
UNITED STATES DEPARTMENT OF LABOR

Frances Perkins, Secretary

BUREAU OF LABOR STATISTICS

Isador Lubin, Commissioner (on leave)

A. F. Hinrichs, Acting Commissioner

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Earnings in the Manufacture of Industrial Machinery

1942

(Part 1)

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Prepared by

Harold R. Hosea, Odis C. Clark, and George E. Votava

DIVISION OF WAGE ANALYSIS

ROBERT J. MYERS, *Chief*



Bulletin No. 720

[Reprinted from the *Monthly Labor Review*,
May, June, July August, and September 1942.]

UNITED STATES

GOVERNMENT PRINTING OFFICE

WASHINGTON : 1942

For sale by the Superintendent of Documents, Washington, D. C. - - - - Price 10 cents

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LETTER OF TRANSMITTAL

UNITED STATES DEPARTMENT OF LABOR,
BUREAU OF LABOR STATISTICS,
Washington, D. C., October 14, 1942.

The SECRETARY OF LABOR:

I have the honor to transmit herewith a report on earnings in the manufacture of industrial machinery, 1942, in six branches of the industry embracing agricultural, mining, textile, construction, miscellaneous industrial, and oil-field machinery. The report was prepared in the Division of Wage Analysis, Robert J. Myers, Chief.

A. F. HINRICHS, *Acting Commissioner.*

HON. FRANCES PERKINS,
Secretary of Labor.

PREFACE

To provide basic information on the effects of the transition to a war economy on industrial products, technological processes, occupational patterns, and wage structures, the Bureau of Labor Statistics has undertaken a series of studies of establishments manufacturing machinery and allied products. This bulletin contains a summary of the data collected during the spring of 1942 from plants in six branches of the machinery industry. The individual reports are reprinted, with minor changes, from recent issues of the Monthly Labor Review, and the products discussed are agricultural, mining, textile, construction, miscellaneous industrial, and oil-field machinery. Summaries of the data for other industry branches are in preparation, and are made available in mimeographed form as the analyses are completed.

Each of the industrial branches covered in this series of studies has been defined in terms of the principal products of the various plants during the year 1939—the latest period for which data are available from the Census of Manufactures. It is recognized that a group of plants, classified as constituting an industrial branch in 1939, may be far from a homogeneous group at the present time. It is, nevertheless, useful to begin with the 1939 classification as a starting point. The data on changes in types of product within a former industry are, in themselves, highly significant since they reflect, in addition to the developments which might be expected over a three-year period, the impact of the war program.

The data for this survey were collected by trained field representatives of the Bureau who visited the plants and analyzed pay rolls and other pertinent records. The detailed wage data on individual employees are limited to day-shift workers in certain occupational groups selected for study either because of their numerical importance or because they are key jobs. In general, however, occupational earnings rates were compiled for 80 to 90 percent of the wage earners employed on day shifts.

*Bulletin No. 720 of the
United States Bureau of Labor Statistics*

[Reprinted from the MONTHLY LABOR REVIEW, May, June, July, August, and September]

**Earnings in the Manufacture of Industrial
Machinery, 1942**

CHAPTER I

**EARNINGS IN THE MANUFACTURE OF AGRICUL-
TURAL MACHINERY, 1942**

Summary

These data, which refer to February and March 1942, show that conversion to war production is not as yet far advanced in this industry. Conversion will be limited for the immediate present because of the obvious necessity for providing agriculture with adequate equipment. Information from 55 plants, employing a total of more than 12,000 wage earners, showed average hourly earnings of 84.1 cents for the industry and an average workweek of 40.8 hours. Hourly earnings in northern plants were, on the average, more than 26 cents above the rate for plants in the South. Size of plant exerted a marked influence on earnings; the workers in 25 plants, each employing 50 wage earners or less, received an average of 54.2 cents per hour as compared with 91.7 cents in 8 plants with more than 250 workers each. Wage differences between North and South were accentuated by the fact that the northern plants are of much larger average size.

Occupational earnings ranged from 51.2 cents per hour for molders' helpers to \$1.107 for skilled drop-hammer operators. Wide differences in the earnings in different occupational groups appear in the comparisons of plants of varying size and in different parts of the country.

Scope of Survey

According to the latest Census of Manufactures, there were 317 plants engaged primarily in the manufacture of agricultural machinery; these plants as a group employed an average of 27,806 wage earners during 1939. Of the 317 plants, 100 were employing 5 workers or less and were excluded from this survey. The establishments covered in this study constitute 25 percent of the remaining 217 plants reported by the Census. This sample of plants was selected as far as possible to be representative of the industry as a whole with respect to location, size in terms of wage earners, and corporate affiliation. In August 1939, the 55 plants covered by the survey employed 8,582 wage earners.

About half (28) of the 55 plants surveyed are in the East North Central region (Illinois, Indiana, Michigan, Ohio, and Wisconsin). Another 10 are west of the Mississippi River, 8 in the New England and Middle Atlantic regions, and 9 in the South (see table 2, p. 4). The geographic and size distribution of these 55 plants is essentially the same as that for the entire 217 reported in 1939 by the Census.

Of the 55 plants included in this survey, 25 employed 50 wage earners or fewer during the February or March pay-roll period selected for study. These plants account for less than 5 percent of the wage earners studied. The 22 plants with 51 to 250 wage earners apiece employed a total of 3,270 workers or about 27 percent of all those included in the survey. The 8 comparatively large plants (251 or more workers apiece) employed 8,235 wage earners or more than two-thirds of the total. Most of the earnings data shown in this report are based on a representative pay-roll period during February-March 1942; in a few plants the period used fell wholly or partly in the latter part of January.

Characteristics of the Industry

TYPES OF PRODUCT

The establishments classified by the Census of Manufactures in the agricultural-machinery industry include those "primarily engaged in the manufacture of agricultural machinery and equipment, except tractors, for use in the preparation or maintenance of the soil, the planting and harvesting of the crop, preparing crops for market, or for use in other operations or processes pertaining to agriculture. The manufacture of agricultural hand tools is not included in this industry."

Conversion of facilities to war production appears not to have been a major factor in this industry thus far. A relatively high priority rating has been assigned by the War Production Board for the manufacture of certain types of farm machinery, and production of some forms of equipment during the year ending October 31, 1942, has been set at about 83 percent of the 1940 level with provision for 150 percent on replacement parts. It is likely that 1943 production of farm machinery will be substantially curtailed. The majority of the products (in terms of value) of the entire group of 55 plants consisted of agricultural machinery in 1940 and 1941. During the first 2 months of 1942, only 1 of the 55 plants reported more than 50 percent of its product as made up of war materials; this was a midwestern plant employing slightly more than 200 workers in February 1942. There were, however, 3 plants producing some war materials in 1941 and 5 were in this category during the first 2 months of 1942.

LABOR SUPPLY

Distributions of workers by skill class are available for 8,940 of the 12,095 workers in the plants surveyed. Of the 8,940 workers, about 26 percent may be regarded as skilled workers, 44 percent as semi-skilled, and the remaining 30 percent as unskilled. It is believed that inclusion of all workers in the plants surveyed would not greatly affect this estimate of distribution by skill class.

Male white workers predominate in this industry; only 282 (2.3 percent) of the workers in the 55 plants surveyed were Negroes, and all of these were employed in 16 plants. Negroes constituted from an eighth to a half of the employees of 5 southern plants. Outside the

South, Negroes did not exceed 7 percent of the total number of workers in any plant; in 6 plants there were 5 Negroes or less, and 39 reported none at all. Negro workers were employed principally as laborers, helpers, janitors, molders, and in other foundry jobs.

Women (exclusive of central-office personnel) were employed in but 7 plants. Of the 132 women reported, 121 were employed in 4 plants, principally as bench assemblers, coremakers, and packagers.

Of the 55 plants, 20 were operating under union agreements; in 16 of these plants the unions were affiliated with the A. F. of L. or the C.I.O., while 4 plants worked under contracts with independent unions. Only 1 of the 9 plants in the South reported a union agreement.

METHOD OF WAGE PAYMENT

Slightly less than half (48 percent) of the 8,940 workers for whom earnings rates were compiled were paid on a straight-time basis; the remaining 52 percent were paid on the basis of piece-work or production-bonus systems.

Overtime at the rate of time and a half for work above 40 hours per week was paid in all of the 55 plants studied. In 19 plants this penalty rate also applied to any work over 8 hours per day, and 1 plant reported a daily limit of 9 hours at regular rates. Six plants paid double time for all Sunday work, and 1 applied this rate to any Sunday work above 5 hours. One plant also paid double time for all work above 11 hours per day and/or 56 hours per week.

Five of the 55 plants paid a 5-percent differential for second-shift (evening) work. Four establishments reported a 5-cent and 2 a 3-cent differential, 1 paid 25 cents additional for each 8 hours of evening work, and 2 plants paid 2.5 and 4 cents per hour extra, respectively, for evening work. Of the total, 41 plants either paid no premiums for evening work or reported that they were operating but 1 shift. Only 8 of the 55 plants reported differential rates for third-shift (night) work. Four of the 8 paid an additional 5 cents per hour, and, of the other 4, 1 each paid respectively, 5 percent, 10 percent, 50 cents extra for each 8 hours, and a bonus of a half-hour's earnings.

Employment, Hours, and Hourly Earnings, 1939-42

The 55 plants included in this survey employed a total of 8,582 wage earners during a representative pay-roll period in August 1939; the average employment per plant was 156 (table 1). These same plants

TABLE 1.—*Employment, Average Hourly Earnings, and Average Weekly Hours of Workers in 55 Agricultural-Machinery Plants in Selected Periods, 1939-42*

Year and month	Total wage earners	Average wage earners per plant	Average hourly earnings	Estimated average hourly earnings, exclusive of extra overtime earnings	Average weekly hours
August 1939	8,582	156	\$0.698	\$0.696	38.1
April 1940	10,697	194	.727	.713	38.6
August 1940	10,224	186	.719	.705	38.5
February 1941	11,813	215	.751	.731	39.7
August 1941	12,453	226	.823	.799	40.3
February and March 1942	12,095	220	.841	.814	40.8

employed 12,095 workers, or an average of 220 per plant, during the pay-roll period (February or March 1942) on which the present survey is based. The small decrease in employment shown in the period between April and August 1940 was probably seasonal. The decrease between August 1941 and February and March 1942 is too small to be highly significant, although the change is in the opposite direction to the usual seasonal movement. There are, however, some indications that material and skilled-labor shortages may have been involved.

The average weekly hours worked in these plants increased from 38.1 in August 1939 to 40.8 in February-March 1942. Except for the slight decrease between April and August 1940, which again was probably seasonal, average weekly hours show a gradual but steady rise.

Average hourly earnings, including amounts received on account of penalty overtime payments, rose from 69.8 cents in August 1939 to 84.1 cents in February-March 1942. As in the case of average weekly hours, the trend of hourly earnings has been steadily upward except for the interval April-August 1940. It is believed that these average hourly earnings rates are inflated from 1.2 to 2.7 cents by the inclusion of penalty overtime payments. Estimated average hourly earnings exclusive of these amounts rose from 68.6 cents for August 1939 to 81.4 cents during February-March 1942.

Hourly Earnings and Weekly Hours, February-March 1942

Average hourly earnings of the entire 12,095 workers studied amounted to 84.1 cents during February or March 1942. Workers in the 28 plants in the East North Central region received the highest average—87.6 cents per hour. The averages for the two other northern regions were 80.1 and 83.7 cents, respectively (table 2). Hourly earnings in the 9 southern plants averaged 59.9 cents.

Plant average hourly earnings in slightly less than half (24) of the 55 establishments surveyed averaged between 55 and 80 cents. In but 5 plants were the average earnings 90 cents or more per hour.

TABLE 2.—*Distribution of Agricultural-Machinery Plants by Plant, Average Hourly Earnings and by Region, February-March 1942*

Plant average hourly earnings	All States	East North Central States	West Central and Pacific States	New England and Middle Atlantic States	Southern States
Under 40.0 cents.....	3	—	—	—	3
40.0 and under 50.0 cents.....	7	3	1	2	1
50.0 and under 55.0 cents.....	7	3	3	—	1
55.0 and under 60.0 cents.....	7	4	—	1	2
60.0 and under 65.0 cents.....	8	5	1	1	1
65.0 and under 70.0 cents.....	4	2	1	1	—
70.0 and under 80.0 cents.....	5	2	1	1	1
80.0 and under 90.0 cents.....	9	4	3	2	—
90.0 cents and over.....	5	5	—	—	—
Total.....	55	28	10	8	9
Total workers.....	12, 095	8, 405	1, 382	1, 342	966
Average workers per plant.....	220	300	138	168	107
Average hourly earnings.....	\$0. 841	\$0. 876	\$0. 801	\$0. 837	\$0. 599

At the other extreme were 3 plants, all in the South, with average hourly earnings below 40 cents.

Wide variations in plant average earnings were found in establishments of different sizes. The workers in the 25 plants employing 50 wage earners or less received an average of 54.2 cents per hour as compared with 91.7 cents earned by the 8,235 employees of the 8 largest plants studied (table 3).

TABLE 3.—Average Hourly Earnings of Agricultural-Machinery Workers, by Size of Plant and Region, February–March 1942

Plant size (wage earners)	United States			Northern States			Southern States		
	Number of plants	Number of workers	Average hourly earnings	Number of plants	Number of workers	Average hourly earnings	Number of plants	Number of workers	Average hourly earnings
All plants.....	55	12, 095	\$0. 841	46	11, 129	\$0. 862	9	966	\$0. 599
50 workers or under.....	25	590	. 542	20	432	. 577	5	158	. 449
51–250 workers.....	1 22	3, 270	. 704	18	2, 462	. 750	1 4	808	. 628
251 workers and over.....	8	8, 235	. 917	8	8, 235	. 917	.....	.....	.....

¹ Includes 1 plant in size group 251 and over.

As already noted, southern workers received about 26 cents less per hour, on the average, than northern workers. Part of this difference is obviously a result of the differences in size of plant; the southern plants are little more than a third the size of those in the East North Central region. Comparison of northern and southern plants within the same size groups reduces the regional difference to about 13 cents for small plants and approximately 10 cents for plants in the intermediate size group.

OCCUPATIONAL DIFFERENCES IN AVERAGE HOURLY EARNINGS

The average hourly earnings of male workers in the occupations selected for study ranged from 51.2 cents for molders' helpers to \$1.107 for class A drop-hammer operators when the entire 55 plants studied are considered as a group (table 4). Fourteen occupational groups, which included approximately 11 percent of all the male workers, showed hourly earnings in excess of \$1.00. About 8 percent (754) of the workers, distributed among 5 occupational groups, were in occupations paying less than 60 cents an hour; one of these groups consisted of woman assemblers, class C.

The separate rates shown for different classes of workers within an occupational group are based upon an attempt in each case to determine the nature of the workers' duties in terms of the degree and types of skill required and the amount of responsibility attached to the jobs. While earnings rates are naturally correlated with these grade classifications, they have not been used as the principal basis for determining them. The criteria for judging skill classes have been applied uniformly among the various plants studied as far as it is possible to do so. The wage-rate structure or earnings level within a plant was not used as a basis for determining skill class. A turret-lathe operator, for example, was reported as a class B worker if his current job conformed

to the general criteria established for this class; the fact that one such operator in a high-wage plant might receive 15 cents per hour more than an employee doing a similar grade of work in a lower-wage plant was not taken into consideration. The occupational classes A, B, and C shown in this report are, in general, comparable with the concepts of skilled, semiskilled and unskilled workers, respectively. However, the popular interpretation of skill classes varies considerably from industry to industry and among different plants. The present classifications represent an attempt to apply uniform standards

TABLE 4.—Average Hourly Earnings on Daylight Shift in Selected Occupations in Agricultural-Machinery Plants, February–March 1942

Occupation and class	United States		Northern States		Southern States	
	Number of workers	Average hourly earnings ¹	Number of workers	Average hourly earnings ¹	Number of workers	Average hourly earnings ¹
Males:						
Acetylene-burner operators.....	4	(²)	4	(²)	—	—
Apprentices.....	65	\$0.625	59	\$0.625	6	(²)
Assemblers, bench, class A.....	111	.986	99	.996	12	\$0.898
Assemblers, bench, class B.....	456	.852	402	.867	54	.740
Assemblers, bench, class C.....	550	.783	499	.817	51	.455
Assemblers, floor.....	382	.891	366	.910	16	.448
Blacksmiths.....	76	.832	73	.838	3	(²)
Boring-mill operators, class A.....	4	(²)	4	(²)	—	—
Boring-mill operators, class B.....	23	.831	21	.850	2	(²)
Broaching-machine operators.....	11	.909	11	.909	—	—
Buffers.....	96	1.082	87	1.096	9	(²)
Bulldozer operators.....	129	.944	117	.975	12	.638
Carpenters, class A.....	14	.879	14	.879	—	—
Carpenters, class B.....	32	.774	31	.776	1	(²)
Carpenters, class C.....	6	(²)	5	(²)	1	(²)
Carpenters, flask.....	11	.819	11	.819	—	—
Castings cleaners.....	169	.790	151	.832	18	.442
Chippers, class B.....	22	1.053	22	1.053	—	—
Chippers, class C.....	45	.859	45	.859	—	—
Core pasters.....	5	(²)	3	(²)	2	(²)
Coremakers, class A.....	80	.995	71	1.031	9	(²)
Coremakers, class B.....	45	.887	45	.887	—	—
Coremakers' helpers.....	31	.653	28	.668	3	(²)
Crane followers.....	3	(²)	3	(²)	—	—
Crane operators.....	26	.804	26	.804	—	—
Craters.....	18	.844	18	.844	—	—
Cupola tenders.....	24	.657	23	.667	1	(²)
Cupola tenders' helpers.....	21	.714	16	.766	5	(²)
Die setters.....	19	.847	18	.849	1	(²)
Drill-press operators, class A.....	28	.888	24	.899	4	(²)
Drill-press operators, class B.....	199	.821	181	.849	18	.544
Drill-press operators, class C.....	159	.729	154	.737	5	(²)
Drop-hammer operators, class A.....	71	1.107	62	1.148	9	(²)
Drop-hammer operators, class B.....	62	.870	50	.955	12	.515
Electricians.....	28	.983	27	.978	1	(²)
Elevator operators.....	28	.681	27	.690	1	(²)
Firemen, stationary boiler.....	65	.676	59	.698	6	(²)
Flask and pattern carriers.....	14	.774	14	.774	—	—
Foremen, working, class A.....	71	1.013	41	.935	30	1.120
Foremen, working, class B.....	80	.903	65	.920	15	.831
Foremen, working, class C.....	48	.810	38	.836	10	.713
Gear cutters, class B.....	3	(²)	3	(²)	—	—
Grinding-machine operators, class A.....	42	1.064	38	1.080	4	(²)
Grinding-machine operators, class B.....	184	.721	130	.724	4	(²)
Grinding-machine operators, class C.....	7	(²)	3	(²)	4	(²)
Hammersmiths.....	3	(²)	2	(²)	1	(²)
Heat treaters, class A.....	26	1.082	24	1.096	2	(²)
Heat treaters, class B.....	35	.978	32	1.010	3	(²)
Helpers, journeymen's.....	131	.633	102	.691	29	.427
Helpers, machine operators'.....	199	.625	168	.649	31	.492
Inspectors, class A.....	38	.937	37	.932	1	(²)
Inspectors, class B.....	82	.833	78	.840	4	(²)
Inspectors, class C.....	79	.791	74	.811	5	(²)
Janitors.....	123	.622	118	.635	5	(²)
Job setters.....	13	.924	13	.924	—	—

See footnotes at end of table.

TABLE 4.—Average Hourly Earnings on Daylight Shift in Selected Occupations in Agricultural-Machinery Plants, February–March 1942—Continued

Occupation and class	United States		Northern States		Southern States	
	Number of workers	Average hourly earnings ¹	Number of workers	Average hourly earnings ¹	Number of workers	Average hourly earnings ¹
Males—Continued.						
Laborers.....	519	\$0. 593	419	\$0. 641	100	\$0. 391
Laborers, foundry.....	176	. 693	173	. 696	3	(²)
Ladle liners.....	10	. 781	10	. 781	.....	.....
Lathe operators, engine, class A.....	48	. 926	48	. 926	.....	.....
Lathe operators, engine, class B.....	69	. 764	63	. 790	6	(²)
Lathe operators, engine, class C.....	4	(²)	4	(²)	.....	.....
Lathe operators, turret, class A.....	24	. 974	22	. 986	2	(²)
Lathe operators, turret, class B.....	92	. 899	88	. 916	4	(²)
Lathe operators, turret, class C.....	5	(²)	5	(²)	.....	.....
Lay-out men, class A.....	11	. 950	10	. 993	1	(²)
Lay-out men, class B.....	17	. 862	17	. 862	.....	.....
Learners, journeymen.....	13	. 585	13	. 585	.....	.....
Learners, machine operators and other.....	43	. 636	43	. 636	.....	.....
Machinists.....	84	. 919	82	. 917	2	(²)
Metal-saw operators.....	11	. 894	11	. 894	.....	.....
Milling-machine operators, class A.....	17	1. 027	17	1. 027	.....	.....
Milling-machine operators, class B.....	27	. 903	24	. 924	3	(²)
Millwrights.....	73	. 929	73	. 929	.....	.....
Molders, bench.....	147	. 883	91	. 962	56	. 755
Molders, floor.....	94	. 907	70	. 894	24	. 943
Molders' helpers.....	83	. 512	37	. 659	46	. 398
Molders, machine, class A.....	215	1. 067	206	1. 062	9	(²)
Molders, machine, class B.....	194	. 953	191	. 955	3	(²)
Packers.....	115	. 722	104	. 739	11	(²)
Painters, brush.....	55	. 741	55	. 741	.....	.....
Painters, dip.....	39	. 786	80	. 822	9	(²)
Painters, spray.....	62	. 838	57	. 846	5	(²)
Patternmakers, metal.....	72	. 992	67	1. 009	5	(²)
Patternmakers, wood.....	58	. 990	51	. 996	7	(²)
Pipe fitters.....	26	. 912	25	. 920	1	(²)
Planer operators.....	12	. 841	11	. 888	1	(²)
Power shear operators.....	119	. 907	107	. 937	12	(²)
Pourers, class B.....	15	1. 002	15	1. 002	.....	.....
Punch-press operators, class A.....	28	. 955	25	. 995	3	(²)
Punch-press operators, class B.....	279	. 842	266	. 853	13	. 628
Punch-press operators, class C.....	101	. 653	94	. 657	7	(²)
Repairmen, machine.....	33	. 858	33	. 858	.....	.....
Repairmen, product, class B.....	4	(²)	2	(²)	2	(²)
Repairmen, product, class C.....	3	(²)	3	(²)	.....	.....
Riveters, pneumatic.....	31	. 887	30	. 900	1	(²)
Sand mixers, hand.....	6	(²)	6	(²)	.....	.....
Sand mixers, machine.....	11	. 810	11	. 810	.....	.....
Sandblasters.....	7	(²)	6	(²)	1	(²)
Screw-machine operators, class A.....	12	1. 098	11	1. 116	1	(²)
Screw-machine operators, class B.....	3	(²)	2	(²)	1	(²)
Shake-out men.....	98	. 873	89	. 893	9	(²)
Shaper operators.....	12	. 898	12	. 898	.....	.....
Sheet-metal operators, class A.....	31	. 860	31	. 860	.....	.....
Sheet-metal operators, class B.....	56	. 760	56	. 760	.....	.....
Stock clerks.....	200	. 729	179	. 744	21	. 594
Straighteners.....	15	. 905	15	. 905	.....	.....
Testers, class B.....	5	(²)	5	(²)	.....	.....
Testers, class C.....	3	(²)	2	(²)	1	(²)
Thread-milling machine operators.....	19	. 858	19	. 858	.....	.....
Time clerks.....	87	. 635	77	. 644	10	(²)
Tool and die makers.....	138	1. 003	133	1. 006	5	(²)
Tool-grinder operators.....	12	. 873	12	. 873	.....	.....
Truckers, hand.....	208	. 664	200	. 676	8	(²)
Truckers, power, inside.....	71	. 789	65	. 801	6	(²)
Truck drivers.....	39	. 714	35	. 746	4	(²)
Tumbler operators.....	31	. 821	31	. 821	.....	.....
Upsetters.....	18	1. 036	18	1. 036	.....	.....
Watchmen.....	101	. 595	90	. 615	11	. 436
Welders, hand.....	141	1. 050	139	1. 055	2	(²)
Welders, machine.....	89	1. 018	82	1. 060	7	(²)
Woodworkers.....	139	. 725	101	. 813	38	. 490
Females:						
Assemblers, bench, class C.....	38	. 584	38	. 584	.....	.....
Packers.....	6	(²)	6	(²)	.....	.....
Coremakers, class B.....	20	(²)	20	(²)	.....	.....

¹ Averages are based on actual earnings exclusive of penalty overtime payments.

² Number of plants and/or workers too small to justify computation of an average; data on numbers of workers are included in such cases to provide additional information on occupational distribution.

The numbers of workers classified in the several occupational groups are too small to justify detailed comparisons on a regional basis. In certain occupations, however, there are sufficient data to emphasize the differences between northern and southern plants. Of the 7,981 workers in northern plants for whom earnings are shown, 12.8 percent are distributed among the 16 occupational groups which show averages above \$1 per hour; in the southern plants one group including only 30 workers, or 4.9 percent of the total for whom adequate data are available, received as much as \$1 per hour; all of these were class A working foremen, one of the two occupational groups for which the southern exceeded the northern average. It is unlikely, however, that this isolated case is significant. The majority of the large (and high-wage) plants are in the North. In many such plants, foremen are assigned exclusively to supervisory work and were, therefore, omitted from the survey by definition. In the South, where smaller plants predominate, the foreman frequently combines his supervisory duties with some sort of skilled work; such workers were included in the study. This comparison thus reflects differences in plant organization rather than wage-rate variation.

The higher rate earned by floor molders in the South appears to be the result of a difference in the division of labor between these workers and their helpers. It will be noted that the smaller southern plants show a much higher ratio of helpers to molders than do the northern plants; further, the helpers in the southern plants receive far lower rates than those current in the generally larger northern plants.

Only 2 occupational groups, including less than 1 percent of the workers in northern plants, earned less than 60 cents per hour on the average; 12 occupational categories, which included two-thirds of the total workers in the South for whom comparable data are available, showed earnings below 60 cents per hour.

Just as average earnings for plants tend to vary significantly in relation to the number of workers employed, it is apparent that occupational rates also reflect differences in size of plant. In order to compare occupational rates in large and small plants, it is obviously desirable to eliminate any regional wage differences as far as possible. The data shown in table 5 are, therefore, limited to the 28 plants in the East North Central region.

The numbers of workers in many of the occupational groups are insufficient to permit any reliable comparison of rates within this region. There are, however, 11 groups which are believed to be adequate for this purpose. In all of these occupations the average earnings of workers in plants with fewer than 100 wage earners are substantially lower than the rates in establishments with 100 or more workers. The differences range from 13 cents per hour for class A floor assemblers to 48 cents for class C bench assemblers. In all but 3 of the 11 occupational groups for which comparisons are possible, the differences amount to more than 25 cents per hour. For class A and class B bench assemblers, class B engine-lathe operators, and class B grinding-machine operators the differences in average rates per hour are not less than 30 cents. The differences are, in general, somewhat larger in occupational groups in which piece rates are common in the larger plants.

Even when the plants employing more than 1,000 workers are excluded, the same general tendency is apparent. In all but 1 of the

11 occupational groups, the average rates in plants employing between 100 and 1,000 workers are greater than in plants employing less than 100 workers. The margin of difference in average rates ranges from 1 cent for class B drill-press operators to 34 cents for class C bench assemblers.

Further evidence of the relationship between plant-size and occupational rates is demonstrated by the fact that the exclusion of plants employing over 1,000 workers lowered the average rates for the larger plants in each of the occupational groups compared.

TABLE 5.—Average Hourly Earnings of Agricultural-Machinery Workers in East North Central Region, by Occupation and Size of Plant, February–March 1942

Occupation and class	Plants employing—					
	100 or more workers				Less than 100 workers	
	Total		100 to 1,000 workers			
	Number of workers	Average hourly earnings ¹	Number of workers	Average hourly earnings ¹	Number of workers	Average hourly earnings ¹
Bench assemblers, class A	65	\$1.08	13	\$0.83	7	\$0.75
Bench assemblers, class B	263	.92	63	.70	33	.61
Bench assemblers, class C	395	.88	136	.74	16	.40
Floor assemblers, class A	22	.86	14	.81	11	.73
Drill-press operators, class B	144	.90	20	.63	21	.62
Engine-lathe operators, class B	32	.92	18	.70	13	.59
Grinding-machine operators, class B	79	.82	33	.63	24	.50
Laborers	323	.65	131	.48	15	.42
Packers	60	.78	35	.69	12	.52
Turret-lathe operators, class B	56	.96	17	.84	8	.69
Watchmen	45	.68	11	.54	18	.45

¹ Exclusive of extra payments for overtime work.

CHAPTER II

EARNINGS IN THE MANUFACTURE OF MINING MACHINERY AND EQUIPMENT, 1942

Summary

The establishments which constitute this small industry are largely concentrated in the four States of Illinois, Pennsylvania, Ohio, and West Virginia. Four of the 13 plants included in this survey were producing some war materials; during the first 2 months of 1942 a fifth or more of the sales of these companies were made under military or naval contracts.

Employment in the plants studied rose from 2,162 in August 1939 to 3,980 in February–March 1942. During the same period, average hourly earnings increased from 66.6 to 87.8 cents. The length of the workweek in this industry, which averaged 47 hours in February–March 1942, has a pronounced effect on average earnings because of the substantial amounts of penalty overtime payments involved. Elimination of these overtime payments is estimated to reduce the hourly rate for the 13 plants studied by more than 7 cents to an average of 80.6 cents in February–March 1942.

No pronounced regional differences in earnings levels are apparent from the data available, but there are marked variations in earnings between large and small plants. Occupational rates ranged from 52.7 cents per hour for general laborers to \$1.116 for class A working foremen.

Scope of Survey

According to the latest Census of Manufactures there were 65 plants engaged primarily in the manufacture of mining machinery and equipment; these plants as a group employed an average of 4,940 wage earners during 1939. Eleven of these 65 plants employed fewer than 6 workers each during 1939 and were excluded from this survey. The 13 establishments included in this study thus constitute slightly less than a fourth of those which employed 6 or more workers in 1939. This sample of plants was selected so far as possible to be representative of the industry as a whole with respect to location and corporate affiliation. Because of the small number of plants involved, it was not possible to stratify the sample rigidly on the basis of size of plant in terms of wage earners. An attempt was made, however, to secure representation among the larger and smaller establishments. The 2,162 workers employed in August 1939 by the plants surveyed constitute about 44 percent of the total for the industry as reported for that month by the Census of Manufactures. Most of the earnings data shown in this report are based on a representative pay-roll period during February or March 1942.

Characteristics of the Industry

Geographic distribution.—Approximately two-thirds of the workers employed during 1939 in plants producing mining machinery and equipment were concentrated in four States—Illinois, Ohio, Pennsylvania, and West Virginia. Small groups of plants were also reported for California, Colorado, Iowa, Missouri, and Washington, and a few were scattered elsewhere about the country. The geographic distribution of the plants and wage earners covered by this survey corresponds roughly to that shown by the Census. Only one southern plant is included, hence data for the South are not shown separately.

Type of product.—The establishments classified by the Census in the mining-machinery industry include those “primarily engaged in the manufacture of machinery and equipment for use in mining, including mine hoists, conveyors, ore-crushing and stamping-mill machinery; flotation and concentration machinery; screeners; mining cars and trucks; coal-sawing machinery; coal breakers, etc.”

As in the case of the agricultural-machinery industry, the conversion of these plants to war production is not as yet a major factor. It should be noted in this connection that manufacturing plants are likely to be affected in one of three general ways by the transition to a war economy. In the first place, continued or increased output of certain products, of which agricultural machinery and coal-mining equipment are typical, is essential to the war program and must be continued. Companies in these fields may be affected but little except for the possibility of increased production. In the industry under consideration this appears to have been the case in 9 of the 13 plants studied.

In the second place, there are numerous establishments which have been affected by the war principally through a change in customers. Plants manufacturing marine engines, power boilers, trucks, and many other products now supply the military and naval forces rather than civilian purchasers. The changes in technological processes, occupational patterns, and wage structure in such plants are usually minor and frequently negligible. Occupational distributions may be affected somewhat by changes occasioned by military or naval specifications relating to products; in addition, the wage structure is likely to be influenced at least temporarily by changes in the relative importance of certain types of jobs; the levels of earnings reflect the increased amounts of overtime and extra-shift operations. The 4 remaining mining-machinery plants included in this survey fall in this category; during the first 2 months of 1942 a fifth or more of the sales of these companies were made under military or naval contracts. Two of the 13 plants reported some sales of war materials during 1941.

Finally, there are plants in which all or a major part of the facilities are converted for the manufacture of war materials not formerly produced by the establishment. None of the 13 plants surveyed was in this category although slightly more than a third of the February sales of 1 plant involved new war activities.

The labor supply.—Estimates of the distribution of workers in this industry by skill class are based upon the 2,821 workers for whom earnings rates are tabulated. Of the 2,821 workers, approximately 39 percent were working at skilled occupations, 37 percent may be

classified as semiskilled, and 24 percent as unskilled. There is no evidence to indicate that inclusion of the remaining workers would greatly affect this estimated distribution.

Four of the 13 plants reported agreements with unions affiliated with the American Federation of Labor and a similar number with the Congress of Industrial Organizations. The remaining 5 plants were not operating on the basis of union agreements during the period of the survey, February–March 1942. Union agreements were, in general, more frequently found in the larger plants.

Women were not ordinarily employed by these companies as wage earners. Of the nearly 4,000 workers employed, only 20 (exclusive of central-office employees) were women, and they were working in 3 plants, principally as small-parts assemblers. Three plants employed a total of 146 Negroes who constituted 5, 6, and 11 percent, respectively, of the wage earners in these establishments. Their work was largely that of casting cleaners, shake-out men, cupola tenders, and janitors.

Method of wage payment.—Incentive methods of wage payment were in effect in only 3 of the 13 plants surveyed. These were, as might be expected, the larger establishments. Of the 2,821 wage earners for whom earnings rates were compiled, 825 were paid on the basis of an incentive system.

All 13 plants studied paid time and one-half for all work over 40 hours per week and 8 also paid this rate for any work above 8 hours per day. One plant paid this rate for any work on Saturday afternoon and 3 more applied it to all work on Sundays and holidays. One plant paid double time for Sunday and holiday work.

Only 2 of the plants surveyed made any provision for shift differentials. One of these paid an additional 5 percent for night work, and the other added 5 cents to the hourly rate for employees other than those whose work was done regularly during the night shift. Detailed data on shift operations were not compiled in connection with this survey, but it appears that the volume of evening- and night-shift employment was not large.

Employment, Hours, and Hourly Earnings, 1939–42

Employment in the 13 plants included in this survey increased by nearly 85 percent between August 1939 and February–March 1942, when a total of 3,980 wage earners were employed. The transition to war production, which was in process in 4 of the plants surveyed, seems not to have had any marked effect on employment except in 1 establishment, which more than doubled its workers between August 1941 and March 1942. Changes in the other 3 plants were negligible, although 2 of them showed very small decreases.

Average hourly earnings rose from 66.6 cents in August 1939 to 87.8 cents during the period of the present survey (table 6). Each of the intervals for which data were compiled show increases except the period April–August 1940.

Weekly hours in these mining-machinery plants appear to have been relatively long since early in 1940. Hours in the plants as a group amounted to 44.6 per week as far back as August 1940, and had climbed almost to 50 a year later. The 4 plants producing some war materials have maintained a somewhat longer workweek than have the

other 9 plants surveyed. These 4 plants, as a group, showed an average of 53.0 hours per week during August 1941 and of 51.4 hours in February and March 1942.

TABLE 6.—*Employment, Average Hourly Earnings, and Average Weekly Hours of Workers in 13 Mining-Machinery Plants for Selected Periods, 1939-42*

Year and month	Total workers	Average workers per plant	Average hourly earnings	Estimated average hourly earnings, exclusive of extra overtime earnings	Average weekly hours
August 1939.....	2,162	166	\$0.666	\$0.656	37.5
April 1940.....	2,426	187	.670	.643	41.9
August 1940.....	2,661	205	.663	.621	44.6
February 1941.....	2,871	221	.683	.631	46.2
August 1941.....	3,559	274	.752	.677	49.5
February and March 1942.....	3,980	306	.873	.806	47.0

The comparatively long workweek among these plants is, of course, reflected in the extent to which average hourly earnings rates are inflated by penalty overtime payments. It is estimated on the basis of data from previous studies that the elimination of such payments would reduce the August 1941 average by about 7.5 cents; during the period of the present survey, estimated net average hourly earnings amounted to 80.6 cents as compared with 87.8 cents when penalty overtime payments are included (table 6).

Hourly Earnings and Weekly Hours, February-March 1942

PLANT AVERAGES

Approximately half (6) of the plants surveyed showed current average hourly earnings (including penalty overtime) between 70 and 90 cents. In only 1 establishment did the workers earn an average of less than 50 cents per hour. In 3 plants the averages were between 90 cents and \$1.00 per hour, and all 3 employed more than 50 workers. None of the plants with 50 workers or less showed average earnings above 80 cents per hour.

The 132 workers employed in plants with fewer than 50 employees earned an average of 69.9 cents per hour, but the greater part of the wage earners, who were employed in the 9 larger establishments, averaged 88.4 cents per hour.

The data on earnings reveal no clear-cut regional differences. As is indicated above, the majority of the plants are in Illinois, Ohio, Pennsylvania, and West Virginia, but the variations in earnings between individual plants are sufficient to overshadow any State or regional differences.

OCCUPATIONAL DIFFERENCES IN AVERAGE HOURLY EARNINGS

Fifteen of the occupational groups for which detailed data were collected showed average earnings above \$1.00 per hour. These groups included 522 workers or about 19 percent of the total for whom rates were compiled. The 34 class A working foremen, whose earnings averaged \$1.116 per hour, constituted the highest paid group. Except for these supervisory employees, tool and die makers received the

highest rate (\$1.087); the earnings of class A turret-lathe operators (\$1.075) were about a cent lower. The earnings data presented in table 7 exclude penalty overtime payments.

TABLE 7.—Average Hourly Earnings of Day-Shift Workers in Selected Occupations in Mining-Machinery Plants, February–March 1942

Occupation and class	Number of workers	Average hourly earnings	Occupation and class	Number of workers	Average hourly earnings
<i>Males</i>			<i>Males—Continued</i>		
Acetylene-burner operators.....	30	\$0.857	Lay-out men.....	32	\$0.995
Apprentices, first year.....	32	.419	Learners.....	50	.606
Apprentices, second year.....	13	.486	Machinists.....	39	.912
Apprentices, third year.....	8	.544	Metal-saw operators.....	13	.945
Apprentices, fourth year.....	4	(¹)	Milling-machine operators, class A.....	18	(¹)
Assemblers, bench, class A.....	85	1.049	Milling-machine operators, class B.....	21	.807
Assemblers, bench, class B.....	61	.872	Millwrights.....	48	1.017
Assemblers, bench, class C.....	49	.728	Molders, bench.....	22	1.011
Assemblers, floor, class A.....	55	1.057	Molders, floor.....	96	.932
Assemblers, floor, class B.....	43	.776	Molders' helpers.....	54	.664
Assemblers, floor, class C.....	53	.543	Molders, machine, class A.....	10	.983
Blacksmiths.....	25	.925	Molders, machine, class B.....	4	(¹)
Boring-mill operators, class A.....	29	1.006	Packers.....	5	(¹)
Boring-mill operators, class B.....	16	.605	Painters, brush.....	3	(¹)
Boring-mill operators, class C.....	1	(¹)	Painters, dip.....	1	(¹)
Broaching-machine operators.....	9	.976	Painters, spray.....	10	.752
Bulldozer operators.....	10	.638	Patternmakers, wood.....	37	1.045
Burrers, class C.....	3	(¹)	Pipe fitters.....	3	(¹)
Carpenters, class A.....	5	.858	Planer operators.....	22	.911
Carpenters, class C.....	8	.620	Power shear operators.....	17	.821
Carpenters, flask.....	4	.790	Punch-press operators, class A.....	1	(¹)
Casting cleaners.....	29	.676	Punch-press operators, class B.....	29	.919
Chippers, class B.....	5	.645	Punch-press operators, class C.....	9	.718
Chippers, class C.....	15	.586	Repairmen, machine.....	16	.770
Coremakers.....	44	.897	Repairmen, product, class A.....	2	(¹)
Core pasters.....	3	(¹)	Repairmen, product, class B.....	2	(¹)
Coremakers' helpers.....	10	.636	Riveters, pneumatic.....	33	.787
Crane followers.....	5	(¹)	Sandblasters.....	4	(¹)
Crane operators.....	30	.737	Sand mixers, hand.....	3	(¹)
Cupola tenders.....	16	.747	Sand mixers, machine.....	4	(¹)
Cupola tenders' helpers.....	9	.624	Screw-machine operators, class A.....	1	(¹)
Drill-press operators, class A.....	37	.994	Screw-machine operators, class B.....	1	(¹)
Drill-press operators, class B.....	32	.778	Screw-machine operators, class C.....	1	(¹)
Drill-press operators, class C.....	11	.581	Shake-out men.....	34	.672
Drop-hammer operators, class A.....	20	(¹)	Shaper operators.....	9	.927
Drop-hammer operators, class B.....	8	(¹)	Sheet-metal workers, class A.....	14	.919
Electricians.....	34	.861	Sheet-metal workers, class B.....	3	(¹)
Elevator operators.....	1	(¹)	Stock clerks.....	148	.719
Firemen, stationary boiler.....	15	.706	Straighteners.....	6	.896
Flask and pattern carriers.....	3	.630	Testers, class B.....	3	(¹)
Foremen, working, class A.....	34	1.116	Testers, class C.....	1	(¹)
Foremen, working, class B.....	14	.822	Thread-milling-machine operators.....	5	.849
Foremen, working, class C.....	4	(¹)	Time clerks.....	3	(¹)
Gear cutters, class A.....	7	1.037	Tool and die makers.....	41	1.087
Gear cutters, class B.....	11	.776	Tool-grinder operators.....	3	(¹)
Gear finishers.....	5	.941	Truck drivers.....	20	.711
Grinding-machine operators, class A.....	18	1.015	Truckers, hand.....	16	.684
Grinding-machine operators, class B.....	28	.730	Truckers, power, inside.....	20	(¹)
Hammersmiths.....	1	(¹)	Tumbler operators.....	2	(¹)
Heat treaters, class A.....	19	.888	Upsetters.....	2	(¹)
Heat treaters, class B.....	11	(¹)	Watchmen.....	36	.623
Helpers, journeymen's.....	125	.677	Welders, hand, class A.....	43	.995
Helpers, machine operators'.....	67	.528	Welders, hand, class B.....	25	.764
Inspectors, class A.....	30	1.032	Welders, machine, class A.....	24	.997
Inspectors, class B.....	35	.806	Welders, machine, class B.....	42	.845
Inspectors, class C.....	38	.699	Winders, class A.....	12	(¹)
Janitors.....	47	.644	Winders, class B.....	4	(¹)
Job setters.....	1	(¹)	Woodworkers.....	24	.785
Laborers.....	118	.527			
Laborers, foundry.....	64	.562			
Ladle liners.....	3	.703			
Lathe operators, engine, class A.....	57	1.023			
Lathe operators, engine, class B.....	30	.756			
Lathe operators, turret, class A.....	27	1.075			
Lathe operators, turret, class B.....	7	.762			
Lathe operators, turret, class C.....	2	(¹)			
			<i>Females</i>		
			Assemblers, bench, class B.....	10	.426
			Assemblers, bench, class C.....	1	(¹)
			Janitresses.....	3	(¹)
			Power shear operators.....	1	(²)
			Stock clerks.....	2	(¹)

¹ Number of plants and/or workers too small to justify computation of an average; data on numbers of workers are included in such cases to provide additional information on occupational distribution.

With the exception of apprentices, only six occupational groups made up of male workers showed average hourly earnings below 60 cents. The laborers, general and foundry, were numerically the most important of the lower-paid groups; their hourly averages were 52.7 and 56.2 cents, respectively. As indicated above, no regional analysis of these data is practicable, and the number of plants is too small to justify an analysis of the effect of size of plant on occupational rates.

The separate rates shown for different classes of workers within an occupational group are based upon an attempt in each case to determine the nature of the workers' duties in terms of the degree and type of skill required and the amount of responsibility attached to the jobs. Although earnings rates are naturally correlated with these grade classifications, these rates have not been used as the principal basis for determining the classification. The criteria for judging skill classes have been applied uniformly among the various plants studied, as far as it is possible to do so. A turret-lathe operator, for example, was reported as a class B worker if his current job conformed to the general criteria established for this class; the fact that one such operator in a high-wage plant might receive 15 cents per hour more than an employee doing a similar grade of work in a lower-wage plant was not taken into consideration.

The number of women employed in these plants was too small to warrant the presentation of earnings averages for more than the one occupational group—bench assemblers, class B. These averaged 42.6 cents. The remaining 7 women were employed as janitresses, stock clerks, and 1 power-shear operator; as a group they received an average of 71.8 cents per hour.

CHAPTER III

EARNINGS IN THE MANUFACTURE OF TEXTILE MACHINERY, 1942

Summary

Current production in virtually all of the 47 textile-machinery plants included in this survey showed marked increases in February–March 1942 over 1939–41 levels, and a fourth or more of the sales of 22 of the plants during the month in which they were studied (February or March 1942) consisted of direct or indirect war materials. Among the products manufactured, in addition to textile machinery, were special tools and machines for ordnance plants, shells, marine-engine parts, aircraft parts, and tank equipment.

Pay-roll data from the 47 plants showed a total employment of 8,447 wage earners—a 40-percent increase since August 1939. Average hourly earnings, including penalty overtime, amounted to 74.3 cents during the period February–March 1942; the typical workweek was 49.5 hours. The industry is largely concentrated on the Atlantic seaboard. Earnings in the Middle Atlantic States averaged 13 cents above the level for the New England area and more than 30 cents above the figure for the South.

Less than 3 percent of the 7,073 workers for whom detailed earnings data were compiled were classified in the only two occupations which showed average hourly earnings above \$1.00 (floor molders and class A bench assemblers). More than 1,200 male workers were classified in occupations which showed averages below 60 cents per hour.

Scope of Survey

According to the latest Census of Manufactures there were 300 plants engaged primarily in the manufacture of textile machinery in 1939; as a group these plants employed an average of 21,904 wage earners. Of the total of 300 establishments, 81 employed 5 workers or fewer and were excluded from this survey. The 47 establishments covered by this study thus constitute slightly more than a fifth (21 percent) of the industry's 1939 total of plants employing more than 5 workers each. The plants studied were selected so far as possible to be representative of the industry as a whole with respect to location, size in terms of wage earners, and corporate affiliation. In August 1939, the 47 plants surveyed employed a total of 5,997 wage earners, or slightly more than a fourth of the industry total at that time as reported by the Census of Manufactures.¹

The textile-machinery industry is confined largely to the Atlantic Seaboard States. Of the plants studied, 20 are located in the 3 States of Pennsylvania, New York, and New Jersey, another 20 are in New

¹ In combining the data for the individual plants, the statistics for 1 large company were used with reduced weight in order to avoid overrepresentation of large plants. The total employment of the plants studied was actually about 7,300 in August 1939.

England, and 6 are located in the South. The 1 remaining establishment is in Illinois. This distribution of plants does not, in general, differ greatly from that shown by the Census of Manufactures; the geographic distribution of the wage earners studied is somewhat more representative than that of the establishments because of the preponderance of small establishments in certain areas, notably the South.

Characteristics of the Industry

Slightly less than a third of the workers studied were employed by the 21 plants located in the Middle Atlantic States² and nearly three-fifths were working in New England establishments, while the 6 southern plants accounted for little more than 7 percent of the total.

The plants classified by the Census in the textile-machinery industry include those "engaged wholly or chiefly in the manufacture of machinery for use in the textile industries." The role of the various companies in this industry in the war program has assumed substantial proportions, but its nature varies considerably. Sales made by virtually all plants during the early months of 1942 indicate marked increases over the 1939-41 levels, and a fourth or more of the sales of 22 of the plants during the month in which they were studied consisted of materials for direct or indirect war use. Fourteen of these companies reported at least 75 percent of their current sales in this category, and 5 of these same firms classified their entire output as directly connected with the war effort.

It should be noted in this connection that in this industry, as well as in many others, certain of the peacetime products of manufacturing plants can be classified as war materials without implying that there has been any drastic change in the nature of the product itself. Certain types of textile machinery, such as those used for manufacturing parachute and uniform cloth, are in this category because of their importance in various phases of the war program. Nevertheless, most of the 22 companies referred to above are manufacturing actual war materials as well as textile machinery. Among the products manufactured are special tools and machines for ordnance plants, shells, marine-engine parts, aircraft parts, and tank equipment. It is clear that drastic technological shifts were made in at least 3 plants and important, though perhaps less marked, changes were necessary in other cases.

The textile industry was involved in the defense program somewhat earlier than were some of the other machinery branches. Either by diversion of their regular product or by the manufacture of actual war supplies, 23 of the 47 plants surveyed reported sales of defense or war materials during 1941 and 5 as early as 1940. Nine plants classified half or more of their 1941 sales as defense or war materials.

THE LABOR FORCE

Almost a third (30.5 percent) of the 7,073 employees for whom detailed earnings data were collected were classified as skilled. Semiskilled workers made up 45.1 percent of the total, with the remaining 24.4 percent classified as unskilled. The wage earners for whom skill classification was ascertained constitute nearly 85 percent

² Including the 1 plant located in Illinois.

of the total employees in the plants studied. It is unlikely that inclusion of the remaining workers would greatly affect this estimated skill distribution.

White males constituted more than 95 percent of the labor force in the plants surveyed. Sixteen plants reported a total of 376 women employed principally as inspectors, assemblers, or operators of light machines. The proportion of women employed was highest in the South, where women comprised 9 percent of all employees in the 6 plants studied; all of them, however, were working in 3 plants. A total of 286 women were employed in 8 of the 20 New England plants and constituted about 4.5 percent of the labor force in that region. Less than 1 percent of the employees in the plants located in the Middle Atlantic States were women and all were employed by 5 of the 21 plants studied.

About 5 percent of the workers in the 6 southern plants were Negroes, and all but 1 plant reported Negro workers. Less than 1 percent of the workers in northern plants were Negroes and all were concentrated in 3 of the 41 plants. The principal occupations of Negro workers were laborers, janitors, molders' helpers, and a few miscellaneous semiskilled jobs.

Three of the 47 plants studied were operating under agreements with nationally affiliated unions, and all of these are in the New England area. In addition, there were employee-representation plans in effect in 3 other plants. Two of the 3 union plants and all 3 plants with employee-representation plans employed 100 workers or more.

Because of the technological similarity between the manufacture of textile machinery and of many of the direct war materials (e. g., special ordnance-manufacturing machinery) produced by these companies, such changes in processes and division of labor as may have occurred seem not to have affected the occupational structure to any marked degree.

METHOD OF WAGE PAYMENT

Over three-fifths (63 percent) of the 7,073 workers for whom detailed earnings data were compiled were paid on a straight-time basis. The remaining 37 percent were paid on the basis of piece work or production-bonus systems.

Incentive methods of wage payment were, however, in effect in only 13 of the 47 establishments studied. Nine of the 13 plants were in the New England area and the remaining 4 were located in the Middle Atlantic States. All of the larger plants (those employing 250 or more workers) used some form of incentive method of wage payment, and nearly 50 percent of the employees in these plants were paid on the basis of a piece or bonus system. At the other extreme, only 2 percent of the workers in plants employing 50 or fewer workers were paid incentive rates, and they were distributed among 3 of the 23 plants in this category. In the 13 plants using incentive systems of wage payment, 37 percent of the workers were paid on this basis.

All of the 47 establishments scheduled in this survey paid time and one-half for work above 40 hours per week and 14 applied this penalty rate to any work above 8 hours per day. Five plants paid double time for all Sunday work.

Twenty-eight of the plants studied were operating but 1 shift; 13 reported 2 shifts and 6 were working 3 shifts. Five of the 2-shift

plants paid no premium: for evening work, 1 paid an additional 2.5 cents per hour and granted a half-hour lunch period at full pay, 1 paid an additional 3 cents per hour, and in 3 the premium was 5 cents per hour. In the remaining 3 plants, 10 percent was added to the base rates of evening-shift workers.

One of the 6 plants operating 3 shifts paid no premium for work on either late shift. Another paid no differential for evening work but added 10 percent to the base rates for night-shift workers. In 2 more cases the premiums for evening and night work were the same—the premium was 5 cents per hour in 1 case and 10 cents in the other. The 2 remaining plants in this group paid an extra 10 percent to workers on both late shifts, but employees on the third shift in 1 of these plants also received a 25-minute lunch period on company time.

Employment, Hours, and Hourly Earnings, 1939-42

TREND FROM 1939 TO 1942

The effect of the war is apparent in the increase of more than 40 percent in employment in the plants studied between August 1939 and February-March 1942. During the same period, the average number of workers per plant rose from 156 to 205 (table 8).

TABLE 8.—*Employment, Average Hourly Earnings, and Average Weekly Hours of Workers in 47 Textile-Machinery Plants in Selected Periods, 1939-42*

Year and month	Total wage earners ¹	Average wage earners per plant	Average hourly earnings ²	Estimated average hourly earnings exclusive of extra overtime earnings	Average weekly hours
August 1939.....	5,997	156	\$0.621	\$0.607	39.0
April 1940.....	6,729	167	.601	.583	40.3
August 1940.....	5,909	148	.615	.598	40.0
February 1941.....	7,036	175	.642	.596	45.6
August 1941.....	8,111	200	.687	.640	45.2
February-March 1942 ³	8,447	205	.743	.669	49.5

¹ Data for 1 large plant weighted in order properly to stratify the sample.

² Averages for earlier periods exclude data on a few small plants for which the information was not available; the effect of these omissions is negligible.

³ Data for 1 plant based on a pay-roll period in April.

Average hourly earnings for all workers employed in these plants rose from 62.1 cents per hour in August 1939 to 74.3 cents during the period of this survey.³

The workweek in the textile-machinery industry has been relatively long throughout the period covered by these data. Even the weekly average of 39.0 hours shown for August 1939 includes overtime for some workers, and it is estimated that exclusion of penalty payments for such work would reduce the average hourly earnings rate by 1.4 cents to 60.7 cents per hour. The average workweek of almost 50 hours for the latest period involves relatively large amounts of penalty

³ These averages are somewhat lower than those shown in the Bureau's monthly trend series as a result of minor differences in the characteristics and distribution of the plants included in the samples upon which the two averages are based. The trend of earnings as indicated in table 8, however, corresponds closely to that shown in the monthly reports.

overtime earnings. Deduction of such amounts is estimated to result in a net hourly earnings rate of 66.9 cents as compared with the 74.3-cent gross rate.

REGIONAL DIFFERENCES

The 2,775 workers in plants located in the Middle Atlantic States received an average of 84.4 cents per hour (including penalty overtime payments) during the period February–March 1942. This figure is 13 cents above the corresponding average for the 5,048 New England workers despite the fact that the New England plants are nearly 50 percent larger on the average. This regional comparison is not affected materially by the amounts of penalty overtime earnings involved. The 624 workers in the southern plants, which were scarcely half the average size of the entire group of plants studied, earned an average of 53.8 cents per hour (table 9). The difference in earnings levels between North and South is exaggerated somewhat by differences in the length of the workweeks among plants in the two regions. Weekly hours in southern plants were about 6 below the corresponding figure for northern plants. This regional difference appears also to be inflated by some variations in the types of product. The manufacture of complete machinery is more important in the North, while many of the southern establishments are engaged principally in making parts only. Nevertheless, the North-South differential in this industry is believed to be substantial.

TABLE 9.—*Distribution of Textile-Machinery Plants by Plant Average Hourly Earnings and Region, February–March 1942*

Plant average hourly earnings	All States	Middle Atlantic States ¹	New England States	Southern States ²
40.0 and under 50.0 cents	4	1	—	3
50.0 and under 60.0 cents	10	3	7	—
60.0 and under 70.0 cents	8	2	3	3
70.0 and under 80.0 cents	11	5	6	—
80.0 and under 90.0 cents	10	6	4	—
90.0 cents and over	4	4	—	—
Total	47	21	20	6
Number of workers	8,447	2,775	5,048	624
Average number of workers per plant	205	188	252	104
Average hourly earnings	\$0.743	\$0.844	\$0.714	\$0.538

¹ Includes 1 plant in Illinois.

² North Carolina, South Carolina, and Kentucky.

Plant average hourly earnings in 14 of the establishments surveyed amounted to 80 cents or more per hour. Ten of these plants are located in the Middle Atlantic area and 4 in New England; none was in the South. All 4 of the plants which showed average earnings of 90 cents an hour and above were in the Middle Atlantic region. Conversely, 3 of the 4 plants with average hourly earnings below 50 cents were in the South, and no southern plant showed an average as high as 70 cents per hour.

EARNINGS AND SIZE OF PLANT

The data on this industry are not conclusive with respect to the relationship between size of plant and earnings levels. The regional differentials, as well as marked differences in the length of the workweeks among the several plants, are so large as to obscure any existing variations in earnings levels on the basis of size of plant.

EARNINGS AND WAR PRODUCTION

Earnings seem not to have been greatly affected by the shift to war production in these textile-machinery plants. Those that were classified as selling 25 percent or more of defense or war materials showed no significant difference in wages in comparison with the others studied. Average earnings in establishments producing substantial amounts of war materials were somewhat higher in the Middle Atlantic region, but the difference is no greater than that which would result from the larger amounts of penalty overtime earnings occasioned by the comparatively longer workweek in these plants.

OCCUPATIONAL DIFFERENCES IN AVERAGE HOURLY EARNINGS

Less than 3 percent of the 7,073 workers for whom detailed earnings data were compiled were classified in the 2 occupational groups which showed average earnings above \$1.00 per hour. These occupations were floor molders who averaged \$1.053 and class A bench assemblers at \$1.131.

In addition to the 542 apprentices and learners, 20 occupational groups, in which over 1,200 male workers were classified, showed average earnings below 60 cents per hour. Most important numerically were the 212 laborers with an average of 56.2 cents, 153 class C drill-press operators at 55.7 cents, and 117 watchmen at 54.2 cents. The lowest paid occupational group were the 22 molders' helpers whose average hourly earnings were 46.8 cents.

The numbers of workers classified in the various occupational groups are insufficient in most cases to warrant regional comparisons. The southern rates are below the northern levels in virtually every case, although the amount of the differences vary considerably. The southern rate for class B bench assemblers, for example, is more than 24 cents below that in northern plants. On the other hand, the regional differences in the case of tool makers and stock clerks amount to 1 cent or less per hour, and for one group—the all-around machine operators—the rates were identical. In both cases, however, the numbers of workers are so small that the comparisons cannot be regarded as highly significant (table 10).

It is not possible to present detailed information on the earnings of women because their numbers are comparatively small. Of the few women for whom averages can be computed, the class B bench assemblers are the highest paid, with an average of 72.7 cents per hour. At the other extreme, the 11 class C punch-press operators earned an average of 41.1 cents per hour; the only lower rate was that for the 25 learners (40.7 cents).

TABLE 10.—Average Hourly Earnings of Day-Shift Workers in Selected Occupations in Textile-Machinery Plants, February-March 1942

Occupation and class	United States		North		South	
	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings
<i>Males</i>						
Apprentices.....	203	\$0.440	203	\$0.440		
Assemblers, bench, class A.....	158	1.131	148	1.157	10	\$0.735
Assemblers, bench, class B.....	149	.733	129	.766	20	.520
Assemblers, bench, class C.....	221	.682	216	.687	5	.472
Assemblers, floor, class A.....	127	.924	127	.924		
Assemblers, floor, class B.....	100	.772	99	.773	1	(¹)
Assemblers, floor, class C.....	65	.669	65	.669		
Balancing-machine operators.....	4	(¹)	4	(¹)		
Blacksmiths.....	24	.796	24	.796		
Boring-mill operators, class A.....	24	.936	41	.942	1	(¹)
Boring-mill operators, class B.....	32	.657	32	.657		
Boring-mill operators, class C.....	4	(¹)	4	(¹)		
Broaching-machine operators.....	12	.718	12	.718		
Buffers.....	88	.642	85	.643	3	(¹)
Bulldozer operators.....	2	(¹)	2	(¹)		
Burrers, class B.....	32	.581	32	.581		
Burrers, class C.....	47	.469	47	.469		
Carpenters, class A.....	19	.853	19	.853		
Carpenters, class B.....	30	.735	28	.737	2	(¹)
Carpenters, class C.....	56	.615	56	.615		
Carpenters, flask.....	5	.813	5	.813		
Casting cleaners.....	149	.602	141	.617	8	(¹)
Chippers, class B.....	16	.600	16	.600		
Chippers, class C.....	30	.523	30	.523		
Coremakers.....	24	.902	23	.905	1	(¹)
Coremakers' helpers.....	8	.576	8	.576		
Core pasters.....	7	(¹)	7	(¹)		
Crane followers.....	1	(¹)	1	(¹)		
Crane operators.....	14	.678	14	.678		
Craters.....	7	.665	7	.665		
Cupola tenders.....	6	.648	6	.648		
Cupola tenders' helpers.....	6	.625	6	.625		
Die setters.....	6	.709	6	.709		
Drill-press operators, class A.....	92	.793	91	.794	1	(¹)
Drill-press operators, class B.....	62	.691	60	.694	2	(¹)
Drill-press operators, class C.....	153	.557	141	.571	12	.393
Drop-hammer operators.....	3	(¹)	3	(¹)		
Electricians.....	31	.809	31	.809		
Elevator operators.....	10	.553	10	.553		
Firemen, stationary boiler.....	9	.610	8	.649	1	(¹)
Flask and pattern carriers.....	1	(¹)	1	(¹)		
Foremen, working, class A.....	116	.990	109	1.001	7	.829
Foremen, working, class B.....	76	.863	71	.869	5	.786
Foremen, working, class C.....	42	.717	38	.719	4	(¹)
Gear cutters, class A.....	10	.974	9	.983	1	(¹)
Gear cutters, class B.....	27	.602	26	.606	1	(¹)
Gear cutters, class C.....	1	(¹)	1	(¹)		
Gear finishers.....	14	(¹)	14	(¹)		
Grinding-machine operators, class A.....	66	.861	62	.872	4	(¹)
Grinding-machine operators, class B.....	93	.627	79	.654	14	.474
Grinding-machine operators, class C.....	3	(¹)	3	(¹)		
Heat treaters, class A.....	8	.863	8	.863		
Heat treaters, class B.....	17	.682	13	.724	4	.518
Helpers, journeymen's.....	101	.534	97	.538	4	.445
Helpers, machine operators'.....	106	.547	96	.565	10	.379
Inspectors, class A.....	45	.821	44	.825	1	(¹)
Inspectors, class B.....	53	.716	51	.725	2	(¹)
Inspectors, class C.....	37	.523	33	.534	4	(¹)
Janitors.....	96	.566	92	.572	4	(¹)
Job setters.....	56	.762	56	.762		
Laborers.....	212	.562	201	.573	11	.357
Laborers, foundry.....	8	(¹)	8	(¹)		
Ladle liners.....	19	.617	19	.617		
Lathe operators, engine class A.....	142	.888	139	.892	3	(¹)
Lathe operators, engine, class B.....	167	.677	161	.681	6	.580
Lathe operators, engine, class C.....	49	.626	45	.641	4	(¹)
Lathe operators, turret, class A.....	91	.900	87	.905	4	(¹)
Lathe operators, turret, class B.....	128	.635	118	.641	10	.555
Lathe operators, turret, class C.....	12	.682	12	.682		
Lay-out men.....	10	.841	10	.841		
Learners, journeymen.....	76	.480	76	.480		
Learners, machine operators and other.....	263	.444	243	.449	20	.395

See footnote at end of table.

TABLE 10.—Average Hourly Earnings of Day-Shift Workers in Selected Occupations in Textile-Machinery Plants, February–March 1942—Continued

Occupation and class	United States		North		South	
	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings
<i>Males—Continued</i>						
Machine operators, all-around	36	\$0.763	14	\$0.763	22	\$0.763
Machinists	130	.907	117	.915	13	.838
Metal-saw operators	18	.741	18	.741		
Milling-machine operators, class A	75	.883	73	.889	2	(1)
Milling-machine operators, class B	192	.688	191	.690	1	(1)
Milling-machine operators, class C	5	.666	5	.666		
Millwrights	45	.777	39	.785	6	.728
Molders, bench	56	.871	56	.871		
Molders, floor	50	1.053	41	1.094	9	(1)
Molders' helpers	22	.468	12	.556	10	(1)
Molders, machine, class A	9	(1)	9	(1)		
Molders, machine, class B	70	.887	70	.887		
Packers	35	.667	33	.682	2	(1)
Painters, brush	76	.626	75	.627	1	(1)
Painters, dip	33	.590	33	.590		
Painters, spray	30	.698	30	.698		
Patternmakers, metal	34	.795	34	.795		
Patternmakers, wood	34	.910	33	.907	1	(1)
Pipe fitters	29	.766	29	.766		
Planer operators	50	.918	50	.918		
Platers	3	(1)	3	(1)		
Pourers	92	(1)	92	(1)		
Power-shear operators	7	.746	7	.746		
Punch-press operators, class A	5	(1)	5	(1)		
Punch-press operators, class B	60	.613	57	.621	3	(1)
Punch-press operators, class C	29	.505	29	.505		
Repairmen, machine tool	83	.752	82	.753	1	(1)
Repairmen, product, class A	13	.827	13	.827		
Repairmen, product, class B	7	.707	6	(1)	1	(1)
Repairmen, product, class C	10	.539	10	.539		
Sandblasters	8	.808	8	.808		
Sand mixers, hand	18	(1)	18	(1)		
Sand mixers, machine	4	(1)	4	(1)		
Screw-machine operators, class A	18	.855	16	.886	2	(1)
Screw-machine operators, class B	23	.674	22	.680	1	(1)
Screw-machine operators, class C	35	.596	34	.603	1	(1)
Shake-out men	7	(1)	7	(1)		
Shaper operators	10	.905	10	.905		
Sheet-metal workers, class A	40	.922	40	.922		
Sheet-metal workers, class B	43	.747	43	.747		
Solderers, class B	2	(1)	1	(1)	1	(1)
Stock clerks	251	.602	241	.603	10	.593
Straighteners	48	.796	48	.796		
Testers, class A	3	(1)	1	(1)	2	(1)
Testers, class B	2	(1)	2	(1)		
Testers, class C	4	(1)	4	(1)		
Thread-milling machine operators	10	.721	10	.721		
Time clerks	91	.566	90	.567	1	(1)
Tool and die makers	124	.987	118	.987	6	.983
Tool-grinder operators	48	.695	48	.695		
Truck drivers	47	.619	44	.633	3	(1)
Truckers, hand	86	.541	86	.541		
Truckers, power, inside	11	.639	11	.639		
Tumbler operators	18	.541	18	.541		
Watchmen	117	.542	108	.552	9	.419
Welders, hand, class A	35	.943	35	.943		
Welders, hand, class B	19	.651	19	.651		
Welders, machine	12	.750	12	.750		
Woodworkers	93	.634	63	.736	30	(1)
<i>Females</i>						
Assemblers, bench, class A	5	(1)			5	(1)
Assemblers, bench, class B	7	.727	5	(1)	2	(1)
Assemblers, bench, class C	60	.428	57	.427	3	(1)
Buffers	5	.512	5	.512		
Burrers, class C	29	(1)	29	(1)		
Coremakers, class B	7	(1)	7	(1)		
Drill-press operators	18	(1)	18	(1)		
Gear cutters	3	(1)	3	(1)		
Gear finishers	4	(1)	4	(1)		

See footnote at end of table.

TABLE 10.—Average Hourly Earnings of Day-Shift Workers in Selected Occupations in Textile-Machinery Plants, February-March 1942—Continued

Occupation and class	United States		North		South	
	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings
<i>Females—Continued</i>						
Grinding-machine operators, class B	3	(1)	3	(1)		
Inspectors, class B	12	\$0.717	10	\$0.740	2	(1)
Inspectors, class C	28	.456	16	.520	12	\$0.370
Janitresses	2	(1)	2	(1)		
Lathe operators, engine, class C	2	(1)	2	(1)		
Learners	25	.407	23	.412	2	(1)
Milling-machine operators, class B	16	(1)	16	(1)		
Packers	9	.496	9	.496		
Painters, brush	10	.437	10	.437		
Punch-press operators, class B	8	(1)			8	(1)
Punch-press operators, class C	11	.411	9	.413	2	(1)
Screw-machine operators, class C	1	(1)	1	(1)		
Solderers, class C	11	(1)	11	(1)		
Stock clerks	16	(1)	16	(1)		
Straighteners	1	(1)	1	(1)		
Thread-milling machine operators	1	(1)	1	(1)		
Time clerks	13	(1)	13	(1)		
Tool grinder operators	2	(1)	2	(1)		

¹ Number of plants and/or workers too small to justify computation of an average; data on numbers of workers are included in such cases to provide additional information on occupational distribution.

NOTE.—Averages are based on actual earnings exclusive of penalty overtime payments.

CHAPTER IV

EARNINGS IN THE MANUFACTURE OF CONSTRUCTION MACHINERY, 1942

Summary

The 41 plants included in this survey, which constitute about one-fourth of the total in the construction-machinery industry, reflect the impact of the war economy. During 1941 the output of 14 plants consisted of products with high priority ratings either on the basis of war contracts or for essential civilian use. During the early part of 1942, 5 plants reported their entire output as closely connected with the war effort; conversion of at least a portion of the facilities of these plants was involved.

Employment in these 41 plants, as a group, increased from 5,793 in August 1939 to 11,359 in February-April 1942. During the same period, average hourly earnings, including penalty overtime payments, rose from 69.2 to 90.5 cents. A steady increase in the length of the workweek is responsible for part of this increase in hourly earnings; it is estimated that elimination of premium payments for overtime work would reduce the average hourly earnings figure for the latter period from 90.5 to 81.2 cents. On the basis of size of plant, hourly earnings varied from 75.3 cents in plants with fewer than 50 workers to 93.2 cents in those with 500 or more employees.

A total of 1,250 workers, or nearly a fifth of those for whom detailed earnings data were compiled, were classified in the 15 occupational groups which showed average earnings of \$1.00 or more per hour. With the exception of apprentices, only 3 occupational groups of men, in which 150 workers were classified, showed hourly averages below 60 cents. The number of women employed in this industry is negligible.

Scope of Survey

According to the latest Census of Manufactures there were 199 plants engaged primarily in the manufacture of construction and similar machinery; these plants as a group employed an average of 17,259 wage earners during 1939. Of the total of 199 plants, 29 which were employing 5 workers or less were excluded from this survey. The establishments studied include 24 percent of the remaining 170 plants reported by the Census. This sample of plants was selected as far as possible to be representative of the industry as a whole with respect to location, size in terms of number of wage earners, and corporate affiliation. In August 1939, the 41 plants surveyed employed a total of 5,793 wage earners.

Characteristics of the Industry

TYPES OF PRODUCT

The establishments classified by the Census in the construction-machinery industry include those "primarily engaged in the manufacture of heavy machinery used by the construction industries for portable or fixed plant operation in dredging (including mining dredges), excavating, and road building. Road-maintenance machinery (such as sweepers and snow plows) are also included in this classification." Well-drilling and mining machinery are not included in this industry.

The role of individual establishments in the war effort, as pointed out in previous reports in this series, may take the form of diversion of their usual products to new channels (i.e., a change in customers), or of a shift to the production of military and naval equipment. In the latter case, some conversion of plant facilities is likely to occur.

During 1939 and 1940, none of the 41 plants studied reported diversion of its regular products to the defense program and none was producing direct war materials. In 1941, the production of 14 plants reflected the transition to a war economy in one fashion or another. Of the total, 9 were maintaining or increasing their output of regular products under high priority ratings either on the basis of war contracts or for essential civilian use. Five of these 9 reported half or more of their 1941 dollar sales in these categories. A total of 5 plants produced some direct military equipment during 1941, but in all cases such material constituted less than 50 percent of total sales. Conversion of a portion of the facilities and equipment in these 5 plants was, of course, involved.

The number of plants engaged in direct or indirect war production during the period of the present survey was the same as that reported for 1941 in each case. There was, however, a marked increase in the proportions of sales based on war contracts or high-priority orders; 5 of the 14 plants reported their entire output for March or April 1942 in this category.

THE LABOR SUPPLY

Distributions of workers by skill class are available only for the 7,087 workers for whom detailed earnings data were compiled. Of this total, about 34 percent may be regarded as skilled workers, 41 percent as semiskilled, and the remaining 25 percent as unskilled. It is unlikely that inclusion of the remaining workers would greatly affect this estimate of distribution by skill class.

The employment of women in this industry is negligible, as might be expected. One of the 41 plants studied employed 39 women who constituted about 2 percent of the workers in that plant. Another plant employed one woman and the remaining 39 employed none. All woman workers were employed as winders or janitresses.

Negroes constituted about one-half of 1 percent of the total employment of the 41 plants in the period February–April 1942. All of the 58 Negro workers employed were found in 6 plants, of which 4 were in the North. They were employed principally as porters and janitors; a few other occupations were represented, among which are lathe hands (semiskilled), casting cleaners, molders' helpers, and shake-out men.

Nineteen of the 41 plants were operating under agreements with unions during the period of this survey. Fourteen of the 19 agreements were with nationally affiliated unions. Agreements were found much more frequently in the larger plants than in the smaller ones.

METHOD OF WAGE PAYMENT

Slightly less than a third (30 percent) of the workers included in this survey were paid on the basis of an incentive-wage system, i. e., a system involving piece rates or bonuses. Only 9 plants made use of these systems, but all of them were relatively large plants. Less than half (45 percent) of the wage earners in these 9 establishments were paid straight-time rates. Among the plants with fewer than 250 workers each, less than 1 percent of the employees, on the average, were paid under incentive systems.

Payment at the rate of one and one-half times the regular rate was made for work in excess of 40 hours per week by all the plants studied, and 27 also applied this rate to all work above 8 hours per day. Nineteen plants paid time and one-half for all Saturday work and 2 paid double time for such work. Sunday work was paid for at double rates in 19 plants. Double time applied to all work above 10 hours per day in 1 plant and above 11 hours in another. Double time was also the most frequent rate for holiday work.

Twelve of the 41 plants studied were operating but 1 shift, 19 were working 2 shifts, 9 reported 3 shifts, and for 1 no data were available. Five of the plants operating 2 shifts paid no premium for evening work, 1 added 3 cents to the base hourly rate, 6 added 5 cents, and 2 added 10 cents. In 4 cases the premium for evening work was on a percentage basis; 3 added 5 percent and in 1 plant the differential was 10 percent. One 2-shift plant granted 13.5 hours' pay for 11 hours of work.

Of the 9 plants operating 3 shifts, 1 paid no differential for either late shift. Three more paid no premium for evening work, but night workers received a differential; in 2 cases they were paid for 1 and 1½ more hours than they actually put in and in the other case the base rate was increased by 10 percent. In 2 of the 9 plants, the premiums were the same for both late shifts—the amounts were 3 and 5 cents per hour. Two more plants, which paid 5 cents per hour additional for evening work, reported differentials of 8 and 10 cents per hour, respectively, for night work. The 1 remaining plant in this group paid a premium of 5 percent for evening and 10 percent for night work.

Employment, Hours, and Hourly Earnings, 1939-42

Employment data for the 41 plants included in this survey show striking increases during each of the periods surveyed since August 1939. Between that date and the first quarter of 1942, the number of wage earners in these establishments rose from 5,793 to 11,359 or about 96 percent. The rise of almost a third during the last 12 months is, at least in part, evidence of the role of this industry in the war effort (table 11).

Average hourly earnings in these 41 plants as a group amounted to 69.2 cents in August 1939. The average workweek of 38.4 hours at that time was not sufficiently long to involve large amounts of penalty

overtime earnings; elimination of such payments would tend to reduce the average by little more than 1 cent per hour. During the early months of 1942, however, the average working time in these plants as a group had risen to an even 50 hours per week, and penalty overtime payments assumed increased importance. It is estimated that the average hourly earnings rate of 90.5 cents per hour would be lowered by more than 9 cents by the elimination of payment for overtime at penalty rates (table 11).

TABLE 11.—*Employment, Average Hourly Earnings, and Average Weekly Hours of Work in 41 Construction-Machinery Plants for Selected Periods, 1939-42*

Year and month	Total workers	Average workers per plant	Average hourly earnings	Estimated average hourly earnings exclusive of extra overtime earnings	Average weekly hours
All States					
August 1939.....	5,793	141	\$0.692	\$0.679	38.4
April 1940.....	6,678	163	.722	.699	40.7
August 1940.....	7,217	176	.727	.700	41.6
February 1941.....	8,670	211	.795	.735	46.1
August 1941.....	10,316	252	.834	.760	48.0
February-April 1942.....	11,359	277	.905	.812	50.0
North Central States					
August 1939.....	4,907	204	\$0.687	\$0.675	38.1
April 1940.....	5,629	235	.719	.697	40.6
August 1940.....	6,225	259	.721	.693	41.7
February 1941.....	7,507	313	.790	.728	46.6
August 1941.....	8,715	363	.831	.757	48.0
February-April 1942.....	9,702	404	.903	.808	50.4
Other States					
August 1939.....	886	52	\$0.718	\$0.699	39.9
April 1940.....	1,049	62	.738	.712	41.3
August 1940.....	992	58	.763	.737	41.1
February 1941.....	1,163	68	.829	.791	42.6
August 1941.....	1,601	94	.850	.773	48.2
February-April 1942.....	1,657	97	.918	.839	47.5

Hourly Earnings and Weekly Hours, February-April 1942

PLANT AVERAGES

No marked regional differences in plant average hourly earnings are apparent. Of the 41 plants studied, 24 are located in the North Central States, and are within the same broad wage area. Most of the remainder are located in the Middle Atlantic or Pacific Coast States, and do not constitute a sufficiently homogeneous group for purposes of regional comparisons. This industry is not important in the South. Consequently, only 4 southern plants were included in the survey. The North-South wage differences which are found in many industries are not apparent in this case. However, it must be noted that the number of plants in the South is hardly large enough to warrant broad generalizations as to regional wage differences. Average hourly earnings in the 2 groups of States varied by only 1.5 cents, a difference that cannot be characterized as significant (table 12).

The regional wage difference would be greater, however, if penalty overtime earnings were eliminated, since the average workweek in the North Central area was longer by about 3 hours.

TABLE 12.—Average Weekly Hours and Average Hourly Earnings of Workers in Construction Machinery, by Size of Plant and Region, February–April 1942

Plant size in terms of wage earners	Number of plants	Number of workers	Average weekly hours	Average hourly earnings
All States				
All plants.....	41	11,359	50.0	\$0.905
Under 50.....	14	289	47.6	.753
50 and under 250.....	14	1,610	48.9	.857
250 and under 500.....	7	2,173	50.8	.871
500 and over.....	6	7,287	50.1	.932
North Central States				
All plants.....	24	9,702	50.4	\$0.903
Under 50.....	6	150	47.9	.766
50 and under 250.....	8	1,030	49.8	.809
250 and under 500.....	4	1,235	53.9	.826
500 and over.....	6	7,287	50.1	.932
Other States				
All plants.....	17	1,657	47.5	\$0.918
Under 50.....	8	139	47.2	.739
50 and under 250.....	6	580	47.3	.943
250 and under 500.....	3	938	47.6	.929
500 and over.....				

Almost two-thirds (64 percent) of the workers studied were employed in the 6 largest plants. These earned an average of 93.2 cents per hour during a representative pay-roll period in February, March, or April of this year. All of these plants are located in the North Central region. Average hourly earnings in the 14 plants employing fewer than 50 workers were substantially lower—75.3 cents—but these establishments accounted for less than 3 percent of the wage earners studied. In general, plant average hourly earnings varied directly with size of plant in terms of employees. These comparisons are not greatly affected by variations in the length of the workweek. For plants employing between 50 and 500 workers, average earnings were somewhat lower in the North Central region than they were elsewhere (table 12). Seven of the 41 plants studied showed average hourly earnings of \$1.00 or more.

OCCUPATIONAL DIFFERENCES IN AVERAGE HOURLY EARNINGS

Average hourly earnings (exclusive of penalty overtime payments) amounted to \$1.00 or more in 15 of the occupational groups into which the 7,044 male workers studied were classified. These 15 occupations include more than 1,250 workers or nearly a fifth of the total. Most important numerically were the 281 class A floor assemblers with an average of \$1.001, the 229 class A (hand) welders at \$1.006, and 163

class A turret-lathe operators with an hourly average of \$1.033. With the exception of working foremen, patternmakers (\$1.097) and tool and die makers (\$1.096) were the highest-paid occupational groups containing substantial numbers of workers (table 13).

Only 3 occupational groups of men (except for apprentices) showed hourly averages below 60 cents; these groups included but 150 workers employed as coremakers' helpers, foundry laborers, and watchmen.

As has already been pointed out, the employment of women in this industry is negligible. The 35 class B winders and the 8 janitresses constitute the entire group of female factory workers in the plants surveyed. Because of the absence of any marked regional differentials as outlined above, occupational earnings rates have been tabulated only for the entire 41 plants as a group.

TABLE 13.—Average Hourly Earnings of Day-Shift Workers in Selected Occupations in Construction-Machinery Plants, February–April 1942

Occupation and class	Number of workers	Average hourly earnings	Occupation and class	Number of workers	Average hourly earnings
<i>Males</i>			<i>Males—Continued</i>		
All male workers.....	7,044	\$0.827	Grinding-machine operators, class A.....	26	\$0.995
Acetylene-burner operators.....	71	.875	Grinding-machine operators, class B.....	45	.814
Apprentices, first year.....	59	.441	Hammersmiths.....	6	.861
Apprentices, second year.....	54	.495	Heat treaters, class A.....	10	.949
Apprentices, third year.....	21	.584	Heat treaters, class B.....	10	.753
Apprentices, fourth year.....	27	.764	Helpers, journeymen's.....	197	.735
Assemblers, bench, class A.....	71	.923	Helpers, machine operators.....	178	.710
Assemblers, bench, class B.....	125	.829	Inspectors, class A.....	52	.984
Assemblers, bench, class C.....	103	.643	Inspectors, class B.....	29	.853
Assemblers, floor, class A.....	281	1.001	Inspectors, class C.....	30	.739
Assemblers, floor, class B.....	431	.747	Janitors.....	109	.617
Assemblers, floor, class C.....	231	.684	Job setters.....	2	(¹)
Blacksmiths.....	44	.995	Laborers.....	390	.615
Boring-mill operators, class A.....	93	1.085	Laborers, foundry.....	63	.524
Boring-mill operators, class B.....	36	.885	Lay-out men, class A.....	84	.991
Broaching-machine operators.....	21	.938	Lay-out men, class B.....	15	.815
Bulldozer operators.....	11	.938	Lathe operators, engine, class A.....	147	.995
Burrers, class B.....	22	.814	Lathe operators, engine, class B.....	110	.781
Burrers, class C.....	19	.721	Lathe operators, turret, class A.....	163	1.033
Carpenters, class A.....	11	.905	Lathe operators, turret, class B.....	70	.816
Carpenters, class B.....	56	.822	Learners.....	101	.609
Carpenters, class C.....	22	.755	Machinists.....	116	1.010
Carpenters, flask.....	5	.758	Machine operators, all-around.....	25	.914
Casting cleaners.....	41	.669	Metal-saw operators.....	37	.676
Chippers, class B.....	53	.823	Milling-machine operators, class A.....	63	1.016
Chippers, class C.....	71	.796	Milling-machine operators, class B.....	55	.835
Coremakers, class A.....	73	1.022	Millwrights.....	21	.895
Coremakers, class B.....	2	(¹)	Molders, bench.....	29	.963
Coremakers' helpers.....	13	.591	Molders, floor.....	108	.997
Core pasters.....	5	.704	Molders' helpers.....	34	.683
Crane followers.....	6	.720	Molders, machine, class A.....	14	1.117
Crane operators.....	140	.788	Molders, machine, class B.....	34	.960
Craters.....	18	.693	Packers.....	17	.770
Cupola tenders.....	13	.893	Painters, brush.....	32	.800
Cupola tenders' helpers.....	6	.700	Painters, dip.....	5	(¹)
Die setters.....	1	(¹)	Painters, spray.....	82	.817
Drill-press operators, class A.....	70	.951	Patternmakers, wood.....	56	1.097
Drill-press operators, class B.....	163	.820	Pipe fitters.....	26	.856
Drill-press operators, class C.....	61	.698	Planer operators.....	53	.915
Drop-hammer operators, class A.....	12	1.112	Platers.....	1	(¹)
Drop-hammer operators, class B.....	5	.842	Pourers, class B.....	12	.758
Electricians.....	93	.770	Power-shear operators.....	53	.865
Elevator operators.....	1	(¹)	Punch-shear operators, class A.....	11	1.012
Firemen, stationary boiler.....	29	.786	Punch-press operators, class B.....	58	.813
Flask and pattern carriers.....	3	(¹)	Punch-press operators, class C.....	5	.723
Foremen, working, class A.....	71	1.127	Repairmen, machine tool.....	30	.945
Foremen, working, class B.....	40	.964	Repairmen, product, class A.....	2	(¹)
Foremen, working, class C.....	7	.741	Repairmen, product, class B.....	1	(¹)
Gear cutters, class A.....	10	1.008	Repairmen, product, class C.....	1	(¹)
Gear cutters, class B.....	18	.862	Riveters, pneumatic.....	43	.953
Gear finishers.....	1	(¹)	Sandblasters.....	11	.751
			Sand mixers, hand.....	2	(¹)

See footnote at end of table.

TABLE 13.—Average Hourly Earnings of Day-Shift Workers in Selected Occupations in Construction-Machinery Plants, February–April 1942—Continued

Occupation and class	Number of workers	Average hourly earnings	Occupation and class	Number of workers	Average hourly earnings
<i>Males—Continued</i>			<i>Males—Continued</i>		
Sand mixers, machine.....	12	\$0.723	Truck drivers.....	30	\$0.729
Screw-machine operators, class A.....	15	1.017	Truckers, hand.....	136	.698
Screw-machine operators, class B.....	49	.999	Truckers, power, inside.....	24	.733
Screw-machine operators, class C.....	4	(¹)	Tumbler operators.....	6	.613
Shake-out men.....	28	.751	Watchmen.....	74	.561
Shaper operators.....	12	.916	Welders, hand, class A.....	229	1.006
Sheet-metal workers, class A.....	35	.966	Welders, hand, class B.....	172	.977
Sheet-metal workers, class B.....	54	.926	Welders, machine.....	1	(¹)
Stock clerks.....	219	.712	Winders, class B.....	24	(¹)
Straighteners.....	1	(¹)	Winders, class C.....	5	(¹)
Testers, class A.....	10	.974	Woodworkers.....	13	.845
Testers, class B.....	14	.817			
Testers, class C.....	5	.690	<i>Females</i>		
Thread-milling machine operators.....	3	(¹)	All female workers.....	43	.554
Time clerks.....	47	.745			
Tool and die makers.....	57	1.096	Janitresses.....	3	(¹)
Tool-grinder operators.....	47	.826	Winders, class B.....	35	(¹)

¹ Number of plants and/or workers too small to justify computation of an average; data on numbers of workers are included in such cases to provide additional information on occupational distribution.

NOTE—Earnings shown are exclusive of extra payments for overtime work.

CHAPTER V

EARNINGS IN THE MANUFACTURE OF MISCELLANEOUS INDUSTRIAL MACHINERY, 1942

Summary

During the first 4 months of 1942, 19 of the 89 industrial-machinery plants included in the survey were producing direct war materials for which many of them were not formerly equipped; the entire output of 4 of the 19 plants consisted of war materials.

Employment in the plants in this industry has virtually doubled since the summer of 1939, and average earnings, which amounted to about 69 cents per hour at that time, had risen to almost 84 cents by the spring of 1942. Since these earnings include overtime pay at premium rates, they are considerably affected by the increase in the industry's workweek, which shows a rise of more than 11 hours since late 1939. Average hourly earnings, exclusive of overtime premiums, are estimated at 67.2 cents in August 1939 and 74.8 cents during the period of the present survey.

Nearly 12 percent of the male workers included in the study were classified in the 8 occupational groups which showed average hourly earnings in excess of \$1. Apart from learners, apprentices, and helpers, the only important occupational groups with averages below 60 cents per hour were those of janitors, laborers, and watchmen. No striking regional differences in earnings levels are apparent among the plants in various parts of the North, but the North-South difference found in many industries is also apparent in this industry.

Scope of Survey

According to the Census of Manufactures there were, in 1939, 579 plants in the industry group "Industrial machinery, not elsewhere classified"; 168 establishments employing 5 workers or less, however, were excluded from the scope of the present survey. The 89 plants from which data were obtained constitute approximately 22 percent of the 411 remaining establishments employing 6 or more workers. The sample plants were selected, insofar as possible, to be representative of the industry with respect to general wage area, size (in terms of number of employees), and corporate affiliation. The data for a few plants were used with reduced weights in order to avoid overrepresentation of the larger establishments. Most of the earnings data shown in this report are based on a representative pay-roll period during February, March, or April 1942.

Characteristics of the Industry

This industry manufactures a wide variety of products for which no specific categories have been established by the Census of Manufac-

tures. Much of the machinery manufactured in this industrial branch is used for many different purposes, thus making it impossible to classify the plants in special categories such as those for agricultural or mining machinery. Also included are plants whose products are designed for specialized use in a field too limited in size to warrant separate analysis. Typical products are equipment and machinery used in oil refineries, foundries, chemical plants, and pipe mills. Although the products are consequently far from homogeneous, the industry is one of the largest in the machinery group. The technological processes employed in these plants, moreover, have much in common; evidence of this fact is found in the relatively high degree of similarity of the occupational patterns among the plants studied.

Nearly a third of the plants classified by the Census in this industry are in the three States of New Jersey, New York, and Pennsylvania, and about two-fifths of the industry's total workers were employed in this area during 1939. Slightly less than a third of the establishments are in the East North Central States (Illinois, Indiana, Michigan, Ohio, and Wisconsin). The remainder are distributed throughout the country with approximately 10 percent each in the New England, West North Central, Western, and Southern States. The plants and employees included in the present survey are distributed geographically in approximately the same fashion.

PRODUCTION OF WAR MATERIALS

Five of the 89 plants included in this survey were producing materials directly connected with the defense program during the latter part of 1939. By 1941, slightly less than half (40) of these plants were manufacturing war materials; in 16 plants production included articles which, in most cases, they had not produced before. Among these 16 plants, 9 reported 50 percent or more of their 1941 dollar volume of sales as direct war materials. During the first quarter of 1942, more than half (47) of the 89 plants were directly involved in the war effort. Nineteen of these 47 plants were manufacturing direct war materials during this period, and 12 showed 75 percent or more of their sales in this category; 4 were devoting their entire facilities to the production of war materials. Conversion of at least a portion of the facilities of these 19 plants for the manufacture of products for which they were not formerly equipped was, of course, essential. It appears, however, that, despite the necessity of some technological changes, the changes that were made were not so drastic as to result in major shifts in occupational structure.

THE LABOR FORCE

Distributions by skill class are available for the 8,551 workers for whom detailed earnings data were compiled in the course of the study. Approximately 36 percent may be regarded as skilled employees, with the semiskilled and unskilled workers making up 38 and 26 percent, respectively.

Except for central-office personnel, women constitute scarcely one-half of 1 percent of the employees in the 89 plants studied. All of the 56 women scheduled were working in 6 eastern and midwestern

plants; none was found in plants in the West or South. The majority of the women employed were performing light assembly work or were operating punch presses.

About 3.5 percent of the workers in the 89 plants were Negroes, a majority of whom were employed in foundry departments. Negroes were also employed as janitors and general laborers but, as in the other branches of the industry studied by the Bureau, their numbers among other occupations were negligible. There were a few scattered cases of Negroes working as semiskilled machine operators. Negroes constituted, however, almost a third of the 1,281 workers employed in the 9 southern plants studied. Fifteen of the 80 northern plants had some Negro workers, but the total number amounted to less than 0.3 percent of all the employees.

Approximately a fourth (21) of the 89 plants studied were operating under agreements with nationally affiliated unions. About a third of the plants studied in the North Central, Western, and Southern States reported such agreements, but only 4 of the 36 northeastern plants were in this category. Four plants were operating under agreements with independent unions, and 64 plants reported no agreements. As might be expected, union agreements were infrequently found among the small plants; 36 of the 43 with 50 employees or less had no agreements. All but one of the 7 plants employing between 250 and 500 workers were operating under union agreements and 3 of the 6 largest plants (500 workers or more) reported agreements in effect.

METHOD OF WAGE PAYMENT

Incentive methods of wage payment are not in general use in this industry. Many of the establishments operate on a job-shop or special-order basis and find it impractical to conduct the elaborate job analyses and time studies essential to incentive payment. In 15 of the 89 plants studied, incentive systems were in effect, and about half the employees in these plants were paid on this basis. Eight of the 15 employed 100 workers or less each. Virtually all the plants making use of incentive systems are in the East and Midwest. Only 1 western plant reported such a system and none was found in the South. The relative unimportance of piece and bonus rates in these plants is evident from the fact that more than four-fifths of the 8,551 workers for whom detailed earnings data were compiled were paid on a straight-time basis.

Time and a half for all work above 40 hours per week and/or 8 hours per day was paid in all the plants studied. Fourteen plants reported double time paid for any work on Sundays, and one paid two and one-fourth times the regular rate if the Sunday work brought total hours for the week above 40. One establishment paid double time for any work above 11 hours a day. Eleven plants paid double time for holiday work. The remainder reported no special provisions.

Of the 89 plants, 49 were operating but one shift at the time the study was made; 20 were working 2 shifts, 17 reported 3 shifts, and comparable data for the 3 remaining plants were not available.

Thirteen of the 37 plants known to be operating more than 1 shift paid no differential rates for evening or night work (table 14). The

most common differential was an additional 5 cents per hour, although a premium of 10 percent of base rates or earnings appeared almost as frequently. Only one of the companies operating 3 shifts paid higher rates for work on the third or night shift than those effective for evening- or second-shift workers.

TABLE 14.—*Scale of Wages for Second and Third Shifts in Plants Manufacturing Miscellaneous Industrial Machinery, February–April 1942*

Type of plant	Number of plants	Differential paid for—	
		Second shift	Third shift
Plants with 1 shift only..	49		
Plants with 2 shifts.....	7	No differential.....	
	1	2 cents per hour.....	
	1	2.5 cents per hour, foundry; 5 cents per hour, machine shop.	
	5	5 cents per hour.....	
	1	10 cents per hour, plus 30-minute paid lunch period.	
	1	5 percent over base rate.....	
	1	10 percent over base rate.....	
	1	10 percent over base rate, machine shop.	
	1	8 hours' pay for 7.5 hours' work.....	
	1	10 hours pay for 9.5 hours' work.....	
Plants with 3 shifts.....	6	No differential.....	No differential.
	1	2.5 cents per hour.....	2.5 cents per hour.
	1	3 cents per hour for average hourly earnings up to 56 cents per hour; 4 cents for 56–60 cents per hour; 5 cents for 60–75 cents per hour; 7 cents over 90 cents per hour.	Same as second shift.
	1	3 cents per hour.....	3 cents per hour.
	2	5 cents per hour.....	5 cents per hour.
	1	6 percent over base rate.....	6 percent over base rate.
	2	10 percent over base rate.....	10 percent over base rate.
	1	10 percent over base rate or piece rate.....	10 percent over base rate or piece rate.
	1	10 percent over base rate between 4 p. m. and 8 a. m.	10 percent between 4 p. m. and 8 a. m.
	1	8 hours' pay for 7.5 hours' work, plus 10 percent over base rate, machine shop; 2.5 cents per hour, foundry.	8 hours' pay for 7 hours' work, plus 15 percent over base rate, machine shop.
	3	Data not available.....	

Employment, Hours, and Hourly Earnings, 1939–42

TREND FROM 1939 TO 1942

Comparable data on employment and earnings for selected periods during 1939–42 are available for 82 of the 89 plants surveyed. As is indicated in table 15, employment in these plants rose from 5,168 in August 1939 to 10,648 early in 1942—an increase of more than 100 percent. Average hourly earnings, including penalty overtime payments, amounted to 69.1 cents in August 1939 but had risen to 83.9 cents by the time of the Bureau's study. A steady rise in the length of the average workweek, however, tended to inflate the hourly rates because of penalty payments for overtime work. It is estimated that elimination of these amounts would reduce to approximately 75 cents the average hourly earnings figure for the period covered by the survey. Inclusion of the 7 plants for which comparable early data were not available adds approximately 1,000 workers, but the effect on average earnings and hours is negligible.

TABLE 15.—*Employment, Average Hourly Earnings, and Average Weekly Hours in 82 Plants Manufacturing Miscellaneous Industrial Machinery, Specified Periods, 1939-42*

Year and month	Total workers ¹	Average workers per plant	Average hourly earnings	Estimated average hourly earnings exclusive of extra overtime earnings	Average weekly hours
August 1939.....	5,168	79	\$0.691	\$0.672	40.0
April 1940.....	6,392	96	.692	.669	40.9
August 1940.....	6,104	92	.711	.688	40.9
February 1941.....	7,509	118	.732	.678	46.0
August 1941.....	9,248	146	.778	.711	47.6
February-April 1942.....	10,648	170	.839	.748	51.1

¹ The data for several large companies were used with reduced weight in order to avoid overrepresentation of large plants.

PLANT AVERAGES

Nearly a fourth (21) of the plants studied showed average hourly earnings, including penalty overtime, of 90 cents or above, and 11 averaged \$1 or more. At the other extreme, there were 8 plants with averages below 60 cents per hour; 2 of the 8 were in the South.

Plant average hourly earnings in this industry tend to vary directly with size of plant. Average earnings for the 1,206 workers employed in the smallest plants (having fewer than 50 workers) amounted to 77.4 cents per hour, as compared with 92.6 cents for 2,292 workers in plants with 250 to 500 employees. The workers in all plants with 500 or more employees, however, averaged only about 79 cents per hour.

REGIONAL DIFFERENCES

The 5,902 workers employed in plants in the northeastern part of the country earned an average of 85.0 cents per hour, including penalty overtime, during the period of this survey. The earnings of the 4,470 employees in midwestern and western plants were about 2 cents higher. This small difference is not considered to be significant since even minor variations in the characteristics of the plants or in the amount of overtime work would be sufficient to offset it. The North-South difference amounted to more than 10 cents per hour.

OCCUPATIONAL DIFFERENCES

Earnings in 8 occupational groups averaged more than \$1 an hour during the period of this survey (table 16). Slightly more than 1,000 male workers were classified in these occupations. Most important numerically were the 343 class A machinists, with an average of \$1.004 per hour, and the 172 class A hand welders who were paid \$1.014.

TABLE 16.—Average Hourly Earnings¹ of Male Day-Shift Workers in Selected Occupations in Miscellaneous Industrial Machinery Manufacture, February–April, 1942

Occupation and class	United States		Northern States		Southern States	
	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings
All occupations.....	8,508	\$0.756	7,607	\$0.769	901	\$0.645
Acetylene-burner operators.....	25	.863	20	.836	5	(²)
Apprentices:						
First year.....	71	.417	57	.430	14	.361
Second year.....	38	.608	25	.642	8	.500
Third year.....	33	.695	26	.686	7	.729
Fourth year.....	9	.732	9	.732		
Assemblers, bench:						
Class A.....	59	.918	58	.917	1	(²)
Class B.....	128	.766	128	.766		
Class C.....	54	.596	54	.596		
Assemblers, floor:						
Class A.....	234	.952	222	.948	12	1.008
Class B.....	297	.794	291	.795	6	.717
Class C.....	192	.654	189	.654	3	(²)
Balancing-machine operators.....	3	(²)	3	(²)		
Blacksmiths.....	35	.829	32	.815	3	(²)
Boring-mill operators:						
Class A.....	105	1.031	104	1.033	1	(²)
Class B.....	62	.796	60	.792	2	(²)
Broaching-machine operators.....	9	.764	9	.764		
Buffers.....	1	(²)	1	(²)		
Bulldozer operators.....	4	(²)	4	(²)		
Burrers:						
Class B.....	30	.658	30	.658		
Class C.....	44	.652	44	.652		
Carpenters:						
Class A.....	23	.947	20	.942	3	(²)
Class B.....	31	.799	29	.793	2	(²)
Class C.....	18	.655	16	.668	2	(²)
Carpenters, flask.....	13	.807	11	.836	2	(²)
Casting cleaners.....	171	.628	145	.656	26	.468
Chippers:						
Class B.....	60	.660	36	.739	24	.540
Class C.....	41	.650	41	.650		
Core pasters.....	4	(²)	4	(²)		
Coremakers.....	142	.863	116	.872	26	.820
Coremakers' helpers.....	28	.591	28	.591		
Crane followers.....	18	.940	18	.640		
Crane operators.....	82	.763	70	.761	12	.775
Craters.....	10	.708	10	.708		
Cupola tenders.....	23	.765	21	.742	2	(²)
Cupola tenders' helpers.....	26	.615	21	.642	5	(²)
Die setters.....	7	.929	7	.929		
Drill-press operators:						
Class A.....	92	.911	92	.911		
Class B.....	126	.750	114	.761	12	(²)
Class C.....	73	.584	69	.584	4	(²)
Drop-hammer operators:						
Class A.....	12	1.094	12	1.094		
Class B.....	7	.878	7	.878		
Electricians.....	62	.922	58	.908	4	(²)
Elevator operators.....	1	(²)	1	(²)		
Firemen, stationary, boiler.....	21	.675	21	.675		
Flask and pattern carriers.....	4	(²)	4	(²)		
Foremen, working:						
Class A.....	111	1.157	99	1.139	12	1.311
Class B.....	35	.879	35	.879		
Class C.....	23	.707	23	.707		
Gear cutters:						
Class A.....	5	.982	5	.982		
Class B.....	2	(²)	2	(²)		
Grinding-machine operators:						
Class A.....	71	.948	70	.943	1	(²)
Class B.....	128	.709	119	.728	9	(²)
Hammersmiths.....	5	(²)	5	(²)		

See footnotes at end of table.

TABLE 16.—Average Hourly Earnings¹ of Male Day-Shift Workers in Selected Occupations in Miscellaneous Industrial Machinery Manufacture, February–April, 1942—Con.

Occupation and class	United States		Northern States		Southern States	
	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings
Heat treaters:						
Class A.....	10	\$0.961	10	\$0.961		
Class B.....	19	.663	19	.663		
Helpers, journeymen's.....	215	.598	177	.618	38	\$0.502
Helpers, machine operators.....	224	.589	150	.639	74	.439
Inspectors:						
Class A.....	74	.933	74	.933		
Class B.....	62	.741	61	.738	1	(²)
Class C.....	46	.581	45	.582	1	(²)
Janitors.....	101	.550	98	.553	3	(²)
Job setters.....	34	.958	18	.921	16	(²)
Laborers.....	529	.519	309	.593	220	.416
Laborers, foundry.....	197	.566	144	.627	53	(²)
Ladle liners.....	5	(²)	3	(²)	2	(²)
Lathe operators, engine:						
Class A.....	189	.985	175	.979	14	1.057
Class B.....	187	.757	181	.759	6	.708
Class C.....	16	.655	16	.655		
Lathe operators, turret:						
Class A.....	108	1.006	108	1.006		
Class B.....	115	.700	108	.707	7	.586
Class C.....	7	(²)	7	(²)		
Lay-out men:						
Class A.....	65	.913	62	.909	3	(²)
Class B.....	18	.773	18	.773		
Learners, journeymen's.....	96	.581	96	.581		
Learners, machine operator, and other.....	297	.554	297	.554		
Machinists:						
Class A.....	343	1.004	251	.992	92	1.037
Class B.....	23	.814	23	.814		
Metal-saw operators.....	26	.716	25	.720	1	(²)
Milling-machine operators:						
Class A.....	95	.968	94	.970	1	(²)
Class B.....	179	.676	178	.675	1	(²)
Millwrights.....	39	.817	37	.829	2	(²)
Molders, bench.....	52	.896	52	.896		
Molders, floor.....	225	.920	179	.890	46	1.037
Molders' helpers.....	109	.553	73	.612	36	.436
Molders, machine:						
Class A.....	51	.869	46	.898	5	(²)
Class B.....	16	.824	16	.824		
Packers.....	69	.668	69	.668		
Painters, brush.....	47	.750	44	.747	3	(²)
Painters, dip.....	8	(²)	8	(²)		
Painters, spray.....	45	.692	45	.692		
Pattern makers, metal.....	8	(²)	8	(²)		
Pattern makers, wood.....	98	1.075	87	1.067	11	1.137
Pipe fitters.....	26	.925	26	.925		
Planer operators.....	72	.938	70	.938	2	(²)
Platers.....	5	(²)	5	(²)		
Pourers, class B.....	2	(²)	1	(²)	1	(²)
Power-shear operators.....	19	.746	19	.746		
Punch-press operators:						
Class A.....	1	(²)	1	(²)		
Class B.....	28	.748	28	.748		
Class C.....	26	.507	26	.507		
Repairmen, machine.....	47	.816	46	.819	1	(²)
Repairmen, product:						
Class A.....	1	(²)	1	(²)		
Class B.....	3	(²)	3	(²)		
Class C.....	2	(²)	2	(²)		
Riveters, pneumatic.....	1	(²)	1	(²)		
Sand mixers, hand.....	9	(²)	9	(²)		
Sand mixers, machine.....	12	.654	10	.691	2	(²)
Sandblasters.....	12	.674	11	.681	1	(²)
Screw-machine operators:						
Class A.....	27	.924	27	.924		
Class B.....	26	.789	26	.789		
Class C.....	19	.686	19	.686		
Shake-out men.....	47	.642	46	.647	1	(²)
Shaper operators.....	46	.813	45	.815	1	(²)
Sheet-metal workers:						
Class A.....	19	.970	19	.970		
Class B.....	24	.868	24	.868		
Class C.....	13	.591	13	.591		

See footnotes at end of table.

TABLE 16.—Average Hourly Earnings¹ of Male Day-Shift Workers in Selected Occupations in Miscellaneous Industrial Machinery Manufacture, February–April, 1942—Con.

Occupation and class	United States		Northern States		Southern States	
	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings
Stock clerks.....	280	\$0.637	268	\$0.640	12	\$0.567
Straighteners.....	9	(?)	9	(?)	-----	-----
Testers:						
Class A.....	16	.828	16	.828	-----	-----
Class B.....	8	.765	8	.765	-----	-----
Class C.....	4	.649	4	.649	-----	-----
Thread-milling-machine operators.....	2	(?)	2	(?)	-----	-----
Time clerks.....	62	.608	61	.611	1	(?)
Tool and die makers.....	107	1.043	105	1.042	2	(?)
Tool-grinder operators.....	5	(?)	5	(?)	-----	-----
Truckers, hand.....	46	.615	46	.615	-----	-----
Truckers, power, inside.....	5	(?)	5	(?)	-----	-----
Truck drivers.....	39	.720	36	.737	3	(?)
Tumbler operators.....	2	(?)	2	(?)	-----	-----
Upsetters.....	4	(?)	4	(?)	-----	-----
Watchmen.....	135	.548	124	.561	11	.408
Welders, hand:						
Class A.....	172	1.014	158	1.016	14	1.000
Class B.....	91	.772	91	.772	-----	-----
Welders, machine.....	14	.773	12	.693	2	(?)
Winders:						
Class A.....	2	(?)	-----	-----	2	(?)
Class B.....	1	(?)	1	(?)	-----	-----
Class C.....	2	(?)	1	(?)	1	(?)
Woodworkers.....	25	.640	25	.640	-----	-----

¹ Averages are based on actual earnings exclusive of penalty overtime payments.

² Number of plants and/or workers too small to justify computation of an average; data on numbers of workers are included in such cases to provide additional information on occupational distribution.

More than 1,700 male workers were classified in the 13 occupations (apprentices and learners excepted) which showed average earnings below 60 cents per hour. Almost a third of these workers, however, were classified as helpers. Apart from these groups, the only important occupations with averages below 60 cents were janitors, laborers, and watchmen.

Regional comparisons of occupational rates are possible in only a few cases because of the relatively small numbers of workers in the southern plants. The rates in southern plants are well below the corresponding averages for northern plants in most of the numerically important occupations; in the majority of cases in which the reverse is true, the numbers of workers are too small to make the differences significant. The two important exceptions are the class A machinists and the floor molders. Such apparent anomalies may be the indirect result of the greater competition among employers for the relatively small supply of highly skilled workers in the South.

As already indicated, the employment of women in this industry is negligible. The average hourly earnings of the 43 for whom data are available amounted to 50.7 cents. This average is, of course, heavily weighted by the rate for bench assemblers who received an average of 50.4 cents per hour and constituted the only group containing sufficient numbers to warrant the computation of an average.

CHAPTER VI

EARNINGS IN THE MANUFACTURE OF OIL-FIELD MACHINERY, 1942

Summary

DURING the first 3 months of 1942, 11 of the 42 plants included in the Bureau's survey of the oil-field-machinery industry were producing direct war materials for which many of them were not formerly equipped. In none of the plants, however, did the output consist entirely of war materials.

The number of employees in the industry increased approximately 60 percent from the summer of 1939, and average earnings, which were nearly 72 cents at that time, had risen to 83 cents by the spring of 1942. As these earnings include overtime pay at premium rates, they were considerably affected by the increase in the industry's workweek, which rose more than 7 hours since late 1939. Average hourly earnings, exclusive of overtime premiums, are estimated at 77.6 cents during February-March 1942.

Over 21 percent of the male workers included in the survey were classified in the 15 occupational groups which showed average hourly earnings in excess of \$1. Apart from learners, apprentices, and helpers, the only occupational groups with hourly averages below 50 cents were foundry and general laborers and watchmen. The relatively high wage levels prevailing in California plants appear to be due in part to the large average size of the plants there.

Scope of Survey

According to the Census of Manufactures there were, in 1939, 223 plants in the industry group "Oil-field machinery and tools"; however, 48 establishments employing 5 workers or less were excluded from the scope of the present survey. The 42 plants from which data were obtained by means of this survey constitute approximately 24 percent of the remaining 175 establishments employing 6 or more workers. The sample plants were selected, as far as possible, to be representative of the industry with respect to geographic region, size (in terms of number of employees), and certain other characteristics. Although proportionately more large plants than small were studied, the data for some of the large establishments were used with reduced weights in order to avoid overrepresentation of such establishments. Most of the earnings data shown in this report are based on a representative pay-roll period during February or March 1942.

Characteristics of the Industry

GEOGRAPHIC DISTRIBUTION

Nearly half of the plants classified by the Census in this industry are located in the three States of Louisiana, Oklahoma and Texas, and almost three-fifths of the industry's workers were employed in this

area during 1939. Nearly one-fourth of the plants are in California, but these plants employed less than one-fifth of the workers in the industry. The remaining quarter of the plants are more widely dispersed; most of them, however, are in the area lying between the Appalachian Mountains and the Mississippi River, and extending from the Lake States to Tennessee. The greatest concentration within this area is in Ohio, Pennsylvania, and West Virginia, in which are found about one-sixth of the establishments and workers in the industry. The plants and employees included in this survey show a geographical pattern roughly similar to that of the industry as a whole.

The manufacture of machinery of any type is typically carried on near areas of the product's ultimate utilization. This is especially true of oil-field machinery. The three States of Kansas, Oklahoma, and Texas have recently produced about 53 percent of the country's petroleum, and plants in these States employed 62 percent of the workers in the oil-field machinery industry in 1939. California produced about 17 percent of the petroleum in the United States, and in this State were employed about 18 percent of the workers engaged in the production of oil-field machinery. The States of Ohio, Pennsylvania, and West Virginia, which once produced a large part of the total national output, still employed 17 percent of the Nation's oil-field machinery workers in 1939, although less than 2 percent of the petroleum output in the United States was produced there. On the other hand, the new oil fields of Illinois produced about 10 percent of the country's petroleum, but less than 1 percent of the workers in the oil-field-machinery industry were employed in Illinois.

PRODUCTION OF WAR MATERIALS

During 1940 none of the 42 plants included in this survey was producing materials directly connected with the defense program. In 1941 only 11 plants were manufacturing defense materials, and in 10 of these plants the defense materials constituted less than 25 percent of total production. Conversion became apparent in 1942, when 17 of the 42 plants were reported as manufacturing direct war materials. Of these 17 plants, 11 reported that war materials represented less than half of their sales volume for the period, and 4 stated that over 75 percent of their sales were in this category. None of the 42 plants was devoting its entire facilities to the production of materials for the war program. The fact should not be overlooked, of course, that oil-field machinery itself, although not here considered as a direct war material, plays a vital part in supplying the fuel and lubricants for mechanized armies.

Conversion in the industry varies considerably by size of plant. Of the 23 plants employing fewer than 50 workers, only 3 reported any conversion. This is in contrast to the 19 plants which employed 50 or more workers, of which 14 reported the manufacture of war materials.

THE LABOR FORCE

Distributions by skill class are available for the 3,155 workers for whom detailed earnings data were compiled. Approximately 37 percent of these workers may be regarded as skilled. Semiskilled and unskilled employees comprised approximately 34 and 29 percent, respectively, of the total.

Except for central-office personnel, practically no women were employed in the industry. Only 3 women were working in the 42 plants studied; 2 as janitresses and 1 as a packer.

Negroes comprised about 5 percent of the workers in the industry. Almost all were employed as laborers, helpers, or janitors. The employment of Negroes was negligible except in the Southern States, where 1 out of every 12 workers was a Negro.

Of the 42 plants studied, only 7 were operating under collective-bargaining agreements with nationally affiliated unions. These plants, however, employed approximately 37 percent of all the workers studied. Two of the remaining plants had agreements with independent unions, and 33 reported no agreements. Union agreements were seldom found in small plants; of the 23 plants employing fewer than 50 workers only 1 reported a union agreement. On the other hand, 6 of the 19 plants which employed 50 workers or more had agreements with affiliated unions. The 3 organized California plants had agreements with unions affiliated with the Congress of Industrial Organizations, and the 4 organized southern plants with unions affiliated with the American Federation of Labor. No agreements were reported for plants in the Atlantic or Midwest regions.

METHOD OF WAGE PAYMENT

There is no general use of incentive methods of wage payment in this industry. This fact undoubtedly reflects the lack of standardization in the production of oil-field machinery. Few processes in its manufacture are routine or repetitive, and piece rates cannot be established easily. In only 2 of the 42 plants in the survey were incentive systems of pay in effect; in 1 plant with fewer than 100 workers only 12 percent were thus employed, and in the other about four-fifths of the 235 workers were paid on a piece-rate basis. Over 94 percent of the workers in the industry were employed at straight-time rates.

Provisions for the payment of overtime in this industry are not so liberal as in some other branches of the machinery industries. In 20 of the 42 plants studied, overtime rates were paid only as required by Federal statute—time and a half after a 40-hour week. In 19 plants this rate was also paid after 8 hours in any 1 day, and in 3 plants the time-and-a-half rate was paid for all Saturday work.

In 29 plants no special provisions were reported for payment of Sunday or holiday work. Work on Sunday was paid for at the rate of time and a half in 10 plants; work on holidays was paid for at the same rate in 7 plants. Double time for overtime is not common in the industry. Double-time rates were paid for Sunday work in 3 plants, for holiday work in 1 plant, and for work in excess of 11 hours in 1 day in another plant.

Of the 42 plants studied, 20 were on a 1-shift basis, 10 operated 2 shifts, and 9 reported 3 shifts. For the remaining 3 plants information on this point is not available.

Of the 19 plants reported as operating more than 1 shift, 8 paid no differential for either the evening or night shift, 1 paid a bonus of 5 cents to working foremen only, and another paid a 5-cent differential for the night shift but none for the evening shift (table 17). Of the 11 plants paying some differential, 9 paid a flat-rate bonus (usually 5

cents per hour) to evening- and night-shift workers rather than a percentage rate or other bonus scaled to their regular earnings. In 5 of the 6 plants operating 3 shifts and paying some differential to workers on either the evening or night shifts, the differential was greater for night-shift than for evening-shift workers.

TABLE 17.—*Scale of Wages for Second and Third Shifts in Oil-Field-Machinery Plants, February–March 1942*

Type of plant	Number of plants	Differential paid for—	
		Second shift	Third shift
Plants with 1 shift only	20		
Plants with 2 shifts	5	No differential.	
	3	5 cents per hour.	
	1	5 cents, for working foreman only.	
	1	8 hours' pay for 7½ hours' work.	
Plants with 3 shifts	3	No differential.	No differential.
	1	do.	5 cents per hour.
	1	3 cents per hour.	5 cents per hour.
	1	4 cents per hour.	7 cents per hour.
	1	5 cents per hour for workers at hourly rates up to 89 cents.	5 cents per hour for workers at hourly rates up to 89 cents.
	1	10 cents for workers at hourly rates of 90 cents and over.	10 cents for workers at hourly rates of 90 cents and over.
	1	5 cents per hour.	10 cents per hour.
	1	8 hours' pay for 7½ hours' work.	8 hours' pay for 7 hours' work.
	3	Data not available.	

Employment, Hours, and Hourly Earnings, 1939–42

TREND FROM 1939 TO 1942

Comparable data on employment and earnings for selected periods since the outbreak of the war are available for 37 of the 42 plants studied. Employment in these plants increased from 2,276 in August 1939 to 3,651 in February–March 1942, or by 60 percent (table 18). Even this substantial increase is less marked than that of certain other machinery industries which have been more completely converted to war production.

TABLE 18.—*Employment, Average Hourly Earnings, and Average Weekly Hours of Workers in 37 Oil-Field-Machinery Plants for Specified Periods, 1939–42*

Year and month	Total workers ¹	Average workers per plant	Average hourly earnings ²	Estimated average hourly earnings, exclusive of extra overtime earnings	Average weekly hours
August 1939	2,276	67	\$0.715	\$0.706	37.0
April 1940	2,529	73	.718	.708	37.3
August 1940	2,417	71	.692	.679	38.3
February 1941	2,579	74	.722	.702	40.0
August 1941	3,330	96	.746	.707	43.4
February–March 1942	3,651	105	.804	.757	44.1

¹ Data for 1 plant used with reduced weight to avoid overrepresentation of large plants. The actual total employment for all 37 plants was 4,351.

² Data for 5 plants excluded because comparable figures for these plants were not available for earlier periods. Inclusion of data for these plants for February–March 1942 would show gross average hourly earnings of 83.0 cents and an average of about 77.6 cents, exclusive of extra overtime payments.

Average hourly earnings, including extra overtime payments, amounted to 71.5 cents in August 1939 and had increased to 80.4 cents by February-March 1942. During the same period, the average workweek in these plants increased from 37.0 hours to 44.1 hours, a change which progressively inflated hourly rates by increased premiums for overtime. The elimination of such penalty payments is estimated to reduce the average hourly earnings for the current period by nearly 5 cents, or to about 75.7 cents. Exclusive of the effect of penalty overtime payments, hourly rates increased slightly over 7 percent during the 30-month period.

PLANT AVERAGES, FEBRUARY-MARCH 1942

Nearly one-third (13) of the plants surveyed showed average hourly earnings, including penalty payments for overtime, of 90 cents or above, and 5 plants had average earnings of \$1.00 or more. On the other hand, 3 plants showed average hourly earnings below 60 cents. Of the 23 plants employing fewer than 50 workers, approximately two-fifths paid an average wage of 80 cents per hour or more; of the plants employing 50 workers or more, nearly three-fifths paid an average wage of at least 80 cents.

The 1,014 workers employed in California plants were paid an average of 97.5 cents per hour, nearly 15 cents above the average for the industry. The 2,336 workers employed in plants of the Southwest region received 79.8 cents on the average, and the 779 employees of plants in the Atlantic and Midwestern States were paid average earnings of 70.4 cents. These apparent regional differences, however, were in a considerable part a reflection of variations in size of plant, since the average number of workers per plant in California plants was at least 35 percent greater than the number in the Atlantic and Midwestern area, and nearly 15 percent greater than in the Southwest region.

AVERAGE EARNINGS BY OCCUPATION

For 15 occupational groups, the average hourly earnings were over \$1.00 during the period of the survey. These occupations include slightly more than 650 workers, or somewhat over a half of the skilled workers for whom detailed earnings data were secured. Three occupational groups, class A working foremen, tool and die makers, and wood patternmakers, showed average hourly earnings of \$1.15 or more. The largest groups earning over \$1.00 per hour consisted of the 178 class A engine-lathe operators, 92 class A hand welders, and 65 class A turret-lathe operators (table 19). With but one exception, all class A machine operators were earning over \$1.00 per hour. This one exception was in the case of class A drill-press operators, an occupation which ordinarily requires less precision or less difficult set-ups than the work involved in other machine operations.

TABLE 19.—Average Hourly Earnings of Day-Shift Male Workers in Selected Occupations in Oil-Field-Machinery Plants, February–March 1942

Occupation and class	Number of workers	Average hourly earnings ¹	Occupation and class	Number of workers	Average hourly earnings ¹
Acetylene-burner operator.....	21	\$0.765	Lathe operators, engine, class B....	66	\$0.788
Apprentices, first year.....	35	.506	Lathe operators, engine, class C....	11	.551
Apprentices, second year.....	38	.545	Lathe operators, turret, class A....	65	1.041
Apprentices, third year.....	14	.657	Lathe operators, turret, class B....	47	.747
Apprentices, fourth year.....	2	(²)	Lay-out men, class A.....	16	.989
Assemblers, bench, class A.....	26	.962	Lay-out men, class B.....	3	(²)
Assemblers, bench, class B.....	35	.726	Machinists, class A.....	132	.992
Assemblers, bench, class C.....	65	.614	Machinists, class B.....	21	.880
Assemblers, floor, class A.....	54	.937	Metal-saw operators.....	18	.621
Assemblers, floor, class B.....	58	.809	Milling-machine operators, class A..	46	1.042
Assemblers, floor, class C.....	36	.652	Milling-machine operators, class B..	46	.717
Blacksmiths.....	30	1.030	Millwrights.....	16	.930
Boring-mill operators, class A.....	30	1.088	Molders, bench.....	11	.994
Boring-mill operators, class B.....	21	.623	Molders, floor.....	26	1.001
Broaching-machine operators.....	4	(²)	Molders, machine, class A.....	2	(²)
Bulldozer operators.....	4	(²)	Molders, machine, class B.....	7	(²)
Carpenters, class A.....	10	.727	Molders' helpers.....	26	.439
Carpenters, class B.....	14	.767	Packers.....	11	.719
Carpenters, class C.....	1	(²)	Painters, brush.....	12	.682
Carpenters, flask.....	3	(²)	Painters, spray.....	12	.619
Casting cleaners.....	36	.535	Patternmakers, wood.....	10	1.155
Coremakers.....	14	.960	Pipefitters.....	5	(²)
Coremakers' helpers.....	7	(²)	Planer operators.....	20	1.036
Crane followers.....	4	(²)	Platers.....	1	(²)
Crane operators.....	41	.696	Power-shear operators.....	9	.717
Craters.....	1	(²)	Punch-press operators, class A.....	2	(²)
Cupola tenders and helpers.....	13	.552	Punch-press operators, class B.....	18	.769
Drill-press operators, class A.....	25	.880	Repairmen, machine.....	13	1.031
Drill-press operators, class B.....	49	.713	Riveters, pneumatic.....	3	(²)
Drill-press operators, class C.....	26	.555	Sand blasters.....	6	(²)
Drop-hammer operators, class A.....	4	(²)	Sand mixers, hand.....	4	(²)
Drop-hammer operators, class B.....	4	(²)	Sand mixers, machine.....	3	(²)
Electricians.....	21	.957	Screw-machine operators, class A.....	2	(²)
Elevator operators.....	2	(²)	Screw-machine operators, class B.....	10	.922
Firemen, stationary boiler.....	11	.531	Screw-machine operators, class C.....	9	(²)
Flask and pattern carriers.....	2	(²)	Shake-out men.....	19	.507
Foremen, working, class A.....	50	1.252	Shaper operators.....	26	.974
Foremen, working, class B.....	13	1.073	Sheet-metal workers, class A.....	4	(²)
Foremen, working, class C.....	14	.735	Sheet-metal workers, class B.....	4	(²)
Gear cutters, class A.....	3	(²)	Stock clerks.....	88	.662
Gear cutters, class B.....	4	(²)	Straighteners.....	6	.806
Gear finishers.....	3	(²)	Testers, class A.....	1	(²)
Grinding-machine operators, class A.....	19	1.001	Testers, class B.....	2	(²)
Grinding-machine operators, class B.....	25	.708	Testers, class C.....	5	(²)
Hammersmiths.....	17	.974	Thread-milling-machine operators.....	16	.671
Heat treaters, class A.....	24	.932	Time clerks.....	5	(²)
Heat treaters, class B.....	14	.767	Tool and die makers.....	40	1.163
Helpers, general.....	119	.589	Tool-grinder operators.....	26	.930
Helpers, journeymen's.....	139	.685	Truck drivers.....	37	.647
Helpers, machine operators'.....	154	.605	Truckers, inside (power).....	3	(²)
Inspectors, class A.....	31	1.087	Truckers, hand.....	20	.606
Inspectors, class B.....	45	.708	Tumbler operators.....	2	(²)
Inspectors, class C.....	13	.572	Upsetters.....	5	(²)
Janitors.....	41	.550	Watchmen.....	87	.480
Job setters.....	4	(²)	Welders, hand, class A.....	92	1.066
Laborers.....	208	.450	Welders, hand, class B.....	28	.814
Laborers, foundry.....	40	.386	Welders, machine.....	8	.925
Lathe operators, engine, class A.....	178	1.092	Woodworkers.....	3	(²)
			Total.....	3,155	.769

¹ Averages are based on actual earnings, exclusive of penalty overtime payments.

² Number of plants and/or workers too small to justify computation of an average; data on numbers of workers are included in such cases to provide additional information on occupational distribution.

About 650 male workers were classified in 13 occupations (apprentices excepted) which showed average hourly earnings below 60 cents. In 4 of these occupational groups—foundry laborers, general laborers, molders' helpers, and watchmen—the average hourly earnings were below 50 cents. Nearly one-fourth of those with average hourly earnings of less than 60 cents were classified as helpers.

Comparisons of occupational averages on a regional basis are possible for 23 occupational groups, as indicated in table 20. In general, the rates for the California plants were highest and those for plants in the Atlantic and Midwestern States were lowest. This corresponds to the relationships found in connection with general plant averages. Machine-operator helpers, laborers, stock clerks, and tool and die makers, were the only important exceptions. All 4 of these groups involve occupations ordinarily paid on a straight-time basis rather than under an incentive system of wage payment. The rates for tool and die makers were undoubtedly influenced by the recognized shortage of such workers.

As noted earlier, in the discussion of plant averages, these differences are accentuated by regional variations in size of plant. The data available are not adequate to permit a precise statement of the effect of these variations, but it is certain that the differences shown in table 4 would be somewhat reduced were it possible to make allowance for the fact that the typical California plant is larger than the average for all those studied, whereas the Atlantic and Midwestern plants are about a fourth smaller than the general average.

TABLE 20.—Average Hourly Earnings¹ of Day-Shift Workers in Oil-Field-Machinery Plants, by Occupation and Region, February–March 1942

Occupation and class	Southwestern States		California		Atlantic and Midwestern States	
	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings
Assemblers, floor, class A.....	45	\$0.873	9	\$0.989	3	(?)
Assemblers, floor, class B.....	34	.740	25	.832	1	(?)
Assemblers, floor, class C.....	17	.627	19	.657		
Blacksmiths.....	14	1.036	9	1.056	7	\$0.910
Crane operators.....	15	.727	8	.847	18	.602
Drill-press operators, class B.....	21	.665	22	.776	6	.592
Foreman, working, class A.....	18	1.204	23	1.288	9	1.189
Helpers, general.....	30	.583	19	.687	69	.569
Helpers, journeymen's.....	50	.617	38	.801	55	.616
Helpers, machine operators'.....	78	.520	55	.689	21	.700
Inspectors, class A.....	17	.985	13	1.192	1	(?)
Inspectors, class B.....	30	.652	10	.793	5	(?)
Laborers.....	175	.421	2	(?)	31	.607
Lathe operators, engine, class A.....	75	1.070	73	1.177	31	.913
Lathe operators, engine, class B.....	32	.802	7	.889	27	.744
Lathe operators, turret, class A.....	30	.987	32	1.097	3	(?)
Lathe operators, turret, class B.....	21	.675	22	.861	4	(?)
Milling-machine operators, class A.....	21	1.071	15	1.154	9	.901
Milling-machine operators, class B.....	30	.689	11	.848	5	.600
Stock clerks.....	60	.623	17	.768	11	.680
Tool and die makers.....	24	1.158	15	1.079	1	(?)
Wetchemen.....	38	.578	11	.602	19	.602
Welders, hand, class A.....	53	1.039	30	1.166	9	.887

¹ Averages are based on actual earnings, exclusive of penalty overtime payments.

² Number of plants and/or workers too small to justify computation of an average. Data on numbers of workers are included in such cases to provide additional information on occupational distribution.