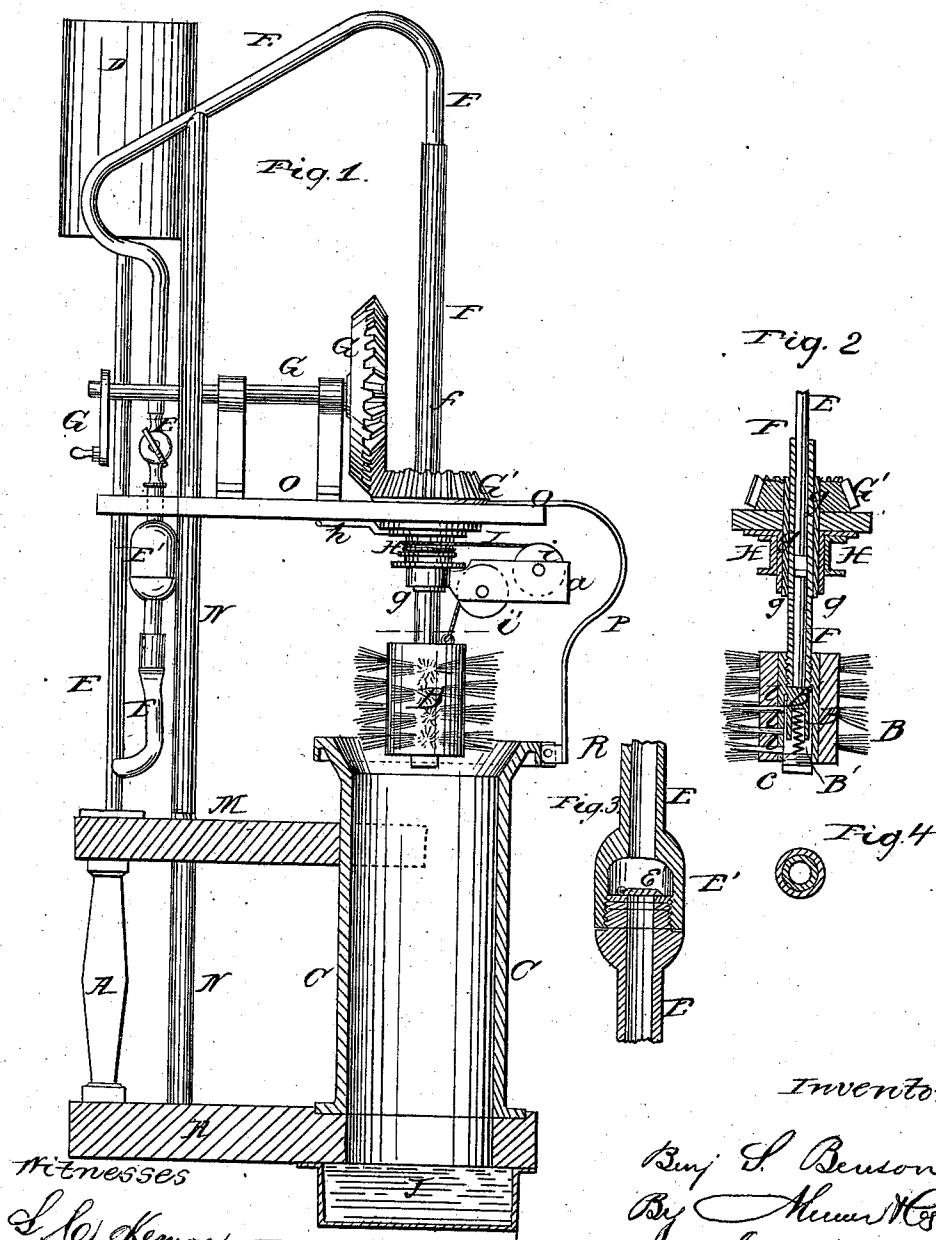


B. S. Benson,
Blacking Pine Molds.
N^o 83,448. Patented Oct. 27, 1868.



Witnesses
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BENJAMIN S. BENSON, OF BALTIMORE, MARYLAND.

Letters Patent No. 83,448, dated October 27, 1868.

IMPROVEMENT IN MOULD-BLACKING MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, BENJAMIN S. BENSON, of the city and county of Baltimore, and State of Maryland, have invented a new and improved Mould-Blackening Machine; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical section.

Figure 2 is an axial section of the brush and its stem.

Figure 3 is a similar section of the valve-chamber E'.

Figure 4 is a cross-section of the brush-stem, and showing their connection.

This invention is an improvement in machines for blacking the moulds used in casting metallic pipe, and consists in a new arrangement of the mechanism by which the blacking is fed to the brush, through the stem that holds the latter, and is thrown against the walls of the mould from among the bristles of the brush.

In the drawings, A A represent the frame of my machine, B the blacking-brush, C the mould, D the reservoir that holds the liquid blacking, and E is a pipe, provided with a cock, *e*, and a valve, *e'*, seating downward, in a small chamber or enlargement, E', the object of which pipe is to conduct the blacking-fluid from the reservoir D to the blacking-brush B.

The stem F, of brush B, is hollow, forming a sleeve, which encloses the lower end of pipe E, and slides up and down on it, the lower end of the pipe being properly packed. The interior of the brush itself forms a chamber, which receives the blacking, and from which it is discharged, through the walls of the brush, among the bristles, by means of small ducts, *b b b*. The lower end of the stem from which the blacking flows into chamber B' of the brush is provided with a spring-valve, *c*, seating upward. The stem F is rotated about the pipe E, within it, by means of a crank-shaft, and wheel, G, gearing with a horizontal wheel, G', through the centre of which the stem slides up and down, being prevented from rotating independently of the wheel by means of a spline, *f*.

The hub of the wheel G' is elongated below the wheel, and bears a spool, H, which, by means of a latch or stop, *h*, may be locked to, so as not to rotate at all, or may be unlocked, and left to revolve loosely upon the hub *g* of the wheel G'. A cord, I, passing over a couple of pulleys, *i i*, supported by an arm, *a*, which is itself supported by the hub, extends down to the upper end of the brush, to which it is attached.

Beneath the mould C, I provide a tank of water, J, the purpose of which will be hereafter explained.

M is a stout standard, projecting upward from the floor of the instrument, and serving as a spindle-step, upon which, when the brush is raised out of the mould, the brush, wheels, spool, and pipe E, can be swung

around out of the way, leaving the approach to the upper part of the mould unobstructed. The whole of said apparatus is pivoted on the standard M, by means of a long sleeve-socket, N, which slips down over the standard, and which not only allows the apparatus to be rotated on the standard, but also to be raised vertically, if necessity should require.

The wheel G' bears in an arm or beam, O, from the end of which a curved rod, P, extends down to a level with the top of the mould, where it supports a ring, R, the object of which is to encompass the top of the mould when the apparatus is in use, and thus to hold the wheel G, and the stem F, and brush B, so that they will work exactly in the axial line of the mould, in order that the space between the brush and the mould may be uniform on all sides, and the blacking may be evenly distributed. When the ring R is to be placed over the end of the mould, the whole apparatus is raised up, by sliding the sleeve N upward on the standard M, the ring is then swung to place, and properly adjusted, and the apparatus is lowered down, until the ring rests in its proper position, around the upper end of the mould, as seen in fig. 1.

The operation of a machine thus constructed is as follows:

After the ring R is fixed in position, as above explained, the latch *h* is unlocked, and the weight of the brush B causes it to fall through the mould into the tank J, where it is moistened by the water, and cleansed from all dirt that may have lodged among or upon the bristles.

The descent of the brush causes a suction in the tube E, which draws the blacking from the reservoir D, through the pipe E, the downward-seating valve *e'* in the pipe opening to allow the fluid to pass, and the upward-seating valve *c* of the brush being all the while closed by the action of its spring, seen in fig. 2. When the brush has fallen into the water, the valve *e'* closes, and prevents the return of the blacking to the reservoir. When the brush has thus fallen into the tank, pumping the blacking from the reservoir, and filling the pipe E, by means of its fall, the operator locks the spool H, by means of the latch *h*, so that the spool cannot revolve, and then, by means of the crank G, rotates the brush. The brush, to which one end of the cord I is fixed, thus turning on its vertical axis, and the spool, to which the other end of the cord is fixed, being immovable, the cord will be wound around the spool, and will slowly draw up the brush, through the mould, till it rises to the position seen in fig. 1. The moment the brush begins to ascend, it commences to shorten the distance between the valve *c* of the brush, and the valve *e'* of the pipe E, through all of which distance the pipes are filled with liquid blacking. The latter becomes instantly subjected to such a compression, therefore, that it must escape by some means or other. It cannot go back to the reservoir, by rea-

son of valve *e'*, so, when sufficient force has been applied to overcome the spring of valve *c*, it opens that valve, and injects the fluid into chamber *B'*, inside of the brush, and from that chamber, through the ducts *bb*, against the walls of the mould, and it continues thus to throw the blacking from the pipes into the mould, till the brush ceases to ascend. When the operator has caused the brush thus to pass up, through the mould, to its top, he removes the mould, puts another in its place, unlocks the spool, allowing the brush to fall into the water again, and is ready to repeat the operation above described.

It will be observed that in this instrument the brush and pipes *E* and *F*, with their valves, combine in one instrument a blacking-brush and a forcing-pump, forcing the liquid from the reservoir to the mould by the same means which are employed to distribute the blacking uniformly on the mould.

It will also be observed that the distribution of the blacking is as perfectly uniform as it is possible to have it, since the blacking is thrown from all sides of the brush, which, during the time, is rotating on its vertical axis, and rising through the moulds.

The operation of the whole instrument is exceedingly simply and convenient. In using it, there is no delay in adjusting the moulds, as all the working-parts are hoisted or swung out of the way.

The bristles of the brush are long enough to come in contact with the walls of the mould, and, as the brush revolves, they smooth down the blacking upon the walls.

On the 3d day of September, 1861, a patent was granted to me for an improved machine of this class, in which the blacking was poured by the workman into the mould, above the brush, and distributed by the latter as it descended. That machine also contained

a pump, which operated to force water into the mould as the latter, or the plunger, was raised and lowered. The machine was, however, essentially different in construction and operation from the one which forms the subject of this application.

The blacking was not automatically supplied through a tube while the brush was spreading and smoothing it; there was no revolving reciprocating blacking-brush; the apparatus for communicating motion to the brush was essentially different; and there were other points of marked dissimilarity, not only in the operation, but in the very purpose of the device.

In the present application I do not claim any of the improvements embraced in the former, nor anything operating in a similar manner, and for a similar purpose; but having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. Supplying the brush and mould with blackwash, or facing, for coating the inner surface of pipe-moulds, through a hollow shaft or tube, while the brush is spreading and smoothing it.
2. The reservoir *D*, communicating-pipes *E F*, valves *e' c*, and hollow revolving shaft, in combination with a revolving reciprocating brush.
3. The spool *H* and pawl or latch *h*, in combination with the cord *I* and pulleys *i i*.
4. A revolving reciprocating brush, in combination with a force-pump, so arranged that it will supply the brush with the blackwash at the time of its being rotated.

BENJAMIN S. BENSON.

Witnesses:

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