The Manufacture of Drain Pipes.

The manufacture of drain pipes has been brought to a high state of perfection. It is similar in many respects to that of bricks and tiles, and, as with these, the quality of the product depends not so much upon manipulative skill as upon the proper selection of the materials and their freedom from impurities. The material employed in the manufacture of drain pipes in the neighborhood of this city is a refractory potter's plastic clay, of which that from Woodbridge, N. J., which is largely used for the purpose, may be taken as a fair representative. This particular clay is an aluminous silicate, containing a slight percentage of lime and magnesia, with more or less oxide of iron. It need hardly be explained that the refractory clays used in this manufacture do not require to be of the finest quality. The latter are reserved for manufacture into brick, ermelins and pots for smelting metals, and for glass-makers, rotary for gas-making and the like. Nevertheless, though a large variety of clays, mantis for these uses, may be employed advantageously for the production of drain pipes, the material must be sufficiently refractory to permit the articles fashioned from them to be burned hard without softening under the heat, or in any way losing the regularity of their forms or the accuracy of their outlines. If not sufficiently indurated, the pipes will become eroded and flattened in the kiln, and objects of more artistic workmanship will lose their character and their value.

The following description will serve as a fair illustration of the method pursued in manufacturing this class of articles: The first process consists in tempering the clay with water and thoroughly mixing it, which is done in most establishments in large mills having spirally disposed blades, which cut up the mass and at the same time move it forward. In order that the mixture shall be perfect, in some cases it passes through two mills, one horizontal and the other vertical, from which it goes to the press. Where the presence of stones, nodules of iron pyrites, and similar objectionable foreign substances is suspected, the prevention of wiring is resorted to—that is, a workman takes a good deal of clay, tempests it through repeatedly with a wire.

After wiring, the stiffly tempered, plastic mass is placed in the press shown in our engraving, which has the following construction: It consists of a receiving cylinder, in which is a follower, driven down by a piston working in the large steam cylinder seen above. Through the lower cylinder runs a spindle, which supports at its lower and a core. At the bottom of the cylinder are adjustable dies, between which and the core the clay is forced, emerging, as in the case of the lead in lead pipe manufacture, in the form of a tube or pipe. Before pressure is applied, however, a wooden drum is placed upon a platform, which may be screwed up and down, and which is located on the bed-block of the press. Sliding on this...
having turned to a dark-brownish, glossy hue, the work is done.

**Explosion of a Rolling-Mill Boiler.**

We continue our contributions to the subject of steam boiler explosions this month, with the publication of an article by the President of the Hartford Steam Boiler Inspection and Insurance Company, on an explosion caused by faulty construction and improper setting. As the defects here exposed are by no means uncommon, the case will be found to present points of interest and instruction. We give the history of the explosion as it appeared in the company’s monthly bulletin.

**Fig. 1.**

**Fig. 2.**

**Fig. 3.**

"Explosions of boilers at rolling mills and blast furnaces are of frequent occurrence. When we consider their great length, in many cases their defective construction and setting, and the manner in which they are cared for, we confess a feeling of surprise that they do not more frequently explode. Two days and night, 164 hours a week, their bottom sheets exposed to an intense heat, with great variations in their work, due to the manipulation of the iron in the furnaces over which they are placed; also from severe strains caused by the sudden lowering and almost stoppage of the rolls, at times by heavy blooms or plates; the engine valves fly off, and probably the Hartford Steam Boiler inspectors upon the boilers to keep up the steam supply. "

"The boiler here described, known as No. 15 by the mill people, by its explosion caused the death of 16 persons and the injury of several others, with a loss of damage to property of about $3,000, upon which there was no insurance. It was what is known as a plain horizontal boiler, erected about the year 1877, though it has not been in continuous operation since that time. In dimensions it was 27 feet 6 inches long, 28 inches in diameter; shell, 7 inches thick, iron in one course, varying a little in thickness, as they often do; the body of the front iron, the feed-water entering through the front head, the blow-off at the back; steam dome, 25 1/2 inches, with a cast-iron head, upon the top of which was mounted a common lever safety valve of 3 inches diameter, located at 6 pounds pressure; under the valve chamber was a T connection at the steam pipe. The arrangement of steam pipes was that generally used in mills of this kind—a main steam pipe, 8 inches in diameter, leading from the engine through the mill, with 6-inch branches to each boiler; at the places where the branches tapped the main pipe, were stop valves, by which its boiler might be shut off the line whenever necessary for examination, cleaning, or repairs. When the explosion occurred, carrying away the connecting branch pipe, the steam from all the other boilers emptied upon those who were near it. This explains why nearly all the victims of this explosion died from burns. The nestling was built above the furnace in the ordinary way."

It will be noticed there are three cases represented, being, by the fire from the up-take impinging upon the sheet immediately over it, driving off the water, overheating and cracking it. This defect was no doubt greatly aggravated by the feed entering the boiler at that point. It was pumped from an open well at a temperature perhaps of 100°. The paterns of the Hartford Steam Boiler Inspection and Insurance Company, using boilers similarly plated, were advised of this danger some years ago. I am speaking more particularly of the up-take now, and have generally protected their boilers as advised by its inspectors, by an arch or hand across the up-take, the effect of which is to protect the exposed part, as well as curving the flame along the boiler bottom.

"At the coroner’s inquest, mention was made of the great difficulty and delays occasioned by means-seeks at the back head; and at the up-take end of the boilers. Some of their boilers have been during the last year, protected by the method just described; No. 15 had been altered in accordance with this plan, at the time a third patch was put on the fire sheet, only five weeks previous.

"Some ten or twenty minutes before the explo-