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PUMP MECHANISM FOR TYPE CASTING MACHINES.

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Fig. 1.

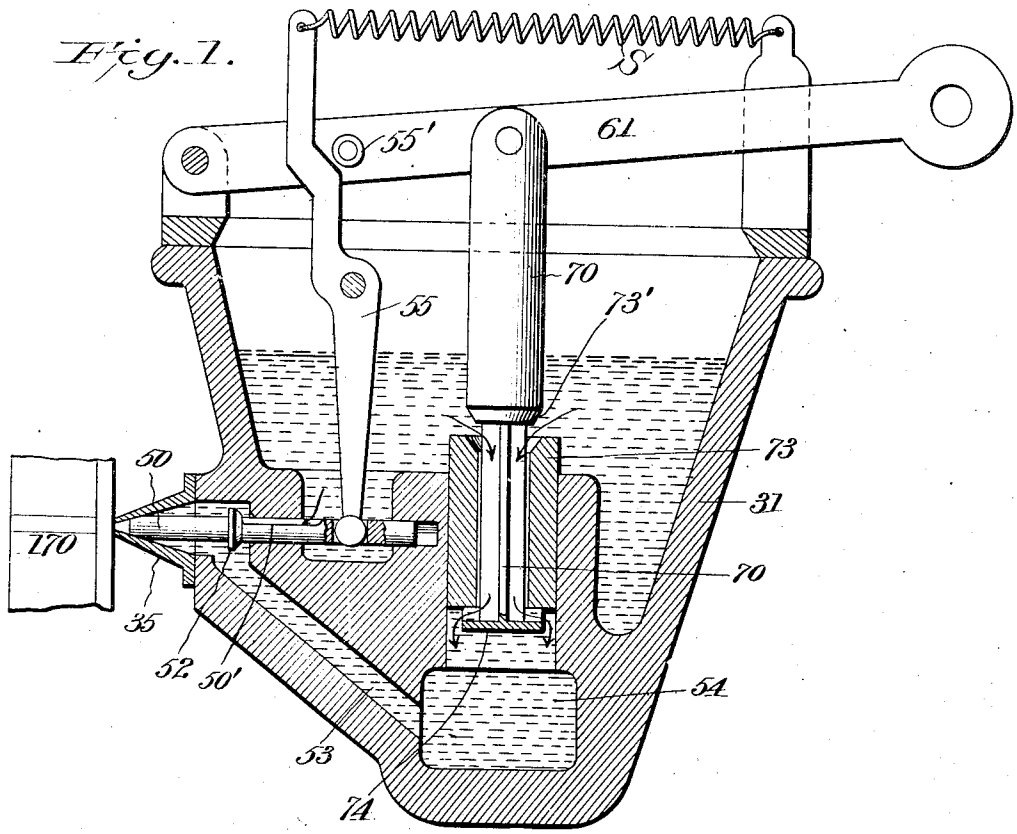
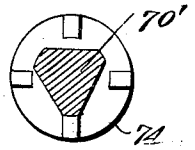


Fig. 2.



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PUMP MECHANISM FOR TYPE-CASTING MACHINES.

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To all whom it may concern:

Be it known that we, FRANK HOWARTH BROWN and JOHN EDWARD HANRAHAN, of Baltimore, Maryland, and GEORGE ALBERT BOYDEN, of Mount Washington, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Pump Mechanism for Type-Casting Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain new and useful improvements in pump mechanism for type casting machines, and the invention has for its object to provide valve mechanism that will be positive in its action, both in admitting molten metal to the well, and also preventing its escape back from the latter through the valve mechanism when the metal is being ejected into the mold.

With the introduction of the sorts machine for casting type, invented by applicants, the art of producing type at the present time is being revolutionized, for the reason that instead of making type under the heretofore well known foundry practice with skilled labor, and then distributing the type throughout the country for printers to use, the printers are now producing type in their own offices with unskilled labor. This results in a great saving of time and money and affords convenience in procuring immediately type and sorts when needed. Said invention necessitated the creation of various systems and inventions, not only with relation to the type casting machine proper, but also to molds, mold making, matrices and matrix making, and to one of these systems the present invention relates.

The invention will be hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawing:—Figure 1 is a sectional view of the metal receptacle of a type casting machine, illustrating the pump and the valve parts. Fig. 2 is a detail sectional view illustrating the valve stem and spider.

Referring to the drawing, 31 designates the metal receptacle which contains the molten metal, the latter being reduced to and maintained in a molten condition by a suitable heating medium, not shown. Said receptacle is provided with a nipple 35 through which the metal is injected into the mold mechanism 170, which may be of any preferred construction. Within the nipple 35 is arranged a choker 50 which acts as a valve to cut off the metal between the nipple 35 and the mold 170, and said choker is also provided with a second valve 52 arranged to control the flow of molten metal from the receptacle into the port leading to said nipple. The stem of the choker is provided with a groove 50′ through which the molten metal passes to said port when the choker is in the position illustrated in Fig. 1. The choker 50 is actuated by a lever 55, suitably pivoted to the receptacle and having its lower end engaging with said choker, the upper end of said lever projecting into the path of a roller 55′ mounted on the actuating lever 61. A downward movement of the lever 61 causes said roller to engage the beveled end of said lever, rocking the latter, thereby causing the choker to move in a direction to open the orifice in the nipple leading to the mold 170, and simultaneously closing the passage from the metal receptacle to the port end leading to the nipple. Therefore, when the lever 61 is forced downward, the valve 52 is closed, and molten metal prevented from passing therethrough back to the receptacle; at the same time the orifice in the apex of the nipple is opened to permit the metal to pass through passage 53 to the mold.

To the actuating lever 61 is secured a valve stem 70 arranged to impart motion to a pump plunger 73, which latter is fitted into the bore of the well 54, sufficiently tight to make a comparatively metal tight joint. The lower portion of said stem is preferably formed as a valve 73′ adapted to seat itself on the top of plunger 73, whereby said valve, when in action is moved against the pressure in the well 74 to close the central bore with which said plunger is provided. From the valve 73′ extends a stem 70′ which is passed through the bore in the plunger 73 and cut away at its sides to form passages for the metal, whereby the latter will pass from the receptacle 31 to the well 54, thus allowing

for a free delivery of molten metal from the receptacle to the well, as indicated by the arrows. On the end of said stem 70′ is arranged a spider 74, of such formation that when the pump mechanism is in the position illustrated, the molten metal is free to pass from the bore of the plunger to the well 54, as indicated by arrows.

When the parts are in their normal positions, the valve end of the rod 70 is out of engagement with its seat upon the plunger 73, and molten metal is free to pass through the bore of said plunger. In the operation of the device, lever 61 is forced downward by any suitable means, the first action being to close valve 73′ against the pressure of the metal in the well. Simultaneously with this action, the roller 55′ engages the upper end of lever 55, causing the choker to be moved in a direction to close valve 52 and withdraw the forward end of the choker from the opening in the apex of the nipple 35. The continued downward movement of lever 61 causes the valve 73′ to seat itself on the plunger 73, closing the bore thereof, forcing said plunger downward, and thereby ejecting molten metal from the well 54 through passage 53 and nipple 35 into the mold 170. When the lever 61 is raised or released the valve 73′ is first lifted from its seat, thereby opening the bore and reëstablishing the passage of the molten metal through the plunger, and as the latter moves upward the molten metal flows from the receptacle to the well 54. Simultaneously with the above movement, the choker is moved by spring S to close the opening in the nipple and open the valve 52, whereby the metal may also pass from the receptacle through the groove 50′ in the stem of the choker, to the passage 53. Thus the well 54 is quickly and entirely filled ready for the next cast.

The advantages of our invention will be at once apparent to those skilled in the art to which it appertains. It will be particularly noted that by arranging the valve on the plunger stem to work against the pressure in the well, the resistance of the metal against the plunger always insures the valve being closed, and in the reverse action, when the pump is lifting, insures the opening of the passage. Thus the action of the valve is positive and uniform, which is absolutely essential in practice, and a decided advantage. Many other forms of valves having been employed in connection with pump mechanism for type casting machines, these latter valves, however, by reason of their uncertain action being of little value for the purpose designed.

It will also be noted that the drawings are only employed for illustrative purposes, and the invention is not specifically limited to any of the structural features therein shown, or any other specific valve mechanism.

We claim as our invention:—

1. Pump mechanism for type casting machines comprising a pump plunger having a central bore, a valve for closing said bore and moving said plunger against pressure generated in the pump well, said valve being provided with a stem passed through said bore and cut away at its sides, and a spider on the lower end of said stem and provided with means for permitting molten metal to pass out of said bore when said valve is unseated.

2. Pump mechanism for type casting machines comprising a pump plunger having a central bore, a valve for closing said bore and moving said plunger against pressure generated in the pump well, said valve being provided with a stem passed through said bore and cut away at its sides, and a spider on the lower end of said stem and provided with raised portions, the spaces between said raised portions forming channels for the passage of molten metal when said valve is unseated.

3. Pump mechanism for type casting machines comprising a pump plunger having a central bore, a valve for closing said bore and moving said plunger against pressure generated in the pump well, said valve being provided with a stem passed through said bore, means for permitting metal to flow through said bore around said stem, and a spider on the lower end of said stem and provided with means for permitting molten metal to flow out of said bore when said valve is unseated.

In testimony whereof, we have signed this specification in the presence of two subscribing witnesses.

FRANK HOWARTH BROWN.
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Witnesses:
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