

No. 676,762.

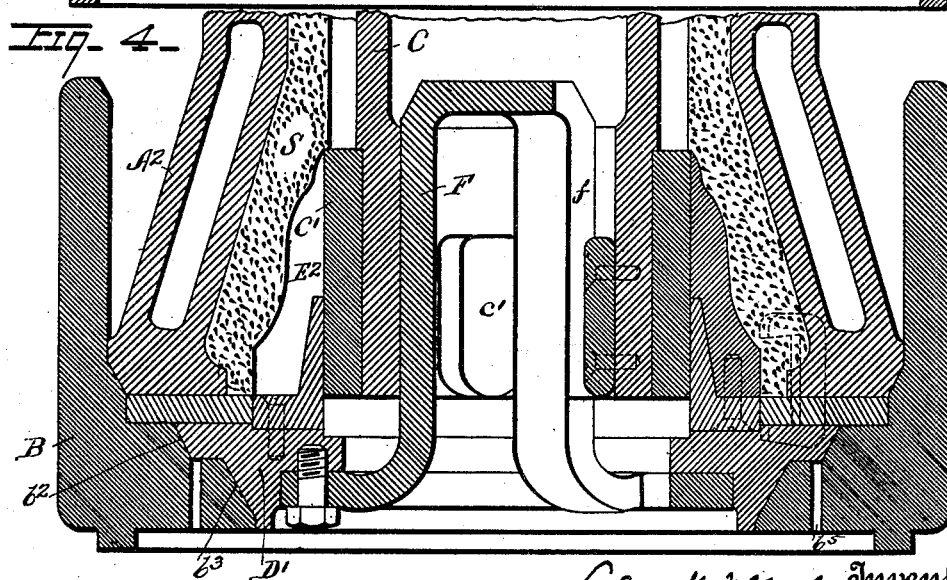
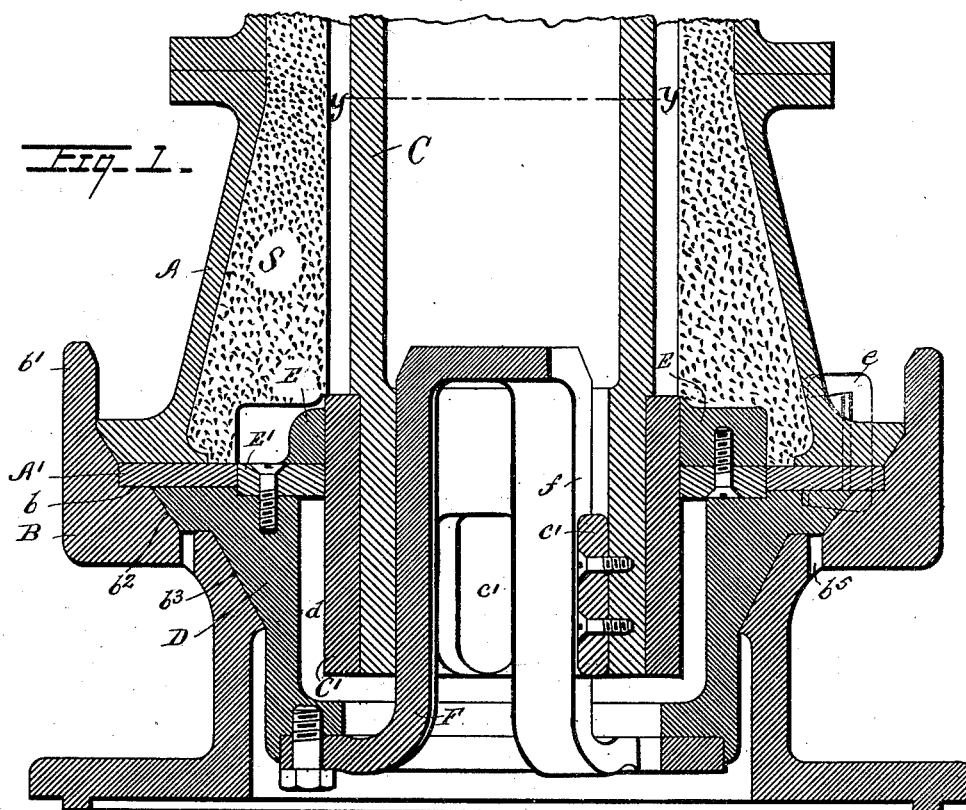
Patented June 18, 1901.

A. H. McNEAL.  
PIPE MOLDING APPARATUS.

(Application filed Feb. 28, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses  
*Caleb J. Rieker*  
*D. Stewart*

*Andrew H. McNeal* Inventor

*J. H. Stewart*

Attorney

No. 676,762.

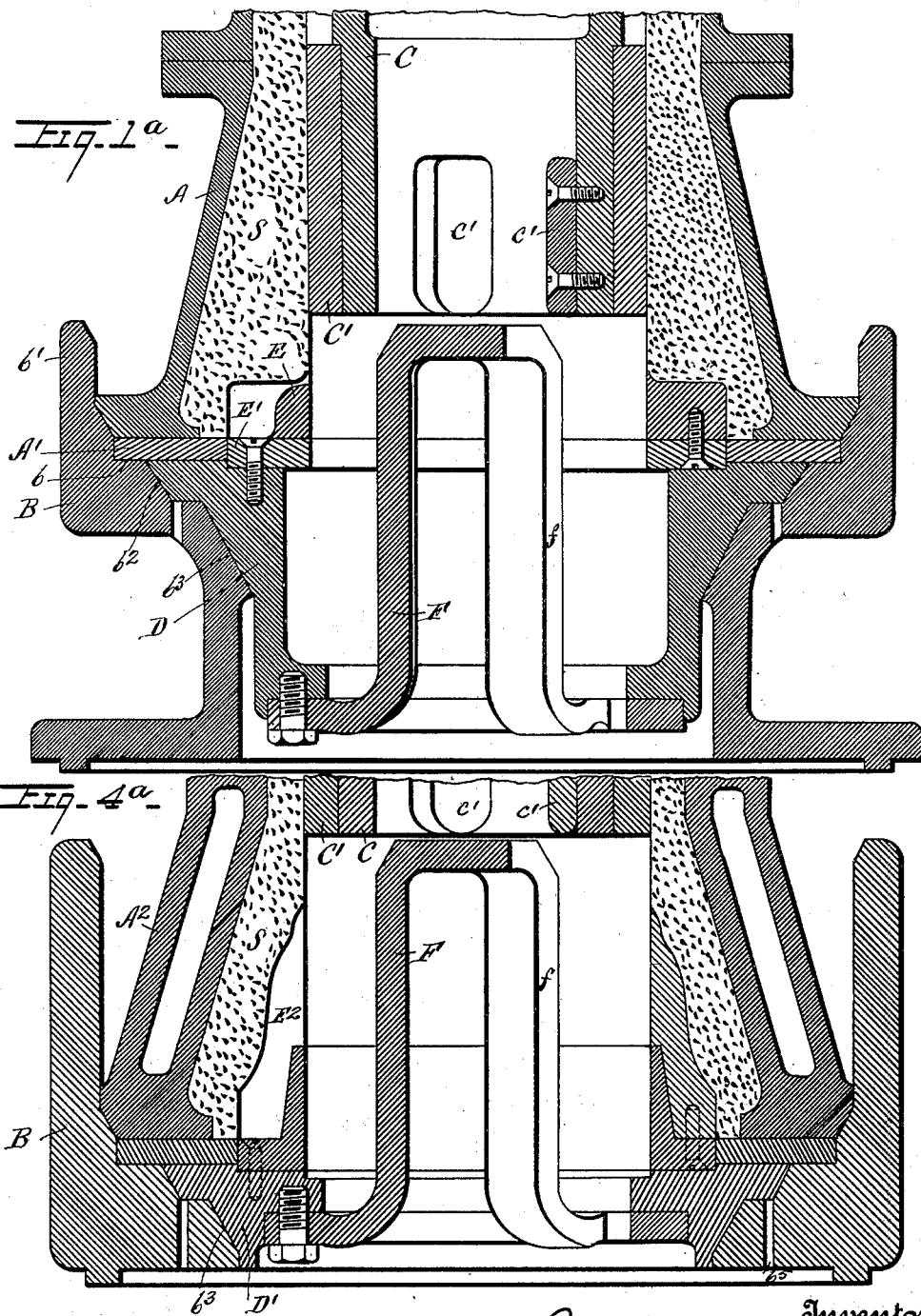
Patented June 18, 1901.

A. H. McNEAL.  
PIPE MOLDING APPARATUS.

(No Model.)

(Application filed Feb. 28, 1901.)

3 Sheets—Sheet 2.



Witnesses  
*Calder & Barber*  
*Drumstewart*

*A. H. McNeal* Inventor  
by *J. H. Stewart* Attorney

No. 676,762.

Patented June 18, 1901.

A. H. McNEAL.  
PIPE MOLDING APPARATUS.

(Application filed Feb. 28, 1901.)

(No Model.)

3 Sheets—Sheet 3.

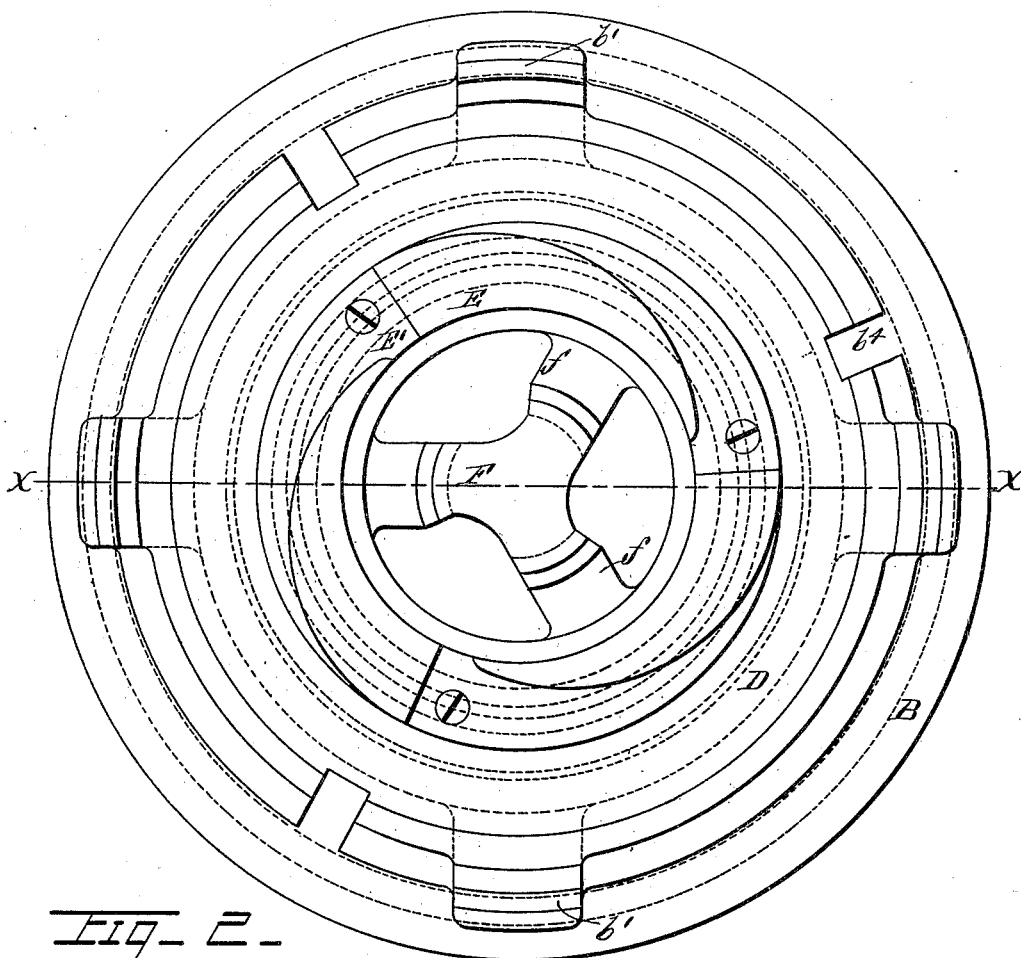


Fig. 2-

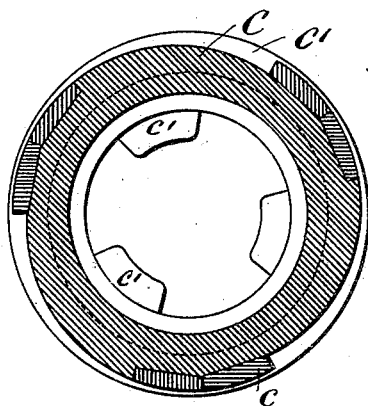


Fig. 3-

Witnesses  
David Levan  
D. M. Stewart

Inventor  
A. H. McNeal  
By  
D. M. Stewart Attorney

# UNITED STATES PATENT OFFICE.

ANDREW H. MCNEAL, OF BURLINGTON, NEW JERSEY.

## PIPE-MOLDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 676,762, dated June 18, 1901.

Application filed February 28, 1901. Serial No. 49,213. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW H. MCNEAL, a citizen of the United States of America, and a resident of Burlington, in the county of Burlington and State of New Jersey, have invented certain new and useful Improvements in Pipe-Molding Apparatus, of which the following is a specification.

My invention relates to pipe-molding apparatus designed to form the enlarged or flanged end of the mold simultaneously with the body portion and at the bottom of the mold, so as to more certainly secure sound metal at such portion of the casting.

My improvements consist more particularly in the construction of the separate rotary former for the flanged or bell-mouthed end of the mold and its relation to the cooperating rotary body-former and the relatively fixed flask and base-piece.

The invention is fully described in connection with the accompanying drawings, and the novel features are particularly pointed out in the claims.

Figure 1 is a cross-sectional elevation taken on the line  $x x$  of Fig. 2, showing the lower end of the flask, the base on which the latter rests, the rotary flange-former, and the rotary body-former, the latter being represented as lowered into engagement with the flange-former; and Fig. 1<sup>a</sup> is a similar view representing the rotary body-former as raised out of engagement with the flange-former. Fig. 2 is a plan view of the flange-former seated in the base-piece, the flask and body-former being removed. Fig. 3 is a sectional plan view of the body-former, taken on the line  $y y$  of Fig. 1. Figs. 4 and 4<sup>a</sup> are similar views to Figs. 1 and 1<sup>a</sup>, respectively, showing a modified construction for the forming of a bell-mouthed pipe end instead of a flanged one, as in Figs. 1 and 1<sup>a</sup>.

A represents the flask, the lower portion of which is of increased diameter to allow for the formation of the flange or bell-mouthed end of the mold.

B is the fixed base-plate or ramming-seat, formed with an annular seat  $b$ , upon which rests the draw-ring A', clamped to the bottom of the flask, the rim of which latter is guided vertically in concentric standards  $b'$  on the base-plate.

C is the rotary tubular body-former, having a cam-shaped profile in cross-section designed to compress the sand S outwardly, the main wearing-surface being preferably formed by removably-secured cam or pressing strips  $c$ , as set out in Patent No. 402,029, issued to me and W. A. Stineruck jointly, April 23, 1889. Its lower end is provided with a removably-secured sleeker-sleeve C', preferably a trifle larger in diameter than the cam-shaped portion of the former, and is formed with one or more interior lugs  $c' c'$ , designed to engage or disengage the separate bottom-end former, which I will now describe. This bottom-end former comprises a former head or stock D, centrally and rotably supported in the base-plate B, preferably upon conical seats  $b^2 b^3$ , cam-formers E, secured to said head or stock and rotated therewith to compress outwardly the sand S, forming the enlarged end of the pipe-mold, and a centering lug-engaging carrier or tongue F, secured to the head D, fitting loosely in the end of the body-former C and formed with vertical slideways  $f$  to engage the interior lugs  $c' c'$  on the lowered body-former, while permitting the latter to be freely raised out of such engagement, both of which positions are indicated in Fig. 1.

The former-cams E for the flange of the pipe are secured, as shown, to an annular plate E', which fits loosely in the draw-ring A' and is carried by the rotary former-head D. The overlapping inner edge of the draw-ring A' forms a bottom support for the sand S and, as already stated, is removably secured against the lower face of the flask A, preferably by clamps  $e$ , the lower heads of which loosely enter clearance-slots  $b^4$  in the base-plate when the flask is in position on the latter. Connected escape-holes  $b^5$  are also provided in the base-plate to release any particles of sand that may get under the former-head D.

In the slightly-modified construction indicated in Figs. 4 and 4<sup>a</sup> the former-cams E<sup>2</sup> differ in shape from the former-cams E, previously described, so as to form the mold with a bell-mouthed end instead of a flange end, but are likewise carried by the rotary former-head to form and pack the sand at the bottom of the mold, as desired. The construc-

tion of the flask A<sup>2</sup> is substantially the same as that of flask A, Figs. 1 and 1<sup>a</sup>, being enlarged in diameter interiorly to provide sufficient sand for the formation of the bell-mouthed end of the mold and similarly guided vertically in standards on the base-plate.

In operation the complete former-head is first placed in position in the recessed base-plate. The flask, with draw-ring A' clamped thereto, is then centrally supported on it, and, finally, the rotary body-former is lowered into engagement with the former-head and rotated with the latter until the sand supplied from above in any suitable manner is properly shaped and packed below, when the rotating body-former is gradually raised out of engagement with the former-head, carrying with it the sleeve C' and completing the packing and sleeaking of the body portion of the mold.

In my improved apparatus it will be seen that the cam pressing-faces upon both the enlarged head and upon the cylindrical body-former may be changed not only for the purpose of remedying wear, but also to vary the outside diameters either of the cylindrical body of the mold or of the flange or bell-shaped portion, or both. The body-former being centered interiorly at its lower end upon the entering carrier portion F of the former-head, the sleeve C', as well as the pressing-cams upon the body-former C, may be varied in size, as desired, ample clearance being provided in the bore d of the former-head, and the former-cams E being also readily changed to increase or decrease the flange or bell-mouth without involving any change in the flask, base-plate, or former-head.

What I claim is—

1. A pipe-molding apparatus comprising a base-plate, a flask seated thereon, a vertically-movable cylindrical body-former, and a former-head rotatably seated in said base-plate and provided with forming-cams and a central carrier-boss adapted to center and to engage the lowered end of the body-former so as to be rotated therewith substantially as set forth.

2. In a pipe-molding apparatus the combination with a base-plate having flask-centering standards and a former-head rotatably

seated therein and provided with a central carrier-boss, of a flask centrally seating on said base-plate, and a vertically-movable rotary body-former having its lower end centering on and engaging said carrier-boss of the former-head substantially as set forth.

3. In a pipe-molding apparatus the combination with a base-plate, a flask centrally seated thereon, and a vertically-movable rotary body-former, of a rotary former-head seated in said base-plate beneath the flask, and provided with a central carrier-boss adapted to fit within and engage the lower end of the body-former and an enlarged annular recess around said boss affording clearance-space for the sleeved end of the lowered body-former substantially as set forth.

4. In a pipe-molding apparatus the combination with a base-plate, a flask centrally seated thereon, and provided with a draw-ring clamped to the bottom face thereof, of a vertically-movable rotary body-former, a rotary former-head seated in said base-plate beneath the flask and adapted to fit within and engage the lower end of the body-former, an annular plate secured to said former-head and fitting between said draw-ring and the body-former, and forming-cams secured to said annular plate, substantially as set forth.

5. In a pipe-molding apparatus the combination with a base-plate, a flask centrally seated thereon, and a vertically-movable rotary body-former, of a rotary former-head seated in said base-plate and provided with removably-secured forming-cams and a central boss adapted to engage the body-former substantially as set forth.

6. In a pipe-molding apparatus the combination with a base-plate, a flask centrally seated thereon, and a vertically-movable rotary body-former, of a rotary former-head seated in said base-plate and provided with forming-cams and a removably-secured central boss adapted to engage the body-former substantially as set forth.

Signed at Philadelphia this 21st day of February, 1901.

ANDREW H. MCNEAL.

Witnesses:

E. C. RHOADS,  
JOHN THIEL.