Dec. 18, 1928. 1,695,855

W. D. MOORE ET AL

APPARATUS FOR MARKING PIPES

Filed June 3, 1926 3 Sheets-Sheet 1

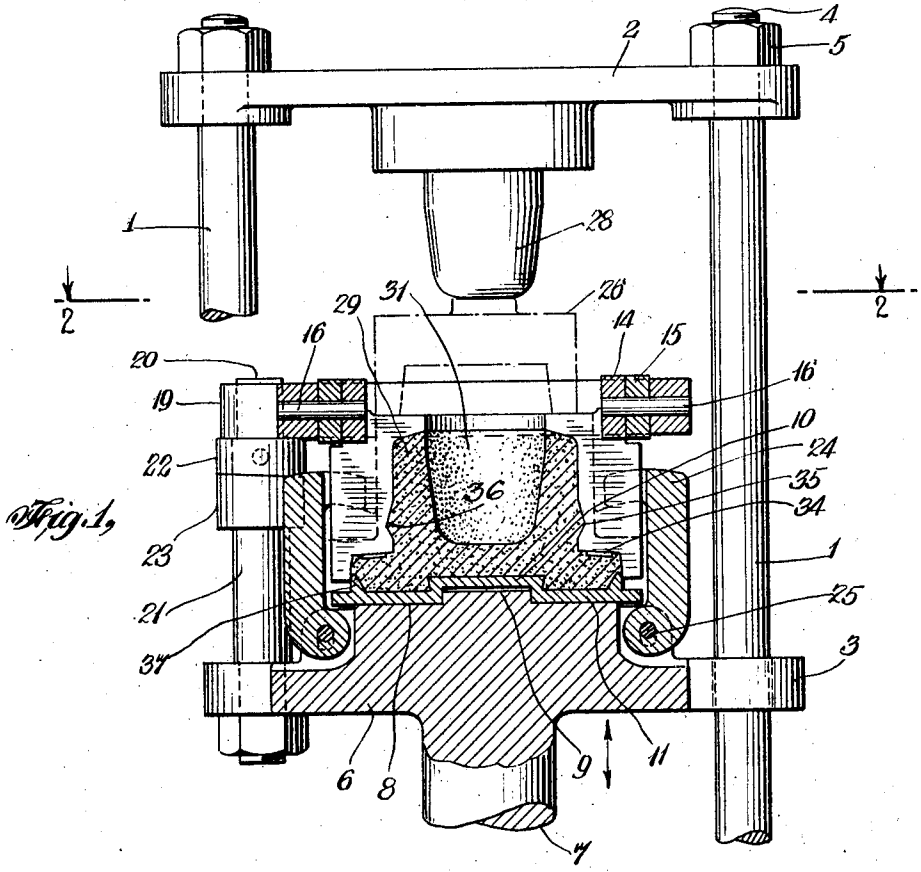


Fig. 1.

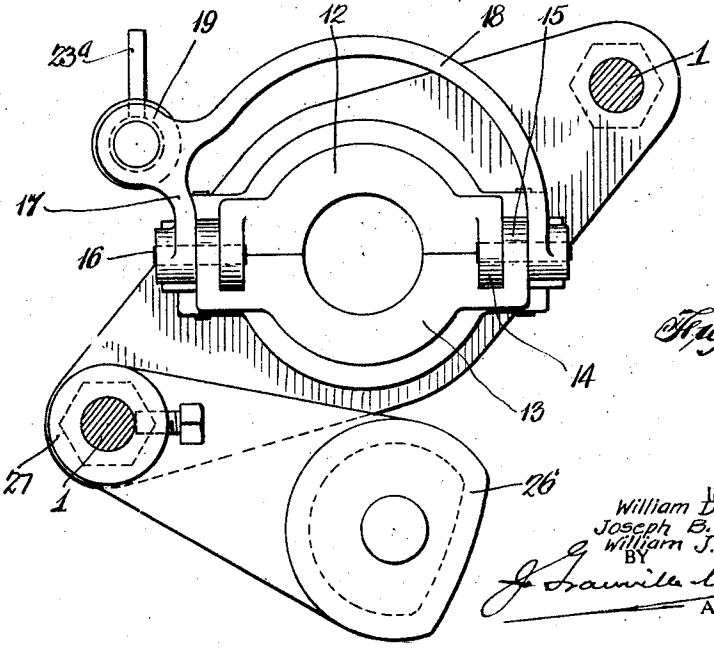


Fig. 2.

INVENTORS
William D. Moore
Joseph B. Loring
William J. Bowers
BY
J. Hamilton Meyers
ATTORNEY

Dec. 18, 1928. 1,695,855

W. D. MOORE ET AL

APPARATUS FOR MARKING PIPES

Filed June 3, 1926 3 Sheets-Sheet 2

Fig. 3.

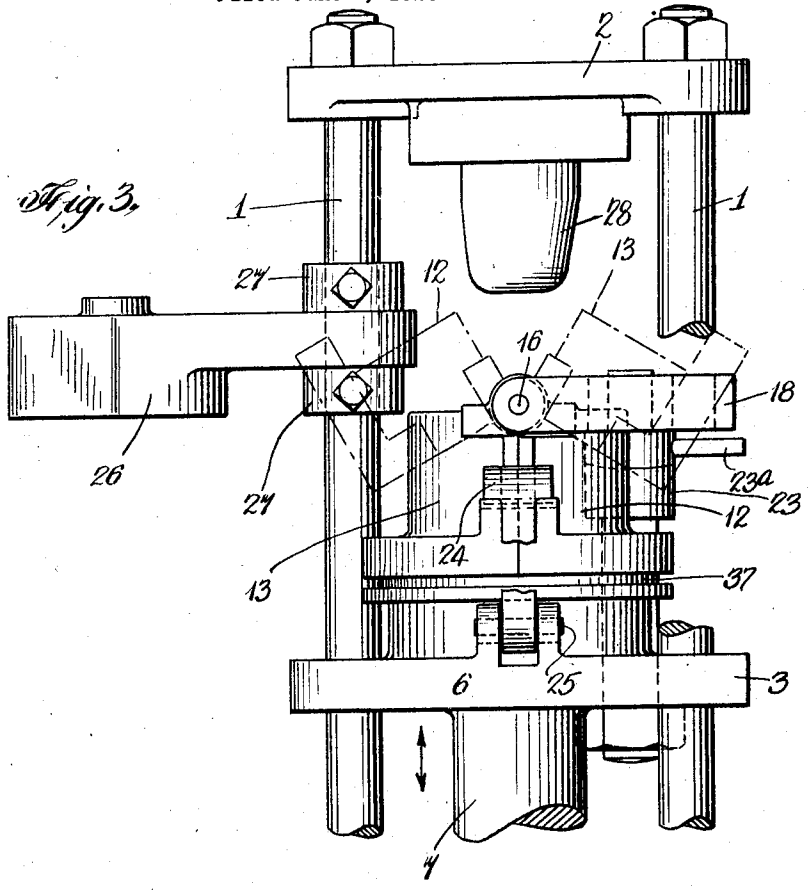
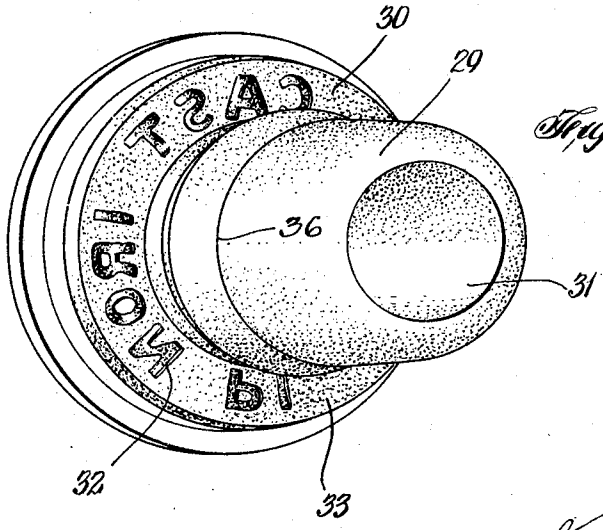


Fig. 4.



INVENTORS
William D. Moore
Joseph B. Loring
William J. Bowers
BY
J. Granville Meyer
ATTORNEY

Dec. 18, 1928. 1,695,855

W. D. MOORE ET AL

APPARATUS FOR MARKING PIPES

Filed June 3, 1926 3 Sheets-Sheet 3

Fig. 5,

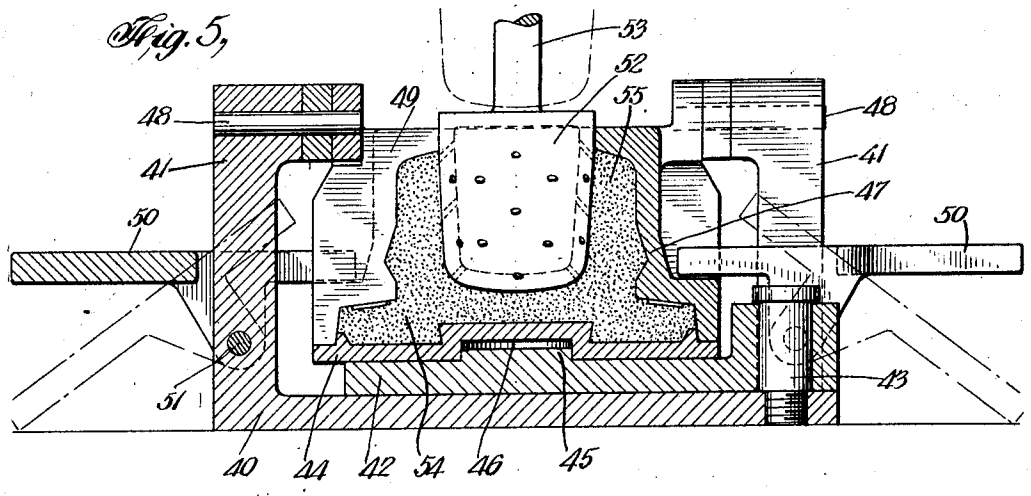
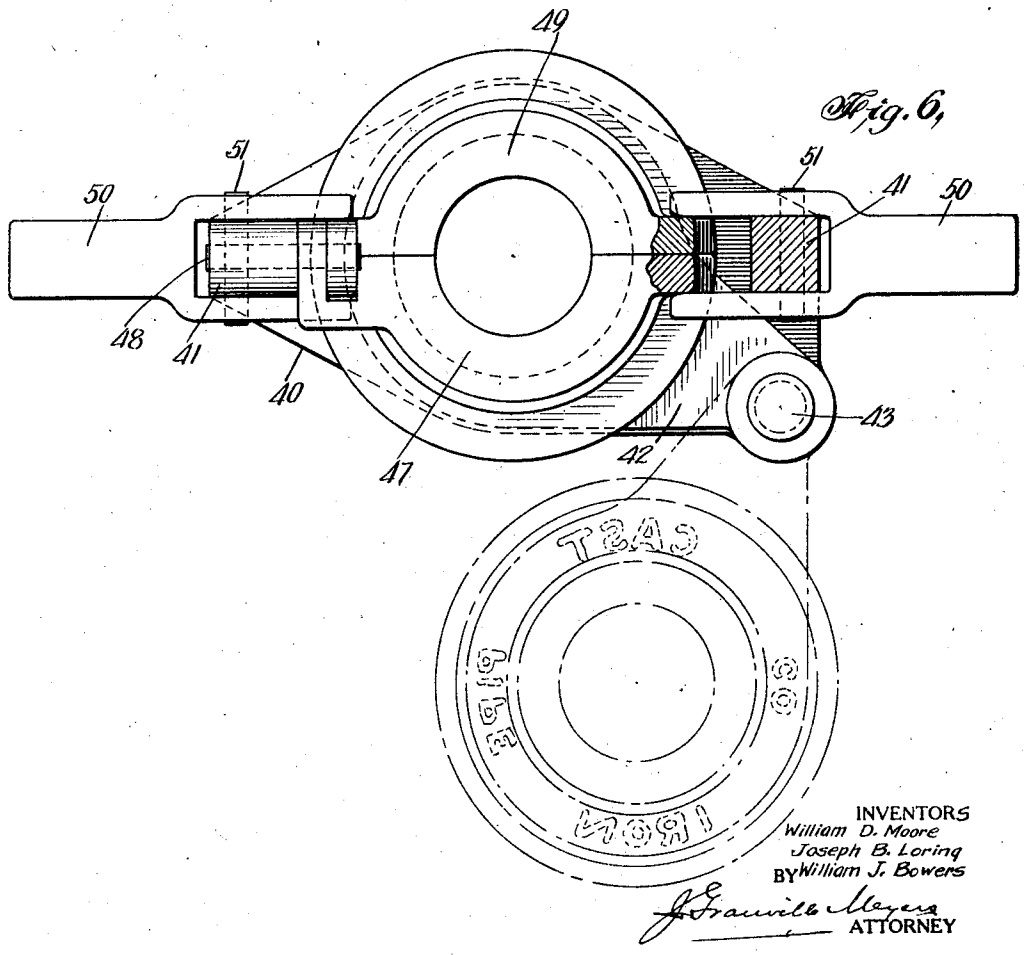


Fig. 6,



INVENTORS
William D. Moore
Joseph B. Loring
BY William J. Bowers
J. Granville Meyers
ATTORNEY

Patented Dec. 18, 1928. 1,695,855

UNITED STATES PATENT OFFICE.

WILLIAM D. MOORE, JOSEPH B. LORING, AND WILLIAM J. BOWERS, OF BIRMINGHAM, ALABAMA, ASSIGNORS TO SAND SPUN PATENTS CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

APPARATUS FOR MARKING PIPES.

Application filed June 3, 1926. Serial No. 113,411.

This invention is an improvement in mechanism for imprinting on cast articles designs in the form of letters and the like, and more particularly in a mechanism for imprinting designs such as trade-marks on the bell ends of centrifugally cast pipe of the bell and spigot type.

A convenient location for the design is on the end of the wall of the bell or socket. This surface faces axially or substantially so, and a design placed thereon is visible, even when the pipes are stacked.

Pipes of the character in question are cast in rotary molds, and a head core independent of the mold is utilized in the formation of the bell or socket end. The core, usually composed of oil and sand, molded to shape, has at one end a marginal annular rib, the inner face of which provides a convenient location for the matrix of the design.

Pipes of the character in question are sometimes cast in tiltable molds, the pouring or at least a portion thereof taking place while the mold is inclined with the bell end downward. While usually the mold is so manipulated during the pouring as to attain uniform longitudinal distribution of the molten metal without any excess at the head core end, it sometimes happens that a part of the molten metal may strike the face of the head core, where cooling quickly it is retained.

During the longitudinal distribution of the molten metal the mold is usually rotated slowly, at a speed insufficient to hold the metal on the mold wall. Circumferential distribution is attained by an abrupt and rapid increase in the speed of rotation, and this takes place at or near the end of the leveling operation.

Should any of the molten metal adhere to the face of the head core during the slow rotation, it will be thrown off during the rapid rotation and onto the inner surface of the casting wall. Such metal does not wholly merge into the metal of the wall, but remains as an excresence which later must be ground away.

For this reason the head cores are usually deeply recessed, axially on the inner face or end, so that any excess of metal will enter this recess and will be retained therein during the rapid rotation of the pipe and mold. The side wall of the recess is shaped to resist the radial urge of the centrifugal action on the retained metal, thus to prevent any impairment of the casting wall.

The cores are formed in mold boxes on a circular head plate by means of which the head core may be connected to the flask. The surface of the core which defines the end of the bell or spigot carries the design matrix, and this surface faces axially of the head core and in the opposite direction to the head plate. Referring to Figures 1 and 4, it will be seen that the matrix is on the inner wall of the annular flange or rib at the outer end of the head core. Just above it the head core has an external rib, spaced apart slightly from the flange, and since the mold box conforms closely to the external contour of the head core, it will be evident that axial movement of the mold and head core, which movement is obviously the best to separate mold and core without impairment of the design, is impossible.

One of the primary objects of the present invention is the provision of a core box or mold of a character such that cores may be made each with a clear, distinct and clean-cut matrix of the design without material deviation from the usual method of forming the cores.

Another object is the provision of a core box or mold of a character such that the box may be easily and quickly removed from the core on the head plate without impairment or marring of the design.

Another object is the provision of a box so formed as to facilitate the formation of a design carrying flange or rib of uniform density.

Another object is the provision of mechanism in connection with the mold box for forming the axial recess in a manner such that the formation of the recess will assist in obtaining a clear impression of the design.

With these and other objects in view the invention consists in the construction and novel combination of parts fully described hereinafter, illustrated in the accompanying drawings, and pointed out in the claims appended hereto, it being understood that various changes in the form, proportion, size and minor details of machine construction within the scope of the claims, may be resorted to

without departing from the spirit of the invention.

In the drawings forming a part hereof:

Fig. 1 is a vertical section through the improved mechanism.

Fig. 2 is a section on the line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 1 with the stop plate in inoperative position.

Fig. 4 is a perspective view of the completed head core looking from the inner end or face.

Fig. 5 is a plan view of an alternate construction.

Fig. 6 is a vertical section of the same.

In the present embodiment of the invention a suitable supporting frame is provided, including a pair of laterally spaced vertically arranged rods or standard 1, connected at their tops by a cross-plate 2. This plate has openings at its ends which receive reduced threaded stems 4 on the rods, and it is secured in place by means of nuts 5.

A cross-head 3 has guided vertical movement on the standard 1, and the head carries at its center an elevated substantially circular table 6, which forms the bottom of the mold box to be described, and carries the core plate of the head core, by means of which the head core is secured to the flask.

The cross head 3 is the upper end of a plunger 7, mounted in a suitable cylinder not shown, in which the plunger is moved by means of fluid under pressure, as for instance water, the flow of the fluid being controlled in any usual manner. The upper face of the table is annularly rabbeted at its periphery as shown at 8, to provide a central boss 9, which fits within the recess 10 on the adjacent face of the core plate 11, the said recess being central to the core plate.

The core plate forms the bottom of the mold, and the side walls and top are constituted by similar sections 12 and 13. Each of these sections which are of substantially semi-cylindrical form, has a pair of hinged ears 14 and 15 respectively at its top, the corresponding ears of the pairs lapping upon each other. Each pair of lapping ears is engaged by a pintle pin 16, supported by one of the arms 17 or 18 as the case may be of a substantially yoke shaped member, the body of which is a bearing 19.

The bearing 19 engages the reduced upper end 20 of a hinge post 21 supported by the crosshead, and the body rests upon a cam sleeve 22 rotatable on the post and provided with a handle 23^a for convenience in manipulating the same. A complementary cam sleeve 23 is secured on the post just below the sleeve 22, and the abutting ends of the sleeves are so shaped that relative rotative movement of the sleeves in one direction will move them away from each other. The arrangement is such that when the handle 23^a is moved angularly the yoke shaped member and the mold sections will be slightly lifted, that is, will be moved away from the table 6 a slight distance as for instance $\frac{1}{8}$ of an inch.

The mold sections 12 and 13 are clamped together to complete with the core plate the formation of the mold, by clamps 24 pivoted to the table as indicated at 25 with a lost motion connection. The connection is such that the table may move slightly vertically with respect to the sections without disturbing the position of the clamps with respect thereto. The sections 12 and 13 have marginal vertical ribs which abut when the sections are closed, and the clamps are U-shaped to engage the abutting ribs at each side of the mold. Thus the sections are clamped together, and a limited movement of the table with respect to the mold sections, for a purpose to be presently described, is permitted.

A stop plate 26 is hinged to one of the rods 1, between a pair of holding collars 27 on the rod, and this plate is adapted to be swung into and out of position over the mold box. When in position over the box, the stop plate engages the upper ends of the mold sections to prevent upward movement thereof during the lifting of the table. When the stop plate is swung away from over the mold, it permits access to the mold cavity, and enables the operation of the recess forming plug, to be described.

The plug 28 is carried by the cross plate 2, depending from the center thereof between the standards or rods 1. The plug is shaped to form a recess of the desired shape and capacity, and it is moved into the mold by relative movement of the plate 2 and the table, the table in the present instance being the movable element.

Referring to Figures 1 and 4 it will be seen that the improved core includes a body 29 having at one end a marginal annular flange 30, and at the other an axial recess 31 of relatively great depth. The design indicated at 32 is formed on the annular axially facing surface 33 between the circular side wall of the body and the circular side wall of the flange. The head core is as before stated supported in the flask at the bell end thereof, and assists in the formation of the bell end of the casting.

The shoulder or ledge 33 forms the end of the bell, and with the design on this surface, it will be impressed on the casting on the face of the bell. The characters forming the pattern and indicated at 34 are raised on the mold sections 12 and 13 at the lower ends thereof, and it will be noticed referring to Figure 1 that the said sections have an internal groove 35 just above this point, which provides for the annular rib 36 on the head core. Obviously it would be impossible to separate mold and head core by axial movement on account of the rib and groove 35—36 in head core and mold wall respectively.

Only such movement would enable separation of matrix and design to leave a clear cut impression.

The operation is as follows: With the parts in the position of Figures 1 and 2, but with the stop plate 26 swung aside as in the position of Figure 3, a suitable molding material, as for instance sand and oil is packed into the mold through the opening at the top. It will be noticed referring to Figure 1 that the head plate has an annular rib 37 on its upper face which abuts the inner surface of cavity wall of the mold sections 12 and 13. This arrangement permits relative movement of mold sections and head plate without leaving an opening between them.

After the molding material has been packed as above described, the stop plate is swung into position above the mold, and the table 6 is lifted slightly, usually about 1/8 of an inch. This movement compresses the molding material closely into the pattern. The stop plate is now swung outwardly into the position of Figure 3, and the table is lifted toward the recess forming plug 28, forcing the plug through the opening at the top of the mold and down into the molding material therein. The recess 31 is formed, and the formation of the same insures the dense packing of the molding material into all parts of the mold cavity.

The table is now lowered, the catches 24 released, and by means of the cam 22 the parts are loosened, the mold sections being moved slightly with respect to the head plate. The mold sections may now be swung outwardly and upwardly away from the head core. This combination of outward and upward movement withdraws the raised characters on the mold sections from the matrix on the said core without impairing the same, and without impairment of the sharply cut lines of the same. The entire mold top including the sections 12 and 13 and the yoke-shaped member may be swung away from over the head plate giving free access thereto. Cores of various size and for pipes of different classes may be made on the same measurements, merely by changing the box sections.

In the alternate construction shown in Figures 5 and 6, a base plate 40 is provided having oppositely disposed substantially vertical standards 41. Upon the base plate a core plate 42 is arranged, the said support being hinged at 43 to the base plate, on a vertical axis, to swing outwardly away from the base plate for a purpose to be presently described

The core plate 44 similar to that shown in Figures 1 to 4 rests upon the core plate support, the said support having a central boss 45 engaging a central recess 46 in the bottom of the core plate. The mold body sections 47 similar to those shown in Fig. 1 are hinged to the standards 41, on pivot pins 48 which hinge the section to swing outwardly and upwardly away from each other and from the core plate and the core thereon.

The body mold sections have the abutting flanges 49, and each pair is engaged by the arms of a yoke-shaped clamp 50 pivoted at 51 to the standards 41, to swing into and out of clamping position. When the clamps are in the position of Fig. 6, the arms of the forks engage the abutting ribs, locking the body mold sections together.

The recess forming plug 52 is provided with any suitable means for manipulating the same, as for instance a handle 53, and the mold is adapted to rest upon a table, bench or the like when in use. The mold may be supported upon a movable plunger if desired in the same manner as in the Fig. 1 construction, and the plug may occupy a fixed position above the same. The alternate construction is more particularly adapted to hand ramming, and the operation is as follows:

With the mold body sections in proper position above the core plate support, and clamped together, and with the core plate on the support, the sand properly prepared is introduced through the top of the mold and packed into place, it being understood that the body mold sections are provided with the design pattern to reproduce the design matrix on the rib 54 of the core 55. After the mold has been properly packed, the plug is used to from the recess, and the pressure due to the entrance of the plug into the mold completes the close packing of the sand.

The plug is then removed, the clamps are released, and the body mold sections are swung outwardly and upwardly away from each other. The core plate support with the core plate and core is swung outwardly from beneath the body mold sections, and to one side, where the core is easily accessible for removal. Any suitable means may be provided for holding the body mold sections in open position, as for instance any usual and well-known form of latch.

If desired, the sand which forms the core may be blown into the mold. In order to enable this action, the recess forming plug is made hollow as shown in the plug 52 in Figures 5 and 6, and openings or blow holes lead from the hollow to the exterior. These openings are spaced over the entire area of the plug.

It will be apparent from the drawing and the description, that the improved mold includes a body and a bottom, the body reamed or counterbored at the end adjacent to the bottom to provide an annular shoulder facing the body and spaced apart therefrom when the parts are in molding position. The shoulder and the body cooperate in the molding operation to form the annular external flange at the end of the core.

What is claimed is:

1. A mold for head cores for the bell ends of cast pipes of the bell and spigot type, including a hollow mold contoured to form at one end of the head core an annular marginal rib with a selected design on the face adjacent to the core, the mold sectional, the sections relatively movable, means to impart relative movement to the sections to compress the rib, and independent means to move the sections apart to partially release the matrix from the design.

2. A mold for head cores for the bell ends of cast pipes, provided with a design to form a matrix in the head core for reproducing the design at the end of the bell, the mold including a bottom, and a body composed of similar sections hinged together at the end remote from the bottom to swing outwardly therefrom, and means for locking the sections together supported by the bottom and having a lost motion connection therewith.

3. A mold for head cores for the bell ends of cast pipes, including a mold contoured to form at one end of the mold an annular rib with a selected design on the face adjacent to the core, the mold sectional and open at the top, and a recess forming plug shaped to move into the opening to form an axial recess in the core.

4. A mold for head cores for the bell ends of cast pipes, including a bottom to define one end of the core, and a body to define the side wall and opposite end, said body enlarged internally at the end adjacent to the bottom to provide at the end of the core an annular rib for defining the end of the bell, the enlargement providing a shoulder at the inner end thereof facing the bottom, and having thereon a design to be reproduced as a matrix in the head core, the body composed of similar sections hinged together at the end remote from the bottom to swing outwardly and upwardly from the bottom.

5. A mold for head cores for the bell ends of cast pipes, including a bottom to define one end of the core, and a body to define the side wall and opposite end, said body enlarged internally at the end adjacent to the bottom to provide at the end of the core an annular rib for defining the end of the bell, the enlargement providing a shoulder at the inner end thereof facing the bottom, and having thereon a design to be reproduced as a matrix in the head core, the body composed of similar sections hinged together at the end remote from the bottom to swing outwardly and upwardly from the bottom, the bottom and body mounted for relative axial movement.

6. A mold for head cores for the bell ends of cast pipes, including a bottom to define one end of the core, and a body to define the side wall and opposite end, said body enlarged internally at the end adjacent to the bottom to provide at the end of the core an annular rib for defining the end of the bell, the enlargement providing a shoulder at the inner end thereof facing the bottom, and having thereon a design to be reproduced as a matrix in the head core, supports for the bottom and body having relative axial movement, the body support mounted to swing out of alinement with the bottom, the body composed of similar sections hinged to the support.

7. A mold for head cores for the bell ends of cast pipes, including a bottom to define one end of the core, and a body to define the side wall and opposite end, said body enlarged internally at the end adjacent to the bottom to provide at the end of the core an annular rib for defining the end of the bell, the enlargement providing a shoulder at the inner end thereof facing the bottom, and having thereon a design to be reproduced as a matrix in the head core, supports for the bottom and body having relative axial movement, the body support mounted to swing out of alinement with the bottom, the body composed of similar sections hinged to the support, and means to lock the body sections together.

8. A mold for head cores for the bell ends of cast pipes, including a bottom to define one end of the core, and a body to define the side wall and opposite end, said body enlarged internally at the end adjacent to the bottom to provide at the end of the core an annular rib for defining the end of the bell, the enlargement providing a shoulder at the inner end thereof facing the bottom, and having thereon a design to be reproduced as a matrix in the head core, the body composed of similar sections hinged together at the end remote from the bottom to swing outwardly and upwardly from the bottom, the body having a central opening at the end remote from the bottom, a stop plate mounted to swing over the opening, the bottom and body mounted for relative axial movement with respect to each other and with respect to the stop plate.

9. A mold for head cores for the bell ends of cast pipes, including a bottom to define one end of the core, and a body to define the side wall and opposite end, said body enlarged internally at the end adjacent to the bottom to provide at the end of the core an annular rib for defining the end of the bell, the enlargement providing a shoulder at the inner end thereof facing the bottom, and having thereon a design to be reproduced as a matrix in the head core, the body composed of similar sections hinged together at the end remote from the bottom to swing outwardly and upwardly from the bottom, the body having a central opening at the end remote from the bottom, and a recess forming plug of a size to pass through the central opening, the bottom and body having relative axial movement with

respect to each other and with respect to the plug.

10. A mold for head cores for the bell ends of cast pipes, including a bottom to define one end of the core, and a body to define the side wall and the opposite end, said body reamed or counterbored at the end adjacent to the bottom to provide an annular shoulder facing the bottom and spaced apart therefrom, said shoulder and bottom cooperating in the molding operation in the formation of an annular external flange at the end of the core.

11. A mold for head cores for the bell ends of cast pipes, including a bottom to define one end of the core, and a body to define the side wall and the opposite end, said body reamed or counterbored at the end adjacent to the bottom to provide an annular shoulder facing the bottom and spaced apart therefrom, said shoulder and bottom cooperating in the molding operation in the formation of an annular external flange at the end of the core, and means in connection with the shoulder to form a design matrix on the adjacent face of the flange.

12. A mold for head cores for the bell ends of cast pipes, including a bottom to define one end of the core, and a body to define the side wall and the opposite end, said body reamed or counterbored at the end adjacent to the bottom to provide an annular shoulder facing the bottom and spaced apart therefrom, said shoulder and bottom cooperating in the molding operation in the formation of an annular external flange at the end of the core, and means in connection with the shoulder to form a design matrix on the adjacent face of the flange, said body and bottom mounted for relative axial movement, the bottom having an annular rib fitting within the end of the body to enable such relative axial movement within limits without complete separation of the parts.

13. A mold for head cores for the bell ends of cast pipes, closed at one end, and internally enlarged at the said end to provide a core molded in the mold with an annular flange at the said end of the mold, the mold having means to form a matrix on that face of the flange remote from the closed end.

Signed at Birmingham, in the county of Jefferson, and State of Alabama, this 12th day of May, A. D. 1926.

WILLIAM D. MOORE,
JOSEPH B. LORING.
WILLIAM J. BOWERS.