Firth & Ingham,

Blacking Pine Molds.

No. 26,486. Patented Dec. 20, 1859.

Fig. 1.

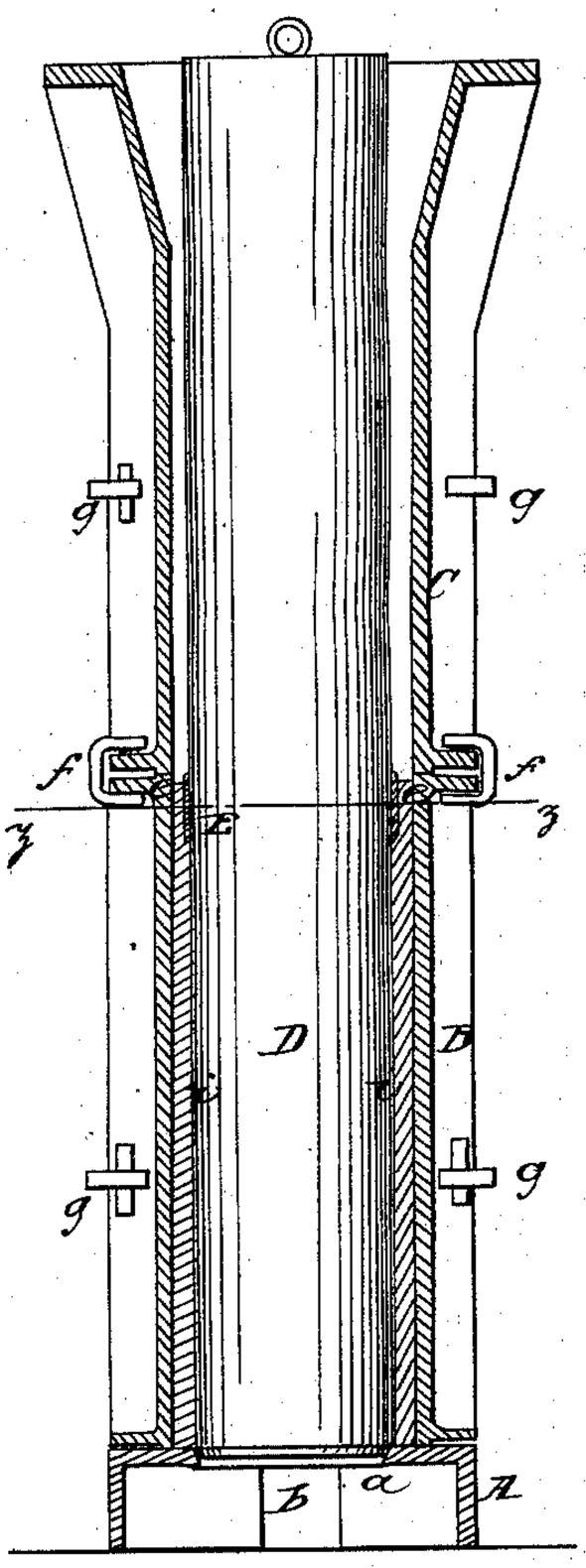


Fig. 2.

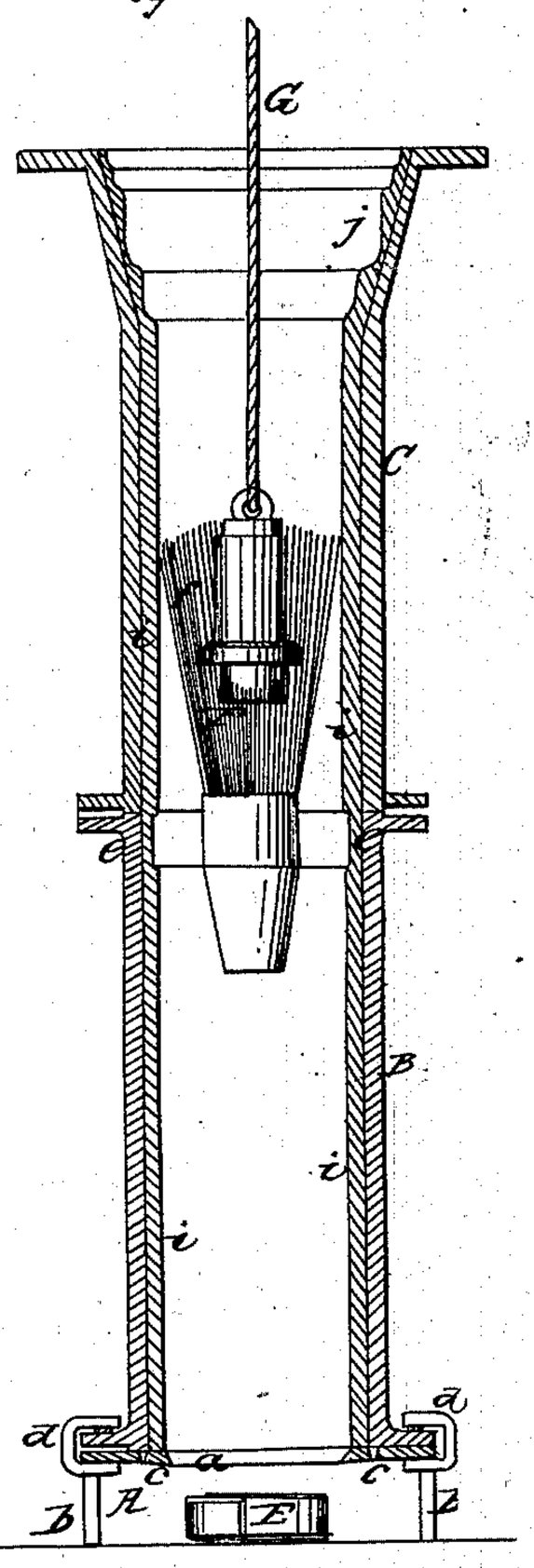
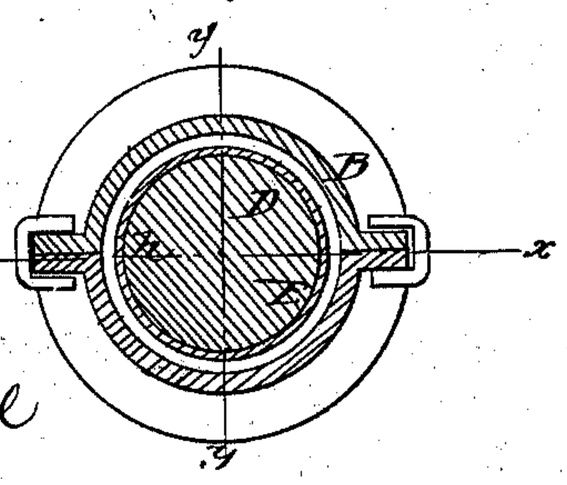


Fig. 3



Witnesses

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JOHN FIRTH AND JOHN INGHAM, OF PHILLIPSBURG, NEW JERSEY.

IMPROVEMENT IN PIPE-MOLDING.

Specification forming part of Letters Patent No. **26,486,** dated December 20, 1859.

To all whom it may concern:

Be it known that we, JOHN FIRTH and JOHN INGHAM, both of Phillipsburg, in the county of Warren and State of New Jersey, have invented a new and useful Improvement in Molding for Casting Pipes; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figures 1 and 2 are longitudinal central sections of the mold in the process of formation, *x x y y* in Fig. 3 indicating the planes of section. Fig. 3 is a transverse section of Fig. 1, taken in the line *z z*.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to an improvement in dry-sand molding for casting small pipes, whose molds have heretofore been necessarily jointed in order to admit of blackwashing and to remove the belt or boss patterns.

The object of our invention is to form the molds without joints for casting with belts or bosses, and blackwash the same in a perfect manner, as hereinafter fully described.

To enable those skilled in the art to fully understand and construct our invention, we will proceed to describe it.

A represents what we term a "bottom plate," which is an inverted shell provided with an opening, *a*, of circular form in its upper surface, the bottom plate having two slots or openings, *b b*, at opposite points in its side, both of which are shown in Fig. 2.

B represents a flask, which is fitted vertically on the bottom plate, A, and adjusted properly thereon by guide-pins *c c*, which are at the lower end of the flask, and fit in holes in the upper surface of the bottom plate, as shown clearly in Fig. 2. The flask B is secured to the bottom plate by clamps *d d*, which are also shown in Fig. 2. On the top of the flask B another flask, C, is secured by clamps *e*. Any proper number of flasks may be used, as circumstances may require. The flasks B C are each formed of two longitudinal parts connected by clamps *g*, as usual.

D is the body-pattern, which is of cylindrical form, or of a form corresponding to the pipes to be cast, and also corresponding to their external dimensions. This body-pattern has a flexible ring, E, placed on it, said ring being cut or divided, as shown at *h*, and beveled at its ends. The ring E, when detached from the body-pattern, will, on account of its elasticity, coil up or contract, forming a ring considerably smaller than the diameter of the body-pattern; but when adjusted on said pattern the ends of the ring will just be in contact, as shown in Fig. 3.

The mold is formed as follows: The flask B is secured on the bottom plate, A, and the body-pattern D fitting directly over the hole *a*, which serves as a guide for the central adjustment of the body-pattern within the flask B, the sides of the hole being made inclined to receive the lower edge of the body-pattern, as shown in Fig. 1. Sand *i* is then rammed down in the flask B between the body-pattern D and the flask, and ring E is fitted on the body-pattern and adjusted upon it so that its upper edge will be in line with the upper edge of the flask, the sand *i* being rammed around the ring. The flask C is then secured to the top of flask B and rammed with sand *i*, precisely the same as the flask B. A socket-pattern is introduced to form the socket-mold *j*, as shown in Fig. 2. The body-pattern D is then raised and withdrawn from the flasks B C, and the ring E is stripped from the body-pattern as the latter is withdrawn, and it drops within the bottom plate, A, the ring, of course, freely dropping in consequence of contracting or coiling as soon as the pattern D leaves it. The ring, as will be seen, forms the recess *e* in the mold for the casting of the belt or boss on the pipe.

The molds after being thus formed are blackwashed as follows: We employ a brush, F, of round form and somewhat larger in diameter than the mold. To this brush a handle or cord, G, is attached, and the brush is entered into the top of the mold and a sufficient quantity of blackwash poured on it. The brush is then lowered down through the mold. If a handle be used, the handle is detached when the brush is at the bottom of the mold and the handle raised or withdrawn. If a cord, G, be used, as shown in the drawings, the cord is dropped through the bottom of the mold. The molds, after being blackwashed, are placed bodily or entire in the oven and dried, and then removed bodily and lowered into the casting-pit, and are ready for the core and iron, no further manipulation being required.

The molds of small pipes—those of two inches diameter and less—have not hitherto been blackwashed in full length, (nine feet.) The molds have been parted for this purpose. Then, again, as belts or bosses are generally required on small pipes, in molding the pipes vertically it has been hitherto necessary to employ patterns to form the recesses *e* for casting the belts or bosses, said patterns being rigid rings and placed around the body-pattern at suitable points, and remaining in the mold when the body-pattern is withdrawn; hence the necessity of parting the molds in order to remove said patterns or rings. This parting of the molds as practiced by the old method of molding involves considerable labor and expense. It is necessary to have guide-pins and pin-holes in the joints of the flasks to be parted, so that the parts can be replaced with precision. In ramming up the molds the molder must make sand joints at each of the flask-joints. It is also necessary in all cases that each part of the flask should be clamped firmly in its place as they are rammed up. When the mold is rammed up and the body-pattern is withdrawn, the molder must remove the clamps from the joints to be parted, after which the mold is commonly parted into three lengths of about three feet each in length. The belt or boss patterns are then removed, and the short lengths of mold are blackwashed as follows: The molder has a hemp swab so small that it will swing around in the mold, yet so large that when well saturated with blackwash it will contain enough to blackwash the three-feet length of mold at once. The molder holds this swab by the tip end, and when he has entered the lower end into the mold he gives the upper end of the swab a sharp rotary motion. Then, lowering the swab quickly down the mold, its momentum keeps it rotating sufficiently long for the lower end of the swab to blackwash the mold to the bottom, after which the swab is withdrawn and the operation on that part of the mold is finished. The other parts are blackwashed in a similar manner, and they are then placed into the oven and dried, after which they are taken to the casting-pit, put together, and the joints reclamped firmly. This latter operation—reclamping—is attended with considerable difficulty. The joints must not only be tight, but the mold must be straight, and to accomplish this requires much time and ability. When one part of the mold is placed upon another, a straight-edge must be put into the mold and the wedges driven in the clamps till the mold is straight on two sides, after which the other part is put on and the straightening process repeated. After this the mold is ready for the core and the iron.

From the above description it will be readily seen, especially by molders or those skilled in the art, that the forming of molds without joints is extremely useful and valuable. In the first place, there is no use for steady-pins in the cross-joints. This saves much in the first cost of flasks. In the next place the molder has no sand joints to make, neither has he to take off the clamps from the joints and separate his flasks into three parts, nor take out the belt-patterns. By our improvement, the molds being entire or in one piece, they are conveyed bodily to the oven, and, when dried, removed therefrom to the casting-pit at one operation. We save, therefore, the entire amount of labor formerly needed to put the several parts of the mold together, clamp, and straighten them. We also save much indirectly. The difficulty in getting the molds straight in the old method is sometimes so great that the work is imperfectly done, and the pipes are frequently injured or spoiled on an account of the molds not being quite straight; and as we do not disturb the clamps we are enabled to make this class of pipes in twelve-feet lengths. This according to the old mode of molding is impracticable. Twelve-feet lengths could be made; but the risk and difficulty being so great the making of them in that way is precluded.

By our arrangement of blackwashing the work may be expeditiously done. The brush used, as shown, is allowed to conform or adjust itself to the varying diameter of the mold, and as it bears all around on the inner side of the mold and is supplied with the blackwash while near the top of the same, it will be seen that the desired work will be done by simply lowering the brush.

We would remark that the flexible ring may be constructed of leather with steel springs fitted therein, or steel alone may be used. We do not, however, confine ourselves to any particular material.

We wish it to be distinctly understood that we do not claim, broadly, the employment or use of a brush for blackwashing, for ordinary hand-brushes are now used for blackwashing large pipe-molds; but,

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The employment or use of the flexible or elastic ring E in connection with the body-pattern D, flasks B C, and bottom plate, A, or its equivalent, for the purpose specified.

2. Blackwashing the molds by means of a brush, F, or an equivalent device, supplied with the blackwash and passed through the molds, substantially as and for the purpose set forth.

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