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NATIONAL RECOVERY ADMINISTRATION

DIVISION OF REVIEW

EVIDENCE STUDY

NO. 30

OF

THE PLUMBING CONTRACTING INDUSTRY

Prepared by

JOHN C. HUMPHREY

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PRELIMINARY DRAFT

(NOT FOR RELEASE: FOR USE IN DIVISION ONLY)

THE EVIDENCE STUDY SERIES

The EVIDENCE STUDIES were originally planned as a means of gathering evidence bearing upon various legal issues which arose under the National Industrial Recovery Act.

These studies have value quite aside from the use for which they were originally intended. Accordingly, they are now made available for confidential use within the Division of Review, and for inclusion in Code Histories.

The full list of the Evidence Studies is as follows:

- | | |
|-------------------------------------|---|
| 1. Automobile Manufacturing Ind. | 25. Mason Contractors Industry |
| 2. Boot and Shoe Mfg. Ind. | 24. Men's Clothing Industry |
| 3. Bottled Soft Drink Ind. | 25. Motion Picture Industry |
| 4. Builders' Supplies Ind. | 26. Motor Bus Mfg. Industry (Dropped) |
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| 8. Cotton Garment Industry | 30. Plumbing Contracting Industry |
| 9. Dress Mfg. Ind. | 31. Retail Food (See No. 42) |
| 10. Electrical Contracting Ind. | 32. Retail Lumber Industry |
| 11. Electrical Mfg. Ind. | 33. Retail Solid Fuel (Dropped) |
| 12. Fab. Metal Prod. Mfg., etc. | 34. Retail Trade Industry |
| 13. Fishery Industry | 35. Rubber Mfg. Ind. |
| 14. Furniture Mfg. Ind. | 36. Rubber Tire Mfg. Ind. |
| 15. General Contractors Ind. | 37. Silk Textile Ind. |
| 16. Graphic Arts Ind. | 38. Structural Clay Products Ind. |
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| 18. Hosiery Ind. | 40. Trucking Industry |
| 19. Infant's & Children's Wear Ind. | 41. Waste Materials Ind. |
| 20. Iron and Steel Ind. | 42. Wholesale & Retail Food Ind. (See No. |
| 21. Leather | 43. Wholesale Fresh Fruit & Veg. 31) |
| 22. Lumber & Timber Prod. Ind. | |

In addition to the studies brought to completion, certain materials have been assembled for other industries. These MATERIALS are included in the series and are also made available for confidential use within the Division of Review and for inclusion in Code Histories, as follows:

- | | |
|------------------------------------|---|
| 44. Wool Textile Industry | 49. Household Goods & Storage, etc. (Drop- |
| 45. Automotive Parts & Equip. Ind. | 50. Motor Vehicle Retailing Trade Ind. ped) |
| 46. Baking Industry | 51. Retail Tire & Battery Trade Ind. |
| 47. Canning Industry | 52. Ship & Boat Bldg. & Repairing Ind. |
| 48. Coat and Suit Ind. | 53. Wholesaling or Distributing Trade |

L. C. Marshall
Director, Division of Review

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PLUMBING CONTRACTING

Foreword

There is a decided lack of published government data coextensive with the code definition of the Plumbing Contracting Industry. The Census of the Construction Industry, taken only for the year 1929, is the principal source of relevant data but for purposes of analysis of the Industry, as defined by the Code, its figures are subject to qualification.

The Census of Construction classifies plumbing contractors by value of business, dividing them into two groups: (1) those having a value of business of \$25,000 and more in 1929; and, (2) those having a value of business of less than \$25,000 in 1929. In the former group the classifications by kind of contractor are "Plumbing" and "Plumbing and Heating, Combined"; and, in the latter group, "Plumbing and Heating, Combined". Thus, any combination of Census classifications which includes the total plumbing contracting business will also include the heating contracting business, which was not covered by the Code definition.

While the Census of Construction data are thus on the one hand too inclusive for the Industry as codified, they are for another reason not sufficiently inclusive. The establishments covered by the two combined Census classifications do not represent the total number of establishments doing plumbing work, since the Census counts as plumbing contractors only those for whom plumbing is the principal line of work, whereas the Code is intended to cover also the plumbing work done by other kinds of subcontractors and by general contractors, as well as work done by qualified mechanics in the employ of industrial firms and building owners or operators.

Regarding the Census data, it should also be noted that not all the establishments reported every item on the Census schedule. In cases where complete reporting of an item was lacking, estimates of totals have been derived from the data furnished by the reporting establishments.

The labor data available are far from complete. In the absence of statistics on actual earnings, wage rates as reported by the Builders' Association and by the Bureau of Labor Statistics have been used.

It should be pointed out that the primary data furnished by NRA, Research and Planning Division, and by the former Code Authority, represent estimates rather than statements of fact.

Chapter I

THE NATURE OF THE INDUSTRY

Definition and Scope of the Industry

The Plumbing Contracting Division of the Construction Industry, as defined by the Code,

"includes selling to consumers and/or repairing or installing, for profit or hire, all types of plumbing equipment and fixtures, including water supply systems or parts thereof, drainage systems or parts thereof, plumbing connections to air conditioning systems, air and gas piping, gas and gasoline piping, vacuum cleaning systems or parts thereof, such other piping and equipment as is commonly handled by Master Plumbers, and all other articles pertaining to plumbing".1/

The term "Plumbing Contractor" or "Master Plumber" as defined by the Code means:

"Section 2. Any individual who has passed a satisfactory examination, where required by law, covering his technical training and experience in the engineering and manual aspects of his Division; has a license where required, in conformity with the requirements of the area in which he operates, or, in areas where no license is required, is capable of making a satisfactory installation under either the 'United States Bureau of Standards' Recommended Minimum Requirements for Plumbing as Revised to May, 1951', or the 'Plumbing Code' approved by the National Association of Master Plumbers of The United States, Inc., in Convention June, 1933; or a firm, corporation or other entity organized for the purpose of selling and installing plumbing products, any member, officer, or regular employee of which is qualified as above provided. Copies of said 'Recommended Minimum Requirements' and 'Plumbing Code' shall be obtainable through the Code Authority."

The bulk of all plumbing work is done by plumbing contractors either direct for building owners or under subcontracts through general contractors. Plumbing work is also done by licensed or otherwise qualified mechanics in the employ of industrial firms and building owners or operators, and by homeowners and householders who make their own installations and repairs.

Number of Establishments

The Census of Construction reported that there were 25,524 establishments doing plumbing contracting work in 1929, of which number approximately 11 per cent were engaged in plumbing contracting only, and approximately 89 per cent of which were engaged in plumbing and heating contracting combined. (See Table I, below.) Since plumbing contractors usually are licensed or since their addresses are readily

1/ Code No. 244-Supplement No. 9

available, it is believed that the coverage of the Census canvass was practically complete.

No data are available as to the number of establishments operating during 1931 and 1933. The Industry presented a list of 25,000 plumbing contractors in 1934 and the Code Authority showed 25,500 plumbing contractors on its mailing list as of March 10, 1935.

Size of Establishments

As already indicated, the Census of Construction for 1929 classifies contractors by value of business, dividing them into two groups: (1), those having done a business of less than \$25,000; and, (2), those having done a business of \$25,000 and over. Most of the establishments were in the former group, there being 21,498 such establishments, or approximately 84 per cent of the total number of establishments. In the latter group there were only 4,026 establishments, or approximately 16 per cent of the total. (See Table I, Below) Only a little more than one-third the estimated total business was done by the small-sized establishments.

TABLE I

Number of Establishments, by Value of Business and Kind of Contractor, 1929

Value of Business and Kind of Contractor	Establishments		Value of Business	
	Number	Per Cent of Total	Amount (000's)	Per Cent of Total
U. S. Total	25,524	100.0	\$556,093 ^{a/}	100.0
Less than \$25,000				
Plumbing and Heating, Combined	21,498	84.2	205,521 ^{b/}	36.9
\$25,000 and over				
Plumbing	3,803	11.0	256,834	46.2
Plumbing and Heating, Combined	1,218	4.8	93,738	16.9

Source: Census Report, Construction Industry, 1929, Subcontractors, "Plumbing," and "Plumbing and Heating, Combined."

^{a/} In part an estimate as explained in footnote ^{b/}.

^{b/} Estimated by multiplying the average value of business for the 5,008 reporting establishments by the total number of establishments.

Geographical Distribution of Establishments

Establishments of the Industry are situated in every State and in the District of Columbia. Data presented below in Table II show that 68 per

cent of the total number of establishments were situated in ten states, New York having about 16 per cent and Pennsylvania approximately 12 per cent of the total.

TABLE II

Number of Establishments, by Principal States, 1929

State	Total		\$25,000 and over		Less than \$25,000	
	Number of Establishments	Per Cent of Total	Number of Establishments	Per Cent of Total	Number of Establishments	Per Cent of Total
U.S. Total	25,524	100.0	4,026	100.0	21,498	100.0
California	1,554	6.1	255	6.3	1,299	6.0
Connecticut	976	3.9	135	3.4	841	3.9
Illinois	1,323	5.2	294	7.3	1,029	4.8
Massachusetts	1,300	5.1	230	5.7	1,070	5.0
Michigan	1,209	4.7	229	5.7	980	4.6
New Jersey	2,016	7.9	241	6.0	1,775	8.3
New York	4,039	15.8	608	17.3	3,431	15.8
Ohio	1,451	5.6	239	5.9	1,192	5.5
Pennsylvania	2,973	11.6	321	8.0	2,652	12.3
Wisconsin	696	2.7	171	4.3	525	2.5
Total for 10 States	17,517	68.6	2,815	69.9	14,704	68.4
Total for Other States	8,007	31.4	1,213	30.1	6,794	31.6

Source: Census Report, Construction Industry, 1929, Subcontractors, "Plumbing," and "Plumbing and Heating, Combined."

Aggregate Capital Investment

Estimates as to the total amount of capital invested in the Industry are not available. Data on the inventory value of construction equipment at the end of 1929 are available from the Census of Construction, which show the average value of equipment per plumbing contractor as \$2,746, and the average per plumbing and heating contractor as \$3,345. ^{1/} Since only those firms which did an annual business of \$25,000 and over reported this item, the average for all establishments would not be so large as these figures indicate.

Estimated Total Value of Business

On the basis of Census of Construction data, the value of business for plumbing and plumbing and heating contractors in 1929, is estimated

^{1/} Census report, The Construction Industry, 1929, Subcontractors, "Plumbing," and "Plumbing and Heating, Combined," Table 5.

at \$556,093,000. (See Table I, above.) Since not all of those establishments in the "less than \$25,000" group reported their volume of business the total for this group has been estimated from the average value of business per reporting establishment. The value of heating contracting business which was not covered by the Plumbing Contracting Code is included in the figure, but it would be difficult to find a basis for estimating accurately the portion of the total which should be allocated to this work.

Products of the Industry.

The principal products sold and/or installed by the Industry are domestic and industrial water and sanitary systems. No data are available to show the retail sales value or the total installation cost of each specified product.

Competition from Other Industries

There are practically no other industries whose products compete directly with those of the Plumbing Contracting Industry. Members of other divisions of the Construction Industry may be regarded as competitors of plumbing contractors when they bid on plumbing projects; or, competition may be said to exist between members of this Industry and homeowners, householders, and commercial and industrial concerns doing plumbing work on their own properties.

Chapter II

LABOR STATISTICS

Number of Wage Earners

Census of Construction Data. - From the data in the Census of Construction, the number of wage earners may not be validly estimated even for the reporting group of establishments having an annual value of business of \$25,000 and over, due to the peculiar characteristics of employment in this industry. Plumbers operate in a common pool system. Non-continuous employment with any given employer, continual rotation of plumbers from shop to shop, and high labor turnover result in much lost time even during the busy seasons. The Census of Construction data, which show the number of wage earners as of the 15th of the month, obviously can not take into consideration the rotating aspect of employment. Consequently, any figure reported by this Census represents only the lower limit of the number employed by the larger establishments.

Census of Occupations Data. - The 1930 Census of Occupations does not list plumbers separately but combines that classification with the gas and steamfitter classification. In 1930, there were reported 237,813 plumbers and gas and steamfitters, and 5,937 apprentices in all manufacturing and mechanical industries. In the Building Industry alone there were reported 164,601 plumbers and gas and steamfitters and 5,475 apprentices. 1/ It should be noted that these data refer not to the number actually employed in that year, but to the number reporting themselves as belonging, by occupation, to the plumbing and gas and steamfitting trades. The use of Census of Occupations data may lead to over-estimation due to the fact that apprentices, laborers, helpers, and other unqualified workers tend to classify themselves as plumbers.

Reports from 4,093 local unions of plumbers and steamfitters submitted to the Research and Planning Division of N.R.A. in 1934 show that 65 per cent of their total membership was composed of plumbers. If this ratio were applied to the Census of Occupations totals would indicate approximately 106,990 plumbers in addition to an indeterminate number of apprentices, laborers, etc., for the entire Building Industry in 1930.

Code Authority Data. - E. L. Flentje of the former Code Authority reported estimates of the number employed as 172,000 in 1929; 140,000 in 1931; 120,000 in 1932; and 130,000 in 1934. 2/

Research and Planning Division Data. - A study made by the National Association of Master Plumbers covering 7045 firms, showed an average of 6 full or part-time employees for each plumbing contractor in 1929, and an average of 2.52 employees for the two-year period during 1932 and 1933. Among the employees reported were some engaged part-time in heating and piping and some who worked at both heating and plumbing. Also, these figures include journeymen plumbers, apprentices, warehousemen, wagon drivers, helpers, laborers, bookkeepers, stenographers and estimators. These averages, multiplied by the number of contractors, would indicate a total employment of approximately 150,000 in 1929, and 63,000 as the average for 1932 and 1933.

Seasonality of Employment. - Plumbing contracting is less influenced by seasonal factors than other divisions of the Construction Industry, largely due to the steady volume of maintenance and emergency repair work. Census of Construction data, presented below in Table III, indicate that in the 2,510 plumbing contracting establishments reporting the number of wage earners by months, 3/ the minimum employment of February was approximately 83 per cent of the maximum reached in August during the year 1929.

1/ Census of Population, 1930, Occupation Statistics. "Gainful Workers by Industry and Occupation."

2/ The basis for arriving at these estimates is not known.

3/ A sample which covers about 90 per cent of all the plumbing contracting establishments in the \$25,000 and over group.

TABLE III

Number of Wage Earners Reported by 2,510 Plumbing-Contracting Establishments, by Months, 1929 a/

Month	Number of Wage Earners	Per Cent of Maximum Month
Average	28,808	----
January	26,796	86.3
February	25,748	82.9
March	26,896	86.6
April	28,918	93.2
May	29,494	95.0
June	30,348	97.8
July	30,525	98.3
August	31,044	100.0
September	30,900	99.5
October	30,251	97.4
November	28,297	91.2
December	26,480	85.3

Source: Census report, Construction Industry, 1929, Subcontractors, "Plumbing."

a/ The reporting concerns fell in the group having an annual value of business of \$25,000 and over in 1929. The number of wage earners is reported as of the 15th of each month or the nearest representative day.

Estimated Total Annual Wages Paid

Census of Construction Data. - Only the "\$25,000 and over" group of establishments reported on wages in the Census of Construction. These establishments reported that wages amounted to \$89,315,000 in 1929, or 25.9 per cent of the value of business done by their own forces (\$344,293,000) 1/. If this percentage is applied to the estimated total value of business for both groups of establishments (\$556,093,000) there would be an estimated total amount of wages of \$144,028,000 in 1929. (See Table IV below.) This figure includes an indeterminate amount of wages paid in heating contracting work, which was not covered by the Code. On the other hand, the figure is underestimated to a certain degree since a portion of the total value of business is represented by wages accruing to plumbing contractors for their own work.

Code Authority Data. - The Code Authority estimates of the total annual wages paid by the Industry are shown in Table IV, as follows:

1/ This value figure obtained by subtracting from \$350,572,000 (See Table I above) \$6,279,000 for sub-contract work let.

TABLE IV

Estimated Total Annual Wages Paid: 1929, 1931, 1933, and 1934

Year	Amount of Total Annual Wages
1929	\$189,200,000
1931	126,000,000
1933	84,000,000
1934	123,500,000

Source: Code Authority for the Plumbing Contracting Division of the Construction Industry.

Average Hourly Wage Rate

The average hourly wage rate for plumbers tends to vary with the size and location of the city of employment, higher rates prevailing in the larger cities in the northern zone of states. The average rates reported by the Builders' Association, shown below in Table V, are for union and non-union plumbers in both large and small cities throughout the United States. Beginning in 1930, intense competition led to a collapse of the wage-rate structure with great instability of rates prevailing both in single communities and throughout the country. Under such conditions the wide variation in rates practically invalidates the significance of an "average" wage rate for the years following 1930.

TABLE V

Average Hourly Wage Rate for Plumbers in Various Cities,
1929, 1931, 1933, and 1934

Year	Number of Cities Covered	Average Hourly Wage Rate
1929	107	\$1.31
1931	121	1.30
1933	113	1.07
1934	113	1.17

Source: Builders' Association, Annual report: "Wage Rates Per Hour For Building Trades in the Principal Cities."

Union Wage Scales

Union scales of hourly wage rates, as reported by the Bureau of Labor Statistics, for plumbers in ten leading cities are presented in Table VI.

These figures indicate that the greatest reduction in hourly rates during the six-year period shown occurred in 1932, with some further decreases following in 1933. The 1934 rates were about the same as, or slightly higher than, the rates for 1933.

TABLE VI

Union Scales of Hourly Wage Rates for Plumbers in
10 Important Cities, 1929-1934

City	Rates Per Hour (Dollars)					
	1929	1930	1931	1932	1933	1934
Baltimore	1.375	1.375	1.500	1.500	1.000	1.100
Boston	1.375	1.500	1.500	1.250	1.250	1.250
Chicago	1.625	1.625	1.700	1.375	1.375	1.375
Denver	1.375	1.375	1.375	1.188	1.000	1.000
Los Angeles	1.125	1.125	1.125	1.125	1.125	1.125
New Orleans	1.050	1.050	1.050	1.050	1.050	1.050
New York	1.500	1.650	1.650	1.400	1.500	1.500
Philadelphia	1.150	1.250	1.250	1.040	1.040	1.150
St. Louis	1.625	1.625	1.625	1.625	1.438	1.438
San Francisco	1.250	1.250	1.250	1.250	1.250	1.100

Source: Bureau of Labor Statistics, Monthly Labor Review (June, 1935)
p. 1559.

Union Scales of Hours Per Week

Table VII, below, shows the union scales of hours per week in ten cities, as reported by the Bureau of Labor Statistics, and indicates a general reduction during the last few years of hours per week for union plumbers. In 1929, there were union agreements in eight of the ten important cities requiring a 44 hour week, and in two cities a 40 hour week was specified. By 1934, a 40 hour week was in effect for union plumbers in all of the cities except Chicago, where the scale of 44 hours was continued, and in Philadelphia, where 35 hours per week was specified.

TABLE VII

Union Scales of Hours for Plumbers in 10 Important
Cities, 1929-1934

City	Hours Per Week					
	1929	1930	1931	1932	1933	1934
Baltimore	40	40	40	40	40	40
Boston	44	40	40	40	40	40
Chicago	44	44	44	44	44	44
Denver	44	40	40	40	40	40
Los Angeles	44	44	40	40	40	40
New Orleans	44	44	44	44	44	40
New York	44	40	40	40	40	40
Philadelphia	44	40	40	40	40	35
St. Louis	40	40	40	40	40	40
San Francisco	44	40	40	40	40	40

Source: Bureau of Labor Statistics, Monthly Labor Review (June, 1935)
p. 1559.

Average Hours Worked Per Year

Since plumbing work is done on an hourly rather than a weekly basis, the best available measure of the period actually worked per year is the average number of hours worked. The Research and Planning Division, NRA, has estimated the average number of hours worked in 1929 for a few important regions. These figures, which are presented in Table VIII below, were derived by dividing the average annual earnings by the average hourly wage rate. Assuming a 44-hour week for all regions, these data would indicate a range of weeks worked per year from approximately 21.5 for the Gary region to about 30 for the Denver region.

TABLE VIII

Estimated Average Number of Hours Worked Per Year, by Selected Regions, 1929

Region	Average Number of Hours Per Year
Denver, Colorado	1,328
Buffalo, New York	1,185
Gary, Indiana	947
Louisville, Kentucky	960
Galveston, Texas	1,000
Birmingham, Alabama	1,023

Source: NRA, Research and Planning Division, compiled from "area agreement" data.

Child Labor

Child labor is not an important problem in the Industry. According to the Census of Occupations, there were 1,698 plumbers', gas, and steamfitters' apprentices reporting themselves as belonging to the Building Industry who were between the ages of 10 and 17 years in 1930. 1/

Number of Plumbers by Principal States

Census of Occupations data have been used to show the distribution of wage earners in the principal states. (See Table IX, below.) Since plumbers are not classified separately, but combined with gas and steamfitters, the number of plumbers has been estimated for the principal states by assuming that 65 per cent of the total reported were plumbers, as indicated by the membership of local unions of plumbers and steamfitters. 2/ As already indicated, these estimates include the plumbers in all manufacturing and mechanical industries, rather than in the Building Industry only, and tend toward exaggeration. These figures do not apply to the number of persons actually employed, but apply rather to the number of persons reporting themselves belonging, by occupation, to the plumbing trade.

1/ Census of Population, 1930, Occupation Statistics, "Gainful Workers by Industry and Occupation."

2/ Regarding this percentage, see above, p. 6.

The data in Table IX show that in 1930 about 66 per cent of the total estimated number of plumbers resided in the ten leading states, with approximately 17 per cent in New York and 10 per cent in Pennsylvania.

TABLE IX

Total Number of Plumbers and Gas and Steamfitters and Estimated Number of Plumbers in Manufacturing and Mechanical Industries, by Principal States, 1930

State	Total Number of Plumbers and Gas and Steamfitters	Estimated Number of Plumbers	
		Number	Per Cent of Total
U. S. Total	237,813	154,578	100.0
California	13,405	8,713	5.6
Connecticut	5,379	3,496	2.3
Illinois	16,781	10,908	7.1
Massachusetts	12,009	7,806	5.1
Michigan	11,131	7,235	4.7
New Jersey	16,466	10,703	6.9
New York	41,207	26,785	17.3
Ohio	13,952	9,069	5.9
Pennsylvania	22,692	14,750	9.5
Wisconsin	4,755	3,091	2.0
Total for 10 States	157,777	102,574	66.4
Total for Other States	80,036	52,004	33.6

Source: Census of Population, 1930, Occupations, by States for total number of plumbers and gas and steamfitters; number of plumbers estimated at 65 per cent of the total on the basis of membership of local unions of plumbers and steamfitters.

Estimated Total Annual Wages Paid by Principal States

The method previously used in this report in estimating total wages paid in both groups of establishments in the United States as a whole has been applied in estimating wages paid in the ten principal states. The data are given in Table X, below. These wage figures include wages paid in heating contracting work, which was not covered by the Code, but do not include wages paid to plumbing contractors for their own work.

Approximately 73 per cent of the total annual wages were paid in ten states.

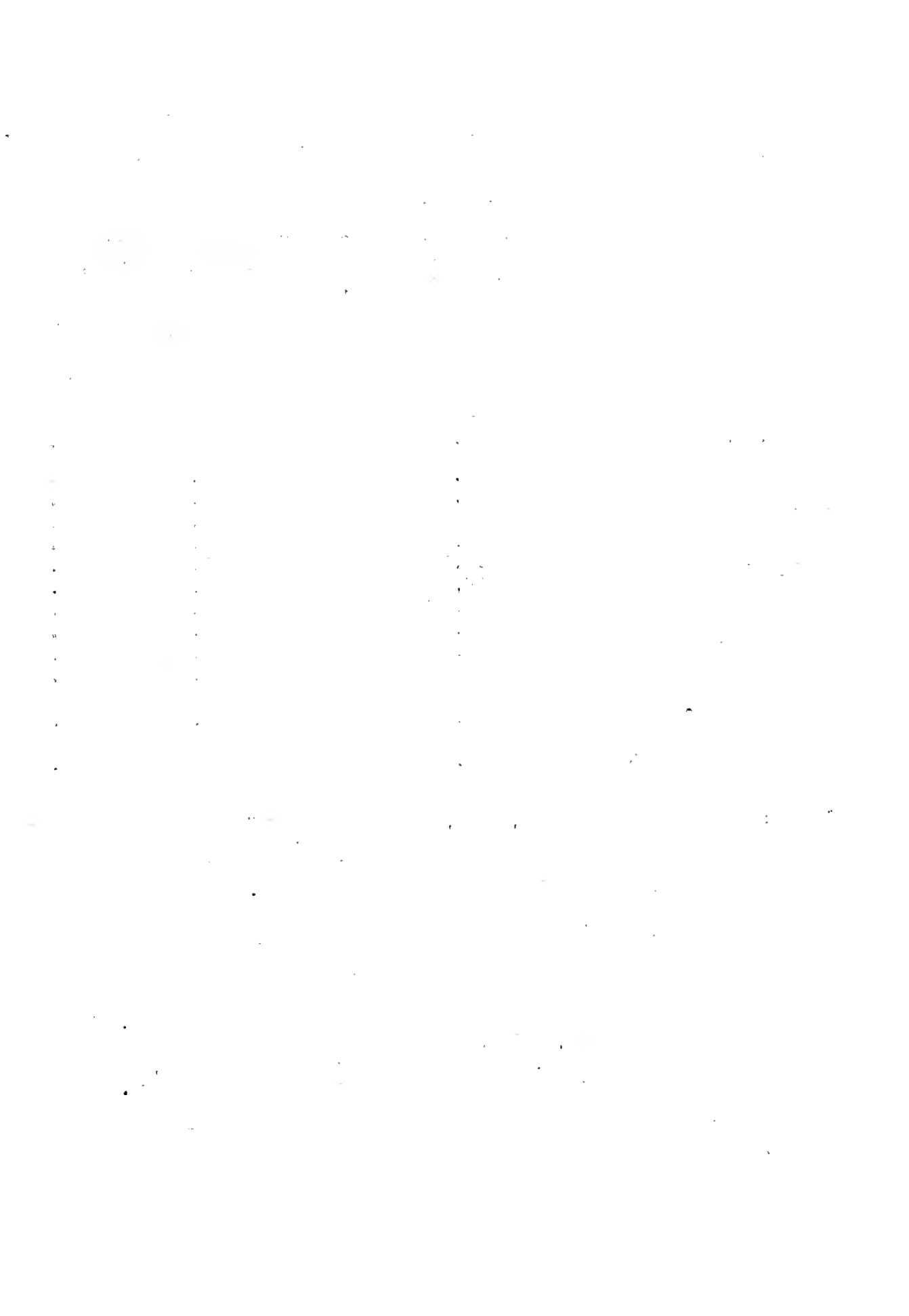


TABLE X

Estimated Wages Paid, by Principal States, 1929 ^{a/}

State	Estimated Total Wages	
	Amount (000's)	Per Cent of Total
U. S. Total	\$144,028	100.0
California	9,071	6.3
Connecticut	4,775	3.3
Illinois	12,525	8.7
Massachusetts	7,534	5.2
Michigan	7,719	5.4
New Jersey	9,247	6.4
New York	29,972	20.8
Ohio	8,039	5.6
Pennsylvania	11,736	8.1
Wisconsin	4,472	3.2
Total for 10 states	105,090	73.0
Total for other states	38,938	27.0

Source: Census report, Construction Industry, 1929, Sub-contractors, "Plumbing," and "Plumbing and Heating, Combined."

^{a/} Estimated by computing the percentage relationship of reported total wages to reported net value of business for the "\$25,000 and over" group of establishments in each of the ten states, and applying this percentage to the estimated total value of business for all reporting plumbing and plumbing and heating establishments.

Relation of Labor Cost to Value of Business

In the 2,808 plumbing contracting establishments reporting wage data in the Census of Construction, wages represented, on the average, approximately 26 per cent of the total value of business, and in the 1,218 plumbing and heating contracting establishments, 24.5 per cent. (See Table XI, below.)

E. L. Flentje of the former Code Authority has stated that labor costs represent about 33 per cent of the cost of new work and about 31 per cent of the cost of remodeling work. These averages are not contradictory to the Census of Construction averages, since it appears that the Code Authority figures are based primarily on the cost to the contractor, rather than on the cost to the purchaser or ultimate consumer.

TABLE XI

Value of Business Compared with Annual Wages, 1929 a/

Kind of Contractor	Number of Establishments Reporting	Value of Business (000's)	Annual Wages	
			Amount (000's)	Per Cent of Value of Business
Plumbing	2,808	\$256,834	\$66,393	25.9
Plumbing and Heating, Combined	1,218	93,738	22,922	24.5

Source: Census report, Construction Industry, 1929, Subcontractors, "Plumbing," and "Plumbing and Heating, Combined."

a/ The reporting concerns fell in the group having a value of business of \$25,000 and over in 1929.

Chapter III

MATERIALS

Materials Used by the Industry

The principal materials used by the Industry are mainly finished products rather than raw or semi-processed materials. The principal materials used are as follows:

- (1) Enameled iron, vitreous china, and porcelain plumbing fixtures.
- (2) Brass, lead, copper, tin, wrought iron, vitrified and steel pipe.
- (3) Cast and spun brass accessories.

Expenditures for Materials

According to the Census of Construction, the total cost of materials for the 4,026 plumbing and plumbing and heating contractors in the "\$25,000 and over" group amounted to \$184,357,000 in 1922.

An analysis of the cost of materials purchased and used by plumbing contractors is presented in Table XII. Although two Census groups, "plumbing," and "plumbing and heating," should be combined to obtain coverage as broad as that of the Code, data are presented here for the first group only because of the large proportion of materials used by members of the latter group in operations that were not actually covered by the Code.

The table indicates that equipment, or fixtures, represented approximately 80 per cent of the total cost of materials; plumbing and gas fitting equipment accounting for approximately 65 per cent; and heating and ventilating equipment for about 15 per cent.

TABLE XII

Cost of Materials Furnished and Used,
By Principal Product Groups, 1929 a/

Product Groups	Cost of Materials	
	Amount	Per Cent of Total
Total Cost of all Materials	\$135,603,332	100.00
Plumbing and Gas Fitting Equipment	87,863,345	64.79
Heating and Ventilatin Equipment	20,468,654	15.10
Pipe: Cast Iron, Sheet, and Tube Steel	1,920,754	1.42
Roofing and Sheet Metal	301,595	.59
Electrical Appliances and Supplies	619,962	.46
Pipe: Drain Tile, Vitrified, Concrete	596,345	.44
Textiles and Caulking Materials	125,060	.09
Lumber, Rough and Finished	98,746	.07
Tile, Facing, and Terra Cotta	58,343	.04
Composition Board	55,821	.04
Cast Iron, Excluding Pipe	54,948	.04
Cost of Materials Distributed by Kind	112,663,575	83.08
Cost of All Other Materials	22,939,757	16.92

Source: Census report, Construction Industry, 1929, Subcontractors,
"Plumbing,"

a/ The reporting firms fell in the group having a value of business
of \$25,000 and over in 1929.

Sources of Production of Plumbing Fixtures and Accessories

Data from the Census of Manufactures, presented in Tables XIII and XIV below, show the principal states for the production of the chief fixtures and accessories used by the Industry. It is reasonable to assume that practically all of the plumbing fixtures manufactured are used by the Plumbing Contracting Industry or by industrial concerns and property owners making their own repairs.

Production of enameled iron plumbing fixtures is concentrated in Pennsylvania, California, and Ohio. Pennsylvania produced approximately 26 per cent of the bath-tubs, 25 per cent of the lavatories, and 22 per cent of the sinks manufactured in 1929.

TABLE XIII

Volume and Value of Production of the Chief Enameled Iron
Plumbing Fixtures, by Principal States, 1929

State	Bath-Tubs		Laboratories		Sinks	
	Number	Value	Number	Value	Number	Value
U. S. Total	943,905	\$21,355,379	1,116,847	\$8,050,040	1,210,615	\$12,872,142
California	81,438	2,272,733	111,754	831,159	119,708	649,366
Ohio	43,486	1,029,282	59,745	749,594	94,971	909,401
Pennsylvania	243,430	5,470,566	275,735	1,632,265	268,858	2,785,614
Total for 3 States	368,354	8,772,581	447,234	3,413,018	483,537	4,344,381
Total for Other States	575,551	12,582,798	669,613	4,637,022	727,078	8,527,761

Source: Census of Manufactures, 1929, Vol. II, "Plumbers Supplies," Data do not include production of those establishments whose products were valued at less than \$5,000 in 1929.

Table XIV below, indicates that the production of plumbers' brass goods and miscellaneous supplies is largely concentrated in eight states which, in 1929, produced about 74 per cent of the total value of brass valves, faucets, and snigots; for about 89 per cent of plumbers' other brass goods; and for approximately 65 per cent of other plumbers' supplies.

TABLE XIV

Value of Production of Plumbers' Brass Goods and Other Plumbers' Supplies, By Principal States, 1929

State	Brass Valves, Faucets, and Spigots		Other Plumbers' Brass Goods ^{a/}		Other Plumbers' Supplies	
	Value (000's)	Per Cent of Total	Value (000's)	Per Cent of Total	Value (000's)	Per Cent of Total
U. S. Total	\$32,834	100.0	\$32,772	100.0	\$20,440	100.0
Connecticut	1,987	6.1	5,314	17.7	504	2.5
Illinois	6,006	18.3	8,548	26.1	1,477	7.2
Michigan	2,700	8.2	4,189	12.8	2,377	11.6
New Jersey	838	2.6	942	2.9	1,789	8.8
New York	537	1.6	2,949	9.0	3,168	15.5
Ohio	9,283	28.3	2,689	8.2	1,534	7.5
Pennsylvania	847	2.5	2,588	7.9	1,943	9.5
Wisconsin	2,188	6.7	1,331	4.1	431	2.1
Total for 8 States	24,386	74.3	29,050	88.7	13,223	64.7
Total for Other States	8,448	25.7	3,722	11.3	7,217	35.3

Source: Census of Manufactures, 1929, Vol. II, "Plumbers' Supplies."
 Data do not include production of those establishments whose products were valued at less than \$5,000 in 1929.

^{a/} Includes brass valves, faucets, and spigots not reported separately.

The tools used by the industry consist primarily of machine hand tools which are produced largely in Connecticut, Illinois, Michigan, Ohio, Rhode Island, and Wisconsin. ^{1/}

Relation of Cost of Materials to Value of Business

In the 2,808 plumbing contracting establishments in the "\$25,000 and over group" reporting to the Census of Construction in 1929, the cost of materials represented, on the average, approximately 52.8 per cent of the total value of business, and in the 1,218 plumbing and heating contracting establishments in the same group, about 53.0 per cent.

^{1/} Census of Manufactures, 1929, Vol. II, "Machine Tool Accessories."

TABLE XV

Value of Business and Cost of Materials, 1929 ^{a/}

Type of Contracting Establishment	Number of Establishments Reporting	Value of Business (000's)	Cost of Materials	
			Amount (000's)	Per Cent of Total Value of Business
Plumbing	2,808	\$256,854	\$135,603	52.8
Plumbing and Heating, Combined	1,218	93,738	48,754	52.0

Source: Census report, Construction Industry, 1929. Subcontractors, "Plumbing", and "Plumbing and Heating, Combined."

^{a/} The reporting establishments fell in the group doing a business of \$25,000 and over in 1929.

Chapter IV

PRODUCTION AND DISTRIBUTION

Estimated Value of Business by Principal States

The "products" of the Industry are represented by contracts made and performed and the best available measure of total production is the value of business transacted. The value of business transacted by plumbing, and plumbing and heating contractors in ten states is shown in Table XVI below.

These ten states accounted for approximately 74 per cent of the total value of business performed by the establishments in all establishments combined. In 1929, New York, Pennsylvania, Illinois, and California accounted for about 45 per cent of the total.

TABLE XVI

Estimated Value of Business, by Principal States, 1929
(In thousands)

State	Estimated Total		\$25,000 and Over Group		Less than \$25,000 Group	
	Value	Per Cent of Total	Value (reported)	Per Cent of Total	Value (estimated)	a/
U. S. Total	\$556,093	100.0	\$350,572	100.0	\$205,521	
California	59,097	7.0	26,388	7.7	12,209	
Connecticut	17,750	3.2	8,588	2.4	9,162	
Illinois	42,039	7.6	30,681	8.8	11,348	
Massachusetts	27,005	4.9	16,716	4.8	10,289	
Michigan	32,579	5.9	22,395	6.4	10,275	
New Jersey	35,873	6.1	16,372	4.6	17,601	
New York	111,420	20.0	82,454	23.5	28,996	
Ohio	29,884	5.4	17,251	4.9	12,633	
Pennsylvania	60,807	10.9	37,308	10.6	23,499	
Wisconsin	13,478	3.3	12,595	3.6	5,883	
Total for 10 States	412,913	74.3	271,048	77.3	141,895	
Total for Other States	143,180	25.7	79,524	22.7	63,626	

Source: Census report, Construction Industry, 1929, Subcontractors, "Plumbing", and "Plumbing and Heating, Combined."

a/ Estimated by multiplying the average value of business per reporting establishment by the total number of establishments.

Interstate Nature of Plumbing Contracts

The distributive function performed by the Industry is that of supplying goods and services to the ultimate consumer. While shipment of goods by plumbing contractors from one state to another is not an important phase of the Industry, contractors may receive a large portion of their plumbing fixtures and supplies from establishments outside the contractors' home states.

In addition, contracts may be performed in one state by contractors located in other states. Data from the Census of Construction, shown in Table XVII, below, indicate that approximately 97 per cent of the total business reported, by location, was performed within the contractor's home state and about 3 per cent was performed outside his home state. The proportion done outside the home state varies among the ten leading states, ranging from 0.2 per cent in Michigan to 4.6 per cent in Massachusetts.

TABLE XVII

Value of Business Performed in Home State and Outside
Home State, By Principal States, 1929 a/

State	Number of Estab- lishments Reporting	Value of Business (In thousands)				
		Total	In Home State		Outside Home State	
			Amount	Per Cent Of Total	Amount	Per Cent of Total
U. S. Total	3,937	\$330,568	\$321,283	97.2	\$9,285	2.8
California	247	25,087	24,523	97.8	564	2.2
Connecticut	133	8,272	8,178	98.9	94	1.1
Illinois	285	28,333	28,149	99.4	184	0.6
Massachusetts	226	15,907	15,171	95.4	736	4.6
Michigan	227	22,014	21,963	99.8	51	0.2
New Jersey	238	15,936	15,881	99.7	55	0.3
New York	674	78,677	76,499	97.2	2,178	2.8
Ohio	236	16,751	16,592	99.1	159	0.9
Pennsylvania	313	25,683	25,078	97.6	605	2.4
Wisconsin	169	10,759	10,703	99.5	56	0.5
Total for 10 States	2,748	247,419	242,737	98.1	4,682	1.9
Total for Other States	1,189	83,149	78,546	94.5	4,603	5.5

Source: Census report, Construction Industry, 1929, Subcontractors, "Plumbing", and "Plumbing and Heating, Combined."

a/ The reporting establishments fell in the group having a value of business of \$25,000 and over in 1929.



Advertising

The Plumbing Contracting Industry itself participates in advertising only locally. However, the Industry shares in the benefits derived from the national advertising of manufacturers of plumbing fixtures.

Shifts in Centers of Production

It would be difficult to determine to what extent, if any, the centers of the Industry have shifted since 1929. Changes of this nature are taking place more or less constantly and usually accompany movements in the general building industry and follow the adoption of higher standards of living.

Productive Capacity

The productive capacity of the Industry is almost without limitations. Due to the limited amount of capital necessary to enter the Industry, the number of members may increase or decrease very rapidly. The capacity of the Industry has ever been taxed throughout the country as a whole, although capacity may have been reached at times within restricted areas.

Chapter V

TRADE PRACTICES

Unfair Trade Practices

The unfair trade practices prevalent in the Industry, which were diminished rather than eliminated under the Code, are quite similar to those found in the Construction Industry as a whole and in its other divisions.

These practices are mainly: bid-shopping, bid-peddling, substitution of materials, selling goods or rendering services below cost, lumping or subletting of labor contracts, enticing employees from competitors, and inducing the abrogation of existing contracts. The most important of these are discussed below.

Bid-Shopping. - Bid-shopping is the practice of seeking, by an awarding authority, of a bid lower than any of those submitted by the original bidders. Other contractors are contacted or the original bidders are requested to lower their bids, or both.

Bid-Peddling. - Bid-peddling is the practice of attempting to secure a contract by reducing the original bid. The bidder, having ascertained that his submitted bid was not the lowest figure, reduces the original bid.

Substitution of Materials. - This is the practice of substituting materials less costly, and usually of inferior quality, than those called for in the contract or agreed upon.

Selling Goods or Rendering Services Below Cost. - This practice tends to be cumulative in effect. In his attempt to realize absolute costs or a minimum of profit, the contractor turns his attention to the costs of materials and labor, substituting inferior materials and reducing wages and lengthening hours.

Lumping or Sub-Letting of Labor Contracts. - This practice is engaged in as a subterfuge for reducing labor costs. The contract for labor services is transferred from one who is qualified by experience to bid to one who is not qualified to bid, and through bargaining, labor rates are reduced to a minimum.

Spread of Unfair Trade Practices From One Area to Another

It would be difficult to cite specific examples where unfair trade practices originating in one area spread to other areas. But unfair trade practices are so universal and the methods so similar, that it seems evident that whenever such practices have originated they have permeated the Industry. According to the Census of Construction, approximately 16 per cent of the total value of business, reported by location, was performed outside the contractor's home city. ^{1/} The fact that contractors operate outside their home community enhances the spread of unfair practices.

^{1/} Census report, Construction Industry, 1929, Table 3, Subcontractors, "Plumbing," and "Plumbing and Heating, Combined." The reporting establishments fell in the group having a value of business of \$25,000 and over in 1929.

Effect of Prices of Individual Members Upon the National Price Structure.

Due to the relative ease with which a member of the Industry may operate within a more or less unlimited area, the prices of the lowest bidder tend to determine prices throughout the country.

Chapter VI

GENERAL INFORMATION

History of the Industry

As recently as 1874 the plumbing processes in the United States were simple and to a high degree ineffective. House drains consisted of bluestone flags laid on earth or rock foundations; the brick sides, covered with loose bluestone flags, formed a square or oblong box. Such drains were not satisfactory, frequently serving as breeding places for rats and vermin and often filling the house with sewer gas.

During the years immediately following 1874, in which year the vent was first used, considerable progress was made as evidenced by the fact that the trap, the vent, and other improvements were developed. In 1886 an order was issued in New York City requiring that "all future house drains in the interior of buildings must be of extra heavy cast iron pipe and all soil, waste, and vent piping and fittings used for rising lines and branches of soil waste, and vent piping must be of heavy cast iron steel or wrought iron." As governmental divisions and subdivisions have realized the importance of efficient plumbing in relation to health and sanitation, and have legislated to that end, the industry has grown and developed.

History of the Industry's Labor Organizations

It was during the period of rapid development that plumber employers began to organize. The National Association of Master Plumbers was formed in 1883. In 1912, as the result of an amalgamation of plumbers, and steam and hot-water fitters, the United Association of Journeymen Plumbers and Steamfitters of the United States and Canada was formed. Both organizations have experienced a spasmodic and sporadic growth. The National Association of Master Plumbers has affiliated with it 530 local associations, and in 1929 had a membership of 150,000. The United Association of Journeymen is comprised of 656 locals in 46 states, and in 1929 had a membership of 65,000.

Experts

The following is a list of persons who, because of their training and experience, may be regarded as qualified experts in the industry:

E. L. Flentje	1240 Shoreham Building	Washington, D. C.
Robert J. Barrett	1240 Shoreham Building	Washington, D. C.
P. W. Donoghue	342 Newberry St.	Boston, Mass.
E. B. Kleine	329 Ludlow Ave.	Cincinnati, Ohio
L. J. Kruse	6247 College Ave.	Oakland, Calif.
D. A. Hayfield	131 E. Bay St.	Jacksonville, Fla.
J. J. Shanahan	217 W. Freemason St.	Norfolk, Va.
Geo. W. Frank	79 Best St.	Buffalo, N. Y.
J. Sheehan, Jr.	1609 Olive St.	St. Louis, Mo.
James Smyth	230 N. Division St.	San Antonio, Texas.

