

F. C. LUCKE D'AIX.
 LINE CASTING MACHINE.
 APPLICATION FILED OCT. 8, 1912.

1,065,329.

Patented June 17, 1913.

3 SHEETS—SHEET 1.

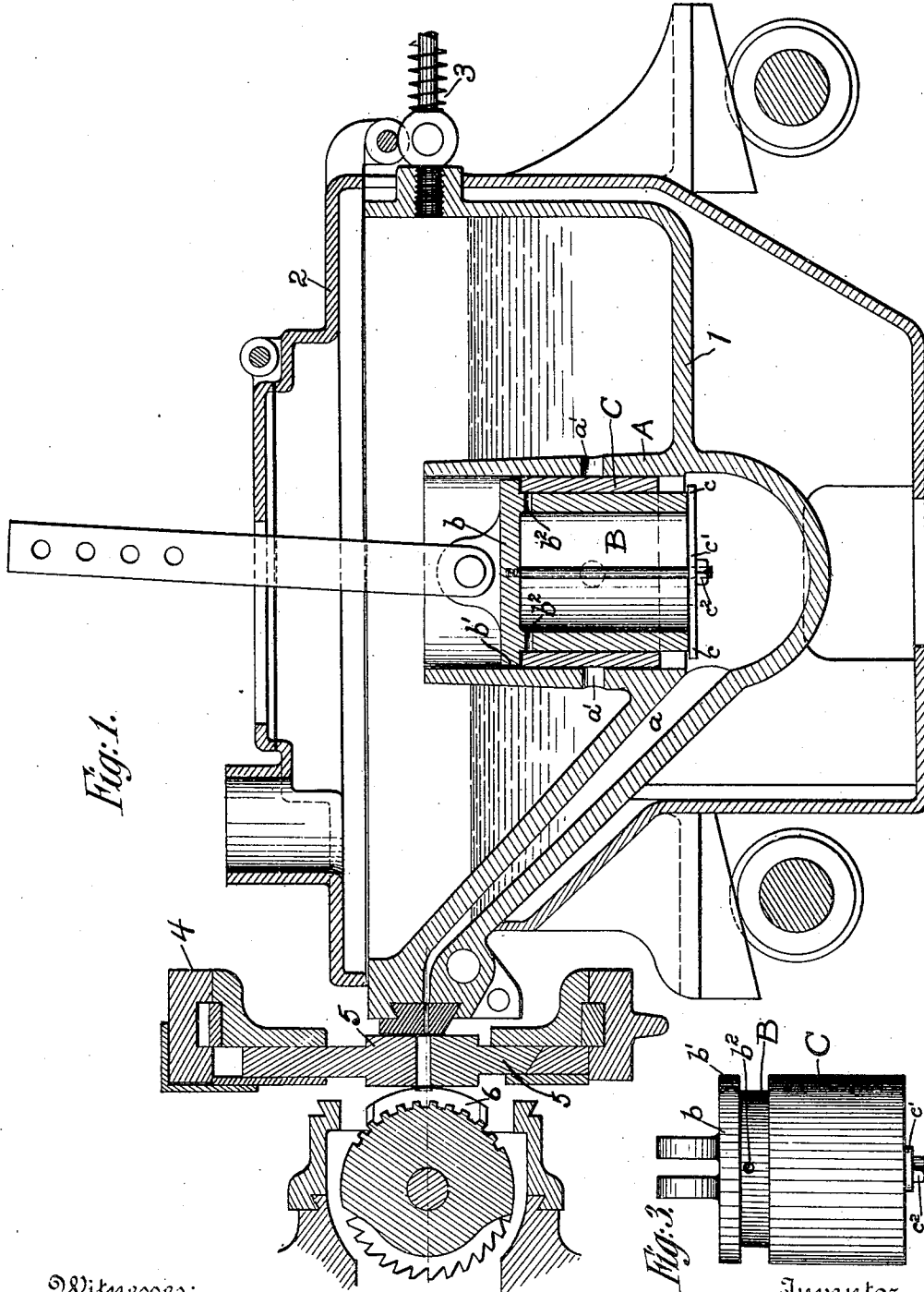


Fig. 1.

Fig. 3.

Witnesses:
Karl Kiedde.
H. B. Marston.

By

Inventor
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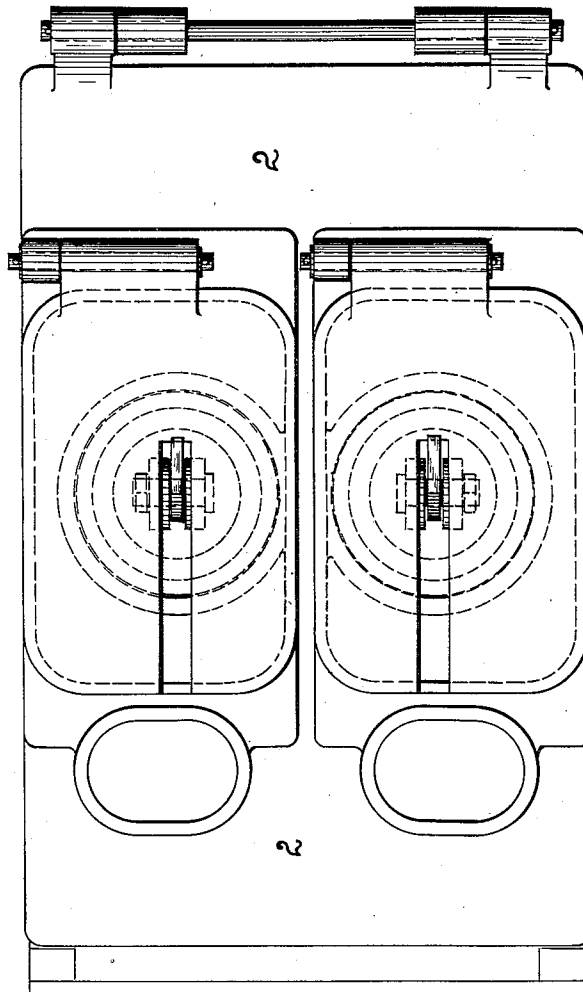
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3 SHEETS—SHEET 2.

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Fig. 2.



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UNITED STATES PATENT OFFICE.

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LINE-CASTING MACHINE.

1,065,329.

Specification of Letters Patent. Patented June 17, 1913.

Application filed October 8, 1912. Serial No. 724,638.

To all whom it may concern:

Be it known that I, FRITZ C. LUCKE D'AIX, of the city, county, and State of New York, have invented a new and useful Improvement in Line-Casting Machines, of which the following is a specification.

This invention relates to line casting machines wherein molten metal is delivered into a slotted mold and against a line of matrices which close the front of the mold slot, from a melting pot wherefrom the molten metal is ejected at the proper time by means of an automatically operating pump; and it has to do with means for relieving the suction action of the pump plunger on its return or back stroke, the tendency of which is to draw the metal from the interior and back of the slug at which points it is still hot, although the outer or front portions of the slug may have cooled to the point of solidification, the result of this action being to impair the solidity of the slug and thus to unfit it for good work.

The object of my invention is to provide a simple and effective means of relieving this injurious suction action.

The preferred embodiment of my invention is illustrated in the accompanying drawing, in which—

Figure 1 is a vertical section, from front to rear of the machine, of a melting pot embodying my improvement and so much of the parts of a line casting machine associated therewith as are requisite to an understanding of the improvement. Fig. 2 is a plan of the melting pot. Fig. 3 is a side elevation of the pump plunger detached. Figs. 4, 5, 6 are skeletonized vertical sections of the pump, without the surrounding melting pot, illustrative of the pump action in different positions of the plunger.

In Fig. 1 is represented a melting pot 1 of known type; 2 is the pot cover; 3 is the yielding connection between the pot and the mechanism by which the pot is moved to and from the mold; 4 is the mold carrier; 5 are the jaws of the slotted mold mounted in a slide on said carrier. 6 is the line of matrices closing the front of the slot in the mold, and mounted in a carrier of the kind represented in my reissued Patent No. 13,048 of December 7, 1909. In the parts thus far described, there is nothing new.

I come now to the parts in which my present improvement is embodied.

A is the pump cylinder, open top and bot-

tom, with its top above the level of the molten metal contained in the melting pot. The pump cylinder is cast in one, as customary, with the melting pot, and has the customary spout *a* through which the molten metal ejected by the pump is delivered to the rear side of the mold slot. In the side of the cylinder are one or more inlet ports *a'* through which the molten metal from the pot can enter the cylinder, these openings being located in the cylinder at a point below that reached by the plunger on its return stroke.

Within the pump cylinder is the tubular plunger B, cylindrical in shape, closed at its top by a head *b* and open at its bottom. The plunger is of sufficiently smaller external diameter than the internal diameter of the pump cylinder A, to leave between the two an annular space which is filled by a metallic sleeve C, with sufficient snugness to act as a packing for the plunger, to prevent the upward escape, or undue escape, of the liquid metal between it and the cylinder, but still is slidably mounted upon the plunger which it encircles, so that it may slide up and down upon the plunger between the flange *b'*, on the head *b* of the plunger, and the flanges *c*, at the lower end of the plunger, formed by the laterally projecting ends of a cross bar *c'*, held up against the lower end of the plunger by a nut and bolt connection, *c''*, with the plunger head *b* above. The flange *b'*, on the head of the plunger, is of sufficiently less diameter than the cylinder A to allow air from the space in the melting pot above the level of the molten metal to pass down freely between it and the cylinder. In the side of the plunger B, just below the flange *b'*, are one or more ports or openings *b''*, through which air from the interior of the melting pot can pass down into the interior of the plunger. The proportions and related movements of the respective parts are such that when the plunger is at the end of its return or up stroke, with the sleeve C in its lowest position on the plunger (as seen in Fig. 5), both the air and the liquid ports, *b''*, *a'*, will be open, and when the plunger is at the end of its ejecting or down stroke, with the sleeve C at its highest position on the plunger, both the air and the liquid ports, *b''*, *a'*, will be closed.

The operation is as follows: Assuming the plunger to be at the end of its return or up

stroke, with the sleeve C resting on the lower flange *c*, and both ports, *a'* and *b*², open, as in Fig. 5, then as the plunger enters on its down stroke, as soon as it has moved down 5 far enough to cover the air ports *b*² with the sleeve, at which time the sleeve will have brought up against the top flange *b'*, as seen in Fig. 6, further downward movement of the plunger will close the liquid ports *a'* 10 in the pump cylinder, and both sets of ports *a'*, *b*², will remain closed until the termination of the down or ejecting stroke of the plunger, as indicated in Fig. 1, where the plunger is shown at the end of its down 15 stroke. When the plunger, on its up or return stroke, begins to rise from this position, the suction within the body of the pump below the plunger, induced by this movement, will hold the sleeve down, while 20 the plunger continues to rise, thus almost instantly opening the air ports *b*², and permitting air to enter the interior of the plunger, as seen in Fig. 4, thus equalizing the pressures within and without 25 the pump; and as the sleeve continues to occupy this position (resting upon the lower flange *c*) during the remainder of the stroke, at the end of which the plunger returns to the position shown in Fig. 5, it will be seen 30 that there will be during this time no suction action which will tend to draw the metal back away from the slotted mold into which it has been forced. The moment the parts take the position shown in Fig. 5, a 35 new charge of the molten metal can enter the pump. The packing sleeve C is thus also in effect a sliding cylindrical slide valve through which the ports in plunger and pump respectively are controlled.

40 It will be noticed that in the plan view, Fig. 2, the melting pot structure is represented as a single casting with two separate melting pots arranged side by side, each, of course, with its own pump and spout, one or 45 both of which may be operated at pleasure—all that is needed in case one only is to be used, being to disconnect or uncouple the

pump of the other from its operating mechanism. This arrangement is convenient for casting long or short lines of type, or single 50 types. In case it is required to cast a short line, or a single type, all that is needed is to connect up with the operating mechanism, the pump of the selected pot, leaving the other inactive. 55

Having set forth my improvement and the best way now known to me of carrying the same into effect, I state in conclusion that I do not limit myself to the specific structural 60 details hereinbefore shown and described in illustration of the invention, for manifestly the same can be considerably varied without departure from the spirit of the invention: But

What I claim therein as new and desire to 65 secure by Letters Patent, is:

In a linotype machine, the combination of a melting pot; a pump cylinder contained within said pot, and provided with an ejecting spout; a tubular plunger within the 70 cylinder, closed at top and open at bottom; a packing sleeve interposed between the plunger and cylinder, mounted on and carried by said plunger and slidable lengthwise thereof; means on the plunger for confining 75 the sliding movement of the sleeve within prescribed limits; and air and liquid ports in the plunger and cylinder respectively, controlled by said packing sleeve, communicating the one with the air space in the melting 80 pot above the level of the molten metal therein, and the other with the space containing the charge of molten metal, said ports being, by the action of the packing sleeve, closed during the ejecting stroke, and opened dur- 85 ing the return stroke, of the plunger, substantially as and for the purposes hereinbefore set forth.

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

FRITZ CARL LUCKE D'AIX.

Witnesses:

KARL KAELEBLE,
WM. P. PARKER.