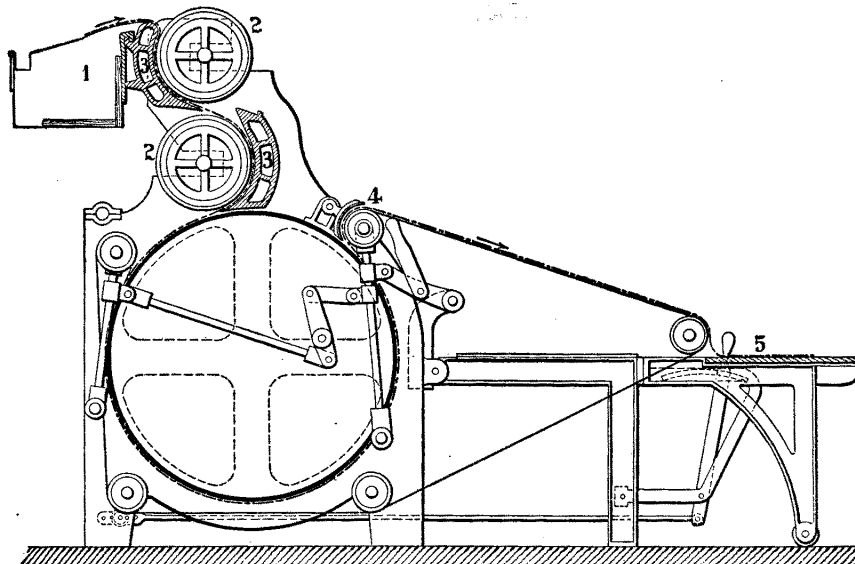


LAUNDRY MACHINERY AND INDUSTRY



SECTIONAL VIEW OF MANGLE.

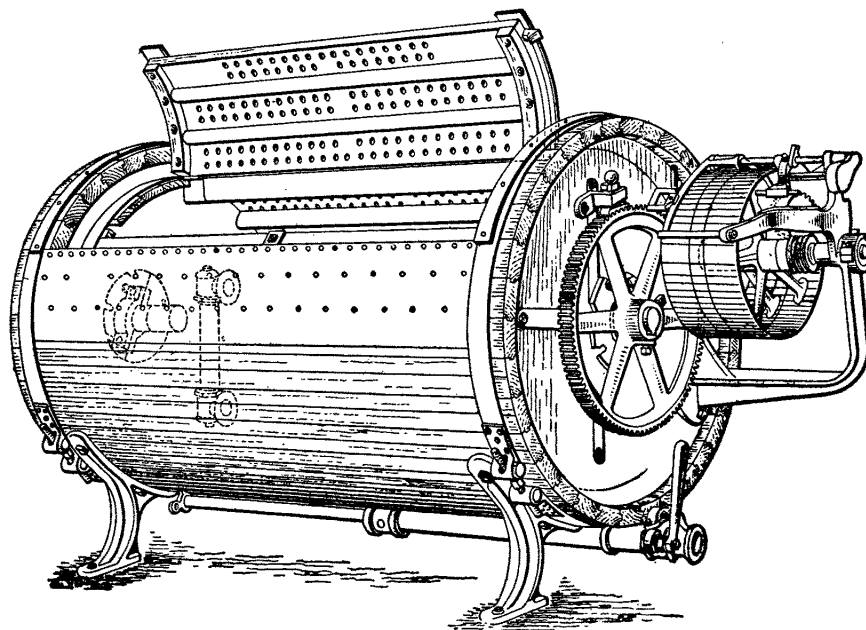
1. Feed box. 2. Cover rolls. 3. Steam closets. 4. Scraper. 5. Discharging table.

(from ME. *laundry*, *laundere*, *lander*, washer-woman, from OF. *lavendier*, *lavandier*, washerman, from Lat. *lavandus*, gerundive of *lavare*,

to wash). The mechanical appliances used in steam laundries include the wheeled truck for carrying the clothes from one machine or appliance to another, the washing machine, the drying apparatus, mechanical sprinklers, starching machines, and, in addition to the mangle and ordinary ironer, a multitude of specially shaped machines for ironing sleeves, collars, and cuffs, for finishing the edges of collars, and for fluting ruffles.

The quality of water used in a laundry is of great importance. If the water is hard, muddy, or colored, a special plant for softening or filtering may be necessary. A large amount of steam is required, both for motive power and for heating the water. In a large laundry or in a hospital the disinfecter is the first consideration and is a most important appliance. Here in a jacketed container of steel the clothes are submitted under a partial vacuum to high-

wringer, then placing them in a centrifugal dryer; or the entire operation may be performed in a hydro-extractor revolving at high speed. (See DRYING MACHINES.) The drying in the largest laundries as well as in well-equipped smaller plants is usually done in an artificially heated drying room or drying closets. These are of various forms and degrees of elaboration, with careful provision for heating and the circulation of air by mechanical draft, as the moist vapor-laden air must be withdrawn and dry air driven in to take its place. This is accomplished by power-driven fans. The handling of the clothes is also effected mechanically in certain installations. The arrangement of closets, horses, etc., varies with the size and nature of the plant. *Ironing machines*, though of many different forms, generally operate upon the same principle, which is that of the calender. (See CALENDERING.) A hard surface or



POWER WASHING MACHINE.

pressure steam at a temperature exceeding 300° F. The steam is then conducted to the fire of the boiler where it was generated. The clothes are then subjected to the action of air at atmospheric pressure at steam temperature. Next come the washers, of which two general types are in use, revolving and stationary. In the first the revolution of closed cylinders keeps the clothes in motion; in the second the cleansing is performed by the strokes of mechanically driven plungers. The boiling, rinsing, and bluing may all be performed in the washer or in another tub. The water is heated by steam, and sometimes the boiling is done under steam pressure, in which case the boiler must be especially strong; in fact, it is often made of $\frac{1}{2}$ -inch boiler plate and strong enough to resist a pressure up to 50 pounds. Various valves, starting and other devices in the interest of safety, are provided in view of the limited intelligence of many of the operatives. *Drying* is effected by passing the clothes through a

trough of carefully polished metal, heated by steam, gas, or electricity, revolves close to a second hard surface, which is usually covered with a felt padding and a cotton sheet. On the latter surface the article to be ironed is so placed that it is brought into close contact with the hot revolving cylinder of metal, the padded cover providing for such inequalities of surface as seams and hems. The most familiar form is the *mangle*, designed for ironing sheets, towels, and other articles of uniform shape and thickness. The principle is capable of endless adaptations, however, which fits it for ironing specially shaped garments, such as shirt bosoms and bodies, cuffs, collars, and sleeves. For such pieces as require starching there are specially constructed jacketed starch cookers to make the starch. Various types of machine starchers are used for different-shaped articles.

Owing to the large number of women employed in modern steam laundries, these establishments have received considerable attention from safety

engineers and welfare workers, and the modern tendency is to surround the moving machinery with every possible safeguard and to secure most sanitary conditions of operation and maintenance. Likewise the power question is important, as whether electric driving or shafting should be used is often a consideration. Electricity, of course, furnishes an ideal source of power with its self-contained motors, and now not only large laundries but even private laundries are being equipped with small-sized machines designed to reduce manual labor. These include electrically driven washing machines, mangles, electric irons, and other appliances, all of which result in neatness and labor saving, if not always in economy. Many devices of this kind are manufactured by the large supply companies and are often distributed by local central stations.

Laundry Industry in the United States. The thirteenth census of the United States, published in 1913, reported that the laundry industry from the returns received for the year 1909 included 5186 establishments, which gave employment to 124,214 persons and paid out \$53,007,747 in salaries and wages, \$17,693,360 for materials, and \$14,483,497 for miscellaneous expenses. The receipts for the year were reported as amounting to \$104,680,086. Naturally the laundry industry flourishes most in the cities and States of the densest population, and local conditions and customs govern. The average number of wage earners, 109,484, were divided into 31,479 males, of whom 268 were under 16 years of age, and 78,005 females, of whom 675 were under 16 years of age. These employees were distributed in establishments where the prevailing number of hours of labor was specified as follows: working 48 hours and under, 9216 employees; between 48 and 54 hours, 17,285; 54 hours, 20,790; between 54 and 60 hours, 24,864; between 60 and 72 hours, 598; 72 hours and over, 147. Of the total number of laundries covered by the census about 22 per cent were under corporate ownership; but these gave employment to about one-half of the wage earners and reported about one-half of the total received for work done during the census year. The laundries whose receipts for work done were \$100,000 and over as reported numbered 140, or 2.7 per cent of the total number of establishments, receiving \$21,489,526, or 20.5 per cent of the total amount. There were 1346 establishments whose receipts were between \$20,000 and \$100,000 and 2359 of which the receipts were between \$5000 and \$20,000. In no case did a laundry report receipts amounting to as much as \$1,000,000. The six cities in which 2000 or more persons were engaged in the industry, or in which receipts for work done during the year amounted to \$2,000,000 were, in the order of their importance by receipts for work done, Chicago, New York, Philadelphia, San Francisco, Los Angeles, and St. Louis. Although the population of New York was more than double that of Chicago, the receipts for laundry work done in steam laundries were only about three-fourths as great.

Bibliography. Consult Sidney Tebbutt's paper on "Steam Laundry Machinery," read in 1899 before the Institution of Mechanical Engineers of Great Britain and reprinted in *Cassier's Magazine* (London and New York) for February, 1899; also a paper by F. J. Johnson on "Large Steam Laundries," in the same maga-

zine for August, 1911. Rothery and Edmonds, *The Modern Laundry* (London, 1909), is a comprehensive manual of British practice.