

MANUFACTURES : MICHIGAN

STATISTICS OF MANUFACTURES FOR THE STATE, CITIES, AND INDUSTRIES

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INTRODUCTION.

This advance bulletin gives the statistics of manufactures for the state of Michigan for the calendar year 1909 as shown by the Thirteenth Census. It will be reprinted without change as a part of the Compendium of the Census for Michigan, and in the final reports of the Thirteenth Census.

The text summarizes the general results of the census inquiry, presenting a series of special tables in which the main facts printed in the general tables are given in convenient form for the state as a whole and for important industries. It also presents tables in which the statistics for the industries of the state as a whole and for a few important industries are classified by character of ownership, size of establishments, number of wage earners, and prevailing hours of labor, information which could not be presented in general tables for each industry without disclosing the facts for individual establishments.

At the end of the bulletin are two general tables.

Table I gives for 1909, 1904, and 1899 the number of establishments and of persons engaged in the industries, primary power, capital, salaries and wages, cost of materials, value of products, and value added by manufacture reported for all industries combined and for certain important industries (1) for the state as a whole and (2) for the cities of Detroit, Grand Rapids, and Saginaw. It also gives the same items for all industries combined for every city having in 1910 a population of over 10,000 but less than 50,000.

Table II gives statistics in detail for 1909 for the state and for a larger number of industries.

Scope of census: Factory industries.—Census statistics of manufactures are compiled primarily for the purpose of showing the absolute and relative magnitude of the different branches of industry covered and their growth or decline. Incidentally, the effort is made to present data throwing light upon character of organization, location of establishments, size of establishments, labor force, and similar subjects. When use is made of the data for these purposes, it is imperative that due attention should be given to the limitations of the figures. Particularly is this true when the attempt is made to derive from them figures purporting to show average wages, cost of production, or profits. These limitations will be fully discussed in the general report on manufactures for the United States as a whole. It is impossible to reproduce such discussion in the bulletins relative to the individual states.

The census of 1909, like that of 1904, was confined to manufacturing establishments conducted under the factory system, as distinguished from the neighborhood, hand, and building industries. Where statistics for 1899 are given they have been reduced to a

comparable basis by eliminating the latter classes of industries. The census does not include establishments which were idle during the entire year, or had a value of products of less than \$500, or the manufacturing done in educational, eleemosynary, and penal institutions, or in governmental establishments, except those of the Federal Government.

Period covered.—The returns cover the calendar year 1909, or the business year which corresponds most nearly to that calendar year. The statistics cover a year's operations, except for establishments which began or discontinued business during the year.

The establishment.—The term "establishment" comprises the factories, mills, or plants which are under a common ownership or control, and for which one set of books of account is kept.

If, however, the plants constituting an establishment as thus defined were not all located within the same city or state, separate reports were secured in order that the separate totals might be included in the statistics for each city or state. In some instances separate reports were secured for different industries carried on in the same establishment.

Classification by industries.—The establishments were assigned to the several classes of industries according to their products of chief value. The products reported for a given industry may thus, on the one hand, include minor products very different from those covered by the class designation, and, on the other hand, may not include the total product covered by this designation, because some part of this product may be made in establishments in which it is not the product of chief value.

Selected industries.—The general tables at the end of this bulletin give the principal facts separately for the industries of the state. A selection has been made of the leading industries of the state for more detailed consideration. Sometimes an industry of greater importance than some of those selected is omitted because it comprises so few establishments that these detailed presentations would reveal the operations of individual concerns.

Comparisons with previous censuses.—Owing to the changes in industrial conditions it is not always possible to classify establishments by industries in such a way as to permit accurate comparison with preceding censuses. Table I, giving comparable figures for 1909, 1904, and 1899, therefore, does not embrace all the industries shown for 1909 in Table II.

Influence of increased prices.—In considering changes in cost of materials, value of products, and value added by manufacture, account should be taken of the general increase in the prices of commodities during recent years. To the extent to which this factor has been influential the figures can not be taken as an exact measure of increase in the volume of business.

Persons engaged in industry.—At the censuses of 1909, 1904, and 1899 the following general classes of persons engaged in manufacturing industries have been distinguished: (1) Proprietors and firm members, (2) salaried officers of corporations, (3) superintendents and managers, (4) clerks, and (5) wage earners. In the censuses of 1904 and 1899 these five classes were shown according to the three main groups: (1) Proprietors and firm members, (2) salaried officials, clerks, etc., and (3) wage earners. The second group included the three classes of salaried officers of corporations, superintendents and managers, and clerks. In the present census an entirely different

grouping is employed: That into (1) proprietors and officials, (2) clerks, and (3) wage earners. The first group includes proprietors and firm members, salaried officers of corporations, and superintendents and managers.

At this census the number of persons engaged in the industries, segregated by sex, and, in the case of wage earners, also by age (whether under 16 or 16 and over), was reported for December 15, or the nearest representative day. The 15th of December was selected as representing for most industries normal conditions of employment, but where conditions were exceptional, and particularly in the case of certain seasonal industries, such as canning, the December date could not be accepted as typical and an earlier date had to be chosen.

In the case of employees other than wage earners the number thus reported on December 15, or other representative day, has been treated as equivalent to the average for the year, since the number of employees of this class does not vary much from month to month in a given industry. In the case of wage earners the average is obtained in the manner explained in the next paragraph.

Wage earners.—In addition to the report by sex and age of the number of wage earners on December 15, or other representative day, a report was obtained of the number employed on the 15th of each month, without distinction of sex or age. From these figures the average number of wage earners for the year has been calculated by dividing the sum of the numbers reported each month by 12. The average thus obtained represents the number of wage earners that would be required to perform the work done if all were constantly employed during the entire year. Accordingly, the importance of any industry as an employer of labor is believed to be more accurately measured by this average than by the number employed at any one time or on a given day.

The number of wage earners reported for the representative day, though given for each separate industry, is not totaled for all industries combined, because in view of the variations of date such a total is believed not to be significant. It would involve more or less duplication of persons working in different industries at different times, would not represent the total number employed in all industries at any one time, and would give an undue weight to seasonal industries as compared with industries in continual operation.

In particular, totals by sex and age for the wage earners reported for the representative day would be misleading because of the undue weight given to seasonal industries, in some of which, such as canning and preserving, the distribution of the wage earners by sex and age is materially different from that in most industries of more regular operation. In order to determine as nearly as possible the sex and age distribution of the average number of wage earners in the state as a whole, the following procedure has been adopted:

The percentage distribution by sex and age of the wage earners in each industry, for December 15, or the nearest representative day, has been calculated from the actual numbers reported for that date. This percentage has been applied to the average number of wage earners for the year in that industry, to determine the average number of men, women, and children employed. These calculated averages for the several industries have been added up to give the average distribution for the state as a whole.

In 1899 and 1904 the schedule called for the average number of wage earners of each sex 16 years and over, and the total number under 16 years of age, for each month, and these monthly statements were combined in an annual average. Comparatively few manufacturing concerns, however, keep their books in such way as to show readily the number of men, women, and children (under 16) employed each month. These monthly returns by sex and age were, in fact, largely estimates. It was believed that a more accurate and reliable sex and age distribution could be secured by taking as a basis of estimate the actual numbers employed on a single day.

Prevailing hours of labor.—The census made no attempt to ascertain the number of employees working a given number of hours per week. The inquiry called merely for the prevailing practice followed in each establishment. Occasional variations in hours in an establishment from one period to another are disregarded, and

no attention is given to the fact that a limited number of employees may have hours differing from those of the majority. In the tables all the wage earners of each establishment are counted in the class within which the establishment itself falls. In most establishments, however, all or practically all the employees work the same number of hours, so that these figures give a substantially correct picture of the hours of labor in manufacturing industries.

Capital.—For reasons stated in prior census reports, the statistics of capital secured by the census canvass are so defective as to be without value, except as indicating very general conditions. The instructions on the schedule for securing capital were as follows:

The answer should show the total amount of capital, both owned and borrowed, on the last day of the business year reported. All the items of fixed and live capital may be taken at the amounts carried on the books. If land or buildings are rented, that fact should be stated and no value given. If a part of the land or buildings is owned, the remainder being rented, that fact should be so stated and only the value of the owned property given. Do not include securities and loans representing investments in other enterprises.

Materials.—Cost of materials refers to the materials used during the year, which may be more or less than the materials purchased during the year. The term materials includes fuel, rent of power and heat, mill supplies, and containers, as well as materials forming a constituent part of the product. Fuel includes all fuel used, whether for heat, light, or power, or for the process of manufacture.

Expenses.—Under "Expenses" are included all items of expense incident to the year's business, except interest, whether on bonds or other forms of indebtedness, and allowances for depreciation.

Value of products.—The value of products for any industry includes the total value of all products manufactured in establishments whose products of chief value fall under the industry designation. The amounts given represent the selling value at the factory of all products manufactured during the year, which may differ from the value of the products sold. Amounts received for work on materials furnished by others are included.

Value added by manufacture.—The value of products is not a satisfactory measure of either the absolute or the relative importance of a given industry, because only a part of this value is actually created by the manufacturing process carried on in the industry itself. Another part of it, and often by far the larger part, represents the value of the materials used, which have been produced by agriculture or mining or by other industrial establishments. For many purposes, therefore, the best measure of the importance of different classes of industry is the value created as the result of the manufacturing operations carried on within the industry. This value is obtained by deducting the cost of the materials consumed from the value of the product. The figure thus obtained is termed in the census reports "value added by manufacture."

There is a further statistical advantage which "value added" has over gross value of products. In combining the value of products for all industries the value of products produced by one establishment and used as materials in another is duplicated, and the total, therefore, gives a greatly exaggerated idea of the wealth created. No such duplication takes place in the total "value added by manufacture."

Cost of manufacture and profits.—Census data do not show the entire cost of manufacture, and consequently can not be used to show profits. No account has been taken of interest and depreciation. Even if the amount of profit could be determined by deducting the expenses from the value of the products, the rate of profit on the investment could not properly be calculated, because of the very defective character of the returns regarding capital.

Primary power.—The figures given for this item show the total of the primary power used by the establishments. They do not cover the power developed by motors operated by such power, the inclusion of which would evidently result in duplication.

Location of establishments.—The Census Bureau has classified establishments by their location in cities or classes of cities. In interpreting these figures due consideration should be given to the fact that often establishments are located just outside the bound-

aries of cities, and are necessarily so classified, though locally they are looked upon as constituting a part of the manufacturing interests of the cities.

Laundries.—The census of 1909 was the first to include statistics of laundries. The reports are confined to establishments using mechanical power. The data are presented separately and are

not included in the general total for manufacturing industries, in order to avoid interference with comparisons with prior censuses.

Custom sawmills and gristmills.—In order to make the statistics for 1909 comparable with those for 1904, the data for these mills have been excluded from all the tables presenting general statistics, and are given in a separate table at the end of this report.

INDUSTRIES IN GENERAL.

General character of the state.—Michigan, with a gross area of 57,980 square miles, of which 500 represent water surface, and a population in 1910 of 2,810,173, ranks twenty-second in area and eighth in population among the 49 states and territories of continental United States. The total population was 2,420,982 in 1900 and 2,093,890 in 1890. In 1910 the density of population for the entire state was 48.9 per square mile, the corresponding figure for 1900 being 42.1. In 1910, 47.2 per cent of the entire population of the state resided in cities and incorporated villages having 2,500 inhabitants or over, as against 39.3 per cent in 1900.

In 1910 the following three cities in the state had a population of over 50,000: Detroit, 465,766; Grand Rapids, 112,571; and Saginaw, 50,510. There were also 21 cities having a population of over 10,000 but less than 50,000. (See table on page 12.) These 24 cities of more than 10,000 inhabitants contained 37.1 per cent of the total population of the state in 1910 and were credited with 68.5 per cent of the total value of its manufactures for 1909. Apart from these cities, only 10.1 per cent of the population resided in places of 2,500 inhabitants or over.

The growth of the manufacturing industries has been closely related to the development of the transportation facilities of the state. The rapid advance in manufactures dates from about 1825, when the Erie Canal, affording connection with the eastern seaboard, was opened. The transportation facilities of the state at present, both by rail and by water, are excellent. With 9,059 miles of railroad in 1909, Michigan was the sixth state in the Union in the length of its trackage.¹ The state borders on four of the Great Lakes, which furnish splendid intrastate and interstate communication by water. Detroit, located on the main lines of several of the most important railroad systems connecting the Eastern states with the Middle West, and near the western end of Lake Erie, is particularly well situated as a commercial center.

Importance and growth of manufactures.—Michigan has for many years been one of the leading manufacturing states. In 1849 the value of its manufactured products amounted to \$11,169,000; by 1869 it had increased to \$118,395,000; and in 1909 it amounted to \$685,109,000. The early development of manufactures in the state was due largely to the utilization

of its extensive forests, while the growing markets afforded by the rapidly developing West, the advantageous situation of the state with respect to the markets of both the East and the West, and its important agricultural and mineral resources have also been influential factors in its later progress.

During 1849 an average of 9,344 wage earners, representing 2.3 per cent of the total population of the state, were employed in manufactures, while in 1909 an average of 231,499 wage earners, or 8.2 per cent of the total population, were so engaged. During this period the gross value of manufactured products per capita of the total population of the state increased from \$28 to \$244. The proportion which the manufactures of the state represented of the total value of the products of manufacturing industries in the United States increased from 1.1 per cent in 1849 to 2.8 per cent in 1899 and 3.3 per cent in 1909. The growing industrial importance of Michigan is indicated by the fact that in the value of manufactured products it has advanced from seventeenth place among the states of the Union in 1849 to ninth in 1899, eighth in 1904, and seventh in 1909.

The table on the next page gives the most important figures relative to all classes of manufactures combined for 1909, 1904, and 1899, together with the percentages of increase from census to census.

In 1909 the state of Michigan had 9,159 manufacturing establishments, which gave employment to an average of 271,071 persons during the year and paid out \$153,838,000 in salaries and wages. Of the persons employed, 231,499 were wage earners. These establishments turned out products to the value of \$685,109,000, to produce which materials costing \$368,612,000 were utilized. The value added by manufacture was thus \$316,497,000, which figure, as explained in the Introduction, best represents the net wealth created by manufacturing operations during the year.

In general, this table brings out the fact that the manufacturing industries of Michigan as a whole showed a greater development during the more recent five-year period 1904–1909 than during the preceding five-year period 1899–1904. The absolute gain in value of products for the five years from 1904 to 1909 was \$255,989,000, which surpassed the total value of products for the state in any census year prior to 1889. During this period the number of establishments increased 23 per cent, the average number of wage

¹ Statistics of Railways in the United States, Interstate Commerce Commission, 1909.

earners 32.1 per cent, and the amount paid in wages 46.4 per cent, while the value of products increased 59.7 per cent and the value added by manufacture 59 per cent.

As pointed out in the Introduction, it would be

improper to infer that manufactures increased in volume to the full extent indicated by these figures regarding values, since the increase shown is certainly due, in part, to the increase that has taken place in the prices of commodities.

	NUMBER OR AMOUNT.			PER CENT OF INCREASE.	
	1909	1904	1899	1904-1909	1899-1904
Number of establishments.....	9, 159	7, 446	7, 310	23. 0	1. 9
Persons engaged in manufactures.....	271, 071	200, 196	(¹)	35. 4	(¹)
Proprietors and firm members.....	8, 965	7, 732	(¹)	15. 9	(¹)
Salaried employees.....	30, 607	17, 235	13, 350	77. 6	29. 1
Wage earners (average number).....	231, 499	175, 229	155, 800	32. 1	12. 5
Primary horsepower.....	598, 288	440, 890	368, 497	35. 7	19. 6
Capital.....	\$583, 947, 000	\$337, 894, 000	\$246, 997, 000	72. 8	36. 8
Expenses.....	591, 296, 000	374, 842, 000	275, 876, 000	57. 7	35. 9
Services.....	153, 838, 000	98, 749, 000	74, 868, 000	55. 8	31. 9
Salaries.....	34, 870, 000	17, 470, 000	12, 336, 000	99. 6	41. 6
Wages.....	118, 968, 000	81, 279, 000	62, 532, 000	46. 4	30. 0
Materials.....	368, 612, 000	230, 081, 000	175, 966, 000	60. 2	30. 8
Miscellaneous.....	68, 846, 000	46, 012, 000	25, 042, 000	49. 6	83. 7
Value of products.....	685, 109, 000	429, 120, 000	319, 692, 000	59. 7	34. 2
Value added by manufacture (value of products less cost of materials).....	316, 497, 000	199, 039, 000	143, 726, 000	59. 0	38. 5

¹ Figures not available.

The relative importance and growth of the leading manufacturing industries of the state are shown in the table on page 5.

It should be borne in mind, in considering this table, that the value of products in some of the industries involves a certain amount of duplication, due to the use of the product of one establishment in the industry as material for another establishment.

In addition to the 58 industries presented separately in the table for which products valued at more than \$1,000,000 were reported, there are 13 other industries which had a value of products in excess of that amount in 1909. They are included under the head of "All other industries" in the table, in some cases because the operations of individual establishments would be disclosed if they were shown separately; in others, because the returns do not properly present the true condition of the industry, for the reason that it is more or less interwoven with one or more other industries; and in still others, because comparative statistics can not be presented for either 1899 or 1904, on account of changes in classification or because such figures would disclose the operations of individual establishments. Of these industries the smelting and refining of copper was the most important, and ranked high among the leading industries of the state. The construction of steam-railroad cars, consisting in Michigan almost entirely of freight cars, was next in importance, but there were only two establishments in the state in 1909 engaged in this industry. Detroit was an important center of the industry, having one of the largest car plants in the country. The manufacture of cash registers and calculating machines is another important industry for which separate statistics can not be presented. This industry also was centered in Detroit and has developed almost wholly within the

past five years. The manufacture of billiard tables and materials, and the manufacture of matches are not among the leading industries in the state, but are worthy of mention because Michigan is one of the chief states of the Union in both branches of manufacture. The eight remaining industries having products valued at more than \$1,000,000 which are included under "All other" are: Blacking and cleansing and polishing preparations; explosives; house-furnishing goods, "not elsewhere specified;" iron and steel, bolts, nuts, washers, and rivets, not made in steel works or rolling mills; liquors, distilled; rubber goods, "not elsewhere specified;" silk and silk goods; and wire. The statistics for 1909, however, for the manufacture of blacking and cleansing and polishing preparations, and the manufacture of iron and steel bolts, nuts, washers, and rivets, other than in steel works or rolling mills, are presented in Table II, page 34.

The most important industries listed in the table, in which they are arranged in the order of the value of products, call for brief consideration.

Automobiles, including bodies and parts.—The manufacture of automobiles in Michigan on any considerable scale commenced in Detroit less than a decade ago, although it had been carried on to a limited extent prior to that time. The industry developed rapidly, and by 1904 Michigan had become the leading state in the manufacture of automobiles, which position it held in 1909. In 1904 Michigan contributed 26.6 per cent of the total value of products for this industry for the country as a whole, while in 1909 the proportion had increased to 38.8 per cent. The total value of products for this industry in Michigan in 1909 was \$96,651,000, which was more than twelve times the amount reported for 1904, while the value added by

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manufacture in 1909 was over nine times that reported for 1904. Of the total value of manufactured products and value added by manufacture for the state in 1909, the automobile industry contributed 14.1 per cent and 13.5 per cent, respectively, while of the total increase of \$255,989,000 in value of products for all manufacturing industries in the state from 1904 to 1909,

\$88,654,000, or over one-third, was reported for this one industry. This classification also includes the manufacture of automobile parts and accessories, but this branch of the industry has become so interwoven with other industries that it is impossible to determine to what extent it is covered by the statistics for the automobile industry.

INDUSTRY.	Number of establishments.	WAGE EARNERS.		VALUE OF PRODUCTS.		VALUE ADDED BY MANUFACTURE.		PER CENT OF INCREASE. ¹			
		Average number.	Per cent distribution.	Amount.	Per cent distribution.	Amount.	Per cent distribution.	Value of products.		Value added by manufacture.	
								1904-1909	1899-1904	1904-1909	1899-1904
All industries	9,159	231,499	100.0	\$985,109,000	100.0	\$316,497,000	100.0	59.7	34.2	59.0	38.5
Automobiles, including bodies and parts.....	113	25,444	11.0	96,651,000	14.1	42,739,000	13.5	1,108.6	-----	839.2	-----
Lumber and timber products.....	1,180	35,027	15.4	61,514,000	9.0	32,472,000	10.3	7.5	-16.7	(²)	-11.2
Foundry and machine-shop products.....	654	21,049	9.4	45,399,000	6.6	26,688,000	8.4	44.4	23.6	53.8	16.6
Flour-mill and gristmill products.....	520	1,530	0.7	34,801,000	5.1	5,502,000	1.7	31.5	22.5	77.6	-4.3
Furniture and refrigerators.....	202	16,010	7.2	28,642,000	4.2	16,024,000	5.4	39.7	27.8	42.7	38.0
Printing and publishing.....	1,045	7,210	3.1	17,348,000	2.5	12,413,000	3.9	44.0	46.8	43.9	37.8
Tobacco manufactures.....	720	7,876	3.4	16,179,000	2.4	8,971,000	2.8	36.4	28.3	27.8	14.8
Leather, tanned, curried, and finished.....	24	2,291	1.0	15,331,000	2.2	3,216,000	1.0	64.1	55.3	55.1	56.9
Butter, cheese, and condensed milk.....	435	1,073	0.5	14,287,000	2.1	1,010,000	0.6	74.0	109.5	61.6	83.3
Paper and wood pulp.....	32	4,327	1.9	13,622,000	2.0	4,807,000	1.6	89.6	74.0	77.4	82.8
Brass and bronze products.....	60	4,771	2.1	13,890,000	2.0	4,807,000	1.6	-----	-----	-----	-----
Patent medicines and compounds and druggists' preparations.....	159	3,240	1.4	13,475,000	2.0	8,534,000	2.7	28.7	43.7	27.0	51.7
Slaughtering and meat packing.....	45	902	0.4	13,435,000	2.0	1,799,000	0.6	111.4	17.7	143.3	24.9
Chemicals.....	30	3,174	1.4	12,890,000	1.9	7,818,000	2.5	42.6	69.7	68.7	75.8
Food preparations.....	49	1,303	0.6	11,492,000	1.7	6,742,000	2.1	70.2	267.0	49.9	270.5
Bread and other bakery products.....	816	2,637	1.1	11,082,000	1.6	4,411,000	1.4	55.7	73.6	35.2	76.9
Beet sugar.....	11	1,400	0.6	10,477,000	1.5	4,249,000	1.3	94.8	235.7	162.8	228.7
Carriages and wagons and materials.....	212	4,034	1.7	10,169,000	1.5	4,807,000	1.6	-31.8	15.5	-24.1	20.8
Liquors, malt.....	79	1,527	0.7	6,840,000	1.4	7,419,000	2.3	40.6	32.1	39.8	29.1
Agricultural implements.....	32	2,359	1.0	6,273,000	1.4	6,383,000	2.0	6.3	37.5	22.2	35.4
Stoves and furnaces, including gas and oil stoves.....	33	4,482	1.9	6,123,000	1.3	6,307,000	2.0	13.7	-----	19.2	-----
Paint and varnish.....	20	1,024	0.4	7,416,000	1.1	3,384,000	1.1	24.5	75.9	33.0	79.3
Cars and general shop construction and repairs by steam-railroad companies.....	32	5,401	2.3	6,838,000	1.0	3,022,000	1.2	27.4	23.9	41.6	25.2
Gas, illuminating and heating.....	55	1,771	0.8	6,748,000	1.0	4,610,000	1.5	74.5	102.5	68.2	133.7
Clothing, men's, including shirts.....	40	3,580	1.5	6,532,000	1.0	3,143,000	1.0	55.4	2.6	87.4	-2.7
Iron and steel, blast furnaces.....	11	1,016	0.4	5,824,000	0.8	1,600,000	0.5	25.4	99.6	3.9	67.0
Wirework, including wire rope and cable.....	37	909	0.4	5,285,000	0.8	1,830,000	0.6	62.8	107.7	25.2	107.5
Boots and shoes, including cut stock and findings.....	23	2,465	1.1	5,266,000	0.8	1,900,000	0.6	48.0	84.4	20.0	101.7
Shipbuilding, including boat building.....	91	2,344	1.0	5,034,000	0.7	2,544,000	0.8	69.3	-32.9	34.3	-15.2
Canning and preserving.....	104	2,073	0.9	4,971,000	0.7	1,897,000	0.6	30.2	43.7	31.5	72.6
Copper, tin, and sheet-iron products.....	152	2,386	1.0	4,920,000	0.7	2,384,000	0.8	70.6	177.0	59.7	234.0
Corsets.....	14	2,461	1.1	4,368,000	0.6	2,431,000	0.8	121.2	10.0	65.4	27.9
Musical instruments, pianos and organs and materials.....	17	1,770	0.8	4,226,000	0.6	2,217,000	0.7	113.0	68.1	79.7	74.8
Hosiery and knit goods.....	35	2,545	1.1	4,029,000	0.6	1,082,000	0.6	11.2	29.8	11.3	63.6
Copperage and wooden goods, not elsewhere specified.....	101	2,642	1.1	3,989,000	0.6	1,985,000	0.6	2.5	65.7	-5.4	105.0
Salt.....	27	1,363	0.6	3,653,000	0.5	2,010,000	0.6	51.0	-2.3	65.0	-11.1
Clothing, women's.....	52	2,194	0.9	3,587,000	0.5	1,877,000	0.6	-1.2	65.4	-1.1	94.7
Paper goods, not elsewhere specified.....	18	1,181	0.5	3,551,000	0.5	1,698,000	0.5	167.2	-----	211.5	-----
Confectionery.....	56	1,052	0.5	2,944,000	0.4	1,147,000	0.4	73.5	25.4	72.2	18.9
Cement.....	13	1,306	0.6	2,915,000	0.4	1,512,000	0.5	13.0	-----	-8.4	-----
Iron and steel, steel works and rolling mills.....	8	1,183	0.5	2,670,000	0.4	1,072,000	0.3	-1.5	-24.1	17.5	-24.6
Boxes, fancy and paper.....	19	1,320	0.6	2,653,000	0.4	1,035,000	0.3	100.0	155.0	114.7	123.1
Leather goods.....	57	834	0.4	2,500,000	0.4	1,102,000	0.4	84.3	-4.3	75.2	-2.8
Wood distillation, not including turpentine and rosin.....	12	806	0.3	2,399,000	0.4	1,244,000	0.4	225.1	-----	221.4	-----
Electrical machinery, apparatus, and supplies.....	40	1,218	0.5	2,327,000	0.3	1,297,000	0.4	231.5	60.3	217.0	59.4
Fur goods.....	31	619	0.3	2,284,000	0.3	1,300,000	0.4	29.0	2.5	76.9	26.1
Brick and tile.....	124	1,565	0.7	2,047,000	0.3	1,472,000	0.5	24.0	45.3	20.1	39.7
Show cases.....	11	823	0.4	1,866,000	0.3	1,070,000	0.3	69.2	769.4	61.4	670.9
Wood, turned and carved.....	58	1,137	0.5	1,708,000	0.3	1,074,000	0.3	9.0	69.6	9.8	53.5
Woolen, worsted, and felt goods, and wool hats.....	15	554	0.2	1,571,000	0.2	708,000	0.2	-----	-----	-----	-----
Gas and electric fixtures and lamps and reflectors.....	20	395	0.2	1,546,000	0.2	904,000	0.3	-----	-----	-----	-----
Marble and stone work.....	113	551	0.2	1,504,000	0.2	612,000	0.3	38.2	10.6	32.6	26.5
Wall plaster.....	16	746	0.3	1,421,000	0.2	1,009,000	0.3	68.8	-----	118.4	-----
Springs, steel, car and carriage.....	5	588	0.3	1,308,000	0.2	760,000	0.2	141.8	-7.4	189.6	-4.8
Cars and general shop construction and repairs by street-railroad companies.....	15	574	0.2	1,301,000	0.2	352,000	0.1	121.3	66.7	28.6	95.0
Window shades and fixtures.....	7	686	0.3	1,296,000	0.2	489,000	0.2	155.1	-----	230.4	-----
Cutlery and tools, not elsewhere specified.....	37	698	0.3	1,124,000	0.2	740,000	0.2	54.0	58.7	65.1	56.5
Coffins, burial cases, and undertakers' goods.....	18	439	0.2	1,085,000	0.2	602,000	0.2	-11.4	54.9	-15.4	63.6
Artificial stone.....	191	514	0.2	903,000	0.1	559,000	0.2	663.0	-----	635.5	-----
Mattresses and spring beds.....	14	306	0.1	889,000	0.1	282,000	0.1	34.0	-1.3	54.1	-8.0
Fancy articles, not elsewhere specified.....	11	1,147	0.5	593,000	0.1	394,000	0.1	-----	-----	-----	-----
Scales and balances.....	4	228	0.1	524,000	0.1	295,000	0.1	103.1	226.6	52.8	275.4
Oil, essential.....	23	54	(²)	480,000	0.1	71,000	(²)	102.5	29.0	-4.1	12.1
All other industries	946	21,562	9.3	87,874,000	12.8	34,552,000	10.9	-----	-----	-----	-----

¹ Percentages are based on figures in Table I, and a minus sign (-) denotes decrease. Where the percentages are omitted, comparable figures can not be given.
² Less than one-tenth of 1 per cent.

A number of the foundries and machine shops were engaged incidentally in the manufacture of automobile parts and accessories, and rubber automobile tires form a very important item in the manufacture of "Rubber goods, not elsewhere specified." Many electric attachments and motors are also made in establishments engaged in the general manufacture of electrical machinery, apparatus, and supplies, and the brass mountings and fixtures used on automobiles are made to a considerable extent in establishments primarily engaged in the manufacture of brass and bronze products.

Lumber and timber products.—This classification includes logging plants, whose chief products are logs and bolts; sawmills, shingle mills, and planing mills producing rough lumber, shingles, lath, cooperage materials, sash, doors, blinds, interior finish, and other millwork; and wooden packing-box factories. The statistics for those mills engaged exclusively in custom sawing for local consumption are not included here, but are shown separately on page 25. Until the rise of the automobile industry, this was the most important industry in the state as measured by value of products, and it still continues to lead all others in number of establishments, average number of wage earners, and amount paid in wages. The supply of timber in the state has been declining steadily, and the value of products showed a decrease both from 1889 to 1899 and from 1899 to 1904. Since 1904, however, the industry has shown a slight increase in this respect. In 1909 the total value of products reported for this industry was \$61,514,000 and it gave employment to an average of 35,627 wage earners during the year.

Foundry and machine-shop products.—In addition to the general class of foundries and machine shops, this industry also includes establishments which manufacture bells, gas machines and meters, hardware, plumbers' supplies, steam fittings, and structural ironwork. The industry was really of greater importance in the state than is indicated by the statistics, as some machine shops manufactured a distinctive product and were assigned to other classifications. A number of the most important establishments were engaged in the manufacture of cast-iron radiators and boilers for steam and hot-water heating, gas engines and automobile motors, and cranes and pile drivers. The gross value of products increased from \$25,430,000 in 1899 to \$45,399,000 in 1909, or 78.5 per cent for the decade.

Food and kindred products.—This group of industries in Michigan includes seven industries, namely, flour mills and gristmills; the butter, cheese, and condensed milk industry; slaughtering and meat packing; the manufacture of food preparations; bakeries; the beet sugar industry; and canning and preserving. The

figures for the mills which do custom grinding only are not included in the general tables but are shown in a separate statement on page 25. Under the slaughtering and meat-packing classification are included wholesale establishments which do slaughtering, prepare or pack meat, and manufacture sausage. The classification "Food preparations" includes the statistics for the factories which manufacture fancy cereals, mincemeat, canned soups, and similar preparations as chief products. The canning and preserving industry embraces all establishments in which fruit, vegetables, and fish, are canned or preserved, as well as those which prepare pickles, preserves, and sauces. In 1909 there were 1,980 establishments reported for these seven industries, which employed 10,978 wage earners and manufactured products valued at \$100,605,000, adding \$26,480,000 to the cost of materials by the process of manufacture. This group of industries, however, is of much less importance relatively when measured by value added by manufacture or average number of wage earners than when measured by value of products, owing principally to the comparatively simple processes involved in the manufacture of flour-mill and gristmill products, and butter, cheese, and condensed milk, and in slaughtering and meat packing. Each of these seven industries showed a noteworthy increase in value of products during the decade, the largest percentage of gain being that of 554 in the beet-sugar industry, and the smallest that of 61.1 in the flour-mill and gristmill industry.

Furniture and refrigerators.—Michigan was the second state in the Union in the manufacture of furniture and refrigerators in 1909, and first in the manufacture of refrigerators alone. Of the 202 establishments included in this classification in 1909, only 10 were primarily engaged in the manufacture of refrigerators, the value of the output of these establishments constituting about one-twelfth of the total value of products reported for the industry. The importance of the industry in the state is no doubt due largely to the abundant available supply of pine and hardwood suitable for these purposes. While the supply of such woods in the state has diminished in late years, the quantity of high-grade lumber imported has largely increased, and the industry in the state has maintained the impetus afforded by its early natural advantages and continued to prosper, as is indicated by the fact that the average number of wage earners employed increased from 12,833 to 16,610, or 29.4 per cent, and the value of products from \$16,040,000 to \$28,642,000, or 78.6 per cent, during the decade. During this period, however, the proportion which the value of the products of the furniture and refrigerator industry in Michigan formed of the total reported for the

industry in the United States has decreased, being 11.9 per cent in 1909 and 12.3 per cent in 1899.

Printing and publishing.—This industry includes establishments engaged in printing and publishing newspapers and periodicals, books, or music; job printing offices; establishments engaged in bookbinding and blank-book making; and those that make a specialty of lithographing and of steel or copper-plate engraving. This is the second industry in the state in number of establishments, reporting in 1909 about one-ninth of all manufacturing establishments, although it employed only 3.1 per cent of the wage earners and contributed only 2.5 per cent of the value of products. The industry experienced a decided growth during the last decade, the number of wage earners increasing 2,177, or 43.2 per cent, and the value of products \$9,142,000, or 111.4 per cent.

Tobacco manufactures.—This industry covers the manufacture of cigars, cigarettes, chewing and smoking tobacco, and snuff. Of the 729 establishments included in the industry, all but 14 were engaged primarily in the manufacture of cigars and cigarettes, but the value of the output formed only about three-fifths of the total shown for the entire industry. Detroit is the center of the industry, as it reported over three-fourths of the total value of the tobacco products for the state in 1909. The total value of products increased from \$9,245,000 in 1899 to \$11,864,000 in 1904 and \$16,179,000 in 1909, making a gain of \$6,934,000, or 75 per cent, for the decade.

Leather, tanned, curried, and finished.—This industry includes not only establishments which are engaged primarily in the tanning, currying, and finishing of leather for themselves but also those which treat hides or skins for others. The cost of materials and the value of products, however, do not include the cost or value of the hides or skins treated under contract. In 1849 Michigan reported 61 establishments, which employed only 283 wage earners and turned out products valued at only \$402,000, whereas in 1909, 24 plants were reported, which engaged 2,291 wage earners, and the value of whose products amounted to \$15,331,000. The real development of the industry, however, has taken place since 1889, when the value of products was only \$1,744,000. During the following 10 years the value of the output of the tanneries in the state increased over 240 per cent, while during the next decade the increase was over 150 per cent.

Paper and wood pulp.—Of the 32 establishments included in this classification, there were 8 which manufactured both pulp and paper and 24 which produced paper only. All but 5 of the last-named mills used wood pulp to some extent. The development of the industry in Michigan has been due to the more extensive use of wood pulp in the manufacture of paper.

In 1889 there were 31 establishments reported for the state, which employed an average of 1,219 wage earners and manufactured products valued at \$2,919,000. The growth during the decade 1899–1909 was particularly noteworthy, as the value of products increased from \$4,218,000 to \$13,922,000, a gain of \$9,704,000, or 230.1 per cent.

Brass and bronze products.—In 1909 this industry in Michigan included 60 establishments, of which 45 were primarily engaged in the manufacture of brass castings and brass goods, such as oiling devices, brass spigots, and automobile and motor specialties; 12 in the manufacture of brass ware, such as ornaments for furniture, stair rods, and automobile parts; 2 in the production of rolled brass and copper; and 1 in the manufacture of brass. The remarkable development of this industry in the state during recent years has been due mainly to the increased demand for brass specialties in the manufacture of automobiles. The total value of products increased from \$2,148,000 in 1899 to \$13,890,000 in 1909. Michigan ranked third among the states of the Union in this industry, as measured by value of products.

Patent medicines and compounds and druggists' preparations.—Of the 159 establishments reported in 1909, 116 were primarily engaged in the manufacture of patent medicines and compounds, but the total value of products for these establishments represented only about one-eighth of the total shown for the industry. The 18 establishments engaged in the manufacture of druggists' preparations contributed about four-fifths of the total value of products. This industry also included 25 establishments manufacturing perfumes and cosmetics in 1909. Michigan is second among the states of the Union in the industry as a whole and first in the manufacture of druggists' preparations. In 1909 the total value of products was \$13,475,000, as compared with \$7,284,000 in 1899.

Chemicals.—Although this industry did not rank among the first in the state, Michigan held fourth place among the states of the Union in the value of chemical products manufactured. The large supply of brine from the salt wells of the state has made the manufacture of alkali products of great importance. The value of sodas forms about five-eighths of the total value of products for this industry in 1909. A comparatively large number of small establishments were engaged in the manufacture of potash, principally from wood ashes. The growth of the industry has been rapid, the value of products being \$12,890,000 in 1909, an increase over 1899 of 142.1 per cent.

Carriages and wagons and materials.—This classification includes those establishments which made five or more horse-drawn vehicles during the year, as well as those engaged in the manufacture of carriage or

wagon bodies, tops, or other parts. In contrast to the great increase noted in the automobile industry from 1904 to 1909 has been the decline in the manufacture of carriages and wagons during the same period. While the value of products of this industry increased from \$12,887,000 in 1899 to \$14,889,000 in 1904, it decreased to \$10,159,000 in 1909, a loss of 31.8 per cent in the last five years.

Other industries which are of less importance in the state but in which Michigan holds high rank among the states are the manufacture of stoves and furnaces and of corsets, the salt industry, wood distillation, and the manufacture of fur goods, show cases, and wall plaster.

Several industries are not fully represented by the statistics given in the above table, because to a large extent they are interwoven with one or more other industries. Important among these are the manufacture of steel springs for cars and carriages, the making of window shades and fixtures, the production of wire-work, including wire rope and cable, and the turning and carving of wood.

The rank of the industries when measured by value added by manufacture differs considerably from their rank based on value of products. Of all the industries presented separately in this table, only six hold the same position when ranked according to value added by manufacture. Noticeable changes in rank are found in the case of slaughtering and meat packing, which drops from thirteenth place in gross value to thirty-sixth place in added value; the butter, cheese, and condensed-milk industry, which falls from ninth to thirty-first place; the leather industry, which drops from eighth to twenty-second; and the flour-mill and gristmill industry, which falls from fourth to thirteenth place. On the other hand, the malt-liquor industry advances from nineteenth to ninth place; the manufacture of salt from thirty-sixth to twenty-eighth; the manufacture of agricultural implements from twentieth to eleventh; and the manufacture of stoves and furnaces from twenty-first to twelfth.

This table shows also the percentages of increase or decrease for each industry in respect to value of products and value added by manufacture in all cases where comparable statistics can be presented. Exceptionally large increases are shown for several of the industries for each of the five-year periods, while others show marked decreases. From 1904 to 1909 the largest increases in both items are shown for the manufacture of automobiles, artificial stone, and electrical machinery, apparatus, and supplies, and for wood distillation, not including turpentine and rosin. In these four industries the percentages of increase in value of products ranged from 1,108.6 to 225.1. From 1899 to 1904 the largest gains in both items are shown for the manufacture of show cases, food preparations, beet sugar, and scales and balances. In value of products

four industries show a decrease from 1904 to 1909 and seven a decrease from 1899 to 1904, while the value added by manufacture decreases from 1904 to 1909 were reported for six industries and from 1899 to 1904 for nine industries. The largest relative decrease in value of products from 1904 to 1909 (31.8 per cent) was in the carriage and wagon industry.

Persons engaged in manufacturing industries.—The following table shows, for 1909, the distribution of the number of persons engaged in manufactures, the average number of wage earners being distributed by sex and age. It should be borne in mind, however, that the sex and age classification of the average number of wage earners in this and other tables is an estimate obtained by the method described in the Introduction.

CLASS.	PERSONS ENGAGED IN MANUFACTURES.		
	Total.	Male.	Female.
All classes	271,071	231,915	39,156
Proprietors and officials.....	16,996	16,434	562
Proprietors and firm members.....	8,965	8,564	401
Salaried officers of corporations.....	3,089	3,020	69
Superintendents and managers.....	4,942	4,844	98
Clerks.....	22,570	16,183	6,387
Wage earners (average number).....	231,499	199,298	32,201
16 years of age and over.....	228,082	197,777	31,295
Under 16 years of age.....	2,517	1,521	996

The average number of persons engaged in manufactures during 1909 was 271,071, of whom 231,499 were wage earners. Of the remainder, 16,996 were proprietors and officials, and 22,576 were clerks. Corresponding figures for individual industries will be found in Table II, page 34.

The next table shows, for 1909, the percentages of proprietors and officials, clerks, and wage earners, respectively, among the total number of persons employed in manufactures. It covers all industries combined and 29 important industries individually.

Of the total number of persons engaged in all manufacturing industries, 6.3 per cent were proprietors and officials, 8.3 per cent clerks, and 85.4 per cent wage earners. The highest percentages of proprietors and officials shown for any of the individual industries were for the flour mills and gristmills, the butter, cheese, and condensed-milk factories, and the bakeries, in which industries they constituted 31.8, 30.9, and 24.7 per cent, respectively, of the total number of persons engaged. In these industries, the majority of the establishments are comparatively small, and the work is to a large extent done by the proprietors or their immediate representatives, so that the proportion of persons engaged in these industries falling into the class of proprietors and officials is very much higher than for most other industries or for all industries combined.

On account of the large average number of wage earners in the establishments engaged in the manufacture of automobiles, of boots and shoes, and of paper and wood pulp, and in the steam-railroad repair shops, these industries show the smallest proportions of proprietors and officials.

dustry than in any other industry in the state, the largest actual number of such wage earners was reported for the tobacco manufactures industry, in which 534 children were employed, representing 6.3 per cent of the total number of wage earners engaged in the industry.

INDUSTRY.	PERSONS ENGAGED IN MANUFACTURES.			
	Total number.	Per cent of total.		
		Proprietors and officials.	Clerks.	Wage earners (average number)
All industries.....	271,071	6.3	8.3	85.4
Agricultural implements.....	3,041	5.3	17.1	77.6
Automobiles, including bodies and parts.....	28,098	1.9	7.5	90.0
Beet sugar.....	1,755	3.2	13.6	83.2
Boots and shoes, including cut stock and findings.....	2,703	2.1	7.0	90.8
Brass and bronze products.....	5,211	3.2	5.3	91.0
Bread and other bakery products.....	3,984	24.7	9.1	66.2
Butter, cheese, and condensed milk.....	1,740	30.9	7.5	61.7
Carriages and wagons and materials.....	4,707	7.7	6.6	85.7
Cars and general shop construction and repairs by steam-railroad companies.....	5,706	2.2	3.1	94.7
Chemicals.....	3,512	3.2	6.4	90.4
Clothing, men's, including shirts.....	3,944	2.9	6.4	90.8
Flour-mill and gristmill products.....	2,623	31.8	9.0	58.3
Food preparations.....	1,072	5.0	16.4	77.9
Foundry and machine-shop products.....	25,334	5.9	8.7	85.5
Furniture and refrigerators.....	18,299	3.2	6.1	90.8
Gas, illuminating and heating.....	2,435	6.3	20.9	72.7
Iron and steel, blast furnaces.....	1,101	3.3	4.4	92.3
Leather, tanned, curried, and finished.....	2,440	2.7	3.4	93.0
Liquors, malt.....	2,001	10.0	13.1	76.3
Lumber and timber products.....	39,011	5.8	2.8	91.3
Paint and varnish.....	1,657	4.2	34.0	61.8
Paper and wood pulp.....	4,531	2.2	3.4	94.5
Patent medicines and compounds and druggists' preparations.....	5,124	6.3	30.2	63.4
Printing and publishing.....	11,048	13.9	20.7	65.3
Shipbuilding, including boat building.....	2,758	5.4	9.6	85.0
Slaughtering and meat packing.....	1,114	7.6	11.4	81.0
Stoves and furnaces, including gas and oil stoves.....	5,027	2.8	8.0	89.2
Tobacco manufactures.....	9,242	10.2	4.5	85.2
Wirework, including wire rope and cable.....	1,261	6.5	21.4	72.1
All other industries.....	69,942	6.0	8.4	85.0

INDUSTRY.	WAGE EARNERS.			
	Average number. ¹	Per cent of total.		
		16 years of age and over.		Under 16 years of age.
		Male.	Female.	
All industries.....	231,499	85.4	13.5	1.1
Agricultural implements.....	2,359	90.4	0.1	0.4
Automobiles, including bodies and parts.....	25,444	98.0	1.1	(²)
Beet sugar.....	1,460	90.7	0.3	.....
Boots and shoes, including cut stock and findings.....	2,455	58.5	35.1	6.4
Brass and bronze products.....	4,771	93.7	3.1	3.2
Bread and other bakery products.....	2,037	80.0	18.2	1.8
Butter, cheese, and condensed milk.....	1,973	90.7	9.1	0.2
Carriages and wagons and materials.....	4,934	98.2	1.7	0.1
Cars and general shop construction and repairs by steam-railroad companies.....	5,401	90.8	0.1	0.2
Chemicals.....	3,174	90.0	0.8	0.3
Clothing, men's, including shirts.....	3,580	12.5	87.6	.....
Flour-mill and gristmill products.....	1,530	98.8	0.0	0.3
Food preparations.....	1,303	62.8	37.2	.....
Foundry and machine-shop products.....	21,649	98.0	1.4	0.5
Furniture and refrigerators.....	10,610	95.6	2.7	1.7
Gas, illuminating and heating.....	1,771	99.7	0.2	0.1
Iron and steel, blast furnaces.....	1,016	90.0	0.1	.....
Leather, tanned, curried, and finished.....	2,201	98.8	0.3	0.8
Liquors, malt.....	1,527	99.1	0.9	.....
Lumber and timber products.....	35,027	90.1	0.5	0.4
Paint and varnish.....	1,924	88.5	10.3	1.3
Paper and wood pulp.....	4,327	82.3	17.7	.....
Patent medicines and compounds and druggists' preparations.....	3,249	50.7	47.0	1.4
Printing and publishing.....	7,219	73.5	25.1	1.4
Shipbuilding, including boat building.....	2,344	90.7	0.3	.....
Slaughtering and meat packing.....	902	96.3	3.0	0.7
Stoves and furnaces, including gas and oil stoves.....	4,482	98.1	0.1	1.8
Tobacco manufactures.....	7,876	28.3	65.4	6.3
Wirework, including wire rope and cable.....	909	89.3	9.0	1.7
All other industries.....	59,455	73.2	25.4	1.4

¹ For method of estimating the distribution, by sex and age periods, of the average number in all industries combined, see Introduction.
² Less than one-tenth of 1 per cent.

The next table shows, for 1909, in percentages, for all industries combined, the distribution of the average number of wage earners by age periods, and for those 16 years of age and over by sex, calculated in the manner described in the Introduction. It also shows, for some of the important industries separately, a similar distribution of wage earners as reported for December 15, or the nearest representative day. As a means of judging the importance of the several industries, the average number employed for the year is also given in each case.

In order to compare the distribution of persons engaged in manufactures in 1909 with that shown at the census of 1904 it is necessary to use the classification employed at the earlier census. (See Introduction.) The following table makes this comparison according to occupational status:

For all industries combined, 85.4 per cent of the average number of wage earners were males 16 years of age and over, 13.5 per cent females 16 years of age and over, and only 1.1 per cent children under the age of 16. Women 16 years of age and over constituted 87.5 per cent of all wage earners in the men's clothing industry; 65.4 per cent of the total in the tobacco-manufactures industry; and 47.9 per cent of the total in the manufacture of patent medicines and compounds and druggists' preparations. A large number of women were also employed in making food preparations, in boot and shoe factories, and in printing and publishing establishments. Although the proportion of children under 16 years of age in the total number of wage earners was larger in the boot and shoe in-

CLASS.	PERSONS ENGAGED IN MANUFACTURES.				Per cent of increase, 1904-1909.
	1909		1904		
	Number.	Per cent distribution.	Number.	Per cent distribution.	
Total.....	271,071	100.0	200,196	100.0	35.4
Proprietors and firm members.....	8,965	3.3	7,732	3.9	15.9
Salariat employees.....	30,607	11.3	17,235	8.6	77.6
Wage earners (average number).....	231,499	85.4	175,229	87.5	32.1

Comparable figures are not obtainable for 1899. The table shows a greater percentage of increase in the salariat employees than in the other two classes. The next table shows the average number of wage earners, distributed according to age periods, and in the case of those 16 years of age and over, according to sex, for 1909, 1904, and 1899. The aver-

ages for 1909 are estimated on the basis of the actual number reported for a single representative day. (See Introduction.)

CLASS.	AVERAGE NUMBER OF WAGE EARNERS.					
	1909		1904		1899	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
Total.....	231,499	100.0	175,229	100.0	155,800	100.0
16 years of age and over..	228,982	98.9	171,046	98.1	153,279	98.4
Male.....	197,777	85.4	147,676	84.3	134,265	86.2
Female.....	31,205	13.5	24,270	13.8	19,014	12.2
Under 16 years of age....	2,517	1.1	3,283	1.9	2,521	1.6

This table indicates that for all industries combined there has not been much change in the proportions of male and female wage earners 16 years of age and over. In 1909 males 16 years of age and over formed 85.4 per cent of all wage earners, as compared with 84.3 per cent in 1904 and 86.2 per cent in 1899. The number of children employed in 1909 was practically the same as in 1899, but shows a decrease of 766 since 1904, while the proportion of such wage earners was somewhat less in 1909 than at either of the other two censuses.

Wage earners employed by months.—The following table gives the number of wage earners employed on the 15th of each month during the year 1909 for all industries combined, for the beet-sugar industry, and for all other industries combined; it gives also the percentage which the number reported for each month is of the greatest number reported for any month. In Table II, page 34, are shown, for practically all of the important industries in the state, the largest number and also the smallest number of wage earners reported for any month. The figures are for the 15th day, or the nearest representative day, of the month.

MONTH.	WAGE EARNERS.					
	All industries.		Beet sugar.		All other industries.	
	Number.	Percent of maximum.	Number.	Percent of maximum.	Number.	Percent of maximum.
January.....	211,679	84.6	925	21.2	210,754	85.6
February.....	218,230	87.3	290	6.6	217,040	85.5
March.....	223,087	89.2	292	6.7	222,795	89.0
April.....	223,273	89.0	403	9.2	221,870	89.1
May.....	226,811	90.7	536	12.3	226,275	91.0
June.....	229,058	91.6	576	13.2	228,482	92.8
July.....	232,023	92.8	475	15.4	231,348	93.9
August.....	235,804	94.4	755	17.3	235,040	95.4
September.....	240,310	96.1	878	20.1	239,432	97.2
October.....	241,912	96.7	4,050	92.6	237,302	96.6
November.....	246,720	98.7	4,372	100.0	242,357	98.4
December.....	250,078	100.0	3,773	86.3	246,305	100.0

The manufacture of beet sugar was the only seasonal industry of importance in the state. In this industry there was a variation in the number of wage earners employed from a minimum of 290 in February to a maximum of 4,372 in November, but the number employed was so small that the fluctuations in the industry affect but slightly the totals for all industries combined. It will be observed that, except for a slight decrease in April, the number of wage earners in all industries combined increased steadily throughout the year from January, the month of least activity, to December, the month of greatest activity.

Prevailing hours of labor.—In the next table wage earners have been classified according to the hours of labor prevailing in the establishments in which they are employed. In making this classification the average number of wage earners employed during the year is used, and the number employed in each establishment is classified as a total according to the hours prevailing in that establishment, even though a few employees work a greater or less number of hours.

It is evident from the figures that for nearly one-half of the wage earners employed in the manufacturing industries of Michigan the hours of labor were 60 a week. Of the remainder, the majority worked either 54 hours a week or between 54 and 60 hours a week. Only 7.7 per cent of the total worked in establishments where the prevailing number of hours of labor was less than 54 a week, and only 4.3 per cent in establishments where it was more than 60 a week.

Of the wage earners employed in the lumber industry, 32,413, or 91 per cent, were in establishments where the prevailing hours were 60 a week; in the furniture and refrigerator industry, 12,109, or 72.9 per cent, were in such establishments; and in the automobile industry, 13,564, or 53.3 per cent. More than one-half of the 113,762 wage earners in this class of establishments were, therefore, employed in these three industries. In the foundries and machine shops the hours usually ranged from 54 to 60 a week. In the distillation of wood and in the chemical and the gas industries, more than half the wage earners worked over 60 hours per week, while in the beet-sugar, blast-furnace, and cement industries all or the greater part of the wage earners worked 72 hours per week or more. On the other hand, in the manufacture of men's clothing, more than half the wage earners worked 48 hours per week or less, and the same hours prevailed for about one-third of the wage earners in marble and stone work, in the breweries, in printing and publishing establishments, and in the tobacco manufactures industry.

INDUSTRY.	AVERAGE NUMBER OF WAGE EARNERS IN ESTABLISHMENTS GROUPED ACCORDING TO PREVAILING HOURS OF WORK PER WEEK.								
	Total.	48 and under.	Between 48 and 54.	54.	Between 54 and 60.	60.	Between 60 and 72.	72.	Over 72.
All industries	231,499	11,174	6,612	38,449	51,552	113,762	2,748	1,284	5,918
Agricultural implements	2,359			1,110	787	453			
Artificial stone	514	3		159	25	327			
Automobiles, including bodies and parts	25,444	2	17	4,775	7,086	13,564			
Beet sugar	1,400								1,400
Boots and shoes, including out stock and findings	2,455	6	11	1,674	572	192			
Boxes, fancy and paper	1,326		12	490	470	345			
Brass and bronzo products	4,771		35	102	2,332	2,302			
Bread and other bakery products	2,637	128	120	702	195	1,211	201	52	28
Brick and tile	1,505	378	66	130	2	889			
Butter, cheese, and condensed milk	1,073	145	13	27	44	750	68	25	1
Canning and preserving	2,073	6		58	373	1,589	15	27	5
Carriages and wagons and materials	4,034	55		53	2,105	1,821			
Cars and general shop construction and repairs by steam-railroad companies	5,401		642	1,400	1,005	1,276	118		
Cars and general shop construction and repairs by street-railroad companies	574			360	19	190	2		3
Cement	1,306					38	294		974
Chemicals	3,174			2	1,426	35	174	96	1,441
Clothing, men's, including shirts	3,580	2,224	79	809	429	39			
Clothing, women's	2,194	114	823	1,101	48	48			
Coffins, burial cases, and undertakers' goods	439	2		50	151	230			
Confectionery	1,052	39	2	492	225	318	4	2	
Cooperage and wooden goods, not elsewhere specified	2,642	252		27	17	2,346			
Copper, tin, and sheet-iron products	2,386	81	54	907	620	723	1		
Corsets	2,461	7	42	1,000	299	123			
Cutlery and tools, not elsewhere specified	608			4	259	405			
Electrical machinery, apparatus, and supplies	1,218	4	26	236	310	642			
Fancy articles, not elsewhere specified	1,147	3	6	104	1,031	3			
Flour-mill and gristmill products	1,530	115	33	11	10	1,219	85	57	
Food preparations	1,303	5	17	34	127	834		279	7
Foundry and machine-shop products	21,640	160	108	3,936	9,355	8,096	14		
Fur goods	610		37	383	133	60			
Furniture and refrigerators	16,610	53	44	1,240	3,155	12,190			
Gas and electric fixtures and lamps and reflectors	395		21	28	156	190			
Gas, illuminating and heating	1,771	1		22	40	779	353	46	521
Hosiery and knit goods	2,545	8	308	807	758	606			
Iron and steel, blast furnaces	1,016						55		961
Iron and steel, steel works and rolling mills	1,183				317	866			
Leather goods	834			43	276	515			
Leather, tanned, curried, and finished	2,291				519	1,772			
Liquors, malt	1,527	605	8	378		423		113	
Lumber and timber products	35,627	341	263	721	1,762	32,413	124	3	
Marble and stone work	551	228	1	172	15	135			
Mattresses and spring beds	306			16	273	17			
Musical instruments, pianos and organs and materials	1,770		1	51	1,106	621			
Oil, essential	54				5	48	1		
Paint and varnish	1,024		25	634	60	296			
Paper and wood pulp	4,327				225	2,534	1,084	484	
Paper goods, not elsewhere specified	1,181	3	15	410	592	161			
Patent medicines and compounds and druggists' preparations	3,240	71	580	2,161	357	79	1		
Printing and publishing	7,210	2,718	833	2,334	833	500	1		
Salt	1,363	15		99	9	1,173	9	4	54
Scales and balances	228				228				
Shipbuilding, including boat building	2,344	2	3	85	1,093	1,161			
Show cases	823				72	621			
Slaughtering and meat packing	902	14		35	3	849	1		
Springs, steel, car and carriage	588				200	388			
Stoves and furnaces, including gas and oil stoves	4,482	255	671	60	1,180	2,316			
Tobacco manufactures	7,876	2,500	1,173	1,854	1,081	356	3		
Wall plaster	746			38	1	648		59	
Window shades and fixtures	636	24		68	281	263			
Wirework, including wire rope and cable	900		21	232	259	397			
Wood distillation, not including turpentine and rosin	806				6	345	88		367
Wood, turned and carved	1,137	10	18	20	36	1,053			
Woolen, worsted, and felt goods, and wool hats	554			25	51	478			
All other industries	21,502	588	484	5,595	5,294	9,416	52	37	96

Location of establishments.—The next table shows the extent to which the manufactures of Michigan are centralized in cities of 10,000 population or over. (See Introduction.) The comparison is confined here, as in other states, to the years 1899 and 1909, in the absence of a Federal census of population by which the grouping of cities in 1904 could be determined.

In 1909 the proportion of the total value of manufactured products reported from cities having over 10,000 inhabitants was 68.5 per cent, as compared with 55.7 per cent in 1899. It is natural that such

cities should show an increase in relative industrial importance in a state where the lumber industry is declining and where the chief growth in manufacturing is in such industries as the manufacture of automobiles, foundries and machine shops, the manufacture of furniture, and other industries generally conducted in large factories located in or near the centers of population.

The cities having a population of over 100,000 contributed 43.1 per cent of the total value of products in 1909, as compared with only 27.6 per cent in 1899. A part of this increase is occasioned by an addition to

the group. In 1899 Detroit was the only city in the state having over 100,000 inhabitants, but during the succeeding decade the population of Grand Rapids, which is an important manufacturing center, passed this figure, so that for 1909 its statistics are included with those of Detroit.

For 1909 the group comprising the cities having between 25,000 and 100,000 inhabitants, which reported 17.8 per cent of the total value of the manufactured products of the state in that year, includes

Saginaw, Bay City, Kalamazoo, Flint, Jackson, Lansing, and Battle Creek. In 1900, however, Kalamazoo, Flint, Lansing, and Battle Creek all had less than 25,000 inhabitants, so that for 1899 their statistics are included with those for the cities having between 10,000 and 25,000 inhabitants. The transfer of these four cities, therefore, largely accounts for the increased proportions of the totals for the various items shown for the cities having between 25,000 and 100,000 inhabitants.

ITEM.	Year.	Aggregate.	CITIES HAVING A POPULATION OF 10,000 AND OVER.								DISTRICTS OUTSIDE OF CITIES HAVING A POPULATION OF 10,000 AND OVER.	
			Total.		10,000 to 25,000		25,000 to 100,000		100,000 and over.		Number or amount.	Percent of total.
			Number or amount.	Percent of total.	Number or amount.	Percent of total.	Number or amount.	Percent of total.	Number or amount.	Percent of total.		
Population.....	1910	2,810,173	1,043,746	37.1	203,817	7.3	261,592	9.3	578,337	20.0	1,766,427	62.9
	1900	2,420,982	681,312	28.1	199,771	8.2	195,837	8.1	285,704	11.8	1,739,070	71.9
Number of establishments.....	1909	9,159	4,500	49.1	815	8.9	1,125	12.3	2,560	27.9	4,059	50.0
	1899	7,810	2,892	39.6	773	10.0	800	11.8	1,259	17.2	4,418	60.4
Average number of wage earners	1909	231,499	157,325	68.0	20,380	8.8	38,344	16.6	98,601	42.6	74,174	32.0
	1899	155,800	84,805	54.4	21,274	13.7	26,158	16.1	38,373	24.6	70,995	45.0
Value of products.....	1909	\$685,109,169	\$489,003,103	68.5	\$52,485,164	7.0	\$121,895,141	17.8	\$295,222,798	43.1	\$215,506,060	31.5
	1899	319,601,856	178,124,393	55.7	43,150,084	13.5	40,001,785	14.0	88,305,024	27.0	141,507,403	44.3
Value added by manufacture...	1909	316,497,147	227,482,140	71.9	23,887,087	7.0	58,325,512	18.4	145,209,541	45.9	89,015,007	28.1
	1899	143,725,728	85,008,397	59.1	22,206,278	15.5	21,353,692	14.8	41,358,427	28.8	58,717,331	40.9

The group of cities having a population of between 10,000 and 25,000 was augmented in 1909 by the addition of Pontiac, Escanaba, Ironwood, Traverse City, Adrian, and Holland, all of which had less than 10,000 inhabitants in 1900. In spite of these additions, however, the group, owing to the loss of the four cities above mentioned, shows a smaller proportion in 1909 as compared with 1899 of the total for each item covered by the table.

The population in 1910 and 1900 of the 24 cities which had 10,000 inhabitants or over in 1910 is given in the following tabular statement:

CITY.	1910	1900	CITY.	1910	1900
Detroit.....	405,766	285,704	Pontiac.....	14,532	9,799
Grand Rapids...	112,571	87,505	Escanaba.....	13,194	9,540
Saginaw.....	80,510	42,345	Ironwood.....	12,821	9,705
Bay City.....	45,166	40,747	Alpena.....	12,706	11,802
Kalamazoo.....	39,437	24,404	Sault Ste. Marie.	12,615	10,538
Flint.....	38,550	13,103	Ishpeming.....	12,448	13,255
Jackson.....	31,433	25,180	Manistee.....	12,381	14,280
Lansing.....	31,229	16,485	Traverse City...	12,115	9,407
Battle Creek.....	25,267	18,503	Marquette.....	11,593	10,058
Muskegon.....	24,062	20,818	Adrian.....	10,793	9,054
Port Huron.....	18,863	19,158	Menominee.....	10,507	12,818
Ann Arbor.....	14,817	14,509	Holland.....	10,490	7,790

¹ Includes population of West Bay City, annexed to Bay City in 1905.

The relative importance in manufactures of each of these 24 cities is shown in the next table, in which the value of products and average number of wage earners reported for each are shown separately for 1909, 1904, and 1899, so far as comparative figures are available.

Every city for which comparative figures are available, except Port Huron, Marquette, Escanaba, and Ishpeming, shows an increase in value of products from 1904 to 1909, and all except Bay City, Menominee,

and Manistee show increases from 1899 to 1904. Many of the cities enumerated in the list, however, are not important as manufacturing centers.

CITY.	AVERAGE NUMBER OF WAGE EARNERS.			VALUE OF PRODUCTS.		
	1900	1904	1899	1909	1904	1899
Detroit ¹	81,011	48,483	38,373	\$252,002,123	\$128,240,680	\$88,365,924
Grand Rapids ¹	17,590	15,514	12,020	42,230,075	30,089,087	22,228,487
Flint.....	7,088	2,161	1,060	24,118,007	0,177,170	4,713,044
Battle Creek.....	4,175	3,389	2,051	20,174,016	12,298,244	6,301,000
Saginaw ¹	5,990	4,445	4,205	18,833,047	10,078,508	8,052,978
Kalamazoo.....	0,272	5,066	3,870	17,003,560	13,141,707	7,186,368
Lansing.....	5,285	2,982	1,425	16,567,093	6,887,415	2,942,306
Jackson.....	4,797	3,907	3,715	14,005,071	8,348,125	6,709,995
Bay City ²	4,737	4,459	4,300	10,293,747	8,808,569	9,010,325
Muskegon.....	4,522	3,078	3,078	9,647,823	6,319,441	4,527,467
Adrian.....	1,059	1,502	1,030	6,085,126	4,897,422	2,124,023
Pontiac.....	1,739	1,290	1,092	5,803,001	3,047,426	2,470,887
Holland.....	1,040	(³)	(³)	4,022,265	(³)	(³)
Sault Ste. Marie..	1,005	895	317	4,018,715	2,412,481	728,169
Alpena.....	1,432	1,245	1,202	3,963,823	2,905,303	2,273,343
Menominee.....	1,700	1,489	1,703	3,727,596	2,073,935	4,075,825
Port Huron ¹	1,580	2,136	2,026	3,588,272	3,714,859	3,026,816
Manistee.....	2,125	2,084	2,103	3,344,087	3,250,001	3,025,317
Traverse City.....	1,220	1,108	909	2,289,150	2,176,903	1,201,318
Ann Arbor.....	573	540	023	1,895,894	1,385,731	1,377,278
Marquette.....	498	738	836	1,254,553	2,364,081	1,585,083
Escanaba.....	720	949	520	1,074,109	1,332,979	600,822
Ironwood.....	201	87	90	377,410	201,783	145,122
Ishpeming.....	66	73	80	132,374	246,862	104,068

¹ Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

² In 1904 and 1899 the statistics for West Bay City, which was annexed to Bay City in 1905, are included.

³ Figures not available.

The value of the manufactured products of Detroit increased from \$88,365,924 in 1899 to \$252,992,123 in 1909, or 186.3 per cent, and the number of wage earners from 38,373 to 81,011, or 111.1 per cent. In 1909 Detroit contributed 36.9 per cent of the total value of the manufactured products of the state, as compared with 29.9 per cent in 1904 and 27.6 per cent in 1899, while its industries gave employment to

35 per cent of the total number of wage earners in the manufacturing industries of the state in 1909, as compared with 27.7 per cent in 1904 and 24.6 per cent in 1899. Ranked by value of manufactured products, the city held fifteenth place among the cities of the United States in 1899, fourteenth in 1904, and sixth in 1909.

The manufacture of automobiles has become by far the most important industry of Detroit, accounting for 23.5 per cent of the total value of the city's manufactures in 1909, as compared with 4.9 per cent in 1904. The value of the automobile output of the city in 1904 was \$6,240,000, or 78 per cent of the state total for this industry, and in 1909 it was \$59,536,000, or 61.6 per cent of the state total. Foundries and machine shops, with \$18,296,000, slaughtering and meat packing, with \$12,850,000, tobacco manufactures, with \$12,773,000, the brass and bronze products industry, with \$12,297,000, and the patent medicine and compound industry, with \$11,558,000, are the other leading industries of the city, as measured by value of products.

In the case of 13 industries shown separately in Table I, both for the state and for Detroit, the city contributed more than half of the total value of products, as follows: Slaughtering and meat packing, 95.6 per cent; brass and bronze products, 88.5 per cent; steel works and rolling mills, 86 per cent; patent medicines, 85.8 per cent; tobacco manufactures, 78.9 per cent; fur goods, 76.1 per cent; men's clothing, 72.9 per cent; copper, tin, and sheet-iron products, 71.7 per cent; stoves and furnaces, 62.2 per cent; automobiles, 61.6 per cent; leather goods, 54.5 per cent; boots and shoes, 52.2 per cent; and malt liquors, 50.2 per cent.

In addition to the 45 industries presented separately for Detroit in Table I, page 26, there are 113 others which, for various reasons, are included in the group of "All other industries." Some of these industries are among the most important in the city, 10 of them having products in 1909 valued at more than \$1,000,000.¹

Grand Rapids, the second manufacturing city in the state, shows an increase in value of products from \$22,228,487 in 1899 to \$42,230,675 in 1909. By far the most important industry of the city is the manufacture of furniture, Grand Rapids being in fact the recognized center of the furniture industry in the United States. This industry, with products valued at \$12,630,000, contributed 29.9 per cent of the total value of the manufactured products of the city in 1909, and gave employment to 7,250, or 41.2 per cent of the total number of wage earners reported for all manufacturing industries of the city. The value of

products of the industry in the city represented 44.1 per cent and the number of wage earners employed 43.6 per cent of the corresponding totals for the industry in the state. Other important industries are the manufacture of flour-mill and gristmill and of foundry and machine-shop products, printing and publishing, and the lumber and timber products and bakery industries.

Flint, the third city in the state in value of manufactured products in 1909, owes its rapid advance from tenth place in 1904 to the development of the automobile industry, which, with the manufacture of carriages and wagons, accounts for over three-fourths of the total value of products of the city. The value of the city's manufactures increased 290.4 per cent from 1904 to 1909, an increase greater than that for any other city of 10,000 population or over in the state.

Battle Creek, which ranked seventh in value of products in 1899, was fourth both in 1904 and in 1909. During the past 10 years the value of the city's manufactures has more than trebled. This gain was due principally to the increase in the manufacture of food preparations, the total output of which was valued at \$9,717,000 in 1909, or 84.6 per cent of the total for the industry in the state. Battle Creek outranks all other cities in the United States in this branch of manufacturing. The manufacture of agricultural implements and of foundry and machine-shop products are other important industries.

Saginaw, although reporting an increase in value of manufactured products from \$8,652,978 in 1899 to \$18,833,047 in 1909, dropped from third place in importance in this respect in 1899 to fifth place in 1904 and 1909. The principal industries of the city are the manufacture of beet sugar, lumber and timber products, foundry and machine-shop products, cooperage and wooden goods, and furniture.

Kalamazoo dropped from third place among the cities of the state in value of manufactured products in 1904 to sixth place in 1909, in spite of an increase in this respect from \$13,141,767 to \$17,903,560. The leading industries of the city are the manufacture of paper and wood pulp, corsets, and foundry and machine-shop products, printing and publishing, and the manufacture of carriages and wagons.

Of the \$16,567,093 reported as the total value of products manufactured in Lansing in 1909, about one-half was contributed by the automobile industry, and mainly on account of the decided increase in this industry the city advanced from thirteenth place among the cities of the state in respect to value of manufactures in 1899 to seventh place in 1909. Foundries and machine shops are also important.

Jackson is another city which owes its rapid industrial growth largely to the manufacture of automobiles, the output of which represented about one-third of the total value of all manufactured products of the

¹ These industries were as follows:

Cars and general shop construction and repairs by street-railroad companies.	Iron and steel, bolts, nuts, washers, and rivets, not made in steel works or rolling mills.
Cars, steam-railroad, not including operations of railroad companies.	Leather, tanned, curried, and finished.
Cash registers and calculating machines.	Matches.
Chemicals.	Paint and varnish.
Gas, illuminating and heating.	Rubber goods, not elsewhere specified.

city. The manufacture of carriages and wagons and of foundry and machine-shop products are also important industries.

The manufactured products of Bay City increased only 14.2 per cent in value during the decade, while those of Muskegon more than doubled. In the former, the lumber industry predominates, followed by foundries and machine shops; in Muskegon, the industries are more diversified and include the manufacture of billiard tables, foundry and machine-shop products, furniture, hosiery and knit goods, and paper and wood pulp. Muskegon was at one time a lumber town exclusively, and affords an illustration of the successful development of other manufacturing industries to supplant the disappearing sawmills. In Adrian the wirework industry accounts for more than half of the total value of manufactured products reported, and in Pontiac the manufacture of automobiles is the predominating industry.

Several of the less important cities show industrial development, the increase in the value of manufac-

tured products for Sault Ste. Marie being particularly noticeable (534.5 per cent in 10 years). The leading industry in each of the remaining cities mentioned in the table was as follows: Holland, the furniture industry; Sault Ste. Marie and Alpena, the tanning, currying, and finishing of leather; Menominee, Manistee, Traverse City, and Ironwood, the lumber industry; Port Huron, Marquette, and Escanaba, steam-railroad repair shops; Ann Arbor, flour mills and gristmills; and Ishpeming, bakeries.

Character of ownership.—The table that follows has for its purpose the presentation of conditions in respect to the character of ownership, or legal organization, of manufacturing enterprises. For all industries combined comparative figures are given covering the censuses of 1909 and 1904. Comparative data for 1899 are not available. Figures for 1909 only are presented for several important industries individually. In order to avoid disclosing the operations of individual concerns it is necessary to omit several important industries from this table and the one following:

INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.	INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
ALL INDUSTRIES:									
1909	9,156	231,499	\$685,109,169	\$316,497,147					
1904	7,446	175,229	429,120,060	199,039,129					
Individual:									
1909	4,567	20,504	57,652,930	25,700,157					
1904	3,602	20,527	47,121,641	22,032,918					
Firm:									
1909	1,809	17,252	51,758,822	22,763,304					
1904	1,724	22,589	52,523,803	23,557,908					
Corporation:									
1909	2,638	193,139	571,102,107	267,060,506					
1904	2,044	131,894	328,185,756	153,159,910					
Other:									
1909	145	544	4,595,310	973,180					
1904	76	219	1,288,857	288,393					
Per cent of total:									
1909	100.0	100.0	100.0	100.0					
1904	100.0	100.0	100.0	100.0					
Individual:									
1909	49.9	8.9	8.4	8.1					
1904	48.4	11.7	11.0	11.1					
Firm:									
1909	19.8	7.5	7.0	7.2					
1904	23.2	12.9	12.2	11.8					
Corporation:									
1909	28.8	83.4	83.4	84.4					
1904	27.4	75.3	70.5	76.0					
Other:									
1909	1.6	0.2	0.7	0.3					
1904	1.0	0.1	0.3	0.1					
Agricultural implements, 1909									
Individual	32	2,359	\$9,272,787	\$6,382,634					
Firm	8	45	172,670	78,872					
Corporation	6	21	52,704	32,206					
	18	2,203	9,047,413	6,271,556					
Per cent of total:									
Individual	100.0	100.0	100.0	100.0					
Firm	25.0	1.9	1.9	1.2					
Corporation	18.8	0.9	0.6	0.5					
	56.2	97.2	97.6	98.3					
Automobiles, including bodies and parts, 1909									
Individual	113	25,444	\$96,651,451	\$42,769,030					
Firm	10	71	172,570	92,321					
Corporation	9	515	1,701,035	887,940					
	94	24,858	94,777,846	41,788,769					
Per cent of total:									
Individual	100.0	100.0	100.0	100.0					
Firm	8.8	0.3	0.2	0.2					
Corporation	8.0	2.0	1.8	2.1					
	83.2	97.7	98.1	97.7					
Bread and other bakery products, 1909									
Individual	816	2,637	\$11,082,213	\$4,411,614					
Firm	686	1,398	5,800,674	2,289,262					
Corporation	106	343	1,596,903	607,758					
	24	896	3,684,576	1,514,594					
Per cent of total:									
Individual	100.0	100.0	100.0	100.0					
Firm	84.1	53.0	52.4	51.9					
Corporation	13.0	13.0	14.4	13.8					
	2.9	34.0	33.2	34.3					
Butter, cheese, and condensed milk, 1909									
Individual	435	1,073	\$14,287,499	\$1,910,697					
Firm	131	180	2,980,002	374,495					
Corporation	84	157	2,512,295	335,324					
Other	118	518	5,531,195	888,520					
	102	209	3,257,107	312,358					
Per cent of total:									
Individual	100.0	100.0	100.0	100.0					
Firm	30.1	17.3	20.9	10.6					
Corporation	19.3	14.6	17.6	17.5					
Other	27.1	48.3	38.7	46.5					
	23.4	10.5	22.8	16.9					
Carriages and wagons and materials, 1909									
Individual	212	4,034	\$10,158,893	\$4,899,027					
Firm	124	348	714,140	437,434					
Corporation	52	514	935,267	546,982					
	36	3,172	8,509,476	3,912,211					
Per cent of total:									
Individual	100.0	100.0	100.0	100.0					
Firm	58.5	8.6	7.0	8.9					
Corporation	24.5	12.7	9.2	11.2					
	17.0	78.6	83.8	70.9					
Chemicals, 1909									
Individual	36	3,174	\$12,890,206	\$7,817,825					
Firm	19	20	46,873	35,420					
Corporation	3	5	0,450	4,064					
	14	3,149	12,836,877	7,778,341					
Per cent of total:									
Individual	100.0	100.0	100.0	100.0					
Firm	52.8	0.6	0.4	0.5					
Corporation	8.3	0.2	(1)	0.1					
	38.9	99.2	99.6	99.5					
Clothing, men's, including shirts, 1909									
Individual	40	3,580	\$6,532,331	\$3,143,805					
Firm	11	290	381,319	221,008					
Corporation	14	450	1,113,036	495,167					
	15	2,831	5,037,370	2,427,582					
Per cent of total:									
Individual	100.0	100.0	100.0	100.0					
Firm	27.5	8.1	5.8	7.0					
Corporation	35.0	12.8	17.0	15.7					
	37.5	79.1	77.1	77.2					
Flour-mill and gristmill products, 1909									
Individual	520	1,530	\$34,860,803	\$5,501,392					
Firm	250	454	10,277,037	1,664,004					
Corporation	178	348	7,736,584	1,357,486					
	92	728	16,847,182	2,479,902					
Per cent of total:									
Individual	100.0	100.0	100.0	100.0					
Firm	48.1	29.7	29.5	30.2					
Corporation	34.2	22.7	22.2	24.7					
	17.7	47.6	48.3	45.1					
Foundry and machine-shop products, 1909									
Individual	654	21,649	\$45,399,023	\$26,688,471					
Firm	200	1,501	3,000,602	1,749,351					
Corporation	128	1,270	2,831,102	1,744,315					
	326	18,878	39,567,310	23,194,805					
Per cent of total:									
Individual	100.0	100.0	100.0	100.0					
Firm	30.6	6.9	6.6	6.5					
Corporation	19.6	5.9	6.2	6.5					
	49.8	87.2	87.2	86.9					

¹ Less than one-tenth of 1 per cent.

² Includes the groups "Other," to avoid disclosure of individual operations.

INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.	INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
Furniture and refrigerators, 1909.					Shipbuilding, including boat building, 1909.				
Individual	202	16,610	\$28,641,684	\$10,923,456	Individual	61	2,344	\$5,033,836	\$2,544,064
Firm	38	537	928,704	601,947	Firm	50	422	446,136	261,150
Corporation	27	503	997,904	556,950	Corporation	19	166	360,530	210,042
Per cent of total	100.0	100.0	100.0	100.0	Per cent of total	100.0	100.0	100.0	100.0
Individual	18.8	3.2	3.2	3.3	Individual	64.8	18.0	8.0	10.3
Firm	13.4	3.6	3.5	3.3	Firm	20.0	7.1	7.2	8.3
Corporation	67.8	93.2	93.3	93.4	Corporation	14.3	74.9	84.0	81.5
Liquors, malt, 1909.					Slaughtering and meat packing, 1909.				
Individual	79	1,527	\$9,840,108	\$7,419,069	Individual	45	902	\$13,435,114	\$1,769,289
Firm	12	55	317,671	229,728	Firm	26	193	1,199,986	242,016
Corporation	13	151	1,212,617	947,968	Corporation	12	72	1,171,597	198,940
Per cent of total	100.0	100.0	100.0	100.0	Per cent of total	100.0	100.0	100.0	100.0
Individual	15.2	3.6	3.2	3.1	Individual	57.8	11.4	8.9	13.7
Firm	16.5	9.9	12.3	12.8	Firm	26.7	8.0	8.7	11.2
Corporation	68.4	86.5	84.4	84.1	Corporation	15.6	80.6	82.3	75.1
Lumber and timber products, 1909.					Stoves and furnaces, including gas and oil stoves, 1909.				
Individual	1,180	35,027	\$61,513,580	\$32,471,918	Individual	33	4,482	\$9,122,873	\$6,306,633
Firm	580	5,570	9,868,776	5,193,708	Individual	5	21	41,163	20,018
Corporation	311	5,682	9,690,787	5,145,065	Corporation	28	4,461	9,081,710	6,280,615
Per cent of total	100.0	100.0	100.0	100.0	Per cent of total	100.0	100.0	100.0	100.0
Individual	49.2	15.6	16.0	15.7	Individual	15.2	0.5	0.5	0.4
Firm	26.4	15.9	15.8	15.8	Corporation	84.8	99.5	99.5	99.6
Corporation	24.5	68.4	68.2	68.4	Tobacco manufactures, 1909.				
Printing and publishing, 1909.					Individual	729	7,876	\$16,178,533	\$8,970,598
Individual	1,045	7,219	\$17,348,341	\$12,413,815	Firm	605	1,025	5,338,052	2,087,042
Firm	598	1,805	3,198,694	2,405,930	Corporation	33	5,167	11,337,784	6,008,072
Corporation	177	734	1,407,300	985,308	Per cent of total	100.0	100.0	100.0	100.0
Other	233	4,608	12,460,990	8,786,143	Individual	83.0	24.4	20.6	23.3
Per cent of total	100.0	100.0	100.0	100.0	Firm	12.5	10.1	9.3	9.1
Individual	57.2	25.0	18.4	19.4	Corporation	4.5	65.5	70.1	67.6
Firm	16.9	10.2	8.1	7.9	Includes the group "Firm," to avoid disclosure of individual operations.				
Corporation	22.3	63.8	71.9	70.8					
Other	3.5	1.0	1.6	1.9					

The most important distinction shown is that between corporate and all other forms of ownership. Of the total number of establishments in all industries combined, 28.8 per cent were under corporate ownership in 1909, as against 71.2 per cent under all other forms. The corresponding figures for 1904 were 27.4 per cent and 72.6 per cent, respectively. In respect to value of products the difference was even more pronounced, but in the opposite direction, for in 1909 the establishments operated by corporations reported 83.4 per cent of the total, as against 16.6 per cent for establishments under all other forms of ownership, while in 1904 the corresponding figures were 76.5 per cent and 23.5 per cent, respectively. The establishments operated by firms and those operated by individuals both show decreases between 1904 and 1909 in their proportions of the totals for wage earners and value of products, the decreases being slightly greater in the case of firms.

In 5 of the 17 industries shown separately in the table the majority of the establishments were under the corporate form of ownership, while in all but 3 the establishments under this form of ownership contributed the major part of the total value of products. The 102 establishments in the butter, cheese, and condensed-milk industry which are classified in the table as under "Other" forms of ownership are for the most part cooperative creameries, established and operated by the farmers for the purpose of securing a better and steadier market for their milk and cream.

Size of establishment.—The tendency for manufacturing to become concentrated in large establishments, or the reverse, is a matter of interest from the standpoint of industrial organization. In order to throw some light upon it, the next table groups the establishments according to the value of their products. The table also shows the average size of establishments for all industries combined and for certain important industries separately, as measured by number of wage earners, value of products, and value added by manufacture. The totals for all industries are shown for the last two censuses, while for the individual industries figures are given for 1909 only.

This table shows that in 1909, of the 9,159 manufacturing establishments in the state only 88, or 1 per cent, had a value of products exceeding \$1,000,000 each. These establishments, however, had an average of 56,226 wage earners, or 24.3 per cent of the total number in all establishments, and reported 37.7 per cent of the total value of products and 34.2 per cent of the total value added by manufacture.

On the other hand, the very small establishments—that is, those having a value of products of less than \$5,000—constituted a considerable proportion (36.8 per cent) of the total number of establishments, but the value of their products amounted to only 1.1 per cent of the total. The establishments whose output was valued at \$100,000 but less than \$1,000,000 reported 44 per cent of the total value of products.

MANUFACTURES—MICHIGAN.

INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.	INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
ALL INDUSTRIES:									
1909.....	9,159	231,499	\$985,109,169	\$316,497,147	Carriages and wagons and materials, 1909.....	212	4,034	\$10,158,883	\$4,896,627
1904.....	7,446	175,229	429,120,000	199,039,129	Less than \$5,000.....	106	122	257,040	168,562
Less than \$5,000:					\$5,000 and less than \$20,000.....	65	310	611,977	394,561
1909.....	3,372	3,906	7,821,328	4,014,568	\$20,000 and less than \$100,000.....	19	415	931,216	445,362
1904.....	2,634	3,791	6,522,567	4,054,535	\$100,000 and less than \$1,000,000 ²	22	3,187	8,357,750	3,888,142
\$5,000 and less than \$20,000:					Per cent of total.....	100.0	100.0	100.0	100.0
1909.....	2,665	12,382	27,383,330	14,559,126	Less than \$5,000.....	50.0	3.0	2.5	3.4
1904.....	2,281	12,581	24,062,938	12,787,421	\$5,000 and less than \$20,000.....	30.7	7.7	6.0	8.1
\$20,000 and less than \$100,000:					\$20,000 and less than \$100,000.....	9.0	10.3	9.2	9.1
1909.....	1,009	35,706	90,330,115	41,918,104	\$100,000 and less than \$1,000,000 ²	10.4	79.0	82.3	79.4
1904.....	1,083	37,031	75,969,984	37,856,018	Average per establishment.....	10		\$47,910	\$23,087
\$100,000 and less than \$1,000,000:					Chemicals, 1909.....	36	3,174	\$12,890,206	\$7,817,825
1909.....	1,035	123,270	301,233,300	146,842,096	Less than \$5,000.....	20	46	36,830	25,160
1904.....	807	100,354	222,432,102	106,962,893	\$5,000 and less than \$20,000.....	5	10	30,876	18,111
\$1,000,000 and over:					\$100,000 and less than \$1,000,000 ²	8	652	2,460,303	1,425,901
1909.....	88	56,220	258,341,090	108,263,253	\$1,000,000 and over.....	3	2,496	10,362,197	6,347,653
1904.....	41	21,472	100,138,469	37,377,662	Per cent of total.....	100.0	100.0	100.0	100.0
Per cent of total:					Less than \$5,000.....	55.6	0.5	0.3	0.3
1909.....	100.0	100.0	100.0	100.0	\$5,000 and less than \$20,000.....	13.9	0.3	0.2	0.2
1904.....	100.0	100.0	100.0	100.0	\$20,000 and less than \$100,000.....	22.2	29.5	19.1	18.2
Less than \$5,000:					\$100,000 and over.....	8.3	78.6	80.4	81.2
1909.....	36.8	1.7	1.1	1.6	Average per establishment.....	88		\$358,061	\$217,162
1904.....	35.4	2.2	1.5	2.0	Clothing, men's, including shirts, 1909.....	40	3,580	\$6,532,331	\$3,143,805
\$5,000 and less than \$20,000:					\$5,000 and less than \$20,000.....	10	72	97,877	53,858
1909.....	29.1	5.3	4.0	4.0	\$20,000 and less than \$100,000.....	17	418	858,022	421,480
1904.....	30.6	7.2	5.6	6.4	\$100,000 and less than \$1,000,000 ²	13	3,000	5,575,532	2,685,467
\$20,000 and less than \$100,000:					Per cent of total.....	100.0	100.0	100.0	100.0
1909.....	21.8	15.4	13.2	13.2	\$5,000 and less than \$20,000.....	25.0	2.0	1.5	1.7
1904.....	22.6	21.1	17.7	10.0	\$20,000 and less than \$100,000.....	42.5	11.7	13.1	13.4
\$100,000 and less than \$1,000,000:					\$100,000 and less than \$1,000,000 ²	32.5	86.3	85.4	81.9
1909.....	11.3	53.3	44.0	46.4	Average per establishment.....	00		\$163,308	\$78,595
1904.....	10.8	57.3	51.8	53.7	Flour-mill and gristmill products, 1909.....	520	1,530	\$34,860,803	\$5,561,392
\$1,000,000 and over:					Less than \$5,000.....	30	20	109,462	17,008
1909.....	1.0	24.3	37.7	34.2	\$5,000 and less than \$20,000.....	163	151	1,084,811	369,092
1904.....	0.6	12.3	23.3	18.8	\$20,000 and less than \$100,000.....	257	582	11,360,606	1,041,702
Average per establishment:					\$100,000 and less than \$1,000,000.....	5	502	12,421,120	1,866,701
1909.....	25		\$74,802	\$34,556	\$1,000,000 and over.....	5	275	9,075,604	1,316,310
1904.....	24		\$57,631	\$26,731	Per cent of total.....	100.0	100.0	100.0	100.0
Agricultural implements, 1909.....	32	2,359	\$9,272,787	\$6,382,634	Less than \$5,000.....	7.5	1.3	0.3	0.3
Less than \$5,000.....	6	5	14,397	6,510	\$5,000 and less than \$20,000.....	31.3	0.9	5.7	6.5
\$5,000 and less than \$20,000.....	10	50	104,443	62,118	\$20,000 and less than \$100,000.....	49.4	38.0	32.6	35.3
\$20,000 and less than \$100,000.....	6	171	360,672	209,500	\$100,000 and less than \$1,000,000.....	10.8	32.8	35.3	33.9
\$100,000 and less than \$1,000,000.....	7	1,113	2,511,628	1,529,746	\$1,000,000 and over.....	1.0	18.0	26.0	23.9
\$1,000,000 and over.....	3	1,011	6,272,647	4,571,742	Average per establishment.....	3		\$67,040	\$10,580
Per cent of total.....	100.0	100.0	100.0	100.0	Foundry and machine-shop products, 1909.....	654	21,649	\$45,399,023	\$26,688,471
Less than \$5,000.....	18.8	0.2	0.2	0.1	Less than \$5,000.....	161	195	382,955	246,894
\$5,000 and less than \$20,000.....	31.2	2.5	1.1	1.0	\$5,000 and less than \$20,000.....	188	1,072	2,027,684	1,344,589
\$20,000 and less than \$100,000.....	18.8	7.2	4.0	1.0	\$20,000 and less than \$100,000.....	194	5,539	9,254,081	5,473,522
\$100,000 and less than \$1,000,000.....	21.9	47.2	27.1	3.3	\$100,000 and less than \$1,000,000.....	106	13,034	27,717,048	15,853,880
\$1,000,000 and over.....	9.4	42.9	67.6	71.6	\$1,000,000 and over.....	5	2,809	6,017,255	3,746,576
Average per establishment.....	74		\$289,775	\$190,457	Per cent of total.....	100.0	100.0	100.0	100.0
Automobiles, including bodies and parts, 1909.....	113	25,444	\$96,651,451	\$42,760,030	Less than \$5,000.....	24.0	0.9	0.8	1.0
Less than \$5,000.....	7	14	20,092	13,543	\$5,000 and less than \$20,000.....	28.7	5.0	4.5	5.0
\$5,000 and less than \$20,000.....	14	78	149,312	51,043	\$20,000 and less than \$100,000.....	29.7	21.0	20.4	26.5
\$20,000 and less than \$100,000.....	35	777	1,543,955	780,100	\$100,000 and less than \$1,000,000.....	16.2	60.2	61.1	59.4
\$100,000 and less than \$1,000,000.....	41	6,005	16,627,852	8,492,259	\$1,000,000 and over.....	0.8	13.0	13.3	14.0
\$1,000,000 and over.....	10	18,570	78,411,370	33,420,019	Average per establishment.....	33		\$60,417	\$10,808
Per cent of total.....	100.0	100.0	100.0	100.0	Furniture and refrigerators, 1909.....	202	16,610	\$28,041,684	\$16,923,456
Less than \$5,000.....	6.2	0.1	(¹) 0.2	(¹) 0.0	Less than \$5,000.....	24	40	66,423	42,592
\$5,000 and less than \$20,000.....	12.4	0.3	0.1	0.1	\$5,000 and less than \$20,000.....	31	217	342,083	209,569
\$20,000 and less than \$100,000.....	31.0	3.1	1.6	0.1	\$20,000 and less than \$100,000.....	67	2,659	3,060,245	2,303,083
\$100,000 and less than \$1,000,000.....	30.3	23.0	17.1	1.8	\$100,000 and less than \$1,000,000 ²	80	13,604	24,272,733	14,368,272
\$1,000,000 and over.....	14.2	73.0	81.1	10.9	Per cent of total.....	100.0	100.0	100.0	100.0
Average per establishment.....	225		\$855,23	\$378,487	Less than \$5,000.....	11.9	0.2	0.2	0.3
Bread and other bakery products, 1909.....	816	2,637	\$11,082,213	\$4,411,614	\$5,000 and less than \$20,000.....	15.3	1.3	1.2	1.2
Less than \$5,000.....	363	196	985,510	411,949	\$20,000 and less than \$100,000.....	33.2	16.0	13.8	13.6
\$5,000 and less than \$20,000.....	369	811	3,356,822	1,340,055	\$100,000 and less than \$1,000,000 ²	30.6	82.4	84.7	81.9
\$20,000 and less than \$100,000.....	81	918	3,243,868	1,223,672	Average per establishment.....	82		\$141,791	\$83,779
\$100,000 and less than \$1,000,000.....	13	712	3,490,013	1,432,938	Liquors, malt, 1909.....	79	1,527	\$9,840,108	\$7,419,069
Per cent of total.....	100.0	100.0	100.0	100.0	Less than \$5,000.....	4	5	7,168	4,010
Less than \$5,000.....	44.5	7.4	8.9	9.3	\$5,000 and less than \$20,000.....	12	36	146,400	101,424
\$5,000 and less than \$20,000.....	44.0	30.8	30.3	30.4	\$20,000 and less than \$100,000.....	31	306	1,694,052	1,137,860
\$20,000 and less than \$100,000.....	9.9	34.8	29.3	27.8	\$100,000 and less than \$1,000,000 ²	32	1,180	8,121,798	6,175,766
\$100,000 and less than \$1,000,000.....	1.6	27.0	31.5	32.5	Per cent of total.....	100.0	100.0	100.0	100.0
Average per establishment.....	3		\$13,581	\$5,406	Less than \$5,000.....	5.1	0.3	0.1	0.1
Butter, cheese, and condensed milk, 1909.....	435	1,073	\$14,287,499	\$1,910,697	\$5,000 and less than \$20,000.....	15.2	2.4	1.5	1.4
Less than \$5,000.....	84	14	102,343	16,527	\$20,000 and less than \$100,000.....	39.2	20.0	16.0	15.3
\$5,000 and less than \$20,000.....	160	192	2,054,246	296,219	\$100,000 and less than \$1,000,000 ²	40.5	77.3	82.5	83.2
\$20,000 and less than \$100,000.....	218	554	8,590,081	1,063,711	Average per establishment.....	10		\$124,558	\$93,012
\$100,000 and less than \$1,000,000.....	17	313	3,540,829	534,240	Includes the group "Less than \$5,000."				
Per cent of total.....	100.0	100.0	100.0	100.0	Includes the group "\$20,000 and less than \$100,000."				
Less than \$5,000.....	7.8	1.3	0.7	0.9	Includes the group "\$1,000,000 and over."				
\$5,000 and less than \$20,000.....	38.2	15.1	14.4	15.5					
\$20,000 and less than \$100,000.....	50.1	54.4	60.1	55.7					
\$100,000 and less than \$1,000,000.....	3.9	29.2	24.8	28.0					
Average per establishment.....	2		\$32,845	\$4,392					

¹ Less than one-tenth of 1 per cent.
² Includes the group "\$1,000,000 and over."

³ Includes the group "\$20,000 and less than \$100,000."
⁴ Includes the group "Less than \$5,000."

INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.	INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
Lumber and timber products, 1909	1,180	35,627	\$61,513,560	\$32,471,018	Slaughtering and meat packing, 1909	45	902	\$13,435,114	\$1,769,289
Less than \$5,000.....	429	812	957,731	639,110	Less than \$5,000.....	7	5	19,165	6,915
\$5,000 and less than \$20,000.....	332	2,554	3,515,249	2,114,914	\$5,000 and less than \$20,000.....	10	20	102,927	33,695
\$20,000 and less than \$100,000.....	249	7,328	11,689,500	6,632,352	\$20,000 and less than \$100,000.....	18	64	802,640	153,145
\$100,000 and less than \$1,000,000.....	167	23,351	41,219,906	21,361,365	\$100,000 and less than \$1,000,000.....	7	139	2,800,928	394,833
\$1,000,000 and over.....	3	1,582	4,131,024	1,724,177	\$1,000,000 and over.....	3	644	9,589,445	1,140,701
Per cent of total.....	100.0	100.0	100.0	100.0	Less than \$5,000.....	15.6	0.6	0.1	0.4
Less than \$5,000.....	36.4	2.3	1.6	2.0	\$5,000 and less than \$20,000.....	22.2	2.2	0.8	1.0
\$5,000 and less than \$20,000.....	28.1	7.2	5.7	6.5	\$20,000 and less than \$100,000.....	40.0	10.4	6.4	10.9
\$20,000 and less than \$100,000.....	21.1	20.6	19.0	20.4	\$100,000 and less than \$1,000,000.....	15.6	15.4	21.3	22.3
\$100,000 and less than \$1,000,000.....	14.2	65.5	67.0	65.8	\$1,000,000 and over.....	6.7	71.4	71.4	64.5
\$1,000,000 and over.....	0.3	4.4	6.7	5.3	Average per establishment.....	20		\$208,568	\$39,318
Average per establishment.....		30	\$52,130	\$27,519	Stoves and furnaces, including gas and oil stoves, 1909	33	4,482	\$9,123,873	\$6,306,633
Printing and publishing, 1909	1,045	7,210	\$17,348,341	\$12,413,815	Less than \$5,000.....	5	15	16,182	10,298
Less than \$5,000.....	570	803	1,389,472	1,069,979	\$5,000 and less than \$20,000.....	8	20	97,841	53,308
\$5,000 and less than \$20,000.....	316	1,577	2,898,592	2,189,911	\$20,000 and less than \$100,000.....	7	165	315,227	191,403
\$20,000 and less than \$100,000.....	122	2,361	5,574,727	3,965,107	\$100,000 and less than \$1,000,000.....	0	1,026	2,334,121	1,524,226
\$100,000 and less than \$1,000,000.....	28	2,478	7,494,550	5,188,818	\$1,000,000 and over.....	4	3,247	6,359,592	4,525,398
Per cent of total.....	100.0	100.0	100.0	100.0	Less than \$5,000.....	15.2	0.3	0.2	0.2
Less than \$5,000.....	55.4	11.1	8.0	8.6	\$5,000 and less than \$20,000.....	24.2	0.6	1.1	0.8
\$5,000 and less than \$20,000.....	30.2	21.8	16.7	17.6	\$20,000 and less than \$100,000.....	21.2	3.7	3.5	3.0
\$20,000 and less than \$100,000.....	11.7	32.7	32.1	31.9	\$100,000 and less than \$1,000,000.....	27.3	22.0	25.6	24.2
\$100,000 and less than \$1,000,000.....	2.7	34.3	43.2	41.8	\$1,000,000 and over.....	12.1	72.4	69.7	71.8
Average per establishment.....		7	\$16,601	\$11,870	Average per establishment.....		136	\$270,451	\$191,110
Shipbuilding, including boat building, 1909	91	2,344	\$5,033,836	\$2,544,004	Tobacco manufactures, 1909	729	7,876	\$10,178,533	\$8,970,598
Less than \$5,000.....	52	38	102,145	64,735	Less than \$5,000.....	508	405	1,022,201	644,045
\$5,000 and less than \$20,000.....	21	101	197,958	117,093	\$5,000 and less than \$20,000.....	167	935	1,545,615	985,201
\$20,000 and less than \$100,000.....	9	385	373,579	233,320	\$20,000 and less than \$100,000.....	40	802	1,427,187	830,372
\$100,000 and less than \$1,000,000.....	9	1,820	4,360,154	2,128,816	\$100,000 and less than \$1,000,000.....	10	3,240	5,439,938	2,993,482
Per cent of total.....	100.0	100.0	100.0	100.0	\$1,000,000 and over.....	3	2,398	6,743,502	3,517,497
Less than \$5,000.....	57.1	1.6	2.0	2.5	Less than \$5,000.....	69.0	5.1	6.3	7.2
\$5,000 and less than \$20,000.....	23.1	4.3	3.9	4.4	\$5,000 and less than \$20,000.....	22.9	11.0	6.4	11.0
\$20,000 and less than \$100,000.....	9.9	16.4	7.4	9.2	\$20,000 and less than \$100,000.....	5.5	11.3	8.8	9.3
\$100,000 and less than \$1,000,000.....	9.9	77.6	80.6	83.7	\$100,000 and less than \$1,000,000.....	2.2	41.2	33.0	33.4
Average per establishment.....		26	\$55,317	\$27,957	\$1,000,000 and over.....	0.4	30.4	41.7	30.2
					Average per establishment.....		11	\$22,193	\$12,305

¹ Includes the group "\$1,000,000 and over."

It will be seen from the above table that during the five years from 1904 to 1909 there was a considerable increase, in the relative importance as measured by number of wage earners, value of products, and value added by manufacture, of the largest establishments—those reporting products valued at not less than \$1,000,000—and a decrease in that of all other classes.

The fact that between 1904 and 1909 the average value of products per establishment increased from \$57,631 to \$74,802, and the average value added by manufacture from \$26,731 to \$34,556 can not be taken as in itself indicating a tendency toward concentration. The increased values shown may be, and probably are, due in part to the increase that has taken place in the prices of commodities. The average number of wage earners per establishment increased from 24 to 25.

The 88 establishments reporting products valued at \$1,000,000 or over included 16 in the automobile industry, 5 flour mills, 5 foundries and machine shops, 4 establishments engaged in the manufacture of stoves and furnaces, and 3 each in the agricultural-implement, chemical, lumber, slaughtering and meat-packing, and tobacco-manufactures industries. The average value of output per establishment was \$855,323 in the automobile industry, \$358,061 in the chemical industry, \$298,558 in the slaughtering and meat-packing industry, \$289,775 in the agricultural-implement industry, and \$276,451 in the stove and furnace industry.

In some respects, and especially from the standpoint of conditions under which persons engaged in manufactures work, the best classification of establishments to bring out the feature of size is a classification according to the number of wage earners employed. The next table shows, for 1909, such a classification for all industries combined and for 29 important industries individually, and gives not only the number of establishments falling into each group, but also the average number of wage earners employed.

Of the 9,159 establishments reported for all industries, 13.1 per cent employed no wage earners; 51.3 per cent, from 1 to 5; 17.5 per cent, from 6 to 20; 7.9 per cent, from 21 to 50; and 10.2 per cent, 51 and over. The most numerous single group consists of the 4,697 establishments employing from 1 to 5 wage earners, and the next of the 1,600 establishments employing from 6 to 20 wage earners. There were 173 establishments that employed over 250 wage earners; 15 of these establishments, of which 5 were automobile factories, employed over 1,000 wage earners each.

Of the total number of wage earners, 41.5 per cent were in establishments employing over 250 wage earners. The single group having the largest number of wage earners was the group comprising the establishments employing from 101 to 250 wage earners each. This group employed 52,775 wage earners, or 22.8 per cent of the total. Practically one-half of the wage earners in the automobile industry were em-

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ployed in the five plants employing over 1,000 each, and 68.3 per cent of those in the chemical industry were in the two plants employing over 1,000 each, while in the manufacture of patent medicines the one establishment in this group reported 55.1 per cent of the

total number of wage earners for the industry. In the steam-railroad repair shops and in the men's clothing, paint and varnish, and stove and furnace industries, more than one-half of the wage earners worked in plants employing more than 500 wage earners each.

INDUSTRY.	Total.	ESTABLISHMENTS EMPLOYING—								
		No wage earners.	1 to 5 wage earners.	6 to 20 wage earners.	21 to 50 wage earners.	51 to 100 wage earners.	101 to 250 wage earners.	251 to 500 wage earners.	501 to 1,000 wage earners.	Over 1,000 wage earners.
NUMBER OF ESTABLISHMENTS.										
All industries.....	9,159	1,200	4,697	1,800	726	428	335	112	46	15
Agricultural implements.....	32	2	12	4	6	2	1	5		
Automobiles, including bodies and parts.....	113		19	21	19	14	23	5	7	5
Beet sugar.....	11				3	3	4		1	
Boots and shoes, including cut stock and findings.....	23		6	3	2	6	4	1	1	
Brass and bronze products.....	60	1	17	11	8	9	10	3		1
Bread and other bakery products.....	816	217	515	62	15	5	2			
Butter, cheese, and condensed milk.....	435	27	378	25	3					
Carriages and wagons and materials.....	212	31	115	36	9	12	4	4	1	
Cars and general shop construction and repairs by steam-railroad companies.....	32		8	5	3	4	3	4	5	
Chemicals.....	36	7	18	3	1	1	3	1		2
Clothing, men's, including shirts.....	40	1	4	13	7	7	5		3	
Flour-mill and gristmill products.....	520	62	415	34	7	2				
Food preparations.....	49	2	28	6	9	2	1		1	
Foundry and machine-shop products.....	654	45	236	160	93	50	39	8	5	
Furniture and refrigerators.....	202	5	33	29	43	43	32	15	2	
Gas, illuminating and heating.....	55		17	22	9	5	1		1	
Iron and steel, blast furnaces.....	11				2	0	2	1		
Leather, tanned, curried, and finished.....	24	1		3	7	4	8	1		
Liquors, malt.....	79		22	37	15	3	2			
Lumber and timber products.....	1,180	41	533	283	154	84	60	20	6	
Paint and varnish.....	20	1	7	8	1		2		1	
Paper and wood pulp.....	32			5	7	4	14	1	1	
Patent medicines and compounds and druggists' preparations.....	150	53	77	14	11		2	1		1
Printing and publishing.....	1,045	214	589	175	45	12	9	1		
Shipbuilding, including boat building.....	91		45	11	2	4	4	1	1	
Slaughtering and meat packing.....	45	5	26	6	5		2	1		
Stoves and furnaces, including gas and oil stoves.....	33		11	6	3	6	2	1	3	1
Tobacco manufactures.....	720	237	308	85	20	5	7	4	2	1
Wirework, including wire rope and cable.....	37	2	13	9	8	2	3			
All other industries.....	2,384	223	1,185	515	209	122	86	34	0	4
AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	231,499		10,156	17,898	23,745	30,771	52,775	38,608	31,173	28,313
Agricultural implements.....	2,359		31	67	207	140	170	1,738		
Automobiles, including bodies and parts.....	25,444		61	241	604	1,044	3,037	2,025	5,212	12,620
Beet sugar.....	1,460				105	150	677		622	
Boots and shoes, including cut stock and findings.....	2,455		20	25	97	459	611	276	997	
Brass and bronze products.....	4,771		40	119	234	608	1,578	1,086		1,040
Bread and other bakery products.....	2,637		1,004	627	402	355	240			
Butter, cheese, and condensed milk.....	1,073		607	267	96	109				
Carriages and wagons and materials.....	4,034		247	343	288	825	582	1,245	501	
Cars and general shop construction and repairs by steam-railroad companies.....	5,401		28	64	117	289	541	1,517	2,845	
Chemicals.....	3,174		26	38	24	66	495	328		2,167
Clothing, men's, including shirts.....	3,580		15	167	255	390	813		1,040	
Flour-mill and gristmill products.....	1,530		798	326	200	137				
Food preparations.....	1,303		60	63	272	165	243		510	
Foundry and machine-shop products.....	21,649		587	1,953	2,913	4,204	6,200	2,744	2,088	
Furniture and refrigerators.....	16,610		76	323	1,491	3,093	5,100	5,204	1,233	
Gas, illuminating and heating.....	1,771		61	243	330	388	235		514	
Iron and steel, blast furnaces.....	1,016				75	394	284	203		
Leather, tanned, curried, and finished.....	2,291			53	288	330	1,311	300		
Liquors, malt.....	1,527		66	487	510	210	245			
Lumber and timber products.....	35,627		1,278	3,161	5,101	6,167	0,404	6,937	3,570	
Paint and varnish.....	1,024		17	79	39		258		631	
Paper and wood pulp.....	4,327			58	240	264	2,654	347	764	
Patent medicines and compounds and druggists' preparations.....	3,249		154	175	384		266	481		1,789
Printing and publishing.....	7,210		1,420	1,891	1,454	837	1,363	254		
Shipbuilding, including boat building.....	2,344		95	118	65	312	774	314	666	
Slaughtering and meat packing.....	902		58	56	149		347	297		
Stoves and furnaces, including gas and oil stoves.....	4,482		30	68	112	410	361	255	2,243	1,003
Tobacco manufactures.....	7,876		777	877	571	382	1,273	1,415	1,473	1,108
Wirework, including wire rope and cable.....	909		43	100	245	156	365			
All other industries.....	59,455		2,562	5,909	6,844	8,777	12,770	11,552	4,452	6,580

INDUSTRY.	Total.	ESTABLISHMENTS EMPLOYING—								
		No wage earners.	1 to 5 wage earners.	6 to 20 wage earners.	21 to 50 wage earners.	51 to 100 wage earners.	101 to 250 wage earners.	251 to 500 wage earners.	501 to 1,000 wage earners.	Over 1,000 wage earners.
		PER CENT OF AVERAGE NUMBER OF WAGE EARNERS.								
All industries.....	100.0	4.4	7.7	10.3	13.3	22.8	16.7	13.5	11.4	
Agricultural implements.....	100.0	1.3	2.8	8.8	6.2	7.2	73.7	.....	.....
Automobiles, including bodies and parts.....	100.0	0.2	0.9	2.4	4.1	14.3	8.0	20.5	40.6	
Beet sugar.....	100.0	.....	.....	7.2	10.7	39.5	.....	42.6	.....
Boots and shoes, including cut stock and findings.....	100.0	0.8	1.0	2.7	18.7	24.9	11.2	40.6	.....
Brass and bronze products.....	100.0	0.8	2.5	4.9	14.0	33.1	22.8	.....	21.9
Bread and other bakery products.....	100.0	38.1	23.8	15.2	13.5	9.4	.....	.....	.....
Butter, cheese, and condensed milk.....	100.0	56.0	24.0	8.4	10.2	.....	.....	.....	.....
Carrriages and wagons and materials.....	100.0	6.1	8.5	7.1	20.5	14.4	30.0	12.5	.....
Cars and general shop construction and repairs by steam-railroad companies.....	100.0	0.5	1.2	2.2	5.4	10.0	28.1	52.7	.....
Chemicals.....	100.0	0.8	1.2	0.8	3.0	15.6	10.3	.....	68.3
Clothing, men's, including shirts.....	100.0	0.4	4.7	7.1	10.9	22.7	.....	54.2	.....
Flour-mill and gristmill products.....	100.0	52.2	21.3	17.6	0.0	.....	.....	.....	.....
Food preparations.....	100.0	4.6	4.8	20.9	11.9	18.6	.....	30.1	.....
Foundry and machine-shop products.....	100.0	2.7	9.0	13.5	10.4	28.0	12.7	13.8	.....
Furniture and refrigerators.....	100.0	0.5	1.9	9.0	18.6	30.7	31.0	7.4	.....
Gas, illuminating and heating.....	100.0	3.4	13.7	18.6	21.9	13.3	.....	29.0	.....
Iron and steel, blast furnaces.....	100.0	.....	.....	7.4	38.8	28.0	25.0	.....	.....
Leather, tanned, curried, and finished.....	100.0	.....	2.3	12.6	14.8	57.2	13.1	.....	.....
Liquors, malt.....	100.0	4.3	31.0	33.4	14.3	16.0	.....	.....	.....
Lumber and timber products.....	100.0	3.6	8.9	14.3	17.2	26.4	19.5	10.0	.....
Paint and varnish.....	100.0	1.7	7.7	3.8	.....	25.2	.....	61.6	.....
Paper and wood pulp.....	100.0	.....	1.3	5.6	6.1	61.3	8.0	17.7	.....
Patent medicines and compounds and druggists' preparations.....	100.0	4.7	5.4	11.8	.....	8.2	14.8	.....	55.1
Printing and publishing.....	100.0	10.7	26.2	20.1	11.0	18.0	3.5	.....	.....
Shipbuilding, including boat building.....	100.0	4.1	5.0	2.8	13.3	33.0	13.4	28.4	.....
Slaughtering and meat packing.....	100.0	5.9	6.2	16.5	.....	38.5	32.9	.....	.....
Stoves and furnaces, including gas and oil stoves.....	100.0	0.7	1.5	2.5	0.1	8.1	5.7	50.0	22.4	
Tobacco manufactures.....	100.0	9.9	11.1	7.2	4.8	16.2	18.0	18.7	14.1	
Wirework, including wire rope and cable.....	100.0	4.7	11.0	27.0	17.2	40.2	.....	.....	.....
All other industries.....	100.0	4.3	9.9	11.5	14.8	21.5	19.4	7.5	11.1	

Expenses.—As stated in the Introduction, the census does not purport to furnish figures that can be used for determining the cost of manufacture and profits. Facts of interest can, however, be brought out concerning the relative importance of the different classes of expenses which make up the total.

INDUSTRY.	PER CENT OF TOTAL EXPENSES REPORTED.			
	Salaries.	Wages.	Materials.	Miscellaneous expenses.
All industries.....	5.9	20.1	62.3	11.6
Agricultural implements.....	10.3	16.9	38.7	34.1
Automobiles, including bodies and parts.....	3.3	20.1	69.8	6.8
Beet sugar.....	4.6	16.7	73.0	11.7
Boots and shoes, including cut stock and findings.....	5.0	18.9	67.0	8.5
Brass and bronze products.....	4.5	19.4	71.0	5.1
Bread and other bakery products.....	4.0	15.8	72.9	7.3
Butter, cheese, and condensed milk.....	1.4	4.1	91.1	3.4
Carrriages and wagons and materials.....	5.9	24.8	58.2	11.1
Cars and general shop construction and repairs by steam-railroad companies.....	4.5	51.2	42.6	1.0
Chemicals.....	6.5	23.4	59.0	11.0
Clothing, men's, including shirts.....	0.9	21.5	59.6	12.0
Flour-mill and gristmill products.....	1.2	2.5	92.9	3.3
Food preparations.....	4.6	7.7	50.4	37.4
Foundry and machine-shop products.....	8.4	31.0	47.1	13.6
Furniture and refrigerators.....	8.3	32.6	46.0	13.1
Gas, illuminating and heating.....	12.1	24.5	47.6	15.8
Iron and steel, blast furnaces.....	2.8	11.9	70.4	5.9
Leather, tanned, curried, and finished.....	1.0	8.0	86.0	4.4
Liquors, malt.....	7.0	14.6	32.9	44.9
Lumber and timber products.....	4.3	30.0	53.4	12.3
Paint and varnish.....	13.5	8.5	61.3	16.7
Paper and wood pulp.....	3.4	17.2	72.7	6.7
Patent medicines and compounds and druggists' preparations.....	18.7	13.2	43.4	24.7
Printing and publishing.....	18.0	28.2	34.7	10.1
Shipbuilding, including boat building.....	6.5	29.2	52.7	11.6
Slaughtering and meat packing.....	1.2	3.8	92.3	2.6
Stoves and furnaces, including gas and oil stoves.....	9.5	35.7	35.5	10.3
Tobacco manufactures.....	4.9	20.9	48.9	25.3
Wirework, including wire rope and cable.....	6.8	8.9	71.8	12.5
All other industries.....	6.0	19.2	63.2	11.0

The table in the preceding column shows, for 1909, in percentages the distribution of expenses among the classes indicated for all industries combined and for certain important industries separately. The figures on which the percentages are based appear in Table II, page 34.

The table shows that, for all industries combined, 62.3 per cent of the total expenses were incurred for materials, 26 per cent for services, that is, salaries and wages, and but 11.6 per cent for other purposes. As would be expected, these proportions vary greatly in the different industries.

Engines and power.—The next table shows, for all industries combined, the number of engines or other motors, according to their character, employed in generating power (including electric motors operated by purchased current), and their total horsepower at the censuses of 1909, 1904, and 1899. It also shows separately the number and horsepower of electric motors, including those operated by current generated in the manufacturing establishments.

The table indicates that the total primary horsepower increased 72,393, or 19.6 per cent, from 1899 to 1904 and 157,398, or 35.7 per cent, from 1904 to 1909. The greater part of the increase was in owned steam and in rented electric power. In 1909, as in 1904 and 1899, steam power formed the major part of the total primary power reported, but notwithstanding an increase of 57,255 horsepower during the earlier five-year period and of 89,430 horsepower during the later period, the proportion which this kind of power formed of the

total primary power decreased from 86.5 per cent in 1899 to 85.3 per cent in 1904 and 77.8 per cent in 1909. The more general use of gas engines in recent years is shown, 1,167 such engines, with an indicated capacity of 13,988 horsepower, being reported in 1909, as against 954 engines, with 10,534 horsepower, in 1904, and 586 engines, with 5,603 horsepower, in 1899. The figures also show that the practice of renting electric power is increasing rapidly, 74,270 horsepower, or 12.4 per cent of the total primary power, being of this character in 1909, as compared with 12,411 horsepower, or 2.8 per cent, in 1904 and 4,264 horsepower, or 1.2 per cent, in 1899. The use of electric motors for the purpose of applying the power generated within the establishments is rapidly becoming more common, the horsepower of such motors increasing from 7,824 in 1899 to 27,559 in 1904 and 58,794 in 1909.

POWER.	NUMBER OF ENGINES OR MOTORS.			HORSEPOWER.			PER CENT DISTRIBUTION OF HORSEPOWER.		
	1909	1904	1899 ¹	1909	1904	1899 ¹	1909	1904	1899
	Primary power, total	15,527	6,616	6,536	598,288	440,890	368,497	100.0	100.0	100.0
Owned.....	6,967	6,616	6,536	521,543	426,074	362,112	87.2	96.6	98.3
Steam.....	5,066	4,978	5,220	465,520	376,090	318,835	77.8	85.3	86.5
Gas.....	1,167	954	586	13,988	10,534	5,603	2.3	2.4	1.5
Water wheels.....	700	684	730	41,442	39,342	30,520	6.9	8.9	9.0
Water motors.....	34	(²)	(²)	577	(²)	(²)	0.1	(²)	(²)
Other.....				16	108	1,145	(³)	(³)	0.3
Rented.....	8,560	(²)	(²)	76,745	14,816	6,385	12.8	3.4	1.7
Electric.....	8,560	(²)	(²)	74,270	12,411	4,264	12.4	2.8	1.2
Other.....				2,475	2,405	2,121	0.4	0.5	0.6
Electric motors	12,917	1,826	288	133,064	39,970	12,088	100.0	100.0	100.0
Run by current generated by establishment.....	4,357	1,826	288	58,704	27,559	7,824	44.2	68.0	64.7
Run by rented power.....	8,560	(²)	(²)	74,270	12,411	4,264	55.8	31.1	35.3

¹ Includes the neighborhood industries and hand trades, omitted in 1904 and 1909.
² Not reported.
³ Less than one-tenth of 1 per cent.

SUPPLEMENTARY DATA REGARDING IMPORTANT INDUSTRIES.

(With statistics for laundries and custom sawmills and gristmills.)

For certain industries the Census Bureau collects, by means of special schedules, details regarding the quantity and cost of materials and the quantity and value of products and other information for securing which no provision is made on the general schedule. Data for 10 important industries in Michigan are here presented.

Automobiles, including bodies and parts.—The number and value of the different classes of machines manufactured, as reported at the censuses of 1909 and 1904, are shown in the next table.

There were 64,800 machines of all kinds, valued at \$70,359,749, turned out in 1909, as compared with 9,125 machines, valued at \$6,552,804, in 1904. The increase in value was much greater relatively than that in number, so that the average value per machine in 1909, \$1,086, was higher than in 1904, when it was \$718. The value of all other products reported, which, for the

Fuel.—Closely related to the question of kind of power employed is that of the fuel consumed in generating this power, or otherwise used as material in the manufacturing processes.

The following table shows the quantity of each kind of fuel used in 1909 for all industries and for certain selected industries:

INDUSTRY.	Anthracite coal (tons).	Bituminous coal (tons).	Coke (tons).	Wood (cords).	Oil, including gasoline (barrels).	Gas (1,000 feet).
All industries	61,448	4,524,009	270,264	709,434	384,140	316,102
Agricultural implements.....	46	24,865	3,543	221	16,456	.....
Automobiles, including bodies and parts.....	1,451	98,900	5,178	1,810	34,939	90,610
Beet sugar.....	8,981	140,131	8,585	6	.....	.....
Boots and shoes, including cut stock and findings.....	5	3,706	15	35	.....	238
Brass and bronze products.....	2,684	55,381	16,106	201	15,333	8,491
Bread and other bakery products.....	5,038	11,505	9,683	18,186	215	29,756
Butter, cheese, and condensed milk.....	462	41,585	513	5,003	230	.....
Carriages and wagons and materials.....	126	35,477	633	1,619	765	76
Cars and general shop construction and repairs by steam-railroad companies.....	722	79,292	795	1,153	10,171	799
Chemicals.....	1,065,882	.....	320	2,194	2,440	.....
Clothing, men's, including shirts.....	18	3,561	7	8	20	2,455
Flour-mill and gristmill products.....	1,035	77,060	5	7,258	2,366	867
Food preparations.....	2,330	47,611	3,827	.....	35	38,968
Foundry and machine-shop products.....	2,251	157,085	44,141	3,857	10,119	21,814
Furniture and refrigerators.....	5,430	100,371	1,480	1,526	295	3,206
Gas, illuminating and heating.....	2,423	426,763	3,192	.....	111,857	.....
Iron and steel, blast furnaces.....	9,167	123,174	172	224	.....	.....
Leather, tanned, curried, and finished.....	1,500	66,554	.....	52	.....	.....
Liquors, malt.....	193	78,800	650	9,768	37	310
Lumber and timber products.....	1,251	70,242	20	7,656	1,799	1,777
Paint and varnish.....	31	17,827	2,040	.....	50	631
Paper and wood pulp.....	.....	385,344	.....	11,298	.....	47
Patent medicines and compounds and druggists' preparations.....	313	25,106	23	28	63	2,681
Printing and publishing.....	1,557	12,807	257	1,838	1,470	23,063
Shipbuilding, including boat building.....	13	29,033	636	279	2,346	14
Slaughtering and meat packing.....	45	19,644	.....	1,283	36	281
Smelting and refining, copper.....	5,862	63,426	3,097	320	15	.....
Stoves and furnaces, including gas and oil stoves.....	98	26,658	12,482	685	499	3,782
Tobacco manufactures.....	865	0,890	150	617	1	689
Wirework, including wire rope and cable.....	9	4,029	140	.....	100	722
All other industries.....	10,704	1,338,258	29,532	460,309	169,376	84,825

NOTE.—In addition there were 179,800 tons of other varieties of fuel reported.

most part, represents the value of automobile bodies and parts turned out by establishments engaged primarily in that branch of manufacture, increased even more rapidly than that of the complete machines, being more than eighteen times as great in 1909 as in 1904; the fact that the value of "All other products" in 1909 was \$26,291,702 indicates the importance of that branch of the industry.

While comparative figures in respect to the horsepower of the machines manufactured are not available for previous censuses, it is of interest to know that of the 64,800 machines reported for 1909, 4,328 were of less than 10 horsepower; 13,814, of 10 horsepower but less than 20; 17,938, of 20 horsepower but less than 30; 28,103, of 30 horsepower but less than 50; and 617, of 50 horsepower but less than 90.

In 1909 all the automobiles manufactured were gasoline, except 538 which were electric; in 1904 only

11 electric automobiles were reported. Of the total number of cars reported for 1909, 64,025, or 98.8 per cent, were passenger vehicles, and 775, or 1.2 per cent, were business vehicles. In 1904, only 102 of the last named vehicles were reported, forming about the same proportion of the total number manufactured as in 1909. In 1909 68.5 per cent of the passenger vehicles were touring cars, and 28.9 per cent runabouts.

PRODUCT.	1909		1904	
	Number.	Value.	Number.	Value.
Total value.....		\$90,051,451		\$7,990,534
Automobiles.....	64,800	70,359,740	9,125	6,552,804
Gasoline.....	64,262	69,130,223	9,114	6,537,404
Electric.....	538	1,220,526	11	15,400
Passenger vehicles.....	64,025	69,038,967	9,023	6,481,164
Buggies, runabouts, and touring cars.....	62,319	64,940,793	9,023	6,481,164
Limousines, cabs, etc.....	1,500	3,825,066	(¹)	
Omnibuses, ambulances, fire-department patrol, sight-seeing wagons, etc.....	140	273,108	(¹)	
Business vehicles (merchandise).....	775	1,320,782	102	71,640
Delivery wagons.....	401	319,071	51	35,250
Trucks and all other.....	374	1,001,711	51	36,390
All other products, including bodies and parts and repair work.....		20,201,702		1,443,730

¹ Not reported.

Lumber and timber products.—This industry in Michigan dates from 1834, when the first steam sawmill was built in the Saginaw Valley. Its growth thereafter was very rapid, for in 1849 there were 558 establishments reported, which employed an average of 2,730 wage earners and turned out products valued at \$2,464,000. The industry was at first concentrated along the valleys of the Grand, Saginaw, and Muskegon Rivers and their tributaries, and at such lake ports as Alpena, Manistee, Ludington, Cheboygan, and Grand Haven.

The following statement of the production of rough lumber, lath, and shingles in 1909 and 1899 indicates the decline which has taken place in the sawmill branch of the lumber industry during the last decade:

PRODUCT.	1909	1899
Rough lumber..... M feet b. m.	1,889,724	3,018,338
Lath..... thousands..	218,308	259,917
Shingles..... thousands..	891,649	1,926,110

In 1899 Michigan was the second state in the Union in the production of rough lumber, with a total output of 3,018,338 M feet board measure, but in 1909 it had dropped to tenth place in this respect, with a production of only 1,889,724 M feet, a decrease of 37.4 per cent in 10 years. The output of lath fell off 16 per cent and that of shingles 53.7 per cent during the same period.

Until recently the cut consisted very largely of white pine, but the depletion of the great white-pine forests, which made Michigan at one time the foremost lumber state, has necessitated the utilization of other woods, of which the state has a considerable supply. In 1909 the combined output of softwood formed only

a little over one-half of the total cut. Hemlock contributed nearly two-thirds and white pine only about one-fourth of the softwood, while small quantities of spruce, cedar, tamarack, and balsam fir were also reported. Maple was by far the most important of the hardwoods, while beech, basswood, birch, elm, and oak constituted most of the remainder. The state ranked first in 1909 in the cut of maple and beach.

Flour-mill and gristmill products.—The following tabular statement gives the quantity and value of products for the last three census years:

PRODUCT.	1909	1904	1899
Total value.....	\$34,860,803	\$26,512,027	\$21,643,547
Wheat flour:			
White—			
Barrels.....	3,409,122	3,860,809	
Value.....	\$18,050,601	\$16,987,310	4,050,329
Graham—			
Barrels.....	38,078	40,410	\$14,340,001
Value.....	\$178,090	\$167,780	
Corn meal and corn flour:			
Barrels.....	177,189	210,116	537,630
Value.....	\$606,706	\$505,615	\$1,020,986
Rye flour:			
Barrels.....	61,963	61,842	44,200
Value.....	\$206,698	\$210,597	\$128,567
Buckwheat flour:			
Pounds.....	20,161,026	21,930,850	13,026,863
Value.....	\$547,024	\$524,024	\$282,728
Barley meal:			
Pounds.....	33,600	205,770	540,550
Value.....	\$499	\$2,411	\$0,703
Hominy and grits:			
Pounds.....	38,610	43,802	2,069,950
Value.....	\$1,098	\$1,075	\$10,972
Feed:			
Tons.....	354,591	212,575	209,535
Value.....	\$10,203,552	\$4,535,938	\$3,020,216
Offal:			
Tons.....	160,219	191,829	154,011
Value.....	\$3,706,934	\$3,314,293	\$1,900,207
All other products.....	\$629,701	\$252,579	\$239,507

The output of wheat flour in 1909 was 453,419 barrels less than in 1904, and 602,529 barrels less than in 1899, representing a decrease of 11.6 per cent for the five-year period, and 14.9 per cent for the decade. Owing, however, to the higher price of flour prevailing in 1909, an increase of \$1,683,501, or 9.8 per cent, is shown in its value from 1904 to 1909, and of \$4,488,990, or 31.3 per cent, from 1899 to 1909. The increase during the more recent five-year period in the total value of products for the industry was due mainly to the decided advance in the value of feed reported, the output of which increased 66.8 per cent in quantity, and 124.9 per cent in value, during the five years. The value of corn meal and corn flour combined increased 19.8 per cent, but the output of these products decreased 15.7 per cent. Rye flour was the only product besides feed showing increases in both quantity and value, the increases being two-tenths of 1 per cent and 21.5 per cent, respectively.

Of the total value of products reported in 1909, the value of white flour formed 53.5 per cent; that of feed, which is made principally from corn and oats, 29.3 per cent; and that of offal, which consists chiefly of bran and middlings, the by-products of the manufacture of wheat flour, 10.8 per cent. The corresponding proportions for 1904 were 64.1 per cent, 17.1 per cent, and 12.5 per cent, respectively.

The equipment of the flour mills and gristmills of the state in 1909 included 3,833 pairs of rolls and 336 runs of stone and steel burrs, as compared with 3,823 pairs of rolls and 406 runs of stone and steel burrs in 1904. Nineteen mills manufactured barrels in 1909 and two manufactured sacks.

Printing and publishing.—Although this industry as a whole in Michigan shows decided development during the decade 1899–1909, as measured by the financial statistics, the increase was due more to the extensive development of the book and job printing branch than to the growth in the publication of newspapers and periodicals. The following table gives the number and aggregate circulation of the newspapers and periodicals published in 1909, 1904, and 1899, classified according to frequency of issue:

PERIOD OF ISSUE.	NUMBER OF PUBLICATIONS.			AGGREGATE CIRCULATION PER ISSUE.		
	1909	1904	1899	1909	1904	1899
Total	747	787	706	2,766,282	3,074,297	2,374,403
Daily.....	87	80	70	681,919	544,282	370,848
Sunday.....	15	12	8	256,533	172,637	(1)
Semiweekly and tri-weekly.....	34	30	28	82,640	99,330	200,073
Weekly.....	526	570	522	750,298	774,758	752,032
Monthly.....	73	74	65	927,001	1,372,519	984,025
All other classes.....	12	15	13	67,241	110,712	67,425

¹ Included in circulation for daily.

Although both the total number of publications and their aggregate circulation were smaller in 1909 than in 1904, both were greater than in 1899. The circulation of all classes of publications except daily and Sunday newspapers decreased from 1904 to 1909, but the greatest decrease was in the circulation of monthlies, which fell off 444,918 during the five-year period. The combined circulation of the daily and Sunday editions was 938,502 in 1909, as compared with 370,848 in 1899, a gain of 153.1 per cent for the decade. The number of dailies increased from 70 in 1899 to 87 in 1909, while the number of Sunday editions increased from 8 to 15 during the same period.

The circulation of the weeklies increased somewhat between 1899 and 1904, but as a result of a decrease during the next five years it was slightly less in 1909 than at the beginning of the decade. The circulation of the semiweeklies and triweeklies fell off more than one-half, and that of the monthlies 5.7 per cent, during the decade, although there was a considerable increase in the latter class of publications from 1899 to 1904.

Of the 747 publications reported in 1909, 50, having a combined circulation of 144,082, were printed in foreign languages. Of these, 18 were printed in German, 10 each in Dutch and Finnish, 4 in Polish, 3 in Swedish, and 1 each in Croatian, French, Italian, Italian and English, and Slovenian. Five of the 50 publications were dailies, and 30 were weeklies.

Leather, tanned, curried, and finished.—The quantity and cost of the materials used in the industry and the quantity and value of its products for 1909, 1904, and 1899 are shown in the following statement:

MATERIAL OR PRODUCT.	1909	1904	1899
Materials used, total cost	\$12,120,971	\$7,271,023	\$4,697,367
Hides (all kinds):			
Number.....	1,430,885	1,126,456	751,935
Cost.....	\$8,022,645	\$5,202,740	\$3,582,806
Skins:			
Calf and kip—			
Number.....	918,066	312,051	
Cost.....	\$881,805	\$287,889	620,507
All other—			
Number.....	856,386	594,014	\$329,831
Cost.....	\$173,383	\$224,774	
All other materials.....	\$3,043,138	\$1,465,620	\$784,040
Products, total value	\$15,331,104	\$9,340,349	\$6,015,590
Leather:			
Sole—			
Sides.....	1,603,512	1,353,293	914,954
Value.....	\$7,326,276	\$4,954,749	\$3,030,684
Upper—			
Sides.....	716,396	406,235	281,559
Splits.....	760,801	532,757	100,000
Value.....	\$3,087,868	\$1,426,455	\$817,888
Harness—			
Sides.....	214,870	105,695	212,386
Value.....	\$1,210,132	\$854,190	\$689,832
Trunk, bag, and pocketbook.....	\$476,862	\$788,535	\$107,763
All other.....	\$2,840,322	\$1,010,006	\$585,108
All other products.....	\$225,610	\$163,650	\$291,102
Amount received for work on materials for others.....	\$164,025	\$152,264	\$133,213

The number of hides used increased 90.3 per cent and their cost 123.9 per cent from 1899 to 1909, while the number of skins used showed an even greater increase—186.1 per cent.

Hides were converted chiefly into sole, upper, and harness leather. Sole leather, practically all of which was hemlock, was the principal product, the output having increased 75.3 per cent during the decade. The quantity and value of upper leather increased substantially during the same time. The production of harness leathers shows a falling off in both quantity and value from 1899 to 1904, but more than made up these losses during the succeeding five years. Trunk, bag, and pocketbook leathers show a large increase in value in 1909 as compared with 1899, but a considerable loss as compared with 1904.

Butter, cheese, and condensed milk.—The increasing practice of separating the cream from the milk on the farm instead of sending the whole milk to the factories is indicated by the fact that in 1909, in spite of a considerable growth in the industry as a whole, only 270 cream separators were used in the various factories of the state, as compared with 379 in 1904. The quantity of milk used in the industry decreased from 670,230,324 pounds in 1904 to 478,008,911 pounds in 1909, whereas the quantity of cream made the remarkable increase from 7,714,987 pounds in 1904 to 83,241,827 pounds in 1909. The home separation of milk, together with the fact that in some sections of the state it is coming to be more profitable to sell the milk to retail dealers and to the creameries than to

cheese factories, account in a measure for the decrease in the production of cheese during the period from 1904 to 1909. During this period the number of establishments engaged primarily in the manufacture of butter increased from 203 to 299, while the number of cheese factories decreased from 162 to 128. Eight condensed-milk factories were reported in 1909 as compared with 6 in 1904.

The quantity and value of products for 1909, 1904, and 1899 are presented in the following table:

PRODUCT.	1909	1904	1899
Total value	\$14,287,499	\$8,208,706	\$3,918,995
Butter:			
Packed solid—			
Pounds.....	30,328,760	10,272,730	7,553,059
Value.....	\$8,586,270	\$4,027,770	\$1,472,672
Prints or rolls—			
Pounds.....	5,183,000	1,740,270	267,653
Value.....	\$1,456,867	\$383,426	\$53,199
Cream sold:			
Pounds.....	2,572,764	3,130,609	1,049,312
Value.....	\$249,276	\$234,540	\$69,032
All other butter-factory products¹.....	\$98,862	\$136,700	\$75,782
Cheese:			
Full cream—			
Pounds.....	13,028,317	16,452,577	9,995,766
Value.....	\$1,866,879	\$1,676,280	\$932,773
Part cream—			
Pounds.....	76,220	.....	.....
Value.....	\$10,984	.....	.....
Other kinds ² —			
Pounds.....	277,623	302,270	429,816
Value.....	\$40,012	\$41,790	\$49,783
All other cheese-factory products³.....	\$6,510	\$20,212	\$11,934
Condensed milk:			
Sweetened—			
Pounds.....	27,695,866	27,266,506	18,378,869
Value.....	\$1,693,030	\$1,630,730	\$1,262,817
Unsweetened—			
Pounds.....	4,709,078	415,102	.....
Value.....	\$231,591	\$13,547	.....
All other products.....	\$53,212	\$37,705	.....

¹ Includes skimmed milk sold and caseln. ² Includes skimmed-milk cheese.
³ Includes whey.

The increase in this industry was due principally to the greater production of butter, which in 1909 was more than four times as great in quantity and more than six times as great in value as in 1899. The greater part of the butter produced was packed solid, though an increasing proportion was put up in prints or rolls, 14.6 per cent of the total output being in this form in 1909, as compared with only 3.4 per cent in 1899. The amount of cheese manufactured was less in 1909 than in 1904, but greater than in 1899, although its value showed an increase at each census. The output of condensed milk increased steadily from census to census.

Paper and wood pulp.—Michigan ranked eighth among the states in the manufacture of paper and wood pulp in 1909. A total of 132,846 cords of wood was used, of which hemlock formed 43.8 per cent; spruce, domestic and imported, 22.5 per cent; slab wood and other mill waste, 18.2 per cent; and balsam fir, 9.9 per cent. The quantity and cost of the principal materials used in the manufacture of paper and wood pulp, the quantity and value of the principal products, and the equipment reported in 1909, 1904, and 1899 are shown in the next table.

MATERIAL, PRODUCT, OR MACHINE.	1909	1904	1899
Materials used, total cost.....	\$9,024,595	\$4,581,471	\$2,707,827
Pulp wood.....	\$558,230	\$486,748	\$161,314
Wood pulp purchased:			
Tons.....	60,750	35,870	26,097
Cost.....	\$2,405,975	\$1,269,198	\$732,948
Ground—			
Tons.....	15,320	9,712	4,054
Cost.....	\$384,480	\$191,713	\$81,267
Sulphite fiber—			
Tons.....	29,070	15,197	14,476
Cost.....	\$1,329,972	\$630,761	\$385,682
Other chemical fiber—			
Tons.....	16,300	10,970	7,567
Cost.....	\$691,514	\$346,724	\$315,999
Rags, including cotton and flax waste and sweepings:			
Tons.....	11,030	8,192	4,902
Cost.....	\$383,886	\$199,937	\$132,772
Old and waste paper:			
Tons.....	114,407	60,417	32,836
Cost.....	\$2,193,302	\$1,058,014	\$700,270
All other materials.....	\$3,183,202	\$1,567,574	\$975,523
Products, total value.....	\$13,922,124	\$7,340,631	\$4,217,869
Book, cover, plate, and coated paper:			
Tons.....	85,048	52,048	48,206
Value.....	\$6,499,805	\$3,628,967	\$2,350,790
Wrapping paper:			
Tons.....	50,328	32,654	20,370
Value.....	\$2,709,583	\$1,565,811	\$811,750
Boards:			
Tons.....	56,342	26,382	14,051
Value.....	\$1,800,436	\$812,747	\$348,947
Building, roofing, and sheathing paper—			
Tons.....	5,530	3,303	1,337
Value.....	\$169,218	\$100,604	\$34,439
Wood pulp made for sale or for consumption in mills other than where produced:			
Tons.....	8,199	11,158	8,184
Value.....	\$300,948	\$497,286	\$346,516
All other products.....	\$2,286,074	\$825,132	\$325,427
Wood pulp:			
Quantity produced (including that used in mills where manufactured), tons.....	65,331	38,612	20,707
Ground.....	12,273	14,079	6,676
Soda fiber.....	.....	.....	1,033
Sulphite fiber.....	53,058	24,533	12,998
Equipment:			
Paper machines:			
Total number.....	68	55	46
Capacity, yearly, tons.....	301,345	181,108	111,669
Fourdriner—			
Number.....	43	34	23
Capacity per 24 hours, tons.....	573	444	(1) 23
Cylinder—			
Number.....	25	21	23
Capacity per 24 hours, tons.....	321	185	(1) 23
Pulp:			
Grinders, number.....	17	20	26
Digesters, number.....	27	24	18
Capacity, yearly, tons of pulp, total.....	74,932	46,410	20,558
Mechanical.....	18,303	25,810	(2)
Chemical.....	56,629	20,600	(2)

¹ Not reported.

² Not reported separately.

The total cost of materials used increased 97 per cent from 1904 to 1909. During the same period the total cost of pulp wood consumed increased 76.3 per cent, and that of wood pulp purchased 89.6 per cent. Out of a total of 60,750 tons of purchased wood pulp in 1909, 47.9 per cent was produced by the sulphite process, 26.9 per cent by other chemical processes, and the remainder by the mechanical process.

The principal product was book paper, the value of which represented nearly one-half of the total value of products in 1909. During the decade the quantity of this paper manufactured increased 78.5 per cent and the value 176.5 per cent. Wrapping paper and boards also show large increases. The total amount of wood pulp produced, including that used in the mills where it was manufactured, increased from 38,612 tons in 1904 to 65,331 tons in 1909. Of this total for 1909, 81.2 per cent was sulphite fiber and the remaining

18.8 per cent ground wood. The value of the "Wood pulp made for sale or for consumption in mills other than where produced" fairly represents the amount of duplication in the combined paper and wood pulp industry, because this product of the pulp mills of Michigan is used largely as material in the paper mills of the same state.

The number of paper machines increased 13 and the yearly capacity 120,237 tons from 1904 to 1909, while the corresponding increases from 1899 to 1904 were 9 and 69,439, respectively. The number of Four-drinier paper machines increased from 23 in 1899 to 43 in 1909, and the cylinder machines from 23 to 25. The number of digesters increased during the decade from 18 to 27, with a much greater relative increase in the output of sulphite fiber. There was a decrease from 1904 to 1909, however, in the number of grinders, accompanied by a decrease in the amount of ground wood produced, though more than twice as much ground wood was made in 1904, when 20 grinders were reported, as in 1899, when 26 grinders were reported.

Slaughtering and meat packing.—The following table gives the quantity and value of the various products reported for 1909, 1904, and 1899:

PRODUCT.	1909	1904	1899
Total value	\$13,435,114	\$9,355,050	\$5,401,523
Beef, fresh:			
Pounds.....	24,099,494	12,149,200	16,467,025
Value.....	\$1,931,128	\$550,968	\$1,184,398
Veal, fresh:			
Pounds.....	2,603,074	992,370	674,400
Value.....	\$300,568	\$83,703	\$90,815
Mutton, fresh:			
Pounds.....	3,509,894	2,350,900	1,925,018
Value.....	\$363,474	\$109,644	\$159,952
Pork, fresh:			
Pounds.....	16,479,567	9,909,375	12,036,427
Value.....	\$2,014,770	\$839,370	\$821,545
Pork, salted or cured:			
Pounds.....	36,145,040	30,277,890	35,054,000
Value.....	\$4,707,180	\$3,003,527	\$2,470,251
Sausage, fresh or cured.....	\$1,397,533	\$381,550	\$277,091
Lard:			
Pounds.....	13,351,255	8,146,572	2,284,883
Value.....	\$1,859,703	\$624,370	\$161,885
Hides:			
Number.....	57,635	26,455	40,243
Pounds.....	2,982,942	1,610,500	1,897,018
Value.....	\$365,080	\$131,686	\$165,857
Pelts:			
Number.....	88,285	44,510	()
Value.....	\$94,862	\$39,056	()
All other products.....	\$391,816	\$202,046	\$99,720

¹ Figures not available.

The slaughtering and meat-packing industry has made large gains in Michigan during the past few years, the total value of products in 1909 being more than double that in 1904. The combined value of fresh and cured pork represented a little more than one-half the total for the industry in 1909. Both fresh and cured pork showed large actual gains in 1909 as compared with 1904, though not so great relatively as some of the other products. The most notable increases during this period were in the value of fresh beef, lard, and sausage, the value of the first being over twice as great, that of the second nearly three times as great, and that

of the third over three and one-half times as great in 1909 as in 1904. All the other products enumerated, but more especially fresh veal, show considerable gains in both quantity and value for this five-year period. As a result of the increase in prices, however, the increase in value was in all cases greater than that in quantity.

Beet sugar.—The importance of the state in this industry and the increasing proportion that beet sugar constitutes of the total sugar production of the country make the supplemental data for this industry of particular interest.

The following table shows the quantity of beets used and the quantity and value of the different sugar-beet products reported for 1909, 1904, and 1899:

MATERIAL OR PRODUCT.	1909	1904	1899
Beets used, tons.....	816,609	535,508	205,925
Products, total value	\$10,476,376	\$5,378,004	\$1,602,266
Sugar:			
Granulated—			
Tons.....	103,864	50,966	16,369
Value.....	\$9,756,587	\$5,184,031	\$1,561,100
Raw—			
Tons.....	551	2,016	480
Value.....	\$41,404	\$120,109	\$39,184
Molasses and sirup:			
Gallons.....	5,016,748	1,081,131	321,100
Value.....	\$337,200	\$21,741	\$1,225
Pulp.....	\$330,025	\$45,414	\$241
All other products.....	\$2,000	\$6,709	\$516

The quantity of beets used increased from 205,925 tons in 1899 to 816,609 tons in 1909, and the quantity of granulated sugar manufactured from 16,369 tons to 103,864 tons during the same period. The value of granulated sugar constituted 93.1 per cent of the total value of products in 1909, molasses and sirup and pulp accounting for most of the remainder.

Carriages and wagons and materials.—The decline which has taken place in this industry during recent years is brought out in the following table, which shows the number and value of the different kinds of vehicles manufactured in 1909, 1904, and 1899:

PRODUCT.	1909	1904	1899
Total value	\$10,158,883	\$14,889,457	\$12,887,134
Carriages (family and pleasure):			
Number.....	91,558	174,880	193,254
Value.....	\$4,453,090	\$7,784,444	\$7,425,754
Wagons:			
Number.....	28,720	52,273	49,003
Value.....	\$1,586,172	\$2,352,958	\$2,049,460
Business—			
Number.....	17,600	20,283	()
Value.....	\$985,599	()	()
Farm—			
Number.....	10,037	30,521	()
Value.....	\$523,803	()	()
Government, municipal, etc.—			
Number.....	183	1,469	()
Value.....	\$76,770	()	()
Public conveyances (cabs, hacks, hansom, hotel coaches, omnibuses, etc.):			
Number.....	201	120	.....
Value.....	\$118,490	\$116,025	.....
Sleighs and sleds:			
Number.....	32,751	53,180	51,149
Value.....	\$570,207	\$977,522	\$846,765
Automobiles:			
Number.....	143	.....	.....
Value.....	\$179,819	.....	.....
All other products, including parts and repair work.....	\$3,251,105	\$3,058,207	\$2,565,155

¹ Not reported separately.

During the past few years there has been, in Michigan, a considerable shifting of capital from the manufacture of carriages and wagons to the manufacture of automobiles. As a result of the increasing displacement of carriages and wagons by motor vehicles not only has the automobile industry attracted new capital into the state, but many factories which were formerly engaged in the manufacture of carriages and wagons have found it more profitable to use their plants for making automobiles or automobile bodies or parts.

Less than half as many pleasure carriages were manufactured in the state in 1909 as in 1899, and in the number of wagons the loss was nearly as great. The decreases took place mainly during the five years from 1904 to 1909.

Laundries.—Statistics for steam laundries are not included in the general tables, or in the totals for manufacturing industries. There were 219 such establishments in Michigan, 35 of which were in Detroit, 8 in Lansing, 5 each in Grand Rapids, Ann Arbor, and Battle Creek, and 4 each in Adrian, Jackson, Port Huron, and Saginaw.

The following statement summarizes the statistics:

Number of establishments.....	219
Persons engaged in the industry.....	4,328
Proprietors and firm members.....	249
Salaried employees.....	350
Wage earners (average number).....	3,729
Primary horsepower.....	4,071
Capital.....	\$2,009,251
Expenses.....	2,594,945
Services.....	1,602,951
Materials.....	621,786
Miscellaneous.....	370,208
Amount received for work done.....	3,261,841

The most common form of ownership was the individual, with 137 establishments. The firm and corporate forms of ownership were represented by 49 and 33 establishments, respectively. Ninety-six establishments had receipts for the year's business of less than \$5,000; 77, receipts of \$5,000 but less than \$20,000; 41, receipts of \$20,000 but less than \$100,000; and 5, receipts of \$100,000 but less than \$1,000,000.

The number of wage earners employed each month and the per cent which this number represents of the greatest number employed in any month were as shown in the next table

MONTH.	WAGE EARNERS.		MONTH.	WAGE EARNERS.	
	Number.	Per cent of maximum.		Number.	Per cent of maximum.
January.....	3,434	83.8	July.....	4,066	99.3
February.....	3,423	83.6	August.....	4,066	100.0
March.....	3,463	84.5	September.....	3,987	97.3
April.....	3,567	87.1	October.....	3,795	92.7
May.....	3,639	88.8	November.....	3,726	91.0
June.....	3,821	93.3	December.....	3,732	91.1

The different kinds of primary power, the number of engines or motors, and the horsepower used in 1909 are shown in the following tabular statement:

KIND.	Number of engines or motors.	Horse-power.
Primary power, total.....		4,071
Owned:		
Steam.....	163	3,537
Gas.....	25	100
Water motors.....	1	1
Rented:		
Electric.....	90	430
Other.....		3

The kind and amount of fuel used are shown in the following statement:

KIND.	Unit.	Quantity.
Anthracite coal.....	Tons.....	854
Bituminous coal.....	Tons.....	43,090
Coke.....	Tons.....	361
Wood.....	Cords.....	2,041
Oil.....	Barrels.....	640
Gas.....	1,000 feet.....	14,981

Custom sawmills and gristmills.—Statistics for custom sawmills and gristmills are not included in the general tables or in the totals for manufacturing industries, but are presented in the following table:

	Custom sawmills.	Custom gristmills.
Number of establishments.....	197	208
Persons engaged in the industry.....	580	357
Proprietors and firm members.....	271	256
Salaried employees.....	3	8
Wage earners (average number).....	306	93
Primary horsepower.....	4,894	7,172
Capital.....	\$322,255	\$722,877
Expenses.....	125,630	1,851,926
Services.....	103,029	30,798
Materials.....	4,051	1,792,317
Miscellaneous.....	18,550	19,811
Value of products.....	236,209	12,140,461

¹ Includes estimate of all grain ground. A similar estimate for value of lumber sawed by custom sawmills is impracticable.

MANUFACTURES—MICHIGAN.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899.

THE STATE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaried employes.	Wage earners (average number).							
STATE—All Industries.....	1909	9,159	271,071	8,965	30,607	231,499	598,288	\$583,947	\$34,870	\$118,968	\$368,612	\$685,109	\$310,497
	1904	7,446	200,190	7,732	17,235	175,229	440,890	337,894	17,470	81,279	230,081	429,120	199,039
	1899	7,310	.....	.....	13,350	155,800	368,497	246,997	12,336	62,532	175,966	319,692	143,726
Agricultural implements.....	1909	32	3,041	22	660	2,359	5,195	15,649	770	1,261	2,890	9,273	6,383
	1904	42	3,003	26	713	3,104	6,986	14,342	678	1,686	3,407	8,720	5,223
	1899	59	2,024	60	620	1,944	.....	8,932	540	953	2,482	6,340	3,858
Artificial stone.....	1909	191	701	228	40	514	634	926	40	255	340	908	550
	1904	27	111	30	14	67	38	118	7	35	43	119	70
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Automobiles, including bodies and parts.	1909	113	28,098	29	2,025	25,444	25,938	52,926	2,570	15,491	53,882	96,651	42,760
	1904	93	2,953	17	201	2,735	1,800	4,347	236	1,268	3,443	7,197	4,454
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Beet sugar.....	1909	11	1,755	.....	295	1,460	8,854	21,378	395	910	6,228	10,477	4,249
	1904	19	1,480	.....	209	1,211	8,796	12,990	294	581	3,761	5,378	1,617
	1899	9	591	.....	118	473	.....	4,014	102	217	1,110	1,602	492
Boots and shoes, including cut stock and findings.	1909	23	2,703	9	239	2,455	786	2,886	246	936	3,347	5,256	1,909
	1904	23	1,018	17	178	1,723	649	1,702	190	681	2,010	3,531	1,515
	1899	13	1,213	19	77	1,117	.....	1,136	70	386	1,164	1,915	751
Boxes, fancy and paper.....	1909	19	1,427	14	87	1,328	1,504	1,896	118	447	1,018	2,653	1,035
	1904	22	597	13	48	536	558	671	54	230	431	913	482
	1899	12	599	7	24	588	.....	266	22	107	142	358	216
Brass and bronze products.....	1909	60	5,211	35	405	4,771	11,622	8,647	671	2,450	8,993	13,890	4,897
	1904	36	2,220	32	165	2,029	2,036	2,495	214	935	1,703	3,695	1,992
	1899	20	1,298	28	95	1,175	.....	1,436	117	471	1,119	2,148	1,029
Bread and other bakery products.....	1909	816	3,984	917	430	2,637	1,953	5,750	305	1,444	6,671	11,082	4,411
	1904	614	3,178	721	263	2,194	1,202	2,829	100	1,032	3,853	7,116	3,203
	1899	465	2,022	493	200	1,329	.....	1,921	138	585	2,253	4,098	1,845
Brick and tile.....	1909	124	1,806	140	101	1,565	8,346	3,017	97	803	575	2,047	1,472
	1904	169	1,731	208	89	1,436	8,147	2,182	73	651	425	1,651	1,225
	1899	177	1,715	220	52	1,443	5,640	1,497	30	480	239	1,136	897
Butter, cheese, and condensed milk.....	1909	435	1,740	350	317	1,073	4,770	3,434	187	554	12,377	14,287	1,010
	1904	371	1,301	259	167	875	3,794	1,888	65	432	7,027	8,200	1,182
	1899	286	798	203	92	593	.....	1,261	25	222	3,274	3,010	645
Canning and preserving.....	1909	104	2,387	88	226	2,073	3,374	4,405	226	665	3,074	4,071	1,897
	1904	134	2,319	122	175	2,022	2,636	2,281	150	521	2,374	3,817	1,443
	1899	117	1,650	140	110	1,400	.....	1,068	93	310	1,821	2,057	836
Carriages and wagons and materials.....	1909	212	4,707	240	433	4,034	6,302	10,189	532	2,240	5,262	10,159	4,897
	1904	218	7,231	233	598	6,400	8,411	11,302	583	3,053	8,440	14,889	6,449
	1899	271	.....	450	450	6,111	.....	8,916	399	2,514	7,550	12,887	5,337
Cars and general shop construction and repairs by steam-railroad companies.	1909	32	5,706	2	303	5,401	5,742	3,571	311	3,500	2,916	6,838	3,022
	1904	34	4,636	.....	201	4,435	4,163	2,463	191	2,497	2,599	5,369	2,770
	1899	42	4,120	.....	182	3,938	.....	2,527	147	2,026	2,120	4,333	2,213
Cars and general shop construction and repairs by street-railroad companies.	1909	15	602	.....	28	674	1,704	1,345	26	318	940	1,301	352
	1904	4	438	.....	14	424	225	527	19	240	313	588	275
	1899	6	235	.....	8	227	.....	167	10	114	158	290	141
Cement.....	1909	13	1,465	1	158	1,306	21,773	14,079	212	820	1,403	2,015	1,512
	1904	13	1,171	.....	142	1,029	18,593	10,633	175	669	909	2,500	1,651
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chemicals.....	1909	36	3,612	25	313	3,174	26,694	20,015	560	2,012	5,072	12,890	7,818
	1904	14	3,657	2	322	3,333	22,800	14,797	388	1,848	4,403	9,037	4,034
	1899	25	.....	.....	143	2,863	.....	7,482	216	1,154	2,089	5,325	2,036
Clothing, men's, including shirts.....	1909	40	3,944	42	322	3,580	1,161	3,551	395	1,221	3,389	6,532	3,143
	1904	43	2,520	44	155	2,326	931	1,894	164	717	2,526	4,203	1,677
	1899	49	.....	.....	189	2,457	.....	2,012	167	648	2,372	4,095	1,723
Clothing, women's.....	1909	52	2,521	42	285	2,194	581	1,890	277	745	1,710	3,587	1,877
	1904	44	2,312	50	219	2,043	922	1,307	167	658	1,731	3,020	1,898
	1899	31	1,703	43	120	1,540	.....	599	122	302	1,219	2,194	975
Coffins, burial cases, and undertakers' goods.	1909	18	553	8	106	439	711	753	114	208	493	1,085	592
	1904	16	702	11	61	630	982	770	66	301	525	1,225	700
	1899	18	455	18	57	380	.....	673	55	160	303	791	428
Confectionery.....	1909	50	1,335	66	217	1,052	812	1,770	221	361	1,797	2,944	1,147
	1904	44	949	59	107	783	616	767	99	232	1,033	1,699	666
	1899	38	.....	.....	115	613	.....	588	74	170	795	1,355	560
Cooperage and wooden goods, not elsewhere specified.	1909	101	2,916	106	168	2,642	8,500	3,018	227	1,016	2,004	3,989	1,985
	1904	98	2,815	99	102	2,614	7,205	2,510	136	958	1,794	3,863	2,069
	1899	120	1,848	123	50	1,675	.....	1,380	46	613	965	1,989	1,024
Copper, tin, and sheet-iron products.....	1909	152	2,801	165	250	2,386	1,875	4,758	248	1,122	2,545	4,929	2,384
	1904	67	1,771	83	118	1,570	1,445	1,587	114	687	1,396	2,889	1,493
	1899	44	.....	.....	49	549	.....	605	46	205	500	1,043	447
Corsets.....	1909	14	2,875	6	408	2,461	734	3,038	629	835	1,877	4,368	2,491
	1904	11	1,545	6	161	1,378	316	1,449	143	409	700	1,975	1,275
	1899	14	1,047	10	148	1,489	.....	1,261	151	376	706	1,703	997

1 Not reported separately.

2 Excluding statistics for two establishments, to avoid disclosure of individual operations.

3 Excluding statistics for one establishment, to avoid disclosure of individual operations.

MANUFACTURES—MICHIGAN.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

THE STATE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES—Continued.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaried employes.	Wage earners (average number).							
STATE—Continued.													
Cutlery and tools, not elsewhere specified.	1909	37	850	41	141	668	1,379	\$1,369	\$106	\$307	\$384	\$1,124	\$740
	1904	30	510	38	48	433	802	402	47	103	262	730	468
	1899	26	373	27	29	29	317	297	32	120	161	460	299
Electrical machinery, apparatus, and supplies.	1909	40	1,496	26	252	1,218	1,355	2,244	257	404	1,030	2,327	1,207
	1904	14	597	8	60	529	370	414	59	177	294	702	408
	1899	12	222	9	20	184	300	547	20	86	182	438	256
Fancy articles, not elsewhere specified.	1909	11	1,218	7	64	1,147	87	523	77	153	199	593	394
	1904	7	196	2	26	168	56	124	21	50	115	262	147
	1899	14	110	3	3	104	10	10	1	13	5	20	24
Flour-mill and gristmill products.	1909	520	2,623	660	433	1,530	38,001	11,147	365	806	20,359	34,861	5,502
	1904	405	2,353	568	277	1,508	34,755	7,654	233	767	23,414	26,512	3,098
	1899	395	2,000	200	200	1,320	6,010	6,010	152	675	18,400	21,644	3,238
Food preparations.	1909	40	1,472	28	341	1,303	8,983	5,629	431	724	4,760	11,492	6,742
	1904	55	1,411	54	316	1,041	5,400	3,446	335	460	2,256	6,754	4,408
	1899	25	404	22	99	373	797	797	55	143	678	1,892	1,214
Foundry and machine-shop products.	1909	654	25,334	505	3,180	21,649	34,152	48,005	3,347	12,344	18,711	45,300	26,688
	1904	452	18,604	441	1,767	16,396	21,278	23,147	1,875	8,057	14,086	31,434	17,348
	1899	417	18,221	388	1,485	16,331	16,331	23,380	1,403	7,775	10,551	25,430	14,879
Fur goods.	1909	31	824	38	167	619	232	1,527	155	207	684	2,284	1,300
	1904	20	707	23	49	635	350	1,040	45	242	1,036	1,771	735
	1899	18	707	23	49	635	350	1,040	45	242	1,036	1,771	735
Furniture and refrigerators.	1909	202	18,290	120	1,569	16,610	27,485	28,222	2,102	8,300	11,718	28,642	16,024
	1904	142	16,602	96	941	14,505	10,812	17,768	1,139	6,468	8,640	20,502	11,862
	1899	133	13,716	91	792	12,833	12,833	15,600	870	4,885	7,443	16,040	8,697
Gas and electric fixtures and lamps and reflectors.	1909	20	486	12	79	395	386	923	98	210	642	1,546	604
	1904	13	92	1	15	76	45	220	18	37	243	406	253
	1899	13	92	1	15	76	45	220	18	37	243	406	253
Gas, illuminating and heating.	1909	55	2,435	2	662	1,771	6,055	33,259	540	1,096	2,120	6,748	4,610
	1904	46	1,670	3	380	1,287	2,370	19,712	260	575	1,120	3,866	2,746
	1899	38	885	227	227	658	658	16,295	142	294	298	1,473	1,175
Hosiery and knit goods.	1909	35	2,818	19	254	2,545	3,201	3,735	325	760	2,047	4,020	1,682
	1904	38	3,274	14	175	3,085	2,501	3,284	175	769	1,844	3,624	1,780
	1899	32	2,714	4	201	2,509	2,136	2,136	188	580	1,450	2,701	1,332
Iron and steel, blast furnaces.	1909	11	1,401	85	1,016	17,403	8,291	8,291	148	632	4,224	5,824	1,600
	1904	11	1,236	97	1,139	7,491	4,253	4,253	110	588	3,104	4,644	1,540
	1899	7	657	44	513	2,704	2,030	2,030	64	216	1,405	2,327	922
Iron and steel, steel works and rolling mills.	1909	8	1,273	90	1,183	4,200	2,326	120	661	1,598	2,670	1,072	1,072
	1904	5	1,056	38	1,018	4,030	1,698	46	527	1,800	2,712	912	912
	1899	3	1,487	28	1,459	7,600	1,829	31	725	2,365	3,575	1,210	1,210
Leather goods.	1909	57	1,036	48	154	834	760	1,653	171	434	1,458	2,590	1,102
	1904	45	761	45	86	630	342	762	60	339	760	1,389	629
	1899	41	761	45	86	630	342	662	62	307	805	1,452	647
Leather, tanned, curried, and finished.	1909	24	2,440	5	144	2,291	6,719	12,012	232	1,133	12,121	15,331	3,210
	1904	25	1,852	13	92	1,747	4,301	6,861	147	866	7,271	9,340	2,069
	1899	27	1,518	19	72	1,427	5,214	5,214	96	559	4,097	6,016	1,310
Liquors, malt.	1909	70	2,001	46	428	1,527	9,219	12,384	558	1,073	2,421	6,840	7,410
	1904	86	1,888	51	266	1,271	7,518	8,951	391	804	1,694	6,999	5,305
	1899	77	1,271	49	242	980	6,235	6,235	297	599	1,188	5,297	4,109
Lumber and timber products.	1909	1,180	36,011	1,310	2,074	35,627	133,739	57,200	2,337	16,298	20,042	61,514	32,472
	1904	1,058	37,124	1,315	1,616	34,193	119,485	48,771	1,713	15,095	24,720	57,217	32,488
	1899	1,024	46,163	1,904	1,904	46,163	46,163	53,630	1,815	18,478	32,067	68,673	36,606
Marble and stone work.	1909	113	795	145	99	551	1,570	1,071	82	393	592	1,504	912
	1904	73	583	102	45	436	872	654	36	287	400	1,088	688
	1899	74	583	102	45	436	872	544	20	260	440	984	544
Mattresses and spring beds.	1909	14	357	14	37	306	508	489	41	140	407	689	282
	1904	12	227	11	22	194	377	306	30	93	331	514	183
	1899	13	227	11	22	194	377	203	26	86	322	521	190
Musical instruments, pianos and organs and materials.	1909	17	1,063	8	176	1,779	2,090	5,384	299	1,075	2,009	4,226	2,217
	1904	13	1,167	14	84	1,069	1,310	2,364	113	637	750	1,884	1,234
	1899	11	827	4	63	760	812	1,212	69	378	474	1,180	706
Oil, essential.	1909	23	89	27	8	54	365	306	13	17	415	486	71
	1904	6	30	18	5	13	11	174	0	8	166	240	74
	1899	0	0	10	79	79	79	210	0	24	120	186	66
Paint and varnish.	1909	20	1,657	11	622	1,024	2,362	7,113	888	557	4,032	7,416	3,384
	1904	17	958	10	300	648	1,413	4,521	308	304	3,414	5,958	2,544
	1899	17	752	14	248	490	490	2,494	286	179	1,969	3,388	1,410
Paper and wood pulp.	1909	32	4,581	5	249	4,327	48,700	15,754	423	2,142	9,025	13,022	4,897
	1904	30	3,221	6	193	3,052	31,357	8,398	218	1,306	4,581	7,341	2,760
	1899	27	2,130	9	107	2,014	2,014	4,500	143	701	2,798	4,218	1,510

¹ Excluding statistics for one establishment, to avoid disclosure of individual operations.
² Excluding statistics for two establishments, to avoid disclosure of individual operations.
³ Figures can not be shown without disclosing individual operations.

MANUFACTURES—MICHIGAN.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

THE STATE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES—Continued.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaried employes.	Wage earners (average number).							
Expressed in thousands.													
STATE—Continued.													
Paper goods, not elsewhere specified....	1909 1904 1899	18 16 23	1,311 378 155	0 1 1	124 37 18	1,181 341 130	2,580 975	\$2,776 1,068 161	\$161 45 16	\$483 146 36	\$1,953 818 60	\$3,551 1,329 202	\$1,508 513 142
Patent medicines and compounds and druggists' preparations.	1909 1904 1899	159 96 75	5,124 3,051	133 76	1,742 1,039 940	3,249 2,536 2,263	2,270 2,306	11,452 8,467 4,071	2,134 1,063 845	1,500 952 765	4,941 3,738 2,885	13,475 10,470 7,284	8,534 6,672 4,399
Printing and publishing.....	1909 1904 1899	1,045 837 829	11,048 8,650	991 1,019	2,838 1,632 1,399	7,219 5,999 5,042	7,651 5,292	13,725 9,079 7,380	2,561 1,410	4,000 2,981 2,198	4,935 3,424 1,946	17,348 12,050 8,626	12,413 8,626 6,260
Salt.....	1909 1904 1899	27 41 53	1,567 1,490 1,500	12 22 29	192 80 91	1,363 1,388 1,449	6,628 6,001	5,167 3,538 4,760	197 92 87	745 626 619	1,643 1,101 1,096	3,653 2,405 2,461	2,010 1,214 1,365
Scales and balances.....	1909 1904 1899	4 7 3	247 181 51	..... 17 3	19 32 15	228 132 33	310 140	334 373 103	24 25 5	137 58 16	229 65 28	524 258 70	295 193 51
Shipbuilding, including boat building..	1909 1904 1899	91 57 54	2,758 2,207 3,042	103 59 53	311 150 73	2,344 1,998 3,457	6,485 4,164	6,072 3,912 3,893	308 135 76	1,380 1,008 1,344	2,400 1,079 4,432	5,034 2,973 4,432	2,544 1,894 2,234
Show cases.....	1909 1904 1899	11 10 4	651 691 68	31 8 6	97 66 4	823 617 58	1,403 942	1,000 728 42	134 84 4	450 314 33	796 562 48	1,866 1,165 134	1,070 663 86
Slaughtering and meat packing.....	1909 1904 1899	45 26 32	1,114 590	55 28	157 63 72	902 499 469	3,404 959	3,584 1,378 1,450	152 65 67	481 265 236	11,666 5,629 4,820	13,435 6,356 5,402	1,769 727 582
Springs, steel, car and carriage.....	1909 1904 1899	5 6 5	633 348 367	..... 1	45 24 16	588 323 351	908 572	1,200 372 368	77 20 16	300 128 150	558 282 312	1,308 541 584	750 259 272
Stoves and furnaces, including gas and oil stoves.	1909 1904 1899	33 27	5,027 4,037	9 24	536 441	4,482 4,472	5,910 4,580	9,522 6,092	758 576	2,832 2,491	2,816 2,737	9,123 8,026	6,307 5,289
Tobacco manufactures.....	1909 1904 1899	729 706 607	9,242 7,619	813 786	563 405 362	7,876 6,428 5,282	937 1,156 853	6,837 4,147 2,826	716 385 398	3,076 2,467 1,769	7,208 4,847 3,131	16,170 11,804 9,245	8,071 7,017 6,114
Wall plaster.....	1909 1904 1899	16 8	840 393	10 5	84 45	746 343	3,020 2,125	1,775 1,036	123 42	276 157	412 380	1,421 842	1,009 462
Window shades and fixtures.....	1909 1904 1899	7 3	663 241	2	25 16	636 225	1,236 342	1,192 170	33 21	261 85	807 360	1,206 508	469 148
Wirework, including wire rope and cable.	1909 1904 1899	37 30 30	1,261 1,221	23 21	329 216 120	909 984 484	1,900 1,355	4,407 2,426	326 200	428 392	3,446 1,090	5,285 3,450	1,839 1,469 708
Wood distillation, not including turpentine and rosin.	1909 1904 1899	12 9	859 327	1 4	52 32	806 291	5,012 366	2,830 1,334	64 32	504 156	1,155 351	2,399 738	1,244 387
Wood, turned and carved.....	1909 1904 1899	58 74 56	1,278 1,397 1,023	68 79 59	73 92 46	1,137 1,226 918	4,695 3,897	1,287 1,636 787	82 82 50	548 528 306	634 589 287	1,708 1,567 924	1,074 978 637
Woolen, worsted, and felt goods, and wool hats.	1909 1904 1899	15 15 16	610 529 376	18 20 16	38 27 23	554 482 337	1,900 1,186 1,076	1,421 707 776	53 24 18	235 170 108	863 595 407	1,571 977 627	708 382 220
All other industries.....	1909 1904 1899	946 699 699	26,299 18,748	1,078 700	3,659 1,487 1,251	21,562 16,561 13,854	41,728 35,109	56,600 30,367 25,761	4,476 1,439 1,181	11,651 7,798 5,345	53,342 44,194 36,140	87,874 64,411 48,892	34,532 20,217 12,762

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

DETROIT—All Industries.....	1909 1904 1899	2,036 1,362 1,269	95,841 55,718	1,804 1,312	13,028 5,923 4,947	81,011 48,483 38,373	114,190	\$190,125 91,038 67,224	\$15,290 6,126 4,726	\$43,007 22,658 15,317	\$130,218 66,581 47,007	\$252,992 128,247 88,386	\$122,774 61,666 41,359
Automobiles, including bodies and parts.	1909 1904 1899	68 19	17,437 2,191	..... 12	1,762 146	15,675 2,034	14,666	28,928 3,447	1,781 168	9,621 959	31,363 2,631	59,536 6,240	28,173 3,609
Baskets and rattan and willow ware...	1909 1904 1899	7 7 10	22 17 35	6 7 10	..... 1 2	16 9 23	26	15 8 26	..... (6) (6)	5 4 9	11 5 6	27 15 23	16 10 17
Blackening and cleansing and polishing preparations.	1909 1904 1899	8 3 3	21 25 12	7 5 6	8 9 1	6 11 5	85	16 38 3	8 6 (6)	3 5 3	15 20 6	30 47 18	15 27 12

¹ Excluding statistics for two establishments, to avoid disclosure of individual operations.

² Excluding statistics for one establishment, to avoid disclosure of individual operations.

³ Not reported separately.

⁴ Figures can not be shown without disclosing individual operations.

⁵ Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

⁶ Less than \$500.

MANUFACTURES—MICHIGAN.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES—Continued.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaried employes.	Wage earners (average number).							
Expressed in thousands.													
DETROIT—Continued.													
Boots and shoes, including out stock and findings.	1909	8	1,453	6	120	1,327	302	\$1,582	\$160	\$491	\$1,702	\$2,744	\$1,042
	1904	8	1,037	6	105	926	.....	1,074	134	400	1,117	2,030	922
	1899	16	690	12	33	645	.....	741	33	235	702	1,213	511
Boxes, cigar.....	1909	4	260	4	7	249	104	140	7	70	111	238	127
	1904	4	214	4	3	202	.....	102	7	62	86	184	98
	1899	3	160	4	4	152	.....	90	4	34	50	119	69
Boxes, fancy and paper.....	1909	7	400	6	28	360	142	357	35	115	148	362	234
	1904	8	438	6	17	415	.....	265	26	97	115	313	198
	1899	5	399	4	14	361	.....	191	15	70	85	230	145
Brass and bronze products.....	1909	37	4,374	16	326	4,032	10,051	7,306	461	2,040	8,273	12,207	4,024
	1904	23	2,190	20	147	2,032	.....	3,430	210	987	3,429	5,682	2,263
	1899	17	883	18	62	803	.....	1,030	85	333	920	1,633	713
Bread and other bakery products.....	1909	205	1,606	272	226	1,408	1,112	2,003	220	638	2,897	4,826	1,929
	1904	150	1,165	164	127	874	.....	1,063	90	424	1,560	2,932	1,366
	1899	100	866	168	65	603	.....	806	85	274	1,004	1,877	873
Brick and tile.....	1909	10	205	13	9	183	504	207	8	100	84	280	202
	1904	3	27	3	4	20	.....	68	2	12	10	33	23
	1899	3	30	3	1	35	.....	104	(*)	14	5	25	20
Canning and preserving.....	1909	9	496	6	82	408	549	1,270	99	157	855	1,568	713
	1904	8	670	8	53	609	.....	731	71	174	1,144	1,788	644
	1899	15	212	2	32	178	.....	109	41	48	655	708	153
Carpets, rag.....	1909	7	27	8	.....	10	26	14	.....	9	3	20	17
	1904	4	40	5	.....	4	.....	10	2	8	3	22	19
	1899	3	.....	.....	2	17	.....	17	1	6	1	10	9
Carriages and wagons and materials.....	1909	34	321	44	14	263	188	655	27	104	180	507	318
	1904	26	956	31	41	894	.....	822	52	403	794	1,515	721
	1899	10	.....	.....	23	316	.....	553	31	140	350	900	316
Clothing, men's, including shirts.....	1909	22	3,008	27	195	2,786	951	2,473	260	603	2,352	4,701	2,409
	1904	28	1,996	33	103	1,590	.....	1,270	90	472	1,701	2,957	1,166
	1899	20	1,414	33	74	1,307	.....	817	60	295	1,050	1,829	779
Clothing, women's.....	1909	27	1,041	29	91	921	154	825	82	357	661	1,494	833
	1904	15	780	24	57	708	.....	317	44	233	694	1,108	474
	1899	10	684	16	31	637	.....	178	27	128	401	692	291
Coffins, burial cases, and undertakers' goods.	1909	5	117	6	16	95	148	156	21	56	117	208	151
	1904	5	147	3	15	129	.....	190	22	63	138	285	147
	1899	7	145	8	20	117	.....	212	27	47	71	233	162
Confectionery.....	1909	23	501	30	84	387	341	374	69	139	629	1,136	507
	1904	16	464	17	60	387	.....	303	55	115	517	845	328
	1899	13	.....	.....	78	360	.....	281	43	94	433	740	307
Cooperage and wooden goods, not elsewhere specified.	1909	9	144	13	5	126	155	141	8	56	131	241	110
	1904	8	127	10	4	113	.....	101	3	51	203	300	97
	1899	11	140	12	4	124	.....	131	2	56	142	242	100
Copper, tin, and sheet-iron products.....	1909	72	2,152	74	146	1,932	1,453	3,800	158	851	1,032	3,534	1,602
	1904	28	1,374	24	94	1,256	.....	1,274	95	508	1,117	2,258	1,141
	1899	18	.....	.....	25	358	.....	204	30	125	383	655	272
Cutlery and tools, not elsewhere specified.	1909	19	373	11	103	250	710	514	50	130	154	466	312
	1904	15	88	1	15	72	.....	112	17	32	61	140	85
	1899	16	49	3	4	42	.....	66	7	21	9	56	47
Electrical machinery, apparatus, and supplies.	1909	23	685	15	129	541	575	1,056	145	226	493	1,148	655
	1904	8	125	6	29	90	.....	177	27	35	65	101	126
	1899	9	150	8	20	122	.....	433	22	60	154	363	209
Electroplating.....	1909	8	121	6	11	104	190	67	9	66	60	169	100
	1904	4	70	3	9	58	.....	13	7	24	6	51	45
	1899	4	55	4	7	44	.....	13	6	17	5	37	32
Emery and other abrasive wheels.....	1909	4	122	2	18	102	155	198	17	61	155	284	120
	1904	3	73	3	11	59	.....	104	16	37	31	135	104
	1899	3	70	1	13	56	.....	85	9	34	72	138	66
Flags, banners, regalia, society badges and emblems.	1909	5	51	3	8	40	28	46	6	14	30	69	39
	1904	14	100	3	17	80	.....	92	18	66	62	163	101
	1899	23	95	4	8	83	.....	30	7	27	67	135	68
Flour-mill and gristmill products.....	1909	5	220	5	40	169	1,150	1,432	65	78	4,422	5,089	667
	1904	7	160	8	25	123	.....	491	25	69	2,804	3,034	230
	1899	3	.....	.....	12	55	.....	258	8	28	1,254	1,455	201
Foundry and machine-shop products.....	1909	215	10,212	125	1,393	8,694	10,336	20,434	1,413	4,828	7,614	18,296	10,682
	1904	125	7,194	92	761	6,341	.....	9,003	795	3,396	6,186	13,647	7,461
	1899	108	.....	.....	728	8,125	.....	12,223	803	3,921	5,140	12,714	7,574
Fur goods.....	1909	19	519	24	124	371	24	884	112	181	707	1,738	1,031
	1904	10	311	14	20	268	.....	451	28	130	677	1,121	444
	1899	11	.....	.....	84	351	.....	320	53	143	800	1,302	442

1 Excluding statistics for one establishment, to avoid disclosure of individual operations.
 2 Excluding statistics for two establishments, to avoid disclosure of individual operations.
 * Less than \$500.

MANUFACTURES—MICHIGAN.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES—Continued.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaried employes.	Wage earners (average number).							
Expressed in thousands.													
DETROIT—Continued.													
Furniture and refrigerators.....	1909	33	2,528	28	210	2,290	3,722	\$3,203	\$257	\$1,186	\$1,302	\$3,762	\$2,400
	1904	¹ 24	2,110	19	151	1,949	.....	2,406	189	811	1,038	2,624	1,686
	1899	² 22	1,604	25	135	1,404	.....	1,420	137	542	790	1,865	1,069
Hand stamps and stencils and brands..	1909	7	24	7	2	15	5	14	1	6	8	39	31
	1904	² 4	27	6	.....	21	.....	12	.....	9	6	29	23
	1899	6	20	7	4	15	.....	15	2	5	7	22	15
Hosiery and knit goods.....	1909	9	367	7	26	334	214	424	25	91	320	559	233
	1904	12	553	8	48	497	.....	624	44	120	372	720	348
	1899	¹ 8	442	2	14	426	.....	241	15	85	224	442	218
Iron and steel, steel works and rolling mills.	1909	5	1,064	.....	75	980	3,430	1,969	114	550	1,317	2,297	980
	1904	4	892	.....	30	832	.....	1,447	37	431	1,004	2,362	758
	1899	4	1,146	.....	25	1,121	.....	1,794	28	595	2,159	3,199	1,040
Leather goods.....	1909	22	516	18	95	403	530	821	85	211	819	1,396	577
	1904	10	352	6	42	304	.....	225	30	108	340	632	283
	1899	² 6	.....	.....	19	201	.....	142	18	91	190	383	184
Liquors, malt.....	1909	18	838	13	170	646	3,886	5,208	250	495	1,185	4,042	3,757
	1904	19	618	10	115	493	.....	3,977	173	368	795	3,272	2,477
	1899	20	539	12	115	412	.....	2,800	133	257	547	2,593	2,046
Lumber and timber products.....	1909	59	2,322	52	224	2,046	4,629	4,608	241	1,013	3,759	6,110	2,351
	1904	¹ 30	1,166	26	101	1,030	.....	1,435	107	554	1,196	2,167	971
	1899	43	.....	.....	71	1,252	.....	1,444	63	481	1,280	2,204	924
Marble and stone work.....	1909	19	236	25	17	194	560	330	14	131	172	413	241
	1904	12	201	21	6	174	.....	236	5	112	109	312	203
	1899	16	.....	.....	3	169	.....	233	2	117	176	394	218
Models and patterns, not including paper patterns.	1909	17	222	18	16	188	95	106	15	125	24	238	214
	1904	7	76	7	1	68	.....	18	1	30	4	50	46
	1899	7	103	10	1	92	.....	17	1	46	4	68	64
Optical goods.....	1909	6	241	3	50	188	79	283	52	75	97	358	201
	1904	3	147	1	12	134	.....	117	15	35	29	108	79
	1899	3	.....	.....	28	168	.....	196	24	46	106	209	103
Patent medicines and compounds and druggists' preparations.	1909	74	4,280	54	1,417	2,818	1,810	10,179	1,853	1,328	4,304	11,558	7,254
	1904	42	3,189	34	875	2,280	.....	7,912	862	859	3,509	9,423	5,914
	1899	34	.....	.....	814	2,022	.....	3,693	720	654	2,450	6,176	3,726
Photo-engraving.....	1909	7	213	5	55	153	116	171	63	116	60	351	291
	1904	6	222	8	54	160	.....	213	30	126	49	299	250
	1899	6	87	6	13	68	.....	47	10	34	11	89	78
Printing and publishing.....	1909	224	4,058	212	1,327	2,510	2,602	4,168	1,166	1,570	2,044	7,291	5,247
	1904	165	2,836	160	756	1,920	.....	2,873	998	1,114	1,410	4,855	3,445
	1899	140	.....	.....	918	1,576	.....	2,115	641	794	816	3,499	2,683
Shipbuilding, including boat building..	1909	17	607	22	100	485	1,079	1,611	77	300	512	1,102	590
	1904	¹ 7	127	7	9	111	.....	159	8	64	53	187	134
	1899	¹ 10	109	10	8	91	.....	75	6	48	36	124	88
Show cases.....	1909	6	117	3	20	94	435	161	23	55	109	240	131
	1904	5	209	6	22	181	.....	175	27	98	142	319	177
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Slaughtering and meat packing.....	1909	29	983	33	139	811	3,092	3,340	138	483	11,221	12,850	1,629
	1904	11	486	10	56	420	.....	1,251	57	222	4,763	5,350	597
	1899	¹ 16	417	18	61	338	.....	1,185	60	178	3,628	4,048	420
Stoves and furnaces, including gas and oil stoves.	1909	8	3,130	.....	322	2,808	2,741	6,239	481	1,800	1,570	5,676	4,106
	1904	² 0	3,431	1	308	3,122	.....	4,038	414	1,814	1,751	5,595	3,814
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tobacco manufactures.....	1909	198	6,544	202	459	5,883	925	5,436	638	2,177	5,869	12,773	6,904
	1904	225	4,517	235	280	4,002	.....	2,084	287	1,341	3,301	7,727	4,426
	1899	192	4,037	193	297	3,542	.....	1,930	357	1,003	2,074	6,536	4,462
Umbrellas and canes.....	1909	3	17	4	4	9	3	26	2	2	22	41	19
	1904	5	82	6	12	64	.....	89	12	22	104	240	76
	1899	4	86	4	8	74	.....	36	6	16	138	181	43
All other industries.....	1909	355	21,637	340	3,338	17,959	39,344	66,789	4,548	9,864	30,390	59,842	29,452
	1904	238	12,805	229	1,155	11,421	.....	35,795	1,105	5,479	20,675	34,895	14,220
	1899	262	.....	.....	1,030	10,464	.....	30,821	1,095	4,154	18,631	29,221	10,590

¹ Excluding statistics for one establishment, to avoid disclosure of individual operations.² Excluding statistics for two establishments, to avoid disclosure of individual operations.³ Figures can not be shown without disclosing individual operations.⁴ Not reported separately.

MANUFACTURES—MICHIGAN.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES—Continued.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaried employees.	Wage earners (average number).							
GRAND RAPIDS—All industries.	1909	524	20,327	447	2,200	17,500	27,075	\$38,783	\$3,132	\$9,217	\$19,736	\$42,231	\$22,495
	1904	388	17,366	386	1,466	15,514		26,431	1,671	7,318	14,422	30,690	16,268
	1899	382			1,148	12,920		22,692	1,137	5,298	11,121	22,228	11,107
Bread and other bakery products.....	1909	60	477	74	42	361	185	2,075	48	185	872	1,476	604
	1904	30	305	34	51	310		740	40	137	613	1,178	565
	1899	40	265	40	56	100		510	35	80	442	762	310
Brass and bronze products.....	1909	5	445	7	33	405	401	561	47	209	243	680	437
	1904	3	382	6	20	350		277	28	136	138	399	261
	1899												
Brick and tile.....	1909	3	67		9	58	135	207	7	32	20	89	60
	1904	3	69	7	9	53		185	7	26	16	69	53
	1899												
Carpets, rag.....	1909	3	8	3	2	3	7	10	2	2	1	11	10
	1904	3	16	7	1	8		4	1	3	1	8	7
	1899	4				2		2		(*)	1	3	2
Carriages and wagons and materials....	1909	8	102	7	8	87	173	181	11	48	70	194	124
	1904	11	210	9	17	184		938	18	95	231	495	264
	1899	10	310	9	21	280		906	21	124	380	683	294
Clothing, men's, including shirts.....	1909	6	265	6	50	239	70	342	47	84	220	513	293
	1904	6	326	5	38	283		297	44	86	245	450	205
	1899	9	308	8	37	263		153	20	68	160	355	195
Copper, tin, and sheet-iron products....	1909	11	128	11	10	101	39	128	14	53	102	231	129
	1904	5	72	11	5	50		57	3	30	43	101	58
	1899	44			5	40		104	3	19	37	81	44
Cutlery and tools, not elsewhere specified.	1909	7	33	11	2	20	70	36	2	12	9	38	29
	1904	43	21	5	2	14		18	1	8	4	20	10
	1899	44	8	2	1	5		6	(*)	2	2	7	5
Flour-mill and gristmill products.....	1909	8	184	6	60	118	1,510	1,153	66	72	3,045	3,781	730
	1904	0	147	8	33	106		600	40	64	2,166	2,371	265
	1899	6			22	92		650	20	45	1,009	1,375	206
Foundry and machine-shop products....	1909	49	1,815	40	243	1,532	2,107	2,815	280	825	1,134	2,740	1,606
	1904	33	1,121	28	129	964		1,313	142	473	982	1,698	980
	1899	32			123	611		1,420	87	399	557	1,362	805
Furniture and refrigerators.....	1909	54	7,854	33	571	7,250	10,305	13,322	927	3,903	4,937	12,630	7,693
	1904	38	7,071	20	367	6,654		8,005	558	3,240	3,583	9,409	6,826
	1899	434	6,570	11	323	6,230		8,302	418	2,582	3,345	7,495	4,159
Leather goods.....	1909	6	64	5	8	51	26	137	10	30	113	179	66
	1904	5	63	11	9	43		115	6	21	59	100	47
	1899	3			3	30		31	3	13	61	92	31
Leather, tanned, curried, and finished..	1909	3	108		10	98	437	570	14	50	545	705	100
	1904												
	1899	3	110	1	8	101		478	11	45	563	698	135
Lumber and timber products.....	1909	20	709	17	98	594	2,504	1,434	108	343	907	1,697	790
	1904	9	410	12	37	361		552	43	183	607	967	360
	1899	14	939	11	47	581		1,200	45	276	891	1,470	618
Marble and stone work.....	1909	6	62	7	14	41	77	121	13	34	30	108	69
	1904	44	43	5	2	36		45	2	27	49	102	53
	1899	44			9	14		20	3	10	11	33	22
Patent medicines and compounds and druggists' preparations.	1909	18	126	19	49	58	33	156	32	24	117	285	168
	1904	8	37	7	10	20		26	8	8	20	83	63
	1899	49	127	7	33	87		406	34	34	105	425	260
Printing and publishing.....	1909	68	1,148	53	203	832	781	1,629	207	489	587	2,057	1,470
	1904	48	801	38	166	597		744	170	318	357	1,292	935
	1899	40	626	41	100	485		1,339	75	233	181	725	544
Tobacco manufactures.....	1909	36	522	36	28	458	6	236	26	188	302	725	423
	1904	34	362	35	24	303		127	17	133	159	575	416
	1899	36	278	30	16	226		113	9	79	130	305	169
Wall plaster.....	1909	5	361		61	300	2,408	1,033	224	135	226	866	640
	1904	4	338	1	42	295		801	30	139	274	713	439
	1899												
All other industries.....	1909	142	5,810	112	723	4,084	6,403	12,637	957	2,493	6,238	13,226	6,688
	1904	135	5,482	137	474	4,871		10,281	408	2,192	5,175	10,684	5,509
	1899	130			347	3,398		6,992	347	1,262	2,601	5,858	3,257

¹ Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

² Figures can not be shown without disclosing individual operations.

³ Less than \$500.

⁴ Excluding statistics for one establishment, to avoid disclosure of individual operations.

⁵ Excluding statistics for two establishments, to avoid disclosure of individual operations.

⁶ Not reported separately.

MANUFACTURES—MICHIGAN.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES—Continued.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaried employes.	Wage earners (average number).							
Expressed in thousands.													
SAGINAW—All industries.....	1909	203	7,090	232	868	5,990	14,412	\$26,703	\$926	\$3,184	\$10,409	\$18,833	\$8,424
	1904	179	5,205	191	569	4,445		7,273	502	1,931	5,367	10,079	4,712
	1899	184			357	4,205		7,041	355	1,672	5,084	8,653	3,569
Bread and other bakery products.....	1909	0	112	12	17	83	76	134	13	42	223	328	105
	1904	9	68	10	5	53		59	2	27	75	131	50
	1899	15	47	15	1	31		41	(²)	13	42	74	32
Carriages and wagons and materials.....	1909	5	30	6		24	20	57		13	9	31	22
	1904	6	42	8	3	31		61	1	18	21	48	27
	1899	11	83	10	15	58		114	9	27	49	141	92
Cooperage and wooden goods, not elsewhere specified.	1909	9	690	14	34	642	1,648	983	48	207	699	1,200	507
	1904	9	543	12	29	502		464	44	174	454	918	464
	1899	7	217	8	5	204		217	5	69	121	224	103
Flour-mill and gristmill products.....	1909	4	101	3	40	58	457	551	30	32	558	731	173
	1904	4	82	5	22	55		280	17	24	551	652	101
	1899	3			11	34		192	9	19	341	407	60
Foundry and machine-shop products.....	1909	23	871	25	148	698	1,674	2,064	219	432	788	1,838	1,050
	1904	14	886	11	115	760		1,200	122	420	918	1,884	906
	1899	10	652	7	70	575		1,094	89	286	721	1,256	535
Furniture and refrigerators.....	1909	12	484	8	59	417	806	1,090	43	199	326	881	555
	1904	5	194	4	10	174		162	11	80	92	212	120
	1899	4	103	5	0	92		92	6	36	50	131	72
Liquors, malt.....	1909	5	92	4	14	74	170	526	24	58	110	393	283
	1904	6	82	5	19	58		418	25	39	90	297	207
	1899	5	60	4	11	45		271	14	27	42	200	164
Lumber and timber products.....	1909	12	783	21	66	696	2,082	1,804	61	335	1,620	2,404	775
	1904	13	709	23	65	672		1,044	55	260	1,314	1,908	594
	1899	17			87	1,107		2,339	85	431	1,800	2,610	810
Marble and stone work.....	1909	4	27	7	3	17	80	26	2	12	22	50	28
	1904	3	33	5	2	26		20	1	20	21	68	47
	1899	3			2	27		24	1	18	17	57	40
Printing and publishing.....	1909	22	206	21	81	164	411	422	70	100	127	428	301
	1904	23	225	28	51	146		180	33	85	81	317	230
	1899	22	185	24	20	132		182	28	66	48	227	179
Salt.....	1909	3	15	3	2	10	30	29	2	6	20	44	24
	1904	4	14	5		9		31		4	13	27	14
	1899	10	82	6	8	68		182	5	32	70	147	77
Tobacco manufactures.....	1909	27	163	30	6	127		80	4	56	82	203	121
	1904	20	183	21	15	147		57	7	68	73	214	141
	1899	10	140	20	3	117		57	2	50	60	178	118
All other industries.....	1909	68	3,456	78	398	2,980	6,268	18,928	410	1,602	5,816	10,296	4,480
	1904	63	2,003	54	227	1,812		3,202	184	762	1,604	3,403	1,739
	1899	58			109	1,715		2,236	102	598	1,705	2,986	1,281

¹ Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

² Less than \$500.

³ Excluding statistics for one establishment, to avoid disclosure of individual operations.

⁴ Excluding statistics for two establishments, to avoid disclosure of individual operations.

MANUFACTURES—MICHIGAN.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

CITIES OF 10,000 TO 50,000 INHABITANTS—ALL INDUSTRIES COMBINED.

CITY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaried employes.	Wage earners (average number).							
Expressed in thousands.													
Adrian.....	1909	80	1,466	60	341	1,059	3,211	\$5,080	\$327	\$540	\$4,150	\$0,085	\$1,035
	1904	65	1,830	48	280	1,502		3,258	261	2,829	4,807	2,068	
	1899	63			195	1,030		1,631	120	464	898	2,125	1,227
Alpena.....	1909	58	1,614	57	125	1,432	10,670	5,798	151	711	2,801	3,004	1,603
	1904	57	1,369	60	64	1,245		2,682	68	534	1,684	2,905	1,221
	1899	40		54	54	1,202		2,356	46	496	1,276	2,273	997
Ann Arbor.....	1909	63	783	67	143	573	1,458	1,760	125	287	1,010	1,800	856
	1904	65	690	61	80	549		1,095	62	244	774	1,389	612
	1899	71		67	67	623		1,055	40	234	785	1,377	592
Battle Creek.....	1909	105	5,281	95	1,011	4,175	14,023	10,176	1,250	2,354	7,008	20,174	13,106
	1904	120	4,200	131	770	3,389		13,039	872	1,886	3,984	12,298	8,314
	1899	75		432	432	2,051		7,212	402	970	2,100	6,301	4,201
Bay City ¹	1909	182	5,357	178	442	4,737	17,872	10,280	467	2,118	5,647	10,294	4,647
	1904	173	4,899	161	282	4,456		5,343	272	2,001	4,948	8,800	3,861
	1899	177		262	262	4,309		6,843	243	1,801	5,235	9,010	3,775
Escanaba.....	1909	39	804	30	48	720	1,416	1,024	62	405	364	1,074	710
	1904	34	1,053	28	76	949		1,019	77	452	404	1,333	929
	1899	26		25	25	620		431	31	238	250	610	360
Flint.....	1909	104	7,840	117	635	7,088	8,240	18,085	535	4,429	13,971	24,118	10,147
	1904	70	2,494	84	249	2,181		4,210	228	1,041	3,769	6,177	2,408
	1899	63		87	87	1,960		2,507	73	802	2,754	4,713	1,950
Holland.....	1909	59	2,183	45	198	1,940	2,956	4,524	262	636	2,585	4,022	2,037
	² 1904												
	² 1899												
Ironwood.....	1909	14	229	16	12	201	521	304	14	88	201	377	176
	1904	13	108	14	7	87		168	5	47	78	202	124
	1899	14		3	3	90		88	3	46	55	146	90
Ishpeming.....	1909	19	92	10	7	60	73	88	7	37	52	132	80
	1904	15	92	11	8	73		100	11	42	142	247	105
	1899	14		5	5	80		132	7	44	95	165	100
Jackson.....	1909	169	5,024	135	692	4,707	6,300	9,078	719	2,462	8,168	14,006	5,838
	1904	147	4,575	132	476	3,967		5,346	427	1,838	4,272	8,348	4,076
	1899	117		374	374	3,715		4,371	350	1,437	3,808	6,710	2,602
Kalamazoo.....	1909	193	7,527	152	1,103	6,272	14,449	16,395	1,236	3,149	9,505	17,904	8,309
	1904	157	6,467	133	668	5,666		691	618	2,562	6,866	13,142	6,240
	1899	120		485	485	3,870		5,571	432	1,428	3,893	7,186	3,203
Lansing.....	1909	169	6,152	142	725	5,285	8,720	13,131	808	2,707	8,802	10,567	7,765
	1904	98	3,405	83	340	2,982		5,999	352	1,889	3,473	6,887	3,414
	1899	74		163	163	1,425		2,047	135	577	1,632	2,942	1,310
Manistee.....	1909	64	2,365	78	162	2,125	6,811	3,248	183	1,019	1,289	3,344	2,055
	1904	47	2,238	33	121	2,084		2,832	166	969	1,274	3,257	1,983
	1899	56		113	113	2,103		3,606	111	964	1,376	3,625	2,249
Marquette.....	1909	34	601	29	74	498	1,500	1,392	82	365	556	1,255	609
	1904	31	814	23	53	738		1,663	67	436	1,392	2,364	972
	1899	29		64	64	836		1,177	70	355	813	1,585	772
Menominee.....	1909	52	1,930	41	189	1,700	4,770	5,213	205	718	1,657	3,728	2,071
	1904	45	1,030	35	106	1,489		3,340	120	705	1,373	2,974	1,601
	1899	38		88	88	1,703		3,788	120	709	1,837	4,076	2,239
Muskegon.....	1909	101	5,068	89	487	4,522	10,436	8,337	445	2,107	4,938	9,648	4,710
	1904	70	3,371	70	223	3,078		4,790	257	1,211	3,526	6,310	2,793
	1899	67		104	104	3,078		3,637	154	1,125	2,269	4,527	2,258
Pontiac.....	1909	42	2,009	27	243	1,739	2,854	3,826	221	1,087	3,241	5,894	2,653
	1904	47	1,474	37	141	1,266		2,067	134	688	1,735	3,047	1,312
	1899	47		109	109	1,062		1,295	79	422	1,602	2,471	869
Port Huron.....	1909	82	1,862	75	207	1,580	3,130	3,880	201	761	1,660	3,588	1,638
	³ 1904	74	2,356	69	151	2,136		3,205	155	1,107	1,747	3,715	1,968
	1899	78		210	210	2,026		3,149	138	933	1,752	3,627	1,875
Sault Ste. Marie.....	1909	47	1,125	37	83	1,005	3,230	4,663	117	542	3,123	4,610	1,490
	1904	38	967	32	70	865		1,634	89	462	1,427	2,412	985
	1899	33		24	24	317		313	18	153	279	728	440
Traverse City.....	1909	61	1,403	54	129	1,220	4,231	1,958	139	444	1,183	2,289	1,106
	1904	46	1,217	43	66	1,108		1,934	83	434	1,098	2,177	1,079
	1899	36		53	53	909		870	44	392	615	1,201	686

¹ In 1904 and 1899 the statistics for West Bay City, which was annexed in 1905, are included.
² Figures not available.
³ Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

TABLE II.—DETAIL STATEMENT FOR

INDUSTRY.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.										WAGE EARNERS—NUMBER DEC. 15, OR NEAREST REPRESENTATIVE DAY.					Primary horse-power.
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks.		Wage earners.			Total.	16 and over.		Under 16.				
					Male.	Female.	Average number.	Number.			Male.	Female.	Male.	Female.			
								Maximum month.	Minimum month.								
1 All industries.....	9,159	271,071	8,965	8,031	16,183	6,393	231,499	De 250,078	Ja 211,679	(1)	(1)	(1)	(1)	(1)	598,288		
2 Agricultural implements.....	32	3,041	22	140	418	102	2,359	De 2,593	Se 2,028	2,570	2,556	3	11	.....	5,195	
3 Artificial stone.....	191	791	228	24	17	8	614	Au 773	Ja 2	651	650	1	.....	.....	634
4 Automobiles, including bodies and parts.	113	28,098	29	518	1,028	479	25,444	Au 20,006	Ja 20,404	33,884	33,490	376	12	.....	25,938	
5 Baking powders and yeast	7	46	20	2	3	1	20	Oc 25	Ja 15	26	14	12	.....	.....	58
6 Baskets, and rattan and willow ware..	18	410	21	13	9	3	373	Jy 2	Ja 116	427	347	78	.....	2	900	
7 Beet sugar.....	11	1,755	.....	56	200	30	1,460	No 4,372	Fe 280	4,008	4,085	13	.....	.....	8,854
8 Bleaching and cleansing and polishing preparations.	17	273	21	14	101	49	88	Jy 2	De 74	74	58	16	.....	.....	249
9 Boots and shoes, including out stock and findings.	23	2,703	9	49	127	63	2,455	De 2,547	My 2,395	2,547	1,400	893	99	65	786		
10 Boxes, cigar.....	12	392	9	12	8	1	362	Fe 403	Ap 330	420	171	231	8	10	255		
11 Boxes, fancy and paper.....	19	1,427	14	46	19	22	1,326	No 1,490	Ja 1,217	1,442	655	708	13	66	1,504		
12 Brass and bronze products.....	60	5,211	35	131	172	102	4,771	De 5,388	Je 4,472	5,660	5,300	174	175	5	11,022		
13 Bread and other bakery products.....	816	3,984	917	67	206	157	2,037	Au 2,782	Fe 2,408	2,700	2,207	504	28	21	1,053		
14 Brick and tile.....	124	1,806	140	60	22	10	1,565	Jy 2,407	Fe 586	2,130	2,122	.....	8	.....	8,346
15 Brooms.....	29	153	34	.....	1	.....	118	My 126	Oc 95	124	83	31	9	1	84
16 Brushes.....	14	260	23	4	6	4	223	Fe 240	Jy 200	229	127	96	3	3	222		
17 Butter, cheese, and condensed milk	435	1,740	350	187	63	67	1,073	Jy 2	Fe 949	1,156	1,047	106	2	.....	4,770	
18 Canning and preserving.....	104	2,387	88	86	110	30	2,073	Se 4,172	Ja 654	3,603	1,696	1,841	40	26	3,374		
19 Carpets, rag.....	30	117	34	2	3	2	76	Ja 95	Ja 43	65	38	26	.....	1	107	
20 Carriages and wagons and materials..	212	4,707	240	121	209	103	4,034	Ap 4,347	Au 3,512	4,340	4,270	75	4	.....	6,362	
21 Cars and general shop construction and repairs by steam-railroad companies.	32	5,766	2	126	169	8	5,401	Oc 5,736	Je 4,868	5,738	5,725	3	10	.....	5,742	
22 Cars and general shop construction and repairs by street-railroad companies.	15	602	.....	15	11	2	574	De 626	Ja 517	626	626	.....	.....	.....	1,704
23 Cement.....	13	1,465	1	40	106	12	1,306	My 1,594	Fe 774	1,289	1,285	4	.....	.....	21,773
24 Chemicals.....	36	3,512	25	89	199	25	3,174	De 3,405	Ap 2,880	3,406	3,372	26	8	.....	26,694	
25 Clothing, men's, including shirts.....	40	3,944	42	71	171	80	3,580	De 3,878	Je 3,310	3,897	485	3,412	.....	.....	1,161
26 Clothing, women's.....	52	2,521	42	86	97	102	2,194	Mh 2,493	Oc 1,844	2,506	181	2,394	5	10	581		
27 Coffins, burial cases, and undertakers' goods.	18	553	8	30	61	15	439	De 478	Au 307	478	412	66	.....	.....	711
28 Confectionery.....	56	1,335	66	38	93	86	1,052	No 1,317	Ja 877	1,248	492	728	3	25	812		
29 Cooperage and wooden goods, not elsewhere specified.	101	2,916	106	72	68	28	2,642	Oc 2,907	No 2,552	3,000	2,605	362	28	5	8,500		
30 Copper, tin, and sheet-iron products..	152	2,801	165	74	115	61	2,386	No 2,521	Ja 1,984	2,528	2,102	273	112	41	1,875		
31 Corsets.....	14	2,875	6	47	204	157	2,461	Oc 2,536	Ja 2,258	2,519	463	2,067	2	47	734		
32 Cutlery and tools, not elsewhere specified.	37	850	41	31	88	22	668	De 809	My 509	812	667	145	.....	.....	1,379
33 Dairymen's, poulterers', and apothecaries' supplies.	6	15	6	.....	.....	1	8	Ap 2	Au 4	11	11	.....	.....	.....	20
34 Electrical machinery, apparatus, and supplies.	40	1,496	26	85	102	65	1,218	My 1,345	Au 1,051	1,302	975	327	.....	.....	1,355
35 Electroplating.....	14	152	13	7	.....	4	128	Ap 138	De 120	121	119	2	.....	.....	237
36 Emery and other abrasive wheels.....	4	122	2	7	6	5	102	De 121	Ja 92	121	93	28	.....	.....	155
37 Fancy articles, not elsewhere specified	11	1,218	7	18	32	14	1,147	Jy 1,725	Fe 637	1,054	726	293	15	20	87		
38 Flour-mill and gristmill products.....	520	2,623	660	173	165	95	1,530	Oc 1,645	Je 1,407	1,630	1,610	15	5	.....	38,091	
39 Food preparations.....	49	1,672	28	66	175	100	1,303	Se 1,534	Ja 1,044	1,618	1,616	602	.....	.....	8,983
40 Foundry and machine-shop products.	654	25,334	505	978	1,580	622	21,049	De 26,246	Ja 18,733	27,102	20,633	384	128	17	34,152		
41 Fur goods.....	31	324	38	23	74	70	619	Oc 763	Fe 486	702	268	423	7	4	232		
42 Furnishing goods, men's.....	24	522	30	9	24	17	442	Oc 467	Mh 422	478	46	419	6	7	174		
43 Furniture and refrigerators.....	202	18,299	120	458	751	360	16,610	No 17,732	Je 15,083	17,943	17,152	488	270	33	27,485		
44 Gas and electric fixtures and lamps and reflectors.	20	2,480	12	20	32	18	395	De 561	Fe 293	561	504	57	.....	.....	386
45 Gas, illuminating and heating.....	55	2,435	2	152	318	192	1,771	De 1,974	Mh 1,514	1,974	1,969	4	1	.....	6,055	
46 Gloves and mittens, leather.....	9	209	9	5	7	6	182	Mh 236	Au 134	248	87	149	2	10	107		
47 Hand stamps and stencils and brands.	10	108	11	1	.....	4	92	Ap 118	Au 31	91	59	29	2	1	56	
48 Hats and caps, other than felt, straw, and wool.	7	159	18	9	16	7	114	De 168	Ap 87	168	105	53	.....	.....	17
49 Hosiery and knit goods.....	35	2,818	19	78	100	76	2,545	No 2,671	Ja 2,237	2,675	569	2,044	21	50	3,291		
50 Ice, manufactured.....	5	113	2	10	11	3	87	Au 142	Ja 53	67	67	.....	.....	.....	1,959
51 Iron and steel, blast furnaces.....	11	1,101	.....	36	44	5	1,016	Se 1,235	Ja 699	1,227	1,226	1	.....	.....	17,403
52 Iron and steel, steel works and rolling mills.	8	1,273	.....	24	51	15	1,183	No 1,386	Jy 1,050	1,332	1,331	1	.....	.....	4,290
53 Iron and steel, bolts, nuts, washers, and rivets, not made in steel works or rolling mills.	4	731	1	14	22	8	686	De 781	Ja 602	781	774	5	2	.....	813	
54 Jewelry.....	10	118	6	5	9	5	93	Mh 99	Jy 78	99	94	.....	.....	.....	30
55 Leather goods.....	57	1,036	48	41	81	32	834	De 884	Fe 782	888	727	140	19	2	760		
56 Leather, tanned, curried, and finished.	24	2,440	5	60	63	21	2,391	De 2,392	Ap 2,100	2,392	2,304	8	20	.....	6,719	
57 Lime.....	11	181	10	9	5	.....	167	Jy 195	Ja 104	161	161	.....	.....	.....	265
58 Liquors, malt.....	79	2,001	46	166	239	23	1,527	Jy 1,670	Ja 1,434	1,523	1,509	14	.....	.....	9,219
59 Liquors, vinous.....	3	19	4	1	2	1	11	Se 21	Ja 2	21	16	5	.....	.....	.....
60 Lumber and timber products.....	1,180	89,011	1,310	962	844	268	35,627	De 37,468	Ap 33,004	43,689	43,300	217	167	5	133,789		
61 Marble and stone work.....	113	795	145	19	63	17	551	Je 632	Fe 378	580	580	.....	.....	.....	1,570
62 Mattresses and spring beds.....	14	367	14	9	17	11	308	Se 350	Ja 249	278	220	58	.....	.....	508

¹ No figures given for reasons explained in the Introduction, page 2. See also discussion of wage earners on page 10.

MANUFACTURES—MICHIGAN.

THE STATE, BY INDUSTRIES: 1909.

	Capital.	EXPENSES.										Value of products.	Value added by manufacture.
		Total.	Services.			Materials.		Miscellaneous.					
			Officials.	Clerks.	Wage earners.	Fuel and rent of power.	Other.	Rent of factory.	Taxes, including internal revenue.	Contract work.	Other.		
1	\$583,946,965	\$591,296,389	\$15,732,797	\$19,137,417	\$118,967,830	\$16,824,150	\$361,787,872	\$1,671,685	\$10,085,772	\$3,397,011	\$53,691,875	\$685,109,169	\$316,497,147
2	15,640,248	7,471,899	267,056	503,251	1,260,815	104,887	2,785,266	2,540	94,030	80	2,453,965	9,272,787	6,382,634
3	920,338	723,702	28,644	11,226	255,247	5,840	343,143	0,170	3,228	3,731	63,473	908,101	559,118
4	52,926,297	77,168,738	1,130,784	1,439,111	15,490,755	531,063	53,351,358	99,328	185,038	78,001	4,893,240	96,661,451	42,769,030
5	30,721	79,302	1,400	2,713	10,599	852	54,285	904	273	.....	8,216	88,678	33,541
6	520,881	420,076	13,560	11,098	159,200	4,785	108,804	2,032	3,942	150	64,539	480,482	306,833
7	21,378,000	8,530,989	210,073	185,027	910,165	375,097	5,851,901	302	98,410	1,591	897,463	10,470,876	4,249,278
8	371,746	890,121	31,900	100,751	38,063	3,943	427,014	1,500	1,540	.....	226,254	1,014,322	583,365
9	2,885,564	4,951,650	70,551	100,858	935,935	27,236	3,320,075	27,249	16,439	10,402	307,905	5,255,966	1,908,655
10	252,584	326,943	10,078	4,971	110,755	4,551	170,120	5,628	3,190	166	17,484	371,157	106,480
11	1,895,567	2,408,504	80,750	31,504	447,723	50,389	1,567,259	17,494	10,092	28	196,899	2,663,416	1,035,708
12	8,647,238	12,657,691	370,737	200,382	2,450,112	246,320	8,746,801	17,208	50,028	306	508,768	13,890,220	4,897,090
13	5,749,750	9,150,751	110,870	245,352	1,443,823	204,355	6,460,244	127,105	34,372	1,025	507,939	11,082,213	4,411,614
14	3,017,098	1,427,350	77,412	10,846	803,390	404,462	10,777	6,861	19,830	.....	124,781	2,047,211	1,471,971
15	115,128	202,911	.....	520	61,687	1,025	188,579	1,194	743	.....	8,263	304,090	113,566
16	329,694	314,405	8,020	9,370	94,092	4,088	104,646	1,730	3,454	.....	28,909	351,095	182,361
17	3,433,729	13,580,217	115,683	71,769	554,406	130,134	12,237,068	10,358	21,859	10,271	418,982	14,287,499	1,010,697
18	4,494,997	4,234,116	118,611	107,116	664,685	63,211	3,010,799	6,216	22,762	04	240,712	4,970,911	1,866,901
19	65,105	63,025	2,850	1,010	35,036	2,259	11,500	2,250	405	1,700	5,835	98,762	84,903
20	10,188,595	9,037,296	268,312	263,808	2,239,979	102,417	5,159,839	20,507	66,374	4,722	911,248	10,158,883	4,899,627
21	3,571,062	6,838,436	176,432	184,254	3,499,645	188,129	2,727,645	100	18,577	619	93,035	6,838,438	3,922,664
22	1,346,198	1,301,438	17,512	8,286	318,359	10,963	937,648	.....	3,209	.....	5,461	1,301,444	352,833
23	14,678,603	2,759,991	103,867	108,301	825,646	745,297	657,785	24,656	52,450	5,040	236,949	2,914,953	1,511,871
24	20,015,346	8,592,007	322,015	237,725	2,012,122	2,487,283	2,685,098	1,215	93,476	.....	853,073	12,890,206	7,817,825
25	3,550,624	5,080,694	176,088	219,058	1,221,005	26,866	3,361,660	31,341	24,365	33,500	503,051	3,143,895	3,143,895
26	1,889,520	3,150,750	115,612	161,821	744,598	21,564	1,088,778	20,036	10,093	3,846	374,802	3,586,856	1,876,514
27	753,002	914,692	44,976	69,034	207,878	9,613	483,762	3,082	9,423	3,050	83,268	1,084,627	501,162
28	1,769,809	2,657,530	70,192	141,907	361,007	32,826	1,704,002	49,079	9,728	23,201	195,298	2,948,761	1,146,333
29	3,018,175	3,900,426	135,859	90,890	1,016,422	14,067	1,989,693	5,701	40,321	30,813	233,160	3,989,384	1,985,624
30	4,757,834	4,213,649	114,758	133,141	1,121,640	35,635	2,509,394	27,554	22,716	4,602	244,209	4,928,822	2,383,793
31	3,038,479	3,932,441	237,192	391,974	835,250	20,089	1,856,495	9,343	20,860	34,128	527,104	4,367,516	2,490,932
32	1,368,691	916,906	50,706	46,110	306,988	22,412	301,445	7,911	9,402	4,935	96,997	1,128,922	740,065
33	25,519	14,412	.....	140	3,708	172	0,505	246	93	.....	530	21,324	11,647
34	2,244,049	2,057,924	151,041	104,747	494,325	42,926	987,562	13,988	10,462	8,085	243,888	2,320,999	1,296,511
35	79,749	169,142	7,182	1,412	81,030	8,284	60,208	4,622	487	.....	5,317	197,778	129,286
36	198,276	244,985	10,124	6,597	61,414	6,185	149,298	1,200	5,922	.....	4,245	284,455	128,072
37	523,446	497,744	26,840	50,510	153,335	4,355	194,704	5,106	2,748	.....	60,146	592,893	393,804
38	11,147,135	31,617,233	228,537	160,030	805,899	245,702	20,110,649	38,500	87,720	925	930,106	34,860,893	5,501,392
39	5,629,074	9,431,415	222,287	209,003	723,565	253,159	4,497,113	12,641	31,118	200	3,482,389	11,491,660	6,741,888
40	48,965,184	39,764,243	1,726,200	1,620,357	12,344,403	838,796	17,871,750	144,737	299,743	293,311	4,624,885	45,399,023	26,688,471
41	1,527,408	1,054,411	48,784	106,694	266,562	14,080	968,699	27,942	6,760	1,550	212,500	2,283,576	1,299,897
42	106,747	508,004	13,580	28,040	139,934	3,574	274,205	5,646	1,108	96	41,671	617,109	339,240
43	28,222,203	25,448,589	1,052,250	1,049,734	8,300,170	311,339	11,406,889	40,504	224,430	115,362	2,941,890	28,641,684	16,923,456
44	922,548	1,135,425	57,771	40,450	218,848	11,945	630,217	7,680	4,900	.....	8,674	1,545,896	903,734
45	33,258,917	4,472,212	244,820	204,680	1,090,124	1,448,684	680,433	840	308,202	7,584	390,830	6,748,070	4,018,953
46	137,643	367,730	19,956	6,645	58,542	1,945	236,226	294	2,040	39	32,043	386,064	147,893
47	134,920	93,889	5,200	1,907	43,650	1,407	30,203	2,358	688	800	7,577	135,950	104,250
48	174,947	323,974	14,382	20,012	75,297	1,878	166,610	6,401	789	.....	38,605	354,451	185,963
49	3,734,803	3,483,550	133,387	191,632	768,956	51,910	1,994,696	13,122	29,874	101,303	198,670	4,020,105	1,982,490
50	676,553	153,786	10,260	9,720	77,174	20,022	20,440	.....	3,915	.....	12,255	199,105	153,643
51	8,290,548	5,317,635	96,434	52,031	632,096	1,896,917	2,357,594	3,000	48,511	12,340	249,706	5,824,396	1,000,885
52	2,326,255	2,672,193	60,373	59,336	661,435	168,913	1,420,217	4,342	11,938	.....	167,639	2,669,872	1,071,742
53	1,299,206	1,130,611	37,977	31,899	421,574	18,854	515,810	.....	11,841	.....	92,647	1,279,786	745,113
54	85,031	140,333	7,670	8,061	68,102	821	43,010	5,461	566	.....	6,642	205,630	161,799
55	1,653,043	2,220,044	50,595	111,518	433,647	13,615	1,444,335	33,236	9,065	50	114,983	2,559,755	1,101,895
56	12,012,403	14,102,199	146,018	86,130	1,133,181	194,423	11,026,548	3,160	71,405	.....	541,334	15,331,104	3,210,133
57	881,890	268,990	14,650	3,730	85,195	64,929	68,672	3,375	.....	2,400	28,530	927,079	193,478
58	12,383,746	7,351,986	370,843	187,510	1,072,696	240,459	2,180,580	5,085	1,635,211	4,630	1,654,072	9,840,108	7,410,069
59	43,075	16,164	900	1,064	6,040	173	5,553	.....	884	.....	950	20,674	14,948
60	57,290,374	54,363,745	1,510,379	827,020	16,293,314	262,174	28,779,498	65,295	982,615	1,616,994	4,021,486	61,515,590	32,471,918
61	1,070,977	1,193,640	20,048	61,681	393,149	25,348	567,647	10,649	7,391	15,342	92,885	1,564,315	911,920
62	469,179	634,763	19,720	21,142	139,505	6,102	400,861	4,900	5,666	.....	36,877	689,079	282,126

* Same number reported for one or more other months.

TABLE II.—DETAIL STATEMENT FOR THE

INDUSTRY.	Number of establishments	PERSONS ENGAGED IN INDUSTRY.										WAGE EARNERS—NUMBER DEC. 15, OR NEAREST REPRESENTATIVE DAY.				Primary horse-power.	
		Total.	Proprietors and firm members.	Salaried officers, supts. and managers.	Clerks.		Wage earners.					Total.	10 and over.		Under 10.		
					Male.	Female.	Average number.	Number.		Male.	Female.		Male.	Female.			
								Maximum month.	Minimum month.								
1 Millinery and lace goods.....	5	40	7	.....	2	31	Ja ¹	45	Do	18	35	18	17	.....	1	
2 Mirrors.....	8	262	3	12	8	232	Se	244	Ja	224	234	234	.....	303		
3 Models and patterns, not including paper patterns.	32	271	37	9	3	216	Do	269	Jo	173	270	237	1	2	189		
4 Musical instruments and materials, not specified.	9	211	9	18	12	13	159	Ap ¹	163	Au	154	158	150	8	161		
5 Musical instruments, pianes and organs and materials.	17	1,003	8	54	97	25	1,779	De	1,956	Ja	1,041	1,957	1,892	55	10	2,690	
6 Oil, essential.....	23	80	27	3	4	1	54	Au	111	Jn ¹	15	104	100	4	365		
7 Oilcloth and linoleum.....	3	59	.....	8	10	2	39	Au	42	My ¹	37	41	41	.....	210	
8 Optical goods.....	11	254	6	12	22	19	195	Se	203	Ja	184	193	102	73	12	6	88
9 Paint and varnish.....	20	1,057	11	59	444	119	1,024	My	1,065	Ja	915	1,056	934	108	11	3	2,302
10 Paper and wood pulp.....	32	4,581	5	95	120	34	4,327	Jo	4,480	Mh	4,168	4,305	3,018	777	.....	48,700
11 Paper goods, not elsewhere specified.	18	1,811	6	41	55	28	1,181	De	1,286	Ja	1,088	1,288	681	602	1	4	2,580
12 Patent medicines and compounds and druggists' preparations.	150	5,124	133	192	984	616	3,240	Do	3,425	Jy	3,050	3,440	1,740	1,052	22	26	2,270
13 Photo-engraving.....	11	293	5	26	32	12	218	Do	236	Ja	101	235	218	15	2	145	
14 Pottery, terra-cotta, and fire-clay products.	7	230	7	10	5	2	206	My	225	No	100	197	106	1	.....	420
15 Printing and publishing.....	1,045	11,048	991	547	1,620	671	7,219	De	7,576	Ap	7,070	7,532	5,539	1,800	94	9	7,651
16 Pumps, not including steam pumps..	6	46	5	1	4	1	35	Je	41	Ja	29	30	39	.....	72	
17 Salt.....	27	1,567	12	57	98	37	1,303	Je	1,463	Ja	1,200	1,288	1,204	84	.....	6,628
18 Saws.....	11	199	11	8	14	6	160	Ap	184	Au	149	157	130	27	.....	538
19 Scales and balances.....	4	247	.....	8	6	5	228	Se	242	Ja	204	223	218	.....	310	
20 Shipbuilding, including boat building	91	2,758	103	46	193	72	2,344	My	3,492	No	1,536	2,206	2,200	0	.....	0,485
21 Show cases.....	11	951	31	24	48	25	823	De	871	Ja	763	871	855	6	10	1,403	
22 Slaughtering and meat packing.....	45	1,114	55	30	107	20	902	De	962	My	864	923	889	28	6	3,404	
23 Springs, steel, car and carriage.....	5	633	.....	22	17	6	588	No	672	Fe	518	600	675	5	10	998
24 Steam packing.....	4	38	3	4	6	1	24	No	30	My	20	30	30	.....	10	
25 Stereotyping and electrotyping.....	3	37	3	1	4	2	27	Ja ²	27	Jy ²	27	27	26	.....	60	
26 Stoves and furnaces, including gas and oil stoves.	33	5,027	9	132	340	64	4,482	Oc	4,898	Ja	2,758	4,712	4,623	5	84	5,910	
27 Surgical appliances and artificial limbs	9	43	10	.....	3	14	16	Ja ¹	17	Mh ¹	16	18	12	6	.....	6
28 Tobacco manufactures.....	729	9,242	813	134	363	56	7,876	Ap	8,349	Ap	7,429	8,400	2,395	5,540	48	486	937
29 Type founding and printing materials.	5	77	5	5	6	1	60	Je	106	Ja ¹	6	96	90	6	.....	125
30 Umbrellas and canes.....	4	23	5	1	.....	3	14	My ¹	15	Ja ¹	13	14	2	12	.....	4
31 Wall plaster.....	16	840	10	18	56	10	746	Ap	819	De	647	651	620	31	.....	3,020
32 Window shades and fixtures.....	7	663	2	8	14	3	636	De	726	Jy	427	712	572	137	3	1,230	
33 Wirework, including wire rope and cable.	37	1,261	23	50	212	58	909	Do	996	Jy	833	978	874	88	16	1,000	
34 Wood distillation, not including turpentine and rosin.	12	859	1	28	21	3	806	De	955	Jy	737	946	946	.....	.....	5,012
35 Wood, turned and carved.....	58	1,278	68	42	22	9	1,137	Fe	1,287	Au	979	1,203	1,174	26	3	4,695	
36 Woolen, worsted, and felt goods, and wool hats.	15	610	18	26	9	3	554	De	606	Jy	515	607	344	261	2	1,900	
37 All other industries ³	584	20,107	603	577	1,728	541	16,568	.....	.....	.....	.....	.....	.....	.....	.....	33,673

¹ Same number reported for one or more other months.
² Same number reported throughout the year.
³ All other industries embrace—

Artificial flowers and feathers and plumes.....	5	Cash registers and calculating machines.....	5	Explosives.....	3
Artists' materials.....	2	Charcoal.....	5	Fertilizers.....	3
Awnings, tents, and sails.....	17	China decorating.....	3	Files.....	1
Axle grease.....	1	Clocks and watches, including cases and materials..	4	Firearms and ammunition.....	2
Babbitt metal and solder.....	5	Cloth, sponging and refinishing.....	2	Flags, banners, regalia, society badges and em- bloms.....	7
Bags, other than paper.....	2	Clothing, horse.....	1	Flavoring extracts.....	11
Bags, paper.....	1	Clothing, men's, buttonholes.....	1	Flax and hemp, dressed.....	1
Belting and hose, leather.....	6	Coffee and spice, roasting and grinding.....	12	Foundry supplies.....	1
Belting and hose, woven and rubber.....	1	Cordage and twine and jute and linen goods.....	1	Fuel, manufactured.....	1
Billiard tables and materials.....	1	Cordials and syrups.....	1	Furs, dressed.....	5
Bluing.....	2	Crucibles.....	2	Galvanizing.....	1
Butter, reworking.....	2	Dentists' materials.....	2	Glass.....	2
Buttons.....	2	Dyeing and finishing textiles.....	1	Glass, cutting, staining, and ornamenting.....	15
Calcium lights.....	1	Dyestuffs and extracts.....	2	Glucose and starch.....	1
Card cutting and designing.....	2	Enamelling and japanning.....	2	Glue.....	1
Carriages and sleds, children's.....	9	Engravers' materials.....	1	Gold and silver, reducing and refining, not from the ore.....	1
Cars, steam-railroad, not including operations of railroad companies.....	2	Engraving and diesinking.....	4		
		Engraving, wood.....	2		

MANUFACTURES—MICHIGAN.

STATE, BY INDUSTRIES: 1909—Continued.

	Capital.	EXPENSES.									Value of products.	Value added by manufacture.	
		Total.	Services.			Materials.		Miscellaneous.					
			Officials.	Clerks.	Wage earners.	Fuel and rent of power.	Other.	Rent of factory.	Taxes, including internal revenue.	Contract work.			Other.
1	\$10,037	\$30,662	.....	\$608	\$11,048	\$272	\$21,671	\$2,200	\$14	.....	\$2,863	\$54,553	\$32,610
2	396,062	560,230	\$23,940	10,394	127,070	7,018	367,807	4,170	2,418	.....	10,822	650,066	284,241
3	180,028	211,197	11,386	4,699	140,965	3,937	29,353	6,657	553	.....	12,834	200,056	256,765
4	179,151	193,123	22,566	12,768	83,060	3,212	37,246	1,781	1,310	.....	30,280	223,071	182,013
5	5,384,400	3,821,211	143,279	156,089	1,075,304	38,609	1,970,866	8,530	22,419	.....	400,115	4,226,266	2,210,791
6	305,895	453,857	9,200	3,900	16,571	2,443	412,639	.....	1,904	.....	7,200	486,159	71,077
7	137,418	227,289	14,400	6,255	28,133	4,720	156,025	1,800	1,100	.....	16,856	250,159	95,414
8	297,215	201,822	15,704	37,483	78,013	3,981	109,418	5,200	1,900	.....	39,043	389,210	275,811
9	7,113,027	6,573,599	210,998	677,233	556,984	52,176	3,989,170	4,340	31,570	1,720	1,058,399	7,415,914	3,383,568
10	15,754,419	12,417,132	284,879	137,803	2,141,844	958,147	8,066,448	.....	113,847	46,253	667,911	13,022,124	4,897,620
11	2,775,887	3,126,327	91,340	70,021	482,708	33,580	1,919,727	3,315	100,437	200	424,999	3,550,959	1,597,652
12	11,451,018	11,390,301	565,371	1,568,390	1,509,355	68,820	4,872,597	34,825	111,761	9,318	2,055,658	13,476,450	8,534,030
13	213,895	353,034	30,060	37,184	158,138	7,583	69,417	13,115	875	4,570	23,377	437,688	360,688
14	325,427	196,452	10,613	3,722	88,020	35,450	38,346	.....	1,613	.....	17,079	245,677	171,872
15	13,725,083	14,200,556	947,686	1,613,036	3,990,521	198,278	4,736,248	265,437	87,487	520,044	1,837,019	17,348,341	12,418,815
16	86,981	60,075	1,000	2,835	19,790	2,282	28,820	276	312	.....	4,760	74,098	42,906
17	5,160,670	3,058,708	92,050	105,414	745,401	555,214	1,088,196	.....	38,277	32,890	401,317	3,052,996	2,009,646
18	345,006	244,140	15,220	17,610	85,594	7,509	78,414	2,032	1,378	.....	36,473	277,824	101,001
19	334,327	477,712	6,193	8,193	136,652	6,037	223,159	3,340	1,905	.....	82,792	523,087	204,491
20	6,071,919	4,725,309	128,720	179,707	1,380,081	84,807	2,404,965	12,836	40,359	1,049	492,716	5,083,836	2,544,064
21	1,600,139	1,682,238	56,050	77,600	458,733	10,354	776,643	2,610	8,879	2,000	279,760	1,865,847	1,069,850
22	3,584,247	12,632,675	50,818	95,400	481,245	59,329	11,606,490	2,872	18,630	.....	311,785	13,435,114	1,769,289
23	1,208,730	1,055,884	52,268	24,753	308,725	40,173	512,050	.....	7,370	.....	184,639	1,307,747	749,518
24	17,179	32,741	4,950	5,625	11,152	95	9,208	.....	600	.....	1,021	35,525	29,222
25	50,545	61,433	1,500	3,894	21,039	1,790	17,848	1,808	108	.....	12,816	75,443	65,805
26	9,521,706	7,936,922	301,783	396,108	2,831,581	124,742	2,691,498	4,235	93,056	2,006	1,461,813	9,122,873	6,300,038
27	14,030	67,541	.....	8,364	10,416	264	15,485	.....	1,083	.....	31,313	101,074	85,325
28	6,836,927	14,729,529	294,865	420,740	3,075,833	48,227	7,159,008	103,162	2,219,268	.....	1,407,720	10,178,533	8,070,598
29	150,907	70,727	3,685	1,974	28,551	2,399	25,864	1,600	1,248	.....	11,316	80,538	62,275
30	36,425	45,039	900	1,137	3,526	245	31,450	5,220	141	.....	2,420	59,112	27,417
31	1,774,003	1,125,976	43,976	79,138	275,613	75,123	336,643	325	9,485	.....	308,608	1,426,074	1,008,903
32	1,101,668	1,283,775	10,530	13,373	261,234	7,309	799,259	6,240	6,961	.....	119,879	1,295,954	489,386
33	4,406,719	4,801,238	93,989	231,897	428,470	32,273	3,413,947	6,018	24,688	83,092	486,858	5,284,870	1,838,650
34	2,820,760	1,956,220	39,918	23,848	504,151	969,203	186,243	.....	23,226	12,336	197,392	2,308,927	1,243,578
35	1,286,946	1,409,714	61,191	21,062	548,042	16,528	617,495	7,490	9,172	11,059	117,675	1,708,258	1,074,235
36	1,421,040	1,248,058	41,650	11,807	234,657	34,899	827,940	4,140	11,603	.....	81,362	1,571,364	708,525
37	40,074,957	69,317,310	1,102,612	2,529,760	9,122,844	1,287,167	48,021,000	134,750	2,350,331	221,922	4,546,903	77,873,025	28,565,452

* All other industries embrace—Continued.

Graphite and graphite refining.....	1	Looking-glass and picture frames.....	16	Silverware and plated ware.....	1
Grease and tallow.....	13	Malt.....	4	Smelting and refining, copper.....	4
Grindstones.....	2	Matches.....	2	Smelting and refining, not from the ore.....	4
Hair work.....	5	Mineral and soda waters.....	97	Soap.....	8
Hats, fur-felt.....	1	Mucilage and paste.....	3	Sporting and athletic goods.....	12
Hats, straw.....	1	Needles, pins, and hooks and eyes.....	2	Statuary and art goods.....	3
Hones and whetstones.....	2	Oil, not elsewhere specified.....	4	Sulphuric, nitric, and mixed acids.....	1
Horseshoes, not made in steel works or rolling mills.....	1	Paving materials.....	1	Toys and games.....	8
House-furnishing goods, not elsewhere specified.....	7	Phonographs and graphophones.....	1	Typewriters and supplies.....	2
Ink, printing.....	2	Photographic apparatus and materials.....	2	Upholstering materials.....	7
Ink, writing.....	3	Pipes, tobacco.....	1	Vinegar and elder.....	146
Instruments, professional and scientific.....	6	Rubber goods, not elsewhere specified.....	5	Washing machines and clothes wringers.....	6
Iron and steel forgings.....	4	Rules, ivory and wood.....	1	Waste.....	4
Kaolin and ground earths.....	1	Safes and vaults.....	1	Wheelbarrows.....	2
Labels and tags.....	6	Scissors, machine.....	3	Windmills.....	1
Lasts.....	2	Signs and advertising novelties.....	1	Wire.....	1
Lead, bar, pipe, and sheet.....	1	Silk and silk goods, including throwsters.....	2		
Liquors, distilled.....	2				