(No Model.)

J. C. SIMS.

APPARATUS FOR BLACKING MOLDS FOR ROLL PINIONS.

No. 282,676. Patented Aug. 7, 1883.

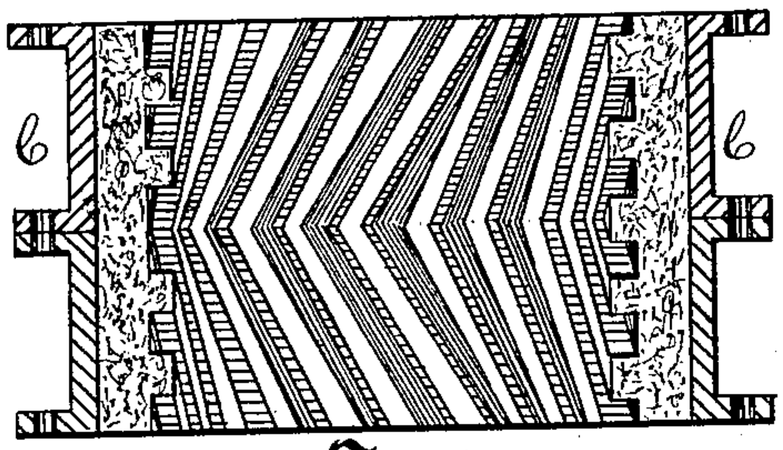

Fig 1.

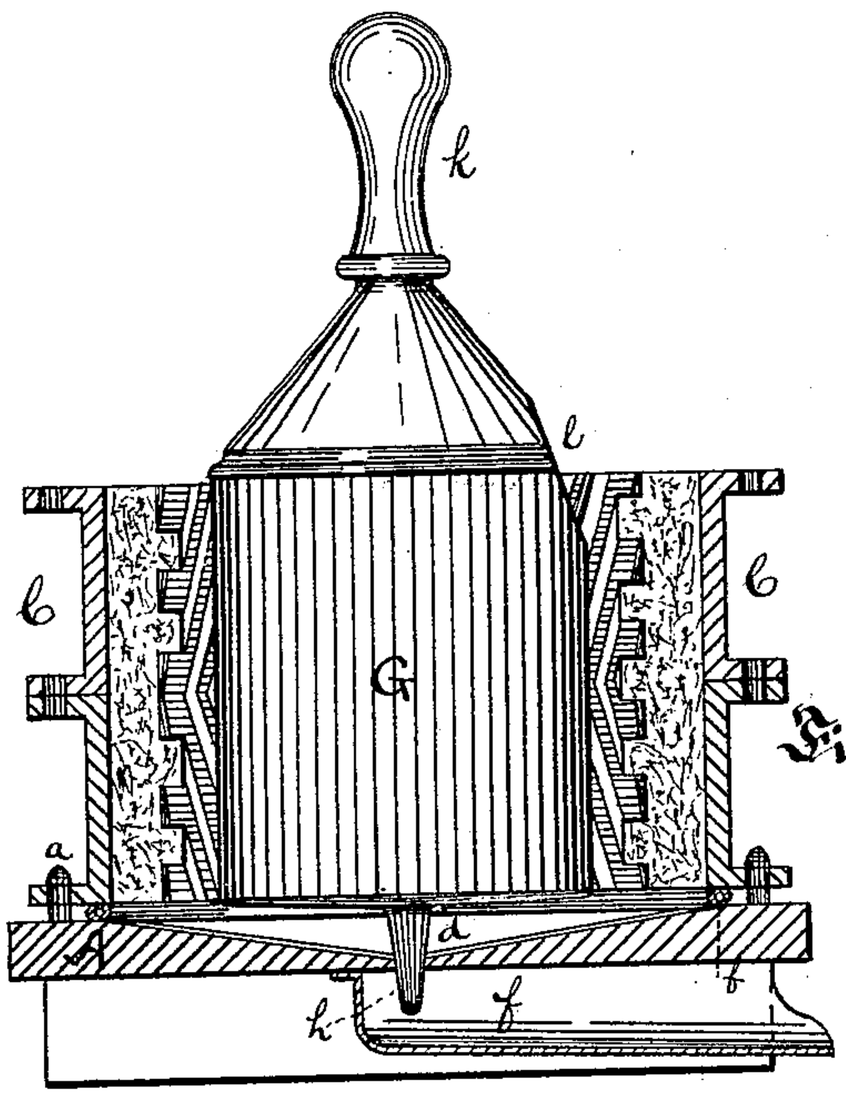

Fig 2.

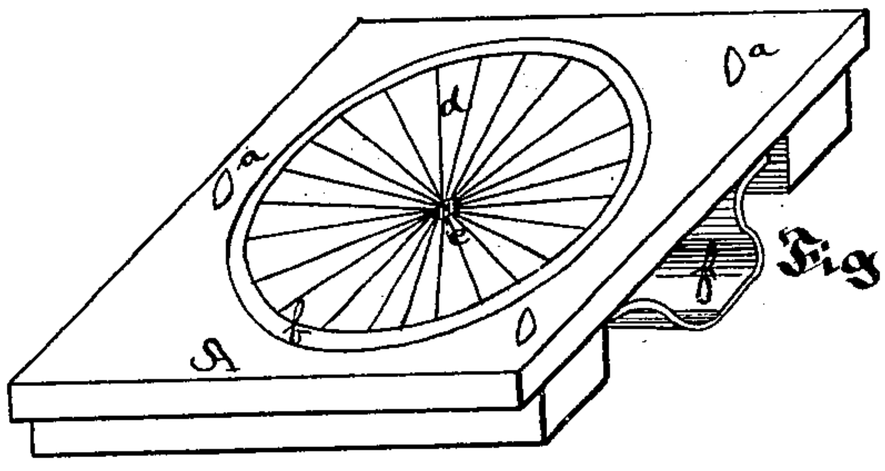

Fig 3.

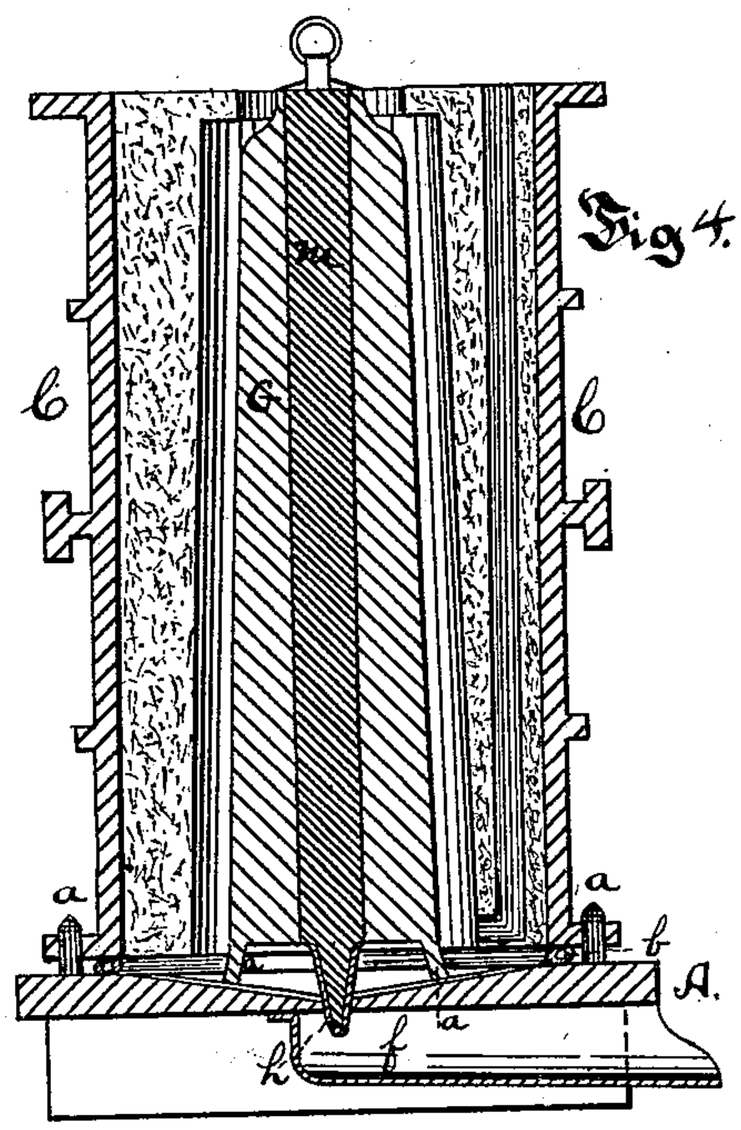

Fig 4.

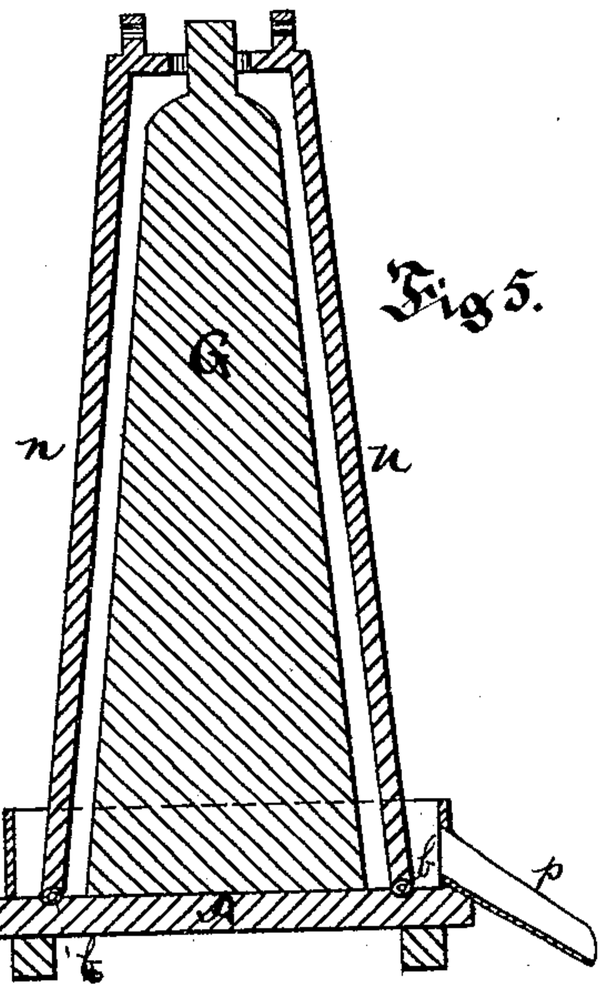

Fig 5.

Witnesses.

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UNITED STATES PATENT OFFICE.

JAMES C. SIMS, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND H. O. HORNBERGER, OF SAME PLACE.

APPARATUS FOR BLACKING MOLDS FOR ROLL-PINIONS.

SPECIFICATION forming part of Letters Patent No. 282,676, dated August 7, 1883.

Application filed March 30, 1883. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. SIMS, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Blacking Molds for Roll-Pinions, Gearing, &c.; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to means for blacking or painting molds, and has special reference to the blacking of irregular molds—such as molds for roll-pinions and gearing—and molds of different diameters—such as the ingot-molds employed for casting steel and the sand-molds for these ingot-molds or for large pipe. In casting these pinions and other heavy articles it is necessary to coat or paint the surface of the molds in order to prevent the sand or metal of the mold from sticking or adhering to the casting or ingot; and in order to black or paint the ordinary molds for casting water-pipe, it has been customary to suspend near the top of the mold a wooden or like disk of slightly smaller diameter than that of the mold and pour the blacking material or solution on this disk, the disk spreading the blacking, so that it coated the walls of the molds. This means of blacking was only applicable to blacking cylindrical perpendicular molds. Apparatus for blacking pipe has also been formed of a plug having a base or stopper which seated itself in the sand of the mold, and around which the blacking material was poured, the plug being withdrawn to discharge the blacking material; but this was not adapted to blacking irregular molds open at both ends—such as molds for roll-pinions and similar irregular molds—and in order to black these molds it has been necessary to employ brushes to paint the surface of the molds, and this of course consumes time and is laborious, and during the painting the mold is liable to be marred or injured. The usual method of coating ingot-molds with plumbago has been to suspend the mold by means of a derrick and paint it from below, the operation being dangerous and often imperfectly accomplished. For these reasons a rapid and efficient means of coating or blacking these irregular molds is much needed.

My invention consists, essentially, in combining with the mold to be blacked a supporting-board, packing to form a tight joint between them, and a plug corresponding approximately to the cavity of the mold to be blacked and adapted to fit within the mold-cavity, so that the space between the mold and plug may be filled with the blacking material, and then discharged at the base of the mold.

It also consists in certain other improvements in the construction of the apparatus employed, as hereinafter specifically set forth.

To enable others skilled in the art to practice my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a longitudinal section of a mold for casting a double spiral pinion. Fig. 2 is a like view of the mold and blacking apparatus, the plug being shown in full lines. Fig. 3 is a perspective view of the bottom board, on which the mold is supported during blacking. Fig. 4 is a longitudinal section, illustrating the painting of a long cylindrical mold, and Fig. 5 is a like view, illustrating the painting or coating of the ingot-mold.

Like letters indicate like parts in each.

My invention is particularly illustrated in connection with molds for double spiral pinions, as these pinions give a clear illustration of the irregular form of this class of molds and the difficulty of painting them. In painting these molds it was necessary to get in with the brush around all these cogs.

In my improvement I employ a bottom board or table, A, which can either be supported on a suitable trestle or frame, or upon a bucket or tub, into which the blacking or coating material may be discharged from the mold. The board is provided with the packing *b*, of rubber or other suitable material, which is secured to the board in such position that the flask C of the mold will rest upon this packing and thus form a tight joint between the mold and board. Within the packing-ring *b* the board A is hollowed out, as at *d*, the sides sloping downwardly to the center, at which the board is perforated to form the tap-hole *e*, and this portion of the board between the ring *b* and tap-hole *e* is preferably covered with tin

or like sheet metal. The board A is provided with suitable guide-pins, *a*, by which the mold or flask is held in proper relative position on the board. The tap-hole *e* may either open directly into a bucket, tub, or like receptacle, on which the board is supported, or the board may be provided with a trough, *f*, secured to its under surface, and leading from the tap-hole to one side of the board, where it may empty into a suitable receptacle.

G represents my improved plug, which is made slightly smaller than the interior diameter of the mold-cavity, so as to almost fill the cavity of the mold. It is provided with the stopper *h*, which fits into the tap-hole *e* of the board A, and it extends through the mold, the plugs for pinions and like molds being provided with a handle, *k*, by which it may be inserted into and lifted out of the mold-cavity. The stopper *h* is preferably covered with rubber or other suitable packing material to make a tight joint in the tap-hole *e*. At a point about opposite the top of the mold the plug G is beveled off to form the inclined face *l* to form a larger space for pouring the blacking material.

In coating or blacking these roll-pinions and like molds, the flask containing the mold is raised and placed on the board or table A, the edges of the flask resting on the packing *b*, and thus forming a water-tight joint between the board and mold. The plug G is then placed within the mold-cavity, its stopper fitting into the tap-hole *e*, and the mold is ready to coat. The blacking or coating material is then poured into the cavity between the mold and plug until the entire space is filled, the blacking material entering into all the irregularities of the mold and coating it perfectly over its entire surface. The coating material also coats the lower face of the mold, and, if it is desired to coat the upper face, this can be done with a brush in an instant. As soon as the mold is filled and thoroughly coated the plug G is raised, thus withdrawing the stopper from the tap-hole *e*, and the coating material is thus discharged from the mold into a suitable receptacle under or at the side of the table, all the surplus coating material being thus drained from the mold. The entire operation of coating does not generally occupy more than two minutes.

In coating or blacking long molds, the mold-cavities of which are of different diameters, such as pipe-molds, leaving flanges or pockets at the sides, or molds for casting the metal ingot-molds employed in steel works, as shown in Fig. 4, the plug G corresponds approximately to the mold-cavity, and the blacking apparatus is constructed in substantially the manner above described, differing only in that the stopper of the plug is attached to a rod, *m*, extending centrally through the plug, and the plug is supported on feet *a*, a short distance above the table A. The plug is placed on the table, the stopper fitting into the tap-hole *e*, and the flask containing the mold is raised by means of a crane or derrick and placed over the plug, its base resting on the packing *b*. The coating material is then poured between the plug and mold, as above described, and the stopper *h* on the rod *m* is raised a short distance by drawing on the rod to discharge the coating-material, and the coated mold is then lifted off the coating apparatus.

In coating the ingot-molds for casting steel the operation is substantially the same, and the same apparatus as that shown in Fig. 4 may be employed, the packing between the board and mold being formed of incombustible material such as asbestus, as these molds are often highly heated. I have, however, shown in Fig. 5 apparatus for more rapidly carrying out my invention with these ingot-molds. The board or table A is provided with the incombustible packing *b*, and the plug G is permanently secured to the table. The table is provided with the surrounding walls *n* and the spout *p* at one side. The mold is raised and placed over the plug, and, when lowered to place, the plumbago solution or coating material poured between them. The mold is then raised slowly and the coating material escapes between the table and the base of the mold and passes through the spout *p* to the receptacle, the coating of these heavy molds being thus rapidly accomplished. By my invention I am enabled to coat or black these molds of irregular forms or of different diameters rapidly and with very little labor, and the coating is spread over the entire surface of the mold more evenly and perfectly than when applied with a brush in the ordinary manner.

What I claim as my invention, and desire to obtain by Letters Patent, is—

1. In apparatus for coating or blacking molds, the combination of the mold to be coated, the supporting-board, packing between the mold and board, and the plug supported on the board and fitting within the mold-cavity, substantially as and for the purposes set forth.

2. In combination with the mold, the board for supporting the same, provided with a tap-hole, and the plug corresponding approximately to the mold-cavity and having a stopper adapted to close the tap-hole of the board, substantially as and for the purposes set forth.

3. In apparatus for coating or blacking molds, the combination, with the plug G, having the stopper *h*, of the board A, having the tap-hole *e* and trough *f*, substantially as and for the purposes set forth.

In testimony whereof, I the said James C. Sims, have hereunto set my hand.

JAMES C. SIMS.

Witnesses:
JAMES I. KAY,
J. N. COOKE.