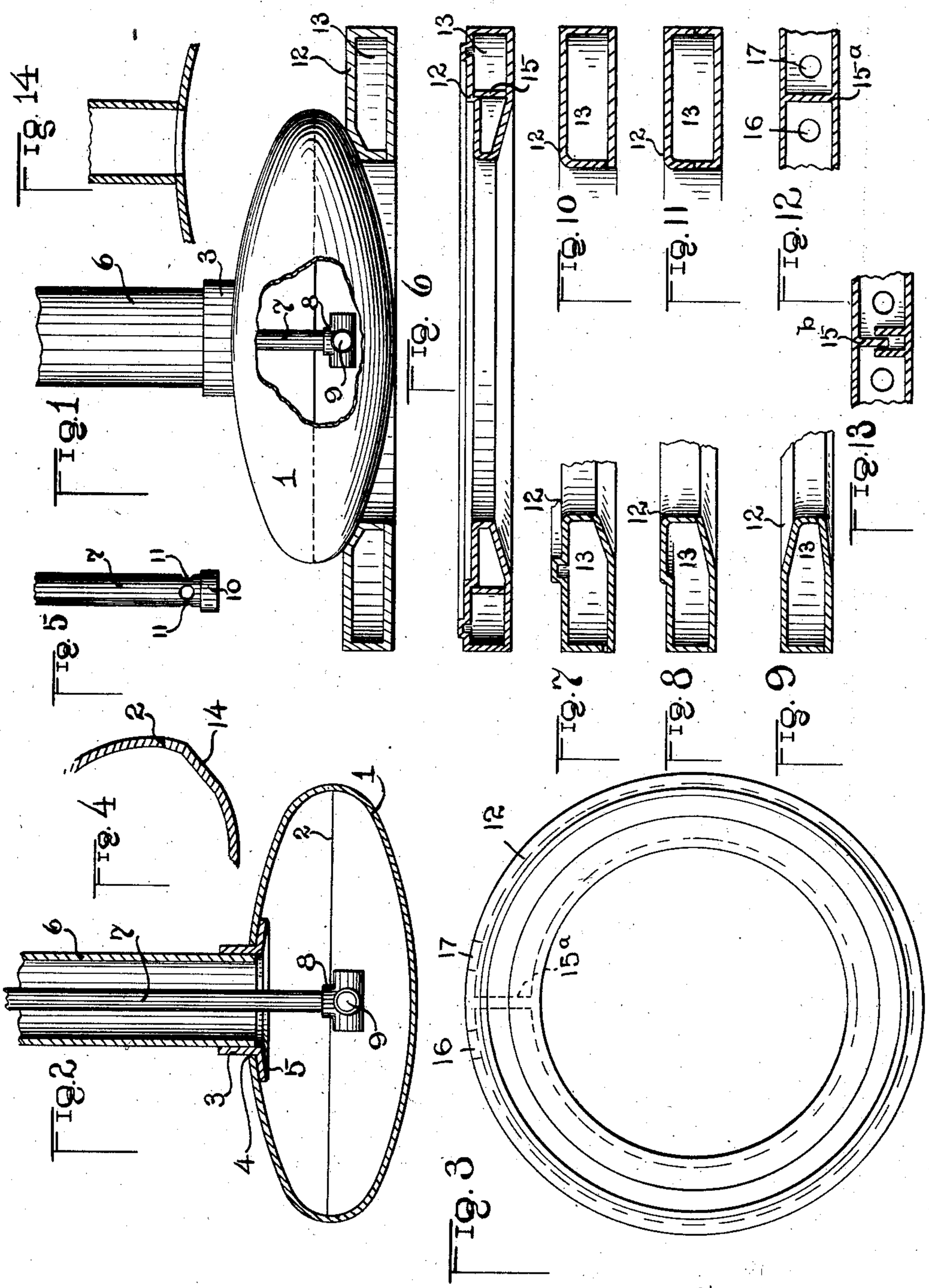
F. McCARTHY.

HOT BLAST VALVE.

APPLICATION FILED MAR. 16, 1910.

997,461. Patented July 11, 1911.



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UNITED STATES PATENT OFFICE.

FELIX McCARTHY, OF POTTSTOWN, PENNSYLVANIA.

HOT-BLAST VALVE.

997,461. Specification of Letters Patent. Patented July 11, 1911.

Application filed March 16, 1910. Serial No. 549,608.

To all whom it may concern:

Be it known that I, FELIX McCARTHY, a citizen of the United States, residing at Pottstown, in the county of Montgomery and State of Pennsylvania, have invented certain new and useful Improvements in Hot-Blast Valves; 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 new and useful improvements in hot blast valves and seats therefor and my object is to provide means for forming the valves and seats from a single or two sections of material and fastening the edges thereof together to form a hollow body, said sections preferably consisting of flanged steel or iron.

A further object is to attach the stem of the valve to the valve proper by welding, and, a further object is to provide a feed pipe and so arrange the lower end thereof that the water discharged therefrom will engage the walls of the valve on all sides.

Other objects and advantages will be hereinafter referred to and more particularly pointed out in the specification and claims.

In the accompanying drawings which are made a part of this application, Figure 1 is an elevation of the valve showing the seat therefor in section and parts of the valve broken away. Fig. 2 is a central sectional view through the valve. Fig. 3 is a top plan view of the valve seat. Fig. 4 is a detail sectional view on an enlarged scale of a portion of the valve. Fig. 5 is a detail elevation of the lower end of the feed pipe showing a slightly modified form from that disclosed in Figs. 1 and 2. Figs. 6, 7, 8, 9, 10, 11, 12 and 13 are detail sectional views of various forms of valve seats showing the manner of constructing the same, and, Fig. 14 is a sectional view showing a different manner of securing the stem to the valve.

Referring to the drawings in which similar reference numerals designate corresponding parts throughout the several views, 1 indicates the valve proper such as is commonly used in connection with hot air furnaces, said valve being preferably oval in cross section. The valve is constructed in two sections, as shown in Fig. 4, said sections being welded together, as shown at 2, to form the two sections into one solid body, which welding process may be accomplished in any preferred manner. Previous to welding the upper and lower sections of the valve together, a sleeve 3 is introduced through an opening 4 at the center of the upper section, the flange 5 of the sleeve engaging the lower face of the upper section of the valve and by welding the sleeve to the upper section, the two sections will be likewise substantially integral with each other.

Secured within the projecting portion of the sleeve 3 is the usual form of stem 6 and through this stem is introduced a feed pipe 7, the sleeve and stem being also welded together. Instead of using the sleeve 3, the stem 6 may be welded directly to the valve 1, as shown in Fig. 14 of the drawing.

The object of the feed pipe 7 is to discharge water into the valve 1 and in order to cause the water to strike and cover all parts of the valve, a head 8 is attached to the lower end thereof, said head having preferably four extensions 9 through which the water is discharged into the valve and by arranging said extensions diametrically opposite each other, the water will be discharged over the entire surface of the valve. Instead of providing the head 8 and the extensions 9, the lower end of the feed pipe may be covered with a cap 10 and the pipe provided with four openings 11 at a point above the cap.

The valve 1 normally rests upon a seat 12, which seat is in the form of a ring and hollow to form a circulating chamber 13 so that water may be kept circulating through said seat to cool the same. The lower portion of the valve 1 is preferably provided with a flattened surface 14 so as to form a perfect union between the valve and the seat therefor, said flattened surface extending entirely around the valve and being machined before applied to use. The seats 12 are preferably formed from one section of material, the meeting edges of which are secured together by means of welding, but if preferred, they may be made in two sections, as shown in Figs. 8 to 11. As shown in Fig. 6, the seat may be provided with a partition 15, which partition extends circumferentially of the seat and divides the interior of the seat into two chambers, through which the water circulates.

In order to cause the water to positively circulate through the valve seat, the water is entered through one port 16 and discharged through an additional port 17,

which ports are spaced apart and between said ports is a partition 15^a, said partition extending transversely of the circulating chamber and entirely closing the passage therethrough. By this means, it will be readily seen that the water entering through the port 16 will circulate entirely around the seat before reaching the port 17 on the opposite side of the partition.

As shown in Fig. 12, the partition 15^a is formed integral with one of the sections of the seat and welded to the other section, while in Fig. 13, the partition 15^b is constructed differently from the partition 15^a, in that one of the sections of the seat is provided with a partition member which projects a distance between a pair of partition members carried by the opposite section of the seat, the free edges of said sections when secured together forming a complete partition.

Heretofore, the valves and seats therefor have been molded from brass, cast iron or cast steel, but when so constructed, they soon crack from the intense heat necessary to the blast furnace, thereby destroying the same and as water is passing through the valves and seats, the cracking of these parts will permit the water to pass into the furnace where it is turned into steam. This steam not only cools the furnace, but causes a great deal of trouble, as it requires a greater amount of fuel to heat the hearth of the furnace and frequently the furnace becomes so chilled as to completely destroy the products being heated, resulting in a great loss in money. It has also been found that in cases where the water is discharged direct from the feed pipe into the valve, should the hot blast move up one side of the valve, the water would be moved up the other side of the valve in view of the intense heat at the one point, but by providing four discharge openings, as shown, this objectionable feature is overcome, as the water is positively thrown over all parts of the bottom of the valve. It will further be seen that by forming the various parts of the valve and seat from flanged steel or iron and welding the same together, said parts will not become cracked from the heat, as they will fully withstand contraction and expansion, thus greatly prolonging the life and utility of the parts and it will likewise be seen that there are no projecting parts which will not be properly cooled by the water passing through the valve and seat, thereby obviating any possibility of leaks occurring by the uncooled portions burning away.

What I claim is:—

1. A hollow valve for blast furnaces, said valve being formed in two sections, the meeting edges of which are welded together, a sleeve welded to one of said sections forming the valve and a stem welded to said sleeve.

2. A valve construction of the class described, comprising the combination with a hollow valve and a stem projecting therefrom, of a feed pipe extending through said stem and into the hollow valve, said feed pipe being bodily removable from the valve and stem, said feed pipe having openings at its lower end arranged in pairs and diametrically opposite each other adapted to discharge the contents of the pipe into all parts of the valve.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FELIX McCARTHY.

Witnesses:
J. HOWARD KENNEY,
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