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DIE CASTING APPARATUS.

APPLICATION FILED APR. 23, 1920.

1,349,122. Patented Aug. 10, 1920.

Fig. 1,

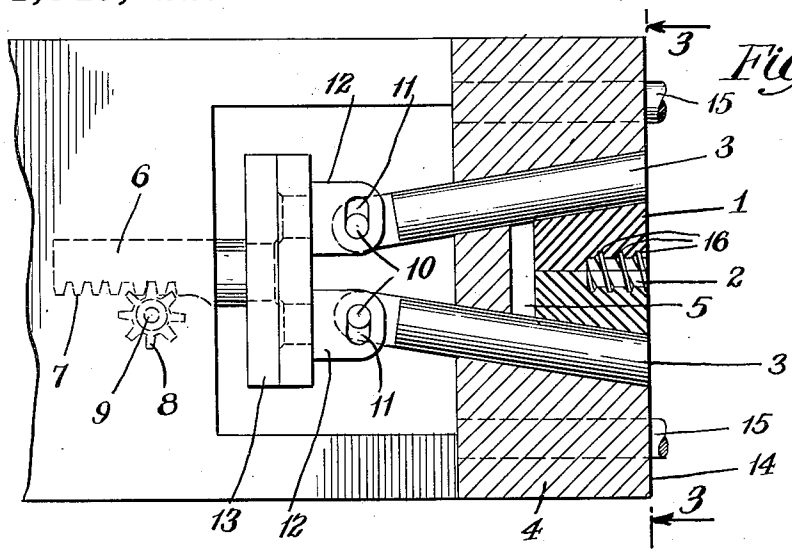


Fig. 2,

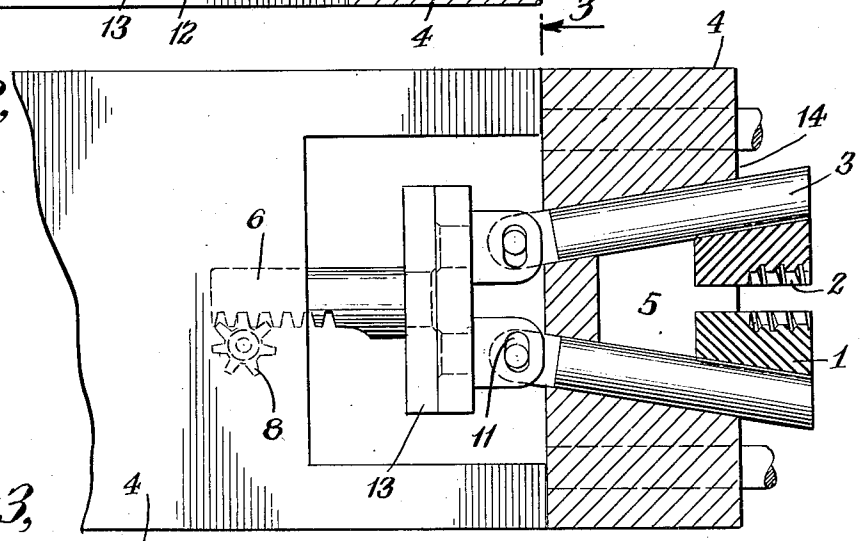
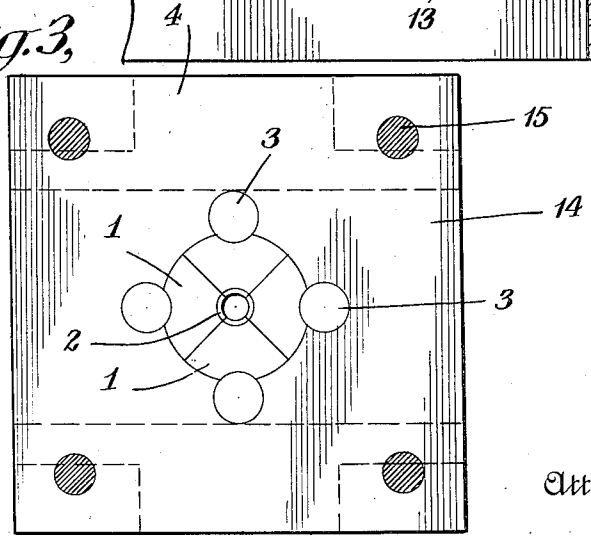


Fig. 3,



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DIE-CASTING APPARATUS.

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To all whom it may concern:

Be it known that I, CONRAD EDLUND, a citizen of the United States, residing in the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Die-Casting Apparatus, of which the following is a specification.

My invention relates to die casting apparatus and particularly to such apparatus intended for use in casting screws, worms, cams or other parts having laterally projecting portions in which difficulty may arise in removing the completed casting from the die. In accordance with my present invention, I provide a die having a plurality of parts which meet along radial planes or otherwise, so as to jointly form a die cavity extending longitudinally of the die parts. These die parts are carried by members which are inclined to the axis of the die. In opening and closing the die these carrying members are moved in the direction of their lengths while being maintained and guided at divergent angles to the axis of the die. With such a construction it will be obvious that when the casting is made the parts of the die will be moved in the general axial direction and at the same time separated from each other as the members carrying the same move along the divergent angles. At the end of this movement the die parts are sufficiently separated from each other to permit the casting to be readily removed by movement in the axial or longitudinal direction of the die.

In the preferred embodiment of my device a plurality of rods, for example four rods are slidably mounted in guide openings extending through a block at acute angles to the axis or center line of the block. Each of these rods is secured to the outer longitudinal surface of one of the die parts, these parts each constituting, in cross section, a segment of a circle, so that when the die is closed the parts meet along radial planes. The die cavity extends axially of the die and is formed jointly by the inner surfaces of the segmental parts mentioned. The carrying rods may be moved in the direction of their lengths by suitable connections such as pin and slot connections with a member which may be moved in the axial direction of the die by suitable means such as a rack and pinion. When the die parts are in closed position, the same will be drawn within a recess in the block through which the inclined carrying rods extend, so that another die member, if another member be required to complete the die, may be superposed against the block and die parts contained therein, this last named die member being removed from the block before the inclined rods referred to are actuated to separate the die parts which are carried by such rods.

In order that a clearer understanding of my invention may be had, attention is hereby directed to the accompanying drawings forming part of this application and illustrating one form of my invention. In the drawings, Figure 1 represents, partly in side elevation and partly in vertical section, a part of a die casting apparatus embodying my invention; Fig. 2 is a similar view showing the die parts separated; and Fig. 3 is a cross section taken on line 3—3 of Fig. 1.

Referring to the drawings, I have illustrated a die intended for use in casting a cylindrical worm, this die having four segmental portions 1, 1. It will be noted that these die parts constitute segments of a circle, in cross section, the die cavity 2 being formed axially of the die parts, partly in one and partly in the others.

The die parts 1 are preferably provided with outer surfaces which are inclined in their lengthwise direction at divergent angles to the axis of the die. The rods 3, 3 are secured in any desired manner to the outer surfaces of parts 1, 1, so as to extend lengthwise thereof and to be inclined to the axis or center line of the die at the same angles as the outer surfaces of the die parts.

The rods 3 are slidably mounted in inclined openings in the block 4, the block also being provided with a recess 5 in which the die parts 1 are received when the same are in closed position. The outer ends of the rods 3, that is, the ends which are farthest apart from each other, are preferably flush with the adjacent end surfaces of the die parts 1. The inner ends of rods 3, that is, the ends which are approached most closely to each other, are connected to a member 6 which is adapted to move in the longitudinal or axial direction of the die. Member 6 is adapted to move along suitable guiding and bearing means, which I do not consider necessary to illustrate, and may be provided with a rack 7 which is actuated by a pinion

8 on a transverse shaft 9 which may be rotated in any desired manner to separate the die parts 1 or bring the same together.

The longitudinally movable member 6 and the inclined rods 3 must, of course, be connected in such a manner as to permit the ends of the inclined rods to move toward and away from each other as they reciprocate. In the construction illustrated, I have shown the rods 3 as being provided with pins 10 extending laterally from their inner ends, these pins engaging within slots 11 which extend laterally across lugs 12 which are provided on or are secured to a head 13 to which the member or rack plate 6 is secured.

When the die parts 1 are drawn together as is illustrated in Fig. 1, the outer ends of the die parts and of the rods 3 will be flush with the outer face 14 of the block 4. Locating pins 15, 15 extend outwardly from the face 14 of block 4, and may be used in positioning an additional die member (not shown) on the face 14, which additional member may contain a continuation of the die cavity 2, or may form a closure therefor and may contain the gate opening through which the casting may be poured. The use of such an additional member will be readily understood, and I have not deemed it necessary to illustrate the same.

It will be obvious that the undercuts, or laterally extending projections 16, of the die cavity, used for producing the thread extending around a cylindrical worm or the like, prevent the removal of the finished casting from the die cavity, unless the die parts are separated laterally. With the construction illustrated, after the die member which rests against surface 14 of block 4 has been removed, rods 3 are moved from the position of Fig. 1 to the position of Fig. 2 by means of the rack and pinion 7 and 8, the die parts 1 being extended longitudinally beyond the surface 14 of block 4 and separated laterally sufficiently to permit the removal of the casting in an axial direction.

It will be understood that my invention is not limited strictly to the details of construction described, but is as broad as is indicated by the accompanying claims.

What I claim is:—

1. In die casting apparatus, the combination of a die having a plurality of segmental parts adapted to meet along longitudinal planes, said parts having jointly a die cavity extending lengthwise thereof, with undercuts, elongated members secured to said parts, respectively, arranged symmetrically at inclinations to the axis of the die, and means for moving said members in the directions of their lengths in opening and closing the die.

2. In die casting apparatus, the combination of a die having a plurality of segmental parts adapted to meet along longitudinal planes, said parts having jointly a die cavity extending lengthwise thereof, with undercuts, rods secured to said parts, respectively, guiding and bearing means for said rods, maintaining the same at acute angles to the axis of the die, and means connected with said rods for moving the same lengthwise in opening and closing the die.

3. In die casting apparatus, the combination of a die having a plurality of segmental parts adapted to meet along longitudinal planes, said parts having jointly a die cavity extending lengthwise thereof, with undercuts, rods secured to said parts, respectively, guiding and bearing means for said rods, maintaining the same at acute angles to the axis of the die, a member movable in the axial direction of said die, and pin and slot connections between said member and the ends of said rods, for moving said rods lengthwise as said member moves.

4. In die casting apparatus, the combination of a die having a plurality of segmental parts adapted to meet along longitudinal planes, said parts having jointly a die cavity extending lengthwise thereof, with undercuts, rods secured to the outer longitudinal surfaces of said parts, a block having openings therethrough arranged at like divergent angles to the axis of the die, through which said rods extend and by which they are guided, and a cavity in which said die parts are received when closed, a member situated beyond said block, movable in the axial direction of said die, and connections between said member and the ends of said rods for moving said rods lengthwise as said member moves, to close said die parts together and open the same sufficiently to permit the removal therefrom in an axial direction of a casting made therein.

This specification signed and witnessed this 31st day of March, 1920.

CONRAD EDLUND.

Witnesses:
WILLIAM E. BAUERSCHMIDT,
WILLIAM R. AHRBERG.