

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Employment in Manufacturing, 1899-1939: An Analysis of Its Relation to the Volume of Production

Volume Author/Editor: Solomon Fabricant

Volume Publisher: NBER

Volume ISBN: 0-87014-040-X

Volume URL: <http://www.nber.org/books/fabr42-1>

Publication Date: 1942

Chapter Title: Appendix F: Indexes of Output, Employment, Manhours, Employment per Unit of Product, and Manhours per Unit of Product in Manufacturing Industries

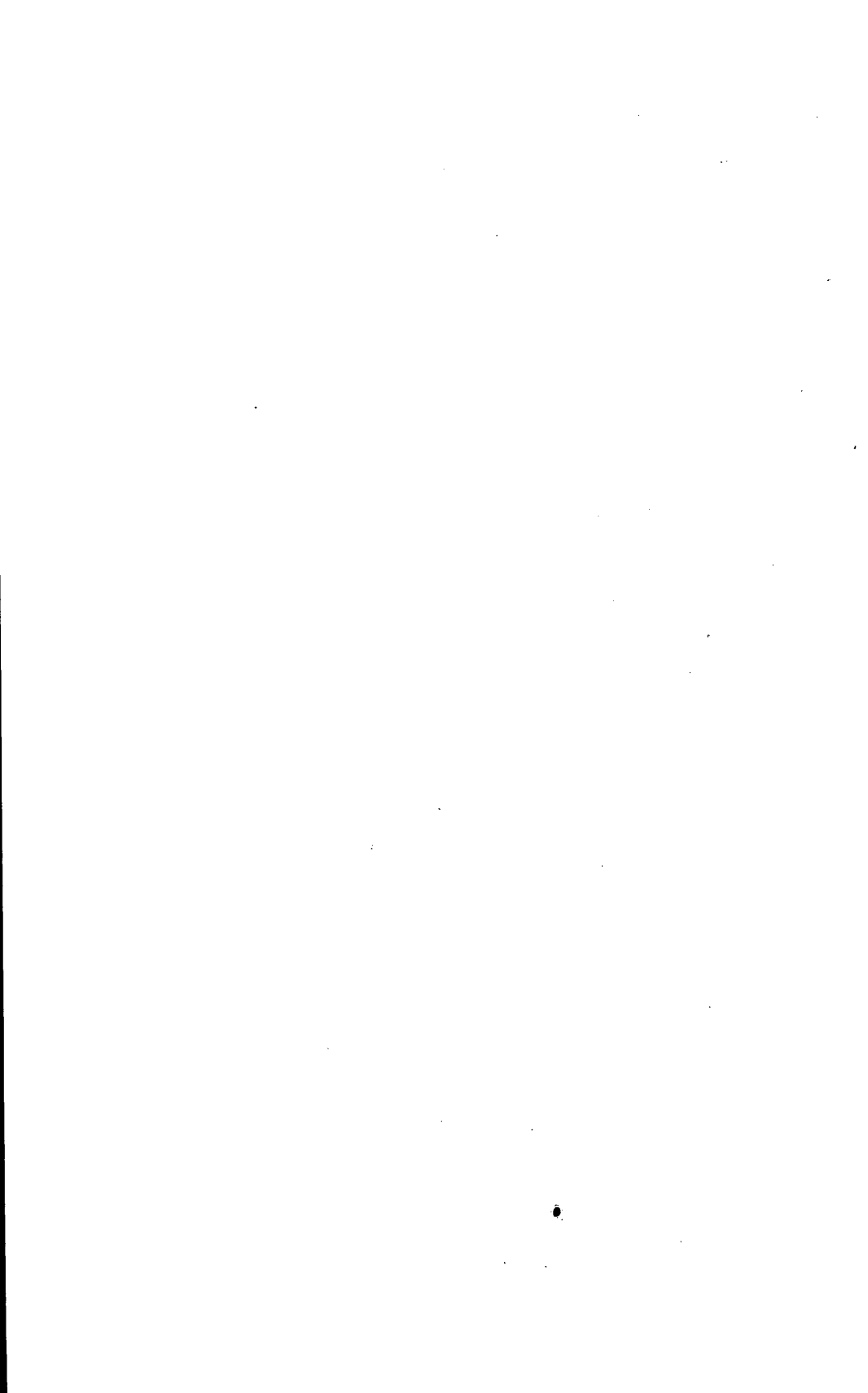
Chapter Author: Solomon Fabricant

Chapter URL: <http://www.nber.org/chapters/c4884>

Chapter pages in book: (p. 259 - 332)

Appendix F

Indexes of Output, Employment, Manhours, Employment per Unit of Product, and Manhours per Unit of Product in Manufacturing Industries



Appendix F

Indexes of Output, Employment, Manhours, Employment per Unit of Product, and Manhours per Unit of Product in Manufacturing Industries

INTRODUCTORY NOTE

THE various indexes of labor input, output, and labor per unit, given only in summary or chart form in the text of this report, are presented in Table F-1 in full. They are supplied for every manufacturing industry or group of industries for every year for which we have data on both output and employment. Occasionally data on physical output, and almost always data on employment, are available for industries and years not covered here, but (except for the groups) these are generally omitted because they do not cover both series for the same year.

The indexes of physical output (described briefly in Appendix D, above) are reproduced from *The Output of Manufacturing Industries, 1899-1937*,¹ for the period covered by that volume, with a few additions or corrections mentioned in footnotes to the present tables. Output indexes for the period prior to 1899 and for 1937-39 were computed along lines similar to those laid down in the volume cited, and utilizing the same sort of data, mostly from the Census of Manufactures.

The indexes of wage-earner employment are based on the Census of Manufactures data given in Table B-1 above, except those for the period preceding 1899 which are not reproduced in the present report.² In the computation of the indexes of wage-earner employment due account was taken of all the discontinuities shown in Table B-1, whenever overlaps were provided by the Census, or whenever reasonable estimates of such overlaps could be prepared. In a few cases, when the discontinui-

¹ National Bureau of Economic Research, 1940.

² The indexes of wage-earner employment were extrapolated beyond 1899 *via* total employment, rather than wage earners alone, since there are several rather definite indications in the early Census reports and schedules that the figures on employment covered all workers and not wage earners exclusively.

ties seemed sufficiently serious and nothing could be done to bridge them, part of the data had to remain unused.

The indexes of total employment (including wage earners, salaried workers, proprietors and firm members) are based on the Census data described in Appendix B, above. Except for total manufacturing, the indexes are given only for 1904-39. The year 1931 is excluded in every case, whereas the year 1899 was not covered, except for total manufacturing, because the published 1899 figures for proprietors pertain to custom establishments, hand trades, and other plants excluded in later years. Various items of information are available in the 1899 Census report on the number of proprietors in such establishments, but it appeared advisable to use this information only to obtain an 1899 figure, comparable with later years, for all factories combined. The total of salaried personnel for 1933, including corporate officials, was estimated on the basis of that year's report for salaried persons excluding corporate officials, and of corresponding figures for 1929 and 1935. No adjustment could be made for the break between 1904 and 1909 caused by the inclusion of central-office personnel among salaried workers in the latter year but not in the earlier year. (Central-office personnel are not included in our total employment indexes for the period following 1925.) The break between 1919 and 1921 caused by the exclusion after 1919 of establishments with value of products of \$500 to \$5,000, was treated as follows: The series on salaried personnel was assumed to be unaffected by the break, since few such persons are employed in small establishments. As for proprietors and firm members, their number in plants with over \$5,000 products in 1921, expressed as a percentage of their number in plants with over \$5,000 products in 1919, was assumed equal to the corresponding percentage for wage earners and salaried workers combined.³

³ Occasionally this assumption yielded an absurd result; i.e., in effect it led to a negative figure for the number of proprietors in 1919 in establishments with a product of \$500-\$5,000. An alternative procedure was then followed: it was assumed that the number of proprietors in the class of establishments with products valued at between \$500 and \$5,000 in 1919 was equal to the number of establishments, and this number was then subtracted from the total number of proprietors in all establishments with product over \$500 to yield the number of proprietors in establishments with product over \$5,000, a number comparable with that available for 1921. (This assumption was used for total manufacturing to pass over the break between 1919 and 1921

Indexes of total employment, including nonfactory personnel employed in factories, are given for the years 1935-39 in footnotes to the various tables below. The basic data on nonfactory personnel are described in the note to Table B-4, and reasons are there given for the belief that some part of this personnel was reported as wage earners, salaried persons or proprietors in years preceding 1935. But since it is unlikely that *all* such persons were reported prior to 1935, these indexes should be considered to be *maximum* estimates of the number of all persons employed in factories in 1935-39 relative to the corresponding number employed in 1929.

The data on hours of labor worked per week by wage earners, given in Appendix C, were converted to indexes and multiplied by the corresponding indexes of wage-earner employment to obtain the indexes of manhours worked by wage earners presented below. Where two estimates of manhours are given, "Estimate A" was obtained by use of the Census and Bureau of Labor Statistics data ⁴ shown in Appendix C, and "Estimate B" was obtained by use of the National Industrial Conference Board series.

The indexes of employment per unit of product and of manhours per unit were derived by division of the appropriate indexes of employment or manhours by the corresponding indexes of output.⁵ Since the indexes were originally computed to more significant figures than are published here, and then were rounded off, some apparent inconsistencies may be found, but none is serious.

The bases of the indexes following are 1929, except when no 1929 figure is given, in which case the base is 1937.⁶ The indexes for total manufacturing are on the 1899 base.

The industries are presented by groups, with the groups arranged in the order set forth in earlier appendices; total manufacturing is given at the end of the table. Within each group the industries are listed in the order most economical of space.

even though the first assumption noted would not result in absurdity. For total manufacturing we found it worth while to examine all the Census data in detail, arriving at the conclusion that the procedure followed was most satisfactory.)

⁴ If data were available from both Census and BLS sources, the former were utilized.

⁵ Estimates of manhours per unit obtained from special studies are identified by footnotes describing the sources of these estimates.

⁶ These are the "comparison bases." The bases utilized in computing the original indexes of output are different; see *The Output of Manufacturing Industries, 1899-1937*, Appendix A.

TABLE F-1

Indexes of Output, Employment, Manhours, Employment per Unit of Product, and Manhours per Unit of Product in Manufacturing Industries

FOODS

BAKING POWDER

Year	Output	Employment Wage		Employment per Unit Wage	
		Earners	Total*	Earners	Total*
1927	88	101	110	114	124
1929	100	100	100	100	100
1931	96	96	..	99	..
1933	74	89	91	122	123
1935	73	89	92	122	126
1937	63	79	80	125	126
1939	69	78	78	112	112

SHORTENINGS

Year	Output	Employment Wage		Employment per Unit Wage	
		Earners	Total*	Earners	Total*
1927	88	89	85	90	86
1929	100	100	100	100	100
1931	96	123	..	124	..
1933	74	122	119	125	121
1935	73	162	156	120	116
1937	63	164	162	111	110
1939	69	156	150	106	102

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

		1935	1937	1939
<i>Baking powder</i>	Employment	103	84	110
	Employment per unit	142	133	159
<i>Shortenings</i>	Employment	168	167	170
	Employment per unit	125	113	115

BAKERY PRODUCTS*

Year	Output	Employment Wage		Employment per Unit Wage		Man- hours Wage	Manhours per Unit Earners (ESTIMATE A)
		Earners	Total*	Earners	Total*		
1923	77	81	83	106	108	..	..
1925	80	80	81	100	102	..	..
1927	90	86	86	95	96	..	..
1929	100	100	100	100	100	..	..
1931	91	91	..	101	..	..	..
1933	74	91	89	122	119	..	..
1935	88	109	103	124	116	87	96
1937	97	119	115	122	118	100	100
1939	102	115	110	113	108	94	91

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	117	120	124
Employment per unit	133	123	122

* Combination of *bread and cake* and *biscuits and crackers*. Data on hours are not available for these separately.

BISCUITS and CRACKERS^a

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1923	81	104	103	127	126
1925	86	96	95	112	111
1927	91	97	97	107	106
1929	100	100	100	100	100
1931	86	84	..	98	..
1933	78	80	77	103	99
1935	96	86	83	90	87
1937	106	85	83	80	78
1939	113	86	82	76	73

BREAD and CAKE^a

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1923	75	76	79	102	105
1925	78	77	78	98	101
1927	90	83	85	93	94
1929	100	100	100	100	100
1931	92	93	..	101	..
1933	74	93	91	126	123
1935	86	113	106	131	123
1937	96	126	121	132	127
1939	99	121	115	122	116

^aExcludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

		1935	1937	1939
<i>Biscuits and crackers</i>	Employment	93	..	93
	Employment per unit	98	..	83
<i>Bread and cake</i>	Employment	122	..	130
	Employment per unit	141	..	131

^a For indexes of manhours and manhours per unit see the combination *bakery products*.

CANE-SUGAR REFINING^a

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit Wage Earners (ESTIMATE A)
		Wage Earners	Total*	Wage Earners	Total*		
1909	55	68	65	123	118	107	173
1914	66	81	79	123	120	..	..
1919	79	131	131	165	166	..	..
1921	74	111	112	150	151	..	..
1923	87	110	110	127	127	..	..
1925	106	104	104	98	99	..	..
1927	100	101	101	100	100	..	..
1929	100	100	100	100	100	..	..
1931	87	85	..	98	..	..	..
1933	77	83	82	107	106	92	106
1935	83	99	97	120	118	95	103
1937	89	101	100	113	113	100	100
1939	83	102	101	123	122	95	102

^a Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	98	104	107
Employment per unit	119	117	130

^a For indexes back to 1899 see the combination *cane sugar, total*.

BEET SUGAR

Year ^a	Output	Employment		Employment per Unit		Man- Manhours		Man- Manhours	
		Wage Earners	Total*	Wage Earners	Total*	hours per Unit (ESTIMATE A)	hours per Unit (ESTIMATE B)	hours per Unit ^b Wage Earners (ESTIMATE A)	hours per Unit ^b Wage Earners (ESTIMATE B)
1899	6	26	..	392	..	..	..	..	..
1904	23	53	51	234	227	..	..	..	..
1909	45	96	91	212	200	109	289	..	..
1914	68	107	104	156	152	..	..	..	..
1919	67	157	154	233	228	..	..	..	205
1921	96	181	174	189	180	..	..	..	133
1923	68	101	104	147	152	..	..	..	138
1925	100	118	116	118	116	..	..	..	135
1927	84	99	99	118	118	..	..	..	104
1929	100	100	100	100	100	..	..	..	100
1931	107	83	..	78	..	..	..	..	82
1933	151	143	133	94	88	130	102	..	77
1935	111	123	121	111	108	98	106	..	80
1937	120	125	122	104	102	100	100	..	..
1939	149	139	133	93	89	108	87	..	..

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	121	128	138
Employment per unit	109	107	92

^a Crop years; see Appendix B-1, foods, footnote *l*.

^b Derived from a series on "manhours per 100-pound bag of sugar produced," R. K. Adamson and M. E. West, *Productivity and Employment in Selected Industries: Beet Sugar* (National Research Project in cooperation with National Bureau of Economic Research, Philadelphia, 1938), p. 79. The data are based on a field study of 31 factories.

CONFECTIONERY

Year	Output	Employment		Employment per Unit		Man- Manhours	
		Wage Earners	Total*	Wage Earners	Total*	hours per Unit Wage Earners (ESTIMATE A)	hours per Unit Wage Earners (ESTIMATE B)
1925	91	100	102	110	112	..	..
1927	94	99	101	106	107	..	..
1929	100	100	100	100	100	..	..
1931	80	81	..	101	..	..	..
1933	79	80	78	101	99	89	125
1935	100	82	80	82	79	91	100
1937	111	85	81	76	73	100	100
1939	113	78	75	69	66	90	88

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	86	87	84
Employment per unit	86	78	74

CANE SUGAR, not elsewhere made*

CORN PRODUCTS

Year	Output	Employment Wage		Employment per Unit Wage		Output	Employment Wage		Employment per Unit Wage	
		Earners	Total*	Earners	Total*		Earners	Total*	Earners	Total*
1909	168	177	193	106	115	47	71	71	152	151
1914	132	156	165	118	125	50	67	72	133	144
1919	125	262	256	210	205	69	116	105	167	152
1921	129	117	124	91	96	57	91	86	159	151
1923	88	122	137	139	156	76	97	94	127	123
1925	69	89	92	129	134	76	96	95	127	126
1927	36	42	45	115	123	92	104	100	112	109
1929	100	100	100	100	100	100	100	100	100	100
1931	91	88	..	96	..	76	99	..	130	..
1933	125	102	101	82	81	84	113	106	135	127
1935	174	127	136	73	78	68	109	105	161	155
1937	192	182	177	95	92	84	104	99	124	117
1939	244	182	180	74	74	97	100	96	103	98

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

		1935	1937	1939
Cane sugar, n.e.m.	Employment	137	178	194
	Employment per unit	79	93	79
Corn products	Employment	108	100	109
	Employment per unit	159	118	112

* For indexes back to 1899 see the combination *cane sugar, total*. For this industry, years refer to crop years; see Appendix B-1, roods, footnote l.

ICE CREAM

Year	Output	Employment Wage		Employment per Unit Wage		Man- hours Wage	Manhours per Unit Earners (ESTIMATE A)
		Earners	Total*	Earners	Total*		
1923	77	103	98	135	128	..	..
1925	84	103	100	123	119	..	..
1927	88	98	98	112	112	..	..
1929	100	100	100	100	100	..	..
1931	83	80	..	96	..	..	..
1933	60	64	71	106	117	76	139
1935	82	77	77	95	94	88	117
1937	109	83	84	76	77	100	100
1939	116	70	70	60	61	81	76

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	105	112	120
Employment per unit	129	103	103

CANE SUGAR, TOTAL ^a						BUTTER, CHEESE and CANNED MILK ^b				
Year	Output	Employment		Employment per Unit		Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*		Wage Earners	Total*	Wage Earners	Total*
1899	52	87	..	168	..	20	43	..	213	..
1909	67	83	84	124	125	33	62	70	190	213
1919	84	150	150	179	179	70	119	110	171	158
1929	100	100	100	100	100	100	100	100	100	100
1937	96	112	112	117	116	114	111	107	98	94
1939	93	113	113	121	121	126	110	108	87	86

* Excludes nonfactory personnel, 1937-39. The following indexes (1929:100) cover all personnel:

	1937	1939
<i>Cane sugar, total</i>	Employment 115	120
	Employment per unit 119	129

Butter, cheese and canned milk

Employment	133	124
Employment per unit	117	98

^a Combination of two industries, *cane sugar, n.e.m.* and *cane-sugar refining*. Data for 1899 are not available for these separately.

^b Combination of three industries. Data for 1899 are not available for these separately.

BUTTER^a

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit Wage Earners (ESTIMATE A)
		Wage Earners	Total*	Wage Earners	Total*		
1904	33	50	56	153	172	..	..
1909	40	60	68	152	170	..	..
1914	50	74	75	147	150	..	..
1919	60	92	92	154	153	..	..
1921	72	97	94	135	132	..	..
1923	84	106	104	126	124	..	..
1925	92	93	92	102	101	..	..
1927	97	105	104	108	107	..	..
1929	100	100	100	100	100	..	..
1931	102	82	..	80	..	..	..
1933	110	86	81	79	74	..	..
1935	104	97	93	92	89	..	..
1937	105	102	98	97	94	100	100
1939	115	94	94	82	82	90	82

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	119	127	113
Employment per unit	114	121	98

^a For indexes back to 1899 see the combination *butter, cheese and canned milk*.

CHEESE^a

MILK, CANNED^a

Year	Output	Employment Wage		Employment per Unit Wage		Output	Employment Wage		Employment per Unit Wage	
		Earners	Total*	Earners	Total*		Earners	Total*	Earners	Total*
1904	56	77	92	138	164	11	48	37	438	335
1909	55	79	108	143	195	18	59	49	329	273
1914	66	85	85	128	129	36	85	75	237	210
1919	86	116	105	135	122	84	194	163	230	193
1921	77	103	95	133	123	69	134	121	194	176
1923	101	126	115	125	114	73	117	112	161	154
1925	100	100	96	100	96	76	101	98	132	129
1927	97	103	97	107	100	88	105	103	120	117
1929	100	100	100	100	100	100	100	100	100	100
1931	92	87	..	95	..	100	87	..	87	..
1933 ^b	95	92	76	98	80	98	90	87	91	89
1935	126	128	92	101	73	115	120	116	104	101
1937	129	132	118	102	92	128	127	127	99	99
1939	147	147	140	100	95	144	137	134	95	92

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

		1935	1937	1939
Cheese	Employment	107	138	147
	Employment per unit	84	107	100
Milk, canned	Employment	122	146	146
	Employment per unit	106	114	101

^a For indexes back to 1899 see the combination *butter, cheese and canned milk*.

^b The 1933 Census of the *cheese* industry is considered by the Bureau of the Census to be somewhat incomplete.

CEREALS

Year	Output	Employment Wage		Employment per Unit Wage		Man- hours Wage	Manhours per Unit Earners (ESTIMATE A)
		Earners	Total*	Earners	Total*		
1925	70	95	91	136	130	..	..
1927	80	93	88	116	110	..	..
1929	100	100	100	100	100	..	..
1931	100	108	..	108	..	..	..
1933	79	110	101	139	128	83	81
1935	70	122	113	175	162	88	98
1937	77	125	114	162	148	100	100
1939	74	120	109	163	147	91	95

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	118	115	115
Employment per unit	170	149	156

FRUITS and VEGETABLES, CANNED* ICE

Year	Output	Employment Wage		Employment per Unit Wage		Employment ^o Wage			Employment ^o per Unit Wage	
		Earners	Total*	Earners	Total*	Output	Earners	Total*	Earners	Total*
1899	17	44	..	262	..	9.8	21	..	217	..
1904 ^b	24	48	49	205	206	17	31	32	187	193
1909	29	50	52	174	184	30	49	51	167	172
1914	42	63	65	150	156	44	71	72	162	166
1919	55	77	81	141	148	60	93	94	155	157
1921	38	52	55	139	146	67	75	78	111	115
1923	67	73	75	110	112	77	83	86	108	112
1925	82	87	87	105	105	88	77	80	88	91
1927	82	82	83	100	101	88	69	74	78	84
1929	100	100	100	100	100	100	100	100	100	100
1931	91	81	..	89	..	96	78	..	82	..
1933	88	85	84	97	96	74	66	72	89	98
1935	127	118	116	92	91	72	59	68	82	94
1937	151	139	135	92	90	75	58	64	77	85
1939	159	118	116	74	73	75	49	56	66	74

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

		1935	1937	1939
<i>Fruits and vegetables, canned</i>	Employment	119	139	121
	Employment per unit	94	92	76
<i>Ice</i>	Employment	90	76	95
	Employment per unit	124	100	127

^a For indexes of manhours and manhours per unit see the combination *fish, fruits and vegetables, canned*.

^b Packing and shipping houses that handled dried fruits completely processed on fruit farms were included in *canned fruits and vegetables* in 1904 only.

^c Incomparabilities mar the series for *ice* because of the erroneous inclusion, in varying degree, of some wage earners employed in delivery service.

FEEDS

Year	Output	Employment Wage		Employment per Unit Wage		Man- hours Wage	Manhours per Unit Earners (ESTIMATE A)
		Earners	Total*	Earners	Total*		
1927	74	75	78	100	106	..	..
1929	100	100	100	100	100	..	..
1931	76	83	..	109	..	..	..
1933	70	86	83	123	119	57	91
1935	90	114	108	126	120	73	90
1937	111	141	135	127	122	100	100
1939	130	151	135	116	104	102	88

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	127	143	172
Employment per unit	141	128	133

FISH, CANNED^a

Year	Output	Employment Wage		Employment per Unit Wage	
		Earners	Total*	Earners	Total*
1904	65	62	64	94	98
1909	78	72	74	93	96
1914	73	81	84	112	115
1919	85	91	94	107	111
1921	45	58	62	131	138
1923	59	67	72	114	123
1925	73	77	79	106	108
1927	77	93	94	120	122
1929	100	100	100	100	100
1931	64	63	..	99	..
1933	69	73	74	107	108
1935	103	98	97	95	94
1937	104	134	130	129	126
1939	113	131	128	116	114

CHOCOLATE

Year	Output	Employment Wage		Employment per Unit Wage	
		Earners	Total*	Earners	Total*
1904	..	..	..	..	..
1909	..	..	..	..	..
1914	..	..	..	..	..
1919	..	..	..	..	..
1921	60	106	114	177	189
1923	82	110	119	134	144
1925	90	114	120	127	134
1927	96	103	104	108	109
1929	100	100	100	100	100
1931	98	91	..	92	..
1933	105	103	103	99	98
1935	140	133	133	95	95
1937	124	118	120	96	97
1939	145	103	103	71	70

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

		1935	1937	1939
Fish, canned	Employment	101	135	132
	Employment per unit	98	130	117
Chocolate	Employment	145	122	125
	Employment per unit	104	98	86

^a For indexes on manhours and manhours per unit see the combination *fish, fruits and vegetables, canned*.

OLEOMARGARINE, not elsewhere made

Year	Output	Employment Wage		Employment per Unit Wage	
		Earners	Total*	Earners	Total*
1925	72	107	102	148	142
1927	79	98	98	124	123
1929	100	100	100	100	100
1931	71	68	..	96	..
1933	63	55	54	87	86
1935	94	77	71	81	76
1937	126	79	75	63	60
1939	112	64	59	57	53

MACARONI

Year	Output	Employment Wage		Employment per Unit Wage	
		Earners	Total*	Earners	Total*
1925	..	..	..	..	..
1927	91	90	93	100	102
1929	100	100	100	100	100
1931	97	94	..	97	..
1933	..	108	106	..	..
1935	116	118	115	102	99
1937	123	127	122	104	99
1939	128	119	112	93	88

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

		1935	1937	1939
Oleomargarine, n.e.m.	Employment	80	102	81
	Employment per unit	85	81	72
Macaroni	Employment	129	127	133
	Employment per unit	112	104	104

FLOUR

Year	Output	Employment		Employment per Unit		Man-hours per Unit		Man-hours per Unit ^a	
		Wage Earners	Total*	Wage Earners	Total*	Wage Earners (ESTIMATE A)	Wage Earners	Wage Earners (ESTIMATE B)	Wage Earners
1869	41	76	..	185	..	..	..	..	..
1879	60	76	..	125	..	..	..	..	..
1889	70	82	..	117	..	..	..	..	..
1899	94	119	..	127	..	..	..	..	..
1904	98	144	143	148	147	..	..	..	..
1909	102	145	158	142	155	190	159	..	144
1914	108	146	157	136	146	..	..	..	156
1919	114	168	182	148	160	..	..	..	129
1921	94	131	137	139	146	..	..	..	116
1923	106	130	134	123	126	..	..	..	110
1925	102	118	119	116	117	..	..	..	105
1927	100	111	112	111	112	..	..	..	105
1929	100	100	100	100	100	..	..	..	100
1931	91	84	..	93	..	..	..	..	91
1933	80	86	80	107	100	87	93	..	89
1935	82	98	91	119	110	90	94	..	93
1937	86	98	89	114	104	100	100	..	..
1939	92	92	82	99	89	90	83	..	..

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	101	92	97
Employment per unit	123	108	105

^a Derived from indexes in an unpublished report on "Productivity and Employment in Selected Industries: Wheat Flour" (National Research Project, in cooperation with the National Bureau of Economic Research, Philadelphia, 1938). The series is a chain of link ratios of comparable aggregates based on a sample of 5 to 34 mills (1909-29), and the usual ratio for a constant sample of 41 mills (1929-35).

FISH, FRUITS and VEGETABLES, CANNED^a

Year	Output	Employment		Employment per Unit		Man-hours per Unit	
		Wage Earners	Total	Wage Earners	Total	Wage Earners (ESTIMATE A)	Wage Earners
1909	22	38	..	170	..	56	249
1935	86	83	..	97	..	79	92
1937	100	100	..	100	..	100	100
1939	106	87	..	82	..	84	80

^a Combination of *fish, canned*, and *fruits and vegetables, canned*. Data on hours are not available for these separately.

MEAT PACKING

Year	Output	Employment		Employment per Unit		Man- Manhours		Man- Manhours	
		Wage	Total*	Wage	Total*	hours	per Unit	hours	per Unit
		Earners		Earners		Wage	Earners	Wage	Earners
						(ESTIMATE A)		(ESTIMATE B)	
1879	26	18	..	70	..	..	..	..	..
1889	47	32	..	68	..	..	..	..	..
1899	56	56	..	100	..	..	..	..	..
1904	64	61	57	96	90	..	..	..	..
1909	72	72	70	100	96	73	101	..	..
1914	71	81	79	114	112	..	..	89	125
1919	93	131	129	141	138	..	..	..	..
1921	77	96	98	123	127	..	..	88	114
1923	97	108	109	112	112	105	109	106	110
1925	92	98	99	106	108	98	106	96	104
1927	95	97	98	102	103	98	103	96	101
1929	100	100	100	100	100	100	100	100	100
1931	94	87	..	92	..	85	90	84	89
1933	95	92	92	97	96	75	78	82	86
1935	85	95	95	112	112	71	83	76	90
1937	94	104	104	111	111	78	84	82	87
1939	104	98	95	95	91	73	70	78	75

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	103	110	116
Employment per unit	121	117	112

SAUSAGE, not elsewhere made

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1929	100	100	100	100	100
1931	108	106	..	98	..
1933	..	132	128	..	..
1935	154	155	146	101	95
1937	182	173	161	95	88
1939	203	170	158	84	78

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	172	171	200
Employment per unit	112	94	99

RICE

Year	Employment Wage			Employment per Unit Wage	
	Output	Earners	Total*	Earners	Total*
1899	21	41	..	198	..
1904	51	94	91	183	178
1909	52	78	83	150	159
1914	55	79	81	143	147
1919	88	133	151	151	171
1921	94	122	125	131	133
1923	95	111	112	117	118
1925	76	82	88	107	115
1927	100	96	101	96	101
1929	100	100	100	100	100
1931	102	95	..	93	..
1933	90	103	96	115	107
1935	96	127	123	133	129
1937	106	140	131	132	124
1939	121	148	138	122	115

TOTAL FOODS

Year	Employment Wage			Employment per Unit Wage	
	Output	Earners	Total*	Earners	Total*
1899	30	44	..	145	..
1904	37	52	53	140	143
1909	45	61	65	135	145
1914	53	72	76	136	144
1919	65	99	105	153	161
1921	64	83	86	129	134
1923	80	91	93	114	116
1925	85	90	91	106	107
1927	90	91	92	101	102
1929	100	100	100	100	100
1931	91	86	..	95	..
1933	82	88	86	107	105
1935	92	102	99	110	107
1937	104	112	109	108	104
1939	111	105	101	95	91

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
<i>Rice</i> Employment	128	131	152
Employment per unit	133	124	125
<i>Total foods</i> Employment	111	116	118
Employment per unit	120	111	106

BEVERAGES

MALT

Year	Employment Wage			Employment per Unit Wage	
	Output	Earners	Total*	Earners	Total*
1925	83	96	94	116	113
1927	80	85	85	105	105
1929	100	100	100	100	100
1931	89	92	..	103	..
1933	125	144	142	115	113
1935	213	244	232	114	109
1937	245	279	265	114	108
1939	235	247	235	105	100

BEVERAGES, NONALCOHOLIC*

Year	Employment Wage			Employment per Unit Wage	
	Output	Earners	Total*	Earners	Total*
1925	..	..	..	..	..
1927	..	..	..	..	..
1929	..	..	..	..	..
1931	66	85	..	129	..
1933	35	54	58	153	164
1935	52	60	65	116	126
1937	100	100	100	100	100
1939	142	76	86	53	60

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
<i>Malt</i> Employment	244	289	257
Employment per unit	115	118	109
<i>Beverages, nonalcoholic</i> Employment	73	100	137
Employment per unit	140	100	96

* For indexes of manhours and manhours per unit back to 1933 see the combination *beverages and malt liquors*.

LIQUORS, MALT^a

Year	Output ^b	Employment		Employment per Unit		Man-hours Wage Earners (ESTIMATE A)	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1899	62	84	..	134	..	..	..
1904	82	102	101	125	123	..	..
1909	96	116	116	121	121	..	..
1914	112	132	131	117	117	..	..
1919	47	73	74	155	158	..	..
1921	16	..	40	..	256	..	..
1923	9.0	..	..	..	..	..	..
1925	8.7	..	..	..	..	..	..
1927	7.4	..	..	..	..	..	..
1929	6.6	..	..	..	..	..	..
1931	5.3	..	..	..	..	..	..
1933	19	50	53	266	282	..	..
1935	77	83	83	108	108	..	..
1937	100	100	100	100	100	100	100
1939	95	77	73	80	76	78	82

* Excludes nonfactory personnel, 1935-39. The following indexes (1937:100) cover all personnel:

	1935	1937	1939
Employment	91	100	104
Employment per unit	118	100	109

^a For indexes of manhours and manhours per unit back to 1933 see the combination *beverages and malt liquors*.

^b The output series for 1899-1937 are based on data compiled by the Bureau of Internal Revenue and cover fiscal years ending June 30.

LIQUORS, DISTILLED

Year	Output ^a	Employment		Employment per Unit		Man-hours Wage Earners (ESTIMATE A)	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1899	2,574	251	..	9.7	..	..	..
1904	2,892	361	390	12	13	..	..
1909	3,356	433	449	13	13	94	301
1914	4,257	424	449	10	11	..	..
1919	108	93	94	86	87	..	..
1921	117	77	77	66	66	..	..
1923	92	72	81	78	89	..	..
1925	55	94	94	171	171	..	..
1927	48	80	80	167	168	..	..
1929	100	100	100	100	100	..	..
1931	94	67	..	71	..	..	..
1933 ^b	322	169	173	53	54	..	..
1935	6,986	831	769	12	11	..	..
1937	10,696	634	600	5.9	5.6	100	100
1939	6,803	417	409	6.1	6.0	64	101

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	796	761	460
Employment per unit	11	7.1	6.8

^a The output series for 1899-1937 are based on data compiled by the Bureau of Internal Revenue and cover fiscal years ending June 30.

^b The 1933 Census of this industry is considered by the Bureau of the Census to be somewhat incomplete.

BEVERAGES and MALT LIQUORS^a

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1933	23	51	55	227	242	53	234
1935	69	75	76	109	111	72	105
1937	100	100	100	100	100	100	100
1939	110	76	78	70	71	74	67

* Excludes nonfactory personnel, 1935-39. The following indexes (1937:100) cover all personnel:

	1935	1937	1939
Employment	83	100	118
Employment per unit	121	100	107

^a Combination of *beverages, nonalcoholic, and liquors, malt*. Data on hours are not available for these separately.

LIQUORS, VINOUS

TOTAL BEVERAGES

Year	Output ^a	Employment		Employment per Unit		Employment			Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*	Output ^b	Wage Earners	Total*	Wage Earners	Total*
1899	..	..	..	..	..	43	62	..	143	..
1904	..	..	..	..	..	55	77	74	140	135
1909	..	..	..	..	..	63	87	86	138	136
1914	..	..	..	..	..	76	99	97	131	129
1919	..	..	..	..	..	23	62	64	268	278
1921	..	..	..	..	..	..	40	44	..	..
1923	123	277	264	226	215	..	36	40	..	..
1925	32	142	145	447	454	..	34	37	..	..
1927	39	81	95	208	246	..	33	37	..	..
1929	100	100	100	100	100	..	35	39	..	..
1931	58	52	..	88	..	..	29	..	..	..
1933	165	678	744	412	452	17	49	53	292	312
1935	809	1,255	1,318	155	163	70	79	80	112	114
1937	1,075	1,616	1,615	150	150	100	100	100	100	100
1939	2,038	1,105	1,160	54	57	108	76	77	70	72

* Excludes nonfactory personnel, 1935-39. The following indexes (on the 1929 base for *liquors, vinous*, and the 1937 base for *total beverages*) cover all personnel:

		1935	1937	1939
<i>Liquors, vinous</i>	Employment	1,517	1,661	1,459
	Employment per unit	187	154	72
<i>Total beverages</i>	Employment	85	100	111
	Employment per unit	121	100	104

^a The output series are based on data compiled by the Bureau of Internal Revenue and cover fiscal years ending June 30.

^b The output series in large part are based on data compiled by the Bureau of Internal Revenue and cover fiscal years ending June 30.

TOBACCO PRODUCTS

CHEWING and SMOKING TOBACCO

Year	Output ^a	Employment		Employment per Unit		Man-hours Wage Earners (ESTIMATE A)	Manhours per Unit ^b
		Wage Earners	Total*	Wage Earners	Total*		
1899	89	269	..	304	..	..	..
1904	106	222	211	208	198	..	..
1909	130	251	..	194	..	..	..
1914	133	240	254	181	192	..	..
1919	128	169	179	133	140	..	..
1921	116	154	161	132	139	..	..
1923	124	151	157	121	126	..	..
1925	124	139	141	112	113	..	..
1927	114	121	121	107	107	..	..
1929	100	100	100	100	100	..	..
1931	96	106	..	111	..	..	..
1933	81	95	91	116	112	100	102
1935	82	93	93	113	113	97	98
1937	83	94	95	113	114	100	100
1939	76	85	86	113	113	90	99

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	103	96	92
Employment per unit	125	115	122

^b For 1909 indexes see the group total, *tobacco products*.

CIGARETTES

Year	Output	Employment		Employment per Unit		Man-hours ^b Wage Earners (ESTIMATE A)	Manhours per Unit ^b
		Wage Earners ^a	Total*	Wage Earners ^a	Total*		
1899	3.1	..	..	..	..	..	..
1904	2.8	21	..	743	..	..	..
1909	5.6	39	..	688	..	..	..
1914	14	55	52	403	380	..	..
1919	43	107	98	248	228	..	..
1921	42	102	95	240	224	..	..
1923	54	100	92	185	169	..	..
1925	67	..	..	..	..	..	..
1927	81	102	..	126	..	..	..
1929	100	100	100	100	100	..	..
1931	96	95	..	100	..	..	..
1933	96	107	91	112	95	80	112
1935	113	116	99	102	88	91	108
1937	134	124	105	92	78	100	100
1939	144	130	110	90	76	103	96

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	106	106	117
Employment per unit	94	79	81

^a For indexes covering all Census years 1899-1939 see the combination *cigars and cigarettes*. The output series up through 1937 are based on data compiled by the Bureau of Internal Revenue and cover fiscal years ending June 30.

^b For 1909 indexes see the group total, *tobacco products*.

CIGARS^a

Year	Output	Employment		Employment per Unit		Man-hours ^b Wage Earners (ESTIMATE A)	Manhours per Unit ^b
		Wage Earners	Total*	Wage Earners	Total*		
1869	15	24	..	155	..	..	..
1879	32	49	..	154	..	..	..
1889	58	90	..	156	..	..	..
1899	80	117 ^a	..	147	..	..	..
1904	106	153	..	144	..	..	..
1909	111	154	..	138	..	..	..
1914	119	165	169	138	142	..	..
1919	112	136	138	121	123	..	..
1921	107	133	135	124	126	..	..
1923	108	129	132	120	123	..	..
1925	100	..	..	..	..	..	..
1927	100	112	..	112	..	..	..
1929	100	100	100	100	100	100	100
1931	82	81	..	99	..	..	..
1933	66	80	77	121	118	58	88
1935	70	67	66	95	94	45	64
1937	80	66	66	83	83	48	60
1939	78	60	60	78	77	41	53

CIGARS and CIGARETTES^a

Year	Output	Employment		Employment per Unit		Man-hours ^b Wage Earners (ESTIMATE A)	Manhours per Unit ^b
		Wage Earners	Total*	Wage Earners	Total*		
1899	22	97	..	438	..	..	..
1904	28	127	129	447	456	..	..
1909	32	131	..	408	..	..	..
1914	41	143	143	345	345	..	..
1919	61	130	129	212	211	..	..
1921	59	127	126	214	212	..	..
1923	68	123	123	183	182	..	..
1925	75	111	110	148	147	..	..
1927	86	110	111	128	129	..	..
1929	100	100	100	100	100	..	..
1931	92	84	..	91	..	..	..
1933	89	85	80	96	91	108	149
1935	104	76	73	74	71	93	110
1937	122	78	75	64	61	100	100
1939	128	74	71	58	56	92	88

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

		1935	1937	1939
Cigars	Employment	67	67	61
	Employment per unit	96	84	78
Cigars and cigarettes	Employment	76	75	74
	Employment per unit	73	62	58

^a Cigars and cigarettes is a combination of two industries; separate data for these are not available for all years. The output series up through 1937 are based on Bureau of Internal Revenue data and cover fiscal years ending June 30.

^b For 1909 indexes see the group total, *tobacco products*.

^c The 1899 figure for cigar employment is based on the corresponding figure for *cigars and cigarettes* combined. Cigarettes were of very slight importance in that year.

TOTAL TOBACCO PRODUCTS

Year	Output ^a	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1899	30	113	..	378	..	..	..
1904	37	135	137	362	366	..	..
1909	43	142	144	326	332	254	686
1914	53	152	154	288	292	..	..
1919	69	133	134	193	193	..	..
1921	66	129	129	196	195	..	..
1923	74	126	126	171	171	..	..
1925	81	114	113	140	139	..	..
1927	90	111	112	124	125	..	..
1929	100	100	100	100	100	..	..
1931	93	86	..	93	..	..	..
1933	88	86	81	98	93	106	142
1935	101	78	75	77	75	94	109
1937	117	79	77	68	66	100	100
1939	120	75	73	63	60	91	89

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	78	77	76
Employment per unit	78	66	63

^a The output series up through 1937 are based on data compiled by the Bureau of Internal Revenue and cover fiscal years ending June 30.

TEXTILE PRODUCTS

ARTIFICIAL LEATHER^a

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1923	102	95	100	94	99
1925	109	103	98	95	90
1927	104	105	104	101	100
1929	100	100	100	100	100
1931	59	75	..	128	..
1933	..	75	73	..	..
1935	91	87	85	96	94
1937 ^b	118	98	93	83	79
1939	..	..	..	..	..

OILCLOTH and ARTIFICIAL LEATHER^c

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total	Wage Earners	Total
1923	84	92	..	109	..
1925	..	..	..	..	..
1927	..	..	..	..	..
1929	100	100	..	100	..
1931	..	..	..	..	..
1933	..	..	..	..	..
1935	..	..	..	..	..
1937 ^b	96	97	..	101	..
1939	116	99	..	86	..

* Excludes nonfactory personnel, 1935-37. The following indexes (1929:100) cover all personnel:

	1935	1937
Employment	..	94
Employment per unit	..	80

^a For 1939 figures see the combination *oilcloth and artificial leather*.

^b The data for *artificial leather* are based on figures given in the 1937 Census report. Slightly revised 1937 figures are given in the 1939 report for *oilcloth and artificial leather* in combination.

^c Combination of two industries. Data for 1939 not available separately.

OILCLOTH^a

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1904	36	37	34	104	94
1909	62	69	65	111	105
1914	61	87	86	142	141
1919	38	80	79	210	208
1921	46	67	73	146	159
1923	61	85	82	139	134
1925	66	82	81	124	122
1927	79	76	76	96	96
1929	100	100	100	100	100
1931	77	87	..	113	..
1933	..	89	87	..	..
1935	76	99	97	129	127
1937 ^b	66	90	90	137	137
1939	..	..	..	..	..

LINOLEUM and ASPHALTED-FELT-BASE FLOOR COVERING^c

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total	Wage Earners	Total
1904	..	..	..	..	..
1909	..	..	..	..	..
1914	..	..	..	..	..
1919	55	69	..	125	..
1921	..	..	..	..	..
1923	..	..	..	..	..
1925	..	..	..	..	..
1927	..	..	..	..	..
1929	100	100	..	100	..
1931	..	..	..	..	..
1933	..	..	..	..	..
1935	..	..	..	..	..
1937 ^b	104	103	..	99	..
1939	106	89	..	84	..

* Excludes nonfactory personnel, 1935-37. The following indexes (1929:100) cover all personnel:

	1935	1937
Employment	..	91
Employment per unit	..	139

^a For 1939 figures see the combination *oilcloth and artificial leather*.

^b The data for *oilcloth* are based on figures given in the 1937 Census report. Slightly revised 1937 figures are given in the 1939 report for *oilcloth* and *artificial leather* in combination.

^c Combination of two industries. Separate data for 1919 and 1939 are not available.

CLOTHING, MEN'S^a

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1927	96	99	101	103	105	103	107
1929	100	100	100	100	100	100	100
1931	75	82	..	110	..	80	106
1933	79	93	91	117	115	82	103
1935	100	114	111	113	110	92	91
1937	99	120	116	122	118	102	103
1939	116	124	119	107	102	111	96

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	114	117	123
Employment per unit	114	119	106

^a Includes *clothing, men's, work; clothing, men's, n.e.c.; clothing, men's, buttonholes; and cloth sponging and refinishing*.

ASPHALTED-FELT-BASE
FLOOR COVERING^a

LINOLEUM^a

Year	Employment			Employment per Unit		Employment			Employment per Unit	
	Output	Wage Earners	Total*	Wage Earners	Total*	Output	Wage Earners	Total*	Wage Earners	Total*
1921	24	35	36	144	147	82	88	78	107	96
1923	56	72	56	127	98	99	113	106	114	108
1925	74	105	99	142	134	86	88	79	102	91
1927	105	104	103	99	98	92	97	89	106	97
1929	100	100	100	100	100	100	100	100	100	100
1931	78	83	..	106	..	45	52	..	115	..
1933	84	97	89	115	106	42	51	44	120	104
1935	113	115	107	102	94	60	67	57	111	95
1937	144	140	129	97	90	83	87	76	105	92

* Excludes nonfactory personnel, 1935-37. The following indexes (1929:100) cover all personnel:

	1935	1937
<i>Asphalted-felt-base floor covering</i>	..	130
Employment per unit	..	90
<i>Linoleum</i>	..	76
Employment per unit	..	92

^a For 1919 and 1939 indexes see the combination *linoleum and asphalted-felt-base floor covering*.

CARPETS and RUGS, WOOL

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1899	61	87	..	144	..	..	..
1904	65	102	98	156	150	..	..
1909	78	102	99	130	126	172	204
1914	71	96	94	135	133	..	..
1919	62	70	69	114	112	..	..
1921	59	70	69	119	116	..	..
1923	101	108	105	107	104	..	..
1925	96	104	102	109	107	..	..
1927	89	101	99	113	111	..	..
1929	100	100	100	100	100	..	..
1931	63	70	..	112	..	..	..
1933	61	65	65	108	107	73	112
1935	86	85	85	99	99	97	104
1937	92	94	94	102	102	100	100
1939	91	80	81	87	89	89	90

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	85	95	84
Employment per unit	100	102	92

CORDAGE and TWINE

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1899	67	90	..	136	..
1904	..	101	97	..	..
1909	82	101	98	123	119
1914	98	109	106	111	108
1919	93	122	121	131	130
1921	75	101	101	134	135
1923	96	113	113	118	117
1925	95	106	106	112	112
1927	95	104	104	110	110
1929	100	100	100	100	100
1931	69	77	..	112	..
1933	71	77	77	109	109
1935	72	85	85	117	117
1937	92	97	96	105	104
1939	93	83	83	90	90

JUTE GOODS

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1899	61	91	..	149	..
1904	..	123	117	..	..
1909	109	135	130	124	119
1914	138	162	156	117	113
1919	117	145	142	124	122
1921	77	115	113	148	146
1923	104	123	121	118	116
1925	105	128	127	122	121
1927	97	109	108	112	111
1929	100	100	100	100	100
1931	79	77	..	97	..
1933	89	86	86	96	96
1935	100	93	94	93	94
1937	143	132	131	92	91
1939	100	75	77	75	77

* Excludes nonfactory personnel: 1935-39. The following indexes (1929:100) cover all personnel:

		1935	1937	1939
<i>Cordage and twine</i>	Employment	86	96	86
	Employment per unit	118	105	93
<i>Jute goods</i>	Employment	94	132	78
	Employment per unit	94	92	78

HATS, STRAW, MEN'S

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1927	122	97	99	79	81
1929	100	100	100	100	100
1931	99	84	..	84	..
1933	..	93	91	..	..
1935	143	86	86	60	60
1937 ^a	158	89	89	56	56
1939	117	79	78	67	66

HATS, CLOTH

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1927	97	108	110	112	114
1929	100	100	100	100	100
1931	59	59	..	100	..
1933	..	70	68	..	..
1935	71	65	64	91	89
1937 ^a	53	59	57	112	108
1939	..	..	..	..	..

* Excludes nonfactory personnel, 1935-39. The following figures (1929:100) cover all personnel:

		1935	1937	1939
<i>Hats, straw, men's</i>	Employment	96	91	86
	Employment per unit	67	57	73
<i>Hats, cloth</i>	Employment	70	58	..
	Employment per unit	98	109	..

^a The 1937 Census of *hats, cloth* is considered by the Bureau of the Census to be somewhat incomplete.

HATS, FUR-FELT

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit Wage Earners (ESTIMATE A)
		Wage Earners	Total*	Wage Earners	Total*		
1899	79	114	..	144	..	..	..
1904	106	133	129	126	122	..	..
1909	126	151	148	120	118	239	190
1914	91	129	125	142	138	..	..
1919	94	112	111	118	118	..	..
1921	81	84	84	104	104	..	..
1923	93	101	102	108	109	..	..
1925	86	92	92	106	106	..	..
1927	104	96	96	92	92	..	..
1929	100	100	100	100	100	..	..
1931	78	85	..	110	..	..	..
1933	..	76	74	..	..	..	..
1935	94	89	87	94	93	89	94
1937	100	96	93	96	93	100	100
1939	108	89	88	82	81	90	83

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	91	93	91
Employment per unit	96	93	84

GLOVES, TEXTILE, not elsewhere made

HANDKERCHIEFS

Year	Output	Employment		Employment per Unit		Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*		Wage Earners	Total*	Wage Earners	Total*
1927	104	111	109	107	105	99	111	112	111	113
1929	100	100	100	100	100	100	100	100	100	100
1931	67	77	..	115	..	75	79	..	105	..
1933	..	93	91	..	..	..	78	78	..	..
1935 ^a	61	87	85	142	140	78	81	81	104	104
1937	97	137	132	141	136	86	83	82	97	96
1939	96	133	131	138	136	90	80	79	89	88

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
<i>Gloves, textile, n.e.m.</i>			
Employment	87	133	134
Employment per unit	143	137	140
<i>Handkerchiefs</i>			
Employment	85	83	84
Employment per unit	109	96	93

^a The 1935 figures for *handkerchiefs* are considered by the Bureau of the Census to be roughly but not exactly comparable with those for other years because some leading manufacturers reported unsatisfactorily the detailed breakdown of their 1935 output.

HATS, WOOL-FELT

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1879	236	201	..	85	..
1889	165	132	..	80	..
1899	135	104	..	77	..
1904	68	74	71	109	106
1909	101	98	95	97	94
1914	64	61	61	95	96
1919	79	71	74	90	93
1921	50	70	71	142	142
1923	72	96	99	133	138
1925	73	91	93	126	127
1927	87	104	101	120	116
1929	100	100	100	100	100
1931	84	76	..	91	..
1933	..	80	77	..	..
1935	185	148	142	80	77
1937	256	199	194	78	76
1939	308	218	214	71	69

WOOL SHODDY

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total	Wage Earners	Total
1879	..	..	..	..	..
1889	52	99	..	191	..
1899	55	103	..	188	..
1904	75	111	108	149	144
1909	68	109	105	160	155
1914	82	121	116	147	140
1919	98	145	143	148	146
1921	46	66	70	143	151
1923	100	121	118	121	119
1925	110	126	123	114	112
1927	71	95	95	134	133
1929	100	100	100	100	100
1931	59	61	..	103	..
1933	87	87	84	100	97
1935	..	..	..	..	..
1937	..	..	..	..	..
1939	..	..	..	..	..

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	142	195	216
Employment per unit	77	76	70

CLOTHING, WOMEN'S, not elsewhere classified

Year	Output	Employment		Employment per Unit		Man-hours per Wage Earner	Manhours per Unit (ESTIMATE A)
		Wage Earners	Total*	Wage Earners	Total*		
1927	84	82	84	98	100	..	..
1929	100	100	100	100	100	..	..
1931	103	93	..	90	..	..	..
1933 ^a	91	85	82	94	90	..	..
1935	109	118	111	108	102	91	105
1937 ^a	125	130	121	104	97	100	100
1939	142	150	138	106	97	123	108

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	117	122	146
Employment per unit	108	98	103

^a The 1933 and 1937 Censuses of this industry are reported by the Bureau of the Census to be somewhat incomplete.

COTTON GOODS

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1869	12	29	..	233	..	..	..
1879	22	38	..	173	..	..	..
1889	32	48	..	147	..	..	..
1899	49	70	..	143	..	..	..
1904	54	73	72	137	135	..	..
1909	68	87	86	129	128	102	152
1914	73	89	88	123	121	..	..
1919	78	101	101	130	130	..	..
1921	70	97	97	140	139	..	..
1923	93	111	110	119	118	113	121
1925	93	105	104	113	112	101	109
1927	104	110	110	106	105	117	112
1929	100	100	100	100	100	100	100
1931	78	78	..	100	..	75	96
1933	87	89	89	102	102	79	90
1935 ^a	78	87	87	111	111	64	82
1937	99	99	99	100	100	77	78
1939	106	91	91	86	86	72	68

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	88	99	92
Employment per unit	112	100	87

^a The 1935 figures are considered by the Bureau of the Census to be roughly but not exactly comparable with those for earlier years. See Appendix B-1, TEXTILE PRODUCTS, footnote c.

OUTERWEAR, KNIT^a

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1923	119	143	144	120	121	..	..
1925	85	97	98	114	116	..	..
1927	84	85	86	102	103	..	..
1929	100	100	100	100	100	..	..
1931	108	90	..	83	..	..	..
1933	119	93	93	78	78	..	..
1935	142	122	120	86	85	124	103
1937	117	101	100	86	85	100	100
1939	122	93	90	76	74	94	90

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	126	100	95
Employment per unit	89	85	78

^a For indexes covering other years see *knit goods, total*.

LACE GOODS

CLOTH, KNIT^a

Year	Employment			Employment per Unit		Employment			Employment per Unit	
	Output	Wage Earners	Total*	Wage Earners	Total*	Output	Wage Earners	Total	Wage Earners	Total
1914	74	109	106	147	143	..	..	..	..	..
1919	87	95	94	109	107	..	..	..	..	..
1921	67	93	91	139	136	..	..	..	..	..
1923	101	107	104	106	103	58	85	86	148	150
1925	90	102	101	114	113	64	76	77	119	121
1927	96	95	94	99	98	74	77	78	105	105
1929	100	100	100	100	100	100	100	100	100	100
1931	80	88	..	110	..	148	89	..	60	..
1933	..	86	85	..	..	..	..	..	..	..
1935	143	115	115	80	80	..	..	..	..	..
1937	154	118	117	77	76	..	..	..	..	..
1939	151	106	105	70	70	..	..	..	..	..

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	117	117	109
Employment per unit	82	76	72

^a For indexes covering other years see *knit goods, total*.

HOSIERY, KNIT^a

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1923	57	75	76	131	132	..	..
1925	68	80	81	118	119	..	..
1927	78	87	87	111	111	..	..
1929	100	100	100	100	100	..	..
1931	88	87	..	98	..	..	..
1933	92	91	90	99	98	87	108
1935	102	107	106	104	103	89	100
1937	115	116	115	101	100	100	100
1939	137	123	122	89	89	108	90

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	107	115	124
Employment per unit	105	101	90

^a For indexes covering other years see *knit goods, total*.

UNDERWEAR, KNIT^a

Year	Output	Employment		Employment per Unit		Man-hours Wage Earners (ESTIMATE A)	Manhours per Unit Wage Earners
		Wage Earners	Total*	Wage Earners	Total*		
1923	103	117	117	114	114	..	..
1925	107	116	116	109	108	..	..
1927	102	111	111	109	110	..	..
1929	100	100	100	100	100	..	..
1931	78	77	..	98	..	..	..
1933	98	87	86	88	88	98	102
1935	99	84	85	85	85	84	86
1937	102	96	96	94	94	100	100
1939	109	90	90	82	82	96	90

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	87	96	93
Employment per unit	88	94	85

^a For indexes covering other years see *knit goods, total*.

KNIT GOODS, TOTAL^a

Year	Output	Employment		Employment per Unit		Man-hours Wage Earners (ESTIMATE A)	Manhours per Unit Wage Earners (ESTIMATE B)
		Wage Earners	Total*	Wage Earners	Total*		
1869	1.9	6.0	..	306	..	..	..
1879	3.6	12	..	328	..	..	..
1889	9.1	25	..	270	..	..	..
1899	19	40	..	210	..	..	..
1904	24	50	49	209	204	..	..
1909	33	62	61	187	183	86	301
1914	45	72	71	160	158	..	77
1919	55	83	83	149	150	..	..
1921	59	78	78	131	132	..	76
1923	75	93	94	125	126	..	91
1925	77	90	90	116	117	..	85
1927	83	91	91	110	110	..	90
1929	100	100	100	100	100	..	100
1931	92	85	..	92	..	..	76
1933	100	91	91	91	91	90	105
1935	111	105	105	95	94	93	97
1937	116	111	110	96	95	100	100
1939	132	112	111	85	84	104	91

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	107	110	114
Employment per unit	97	95	86

^a Combination of four knit goods industries, *hosiery, underwear, outerwear, and cloth*. Data are not available for these separately for all years.

SHIRTS and COLLARS, MEN'S

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1927	101	96	98	96	98	..	..
1929	100	100	100	100	100	..	..
1931	99	95	..	96	..	..	..
1933	79	88	87	110	109	..	..
1935	91	97	96	107	106	85	87
1937	93	108	106	116	115	100	100
1939	112	112	110	100	98	107	89

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	99	107	112
Employment per unit	109	115	100

WOOLEN and WORSTED GOODS^a

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit	Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*				
1879	49	63	..	130	..	..	..	..	..
1889	55	74	..	133	..	..	..	..	..
1899	71	86	..	120	..	..	..	..	..
1904	86	97	94	112	109	..	..	..	..
1909	103	111	108	108	105	132	128	..	..
1914	102	108	105	106	103	..	..	124	122
1919	98	113	112	116	115	..	..	..	..
1921	93	110	109	119	118	..	..	109	118
1923	120	132	130	110	109	139	116	136	113
1925	108	112	112	104	104	117	109	107	99
1927	103	105	104	102	101	108	106	102	99
1929	100	100	100	100	100	100	100	100	100
1931	81	81	..	100	..	81	100	73	90
1933	87	87	85	100	98	79	91	74	85
1935	116	110	109	95	94	92	79	89	77
1937	114	108	107	94	93	85	74	81	71
1939	116	101	101	87	87	84	72	80	69

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	110	107	102
Employment per unit	95	93	88

^a Combination of two industries, *woolen goods* and *worsted goods*. Data for all years or for hours of labor are not available for these separately.

WOOLEN GOODS^a

Year	Employment Wage			Employment per Unit Wage	
	Output	Earners	Total	Earners	Total
1909	78	89	87	114	112
1914	83	84	82	102	99
1919	92	108	107	117	116
1921	80	96	96	121	120
1923	115	124	122	108	106
1925	112	115	113	102	101
1927	105	105	105	101	100
1929	100	100	100	100	100
1931	70	73	..	104	..

WORSTED GOODS^a

Year	Employment Wage			Employment per Unit Wage	
	Output	Earners	Total	Earners	Total
1909	123	125	122	102	99
1914	118	124	120	105	102
1919	104	117	116	113	112
1921	105	120	119	114	114
1923	130	138	136	106	105
1925	106	111	111	104	104
1927	103	104	104	102	101
1929	100	100	100	100	100
1931	88	87	..	99	..

^a For indexes covering other years and for indexes of manhours and manhours per unit see the combination *woolen and worsted goods*.

SILK and RAYON GOODS

Year	Output	Employment Wage		Employment per Unit Wage		Man- Manhours hours per Unit Wage Earners		Man- Manhours hours per Unit Wage Earners	
		Earners	Total*	Earners	Total*	(ESTIMATE A)	(ESTIMATE B)	(ESTIMATE B)	(ESTIMATE B)
1879	5.0	21	..	425	..	..	..	..	..
1889	14	35	..	246	..	..	..	..	..
1899	22	50	..	227	..	..	..	..	..
1904	30	61	60	204	201	..	..	..	..
1909	40	76	75	192	189	128	438	..	..
1914	49	83	82	171	170	..	..	88	181
1919	64	97	97	152	153	..	..	..	..
1921	58	93	94	159	160	..	..	87	149
1923	73	96	98	132	134	..	..	93	128
1925	86	102	102	118	118	..	..	100	115
1927	92	98	99	107	108	..	..	94	103
1929	100	100	100	100	100	..	..	100	100
1931	92	84	..	91	..	..	..	78	84
1933	84	85	84	101	99	102	164	66	79
1935 ^a	133	96	95	73	72	106	108	65	49
1937	135	90	88	66	65	100	100	66	49
1939	175	91	90	52	51	106	82	67	38

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	96	89	91
Employment per unit	73	66	52

^a Owing to shifts in the classification of certain types of textile manufacture the Bureau of the Census believes that the 1935 figures are not comparable with those for earlier years (see Appendix B-1, *TEXTILE PRODUCTS*, footnote *h*). The index of output is less affected than the indexes of employment and employment per unit (see *The Output of Manufacturing Industries, 1899-1937*, p. 452, footnote *d*), but even the latter do not appear to be so seriously affected as to be worthless.

ELASTIC WOVEN GOODS,
not elsewhere made

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1927	76	94	99	123	130
1929	100	100	100	100	100
1931	62	75	..	121	..
1933	..	60	63	..	..
1935	69	63	65	91	94
1937	63	67	66	106	106
1939	69	59	59	85	85

CORSETS

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1927	99	101	102	102	102
1929	100	100	100	100	100
1931	111	102	..	92	..
1933	109	103	101	94	93
1935	..	114	113	..	..
1937	129	120	117	93	91
1939	..	..	..	..	..

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
<i>Elastic woven goods, n.e.m.</i> Employment	80	71	66
Employment per unit	116	112	95
<i>Corsets</i> Employment	122	119	..
Employment per unit	..	92	..

LINEN GOODS

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1899	137	150	..	110	..
1904	..	174	163	..	..
1909	200	163	155	81	77
1914	192	162	156	85	81
1919	86	86	86	100	100
1921	72	115	114	160	158
1923	125	131	129	105	103
1925	117	119	117	102	100
1927	120	115	114	96	95
1929	100	100	100	100	100
1931	68	71	..	105	..
1933	72	73	71	101	99
1935	73	80	82	109	111
1937	77	85	84	110	109
1939	75	91	90	122	120

TOTAL TEXTILE PRODUCTS

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1899	38	60	..	159	..
1904	48	68	..	143	..
1909	60	85	..	140	..
1914	72	88	87	122	121
1919	67	94	95	140	142
1921	64	89	89	137	138
1923	82	101	101	122	123
1925	86	96	96	111	111
1927	94	99	99	106	106
1929	100	100	100	100	100
1931	87	83	..	96	..
1933	85	86	85	101	100
1935	99	99	97	99	98
1937	106	106	104	100	98
1939	119	106	104	89	87

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
<i>Linen goods</i> Employment	82	86	91
Employment per unit	112	111	122
<i>Total textile products</i> Employment	100	104	107
Employment per unit	100	98	90

LEATHER PRODUCTS

LEATHER

Year	Output	Employment		Employment per Unit		Man-hours per Unit Wage Earners (ESTIMATE A)	Man-hours per Unit Wage Earners (ESTIMATE B)	Man-hours per Unit Wage Earners (ESTIMATE C) ^a
		Wage Earners	Total*	Wage Earners	Total*			
1889	65	80	..	123	..	..	..	..
1899	70	104	..	150	..	..	..	..
1904	82	115	113	140	137	..	..	..
1909	89	125	123	140	138	175	219	..
1914	84	112	111	133	132	..	..	118 140
1919	104	145	145	139	139	..	..	..
1921	88	98	99	111	112	..	..	96 109
1923	120	120	120	99	100	..	..	120 99
1925	101	105	105	103	104	..	..	104 103
1927	106	106	106	100	100	..	..	102 96
1929	100	100	100	100	100	..	..	100 100
1931	81	84	..	104	..	..	..	80 99
1933	85	88	88	104	103	93	122	78 91
1935	104	102	101	98	98	101	109	82 79
1937	112	102	100	90	90	100	100	82 73
1939	110	95	94	86	85	93	95	77 70

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	103	101	95
Employment per unit	99	90	86

^a J. R. Arnold, "Labor Productivity in the Leather Industry," *Monthly Labor Review*, July 1937, Table 3. The data relate to a sample of companies in four major branches of the leather industry.

BELTING, LEATHER

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1927	80	83	86	104	108
1929	100	100	100	100	100
1931	46	63	..	137	..
1933	48	65	68	136	144
1935	76	91	89	119	116
1937	86	109	101	126	117
1939	76	90	83	119	110

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	101	103	92
Employment per unit	132	119	121

SHOES, LEATHER

Year	Output	Employment		Employment per Unit		Man- Manhours		Man- Manhours	
		Wage Earners	Total*	Wage Earners	Total*	hours Wage Earners (ESTIMATE A)	per Unit	hours Wage Earners (ESTIMATE B)	per Unit
1869	23	39	..	172	..	..	..	..	..
1879	35	48	..	136	..	..	..	..	..
1889	50	60	..	118	..	..	..	..	..
1899	60	69	..	115	..	..	..	..	..
1904	68	73	71	108	104	..	..	..	..
1909	78	90	89	115	113	108	137	..	..
1914	81	93	93	115	114	..	..	113	139
1919	89	103	104	115	117	..	..	..	..
1921	76	89	90	118	119	..	..	92	122
1923	93	110	110	118	119	117	127	113	122
1925	84	101	101	120	121	103	123	104	124
1927	96	99	99	102	103	102	105	101	105
1929	100	100	100	100	100	100	100	100	100
1931	84	88	..	104	..	84	100	89	105
1933	94	93	91	99	96	83	88	83	88
1935	103	98	96	95	93	80	78	82	80
1937	112	105	102	93	91	87	78	91	81
1939	116	106	103	92	89	87	75	86	75

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	98	102	105
Employment per unit	95	91	91

GLOVES, LEATHER

TOTAL LEATHER PRODUCTS

Year	Output*	Employment		Employment per Unit		Employment		Employment per Unit		
		Wage Earners	Total*	Wage Earners	Total*	Wage Earners	Total*	Wage Earners	Total*	
1899	76	131	..	172	..	64	78	..	123	..
1904	87	98	96	113	110	74	83	81	114	110
1909	88	105	106	119	121	83	97	97	118	117
1914	82	98	101	120	124	81	96	97	120	120
1919	94	98	103	105	110	90	109	112	122	124
1921	58	73	75	126	130	74	88	89	118	120
1923	..	92	93	..	..	95	108	109	115	115
1925	..	77	79	..	..	85	99	99	116	118
1927	91	99	101	109	111	97	99	100	102	103
1929	100	100	100	100	100	100	100	100	100	100
1931	74	86	..	116	..	80	86	..	107	..
1933	..	88	88	..	..	86	89	87	103	101
1935	102	107	104	104	102	100	98	95	98	96
1937	98	126	123	129	126	108	104	102	96	94
1939	91	109	106	120	117	110	104	101	94	92

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
<i>Gloves, leather</i> Employment	109	124	110
Employment per unit	107	126	121
<i>Total leather products</i> Employment	98	102	103
Employment per unit	99	94	94

* The indexes of output for 1899-1921 are revised.

RUBBER PRODUCTS

SHOES, RUBBER^a

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*			Wage Earners (ESTIMATE A)
1899	60 ^b	56	..	94	..	..	..
1904	..	74	..	..	..	..	..
1909	..	69	..	..	..	..	..
1914	69	73	69	106	100	..	..
1919	115	128	128	111	112	..	..
1921	91	93	93	102	102	..	..
1923	111	115	112	103	101	..	..
1925	91	97	97	107	106	..	..
1927	120	105	103	87	86	..	..
1929	100	100	100	100	100	..	..
1931	58	62	..	106	..	..	..
1933	71	71	69	99	97	..	..
1935	83	67	66	81	80	96	110
1937	95	72	71	75	74	100	100
1939	81	58	58	72	72	79	93

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	67	71	62
Employment per unit	82	75	76

^a For indexes of manhours and manhours per unit back to 1921 see the group total, *rubber products*.

^b The index for 1899 has been computed since publication of *The Output of Manufacturing Industries, 1899-1937* (National Bureau of Economic Research, 1940). The basic data are from the Census of Manufactures.

TIRES and TUBES, incl. OTHER RUBBER GOODS^a

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1919	48	102	118	212	244
1921	37	65	68	174	184
1923	67	88	89	133	134
1925	83	95	96	114	115
1927	88	93	97	106	110
1929	100	100	100	100	100
1931	71	68	..	95	..
1933	69	71	71	103	103
1935	79	79	79	100	100
1937	90	90	91	100	101
1939	98	86	86	87	87

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	82	92	92
Employment per unit	104	102	94

^a Combination of two industries. Data back to 1919 are not available for these separately. For indexes of manhours and manhours per unit back to 1921 see the group total, *rubber products*.

TIRES and TUBES^a

Year	Output	Employment		Employment per Unit		Man- Manhours		Man- Manhours	
		Wage Earners	Total*	Wage Earners	Total*	hours per Unit Wage Earners (ESTIMATE A)	hours per Unit Wage Earners (ESTIMATE B) ^b	hours per Unit Wage Earners (ESTIMATE A)	hours per Unit Wage Earners (ESTIMATE B) ^b
1914	..	..	..	..	..	..	..	..	429
1919	..	..	..	..	..	..	..	..	..
1921	39	67	71	171	183	..	..	..	..
1923	69	89	90	129	131	..	..	..	138
1925	88	98	100	112	114	..	..	..	135
1927	91	94	99	103	109	..	..	..	109
1929	100	100	100	100	100	..	..	..	100
1931	67	59	..	88	..	..	..	..	78
1933	65	64	64	98	98	82	103	..	..
1935	72	69	68	95	95	91	102	..	..
1937	81	76	77	94	95	100	100	..	..
1939	83	65	66	78	79	94	92	..	..

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	72	78	70
Employment per unit	100	96	84

^a For indexes of output, employment and employment per unit back to 1919 see the combination *tires and tubes incl. other rubber goods*. For indexes of manhours and manhours per unit back to 1921 see the group total, *rubber products*.

^b B. Stern, *Labor Productivity in the Automobile Tire Industry*, Bulletin No. 585 (Bureau of Labor Statistics, July 1933), p. 9. The data cover 6 large plants.

RUBBER GOODS, OTHER^a

Year	Output	Employment		Employment per Unit		Man- Manhours	
		Wage Earners	Total*	Wage Earners	Total*	hours per Unit Wage Earners (ESTIMATE A)	hours per Unit Wage Earners (ESTIMATE A)
1927	80	92	92	115	116	..	..
1929	100	100	100	100	100	..	..
1931	83	85	..	103	..	..	..
1933	80	88	87	109	108	72	100
1935	96	100	100	105	105	81	95
1937	112	120	118	107	106	100	100
1939	136	129	128	95	94	109	90

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	103	121	139
Employment per unit	108	109	102

^a For indexes of output, employment and employment per unit back to 1919 see the combination *tires and tubes incl. other rubber goods*. For indexes of manhours and manhours per unit back to 1921 see the group total, *rubber products*.

TOTAL RUBBER PRODUCTS

Year	Output	Employment		Employment per Unit		Man- Manhours		Man- Manhours	
		Wage Earners	Total*	Wage Earners	Total*	hours per Unit Wage Earners (ESTIMATE A)	hours per Unit Wage Earners (ESTIMATE B)	hours per Unit Wage Earners (ESTIMATE A)	hours per Unit Wage Earners (ESTIMATE B)
1899	..	25	..	..	..	..	..	..	..
1904	..	30	28	..	..	..	..	..	..
1909	..	33	32	..	..	..	..	..	..
1914	..	50	52	..	..	..	..	55	..
1919	54	107	120	199	223	..	..	..	..
1921	43	70	72	163	170	..	..	68	160
1923	72	93	93	129	129	..	..	93	129
1925	84	95	96	113	114	..	..	94	112
1927	92	95	98	104	107	..	..	96	105
1929	100	100	100	100	100	..	..	100	100
1931	70	67	..	96	..	..	..	57	81
1933	69	71	71	103	102	..	..	52	75
1935	79	77	76	97	97	88	100	57	72
1937	91	87	87	96	96	100	100	65	71
1939	97	81	81	84	84	98	91	64	66

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	80	89	87
Employment per unit	100	98	90

PAPER PRODUCTS

PAPER^a

Year	Output	Employment		Employment per Unit		Man- Manhours	
		Wage Earners	Total*	Wage Earners	Total*	hours per Unit Wage Earners (ESTIMATE A)	hours per Unit Wage Earners (ESTIMATE B)
1927	88	95	95	109	108	..	..
1929	100	100	100	100	100	..	..
1931	85	85	..	99	..	..	..
1933	83	84	84	102	102	78	108
1935	96	100	100	105	105	88	106
1937	115	107	106	93	92	100	100
1939	123	107	107	87	86	99	92

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	101	107	112
Employment per unit	106	93	91

^a For indexes back to 1879 see the combination *paper and pulp*.

PAPER and PULP^a

Year	Output	Employment Wage		Employment per Unit		Man- Manhours hours per Unit		Man- Manhours hours per Unit	
		Earners	Total*	Earners	Total*	Wage Earners (ESTIMATE A)	Wage Earners (ESTIMATE B)	Wage Earners (ESTIMATE A)	Wage Earners (ESTIMATE B)
1879	4.1	18	..	434	..	..	..	..	..
1889	8.4	22	..	266	..	..	..	..	..
1899	19	39	..	200	..	..	..	..	..
1904	28	52	49	187	177	..	..	..	..
1909	36	59	57	162	155	78	255	..	..
1914	44	69	66	155	149	..	..	72	161
1919	53	89	87	168	165	..	..	..	..
1921	44	82	80	185	181	..	..	78	174
1923	66	94	93	143	141	..	..	94	142
1925	75	97	96	128	127	..	..	95	126
1927	88	96	96	110	110	..	..	95	109
1929	100	100	100	100	100	..	..	100	100
1931	86	84	..	98	..	..	..	71	83
1933	84	84	84	100	100	77	110	66	79
1935	98	99	99	102	102	87	107	75	77
1937	120	107	107	90	89	100	100	87	72
1939	128	107	107	84	84	98	92	84	66

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	101	108	113
Employment per unit	103	90	88

^a Combination of two industries. Data prior to 1927 are not available for these separately.

PULP^a

Year	Output	Employment Wage		Employment per Unit		Man- Manhours hours per Unit	
		Earners	Total*	Earners	Total*	Wage Earners (ESTIMATE A)	Wage Earners (ESTIMATE B)
1927	86	100	101	116	117	..	..
1929	100	100	100	100	100	..	..
1931	88	82	..	93	..	..	..
1933	89	81	82	91	92	74	117
1935	107	96	97	90	90	82	109
1937	141	109	109	77	78	100	100
1939	147	109	110	74	75	96	92

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	97	110	115
Employment per unit	91	78	78

^a For indexes back to 1879 see the combination *paper and pulp*.

WALL PAPER

TOTAL PAPER PRODUCTS

Year	Output	Employment		Employment per Unit		Output	Employment		Employment per Unit	
		Wage	Total*	Wage	Total*		Wage	Total*	Wage	Total*
1899	..	..	..	..	..	18	40	..	218	..
1904	..	..	..	..	..	26	51	49	197	187
1909	..	..	..	..	..	37	62	60	168	162
1914	..	..	..	..	..	46	71	70	154	150
1919	..	..	..	..	..	53	90	89	170	168
1921	..	..	..	..	..	50	80	79	159	157
1923	..	..	..	..	..	70	95	94	135	134
1925	..	..	..	..	..	77	95	95	124	123
1927	..	..	..	..	..	89	95	95	107	107
1929	100	100	100	100	100	100	100	100	100	100
1931	81	79	..	98	..	86	83	..	96	..
1933	77	69	70	89	90	84	82	83	97	98
1935	93	91	90	98	97	102	97	96	95	95
1937	110	97	95	88	87	122	109	107	89	88
1939	100	86	84	86	84	131	108	106	82	81

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

		1935	1937	1939
Wall paper	Employment	93	96	90
	Employment per unit	100	87	90
Total paper products	Employment	100	109	113
	Employment per unit	98	89	86

PRINTING AND PUBLISHING

TOTAL PRINTING and PUBLISHING

Year	Output	Employment		Employment per Unit		Man- Manhours		Man- Manhours	
		Wage	Total*	Wage	Total*	hours per Unit	Earners	hours per Unit	Earners
						(ESTIMATE A)		(ESTIMATE B)	
1899	17	56	..	326	..	..	..	..	..
1904	26	63	55	239	210	..	..	..	..
1909	36	74	68	208	191	77	218	..	..
1914	47	78	73	165	155	..	..	79	167
1919	54	82	79	152	147	..	..	..	..
1921	52	79	77	151	148	..	..	76	146
1923	73	86	85	117	116	87	119	85	116
1925	82	88	88	107	107	91	111	88	107
1927	90	92	93	101	102	97	108	92	102
1929	100	100	100	100	100	100	100	100	100
1931	84	89	..	106	..	84	100	82	98
1933	72	74	74	102	102	62	86	62	86
1935	87	86	84	98	97	71	81	70	80
1937	102	99	99	98	97	84	83	85	83
1939	97	91	84	95	87	76	79	76	79

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	..	101	99
Employment per unit	..	100	102

CHEMICAL PRODUCTS

CHEMICALS, INDUSTRIAL^a

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1927	74	84	83	114	112	..	..
1929	100	100	100	100	100	..	..
1931	81	78	..	96	..	..	..
1933	80	86	85	107	106	69	123
1935	105	106	106	101	101	83	112
1937	141	127	127	90	90	100	100
1939	155	116	119	75	77	92	84

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	108	129	132
Employment per unit	103	91	86

^a For indexes of output, employment and employment per unit back to 1899, see the combination, *chemicals, industrial, incl. rayon and gases*. For indexes of manhours and manhours per unit back to 1914 see the group total, *chemical products*.

CARBON BLACK

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1914	10	18	20	177	199
1919	23	35	38	154	164
1921	24	43	48	182	202
1923	47	68	78	144	166
1925	70	79	81	112	115
1927	67	81	84	121	126
1929	100	100	100	100	100
1931	75	54	..	73	..
1933	74	76	74	102	100
1935	94	95	95	101	101
1937	133	114	112	86	84
1939	140	82	83	59	60

LINSEED PRODUCTS

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1914	..	..	..	..	..
1919	..	..	..	..	..
1921	..	..	..	..	..
1923	83	97	94	116	113
1925	100	99	100	99	100
1927	95	100	103	106	109
1929	100	100	100	100	100
1931	67	68	..	101	..
1933	..	60	60	..	..
1935	63	87	88	137	139
1937	86	97	97	113	113
1939	73	78	80	107	110

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
<i>Carbon black</i>	Employment	96	112
	Employment per unit	101	84
<i>Linseed products</i>	Employment	88	97
	Employment per unit	139	113

CHEMICALS, INDUSTRIAL, incl. RAYON and GASES*

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit Wage Earners (ESTIMATE A)
		Wage Earners	Total*	Wage Earners	Total*		
1899	6.6	17	..	253	..	..	..
1904	8.3	21	20	257	242	..	..
1909	12	25	24	198	191	27	376
1914	20	34	33	167	161	..	..
1919	36	73	75	202	206	..	..
1921	27	47	49	174	180	..	..
1923	55	74	74	135	135	..	..
1925	56	74	73	132	131	..	..
1927	70	78	78	111	111	..	..
1929	100	100	100	100	100	..	..
1931	92	86	..	94	..	..	..
1933	102	96	93	94	92	..	..
1935	130	115	114	88	87	..	..
1937	172	132	132	77	77	100	100
1939	188	119	120	63	64	89	82

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	115	134	131
Employment per unit	88	78	70

* Combination of three industries. Data back to 1899 are not available for these separately. For indexes of manhours and manhours per unit back to 1914 see the group total, *chemical products*.

RAYON*

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit Wage Earners (ESTIMATE A)
		Wage Earners	Total*	Wage Earners	Total*		
1923	28	37	..	130	..	..	..
1925	40	49	49	121	121	..	..
1927	60	67	67	111	111	..	..
1929	100	100	100	100	100	..	..
1931	138	99	..	72	..	..	..
1933	201	113	113	56	56	86	133
1935	253	129	131	51	52	92	112
1937	310	141	146	45	47	100	100
1939	346	124	130	36	37	87	78

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	131	148	134
Employment per unit	52	48	39

* For indexes of output, employment and employment per unit back to 1899 see the combination *chemicals, industrial, incl. rayon and gases*. For indexes of manhours and manhours per unit back to 1914 see the group total, *chemical products*.

EXPLOSIVES

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1889	11	39	..	354	..	..	..
1899	25	80	..	317	..	..	..
1904	45	103	85	231	189	..	..
1909	62	112	84	182	136	161	242
1914	70	112	100	160	143	..	..
1919	94	165	184	176	196	..	..
1921	61	80	83	132	136	..	..
1923	94	114	102	121	108	..	..
1925	92	101	102	110	110	..	..
1927	96	103	104	108	109	..	..
1929	100	100	100	100	100	..	..
1931	67	84	..	126	..	..	..
1933	58	74	73	129	127	68	110
1935	68	81	82	120	121	77	104
1937	93	96	96	104	104	100	100
1939	98	96	95	98	97	98	93

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	84	96	98
Employment per unit	123	104	100

GLUE and GELATIN

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1927	96	108	106	112	111
1929	100	100	100	100	100
1931	85	85	..	100	..
1933	..	67	71	..	..
1935	110	109	110	99	100
1937	139	118	118	85	85
1939	123	102	103	83	84

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
<i>Glue and gelatin</i> Employment	116	130	113
Employment per unit	105	94	92
<i>Gases, compressed</i> Employment	95	97	100
Employment per unit	100	70	72

* For indexes of output, employment and employment per unit back to 1899 see the combination *chemicals, industrial, incl. rayon and gases*. For indexes of manhours and manhours per unit back to 1914 see the group total, *chemical products*.

GASES, COMPRESSED*

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1927	68	95	89	139	131
1929	100	100	100	100	100
1931	82	84	..	103	..
1933	71	82	66	115	93
1935	95	112	88	118	93
1937	138	137	96	99	69
1939	138	117	74	84	53

FERTILIZERS

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1899	30	55	..	182	..	..	..
1904	37	68	62	181	166	..	..
1909	60	87	85	146	141	124	219
1914	88	109	109	123	123	..	..
1919	80	126	126	156	156	..	..
1921	60	81	83	136	139	..	..
1923	76	89	91	116	119	..	..
1925	87	94	94	108	109	..	..
1927	90	89	90	99	101	..	..
1929	100	100	100	100	100	..	..
1931	78	70	..	89	..	..	..
1933	60	62	63	103	105	62	109
1935	78	83	83	108	107	70	96
1937	106	100	97	94	92	100	100
1939	100	92	88	91	88	82	86

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	91	101	99
Employment per unit	117	95	99

PAINTS and VARNISHES

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit	Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*				
1899	22	33	..	149	..	..	..	..	..
1904	28	40	38	143	136	..	..	..	..
1909	38	49	50	130	134	57	165	..	..
1914	41	55	59	134	143	..	..	56	135
1919	52	74	78	141	150	..	..	..	..
1921	45	62	65	136	143	..	..	56	125
1923	67	78	80	117	119	..	..	75	112
1925	76	87	89	115	117	..	..	89	117
1927	87	96	97	110	111	..	..	94	108
1929	100	100	100	100	100	..	..	100	100
1931	69	77	..	112	..	..	..	66	96
1933	62	78	74	125	119	71	124	61	97
1935	87	95	92	108	105	85	106	73	84
1937	109	108	104	99	95	100	100	86	79
1939	107	96	88	90	82	88	89	76	71

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	105	109	110
Employment per unit	120	100	103

COTTONSEED PRODUCTS

Year ^a	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1899	51	70	..	137	..	..	..
1904	74	98	98	133	133	..	..
1909	73	108	111	147	151	128	145
1914	134	138	141	103	106	..	..
1919	111	169	168	152	151	..	..
1921	80	102	104	127	130	..	..
1923	70	81	83	116	120	..	..
1925	108	102	101	95	94	..	..
1927	121	116	114	96	94	..	..
1929	100	100	100	100	100	..	..
1931	86	78	..	90	..	..	..
1933	94	90	88	96	94	..	..
1935	66	84	83	127	126	68	86
1937	83	105	102	127	123	100	100
1939	84	96	93	114	111	78	76

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	85	103	98
Employment per unit	130	125	116

^a Reports for 1925 and earlier years relate to the 12-month period ending July 31 following the year specified, while those for 1927 and later years relate to the 12-month period ending July 31 of the year specified. It is likely, however, that some manufacturers reported on a calendar-year basis.

SOAP

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1904	46	77	72	168	157	..	..
1909	61	90	91	147	148	125	223
1914	70	99	98	140	139	..	..
1919	89	142	143	159	160	..	..
1921	79	115	114	146	144	..	..
1923	87	118	121	137	139	..	..
1925	86	107	105	124	122	..	..
1927	93	94	92	100	99	..	..
1929	100	100	100	100	100	..	..
1931	98	99	..	101	..	..	..
1933	98	100	95	102	97	105	117
1935	100	97	89	97	89	97	106
1937	109	98	92	89	85	100	100
1939	126	95	91	76	72	96	84

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	96	94	106
Employment per unit	96	87	84

SALT

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1869	12	38	..	306	..
1879	21	55	..	262	..
1889	36	56	..	155	..
1899	53	87	..	164	..
1904	57	85	83	151	146
1909	67	90	89	134	133
1914	72	93	92	129	127
1919	88	119	123	135	140
1921	71	110	110	155	156
1923	87	125	127	144	147
1925	88	116	115	132	132
1927	92	109	110	119	120
1929	100	100	100	100	100
1931	91	87	..	95	..
1933	84	92	88	110	105
1935	87	91	89	105	103
1937	97	85	82	87	85
1939	96	82	80	86	83

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	95	82	88
Employment per unit	109	85	92

WOOD DISTILLATION and
CHARCOAL MANUFACTURE^a

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1921	33	46	48	139	146
1923	..	..	..	..	..
1925	..	..	..	..	..
1927	..	..	..	..	..
1929	100	100	100	100	100
1931	..	..	..	..	..
1933	..	..	..	..	..
1935	72	82	83	113	114
1937	101	96	97	95	96
1939	109	89	91	82	84

CHARCOAL^b

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total	Wage Earners	Total
1921	33	46	48	139	146
1923	..	..	..	..	..
1925	..	..	..	..	..
1927	..	..	..	..	..
1929	100	100	100	100	100
1931	..	..	..	..	..
1933	..	..	..	..	..
1935	72	82	83	113	114
1937	101	96	97	95	96
1939	109	89	91	82	84

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	83	102	96
Employment per unit	115	101	89

^a Combination of two industries. Data for 1939 are not available for these separately.

^b For 1939 output and employment indexes and indexes covering nonfactory personnel see the combination *wood-distillation and charcoal manufacture*.

Because this industry contains a large proportion of small establishments, the degree to which it is covered by the Census probably varies from year to year.

TANNING and DYE MATERIALS

WOOD-DISTILLATION PRODUCTS^a

Year	Employment			Employment per Unit		Employment			Employment per Unit	
	Output	Wage Earners	Total*	Wage Earners	Total*	Output	Wage Earners	Total	Wage Earners	Total
1899	26	68	..	263	..	28	34	..	120	..
1904	38	112	100	298	265	40	49	51	123	127
1909	54	99	95	184	177	54	59	60	109	110
1914	79	117	112	148	142	58	61	61	104	105
1919	82	179	164	220	201	75	108	109	144	146
1921	69	124	120	180	174	31	41	43	131	140
1923	95	134	130	141	137	80	88	90	109	112
1925	87	103	102	118	116	85	88	89	104	104
1927	88	100	103	113	117	92	97	97	105	106
1929	100	100	100	100	100	100	100	100	100	100
1931	78	81	..	104	..	56	57	..	102	..
1933	74	88	88	120	120	..	59	59	..	..
1935	100	110	113	109	113	73	82	83	113	114
1937	101	116	116	115	115	101	96	97	95	96
1939	124	112	112	91	91	..	..	..	..	..

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	124	122	129
Employment per unit	123	120	105

^a For 1939 output and manufacture indexes and indexes covering nonfactory personnel see the combination *wood-distillation and charcoal manufacture*.

TOTAL CHEMICAL PRODUCTS

Year	Output	Employment		Employment per Unit		Man- Manhours		Man- Manhours	
		Wage Earners	Total*	Wage Earners	Total*	Wage Earners	(ESTIMATE A)	Wage Earners	(ESTIMATE B)
1899	19	39	..	212	..	..	..	..	..
1904	23	49	47	215	207	..	..	..	..
1909	31	56	57	178	183	..	..	..	..
1914	42	66	69	156	161	..	..	75	176
1919	52	103	106	200	206	..	..	..	..
1921	42	69	72	165	172	..	..	68	162
1923	64	86	87	134	135	..	..	90	139
1925	70	86	86	124	124	..	..	90	129
1927	83	89	90	108	109	..	..	88	107
1929	100	100	100	100	100	..	..	100	100
1931	87	82	..	95	..	..	..	73	83
1933	84	85	83	102	98	..	..	66	79
1935	101	99	97	98	96	84	104	77	76
1937	124	113	109	91	88	100	100	89	72
1939	133	103	99	78	75	89	83	80	61

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	103	112	114
Employment per unit	102	90	86

PETROLEUM AND COAL PRODUCTS

PETROLEUM REFINING

Year	Output	Employment		Employment per Unit		Man-hours per Unit	Manhours per Unit Wage Earners (ESTIMATE A)
		Wage Earners	Total*	Wage Earners	Total*		
1879	1.7	11	..	618	..	..	..
1889	3.9	13	..	338	..	..	..
1899	5.9	15	..	256	..	..	..
1904	7.2	21	19	289	261	..	..
1909	11	17	17	157	152	18	168
1914	17	31	31	185	184	..	..
1919	34	73	74	215	217	..	..
1921	40	78	75	194	185	..	..
1923	56	83	83	149	149	..	..
1925	73	81	81	111	111	..	..
1927	81	88	88	109	109	..	..
1929	100	100	100	100	100	100	100
1931	91	85	..	94	..	77	85
1933	86	86	84	99	97	65	75
1935	99	96	98	97	98	66	67
1937	119	103	104	87	88	72	61
1939	128	90	93	71	73	64	50

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	99	109	107
Employment per unit	100	91	84

COKE-OVEN PRODUCTS

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1879	2.5	12	..	473	..
1889	9.0	34	..	379	..
1899	18	83	..	454	..
1904	23	92	84	405	371
1909	38	142	129	372	337
1914	38	103	97	272	257
1919	61	143	136	232	221
1921	43	78	79	181	183
1923	89	138	131	154	146
1925	81	113	111	139	137
1927	84	103	101	123	121
1929	100	100	100	100	100
1931	55	70	..	127	..
1933	43	64	62	148	143
1935	58	81	78	140	135
1937	87	100	97	115	111
1939	87	106	101	121	117

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	82	98	106
Employment per unit	141	113	122

FUEL BRIQUETTES						TOTAL PETROLEUM and COAL PRODUCTS				
Year	Output	Employment Wage		Employment per Unit Wage		Output	Employment Wage		Employment per Unit Wage	
		Earners	Total*	Earners	Total*		Earners	Total*	Earners	Total*
1899	..	..	..	..	..	8.7	29	..	337	..
1904	..	..	..	..	..	10	35	32	347	314
1909	7.9	21	22	262	275	16	43	40	266	246
1914	16	33	34	214	218	21	47	46	218	213
1919	21	40	44	191	211	39	90	89	230	229
1921	29	87	90	302	313	41	79	77	194	188
1923	54	85	84	157	154	64	95	94	150	148
1925	59	58	58	98	99	75	88	88	117	117
1927	72	64	64	89	89	83	92	91	110	110
1929	100	100	100	100	100	100	100	100	100	100
1931	50	71	..	141	..	84	82	..	98	..
1933	37	69	71	188	193	78	81	79	104	101
1935	64	80	81	125	127	92	93	94	101	102
1937	79	107	102	136	130	114	103	103	91	91
1939	66	96	96	146	145	121	95	96	79	79

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

		1935	1937	1939
<i>Fuel briquettes</i>	Employment	90	102	98
	Employment per unit	141	130	149
<i>Total petroleum and coal products</i>	Employment	96	107	109
	Employment per unit	105	94	90

STONE, CLAY AND GLASS PRODUCTS

WALL PLASTER and BOARD						ASBESTOS PRODUCTS				
Year	Output	Employment Wage		Employment per Unit Wage		Output	Employment Wage		Employment per Unit Wage	
		Earners	Total*	Earners	Total*		Earners	Total*	Earners	Total*
1927	100	134	132	134	132	73	78	77	108	106
1929	100	100	100	100	100	100	100	100	100	100
1931	65	79	..	122	..	68	74	..	109	..
1933	..	59	59	..	..	56	75	76	134	136
1935	64	101	97	158	153	78	119	119	153	153
1937	112	146	138	130	124	126	161	156	128	124
1939	140	164	157	117	112	..	..	..	..	..

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

		1935	1937	1939
<i>Wall plaster and board</i>	Employment	101	140	167
	Employment per unit	159	125	119
<i>Asbestos products</i>	Employment	124	160	..
	Employment per unit	159	127	..

LIME

Year	Output	Employment		Employment per Unit		Man-hours Wage Earners	Manhours per Unit (ESTIMATE A)
		Wage Earners	Total*	Wage Earners	Total*		
1904	81	129	127	160	158	..	..
1909	91	160	161	177	177	192	215
1914	95	144	144	151	152	..	..
1919	77	132	132	172	172	..	..
1921	58	121	120	208	207	..	..
1923	93	144	144	155	156	..	..
1925	102	141	142	139	139	..	..
1927	101	127	128	126	126	..	..
1929	100	100	100	100	100	..	..
1931	78	78	..	101	..	..	..
1933	..	70	70	..	..	..	..
1935	67	88	88	130	131	..	..
1937	102	114	112	112	110	100	100
1939	118	111	111	94	94	93	80

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	90	115	117
Employment per unit	134	113	99

CEMENT

Year	Output	Employment		Employment per Unit		Man-hours Wage Earners (ESTIMATE A)	Manhours per Unit (ESTIMATE B)	Man-hours Wage Earners (ESTIMATE A)	Manhours per Unit (ESTIMATE B)
		Wage Earners	Total*	Wage Earners	Total*				
1904	19	52	48	279	255	..	..	..	..
1909	43	80	75	185	173	162	256	..	..
1914	61	84	81	137	133	..	..	..	..
1919	57	76	77	134	135	..	..	..	..
1921	60	79	78	131	131	..	..	..	159
1923	77	105	103	136	133	..	..	..	141
1925	94	115	116	122	123	..	..	..	129
1927	100	109	111	108	110	..	..	..	110
1929	100	100	100	100	100	..	..	..	100
1931	75	73	..	98	..	..	..	..	97
1933	36	47	46	131	128	54	102	..	99
1935	44	62	60	140	136	70	108	..	104
1937	68	79	75	116	110	100	100	..	..
1939	72	71	69	99	95	89	84	..	..

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	62	77	73
Employment per unit	140	113	101

* G. Perazich, S. T. Woal, and H. Schimmel, *Mechanization in the Cement Industry*, (National Research Project in cooperation with the National Bureau of Economic Research, Philadelphia, 1939), p. 89. The basic data were collected in a field study covering 16 to 61 percent of the industry.

CONCRETE PRODUCTS^a

ROOFING

Year	Output	Employment Wage		Employment per Unit Wage		Output	Employment Wage		Employment per Unit Wage	
		Earners	Total*	Earners	Total*		Earners	Total*	Earners	Total*
1925	75	89	86	118	114	..	..	..	..	..
1927	94	108	106	115	113	..	..	..	..	..
1929	100	100	100	100	100	100	100	100	100	100
1931	61	56	..	93	..	62	68	..	111	..
1933	25	27	29	108	117	..	73	69	..	..
1935	57	51	52	89	90	83	107	99	130	120
1937	92	78	74	85	81	110	123	115	112	104
1939	153	105	99	69	65	127	134	123	105	97

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

		1935	1937	1939
Concrete products	Employment	55	76	110
	Employment per unit	97	83	72
Roofing	Employment	108	117	138
	Employment per unit	130	106	108

^a Because this industry contains a large proportion of small establishments, the degree to which it is covered by the Census probably varies from year to year.

CLAY PRODUCTS, not elsewhere classified

Year	Output ^a	Employment Wage		Employment per Unit Wage		Man- Manhours hours per Unit Wage Earners		Man- Manhours hours per Unit Wage Earners	
		Earners	Total*	Earners	Total*	(ESTIMATE A)		(ESTIMATE B) ^b	
1914	84	107	107	127	127	..	..	..	..
1919	64	82	84	129	131	..	..	..	114
1921	57	74	75	130	132	..	..	..	109
1923	99	110	110	111	110	..	..	..	102
1925	106	110	110	104	104	..	..	..	100
1927	107	108	108	101	101	..	..	..	100
1929	100	100	100	100	100	..	..	..	100
1931	48	55	..	113	..	..	..	..	131
1933	28	34	35	122	125	40	94	..	128
1935	40	48	48	119	121	62	102	..	121
1937	66	70	69	106	105	100	100	..	..
1939	64	66	66	103	102	91	94	..	..

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	50	70	68
Employment per unit	124	106	106

^a The index for 1914-23 is slightly revised.

^b M. E. West, *Productivity and Employment in Selected Industries: Brick and Tile* (National Research Project, in cooperation with National Bureau of Economic Research, Philadelphia, 1939), p. 115. For 1919-29 the index is based on a sample of 12 to 56 plants, and is a chain of median link relatives; for 1929-35, it is a weighted mean index for 37 identical plants.

GLASS

Year	Output ^a	Employment		Employment per Unit		Man-hours Wage Earners (ESTIMATE A)	Manhours per Unit Earners
		Earners	Total*	Earners	Total*		
1899	25	78	..	314	..	..	..
1904	33	95	90	285	273	..	..
1909	45	102	98	227	218	125	452
1914	64	110	106	173	167	..	..
1919	64	115	113	178	175	..	..
1921	..	81	81	..	..	..	..
1923	..	109	107	..	..	..	..
1925	84	103	102	122	122	..	..
1927	92	97	97	106	106	..	..
1929	100	100	100	100	100	..	..
1931	81	74	..	91	..	..	..
1933	78	74	74	95	96	64	133
1935	118	99	100	84	84	84	116
1937	163	117	119	72	73	100	100
1939	147	103	105	70	72	86	96

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	101	119	108
Employment per unit	86	73	74

^a The index for 1899-1919 has been computed since publication of *The Output of Manufacturing Industries, 1899-1937*. The basic data are from the Census of Manufactures.

SAND-LIME BRICK

TOTAL STONE, CLAY and
GLASS PRODUCTS

Year	Output	Employment		Employment per Unit		Output	Employment		Employment per Unit	
		Earners	Total*	Earners	Total*		Earners	Total*	Earners	Total*
1899	..	..	..	..	..	..	69	..	..	..
1904	..	..	..	..	..	..	85	81	..	..
1909	..	..	..	..	..	..	100	98	..	..
1914	59	98	93	167	158	..	99	97	..	..
1919	52	89	85	171	163	..	92	92	..	..
1921	34	66	62	195	183	..	78	78	..	..
1923	76	103	99	136	131	..	106	105	..	..
1925	114	142	134	124	117	91	107	107	117	117
1927	115	140	133	121	116	100	106	106	106	106
1929	100	100	100	100	100	100	100	100	100	100
1931	54	57	..	106	..	67	68	..	100	..
1933	8.7	15	17	170	195	47	54	54	114	116
1935	26	40	38	151	143	69	73	73	107	107
1937	66	73	68	110	103	100	94	93	94	93
1939	67	61	56	91	84	98	89	88	91	90

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939	
<i>Sand-lime brick</i>	Employment	39	68	62
	Employment per unit	146	103	92
<i>Total stone, clay and glass products</i>	Employment	76	94	93
	Employment per unit	110	94	95

FOREST PRODUCTS

EXCELSIOR

Year	Output	Employment		Employment per Unit	
		Earners	Total*	Wage	Total*
1925	99	105	106	106	107
1927	97	102	103	106	107
1929	100	100	100	100	100
1931	63	75	..	119	..
1933	51	65	66	128	129
1935	60	67	68	112	114
1937	70	77	78	111	112
1939	68	75	76	110	111

BOXES, WOODEN, CIGAR

Year	Output	Employment		Employment per Unit	
		Earners	Total*	Wage	Total*
1925	..	..	..	..	..
1927	98	105	106	106	107
1929	100	100	100	100	100
1931	84	86	..	103	..
1933	65	78	78	120	119
1935	64	73	72	113	111
1937	83	75	74	91	90
1939	79	71	70	90	89

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

		1935	1937	1939
<i>Excelsior</i>	Employment	69	78	78
	Employment per unit	115	112	115
<i>Boxes, wooden, cigar</i>	Employment	76	75	71
	Employment per unit	118	90	90

CASKETS and COFFINS

Year	Output	Employment		Employment per Unit	
		Earners	Total*	Wage	Total*
1927	77	90	90	116	117
1929	100	100	100	100	100
1931	89	92	..	103	..
1933	..	93	95	..	..
1935	97	106	106	109	110
1937	104	105	106	101	102
1939	105	96	94	91	90

COOPERAGE

Year	Output	Employment		Employment per Unit	
		Earners	Total*	Wage	Total*
1927	98	107	106	109	108
1929	100	100	100	100	100
1931	68	77	..	112	..
1933	56	79	78	142	140
1935	60	92	90	155	152
1937	63	90	87	142	138
1939	51	67	67	132	132

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

		1935	1937	1939
<i>Caskets and coffins</i>	Employment	117	110	108
	Employment per unit	121	106	103
<i>Cooperage</i>	Employment	93	87	69
	Employment per unit	156	138	136

LUMBER-MILL and PLANING-MILL PRODUCTS*

Year	Output	Employment		Employment per Unit		Man- Manhours		Man- Manhours	
		Wage Earners	Total*	Wage Earners	Total*	hours per Unit (ESTIMATE A)	Wage Earners	hours per Unit (ESTIMATE B)	Wage Earners
1925	109	114	112	104	103	..	..	123	113
1927	97	100	99	103	102	..	..	105	108
1929	100	100	100	100	100	..	..	100	100
1931	52	49	..	95	..	..	..	44	84
1933	38	44	44	114	114	..	..	34	89
1935	53	60	59	113	112	68	90	52	98
1937	70	77	75	109	107	100	100	68	96
1939	74	72	71	97	96	84	80	63	84

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	60	76	74
Employment per unit	114	109	99

* Combination of two industries, *lumber-mill products* and *planing-mill products*. Indexes of manhours and manhours per unit for 1925-33 are not available for *planing-mill products* separately.

LUMBER-MILL PRODUCTS, not elsewhere classified*

Year	Output	Employment		Employment per Unit		Man- Manhours	
		Wage Earners	Total*	Wage Earners	Total*	hours per Unit (ESTIMATE A)	Wage Earners
1899	107	96	..	90	..	..	..
1904	96	94	93	98	97	..	..
1909	105	127	128	122	122	157	150
1914	96	112	112	117	117	..	..
1919	97	112	112	116	116	..	..
1921	80	87	88	108	109	..	..
1923	99	118	117	120	119	116	117
1925	106	111	110	106	104	112	106
1927	97	99	97	102	100	100	102
1929	100	100	100	100	100	100	100
1931	51	47	..	93	..	44	88
1933	40	45	45	112	111	37	92
1935	55	61	60	111	110	50	91
1937	72	77	76	107	106	74	102
1939	72	71	71	98	98	60	83

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	61	77	72
Employment per unit	112	107	101

* For alternative indexes of manhours and manhours per unit for 1925-33 see the combination *lumber-mill and planing-mill products*.

PLANING-MILL PRODUCTS, not elsewhere made^a

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1925	119	124	121	104	101	..	..
1927	97	107	105	110	108	..	..
1929	100	100	100	100	100	..	..
1931	55	60	..	110	..	..	..
1933	32	39	40	122	124	..	..
1935	46	53	53	117	117	68	96
1937	64	74	71	115	110	100	100
1939	83	78	74	94	89	102	80

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	56	74	80
Employment per unit	123	115	96

^a For indexes of manhours and manhours per unit for 1925-33 see the combination *lumber-mill and planing-mill products*.

TURPENTINE and ROSIN

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1899	119	104	..	87	..
1904	97	83	87	86	90
1909	90	98	103	108	113
1914	82	86	88	105	108
1919	76	69	72	92	95
1921	74	68	71	93	96
1923	88	85	86	97	97
1925	91	73	74	80	81
1927	107	94	95	88	88
1929	100	100	100	100	100
1931 ^a	78	70	..	91	..
1933	82	77	77	94	95
1935	78	78	78	100	100
1937	81	81	83	100	103
1939	67	52	77	78	114

TOTAL FOREST PRODUCTS

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1899	119	81	..	98	..
1904	97	87	..	113	..
1909	90	108	..	130	..
1914	82	98	98	119	119
1919	76	98	98	124	125
1921	74	80	81	96	98
1923	88	107	106	118	116
1925	91	105	104	102	101
1927	107	99	98	99	98
1929	100	100	100	100	100
1931 ^a	78	58	..	92	..
1933	82	52	52	113	113
1935	78	66	66	112	111
1937	81	82	81	108	106
1939	67	77	76	96	96

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
<i>Turpentine and rosin</i> Employment	78	83	78
Employment per unit	100	103	116
<i>Total forest products</i> Employment	68	82	80
Employment per unit	115	108	100

^a The 1931 Census of this industry is reported by the Bureau of the Census to be somewhat incomplete because some establishments failed to report.

IRON AND STEEL PRODUCTS

CAST-IRON PIPE

Year	Output	Employment		Employment per Unit		Man-hours Wage Earners	Manhours per Unit (ESTIMATE A)
		Wage Earners	Total*	Wage Earners	Total*		
1914	62	64	63	103	102	..	..
1919	44	64	65	147	149	..	..
1921	48	63	63	133	133	..	..
1923	93	109	107	117	115	..	..
1925	113	117	115	104	102	..	..
1927	114	116	115	102	101	..	..
1929	100	100	100	100	100	..	..
1931	69	81	..	118	..	..	..
1933	31	48	49	155	157	42	94
1935	46	69	69	148	149	63	93
1937	68	89	89	130	130	100	100
1939	74	84	84	114	114	95	88

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	70	90	86
Employment per unit	150	131	117

FIREARMS

FILES

Year	Output	Employment		Employment per Unit		Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*		Wage Earners	Total*	Wage Earners	Total*
1921	52	69	69	134	134	..	..	..	..	..
1923	77	91	90	118	117	..	..	..	..	..
1925	70	65	66	93	94	..	..	..	..	..
1927	93	90	89	97	96	..	..	..	..	..
1929	100	100	100	100	100	100	100	100	100	100
1931	56	62	..	112	..	63	76	..	121	..
1933	56	49	51	89	92	65	66	67	102	103
1935	72	71	71	99	98	72	73	75	102	104
1937	107	100	96	94	90	106	93	94	89	89
1939	97	73	75	76	77	80	81	83	101	104

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Firearms Employment	72	96	78
Firearms Employment per unit	99	90	81
Files Employment	77	95	87
Files Employment per unit	108	90	108

BLAST-FURNACE PRODUCTS^a

Year	Output	Employment		Employment per Unit		Man- Manhours		Man- Manhours	
		Wage Earners	Total*	Wage Earners	Total*	hours per Unit (ESTIMATE A)	hours per Unit (ESTIMATE B) ^b	hours per Unit (ESTIMATE A)	hours per Unit (ESTIMATE B) ^b
1889	20	117	..	589	..	..	..	..	..
1899	32	157	..	485	..	..	..	..	..
1904	38	141	130	372	344	..	..	..	..
1909	58	154	150	265	258	176	303	..	..
1914	53	118	116	222	218	..	..	..	..
1919	70	173	170	249	244	..	..	..	208
1921	39	75	80	193	206	..	..	..	169
1923	93	147	144	158	155	..	..	..	141
1925	84	117	116	138	137	..	..	..	105
1927	84	112	111	133	132	..	..	..	100
1929	100	100	100	100	100	100	100	..	..
1931	44	54	..	124	..	..	..	..	..
1933	32	48	48	153	152	32	101	..	..
1935	51	61	61	120	121	42	83	..	..
1937	88	92	91	105	104	68	77	..	..
1939	76	78	78	103	103	51	68	..	..

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	61	94	80
Employment per unit	121	107	106

^a For fuller indexes on manhours and manhours per unit see the combination *blast-furnace and steel-mill products*.

^b Bureau of Labor Statistics, *Productivity of Labor in Merchant Blast Furnaces*, Bulletin No. 474 (Dec. 1938), p. 5. The data relate to 21 to 60 merchant plants. The figure for 1927 covers the first 6 months only.

WROUGHT PIPE, not elsewhere made

Year	Output	Employment		Employment per Unit		Man- Manhours	
		Wage Earners	Total*	Wage Earners	Total*	hours per Unit (ESTIMATE A)	hours per Unit (ESTIMATE A)
1925	77	95	94	124	122	..	..
1927	68	97	95	142	139	..	..
1929	100	100	100	100	100	..	..
1931	63	70	..	112	..	..	..
1933	31	57	57	183	182	..	..
1935	56	94	92	168	165	..	..
1937	91	124	119	136	131	100	100
1939	54	73	73	135	134	62	103

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	93	119	75
Employment per unit	167	131	139

STEEL-MILL PRODUCTS*

Year	Output	Employment		Employment per Unit		Man-hours Wage Earners (ESTIMATE A)	Manhours per Unit Wage Earners (ESTIMATE A)
		Wage Earners	Total*	Wage Earners	Total*		
1869	1.9	10	..	544	..	..	..
1879	4.4	21	..	470	..	..	..
1889	10	29	..	279	..	..	..
1899	24	46	..	197	..	..	..
1904	29	53	50	181	173	..	..
1909	43	61	59	140	136	74	166
1914	44	63	62	144	142	..	..
1919	63	95	96	150	151	..	..
1921	38	60	61	157	161	..	..
1923	81	98	97	122	120	..	..
1925	82	94	94	115	115	..	..
1927	81	92	92	113	114	..	..
1929	100	100	100	100	100	..	..
1931	47	67	..	142	..	..	..
1933	43	70	70	163	162	52	118
1935	64	91	90	144	142	71	108
1937	97	121	120	125	124	100	100
1939	86	101	101	117	118	78	87

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	91	122	104
Employment per unit	143	125	121

* For fuller indexes on manhours and manhours per unit see the combination *blast-furnace and steel-mill products*.

TIN CANS and TINWARE, not elsewhere classified

Year	Output	Employment		Employment per Unit		Man-hours Wage Earners (ESTIMATE A)	Manhours per Unit Wage Earners (ESTIMATE A)
		Wage Earners	Total*	Wage Earners	Total*		
1927	87	94	94	108	108	..	..
1929	100	100	100	100	100	..	..
1931	92	80	..	88	..	..	..
1933	94	74	74	78	78	..	..
1935	119	87	90	73	75	81	109
1937	160	105	109	66	68	100	100
1939	165	101	104	61	63	93	90

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	91	111	108
Employment per unit	76	69	65

BLAST-FURNACE and STEEL-MILL PRODUCTS*

Year	Output	Employment		Employment per Unit		Man- Manhours		Man- Manhours	
		Wage Earners	Total*	Wage Earners	Total*	hours per Unit	Earners	hours per Unit	Earners
						(ESTIMATE A)		(ESTIMATE B)	
1899	25	53	..	215	..	..	..	..	..
1904	30	58	55	193	184	..	..	..	..
1909	45	66	65	147	144	84	187	..	..
1914	45	66	65	148	146	..	..	69	153
1919	64	100	100	156	157	..	..	..	..
1921	38	61	62	159	164	..	..	60	157
1923	82	101	100	123	122	107	130	106	130
1925	82	95	96	116	116	95	116	93	113
1927	81	93	93	114	114	92	113	90	110
1929	100	100	100	100	100	100	100	100	100
1931	47	66	..	141	..	51	108	52	112
1933	42	69	68	164	163	49	117	43	101
1935	62	89	88	144	142	66	107	56	89
1937	96	120	119	125	124	94	98	80	83
1939	85	100	100	117	118	73	85	63	74

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	89	120	103
Employment per unit	143	125	120

* Combination of two industries, *blast-furnace products* and *steel-mill products*. Full data on hours of labor are not available for these separately.

WIRE, not elsewhere made

Year	Output	Employment		Employment per Unit		Man- hours	Manhours per Unit		
		Wage Earners	Total*	Wage Earners	Total*				
								(ESTIMATE A)	
1909	66	80	79	121	118	109	146		
1914	64	78	78	122	122	..	..
1919	69	88	88	127	127	..	..
1921	51	66	67	130	132	..	..
1923	97	95	93	98	96	..	..
1925	92	83	84	90	91	..	..
1927	98	88	89	90	90	..	..
1929*	100	100	100	100	100	..	..
1931	50	64	..	130	..	..	..
1933	46	65	67	140	144	..	..
1935	67	96	97	143	144	..	..
1937	90	109	111	122	124	100	100		
1939	91	98	100	108	110	91	90		

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	100	112	104
Employment per unit	148	125	115

* Between 1927 and 1929 certain large establishments engaged primarily in rolling nonferrous metal and manufacturing nonferrous wire were transferred from *wire, n.e.m.*, to *nonferrous-metal products, n.e.c.* In addition, a somewhat different method of handling data on the custom drawing of nonferrous wire was adopted in that year.

TOTAL IRON and STEEL PRODUCTS

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1899	21	47	..	225	..
1904	29	55	..	190	..
1909	44	67	..	153	..
1914	48	70	69	144	142
1919	59	96	97	164	164
1921	46	64	66	141	144
1923	84	100	99	119	117
1925	87	96	96	110	110
1927	87	94	94	108	108
1929	100	100	100	100	100
1931	54	68	..	125	..
1933	45	63	63	140	140
1935	61	82	82	134	133
1937	89	109	108	122	121
1939	82	93	92	113	112

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	83	109	96
Employment per unit	136	122	117

NONFERROUS-METAL PRODUCTS

PRIMARY NONFERROUS METALS*

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1899	25	79	..	318	..	..	..
1904	22	87	81	396	368	..	..
1909	49	96	91	196	186	..	..
1914	57	112	107	197	189	..	..
1919	64	121	118	189	184	..	..
1921	39	60	60	154	154	..	..
1923	75	113	111	151	148	..	..
1925	85	106	104	125	122	..	..
1927	89	98	97	111	110	..	..
1929	100	100	100	100	100	..	..
1931	53	60	..	112	..	..	..
1933	37	47	47	127	128	..	..
1935	52	73	72	140	140	71	107
1937	78	96	96	124	123	100	100
1939	72	81	81	113	113	79	85

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	72	96	85
Employment per unit	140	123	119

* Combination of three industries, *copper*, *lead*, and *zinc*. Data for 1939 are not available for these separately.

COPPER*

Year	Output	Employment		Employment per Unit		Man-hours Wage Earners (ESTIMATE A)	Manhours per Unit Wage Earners
		Wage Earners	Total*	Wage Earners	Total*		
1899	22	78	..	361	..	..	..
1904	31	88	82	282	264	..	..
1909	47	107	102	230	218	131	226
1914	52	122	118	235	229	..	..
1919	60	119	119	199	198	..	..
1921	34	57	59	167	173	..	..
1923	69	115	117	168	171	..	..
1925	78	107	104	137	134	..	..
1927	82	96	95	116	115	..	..
1929	100	100	100	100	100	..	..
1931	54	59	..	110	..	..	..
1933	30	38	40	129	133	..	..
1935	48	72	72	149	149	..	..
1937	80	100	99	124	124	100	100

* Excludes nonfactory personnel, 1935-37. The following indexes (1929:100) cover all personnel:

	1935	1937
Employment	72	99
Employment per unit	149	124

^a For 1939 indexes see the combination *primary nonferrous metals*.

COLLAPSIBLE TUBES

SECONDARY METALS,
NONPRECIOUS

Year	Output	Employment		Employment per Unit		Employment			Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*	Output	Wage Earners	Total*	Wage Earners	Total*
1925	94	107	..	114	..	78	71	74	91	95
1927	103	109	110	106	107	84	67	70	80	84
1929	100	100	100	100	100	100	100	100	100	100
1931	102	95	..	93	..	58	64	..	110	..
1933	108	96	97	89	90	67	71	74	105	110
1935	110	108	109	98	99	87	91	94	105	109
1937	124	109	110	88	89	124	120	122	97	98
1939	126	106	108	85	86	100	87	88	87	88

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
<i>Collapsible tubes</i>	Employment	109	110
	Employment per unit	100	89
<i>Secondary metals, nonprecious</i>	Employment	97	123
	Employment per unit	111	99

LEAD^a

Year	Output	Employment		Employment per Unit		Man-hours Wage Earners	Manhours per Unit EARNERS (ESTIMATE A)
		Wage Earners	Total*	Wage Earners	Total*		
1899	38	173	..	448	..	..	..
1904	51	157	142	309	279	..	..
1909	63	154	141	245	224	238	220
1914	72	153	141	212	195	..	..
1919	63	134	129	213	205	..	..
1921	60	94	89	156	149	..	..
1923	83	129	123	154	148	..	..
1925	99	127	120	128	120	..	..
1927	101	112	108	110	107	..	..
1929	100	100	100	100	100	..	..
1931	58	54	..	93	..	..	..
1933	36	44	44	121	121	..	..
1935	43	66	65	153	151	..	..
1937	58	84	83	144	142	100	100

* Excludes nonfactory personnel, 1935-37. The following indexes (1929:100) cover all personnel:

	1935	1937
Employment	65	83
Employment per unit	152	142

^a For 1939 indexes see the combination *primary nonferrous metals*.

ZINC^a

Year	Output	Employment		Employment per Unit		Man-hours Wage Earners	Manhours per Unit EARNERS (ESTIMATE A)
		Wage Earners	Total*	Wage Earners	Total*		
1899	21	42	..	203	..	..	..
1904	30	56	52	188	175	..	..
1909	41	57	54	141	133	86	183
1914	57	83	78	146	138	..	..
1919	74	119	113	161	153	..	..
1921	34	50	49	147	144	..	..
1923	82	103	97	125	118	..	..
1925	90	97	96	107	106	..	..
1927	94	96	95	102	101	..	..
1929	100	100	100	100	100	..	..
1931	48	62	..	129	..	..	..
1933	50	59	59	119	119	..	..
1935	64	76	76	118	118	..	..
1937	86	97	97	113	113	100	100

* Excludes nonfactory personnel, 1935-37. The following indexes (1929:100) cover all personnel:

	1935	1937
Employment	76	97
Employment per unit	119	113

^a For 1939 indexes see the combination *primary nonferrous metals*.

CLOCKS, WATCHES and MATERIALS

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit (ESTIMATE A)
		Wage Earners	Total*	Wage Earners	Total*		
1927	113	105	103	92	91	..	..
1929	100	100	100	100	100	..	..
1931	64	76	..	119	..	..	..
1933	48	60	60	124	124	52	148
1935	78	84	85	108	109	76	137
1937	139	108	108	78	77	100	100
1939	114	83	82	73	72	72	88

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	86	109	89
Employment per unit	111	78	78

NONFERROUS-METAL PRODUCTS, not elsewhere classified

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit (ESTIMATE A)
		Wage Earners	Total*	Wage Earners	Total*		
1925	70	82	81	117	116	..	..
1927	72	83	83	116	116	..	..
1929 ^a	100	100	100	100	100	..	..
1931	59	62	..	105	..	..	..
1933	43	60	61	140	141	52	106
1935	62	79	80	129	130	75	108
1937	88	105	104	118	117	100	100
1939	90	93	92	103	103	90	89

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	82	104	98
Employment per unit	132	117	109

^a Between 1927 and 1929 certain large establishments engaged primarily in rolling nonferrous metal and manufacturing nonferrous wire were transferred from *wire, n.e.m.*, to *nonferrous-metal products, n.e.c.* In addition, a somewhat different method of handling data on the custom drawing of nonferrous wire was adopted in that year.

TOTAL NONFERROUS-METAL PRODUCTS

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1899	..	49	..	..	..
1904	..	60	..	..	..
1909	..	73	..	..	..
1914	..	76	75	..	..
1919	..	96	96	..	..
1921	..	68	69	..	..
1923	..	93	93	..	..
1925	79	88	88	111	111
1927	84	87	87	102	103
1929	100	100	100	100	100
1931	64	66	..	103	..
1933	47	60	60	127	128
1935	66	84	84	128	127
1937	89	105	104	118	116
1939	89	95	94	107	105

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	87	104	100
Employment per unit	131	116	112

MACHINERY

TYPEWRITERS

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1921	51	74	76	143	147	..	..
1923	74	83	84	111	114	..	..
1925	78	83	88	106	113	..	..
1927	91	92	94	102	103	..	..
1929	100	100	100	100	100	..	..
1931	54	64	..	121	..	..	..
1933	44	57	60	130	129	40	106
1935	80	91	92	114	115	68	98
1937	115	127	125	110	108	100	100

* Excludes nonfactory personnel, 1935-37. The following indexes (1929:100) cover all personnel:

	1935	1937
Employment	101	125
Employment per unit	126	108

AGRICULTURAL IMPLEMENTS^a

Year	Output	Employment		Employment per Unit		Man-hours Wage Earners (ESTIMATE A)	Manhours per Unit Wage Earners
		Wage Earners	Total	Wage Earners	Total		
1921	68	73	80	107	116	61	89
1923	64	74	77	117	121	74	117
1925	61	69	72	113	117	69	113
1927	73	80	81	110	112	79	109
1929	100	100	100	100	100	100	100
1931	30	42	..	138	..	30	99

^a Owing to a serious change in the definition of the industry between 1931 and 1933 no indexes are given for 1933-37.

PHONOGRAPHS

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total	Wage Earners	Total
1899	8.3	8.8	..	106	..
1904	..	24	24	..	..
1909	29	36	35	123	121
1914	38	65	68	172	180
1919	182	199	202	110	112
1921	80	124	130	154	162
1923	105	142	138	136	132
1925	80	78	79	97	98
1927	114	99	98	87	86
1929	100	100	100	100	100

SCALES and BALANCES

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1927	83	95	96	115	116
1929	100	100	100	100	100
1931	60	68	..	113	..
1933	35	53	57	153	164
1935	62	60	63	97	102
1937	87	80	80	92	92

* Excludes nonfactory personnel, 1935-37. The following indexes (1929:100) cover all personnel:

	1935	1937
Employment	71	82
Employment per unit	115	94

ELECTRIC LAMPS^a

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total	Wage Earners	Total		
1920	58	240	..	412	..	229	394
1921	39	166	..	422	..	149	381
1922	51	163	..	318	..	149	292
1923	65	169	..	260	..	160	246
1924	67	137	..	204	..	134	200
1925	72	120	..	166	..	118	164
1926	76	113	..	149	..	110	144
1927	87	111	..	128	..	111	128
1928	86	100	..	116	..	99	115
1929	100	100	..	100	..	100	100
1930	87	91	..	105	..	86	99
1931	80	83	..	104	..	73	91

^a Electric lamps constitute a branch of the Census industry "electrical machinery."

Source: H. Magdoff, I. H. Siegel and M. B. Davis, *Production, Employment and Productivity in 59 Manufacturing Industries, 1919-1936* (National Research Project, Philadelphia, 1939), pp. 66, 69. The index of output is a weighted arithmetic mean of 1929 base relatives of five products, the weight in each case being the number of manhours used in the production of the commodity. The original data on output, employment, and manhours are those compiled in a field study by Witt Bowden of the Bureau of Labor Statistics.

REFRIGERATORS, MECHANICAL

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1921	0.6	..	..	..	..	..	..
1923	2.0	..	..	..	..	..	..
1925	8.4	..	..	..	..	..	..
1927	44	67	69	152	158	..	..
1929	100	100	100	100	100	..	..
1931	118	93	..	78	..	..	..
1933	130	94	94 ^a	72	72 ^a	..	..
1935	212	132	129	62	61	..	..
1937	317	179	172	56	54	100	100
1939	273	125	121	46	44	67	78

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	133	177	130
Employment per unit	63	56	48

^a Owing to lack of published data, the 1933 index for total employment (1929:100) was assumed to be the same as the corresponding index for wage earners.

SEWING MACHINES

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1927	101	96	97	95	96
1929	100	100	100	100	100
1931	49	77	..	158	..
1933	26	60	59	232	226
1935	57	72	71	126	126
1937	100	86	84	86	83
1939	72	75	74	105	103

WASHING and IRONING MACHINES

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1927	73	95	95	130	130
1929	100	100	100	100	100
1931	79	76	..	96	..
1933	92	85	84	92	92
1935	132	107	104	81	79
1937	146	114	107	78	73
1939	135	91	87	68	65

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

		1935	1937	1939
<i>Sewing machines</i>	Employment	73	84	79
	Employment per unit	128	84	110
<i>Washing and ironing machines</i>	Employment	107	110	97
	Employment per unit	82	75	72

TOTAL MACHINERY

Year	Output	Employment	
		Wage Earners	Total*
1899	..	37	..
1904	..	44	..
1909	..	53	..
1914	..	57	56
1919	..	93	92
1921	..	62	64
1923	..	84	85
1925	..	79	80
1927	..	82	83
1929	..	100	100
1931	..	62	..
1933	..	49	50
1935	..	71	72
1937	..	99	99
1939	..	81	81

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	75	100	87

TRANSPORTATION EQUIPMENT

AUTOMOBILES, incl. BODIES and PARTS

Year	Output ^a	Employment		Employment per Unit		Man- Manhours		Man- Manhours	
		Wage Earners	Total*	Wage Earners	Total*	hours per Unit	Wage Earners	hours per Unit	Wage Earners
						(ESTIMATE A)		(ESTIMATE B)	
1899	0.05	0.50	..	1,000	..	..	..	..	..
1904	0.25	2.7	2.7	1,080	1,070	..	..	..	..
1909	1.8	17	17	939	956	21	1,160	..	..
1914	8.5	28	29	334	346	..	..	31	367
1919	28	77	80	272	283	..	..	..	..
1921	25	48	50	194	204	..	..	46	185
1923	63	90	91	144	145	100	158	92	146
1925	72	95	96	132	133	101	141	96	134
1927	63	83	84	131	133	84	134	82	130
1929	100	100	100	100	100	100	100	100	100
1931	44	64	..	145	..	53	120	50	114
1933	35	54	55	154	157	45	127	42	119
1935	74	87	86	117	116	78	106	69	94
1937	90	107	107	119	119	90	100	81	90
1939	67	84	85	124	126	70	104	62	93

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	87	108	87
Employment per unit	118	120	130

^a In the computation of this index only finished automobiles and chassis were considered. Bodies and parts were not included because no separate data for replacement bodies and parts are available; replacement bodies and parts are combined with a percentage, unknown and varying, of the bodies and parts used in the manufacture of new automobiles. The omission from the index of replacement bodies and parts probably results in an understatement of the long-term growth of the industry, and an exaggeration of the cyclical fluctuations of the index of output.

CARS, RAILROAD, not elsewhere made

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1899	119	93	..	78	..	..	..
1904	122	97	87	79	71	..	..
1909	114	117	107	103	94	155	127
1914	154	145	133	94	86	..	..
1919	171	138	130	81	76	..	..
1921	96	120	114	125	119	..	..
1923	229	201	189	88	82	..	..
1925	139	126	123	91	89	..	..
1927	101	95	96	94	95	..	..
1929	100	100	100	100	100	..	..
1931	31	47	..	149	..	..	..
1933	..	36	36	..	..	..	..
1935	30	54	53	182	181	47	150
1937	93	101	98	108	104	100	100
1939	42	61	62	146	147	55	123

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	..	98	62
Employment per unit	..	104	149

LOCOMOTIVES, not elsewhere made

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1889	222	135	..	61	..	..	..
1899	264	172	..	65	..	..	..
1904	366	225	202	61	55	..	..
1909	282	135	132	48	47	211	41
1914	204	157	148	77	73	..	..
1919	321	242	224	75	70	..	..
1921	175	150	143	86	82	..	..
1923	412	278	261	68	64	..	..
1925	137	116	114	85	84	..	..
1927	105	117	114	112	109	..	..
1929	100	100	100	100	100	..	..
1931	23	49	..	212	..	..	..
1933	..	21	25	..	..	..	..
1935	..	34	37	..	..	..	..
1937	55	81	86	148	155	100	100
1939	29	59	62	199	211	60	113

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	..	88	65
Employment per unit	..	159	220

SHIPS and BOATS

Year	Output	Employment		Employment per Unit		Man-hours	Manhours per Unit
		Wage Earners	Total*	Wage Earners	Total*		
1899	97	85	..	87	..	..	..
1904	80	92	88	114	110	..	..
1909	74	74	73	100	99	91	99
1914	74	81	79	109	107	..	..
1916	122	132	..	108	..	..	..
1919	551	703	671	128	122	..	..
1921	213	193	186	91	88	..	..
1923	99	113	111	114	112	..	..
1925	90	91	91	101	101	..	..
1927	110	100	99	91	90	..	..
1929	100	100	100	100	100	..	..
1931	78	82	..	105	..	..	..
1933	23	56	57	247	253	42	147
1935	..	81	84	..	..	64	..
1937	80	113	114	140	142	100	100
1939	110	126	126	114	115	114	83

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	..	115	128
Employment per unit	..	143	116

CARRIAGES, WAGONS and SLEIGHS

MOTORCYCLES and BICYCLES

Year	Output	Employment		Employment per Unit		Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*		Wage Earners	Total	Wage Earners	Total
1889	1,080	1,616	..	150	..	..	..	..	..	..
1899	1,317	1,901	..	144	..	141	399	..	283	..
1904	1,392	1,983	1,933	142	139	32	76	71	239	226
1909	1,333	1,721	1,718	129	129	64	101	95	158	149
1914	1,123	1,347	1,405	120	125	121	152	151	126	126
1919	647	540	553	83	85	180	248	238	138	133
1921	182	219	234	120	129	81	98	102	121	126
1923	300	282	280	94	94	128	150	147	117	115
1925	216	168	164	78	76	98	95	97	98	99
1927	173	118	118	68	68	87	89	90	102	103
1929	100	100	100	100	100	100	100	100	100	100
1931	36	50	..	138	..	..	..	..	..	..
1933	40	53	52	133	129	..	..	..	..	..
1935	59	60	58	101	98	..	..	..	..	..
1937	71	69	66	96	93	..	..	..	..	..
1939	54	47	46	88	85	..	..	..	..	..

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	59	66	48
Employment per unit	100	93	90

CARRIAGES and SLEDS, CHILDREN'S

Year	Output	Employment Wage		Employment per Unit Wage	
		Earners	Total*	Earners	Total*
1899	..	..	..	..	..
1904	..	..	..	..	..
1909	..	..	..	..	..
1914	..	..	..	..	..
1919	..	..	..	..	..
1921	..	..	..	..	..
1923	..	..	..	..	..
1925	92	98	98	106	106
1927	90	99	99	110	110
1929	100	100	100	100	100
1931	71	59	..	82	..
1933	59	56	55	95	94
1935	70	69	69	98	98
1937	89	74	73	83	82
1939	89	61	60	69	68

TOTAL TRANSPORTATION
EQUIPMENT

Output	Employment Wage		Employment per Unit Wage	
	Earners	Total*	Earners	Total*
7.3	34	..	466	..
7.5	36	35	481	472
11	44	44	411	413
20	53	54	262	266
61	147	145	241	238
38	69	70	183	186
76	104	103	138	137
76	96	96	126	127
68	85	86	126	127
100	100	100	100	100
46	64	..	140	..
33	53	53	158	160
72	82	82	115	114
91	108	108	119	119
74	91	92	122	124

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
<i>Carriages and sleds, children's</i>	Employment 72	73	63
	Employment per unit 103	82	71
<i>Total transportation equipment</i>	Employment 83	109	95
	Employment per unit 116	120	127

MISCELLANEOUS PRODUCTS

PENCILS

Year	Output	Employment Wage		Employment per Unit Wage	
		Earners	Total*	Earners	Total*
1929	100	100	100	100	100
1931	74	61	..	82	..
1933	..	61	57	..	..
1935	134	78	73	58	54
1937	130	87	78	67	60
1939	118	74	68	63	57

PENS and POINTS

Output	Employment Wage		Employment per Unit Wage	
	Earners	Total*	Earners	Total*
100	100	100	100	100
83	86	..	103	..
..	67	71	..	..
144	82	85	57	59
221	94	96	43	44
225	74	73	33	32

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
<i>Pencils</i>	Employment 79	78	78
	Employment per unit 59	61	66
<i>Pens and points</i>	Employment 91	97	91
	Employment per unit 63	44	40

BUTTONS

BROOMS

Year	Output	Employment		Employment per Unit		Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*		Wage Earners	Total*	Wage Earners	Total*
1914	96	159	160	165	166	..	..	..	..	..
1919	121	171	175	141	144	..	..	..	..	..
1921	78	107	111	138	143	..	..	..	..	..
1923	113	131	132	116	116	..	..	..	..	..
1925	111	127	127	115	115	..	..	..	..	..
1927	91	107	106	117	116	93	98	100	106	107
1929	100	100	100	100	100	100	100	100	100	100
1931	88	91	..	103	..	88	90	..	103	..
1933	..	109	107	..	..	76	83	80	110	106
1935	121	114	115	94	95	90	92	91	101	101
1937	126	133	132	106	105	81	90	88	110	108
1939	128	121	121	95	95	82	83	83	102	101

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

		1935	1937	1939
<i>Buttons</i>	Employment	120	133	126
	Employment per unit	99	105	99
<i>Brooms</i>	Employment	98	89	88
	Employment per unit	109	109	107

PORTING GOODS, not elsewhere classified

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1929	100	100	100	100	100
1931	96	94	..	98	..
1933	..	76	76	..	..
1935	69	90	89	129	129
1937	91	106	103	116	113
1939	124	120	116	97	94

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	92	104	124
Employment per unit	133	114	100

ORGANS

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1904	168	151	145	90	86
1909	124	100	99	80	79
1914	130	128	126	98	97
1919	92	81	82	88	89
1921	125	98	98	78	78
1923	96	78	80	81	84
1925	104	103	102	99	98
1927	125	116	114	93	91
1929	100	100	100	100	100
1931	54	61	..	113	..
1933	..	24	27	..	..
1935	31	26	28	83	90
1937	..	..	..	..	..
1939	..	..	..	..	..

PIANOS

Year	Output	Employment		Employment per Unit	
		Wage Earners	Total*	Wage Earners	Total*
1904	114	211	208	185	183
1909	156	256	255	164	163
1914	156	239	241	153	154
1919	189	230	231	122	122
1921	128	159	160	124	125
1923	210	223	216	106	103
1925	198	201	197	102	100
1927	151	166	165	110	110
1929	100	100	100	100	100
1931	43	48	..	110	..
1933	..	27	27	..	..
1935	40	41	41	104	105
1937	66	57	56	87	86
1939	65	53	52	82	80

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
<i>Organs</i> Employment	33	..	..
Employment per unit	107	..	..
<i>Pianos</i> Employment	42	58	54
Employment per unit	106	87	83

TOTAL MISCELLANEOUS PRODUCTS

Year	Output	Employment	
		Wage Earners	Total*
1899	..	46	..
1904	..	60	..
1909	..	79	..
1914	..	92	90
1919	..	112	112
1921	..	86	87
1923	..	109	108
1925	..	104	103
1927	..	105	105
1929	..	100	100
1931	..	72	..
1933	..	64	64
1935	..	79	80
1937	..	96	95
1939	..	96	93

* Excludes nonfactory personnel, 1935-39. The following indexes (1929:100) cover all personnel:

	1935	1937	1939
Employment	84	97	102

ALL MANUFACTURING INDUSTRIES COMBINED

Year	Output	Employment		Employment per Unit		Man-hours Wage Earners (ESTIMATE A)	Manhours per Unit Wage Earners
		Wage Earners	Total*	Wage Earners	Total*		
1899	100	100	100	100	100	100	100
1900	102	104	..	101	..	..	..
1901	115	109	..	94	..	..	..
1902	129	118	..	91	..	..	..
1903	132	122	..	93	..	120	91
1904	124	115	116	92	94	..	..
1905	148	128	..	87	..	..	..
1906	159	134	..	85	..	..	..
1907	161	140	..	87	..	136	84
1908	133	124	..	94	..	..	..
1909	158	139	143	88	90	134	85
1910	168	145	..	87	..	..	..
1911	161	145	..	90	..	..	..
1912	185	151	..	81	..	..	..
1913	198	152	..	77	..	..	..
1914	186	146	152	79	82	136	73
1915	218	153	..	70	..	..	..
1916	259	179	..	69	..	..	..
1917	257	191	..	74	..	..	..
1918	254	195	..	77	..	..	..
1919	222	188	197	84	89	164	74
1920	242	188	..	78	..	161	67
1921	194	144	152	74	78	119	61
1922	249	160	..	64	..	137	55
1923	280	183	190	65	68	158	56
1924	266	170	..	64	..	141	53
1925	298	175	183	59	61	148	50
1926	316	179	..	57	..	152	48
1927	317	175	184	55	58	148	47
1928	332	175	..	53	..	147	44
1929	364	187	197	51	54	156	42
1930	311	162	..	52	..	129	41
1931	262	137	..	52	..	104	40
1932	197	117	..	59	..	82	41
1933	228	129	136	57	59	89	39
1934	252	151	..	60	..	95	38
1935	301	160	167	53	56	107	35
1936	353	174	..	49	..	124	35
1937	376	191	198	51	53	134	36
1938	295	160	..	54	..	104	35
1939	374	176	181	47	48	121	32

* Excludes nonfactory personnel, 1935-39. The following indexes (1899:100) cover all personnel:

	1935	1937	1939
Employment	174	201	195
Employment per unit	58	54	52

For source of data see next page.

Source of data: See Explanatory Note (p. 261) for the sources of data for Census years. The intercensal indexes of output are based on various sources (see *The Output of Manufacturing Industries, 1899-1937*, p. 44); the index for 1938 is based on the Federal Reserve index (see current issues of the *Federal Reserve Bulletin*). The intercensal indexes of employment are based on samples collected by several states and by the U. S. Bureau of Labor Statistics—for 1899-1919, see P. H. Douglas, *Real Wages in the United States, 1890-1926*; and for 1919-39, see the mimeographed summary prepared by the Bureau of Labor Statistics. The index of hours used in computing the index of man-hours is based on the B.L.S. series on actual hours for 1909-39; estimates for earlier years have been computed by extrapolating this series by the series on full-time hours derived from the Department of Commerce and Labor—B.L.S. data by P. H. Douglas (see Appendix C).