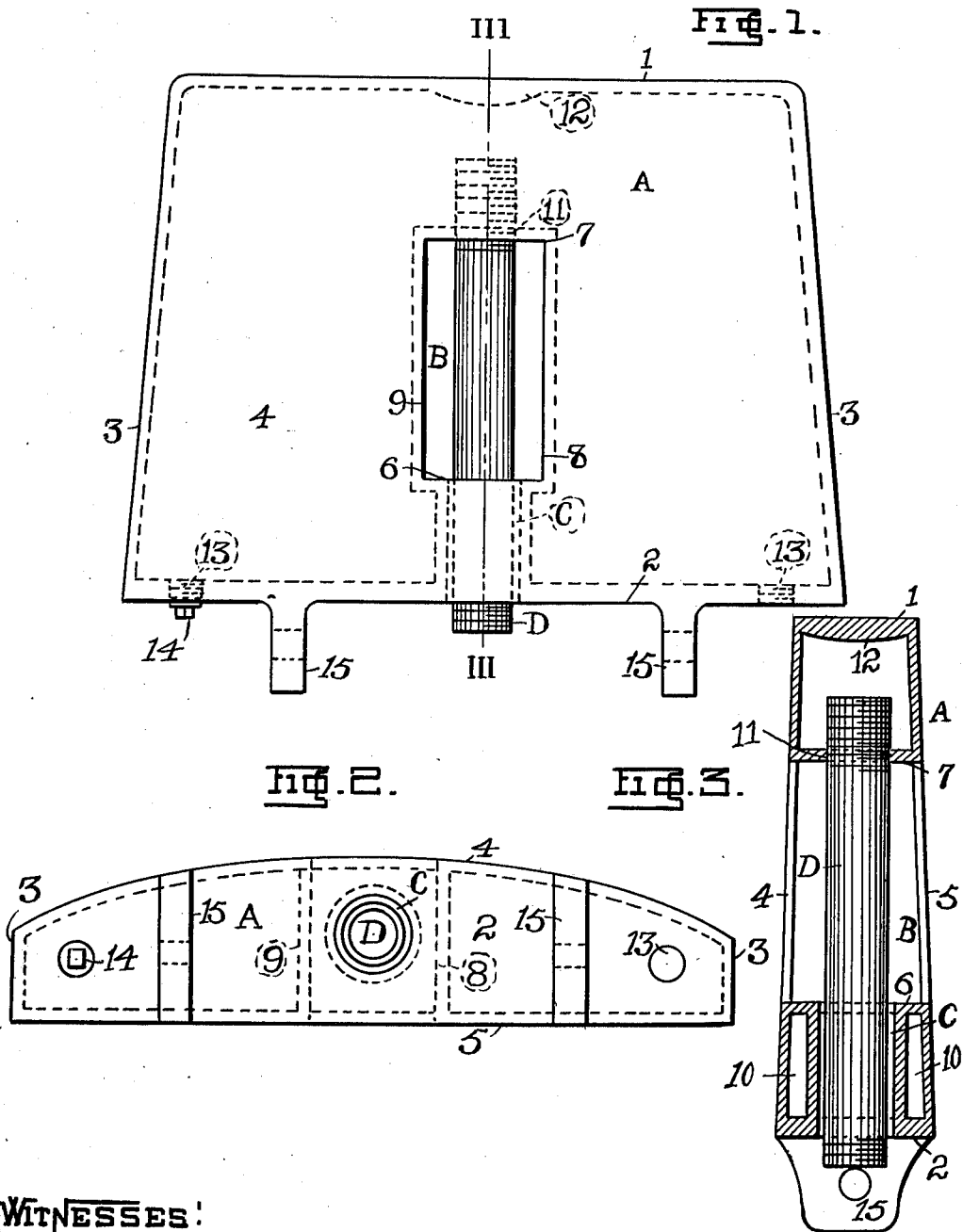


J. SMITH.
BOSH PLATE.

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1,031,388.

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WITNESSES:

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BOSH-PLATE.

1,031,388.

Specification of Letters Patent.

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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 plate, requiring a minimum of material and easily cast or otherwise formed.

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

My object is also to introduce the cold water into the nose of the plate, to cause it to circulate throughout the plate and toward the butt thereof as it becomes heated and to be discharged at the butt, and also to provide cross or lateral circulation at the butt.

To accomplish the ends in view, 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 plate, preventing buckling or collapse without the use of interior supports, leaving the interior of the plate perfectly free for the water circulation. A cylindrical passage leads from the exterior of the plate through its butt-wall into said well, said passage being of an exterior diameter less than the height of the interior of the plate so that cross passages for the circulation of the water are provided above and below said cylindrical passage. A threaded hole is formed in the front or nose-wall of the well in alinement with said cylindrical passage and preferably of somewhat less diameter than the bore of said passage. A water pipe extends from the exterior of the bosh-plate

through said cylindrical passage, which it preferably fits loosely, crosses said well and extends through said threaded hole to a point adjacent to the nose-wall of the bosh plate. The inner portion of said pipe is preferably threaded and engages the threaded hole, thus supporting and securing said pipe removably in position. One or more discharge ports are provided in the butt-wall of the bosh plate, preferably a port adjacent to each end of said wall. One of said ports may be closed, if desired by a plug and the water led from said bosh plate through the one port only. A laterally convexed surface is provided for the inner face of the nose-wall of the bosh-plate in front of the nozzle of the pipe to receive the impact of the water and direct its flow.

In the accompanying drawings, Figure 1 is a plan view of my bosh-plate, the interior construction of which is indicated by dotted lines; Fig. 2 is a butt-end elevation of the plate, and Fig. 3 is a vertical section of the plate 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. The plate is also preferably tapered toward the nose-wall, as shown in Figs. 1 and 3 to facilitate its introduction into or withdrawal from the box which is built into the furnace-wall for its reception. In the center of the plate A is formed a vertical well or aperture 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 plate A and inclosing the interior of said plate.

Leading through the butt-wall 2 and the interior of the plate A into the well B is an inclosed cylindrical passage C of less diameter than the vertical axis of the plate so as to provide above and below said passage C a cross passage 10 for the lateral circulation of water inside of the butt-wall 2.

In the front wall 7 of the well B is pro-

vided a threaded hole 11 in alinement with the passage C and preferably of somewhat less diameter than said passage.

D is a water inlet pipe extending from the butt exterior of the plate A through the passage C, which it preferably fits loosely, crossing the well B and extending through the threaded hole 11 into the interior of the plate to a point adjacent to the nose wall 1 of said plate. The forward end of said pipe D is threaded for engagement with the threads of hole 11 whereby said pipe is removably supported and secured in place.

A laterally convexed boss, 12, is provided on the inner face of nose-wall 1 in alinement with the nozzle of pipe D to receive the flow of water from said pipe and divert the same laterally in both directions.

In the butt-wall 2 of the bosh-plate I provide one or more water-discharge ports 13, one of said ports being preferably located adjacent to each end of said butt-wall. Both of said ports may be used, or if desired, one of said ports may be closed, as by the threaded plug 14. Water connections are provided for the outer end of pipe D and for one or both of the discharge ports 13.

15—15 are the handles or pierced ears which are cast or otherwise secured to the outer surface of the butt-wall 2 to facilitate the handling of the bosh-plate.

The water introduced through the pipe D impacts against the nose-wall 1 or boss 12, dividing into two flows toward the side walls 3—3 of the plate. These currents of water traverse the interior of the bosh-plate and escape through the ports 13—13, a cross-circulation being established through the passages 10—10 along the entire length of the butt-wall 2. In case one of the ports 13 is closed, the water from that side of the bosh-plate passes over to the open port 13 through the passages 10—10 and joins the current on the other side of the plate in escaping from the interior of said plate through the open port 13.

It is evident from the above that the water currents circulate freely throughout the entire interior of the bosh-plate, thoroughly chilling the same, especially the nose portion thereof. There are no obstructions in the interior of the plate to cause clogging or other trouble. Owing to the additional strength provided by the vertical walls of the well B, the plate will withstand any interior pressure or exterior pressure to which it may be subjected without danger of injury. Buckling is avoided, so that the plate may be disconnected and withdrawn or introduced into its wall-box without binding or sticking, thus saving time and labor. A minimum of material, usually expensive bronze or other similar metal, is required and the plate may be cast or other-

wise formed without difficulty as no interior anchors are required in that operation.

The well B may be of any desired size in relation to the bosh-plate, but I prefer the relative dimensions indicated on the drawing.

What I desire to claim is:—

1. A bosh-plate having an unobstructed interior and 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 the plate, and means for the escape of water at the butt of the plate, substantially as described.

2. A bosh-plate having an unobstructed interior and 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, a water-inlet pipe extending through the butt of said plate, across said aperture and discharging into the nose of the plate, and means for the escape of water at the butt of the plate, substantially as described.

3. A bosh-plate having an unobstructed interior and 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, a cylindrical passage extending from the butt of the plate through the interior thereof into said aperture, an opening into the nose of said plate through the opposite wall of said aperture, a water-inlet pipe of less diameter than said passage extending through the same and snugly fitting said opening and adapted to discharge water into the nose of said plate, and means for the escape of water at the butt of the plate.

4. A bosh-plate having an unobstructed interior and 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, a cylindrical passage extending from the butt of the plate through the interior thereof into said aperture, a transverse water passage being provided adjacent to said cylindrical passage, an opening into the nose of said plate through the opposite wall of said aperture, a water inlet pipe of less diameter than said cylindrical passage extending through the same and snugly fitting said opening and adapted to discharge water into the nose of said plate, and means for the escape of water at the butt of the plate.

5. A bosh-plate having an unobstructed interior and 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, a

water-inlet pipe extending through the butt
of said plate, across said aperture and dis-
charging water against the nose-wall of said
plate, a spreader-boss on said nose-wall
5 against which said water is injected and
whereby said water is divided into two
streams passing in either direction along
the interior face of said nose-wall, and

means for the escape of the water at the butt
of the plate.

Signed at Pittsburgh, Pennsylvania this 10
20th day of January 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."