

G. L. COLLORD.
BLAST FURNACE CHARGING APPARATUS.
APPLICATION FILED DEC. 19, 1906.

967,329.

Patented Aug. 16, 1910.

Fig. 1.

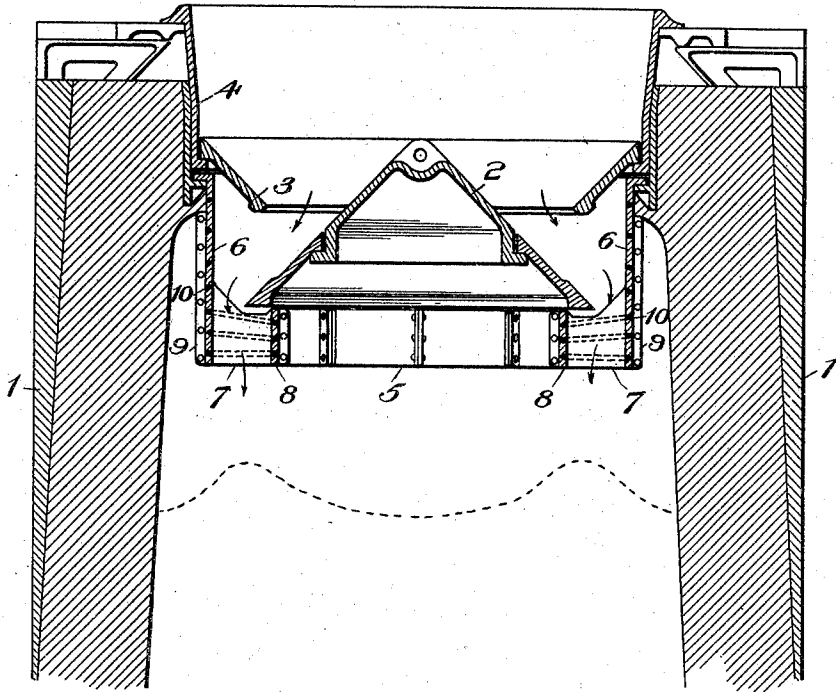


Fig. 3.

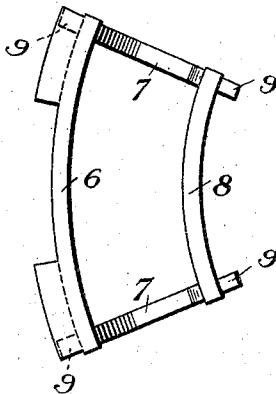
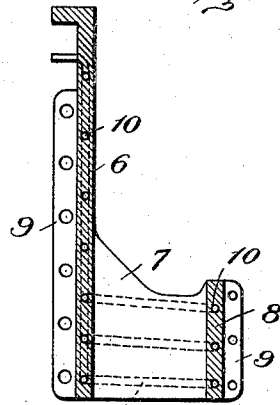


Fig. 2.



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BLAST-FURNACE-CHARGING APPARATUS.

967,329.

Specification of Letters Patent. **Patented Aug. 16, 1910.**

Application filed December 19, 1906. Serial No. 348,633.

To all whom it may concern:

Be it known that I, GEORGE L. COLLORD, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented new and useful Improvements in Blast-Furnace-Charging Apparatus, of which the following is a specification.

My invention relates to improvements in blast furnace charging apparatus designed to produce a uniform distribution of the stock irrespective of the height at which the stock stands in the furnace and in a manner to enable the furnace gases to act substantially evenly throughout the stock. In a companion application filed December 19th, 1906, Serial No. 348,632 I have described and broadly claimed apparatus designed to produce the operation aforesaid and comprising a pair of deflectors or guide walls, one stationary and one carried by the bell, which form a substantially annular and vertical guide passage which receives the stock from the bell or hopper and discharges it straight downwardly into the furnace. According to my present invention, I dispense with the movable deflector on the bell and provide what I term a distributor which is held stationary in the furnace in position to receive and guide the stock as it falls from the hopper. Preferably the distributor comprises a wide outer annular wall or apron which protects the furnace walls and supports at its lower end a narrow concentric inner wall, thereby forming a vertical annular passage through which the stock from the hopper or bell falls and produces what is termed a double wave distribution in the furnace. To prevent distortion from heat, the distributor is preferably formed in segments through which a cooling medium is circulated.

As illustrative of a preferred embodiment of my present invention, but without limitation thereto, reference is made to the accompanying drawings, in which:—

Figure 1, is a vertical central sectional view through the top of a furnace provided with my improved charging apparatus and shown with the bell lowered. Fig. 2, is an enlarged vertical sectional view through one of the water cooled segments of the stock distributor. Fig. 3, is a top plan view of Fig. 2.

Similar reference numerals refer to similar parts throughout the drawings.

I provide a furnace 1 with any suitable arrangement of charging hoppers. A bell 2 closes the opening in the charging extension 3 of the hopper 4. This bell may be of any desired construction and operate in any manner as now practiced. I provide a stock distributor 5 supported by a plurality of straps 6 which are keyed to the hopper 4, the straps and distributor having flanges which engage and support the distributor so that its wide annular wall 6 overhangs into the furnace and is spaced from the walls thereof. This wall 6 extends into the furnace for a distance below the extreme lowered position of the bell as indicated in Fig. 1. At a point below this lowered position of the bell, the wall 6 is provided with a plurality of radial webs which support an inner narrow concentric wall 8 disposed immediately under the bell in its lowered position. The annular base of the bell overlaps this inner wall 8 when lowered so that the stock, as it falls at an incline from the bell, is directed in the manner shown by the arrows so that it falls substantially vertically from the annular distributing passage way formed between the walls 6 and 8. As a preferred construction I cast the distributor in segments, as shown in Fig. 3, each segment being provided with bolting flanges 9 and internal circulating passages 10 which conduct a cooling medium, such as water, through the outer wall 6 and radially through the webs 7 to the inner wall 8, thereby cooling both walls of the distributor and preventing it becoming warped and distorted by the heat to which it will be subjected in the position which it occupies within the furnace.

The inner and outer walls are shown concentric and parallel and disposed vertically. Such an arrangement is preferred but not essential, the main point of my invention being that an outer deflecting and an inner concentric directing wall should be so disposed as to receive the stock as it is charged into the furnace and cause it to fall directly in a substantially vertical line down into the furnace. Here, in practice, the stock will form an annular ridge or wave concentric with the walls of the furnace but sufficiently spaced therefrom to enable the lumps to fall both to the periphery of the furnace and to the center thereof. This arrangement permits a free circulation of the gases, both through the middle of the stock and up along the walls. In some constructions the

neck of the furnace may be contracted so that it forms the outer wall of the distributor, the inner wall 8 being then supported by straps or in any other suitable manner from the furnace. The vertical passage in the distributor may flare in cross section to either or both sides as occasion may require to produce the operation I have in view.

Having described in the foregoing specification an illustrative embodiment of my invention, I desire without limitation to the details thereof to claim as new and protect by Letters Patent:—

1. In a blast furnace charging apparatus, a movable charging bell, a fixed hopper having a centrally disposed opening adapted to be completely closed and sealed by said bell, and a pair of annular deflectors fixed in the furnace and forming a vertical continuous guide passage for the stock which overhangs in the furnace so as to drop the stock away from the furnace walls, the inner deflector being disposed immediately under the bell when lowered.

2. A fixed hopper having a single central charging opening, a vertically movable conical bell which when raised completely closes and seals the said opening, and a double deflector spaced from the furnace walls and so positioned that the inner deflecting portion stands close under the bell when lowered, said deflectors having their bottom edges in substantially the same plane.

3. In a blast furnace charging apparatus, a hopper, a closing bell therefor, and a distributor for the stock as it falls from said bell, said distributor comprising a wide outer annular deflector extending from the hopper down into the furnace and being spaced from the furnace walls, and a nar-

row inner annular guide connected to the lower end of said outer deflector.

4. In a blast furnace charging apparatus, a hopper, a closing bell therefor, a distributor to receive the stock from said bell comprising inner and outer walls connected together and supported from the furnace so that the bell when lowered stands immediately over the inner deflector, said outer deflector being spaced from the furnace walls and extending up to a point adjacent to said hopper.

5. In a blast furnace charging apparatus, a stock distributor disposed within the furnace and comprising inner and outer concentric walls connected by radial webs, said distributor being formed in segments which are independently cooled by the circulation of a cooling medium through the wall sections of each segment.

6. In a blast furnace charging apparatus, the combination with a fixed hopper having a relatively small central discharge opening, of a vertically movable solid closed bell for completely closing and sealing said opening when raised, a fixed deflector ring of less diameter than the bell which is fixedly mounted in the furnace and disposed so that its upper edge is closely overlapped by the base of the bell when lowered, and an outer deflecting means co-acting with said ring to form a vertical guide passage for the stock which overhangs the furnace.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

GEORGE L. COLLORD.

Witnesses:

H. H. GOLDSTEIN,
NOMIE WELSH.