57	57 and under 60	60	Over 60	Under 8 cts.	8 and under 9 cts.	9 and under 10 cts.	10 and under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 cents and over.
Massachusetts	Piece	2	100	54.0	$0.334	$18.05	.....	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	99	.....
	Time	4	135	53.9	.314	16.93	1	134	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	13	110	.....
	Total	6	235	54.0	.322	17.40	1	234	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	14	209	.....
New Hampshire	Piece	2	38	54.9	.338	18.59	.....	3	35	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	3	34	.....
	Time	1	1	55.0	.191	10.51	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
	Total	3	39	54.9	.335	18.38	.....	3	36	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	3	34	.....
New Jersey	Piece	2	36	54.2	.283	15.34	3	.....	33	.....	.....	.....	.....	.....	.....	.....	.....	2	1	1	7	8	17	.....
Rhode Island	Piece	1	55	54.0	.375	20.27	.....	55	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	53	.....
	Time	1	16	54.0	.312	16.86	.....	16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16	.....
	Total	2	71	54.0	.361	19.50	.....	71	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	69	.....
Other States	Piece	5	29	54.1	.338	18.28	.....	25	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	4	24	.....
	Time	3	11	55.2	.341	18.71	.....	7	1	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2	.....	7	1
	Total	8	40	54.4	.339	18.40	.....	32	5	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	3	4	35	1
All States	Piece	12	258	54.2	.337	18.25	3	183	72	.....	.....	.....	.....	.....	.....	.....	.....	2	1	1	10	17	227	.....
	Time	9	163	54.0	.315	17.00	1	157	2	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	14	13	133	1
	Total	21	421	54.1	.328	17.77	4	340	74	3	.....	.....	.....	.....	.....	.....	.....	2	1	3	24	30	360	1

CARD TENDERS: Male.

Connecticut	Time	5	29	56.0	$0.180	$10.01		7	15		7						3	4	4	15	3			
Maine	do	11	70	58.1	.178	10.32				67	3						3	9	21	33	4			
Massachusetts	do	9	187	55.2	.182	10.06		145		8	34								95	70	22			
New Hampshire	do	7	69	55.7	.188	10.47		25	30		14								25	18	26			
New Jersey	Piece	1	4	55.0	.194	10.68			4										1	2	1			
	Time	2	39	55.0	.230	12.65			39										3		20	16		
	Total	2	43	55.0	.227	12.47			43										4	2	21	16		
New York	Time	3	31	59.8	.169	10.11		1			30							1	28	2				
Pennsylvania	Piece	1	6	54.0	.197	10.66		6												4	2			
	Time	5	58	54.5	.191	10.44		30	28								1	1	21	1	34			
	Total	6	64	54.4	.192	10.46		36	28								1	1	21	5	36			
Rhode Island	Time	4	35	54.0	.180	9.74		35									2	2	8	21	2			
Vermont	do	3	10	57.8	.194	11.22				10									1	5	4			
All States	Piece	2	10	54.4	.196	10.67		6	4										1	6	3			
	Time	49	528	55.8	.186	10.40		243	112	85	88						9	17	206	165	115	16		
	Total	51	538	55.8	.186	10.39		249	116	85	88						9	17	207	171	118	16		

CARD STRIPPERS: Male.

Connecticut	Time	5	16	55.2	$0.206	$11.36		7	7		2									4	12			
Maine	do	11	48	58.1	.207	12.00				45	3									14	34			
Massachusetts	do	10	108	54.5	.204	11.14	1	97		1	9								2	17	89			
New Hampshire	Piece	1	6	60.0	.182	10.94					6								1	5				
	Time	7	46	54.6	.196	10.69		22	23		1								4	19	23			
	Total	7	52	55.3	.194	10.72		22	23		7								5	24	23			
New Jersey	Piece	1	5	55.0	.205	11.25			5											4	1			
	Time	1	7	55.0	.260	14.30			7													7		
	Total	2	12	55.0	.237	13.03			12											4	1	7		
New York	Time	3	10	58.8	.193	11.33		2			8									6	4			
Pennsylvania	Piece	1	4	54.0	.245	13.20		4													4			
	Time	5	36	54.6	.248	13.58		13	23												21	15		
	Total	6	40	54.6	.248	13.54		17	23												25	15		

TABLE C.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK, AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS, FOR PIECEWORKERS AND TIMEWORKERS, BY STATES, 1916—Continued.

CARD STRIPPERS: Male—Concluded.

State.	Piece-workers or time-workers.	Number of establishments.	Number of employees.	Average full-time hours per week.	Average rate of wages per hour.	Average full-time weekly earnings.	Employees whose full-time hours per week were—						Employees whose rates of wages per hour were—											
							Under 54	54	Over 54 and under 57	57 and under 60	60	Over 60	Under 8 cts.	8 and under 9 cts.	9 and under 10 cts.	10 and under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 cents and over.
Rhode Island	Time	4	15	54.0	$0.217	$11.72	.....	15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	8	2	.....	.....
Vermont	...do	2	10	57.7	.221	12.73	.....	.....	.....	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	.....	.....	.....
All States	Piece	3	15	56.7	.206	11.65	.....	4	5	.....	6	.....	.....	.....	.....	.....	.....	.....	1	9	5	.....	.....	.....
	Time	48	296	55.4	.211	11.68	1	156	60	56	23	.....	.....	.....	.....	.....	.....	2	4	65	201	24	.....	.....
	Total.	50	311	55.4	.211	11.68	1	160	65	56	29	.....	.....	.....	.....	.....	.....	2	5	74	206	24	.....	.....
COMBER TENDERS: Male.																								
Massachusetts	Time	3	191	55.0	$0.208	$11.45	.....	158	.....	.....	33	.....	.....	.....	.....	.....	.....	.....	.....	92	98	1	.....	.....
Other States	Piece	1	6	56.7	.188	10.65	.....	.....	4	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	6	.....	.....	.....	.....
	Time	6	84	59.1	.177	10.46	.....	11	.....	5	68	.....	.....	.....	.....	.....	.....	.....	71	13	.....	.....	.....	.....
	Total.	6	90	58.9	.178	10.47	.....	11	4	5	70	.....	.....	.....	.....	.....	.....	.....	71	19	.....	.....	.....	.....
All States	Piece	1	6	56.7	.188	10.65	.....	.....	4	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	6	.....	.....	.....	.....
	Time	9	275	56.3	.199	11.15	.....	169	.....	5	101	.....	.....	.....	.....	.....	.....	.....	71	105	98	1	.....	.....
	Total.	9	281	56.3	.198	11.14	.....	169	4	5	103	.....	.....	.....	.....	.....	.....	.....	71	111	98	1	.....	.....
COMBER TENDERS: Female.																								
All States	Piece	2	33	53.5	$0.180	$9.60	10	.....	23	.....	.....	.....	.....	.....	.....	.....	1	2	17	3	10	.....	.....	.....
	Time	11	149	53.6	.176	9.44	24	90	35	.....	.....	.....	.....	.....	.....	.....	5	21	74	27	19	3	.....	.....
	Total.	11	182	53.6	.177	9.47	34	90	58	.....	.....	.....	.....	.....	.....	.....	6	23	91	30	29	3	.....	.....

DRAWING-FRAME TENDERS: Male.

Massachusetts	Time	2	146	53.9	$0.171	$9.20	1	145									2	141	3				
Other States	Piece	2	30	50.9	.222	11.35	23	7								1				24	3	2	
	Time	4	81	58.3	.184	10.71		10	8	17	46						1	32	47		1		
	Total	5	111	56.3	.194	10.88	23	17	8	17	46					1	1	32	47	24	4	2	
All States	Piece	2	30	50.9	.222	11.35	23	7								1				24	3	2	
	Time	6	227	55.5	.175	9.73	1	155	8	17	46						3	173	50		1		
	Total	7	257	55.0	.181	9.93	24	162	8	17	46					1	3	173	50	24	4	2	

DRAWING-FRAME TENDERS: Female.

Massachusetts	Piece	1	9	54.0	$0.190	$10.25		9											9				
	Time	3	677	53.9	.173	9.30	8	669									2	643	26	6			
	Total	3	686	53.9	.173	9.31	8	678									2	643	35	6			
New Jersey	Piece	1	38	54.2	.169	9.17	6		32								17	11	1	9			
	Time	2	301	53.0	.175	9.29	120		181							3	23	155	16	104			
	Total	2	339	53.1	.175	9.28	126		213							3	40	166	17	113			
Pennsylvania	Piece	1	6	54.0	.209	11.28		6											1	5			
	Time	6	208	53.5	.146	7.82	15	193								8	115	31	15	8			
	Total	6	214	53.5	.148	7.91	15	199								8	115	31	16	13			
Rhode Island	Time	3	265	52.9	.167	8.84	74	191									61	184	20				
Other States	Piece	1	120	55.0	.173	9.50			120							13	35	31	24	16	1		
	Time	3	149	55.0	.173	9.50		87	34	28						5	21	72	49	2			
	Total	3	269	55.0	.173	9.50		87	154	28						5	13	56	103	73	18	1	
All States	Piece	4	173	54.7	.174	9.53	6	15	152							13	52	42	35	30	1		
	Time	17	1,600	53.6	.169	9.05	217	1,140	215	28						13	118	138	1,085	126	120		
	Total	17	1,773	53.7	.169	9.10	223	1,155	367	28						13	131	190	1,127	161	150	1	

TABLE C.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK, AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS, FOR PIECEWORKERS AND TIMEWORKERS, BY STATES, 1916—Continued.

SPINNERS, MULE: Male.

State.	Piece-workers or time-workers.	Number of establishments.	Number of employees.	Average full-time hours per week.	Average rate of wages per hour.	Average full-time weekly earnings.	Employees whose full-time hours per week were—						Employees whose rates of wages per hour were—										
							Under 54	54	Over 54 and under 57	57 and under 60	60	Over 60	Under 8 cts.	8 and under 9 cts.	9 and under 10 cts.	10 and under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 cents and over.
Connecticut	Piece	4	42	55.3	$0.311	$17.12	.....	14	23	.....	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	13	21	1
	Time	2	18	58.3	.209	12.13	.....	.....	6	.....	12	.....	.....	.....	.....	.....	.....	1	2	.....	15	.....	.....	.....
	Total	5	60	56.2	.280	15.62	.....	14	29	.....	17	.....	.....	.....	.....	.....	.....	1	2	.....	22	13	21	1
Maine	Piece	11	166	58.1	.290	16.84	.....	.....	.....	160	6	.....	.....	.....	.....	.....	.....	.....	.....	3	153	44	56	8
Massachusetts	Piece	10	465	54.5	.337	18.32	.....	426	.....	9	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	26	93	293	53
	Time	1	6	54.0	.246	13.28	.....	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	.....	.....	.....
	Total	10	471	54.4	.335	18.25	.....	432	.....	9	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	32	93	293	53
New Hampshire	Piece	6	116	54.5	.311	16.93	.....	57	59	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16	42	46	12
	Time	1	10	57.5	.257	14.75	.....	.....	5	.....	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	5	.....	.....
	Total	7	126	54.7	.307	16.76	.....	57	64	.....	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	21	47	46	12
New Jersey	Piece	2	112	54.1	.372	20.15	21	.....	91	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	77	33
New York	Piece	2	46	59.1	.410	24.32	.....	7	.....	.....	39	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	2	11	30
	Time	1	50	54.0	.200	10.80	.....	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50	.....	.....	.....
	Total	3	96	56.4	.301	17.28	.....	57	.....	.....	39	.....	.....	.....	.....	.....	.....	.....	.....	.....	53	2	11	30
Rhode Island	Piece	1	20	54.0	.320	17.28	.....	20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	5	12	1
	Time	3	65	54.0	.324	17.52	.....	65	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	5	47	.....
	Total	3	85	54.0	.323	17.46	.....	85	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15	10	59	1
Pennsylvania	Piece	3	23	54.0	.252	13 65	.....	23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	7	4	.....
	Time	2	30	55.0	.262	14.39	.....	1	29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	27	2	.....
	Total	4	53	54.5	.258	14.07	.....	24	29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	34	6	.....

Vermont	Piece	1	31	58.0	.281	16.32				31											11	10	9	1
	Time	1	24	57.5	.241	13.86				24											24			
	Total	2	55	57.8	.264	15.25				55											35	10	9	1
All States	Piece	40	1,021	55.3	.328	18.16	21	547	173	200	80									3	132	218	529	139
	Time	11	203	55.1	.259	14.23		122	40	24	17							1	2		114	37	49	
	Total	47	1,224	55.3	.317	17.51	21	669	213	224	97							1	2	3	246	255	578	139

SPINNERS, FRAME: Male.

Massachusetts	Time	2	260	53.9	$0.192	$10.35	2	258										3	56	73	128			
Other States	do	3	8	54.6	.154	8.45		6	1	1							1	5	1	1				
	Total	5	268	53.9	.191	10.29	2	264	1	1							1	8	57	74	128			

SPINNERS, FRAME: Female.

Massachusetts	Time	3	529	53.9	$0.188	$10.11	8	521										3	101	329	96			
New Jersey	Piece	1	23	54.6	.169	9.23	1			22								9	9	5				
	Time	2	113	52.6	.199	10.48	55			58									47	11	55			
	Total	2	136	52.9	.194	10.27	56			80								9	56	16	55			
Pennsylvania	Time	6	241	53.3	.142	7.58	28	213									35	117	30	26	30	3			
Rhode Island	do	3	181	54.0	.172	9.30		181										1	24	141	8	7			
Other States	do	2	191	55.4	.179	9.92			165	26							1	5	33	4	131	17			
All States	Piece	1	23	54.6	.169	9.23	1			22								9	9	5				
	Time	16	1,255	53.9	.176	9.51	91	915	223	26							36	123	90	319	509	178			
	Total	16	1,278	53.9	.176	9.51	92	915	245	26							36	123	99	328	514	178			

DOFFERS: Male.

Massachusetts	Piece	1	24	54.0	$0.263	$14.22		24												1	8	10	5	
	Time	3	212	48.9	.153	7.47	124	88										185	3	15				
	Total	3	236	49.4	.164	8.16	124	112										185	3	16	17	10	5	
Other States	Time	5	93	55.4	.134	7.45	2	21	48	22							8	57	22	4	2				
All States	Piece	1	24	54.0	.263	14.22		24												1	8	10	5	
	Time	8	305	50.9	.147	7.46	126	109	48	22							8	57	207	7	17	9			
	Total	8	329	51.1	.156	7.96	126	133	48	22							8	57	207	7	18	17	10	5	

TABLE C.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK, AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS, FOR PIECEWORKERS AND TIMEWORKERS, BY STATES, 1916—Continued.

DOFFERS: Female.

State.	Piece-workers or time workers.	Number of establishments.	Number of employees.	Average full-time hours per week.	Average rate of wages per hour.	Average full-time weekly earnings.	Employees whose full-time hours per week were—						Employees whose rates of wages per hour were—											
							Under 54	54	Over 54 and under 57	57 and under 60	60	Over 60	Under 8 cts.	8 and under 9 cts.	9 and under 10 cts.	10 and under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 cents and over.
Massachusetts	Time	3	288	49.5	$0.147	$7.31	149	139	.....	.....	.....	.....	.....	.....	.....	.....	.....	275	5	6	2	.....	.....	.....
Pennsylvania	...do	6	91	51.7	.110	5.66	27	64	.....	.....	.....	.....	.....	9	4	63	14	1	.....	.....	.....	.....	.....	.....
Rhode Island	...do	3	136	53.9	.124	6.69	3	133	.....	.....	.....	.....	.....	.....	.....	1	135	.....	.....	.....	.....	.....	.....	.....
Other States	...do	3	233	54.9	.133	7.28	12	.....	210	11	.....	.....	.....	.....	.....	.....	167	52	1	12	1	.....	.....	.....
Total	Time	15	748	52.2	.134	6.98	191	336	210	11	.....	.....	.....	9	4	64	316	328	6	18	3	.....	.....	.....

TWISTER TENDERS: Female.

Massachusetts	Piece	1	8	54.0	$0.207	$11.20	.....	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	3	3	1	.....	.....
	Time	4	441	53.9	.182	9.77	4	437	.....	.....	.....	.....	.....	.....	.....	.....	1	20	106	289	25	.....	.....	.....
	Total	4	449	53.9	.183	9.80	4	445	.....	.....	.....	.....	.....	.....	.....	.....	1	20	107	292	28	1	.....	.....
New Jersey	Piece	1	40	55.0	.168	9.23	.....	.....	40	.....	.....	.....	.....	.....	.....	.....	.....	14	18	8	.....	.....	.....	.....
	Time	1	54	54.8	.159	8.71	1	.....	53	.....	.....	.....	.....	.....	.....	.....	.....	12	42	.....	.....	.....	.....	.....
	Total	2	94	54.9	.163	8.93	1	.....	93	.....	.....	.....	.....	.....	.....	.....	.....	26	60	8	.....	.....	.....	.....
Pennsylvania	Piece	1	19	54.0	.205	11.05	.....	19	.....	.....	.....	.....	.....	.....	.....	.....	1	1	2	7	6	2	.....	.....
	Time	7	241	53.9	.158	8.54	6	235	.....	.....	.....	.....	.....	.....	.....	.....	75	48	79	32	7	.....	.....	.....
	Total	8	260	53.9	.162	8.72	6	254	.....	.....	.....	.....	.....	.....	.....	.....	76	49	81	39	13	2	.....	.....
Rhode Island	Piece	1	27	54.0	.220	11.90	.....	27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	3	16	4	.....	.....
	Time	4	112	54.0	.174	9.42	.....	112	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	102	6	1	.....	.....	.....
	Total	5	139	54.0	.183	9.90	.....	139	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	106	9	17	4	.....	.....

Other States	Piece	2	32	56.0	.202	11.34			21	11							1	2	11	17	1		
	Time	9	134	55.2	.153	8.45		92	3	39							1	95	36	1	1			
	Total	9	166	55.3	.163	9.01		92	24	50							1	96	38	12	18	1		
All States	Piece	6	126	54.8	.196	10.74		54	61	11							1	16	27	32	42	8		
	Time	25	982	54.1	.170	9.19	11	876	56	39							80	175	365	328	34			
	Total	28	1,108	54.2	.173	9.33	11	930	117	50							81	191	392	360	76	8		

SPOOLER TENDERS: Female.

Connecticut	Piece	6	40	54.5	$0.206	$11.21		19	21							1	3	6	3	6	14	4	3	
	Time	1	6	55.0	.120	6.62			6							3	3							
	Total	6	46	54.6	.195	10.61		19	27							4	6	6	3	6	14	4	3	
Maine	Piece	10	59	58.0	.198	11.46				59						2	3	14	5	12	13	7	3	
	Time	6	26	58.0	.144	8.35				26							10	11	5					
	Total	12	85	58.0	.181	10.51				85						2	13	25	10	12	13	7	3	
Massachusetts	Piece	9	256	53.9	.224	12.06	4	252									5	26	37	38	80	37	32	1
	Time	6	590	53.4	.158	8.42	42	548										216	365	3	6			
	Total	11	846	53.5	.178	9.52	46	800									5	242	402	41	86	37	32	1
New Hampshire	Piece	7	83	54.5	.207	11.29		39	44							1	6	9	9	10	32	14	2	
	Time	1	6	54.0	.145	7.82		6										6						
	Total	7	89	54.5	.203	11.06		45	44							1	6	15	9	10	32	14	2	
New Jersey	Piece	2	46	54.8	.158	8.68	1		45								16	18	5	2	1	4		
	Time	2	38	52.6	.154	8.13	9		29								1	17	20					
	Total	3	84	53.8	.157	8.43	10		74								17	35	25	2	1	4		
New York	Piece	2	46	54.0	.196	10.59		46										16	2	7	21			
	Time	2	14	54.0	.178	9.60		14											7	7				
	Total	3	60	54.0	.192	10.36		60										16	9	14	21			
Pennsylvania	Piece	4	46	54.0	.217	11.71		46					1	1		1	1	5	7	2	11	15	2	
	Time	8	144	53.0	.119	6.33	14	130						2		72	61	8	1					
	Total	11	190	53.3	.143	7.63	14	176					1	3		73	62	13	8	2	11	15	2	

TABLE C.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK, AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS, FOR PIECEWORKERS AND TIMEWORKERS, BY STATES, 1916—Continued.

SPOOLER TENDERS: Female—Concluded.

State.	Piece-workers or time-workers.	Number of establishments.	Number of employees.	Average full-time hours per week.	Average rate of wages per hour.	Average full-time weekly earnings.	Employees whose full-time hours per week were—						Employees whose rates of wages per hour were—										
							Under 54	54	Over 54 and under 57	57 and under 60	60	Over 60	Under 8 cts.	8 and under 9 cts.	9 and under 10 cts.	10 and under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 cents and over.
Rhode Island	Piece	3	67	54.0	$0.180	$9.74	.....	67	.....	.....	.....	.....	.....	.....	.....	3	4	12	15	12	20	1	.....	.....
	Time	4	121	54.0	.158	8.55	.....	121	.....	.....	.....	.....	.....	.....	.....	.....	.....	105	.....	9	7	.....	.....	.....
	Total	5	188	54.0	.166	8.97	.....	188	.....	.....	.....	.....	.....	.....	.....	3	4	117	15	21	27	1	.....	.....
Vermont	Piece	3	45	57.9	.200	11.59	.....	.....	.....	45	.....	.....	.....	.....	.....	.....	2	7	6	15	6	7	2	.....
	Time	1	50	58.0	.151	8.77	.....	.....	.....	50	.....	.....	.....	.....	.....	.....	.....	48	2	.....	.....	.....	.....	.....
	Total	3	95	57.9	.174	10.11	.....	.....	.....	95	.....	.....	.....	.....	.....	.....	2	55	8	15	6	7	2	.....
All States	Piece	46	688	54.7	.206	11.26	5	469	110	104	.....	.....	1	1	.....	8	40	113	89	104	198	89	44	1
	Time	31	995	53.8	.151	8.14	65	819	35	76	.....	.....	.....	2	.....	75	75	411	400	19	13	.....	.....	.....
	Total	61	1,683	54.1	.174	9.42	70	1,288	145	180	.....	.....	1	3	.....	83	115	524	489	123	211	89	44	1

DRESSER TENDERS: Male.

Connecticut	Time	6	28	55.4	$0.294	$16.29	.....	4	21	.....	3	.....	.....	.....	.....	.....	.....	.....	1	.....	1	12	14	.....
Maine	Piece	1	2	58.0	.316	18.33	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....
	Time	11	34	58.0	.276	16.00	.....	.....	.....	34	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	32	.....	.....
	Total	12	36	58.0	.278	16.13	.....	.....	.....	36	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	32	2	.....
Massachusetts	Piece	4	50	54.0	.344	18.56	.....	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	39	5
	Time	12	108	54.0	.327	17.66	.....	108	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	8	97	.....
	Total	12	158	54.0	.332	17.92	.....	158	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	14	136	5

New Hampshire..	Piece....	1	1	55.0	.350	19.25	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....
	Time....	7	37	54.6	.298	16.29	.....	14	23	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	16	19	.....	.....
	Total.	7	38	54.6	.300	16.37	.....	14	24	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	16	20	.....	.....
New York.....	Piece....	1	5	60.0	.296	17.75	.....	.....	.....	.....	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	1	.....	.....
	Time....	3	17	58.6	.296	15.68	.....	4	.....	.....	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	10	4	.....	.....
	Total.	3	22	58.9	.275	16.15	.....	4	.....	.....	18	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	14	5	.....	.....
Pennsylvania.....	Time....	7	35	54.5	.343	18.73	.....	16	19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	32	2	.....
Rhode Island.....	...do....	5	75	54.0	.338	18.25	.....	75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	71	.....	.....
Other States.....	Piece....	3	9	57.7	.312	18.01	.....	.....	1	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	7	.....	.....
	Time....	4	25	55.9	.294	16.41	.....	.....	17	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	7	11	.....	.....
	Total.	5	34	56.3	.299	16.84	.....	.....	18	16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	9	18	.....	.....
All States.....	Piece....	10	67	55.1	.335	18.43	.....	50	2	10	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	50	2	.....
	Time....	55	359	54.9	.315	17.30	.....	221	80	42	16	.....	.....	.....	.....	.....	.....	.....	2	.....	17	90	248	5	.....
	Total.	57	426	55.0	.319	17.48	.....	271	82	52	21	.....	.....	.....	.....	.....	.....	.....	2	.....	17	102	298	7	.....

DRAWERS-IN: Female.

Connecticut.....	Piece....	5	18	54.8	$0.264	$14.48	.....	4	14	.....	.....	.....	1	.....	1	1	1	.....	.....	.....	3	5	4	2	.....
	Time....	1	2	55.0	.331	9.10	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....
	Total.	6	20	54.8	.254	13.94	.....	4	16	.....	.....	.....	1	.....	1	1	1	1	.....	1	3	5	4	2	.....
Maine.....	Piece....	9	20	58.0	.230	13.36	.....	.....	.....	20	.....	.....	.....	.....	.....	.....	.....	.....	4	3	5	7	1	.....	.....
	Time....	4	7	58.0	.195	11.32	.....	.....	.....	7	.....	.....	.....	.....	.....	.....	.....	.....	1	5	1	.....	.....	.....	.....
	Total.	11	27	58.0	.221	12.83	.....	.....	.....	27	.....	.....	.....	.....	.....	.....	.....	.....	5	8	6	7	1	.....	.....
Massachusetts.....	Piece....	10	142	54.0	.257	13.89	.....	142	.....	.....	.....	.....	.....	.....	.....	.....	2	13	7	12	34	31	39	4	.....
	Time....	2	6	54.0	.181	9.76	.....	6	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	2	2	.....	.....	.....	.....
	Total.	12	148	54.0	.254	13.73	.....	148	.....	.....	.....	.....	.....	.....	.....	.....	3	13	8	14	36	31	39	4	.....
New Hampshire..	Piece....	5	39	54.6	.268	14.66	.....	14	25	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	2	9	21	6	.....	.....
	Time....	3	9	54.9	.197	10.79	.....	1	8	.....	.....	.....	.....	.....	.....	.....	.....	2	3	1	1	2	.....	.....	.....
	Total.	7	48	54.7	.255	13.94	.....	15	33	.....	.....	.....	.....	.....	.....	.....	1	2	3	3	10	23	6	.....	.....

TABLE C.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK, AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS, FOR PIECEWORKERS AND TIMEWORKERS, BY STATES, 1916—Continued.

DRAWERS-IN: Female—Concluded.

State.	Piece-workers or time-workers.	Number of establishments.	Number of employees.	Average full-time hours per week.	Average rate of wages per hour.	Average full-time weekly earnings.	Employees whose full-time hours per week were—						Employees whose rates of wages per hour were—											
							Under 54	54	Over 54 and under 57	57 and under 60	60	Over 60	Under 8 cts.	8 and under 9 cts.	9 and under 10 cts.	10 and under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 cents and over.
New Jersey	Piece	3	57	55.0	$0.262	$14.40	.....	.....	57	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	22	23	10	.....
New York	do	2	14	54.0	.173	9.33	.....	14	.....	.....	.....	.....	.....	.....	.....	1	1	.....	5	6	1	.....	.....	.....
Pennsylvania	Piece	2	10	54.0	.236	12.76	.....	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	6	3	.....	.....
	Time	4	14	54.0	.231	12.45	.....	14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	2	6	1	.....
	Total	6	24	54.0	.233	12.58	.....	24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	5	8	9	1	.....
Rhode Island	Piece	4	62	54.0	.253	13.66	.....	62	.....	.....	.....	.....	.....	1	.....	2	7	2	1	4	14	11	18	2
Vermont	do	3	26	57.9	.279	16.17	.....	.....	.....	26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	13	6	.....
All States	Piece	43	388	54.7	.255	13.97	.....	246	96	46	.....	.....	1	1	1	4	12	15	18	29	101	114	84	8
	Time	14	38	55.0	.205	11.25	.....	21	10	7	.....	.....	.....	.....	.....	.....	1	3	5	14	6	8	1	.....
	Total	54	426	54.7	.251	13.72	.....	267	106	53	.....	.....	1	1	1	4	13	18	23	43	107	122	85	8

LOOM FIXERS: Male.

Connecticut	Time	6	20	55.7	$0.354	$19.60	.....	2	15	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	12	5
Maine	do	12	45	58.0	.312	18.09	.....	.....	.....	44	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	35	.....
Massachusetts	do	11	286	54.0	.410	22.13	.....	286	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	160	124
New Hampshire	do	7	80	54.8	.315	17.27	.....	15	65	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16	64	.....
New Jersey	do	3	113	54.8	.387	21 21	5	.....	108	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	8	40	64
New York	do	3	30	59.2	.309	18.24	.....	4	.....	.....	26	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	9	19	.....
Pennsylvania	do	11	104	54.2	.398	21.58	.....	86	18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	1	22	79
Rhode Island	do	5	95	54.0	.387	20.92	.....	95	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	56	38
Vermont	do	3	36	57.9	.327	18.94	.....	.....	.....	36	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	35	.....
Total	Time	61	809	54.8	.378	20.72	5	488	206	80	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	51	443	310

WEAVERS: Male.

Connecticut	Piece	6	314	55.5	$0.311	$17.25	.....	29	246	.....	39	.....	.....	.....	.....	2	1	1	3	5	39	76	169	18
	Time	1	7	55.0	.302	16.63	.....	.....	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	5	.....
	Total	6	321	55.5	.311	17.22	.....	29	253	.....	39	.....	.....	.....	.....	2	1	1	3	5	39	78	174	18
Maine	Piece	12	450	58.0	.298	17.31	.....	.....	.....	441	9	.....	.....	1	2	2	5	14	6	14	91	109	159	47
	Time	4	19	58.0	.273	15.86	.....	.....	.....	19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	18	.....	.....
	Total	12	469	58.0	.297	17.26	.....	.....	.....	460	9	.....	.....	1	2	2	5	14	6	14	92	127	159	47
Massachusetts	Piece	12	2,133	54.0	.318	17.15	.....	2,133	.....	.....	.....	.....	.....	.....	.....	2	7	16	24	48	282	506	965	283
New Hampshire	Piece	7	470	54.7	.294	16.05	.....	202	260	.....	8	.....	.....	.....	.....	3	2	2	4	7	87	179	160	26
	Time	1	5	54.0	.283	15.28	.....	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	1	.....
	Total	7	475	54.6	.294	16.04	.....	207	260	.....	8	.....	.....	.....	.....	3	2	2	4	7	87	183	161	26
New Jersey	Piece	3	457	54.0	.269	14.57	87	.....	370	.....	.....	.....	.....	.....	.....	2	6	10	23	29	123	117	123	24
	Time	1	11	55.0	.285	15.70	.....	.....	11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	6	.....
	Total	3	468	54.1	.270	14.59	87	.....	381	.....	.....	.....	.....	.....	.....	2	6	10	23	29	123	122	129	24
New York	Piece	3	174	58.8	.258	15.08	.....	35	.....	.....	139	.....	.....	.....	.....	.....	.....	1	2	5	86	50	26	4
	Time	1	2	54.0	.286	15.44	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....
	Total	3	176	58.7	.258	15.08	.....	37	.....	.....	139	.....	.....	.....	.....	.....	.....	1	2	5	86	52	26	4
Pennsylvania	Piece	11	429	54.1	.282	15.25	.....	394	35	.....	.....	.....	.....	.....	.....	1	4	5	10	20	74	141	167	7
Rhode Island	Piece	5	686	54.0	.320	17.30	.....	686	.....	.....	.....	.....	.....	.....	.....	1	7	6	13	13	100	137	292	117
	Time	1	11	54.0	.301	16.24	.....	11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	2	.....
	Total	5	697	54.0	.320	17.28	.....	697	.....	.....	.....	.....	.....	.....	.....	1	7	6	13	13	100	146	294	117
Vermont	Piece	3	274	57.9	.310	17.96	.....	.....	.....	274	.....	.....	.....	.....	.....	3	3	6	7	15	41	52	102	45
	Time	1	8	57.5	.237	13.62	.....	.....	.....	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	1	.....	.....
	Total	3	282	57.9	.308	17.84	.....	.....	.....	282	.....	.....	.....	.....	.....	3	3	6	7	15	48	53	102	45
All States	Piece	62	5,387	54.8	.305	16.70	87	3,479	911	715	195	.....	.....	1	2	16	35	61	92	156	923	1,367	2,163	571
	Time	10	63	55.9	.280	15.64	.....	18	18	27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	41	14	.....
	Total	62	5,450	54.9	.304	16.68	87	3,497	929	742	195	.....	.....	1	2	16	35	61	92	156	931	1,408	2,177	571

TABLE C.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK, AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS, FOR PIECEWORKERS AND TIMEWORKERS, BY STATES, 1916—Continued.

WEAVERS: Female.

State.	Piece-workers or time-workers.	Number of establishments.	Number of employees.	Average full-time hours per week.	Average rate of wages per hour.	Average full-time weekly earnings.	Employees whose full-time hours per week were—						Employees whose rates of wages per hour were—											
							Under	57	Over 54 and under 57	57 and under 60	60	Over 60	Under 8 cts.	8 and under 9 cts.	9 and under 10 cts.	10 and under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 cents and over.
Connecticut	Piece	6	48	54.7	$0.336	$18.36	.....	15	33	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	10	33	4
Maine	do	12	219	58.0	.271	15.74	.....	.....	.....	219	.....	.....	.....	.....	.....	6	5	5	9	20	47	50	62	15
Massachusetts	do	12	1,395	54.0	.298	16.08	.....	1,395	.....	.....	.....	.....	.....	1	.....	.....	5	10	29	56	292	337	531	134
New Hampshire	do	7	576	54.9	.267	14.65	.....	62	514	.....	.....	.....	.....	.....	.....	1	4	7	7	32	143	266	104	12
New Jersey	do	3	1,083	54.2	.252	13.65	178	.....	905	.....	.....	.....	.....	.....	1	5	11	46	79	77	309	315	232	8
New York	do	3	134	54.0	.235	12.72	.....	134	.....	.....	.....	.....	.....	.....	.....	1	.....	1	2	2	82	40	6	.....
Pennsylvania	do	11	558	54.0	.254	13.70	.....	558	.....	.....	.....	.....	.....	.....	.....	.....	4	13	33	34	173	195	103	3
Rhode Island	do	5	504	54.0	.249	13.42	.....	504	.....	.....	.....	.....	.....	.....	.....	1	10	16	34	53	153	147	83	7
Vermont	do	3	124	57.9	.310	17.97	.....	.....	.....	124	.....	.....	.....	.....	.....	.....	1	2	1	4	21	33	44	18
Total	Piece	62	4,641	54.5	.270	14.72	178	2,668	1,452	343	.....	.....	.....	1	1	14	40	100	194	279	1,220	1,393	1,198	201

BURLERS: Female.

Connecticut	Piece	5	41	54.8	$0.206	$11.28	.....	8	33	.....	.....	.....	.....	.....	.....	.....	1	3	5	9	18	5	.....	.....
	Time	1	6	55.0	.127	6.99	.....	.....	6	.....	.....	.....	.....	.....	.....	.....	6	.....	.....	.....	.....	.....	.....	.....
	Total	6	47	54.8	.196	10.73	.....	8	39	.....	.....	.....	.....	.....	.....	.....	7	3	5	9	18	5	.....	.....
Maine	Piece	3	20	58.0	.174	10.07	.....	.....	.....	20	.....	.....	.....	.....	.....	2	5	2	.....	4	7	.....	.....	.....
	Time	8	54	58.0	.145	8.41	.....	.....	.....	54	.....	.....	.....	.....	.....	.....	10	32	12	.....	.....	.....	.....	.....
	Total	11	74	58.0	.153	8.86	.....	.....	.....	74	.....	.....	.....	.....	.....	2	15	34	12	4	7	.....	.....	.....
Massachusetts	Piece	7	420	54.0	.214	11.52	2	418	.....	.....	.....	.....	.....	.....	1	3	12	19	64	68	166	79	8	.....
	Time	3	294	54.0	.158	8.54	.....	294	.....	.....	.....	.....	.....	.....	.....	.....	16	173	105	.....	.....	.....	.....	.....
	Total	10	714	54.0	.191	10.29	2	712	.....	.....	.....	.....	.....	.....	1	3	28	192	169	68	166	79	8	.....
New Hampshire	Piece	5	205	54.9	.197	10.81	.....	21	184	.....	.....	.....	.....	.....	.....	.....	4	29	16	44	102	10	.....	.....

	Time....	4	58	54.8	.158	8.65	.....	9	49	.....	.....	.....	.....	.....	.....	.....	1	50	.....	.....	.....	7	.....	.....
	Total.	7	263	54.9	.188	10.33	.....	30	233	.....	.....	.....	.....	.....	.....	.....	5	79	16	44	102	17	.....	.....
New Jersey.....	Piece....	2	169	55.0	.185	10.17	.....	.....	169	.....	.....	.....	.....	.....	.....	2	11	27	39	39	38	12	1	.....
	Time....	1	57	54.1	.164	8.87	10	.....	47	.....	.....	.....	.....	.....	.....	.....	6	3	38	3	7	.....	.....	.....
	Total.	3	226	54.8	.180	9.84	10	.....	216	.....	.....	.....	.....	.....	.....	2	17	30	77	42	45	12	1	.....
New York.....	Piece....	2	64	54.0	.205	11.07	.....	64	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	23	40	.....	.....	.....
	Time....	1	13	54.0	.190	10.25	.....	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	.....	.....	.....	.....
	Total.	3	77	54.0	.202	10.93	.....	77	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	36	40	.....	.....	.....
Pennsylvania.....	Piece....	7	153	54.0	.180	9.74	.....	153	.....	.....	.....	.....	.....	.....	.....	1	12	20	33	56	31	.....	.....	.....
	Time....	4	102	54.0	.144	7.76	.....	102	.....	.....	.....	.....	.....	.....	.....	6	16	77	2	.....	1	.....	.....	.....
	Total.	11	255	54.0	.166	8.95	.....	255	.....	.....	.....	.....	.....	.....	.....	7	28	97	35	56	32	.....	.....	.....
Rhode Island.....	Piece....	5	180	54.0	.216	11.66	.....	180	.....	.....	.....	.....	.....	.....	2	13	16	11	12	10	40	73	3	.....
	Time....	1	1	54.0	.147	7.94	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
	Total.	5	181	54.0	.215	11.64	.....	181	.....	.....	.....	.....	.....	.....	2	13	16	12	12	10	40	73	3	.....
Vermont.....	Piece....	2	84	58.0	.169	9.80	.....	.....	.....	84	.....	.....	.....	.....	.....	7	15	18	11	17	10	5	1	.....
	Time....	1	25	57.5	.139	7.98	.....	.....	.....	25	.....	.....	.....	.....	.....	.....	18	5	.....	2	.....	.....	.....	.....
	Total.	3	109	57.9	.162	9.38	.....	.....	.....	109	.....	.....	.....	.....	.....	7	33	23	11	19	10	5	1	.....
All States.....	Piece....	38	1,336	54.6	.200	10.90	2	844	386	104	.....	.....	.....	.....	3	28	76	130	180	270	452	184	13	.....
	Time....	24	610	54.6	.155	8.43	10	419	102	79	.....	.....	.....	.....	.....	6	73	341	157	18	8	7	.....	.....
	Total.	59	1,946	54.6	.186	10.13	12	1,263	488	183	.....	.....	.....	.....	3	34	149	471	337	288	460	191	13	.....

MENDERS: Female.

Connecticut.....	Piece....	2	16	55.0	$0.296	$16.29	.....	.....	16	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	2	3	6	1	3
	Time....	4	37	54.8	.239	13.09	.....	8	29	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1	20	15	.....	.....
	Total.	6	53	54.8	.256	14.05	.....	8	45	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	3	23	21	1	3
Maine.....	Piece....	1	1	58.0	.185	10.74	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
	Time....	11	106	58.0	.188	10.91	.....	.....	.....	106	.....	.....	.....	.....	.....	1	.....	2	25	54	24	.....	.....	.....
	Total.	12	107	58.0	.188	10.90	.....	.....	.....	107	.....	.....	.....	.....	.....	1	.....	2	25	55	24	.....	.....	.....
Massachusetts.....	Piece....	8	802	53.9	.252	13.58	12	790	.....	.....	.....	.....	.....	.....	1	9	16	26	26	60	262	241	146	15
	Time....	6	78	54.0	.208	11.21	.....	78	.....	.....	.....	.....	.....	.....	.....	5	.....	1	17	9	46	.....	.....	.....
	Total.	11	880	53.9	.249	13.37	12	868	.....	.....	.....	.....	.....	.....	1	14	16	27	43	69	308	241	146	15

TABLE C.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK, AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS, FOR PIECEWORKERS AND TIMEWORKERS, BY STATES, 1916—Continued.

MENDERS: Female—Concluded.

State.	Piece-workers or time-workers.	Number of establishments.	Number of employees.	Average full-time hours per week.	Average rate of wages per hour.	Average full-time weekly earnings.	Employees whose full-time hours per week were—						Employees whose rates of wages per hour were—											
							Under 54	57	Over 54 and under 57	57 and under 60	60	Over 60	Under 8 cts.	8 and under 9 cts.	9 and under 10 cts.	10 and under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 cents and over.
New Hampshire..	Piece....	3	105	54.9	$0.216	$11.87	.....	11	94	.....	.....	.....	.....	.....	.....	.....	.....	1	6	11	80	7	.....	.....
	Time....	6	22	54.6	.204	11.13	.....	8	14	.....	.....	.....	.....	.....	.....	.....	.....	2	1	10	7	2	.....	.....
	Total.	7	127	54.9	.214	11.74	.....	19	108	.....	.....	.....	.....	.....	.....	.....	.....	3	7	21	87	9	.....	.....
New York.....	Piece....	2	82	54.0	.214	11.54	.....	82	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	70	2	1	.....
	Time....	1	13	54.0	.235	12.69	.....	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	.....	.....	.....
	Total.	3	95	54.0	.217	11.70	.....	95	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	83	2	1	.....
Pennsylvania.....	Piece....	7	214	54.0	.248	13.37	.....	214	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	9	16	89	73	23	.....
	Time....	3	44	54.0	.185	9.97	.....	44	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	42	.....	.....	.....	.....
	Total.	10	258	54.0	.237	12.79	.....	258	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	11	58	89	73	23	.....
Rhode Island.....	Piece....	4	235	54.0	.260	14.03	.....	235	.....	.....	.....	.....	.....	.....	.....	3	5	5	6	5	102	59	46	4
	Time....	2	69	54.0	.244	13.16	.....	69	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69	.....	.....	.....
	Total.	5	304	54.0	.256	13.83	.....	304	.....	.....	.....	.....	.....	.....	.....	3	5	5	6	5	171	59	46	4
Other States.....	Piece....	4	85	57.0	.267	15.13	.....	.....	28	57	.....	.....	.....	.....	.....	.....	.....	8	5	5	20	15	32	.....
	Time....	1	7	57.5	.217	12.47	.....	.....	.....	7	.....	.....	.....	.....	.....	.....	.....	1	1	.....	4	1	.....	.....
	Total.	4	92	57.0	.263	14.93	.....	.....	28	64	.....	.....	.....	.....	.....	.....	.....	9	6	5	24	16	32	.....
All States.....	Piece....	31	1,540	54.2	.249	13.50	12	1,332	138	58	.....	.....	.....	.....	1	12	22	44	52	109	626	403	249	22
	Time....	34	376	55.3	.210	11.59	.....	220	43	113	.....	.....	.....	.....	.....	6	1	6	46	116	183	18	.....	.....
	Total.	58	1,916	54.4	.242	13.13	12	1,552	181	171	.....	.....	.....	.....	1	18	23	50	98	225	809	421	249	22

LABORERS, DYEHOUSE: Male.

Connecticut	Time	5	55	55.5	$0.198	$10.98		8	40		7								7	20	28			
Maine	do	12	59	58.0	.194	11.25				59	17								3	52	4			
Massachusetts	do	12	791	54.1	.194	10.52		774			17								1	584	205	1		
New Hampshire	do	7	143	54.9	.201	11.00		20	123										4	31	108			
New Jersey	Piece	1	34	55.0	.195	10.74			34											24	10			
	Time	3	203	55.8	.216	12.08			186			17				1		1		25	153	22	1	
	Total	3	237	55.7	.213	11.89			220			17				1		1		49	163	22	1	
New York	Piece	1	2	60.0	.292	8.76					2						1		1					
	Time	3	47	59.4	.176	10.42		5			42								29	14	4			
	Total	3	49	59.4	.174	10.35		5			44					1		30	14	4			
Pennsylvania	Time	8	85	54.3	.212	11.51		57	28											26	50	9		
Rhode Island	do	5	209	55.8	.188	10.50		133		76						1	7	37	114	50				
Vermont	do	2	23	57.8	.190	10.98				23									23					
All States	Piece	2	36	55.3	.193	10.63			34		2					1		1	24	10				
	Time	57	1,615	55.0	.197	10.86		997	377	158	66	17			1	1	8	81	889	602	32	1		
	Total	57	1,651	55.0	.197	10.85		997	411	158	68	17			1	2	8	82	913	612	32	1		

OTHER EMPLOYEES: Male.

Connecticut	Piece	2	3	55.0	$0.193	$10.62			3				1							1			1	
	Time	6	379	55.9	.232	12.98		107	228	1	28	15		2		8	17	5	25	75	119	73	45	10
	Total	6	382	55.9	.232	12.97		107	231	1	28	15	1	2		8	17	5	25	76	119	73	46	10
Maine	Piece	1	10	58.0	.148	8.61				10			4							3	3			
	Time	12	698	59.2	.230	13.61				658	5	35				4	19	35	36	283	136	88	58	39
	Total	12	708	59.1	.229	13.54				668	5	35	4			4	19	35	36	286	139	88	58	39
Massachusetts	Piece	10	579	54.0	.297	16.04	3	570			6		4		2	5	3	8	9	55	90	119	223	61
	Time	12	5,748	54.7	.219	11.96	171	5,013	1	48	330	185				1	19	318	981	1,773	1,315	608	684	49
	Total	12	6,327	54.7	.226	12.33	174	5,583	1	48	336	185	4		2	6	22	326	990	1,828	1,405	727	907	110
New Hampshire	Piece	3	96	56.2	.226	12.69		1	72		23					1	1	2	14	11	10	22	21	14
	Time	7	1,731	55.4	.218	12.06	1	390	1,193	2	122	23						31	59	300	503	483	205	111	39
	Total	7	1,827	55.5	.218	12.09	1	391	1,265	2	145	23			1	1	33	73	311	513	505	226	125	39

TABLE C.—AVERAGE AND CLASSIFIED FULL-TIME HOURS PER WEEK, AND RATES OF WAGES PER HOUR, AND AVERAGE FULL-TIME WEEKLY EARNINGS, FOR PIECEWORKERS AND TIMEWORKERS, BY STATES, 1916—Concluded.

OTHER EMPLOYEES: Male—Concluded.

State.	Piece-workers or time-workers.	Number of establishments.	Number of employees.	Average full-time hours per week.	Average rate of wages per hour.	Average full-time weekly earnings.	Employees whose full-time hours per week were—						Employees whose rates of wages per hour were—										
							Under 54	57	Over 54 and under 57	57 and under 60	60	Over 60	Under 8 cts.	8 and under 9 cts.	9 and under 10 cts.	10 and under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 cents and over.
New Jersey	Piece....	3	1,004	55.2	$0.222	$12.23	16	.....	962	.....	17	9	8	.....	.....	1	21	32	94	302	333	128	54	31
	Time....	3	2,517	56.7	.226	12.79	150	.....	1,737	.....	494	136	.....	.....	2	21	37	77	113	106	1,536	460	162	3
	Total.	3	3,521	56.3	.224	12.63	166	.....	2,699	.....	511	145	8	.....	2	22	58	109	207	408	1,869	588	216	34
New York	Piece....	2	65	59.8	.210	12.52	.....	2	.....	.....	63	.....	.....	.....	.....	.....	1	8	14	9	24	5	2	2
	Time....	3	857	60.6	.213	12.92	1	59	.....	.....	726	71	.....	.....	.....	.....	28	26	310	130	218	52	60	33
	Total.	3	922	60.6	.213	12.89	1	61	.....	.....	789	71	.....	.....	.....	.....	29	34	324	139	242	57	62	35
Pennsylvania	Piece....	10	81	53.5	.262	14 07	4	73	4	.....	.....	.....	.....	.....	.....	1	7	5	7	7	23	2	22	7
	Time....	14	1,076	55.1	.226	12.43	36	725	248	.....	25	42	.....	1	20	33	54	76	60	142	347	169	156	18
	Total.	14	1,157	55.0	.228	12.55	40	798	252	.....	25	42	.....	1	20	34	61	81	67	149	370	171	178	25
Rhode Island	Piece....	4	23	54.0	.247	13.32	.....	23	.....	.....	.....	.....	1	.....	.....	.....	1	2	1	1	8	4	4	1
	Time....	5	1,664	54.8	.228	12.48	.....	1,593	2	11	6	52	.....	.....	.....	7	125	98	239	243	462	192	257	41
	Total.	5	1,687	54.7	.228	12.50	.....	1,616	2	11	6	52	1	.....	.....	7	126	100	240	244	470	196	261	42
Vermont	Piece....	2	19	58.0	.194	11.26	.....	.....	.....	19	.....	.....	1	2	1	.....	.....	2	2	1	5	4	1	.....
	Time....	3	613	58.1	.225	13.08	2	.....	.....	600	2	9	.....	.....	.....	3	20	26	25	246	126	87	56	24
	Total.	3	632	58.1	.224	13.03	2	.....	.....	619	2	9	1	2	1	3	20	28	27	247	131	91	57	24
All States	Piece....	37	1,880	55.0	.246	13.50	23	669	1,041	29	109	9	19	2	4	8	35	71	138	389	508	283	321	102
	Time....	65	15,283	55.9	.222	12.40	361	7,887	3,409	1,320	1,738	568	.....	3	22	77	350	720	2,089	3,501	4,742	1,934	1,589	256
	Total.	65	17,163	55.8	.225	12.52	384	8,556	4,450	1,349	1,847	577	19	5	26	85	385	791	2,227	3,890	5,250	2,217	1,910	358

OTHER EMPLOYEES: Female.

Connecticut	Piece	4	21	54.8	$0.219	$12.00	.....	4	17	.....	.....	.....	.....	.....	.....	.....	.....	7	2	4	7	1	.....
	Time	6	58	54.9	.149	8.19	.....	5	53	.....	.....	.....	.....	.....	.....	8	12	26	5	1	3	2	1	.....
	Total	6	79	54.9	.168	9.20	.....	9	70	.....	.....	.....	.....	.....	.....	8	12	26	12	3	7	9	2	.....
Maine	Piece	2	3	58.0	.216	12.51	.....	.....	.....	3	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....
	Time	11	106	58.1	.148	8.58	.....	.....	.....	103	3	.....	.....	.....	.....	5	34	38	24	1	4	.....	.....	.....
	Total	11	109	58.1	.150	8.69	.....	.....	.....	106	3	.....	1	.....	.....	5	34	38	24	1	4	2	.....	.....
Massachusetts	Piece	9	412	51.9	.184	9.61	100	312	.....	.....	.....	.....	3	4	13	18	42	61	50	70	128	11	6	6
	Time	12	1,541	53.9	.169	9.13	20	1,521	.....	.....	.....	.....	.....	.....	.....	.....	44	314	981	106	49	19	28	.....
	Total	12	1,953	53.5	.172	9.23	120	1,833	.....	.....	.....	.....	3	4	13	18	86	375	1,031	176	177	30	34	6
New Hampshire	Piece	3	201	55.0	.194	10.66	.....	4	197	.....	.....	.....	.....	.....	.....	2	11	11	18	49	106	4	.....	.....
	Time	7	365	54.9	.149	8.18	.....	53	312	.....	.....	.....	.....	.....	.....	49	123	78	49	40	23	2	1	.....
	Total	7	566	54.9	.165	9.06	.....	57	509	.....	.....	.....	.....	.....	.....	51	134	89	67	89	129	6	1	.....
New Jersey	Piece	3	539	53.9	.185	9.95	86	.....	453	.....	.....	.....	7	1	1	16	78	76	105	91	104	40	16	4
	Time	3	1,432	53.6	.164	8.77	326	.....	1,105	.....	1	.....	.....	.....	.....	10	175	366	546	132	199	3	1	.....
	Total	3	1,971	53.6	.170	9.09	412	.....	1,558	.....	1	.....	7	1	1	26	253	442	651	223	303	43	17	4
New York	Piece	1	45	54.0	.179	9.64	.....	45	.....	.....	.....	.....	.....	.....	6	3	1	5	6	2	21	1	.....	.....
	Time	3	152	54.1	.145	7.86	.....	149	.....	.....	3	.....	.....	.....	.....	24	44	52	15	10	5	2	.....	.....
	Total	3	197	54.1	.153	8.27	.....	194	.....	.....	3	.....	.....	.....	6	27	45	57	21	12	26	3	.....	.....
Pennsylvania	Piece	11	140	53.9	.190	10.26	1	139	.....	.....	.....	.....	1	.....	1	4	17	26	17	16	39	15	4	.....
	Time	13	441	53.6	.146	7.85	18	423	.....	.....	.....	.....	1	9	2	46	164	123	43	27	22	2	2	.....
	Total	13	581	53.7	.157	8.43	19	562	.....	.....	.....	.....	2	9	3	50	181	149	60	43	61	17	6	.....
Rhode Island	Piece	4	133	54.0	.207	11.15	.....	133	.....	.....	.....	.. ..	7	2	1	2	3	7	24	29	28	14	14	2
	Time	5	691	53.9	.164	8.85	19	672	.....	.....	.....	.....	.....	.....	1	8	110	270	177	24	98	3	.....	.....
	Total	5	824	53.9	.171	9.22	19	805	.....	.....	.....	.....	7	2	2	10	113	277	201	53	126	17	14	2
Vermont	Piece	2	17	58.0	.084	4.87	.....	.....	.....	17	.....	.....	12	3	1	.....	.....	.....	.....	.....	.....	.....	.....	1
	Time	3	106	58.0	.148	8.56	.....	.....	.....	106	.....	.....	.....	.....	.....	.....	42	35	12	15	1	1	.....	.....
	Total	3	123	58.0	.139	8.05	.....	.....	.....	123	.....	.....	12	3	1	.....	42	35	12	15	1	1	.....	1
All States	Piece	39	1,511	53.6	.187	10.05	187	637	667	20	.....	.....	31	10	23	45	152	186	227	259	430	94	41	13
	Time	63	4,892	54.0	.162	8.72	383	2,823	1,470	209	7	.....	1	9	3	150	748	1,302	1,852	356	404	34	33	.....
	Total	63	6,403	53.9	.168	9.04	570	3,460	2,137	229	7	.....	32	19	26	195	900	1,488	2,079	615	834	128	74	13

TABLE D.—AVERAGE FULL-TIME HOURS, HOURS ACTUALLY WORKED, FULL-TIME EARNINGS, AND AMOUNTS ACTUALLY EARNED, AND NUMBER OF EMPLOYEES WORKING EACH CLASSIFIED PER CENT OF FULL TIME AND EARNING EACH CLASSIFIED AMOUNT, DURING ONE PAY-ROLL PERIOD, FOR PIECEWORKERS AND TIMEWORKERS, BY STATES. 1916.

ONE-WEEK PAY ROLLS.

WOOL SORTERS: Male.

State.	Piece-workers or time-workers.	Number of establishments.	Number of employees.	Average full-time hours per week.	Average hours worked per employee during one week.	Average full-time weekly earnings.	Average am't earned per employee during one week.	Employees working each classified per cent of full time during one week.						Employees earning each classified amount during one week.																
								Under 25 per cent.	25 and under 50 per cent.	50 and under 75 per cent.	75 and under 100 per cent.	100 per cent.	Over 100 per cent.	Under $3.	$3 and under $4.	$4 and under $5.	$5 and under $6.	$6 and under $7.	$7 and under $8.	$8 and under $9.	$9 and under $10.	$10 and under $11.	$11 and under $12.	$12 and under $14.	$14 and under $16.	$16 and under $18.	$18 and under $20.	$20 and under $25.	$25 and over
Massachusetts	Piece...	2	100	54.0	51.4	$18.05	$17.21	.....	3	5	9	83	.....	.....	.....	.....	1	1	.....	1	.....	2	2	1	5	8	79	.....	.....
	Time...	4	135	53.9	53.5	16.93	16.83	.....	2	.....	13	106	14	.....	.....	.....	2	.....	.....	.....	1	2	3	8	11	43	64	1	.....
	Total.	6	235	54.0	52.6	17.40	16.99	.....	5	5	22	189	14	.....	.....	.....	3	1	.....	1	1	4	5	9	16	51	143	1	.....
New Jersey	Piece...	2	36	54.2	52.1	15.34	14.86	.....	1	.....	5	30	.....	.....	.....	1	.....	.....	.....	3	.....	2	2	6	6	6	9	1	.....
Rhode Island	Piece...	1	55	54.0	53.6	20.27	20.17	.....	.....	1	3	50	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	3	3	47	.....
	Time...	1	16	54.0	52.3	16.86	16.32	.....	.....	1	1	14	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	15	.....	.....	.....
	Total.	2	71	54.0	53.3	19.50	19.30	.....	.....	2	4	64	1	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	1	18	3	47	.....
Other States	Piece...	3	13	54.0	52.8	18.60	18.24	.....	.....	.....	3	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	9	1	.....
	Time...	3	5	56.8	50.7	14.07	12.75	.....	.....	1	1	3	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	1	1	.....	.....	.....	1	.....
	Total.	6	18	54.8	52.2	17.35	16.72	.....	.....	1	4	13	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	1	1	3	.....	9	2	.....
All States	Piece...	8	204	54.0	52.2	18.20	17.66	.....	4	6	20	173	1	.....	.....	1	1	1	1	4	.....	4	4	7	15	17	100	49	.....
	Time...	8	156	54.0	53.3	16.83	16.64	.....	2	2	15	123	14	.....	.....	.....	2	.....	.....	2	2	2	4	9	11	58	64	2	.....
	Total.	16	360	54.0	52.7	17.61	17.22	.....	6	8	35	296	15	.....	.....	1	3	1	1	6	2	6	8	16	26	75	164	51	.....

CARD TENDERS: Male.

Connecticut	Time	4	22	54.7	55.8	$10.44	$10.66			1	2	9	10						1	1	4	6	8	2					
Maine	do	11	70	58.1	54.3	10.32	9.64		4	4	24	27	11		1	2	2	2	4	2	31	8	13	5					
Massachusetts	do	9	187	55.2	54.7	10.06	9.98	5	5	9	29	68	71	6	1	5	3	2	4	14	32	66	34	16	4				
New Hampshire	do	6	47	54.5	50.2	10.57	9.66	1	1	3	25	3	14	1	1		1			8	10	16	9	1					
New Jersey	Piece	1	4	55.0	57.6	10.68	11.24				1	1	2							1			1	2					
	Time	2	39	55.0	53.1	12.65	12.18	1		1	4	27	6					1			2	4	11	10	10				
	Total	2	43	55.0	53.5	12.47	12.09	1		1	5	28	8					1		1	2	4	12	12	10				
New York	Time	3	31	59.8	66.0	10.11	11.13		1		4	1	25						1	2	1	5	9	12					
Rhode Island	do	4	35	54.0	52.4	9.74	9.57	3	1	3	2	3	23	4	1		1	1		3	4	6	6	9					
Vermont	do	3	10	57.8	52.4	11.22	10.23	1			1	6	2	1					1			1	3	4					
Other States	do	2	3	54.0	28.0	8.86	5.22	1	1			1		2									1						
All States	Piece	1	4	55.0	57.6	10.68	11.24				1	1	2							1			1	2					
	Time	44	444	55.8	54.5	10.39	10.14	12	13	21	91	145	162	16	4	7	7	6	11	30	84	112	94	59	14				
	Total	44	448	55.8	54.5	10.40	10.15	12	13	21	92	146	164	16	4	7	7	6	11	31	84	112	95	61	14				

CARD STRIPPERS: Male.

Connecticut	Time	4	14	54.5	53.8	$11.35	$11.22		1		1	8	4				1					3	6	4					
Maine	do	11	48	58.1	55.6	12.00	11.44	1	1	2	11	24	9	1		1		1			1	6	13	24		1			
Massachusetts	do	10	108	54.5	57.5	11.14	11.79		1	4	5	49	49			1	1	3	1	2	1	34	28	15	20	2			
New Hampshire	do	6	41	54.5	52.1	10.75	10.30		1		16	11	13		1					6	7	10	11	6					
New Jersey	Piece	1	5	55.0	65.0	11.25	13.31						5											4	1				
	Time	1	7	55.0	59.0	14.30	15.35						7												7				
	Total	2	12	55.0	61.5	13.03	14.50						12											4	8				
New York	Time	3	10	58.8	63.6	11.33	12.31				1	2	7							2	1	1	4	2					
Rhode Island	do	4	15	54.0	57.7	11.72	12.67			1	1	3	10					1		1	3		3	5	2				
Vermont	do	2	10	57.7	59.2	12.73	13.05				1	4	5									1	9						
Other States	do	2	3	54.0	56.0	13.34	13.82					2	1										1	2					
All States	Piece	1	5	55.0	65.0	11.25	13.31						5										4	1					
	Time	43	256	55.4	56.4	11.47	11.70	1	4	7	36	103	105	1	1	2	2	5	1	9	14	54	60	66	36	5			
	Total	44	261	55.4	56.6	11.46	11.73	1	4	7	36	103	110	1	1	2	2	5	1	9	14	54	60	70	37	5			

TABLE D.—AVERAGE FULL-TIME HOURS, HOURS ACTUALLY WORKED, FULL-TIME EARNINGS, ETC.—Continued.

ONE-WEEK PAY ROLLS—Continued.

COMBER TENDERS: Male.

State.	Piece-workers or time-workers.	Number of establishments.	Number of employees.	Average full-time hours per week.	Average hours worked per employee during one week.	Average full-time weekly earnings.	Average am't earned per employee during one week.	Employees working each classified per cent of full time during one week.						Employees earning each classified amount during one week.																
								Under 25 per cent.	25 and under 50 per cent.	50 and under 75 per cent.	75 and under 100 per cent.	100 per cent.	Over 100 per cent.	Under $3.	$3 and under $4.	$4 and under $5.	$5 and under $6.	$6 and under $7.	$7 and under $8.	$8 and under $9.	$9 and under $10.	$10 and under $11.	$11 and under $12.	$12 and under $14.	$14 and under $16.	$16 and under $18.	$18 and under $20.	$20 and under $25.	$25 and over
Massachusetts...	Time...	3	191	55.0	54.5	$11.45	$11.38	3	7	6	54	57	64	4	....	6	....	2	3	5	8	50	40	47	15	10	1	....	....
Other States.....	Piece...	1	6	56.7	55.3	10.65	10.41	.....	.....	.....	1	3	2	.....	.....	.....	.....	.....	1	.....	.....	3	2	.....	.....	.....	.....	.....	.....
	Time...	6	84	59.1	50.4	10.46	8.93	8	5	7	9	32	23	8	1	4	....	4	5	4	7	28	23	.....	.....	.....	.....	.....	.....
	Total.	6	90	58.9	50.7	10.47	9.03	8	5	7	10	35	25	8	1	4	....	4	6	4	7	31	25	.....	.....	.....	.....	.....	.....
All States.....	Piece...	1	6	56.7	55.3	10.65	10.41	.....	.....	.....	1	3	2	.....	.....	.....	.....	.....	1	.....	.....	3	2	.....	.....	.....	.....	.....	.....
	Time...	9	275	56.3	53.2	11.15	10.63	11	12	13	63	89	87	12	1	10	....	6	8	9	15	78	63	47	15	10	1	....	....
	Total.	9	281	56.3	53.3	11.14	10.63	11	12	13	64	92	89	12	1	10	....	6	9	9	15	81	65	47	15	10	1	....	....

COMBER TENDERS: Female.

All States.....	Piece...	1	14	51.4	48.9	$9.93	$9.49	.....	1	.....	.....	13	.....	.....	1	.....	.....	.....	.....	.....	3	10	.....	.....	.....	.....	.....	.....	.....
	Time...	7	124	53.5	50.2	9.24	8.65	2	6	2	11	103	.....	4	1	3	2	1	9	41	40	23	.....	.....	.....	.....	.....	.....	.....
	Total.	7	138	53.3	50.0	9.31	8.74	2	7	2	11	116	.....	4	2	3	2	1	9	41	43	33	.....	.....	.....	.....	.....	.....	.....

DRAWING-FRAME TENDERS: Male.

Massachusetts...	Time...	2	146	53.9	49.7	$9.20	$8.49	4	6	11	25	54	46	6	2	3	4	5	15	34	56	19	2	.....	.....	.....	.....	.....	.....
Other States.....	Piece...	2	30	50.9	49.8	11.35	11.20	.....	1	.....	.....	29	.....	1	.....	.....	.....	.....	.....	.....	.....	19	4	1	3	1	1	.....	.....
	Time...	4	81	58.3	59.3	10.71	10.83	1	3	2	9	34	32	1	1	2	1	....	2	4	9	7	30	23	.....	1	.....	.....	.....
	Total.	5	111	56.3	56.8	10.88	10.93	1	4	2	9	63	32	2	1	2	1	....	2	4	9	26	34	24	3	2	1	....	....

All States	Piece...	2	30	50.9	49.8	11.35	11.20		1			29		1								19	4	1	3	1	1		
	Time...	6	227	55.5	53.2	9.73	9.33	5	9	13	34	88	78	7	3	5	5	5	17	38	65	26	32	23		1			
	Total.	7	257	55.0	52.8	9.93	9.55	5	10	13	34	117	78	8	3	5	5	5	17	38	65	45	36	24	3	2	1		

DRAWING-FRAME TENDERS: Female.

Massachusetts	Piece...	1	9	54.0	54.0	$10.25	$10.25					9										9							
	Time...	3	677	58.9	49.0	9.30	8.51	11	34	31	125	476		23	15	10	11	18	69	123	406		2						
	Total.	3	686	53.9	49.1	9.31	8.54	11	34	31	125	485		23	15	10	11	18	69	123	406	9	2						
New Jersey	Piece...	1	38	54.2	50.8	9.17	8.47		2	2	4	30			1	1			3	26	2	1	4						
	Time...	2	301	53.0	50.3	9.29	8.79		11	7	46	231	6	2	7	3	2	9	22	123	44	89							
	Total.	2	339	53.1	50.3	9.28	8.76		13	9	50	261	6	2	8	4	2	9	25	149	46	90	4						
Pennsylvania	Time...	2	72	54.0	51.8	7.56	7.26			4	12	56			1	3	1	17	39	5	6								
Rhode Island	...do...	3	265	52.9	49.4	8.84	8.24	3	8	8	45	201		5	6		3	26	19	148	58								
Other States	...do...	2	115	55.0	52.4	9.79	9.33		4	7	8	96		2		2		3	4	5	54	42	3						
All States	Piece...	2	47	54.2	51.4	9.38	8.81		2	2	4	39			1	1			3	26	2	10	4						
	Time...	12	1,430	53.6	49.8	9.17	8.53	14	57	57	236	1,060	6	32	29	18	17	73	153	404	568	131	5						
	Total.	12	1,477	53.6	49.8	9.17	8.53	14	59	59	240	1,099	6	32	30	19	17	73	156	430	570	141	9						

SPINNERS, MULE: Male.

Connecticut	Piece...	2	23	55.0	52.7	$18.02	$17.13		1		4	18								1					7	6	2	7	
	Time...	1	6	55.0	54.8	12.71	12.64				1	5												6					
	Total.	3	29	55.0	53.1	16.92	16.20		1		5	23								1				6	7	6	2	7	
Maine	Piece...	3	33	58.0	56.8	14.27	13.97			1	4	28											5	19	4	3		2	
Massachusetts	...do...	6	229	54.7	49.7	19.63	16.25	3	6	10	90	98	22	1	2	2		1	1	4		3	3	22	70	56	36	25	3
New Hampshire	...do...	3	59	55.0	48.3	15.42	13.60	1		7	26	23			1					1	3	9	8	8	13	10	6		
New Jersey	...do...	2	112	54.1	53.3	20.15	19.79		2	2	2	102	4						1	1		1	1		1	4	60	38	5
New York	Piece..	1	7	54.0	45.0	16.90	14.08		1		6											1	1		1	2		1	
	Time...	1	50	54.0	66.9	10.80	13.38			2		48						1	1			1	1	22	24				
	Total.	2	57	54.0	64.2	11.55	13.47		1	2	6		48					1	2			2	2	22	25	2		1	
Rhode Island	Time...	2	60	54.0	50.9	17.80	16.79	3	1		4	49	3	1	1	1				1	1	1	7	2	1	3	22	19	
Vermont	Piece...	1	31	58.0	42.8	16.32	12.14	4	1	6	19		1	4	1				1	3			2	4	8	6	2		
	Time...	1	24	57.5	51.9	13.86	12.50	1	2		1	20		1	1	1								21					
	Total.	2	55	57.8	46.8	15.25	12.30	5	3	6	20	20	1	5	2	1			1	3			2	25	8	6	2		

TABLE D.—AVERAGE FULL-TIME HOURS, HOURS ACTUALLY WORKED, FULL-TIME EARNINGS, ETC.—Continued.

ONE-WEEK PAY ROLLS—Continued.

SPINNERS, MULE: Male—Concluded.

State.	Piece-workers or time-workers.	Number of establishments.	Number of employees.	Average full-time hours per week.	Average hours worked per employee during one week.	Average full-time weekly earnings.	Average am't earned per employee during one week.	Employees working each classified per cent of full time during one week.						Employees earning each classified amount during one week.															
								Under 25 per cent.	25 and under 50 per cent.	50 and under 75 per cent.	75 and under 100 per cent.	100 per cent.	Over 100 per cent.	Under $3.	$3 and under $4.	$4 and under $5.	$5 and under $6.	$6 and under $7.	$7 and under $8.	$8 and under $9.	$9 and under $10.	$10 and under $11.	$11 and under $12.	$12 and under $14.	$14 and under $16.	$16 and under $18.	$18 and under $20.	$20 and under $25.	$25 and over
Other States.....	Piece...	1	2	54.0	54.0	$14.54	$14.54	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....
All States.....	Piece..	19	496	55.0	50.5	18.55	16.33	8	11	26	151	273	27	5	4	2	.....	1	4	10	3	14	20	53	106	87	106	73	8
	Time...	5	140	54.6	57.0	14.41	14.66	4	3	2	6	74	51	2	2	2	.....	1	1	1	1	2	8	51	25	3	22	19	.....
	Total.	24	636	54.9	51.9	17.54	15.96	12	14	28	157	347	78	7	6	4	.....	2	5	11	4	16	28	104	131	90	128	92	8

SPINNERS, FRAME: Male.

Massachusetts...	Time...	2	260	53.9	50.0	$10.35	$9.60	6	12	18	24	158	42	8	7	3	6	8	11	41	18	109	32	15	2	.....	.....	.....	.....
Other States.....	...do....	2	7	54.6	57.5	8.67	8.90	.....	.....	.....	2	3	2	.....	.....	1	.....	.....	1	3	.....	.....	.....	2	.....	.....	.....	.....	.....
Total.....	Time..	4	267	53.9	50.2	10.30	9.59	6	12	18	26	161	44	8	7	4	6	8	12	44	18	109	32	17	2	.....	.....	.....	.....

SPINNERS, FRAME: Female.

Massachusetts...	Time...	3	529	53.9	51.3	$10.11	$9.64	7	12	16	43	451	.....	12	6	2	3	11	13	63	178	174	51	16	.....	.....	.....	.....	.....
New Jersey.....	Piece...	1	23	54.6	53.3	9.23	9.10	.....	.....	.....	3	19	1	.....	.....	.....	.....	1	2	9	7	4	.....	.....	.....	.....	.....	.....	.....
	Time...	2	113	52.6	50.3	10.48	9.99	.....	2	3	15	93	.....	.....	1	1	1	1	1	11	46	9	42	.....	.....	.....	.....	.....	.....
	Total.	2	136	52.9	50.8	10.27	9.84	.....	2	3	18	112	1	.....	1	1	1	2	3	20	53	13	42	.....	.....	.....	.....	.....	.....
Pennsylvania....	Time...	2	102	54.0	48.3	7.47	6.70	5	4	6	18	69	.....	8	1	3	14	55	2	2	5	9	.....	3	.....	.....	.....	.....	.....
Rhode Island....	...do...	3	181	54.0	49.0	9.30	8.43	8	6	12	23	131	1	11	1	2	5	7	9	23	114	6	3	.....	.....	.....	.....	.....	.....

Other States	...do	1	26	58.0	55.6	10.87	10.41		1		4	21				1					4	3	18								
All States	Piece	1	23	54.6	53.3	9.23	9.10				3	19	1					1	2	9	7	4									
	Time	11	951	53.9	50.6	9.74	9.16	20	25	37	103	765	1	31	9	9	23	74	25	99	347	201	114	19							
	Total	11	974	53.9	50.6	9.73	9.16	20	25	37	106	784	2	31	9	9	23	75	27	108	354	205	114	19							

DOFFERS: Male.

Massachusetts	Piece	1	24	54.0	35.5	$14.22	$9.37	8		3		13		8						1	1	1	2	6	2	3					
	Time	3	212	48.9	44.1	7.47	6.73	7	7	13	37	146	2	10	4	9	7	103	44	26	5		3	1							
	Total	3	235	49.4	43.2	8.16	7.00	15	7	16	37	159	2	18	4	9	7	103	44	27	6	1	5	7	2	3					
Other States	Time	5	93	55.4	48.0	7.45	6.53	11	5	4	9	56	8	14	4	2	5	18	30	12	1	1	2	2	2						
All States	Piece	1	24	54.0	35.5	14.22	9.37	8		3		13		8						1	1	1	2	6	2	3					
	Time	8	305	50.8	45.3	7.46	6.67	18	12	17	46	202	10	24	8	11	12	121	74	38	6	1	5	3	2						
	Total	8	329	50.8	44.6	7.96	6.86	26	12	20	46	215	10	32	8	11	12	121	74	39	7	2	7	9	4	3					

DOFFERS: Female.

Massachusetts	Time	3	288	49.5	46.6	$7.31	$6.86	2	6	18	34	228		5	3	14	15	125	104	14	8										
Pennsylvania	...do	2	29	54.0	49.4	5.60	5.12	1		2	9	17		2	1	10	6	10													
Rhode Island	...do	3	136	53.9	49.1	6.69	6.09	5	6	8	14	103		10	3	6	6	96	15												
Other States	...do	2	30	54.1	50.1	8.36	7.61		3		5	22			3				19	1	7										
Total	Time	10	483	51.3	47.7	7.14	6.58	8	15	28	62	370		17	10	30	27	231	138	15	15										

TWISTER TENDERS: Female.

Massachusetts	Piece	1	8	54.0	48.7	$11.20	$10.11		1		2	5			1						2	2	1	2							
	Time	4	441	53.9	49.5	9.77	9.03	19	12	23	35	352		23	4	6	9	8	12	54	109	207	8	1							
	Total	4	449	53.9	49.5	9.80	9.05	19	13	23	37	357		23	5	6	9	8	12	54	111	209	9	3							
New Jersey	Piece	1	40	55.0	53.2	9.23	8.92			1	6	33						1	7	13	12	7									
	Time	1	54	54.8	52.3	8.71	8.32		3	1	5	45			1	2	1	1	2	42	5										
	Total	2	94	54.9	52.7	8.93	8.58		3	2	11	78			1	2	1	2	9	55	17	7									
Pennsylvania	Piece	1	19	54.0	54.0	11.05	11.05					19							1	1	3	6	1	7							
	Time	3	46	54.0	51.5	8.61	6.76	1		1	9	35		1		1	2	37		3	2										
	Total	4	65	54.0	52.3	8.24	8.01	1		1	9	54		1		1	2	37	1	4	5	6	1	7							

TABLE D.—AVERAGE FULL-TIME HOURS, HOURS ACTUALLY WORKED, FULL-TIME EARNINGS, ETC.—Continued.

ONE-WEEK PAY ROLLS—Continued.

TWISTER TENDERS: Female—Concluded.

State.	Piece-workers or time-workers.	Number of establishments.	Number of employees.	Average full-time hours per week.	Average hours worked per employee during one week.	Average full-time weekly earnings.	Average am't earned per employee during one week.	Employees working each classified per cent of full time during one week.						Employees earning each classified amount during one week.																
								Under 25 per cent.	25 and under 50 per cent.	50 and under 75 per cent.	75 and under 100 per cent.	100 per cent.	Over 100 per cent.	Under $3.	$3 and under $4.	$4 and under $5.	$5 and under $6.	$6 and under $7.	$7 and under $8.	$8 and under $9.	$9 and under $10.	$10 and under $11.	$11 and under $12.	$12 and under $14.	$14 and under $16.	$16 and under $18.	$18 and under $20.	$20 and under $25.	$25 and over
Rhode Island	Piece...	1	27	54.0	50.4	$11.90	$11.09	.....	1	2	5	17	2	.....	.....	1	.....	.....	2	.....	7	2	5	6	4	.....	.....	.....	.....
	Time...	4	112	54.0	50.8	9.42	8.87	.....	4	5	17	86	.....	2	1	2	1	3	11	6	84	1	1	.....	.....	.....	.....	.....	.....
	Total.	5	139	54.0	50.7	9.90	9.30	.....	5	7	22	103	2	2	1	3	1	3	13	6	91	3	6	6	4	.....	.....	.....	.....
Other States	Piece...	1	11	58.0	52.7	12.05	10.93	.....	.....	2	4	5	.....	.....	.....	.....	.....	1	.....	1	3	1	1	3	1	.....	.....	.....	.....
	Time...	8	131	55.2	52.4	8.43	8.01	.....	3	5	26	95	2	1	2	3	2	6	65	17	35	.....	.....	.....	.....	.....	.....	.....	.....
	Total.	8	142	55.4	52.4	8.71	8.21	.....	3	7	30	100	2	1	2	3	2	7	65	18	38	1	1	3	1	.....	.....	.....	.....
All States	Piece...	5	105	54.8	52.2	10.69	10.16	.....	2	5	17	79	2	.....	1	1	.....	2	10	15	27	18	8	18	5	.....	.....	.....	.....
	Time...	20	784	54.2	50.5	9.27	8.63	20	22	35	92	613	2	27	8	14	15	55	90	122	235	208	9	1	.....	.....	.....	.....	.....
	Total.	23	889	54.2	50.7	9.44	8.83	20	24	40	109	692	4	27	9	15	15	57	100	137	262	226	17	19	5	.....	.....	.....	.....

SPOOLER TENDERS: Female.

Connecticut	Piece...	5	33	54.4	52.5	$11.80	$11.48	.....	1	.....	13	19	.....	1	.....	.....	.....	1	3	.....	5	2	6	9	3	3	.....	.....	.....
	Time...	1	6	55.0	46.4	6.62	5.67	1	.....	.....	3	2	.....	1	.....	.....	2	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Total.	5	39	54.5	51.5	11.00	10.59	1	1	.....	16	21	.....	2	.....	.....	2	2	5	.....	5	2	6	9	3	3	.....	.....	.....
Maine	Piece...	10	59	58.0	43.1	11.46	8.52	4	5	18	21	11	.....	4	1	6	5	3	6	6	9	7	3	3	5	.....	1	.....	.....
	Time...	6	26	58.0	46.9	8.35	6.62	1	5	1	4	15	.....	2	4	.....	1	4	6	8	1	.....	.....	.....	.....	.....	.....	.....	.....
	Total.	12	85	58.0	44.3	10.51	7.94	5	10	19	25	26	.....	6	5	6	6	7	12	14	10	7	3	3	5	.....	1	.....	.....

Massachusetts...	Piece...	9	256	53.9	45.9	12.06	10.08	4	6	62	63	121	.....	4	3	3	3	12	17	34	36	48	41	52	3	.....	.....	.....	.....
	Time...	6	590	53.4	49.3	8.42	7.78	13	23	28	75	451	.....	23	13	6	17	53	51	410	10	4	1	2	.....	.....	.....	.....	.....
	Total.	11	846	53.5	48.2	9.52	8.47	17	29	90	138	572	.....	27	16	9	20	65	68	444	46	52	42	54	3	.....	.....	.....	.....
New Hampshire.	Piece...	6	62	54.4	46.2	11.07	9.46	.....	5	11	25	21	.....	.....	4	1	3	8	4	8	4	8	8	10	4	.....	.....	.....	.....
	Time...	1	6	54.0	54.0	7.82	7.82	.....	.....	.....	.....	6	.....	.....	.....	.....	.....	.....	5	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Total.	6	68	54.3	46.9	10.79	9.31	.....	5	11	25	27	.....	.....	4	1	3	8	9	9	4	8	8	10	4	.....	.....	.....	.....
New Jersey.....	Piece...	2	46	54.8	49.6	8.68	7.79	3	.....	1	13	23	6	3	.....	1	4	1	19	9	3	2	.....	2	2	.....	.....	.....	.....
	Time...	2	38	55.0	49.6	8.13	7.73	.....	1	2	5	30	.....	1	.....	2	2	7	2	22	2	.....	.....	.....	.....	.....	.....	.....	.....
	Total.	3	84	54.9	49.6	8.43	7.76	3	1	3	18	53	6	4	.....	3	6	8	21	31	5	2	.....	2	2	.....	.....	.....	.....
New York.....	Piece...	2	46	54.0	50.3	10.59	9.95	1	1	1	10	31	2	1	1	.....	1	3	5	7	5	5	1	17	.....	.....	.....	.....	.....
	Time...	2	14	54.0	51.5	9.60	9.17	.....	.....	1	2	11	.....	.....	.....	.....	.....	.....	3	.....	11	.....	.....	.....	.....	.....	.....	.....	.....
	Total.	3	60	54.0	50.6	10.36	9.77	1	1	2	12	42	2	1	1	.....	1	3	8	7	16	5	1	17	.....	.....	.....	.....	.....
Pennsylvania....	Piece...	3	39	54.0	46.1	12.43	10.72	.....	2	7	21	9	.....	1	1	1	1	3	1	2	4	2	3	20	.....	.....	.....	.....	.....
	Time...	3	30	54.0	48.3	6.73	6.03	.....	3	1	7	19	.....	2	3	1	3	17	.....	3	1	.....	.....	.....	.....	.....	.....	.....	.....
	Total.	6	69	54.0	47.1	9.95	8.68	.....	5	8	28	28	.....	3	4	2	4	20	1	5	5	2	3	20	.....	.....	.....	.....	.....
Rhode Island....	Piece...	3	67	54.0	51.9	9.74	9.37	.....	.....	5	8	54	.....	.....	.....	1	4	4	7	17	5	15	9	4	1	.....	.....	.....	.....
	Time...	4	121	54.0	51.9	8.55	8.21	2	1	3	11	104	.....	2	1	1	2	4	7	89	7	1	7	.....	.....	.....	.....	.....	.....
	Total.	5	188	54.0	51.9	8.97	8.62	2	1	8	19	158	.....	2	1	2	6	8	14	106	12	16	16	4	1	.....	.....	.....	.....
Vermont.....	Piece...	3	45	57.9	43.4	11.59	8.80	3	7	7	10	18	.....	5	2	4	1	2	3	3	3	9	5	4	3	1	.....	.....	.....
	Time...	1	50	58.0	41.6	8.77	6.30	9	9	3	2	27	.....	12	2	4	1	2	.....	27	2	.....	.....	.....	.....	.....	.....	.....	.....
	Total.	3	95	57.9	42.5	10.11	7.48	12	16	10	12	45	.....	17	4	8	2	4	3	30	5	9	5	4	3	1	.....	.....	.....
All States.....	Piece...	43	653	54.7	47.0	11.31	9.66	15	27	112	184	307	8	19	12	17	22	37	65	86	74	98	76	121	21	4	1	.....	.....
	Time...	26	881	54.0	49.1	8.39	7.67	26	42	39	109	665	.....	43	23	14	28	88	76	560	34	5	8	2	.....	.....	.....	.....	.....
	Total.	54	1,534	54.3	48.2	9.63	8.51	41	69	151	293	972	8	62	35	31	50	125	141	646	108	103	84	123	21	4	1	.....	.....

DRESSER TENDERS: Male.

Connecticut.....	Time...	6	28	55.4	55.3	$16.29	$16.27	.....	.....	.....	2	26	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	1	9	9	7	.....	.....
Maine.....	Piece...	1	2	58.0	51.3	18.33	16.28	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....
	Time...	11	34	58.0	50.4	16.00	13.87	2	2	3	12	11	4	2	.....	.....	.....	1	1	.....	2	.....	.....	7	9	9	1	2	.....
	Total..	12	36	58.0	50.5	16.13	14.00	2	2	3	14	11	4	2	.....	.....	.....	1	1	.....	2	.....	.....	7	10	9	2	2	.....

TABLE D.—AVERAGE FULL-TIME HOURS, HOURS ACTUALLY WORKED, FULL TIME EARNINGS, ETC.—Continued.

ONE-WEEK PAY ROLLS—Continued.

DRESSER TENDERS: Male—Concluded.

State.	Piece-workers or time-workers.	Number of establishments.	Number of employees.	Average full-time hours per week.	Average hours worked per employee during one week.	Average full-time weekly earnings.	Average am't earned per employee during one week.	Employees working each classified per cent of full time during one week.						Employees earning each classified amount during one week.															
								Under 25 per cent.	25 and under 50 per cent.	50 and under 75 per cent.	75 and under 100 per cent.	100 per cent.	Over 100 per cent.	Under $3.	$3 and under $4.	$4 and under $5.	$5 and under $6.	$6 and under $7.	$7 and under $8.	$8 and under $9.	$9 and under $10.	$10 and under $11.	$11 and under $12.	$12 and under $14.	$14 and under $16.	$16 and under $18.	$18 and under $20.	$20 and under $25.	$25 and over
Massachusetts...	Piece...	4	50	54.0	49.2	$18.56	$16.76	.....	.....	.....	26	24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	16	22	11	.....	.....
	Time...	12	108	54.0	53.9	17.66	17.66	.....	1	.....	17	75	15	.....	.....	.....	.....	.....	1	.....	.....	.....	2	12	7	38	33	15	.....
	Total.	12	158	54.0	52.4	17.92	17.37	.....	1	.....	43	99	15	.....	.....	.....	.....	.....	1	.....	.....	.....	2	13	23	60	44	15	.....
New Hampshire.	Piece...	1	1	55.0	54.4	19.25	19.03	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
	Time...	7	37	54.6	52.0	16.29	15.55	.....	1	3	9	18	6	.....	.....	.....	1	.....	.....	.....	2	1	2	7	11	8	5	.....	.....
	Total.	7	38	54.6	52.0	16.37	15.64	.....	1	3	10	18	6	.....	.....	.....	1	.....	.....	.....	2	1	2	7	12	8	5	.....	.....
New York.....	Piece...	1	5	60.0	60.0	17.75	17.75	.....	.....	.....	.....	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	1	.....	.....
	Time...	3	17	58.6	58.3	15.68	15.58	.....	.....	.....	2	11	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	5	10	.....	.....	.....
	Total.	3	22	58.9	58.7	16.15	16.07	.....	.....	.....	2	16	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	5	14	1	.....	.....
Pennsylvania...	Time...	7	35	54.5	52.5	18.73	17.94	.....	2	.....	2	24	7	.....	.....	1	.....	.....	.....	.....	.....	.....	1	.....	4	6	18	5	.....
Rhode Island....	...do....	5	75	54.0	52.6	18.25	17.76	.....	.....	.....	19	46	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	11	14	48	.....	.....
Other States.....	Piece...	3	9	57.7	59.1	18.01	18.40	.....	.....	.....	.....	7	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	4	1	.....
	Time...	4	25	55.9	55.1	16.41	15.98	1	1	.....	1	13	9	1	.....	.....	.....	.....	1	.....	.....	.....	.....	6	1	6	1	9	.....
	Total.	5	34	56.3	56.2	16.84	16.62	1	1	.....	1	20	11	1	.....	.....	.....	.....	1	.....	.....	.....	.....	6	1	10	5	10	.....
All States.....	Piece...	10	67	55.1	51.5	18.43	17.07	.....	.....	.....	29	36	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	18	30	17	1	
	Time...	55	359	55.0	53.4	17.30	16.81	3	7	6	64	224	55	3	.....	1	1	1	3	.....	5	1	8	35	57	100	113	31	.....
	Total.	57	426	55.0	53.1	17.48	16.85	3	7	6	93	260	57	3	.....	1	1	1	3	.....	5	1	8	36	75	130	130	32	.....

DRAWERS-IN: Female.

Connecticut	Piece	5	18	54.8	41.1	$14.48	$10.49			9	5	4			1	2		3		1		1	2	3	4	1			
	Time	1	2	55.0	55.0	9.10	9.10					2							1				1						
	Total	6	20	54.8	42.5	13.94	10.35			9	5	6			1	2		3	1	1		1	3	3	4	1			
Maine	Piece	9	20	58.0	48.2	13.36	11.30		1	3	10	4	2	1			3			1	2		1	8	3			1	
	Time	4	7	58.0	37.9	11.32	7.46	2	1			3	1	2	1							1	2	1					
	Total	11	27	58.0	45.5	12.83	10.30	2	2	3	10	7	3	3	1		3			1	2	1	3	9	3			1	
Massachusetts	Piece	10	142	54.0	46.3	13.89	12.02		11	16	71	44		1	3	4	4	6	11	11	8	12	10	19	25	16	10	2	
	Time	2	6	54.0	54.0	9.76	9.75					6							1		1	4							
	Total	12	148	54.0	46.6	13.73	11.93		11	16	71	50		1	3	4	4	6	12	11	9	16	10	19	25	16	10	2	
New Hampshire	Piece	5	39	54.6	49.3	14.66	13.11	1	2	4	7	25		1				2	1		1	5		14	7	8				
	Time	3	9	54.9	34.7	10.79	6.81	2	1	2	1	3		2	1		1		1	1		1	1	1						
	Total	7	48	54.7	46.6	13.94	11.93	3	3	6	8	28		3	1		1	2	2	1	1	6	1	15	7	8				
New Jersey	Piece	3	57	55.0	48.8	14.40	12.74			10	25	22								3	2	7	13	17	7	7	1		
New York	do	2	14	54.0	44.5	9.33	7.63		1	5	5	3			1			4	3	3	3								
Pennsylvania	Piece	2	10	54.0	32.3	12.76	7.61		2	5	2	1		1			1	2	3			1	2						
	Time	4	14	54.0	51.4	12.45	11.91				6	8								2	2	2	2	1	4		1		
	Total	6	24	54.0	43.5	12.58	10.12		2	5	8	9		1			1	2	3	2	2	3	4	1	4		1		
Rhode Island	Piece	4	62	54.0	51.3	13.66	13.00		2	4	5	51		1			2	4	7	1	2	8	5	9	5	3	9	6	
Vermont	do	3	26	57.9	47.2	16.17	13.53	3		1	13	8	1	3							2	1	1	4	6	6	1	2	
All States	Piece	43	388	54.7	47.3	13.97	12.12	4	19	57	143	162	3	8	5	6	10	21	25	20	20	35	34	74	57	41	21	11	
	Time	14	38	55.0	45.6	11.25	9.39	4	2	2	7	22	1	4	2		1		3	3	3	8	6	3	4		1		
	Total	54	426	54.7	47.1	13.72	11.87	8	21	59	150	184	4	12	7	6	11	21	28	23	23	43	40	77	61	41	22	11	

LOOM FIXERS: Male.

Connecticut	Time	5	17	54.9	54.9	$20.31	$20.31					17														11	6		
Maine	do	11	39	58.1	55.8	17.52	16.89		2	1	2	26	8			1				2					4	23	7	2	
Massachusetts	do	8	164	54.0	47.9	19.72	17.59		1	6	78	71	8						1				3	5	74	2	16	58	5
New Hampshire	do	6	31	54.5	48.2	17.76	15.78		3	3	9	10	6			1		2						7		10	11		
New Jersey	do	3	113	54.8	54.9	21.21	21.23				1	107	5												8	6	14	84	1
New York	do	3	30	59.2	56.3	18.24	17.33		1		12	12	5			1								3		12	11	3	
Pennsylvania	do	9	92	54.1	54.4	22.17	22.29	1			1	75	15	1													3	86	2
Rhode Island	do	5	95	54.0	53.1	20.92	20.62			3	10	79	3									1		1	6	4	8	73	2
Vermont	do	3	36	57.9	57.0	18.94	18.36	1		2	3	13	17	1								1		2		2	15	15	
Total	Time	53	617	54.9	52.6	20.20	19.41	2	7	15	116	410	67	2		3		2	1	2		2	3	18	92	59	96	327	10

TABLE D.—AVERAGE FULL-TIME HOURS, HOURS ACTUALLY WORKED, FULL-TIME EARNINGS, ETC.—Continued.

ONE-WEEK PAY ROLLS—Continued.

BURLERS: Female.

State.	Piece-workers or time-workers.	Number of establishments.	Number of employees.	Average full-time hours per week.	Average hours worked per employee during one week.	Average full-time weekly earnings.	Average am't earned per employee during one week.	Employees working each classified per cent of full time during one week.						Employees earning each classified amount during one week.																
								Under 25 per cent.	25 and under 50 per cent.	50 and under 75 per cent.	75 and under 100 per cent.	100 per cent.	Over 100 per cent.	Under $3.	$3 and under $4.	$4 and under $5.	$5 and under $6.	$6 and under $7.	$7 and under $8.	$8 and under $9.	$9 and under $10.	$10 and under $11.	$11 and under $12.	$12 and under $14.	$14 and under $16.	$16 and under $18.	$18 and under $20.	$20 and under $25.	$25 and over
Connecticut	Piece...	5	41	54.8	44.5	$11.28	$9.28	1	2	14	5	19	....	....	1	1	5	7	4	3	1	3	5	8	3	....	....	....	....
Maine	Piece...	3	20	58.0	53.5	10.07	9.24	....	....	....	8	12	....	....	....	....	....	3	6	1	4	....	2	3	1	....	....	....	....
	Time...	8	54	58.0	51.5	8.41	7.46	....	4	7	8	35	....	2	2	5	2	....	11	24	8	....	....	....	....	....	....	....	....
	Total.	11	74	58.0	52.0	8.86	7.94	....	4	7	16	47	....	2	2	5	2	3	17	25	12	....	2	3	1	....	....	....	....
Massachusetts	Piece...	7	420	54.0	50.9	11.52	10.88	3	4	22	122	269	....	3	1	3	8	16	14	36	72	65	68	83	49	2	....	....	....
	Time...	3	294	54.0	50.3	8.54	7.96	1	4	15	72	202	....	2	3	3	11	57	22	189	7	....	....	....	....	....	....	....	....
	Total.	10	714	54.0	50.7	10.29	9.68	4	8	37	194	471	....	5	4	6	19	73	36	225	79	65	68	83	49	2	....	....	....
New Hampshire.	Piece...	4	34	54.4	50.5	10.79	10.03	....	....	1	17	16	....	....	....	....	....	4	5	5	2	1	8	9	....	....	....	....	....
	Time...	3	15	54.4	46.7	11.24	9.74	....	....	4	4	7	....	....	....	3	....	....	2	3	....	1	1	3	2	....	....	....	....
	Total.	6	49	54.4	49.4	10.93	9.94	....	....	5	21	23	....	....	....	3	....	4	7	8	2	2	9	12	2	....	....	....	....
New Jersey	Piece...	2	169	55.0	55.4	10.17	10.27	1	3	1	26	47	91	2	....	1	2	8	14	15	33	35	26	22	8	2	....	1	....
	Time...	1	57	54.1	51.5	8.87	8.51	2	2	....	10	23	20	3	....	1	2	2	8	21	9	4	6	1	....	....	....	....	....
	Total.	3	226	54.8	54.4	9.84	9.82	3	5	1	36	70	111	5	....	2	4	10	22	36	42	39	32	23	8	2	....	1	....
New York	Piece...	2	64	54.0	35.1	11.07	7.13	2	4	40	6	12	....	2	....	1	16	26	....	6	2	11	....	....	....	....	....	....	....
	Time...	1	13	54.0	52.5	10.25	9.97	....	....	....	2	11	....	....	....	....	....	....	....	2	....	11	....	....	....	....	....	....	....
	Total.	3	77	54.0	38.1	10.93	7.61	2	4	40	8	23	....	2	....	1	16	26	....	8	2	22	....	....	....	....	....	....	....

Pennsylvania	Piece	7	153	54.0	49.9	9.74	9.02		3	4	72	74			3			16	19	19	47	39	10								
	Time	2	46	54.0	51.4	7.93	7.55		1	1	19	25			1		1	2	42												
	Total	9	199	54.0	50.2	9.32	8.68		4	5	91	99			4		1	18	61	19	47	39	10								
Rhode Island	Piece	4	122	54.0	49.4	10.43	9.53	1	2		60	59		1	2	3	9	13	13	13	5	22	16	19	6						
	Time	1	1	54.0	54.0	7.94	7.94					1							1											
	Total	4	123	54.0	49.4	10.41	9.52	1	2		60	60		1	2	3	9	13	14	13	5	22	16	19	6						
Vermont	Piece	2	84	58.0	30.0	9.80	5.08	2	36	39	7			19	11	9	9	23	10		1	2									
	Time	1	25	57.5	50.9	7.98	7.07	1	2	1	3	18		3		1		1	15	3	1	1									
	Total	3	109	57.9	34.8	9.38	5.54	3	38	40	10	18		22	11	10	9	24	25	3	2	3									
All States	Piece	36	1,107	54.6	48.6	10.74	9.61	10	54	121	323	508	91	27	18	18	49	116	85	98	167	178	135	144	67	4		1			
	Time	20	505	54.6	50.6	8.60	7.99	4	13	28	118	322	20	10	6	13	16	62	101	242	25	17	7	4	2						
	Total	54	1,612	54.6	49.2	10.07	9.10	14	67	149	441	830	111	37	24	31	65	178	186	340	192	195	142	148	69	4		1			

MENDERS: Female.

Connecticut	Piece	2	16	55.0	51.8	$16.29	$15.42			2	2	12					1				1	2		5	3		1	1	2		
	Time	3	34	54.8	52.4	13.33	12.74			2	7	25							2			2	3	24	2	1					
	Total	5	50	54.8	52.2	14.27	13.60			4	9	37					1		2		1	4	3	29	5	1	1	1	2		
Maine	Piece	1	1	58.0	58.0	10.74	10.74					1										1									
	Time	11	106	58.0	53.9	10.91	10.10	1	8	4	13	80		1	1	3	5	2	1	2	21	29	21	20							
	Total	12	107	58.0	53.8	10.90	10.11	1	8	4	13	81		1	1	3	5	2	1	2	21	30	21	20							
Massachusetts	Piece	5	188	54.0	51.3	13.13	12.51		3	4	63	118			1	1	1	3	7	9	10	23	23	59	22	23	4	2			
	Time	5	73	54.0	52.6	11.20	10.91		1	1	7	64			1		1	5	1	6	11	16	1	31							
	Total	8	261	54.0	51.7	12.59	12.03		4	5	70	182			2	1	2	8	8	15	21	39	24	90	22	23	4	2			
New Hampshire	Piece	2	22	54.5	51.7	12.05	11.39			1	9	11	1								3		16	3							
	Time	5	20	54.6	49.0	11.41	10.30		1	2	4	13			1		1		2		2	8		4	2						
	Total	6	42	54.5	50.4	11.75	10.84		1	3	13	24	1		1		1		2		5	8	16	7	2						
New York	Piece	2	82	54.0	34.4	11.54	7.41	2	11	56	8	5		2	2	2	12	22	15	12	6	2		7							
	Time	1	13	54.0	54.0	12.69	12.09					13												13							
	Total	3	95	54.0	37.1	11.70	8.13	2	11	56	8	18		2	2	2	12	22	15	12	6	2		20							
Pennsylvania	Piece	7	214	54.0	50.9	13.37	12.68			31	25	158					1	2	11	20	10	18	16	60	48	22	5	1			
	Time	2	42	54.0	52.6	9.99	9.74			1	12	29							2		11	29									
	Total	9	256	54.0	51.2	12.81	12.20			32	37	187					1	2	13	20	21	47	16	60	48	22	5	1			

TABLE D.—AVERAGE FULL-TIME HOURS, HOURS ACTUALLY WORKED, FULL-TIME EARNINGS, ETC.—Continued.

ONE-WEEK PAY ROLLS—Continued.

MENDERS: Female—Concluded.

State.	Piece-workers or time-workers.	Number of establishments.	Number of employees.	Average full-time hours per week.	Average hours worked per employee during one week.	Average full-time weekly earnings.	Average am't earned per employee during one week.	Employees working each classified per cent of full time during one week.						Employees earning each classified amount during one week.															
								Under 25 per cent.	25 and under 50 per cent.	50 and under 75 cent.	75 and under 100 per cent.	100 per cent.	Over 100 per cent.	Under $3.	$3 and under $4.	$4 and under $5.	$5 and under $6.	$6 and under $7.	$7 and under $8.	$8 and under $9.	$9 and under $10.	$10 and under $11.	$11 and under $12.	$12 and under $14.	$14 and under $16.	$16 and under $18.	$18 and under $20.	$20 and under $25.	$25 and over
Rhode Island	Piece...	3	88	54.0	52.3	$12.72	$12.35	.....	.....	1	25	62	.....	.....	.....	.....	.....	1	2	3	2	8	5	67	.....	.....	.....	.....
	Time...	2	69	54.0	52.0	13.16	12.66	.....	2	2	5	60	.....	.....	.....	2	.....	.....	.....	2	.....	3	1	61	.....	.....	.....	.....
	Total.	4	157	54.0	52.2	12.91	12.49	.....	2	3	30	122	.....	.....	.....	2	.....	1	2	5	2	11	6	128	.....	.....	.....	.....
Other States	Piece...	3	57	58.0	54.9	13.53	12.74	2	1	1	4	49	.....	2	.....	1	.....	.....	.....	7	3	4	5	15	9	3	5	3	.....
	Time...	1	7	57.5	53.0	12.47	11.53	.....	1	.....	.....	6	.....	.....	.....	.....	1	.....	.....	1	1	.....	.....	2	1	1	.....	.....	.....
	Total.	3	64	57.9	54.7	13.42	12.61	2	2	1	4	55	.....	2	.....	1	1	.....	.....	8	4	4	5	17	10	4	5	3	.....
All States	Piece...	25	668	54.4	49.6	13.03	11.97	4	15	96	136	416	1	4	3	4	15	28	35	51	35	58	65	216	82	48	15	7	2
	Time...	30	364	55.3	52.7	11.45	11.08	1	13	12	48	290	.....	1	3	5	8	7	8	11	46	87	26	155	5	2	.....	.....	.....
	Total.	50	1,032	54.7	50.7	12.53	11.66	5	28	108	184	706	1	5	6	9	23	35	43	62	81	145	91	371	87	50	15	7	2

LABORERS, DYEHOUSE: Male.

Connecticut	Time...	4	48	54.8	53.4	$11.07	$10.80	.....	2	1	10	25	10	.....	.....	2	.....	1	.....	.....	.....	25	15	4	1	.....	.....	.....	.....
Maine	..do....	12	59	58.0	53.2	11.25	10.31	2	4	9	9	21	14	2	.....	3	1	1	3	5	4	15	13	8	2	.....	1	1	.....
Massachusetts	..do....	12	791	54.0	62.3	10.52	12.16	11	15	18	43	17	687	15	2	6	6	5	11	14	16	59	250	253	116	35	3	.....	.....
New Hampshire	..do....	6	39	54.0	49.1	10.34	9.37	.....	4	2	14	9	10	1	3	.....	1	1	2	2	11	10	5	2	1	.....	.....	.....	.....
New Jersey	Piece...	1	34	55.0	76.3	10.74	14.89	.....	.....	.....	1	.....	33	.....	.....	.....	.....	.....	.....	.....	1	.....	1	6	20	4	2	.....	.....
	Time...	3	203	55.8	68.3	12.08	14.80	.....	6	4	7	15	171	1	.....	1	4	2	3	2	.....	4	7	22	91	55	9	2	.....
	Total.	3	237	55.7	69.5	11.89	14.81	.....	6	4	8	15	204	1	.....	1	4	2	3	2	1	4	8	28	111	59	11	2	.....

New York	Piece	1	2	60.0	42.0	8.76	6.15			2						1		1											
	Time	3	47	59.4	61.4	10.42	10.76	2			3	11	31	2					2	4	11	16	10	2					
	Total	3	49	59.4	60.6	10.35	10.57	2		2	3	11	31	2			1		1	2	4	11	16	10	2				
Pennsylvania	Time	5	47	54.3	56.1	12.30	12.70		1	2	9	10	25				1			2	2	4	8	13	15	2			
Rhode Island	do	5	209	55.8	57.3	10.50	10.83	4	9	9	22	18	147	5	2	7	3	5	2	9	16	44	52	45	16	3			
Vermont	do	2	23	57.8	55.3	10.98	10.52	1	1		8	7	6	1		1				1	1	11	4	3	1				
All States	Piece	2	36	55.3	74.4	10.63	14.40			2	1		33				1		1		1		1	6	20	4	2		
	Time	52	1,466	55.0	61.1	10.84	12.09	20	42	45	125	133	1,101	27	7	20	16	15	21	37	54	183	370	360	245	95	13	3	
	Total	52	1,502	55.0	61.4	10.83	12.14	20	42	47	126	133	1,134	27	7	20	17	15	22	37	55	183	371	366	265	99	15	3	

OTHER EMPLOYEES: Male.

Connecticut	Piece	2	3	55.0	50.0	$10.62	$10.24			1		2			1						1			1					
	Time	5	348	55.6	53.7	13.09	12.61	9	10	14	24	220	71	9	3	2	10	13	12	20	8	46	46	71	29	41	18	13	7
	Total	5	351	55.6	53.7	13.07	12.59	9	10	15	24	222	71	9	4	2	10	13	12	20	8	47	46	71	29	42	18	13	7
Maine	Piece	1	10	58.0	42.6	8.61	7.64	2	2			5	1	4								3		3					
	Time	12	698	59.2	58.1	13.61	13.43	13	17	31	89	348	200	14	13	6	4	21	9	30	30	100	111	119	54	75	29	48	35
	Total	12	708	59.1	57.9	13.54	13.34	15	19	31	89	353	201	18	13	6	4	21	9	30	30	103	111	122	54	75	29	48	35
Massachusetts	Piece	10	579	54.0	52.5	16.04	15.68	13	19	26	187	77	257	16	3	4	9	11	10	15	13	47	49	60	66	93	42	94	47
	Time	12	5,748	54.7	54.6	11.96	11.95	110	140	239	691	2,507	2,061	137	43	72	58	212	227	433	646	864	672	810	539	410	358	219	48
	Total	12	6,327	54.6	54.4	12.33	12.32	123	159	265	878	2,584	2,318	153	46	76	67	223	237	448	659	911	721	870	605	503	400	313	95
New Hampshire	Piece	2	2	54.5	32.0	9.36	7.19	1				1		1										1					
	Time	6	701	55.2	54.4	12.73	12.61	17	14	34	171	271	194	18	4	9	11	5	19	37	91	112	86	107	66	56	28	24	28
	Total	6	703	55.2	54.4	12.72	12.59	18	14	34	171	272	194	19	4	9	11	5	19	37	91	112	86	108	66	56	28	24	28
New Jersey	Piece	3	1,004	55.2	54.7	12.23	12.12	37	43	32	109	117	666	59	17	9	14	13	31	44	49	107	127	216	155	78	34	40	11
	Time	3	2,517	56.7	59.0	12.79	13.47	19	46	57	277	959	1,159	26	11	28	55	62	42	39	96	90	262	792	461	225	181	131	16
	Total	3	3,521	56.3	57.8	12.63	13.13	56	89	89	386	1,076	1,825	85	28	37	69	75	73	83	145	197	289	1,008	616	303	215	171	27
New York	Piece	1	2	54.0	18.0	25.49	8.50			2										2									
	Time	3	857	60.6	57.8	12.92	12.39	55	25	46	105	281	345	59	5	7	26	15	21	32	58	133	92	153	105	49	35	38	29
	Total	3	859	60.6	57.7	12.95	12.38	55	27	46	105	281	345	59	5	7	26	15	21	34	58	133	92	153	105	49	35	38	29
Pennsylvania	Piece	7	63	54.0	48.4	15.18	13.53			8	22	33			1		3	5	3	6		7	2	10	2	4	11	9	
	Time	9	564	55.1	54.2	12.69	12.64	4	11	20	59	338	132	9	5	20	17	26	23	23	40	33	51	91	83	60	44	34	5
	Total	9	627	55.0	53.6	12.94	12.73	4	11	28	81	371	132	9	6	20	20	31	26	29	40	40	53	101	85	64	55	43	5

TABLE D.—AVERAGE FULL-TIME HOURS, HOURS ACTUALLY WORKED, FULL-TIME EARNINGS, ETC.—Continued.

ONE-WEEK PAY ROLLS—Concluded.

OTHER EMPLOYEES: Male—Concluded.

State.	Piece-workers or time-workers.	Number of establishments.	Number of employees.	Average full-time hours per week.	Average hours worked per employee during one week.	Average full-time weekly earnings.	Average am't earned per employee during one week.	Employees working each classified per cent of full time during one week.						Employees earning each classified amount during one week.															
								Under 25 per cent.	25 and under 50 per cent.	50 and under 75 per cent.	75 and under 100 per cent.	100 per cent.	Over 100 per cent.	Under $3.	$3 and under $4.	$4 and under $5.	$5 and under $6.	$6 and under $7.	$7 and under $8.	$8 and under $9.	$9 and under $10.	$10 and under $11.	$11 and under $12.	$12 and under $14.	$14 and under $16.	$16 and under $18.	$18 and under $20.	$20 and under $25.	$25 and over
Rhode Island	Piece...	4	23	54.0	46.6	$13.32	$11.28	3	1	1	2	14	2	4	....	....	....	....	....	1	....	2	6	2	6	2	....	....	....
	Time...	5	1,664	54.8	55.4	12.48	12.73	20	36	47	157	735	669	35	10	12	24	105	65	98	131	190	178	273	127	171	95	111	39
	Total.	5	1,687	54.7	55.2	12.50	12.71	23	37	48	159	749	671	39	10	12	24	105	65	99	131	192	184	275	133	173	95	111	39
Vermont	Piece...	2	19	58.0	44.3	11.26	9.40	1	3	3	6	4	2	4	1	....	....	1	2	2	1	....	....	3	2	2	1	....	....
	Time...	3	613	58.1	54.4	13.08	12.29	27	24	38	110	215	199	26	9	10	13	13	21	29	64	73	110	79	69	30	20	24	23
	Total.	3	682	58.1	54.1	13.03	12.21	28	27	41	116	219	201	30	10	10	13	14	23	31	65	73	110	82	71	32	21	24	23
All States	Piece...	32	1,705	54.8	53.4	13.62	13.40	57	70	71	326	253	928	88	23	13	26	30	46	70	63	167	184	295	231	180	88	143	58
	Time...	58	13,710	55.9	55.8	12.61	12.55	274	323	526	1,683	5,874	5,030	333	103	166	218	472	439	741	1,164	1,641	1,608	2,495	1,533	1,117	838	642	230
	Total.	58	15,415	55.7	55.6	12.73	12.65	331	393	597	2,009	6,127	5,958	421	126	179	244	502	485	811	1,227	1,808	1,792	2,790	1,764	1,297	896	785	288

OTHER EMPLOYEES: Female.

Connecticut	Piece...	4	21	54.8	46.3	$12.00	$10.01	1	.....	2	8	10	.....	1	.....	.....	1	1	.....	.....	5	7	3	2	1	.....	.....	.....	.....
	Time...	5	56	54.9	52.7	8.28	7.98	.....	2	2	4	48	.....	1	2	....	5	9	10	18	5	.....	1	2	2	1	.....	.....	.....
	Total.	5	77	54.9	51.0	9.29	8.53	1	2	4	12	58	.....	2	2	....	6	10	10	18	10	7	4	4	3	1	.....	.....	.....
Maine	Piece...	2	3	58.0	47.0	12.51	10.86	.....	.....	1	2	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....
	Time...	11	106	58.1	50.2	8.58	7.47	3	10	7	21	65	.....	11	2	....	7	12	26	21	20	3	.....	4	.....	.....	.....	.....	.....
	Total.	11	109	58.1	50.1	8.69	7.56	3	10	8	23	65	.....	12	2	....	7	12	26	21	20	3	.....	5	1	.....	.....	.....	.....

Massachusetts...	Piece...	9	412	51.9	46.2	9.61	8.49	3	14	38	161	196	.....	10	18	30	42	49	46	23	32	67	30	50	3	3	.....	.....	.....
	Time...	12	1,541	53.9	50.8	9.13	8.63	17	42	62	214	1,202	4	27	28	17	30	51	199	693	388	38	8	24	12	21	5	.....	.....
	Total.	12	1,953	53.5	49.9	9.23	8.60	20	56	100	375	1,398	4	37	46	47	72	100	245	716	420	105	47	74	15	24	5	.....	.....
New Hampshire.	Piece...	2	5	54.2	35.9	8.88	5.55	.....	1	3	1	.....	.....	.....	.....	1	3	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Time...	6	69	54.2	49.3	8.52	7.72	1	3	3	21	41	.....	3	1	.....	7	8	19	9	17	2	2	1	.....	.....	.....	.....	.....
	Total.	6	74	54.2	48.4	8.54	7.57	1	4	6	22	41	.....	3	1	1	10	9	19	9	17	2	2	1	.....	.....	.....	.....	.....
New Jersey.....	Piece...	3	539	53.9	49.8	9.95	9.30	12	6	42	116	355	8	16	13	17	45	33	44	77	84	95	32	36	28	4	8	7	.....
	Time...	3	1,432	53.6	50.5	8.77	8.26	16	35	65	246	1,003	67	24	26	24	57	150	253	379	305	121	87	5	2	.....	1	.....	.....
	Total.	3	1,971	53.6	50.3	9.09	8.55	28	41	107	362	1,358	75	40	39	41	102	183	297	456	387	216	119	41	30	4	9	7	.....
New York.....	Piece...	1	45	54.0	47.1	9.64	8.27	.....	7	1	7	30	.....	.....	4	8	5	.....	2	5	7	1	3	10	.....	.....	.....	.....	.....
	Time...	3	152	54.1	49.5	7.86	7.27	2	6	7	38	96	3	7	1	5	20	13	76	5	13	6	1	4	1	.....	.....	.....	.....
	Total.	3	197	54.1	49.0	8.27	7.50	2	13	8	45	126	3	7	5	13	25	13	78	10	20	7	4	14	1	.....	.....	.....	.....
Pennsylvania....	Piece...	8	86	54.0	50.4	10.55	9.87	.....	5	3	11	67	.....	1	3	4	4	3	7	18	5	4	8	22	6	.....	1	.....	.....
	Time...	8	232	53.9	50.4	7.97	7.52	.....	6	13	54	158	1	4	7	15	22	47	64	10	24	21	5	11	.....	1	1	.....	.....
	Total.	8	318	53.9	50.4	8.67	8.15	.....	11	16	65	225	1	5	10	19	26	50	71	28	29	25	13	33	6	1	2	.....	.....
Rhode Island....	Piece...	4	133	54.0	48.4	11.15	9.86	3	7	10	27	85	1	10	3	5	1	1	6	15	25	20	16	17	8	6	.....	.....	.....
	Time...	5	691	53.9	48.1	8.85	7.96	34	30	43	93	491	.....	56	3	16	24	87	115	184	104	9	55	36	2	.....	.....	.....	.....
	Total.	5	824	53.9	48.2	9.22	8.27	37	37	53	120	576	1	66	6	21	25	88	121	199	129	29	71	53	10	6	.....	.....	.....
Vermont.....	Piece...	2	17	58.0	12.8	4.87	.96	10	7	.....	.....	.....	.....	17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Time...	3	106	58.0	49.8	8.56	7.38	6	7	10	15	66	2	9	3	4	5	15	20	28	8	9	3	1	1	.....	.....	.....	.....
	Total.	3	123	58.0	44.7	8.05	6.49	16	14	10	15	66	2	26	3	4	5	15	20	28	8	9	3	1	1	.....	.....	.....	.....
All States.....	Piece...	35	1,261	53.3	47.8	9.96	8.99	29	47	100	333	743	9	56	41	65	101	88	105	138	158	194	101	138	47	13	9	7	.....
	Time...	56	4,385	54.0	50.2	8.82	8.22	79	141	212	706	3,170	77	142	73	81	177	392	782	1,347	882	209	162	88	20	23	7	.....	.....
	Total.	56	5,646	53.9	49.7	9.07	8.39	108	188	312	1,039	3,913	86	198	114	146	278	480	887	1,485	1,040	403	263	226	67	36	16	7	.....

TABLE D.—AVERAGE FULL-TIME HOURS, HOURS ACTUALLY WORKED, FULL-TIME EARNINGS, ETC.—Continued.

TWO-WEEK PAY ROLLS.

WOOL SORTERS: Male.

State.	Piece-workers or time-workers.	Number of establishments.	Number of employees.	Average full-time hours per two weeks.	Average hours worked per employee during two weeks	Average full-time bi-weekly earnings.	Average am't earned per employee during two weeks	Employees working each classified per cent of full-time during two weeks.						Employees earning each classified amount during two weeks.																	
								Under 25 per cent.	25 and under 50 per cent.	50 and under 75 per cent.	75 and under 100 per cent.	100 per cent.	Over 100 per cent.	Under $6.	$6 and under $7.	$7 and under $8.	$8 and under $9.	$9 and under $10.	$10 and under $11.	$11 and under $12.	$12 and under $14.	$14 and under $16.	$16 and under $18.	$18 and under $20.	$20 and under $25.	$25 and under $30.	$30 and under $35.	$35 and under $40.	$40 and over
All States	Piece...	4	54	109.4	103.6	$36.83	$34.77	.....	.....	4	26	20	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	3	2	19	21	7
	Time...	1	7	108.0	108.0	41.72	41.73	.....	.....	.....	.....	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	5
	Total.	5	61	109.3	104.1	37.39	35.57	.....	.....	4	26	27	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	3	2	19	23	12

CARD TENDERS: Male.

All States	Piece...	1	6	108.0	108.0	$21.28	$21.28	.....	.....	.....	.....	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	.....	.....	.....	.....	.....
	Time...	5	84	111.9	104.1	20.60	19.06	3	3	3	17	42	16	3	1	.....	.....	1	.....	2	1	3	7	25	38	3	.....	.....	.....
	Total.	6	90	111.6	104.4	20.65	19.21	3	3	3	17	48	16	3	1	.....	.....	1	.....	2	1	3	7	25	44	3	.....	.....	.....

CARD STRIPPERS: Male.

All States	Piece...	2	10	115.2	112.6	$23.69	$23.20	.....	.....	.....	4	4	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	6	1	1	.....	.....
	Time...	5	40	110.3	107.9	26.02	25.36	.....	.....	3	4	25	8	.....	.....	.....	.....	.....	.....	.....	.....	2	1	1	13	13	10	.....	.....
	Total.	6	50	111.1	108.8	25.55	24.93	.....	.....	3	8	29	10	.....	.....	.....	.....	.....	.....	.....	.....	2	1	3	19	14	11	.....	.....

COMBER TENDERS: Female.

All States	Piece...	1	19	110.0	107.3	$18.72	$18.29	.....	.....	1	3	15	.....	.....	.....	.....	.....	.....	.....	1	.....	1	3	11	3	.....	.....	.....	.....
	Time...	4	25	108.2	103.4	20.87	20.00	.....	.....	1	7	17	.....	.....	.....	.....	.....	.....	1	.....	.....	3	5	2	10	4	.....	.....	.....
	Total.	4	44	109.0	105.1	19.94	19.26	.....	.....	2	10	32	.....	.....	.....	.....	.....	.....	1	1	.....	4	8	13	13	4	.....	.....	.....

DRAWING-FRAME TENDERS: Female.

All States	Piece...	2	126	109.9	107.1	$19.18	$18.71	....	....	3	23	100	....	....	....	1	....	2	....	....	1	19	32	28	38	5	....	....	....
	Time...	5	170	107.2	96.3	16.13	14.60	5	3	9	80	71	2	8	1	4	2	3	3	12	37	31	39	13	17	....	....	....	....
	Total.	5	296	108.3	100.9	17.42	16.35	5	3	12	103	171	2	8	1	5	2	5	3	12	38	50	71	41	55	5	....	....	....

SPINNERS, MULE: Male.

Connecticut	Piece...	2	19	111.2	102.5	$32.06	$29.51	....	....	2	7	10	....	....	....	....	....	....	....	....	....	....	1	1	2	6	4	4	1
	Time...	1	12	120.0	89.9	23.67	17.80	2	....	3	....	7	....	2	....	....	....	....	....	....	2	....	1	2	....	5	....	....	....
	Total.	2	31	114.6	97.6	28.81	24.98	2	....	5	7	17	....	2	....	....	....	....	....	....	2	....	2	3	2	11	4	4	1
Maine	Piece...	8	133	116.3	98.9	34.94	30.03	5	4	17	69	35	3	4	1	....	1	....	1	2	....	4	3	3	13	29	34	21	17
Massachusetts	...do...	4	203	108.5	98.9	38.09	34.96	6	3	16	69	109	....	4	1	....	1	....	....	....	1	....	5	5	6	13	37	70	60
New Hampshire	Piece..	3	57	108.0	92.9	37.01	31.55	1	1	15	22	18	....	1	....	....	....	....	....	....	....	....	1	1	7	16	9	11	8
	Time...	1	10	115.0	115.9	29.50	29.72	....	....	....	1	8	1	....	....	....	....	....	....	....	....	....	....	....	....	5	5	....	....
	Total.	4	67	109.0	96.3	35.89	31.28	1	1	15	23	26	1	1	....	....	....	....	....	....	....	....	1	1	7	21	14	14	8
Pennsylvania	Piece...	2	21	108.0	102.1	27.12	25.47	....	1	1	4	15	....	....	....	....	....	....	....	1	....	....	....	1	9	7	2	1	....
	Time...	2	30	109.9	96.2	28.78	25.25	2	2	1	3	21	1	....	2	....	2	....	....	....	....	1	....	....	2	21	....	2	....
	Total.	3	51	109.1	98.6	28.10	25.34	2	3	2	7	36	1	....	2	....	2	....	....	....	1	1	....	1	11	28	2	3	....
All States	Piece...	19	433	110.9	98.4	36.19	32.30	12	9	51	171	187	3	9	2	....	2	....	1	2	2	4	10	11	37	71	86	110	86
	Time...	4	52	113.2	98.5	27.74	24.39	4	2	4	4	36	2	2	2	....	2	....	....	....	2	1	1	2	2	31	5	2	....
	Total.	21	485	111.2	98.4	35.28	31.45	16	11	55	175	223	5	11	4	....	4	....	1	2	4	5	11	13	39	102	91	112	86

SPINNERS, FRAME: Female.

All States	Time...	5	304	108.0	98.9	$17.60	$16.17	3	9	13	125	153	1	6	3	2	2	5	7	8	52	62	41	33	83	....	....	....	....

DOFFERS: Female.

All States	Time...	5	265	108.0	92.2	$13.57	$11.62	12	21	20	69	142	1	27	12	4	4	19	14	34	101	48	1	....	1	....	....	....	....

TABLE D.—AVERAGE FULL-TIME HOURS, HOURS ACTUALLY WORKED, FULL-TIME EARNINGS, ETC.—Continued.

TWO-WEEK PAY ROLLS—Continued.

TWISTER TENDERS: Female.

State.	Piece-workers or time-workers.	Number of establishments.	Number of employees.	Average full-time hours per two weeks.	Average hours worked per employee during two weeks	Average full-time bi-weekly earnings.	Average am't earned per employee during two weeks	Employees working each classified per cent of full-time during two weeks.						Employees earning each classified amount during two weeks.															
								Under 25 per cent.	25 and under 50 per cent.	50 and under 75 per cent.	75 and under 100 per cent.	100 per cent.	Over 100 per cent.	Under $6.	$6 and under $7.	$7 and under $8.	$8 and under $9.	$9 and under $10.	$10 and under $11.	$11 and under $12.	$12 and under $14.	$14 and under $16.	$16 and under $18.	$18 and under $20.	$20 and under $25.	$25 and under $30.	$30 and under $35.	$35 and under $40.	$40 and over
Pennsylvania	Time...	4	195	107.7	99.0	$17.55	$16.43	3	6	7	83	96	.....	4	4	1	3	2	....	1	21	48	18	75	18	.....	.....	.....	.....
Other States	Piece...	1	21	110.0	99.3	21.95	19.82	.....	1	1	10	9	.....	.....	.....	.....	.....	1	.....	1	.....	.....	3	3	13	.....	.....	.....	.....
	Time...	1	3	110.0	103.3	18.92	17.71	.....	.....	.....	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	1	.....	.....	.....	.....
	Total.	1	24	110.0	99.8	21.57	19.55	.....	1	1	11	11	.....	.....	.....	.....	.....	1	.....	1	.....	1	4	3	14	.....	.....	.....	.....
All States	Piece...	1	21	110.0	99.3	21.95	19.82	.....	1	1	10	9	.....	.....	.....	.....	.....	1	.....	1	.....	.....	3	3	13	.....	.....	.....	.....
	Time...	5	198	107.7	99.0	17.57	16.45	3	6	7	84	98	.....	4	4	1	3	2	....	1	21	49	19	75	19	.....	.....	.....	.....
	Total.	5	219	107.9	99.1	17.99	16.77	3	7	8	94	107	.....	4	4	1	3	3	....	2	21	49	22	78	32	.....	.....	.....	.....

SPOOLER TENDERS: Female.

All States	Piece...	3	35	109.6	98.4	$20.79	$18.57	.....	4	1	9	20	1	.....	.....	2	1	2	....	1	1	8	1	3	9	7	.....	.....	.....
	Time...	5	114	105.6	83.8	12.46	9.90	9	9	12	42	42	.....	18	3	7	4	3	19	24	31	5	.....	.....	.....	.....	.....	.....	.....
	Total.	7	149	106.5	87.2	14.41	11.94	9	13	13	51	62	1	18	3	9	5	5	19	25	32	13	1	3	9	7	.....	.....	.....

LOOM FIXERS: Male.

All States	Time...	7	185	109.0	105.2	$45.08	$43.79	1	2	9	23	131	19	1	.....	.....	.....	.....	.....	1	1	.....	1	2	5	2	51	8	113

WEAVERS: Male.

Connecticut	Piece	6	314	111.1	100.0	$34.50	$31.25	3	17	23	111	160	.....	7	....	3	1	1	1	3	1	5	5	8	27	43	93	80	36
	Time	1	7	110.0	103.9	33.26	31.34	.....	.....	.....	3	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	3	.....	.....
	Total	6	321	111.0	100.1	34.44	31.25	3	17	23	114	164	.....	7	....	3	1	1	1	3	1	5	5	8	27	47	96	80	36
Maine	Piece	12	450	116.1	94.4	34.62	28.46	21	25	78	258	64	4	21	1	2	1	11	....	6	13	16	15	26	48	83	64	66	77
	Time	4	19	116.0	76.6	31.72	21.01	3	4	2	3	5	2	3	....	....	1	....	1	2	1	.....	.....	1	.....	3	7	.....	.....
	Total	12	469	116.1	93.7	34.52	28.16	24	29	80	261	69	6	24	1	2	2	11	1	8	14	16	15	27	48	86	71	66	77
Massachusetts	Piece	10	2,020	108.0	95.3	34.50	30.89	41	127	216	531	1,048	57	37	10	20	10	20	14	19	60	39	51	53	202	298	418	398	371
New Hampshire	Piece	6	419	109.2	90.5	32.20	26.51	13	26	76	209	93	2	10	2	4	1	2	3	5	7	9	12	14	80	138	86	34	12
	Time	1	5	108.0	108.9	30.56	30.56	.....	.....	.....	.....	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	1	.....	.....
	Total	6	424	109.2	90.7	32.18	26.56	13	26	76	209	98	2	10	2	4	1	2	3	5	7	9	12	14	80	142	87	34	12
New Jersey	Piece	3	457	108.1	101.3	29.14	27.46	7	18	23	44	356	9	8	1	3	10	5	1	4	9	5	15	23	72	119	93	60	29
	Time	1	11	110.0	68.6	31.40	20.06	2	3	1	2	1	2	1	1	2	.....	.....	.....	.....	.....	1	.....	1	.....	2	2	1	.....
	Total	3	468	108.1	100.5	29.18	27.28	9	21	24	46	357	11	9	2	5	10	5	1	4	9	6	15	24	72	121	95	61	29
New York	Piece	2	78	114.6	105.4	32.29	29.59	.....	3	3	40	32	.....	.....	.....	.....	1	.....	.....	1	.....	.....	4	3	8	26	15	16	4
	Time	1	2	108.0	78.8	30.88	22.53	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	.....	.....
	Total	2	80	114.5	104.8	32.26	29.42	.....	4	3	40	33	.....	.....	.....	.....	1	.....	.....	1	.....	1	4	3	8	26	16	16	4
Pennsylvania	Piece	11	429	108.2	104.3	30.50	29.47	.....	2	19	104	264	40	2	....	1	.....	.....	.....	.....	2	9	13	15	59	110	130	69	19
Rhode Island	Piece	5	686	108.0	84.2	34.60	31.70	15	24	50	137	452	8	11	2	5	5	3	2	3	15	8	22	12	72	105	157	107	157
	Time	1	11	108.0	52.4	32.48	15.76	.....	1	10	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	10	.....	.....	.....	.....	.....	.....
	Total	5	697	108.0	83.7	34.56	31.45	15	25	60	137	452	8	11	2	5	5	3	3	3	15	8	32	12	72	105	157	107	157
Vermont	Piece	3	274	115.8	86.9	35.92	27.81	14	42	34	156	26	2	17	5	2	4	4	6	2	18	6	14	12	24	29	34	37	60
	Time	1	8	115.0	42.8	27.24	10.20	3	2	3	.....	.....	.....	3	....	.....	.....	.....	.....	.....	4	.....	1	.....	.....	.....	.....	.....	.....
	Total	3	282	115.8	85.6	35.68	27.31	17	44	37	156	26	2	20	5	2	4	4	6	2	22	6	15	12	24	29	34	37	60
All States	Piece	58	5,127	109.5	94.6	33.57	29.84	114	284	522	1,590	2,495	122	113	21	40	33	46	27	43	125	97	151	166	592	951	1,090	867	765
	Time	10	63	111.9	72.3	31.28	20.51	8	11	16	8	16	4	7	1	2	1	.....	2	2	5	2	11	2	.....	13	14	1	.....
	Total	58	5,190	109.6	94.4	33.54	29.73	122	295	538	1,598	2,511	126	120	22	42	34	46	29	45	130	99	162	168	592	964	1,104	868	765

TABLE D.—AVERAGE FULL-TIME HOURS, HOURS ACTUALLY WORKED, FULL-TIME EARNINGS, ETC.—Concluded.

TWO-WEEK PAY ROLLS—Concluded.

WEAVERS: Female.

State.	Piece-workers or time-workers.	Number of establishments.	Number of employees.	Average full-time hours per two weeks.	Average hours worked per employee during two weeks	Average full-time bi-weekly earnings.	Average am't earned per employee during two weeks	Employees working each classified per cent of full-time during two weeks.						Employees earning each classified amount during two weeks.															
								Under 25 per cent.	25 and under 50 per cent.	50 and under 75 per cent.	75 and under 100 per cent.	100 per cent.	Over 100 per cent.	Under $6.	$6 and under $7.	$7 and under $8.	$8 and under $9.	$9 and under $10.	$10 and under $11.	$11 and under $12.	$12 and under $14.	$14 and under $16.	$16 and under $18.	$18 and under $20.	$20 and under $25.	$25 and under $30.	$30 and under $35.	$35 and under $40.	$40 and over
Connecticut	Piece...	6	48	109.4	98.5	$36.72	$33.09	.....	1	6	16	25	.....	.....	.....	.....	.....	.....	.....	.....	1	1	4	1	8	12	13	8
Maine	...do...	12	219	116.0	94.9	31.48	25.64	7	17	36	105	54	.....	7	2	.....	.....	4	2	8	11	6	10	19	28	45	34	29	14
Massachusetts	...do...	10	1,335	108.0	89.5	32.17	27.44	28	167	174	464	502	.....	29	9	13	17	28	29	40	57	40	38	52	191	197	217	193	179
New Hampshire	...do...	6	540	109.8	99.1	29.12	26.23	11	25	42	140	322	.....	12	2	2	2	5	4	5	11	2	13	16	97	215	129	24	1
New Jersey	...do...	3	1,083	108.4	104.8	27.30	26.49	8	18	27	93	936	1	11	4	1	2	4	8	5	15	29	56	61	241	288	240	87	31
New York	...do...	2	78	108.0	101.2	85.84	24.20	.....	1	4	29	44	.....	.....	.....	.....	.....	1	1	.....	.....	5	1	2	33	25	10	.....	.....
Pennsylvania	...do...	11	558	108.0	102.3	27.40	25.97	.....	2	28	180	346	2	.....	.....	1	.....	1	2	1	6	16	26	35	153	183	99	32	3
Rhode Island	...do...	5	504	108.0	102.9	26.84	25.54	2	5	34	76	387	.....	2	1	1	2	2	3	5	11	10	30	37	132	139	88	32	9
Vermont	...do...	3	121	115.9	92.7	35.94	29.63	2	7	22	87	6	.....	2	3	.....	.....	2	1	1	2	4	6	8	15	20	15	18	27
Total	Piece..	58	4,489	108.9	98.1	29.44	26.64	58	243	373	1,190	2,622	3	63	21	18	23	47	50	65	113	113	181	234	891	1,120	844	434	272

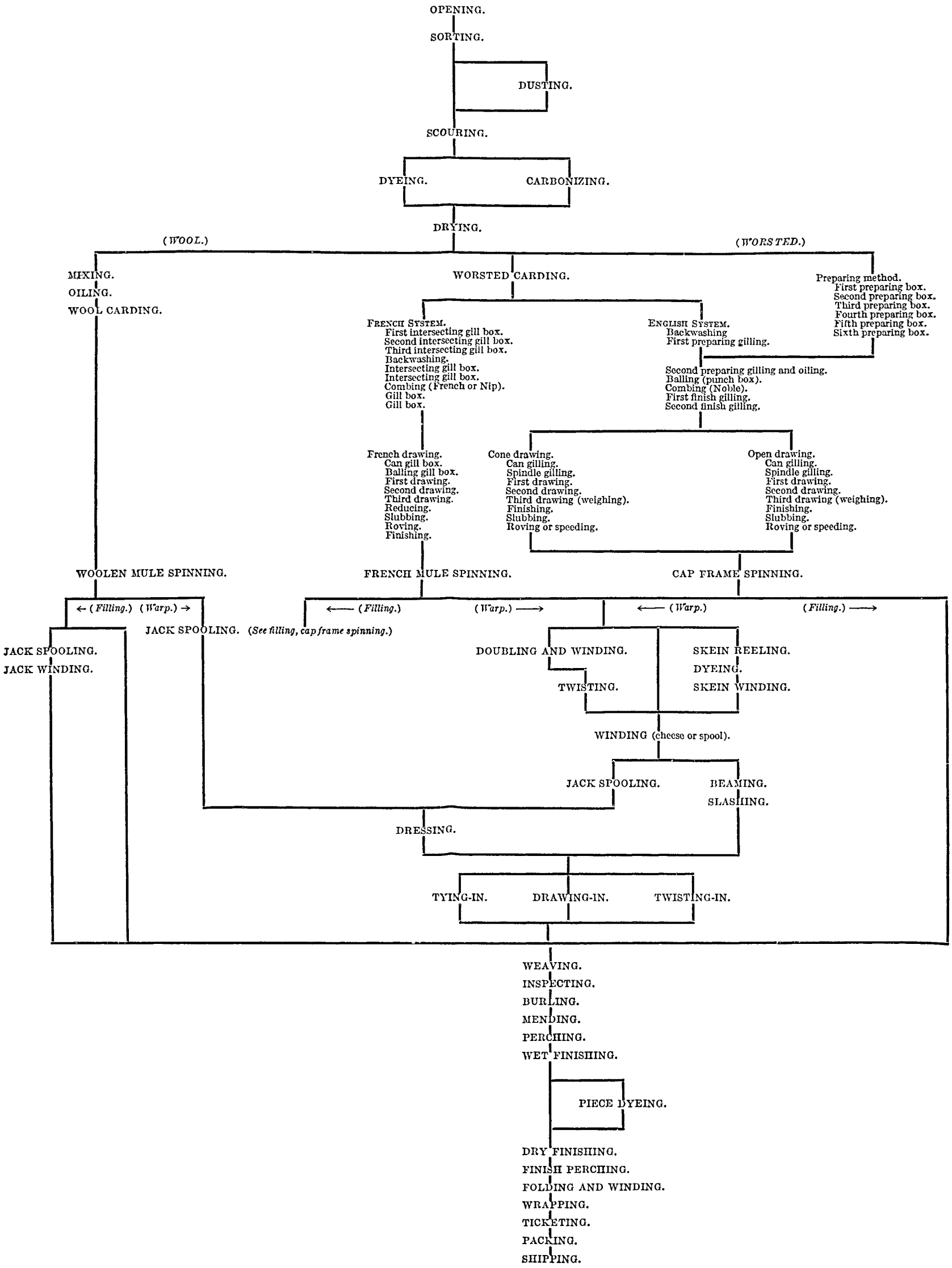
BURLERS: Female.

All States	Piece...	2	229	109.5	99.0	$23.35	$21.13	3	8	5	180	33	.....	3	1	1	....	2	4	1	5	21	11	31	97	41	11	....	....
	Time...	4	105	108.9	97.7	15.27	13.74	1	4	4	53	43	.....	3	2	3	....	2	....	3	26	59	5	1	1	.....	.....	.....	.....
	Total.	5	334	109.3	98.6	20.81	18.81	4	12	9	233	76	.....	6	3	4	....	4	4	4	31	80	16	32	98	41	11	....	....

MENDERS: Female.

Massachusetts	Piece...	3	614	107.7	94.8	$27.43	$24.26	1	34	24	315	240	.....	5	1	....	17	9	12	6	12	15	25	57	165	179	74	20	17
	Time...	1	5	108.0	45.9	22.66	9.46	1	1	3	.....	.....	.....	1	....	....	....	....	3	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Total.	3	619	107.7	94.1	27.40	24.11	2	35	27	315	240	.....	6	1	....	17	9	15	7	12	15	25	57	165	179	74	20	17

SEQUENCE OF PROCESSES IN THE MANUFACTURE OF WOOLEN AND WORSTED CLOTH.



Other States.....	Piece...	2	230	108.7	99.3	27.46	25.42	3	5	18	118	86	.....	5	4	2	2	3	.....	.....	2	3	9	6	65	68	32	27	2
	Time...	3	7	109.4	107.2	19.17	18.77	.....	.....	.....	3	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	1	2	2	.....	.....	.....	.....
	Total.	4	237	108.7	99.5	27.22	25.22	3	5	18	121	90	.....	5	4	2	2	3	.....	.....	2	5	10	8	67	68	32	27	2
All States.....	Piece...	5	844	107.9	96.0	27.44	24.57	4	39	42	433	326	.....	10	5	2	19	12	12	6	14	18	34	63	230	247	106	47	19
	Time...	4	12	108.8	81.6	20.63	14.89	1	1	3	3	4	.....	1	.....	.....	.....	.....	3	1	.....	2	1	2	2	.....	.....	.....	.....
	Total.	7	856	108.0	95.8	27.35	24.44	5	40	45	436	330	.....	11	5	2	19	12	15	7	14	20	35	65	232	247	106	47	19

LABORERS, DYEHOUSE: Male.

All States.....	Time...	5	149	110.1	110.8	$22.06	$22.17	6	3	10	35	4	91	6	.....	.....	2	.....	5	.....	4	2	4	10	64	43	9	.....	.....

OTHER EMPLOYEES: Male.

All States.....	Piece...	4	112	111.0	87.8	$24.70	$22.82	12	10	10	44	28	8	15	1	3	2	3	1	3	6	4	3	10	26	20	9	3	3
	Time...	7	1,573	111.0	98.8	23.57	22.51	68	51	95	307	544	508	78	13	14	14	14	18	22	43	58	122	146	516	258	109	85	63
	Total.	7	1,685	111.0	98.1	23.64	22.56	80	61	105	351	572	516	93	14	17	16	17	19	25	49	62	125	156	542	278	118	88	66

OTHER EMPLOYEES: Female.

Pennsylvania.....	Piece...	3	54	107.6	82.3	$19.60	$14.42	4	5	12	10	22	1	4	5	.....	3	.....	1	1	14	7	5	.....	11	3	.....	.....	.....
	Time...	5	209	106.6	95.5	15.42	13.91	7	7	9	83	101	2	13	3	.....	4	5	8	6	39	73	41	7	10	.....	.....	.....	.....
	Total.	5	263	106.8	92.8	16.29	14.02	11	12	21	93	123	3	17	8	.....	7	5	9	7	53	80	46	7	21	3	.....	.....	.....
Other States.....	Piece...	1	196	110.0	98.3	21.41	19.44	7	4	18	61	105	.....	9	.....	1	2	1	4	3	6	7	14	29	113	7	.....	.....	.....
	Time...	2	298	110.0	96.0	16.17	14.13	9	24	16	98	151	.....	21	6	6	9	4	6	26	69	61	27	23	38	2	.....	.....	.....
	Total.	2	494	110.0	96.9	18.25	16.23	16	28	34	159	257	.....	30	6	7	11	5	10	29	75	68	41	52	151	9	.....	.....	.....
All States	Piece...	4	250	109.5	94.9	21.02	18.35	11	9	30	71	128	1	13	5	1	5	1	5	4	20	14	19	29	124	10	.....	.....	.....
	Time...	7	507	108.6	95.8	15.86	14.04	16	31	25	181	252	2	34	9	6	13	9	14	32	108	134	68	30	48	2	.....	.....	.....
	Total.	7	757	108.9	95.5	17.56	15.46	27	40	55	252	380	3	47	14	7	18	10	19	36	128	148	87	59	172	12	.....	.....	.....

DESCRIPTION OF PROCESSES, MACHINES, AND OCCUPATIONS.

The following is a description of the principal processes and occupations in the manufacture of woolen and worsted cloths. Although both kinds of fabrics are made of wool, they are enough unlike to necessitate many differences in the manufacture, particularly in the preparation of the stock for spinning. In preparing the wool for woolen yarns the object is to retain the natural curly, springy quality of the fiber, while in preparing it for worsted yarns the object is to take out as much of the curl as possible and make the fibers parallel so they will spin into a smoother and harder yarn than the woolen. So many of the processes in the manufacture of woolens and worsteds are identical, however, that it was decided the two could be treated together, with an explanation of the differences in similar processes, and noting the processes that are peculiar to either one. Only the manufacture of staple fabrics—dress goods and men's wear—is included. It was not deemed necessary to include the making of special fabrics requiring special processes and variations. There is considerable variation in treatment in the manufacture of woolens and worsteds, i. e., one or more processes designed to do practically the same thing may be employed, depending on such things as the quality of the wool, its freedom from foreign matter, the length of the fiber, etc. All of the essential processes are included, however, and some that are not so frequently used. In order to show the processes in proper sequence and to bring out the relations of one to the other, a chart is here inserted. Following the chart are the descriptions (1) of the processes, (2) of the machines used, and (3) of the occupations concerned with them, arranged in consecutive order, and grouped in sections which correspond in a general way to the usual departments in a mill. As far as possible technical and shop language has been avoided, and such words and expressions peculiar to the industry as have been used are defined.

Each individual process is treated as a unit. First, the process itself is described, i. e., the state of the product at the beginning, what is done to it and how it is done, and the state of the product after the process are given. Then the machine or machines used in the process and how they act upon the product are described briefly. Following the descriptions of the machines are descriptions of each of the occupations concerned with the process. Certain points are covered for practically every occupation. They are: The character

of the operative, whether man, woman, or child; what the individual worker is required to do and how he does it; whether the operative oils and cleans, or otherwise cares for, his machine; whether the operative stands or sits at his work; the continuity of actual employment; whether or not such employment requires actual physical effort, or is principally watching the machine; particular occupational hazards; and the basis of pay. This involves considerable repetition, but it seemed best to make the description of each occupation complete in itself.

GENERAL OCCUPATIONS.

Woolen and worsted mills are organized after the same general plan as cotton mills, with a superintendent at the head and the several overseers directly under him, one in charge of each department. The departments in woolen and worsted mills vary more than the departments in cotton mills. The division depends not only on the size of the plant but on whether woolen cloth only, or worsted cloth only, or both woolen and worsted are manufactured, and, as well, on the different fabrics and styles. There is always a sorting and scouring department; where woolen cloth is manufactured there is a wool-carding department; where worsted cloth, a wool-combing department; in all cases a spinning department; usually a dressing department with winding, etc., included; or, perhaps, the winding under the spinner; always a weaving department, which usually includes drawing-in, etc.; and, finally, a finishing department, which may be divided into three divisions or three separate departments—burling and mending, wet finishing, and dry finishing. Most woolen and worsted mills have a dyeing department with a boss dyer or overseer at the head. The larger plants have a mechanical department, no mention of which will be made in the following description. In the following account the processes have been grouped in accordance with these departments, with the exception that all warp preparation has been grouped to show the close connection of the operations.

There are several auxiliary occupations that occur in all, or nearly all, the departments. These, while important, do not for the most part enter directly into the manufacturing process. Mention of each occupation will be made under each department, but the general statement which here follows will suffice for a description of them.

Superintendent.—The superintendent has complete charge of the manufacturing and is responsible for the proper management of the plant.

Overseer.—Overseers are men in charge of departments. They are responsible directly to the superintendent. Overseers not only are experts in the processes that come directly under their supervision but they have a comprehensive knowledge of all processes in the mill, for a man can not do satisfactory work in one department unless he

knows its relation to the other departments. Overseers understand thoroughly all the machines in their departments, and are able to direct changes and repairs on them. Overseers are sometimes called bosses—as boss carder, boss weaver, etc.

Second hand.—Second hands are assistants to the overseers. One overseer may have one or more second hands, depending on the size of the mill, the size of the department, and the general physical layout of the plant. Often there is a second hand in charge of each room, where a department is divided into different rooms, or in large rooms there may be two or more second hands. The work of the second hand is supervisory. He not only must see that the employees are doing their work and doing it properly, but he must plan the work and place the workers. The second hand is usually responsible for having the work that comes off the machines according to the specifications. Orders for changes are issued through him and important changes or repairs of machinery are made by him or under his immediate supervision.

Section hand.—Section hands are men in supervisory positions directly under the second hands. They have charge of certain sections in which they must supervise the workers and see that the work comes off properly. An important part of the work of a section hand is fixing—i. e., making repairs and changes in machinery. He inspects the machinery to see that no parts are worn out or missing and that the machines are properly oiled and cleaned. The work of a section hand and that of a fixer are practically the same. Where the work of supervision predominates (as in the spinning department, where the section hand actively directs the doffers), he is called a section hand; where the fixing is important and supervision incidental, he is called a fixer.

Fixer.—(*See* Section hand.)

Oiler.—Oilers are employed in every department of the mill where there are enough machines to make their employment profitable. Their work is to make regular trips around the room, oiling the different parts according to some regular scheme, as determined by the overseer. Fast moving parts have to be oiled frequently; slower moving parts not so often. But it is important that no part be skipped. So the oiler has to be a reliable man who can be depended upon not to neglect his work. Oilers usually have some further duties, such as cleaning the overhead pulleys, belts, shafting, etc. Often they assist fixers, and if they become sufficiently skilled, are promoted to that position.

Trucker or floor man.—Truckers or floor men perform a very necessary function in every department of the mill. As the term would indicate, they are used to convey material from one section of a room to another or from one room to another. For the most part

they are strong men and are required to do the heavy work, such as putting up and taking down beams for warpers. In some mills and some departments they are given specific names, as "beam truckers." In some instances where the duties are distinctive in a particular department, as "filling carrier" in the weaving department, a separate occupation has been described under that department.

Sweeper.—Sweeping the floor several times a day is absolutely necessary in most sections of the mill because the waste is thrown on the floor, and "flyings," or lint, settle on it. So sweepers are employed in most departments, particularly up to and including spinning. The work is very unskilled, requiring the worker merely to push a brush or broom before him, gathering as much waste and dirt as possible. He also has to gather up the sweepings and truck them to the waste house or some place where they can be picked over. As a rule, old men who are beyond doing other work are employed. For this reason the job is made light and the pay small. A certain number of rounds must be made each day and between rounds the sweeper has his time free. Most mills pay sweepers on a time basis, but some pay so much a round.

Waste picker.—Waste pickers are employed in most mills to pick over the sweepings in order to separate the various kinds of waste. Large quantities of perfectly good workable wool get into the sweepings, particularly in the spinning room, and there would be a considerable loss to the management if this were not saved and used over again. Then, too, what is called waste in the ordinary mill, while it can not be used in that particular plant, can still be used for something and has a value on the market. The waste picker usually sorts the various kinds of waste and either bags them or bales them. The work naturally is dusty and disagreeable, and is usually given to a very low grade of employee.

Scrubber or scourer.—Scrubbers or scourers are employees who wash the floors in the mill. They are sometimes men and sometimes women. In departments where good wool or yarn or cloth gets on the floor it is important to have the floors as clean as possible, and washing has to be done frequently. Scrubbers are of a very low grade of employees. They are usually paid on a time basis.

SORTING AND SCOURING DEPARTMENT.

When a sheep is sheared, the shearing is done in such a way that all the wool remains matted in one sheet. This is called a fleece. Each fleece is rolled or folded to a compact size and tied. Several fleeces are packed in a large sack for shipment. It is in this form that the wool comes to the mill. Each fleece when it arrives at the mill contains wool of several different qualities, is heavily im-

pregnated with natural wool grease (yolk), and is laden with dirt and dust, burrs, and other vegetable matter. It is the first concern of the manufacturer to separate the wool into the various grades and to remove the yolk and foreign substances, leaving nothing but the pure wool fibers to work with.

The occupations of the sorting and scouring department are as follows:

Overseer.
Second hand.
Wool sorter.
Duster tender.
Wool-washer feeder.
Wool-washer tender.
Dryer tender.
Burr-picker tender.
Soaking-tank man.
Extractor tender.
Trucker or floor man.
Oiler.
Sweeper.
Opener. (*See* Wool sorter.)
Clipper. (*See* Wool sorter.)
Basket man. (*See* Trucker.)
Weigher. (*See* Trucker.)
Overlooker or inspector. (*See* Section hand.)
Bag man. (*See* Trucker.)
Bin man. (*See* Trucker.)

SORTING.

Wool sorting is the process of separating the various qualities of wool in each fleece. The wool grown on the different parts of the sheep's body is of different lengths and different qualities as regards structure and spinning quality of the fiber. As many as fourteen different qualities may be found on a single fleece, varying from the very fine to the worthless. The number of sorts a fleece is divided into varies according to the needs of the mill. The worthless must be separated from the usable wool in any case, but few mills make the extreme divisions. Five or six sorts is about the usual number.

Wool sorter.—Wool sorting is an occupation in which, until recently, men only were employed. Now some of the larger mills employ a few women. It is one of the few skilled occupations in textile manufacture. Sorters work at a bench directly in front of a window in order to get the maximum light. Baskets or boxes, in which to put the different sorts, are usually arranged in two rows, one on each side of the sorter, and extending at right angles to the bench. The top of the bench is a wire screen through which dust and foreign matter may fall. No machines nor tools are used except a pair of shears to cut off the paint.

The wool sorter takes one fleece at a time from the sack, which is usually placed at the end of the alley formed by the two rows of baskets, unties it, and spreads it out on his bench. He shakes it to knock out the dust, and he picks out the larger burrs, sticks, etc., that are entangled in the wool. The fleece is first divided into two sections down the middle of the back. The sorter next cuts off any wool that has been marked with paint or tar, making it worthless. He uses his shears to do this, but in every other case he uses his

fingers to pull the wool apart. He now separates the fleece into the different qualities, being guided by the position of the wool in the fleece, by its appearance, and by its feel.

Wool sorters learn their trade only through long experience. Year after year their hands become more sensitive to the "feel" of the different qualities and the worker becomes more and more expert. The union requirement is an apprenticeship of three years. Sorters stand at their benches all day, but do not work after dark. This means that during the winter months they do not begin sorting when the mill opens and they quit sometimes an hour before closing time. The work of emptying full baskets and bringing up sacks of wool is done by the sorter in some mills, but in most is done by a floor man. Wool sorting produces a great deal of dust, the inhalation of which subjects the sorter to a particularly virulent disease, known among the workers as "wool-sorters' disease," but technically called "anthrax." These workers usually make sorting their life work and are generally able to increase their rate of pay as their skill increases.

DUSTING.

After the wool has been sorted it goes through several cleaning processes. The first of these is dusting. The object of this process is to remove as much as possible of the dust and dirt and shives (vegetable growth) that adhere to the wool. This is done by running it through a machine called a duster, which beats out the foreign matter, and leaves the wool somewhat "lofty" (fluffed up, full, soft). This process is omitted in some mills, the wool going direct from sorting to scouring. Dusting does not do the fiber any good, so it is omitted unless there is considerable dust in the wool.

Automatic feed.—An automatic feed consists essentially of a hopper out of which rises an endless revolving lattice fitted with spikes pointing upward. The wool in the hopper is picked up by the spikes and carried over the top, where by means of revolving strips of leather it is knocked off onto a feed apron. The quantity carried over the top can be regulated by a spiked cylinder placed just below the top and revolving against the apron in an opposite direction, or by an oscillating cone similarly located. Feeds vary in size and in detail of construction according to the particular use to which they are put. They are found in connection with practically every machine that handles loose wool.

Wool duster.—The duster is a machine designed to beat dust and other foreign matter from the wool. Two types of dusters are in general use—the "cone duster" and the "square duster." Both are simple machines and vary only in the shape of the cylinder. The cylinder is the principal part of the machine and is made up of four lags fitted with spikes, which, when the cylinder revolves, beat the

wool against grids, through which the dust falls. This machine has a tendency to break long fibers, but helps to fluff up the wool, making it more open and "lofty."

Duster tender.—The duster tender is a machine operative, and is usually a man. He has to feed the wool into the machine and remove the dusted wool. Most mills that use a duster use an automatic feed and carry off the wool through a trunk with the aid of a fan. So the tender merely has to keep a supply of wool in the hopper of the automatic feed. This operative starts and stops the machine by throwing a lever. He must oil his machine and keep it clean. Cleaning has to be done every day, and it is important in order to insure good work. Running a duster requires very little skill, and not much physical effort. The operative works on his feet, but leisurely. A great deal of dust is produced in handling the uncleaned wool, but the worker has no protection against it. He is usually paid on a time basis.

SCOURING OR WASHING.

After the wool is dusted, or after sorting in mills where it is not dusted, it goes through a process known as scouring or washing. In this process the natural grease, sweat, and dirt are washed out of the wool. This is accomplished by running the wool through a scouring liquor, made principally of water and soft soap.

Washing and scouring machine.—The wool washing and scouring machine in most general use consists of a series of three or four long, narrow troughs or bowls placed end to end. The wool is first directed into a bowl containing a strong scouring solution, then into one containing a weaker solution and finally into one where it is rinsed in water. Each bowl is equipped with a series of rakes to agitate the liquor and carry the wool forward, so a continuous supply can be fed in. There are also squeeze rollers between the bowls that are constantly squeezing the wool from one bowl and dropping it into the next. The number of bowls and the size of each, the speed of the machine and the strength of the solution, all vary with the needs of the particular work being done.

Wool-washer feeder.—The wool-washer feeder is an unskilled workman, often merely a boy. He has to see that the automatic feed is kept supplied with wool. In some mills he has to truck it from a bin to the washer, while in others he takes it by armfuls and puts it directly into the hopper of the self-feed. This worker usually has to keep the section around the washer clean. His work is not hard nor does it require him to work with any considerable speed. There is a considerable amount of dust produced, particularly if wool that has not been dusted is fed; and wherever there is wool dust there is more or less danger of infection. One feeder can feed two or three washers. He is paid a daily wage.

Wool-washer tender.—The wool-washer tender runs the washing or scouring machine, starts and stops it, puts in the scouring liquor, and watches the operation. He is responsible for having the scouring liquor of the right consistency, and at the proper temperature, and a sufficient quantity in the bowls. He does not handle the wool, a washer feeder usually being employed for that purpose. While the machine is running he must watch the wool from time to time to see that it does not mat or felt. He must draw off the liquor, clean the machine, and keep it oiled and in repair. The work is not hard but it requires a man who can be trusted, for poor washing causes no end of trouble in later processes. The wool-washer tender runs one machine and is paid by the day .

DRYING.

Drying naturally follows after washing, but when the wool is dyed in raw stock it goes to the dyehouse right after washing; and when it is carbonized, this process comes directly after washing also. The wool has to be dried sometime, whether it be directly after washing, or after dyeing, or after carbonizing. Drying is a process of extreme importance, for it is very easy to spoil the wool, and even to render it incapable of being spun. Probably the best way to dry wool is to let the sun and air dry it naturally. But the matter of cost compels manufacturers to resort to artificial drying, usually by hot air. The air must not be too hot lest it render the fiber harsh and lacking the "feel" that is characteristic of good wool.

Drying machine.—Drying machines are of different types and sizes, according to the special needs of each mill. A drying machine consists essentially of a large box 30 or 40 feet long, inclosing a number of steam pipes and a series of revolving screen aprons. The wool is fed onto one end of the top apron by an automatic feed and is carried to the other end, where it drops to the apron below. Each apron runs in the opposite direction to the one just above it, so the stock is carried back and forth as many times as there are aprons. The lowest apron drops the stock into a bin. The hot air is usually made to circulate through the machine by fans suitably located.

Dryer tender.—The dryer tender's work is to watch and regulate the temperature in the dryer and the speed of the aprons. The machine usually feeds and delivers automatically so the tender does not have to handle the stock. He controls the operation—starting and stopping. He has continually to feel of the wool to see that it is being thoroughly dried and not scorched. He runs one machine and has the care of oiling and cleaning it. In some mills, one man is assigned to the back of two or three machines and one to the front, the man in front usually being responsible for the operation. The

dryer tender must be a responsible employee, must understand his machine thoroughly, and must be able to tell the condition of the wool by the feel. Dryer tenders are time workers.

BURR PICKING.

Burrs removed from the wool at the worsted cards usually have a great many short wool fibers adhering to them. These can be removed by running them through a machine known as a burr picker. The wool recovered in this process is too short to use for worsted, but is all right for woolen yarn.

Burr picker.—The burr picker consists of a large cylinder covered with teeth, which picks up the wool from a feed apron and rolls and delivers it to two smaller cylinders revolving in the direction opposite to that of the large one. The force with which the wool is thrown from one to the other causes the wool to lie between the teeth while the burrs remain on them. A device called a burr guide knocks the burrs off the teeth, while a brush removes the fibers. The latter are thrown into contact with a beater, which removes the chaff and shives and delivers the cleaned wool into a truck or bin.

Burr-picker tender.—The burr-picker tender has complete charge of the operation of the burr picker. He starts it and stops it, but does not have to watch the operation of it constantly. In most mills an automatic feed is used in connection with the burr picker, and the hopper is supplied with wool by a floor man or trucker. The burr-picker tender must keep his machine clean. He should remove the burrs and shives after every batch, and should clean the teeth in the cylinder if they get gummed up. He has to oil the picker frequently, the fast moving parts at least twice a day. This operator should understand the machine and be able to adjust the parts if necessary. His work is not hard, but there is more or less danger, particularly from belts. He is paid by the day.

CARBONIZING.

Carbonizing is the process of removing the vegetable matter from the wool fiber by means of chemicals. Imperfect stock is carbonized directly after washing, and burrs from the cards are sometimes treated in this way to recover the good wool, instead of putting them through a burr picker. Carbonizing is based on the principle that certain chemicals properly applied will destroy vegetable matter but not affect the wool. The wool from the washer is put into a soaking tank where it is subjected to a dilute solution of sulphuric acid (sometimes other chemicals) for about three-quarters of an hour. After it is taken out it is put into a hydro-extractor to remove the liquid, and it is then run through the dryer, first at a comparatively low temperature, then at a higher temperature. Dryers for this purpose are made in two sections. The lower

temperature is used first, because the sudden application of the higher temperature would destroy the fiber. Drying leaves the vegetable matter brittle. The wool is afterwards run through a duster equipped with heavy crush rolls which crush the brittle vegetable matter, so the duster can more easily beat it out. The dusted wool is brought back to a soaking tank, where it is treated with a soda solution to neutralize the acid, is dried again, and is ready for carding.

The machines used in this process are a soaking tank, a hydro-extractor, a dryer, and a duster. The hydro-extractor, dryer, and duster have been described and the soaking tank needs no special description.

Soaking-tank man.—The soaking-tank man or carbonizer is usually an adult male. His duty is to run the chemical liquid into the tank, put in the wool and take it out when sufficiently treated. He has a fork for lifting the loose wool, and a wooden pole to push it down into the liquor. He does not pole it about, but merely pushes it down when he first puts it in, so it will be thoroughly immersed. His work does not require much skill; about the only responsibility he has is to keep the wool in the liquor the proper length of time. He usually has nothing to do with the preparation of the liquor, merely running it in and out of the tank. In small mills the same man does the carbonizing and the neutralizing. In larger ones the two are separated. So far as the work is concerned there is little difference whether the wool is being carbonized or neutralized. The work is not hard or dangerous, if ordinary care is exercised. He is paid by the day.

CARDING DEPARTMENT.

Preparation of wool for spinning woolen yarn.]

Wool that is to be spun into woolen yarn, as distinct from worsted yarn, requires comparatively little preparation. All that needs to be done is to loosen the fibers and rearrange and mingle them as much as possible. This is called wool carding. The wool comes from the sorting and scouring department practically free from extraneous matter. After passing through the preliminary process of mixing and oiling it goes to the wool card, which rearranges the fibers, and delivers the wool in small round strands, called roving, ready to go direct to the spinning department.

The occupations of the wool-carding department are as follows:

Overseer.
Second hand.
Mixing picker tender.
Card feeder (Bramwell feed).
Middle-alley man (Apperly feed).
Card tender.
Card stripper.
Card grinder.
Finisher tender. (*See* Card tender.)
Trucker.
Sweeper.
Roving carrier. (*See* Trucker.)

MIXING AND OILING.

The scouring and cleaning processes remove most of the natural grease from the wool, making it almost unworkable, so it becomes necessary to add oil to it in order to render it workable in the processes that are to come. Oiling the wool is almost always done in conjunction with another equally important preparatory operation—mixing. Every mill does some mixing, either mixing different colors, or different grades of wool, or mixing cotton with wool. Whatever the mix, it is done after the wool is cleaned and before it is carded, and in conjunction with oiling. It is important that the mixing be thorough and even, and in order to accomplish this, the wool is run through a machine called a mixing picker. Before the stock is put into the picker, the various grades or colors are spread on the floor in layers of the proper proportionate thickness. It is fed to the machine from this pile in vertical sections. The oiling may be done by hand while piling on the floor, but it is usually done automatically by an attachment to the mixing picker. When the stock leaves this machine it is ready to be carded.

Mixing-picker and automatic oiler.—The wool-mixing picker is similar in principle to the cotton picker. The wool is spread either by hand or by an automatic feeder on the feed apron, which carries it into contact with a beater. This beater, covered with sharp teeth and revolving about 1,000 revolutions a minute, beats the wool against grids, which action tends to separate the fibers and, incidentally, to remove any foreign matter. The fibers, thus separated, are drawn out of the machine by a suction fan and deposited in a fireproof bin, where those of the different grades mix quite uniformly. Oil is applied at this machine while the wool is on the feed apron. It is pumped from a tank onto a revolving bristle brush, which rubs against a blade and sprinkles the oil over the wool on the apron.

Mixing-picker tender.—The mixing-picker tender is charged with the care and operation of the mixing picker. He controls the starting and stopping and regulates the supply of oil. In most mills he is assisted by a helper or floor man who puts the wool into the hopper of the self-feed. The tender is responsible for this being done properly, and he must see that the wool is run through the picker the required number of times. He has to oil the picker—some parts of it must be oiled twice a day—and he must keep it clean—a task much more difficult than keeping most machines clean, because of the oil used on the wool. There is considerable danger of an accident in cleaning, if someone should start the machine. The operative should exercise the greatest care. The operative works on his feet all the time, but does not have to work hard. He is paid by the day.

CARDING.

After the wool is oiled it is ready for carding, the first step in the process of making yarn. The object of carding is to open out the fibers of the wool and arrange them in a mixture of uniform density, so they can be spun into even strands of yarn. Wool carding differs from cotton or worsted carding in that no attempt is made to place the fibers parallel. It is a fundamental difference between worsted and carded wool that the fibers of the former must be approximately parallel, while those of the latter point in every direction. Bulkiness is important in woolen yarn.

The wool is put through a series of machines known collectively as a set of cards. A set includes three cards—a first breaker card, a second breaker card, and a finisher card, together with the feeding and doffing devices that go with them. In most mills the first and second breaker cards are united in one double breaker card. This obviates the necessity for doffing the first and feeding the second.

The wool, direct from the bins where it is stored after it is mixed and oiled, is put into an automatic self-feed, known as a Bramwell feed, which delivers it uniformly to the first breaker card. If the first and second breaker cards are separate, the wool comes from the first breaker in a round strand, known as sliver, which is wound into balls on a machine, known as a balling machine. These balls are then set up in a creel, and several (50 to 80) ends of sliver are fed to the second breaker, on the theory that any unevenness in the sliver is largely overcome by "doubling," i. e., uniting several slivers. If the two cards are joined the wool does not leave the machine until it has been carded twice. The sliver from this second breaker card is led on an overhead carrier to an automatic feeding device on the back of the finisher card, called an Apperly feed. Not so many (40 to 50) doublings are possible with this device as with the creel, but there is no chance of an end breaking and leaving a thin place as there is when the creel is used. The wool after passing through the finisher card is not again drawn off as sliver but is divided by the doffers into several (usually 48) narrow strips, which are rubbed (not twisted) into small round strands by an attachment called a condenser, and are then wound on large jack spools to be taken to the mule for spinning.

The card.—The machine used for carding wool is not unlike that used for carding cotton, except that it is more complicated. It consists essentially of a number of cylinders covered with card clothing (fine wire teeth set about 400 to the square inch) set to work with or against each other to accomplish the desired result. There is a large main cylinder and a smaller doffer just as on the cotton card, but in place of the top flats there are six pairs of smaller

cylinders called "workers" and "strippers." The wool is carded by the action of the teeth on the main cylinder and the workers, the carded fibers remaining embedded between the teeth of the main cylinder. Another cylinder, called the "fancy," in the angle between the main cylinder and the doffer, performs the peculiar function of raising the carded fibers from between the teeth so the doffer can more easily remove them. An oscillating comb strips the doffer and delivers the fibers in a thin fleece. At the first and second breaker cards this sheet is drawn through a tube into a round strand, called "sliver." At the finisher card it is separated into smaller strands called "roving."

The first card the stock is put through is called the "first breaker card." The second is called the "second breaker card," and is practically the same as the first. These are usually combined in one double machine, called the "breaker card." The last card used is called the "finisher card," and is the same as the others except in the manner of feeding and doffing. The sliver delivered from the breaker cards is led over an overhead carrier, and laid out on an apron in parallel diagonal rows (Apperly feed). The feed rollers of the card draw in wool from about 40 slivers in order to get a more uniform fleece at the finisher. This fleece on the finisher card is not drawn off into a sliver, but is divided by the doffers, each with its card clothing in rings instead of covering the whole surface. Each ring delivers a narrow sheet of fleece which is rubbed between two leather aprons that have a reciprocating sidewise motion as well as a continuous forward motion. This device is called a "condenser," and delivers 48 small strands, now called "roving." These strands of roving are wound on large spools, about 32 inches long, called "jack spools." Twenty-four strands are wound on each spool, each strand being coiled in a space about an inch wide so they will stand up and unwind without tangling.

Card feeder.—The card feeder is an unskilled operative, either a man or a boy. It is his duty to keep the hoppers of the Bramwell feeds filled with loose wool. The wool is usually trucked from the storage bins by floor men, and the feeder takes it from the trucks by hand and puts it into the hoppers. One feeder can feed 10 to 12 sets of cards. His work requires no skill. The work is not hard or dangerous. He is paid by the day.

Middle-alley man.—The middle-alley man is an unskilled worker, either a man or a boy. It is his duty to watch the operation of the Apperly feeds, and if the sliver breaks in its passage from the breaker card to the finisher card to mend it. To join a broken sliver merely requires the twisting of the ends together. If for any reason the sliver is not laid evenly and properly on the feed apron of the Apperly feed this worker must remedy it. The middle-alley man minds the

alley between breaker and finisher cards of 10 or 12 sets of cards. His work is light, necessitating principally his watching for breaks, without a great deal of active labor. He is paid by the day.

Card tender, or finisher tender.—The card tender or finisher tender is usually a man, and is responsible for the running of the cards. He starts and stops them when necessary. Although he is responsible for all the cards in a set, he is stationed at the delivery end of the finisher card; hence he is sometimes called "finisher tender." The card tender runs 4 or 5 sets, and is particularly responsible for watching the ends of roving delivered from the condenser. When ends of roving break he must mend them. This he can do without stopping the card by simply twisting the ends together. When the jack spools are filled he must stop the card, take off the full spools, and start the roving on empty ones. The card tender, in addition to keeping the ends running and doffing the full jack spools, should examine the roving to see that it is coming off in an even, round strand, free from twists. If the roving is not up to the standard, he should call the attention of the overseer, or the second hand, to it in order that the necessary changes in the cards may be made. Card tending is not a particularly responsible job, nor is it hard work. The operative is paid by the day.

Card stripper.—Card stripping is an occupation for men. It is their duty to remove short fibers, dust, lint, and other foreign substances that become imbedded around the teeth on the various card cylinders. The method of stripping woolen cards is known as "hand stripping," as distinct from "machine stripping" used in cotton mills. Two men work together while stripping, one on each side of the card. Each has a hand card, which is a flat piece of board covered with card clothing on one side and with a handle at one end so it can be easily manipulated. This hand card is drawn across the cylinder, so that the teeth, which are longer than those on the cylinders, will get between the teeth on the cylinder and thus remove the refuse matter. Most of the smaller cylinders are taken out (beginning with the fancy, then each worker and stripper, and one toward the front) and are put into a rack for stripping. The large cylinder and doffer are stripped in their bearings. Before stripping the feed rolls are disconnected, and the card run about five minutes to run itself clear of the wool in it. The belts are then removed and the fancy and other cylinders taken out. Great care must be exercised not to damage the teeth when handling the cylinders. When all the cylinders are cleaned the machine is cleaned, especially around the bearings, is oiled and greased, and the cylinders are replaced. The belts are put on and the machine run for a few minutes before the feed rollers are connected in order to allow the

loose dirt left by the stripper to fly off. After the feed rollers are connected the card must be run a few minutes for it to become full of wool. Until this condition is brought about the sliver does not weigh up to what the machine is set to deliver and can not be used in succeeding processes. It goes back to the Bramwell feed and is run through again.

Two strippers working together can take care of from 4 to 8 sets of cards, depending on the quality of stock used. The first breaker requires more stripping than the second breaker and both more than the finisher. Many mill superintendents state that the first breaker should be stripped every day, the second breaker every other day, and the finisher every third day, but the practice differs in the different mills. In some mills they do not strip the whole card each time, but on alternate days strip only the large cylinder and doffer. Some mills have a regular schedule of stripping, while others strip only when necessary. Strippers, in addition to stripping, oiling, and cleaning cards, often help the card grinder. Their work requires somewhat more skill than card tending. They must understand how to set up a card, i. e., adjust the cylinders so their teeth will be the proper distance apart. Some mills require this to be done after every stripping. They work on their feet entirely, and, while stripping requires some little physical effort, it is not hard work. It is disagreeable work on account of the dust and fine lint that fill the air while stripping. These workmen are paid by the day.

Card grinder.—The card grinder sharpens the fine teeth on the various cylinders of the cards. The card is thoroughly stripped before grinding and bent teeth are straightened with a jack knife. While the fancy and worker cylinders are off, a traverse grinding roller (an emery wheel about 6 inches in diameter made to move from side to side while turning) is set in the "fancy" cylinder brackets and adjusted just close enough to the teeth of the main cylinder to sharpen them. The doffer is then set up to the grinding roller. This roller is connected with the driving pulley and when the machine is started the emery wheel travels from side to side, grinding both cylinders. The machine is run this way from 6 to 8 hours to grind the main cylinder and doffer. While this is going on, the smaller cylinders —workers, strippers, tumblers, and fancy—are being ground on the grinding frame. A grinding frame is an iron frame supporting a traverse grinding roller, and with bearings to hold the cylinder to be ground. Two cylinders are fastened to the frame, one on each side of the grinding roller, and are ground at the same time. All are driven from a shaft in the bottom of the frame. It requires three or four hours to grind the small rollers. When all the cylinders are sufficiently ground, they are put back into the card and adjusted so that the teeth will be the correct distance apart properly to work the stock. This

adjusting is called "setting the card" and is very delicate and important work. The grinder has a set of gauges with which he measures the spaces between the cylinders, and also has the various hand tools necessary to adjust the machinery.

As a rule cards do not require grinding oftener than once every 5 or 6 months. When one is ground, however, it takes from 2 to 3 days to take down the card, grind it, and set it up. When the grinder has the grinding rollers properly set and running he does not have to watch the running, but has only to look from time to time to see that the work is being done properly. The grinder is also a machine fixer. While the cylinders are off the card, the standing parts are cleaned thoroughly, usually by a stripper, and the grinder examines the whole machine closely for worn or imperfect parts. Besides their mechanical work grinders act as supervisors in their sections and are responsible for the quality of the work. One grinder can handle a section of from 12 to 15 cards, but the number actually looked after varies from mill to mill, according to the organization. In small mills they may not have grinders as a distinct occupation. In such cases the work is done by the second hand. Grinders may be called section hands or second hands, and it is from them that carding overseers are selected.

COMBING DEPARTMENT.

[Preparation of wool for spinning worsted yarn.]

Wool that is to be spun into worsted yarn requires a great deal of preparation before it is ready to be spun. This preparation may be divided into three principal steps, though there are other processes intervening: First, arranging the fibers parallel (carding or preparing); second, separating the long and short fibers (combing); third, drawing out the strand to a suitable size for spinning (drawing). These three steps are common for all wools, but the number of machines through which the stock is put and even the kinds of machines vary according to the length of the fiber used.

Wool may be divided into three classes—long, medium, and short fiber wool. Each of these receives different treatment at some stages in the preparation, and the same treatment at others. Long and medium staple wool is usually treated by a sequence of processes known as the English system, and short staple by a sequence known as the French system. This is not an absolutely fixed practice, but is generally true. The steps in the preparation of the long-staple wools are in general as follows: Preparing (6 steps); backwashing (not always deemed necessary); preparing gilling; balling; combing; finishing gilling; and finally drawing according to the English system. These steps may vary greatly, however, with the needs of the stock or the judgment of the superintendent. The steps in the prepara-

tion of medium staple wool (subject to the same likelihood of variation as in the treatment of long staple wool) are these: Carding; backwashing (not always necessary); preparing gilling; balling; combing; finishing gilling; and then drawing according to the English system. In the preparation of the short-fibered wool (with the chance for variation mentioned above) the steps are carding; preparing gilling (2 or 3 gill boxes); backwashing; gilling (1 or 2 boxes); combing; finishing gilling; and then drawing according to the French system. It will be noted that all these processes are the same, only in different order, except that preparing takes the place of carding for long-staple wools, and that there are two systems of drawing, English and French. These will be explained further on.

Following are the occupations of the combing department:

Overseer.
Second hand.
Section hand.
Card feeder. (*See* Carding department.)
Card tender.
Backwasher tender.
Gill-box tender.
Preparing-box tender.
Punch-box tender.
Comber tender.
Top carrier.
Drawing-frame tender.
Weigher.
Porcupine cleaner.
Bag man. (*See* Trucker.)
Doffer or baller. (*See* Card tender.)
Weigher, special. (*See* Trucker.)
First intersecting gill-box tender. (*See* Gill-box tender.)
Second intersecting gill-box tender. (*See* Gill-box tender.)
Third intersecting gill-box tender. (*See* Gill-box tender.)
Second baller. (*See* Punch-box tender.)
Gill-box head tender. (*See* Gill-box tender.)
Intersecting gill-box tender. (*See* Gill-box tender.)
Wiper. (*See* Oiler.)
First, second, etc., preparer. (*See* Preparing-box tender.)
Balling gill-box tender. (*See* Gill-box tender.)
Can gill-box tender. (*See* Gill-box tender).
Second can gill-box tender. (*See* Gill-box tender.)
Two-spindle gill-box tender. (*See* Gill-box tender.)
Four-spindle drawing-box tender. (*See* Drawing-frame tender.)
Eight-spindle drawing-box tender. (*See* Drawing-frame tender.)
Twelve-spindle drawing-box tender. (*See* Drawing-frame tender.)
Twelve-spindle dandy-frame operator. (*See* Drawing-frame tender.)
Finisher. (*See* Drawing-frame tender.)
Intermediate frame tender. (*See* Drawing-frame tender.)
Slubber tender. (*See* Drawing-frame tender.)
Cone-rover or fly-frame tender. (*See* Drawing-frame tender.)
Roving carrier. (*See* Trucker.)

CARDING.

The object of carding wool to be spun into worsted yarn is somewhat different from that of carding for woolen yarn. In the latter case the object is to give it bulkiness, while in the former the object is to preserve the length of the fibers and to arrange them as nearly parallel as possible. In both cases the fibers of wool are pulled apart by the action of the fine teeth on the various cylinders of the carding machine; but by a change in the direction and relative speeds of the cylinders the worsted carding machine combs out the fibers and lays them approximately parallel. The loose wool is fed into an automatic feed, just as in the case of wool carding. It passes into the worsted card, where it is acted upon by the various parts, and then is drawn out at the front as sliver and coiled into a can, or is wound into a ball. Only one machine, a double card, is used in this case, instead of three, as in the case of wool carding.

Worsted card.—The worsted card, while designed to accomplish very different results, is so similar to the double woolen card as not to require any further explanation here.

Card tender.—Tending a worsted card and tending a woolen card are essentially the same occupation, except in the manner of doffing, due to a different way of delivering the stock. The wool comes off the worsted card in a round strand, called "sliver," and is coiled into a can or wound into a ball. If it coils into a can, doffing is merely removing the can and replacing it with an empty one. If it is wound into a ball, doffing is the simple operation of removing the full ball and starting a new one winding on a pin.

BACKWASHING.

The sliver from a worsted card is put through a washing process known as backwashing, because the card loosens a lot of dirt that was not taken out in earlier processes. In the French system the sliver must be backwashed, because it must be free from oil for French drawing. The sliver is simply run through a bath of soap and water and dried over hot cans. The oil previously put on the wool is, of course, washed out and, if it is to be treated according to the English system, it is necessary to put more on before the next process. This is done by sprinkling it on the wool as it comes from the cans in passing to the backwash gill box.

The backwashing machine.—The backwashing machine consists of two washing boxes, or bowls, one in front of and somewhat higher than the other. Just above each box and near the front edge is a pair of squeeze rollers. In front of the washing boxes are six or eight hollow copper steam cylinders, set horizontally in two tiers.

One or two ends of sliver are directed under an immersion roller in the backwash box, where it is subjected to a bath in soft, soapy

water. The sliver is not agitated at all, but passes to the squeeze rollers, where the suds and dirt are squeezed out. It is then drawn under the immersion roller of the front box, washed, and again squeezed out; then it is drawn around the cylinders or cans, which are filled with steam, to dry it, and led directly to a gill box, which is set up with the backwashing machine.

Backwasher tender.—Backwashing is a machine occupation in which men are usually employed. It is the duty of the backwasher to prepare the washing liquor in the bowls of the washer and to run the ends of the sliver through. The machine is left threaded with a leader. When stock is to be washed, the ends are tied to the leader until they are drawn around the drying cans. Usually six or eight strands of sliver are washed at one time, the ends being fed up from cans or balls. This operative must supply full cans, or balls, as they run out, and must piece ends if they break. The front part of the machine, or gill-box part, is minded by another operative, who is virtually a gill-box tender, though sometimes one man runs both parts. The backwasher tender controls the running of the whole machine, washer, and gill box. This work requires fairly constant attention from the operative to see that the ends are running in properly, are thoroughly dried, and do not break. He has to change the water when necessary and put in fresh washing liquor. He oils and cleans his machine. He works on his feet, but does not have heavy work. He is paid by the day.

GILLING.

Gilling is the process of parallelizing the fibers of wool, one of the two essentials in the manufacture of worsted, as distinct from woolen, yarn. This is accomplished by a repeated process of drawing fine-toothed combs through the stock. Not only are the fibers straightened, but the ends of sliver passed through the gilling machine are often doubled to get a sliver of uniform weight. The wool is put through several gilling processes, because the straightening must be accomplished gradually, lest the combs tangle the fibers and break them. The number and order of the gilling processes and the doublings made depend not only on the system used, but on the stock and the particular results the superintendent is desirous of obtaining. Each step in gilling takes a distinctive name, either from its order (as first or second gill box), or from the particular type of machine used (as intersecting gill box), or its special use (as preparing). Water or oil may be added to the stock at any step in gilling by attaching a sprinkling device to the machine. A suggestion of the order of the various steps in gilling is given above in the general statement regarding the preparation of wool for worsted yarn.

Gill box.—The gill box, or gilling machine, is rather simple in principle. It consists of two pairs of rollers, one in front and one in the

back, about a foot apart, and between these a number of flat steel combs, or fallers, set with the teeth pointing up. These fallers are made to move forward in a horizontal plane from the back rollers to the front pair, where they are dropped down one by one and carried back underneath to the back rollers, to be lifted again, so that each one is continuously describing a rectangle. There are usually 23 fallers, 16 up, moving forward, and 7 down, moving backward; the 16 that are up are close together, forming a compact set of constant length. The number and size of the teeth vary from few and coarse in the earlier processes to more and finer in the later ones. Gill boxes are made in various sizes according to the use to which they are to be put. The fallers or gills, and the rollers to correspond, are made from 10 to 30 inches wide. Gill boxes have different modes of feed and delivery, sometimes feeding from or delivering to a can, and sometimes a ball; and the gill boxes used in the earlier preparing processes have special attachments to handle the loose wool. Some gill boxes have two delivery heads and some only one. Most all have a knock-off motion which stops the machine when an end breaks or runs out.

The gill box is designed to comb out the wool which is fed at the back of the machine through the back rollers. Fallers are constantly coming up just in front of these rollers, projecting their teeth right through the wool. As the fallers move away faster than the back rollers deliver, the fibers that are held in the bite of the rollers are combed out somewhat. The wool is carried forward by the fallers and is caught in the bite of the front rollers. As these rollers take up the wool faster than the fallers bring it forward, the fibers are again drawn through the teeth and combed. After leaving the front rollers the sliver passes through a condenser tube to a coiler head and is coiled in cans to be taken to the next process. Single ends are never fed to a gill box. From two to eight ends are doubled into one (i. e., eight single ends drawn out in front as one) in order to make the sliver as even as possible. After combing, as many as 30 ends are doubled into one at the finishing gill box.

Gill-box tender.—Gill-box tenders may be men or women, but men seem to predominate. These operatives are required principally to keep the sliver fed to the machine and to doff the full cans, or balls, of gilled sliver. When the machine takes the stock from cans, all that is necessary is to replace an empty can with a full one and start the end through the back rollers. When the machine is fed from balls, these have to be set up on skewers in a creel. There is the same difference in doffing. Sometimes it is only necessary to change a full can for an empty one, and sometimes a full ball must be doffed and a new one started. When ends break, this opera-

tive has to piece them. This has to be done carefully else it makes a lump, or a thin place, in the sliver. Gill-box tenders have to keep their machines oiled and cleaned, particularly the fallers, which can not possibly perform their work if clogged with dirt or wool. Each operative generally runs two single-head, or one double-head, gill box, but this varies a lot with the organization and the stock used. These operatives work on their feet, and have to remain near their machines, though they are not actively engaged constantly. The work is not hard. They are paid by the day.

PREPARING.

Preparing is the term given to the process of separating the fibers of long staple wool and drawing them parallel. This takes the place of carding, and is employed because the card has a tendency to tear the fibers. Preparing is quite a different process from carding, but it accomplishes practically the same result. Instead of being acted upon by several cylinders, covered with fine teeth, the wool is simply combed by several fine-toothed combs, in a machine called a preparer. The stock is run through from five to six similar machines before it is in a state ready to be backwashed and to proceed to the succeeding processes.

Preparing machine.—The machines used for preparing are all gill boxes, varying only in size, fineness of the teeth, and speed and manner of feeding. The first gill box used has an apron, which feeds in the loose wool, and a lapper to deliver the wool in a sheet and roll it up. The next box used takes the wool from the lap and delivers it into a can. The succeeding machines feed from and deliver into cans. For these reasons the gill boxes are sometimes given the names, first and second sheeter, third, fourth, fifth, and sixth boxes, though usually they are known as first, second, etc., preparer boxes.

The loose wool is spread on the apron of the first sheeter, is gilled and delivered in front in a sheet about 12 inches wide, and wound into a lap. This lap is then fed to the second sheeter and is delivered as sliver into a can. The slivers are fed into the succeeding preparers from cans and delivered into cans, though sometimes on the other machines and always on the last, a balling attachment is used. The machines taking the loose stock are somewhat wider than those gilling the sliver. The teeth used are finer in each succeeding machine and the speed is faster, 120 fallers dropping each minute on the first sheeter and 180 on the last can box.

Preparing-box tender.—Tending a preparer is practically the same as tending a gill box, with the slight difference in the manner of feeding the stock on some of the machines.

BALLING.

Balling is the process of winding the sliver into balls suitable to put on the creel of the comb. No change whatever takes place in the condition of the wool. The idea is to build, without the use of a bobbin, a ball of four ends, each of sufficient length to run a reasonable length of time on the comb, and each built in a separate section without crossings. This is accomplished by a machine called a punch box.

Punch box or balling machine.—The punch box is a simple machine. There is an iron frame which supports a small positive driven cylinder about 10 inches long, with broad flanges. At the back of the machine are four guide eyes, and between these and the balling device is a measuring motion.

Four cans of sliver are placed behind the frame, or four balls are set up in the creel, and an end drawn through each guide eye and wound on the cylinder in a lap under pressure, all forming a compact regular ball. When the required number of yards is wound, the ball is doffed and another started.

Punch-box tender.—Punch boxes are usually run by men. The tender has to set up in a creel the balls from the balling gill boxes or arrange the cans from the can gill boxes, and lead the required number of ends through the guide eyes, and start them winding on the bobbin. When a ball is wound he removes it, takes out the bobbin, and starts another. It takes about a minute to make a ball, so the operative is kept pretty busy. In addition to running his machine he has to oil and clean it. His work is not hard, but it keeps him on his feet and rather constantly at work. He is paid by the day.

COMBING.

Combing wool is the principal process in making worsted, as distinct from woolen, yarn. We have seen that the wool fibers are opened and separated at the card or preparers, and that they are parallelized at the gill boxes. It now remains to separate the long, straight fibers from the short, curly ones, and this is accomplished in the machine called the comber or comb. The long, straight fibers are called the tops and are drawn out into worsted yarn. The short, curly fibers are called noils and are taken to a woolen mill to be used in the manufacture of woolen yarn. Noils are perfectly good wool but not suitable for worsted yarn.

The comber or the comb.—The type of comb commonly used is known as the "Noble" comb. It is a circular machine, occupying a floor space about 8 feet in diameter, with the parts low enough for the operative to reach over to the middle of it. The principal working parts of the machine are the circular combs, or "circles," as they

are called. There is one large circle about 3½ feet in diameter, set to revolve in a horizontal plane. This has vertical teeth set very close together and about 5 or 6 rows deep. Inside this circle, in the same plane, and opposite each other are two smaller circles about 16 inches in diameter with only two or three rows of teeth. The teeth on all the circles are warmed by steam in order to work the wool better. The smaller circles are set very close to the inside of the larger one and all three turn in the same direction. At the point of contact of the smaller and larger circles is a brush, called a dabbing brush, which is made to move rapidly up and down to push the fibers into the combs. Toward the center of the machine are two pairs of drawing-off rollers, set up vertically, one near each small circle. The creel, which holds 18 balls of sliver, encircles the outside of the machine, and moves around with it.

The balls of wool are set in the creel and are made to unroll by the fluted rollers on which they rest. Each end (72 in number) is drawn through a device called a "conductor" which is made to deliver the wool at the proper time to the comb which is continuously turning, the dabber brush pushing it down into the comb. The wool is spread over the teeth of both the large and small circles. The combing of the wool, i. e., separating the long fiber from the short, is caused by the pulling away of the small circle from the large one, with the consequent pull of the fibers of the wool. The long fibers are caught up by the drawing-off rollers and the short ones remain between the teeth of the small circle. Blades located between the drawing-off rollers and the point of contact with the large circle arise between the rows of teeth in the small circle. These raise the short fibers out of the teeth so they can be brushed off and into a receptacle under the machine, leaving the comb free from "noils" (short fibers) at the point of contact with the large circle. Combing is continuously going on at both small circles while the machine is running, and the combed fibers are being drawn off continuously by the drawing-off rollers. The fibers from both pairs of rollers pass through the same guide eye to a coiler head just outside the machine, where the wool is coiled as one sliver into a can.

Comber tender—Both males and females are employed to tend combs (about three-fifths men and two-fifths women). Although the process is important and the machine complicated, this operative has very few and simple operations to perform. The comb is in continuous operation, unless it is stopped for repairs. The comber tender has to put on new balls of sliver as they run out and draw each of the four ends through a conductor which feeds it to the comb automatically. He has to walk around while doing this, as the creel is constantly going around. When the can is full of combed tops, he has to remove it and set on an empty can—a very simple matter.

He has to watch to see that the ends are feeding up all right, and if the sliver breaks he must piece it by twisting the ends together. Comber tenders frequently run two combs. Two combs keep them constantly busy, but one permits of more leisurely work. Tenders oil and clean their machines, but this is done while the machine is stopped and is an important part of the work. Comber tenders are paid by the day.

AGEING.

Ageing is the process of restoring moisture to the wool. All wool has a natural affinity for moisture. Since in all the succeeding processes, wool is measured by its weight, it is important to have in it a definite per cent of moisture that can be reckoned with all through the various processes. So the balls of top are stored for a considerable time in a room with the air at the proper degree of humidity and the wool allowed to absorb the moisture. This method of adding moisture is of course not used when the water is put on directly at the finishing gilling.

Top carrier.—The top carrier is the man who weighs the balls of top from the finishing gilling, trucks them to the ageing room, and puts them into the proper bins. At the various bins he puts a ticket showing the weight of the top. He also takes the tops from the ageing room to the drawing frames. Sometimes, in the large mills, the work of weighing is done by a man employed for that alone. Then the top carrier is nothing more than a trucker. In other mills, weighing and trucking do not keep him busy, so he is given other work such as carrying out noils from the combs.

WORSTED DRAWING.

Drawing is the process of attenuating the combed sliver in a regular even way until it is of sufficient fineness to be spun into yarn. In this process the stock passes through several machines, each making the strand a little longer and thinner. Not only is the sliver drawn out, but the process of parallelizing, begun in the gilling process, is continued, and the long and short fibers are distributed uniformly throughout the strand. A further result accomplished by drawing is evening—making the sliver weigh the same, yard for yard, throughout its length. This is accomplished by doubling several strands at the back of the machine, which are delivered as one at the front. There are two distinct systems of drawing, one called the English system and the other the French system. Only comparatively long fiber is used in the English system, while the French is designed to use the shorter fiber.

The English system of drawing.—The English system is sometimes spoken of as "open drawing" or "cone drawing" according

as one or the other of two methods of winding the drawing on the spools is used. In open drawing the yarn is wound on the spool by the pull caused by the turn of the flyer (a device shaped something like an inverted "W"). In cone drawing the bobbin is turned independently to wind the yarn. In other respects the process is the same throughout in the two systems.

After the combed wool has been finish-gilled it is put through from 6 to 10 operations in drawing before it is sufficiently fine to be spun, the number varying with the counts to be spun. The average number would be about eight. In order these eight would be: (1) can gilling; (2) spindle gilling; (3) first drawing; (4) second drawing; (5) third drawing; (6) finishing; (7) slubbing; (8) roving. In the first operation—can gilling—the sliver from the finishing gill box is put through a regular gill box and drawn into a sliver of slightly less weight. Several balls of tops (about 5) are set up in a creel and drawn into one sliver, which is coiled in a can. In the second operation—spindle gilling—the slivers from several cans (about 5) are drawn out in a gill box into one of less weight and wound on large bobbins 14 inches long with a 9-inch head. In the third and remaining operations the sliver is drawn out in drawing boxes until, in the last operation, it is sufficiently small to be spun. In each succeeding operation the drawing becomes smaller and is wound on a smaller bobbin; the bobbins are run faster and the number on each machine increases. Each time the drawing is wound on a bobbin a little twist is put in it by the flyer. This is an essential difference between the English and French systems, in the latter no twist being put in until the yarn is spun.

The French system of drawing.—The French system of drawing differs from the English in that it puts no twist in the sliver, but, rather, rubs it into a strand. The sliver is gradually drawn out, as in the English system, by passing it through several machines equipped with rollers, but the machines are somewhat different. It is first put through one or two gill boxes, then through eight or nine French drawing frames. The various steps in French drawing are called first, second, third, etc., drawing processes, except that the last three steps may be termed reducing, slubbing, and roving.

Gill box.—The gill boxes used in drawing are essentially the same as those used in gilling, except that in the second drawing process the gill box has quite a different manner of delivery. In front of this this latter box are two long spindles, each with a flyer fitted on the top, which turns to wind the roving on the spindles. These spindles can be taken out in order to put large (14-inch) bobbins on them, so the sliver can wind on the bobbins. The gill box used in the first process is called a "can gill box" and that used in the second process is called a "spindle gill box."

English drawing box.—Drawing boxes are much the same as the gill box used in the second drawing operation, except that instead of fallers there are one or two pairs of small rollers in their place. All that is really necessary for drawing is two pairs of rollers with the front pair turning faster than the back pair. There must be sufficient distance between the front and back pairs so that any fiber held in one pair can not be held in the other to break it, but the pairs must be near enough for the fibers to be caught up by the rollers. If the fibers were all of the same length the rollers could be adjusted, but the fibers vary, so something must be inserted between them to carry the shorter fibers along. The fallers would do this, but they can not be used, since there is a twist in the sliver. Small rollers that are not heavy enough to hold back the fibers are used, and they cause just enough friction to pass the short fibers along. Drawing boxes are built for use in particular operations, the rollers and spindles getting smaller and being made to run faster in each succeeding operation. The number of spindles on a frame increases also in each succeeding operation, the roving, or speeder frame, having from 80 to 112 spindles. The frames for the different operations are known by the number of spindles they carry, as the four-spindle drawing box, the six-spindle drawing box, the eight-spindle drawing box, the twelve-spindle drawing box, or slubber, the twenty-four spindle finisher, the sixty-four spindle reducer, and the ninety-six spindle speeder, or rover.

The sliver from each operation is set up in a creel of the machine used in the next drawing operation. The ends are simply guided to the back rollers. From there the sliver passes between the intermediate rollers to the front pair, then to the flyer and on to the bobbin. The drawing is caused by the front rollers running faster than the back pair. The flyer puts a little twist in the strand so it will hold. In open drawing the sliver turned by the flyer winds around the bobbin. In cone drawing the bobbin is turned independently of the flyer, either faster or slower, the difference in relative speeds of the flyer and bobbin causing the drawing to wind on the bobbin.

French drawing frame.—French drawing frames have a front and a back pair of rollers, but in every other respect are different from the English drawing frames. Between the front and back rollers there is a middle pair, and between the middle and front, a roller bristling with fine teeth, called a porcupine. This acts much the same as the fallers in a gill box act. In front of the front rollers is a pair of rub aprons, which have a sidewise as well as a forward motion. In front of these are horizontal fluted rollers, on which the bobbin to be wound rests, and which are made to move back and forth transversely. The frames are made with from 8 to 48 bobbins, according to the process for which they are to be used. In the first

and second operations the frames are built for 8 bobbins; in the third operation, 12; in the fourth, fifth, sixth, and seventh operations, 24; and in the eighth and ninth, 48.

The sliver is set up in a creel behind the frame and is passed through the rollers and over the porcupine. This porcupine has to be delicately adjusted so the sliver will not rest on top of the teeth, but will go down between them to separate the fibers. The porcupine turns faster than the back rollers and slower than the front ones, somewhat like the fallers in a gill box. This difference in speed draws out the rub aprons, which rub the sliver into a narrow strand as they carry it forward. Finally it is wound on a bobbin resting horizontally on the fluted rollers. Two ends are wound on each bobbin.

English drawing-frame tender.—Under this head are included all operatives who tend any of the drawing frames in the English system, from the first drawing up to the speeders and rovers. This is done because the duties of all are very nearly the same, and because of the absolute lack of uniformity in practice of designating the occupations by more definite terms.

Drawing-frame tenders may be either men or women. As a general rule, men are more numerous in the earlier drawing operations, and women more numerous in the later ones. This is because the bobbins of drawing frames weigh about 16 pounds in the first operation and only a few ounces in the last. The principal duties of drawing-frame tenders are placing the full bobbins of drawing on the creel, and doffing. Putting the full bobbins, or rolls, on the creel merely requires taking down the empty bobbin and the pin on which it turns and putting the full bobbin on the pin and placing it back on the creel. Doffing requires the removal of the flyers before the bobbin can be taken off, the end of drawing being broken in the process. Piecings are made behind the back rollers, but when the joint comes to the front it is evened by hand; otherwise it would leave a lump. When the full bobbins are taken off and replaced by empty ones, the flyer is set on and the end of drawing twisted around the bobbin so it will start to wind when the machine starts. The number of bobbins that have to be doffed depends on the number of deliveries to the machine. Although this number increases in succeeding operations, doffing grows less frequent, since it takes longer to fill a bobbin. The number of bobbins that have to be set up in the creel in the back varies with the number of deliveries, and also with the number of doublings, but the increase in number always means less frequent changing. Drawing-frame tenders, in addition to creeling and doffing, have to watch for broken ends and have to piece them up when they occur. On the first 6 or 7 machines the flyer is attached to the spindle and both have to be removed and the bobbin slipped off the bottom. On the finer machines the flyer and spindle are separate, but the

flyer can not be taken off till all the spindles are tilted forward. The spindle rail is hinged for this purpose. These operatives oil and clean their frames. They stand at their work and usually run one or two machines. The work is not hard nor does it require constant attention, as the machines are usually equipped with a knock-off motion which stops them when the bobbins are full or an end breaks. Drawing-frame tenders are paid by the day, as a rule, though some mills pay by the number of hanks (840 yards).

French drawing-frame tender.—French drawing-frame tenders may be either men or women, men predominating in the earlier and women in the later processes. The work is very similar to that of the English drawing-frame tenders, except that instead of doffing the creeling bobbins of drawing, the rolls, into which the French drawing frames deliver the stock, have to be taken off and set up in racks on skewers. In this case there are no flyers to bother with. These operatives run only one machine each, but in every other respect the requirements of this occupation are the same as tending English drawing frames.

Weigher.—The weigher is a male employee whose duty it is to weigh the bobbins of drawing after the third step in the English drawing process and arrange them in groups of six or eight, according to the number of doublings called for in the next step. This is done so as to get as nearly even drawing sliver as possible. He records the weight of each bobbin and the group of bobbins and places them in position for the drawing-frame tender. This work is practically unskilled, is not heavy, and there is no chance for advancement. He is a time worker.

Porcupine cleaner.—Porcupine cleaners are girls who are employed in some mills to clean the porcupines used on the French drawing frames. Two or three, or more on some frames, work together when a frame is stopped. They have a small hand brush with stiff bristles which they draw over the teeth of the porcupine. The roll is turned around until all the short fibers and lint that have become imbedded between the teeth are removed. The work requires no skill. It requires the girls to stand and to work moderately fast and constantly while the machine is stopped. The girls employed at this work are usually over 18 and are time workers.

SPINNING DEPARTMENT.

This department takes the roving from the woolen cards and that from the speeders in the worsted department and spins them into woolen and worsted yarn, respectively. Twisting is usually done in this department, so that the yarn, so far as structure is concerned, is ready for weaving when it leaves this department. Filling yarn may go direct to the loom if it is not to be dyed or conditioned. Warp yarn always goes through several processes of preparation before going to the loom.

The occupations of this department are as follows:

Overseer.
Second hand.
Section hand.
Frame spinner.
Mule spinner.
Doffer.
Assistant mule spinner.
Bander.
Twister tender.
Oiler.
Trucker.
Sweeper.
Waste hand.
Joiner. (*See* Assistant mule spinner.)
Piecer. (*See* Assistant mule spinner.)
Back boy. (*See* Assistant mule spinner.)
Bobbin setter. (*See* Doffer.)

SPINNING.

Spinning is the final process in the manufacture of yarn. In this process the strand of wool—from the drawing frames in the case of worsted and from the card in the case of wool—is finally drawn out to the desired size, twisted, and wound on a bobbin or in a cop in suitable size for handling. Woolen yarn is spun on a woolen mule. Worsted yarn prepared according to the English system is spun on some sort of a spinning frame, either flyer, cap, or ring frame. That prepared according to the French system is spun on a French mule.

Cap spinning frame.—The spinning frame in most common use for spinning worsted yarn prepared according to the English system is the "cap" frame as distinct from the "ring" frame most commonly used in spinning cotton. The cap spinning frame is similar in appearance to the finer English drawing frames, except that the stock is delivered on both sides instead of on one side, and that the spindles have no flyers on them. In place of the flyer there is a steel bell-shaped device called a "cap." The spindles are set perpendicularly, 3½ to 5 inches apart. They do not turn, but a tube that fits over them and carries the bobbin is made to turn. Each bobbin is driven by a round cord, called a band, which connects the whorl of the spindle with a tin cylinder that extends the length of the frame, and is connected with the driving pulley at one end, called the "head." The speed of the bobbins varies from 6,000 to 10,000 revolutions a minute, and is regulated to take up the stock delivered at the front rollers, putting the required twist in it. The roving is set up in a creel and is drawn out by draft rollers just as on the English drawing frames. After it leaves the front rollers it is led through a guide eye centered directly over the spindle, and passes under the bottom of the cap and on to the bobbin. The bobbin is wound, or "built," by the properly timed up and down motion of the caps, all on one side moving in unison. Bobbins are wound in two ways, depending on whether the yarn is for warp or for filling. Warp yarn is wound in layers extending the length of the bobbin, tapering slightly at both ends as the bobbin fills. Filling yarn is wound in conical layers of about two-inch traverse.

Some frames are built for winding warp only, and some for winding filling only. Still others are equipped so they can be used for either warp or filling. All the intricate driving gears and cams are inclosed in casing, thus removing much of the danger of accident.

Mule (worsted—French system).—The self-acting mule is perhaps the most ingenious and complicated machine in the mill. It consists of three main parts—the beam, the carriage, and the headstock. The beam supports the creel for the roving and the rollers for drawing the stock out. The carriage contains the spindles, arranged in a single row and tilted slightly toward the rollers. On the carriage also is the drum or cylinder for driving the spindles, and the "fallers" that guide the yarn as it winds. The carriage is made to move back and forth, a distance of about 5 feet, on tracks in front of the beam. The headstock consists of the pulleys, the gears, the chains, scrolls, cams, and all the various mechanisms for operating the different parts of the mule. The headstock is a little to the right of center, dividing the machine into two parts, a long side and a short side. Mules take up a large amount of floor space. They vary in length from 50 to 100 or more feet, depending on the number of spindles (200 to 400), and they are about 10 feet deep when the carriage is out.

The mule accomplishes the same thing as the frame, i. e., draws out, twists, and winds. It does not, however, have one continuous operation as the spinning frame does, but rather four distinct motions: Drawing and twisting; backing off; winding; and reengaging, the cycle being made about four times a minute. The roving is set in a creel and drawn through a set of rollers similar to the spinning frame. When the rollers are delivering the roving in front, the carriage is moving out fast enough to keep the yarn taut, and the spindles are turning to put the twist in the yarn, the tilt of the spindle causing the yarn to slip off the top at each turn instead of winding on it. Thus, drawing and twisting are accomplished at the same time. When the carriage has gone out the full distance, it stops, the spindles stop, and the rollers stop, and the second operation takes place instantly thereafter. This second operation, backing off, is merely a preparation for the winding. There is a quick reversal of direction in the turn of the spindle—just enough to unwind the few turns of yarn between the top of the cop and the point of the spindle—together with a change in position of the fallers, the winding faller moving down into position, and the counter faller moving up to maintain an even tension on the yarn. Then comes the third operation, or winding, which is accomplished by causing the carriage to move in while the spindles turn to wind up the yarn. The yarn is guided while winding by the movement

of the winding faller, and it is always wound "filling wind," i. e., short cone-shaped layers. The yarn is wound into a "cop" either directly on the spindle or on a paper tube slipped over the spindle. Just as soon as all the spun yarn is wound up, and the carriage has got as close as it goes to the beam, the fourth motion, reengaging, takes place. This, like the second, is merely a change in the position of the parts preparatory to the next, or first, operation. The fallers are moved, releasing the yarn, and the mechanism for winding and twisting is set in motion ready to repeat the cycle.

The smoothness of operation of the mule makes it seem simple, but there are the most delicate adjustments for timing and speed. When winding and twisting, the rollers, the carriage, and spindles must start simultaneously; the speed must be regulated to give the proper twist; the different parts must stop at the proper instant; and the reverse motion of the spindles must be just enough to do its part. The builder motion, like all builder motions, is extremely intricate. All the changes from one motion to the other are accomplished with such speed that no time whatever is lost.

Mule (woolen).—The mule used in spinning woolen yarn is essentially the same as that used in spinning worsted. However, there is one marked difference. It has no drafting rollers. All of the draft (the drawing out) is accomplished by the outward motion of the carriage. The woolen roving to be spun comes directly from the cards on jack spools; so the creel on the woolen mule is built to hold the jack spools in a horizontal position. Mules vary in size according to the width of the mill and the counts spun. Some mules have as many as 1,000 spindles.

Cap-frame spinner.—Males and females are employed in about equal numbers to run spinning frames spinning worsted yarn. Spinners are usually boys or girls, though some older women are sometimes employed. Frame spinners tend the operation of the machine but are required to know very little about the mechanism. Their principal duties are to "set in roving," piece up broken ends, and clean the frame. Doffing and oiling are not done by the spinner, but by hands employed especially for that work. "Setting in roving" is setting a full bobbin in the creel in place of an empty one. This is done just as "creeling" on the drawing frames is, but the bobbins empty at more irregular intervals. It is possible for the spinner to change her roving before it runs completely out, what is left being thrown into a receptacle for "white" waste and sent back to be run through all the processes again. Care must be taken in setting in roving not to break the other ends of roving, as the bobbins are set very close together on the creel. "Piecing up" is joining the ends of yarn between the rollers and the spindle when breaks occur there. The yarn does break there more or less frequently, de-

pending on the grade of stock, the atmospheric conditions, etc. When a break, called an "end down," occurs, it does not affect the running of the rest of the spindles. One must possess the knack to piece up an end, for it must be done with great speed. The bobbin is lifted off the spindle, a little yarn pulled off, and the bobbin replaced. The yarn is drawn under the cap, put through the guide eye, and the end put against the end coming from the front rollers. The instant the two ends meet they are twisted together by a quick movement of the thumb and finger holding the thread. The twist must be given at the proper instant; then the joining will not show. Poor twisting or no twisting leaves a lump in the yarn, and is called "dabbing." The knack of piecing up fast and well can be acquired only from practice. The whole operation requires nimble fingers and a certain deftness which girls possess more than others.

Cleaning, the third principal duty of a spinner, is perhaps more important on a spinning frame than on most other machines and it takes more of the spinner's time. Three or four times a day the spinner must lift the covers off the top rollers and pick the lint off the strips of flannel, called top-roll clearers. The spinner must also clean the lap or scavenger rollers, usually after each doff. The scavenger rollers are wooden rollers covered with denim, which clear the bottom front draft roller. They are about 15 or 16 inches long, and it takes some dexterity to take them out to clean them without breaking down some ends. Spinners wipe off other parts of the frame several times a day, a clean machine being essential to good spinning. Great care must be exercised not to break down the ends when cleaning, and in this girls, on account of their small hands, have the advantage in being able to get between the threads.

Spinners do not tend both sides of the spinning frame, as a rule, but tend the sides that face each other in the same alley. Good spinners tend three or four sides apiece, and the number of sides is usually the measure of pay.

While spinning does not require constant active labor or constant attention, the operative is required to remain on his feet in the vicinity of his machines. Sometimes, however, when the stock is running well and the job is up, the spinner may leave his machines for several minutes. The work is light, and there is no danger of accident, except through gross carelessness.

Mule spinner.—Men only are employed as mule spinners, and for two principal reasons—first, because the work requires more mechanical skill than most women possess, and, secondly, because of the long apprenticeship. Mule spinners usually run two mules, set face to face, though sometimes a spinner will run only one when it is a very long one. The length of the mule generally varies with the width of the mill. As a rule, the mule spinner has full charge of the operation

of the mule—oils, cleans, and makes minor repairs on it—and is provided with one or two assistants. These assistants are usually apprentice spinners. Sometimes the work of the assistants is specialized and they are given particular designations, such as "piecers," those who help keep up the ends; "doffers," those who help to doff; and "back boys," those who set in the roving.

The mule spinner must understand the mechanism of the mule, the working of it, at least, if not the principle. He must see that the machine runs smoothly, and must know when any part is out of order, and must be able to adjust it. The routine work of the mule spinner, like that of the frame spinner, consists mainly in setting in roving, piecing up ends, doffing, and cleaning. The responsibility and direction of all these operations are the spinner's, although he is assisted in all by his assistants. "Setting in roving," or "creeling," on a worsted mule is done exactly the same as on the spinning frame or any other machine where the stock is drawn between rollers from bobbins in a creel. Creeling a woolen mule is somewhat different, due to the roving being on jack spools rather than on bobbins. A jack spool carries about 48 ends and when a spool empties all of these ends have to be pieced up, instead of one at a time as on the worsted mule. "Piecing up" is practically the same as on the spinning frame, a little yarn being drawn off the spindle and the end twisted to the end from the rollers. Piecing up has to be done when the carriage is on its outward run, but before it is out too far for the piecer to reach to the rollers. "Doffing" is removing the full cops from the spindles and setting paper tubes on the spindles for the new cops to build on. This is done principally by the assistant, though the spinner helps in order to get it done quickly. Preparing the mule for doffing, and starting it afterward to build a new cop, requires the personal attention and skill of the spinner, and requires the assistance of at least one other person.

When the cop is made, i. e., built up to the desired size, the lever is thrown to stop the mule just as the carriage reaches the end of its outward run, there being enough momentum for the mule to "back off," i. e., for the carriage to reverse its direction and to run in a little way. The rim band is turned back a little by hand to allow the yarn to slacken, and the winding faller is depressed to the base of the spindle and is held there by putting a wooden block between the faller arm and the counter-faller shaft. The counter-faller is held down by a hook on the shaft for that purpose. The "quadrant" and "builder motion" (driving mechanism) are reset to begin winding a new cop. The lever is thrown on for an instant, causing the carriage to run in for about 3 inches, winding a few coils of yarn around the spindle below the paper tube on which the cop is wound. This binds the yarn so it will start to

wind in a tight coil when the mule is started again. The cops are now removed and new paper tubes set on the spindles. The block of wood is removed, allowing the winding faller to assume its proper position for winding a new cop, and the tubes are forced down on the spindles by a wooden block called a "tube setter." Care must be taken in releasing the counter-faller so as not to let it fly up and break the yarn, one person holding the faller while another releases the catch. The mule is now started slowly and carefully, the counter-faller being allowed to rise gradually. The damage that will result from carelessness or incompetency in starting is considerable. Getting a good start—building a good bottom—is the secret of winding a good cop.

The remaining duties of the mule spinner are cleaning and oiling, work that needs no special description. The roller clearers have to be taken off and cleaned and this requires care so as not to break the ends. Mule spinners work on their feet, and the job is so arranged that they have little time to sit down or to leave their machines. They are usually paid on a piece basis—so much a pound.

Doffer.—"Doffer" is the term applied to the boys or young men who doff the spinning frames. Nearly all the machines in the mill have to be doffed, i. e., have the finished products removed, but the occupation term is here confined to those mentioned above.

The specific work of a doffer is to remove the full bobbin from the spindle and set on an empty one. Doffers usually work in teams of two, one team looking after 8 or 10 sides. Both sides of a frame are doffed at the same time, and the more there are who work on it the less time the frame is stopped, and production is increased by that much.

Just before the frame is to be doffed, the doffers put empty bobbins on the "dead" spindles along the front of the frame, there being a "dead" spindle just above each turning spindle for the purpose of aiding in doffing. After the frame is stopped, the "builder" rail is pushed down as far as it will go. The lever is then thrown on and off with a jerk, winding the yarn a few times around the spindle below the bobbin, and leaving the yarn slack so the ends will not break. The doffer lifts the cap off with his right hand and removes the full bobbin with his left, putting it in to his bobbin box, which he pushes as he goes along. He puts the cap over the empty bobbin on the dead spindle, from which he removes it with the same motion, and puts the two on the "live" spindle. When he lifts off the full bobbin he breaks the yarn, and the yarn that was twisted below the bobbin now winds around the spindle. So when the empty bobbin is pushed down on the spindle the yarn is held fast between the spindle and the bobbin, and will start winding as soon as the frame is started.

Doffers acquire considerable skill, and can change bobbins with great rapidity. In addition to changing bobbins they are required to

know something about the machine and how to piece up ends. Each time they doff, before starting the machine, they have to wind the "builder motion"—i. e., the mechanism which causes the yarn to build up in layers—back to its starting point. They must start the machine without a jerk so the ends will not break down, and they must piece up the ends that do break down. "Piecing up" is slightly different from that done by the spinner, because the bobbin is empty and there is no end to wind off to join that at the rollers. The doffer holds a full bobbin under his chin, letting some yarn wind off that on to the empty bobbin. Then he has an end which he can join to that coming from the rollers, when he pieces up just as the spinner does.

Most doffers are under 18 years of age. Small boys usually make the best doffers. They do not have to bend as far as taller persons, and they are more agile than older persons. Doffers can work only when the frames are ready—i. e., when the bobbins are full. There must be enough doffers employed to have some ready to doff as soon as the frame is ready, so there are necessarily periods of waiting. This time is free time, and in many mills equals the actual working period. Doffers are paid usually by the day, but some mills are adopting the piece method, basing the pay on the number of doffs per side. Boys begin doffing at the earliest age possible, but seldom remain until they reach manhood. The work leads to that of section hand in the spinning room, but most of the boys turn to some other man's occupation.

Bander or band boy.—Banding is an occupation that is often used as an intermediate step in the promotion of a doffer to a section hand. The work of a bander is to replace broken bands on a spinning frame with new ones, bands being the cords which transmit the power from the cylinder, or drum, to the spindles. Three or four times a day, as necessity requires, the bander goes around the spinning room looking closely for spindles that are not running, this indicating a broken band. To put on a band he attaches a weight of some sort to the end, and with a stick which has a hook on the end he puts it over the cylinder. He draws it around underneath and ties it around the spindle just under the whorl. When it is tied he slips it up around the whorl.

Banding seems simple, but it requires great care and a reliable man. The knot must be a square one that will not interfere with the running, and it is of the greatest importance that the band be just tight enough. A band can be put on in about a minute, and the number to be put on each day varies greatly. Banders are generally required to put bands not only on spinning frames but also on other frames, such as twisters and winders. Often this work is combined with that of oiling.

TWISTING.

Twisting is joining two or more threads of spun yarn into one, called two, three, or four ply yarn. This is usually done to make stronger yarn. The threads are twisted just as the fibers of the wool are twisted in spinning. Twisting could be done by any of the three forms of spinning frames (not mules) by not using any other rollers than the front pair, since the only difference is that in spinning the stock is drawn out and in twisting it is not, but a special frame is used, called a "twister."

The twister.—The twister is practically the same as a spinning frame, except that in place of horizontal rollers there is one vertical roller, around which the yarn is given one turn before passing to the twisting mechanism. The frames are built either with rings or caps, but seldom with flyers. The bobbins on which the yarn is wound are somewhat larger than those of the spinning frame. Twisters are equipped with a device for stopping the spindle when the knot is being tied. This is called a brake. There are different types, but a common one is hinged on the spindle rail with a lever hanging between two spindles. By moving the lever to one side or the other the brake is pressed against the spindle, which remains stopped till the lever is released. This brake is operated with the knee.

Twister tender.—Females are employed as twister tenders in most mills, but sometimes males are used. Girls under 18 can be used as well as those over 18. One worker can tend from one to four sides. The twister runs continuously. It is the tender's duty to take off the bobbins when full, and to start the yarn on empty ones. She also has to set in the full spools of single-ply yarn as they empty. Whenever ends break or run out she has to tie them together. This requires some skill as the knot must be small and must be tied quickly. While tying the tender holds her knee against the brake so the spindle will not turn. Twister tenders stand at their work and must continually watch for bobbins running out. These operatives usually run as many sides or spindles as will keep them pretty constantly at work. The basis of pay differs in different mills. Some pay by the day or hour, some by the number of spindles, and others by the amount of yarn twisted as measured in pounds.

WARP PREPARATION DEPARTMENT.

This department includes the various steps of transferring the warp yarn from one holder to another for convenience in handling and using in the succeeding processes, as well as drawing the threads parallel and applying the necessary sizing. Any or all the various kinds of winding may be employed in a given plant, depending on its particular needs. Reeling is really a form of winding, but is considered a separate process, since the yarn is not put on a holder,

but is wound in a skein to be dyed or bleached. Jack spooling is the first step in parallelizing the threads of yarn. In some mills when a worsted warp in a solid color (without a pattern) is being prepared, the ends are wound from small spools and set up in a creel directly on to a section beam. This process is called "beaming," and corresponds to "beam warping" in cotton manufacture. The term "dressing" originally meant putting on the sizing material, but now includes all the steps of assembling the warp threads according to the pattern, putting on the size, and winding on the loom beam. The term has so far digressed from its original meaning that very often no size is applied in the dressing process. When the yarn is beamed, jack spooling is, of course, omitted, as is also dressing. The size is applied and the yarn wound on the loom beam at the slasher. This process is the same as "slashing" in cotton. The term "warping" is sometimes given to all the processes in this department, except winding and reeling. Sometimes it is used in the narrower sense, corresponding with beaming.

The occupations of the warp preparation department are as follows:

Overseer.
Second hand.
Winder tender.
Reeler.
Jack-spooler tender.
Dresser tender.
Beamer tender.
Slasher tender.
Size mixer.
Fixer.
Oiler.
Trucker.
Sweeper.
Yarn man. (*See* Trucker.)
Cone winder. (*See* Winder tender.)
Package man. (*See* Trucker.)
Doubler. (*See* Winder tender.)
Spooler (small spools). (*See* Winder tender.)
Beam changer. (*See* Trucker.)

WINDING.

Winding is the general term given to the process of transferring yarn from one holder to another. This process is employed to put the yarn in a more suitable form for transportation, or in a more convenient form for use in subsequent processes. It is usual to wind the yarn from several smaller packages into one larger package or ball. Very often two threads are wound together (not twisted) in one package as a preparatory step to twisting (doubling).

The yarn may be unwound from bobbins, short spools, long spools, skeins, or cheeses; it may be wound onto tubes, short spools, or bobbins. There is a process of winding yarn onto long jack spools, but it is not included under winding. It is given the name "spooling," or "jack spooling." Yarn is also wound into skeins, the process being known as "skein reeling." Winding proper is of three kinds, "spool winding," "tube" or "cheese" winding, and "bobbin" or "jack" winding. Spool winding is winding the yarn, usually

from bobbins or cops, onto small, five or six inch spools. This method is largely being supplanted by the newer method of tube or cheese winding. Sometimes spool winding is called simply "spooling," and is confused with "jack spooling." Tube winding is winding, usually from bobbins or cops, onto paper tubes, building a ball or package that looks like a cheese. Hence this method is often called "cheese winding." Sometimes the term "cheese" is confined to those balls or packages that are cylindrical, and the term "cone" is applied to those built cone-shaped; and the process of winding a "cone" is called "cone winding." This method of winding on tubes is sometimes called "quick-traverse winding" to distinguish it from "slow-traverse winding," the method of winding the yarn in parallel layers on a double-headed spool. "Bobbin winding," or "jack winding," is winding onto bobbins or quills for the shuttle. Winding from skeins onto bobbins or spools is often called "skein winding." Sometimes the manner of winding is used for classifying winding, as "drum winding," where the spool or tube is turned by friction on a drum, and "spindle winding," where the tube turns on a spindle. The latter type is generally known as "Universal winding." Finally, the name of the inventor or maker of the machine used may determine the name by which the process is called, such as "Foster winding." The different forms of winding vary with the needs of the individual mill, and the terms used depend largely on the habit of the overseer or the custom in each mill.

The machines used in winding are all the same in principle. They all have a creel for holding the yarn to be unwound, spindles or drums for winding, a traverse motion for guiding the yarn, and stop motions to release the winding mechanism when a thread breaks or the desired amount is wound. A brief description of each, equipped for its most ordinary use, will suffice. It must be remembered that the machines can be equipped with creels for holding bobbins, spools, or skeins.

Spool (drum) winder.—The spool winder of the drum type is usually used to wind worsted yarn from skeins. The frames are built in different lengths, a common size having fifty drums on a side. The drums are just wide enough to fit inside of the heads of the spools, and are driven by bands connected with a long driving cylinder under the frame. Arms projecting upward from the frame support wheels or reels which hold the skeins. The ends from the skeins are drawn through guide eyes and onto the spools. The turn of the drum imparts the motion to the spool, and the thread is guided onto it in close parallel layers by the traverse motion of the guide eye.

Cheese (drum) winder (cone winder).—The cheese winder of the drum type is usually used for winding yarn from bobbins or cops onto tubes, building either a cylindrical or a conical cheese. The

frame used is long, delivers on both sides, and resembles the spool winder, except for the creel, which is a single row of spindles set along the front below the winding drums. The traverse motion on this type of frame is much quicker than on the spool type, and winds the yarn in open spirals, rather than in parallel layers as on the spool winder.

Universal (spindle) winder.—The Universal winder winds on quite a different principle from the drum winders, and is capable of winding both in open spirals on tubes without heads, or in parallel layers. The machine is built either with one or with six heads. On each head there is a dead spindle which holds the yarn to be unwound and a winding spindle in a horizontal plane perpendicular to the front of the machine. The tube to be wound is slipped over the spindle, and the yarn guided on it by a traversing guide that can be regulated to build the different types of "winds" desired. This type of winder is often used to wind yarn from cheeses or other packages onto quills or cops for the shuttle.

Bobbin winder.—The bobbin winder is designed to wind the yarn onto bobbins. It usually takes the yarn from large jack spools, hence the name "jack winder" sometimes applied to it. The frame is a long one, usually built to hold three jack spools, which are supported by arms projecting above the frame. Along the front of the frame is a single row of upright spindles (usually 120). The ends are directed through guides which are made to traverse up and down, building a bobbin much after the manner of building a spool on a vertical spindle spooler, except that the traverse is very carefully regulated to build a strong, smooth bobbin. This frame is often equipped with a creel capable of holding small spools or cheeses.

Winder tender.—Females are employed almost exclusively as winder tenders, and they are usually over 18 years. Like so many other machine operatives, their work is mainly setting the yarn in the creel, doffing the spools or packages when wound, and tying the ends together if the yarn breaks. Creeling is merely replacing the empty bobbins or spools in the creel, as they run out, by full ones, and tying the ends. Doffing, as on other machines, is simply taking off each filled spool or cheese and starting an empty one to be wound. These operations vary slightly with the different types of machines, especially in skein winding where the skein has to be put on the creel instead of a bobbin or spool. Most winders have automatic stop motions for stopping the machines when an end breaks or runs out. This enables the operative to tell at a glance what has happened so she can attend to it at once. The number of machines winder tenders run varies with the type and size. One operative will run usually one side of a frame delivering on both sides and can take care of from 20 to 40 deliveries, depending on the size of the spool and yarn, etc.

On cheese winding a tender can usually handle more deliveries than on spool winding (40 to 60). Winding cops on one six-headed Universal winder takes the entire time of one operative. On jack winding each operative handles the whole length of the frame, usually 120 spindles. The type of machine, the size of the bobbin or package, the yarn, and other things affect the number of machines or deliveries one operative can tend; but whatever the variation, the operative is kept pretty constantly at work. She works on her feet, moving rapidly from spindle to spindle. The work requires little skill and leads to no better position. These operatives are sometimes paid on a time basis, sometimes by the number of spools or bobbins wound, and sometimes by the weight of yarn wound.

REELING (SKEIN).

Reeling is the process of winding yarn around a frame of a determined circumference into a coil, called a skein. Yarn is put up in this form for convenience in handling in future processes—dyeing, bleaching, etc. The yarn is drawn off bobbins or cops or small spools and wound around the reel until a sufficient length is obtained. The ends are then tied, the skeins removed, and either knotted or banded together to be transported.

Reel.—The reel is the machine for reeling yarn into skeins. It is a simple machine, usually 10 or 12 feet long. It consists of a creel, which holds the bobbins or spools on spindles, and a reel, or "swift," on which the yarn winds. The swift consists of six wooden strips, or rails, supported by arms from a central shaft which runs the length of the frame below and a little in front of the creel. These arms are adjusted so the circumference of the swift can be made into different lengths, as 54, 72, or 96 inches. These arms are also collapsible so the yarn may be removed.

Several bobbins or spools are set up on the spindles in the creel and the ends drawn through guide eyes and fastened to little catches on one of the rails of the swift. When the machine is started the swift turns, winding on the yarn while drawing it off the bobbins. A short horizontal reciprocating motion given to the guide eyes causes the yarn to wind in a coil.

Reeler.—Reeling is an occupation in which women or girls are usually employed. There are usually two girls at each reel. Their work is to set the bobbins or spools on the spindles in the creel, to tie up broken ends, and to doff the skeins when a sufficient number of yards are wound, as indicated by the measuring clock. It does not take long to wind a skein, so doffing is necessary more or less frequently. When the required number of yards are reeled the ends are cut and both ends of the skein are tied together, a piece of string or other distinguishing mark being put at the place where they are

tied, so it can be found after coming from the dye or bleach house. Then a latch is sprung back allowing the swift to collapse, closing up like a fan. The skeins are slipped off the end of the swift by turning a specially arranged wheel at the end. When all the skeins are off, the rails are spread to the proper position and made fast. The ends of yarn hanging from the creel are made fast to the little catches on one of the rails. The lever is then thrown and another skein wound. If the skeins are to be transported any distance, each one is twisted loosely and tied in a loose knot. Reelers stand at their work and keep pretty busy. They oil and clean their machines, but this takes very little time or effort. They are paid on a piece basis, so much a skein.

JACK SPOOLING.

Jack spooling is the process of winding warp yarn on spools, called "jack spools." These are wooden spools, usually about 32 inches long, and carry about 40 ends. The yarn is drawn off as many cops (cheeses, or small 5-inch spools, in the case of worsted) as there are ends. Each end is guided onto the spool so as to form a spirally wound section a little less than an inch wide. When the spool is full it is ready to set up in the dresser creel.

Spooler.—The spooler is a rather simple machine. It consists essentially of a drum 1 yard in circumference, over which the large 32-inch jack spool rests and is turned by friction. Usually 40 ends are wound on a spool in parallel sections a little less than an inch wide. The ends are drawn off bobbins set on vertical spindles, or off cheeses, or off spools on horizontal skewers, and they are guided parallel by guide eyes, which oscillate sideways a little to wind the yarn in spirals so it will remain firm. Some spoolers have a white board at the front over which the yarn passes to be inspected. Sometimes spoolers are made to wind four or six spools at a time.

Spooler tender.—Spooler tenders are usually girls over 18, though sometimes younger girls are employed. There are two distinct classes of spooler tenders, those whose principal duty is to tie up ends, and those who are primarily inspectors of the yarn being spooled. Generally speaking, when spooling woolen yarn, the operative stands behind her machine while it is running and ties on new ends as the bobbins empty. Worsted yarn, as a rule, has to be inspected, and the operative sits in front of the machine, operates it with a foot lever, and constantly watches the ends passing over the inspection board. She has to stop the machine and cut out imperfect places in the yarn as they come along. Worsted yarn, generally, is taken off cheeses or spools, so new ends do not have to be tied on as often as when spooling woolen yarn. Where several spools of woolen yarn are being spooled, requiring drawing yarn from many small bobbins, girls are employed to do nothing but tie on ends from new bobbins.

The tenders set up the spools and take them down when filled. Spooling requires the constant attention of the worker while the machine is running. In most mills there is an interval for relaxation when changing spools. As a rule spool tenders who inspect sit while tending their machines. Those who do not inspect stand most of the time. They are paid by the hour in some mills, and by the spool in others.

DRESSING.

Dressing is the process of arranging the warp threads in their proper order according to the design. The threads are drawn from the jack spools and are finally wound on the loom beam. When dressing woolen yarn, and some worsteds, size is put on to lay the fibers and strengthen the yarn to enable it to withstand the beating up in the loom. So dressers, the machines used in the process, are provided with a size box and drying apparatus. Dressing frames, or dressers without the sizing and drying apparatus, are being largely used now, since the tendency is to use no size whenever possible.

It would be impracticable to arrange all of the three or four thousand threads in a warp by counting and threading through the reeds on the dresser, so only the number of ends necessary for the pattern are so counted and threaded. These are then drawn off in duplicate sections arranged side by side on the warp reel until there are enough sections to make a warp. The first step in dressing is called "picking the pattern," i. e., counting out the threads in the pattern reed according to the pattern paper; the second step is to change the spools in the creel; the third is "tying in," or "twisting in," i. e., joining the new ends to the ends already in the reed; the next is "leasing," i. e., separating the alternate threads; then "reeling," or running the sections on the reel; and, finally, when all the sections are on the reel, transferring the warp to the loom beam, or "beaming."

Dresser (including warp reel and beamer.)—The dresser consists principally of a number of steam pipes inclosed in a wooden frame with a copper cylinder at the front and a size pan and pair of rollers at the back and the necessary guide rollers. There is a reed in back and one in front, the former often called the "tying-in reed," and the latter the "lease reed," because the alternate dents are partly blocked to aid in putting in a lease. In front of a lease reed is a somewhat narrower reed called a condensing or neck reed. Behind the dresser is a creel capable of holding 10 or 12 jack spools. The warp reel or dresser reel is a large wooden reel about 8 feet long and 4 feet in diameter set in front of the dresser. It rests horizontally in a frame on a track which allows it to be moved sideways. On each of the 12 wooden bars which constitute the reel are a number of holes one-eighth of an inch apart in which pins can be set to guide the warp. There is a

tension arrangement for use when winding off the reel onto the loom beams. The beamer is simply bearings raised sufficiently off the floor to support the loom beam. At one end is a driving pulley and gears to turn the beam.

The spools of yarn for the warp are set up in a creel behind the dresser. Bobbins of yarn for the odd ends are placed in a bobbin rack in front of the creel. All the ends are drawn through the tying-in or pattern reed in proper order. They then pass between a size roller, which is partly immersed in the size in the pan, and a squeeze roller. Enough size is drawn up by the turn of the size roller to come in contact with the yarn. The squeeze roller presses the size into the yarn and squeezes out the excess. From these rollers the yarn is guided by skeleton rollers back and forth through the frame, passing over and under the steam pipes, then around the copper cylinder which is filled with steam, until, when thoroughly dried, it passes out of the frame, around a measuring roller, to the lease reed. Just before it passes through the lease reed, it is struck by a revolving blade, called the shaker, to separate the threads that may be stuck with size. The warp is drawn gradually narrower as it passes from the lease reed, through the condenser reed, and on to the dresser reel, where it is wound as a narrow ribbon, 2 to 12 inches wide, in the space marked off by the pins. When the yarn is not sized, it passes directly from the tying-in reed to the measuring roller, the sizing apparatus and the shaker being dispensed with. When the required sections are wound on the reel, the ends are tied to an apron on the loom beam and the whole warp unwound off the reel and wound onto the beam.

Dresser tender.—Dresser tending is one of the more skilled machine occupations in a woolen and worsted mill. Men exclusively are employed, and they get to be tenders only after a considerable period of helping and working under close supervision. The dresser tender usually performs all the operations from setting the spools in the creel to running the yarn onto the loom beam. The dresser is kept threaded and when a new warp is to be made the first thing the dresser does is to pick the pattern. He counts out the threads of the old warp just behind the tying-in reed according to the pattern sheet of the new warp, and separates the groups of colors or yarns by whatever scheme he finds most convenient or workable. He then sets the new spools on the creel and such additional threads as are needed on the bobbin rack. The next thing is to tie or twist together the ends of the old warp with those of the new in their proper order. It is important in this to have all the threads at an even tension. Tenders acquire considerable skill at this and do it very rapidly. The threads are then pulled through the reed and the machine run until the knots are through the lease reed and the condenser reed. Then a lease is

taken; that is, the yarn in front of the lease reed is pressed down with a rod, and a string is put through the shed formed by the alternate threads being held up by the blocks in the alternate dents of the reed. The yarn is then pushed up and a new shed formed with the threads that were on the bottom. A string is put through this new shed and both strings are tied together. This operation—taking a lease—is repeated before each section is put on the reel. When the warp is wound on the loom beam, the lease strings will be on the outside, and the drawer-in is thus enabled to get the proper order of the threads. After the lease is taken, and the measuring clock set, the old warp is cut and the ends of the new warp are tied and fastened to the warp reel. The pegs on the reel are adjusted to the proper width, and the machine is run till the proper length of yarn (the length of the warp) is wound for that section. Another lease is taken, the measuring clock set, the yarn cut, and the new ends fastened to wind on the next section, the reel being moved along so the yarn will be wound on directly in front of the condenser reed. This is repeated till sufficient sections are wound on to make the width of the warp. The next thing to do is to wind the whole warp on the loom beam (beaming). The barrel of the loom beam has a piece of cloth attached to it, slit at the end so each section of warp can be tied to this cloth to insure its being wound with an even tension. The friction device on the reel is thrown in and the beamer run till the whole warp is on the beam. The ends of yarn are made fast, the beam is taken off, and an empty one put on with the aid of a helper or floor man. When the warp is sized in the dressing process, the tender puts the size into the size box and turns on the steam in the jacket, but does not as a rule prepare the size. This is done, of course, before the warp is run through. This work requires not only a man skilled in the various operations but one who is competent and reliable as well. One thread too many or too few of a color or grade, or one misplaced, will spoil the pattern. Then, too, the condition of the size and proper sizing are important, to say nothing of the necessity for having an even and proper tension on all the threads. Dresser tenders usually oil and clean their machines. Their work requires them to be on their feet except when picking the pattern and tying in, when they sit on a stool. These operatives are time workers. In some mills the dresser tender has a helper who puts on the spools, helps to take off the beam, and does whatever else he can to assist the tender.

BEAMING.

Beaming is arranging several threads parallel and in one sheet, and winding them on a large beam. The several threads or ends are drawn from as many spools, laid an equal distance apart and wound

on a beam. The spools are arranged in a creel so they will unwind without tangling. Changing the spools in a creel is a distinct occupation known as "creeling" or "tying-over."

Beamer.—The beamer is one of the simpler machines in the mill. There are three principal parts to it—the creel, the combs, and the beam drive. The creel consists of two upright frames, or racks, placed together at one end and opening in the shape of the letter V. Each rack has several upright bays in which the spools are placed on skewers, one over the other. Creels stand about as high as a person can reach and are built in different sizes, holding from 300 to 1,000 spools. The combs are expansion combs, i. e., the teeth are capable of being moved closer together or farther apart, but always with the spaces between the teeth of uniform size. There are two such combs placed horizontally, so that the threads may be drawn between the teeth. At the lower front part of the machine is the driving drum, a roller about 18 inches in diameter, on which the beam rests, and which is driven by friction. The turn of the beam pulls the yarn off the spools, the combs guiding the threads parallel and equidistant. Beamers have a measuring motion, and a stop motion which operates when a thread breaks, for it is important to have the proper number of threads at all times. When a mechanical stop motion is used, drop wires are set up behind the combs. When an electrical stop motion is used, the drop wires are attached to the uprights of the creel. When a thread ceases to come, the wire drops and operates either a mechanical or electrical device that stops the machine.

Creeler.—Creeling, or tying-over, is a hand occupation in which women are employed for the most part. Men sometimes creel, however. The work requires little or no skill, and not a great deal of physical effort. Creeling is changing the empty spools in the creel for the full ones, the beamer being stopped while the creeling is done.

Creelers work in groups of from two to six, the organization and particular kind of work determining the arrangement. They are stationed in the V-shaped space between the racks. The empty spool and the skewer on which it turns are lifted out of the sockets, the empty spool is slipped off the skewer, and the full one put on. The end left threaded in the machine is tied to the end on the full spool. The full spools are taken from one box and the empty ones are put into another.

Creelers work in a cramped space. They have to reach high and bend low. They have to work fast while creeling, for production is stopped. They are paid on a time basis.

Beamer tender.—Women are employed almost exclusively as beamer tenders. The work requires little or no skill and not a great

deal of physical effort. They usually sit at their work, inspect the yarn and see that the required number of ends are winding on the beam. They neither change the spools in the creel nor change the beam. When an end breaks, the machine stops automatically. Then the tender has to tie the ends together, threading through the combs if necessary. Beamer tenders watch for poor thread and break it out. When the required number of yards is wound on the beam, the knock-off motion stops the machine and the operative cuts the warp, twists the ends so they will not tangle, and tucks the strand under a few of the coils so it will not unwind. When the trucker removes the beam and sets up a new one, the beamer tender fastens the ends of the new warp, which are tied together, on a hook in a depression on the beam. When the work calls for a change in the number of ends on a warp, the beamer tender must adjust the expansion combs so the threads will be an equal distance apart on the beam. There is a little crank at the end of the comb, and all that is required is to turn it one way or the other. These operatives oil and clean their own machines. They are paid on a time basis.

SLASHING.

Slashing is the process of coating the threads of the warp with a starchy substance, called "size." Strength is thereby given to the yarn and the fibers are made to adhere closely, enabling the yarn to stand the continued beating up of the reed in the loom. This is an important process, for poor slashing can cause no end of trouble in the weave room. In the preparation of warps for some kinds of goods, certain substances are put into the size to add weight. After the yarn passes through the slasher it is wound on the beam, which goes in the loom and which must carry the exact number of ends called for by the cloth to be woven. As the section beams, wound on the beamer, carry usually about 500 ends, and as the loom beams carry from 1,500 to 3,500, it is evident the warps of several section beams must be joined. This is done in the slashing process. Slashing is usually employed only when the warp is of one solid color. When the warp is of more than one color, "dressing" is the usual process employed.

Slasher.—The slasher is a large machine occupying a floor space 30 feet to 40 feet long by 7 feet wide. It consists of four principal parts—the creel, the sizing apparatus, the drying apparatus, and the headstock. The creel is an iron frame with bearings to hold the large section beams. When space permits they are horizontal, otherwise they are upright, the beams being set in one over the other. The sizing apparatus consists of a copper-lined box about 12 inches long, 12 inches deep, and the width of the machine, together

with an immersion roller and squeeze rollers. The size box is provided with a perforated steam pipe in the bottom, or a steam jacket around it, in order to keep the size hot. The drying apparatus consists of either one or two large copper cylinders (when one, it is about 12 feet in diameter; when two, one is about 7 feet and the other 5 feet) which are kept filled with steam. The headstock consists of various parts, the principal ones being—a number of upright arms or brackets for holding steel rods, called split rods; an expansion comb; a pair of drag rollers; the mechanism for turning the beam; and, finally, a beam presser. There is a measuring motion, connected with which is a device for putting a mark at each cut for the guidance of the weaver.

A number of section beams (3 to 8) are set in the creel so the warp will unwind in a horizontal plane. The warps from all are joined in one sheet. Passing over the guide roller, they are directed through the hot size under the immersion roller, and are drawn between two pairs of squeeze rollers which squeeze out the excess size and cause the size to penetrate the yarn. From here the warp passes almost around the steam-filled cylinder and comes off dry. It is then drawn to the headstock, passing on the way a fan, which cools the yarn. The threads, which the size tends to make adhere one to the other, are separated by drawing adjoining threads alternately over and under split rods, pass through an expansion comb, which guides them all parallel, and are drawn between the drag rollers, which give tension. They are then wound on the loom beam, the beam presser causing them to wind evenly and firmly.

Slasher tender.—The slasher tenders are men exclusively. It is necessary for the slasher tender to watch his machine rather constantly, for it is his duty to see that the yarn is unwinding off the beams properly, and not lapping; that there is sufficient size of the proper consistency; that the yarn is dry, but not burned; that it is not caked with hard size; that the tension on it is just right; and that it is winding on the loom beam properly, fitting the heads snugly. Then, also, there are the loom beams to be doffed when full, and a new set of section or back beams to be set in when one set runs out. This latter duty, "changing a set," is a good-sized job, and the slasher tender is usually assisted by a helper or another tender.

The machine is not allowed to become unthreaded. It is stopped as soon as the yarn on one of the beams runs out. The immersion roller is raised so the yarn does not remain in the size and become caked while the machine is stopped. The empty beams are taken out of the creel and full ones put in. Most mills have a chain hoist for lifting the full beams up on the creel, for they are very

heavy. Starting with the beam farthest back, the warp is drawn off by hand, joining that from each successive beam until all are joined at the front beam. The new is tied to the old in six or eight places, the immersion roller lowered, and the machine started in slow motion. As soon as the knots pass, a striking comb is turned up in front of the size box, and tapes are placed in the warp so as to separate the yarn from each beam. When the tapes come along the striking comb is turned down and the operative goes to the front of the machine. When the knots joining the old warp to the new reach the front, the split rods are taken out and the expansion comb is turned down. The loom beam is then doffed and a new one set in, the new warp being attached to it when the good yarn comes along. The expansion comb is now turned up again and when the tapes come along the split rods are put in, making the same separations the tapes did. The tender passes a pointed stick over the ends at each split rod, removing any overlapping of the threads. The expansion comb is adjusted to the proper width, is turned down, then up again. This time the proper number of ends passes through each dent because the warp is spread out evenly. If the comb does not pick up the proper number, the tender shifts a few by lifting them over the comb. When this is done the tender sets back the measuring clock, throws the machine in full speed, and the work of changing a set is complete. All through this operation the tender is assisted by another worker usually called a helper.

A set of section beams will run some time, filling several loom beams, so these latter have to be doffed oftener than the set has to be changed. Doffing does not necessitate stopping the machine, so there is no caking of size or burning of yarn. Just as the beam is about full, the belt is thrown on the slow pulley, and the tender contracts the expansion comb, gradually narrowing the warp on the beam. This is done to prevent tangling. When a cut mark comes, the warp is cut, and the ends on the beam are fastened under a coil of yarn. The beam is then dropped a few inches on to a truck. The empty beam is set in, and the sheet of warp fastened to it, the beam presser adjusted, the comb expanded, and the machine thrown in full speed to run till another beam is full. The tender must be careful to see that a good firm beam is started, with the warp evenly spread out and fitting the heads snugly.

In addition to creeling and doffing the slasher tender has more cares than the ordinary machine tender. He must feel of the yarn to see if it is properly sized and dry; he must watch the size to see that it is sufficient and of the right consistency; and he must look for "laps," or broken ends. When an end breaks it leaves a lap on the section beam. This has to be cut off and the end found and

started along with the rest of the ends. The tender usually tucks it under a few ends, marking the point with a piece of different colored yarn. He does this so that when it gets to the comb in front he can be there to put it through a dent. The slasher tender must raise the immersion roller out of the size and raise the squeeze rollers when he leaves at noon, and at night he must not only do these, but he must wash off the rollers thoroughly, run the size out of the box, and wash it out with boiling water. He has to keep the machine wiped off and oiled. He must understand enough about steam to keep the right pressure in the cylinder and must be careful to adjust the vacuum valve when he shuts off the steam; otherwise, when the steam condenses, the vacuum formed might cause the cylinder to collapse.

Slasher tenders have to be more skilled than most textile machine tenders. Each slasher tender runs one slasher, but has the assistance of a helper in creeling and doffing. When creeling or doffing or cutting off a lap, the tender works fast, but at other times he works leisurely, and when his job is up he may occasionally have a few minutes of free time when he can leave his machine. The work is heavy enough to require a grown man, but it is not hard. Slasher tending does not lead to any other occupation. The slasher tender is paid on a time basis.

Size maker.—The size maker is the man who prepares the size. The various ingredients—starch, tallow, water, etc.—are put into a vat or kettle and boiled while agitators turn slowly to thoroughly mix them. The size maker measures and puts in the ingredients (but does not determine the kind or amount) and sees that they boil the proper length of time. Where the size is pumped to the slasher, he runs the pump. He oils and keeps his apparatus in repair. The work is disagreeable and requires a great deal of cleaning. In a great many mills there is not enough work to keep a man at this job, so the work of size maker and slasher tender's helper is combined.

WEAVING DEPARTMENT.

The weaving department is the division of the mill where the cloth is made. In some mills dressing and slashing are under the direction of the boss weaver, but in this account those processes are included in the warp preparation department. Drawing-in, however, is included in the weaving department. The cloth is regularly inspected in the weave room before sending it to the finishing department, but, since inspecting, or "perching," is a finishing process, it will not be included here.

Following are the occupations of the weaving department:

Overseer.
Second hand.
Drawer-in.
Hander-in.
Twister-in.
Leaser.
Loom fixer.
Weaver.
Filling carrier.
Quill boy.
Harness man.
Chain builder.
Drop-wire operator.
Harness raiser.
Oiler.
Trucker.
Sweeper.
Harness builder. (*See* Harness man.)
Harness cleaner. (*See* Harness man.)
Harness set man. (*See* Harness man.)
Harness recleaner and greaser. (*See* Harness man.)
Inspector. (*See* Percher—finishing department.)

DRAWING-IN—TWISTING-IN—TYING-IN.

Drawing-in, twisting-in, and tying-in are three different methods of accomplishing the same thing—namely, putting each thread in the warp through a heddle eye in the harness and a dent in the reed. The first two are hand methods and the last is a machine method. The "harnesses" and "reed" are parts of the loom.

Drawing-in is the most common method, and is the term often used to include all three. In this method a small hook is put through the eye and the thread drawn through. This is the method which until recently was almost universally employed. It is still practically always used for warps of different colors, and always when there are no warp ends in the harnesses and reed.

Twisting-in is a method which can be employed without taking the reed and harnesses out of the loom, and therein lies its advantage. There must be a thread through the eye else twisting-in can not be employed. In this method the end to be drawn through and the end already in are twisted together sufficiently to hold while pulling the end through the eye.

Tying-in, like twisting-in, can not be employed unless a warp is in the reed and harness. In this method the ends are tied and then pulled through the heddle eyes and reed. This method is made possible by the use of a knot-tying machine, which ties the ends with great rapidity. This is the fastest method, one machine taking the place of about 15 drawers-in. This method is used on all plain work and can be used where there are two colors, if the pattern of the new and old are identical, by tying each color separately. A further description of this method, or the machines and occupations connected with it, will not be included here, since the method is comparatively little employed in woolen and worsted manufacture.

Drawer-in.—Drawing-in is a hand occupation in which women are employed for the most part. They perform two operations—drawing-in and reeding. Drawing-in specifically is drawing the threads through the heddle eyes of the harnesses, while reeding is drawing

the threads through the dents in the reed. Warps for certain looms have to be drawn through drop wires as well.

The beam of the warp to be drawn in is set up in a frame by a floor man. The drawer-in pulls the end of the warp over a guide rod which allows the ends to hang freely. She then hangs the harnesses on arms suitably located on the frame, usually resting the lower part of the harness in her lap. The threads hang behind the harnesses. Taking a few at a time she holds them taut with the fingers of the left hand. With her right hand she puts her drawing-in hook (a straight steel blade with a handle and with a notch at the end to catch the thread) through the proper eye in the harness, catches the thread, and pulls it back through the eye. Some hooks have two prongs and some have three prongs, enabling the drawer-in to catch two or three threads with one operation, one prong going through an eye in each harness. When the ends are all drawn through the harnesses, they are drawn through the reed. This work is known specifically as "reeding." The reed is suspended by straps with the lower edge resting on the lap of the operative. A few ends at a time are drawn over the first finger of the left hand and held taut by the thumb. She pushes the reed hook (similar to drawing-in hook, but shorter and with only one stiff flat blade) up from the under side of the reed, hooks the required number of ends, and draws them through the dent as she draws the hook out.

Drawers-in sit at their work. It is light work so far as physical effort is concerned, but it is exacting. The threads have to be drawn-in in their parallel order, certain ends through certain harnesses. These hands acquire considerable skill, and draw the threads accurately and fast. Reeding is particularly exacting, the wires being so very close together. These hands are usually paid on the basis of a thousand ends, or the number of warps, though sometimes by the hour. The continuity of the work depends on the worker.

When drawing in a pattern warp, the ends are handed to the drawer-in by an assistant known as a "hander-in."

Hander-in.—Handers in are for the most part young women or girls. Their work is indicated by their designation. They sit opposite the drawer-in, in a shed formed by drawing the warp over two parallel guide bars, and hook the warp ends in the proper order each time the drawer-in inserts her hook. The hander-in follows the order of threads as indicated by the lease string, or follows a diagram made by the designing department. These workers are used only for striped or pattern warps. The work is light and requires little skill. These girls aim to become drawers-in in time. They are paid on a time basis.

Twister-in.—Twisting-in is an occupation that is not very common since the adoption of the warp tying machine. Men are employed

as twisters-in. They work right at the loom. The harnesses and reed are left in, and the new warp is set in position in the loom. The twister-in wears a belt with two rings through which the ends from the harness and ends from the beam are drawn so that he can select the ends in order, and, by manipulating them between his fingers, untwist the ends slightly and then twist them together. He cuts the tails by a small blade on the belt. When all the ends are joined they are pulled through the harnesses and the reed from the front of the loom. Twisters-in acquire considerable skill and can twist the ends and cut off the tails with remarkable rapidity. They work standing in one place while actually twisting in, but the work does not take very long at one loom. They have free periods of irregular length and coming at irregular intervals, as the need for changing a warp determines. They are usually paid by the thousand ends.

Leaser.—Leasers may be either men or women. Their work is to do by hand what dresser tenders do with lease rods—i. e., take a lease. A lease has been described under "Dresser tender." The leaser, as the term is used here, means one who takes the warp that is to be twisted in, or tied in, and draws by hand the alternate threads over and under a rod or stick called a lease rod. When he has the ends so separated he either puts in a string in place of the rod or leaves the rod in. He divides the ends of warp and ties them in a loose knot so they will hold the lease rod or string in position. The work is unskilled, and can be done while sitting. Leasers are usually paid by the piece. The continuity of work depends on the individual worker.

WEAVING.

Weaving is the final process in the making of cloth. It is the process of interlacing various threads of yarn, one group, called "filling," being inserted at right angles to the other group, called "warp." The yarn to be used for filling goes directly from the spinning machine to the loom to be woven (except that sometimes it goes through a conditioning or moistening process to lessen the tendency to kink). The yarn to be used for warp goes through several processes preparatory to weaving, e. g., winding, dressing, and drawing-in. Warp yarn, as we have seen, goes to the loom wound on a beam, each thread being several hundred feet in length. Filling yarn goes in very much shorter lengths wound on a bobbin or in a cop.

Looms.—Looms used in weaving woolens and worsteds are of two distinct types—cam looms and fancy looms. Cam looms are used for plain weaves where only one kind of filling and not more than 8 harnesses are used. Looms vary greatly in size. A common size loom occupies a floor space about 4 by 6 feet, and stands about 3½ feet high, with an "arch" across the middle extending about a foot

and a half higher. The bulk of the machine is an iron frame capable of supporting the various parts. Held in bearings at the back of the frame is the "loom beam," on which the warp is wound. This is a wooden cylinder a little shorter than the width of the loom, with iron heads about 2 feet in diameter. A little in front of this are the "harnesses," wooden frames about 3 or 4 feet long and 10 or 12 inches wide. Just inside each long side is a small rod and between these rods are strung wires, or varnished cotton strings, with eyes in the middle called "heddles." The harnesses are placed one in front of the other, and are made to move up and down by a system of levers and cams on one side of the loom. Just in front of the harnesses is the "lay of the loom," a heavy wooden stick laid horizontally, and supported by uprights called "swords," which connect with a rocker shaft near the floor and which cause the lay to oscillate when in operation. On the top of the lay is a smooth piece of iron or hard wood, called a "race plate," on which the "shuttle" runs. The shuttle is made of wood with flat sides and pointed ends. A typical size would be about 11 inches long with 2-inch sides. In the center is a spindle which holds the bobbin, and at one end is an eye through which the filling passes. At each end of the lay is a shuttle box which guides the shuttle. Sticks called "picker sticks" are so placed at each end of the lay that when in operation the top end at the proper instant knocks the shuttle, causing it to fly to the other side. Attached to the back of the lay is the "reed," a rectangular frame about 4 or 5 inches wide and as long as the loom is wide, with narrow, flat strips of steel, called "splits," inserted parallel with the short side and very close together. This stands on end with the splits perpendicular, and the greater portion of it projecting above the lay. At the front of the loom is a board, called "the breast beam," over which the cloth passes to a roll just below it, called a "sand roll." This is a cylinder about 5 inches in diameter covered with sand paper or "burred" so as to draw the cloth tight. Two small clamplike devices, called "temples," are fixed to the frame just back of the breast beam so as to keep the cloth stretched to the desired width as it weaves. There are various shafts, cams, and gears in the lower part of the frame all set to operate the different parts at the proper instant.

The loom beam, as we have seen, is taken out of the loom and the warp wound on it at the dresser. The harnesses and reed are also taken out of the loom and the ends of warp drawn through the proper heddle eyes and dents by the drawers-in. When ready for weaving the full beam with the warp drawn in is set in position, the harnesses are strapped up, the reed is set in place, and the ends are tied to a piece of cloth so as to wind up in front. The bobbin of filling is put into the shuttle, which is inserted in one of the shuttle boxes. Then the loom is ready to weave.

The weaving operation consists of three principal or fundamental movements—the "shedding," the "picking," and the "beating-up" movements. In addition to these, looms are provided with five other motions—a "let-off motion," a "take-up motion," and three automatic stop motions—the "filling stop motion," the "warp stop motion" (not on all plain looms), and the "protector" or "bang-off motion."

The shedding motion is the raising and lowering of the harnesses in their proper sequence to form the "sheds" through which the filling is laid. The picking motion is the driving back and forth of the shuttle through the sheds by the action of the picker stick in order to lay out the filling. The beating-up motion is the oscillating back and forth of the lay, the reed pushing the threads of filling up close to the cloth already woven. These motions are all accurately timed to work in harmony.

The let-off motion is the turning of the loom beam to unwind the warp at the proper speed. The take-up motion works in harmony with this, it being the turning of the sand roll to take up the cloth as it is woven. The speed of these motions determines the number of picks per inch in the cloth, i. e., the number of filling threads interlaced through an inch of warp, just as the number of ends drawn through a dent in the reed determines the number of warp ends per inch of filling.

The stop motions are all for the purpose of stopping the loom when something goes wrong, so as not to weave imperfect cloth or break down the ends. The filling stop motion is a forklike device, which at each pick of the loom comes in contact with the filling and is caused to tilt slightly. If there is no thread of filling across the lay, the fork is not tilted, and a hook on the end comes in contact with a lever, which operates the knock-off motion and stops the loom. The warp stop motion is not on all plain looms, but is on all automatic ones. Each thread of warp is put through a drop wire in back of the harnesses. When a thread breaks, the drop wire drops down out of position, and by coming in contact with other and complicated parts, stops the loom. As these two stop motions stop the loom in order to prevent making imperfect cloth, the third one, the protector, stops the loom in order to prevent breaking the ends of warp or even parts of the loom. This is connected with the shuttle boxes, so that if the shuttle does not go into the box at all, or only partly in, a little device, known as a "dagger," comes in contact with a "frog," and thus operates the knock-off motion, and stops the loom. Whenever this protector stops the loom the loom is said to "bang off."

Fancy looms are the same as all other looms in principle, but are provided with a shedding mechanism which permits a greater variety

of shedding than on the cam looms, and with a box motion and additional shuttle boxes so that different colored filling may be used. The shedding, or head, motion is a system of levers placed at one end of the loom to which are connected straps, or chains, each lever and strap raising or depressing one harness. Gears, which operate these levers, are set in motion by other levers which are actuated, i. e., raised or depressed, by rollers linked together in a chain. The large rollers (about 1¼ inches in diameter) are called "risers" and the small ones (about ½ inch in diameter) are called "sinkers." The additional shuttle boxes with which fancy looms are provided are placed directly under those necessary on a plain loom. There are usually three additional on each side, making 4 in all on each side. As many of these as are desired can be used. They are made to move up and down on the lay so that the box to be used can be brought on a level with the race plate. The mechanism for moving the boxes is similar to that regulating the shedding motion and is governed by a chain of risers and sinkers. The chains regulate all the movements which make the pattern, so they have to be built in accordance with the design to be woven. The operation of a fancy loom is practically the same as that of a plain loom. The sheds are formed by raising and lowering the harnesses according to the positions of risers or sinkers on the chain. The shuttles are driven through the sheds in the same manner, the particular shuttle box being brought into position according to the "build" of the "box chain."

Loom fixer.—Loom fixing is an occupation for men and is perhaps the most important in the weave room. The work requires a knowledge of weaving and some mechanical ability. Loom fixers are assigned a certain number of looms called a section. In their respective sections they act as section bosses, are responsible for the care of the looms, and put in new warps.

Putting in new warps constitutes the bulk of their work. Weavers have some sort of signal they display on the loom when a beam of warp runs out. The fixer cuts off the cloth and takes out the empty beam together with the harness and reed. After the loom is thoroughly cleaned he sets in the full beam. The warp is drawn over the middle of the loom, the harnesses are hung on the straps and connected underneath, the reed is fixed in the lay and the reed cap put on. The warp is tied in several places to strands from a piece of cloth called the "apron," which extends over the breast beam and around the sand roll. This serves as an extension of the warp till the new cloth is woven a sufficient distance to reach the sand roll. The fixer then examines the various parts of the loom, changes whatever gears or cams are necessary, sees that the

nuts are all tight, etc. When all is ready he puts in a shuttle and weaves a few inches of cloth, observing whether or not the loom is running properly, and then turns it over to the weaver. The loom is cleaned and oiled when the beam is out. This is usually done by the weaver, but some mills employ hands especially for that work. There is always more or less fixing to do, both of looms and shuttles. Loom fixers have to see that the weavers in their sections do their work properly and keep the loom properly cleaned and oiled. They also must see that the cloth is weaving properly, and they must know enough about the different kinds of cloth to tell by the appearance and feel that it is as it should be. Loom fixers are paid on a time basis. It takes a rather dependable man because of the responsibility involved. Weave room second hands are chosen from the loom fixers.

Weaver.—Weaving is an occupation in which both men and women are employed in almost equal proportions. Children are not employed as weavers, though they sometimes start to learn as young as 16 years.

Weavers are pieceworkers. They are paid by the cut or by the yard, so their object is to weave the most cloth possible. But the cloth woven must pass inspection, and if there are flaws in it, it goes as "seconds." While weavers are paid for seconds, the rate is considerably less (about one-half the rate for "firsts"). On fancy goods, men usually run two looms, while women, as a rule, run only one. Each can run twice as many on plain goods. Weavers must watch carefully the cloth being woven, and change the filling as it runs out. Other duties of weavers are to piece up threads that break in the warp and to take off the cloth when a cut is woven. But the important work of putting in new warps and preparing them for weaving is not required of weavers. In most mills weavers oil and clean their looms, but in other mills men are employed especially for that work.

Changing the filling is an important part of the work of a weaver. An extra shuttle is always kept filled in the shuttle pan on the arch of the loom so as to be ready to be put in when the other runs out. When the loom is stopped, the empty shuttle is pushed out of the shuttle box by hand and slid out through the warp. The full shuttle is pushed into the box in its stead and the end of filling held in the hand until a few picks are put in. Then it is broken off close to the cloth. The empty bobbin is taken off the spindle in the shuttle that was taken out of the loom, a full one put on in its place, and the end threaded through the eye, making the shuttle ready for the loom.

When an end breaks in the warp it has to be found, threaded through the harness and reed, and held in position till enough picks

have been made to bind it, when it is cut off close to the cloth with a knife. If there is no warp stop motion on the loom and an end breaks the cloth will weave with an end short until the weaver discovers and mends it. Sometimes the weaver will discover a place in the cloth that was imperfectly woven. He has a very fine metal comb with which he can pick out the filling down to the perfect cloth. This is called "picking out."

The work is light, but requires the operative to be on his feet most of the time, though in most mills a seat of some kind is provided to be used whenever possible. Close attention directly affects the pay, because it lessens the chances of weaving seconds. Some weavers prefer to run fewer looms and work leisurely, while others prefer to work constantly, with the chance for greater pay.

Filling carrier.—Filling carriers are boys or low-priced men. They are required to keep the filling boxes at the looms supplied with full bobbins of filling. They have a truck on wheels which they push from the filling bins to the various looms. The work is light, involves very little responsibility, and usually permits of more or less free time whenever the job is up.

Quill boy.—Quill boys are required to remove the empty quills from the quill boxes at the looms and truck them into the spinning room. The work is light and permits of more or less free time. Low-priced men are sometimes used for this work.

Harness man.—"Harness men" is the designation given to the workers who have the care of the harnesses and reeds. In most mills all harnesses and reeds when taken out of the loom are brought to the harness man to be cleaned, examined thoroughly, and repaired. Cleaning may be done with a brush or compressed air. A change in the style of the cloth may require fewer or more heddles, and it is the duty of these workers to make the changes. They also group the harnesses in sets to be drawn in. In some organizations the work is divided, and the terms "harness cleaner," "harness builder," and "harness set man" are used. All the work can be done either sitting or standing. It is considered light work which can be done by some of the older men.

Chain builder.—Building chains is a hand occupation for men. The chain builder builds a steel chain according to a chain pattern prepared by the designing department. There are small bars about one-fourth inch in diameter and from 4 to 12 inches long according to the number of harnesses. The chain builder slips washers over these bars, some a little more than a half inch in diameter and called "sinkers," and some a little more than an inch in diameter, called "risers." There are as many bars as there are picks in the pattern, and they are joined together by small steel links that are slipped

over the end and held on with spring pins. This work requires a little mechanical ability in making up the chain, but the most important requirement is reliability, for the risers and sinkers must be in their proper order. The chain builder works at a bench with tools. His work is such that he can either stand or sit. He is paid on a time basis.

Drop-wire operator.—As a rule, drop-wire operators are females, but sometimes they are boys. Their work is to adjust the drop wires in the drop-wire frame at the back of the loom. The drop wires are small, flat-steel plates, each with an eye in it. Each thread of warp is drawn through the eye of a drop wire, and each wire is fixed in the drop-wire frame. This may be done in two distinct ways. In one the drop-wire operator adjusts the wires in the frame (sets them in the frame) so the drawer-in can draw the thread through just as she does through the heddle eyes, while in the other the operator sets the drop wires in after the warp is in the loom. In the latter case the wire is slit so the thread can be slipped into the eye. The operator in this case threads every eye as she places the wires in the frame. This is very light work and requires no skill. It is work that requires the worker to work rather fast when putting on the wires, but permits of a varying amount of free time.

Harness raiser.—After the warp has been put in the loom and it is ready for weaving, the harness raiser goes to the loom and raises each harness to see that the proper threads are in it. He checks up the work of the drawer-in. If he finds only a few mistakes he fixes them. If there are several, they are called to the attention of the drawer-in. The harness raiser has a drawing-in hook with which he can change the threads. This is important work in pattern weaving, and the person employed must be reliable. It is the final checking up, and mistakes not found here will spoil the weave and maybe the whole piece of cloth. The work is light and intermittent. Harness raisers are male employees and are paid on a time basis.

FINISHING DEPARTMENT.

After the cloth is woven and has been given a preliminary inspection in the weave room it is taken to the finishing department. The various processes to which it is subjected in this department depend largely on the style of cloth and the particular finish that is to be put on it. No attempt will be made to cover all the processes, but merely the more important ones to which most woolen and worsted cloth is subjected. Most finishing departments are divided into three sections: (1) Burling and mending, (2) wet finishing, and (3)

dry finishing. In the larger plants each of these divisions has its own overseer. The occupations of this department are as follows:

Overseer.
Burling and mending:
Second hand.
Inspector.
Marker.
Burler.
Mender.
Sewer.
Measurer.
Percher.
Trucker.
Sweeper.
Specker. (*See* Dry-finishing.)
Ticket pricer. (*See* Measurer.)
Stringer or remender. (*See* Mender.)
Wet finishing:
Second hand.
Fuller.
Crabber tender.
Washer tender.
Opener tender. (*See* Scutcher tender.)
Scutcher tender.
Dryer tender.
Inspector. (*See* Burling and mending.)
Percher. (*See* Burling and mending.)
Burler. (*See* Burling and mending.)
Specker. (*See* Burling and mending.)
Trucker.
Dolly tender. (*See* Washer tender.)
Open winder. (*See* Scutcher tender.)
Dry-can tender. (*See* Dryer tender.)
Cloth carrier. (*See* Trucker.)
Extractor tender. (*See* Washer tender.)
Face burler. (*See* Burler.)
Dry finishing:
Second hand.
Specker.
Trucker.
Percher. (*See* Burling and mending.)
Finish sewer. (*See* Sewer-Burling and mending.)
Brusher tender.
Shearer tender.
Dewing machine tender.
Finish percher. (*See* Burling and mending.)
Measuring, folding, and winding machine tender.
Ticketer.
Tenterer.
Weigher.
Shader.
Bander.
Paperer.
Sorter.
Packer.
Shipper.

BURLING AND MENDING.

Inspecting.—The first thing to be done to the cloth after it reaches the finishing room is to inspect it. It is either drawn over an inspection table or over a perch and all imperfections in the cloth marked so as to insure their proper correction in succeeding processes. Only the former method will be mentioned here, as the latter will be described a little farther on under the heading "Perching." It must be remembered that the inspecting may be done by drawing the cloth over a perch, and the employee called a "percher." In such cases the inspecting described under the name "perching" would be called "reperching."

Inspector.—Inspectors (as distinct from perchers) are female employees and are sometimes called table girls. They stand at a table and as they draw the cloth over it they examine it very closely for imperfections, such as ends out, mispicks, smashes, bad places, etc. All imperfections found are marked with a piece of chalk, a particular mark indicating a particular fault; or, perhaps, different colored chalk is used for different faults. This work is important and requires a person who not only is careful and trustworthy, but who understands the different kinds of fabric made in the mill. The work is light, but the inspector has to stand while doing it. Inspectors are paid on a time basis.

Marking.—After the inspector is through with a piece of cloth it is taken by an employee called a marker, who embroiders on the cloth the number, style, etc., so it can be identified in future processes. A tag or paster might be lost, but the stitches will remain in.

Marker.—The marker is usually a girl and in some mills is called an embroiderer. She has a power-driven sewing machine with an embroidery attachment. At one end of the piece of cloth is a paster which shows the style of the cloth, the date woven, the loom number, and sometimes other identification numbers. The marker embroiders with her machine these various numbers along the end of the piece. The work is light and the operative sits while running the machine. In small mills where there is not enough marking for a separate job it is done by some other employee, such as the measurer. Markers are paid on a time basis.

Burling.—After the cloth has been perched and marked it is taken by the burlers. These employees draw the cloth over an inclined table and examine it for knots, which they remove. The cloth has to be examined on both sides, and in some mills the process of burling on the wrong side is called "back burling."

Burling table and burling iron.—The burling table is merely a plain wooden table or bench, the top being smooth and shellacked and inclined toward the worker at an angle of about 45°. It is low enough for the burler to work at it while sitting on an ordinary chair.

The burling iron is a small pair of steel spring nippers, with a sharp point at one end for picking up threads.

Burler.—Burlers are female employees. Each one sits at a burling table and draws the cloth over from back to front, examining it both with eyes and hands for knots, lumps, or loose ends. She raises the knots and imperfect threads with her burling iron, and cuts them off with scissors. Care must be exercised in drawing up the knots and cutting them off, for it is very easy to do this so the ends cut will curl up and leave an imperfect place. Burlers remove all the imperfections they can, and they mark with a piece of chalk any they may find that the percher missed as well as places where they have removed threads. In some mills burlers examine first the back and then the front of the cloth, while in others the front is burled and the back is done at a later stage when it is termed "back burling." Back burling naturally does not require the care that front burling does. Burlers do not have to place the cloth on the table or remove it when burled. There is a floor man employed to do this. This man as a rule keeps a record of the work done by burlers, for they are pieceworkers. Burlers usually keep a record of their own as well.

Mending or sewing.—After the cloth has been burled it is taken to the menders or sewers who sew in pieces of thread wherever they are missing. Threads may have been left out at the loom or may have been taken out by the burlers.

Mender, sewer, or darner.—Menders or sewers are female employees. They sit at a low perch supported from the floor and draw the cloth over, looking for places that have been marked for threads out. They then sew in with a needle the particular kind of yarn needed. They weave the yarn in just as it would be done at the loom, and trim the ends off closely. A good mender can put in a piece of thread and make the cloth look as though it had been woven perfectly at the loom. Mending is fine work and requires capable employees, particularly if colored yarns are used in fancy weaves. Their work is light and clean, and they sit while doing it, making the occupation one of the most agreeable in the mill for girls. They are pieceworkers, and are paid usually by the number of yards of yarn sewed in.

Measurer.—The measurer examines the work of the sewer and measures the length of yarn sewed in and keeps a record of it. The measurer may be either a man or a woman. He spreads the cloth out on a table so he can easily measure the threads. All mills do not have a measurer, but combine the work with that of the marker or some other employee.

Perching.—Perching is inspecting or examining the cloth by drawing it over a rack, called a perch, so it will pass between the employee and the light. In this way the worker can look through the cloth

and find imperfections that would not be visible if the cloth rested on a table. This method of inspecting the cloth is often used in place of that described under "Inspecting," but is always employed after the cloth has been burled and mended to see that it is in as perfect condition structurally as it is possible to make it.

Perch.—A perch consists of two wooden bars, 4 to 6 feet long and about 3 inches in diameter, suspended horizontally from the ceiling so they will be about 4 feet apart and 7 feet from the floor. Perches are always erected in front of a window so the cloth will hang between the percher and the light.

Percher.—As a rule, perchers are men. They are the most important employees in this section of the mill, next to the second hand. A percher places a piece of cloth on the floor and draws the end over the perch. As he pulls the cloth down on the other side between him and the light, he examines it very closely for imperfections. A good light on the other side of the cloth enables him to see through it and thus discover even the minutest imperfection. If he finds anything that can be remedied he marks it and sends the piece to the proper person to remedy it. If there are faults that can not be remedied he designates the cloth as a second or remnant. This is important work and requires a high-class man, one who is dependable and who understands weaving and the structure of various fabrics. His work is light, but he is required to stand on his feet. He is paid on a time basis.

WET FINISHING.

The wet-finishing division comprises all the processes in finishing in which the cloth is wet. Some of the processes that occur in this division follow, though only a few are described: Singeing, to remove nap; crabbing, to set weave; fulling, to shrink cloth; washing, to cleanse cloth; scutching, to open from rope to sheet; stretching, to stretch either in width or length; drying, to dry the cloth; gigging or napping, to raise the nap; lustering or steaming, to put luster on face; carbonizing, to remove vegetable specks by treatment in acid (*see* Carbonizing wool); and dusting or beating after carbonizing, to remove the vegetable matter carbonized. In addition to these there may be inspecting, perching, burling, or specking in this division. The order of processes varies with the goods and the finish desired. Goods dyed in the piece go to the dyehouse after being subjected to the desired processes in wet finishing, and they are returned after dyeing for further treatment in the wet-finishing division.

Fulling.—Cloth that is to be fulled is usually, though not always, put through this process directly after coming from the burling and mending division. Fulling is the process of causing the fibers of the wool to felt. When felted the fibers so join and interlock one with

the other that they form a compact whole not easily separated, and as the fibers naturally adhere closer, the cloth shrinks in the fulling process. Fulling not only adds strength to the cloth, but it lays the foundation for the finish the cloth is to receive. For some finishes flocks (those fine clippings sheared off the surface of the cloth in finishing) are added for weight. These are made to felt into the surface of the cloth in the fulling process.

Three things are necessary to cause the fibers to felt—moisture, pressure, and heat. It has been found that the best way of imparting the moisture is by using a soft soap, which is spread on the cloth. The pressure is applied by running the cloth through the rolls and crimping box of a machine called a fulling mill. The heat is obtained from the friction of running the cloth through the machine.

Fulling mill.—The fulling mill consists essentially of a smooth hard-pine box, curved at the bottom, and with a pair of wooden rollers at the top. The piece of cloth to be fulled is "threaded" between the rollers and the ends sewed so as to make it one continuous strand or rope with the bulk of it resting on the curved bottom. When the soap is applied and the mill is running, the rollers draw the cloth from front to back, crowding it in the crimping box (a shelf on which rests a hinged cover) until it forces the cover up enough to let it out at back. Continuous running for two or three hours with the proper pressure and moisture will cause the cloth to take up in length and width the amount desired.

Fuller.—A fuller is usually a fairly skilled and a comparatively high-priced man. His work consists of threading the cloth into the machine, sewing the ends together, applying the soap, watching the operation, and removing the cloth when sufficiently fulled. The greatest care must be exercised to put the proper quantity of soap on the cloth and apply it evenly. The soap is usually applied by dipperfuls out of a pail. When the machine has run a while the fuller should feel of the cloth to see that it is not dry or too soapy. He must be able to tell these things by the feel, and he must know what to do to remedy them if not right. He must watch closely, lest too much heat be generated, which would weaken the fibers. And he must understand and regulate the pressure so that the cloth will be taken up in length and width at the same time and as nearly even as possible. Thus a fuller is more than a machine tender. Fullers are also responsible for keeping their machines clean, both inside and out, and they must keep them properly oiled. In some mills fullers have a hand-driven railway sewing machine to sew the ends of cloth together; in others they use a needle and thread. As a rule there should be one fuller for every two fulling mills, but the general plan is to have one high-priced fuller and one or more lower-priced men or helpers. The work of a fuller is not hard, though he works on his feet entirely.

Fullers must be reliable men, for poor fulling can not be remedied. They are paid on a time basis.

Crabbing.—Crabbing is the process of setting the weave so it will not be affected—"warped"—in subsequent processes. On account of the tendency of wool fibers to adhere, more particularly if subjected to hot water, goods will shrink in the various finishing processes, particularly in dyeing. The object of crabbing is to accomplish this shrinking or setting in an even and uniform way. This is done by subjecting the goods to boiling water while running it over rolls to prevent wrinkles. The cloth is first subjected for about 20 minutes to warm water to loosen the size put on the warp in dressing it. It is then run through boiling water with more pressure on the cylinder for 20 or 25 minutes to set the weave. Sometimes it is run through the boiling water a second time, but in the opposite direction. Finally it is run through a cold-water bath. In crabbing the cloth is subjected to as harsh treatment as any it will get in subsequent processes or in use by the consumer, thus rendering it stable as to structure.

Crabbing machine or crabber.—The principal features of a crabbing machine are the tanks or bowls which contain the water and the rollers and cylinders, geared to run evenly, around which the cloth passes while being immersed. A squeeze roller rests on the cylinder to squeeze out the water somewhat and to impart the necessary pressure. This pressure can be regulated. There are the necessary guide rollers and the attachment for winding the cloth on the roller. There is sometimes a tank at the front of the machine for immersing the cloth in the cold water. In front of this is a swing folder for laying the cloth in folds.

The roll of cloth is set in position at the back of the crabber and is guided into the machine by two tenders in order to avoid wrinkling. It passes around the cylinder immersed in the water. When it is sufficiently treated it is wound off on a roller. After being subjected to the boiling water it is run through the cold water and laid on a truck in folds by a swinging guide roller called a swing folder.

Crabber tender or crabbing-machine tender.—The crabber tender is a fairly skilled machine operative. He is required to heat the water to the proper temperature; to guide the cloth evenly onto the cylinder so as to avoid wrinkles; and, when sufficiently treated, to run the cloth off on to the roller or into folds. It is essential that the water be kept up to the proper temperature, that there be no wrinkles, that the cloth be left in the water the proper length of time, and that the cloth be kept out between treatments the proper length of time. Crabber tenders usually work two or three to a machine. The usual practice is to have one higher priced man to take the responsibility, and one or two others to handle the cloth and feed

it into the machine. Crabber tenders have to be in rather constant attention while running cloth through, but their work can not be considered hard. They are timeworkers.

Washing.—Washing is one of the processes in wet finishing that all cloth is put through. Cloth that is fulled is washed after fulling, but many kinds of cloth, including worsteds, are not fulled. The purpose of washing is to thoroughly cleanse the cloth. This is done by running it through soap and water, then through clear water to rinse it, and then through an extractor to remove the water. Fine goods that are to be dyed in the piece are run through a solution of fuller's earth after rinsing, in order to be certain there is no soap left in the cloth to spoil the dyeing.

Washer.—Washers are of various types and sizes to suit the particular uses to which they are to be put. All washers consist essentially of a box or tub to hold the liquid and rollers to cause the cloth to circulate. A common type has a curved bottom like the fulling mill where the surplus cloth rests immersed in the washing liquid. The wooden rollers are above the water and squeeze out the water and some of the dirt as the cloth passes through. The two ends of cloth are sewed together after the machine is threaded so as to make a continuous rope of cloth. The water can be drawn off from time to time and fresh put in to rinse the cloth.

Washer tender.—Washer tenders are men operatives. They are not required to be as skilled as fullers. They feed the pieces of cloth into the machine, sew the ends together, start and stop the machine, turn on the water, put in scouring liquor if necessary, draw off the dirty suds, change the water, and take out the cloth when thoroughly washed and rinsed. They have to keep track of the time the cloth is in, for the time each piece shall be run is determined by the overseer. It is usually about two hours in all. When the cloth is taken out of the washer, it is put into an extractor and run 10 or 15 minutes to get out as much water as possible. There is enough work at each washer for one man to devote his whole time to it, i. e., to keep the washer cleaned and oiled, as well as running it, but the usual plan is to have one fairly high priced man and one or more lower priced men to run all the washers, all working together as much as possible. There is more or less dampness around the washers, but the floor is usually built so the water will not form in puddles. Washing is moderately heavy work. These operatives are paid on a time basis.

Opening or scutching.—Opening or scutching is the process of restoring cloth to the open width. After leaving the washer or the extractor or any machine in which the cloth is treated in "rope" form, it has to be opened out again with a flat sheet. When it is opened out it may be wound into a roll or it may be plaited down on a

truck. This latter practice is followed wherever possible, because it saves time when feeding several pieces of cloth up to a machine. If a roll is used, the end of a new piece can not be sewed to it until the piece unrolls, whereas if the cloth is plaited down, the tail end can be left out and the new piece sewed on so as to make a continuous run without having to stop the machine.

Scutcher.—The scutcher is a simple machine that consists of a beater, a scrimp rail, and a pair of drag rollers arranged so the cloth will pass from one to the other in the order mentioned. This machine is supported near the ceiling with a considerable stretch between it and a guide eye that the cloth passes through. This arrangement is designed to permit the cloth to open as much as possible before reaching the scutcher and to prevent twisting and tangling. The cloth is drawn by the drag rollers of the scutcher, first coming in contact with the beater, which revolves against the direction of the cloth, and thus opens it to width. As the cloth passes over the scrimp rail, whose surface speed is faster than that of the cloth, it is stretched out and freed of creases by the diverging serrations with which its surface is cut. The sheet of cloth can be swung onto a truck or led to another machine.

Scutcher or opener tender.—The scutcher tender is a male employee. His work is simple and requires little or no skill. He starts and stops the machine, threads the cloth through, and watches to see that it does not get tangled or knotted. If it does, he stops the machine and straightens it out by hand. If the cloth winds in a roll, he starts it around the roller and takes it off when wound. If it is plaited on a truck, he puts the truck in position for it to fall on evenly and removes the truck when full. He has to keep his machine oiled and cleaned. His work is light, but usually keeps him occupied working leisurely. He is paid on a time basis.

Drying.—Drying is an operation that must follow treating the cloth in the wet state. It may be the final process in wet finishing, or it may follow any wet treatment, such as washing. Drying always follows dyeing.

Dry cans.—Dry cans, or drying cans, are large hollow copper cylinders two or three feet in diameter and wide enough to carry one or two widths of cloth as desired. A number of these cans (from 6 to 30 according to particular needs) are arranged in a long series of two tiers (sometimes higher if space is cramped), and geared to run together, and are called a set or range. The cloth is directed around the cans so that it will touch as much of the surface of each as possible.

Dryer tender.—Dryer tenders are men who look after the operation of the dryers, or dry cans. In a woolen or worsted mill there are usually three men to a set, or range, of dry cans. One takes

charge, starts and stops the machine, and sees that the steam is kept up. He also watches the delivery end, sees that the cloth comes off dry, and moves up the trucks for the cloth to be plaited down onto. The other two men simply guide the cloth straight as it feeds onto the cans. The work is unskilled and requires little physical effort, though working constantly in such a high temperature probably has some injurious effect. They are paid on a time basis.

DRY FINISHING.

The dry-finishing division comprises all the finishing processes subsequent to drying. Some of these follow: Specking, to remove specks of vegetable matter in the cloth; perching, to discover if there are any threads out, etc.; finish sewing, to sew in threads out; brushing, to brush up nap; shearing, to cut off loose threads or nap if desired; dewing or sponging, to dampen the cloth; pressing, both rotary and hydraulic; conditioning, cooling after pressing; finishing perching, a final inspection; measuring, folding, and winding, all done on one machine; ticketing, putting ticket showing style, etc., on the cloth; wrapping, putting paper on bundles; packing; and finally, shipping.

Specker.—A specker is usually a female worker. Her work is to pick specks or pieces of vegetable matter out of the cloth. These usually show up after piece dyeing. The process usually comes in the dry-finishing division, though for some classes of goods it is done in the burling and mending division. The specker works under the same conditions and does practically the same work as the burler. (*See* Burler.)

Winder.—Winders are the men who wind the finished cloth around a flat board for convenience in handling and for shipment. They have a machine which grips the board and causes it to turn, winding the cloth on it. As the cloth passes through the machine it strikes a blade which divides it in the middle and holds it taut while one edge is drawn over to meet the other, thus doubling the cloth lengthways. This operative starts and stops his machine, and has to thread it each time a cut is folded. There is a measuring device which he sets each time and so gets the exact length of each piece, which he marks on it. He keeps rather constantly at work, for it takes only a minute or two to wind a piece of cloth. He is paid on a time basis.

Coverer or paperer.—Coverers, or paperers, as they are called in some places, are usually girls. They wrap the goods in paper after folding is completed. They tie up the package and paste a sticker on the outside, showing style, etc. These girls work standing at a bench, but have a stool to sit on when their work permits. The continuity of work and speed required of these girls depend largely

on the attitude of the overseer. They are usually paid on a time basis.

Packer.—The packer is the man who puts the wrapped cuts into packing cases and nails on the covers. He also trucks the cases to be shipped or stored. This is heavy work and requires a strong man. He is paid on a time basis.

The several occupations in the finishing department that have not been described are for the most part those of machine tenders whose principal duties are to feed up the cloth to the machine and to take it away when it has passed through. The machine operatives in this department are almost exclusively men, but few are required to possess any more skill than that necessary to adjust their machines and run the cloth through properly.

DYEING DEPARTMENT.

Woolen and worsted dyeing, unlike a large part of cotton dyeing, is done in the mill instead of in a converting plant. For this reason most woolen and worsted mills have a dyeing department. Wool is dyed in the loose state, in the top or as slubbing, in the yarn, and in the finished cloth. When the loose wool is dyed it is called "wool dyeing"; when the dye is forced through the ball of top it is called "top dyeing"; when the dye is applied to the strand of slubbing or thread of yarn it is called "skein dyeing"; and when the cloth is dyed "piece dyeing."

The occupations of the dyeing department are as follows:

Overseer.
Second hand.
Fixer.
Oiler.
Dye mixer.
Drug man. (*See* Dye mixer.)
Vat tender.
Kettle man.
Wool dyer. (*See* Vat tender.)
Skein dyer. (*See* Vat tender.)
Piece dyer. (*See* Vat tender.)
Cloth dyer. (*See* Vat tender.)
Extractor man. (*See* Washing and scouring department.)
Trucker.
Floor man.
Dryer tender. (*See* Finishing department.)

All of the above occupations, except the first four, are grouped under "Laborers, dyehouse" in the wage tables of this report.

DYEING.

Dyeing is the process of imparting color to the entire body of the material. The various coloring agents are called dyestuffs. They are generally divided into "direct" colors and "mordant" colors. The former are those which adhere to the fibers directly; the latter, those which will not adhere without the aid of a combining substance called a "mordant." A mordant is a substance which unites chemically with the dyestuffs to form the coloring compound that will unite with the textile material. The mordant is always compounded with some other substances, which together form a soluble metallic

salt, called the "mordanting principle." It is this mordanting principle that is applied to the material to be colored. And then when the mordant color, or dyestuff, is applied it combines in a chemical action with the mordant, forming the insoluble color compound which adheres to the fibers.

The material to be dyed is first washed so that it will contain as nearly as possible only the thoroughly cleaned pure fiber. This is essential because the various dyestuffs produce different results on different material. When the dye that is to be applied is a direct color, it is dissolved in a solution and the material immersed in it. Just the quantity of dye that the material will take up is used, so when the dyeing is complete there is nothing left but the dye liquor. Most dyes are applied with heat, i. e., the solution is brought to a boil while the material is in it. When a mordant is used, the material is usually given a bath in that first, though sometimes the mordant is applied at the same time as the color and sometimes even after. After dyeing the material is washed.

Wool dyeing.—Wool dyeing is the process of imparting a color to the wool fiber in its loose state. Wool dyed in this form is sent to the dyehouse directly after scouring and before drying. The wool is first put into a net, which is put into a round kettle or vat filled with the dye liquid. This liquid is brought to a boil, and the wool allowed to remain in it some little time, depending on the color and the dye used. If mordant colors are used the wool is first given a bath in the solution of the mordanting principle. While the wool is in the vat the attendant works it about by a process known as "poling," being careful to keep the wool below the surface of the liquor. When sufficiently dyed the net is raised and allowed to drain, or the liquor is run out of the vat. If dyed in indigo the wool must be spread out on the floor and constantly worked over to be thoroughly oxidized. After dyeing, water is run into the vat and the wool rinsed. Then it is taken out, put into the extractor to remove the excess liquor, and trucked to the dryer. After this it proceeds as undyed wool.

Skein dyeing.—Skein dyeing is the process of dyeing wool in the form of slubbing (worsted in the process of drawing), or skeins of yarn. The same name is given to the process of dyeing the wool in both stages because they are both handled in the same way. The machine is usually a cylindrical vat placed horizontally with the upper part of the front open. Three large wheels, one at each end and one in the middle, turn on the axis of the cylinder and support a number of bars parallel with and around the axis. A number of skeins are hung on these bars and each tied up in a loose knot. When the bars are full, the dyeing or washing, or mordanting liquor is poured in and the machine started. The skeins are revolved in the liquor the proper length of time and are run between squeeze rolls

as they are taken off. After being dried the material is ready to be returned to the mill to continue on in the process of manufacture.

Piece dyeing.—Piece dyeing is the process of dyeing the cloth after it is woven. The cloth is usually given certain treatments, such as singeing and crabbing, in the wet-finishing division, and is always thoroughly washed before going to the dyehouse. Here it is run through a vat or kettle containing the dye liquor. The vat is about 6 feet wide, and 6 feet deep, 8 or 10 feet long, and is completely inclosed, except the upper part of the front. There is a horizontal roll near the bottom, and one near the top. When the liquor is in, the lower roll is immersed in it, while the upper roll is some feet above it. Several cuts can be run at a time, there being guide pins to keep them separated. The cloth is run through in the form of rope, the two ends being sewed together to form a continuous strand; and it is drawn around both rollers, the upper one being driven to cause the cloth to circulate through the liquor. When the cloth is thoroughly dyed the dye liquor is drawn off and the cloth rinsed in water. The excess liquor is then removed in the hydro-extractor, and the cloth returned to the wet-finishing division to be opened, dried, and subjected to further finishing processes.

Dye mixer.—The dye mixer, or drug man as he is called in some plants, is a male worker. It is his duty to weigh out the various chemicals under the direction of the overseer or second hand, and to dissolve and mix them for the vats. He mixes them in a small vat and stirs them with a paddle. The work requires no knowledge of chemistry nor skill of any kind. It is light work, though perhaps not very agreeable. He is paid on a time basis.

Vat tender or kettle man (wool dyeing).—The vat tender or kettle man (wool dyeing) is a male machine operative. It is his duty to put the wool into the vat, pour in the dye liquor, turn on the steam, and pole the wool with a stick or pole until the liquor boils. It is essential, particularly if dyeing with indigo, to keep the wool immersed. When sufficiently dyed this operative raises the net of wool, lets it drain, and draws off the liquor. If indigo dyed, he spreads the wool on the floor and works it over for 10 or 15 minutes till it is thoroughly oxidized. After dyeing he turns water into the vat to rinse the wool, and when this is drawn off he takes out the wool and puts it on the floor. There is usually one man to a vat. He has nothing to do with the preparation of the dye. He dyes to sample, the overseer or second hand being the final authority in determining the sufficiency of the color. This work requires considerable physical effort when poling, but it is not hard work. The atmosphere is humid and the floor wet. He is paid on a time basis.

Vat tender or kettle man (skein dyeing).—The vat tender or kettle man dyeing yarn in the skein is perhaps a little higher grade man

than the vat tender in wool dyeing. It is his duty to put the skeins on the bars of the dyeing machine; to run in the dye liquor or water and to run it off when necessary; to start and stop his machine; and to watch the operation of it rather closely. The yarn or slubbing is usually run a considerable time in the dye. The operative determines when it is sufficiently dyed, from a sample, and gets the approval of the second hand or overseer before drawing off the dye liquor. On removing the skeins from the machine he may run them between a pair of squeeze rolls or lay them out to be put into the hydro-extractor. This operative usually runs one machine, though sometimes two work together. The atmosphere in the room is humid and the floor usually wet. He is paid on a time basis.

Vat tender or kettle man (piece dyeing).—The vat tender or kettle man dyeing cloth in the piece is the same grade employee as in skein dyeing and does essentially the same work. He first threads the several pieces of cloth into the machine, then sews both ends of each piece together with a small railway sewing machine which he operates with his foot. He runs the liquor in and out when necessary and starts and stops his machine. When it is dyed and rinsed he takes out the cloth and puts it on a truck to be taken to the next process. This is responsible work and requires practically the constant attention of the worker while the cloth is running in the dye, sometimes several hours. Each operative runs one machine. The work is not hard, but the room is damp and the floor usually wet. He is paid on a time basis.

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