

ings are painted in attractive colors inside and outside, including floors, and carefully cased for shipment, accompanied by full directions for setting up.

In addition to the houses here referred to, the company manufacture convenient forms of furniture, such as folding tables, chairs, cots, etc., suitable for the use of tourists, or of sojourners at watering-places, frontier settlements, and other places where quickly-constructed buildings, with the best temporary conveniences, are desirable.

The catalogue of the company, which can be had on application to the agents, Messrs. Roune & Barbour, at the address above given, will be found interesting.

The Shone Hydro-Pneumatic System of Sewerage.

This system of disposing of the sewage of cities, towns and large establishments has attracted much attention in Europe, where it has been adopted in a number of important places. It is claimed for it that it effectually avoids and remedies the difficulties incident to the usual mode of removing sewage by water carriage.

In the Shone system, the area under treatment is divided into as many natural drainage areas as is desirable, and the sewage from each is conveyed in small pipes laid at proper gradients to the lowest point. At this point there is an "ejector" station, and the sewage, as fast as it flows into and fills an ejector, is automatically raised by compressed air into a sealed iron main, and conveyed under pressure to the outfall. By this means, it is claimed, the sewage cannot decompose in the main, no matter how long it may remain therein, since it is cut off from the decomposing agent—the air. This sealed iron pipe can be laid, like the water pipes, a few feet only under the surface of the ground, no matter what may be its natural configuration, for the reason that sufficient pressure is always provided to deliver the sewage at the outfall in a rapid manner. Once in the sealed main, there can be no communication between the sewage and the outer air except at the outfall. The length of the branch sewers leading to each ejector station is short, so that the sewage is delivered quite fresh into the main, and its manurial value is, consequently, not impaired.

To insure the thorough cleansing twice a day of the small mains which supply the pneumatic ejectors, automatic flush tanks, supplied with clean water, are placed where necessary at the head of the small mains converging at the ejector stations. All the gravitation sewers leading sewage into the ejectors are effectually ventilated.

The rate of working the ejectors varies with the rate of flow of the sewage, and to prevent waste of power governors and reducing valves are introduced, where necessary, to check the steam supply to the compressors when the pressure required to raise the sewage has been obtained. The compressors, therefore, as well as the ejectors, work automatically. Where the circumstances permit, an ordinary gravi-

tation sewer may take the place of the sealed iron main.

In respect to house drains, when these are short and laid on the gradient suitable for their rapid discharge, they answer very well; but where they are long, in which case they are liable to become fouled, it is preferred to cause the whole sewage discharges of the house, as these accumulate, to pass quickly through short and properly graded drains into a receptacle, which shall hold them temporarily until they attain a certain volume, which, when suddenly released, will have the effect of charging the main house drain throughout the whole, or greater part, of its length.

For this purpose, Mr. Shone has devised an apparatus (shown in Fig. 1) which is called a "house-sewage ejector," which will receive anything in the

flowing action of the sewage, is lifted from its seat and permits the sewage to enter the ejector. A corresponding valve is on the outlet. When the ejector is full, the compressed air is automatically admitted to it, and the sewage is forced to escape by the only outlet open to it—namely, by way of the outlet pipe, which it does by lifting and passing the ball valve on that pipe. When the whole charge is ejected, the automatic gear, which is very simple, is brought into action, the result of which is that the entrance of compressed air is checked, and the exhaust part of the automatic cylinder is opened, permitting the compressed air, which had ejected the charge, to escape into the atmosphere, or into the gravitation sewers to aid in their ventilation. The operation of filling and emptying the pneumatic ejectors goes on automatically from minute to minute and from hour

to hour, in the manner here described.

To recapitulate, the mechanical appliances required in connection with the application of the Shone system, are:

1. Hydraulic sewage ejectors, fixed at the house; hydraulic flushing ejectors, fixed at the head of the branch mains.
2. Pneumatic sewage ejectors, fixed at as many stations within the area, district or city, to be drained, as may be desirable.
3. Steam engines and boilers (where water power is not available), air compressors and air receivers; these latter are fixed at one station, from which air mains are connected to the various pneumatic ejector stations. The hydraulic and pneumatic ejectors are made of cast iron, of any capacity or shape.

The Shone system, although of comparatively recent creation, is already in operation in eighteen different towns and districts in the United Kingdom and on the continent. It can be advantageously employed in connection with the ordinary gravitation system of city drainage, where there are objections to the adoption of the system in its entirety. It is so employed in several towns and districts in England. The system undoubtedly affords a very admirable solution of the troublesome problem of disposing of sewage, which has so long vexed the souls of town and city authorities.

We refer our readers who desire further information, to Mr. Urban H. Broughton, 67-240 La Salle street, Chicago, who represents the system in this country.

THE SMALL-SHOP MEN, says the *Scientific American*, are valuable in any shop where mechanics rather than operatives are required, because they are generally "men at a pinch," "expediency men," and for the most part excellent workmen. The proprietor of a large manufacturing establishment, building fine tools of a particular character, claims that his best men come from small shops, where make-shifts and contrivances are the rule. "Such men," he says, "can make the shop hum" by their methods. It is very convenient to have a shop full of adapted tools, but it is also convenient to have in the shop graduates from "the little shop" who can contrive as well as tend a machine.

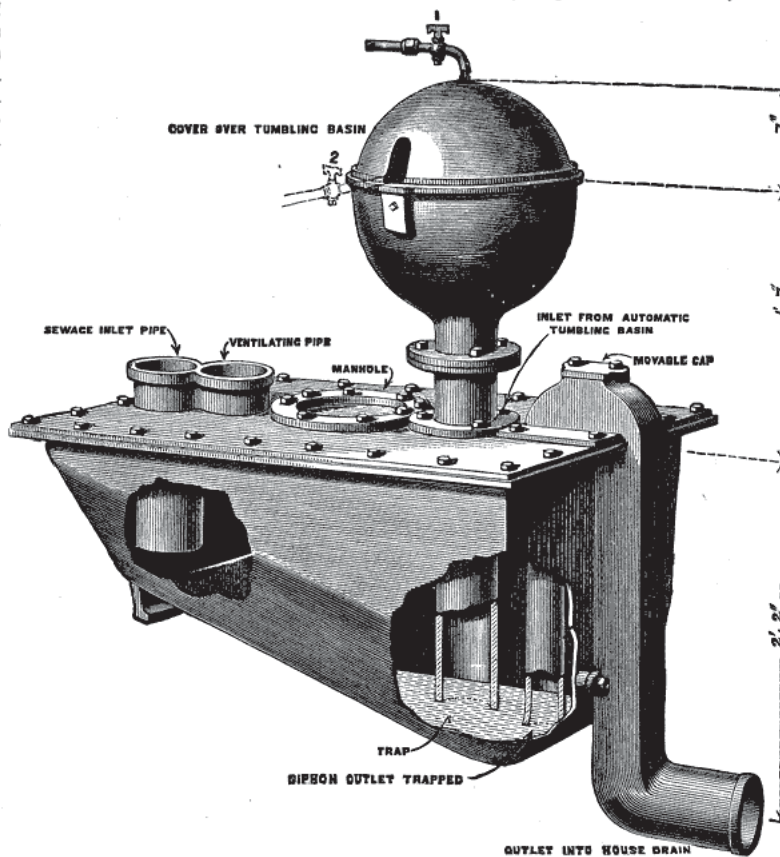


Fig. 1.—SHONE'S HYDRAULIC HOUSE-SEWAGE EJECTOR.

shape of sewage, and permit what it receives to pour out freely. It is automatic in action. The tributary house drains converge to it, and it is so shaped, that, whether it be empty or full, it always forms a deep sewage water-seal or trap, to prevent the entrance into the house of any sewer gas which may be formed in the public sewer, into which it automatically discharges its contents. This apparatus is well ventilated and self-cleansing, and can be so arranged as to discharge as often as is deemed desirable.

The pneumatic sewage ejector referred to herein, is shown in Fig. 2, from an inspection of which it may be readily understood how it receives the sewage through the inlet pipe and how it ejects it again through the outlet into the iron sewage main, without further explanation than that afforded by the engraving itself. The inventor prefers to place this apparatus at each pneumatic station in duplicate. The operation is substantially as follows: The gravitation sewers carry the sewage to the inlet pipe, down which it flows into and fills the ejector. On this inlet pipe there is a ball valve, which, by the in-

The Statistics of the American Iron and Steel Trade for Last Year.

The annual statistical report of the American Iron and Steel Association for 1886 has just been completed by James M. Swank, Esq., Vice-President and General Manager of the Association. The document, which covers nearly 100 printed pages, contains complete statistics of the American trade for the past and previous years, and a review of the iron industry in foreign countries.

"The year 1886," the report states, "was one of the most active years the American iron trade has ever experienced. The improvement in demand which had commenced in the latter part of 1885 was well maintained throughout the whole of 1886. The production of the year in all leading branches of the trade was much the largest in our history, and every ton of iron and steel that was produced may be said to have passed at once into consumption. Prices, which began to advance in the latter part of 1885, showed a hardening tendency in the early months of 1886, declining somewhat, however, with scarcely an exception, during the summer months. The decline in nails was most noticeable. In the closing months of the year all prices again advanced. During November and December, and in the first two weeks of January, the condition of the steel-rail and pig-iron markets of the country undoubtedly bordered on excitement. Steel rails advanced \$4 per ton in these months, and pig iron between \$2 and \$3 per ton. Then came a lull in the demand for certain products, and although some prices continued to advance others showed indications of weakness. In February no signs of an excited condition of our iron and steel markets were anywhere visible, and before the month had expired substantial concessions in the prices of pig iron and old iron rails had been made. In March quotations for these products were still lower than in February. Another advance in prices does not now seem to be probable. While our prices were advancing foreign importations were rapidly increasing; the danger line in prices had been reached and passed. Prices are, however, still higher than they were last year, and production is being maintained at a rate which promises to eclipse in 1887 the remarkable production of 1886. A check upon the importation of foreign iron and steel products is, unfortunately, not likely to occur for several months.

"In the main these are cheering words which we are permitted to write. In many preceding annual reports we have been compelled to tell a different story. Many of our readers will recall with us those dark and almost hopeless days, from 1873 to 1879. The history of the American iron trade appears to have always been marked by cycles of alternate

prosperity and reaction—the latter akin to or wholly comprehensive of real adversity. A glance at the experience of the last few years will show how rapidly these cycles succeed each other.

"No man knows how long the extraordinary demand for iron and steel caused by the present activity in railroad building and railroad betterment will continue. The present year seems to be secure. Beyond it, and may be before its close, we have the evil of over-speculation and the practical working of the Inter-State Commerce Act as possible reactionary elements. What this year's crops may be is another unknown element. One thing, at least, can be counted on with certainty; there will be no change in the

Production of steel nails only in 1886, 100-lb. kegs.	2,968,989
Production of all rolled iron, including iron rails and excluding rails, in 1886, net tons.....	2,250,943
Production of Bessemer steel rails in 1886, net tons	1,763,667
Production of open-hearth steel rails in 1886, net tons.....	5,255
Production of iron rails in 1886, net tons.....	23,679
Total production of rails in 1886, net tons.....	1,792,601
Production of iron and steel street rails in 1886, included above, net tons.....	48,009
Production of Bessemer steel ingots in 1886, net tons.....	2,541,493
Production of open-hearth steel ingots in 1886, net tons.....	245,250
Production of crucible steel ingots in 1886, net tons.....	80,600
Production of blister and patented steel in 1886, net tons.....	2,651
Production of all kinds of steel in 1886, net tons.....	2,870,003
Production of iron blooms in 1886, net tons.....	41,900
Value of imports of iron and steel in 1886.....	\$41,630,779
Value of exports of iron and steel in 1886.....	\$14,865,087
Imports of iron ore in 1886, gross tons.....	1,039,433
Domestic production of iron ore in 1886, gross tons.....	10,000,000
Production of anthracite coal in 1886, gross tons.....	32,136,363
Total domestic production of coal in 1886, gross tons.....	106,780,033
Miles of railroad completed in 1886.....	8,648
Total number of miles of railroad, December 31, 1886.....	137,158
Iron and steel ships built in the fiscal year 1886.....	26
Immigrants in the calendar year 1886.....	392,887

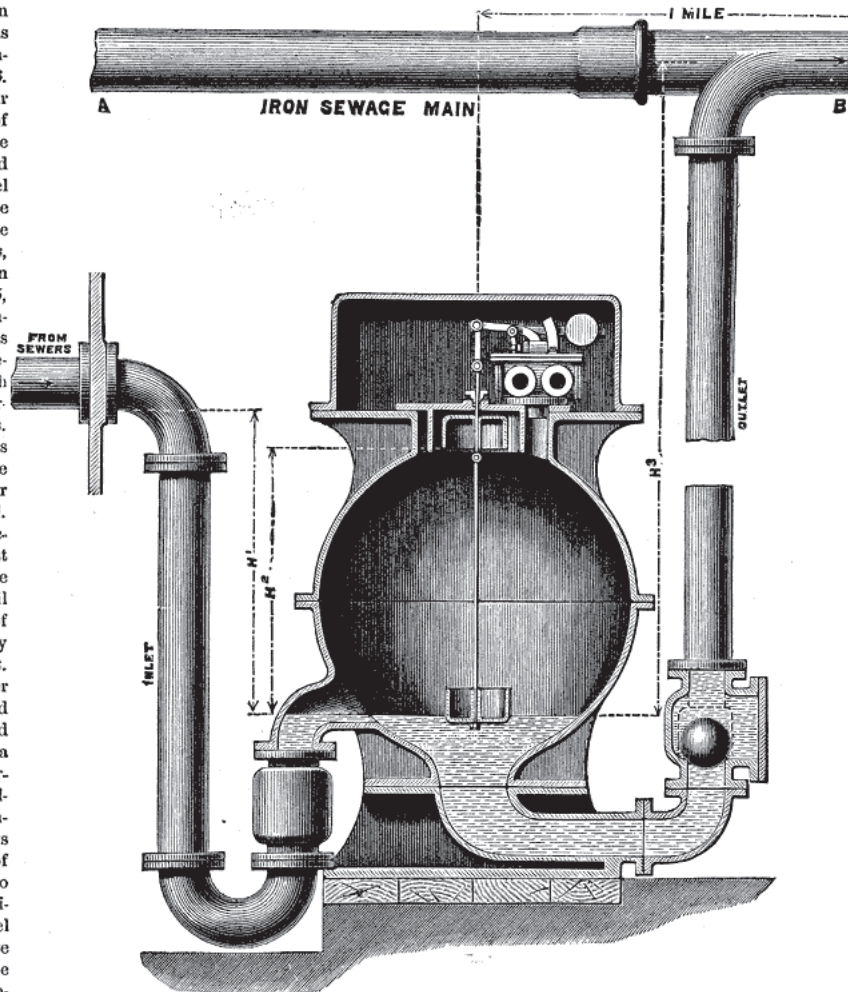


Fig. 2.—PNEUMATIC SEWAGE EJECTOR.

tariff this year to injuriously affect the general prosperity."

Alluding to the numerous labor strikes, the report says: "individual workmen and local interests have suffered, but the country at large has moved on as if nothing had happened. The explanation is that the country is so vast, its resources so ample, its population so large, and the energy of its people so great that no unfavorable influence that is not general in its character can seriously check its onward course."

The summary of the statistics is as follows:

Production of pig iron in 1886, net tons.....	6,365,328
Production of spiegeleisen in 1886, included in pig iron, net tons.....	47,982
Production of bar, rod, bolt, hoop, skelp and shaped iron in 1886, net tons.....	1,580,337
Production of plate and sheet iron, except nail plate, in 1886, net tons.....	420,007
Production of iron and steel, and combined iron and cut nails and spikes, in 1886, kegs of 100 pounds.....	8,160,973

valley and its tributaries is involved. The canal, which would shorten the passage to the mouth of the Mississippi, is to be capable of accommodating "all such boats, steamboats, tugs, barges, and other crafts as navigate the Mississippi above New Orleans." The advantages of this route will be the saving to commerce of heavy rates of insurance, which are made imperative by the dangerous navigation of the Bahamas and the reefs of Florida, and in the coasting service a saving in distance of 1,200 to 1,500 miles. Official statistics go to show that the average tax on commerce through high insurance, etc., over the present route would be about \$5,000,000 yearly. Bradstreet's.

A NEW EXPLOSIVE.—The German army possesses a new explosive called "roburite." It is said to be more powerful than "melanite," the new explosive approved by the French Minister of War for military usage, and can only be exploded by intense heat.

Florida Ship Canal.

There is a movement on foot to carry out the plans of the Atlantic & Mexican Gulf Canal Company, chartered by Florida and Georgia, and granted valuable lands and water power. The route of the canal is from the mouth of the St. Mary's river, on the Atlantic, through Okeeffenoke Swamp and the State of Florida to the gulf. It is stated that twenty-two States and Territories are interested, inasmuch as the traffic of the Mississippi