MUNICIPAL DEPARTMENT

CAST IRON WATER PIPE.*

It is the purpose of the writer to describe the general features of pipe foundry plants, and the methods of tests and inspection which have been in vogue for years past to insure that great systems of mains may safely conduct water through the streets of the larger towns and cities. A pipe foundry does not realize economy of production through any novel methods of foundry practice. The economy results from the manufacture of a great many pieces which are essentially alike. The 12-foot laying length for cast-iron pipes has been adopted as the standard of all foundries, and practically all pipe mains have the bell and spigot joint, made tight by hemp packing and a lead ring. There is more or less difference in the practice of different engineers in the design of the sockets and bell ends of pipes, but as this affects comparatively a small part of the mould, provisions for variations of this kind are readily made. For each size of pipe, therefore, the flask, core barrel and the patterns can be made once for all in cast-iron, and used indefinitely. The base casting and the bell and socket moulds require occasional changes to provide for the difference in standards mentioned above, but these constitute the minor parts of the completed pipe mould.

The most striking feature of a pipe foundry is the circular casting pit, dominated by its large radial crane. The pit around the crane is sunk about 13 or 14 feet below the floor, so that a completed flask for a 12-foot pipe will be about at the floor level, and the crane must be high enough to lift flask and pipe clear of everything, and swing it all around the pit. Around this pit all the work of the foundry proceeds, and the scene is one of great activity and continuous interest.

A completed pipe mould consists of four parts: 1st. The base casting, which carries also the socket ring (for pipes cast bell down); 2nd. The flask proper; 3rd. The core which fits into the socket ring below and is centred by wedges at the top of the flask; and 4th. The bead ring which fits snugly around the top of the core and forms the mould for the bead at the spigot-end of the finished pipe. The moulding of the sand to these different parts constitute as many different processes, the moulding around the flask alone being done in the pit. The process of moulding, then, is as follows: The cast-iron flask, which is in several parts, bolted together, is set up in the pit and secured on a base casting which constitutes the pattern for the outside of the bell of the pipe. A mandrel is then lowered into the flask, fitting into turned bearings in the base, and at the top it is properly centred and wedged in place. The sand is then shoveled into the space between the mandril and the flash, being thoroughly rammed as it is put in, thus making the mould for body of the pipe by the use of permanent patterns.

In the meantime a spindle, which constitutes the core barrel, has been set in lathe bearings at one side of the foundry, and covered first with a layer of hay rope and then coated with damp sand, which is trued to diameter and outline by a mould board. At still a third point of the foundry, the base and socket rings are being moulded with standard patterns; and at a fourth point the bead rings are made. All parts of the mould must then receive a facing of lamp black, and must be separately dried. A drying furnace is provided for each of the parts, and in well-regulated foundries the work on all four parts goes forward harmoniously, so that bases, cores and bead rings are all ready to go into place as soon as the flasks are dried and in condition for casting. It will be readily seen that a process which is thus essentially simple, and in which nearly all parts of the flasks and of the moulds can be used over and over again, will realize a great economy of production; and it is through a careful development of the economics of this process that cast-iron pipe can be sold with profit at a price of from ¾ cent to 1 cent a pound, while the ordinary run of castings may cost from 2 to 5 cents. The casting pit and foundry around it present an interesting scene when the work of the foundry is under full headway. In the pit, the moulding in the flasks, the baking, assembling of parts, casting of pipe, and withdrawal of cores, pipes and burned-out moulds proceed in regular order and in a continuous round. The number of casts varies according to the size of the pipes, the facilities of the foundry and the skill of the foreman.

(To be Continued.)

* From an article by Frederick H. Lewis in Cassier's Magazine.

STREET SWEEPINGS AS FUEL FOR STEAM BOILERS.

From the report of the London County Council on dust destructors, the average from several districts gives 260 tons per annum for 1,000 of the population, although the actual quantities vary widely. Taking this into consideration, and the fact of the preponderant amount of combustible material which has been shown to be present in this refuse, it is apparent that it should be disposed of by fire, not merely with a view to its destruction for hygienic reasons, or yet to reduce its bulk —which is done by the destructors in present use, leaving only from 25 to 30 per cent of ashes and clinkers—but that the heat set free in the process of destruction should be utilized.

Prof. Forbes and others have estimated the value of ashbin refuse at a much higher figure than results from practice, the various estimates ranging from 3 to 5 pounds of water evaporated for one pound of refuse. Hitherto, in practice this result has not been obtained, and according to statistics collected by C. Jones from the larger towns using destructors with steam generators by the waste heat, 6 horse power per cell burning from 6 to 8 tons every 24 hours seems to be the average result. This result, doubtless, can be increased by the use of forced draught, at the same time enabling the furnaces to do a far greater amount of work as destructors.

There is no doubt that the calorific value of the refuse is low, particularly when street sluge is used, and from results obtained by the author, only one pound of water evaporated per pound of unsifted refuse is actually obtained. With screened refuse, however—that is, with the paper and loose rubbish, commonly called breeze taken out—a fair average of 2½ pounds of water evaporated per pound of breeze is the result. For some months past the author has been using this fuel in an ordinary double-flued Galloway boiler, 22 feet long, 7 feet diameter, with 22 cross tubes and steam jet forced draught, the boiler being used for boiling purposes. These results, however, could only be obtained by burning the breeze in direct contact with the boiler, and could not be obtained if used in a destructor and then passed through brick flues to the boiler. —T. W. Baker in Cassier's Magazine.