

J. SMITH.
BOSH PLATE.

APPLICATION FILED FEB. 16, 1912.

1,031,389.

Patented July 2, 1912.

Fig. 1.

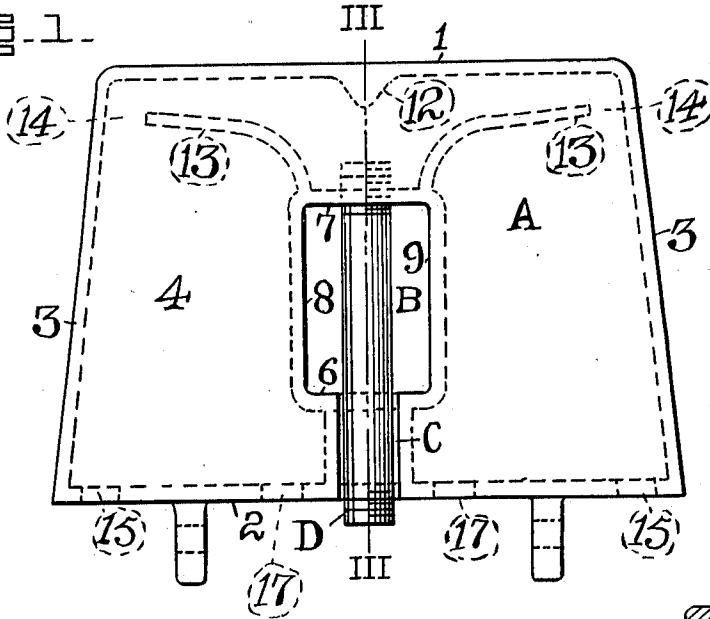


Fig. 3.

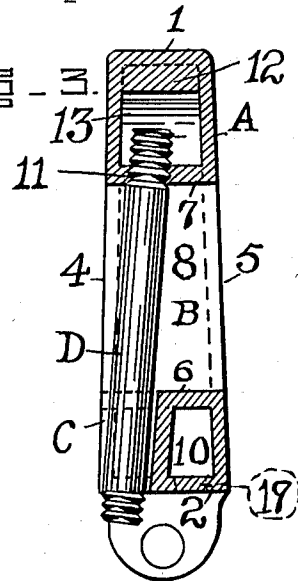
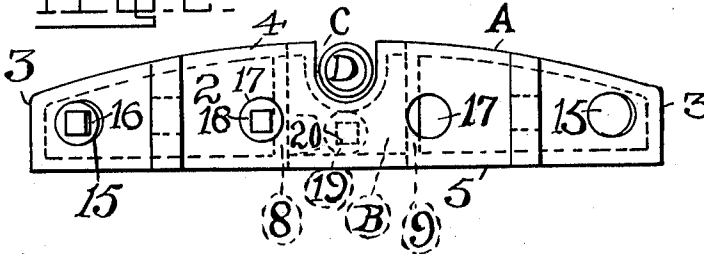


Fig. 2.



WITNESSES
R. A. Lilworth
Wm. Zimmerman

INVENTOR
James Smith,
by Edward A. Lawrence,
his Att'y.

UNITED STATES PATENT OFFICE.

JAMES SMITH, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO
WILLIAM SMITH, OF ALLEGHENY COUNTY, PENNSYLVANIA.

BOSH-PLATE.

1,031,389.

Specification of Letters Patent.

Patented July 2, 1912.

Application filed February 16, 1912. Serial No. 677,913.

To all whom it may concern:

Be it known that I, JAMES SMITH, a subject of the King of Great Britain, and residing in the city of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented or discovered new and useful Improvements in Bosh-Plates, of which the following is a specification.

My invention consists of a new and improved bosh-plate for blast-furnaces and the like.

My object is to provide a strong, durable and inexpensive bosh-plate, requiring a minimum of material and easily cast or otherwise formed.

My object is also to provide a bosh-plate with an interior free from anchors, studs and other supports or obstructions, permitting the free flow of the cooling medium and avoiding clogging.

My object is also to introduce said medium through the center into the nose of the plate and cause the same to flow along the nose-wall toward either side, and thence, rearwardly along the side-walls to be discharged at the butt.

To accomplish these ends, I provide my bosh-plate with a vertical well or aperture in the center thereof, walled-in laterally to inclose the interior of the plate but, preferably, open at top and bottom. The walls of the well form a vertical bridge or support for the top and bottom walls of the bosh-plate which prevents buckling or collapse.

A depression or trough, preferably inclined downwardly, in the top-wall of the plate leads from the butt of the plate into said well, and the nose-wall of said well is provided with a hole in alinement with said trough and leading into the nose of the bosh-plate. A water pipe, connected with the water-supply, extends through said trough, across said well and through said hole into the interior of the bosh-plate at a point adjacent to the nose-wall thereof. I prefer to thread said hole and support and removably secure said pipe in place by screwing the same into said hole.

Extending laterally from the front or nose-wall of said well, in the interior of the bosh-plate, are baffles, preferably curved, which direct the water admitted through said pipe in both directions along the nose-wall of the bosh-plate toward the side-walls thereof, along which latter the currents of

water flow rearwardly to the butt of the bosh-plate. One or more discharge ports are provided in the butt-wall of the bosh-plate connected to a pipe-system for the escape of the heated water. These ports may be adjacent to either end of said butt-wall or adjacent to the center thereof. A cross-passage is provided beneath said trough for the lateral flow of water along said butt-wall from one side of the bosh-plate to the other.

To facilitate the lateral division of the flow of water entering the nose of the bosh-plate from the water pipe, I prefer to provide the interior face of the nose-wall of the plate in front of the nozzle of said pipe with a laterally angular boss against which the flow of water impinges and by which the same is divided into two currents flowing in opposite directions along the nose-wall of the bosh-plate.

Other novel features of construction will appear from the following description.

In the accompanying drawings, Figure 1 is a plan of the bosh-plate, the interior construction of which is indicated by dotted lines; Fig. 2 is a butt-elevation of the same, and Fig. 3 is a horizontal section along the line III—III in Fig. 1.

The following is a detailed description of the drawings.

A is the bosh-plate, having a nose-wall 1, a butt-wall 2, side-walls 3—3, top-wall 4 and bottom-wall 5. The plate is preferably laterally arched, as shown in Fig. 2, for additional strength, and vertically and horizontally tapered toward the nose to facilitate its insertion into and withdrawal from the box which is built into the furnace-wall for its reception. The taper is shown in Figs. 1 and 3.

In the center of the bosh-plate A is formed a vertical well B provided with end-walls 6 and 7, and side-walls 8 and 9, extending from the top-wall to the bottom-wall of the bosh-plate and thus inclosing the interior of the latter.

C is a depression or trough in the top-wall 4 of the bosh-plate, preferably having a semi-circular bottom and inclining downwardly from the butt. Said trough extends from the butt of the bosh-plate into the well B. Beneath the trough C and between the butt-wall 2 of the plate and the well B is a cross-passage 10 for the lateral circula-

tion of water along the inside of the butt-wall 2.

The front wall 7 of the well B is provided with a hole 11 in alinement with the trough C. This hole is preferably threaded.

D is a water-inlet pipe, connected with a water-supply system not shown, and extending along the trough C, across the well B and through the hole 11 to a point in the nose of the bosh-plate A adjacent to the nose-wall 1 thereof. The inner portion of the pipe D is preferably threaded to be screwed into the hole 11 to support and removably secure the said pipe in place. The trough C is preferably deep enough to prevent the pipe D extending above the level of the top-wall 4 of the bosh-plate and preferably fits said pipe loosely enough to permit ready installation or removal of the latter.

A horizontally angular boss 12 is provided on the inner face of the nose-wall 1 in front of the nozzle of the pipe D to receive the impact of the entering water and divert the same laterally in two currents along the nose-wall 1.

13—13 represent two baffles, extending laterally in either direction from the front of the well B within the interior of the bosh-plate to divert the two currents of water toward the side-walls 3—3 along the nose-wall 1. Said baffles extend from bottom-wall to top-wall of the bosh-plate, and are preferably curved as shown in Fig. 1. Said baffles extend to a point adjacent to the side-walls leaving ports 14—14 between them and the said side-walls for the passage of the currents of water rearwardly into the butt of the bosh-plate.

In the butt-wall 2 of the bosh-plate A I provide one or more discharge ports for the escape of the heated water, which ports are connected with a drainage-system, not shown. Thus I may provide a port 15 adjacent to either or both ends of the butt-wall 2, both of which ports may be connected up for the discharge of water, or one of said ports may be closed by a screw-plug 16, so that the water from both sides of the bosh-plate escapes through the other port 15. The water from the other side of the plate, opposite to the side in which the service port is located, crosses over by means of the passage 10 to the service port so that a continuous flow of water is maintained through both sides of the interior of the bosh-plate. Or I may provide discharge ports 17—17 adjacent to the center of the butt-wall 2, and use one or more of the same for the escape of the heated water, one of said ports 17 being closed by a plug 18 where but one discharge port is to be connected up to the drainage-system.

If desired, I may provide the plate with the four discharge ports 15—15 and 17—17

and the user may plug up such holes which are not needed for service and connect the remaining hole or holes with the drainage-system.

By reference to Fig. 2 it will be seen that I have indicated in dotted lines a fifth discharge port 19, closed by a plug 20, and located so as to communicate with the cross-passage 10. Where but one discharge port is to be connected up to the drainage-system, it is frequently found convenient to locate said port in the center of the butt of the bosh-plate, and in the location shown at 19 said port would draw the water equally from both sides of the interior of the bosh-plate and thus equalize the cooling effect.

The course of the currents of water through the interior of the plate is self-evident. The water entering through the pipe D is divided into two currents by the boss 12 and directed along the nose-wall toward the side-walls by the baffles. Passing through the ports 14—14 these currents pass rearwardly along the side-walls and thence to the butt of the plate where the heated water is discharged as above explained.

The well B may be of any desired dimensions relative to those of the bosh-plate so that sufficient space is left about the former for the passage of the currents of water, but I prefer the relative dimensions shown in the drawings.

It is evident from the foregoing description that the water circulates freely throughout the interior of the bosh-plate, thoroughly chilling the same and especially the nose thereof. The interior of the plate, being free from unnecessary obstructions is not subject to clogging. Owing to the additional strength afforded by the vertical walls of the well B, the plate will withstand any interior or exterior pressure without danger of buckling or collapse, thus prolonging the life of the plate and preventing its sticking in its box. A minimum of material, a consideration in the use of bronze and similar metal, is required, and the plate is cast without difficulty, no interior anchors being required. The inclination of the trough C provides sufficient room for the cross-passage 10 beneath the same.

What I desire to claim is:—

1. A bosh-plate having a vertically walled aperture through the central portion thereof, the top and bottom walls of said plate being cut away to form the ends of said aperture, means for introducing water across said aperture into the nose of said plate, means for the escape of water at the butt of said plate, and baffles in the interior of said plate extending laterally from said vertically walled aperture whereby the water is caused to flow in both directions along the nose-wall of the plate.

2. A bosh-plate having a vertically walled

aperture through the central portion thereof, the top and bottom walls of said plate being cut away to form the ends of said aperture, means for introducing water
5 across said aperture into the nose of said plate, means for the escape of water at the butt of said plate, a spreader in the nose of said plate against which the entering water is discharged, and baffles in the interior of
10 said plate extending laterally from said vertically walled aperture whereby the water is caused to flow in both directions along the nose-wall of the plate.

3. A bosh-plate having a vertically walled
15 aperture through the central portion thereof, the top and bottom walls of said plate being cut away to form the ends of said aperture, an open trough in the top wall of said plate extending from the butt thereof
20 into said vertically walled aperture, a water-inlet pipe extending through said trough, across said vertically walled aper-

ture and entering the nose of said plate, and means for the escape of water at the butt of said plate.

4. A bosh-plate having a vertically walled
25 aperture through the central portion thereof, the top and bottom walls of said plate being cut away to form the ends of said aperture, an open trough in the top wall of
30 said plate extending at a downward incline from the butt of said plate into said vertically walled aperture, a water-inlet pipe extending through said trough, across said
35 vertically walled aperture and entering the nose of said plate, and means for the escape of water at the butt of said plate.

Signed at Pittsburgh, Penna., this 14th day of February 1912.

JAMES SMITH.

Witnesses:

E. A. LAWRENCE,
J. H. HARRISON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."