May 15, 1928. 1,669,767

E. C. LYONS

VACUUM HEAD FOR CASTING MACHINES

Filed March 2, 1927 2 Sheets-Sheet 1

Fig. 1

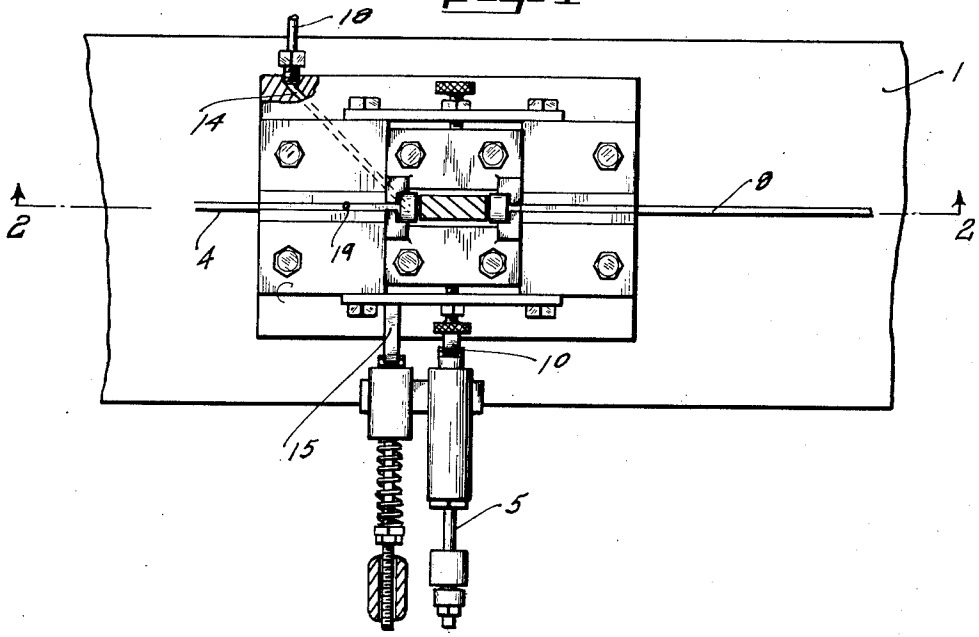
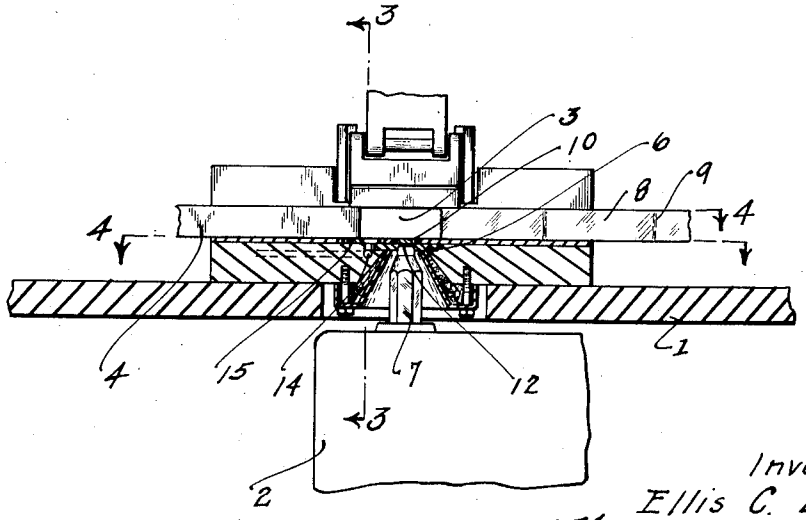


Fig. 2.



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2 Sheets-Sheet 2

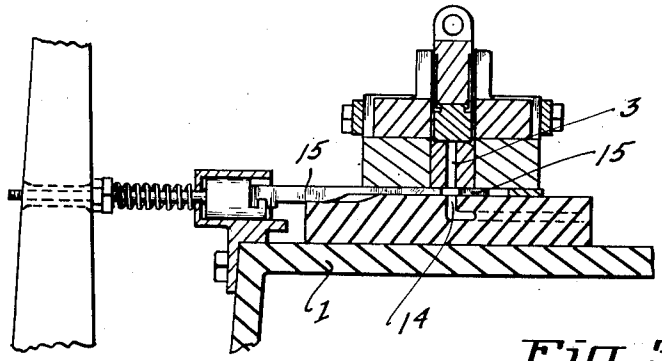

Fig. 3

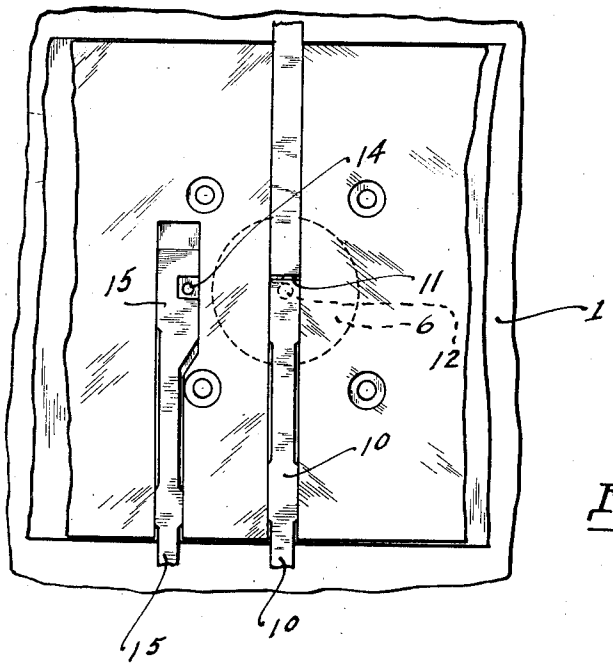

Fig. 4

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UNITED STATES PATENT OFFICE.

ELLIS C. LYONS, OF PORTLAND, OREGON.

VACUUM HEAD FOR CASTING MACHINES.

Application filed March 2, 1927. Serial No. 172,008.

My invention relates to a companion application, entitled, a "Method of casting in vacuum", filed March 2, 1927, Serial Number 172,009.

The present invention consists primarily of a machine adapted to monotype machines, intertype machines, linotype machines, Ludlow machines, and others for the making of slugs, rules, border dashes and furniture used around large press rooms and printing offices and newspaper offices, and consists primarily of a device adapted to said machines and like machines wherein a partial or substantial vacuum or negative atmospheric pressure may be maintained within the casting chamber during the admission of the molten metal within the casting chamber.

I do not wish to be confined to the use in such plants as the same may be used in a modified form in die casting plants and in other places wherein the molten metals are being placed within the die casting chamber of the same.

A further and important object consists in providing simple and efficient means for the exhausting of the chamber in advance of the admission of the molten metal therein and the cutting off of the entrance port through which the negative pressure is created during the admission of the molten metal.

A further object of my invention consists in the exhausting of sufficient of the air from the casting chamber of the die to prevent air pockets or blow holes being formed within the cast member due to the presence of air within the casting chamber during the casting operation.

With these and incidental objects in view, the invention consists in certain novel features of construction and combination of parts, the essential elements of which are set forth in the appended claims, and a preferred form of embodiment of which is hereinafter shown with reference to the drawings which accompany and form a part of this specification.

In the drawings:

Fig. 1 is a top plan view of the casting head, partially in section of the device commonly used in casting operations for printing and press room requirements.

Fig. 2 is a cross section view, taken on line 2—2 of Fig. 1, looking in the direction indicated.

Fig. 3 is a cross section view, taken on line 3—3 of Fig. 2, looking in the direction indicated.

Fig. 4 is a top plan view, taken on line 4—4 of Fig. 2, looking in the direction indicated, which in reality illustrates the casting chamber with the top closures of the head removed.

Like reference characters refer to like parts throughout the several views.

In machines of this type, the same are automatic in their operation, molten metal being supplied through an inlet nozzle and at each stroke of the plunger metal is admitted into the casting chamber through the opening of the inlet port. The feeding plunger progressing each unit as added, which in effect fuses or amalgamates itself to the unit formed in advance thereto and thus forming a continuous strip of material of a length required.

In the drawings, in Fig. 1 the base plate of the casting head is shown at 1, in Fig. 2, and the pot for holding the molten metal is shown at 2 in the same figure. The casting chamber is shown at 3, and illustrates the chamber open for the admission of the molten metal therein. The feeding plunger is shown at 4. The actuating lever is shown at 5, through the operation of which a port is opened through the diaphragm 6 to permit of the admission of molten metal within the chamber 3, through the feeding nozzle 7, directly secured to the pot 2. The strip of finished product is shown at 8, the point of fusing or amalgamation of the units being indicated by the shaded line 9, the unit being of the net length of the casting chamber 3.

As the actuating lever 5 is manipulated the valve 10 is actuated and the pot 11 associated therewith, is placed into and out of engagement with the port 12, in the diaphragm 13, disposed in the base of the casting chamber and associated with the head elements. The feeding nozzle 7 is at all times in intimate contact with the under side of the valve. To create a negative atmospheric pressure within the casting chamber 3, or to substantially create a vacuum within the casting chamber, the ported outlet 14 leading to the casting chamber 3, is adapted to be closed or opened through the actuating of the valve 15. The valve 15 is actuated in timed relation with the valve 10, in a manner

so that as the one is opened the other will be closed. I have not here shown a vacuum unit for creating the exhaust force within the vacuum line 18, as any commercial unit may be used for this purpose. Where the device is to be used in large commerical plants, one vacuum unit may be used in conjunction with several machines upon which my device is placed and I therefore do not wish to be limited to any special form for the creating of the negative pressures within the associated elements and with the casting chamber as well. It is quite essential that adequate lubrication be supplied to the casting head in order that the film of oil may be made to prevent the leaks through the engaging surfaces of the various manipulative parts. Such lubrication should be of the flooded type system and be made to enter directly into the casting chamber as well as to lead to and cover all engaging surfaces. A lubricator may be attached to the oil passageway 19, which is so arranged as to lead the lubrication to all surfaces where a manipulation is to be imparted to the engaging surfaces.

While the form of mechanism herein shown and described is admirably adapted to fulfill the objects primarily stated, it is to be understood that it is not intended to confine the invention to the one form of embodiment herein shown and described as it is susceptible of embodiment in various forms, all coming within the scope of the claims which follow.

What I claim is:

1. In a device of the class described, the combination of a casting head, a casting chamber disposed in said head, feeding and exhaust ports formed in the head and communicating with the casting chamber, valves in said head oppositely opening and closing said ports, actuators for the valves, means for the periodic ejection of the cast materials, as cast from the casting chamber, and means communicating with the exhaust port for the creating of a substantial vacuum within the chamber in advance of the admission of molten metal therein.

2. In a device of the class described, the combination of a casting head, means associated with the head for periodically creating a casting chamber within the head, means in said head for controlling the flow of liquid casting material to the chamber when formed, means in said head adapted for controlling the evacuation of the chamber in advance of the admission of molten metal to the chamber and means for supplying lubrication to the chamber through initial application thereof to the first mentioned means.

3. In a device of the class described, the combination of a casting head, means for the periodic creation of a casting chamber within the head, inlet and exhaust ports associated with the head and in registrable alignment with a ported outlet in a valve associated with the head, an actuator associated with each valve to place the ports of the valves and the head into and out of registry with each other, means for supplying liquid alloys to the casting chamber, means for creating negative atmospheric pressures within the casting chamber and means for lubricating the actuators and the casting chamber walls.

ELLIS C. LYONS.