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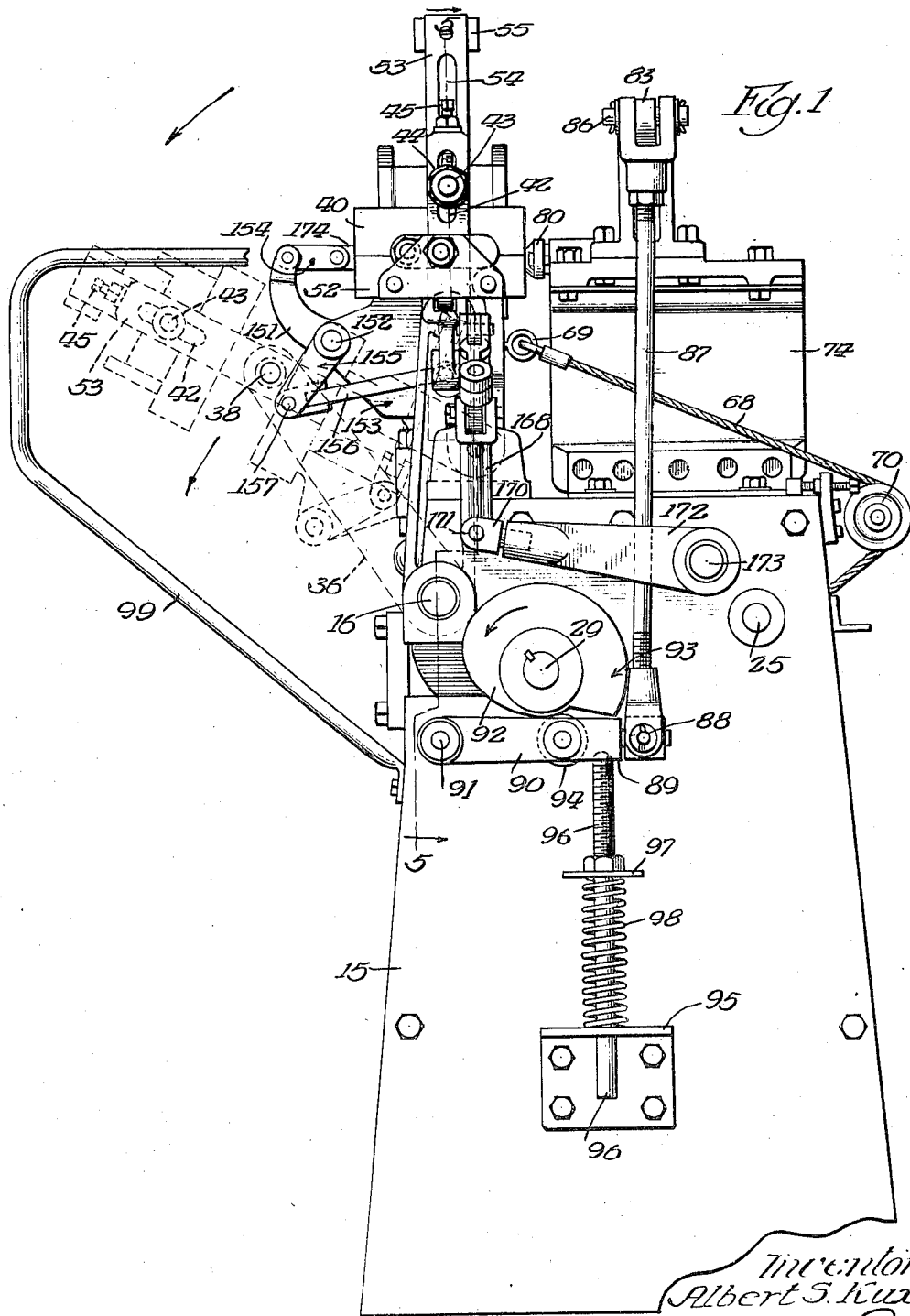
A. S. KUX

1,994,824

DIE CASTING MACHINE

Filed Aug. 10, 1933

8 Sheets-Sheet 1



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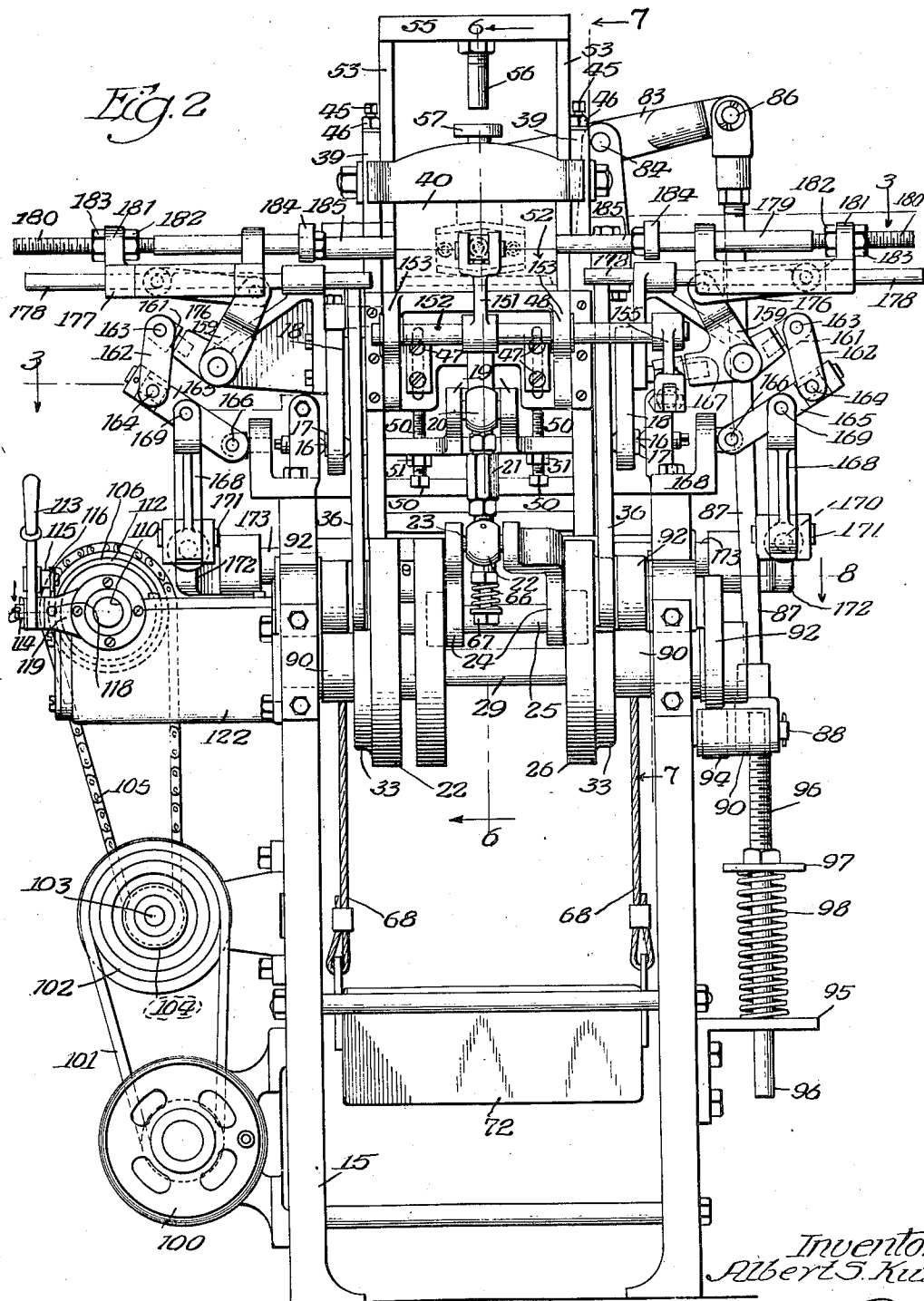
A. S. KUX

1,994,824

DIE CASTING MACHINE

Filed Aug. 10, 1933

8 Sheets-Sheet 2



Inventor  
Albert S. Kux

By *John S. Kux*  
Att'y

March 19, 1935.

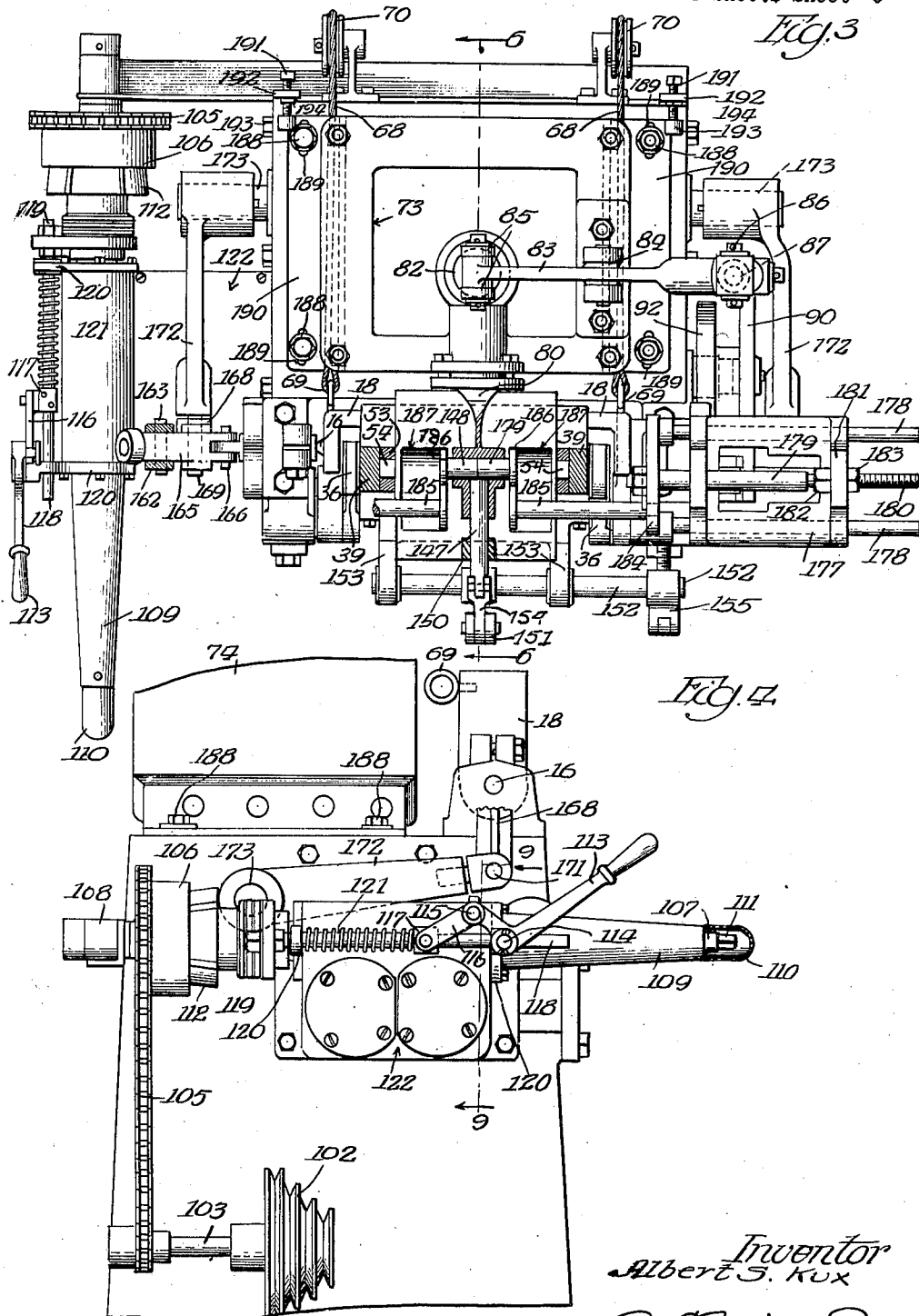
A. S. KUX

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DIE CASTING MACHINE

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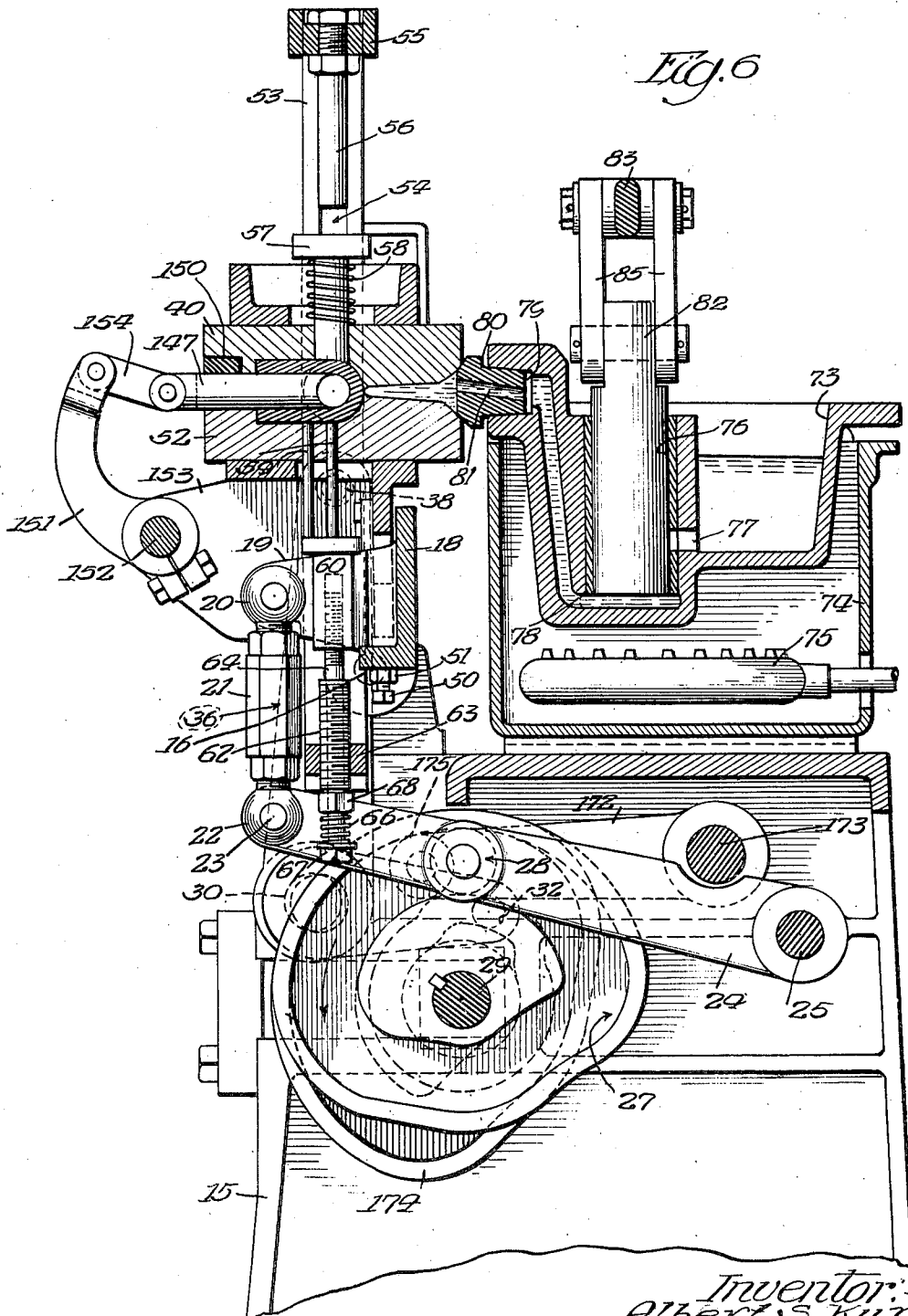
A. S. KUX

1,994,824

DIE CASTING MACHINE

Filed Aug. 10, 1933

8 Sheets-Sheet 5



Inventor:  
Albert S. Kux.  
By *John F. Johnson* Att'y

March 19, 1935.

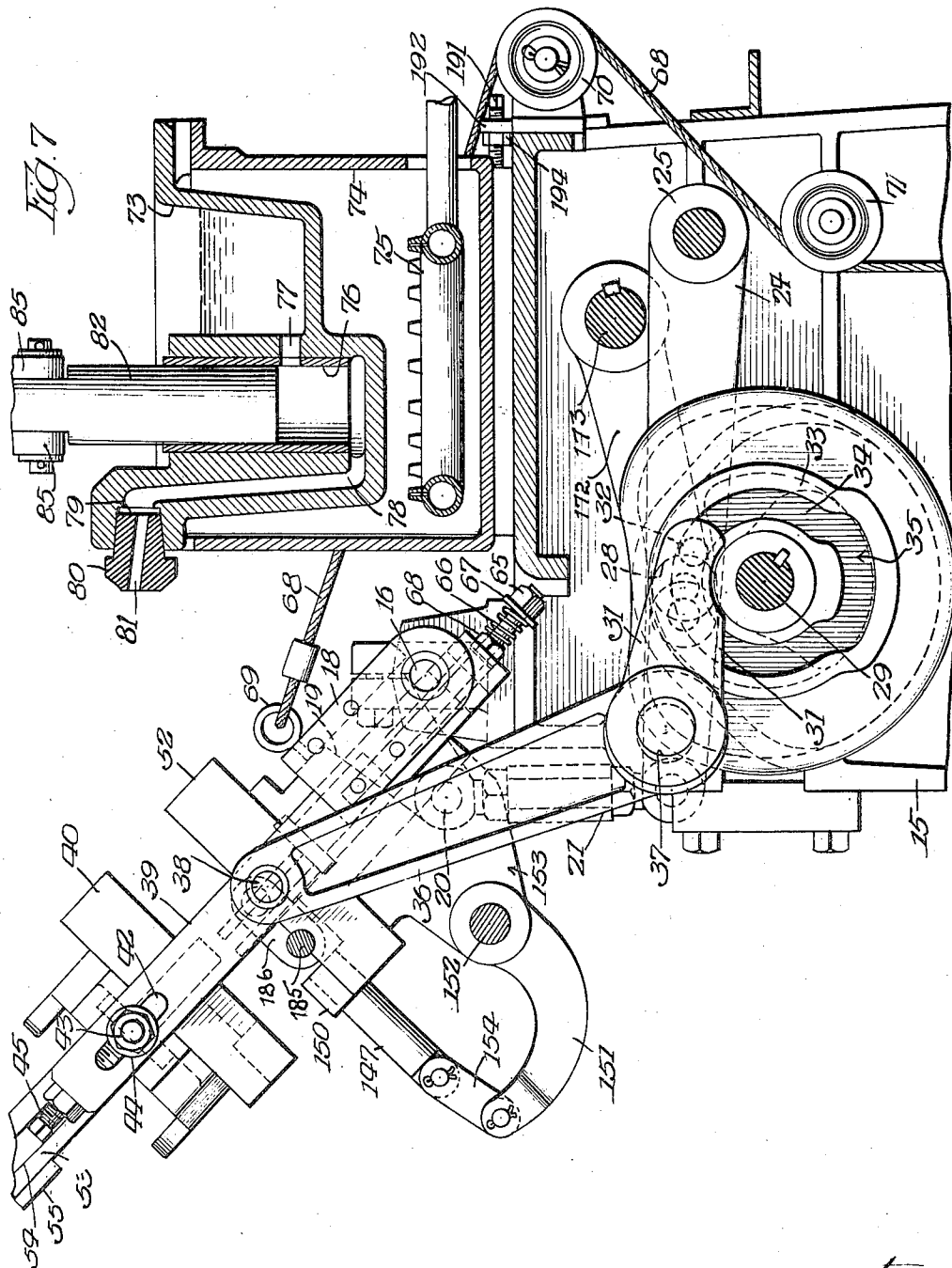
A. S. KUX

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DIE CASTING MACHINE

Filed Aug. 10, 1933

8 Sheets-Sheet 6



Inventor:  
Albert S. Kux

By *E. Gochum*  
Attorney

March 19, 1935.

A. S. KUX

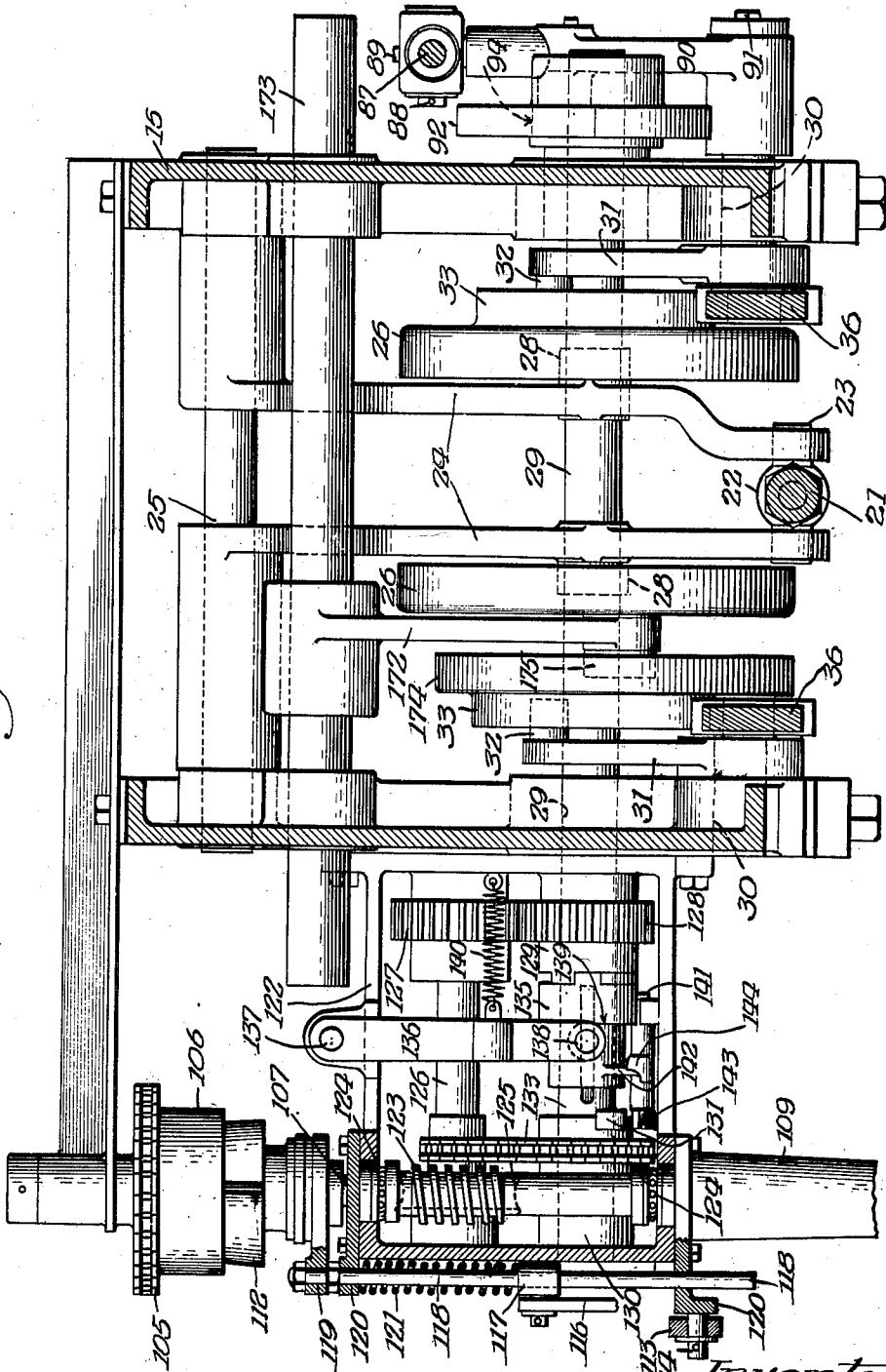
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DIE CASTING MACHINE

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Fig. 8



Inventor  
Albert S. Kux  
By *[Signature]*  
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March 19, 1935.

A. S. KUX

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DIE CASTING MACHINE

Filed Aug. 10, 1933

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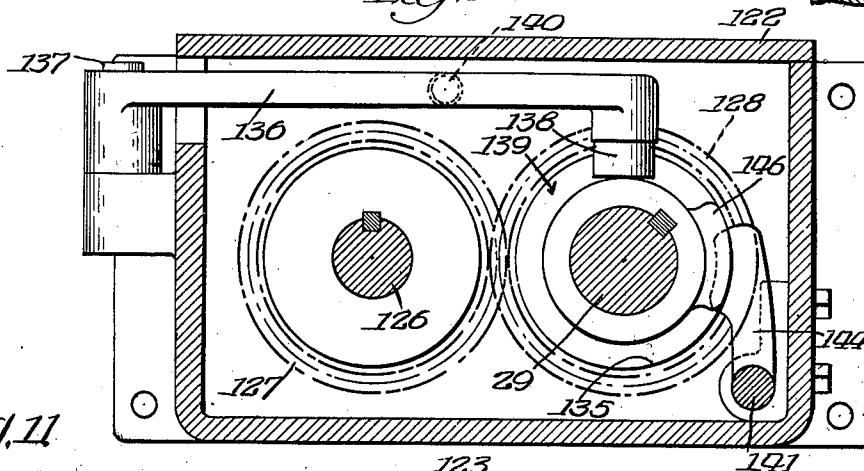
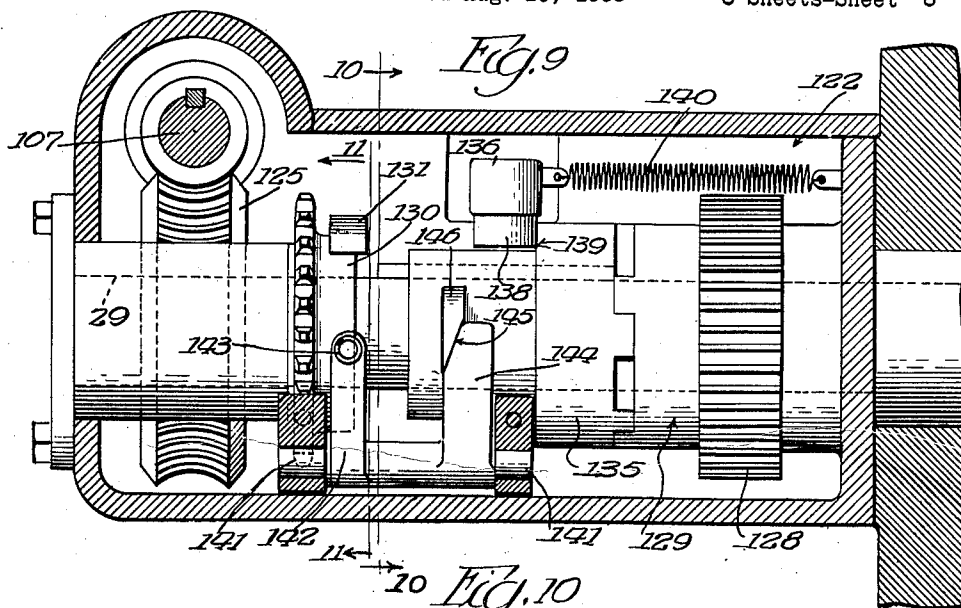
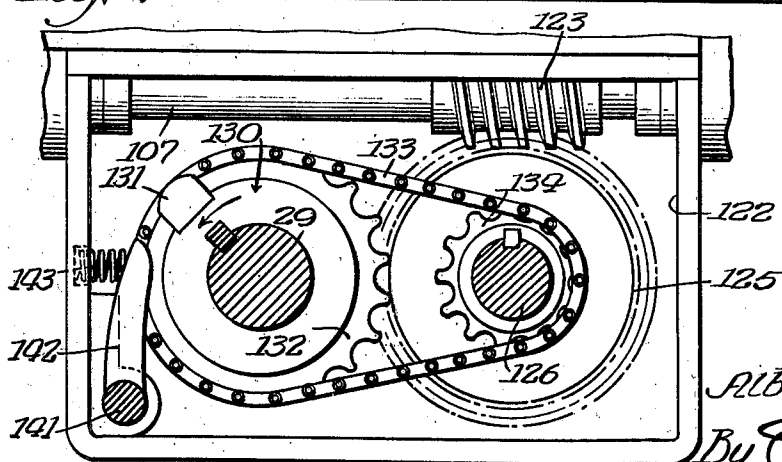


Fig. 11



Inventor  
Albert S. Kux  
By *[Signature]* Att'y.

## UNITED STATES PATENT OFFICE

1,994,824

## DIE CASTING MACHINE

Albert S. Kux, Chicago, Ill.

Application August 10, 1933, Serial No. 684,519

10 Claims. (Cl. 22—70)

This invention relates to improvements in die casting machines, and one of the objects of the same is to provide a machine of this character which will be comparatively simple and compact in construction, and effective and efficient in operation.

A further object is to provide in a machine of this character relatively movable die supporting and carrying members and mechanism for effecting such relative movements, and improved means for effecting an additional or what might be termed a "squeezing" movement to the dies after they have reached the limit of their movement by the relatively moving mechanism, whereby a tight fit will be assured, and which means will also operate to break the dies apart in advance of the operation of the mechanism which subsequently operates to separate the dies to permit the work being discharged or delivered from the dies by the knockout mechanism.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention and in which

Figure 1 is a side elevation of a machine of this character constructed in accordance with the principles of this invention.

Figure 2 is a front elevation of Figure 1, with parts omitted.

Figure 3 is an irregular, horizontal, sectional view taken on line 3—3, Figure 2.

Figure 4 is a left hand side elevation of Figure 2, with parts omitted and parts broken away.

Figure 5 is an irregular, vertical, sectional view taken on line 5—5, Figure 1, on an enlarged scale.

Figure 6 is a vertical sectional view taken on line 6—6, Figure 2, on an enlarged scale and with parts omitted.

Figure 7 is a vertical sectional view taken on line 7—7, Figure 2, showing the parts in a different position from that shown in Figure 6.

Figure 8 is a horizontal sectional view taken on line 8—8, Figure 2, on an enlarged scale.

Figure 9 is a detail sectional view on an enlarged scale, as taken on line 9—9, Figure 4.

Figure 10 is a detail sectional view taken on line 10—10, Figure 9.

Figure 11 is a detail sectional view taken on line 11—11, Figure 9.

Referring more particularly to the drawings, the numeral 15 designates generally a supporting

structure and pivotally mounted thereupon and upon suitable bearing members 16 resting in bearings 17, is a swinging member 18 (see particularly Figures 2, 3, 5 and 6). This member 18 is preferably of a U shape and has secured thereto spaced brackets or portions 19 between which is pivotally mounted one eye 20 of a turn button member 21. The other eye 22 of the turn button member is pivotally connected as at 23 to an arm preferably formed of spaced members 24, and the arms 24 are loosely mounted upon a shaft 25 (see also Figure 8) mounted upon the supporting structure 15. The turn button 21 may be of any desired construction and serves as a means for effecting a relative adjustment between the ends of the arm members 24 and the brackets 19.

The arms 24 are adapted to be rocked about their points of pivotal support 25 so as to swing the member 18 about its pivot 16, preferably by means of two box cams 26 in the cam grooves 27 of which rollers 28 secured to the arm members 24, travel. The cams 26 are secured to a main drive shaft 29 for rotation therewith and the shaft 29 is rotated in a manner to be hereinafter described, but it will be manifest that when the shaft 29 is rotated an oscillatory movement will be imparted to the member 18 about its pivot 16 through the medium of the arms 24, roller 28, cam groove 27 and turn button or link connection 21 between the arms 24 and the brackets 19 on the member 18.

Mounted in the supporting structure 15 are stub shafts 30 and secured to these shafts and for oscillation therewith are arms 31, and mounted upon each of these arms is a roller 32 which operate in a groove in cams 33. The cams 33 are secured to the shaft 29 for rotation therewith, and the portions 34 of the cam grooves receive the rollers 32 while the member 18 is moving about its pivot, and the portion 35 operates in a manner to be hereinafter set forth, to impart an additional or "squeezing" movement to the die carrying members.

Links 36 (see also Figure 8) are loosely mounted upon pins or bearing members 37 connected to the shafts 30 and arranged eccentric to their axes. These links 36 are of any desired length and are preferably arranged to project into the member 18, and are pivotally connected as at 38 to sliding bars 39, and to which sliding bars the upper die carrying member 40 is secured. Any suitable means may be provided for attaching the die carrying member to the slides 39, such for instance as bolts 41 which pass through suitable slots 42 (see particularly Figure 5) and are

threaded into a portion of the die carrying member. The bolts 41 are provided with nuts 43 which engage washers 44 that extend across the slots 42.

- 5 Adjusting screws 45 provided with lock nuts 46 may be provided for determining the adjustment of the die carrying member 40.

10 Secured to the member 18 preferably by means of fastening screws or bolts 47, is a lower die carrying member 48 and the member 48 is provided with slots 49 to receive the bolts 47, and adjusting screws 50 provided with lock collars 51 pass through a portion of the member 18 and serve as a means whereby the lower die carrying member 48 may be adjusted with respect to the member 18. The lower die 52 may be secured to the die carrying member 48 in any suitable manner.

20 The lower die support 48 is preferably spaced from the slides 39 and arranged in such space and secured to the lower die supporting member 48, are bars or members 53 which are provided with slots 54 through which the bolts 41 pass, and these bars 53 are of any desired length and are connected by means of a cross bar 55. A knockout operating device 56 is carried by the cross bar 55 and this device 56 is adapted to co-operate with a knockout 57 controlled by a spring 58 and which knockout 57 passes through the upper die 40, for the purpose of knocking out the work. In operation, the spring 58 normally holds the knockout 57 retracted, but when the slide bars 53 are lowered by the movement of the member 18 about its pivot, the operating device 56 will engage the knockout 57 and depress the same against the stress of the spring 58 to eject the work.

30 The operating mechanism 56 of the knockout 57 is brought into operation when the member 18 is swung about its pivot to a predetermined position, and as the member 18 and the links 36 are mounted upon different centers, it will be manifest that when the member 18 is swung about its pivot from the position shown in Figure 6 to the position shown in Figure 7, the knockout operating device 56 will be brought into contact with the knockout device 57 and will depress the latter to eject or knockout the work from the upper die, and as the member 18 is moved in the opposite direction about its pivot, that is from the position shown in Figure 7 back to the position shown in Figure 6, the actuating element 56 will be moved away from the knockout or ejecting device 57, so that the spring 58 will retract the latter.

35 Knockout pins 59 are supported by a member 60 which slides in suitable guides 61 carried by the member 18. A tubular member 62 is threaded through a portion 63 of the slide bars 39 so as to be adjustable with respect thereto. A pin 64 passes loosely through the tubular member 62 and is threaded into the lower end of the element 60. This pin projects loosely through and beyond the tubular member 62 (see particularly Figure 5) and has threaded upon the end thereof a nut or collar 65. A spring 66 encompasses the portion of the pin 64 beyond the tubular element 62, and one end of this spring rests against a washer 67 supported by the nut or collar 65, and the other end of the spring rests against the extremity of the tubular member 62. The spring 66 tends normally to retract the member 60 to withdraw the pins 59. When the dies are separated by the movement of the member 18 about its pivot 16 the sliding bars 39 will raise the upper

die carrying member 40 and also the tubular member 62 until the end of the latter engages the member 60 and raises the same against the stress of the spring 66. As the slides 39 move downwardly during the return movement of the member 18, the spring 66 acting upon the nut 65 retracts the member 60.

5 It is thought that the operation of this portion of the mechanism will be clearly understood from the foregoing, but briefly stated it is as follows. Assuming the parts to be in the position shown in Figure 7, the operation of this portion of the machine will be as follows. Assuming the main driving shaft 29 to be rotating, the cams 26 as well as the cams 23 will be rotating. The cam 15 grooves in the respective cams are arranged in such a relation with respect to each other that the first operation will be effected by the cams 26 and this will cause the arms 24 to be rocked about their pivots on the shaft 25. Through the medium of the turn button connection 21, the member 18 will swing about its pivots 16 from the position shown in Figure 7 to the position shown in Figure 6. During the movement of the member 18 about its pivot 16, the sliding bars 39 will swing about their pivots 37, causing the upper die carrying member 40 through the medium of the links 36, to be drawn downwardly toward the lower die carrying member 52 into co-operating relation to receive the charge of material to be cast. However, as soon as the die carrying member 40 has been moved to the limit of its movement toward the die carrying member 52 by the swinging of the member 18 about its pivot 16, the portion 35 of the groove in the cam 33 will operate upon the roller 32 carried by the arm 31, which is connected with the links 36 and thereby cause the links 36 to rock about the eccentric pivot 37 and thereby impart what might be termed a "squeezing" action to the die carrying members, one with respect to the other. This will insure a tight fit and the parts will be held in this position during the cycle of operation of the shaft 29 and while the material is being cast. At a predetermined time in the cycle of operation of the cam 33 the groove in the cam 33 will again operate to cause the links 36 to be moved about their eccentric pivot to slightly separate the die carrying members in advance of the movement of the member 18 about its pivots 16.

50 With this construction it will therefore be manifest that after the die carrying members have been brought into close relationship with respect to each other and have reached the limit of the relative movement which would be effected by the member 18 moving about the pivots 16, the links 36 will effect a further and squeezing action upon the dies with respect to each other during their closing movement. Before the member 18 is moved about its pivot 16 to separate the dies 40—52, the links 36 will again operate to impart an initial separation of the die carrying members.

55 Any suitable means may be provided for counterbalancing the movement of the member 18 and its supporting structure about its pivot 16. A simple and efficient means, however, embodies cables 68, one end of which are secured as at 69, to the member 18. The cables pass over suitable pulleys 70—71 and have connected thereto a counterbalancing weight 72.

70 Mounted upon the supporting structure is a container 73 for the material to be cast, and this container is housed within a casing 74, within which latter a heater, preferably in the form 75

of a burner 75, is arranged. The container 73 is provided with a chamber 76 having an inlet 77 in communication with the chamber and a discharge outlet 78, which latter preferably extends from the bottom of the chamber 76 to a point adjacent the top thereof, and is provided with a lateral discharge opening 79, in which a nozzle 80 is arranged. A passage 81 is arranged in the nozzle 80 and the passage inclines downwardly from the outer extremity to the inner extremity of the nozzle so that any material which may be within the passage 81 after the discharge operation, will drain back into the chamber 76. A plunger 82 is arranged in the chamber 76, and this plunger may be operated in any desired or suitable manner so as to force the material from the container 73 to the discharge nozzle.

A simple and efficient means for effecting this operation comprises a lever 83 which is pivotally mounted intermediate its ends as at 84. One end of the lever is connected by means of links 85 with the plunger 82, and to the other end of the lever is pivotally connected as at 86 a rod 87, the free end of which is pivotally connected to a member 88, which latter has a swivel connection 89 to an arm 90, the other end of the arm 90 being pivotally mounted as at 91 upon the supporting structure 15.

Secured to the shaft 29 is a cam 92 having a high portion 93 and the cam is adapted as it rotates, to engage a roller 94 carried by the arm 90. Secured to the main supporting structure 15 is a bracket 95 through which a rod 96 loosely passes, and one end of the rod 96 engages and rests against the arm 90. An adjustable collar 97 is threaded upon the rod 96, and a coil spring 98 encompasses the rod with one end thereof engaging the collar 97 and the other end resting against the bracket 95. By the adjustment of the collar 97 upon the rod 96 the tension, stress or load in the spring 98 may be predetermined and may be built up to any desired degree. By action of the cam 93 upon the arm 90, the stress or load upon the spring 98 may be increased or augmented. The normal tendency of the spring 98 is to raise the rod 87 and force the plunger 82 downwardly in the chamber 76 to discharge a supply of the contents of the container 73 through the nozzle 80 and into the dies 40—52. When, however, the cam 92 is rotated, the arm 90 is gradually depressed against the stress of the spring 98, which will raise the plunger 82 so as to permit the contents of the container 83 to flow through the opening 77 into the chamber 76 beneath the plunger. As soon as the high portion 93 of the cam 92 passes out of contact with the rollers 94 on the arm 90, the spring 98 will suddenly force the plunger 82 downwardly in the chamber 76 and thereby discharge a supply of the material. This construction renders it possible to vary and predetermine the power of the spring 98 and thereby control the pressure exerted upon the plunger 82, obviating the use of expensive and additional pressure creating means.

Obviously, any other form of plunger operating mechanism may be employed which will produce the desired results.

If desired, a guard 99 may be arranged to shield the swinging movement of the support 18 and the mechanism carried thereby.

Any suitable means may be provided for driving the main operating shaft, and to that end there may be provided a motor 100, suitably mounted upon the supporting structure. A belt

101 passes over a pulley on the motor shaft (not shown) and this belt in turn passes over a pulley 102 on a shaft 103, to which latter shaft is secured a sprocket wheel 104. A sprocket chain 105 passes over the sprocket wheel and also over a sprocket wheel carried by a clutch member 106, and which clutch member is loosely mounted upon a shaft 107, the latter being journaled in bearings 108—109. A cap member 110 is removably secured over one extremity of the shaft 107, and such extremity is preferably angular in cross section, as at 111, to permit of the application of the crank or other device for rotating the shaft when desired.

Keyed upon the shaft 107 is another clutch member 112 which co-operates with the clutch member 106, and this clutch member 112 is adapted to be reciprocated upon the shaft in any suitable manner, such as by means of a hand lever 113 pivotally supported as at 114. One arm of the lever 113 is pivotally connected as at 115 to a link 116, and this link in turn is connected to a collar 117 which is secured to a rod 118. The rod 118 is connected as at 119 (see particularly Figure 8) to the clutch member 112 and is slidable through bearings 120. A coiled spring 121 encompasses the rod, and one end of the spring bears against one of the bearings 120 while the other end bears against the collar 117 so that when the lever 113 is rocked about its pivot 114, the collar 117, together with the rod 118, will be moved in a direction to force the clutch member 112 into co-operative relation with the clutch member 106, and at the same time place the spring 121 under tension.

In operation and when the lever 113 is moved about its pivot to force the clutch member 112 into active cooperation with the clutch member 106, the pivot 115 of the link 116 with the lever 113 will pass over the center of the pivot 114 and the clutch members will be locked together.

Carried by the shaft 107 and disposed within a casing 122 is a worm 123, provided with thrust bearings 124, and this worm meshes with a worm gear 125 which is keyed to a shaft 126. A gear 127 is connected to the shaft 126 to rotate therewith and meshes with a gear 128 loosely mounted upon the main driving shaft 29. The gear 128 is provided with a clutch face 129. Keyed also to the shaft 29 is a member 130 which is spaced from the clutch face 129 and is provided with a cam lug or projection 131 and connected with the member 130 is a sprocket wheel 132, over which a sprocket chain 133 passes and which sprocket chain also passes over a sprocket wheel 134 secured to the shaft 126 for rotation therewith.

Arranged between the clutch face 129 of the gear 128, and the member 130 is a clutch member 135 which is splined to the shaft 29 so as to be movable into and out of cooperative relation with the clutch face 129. A lever 136 mounted to swing on an upright pivot 137 is provided with a portion 138 which engages a shoulder 139 on the clutch member 135 and tends, through the medium of a spring 140 to move the clutch member 135 into active engagement with the clutch face 129 and thereby lock the gear 128 to the shaft 29 for rotation therewith.

A rock shaft 141 is provided with an upwardly extending arm or portion 142 arranged to be moved into the path of rotation of the cam or projection 131 so as to be engaged and rocked by such projection against the stress of a spring 143. Secured also to the shaft 141 is another upwardly

extending portion 144 having a cam or inclined portion 145.

Carried by the clutch member 135 is a cam projection 146 that is adapted, when the projecting portion 144 is so positioned, to engage such portion 144 and to be shifted by such portion upon the shaft 29 to move the clutch member 135 out of cooperative relation with the clutch face 129 and thereby release or unlock the gear 128 with respect to the driving shaft 29. This will cause a dwell in the movement of the swinging support or member 18.

When the cam or projection 131 contacts with the projection or arm 142 the shaft 141 will be rocked and the projection or arm 144 will be moved to a position that it will not be engaged by the cam portion 146 on the clutch member 135, at which time the arm 136 and spring 140 will cause the clutch member 135 to be moved into active co-operation with the clutch face 129. As soon as the cam projection 131 moves out of contact with the arm or projection 142, the spring 142 will rock the shaft 141 to again position the arm or projection 144 so as to be engaged by the cam 144 and the clutch member 135 will then be shifted into active co-operation with the clutch member 129 to connect the gear 128 for rotation with the shaft 29. Thus it will be seen that the gear 128 will be automatically locked to and unlocked with respect to the shaft 29.

In the present form of the invention three cores 147, 148, and 149 are shown which are projectable into and removable from the dies, but it is obvious that any desired number of cores may be employed.

The core 147 operates from the front of the machine and is movable (see particularly Figure 7) through a portion 150 of the die member 52 and is operable by means of an arm 151 which is connected with a rock shaft 152 journaled in a bearing 153 carried by the swinging support 18. The free end of the arm 151 is connected by means of a link 154 (see also Figure 1) with the core 147.

Another arm 155 (see also Figures 1 and 2) is connected to the rock shaft 152 (see also Figure 3) and a link 156 is pivotally connected at one end as at 157 to the arm 155. The other end of the link 156 (see particularly Figure 5) is connected by means of a swivel joint 158 with an arm 159 that is pivotally mounted as at 160. To the arm 159 and by means of a swivel joint 161, a link 162 is pivotally connected as at 163. The other end of the link 162 is pivotally connected as at 164 to another link 165, which latter is pivotally connected as at 166 to a swivel joint 167, that in turn is connected with a stationary portion of the supporting structure.

An arm 168 is pivotally connected as at 169 to the link 165 and to the other end of the arm 168 is connected a swivel 170 as at 171, and this swivel 170 is connected to an arm 172<sup>a</sup> which in turn is connected to a rock shaft 173 (see also Figures 6 and 8). Mounted upon the main drive shaft 29 is a box cam 174 in which a roller 175 that is secured to the arm 172, operates, with the result that as the shaft 29 rotates the cam 174 will rotate, and through the medium of the roller 175 a rocking movement will be imparted to the arm 172 as well as to the arm 168, and a rocking movement will also be imparted to the arm 159 about its pivot 160, and this rocking movement through the medium of the link 156 will cause the arm 151 to be rocked about its pivot 152 and thereby advance or retract the core 147. This movement

of the advancing and retracting of the core 147 is effected during the swinging movement of the support 18 about its pivot.

Similar arms 172 and 168, together with similar link constructions 165—162 and arm 159, are arranged on the other side of the machine, and these arms 159 co-operate with and are connected respectively to the core members 149—148 for advancing and retracting them. To that end there is pivotally connected to each of the arms 159 a link 176, and each of the links is connected with a slide 177 movable upon guides 178.

A bar or rod 179 is supported by the slide 177 for adjustment lengthwise thereof, and to that end one end of the bar or rod 179 may be threaded as at 180, the threaded end passing through a portion 181 of the slide, and nuts or collars 182—183 may be threaded upon the rod on each side of the portion 181. To the rod 179 is secured a head 184, and to this head is connected a bar or rod 185, see particularly Figures 1, 3 and 5, which in turn is connected by means of a member 186 with the core member 149. The connection 186 may move in a suitable recess 187 in the die member.

It will therefore be manifest that when the arm 159 is rocked about its pivot 160, the slide 177 will be moved upon the guides 178 and this will, through the medium of the bar or rod 179, move the respective cores 149—148 into and out of the die members.

The positioning and withdrawing of all of the cores will be effected during the time that the swinging support 18 is moved about its pivot.

Obviously, the swivel joint connections provide for the free movement of the links, levers and arms so as to prevent their binding.

If desired, the casing 74 in which the container or molten metal pot 73 is arranged, may be mounted for adjustment (see particularly Figures 3 and 7) and to that end fastening bolts 188 may be provided which pass through slots 189 in flanges 190 on the casing 74, and adjusting screws 191 may also be provided which are threaded through stationary supports 192 and engage a portion 193 on the flange, lock nuts 194 being provided, if desired, for holding the screws 191 in their adjusted position.

While the preferred form of the invention has been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:—

1. In a die casting machine a receptacle for containing molten metal, a nozzle therefor, a pivotally mounted support, a die carrying member mounted upon the support and fixed with respect thereto, a second die carrying member slidably mounted upon the support, means for swinging the said support about its pivot to move the dies into and out of position with respect to the nozzle, pivotally mounted links connected with the slidable die carrying member for automatically moving the last said die carrying member toward and away from the fixed die carrying member, and means automatically operable in conjunction with said links for imparting a subsequent squeezing action to the die carrying members.

2. In a die casting machine, a supporting structure, a receptacle for containing molten metal, a nozzle therefor, a pivotally mounted support, a die carrying member mounted upon the support

and fixed with respect thereto, a second die carrying member slidably mounted upon the support, means for swinging the said support about its pivot to move the dies into and out of position with respect to the nozzle, pivotally mounted links connected with the slidable die carrying member for automatically moving the last said die carrying member toward and away from the fixed die carrying member, means automatically operable in conjunction with said links for imparting a subsequent squeezing action to the die carrying members, the last recited means embodying an arm swingingly connected with said supporting structure and with which arm the links are eccentrally connected, and means for swinging said arm.

3. In a die casting machine a receptacle for containing molten metal, a nozzle therefor, a pivotally mounted support, a die carrying member mounted upon the support and fixed with respect thereto, a second die carrying member slidably mounted upon the support, means embodying an actuator for swinging the said support about its pivot to move the dies into and out of position with respect to the nozzle, means co-operating with said actuator and operating automatically during the movement of said support about its pivot for moving the said movable die carrying member into contact with the fixed die carrying member and also out of contact therewith, and means also responsive to the operation of said actuator for imparting a further and squeezing action to the members after the dies have been brought into contact.

4. In a die casting machine, a supporting structure, a molten metal pot, a discharge nozzle, a pivotally mounted support, a fixed die carrying member carried by said support, a slidable die carrying member mounted upon the support, means for swinging the support about its pivot to move the die carrying members into and out of position with respect to said nozzle, rock shafts journaled to said supporting structure, links eccentrally and pivotally connected with said shafts and also pivotally connected with said slidable die carrying member for moving the die carrying members together, arms connected with said rock shafts, and cam devices for actuating said arms to rock said shafts for imparting another and squeezing movement of the die carrying members one with respect to the other, subsequent to the movement which is imparted to the slidable die carrying member towards the fixed die carrying member by the said links.

5. In a die casting machine, a pot for molten metal provided with a discharge passage, a discharge nozzle connected with said passage and having an extended passage therethrough at substantially right angles to the passage and inclined to the horizontal and downwardly from the outlet to the inlet end thereof whereby surplus metal will be drained back into said pot, a movable support, dies carried thereby, and means for actuating the support to move said dies into and out of position with respect to said nozzle.

6. In a die casting machine a pot for molten metal, a nozzle connected thereto, a plunger for forcing the metal through the nozzle, a pivotally mounted support, die carrying members mounted upon said support, one of which is fixed and the other slidable towards and away from the fixed member, means for swinging the support about

its pivot, means mounted upon a different center from the pivot of the support and responsive in its operation to the movement of the support for causing a relative movement of the die carrying members one with relation to the other, a common actuating shaft for operating the support swinging means and the die sliding means, resilient means operating under a predetermined normal pressure and tending normally to move said plunger in one direction to force the metal through said nozzle, means for varying at will said normal pressure, and means connected with said shaft and operating to move said plunger in the opposite direction, against the stress of the last recited means to augment such stress, and then release the plunger.

7. In a die casting machine a pivotally mounted support, die carrying members on the support, cores and core pulling mechanism carried with the support, means for swinging the support about its pivot, and means embodying levers, links and swivel joint connections between the respective core pulling mechanism and a stationary part of the mechanism for actuating said core pulling mechanism.

8. A die casting machine, a receptacle for the molten metal, a pivotally mounted support, a die carrying member mounted upon the support and fixed with respect thereto, a second die carrying member slidably mounted upon the support, means embodying an actuator for swinging the support about its pivot to move the dies into casting position and for moving the dies together during a portion of the movement of said actuator, and means responsive to the actuation of said actuator for imparting a subsequent and squeezing action to the dies towards each other, and beyond the limit of the first recited movement of the dies towards each other by the said actuator, the last recited means also operable to impart an initial breaking movement between the die members.

9. In a die casting machine, a receptacle for the molten metal, a pivotally mounted mold carrying frame, a mold mounted upon the frame for receiving molten metal from said receptacle, said mold being sectional, means for swinging the mold carrying frame about its pivot and embodying an actuator, means responsive to the operation of said actuator for moving the mold sections together, and means also responsive to the operation of said actuator during a portion of the operation thereof, for imparting a subsequent and squeezing action to the mold sections.

10. In a die casting machine, a receptacle for the molten metal, a pivotally mounted mold carrying frame, a mold mounted upon the frame for receiving molten metal from said receptacle, said mold being sectional, means for swinging the mold carrying frame about its pivot and embodying an actuator, means responsive to the operation of said actuator for moving the mold sections together, and means also responsive to the operation of said actuator during a portion of the operation thereof, for imparting a subsequent and squeezing action to the mold sections, the last recited means also operating to impart an initial and breaking action to the mold sections during the first portion of the operation of said actuator before the mold sections are separated by the actuator.

ALBERT S. KUX.