(No Model.)

G. W. BILLINGS.

APPARATUS FOR LINING MOLDS.

No. 300,941. Patented June 24, 1884.

FIG. 1.

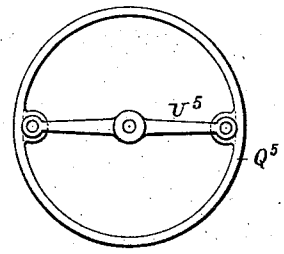


FIG. 2.

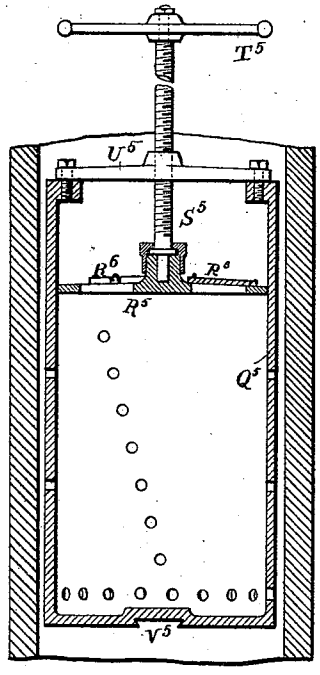


FIG. 4.

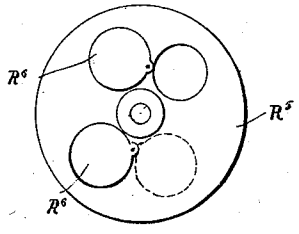
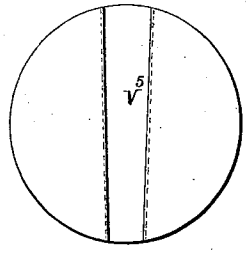


FIG. 3.



ATTEST.
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INVENTOR.
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By J. N. McIntire.
atty

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

GEORGE W. BILLINGS, OF CLEVELAND, OHIO.

APPARATUS FOR LINING MOLDS.

SPECIFICATION forming part of Letters Patent No. 300,941, dated June 24, 1884.

Application filed January 16, 1884. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. BILLINGS, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented an Implement or Apparatus for Lining or Coating Ingot and other Molds; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this application.

My invention relates to a new and useful implement or apparatus for applying the coating (of any of the usual suitable materials employed for that purpose) to the interior surfaces of molds used in casting steel ingots, &c.

My invention is designed more particularly for use in the preparation of molds which are lined with brick or otherwise, so constructed that it is necessary to have their interior surfaces coated over with some suitable material that can be laid on or plastered over the surface while in a plastic condition, and which will, after being smoothed out, become hard and dry and render the interior surface of the mold perfectly true and smooth, and at the same time capable of withstanding the heat to which it must be subjected when the mold shall be poured full of molten or liquid steel.

In another application for Letters Patent by me filed simultaneously with this will be found fully described and shown a form of brick-lined mold such as just above alluded to.

My present invention may be said to consist, primarily, in a contrivance for applying a coating of plastic material to the interior walls or surface of a mold, composed of a suitable receptacle (for holding the material) of a size and shape exteriorly to match the size and shape (in cross-section) of the interior surface of the mold, and provided with perforations for the escape of the contained plastic material as the said receptacle shall be moved endwise within the mold to be coated, all as will be hereinafter more fully explained; and my said invention may be said to consist, secondarily, in the combination, with such a contrivance, of means for forcing the contained material through its escape-aperture to a greater or less extent, at the will of the operator, as will be presently more fully explained.

To enable those skilled in the art to make and use a contrivance embodying my invention, I will now proceed to more fully describe my invention, referring by letters to the accompanying drawings, which form part of this specification, and in which I have illustrated my invention carried out in that form in which I have so far practiced it successfully:

In the drawings, Figure 1 is a top or end view of my novel mold-coating contrivance or implement. Fig. 2 is a vertical or longitudinal central section of the same, and Fig. 3 is a bottom view of the same. Fig. 4 is a top view of the follower detached.

In the several figures the same part will be found designated by the same letter of reference.

In the drawings, Q^5 is a hollow cylindrically-shaped device, one end of which, preferably the upper end, is left open for the ready insertion of a follower or piston-like device, R^5, adapted to work up and down within said cylinder, operated by means of a screw-shaft, S^5, that turns in a nut formed in the cross-head U^5, and that is connected at one end by a connection to the said follower, and provided at its other end with a hand-wheel, T^5. The follower R^5 is made, as shown, with two openings or holes in it to permit the introduction into the receptacle Q^5, beneath said follower, of the charge or supply of "dobe" used to coat or line the interior of the mold, and said openings are provided, as shown, with covers R^6, which prevent the escape of the dobe when the follower is being forced down. The upper open end of the cylinder Q^5 is cast with inwardly-projecting ears, (see Fig. 1,) to which are bolted or otherwise fastened the ends of the cross-head U^5, (see Fig. 2,) and the shell or body portion of said cylinder is perforated with numerous holes for the exudence, as will be presently explained, of the contained plastic material.

In using the contrivance shown the cylinder Q^5 is filled beneath the follower R^5 with the dobe, composed, mainly, of black-lead, but having in it the other usual ingredients to cheapen the compound, or with any of the suitable known materials for coating the interior of molds, (in a soft or plastic state,) and the cylinder is then introduced into the mold to be

coated. The cylinder is then moved back and forth within the mold, the follower R^5 having been forced down (by turning the screw-shaft S^5) so as to squeeze some of the contained material out through the perforations in the shell or body of the cylinder, and as the said cylinder is continuously drawn or moved back and forth within the mold the follower is periodically forced in so as to periodically feed out (through the said perforations) more and more of the coating material, which latter is, so to speak, plastered over the interior of the walls of the mold, and finally smoothed down until the interior of the mold presents a perfectly smooth cylindrical surface about equal in size to the exterior of cylinder Q^5 and composed wholly of the material which has been supplied from said cylinder. The mold thus coated or lined has its interior surface allowed to dry as usual, and is ready for use in the usual manner.

I have used this tool or contrivance mostly in giving an internal coating and smooth finish to brick-lined molds; but it may be used of course to line or coat the interiors of all sorts of molds requiring any sort of coating to be applied thereto before use.

In using this contrivance I have found it convenient (in connection with compressing machinery invented by me, and patented April 11, 1882) to force the cylinder back and forth within the mold by means of the piston and head used in compressing ingots in the molds, and I have therefore preferably formed the lower end or head of the cylinder Q^5 with a sort of dovetailed tapering recess, as seen at V^5, Figs. 2 and 3, adapted to receive or engage with a key such as shown in my patent of April 11, 1882, and which key in said patent would operate to secure the said cylinder to the plunger or head of piston-rod seen in said patent in the same manner that this sort of key fastens the core seen in said patent to the head of the piston-rod there seen. The holes or perforations in the cylinders Q^5 are arranged, preferably, in one circular series located near the bottom of the cylinder, and several other series or sets, each of which runs obliquely lengthwise of the shell, or (if desired) in helical lines; but the disposition, number, and size of these holes are of course matters of minor importance left to the judgment of the constructer, the only essential point being such an arrangement as will best effect an even distribution of the plastic substance forced through them, and will best permit the plain portions of the cylinder Q^5 to evenly and smoothly spread the material on the interior of the mold.

Various changes in the details of the various appliances shown and many modifications may obviously be made in the different parts of my invention without departing from the novel features peculiar thereto.

What I claim as my invention is—

1. A contrivance for lining the interiors of molds with plastic material, composed of the receptacle for holding the soft coating material, provided with perforations through which the soft material to be spread upon the inner wall of the mold may pass, and so sized and shaped exteriorly as to give to the interior of the lined or coated mold the desired size and shape, all substantially as set forth.

2. The combination, with a perforated receptacle adapted to contain the material to be applied to the interior of the mold, and designed to be moved back and forth within the mold to plaster over its interior surface, of a screw-follower or equivalent means for compressing the contents of said receptacle, and thus forcing the said contents out through the perforations, as set forth.

In testimony whereof I have hereunto set my hand this 29th day of December, 1883.

GEO. W. BILLINGS.

In presence of—
J. R. PRICE,
GEO. HOYT POMEROY.