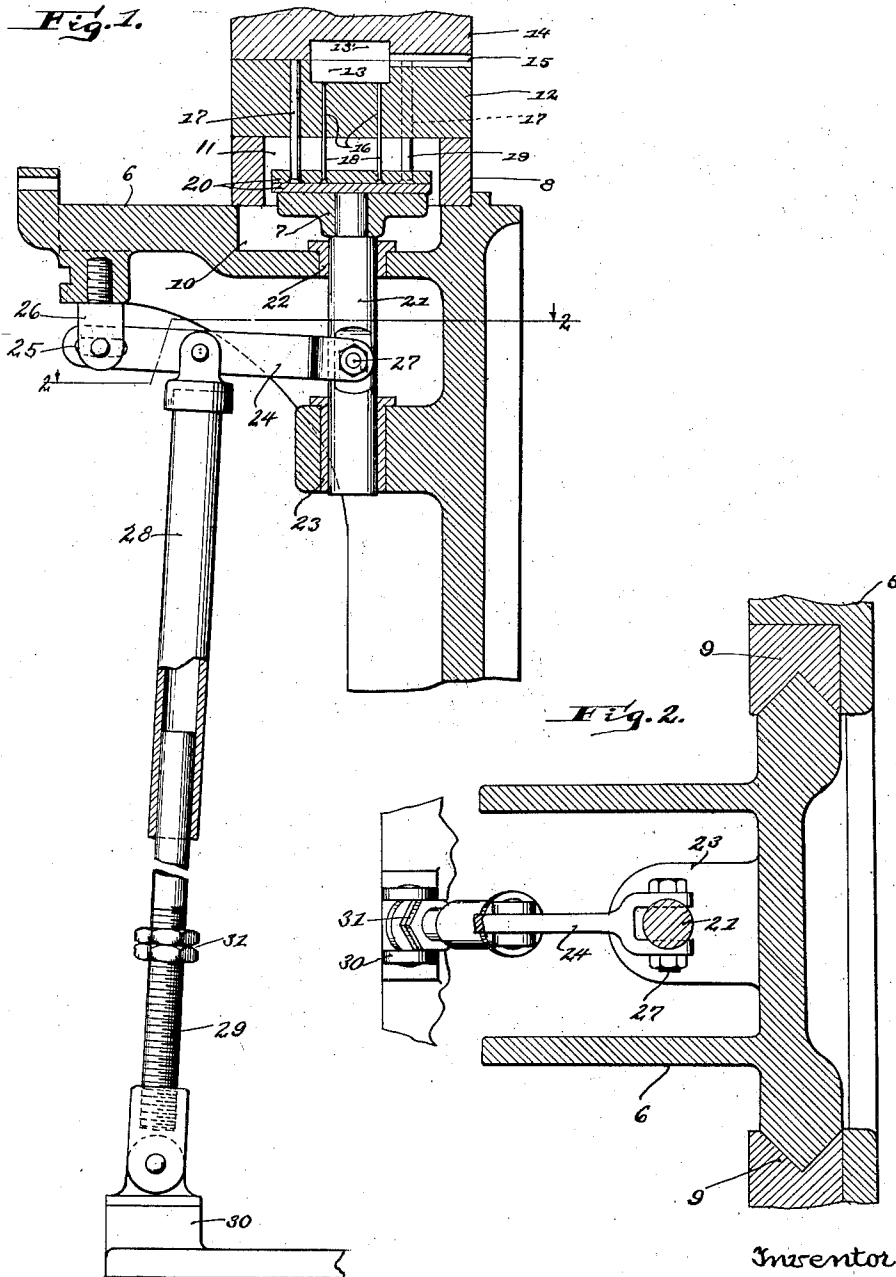


B. E. BOLLING.
DIE CASTING EJECTOR.
APPLICATION FILED JAN. 15, 1920.

1,394,246.

Patented Oct. 18, 1921.



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DIE-CASTING EJECTOR.

1,394,246.

Specification of Letters Patent.

Patented Oct. 18, 1921.

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To all whom it may concern:

Be it known that I, BALTZAR EMANUEL BOLLING, a citizen of the United States, and resident of Racine, in the county of Racine and State of Wisconsin, have invented new and useful Improvements in Die-Casting Ejectors, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention relates to improvements in die casting ejector for a die casting machine.

In the ordinary die casting machine many of the castings are broken in ejecting them from the molding die parts or sections due to the unequal strains placed on the castings in forcing them out of the dies. This loss materially increases the expense of the perfect casting and is otherwise objectionable in limiting the output of the machine.

It is one of the objects of the present invention to overcome the before mentioned objectionable features and provide a die casting ejector which will exert an equal strain upon different portions of the casting in ejecting it from the mold part and thus eliminate the larger part of the breakage and increase the capacity of the casting machine.

A further object of the invention is to provide a die casting ejector in which means are provided for positively positioning the ends of the ejector pins with relation to the recess of the molding die to prevent the marring of the casting by said pins.

A further object of the invention is to provide a die casting ejector in which the die ejecting means is moved upwardly while the die part is moved downwardly to positively eject the casting.

A further object of the invention is to provide a die casting ejector in which the ejector pins and the stop pins are maintained in proper aligned position to prevent tilting and unequal strains upon the casting while ejecting it from the die parts.

A further object of the invention is to provide a die casting ejector in which the ejector parts may be easily changed and other parts substituted therefor to eject castings of various shapes and sizes.

A further object of the invention is to provide a die casting ejector which is of simple construction, is strong and durable

and is well adapted for the purpose described.

With the above and other objects in view, the invention consists of the improved die casting ejector and its parts and combinations as set forth in the claims, and all equivalents thereof.

In the accompanying drawing in which the same reference characters indicate the same parts in all of the views:

Figure 1 is a central vertical sectional view of a portion of a die casting machine provided with the improved casting ejector; and

Fig. 2 is a transverse sectional view thereof taken on line 2—2 of Fig. 1.

Referring to the drawing, the numeral 5 indicates a portion of a die casting machine in which 6 is a vertical reciprocal head or table, 7 the ejector plunger head and 8 the die block mounted on the head. The reciprocal head 6 slides in the bearings 9 of the machine frame and the die block 8 is adjustably mounted on the upper portion of the head in any manner desired. The head 6 is formed with a rectangular recess 10 and the die block 8 is provided with vertically extending central opening 11 of rectangular shape which registers with the recess 10 to accommodate the ejector plunger head 7. A casting die part 12 having a casting recess 13 in its upper portion is mounted on top of the die block 8 and coacts with a companion die part 14 carried by a fixed head (not shown) of the machine. This upper die part 14 is also provided with a recess 13' in register with the recess 13 and forming space therewith in which the casting is molded. The molten metal to the die space is fed through the opening 15 formed between the two die parts. The lower die part 12 is also provided with vertically extending ejector pin holes 16 and stop pin holes 17 for receiving ejector pins 18 and stop pins 19 respectively, which extend slidably therethrough. The lower headed ends of the pins are mounted between and securely fastened to plates 20 which rest loosely upon the ejector plunger head 7 so that when the reciprocal head 6 is moved downwardly to separate the die parts, the lower die part will first separate from the upper die part, and when separated, the pins will be pushed upwardly to force the casting from the lower mold part.

When the casting has been discharged, the lower die part is moved upwardly, and the stop pins, which project upwardly through the upper die part, will engage the lower face of the upper die and be held in position while the lower die is moved into engagement with the upper die, and thus exactly position the upper ends of the ejector pins with relation to the upper surface of the recess of the lower die part. The upper surface of the ejector plunger head 7 is perfectly flat and the lower surface of the lower pin plate 20 is likewise, and as the plates are held on the plunger head by the stop pins, the ejector pins will be maintained in aligned position with relation to the ejector pin holes and prevent tilting the casting in ejecting it from the die.

The ejector plunger head is mounted on the upper end portion of a plunger stem 21 which extends vertically through spaced bearings 22 and 23 forming part of the reciprocal head 6. A lever 24 having a slot 25 formed in its outer end is pivotally and slidably connected at said end to the reciprocal head by a bifurcated pivot bolt 26. The inner end of said lever is bifurcated and straddles a medial portion of the plunger stem 21 and is pivotally connected thereto by a pivot bolt 27. A tubular sleeve 28 pivotally connected at its upper end to a medial portion of the lever 24 extends downwardly therefrom and telescopes over the upper end portion of an upstanding threaded rod 29 which is pivotally connected at its lower end to the base portion 30 of the machine or to the floor. Nuts 31 adjustably threaded on the rod 29 limit the downward movement of the sleeve 28 so that when the reciprocal head moves downwardly a predetermined distance to separate the lower die part from the upper die part, the downward movement of the ejector parts will be stopped when the sleeve strikes the nuts and a farther downward movement of the reciprocal head will force the inner end of the lever and the plunger and the pins upwardly to positively discharge the casting from the lower die part as before described.

From the foregoing description, it will be seen that the die casting ejector is of very simple construction and is well adapted for the purpose described.

What I claim as my invention is:

1. The combination with a die casting machine having a reciprocal head carrying a die part provided with ejector openings, of means for positively ejecting castings from said die part, comprising means extending into said openings and movable therethrough after said reciprocal head has reciprocated a predetermined distance.

2. The combination with a die casting machine having a reciprocal head carrying a die part provided with ejector pin openings,

of means for positively ejecting castings from said die part, comprising an ejector plunger reciprocally carried by the head and having pins which extend into the die part for forcing a casting out of the die part, an automatically moved lever controlling the movement of the ejector plunger, and other means operated by movement of said head for automatically controlling the movement of the lever.

3. The combination with a die casting machine having a reciprocal head carrying a die part provided with ejector pin openings, of means for ejecting castings from said die part, comprising an ejector plunger reciprocally carried by the head and having pins which extend into the die part for forcing a casting out of the die part, an automatically moved lever pivotally connected to the reciprocal head and to the ejector plunger, and means automatically controlling the movement of the lever.

4. The combination with a die casting machine having a reciprocal head carrying a die part provided with ejector pin openings, of means for ejecting castings from said die part, comprising an ejector plunger reciprocally carried by the head and having pins which extend into the die part for forcing a casting out of the die part, an automatically moved lever pivotally connected to the reciprocal head and to the ejector plunger, and means connected to the lever and to a support for automatically limiting the movement of a portion of the lever to cause another portion thereof to move in the opposite direction when the reciprocal head has moved a predetermined distance to separate die parts.

5. The combination with a die casting machine having a fixed die portion and a reciprocal head carrying a die part provided with ejector pin and stop pin openings, of means for ejecting castings from said parts, comprising an ejector plunger reciprocally carried by the head, a plate mounted on the plunger and having projecting stop pins which extend through the stop pin openings and engage the fixed die part and also having ejector pins which extend through the ejector pin openings and engage the casting formed between the die parts, an automatically moved lever pivotally connected to the reciprocal head and to the ejector plunger, and means connected to the lever and to a support for automatically limiting the movement of a portion of the lever to cause another portion thereof to move in the opposite direction and force the pins through the die part when the reciprocal head has moved a predetermined distance to separate the die parts.

6. The combination with a die casting machine having a fixed die portion and a reciprocal head carrying a die part provided with

ejector pin and stop pin openings, of means for ejecting castings from said parts, comprising an ejector plunger reciprocally carried by the head, a plate mounted on the 5 plunger and having projecting stop pins which extend through the stop pin openings and engage the fixed die part and also having ejector pins which extend through the ejector pin openings and engage the casting 10 formed between the die parts, an automatically moved lever pivotally connected to the reciprocal head and to the ejector plunger, a member pivotally connected to the lever, another member connected to a support and 15 slidably connected to the last mentioned member, and means automatically limiting the slidable movement between said members for stopping the movement of a portion of the lever to cause another portion thereof to 20 move upwardly and force the pins through the die part when the reciprocal head has moved a predetermined distance to separate the die parts.

7. The combination with a die casting machine having a fixed die portion and a reciprocal head carrying a die part provided with ejector pin and stop pin openings, of means for ejecting castings from said parts, comprising an ejector plunger reciprocally 30 carried by the head, a plate mounted on the plunger and having projecting stop pins which extend through the stop pin openings and engage the fixed die part and also having ejector pins which extend through the 35 ejector pin openings and engage the casting formed between the die parts, an automati-

cally moved lever pivotally connected to the reciprocal head and to the ejector plunger, a telescoping member connected to the lever and to a support, and means for automati- 40 cally limiting the movement of a part of the telescoping member for stopping the movement of a portion of the lever to cause another portion thereof to move upwardly and force the pins through the die part when the 45 reciprocal head has moved a predetermined distance to separate the die parts.

8. The combination with a die casting machine having a fixed die portion and a reciprocal head carrying a die part provided with 50 ejector pin and stop pin openings, of means for ejecting castings from said parts, comprising an ejector plunger reciprocally carried by the head, a plate mounted on the plunger and having projecting stop pins 55 which extend through the stop pin openings and engage the fixed die part and also having ejector pins which extend through the ejector pin openings and engage the casting formed between the die parts, an automati- 60 cally moved lever pivotally connected to the reciprocal head and to the ejector plunger, a tubular member pivotally connected to the lever, a threaded rod pivotally connected to a support and extending into the tubular 65 member, and a nut threaded on the rod for automatically limiting the movement of the sleeve with relation to the rod.

In testimony whereof, I affix my signature.

BALTZAR EMANUEL BOLLING.