J. M. COSPER.

BLAST FURNACE BELL.

APPLICATION FILED SEPT. 11, 1915.

1,164,929. Patented Dec. 21, 1915.

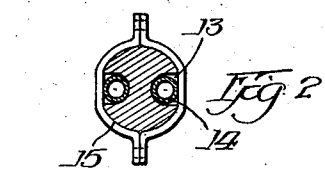


Fig. 2

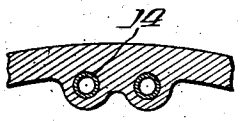


Fig. 3

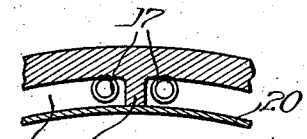


Fig. 4

Fig. 1

Witnesses

Geo. C. Davison

C. F. Murray

Inventor

James M. Cosper

By C. C. Linthicum

Atty.

UNITED STATES PATENT OFFICE.

JAMES M. COSPER, OF BESSEMER, ALABAMA.

BLAST-FURNACE BELL.

1,164,929. Specification of Letters Patent. Patented Dec. 21, 1915.

Application filed September 11, 1915. Serial No. 50,178.

To all whom it may concern:

Be it known that I, JAMES M. COSPER, a citizen of the United States, and resident of Bessemer, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Blast-Furnace Bells, of which the following is a specification.

My invention relates to blast furnaces and has particular reference to a novel water cooled bell for use in connection therewith.

As will be readily understood the heat at all parts of a blast furnace is great and is, of course, high at the point of inlet of materials, as at the bell at the upper end. Such devices are supposed to act as a seal to prevent the escape of gas from the upper end of the furnace but due to the heat, the bells being of rather thin material are likely to warp and become broken and I have conceived the idea of water cooling the lower edge of the bell and this invention relates to novel means for accomplishing this result.

The invention and the objects sought will be better understood by reference to the accompanying drawings wherein—

Figure 1 is a vertical section through the upper portion of a blast furnace equipped with my novel water cooled bell; and Figs. 2, 3, and 4 are sections on the lines 2—2, 3—3, 4—4 of Fig. 1, these views being somewhat enlarged.

Referring to the drawings it will be seen that the bell 10, is adapted to close the space between the annular apron 11, the downward movement of the bell permitting the entrance of materials into the blast furnace. The bell is secured to a vertical shaft 12, the sides of which, as best shown in Fig. 2, are provided with grooves 13, within which pipes 14, are seated and held by a suitable clamp 15, at the lower end. At the upper end the pipes are bent angularly and a hose 16, is attached to each end thereof. The lower ends of the pipes 14, engage with pipes 17, cast in the bell. As best shown in Fig. 3, the lower ends of these pipes terminate one at each side of a division wall 18, which divides a chamber 19. One wall of this chamber consists of the plate 20, this plate being suitably riveted or otherwise secured in place to form a water tight connection. It will be noted that one pipe 17, terminates on each side of the division wall 18. Cold water is caused to flow through one pipe and to circulate entirely around the lower portion of the bell escaping through the other pipe. This forces a circulation and prevents stagnation or overheating of the water.

I claim:

1. A blast furnace bell having a recess near its lower edge said recess being open to the interior of the bell, a plate closing said recess and water pipes communicating with said recess and entering the bell at the axis thereof, substantially as described.

2. In a blast furnace, a bell having a recess near its marginal edge, a division wall in said recess, inlet and outlet pipes communicating with the recess on each side of said wall, and a bell operating stem, said pipes being formed in said stem, substantially as described.

3. In a blast furnace, a bell having an axial operating stem, said bell being provided with a recess near its lower edge, inlet and outlet pipes communicating with said recess, said pipes being formed in said stem and being bodily movable vertically with said bell, substantially as described.

Signed at Bessemer, Alabama, this 16th day of August, 1915.

JAMES M. COSPER.

Witnesses:
R. E. BURKE,
T. M. ELLIS.

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