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J. W. SHOOK, A. E. BARTON, J. J. SHANNON, J. DUNN & E. RAMSAY.
SLAG OR CINDER POT.

(Application filed July 25, 1898.)

(No Model.)

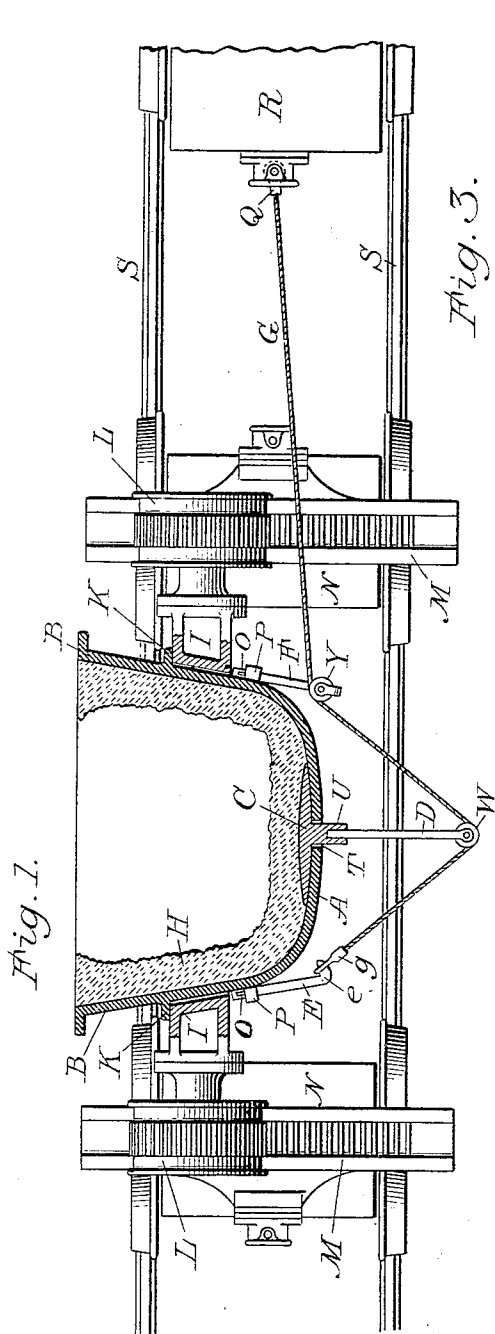


Fig. 1.

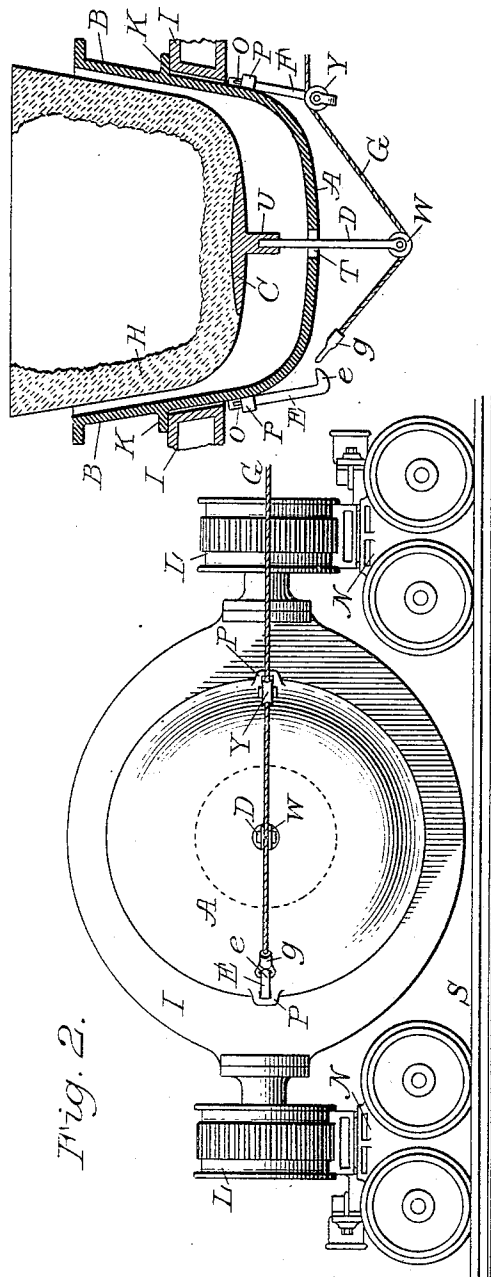


Fig. 2.

Fig. 3.

Witnesses:

W. A. Miller
M. C. Ormand

Inventors:
J. W. Shook,
John J. Shannon,
Joseph Dunn,
A. E. Barton
Erskine Ramsay
By Howard & Howard
their Attys

UNITED STATES PATENT OFFICE.

JAMES W. SHOOK, ALBERT E. BARTON, JOHN J. SHANNON, JOSEPH DUNN,
AND ERSKINE RAMSAY, OF BIRMINGHAM, ALABAMA.

SLAG OR CINDER POT.

SPECIFICATION forming part of Letters Patent No. 618,256, dated January 24, 1899.

Application filed July 25, 1898. Serial No. 686,851. (No model.)

To all whom it may concern:

Be it known that we, JAMES W. SHOOK, ALBERT E. BARTON, JOHN J. SHANNON, JOSEPH DUNN, and ERSKINE RAMSAY, citizens of the United States, residing at Birmingham, Jefferson county, State of Alabama, have invented certain new and useful Improvements in Slag or Cinder Pots, of which the following is a specification.

Our invention relates to devices for cleaning slag or cinder and metal pots or ladles; and our objects are to provide a novel and useful cleaning device for slag and cinder pots that can be operated mechanically to dislodge or eject the skull which is formed in slag or cinder pots during their use at blast-furnaces and steel or iron works, to provide a device of the character indicated that will be simple in construction and effective in the performance of its function, and generally to provide a mechanically-operated cleaning device that will dispense with the laborious and costly manual means of cleaning cinder or slag pots heretofore in common use.

As is well known by those skilled in the art, slag or cinder pots used at blast or other furnaces for receiving the melted slag direct from the furnace and conveying it in a molten condition to the slag dumps or other works soon become lined with what is known as the "skull." Each time the pot is filled more or less of the slag or metal adheres, eventually accumulating and forming the said skull on the inside of the pot, thereby reducing its capacity. It has been the common practice when pots have become lined with the skull to shift them onto a side track, where they are filled with water in order to cool the pot sufficiently to allow a man to get into the pot for the purpose of digging out the skull piece by piece by means of hand-tools. This operation of course is usually performed when the pot is turned over on its side, and it entails not only considerable expense of time and labor, but it also necessitates the use of a larger number of pots than ought to be required, for the reason that generally about one-half of them are out of service undergoing the cleaning operation. By our invention we overcome these objections by providing a mechanical means for dis-

lodging or ejecting the skull from the pot, such means being adapted to be operated in a very short time and so arranged that the entire skull may be dislodged or ejected at one operation.

With these objects in view our invention consists in the combination, with a cinder or slag pot, of a device over which the skull is formed in the pot as it is used and means for causing said device to mechanically dislodge or eject said skull from the pot.

Our invention further consists in the novel construction and details thereof, as hereinafter described with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the drawings, Figure 1 is a sectional plan view of a cinder-pot turned on its side with our invention applied thereto. Fig. 2 is a side view thereof, looking at the bottom of the pot. Fig. 3 is a detail view of a cinder-pot, showing the position of the parts while the skull is being ejected.

Referring now to the drawings, in which the same reference characters indicate the same or corresponding parts in all the views, the letter B indicates a cinder-pot having a bottom A, said pot being mounted upon trucks N, that run upon rails S. In order to permit the pot to be readily turned over on its side, it is mounted upon a yoke I, which surrounds the pot and supports the same through the medium of the flange K, projecting from the side of the pot and resting upon the yoke, the said yoke being provided at each end with pinions L, which mesh with suitable racks M, carried by the trucks.

The pot structure, including the means for mounting the truck above described, forms no part of our invention; but such structure is shown as a suitable construction for the purpose, and obviously any other suitable form of pot or mounting therefor may be used for this purpose, if desired, without affecting our invention, which relates solely to the means which we will now describe for cleaning the pot.

We provide the bottom of the pot with a suitable perforation T and place in the bottom of the pot a plate or disk C, preferably of cast-iron, from which projects a suitable boss or

lug U, having a socket therein, which socket is adapted to receive the end of a bar or rod D, at the other end of which bar or rod is preferably journaled a guide pulley or wheel W.

5 Attached to the pot or pot structure is a bar E, having a hooked end formed by a projection *e*, the upper surface of which is preferably at substantially a right angle to the body of the bar. This bar may be attached to the pot
10 or pot structure by any suitable means, such as an ear P, through which the bar is passed and on which it is supported by means of a key O, passing through a slot in the end of a bar. Attached to the other side of the pot or
15 the pot structure is the bar F, similarly secured to the pot or pot structure by an ear P and a key O, in the lower end of which bar or rod is suitably journaled a guide pulley or wheel Y.

20 A rope or chain G is detachably secured to the projection *e* on the bar E, preferably by means of an eye *g* in the end of the rope, which rope is led from the said bar E over the pulley W at the end of the bar D and thence
25 over the pulley or wheel Y on the bar F, and its outer end is preferably provided with a suitable shackle or eye Q, which is adapted to be connected to a locomotive (conventionally represented at R) or to any other suitable
30 source of power.

If necessary, suitable chocks may be placed under the wheels of the cinder-pot truck to prevent the same from moving when the strain is exerted on the rope or chain.

35 The device hereinbefore described for transmitting the pressure to the plate may, it is evident, be permanently connected to the pot, if desired, and other means for this purpose may be adopted without departing from
40 the essential feature of our invention.

The operation of our device is as follows: The plate C having been placed in the bottom of the cinder or slag pot will in a short time be covered by the skull H, which forms
45 in the pot. When it is desired to dislodge or eject the skull, the pot is turned on its side. The bar D is then inserted in the socket of the boss U or otherwise connected with the plate C and the eye *g* of the rope adjusted
50 over the projection *e* or the rod E and the rope or chain led over the pulleys W and Y, with its opposite end Q coupled to a locomotive or other source of power, by which a pull is exerted upon the rope, thereby forcing the
55 rod D with considerable pressure against the plate, which is moved outwardly, thereby forcibly dislodging or ejecting the skull from the pot. When the bar D has been moved a sufficient distance to effect the displacement
60 of the skull, the eye *g* will slip off the projection or hook *e*, thus detaching the rope from the bar E, thereby preventing any breakage in case the locomotive should move too far or the pull on the rope exerted through too
65 great a distance.

We have shown what is at present the preferred form of device, because of its sim-

licity and effectiveness. We wish it understood, however, that changes may be made in the details and in the arrangement of the
70 parts without departing from our invention, which consists, broadly, in provision for mechanically ejecting or dislodging skull from cinder or slag pots within the scope of the
75 claims, as distinguished from the means heretofore employed for this purpose, depending upon the manual operation of tools for digging the same out piece by piece.

It should be observed that in the operation of our device the result sought is accomplished
80 in a very short time, dispensing with the sidetracking of the slag-pot car and cooling operation, which have been heretofore necessary.

By the terms "slag" or "cinder" pot in the claims and description we mean to include
85 any receptacle for molten or other material which adheres to the sides of the receptacle during use, though our invention is particularly adapted to slag or metal pots at blast or other furnaces.

We claim as our invention—

1. The combination with a slag or cinder pot structure, of a cleaning device located in the bottom of the pot, and over which the skull
95 is formed as the pot is used, an operating connection for moving said cleaning device outwardly from the bottom of the pot interposed between the pot structure and a source of
100 power, and means interposed between the cleaning device and the operating connection and adapted to engage said connection at a point between its connection with the pot
105 structure and the source of power, whereby when strain is exerted upon said operating connection, the cleaning device will be forced outwardly and dislodge the skull, substantially as described.

2. The combination with a slag or cinder pot structure, of a plate located in the bottom of the pot, and over which the skull is formed
110 as the pot is used, a rod or bar attached to said plate, an operating connection between the pot structure and a source of power, and means for causing said operating connection to engage said rod or bar between the points
115 of connection of said operating connection with the source of power and the pot structure, whereby when strain is exerted upon said operating connection, the plate will be forced outwardly and dislodge the skull, substantially as described.

3. The combination with a slag or cinder pot structure, of a cleaning device located in the bottom of the pot, and over which the skull
125 is formed as the pot is used, an operating connection between the pot structure and a source of power, means for causing said operating connection to engage the cleaning device between the points of connection of said
130 operating connection with the source of power and the pot structure, said operating connection being so attached to the pot structure that it will be released therefrom when the cleaning device is moved a predetermined

distance, whereby when strain is exerted upon the operating connection the cleaning device will dislodge the skull, and said operating connection will be detached from the pot structure, when the cleaning device has moved a predetermined distance, substantially as described.

4. The combination with a slag or cinder pot having a perforation in its bottom, of a plate in the bottom of the pot over which the skull is formed as it is used, a rod or bar connected with the plate, a rope or chain bearing against the outer end of said bar or rod, having one end connected to the pot structure and the other end attached to a source of power, substantially as described.

5. The combination with a slag or cinder pot having a perforation in its bottom, of a plate in the bottom of said pot, and over which the skull is formed as the pot is used, a rod adapted to bear against said plate, a bar attached to the pot structure, a rope or chain having one end detachably connected to said bar and passing over the end of the bar bearing against the plate, and means for pulling on said rope or chain, substantially as described.

6. The combination with a cinder or slag pot having a perforation in its bottom, of a plate in the bottom of said pot over which the skull is formed as the pot is used, a bar or rod bearing against said plate and having a rope-guide in its outer end, a rope or chain having one end detachably connected to a fixed support and adapted to be connected at the

other end to a source of power, a guide for said rope attached to the pot structure, said rope leading over the latter guide and the guide at the end of the bar or rod bearing against the plate, whereby the end will become detached from the fixed support when the plate has been moved a sufficient distance to dislodge the skull, substantially as described.

7. The combination with a cinder or slag pot having a perforation in its bottom, a plate in the bottom of said pot having a socketed boss passing through the perforation, a rod inserted in the socket of said boss and carrying a rope-guide at its other end, a rod having a projection forming a hook at one end and attached to the side of the pot, a rod having a rope-guide at one end and attached to the other side of the pot, and a rope or chain having one end attached to the said hook and leading over the said guides, with its other end adapted to be connected to a source of power, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

J. W. SHOOK.

ALBERT E. BARTON.

JOHN J. SHANNON.

JOSEPH DUNN.

ERSKINE RAMSAY.

Witness as to Shook, Shannon, and Dunn:

N. N. POLK.

Witness as to Barton and Ramsay:

J. W. RANDALL.