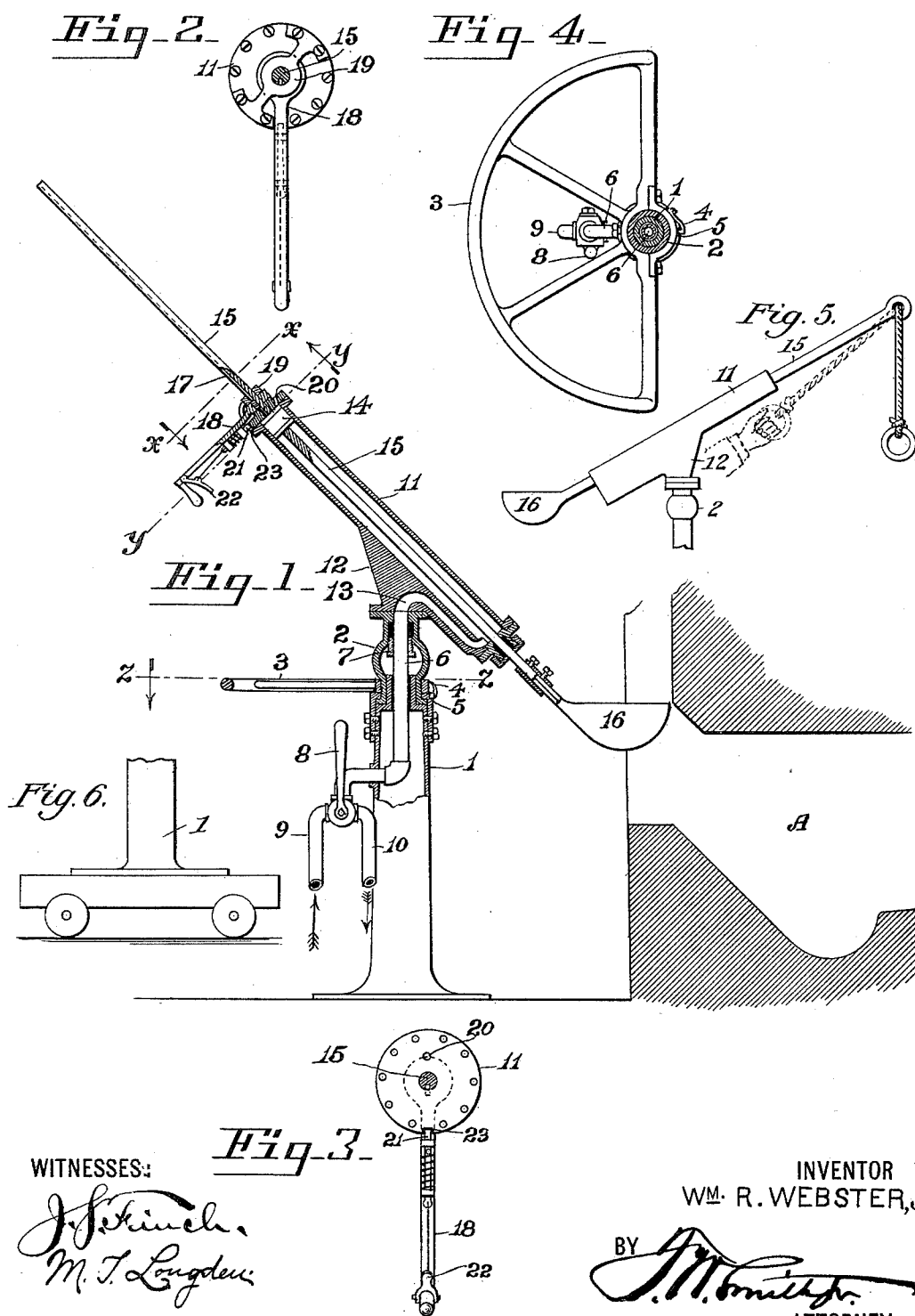


(No Model.)

W. R. WEBSTER, Jr.
MECHANISM FOR HANDLING MOLTEN METAL.

No. 600,566.

Patented Mar. 15, 1898.



UNITED STATES PATENT OFFICE.

WILLIAM R. WEBSTER, JR., OF BRIDGEPORT, CONNECTICUT.

MECHANISM FOR HANDLING MOLTEN METAL.

SPECIFICATION forming part of Letters Patent No. 600,566, dated March 15, 1898.

Application filed March 22, 1897. Serial No. 628,719. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. WEBSTER, Jr., a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Mechanism for Handling Molten Metal; and I 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.

My invention relates to certain improvements in mechanism for handling molten metals, and has for its object to transfer from the furnace a large quantity of molten metal and to deliver the same to any suitable molds within reasonable distance from the furnace.

With these ends in view my invention consists in certain details of construction and combination of parts, such as will be hereinafter fully set forth, and then specifically designated by the claims.

In the accompanying drawings, which form a part of this application, Figure 1 is a sectional elevation of my improvement; and Figs. 2, 3, and 4 are sections, respectively, at the lines *xx*, *yy*, and *zz* of Fig. 1. Figs. 5 and 6 are detail views showing modifications.

Similar numbers and letters of reference denote like parts in the several figures of the drawings.

In handling molten metal ladles are employed, which are usually dipped and carried by hand, so that the amount of metal contained in the ladle is quite limited for the reason that the strength of the workman enables him to carry and properly pour not over thirty or forty pounds.

In pouring large cakes or bars or in making castings it frequently happens that a plurality of pourings becomes necessary—that is to say, more than one ladle of the molten metal is required—and to accomplish this result it is necessary to employ a considerable number of men in order that the delivery of the metal to any one mold may be practically continuous. Notwithstanding the fact that great care and skill are exercised it is true that a “hard set” often forms on the surface of the metal poured from one ladle in the mold before a second ladle of the metal is poured

therein, and this will of course cause an imperfect casting.

Various mechanisms and apparatus have been contrived for controlling the movements of the ladle, with the end in view to obviate the above-noted disadvantages; but it is the aim of my present invention to provide a specific mechanism which shall be capable of operation with great facility and efficiency and which will be readily understood from the following description.

1 is any ordinary standard, and 2 a rotary cap swiveled in any ordinary manner on top of such standard. 3 is a segment-wheel secured around the neck of this cap and carrying a spring-pawl 4, which engages a notch 5 in a stationary part of the standard, the relative position of such pawl and notch being such that their engagement acts as a telltale to the workman to inform him as to the proper position of the ladle preparatory to insertion within and withdrawal from the furnace A.

6 is a delivery-pipe for water, steam, gas, compressed air, &c., which is supported by the standard and passes up through the same and the cap and has its orifice flush with the upper surface of the latter. This pipe passes through any ordinary stuffing-gland 7 in the cap and is of course stationary. The pipe 6 is provided with an ordinary three-way cock 8, which establishes communication, respectively, between the pipe 6 and separate branch pipes 9 10. Through the pipe 9 the water, steam, gas, or other agent is introduced into the pipe 6, while the pipe 10 serves as an outlet for such agent when the cock is properly turned.

Secured to the top of the cap 2 is a cylinder 11, which is provided with a thickened lateral extension 12 for the purposes of such attachment. This cylinder is inclined at any suitable and proper angle and in the thickened portion 12 is a duct 13, which registers with the pipe 6 and leads into the cylinder at the bottom thereof.

14 is a piston-head within the cylinder, and 15 is the piston-rod which extends through and beyond both ends of the cylinder and has secured to its lower end the ladle 16 of any suitable size and shape. Throughout the upper end of the rod 15 is a groove 17, and splined

to this grooved portion in the usual manner is a handle 18. A yoke 19, secured to the end of the cylinder, bridges over the handle 18 in such manner as not to interfere with the free movement of the rod 15, the object of this yoke being to prevent any upward displacement of the handle when the piston-rod is moved up and down and at the same time to provide limits within which this rod may be rotated by the swinging movements of such handle.

20 is a vent in the upper end of the cylinder, which acts of course as a relief to permit of the ready upward movement of the head 14. Carried by the handle 18 is a spring-actuated bolt 21, connected to and operated by a dog 22, pivoted to the handle, said bolt engaging within a notch 23 in the side of the upper end of the cylinder in order to afford means for determining the proper normal position of the ladle and piston-rod, as will be presently more fully explained.

The operation of my improvement is as follows: The position of the parts, as shown at Fig. 1, is that assumed when a ladleful of molten metal has been withdrawn from the furnace, and the segment 3 is now operated to swing the cylinder bodily around so as to bring the ladle in proximity to the molds, the pressure of the agent used through the pipe 6 operating to keep this ladle sustained in elevation. If found necessary, the cock 8 is now operated to effect the lowering of the ladle down to the mold and the handle 18 is then swung around to cause the tilting of the ladle, whereby the pouring is effected. In returning the ladle within the furnace the handle is swung back until the bolt 21 engages the notch 23, so as to bring the ladle in its normal horizontal position and the wheel 3 is operated to swing the cylinder and ladle bodily back to the position preparatory to a succeeding dip of the ladle within the furnace. Should it be ascertained that the position assumed by the ladle in a preceding pouring is too low to permit of its proper delivery within the furnace, the cock 8 is operated to give the ladle the desired elevation, and when the parts are again in the position shown at Fig. 1 the cock is turned so as to effect the discharge of the water in the cylinder out through the pipe 10, thereby causing the gradual plunging of the ladle within the furnace preparatory to a succeeding pouring. It will be observed that I have shown the cylinder normally arranged at an angle of about forty-five degrees, so that the ladle will readily descend by gravity when the pressure beneath the head 14 is relieved; but circumstances might render it advisable or necessary that this inclination of the cylinder should be at a considerably less angle, and in such

instance it might become essential to lower the ladle positively, provided that it would not drop by gravity as the water or other agent was exhausted, such a construction being shown in Fig. 5.

I have shown the standard 1 as a stationary element immediately in front of the furnace; but it will be obvious that this standard may rest on a traveling truck or carriage, as shown in Fig. 6, if desired, so as to bring the cylinder and ladle to the location of the molds, in which instance I would merely provide flexible couplings for the pipes 9 10. Accordingly I do not wish to be limited to any particular means for bodily carrying the cylinder to any convenient point, the gist of my invention in this respect resting in the broad idea of translating the cylinder to the location of the molds preparatory to the independent turning of the ladle for the purpose of pouring.

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

1. In a machine for handling molten metal, the combination of a cylinder normally inclined and mounted upon a suitable support, a pipe communicating with the interior of such cylinder whereby steam, water, air, &c., may be introduced, said pipe being provided with means for controlling the alternate supply and exhaust of such agent, the piston-head within said cylinder, the piston-rod extending through both ends of the cylinder and having secured to its lower extremity the ladle, means for translating the cylinder to the location of the molds preparatory to pouring, and means connected with the piston-rod whereby such rod may be independently revolved, substantially as set forth.

2. In a machine for handling molten metal, the combination of a cylinder normally inclined and mounted upon a rotary element, a pipe communicating with the interior of such cylinder whereby steam, water, air, &c., may be introduced, said pipe being provided with means for controlling the alternate supply and exhaust of such agent, the piston-head within said cylinder, the piston-rod extending through both ends of the cylinder and having secured to its lower extremity the ladle, means attached to said rotary element for manipulating the same, and means connected with the piston-rod outside the cylinder whereby said rod may be revolved, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM R. WEBSTER, Jr.

Witnesses:

J. S. FINCH,

F. W. SMITH, Jr.