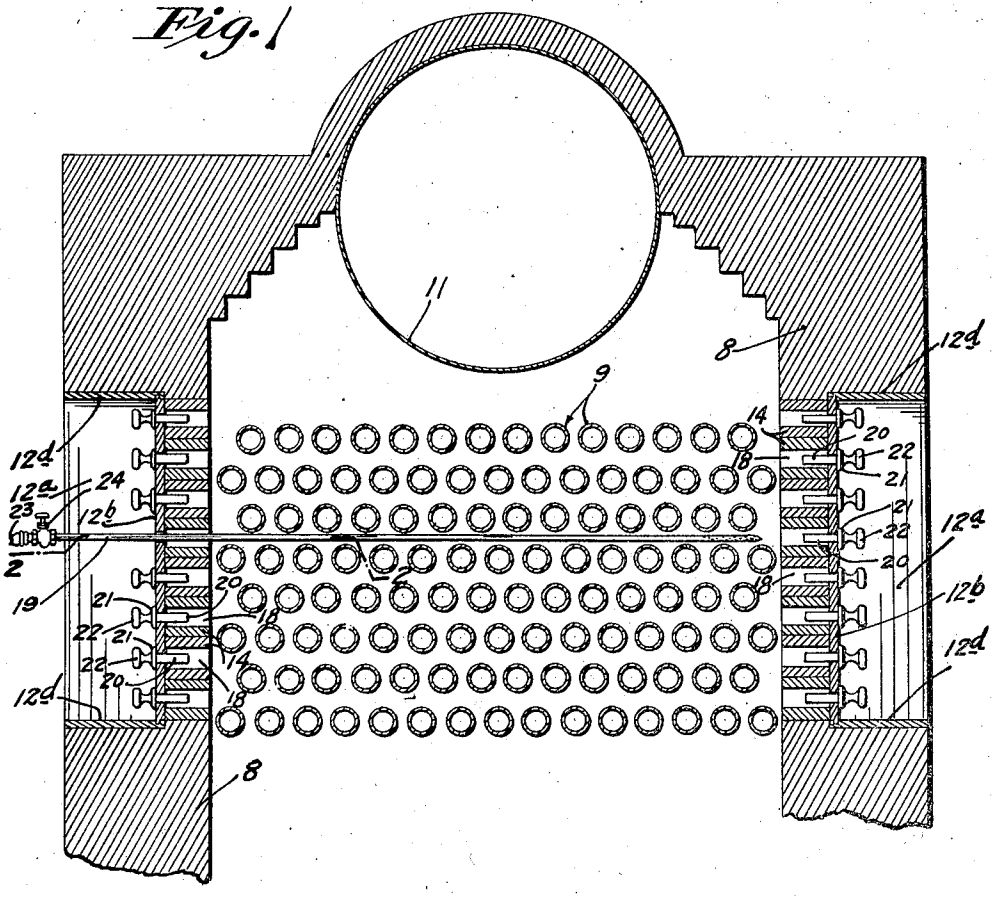
Jan. 6, 1925. 1,521,775

M. LIPTAK

CLEAN OUT DOOR FOR BOILERS

Filed Dec. 26, 1919 3 Sheets-Sheet 1

Fig. 1



Inventor
Michael Liptak
By his Attorneys
Williamson & Merchant

Jan. 6, 1925. 1,521,775

M. LIPTAK

CLEAN OUT DOOR FOR BOILERS

Filed Dec. 26, 1919 3 Sheets-Sheet 2

Fig. 2

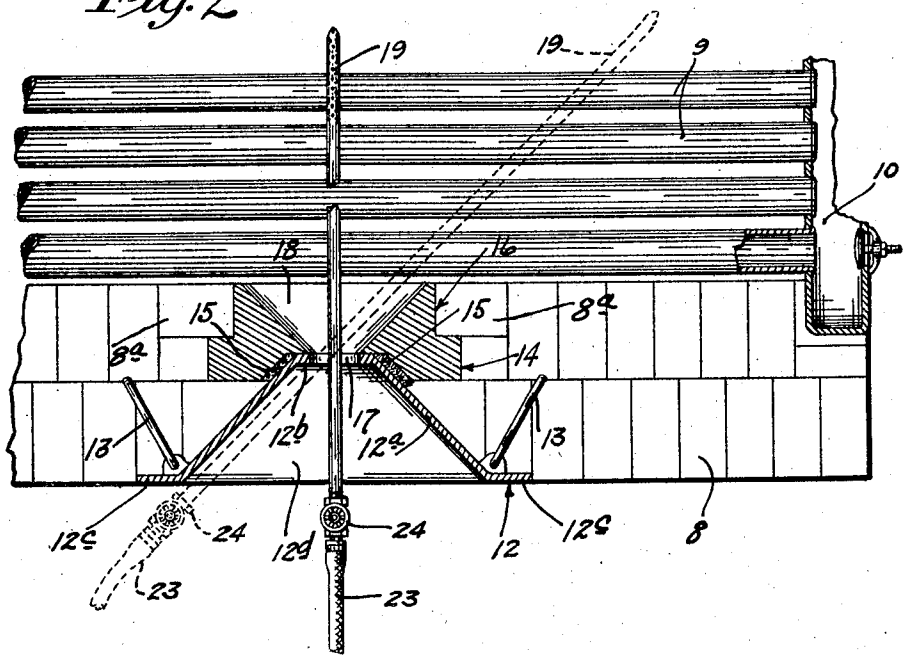
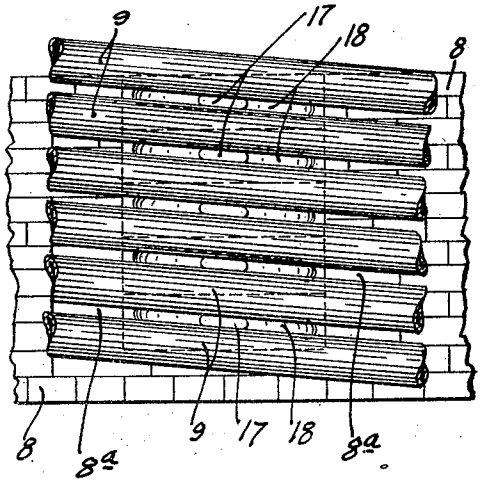


Fig. 3



Inventor
Michael Liptak
By his Attorneys
Williamson & Merchant

Jan. 6, 1925. 1,521,775

M. LIPTAK

CLEAN OUT DOOR FOR BOILERS

Filed Dec. 26, 1919 3 Sheets-Sheet 3

Fig. 4

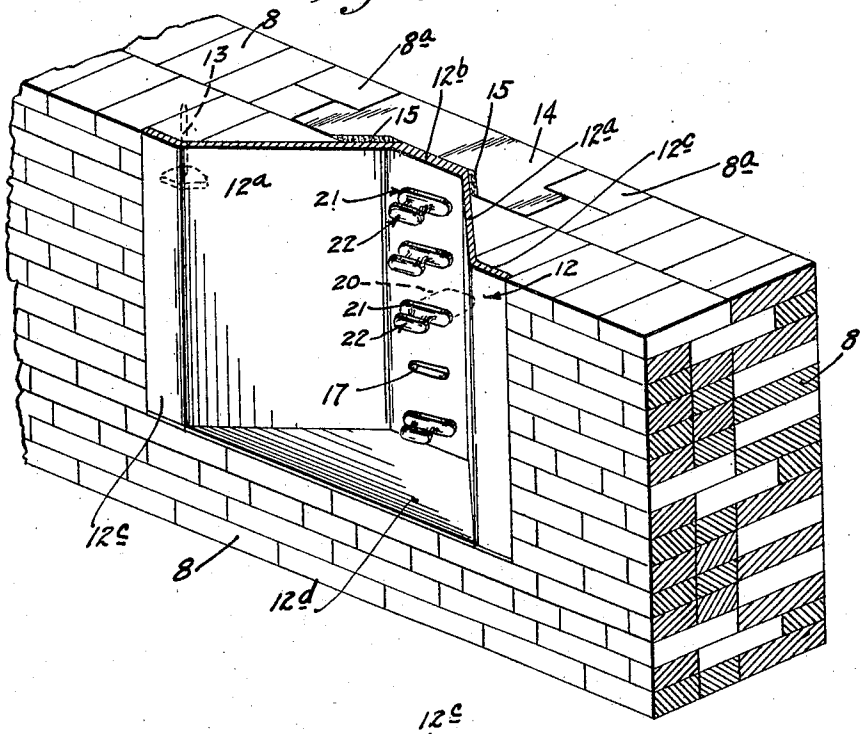


Fig. 5

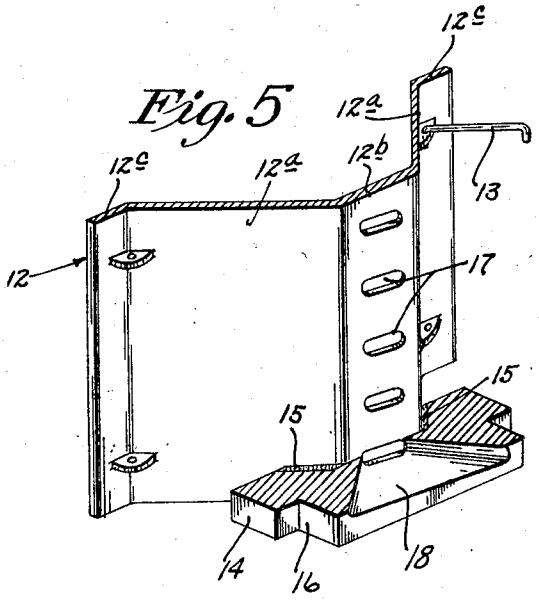


Fig. 6

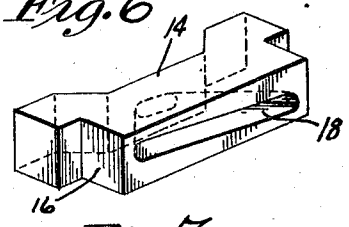
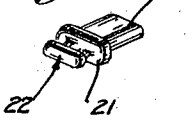


Fig. 7



Inventor
Michael Liptak
By his Attorneys
Williamson & Merchant

Patented Jan. 6, 1925. 1,521,775

UNITED STATES PATENT OFFICE.

MICHAEL LIPTAK, OF ST. PAUL, MINNESOTA.

CLEAN-OUT DOOR FOR BOILERS.

Application filed December 26, 1919. Serial No. 347,296.

To all whom it may concern:

Be it known that I, MICHAEL LIPTAK, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Clean-Out Doors for Boilers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to water tube boilers and has for its object to improve the construction of so-called soot blowout or cleanout doors therefor, as well as the manner of setting or building the said doors in position.

Hitherto, it has been a common practice to provide these soot blowout doors, each with a plurality of vertically spaced ports, all of which, in a common door, would open into a single vertically extended inwardly flaring channel extended vertically past the sides of the adjacent boiler tubes, so that there was, thereby, inadvertently formed, a channel through which the flames could pass upward without being forced to travel between or against the tubes. Moreover, it has been the practice to form these inwardly flaring channels that extend inward from the cleanout ports, by building the same up out of ordinary fire brick, such as used in building the inner surface of the boiler settings or walls, and, to get the desired angle, it was necessary to use a large number of pieces or fragments of the bricks. The mechanics had to cut these bricks to the approximate desired shapes and to secure them in position with the fire clay, which has no adequate binding action, and the result was that the workmanship was very frequently poor and that even when the workmanship was of the best, these fragments of bricks were easily displaced by manipulation of the blowing tube, so that, in time, the bricks which formed the channel would soon be knocked from position, thereby destroying the outline of the channel, exposing the metal of the door to the flames and causing the bricks to lodge against the tubes or fall to the bottom of the channel and close some of the cleanout ports. Hence, cleanout doors constructed on the old plan have been short lived and required frequent re-building and repair. Moreover, displacement of the brick, as above stated, would frequently open undesirable air passages into the boiler.

The above facts are overcome by my invention. The important feature of the invention consists in forming the individual cleanout ports, to wit, the ports that are aligned with the spaces between the horizontal rows of tubes, each for an individual fire brick, tile or block, and in building these port-equipped blocks, one is placed on top of the other with their inner portions flush with the inner surfaces of a boiler wall. These port-equipped blocks, moreover, are built into an interlocked arrangement with the bricks of the boiler wall, so that they cannot fall from position.

In the preferred arrangement, I set into the outer face of the boiler wall a trough-shaped metal door frame or plate provided with ports that align with the contracted outer portions of the ports in the fire brick blocks. With the above arrangement, the blowing tube, when inserted through the cleanout port can come into contact with the surface of only one block or tile in which the particular port is formed, and as such block is interlocked in the wall, there is no possibility of loosening up of any fragments or block sections that can be knocked or forced from position. The small portion of the inwardly converging cleanout port is formed by the metallic door plate so that it prevents the blowing tube from coming into contact with the thin or edge portion of the fire brick tile.

In this connection it may be further stated that, preferably, the port in the metal door plate, both in the horizontal and in vertical directions is made smaller than the contracted portion of the flaring port in the fire brick tile, so that the wear and breaking strain will come entirely on the metal plate.

The invention is illustrated in the ac-

companying drawings wherein like characters indicate like parts throughout the several views. Referring to the drawings:

Fig. 1 is a transverse vertical section taken through a water tube boiler and its walls, some parts being broken away;

Fig. 2 is a fragmentary horizontal section taken through the boiler approximately on the line 2—2 of Fig. 1, some parts being shown in full;

Fig. 3 is a fragmentary view showing a portion of one of the furnace walls and portions of the tubes looking from the inside of the furnace and illustrating particularly the inclination of the tubes and of the cleanout ports;

Fig. 4 is a sectional perspective showing a section of one of the furnace walls and its cleanout door;

Fig. 5 is a perspective view, partly in section, showing one of the door plates or frame and one of the fire brick tiles, the latter being in section;

Fig. 6 is a perspective showing one of fire brick tiles; and Fig. 7 is a perspective showing one of the port plugs.

Of the parts of the boiler, the numeral 8 indicates the side walls of the boiler, the numeral 9 the boiler tubes, the numeral 10 the boiler header, and the numeral 11 the steam drum of the boiler, all of which parts are of the usual or any suitable construction.

The boiler walls will be built up of inside fire brick and outside common brick, preferably in the usual way. In the central portions of the sides, the boiler walls 8 are formed with recesses into which is set and firmly secured channel-shaped door plates or frames 12, preferably of cast iron, and anchored to the masonry of the walls by anchor rods 13, or otherwise. The said door plates 12, as preferably designed are formed with beveled sides 12^a connected by a flat intermediate portion 12^b, and provided at their outer edges with flanges 12^c that are set in flush with the outer faces of the walls 8. At their upper and lower ends, the plates or frames 12 are provided with horizontal head plates 12^d. The central portion 12^b of the door plates 12 are parallel to the inner surfaces of the walls 8, but are located considerably outward thereof.

The port-equipped fire brick tiles 14 that are formed with channels that substantially fit the inner portions of the door plate 12, but since the fit cannot, in practice be very closely made, suitable packing, such as asbestos cement 15 is applied in the joints, as shown in Figs. 2, 4 and 5. As already stated, the inner surfaces of these fire brick tiles 14 will be flush with the inner surfaces of the walls 8, but to secure the said fire bricks in the wall, they are formed at their inner corners with deep notches 16 into which certain of the inner fire bricks or blocks 8^a are projected, as best shown in Figs. 2 and 4.

The inner portions 12^b of the door plates 12 are formed with ports 17 that align with the contracted outer extremities of inwardly diverging ports 18 formed in the fire brick tile 14. As best shown in Figs. 3 and 6, the ports 17 and 18 are inclined so that they correspond to the inclination of the boiler tubes 9 and are so positioned that they are aligned with the spaces between the horizontal rows of tubes. This is important because it permits the soot blowing pipe 19, when inserted through said ports, to be oscillated, as best shown by full and dotted lines in Fig. 2, back and forth in the space between the horizontal rows of tubes that are just above and below the same. The inward divergence of the ports permits the inner or projected end of the blowing tube to be swept back and forth from one end to the other of the tubes, except in respect to those tubes that are on the same side in which the insertion is made, and by inserting the soot blowing tube, first in one side and then in the other, all surfaces of the tubes may be cleaned. Where the tubes are long, two or more cleanout doors may be applied on each side.

Where two boilers are set in one battery, the doors would have to be applied only in the outer wall of each boiler, but the range of oscillation of the soot blowing tube will, even in that event, be sufficient to clean the surfaces of the tubes.

Obviously, the ports 18 do not afford vertical channels for the upward passage of the flames, since the flames cannot pass vertically upward from the one port to the other. For normally closing the ports, I preferably provide removable port closing plugs 20 that quite closely fit the ports 17 of the door plates 12, and which project inward far enough to cause the said plugs to remain firmly seated under the action of gravity and against accidental displacement. The plugs 20 are preferably formed with flanges 21 that normally stand against the door plates and tightly close the joints between the plugs 20 and ports 17. Outward of the flanges 21 the plugs are provided with heads 22 adapting them to be easily handled. Because of their remoteness from the flames, these plugs, which are preferably of cast iron, will never become very hot and, of course, the door plates 12 are protected from the heat of the furnace by the fire brick tiles 14, and other bricks of the boiler walls.

Of course, the soot blowing tube 19 will be connected to a flexible steam supplying pipe or hose 23, in the usual way and will be provided with the customary regulating valve 24.

The port-equipped fire brick tiles de-

scribed may be readily incorporated in boiler walls already erected in connection with the door structures now in use.

What I claim is:

A boiler or furnace wall provided with a cleanout door made up of superimposed fire brick tiles built into said wall, said tiles having individual inwardly flaring cleanout ports, and an outwardly flaring channel-shaped door plate set into said wall and having ports aligned with the contracted outer portions of the ports in said tiles, the said tiles having recesses that receive the inner portion of said channel-shaped plate.

In testimony whereof I affix my signature in presence of two witnesses.

MICHAEL LIPTAK.

Witnesses:

BERNICE G. BAUMANN,

HARRY D. KILGORE.