A. E. MILLER.

MACHINE FOR CASTING TYPE.

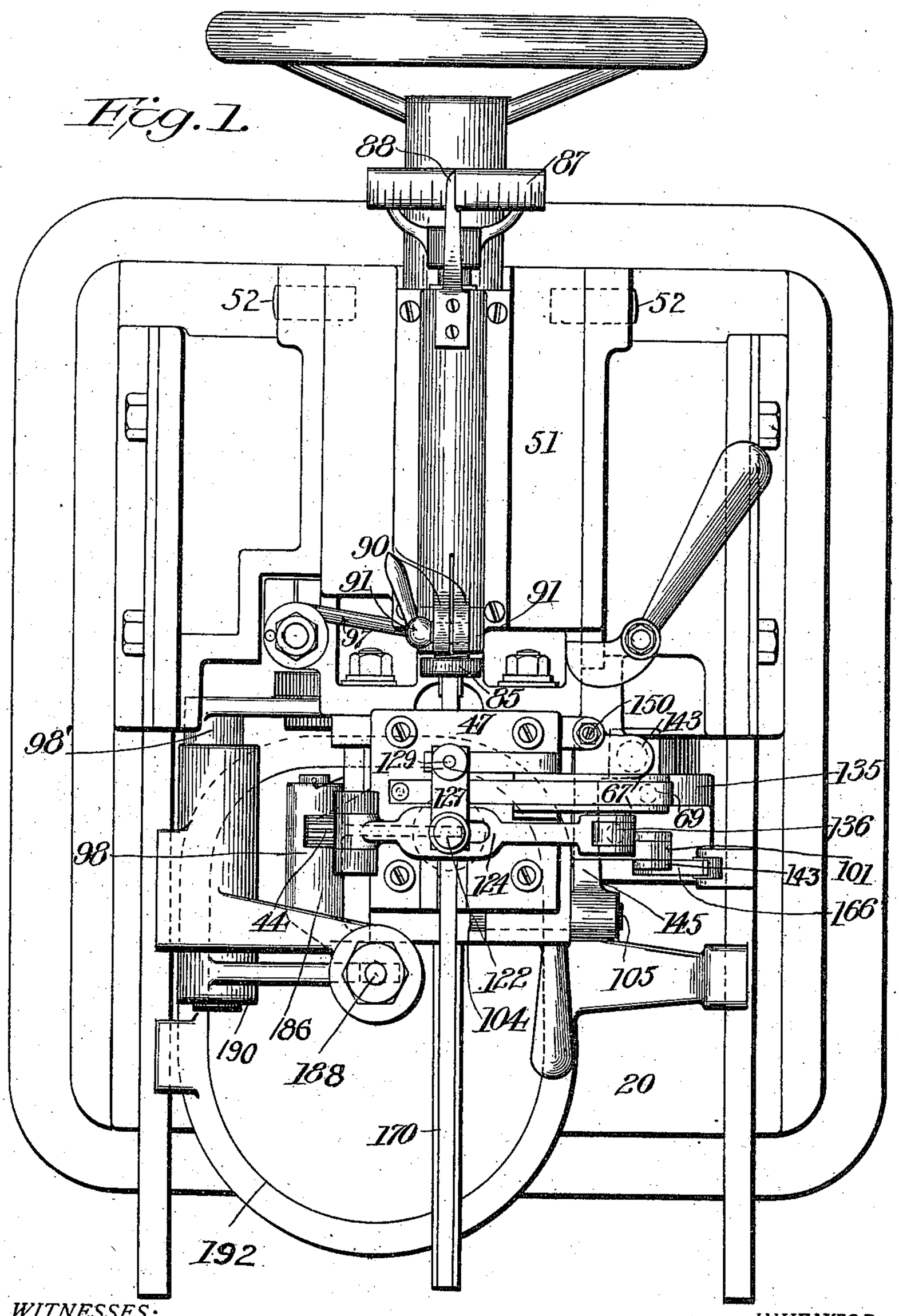
APPLICATION FILED JAN. 16, 1909.

963,790.

Patented July 12, 1910.

8 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

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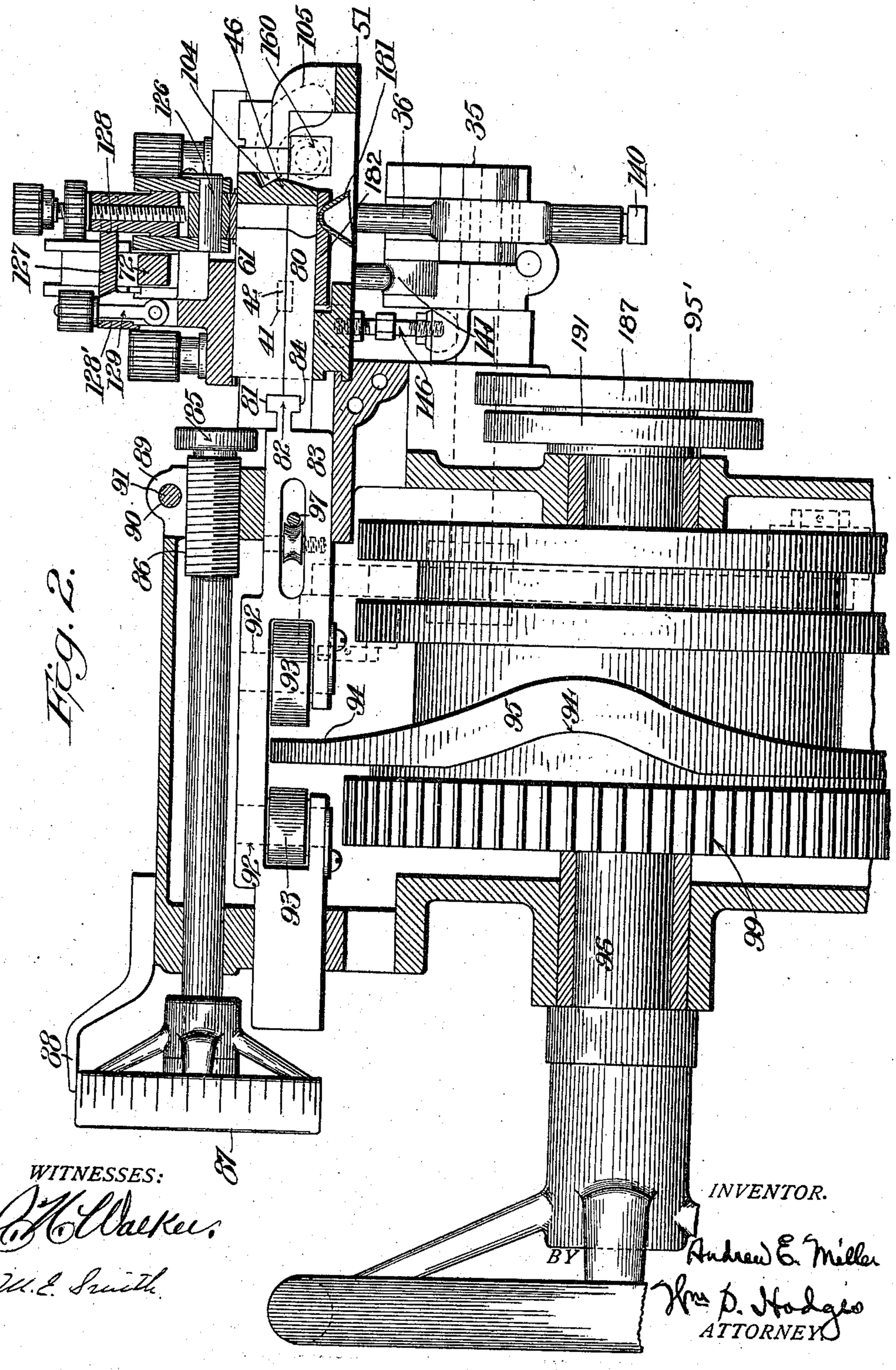

Fig. 2.

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8 SHEETS—SHEET 3.

Fig. 3.

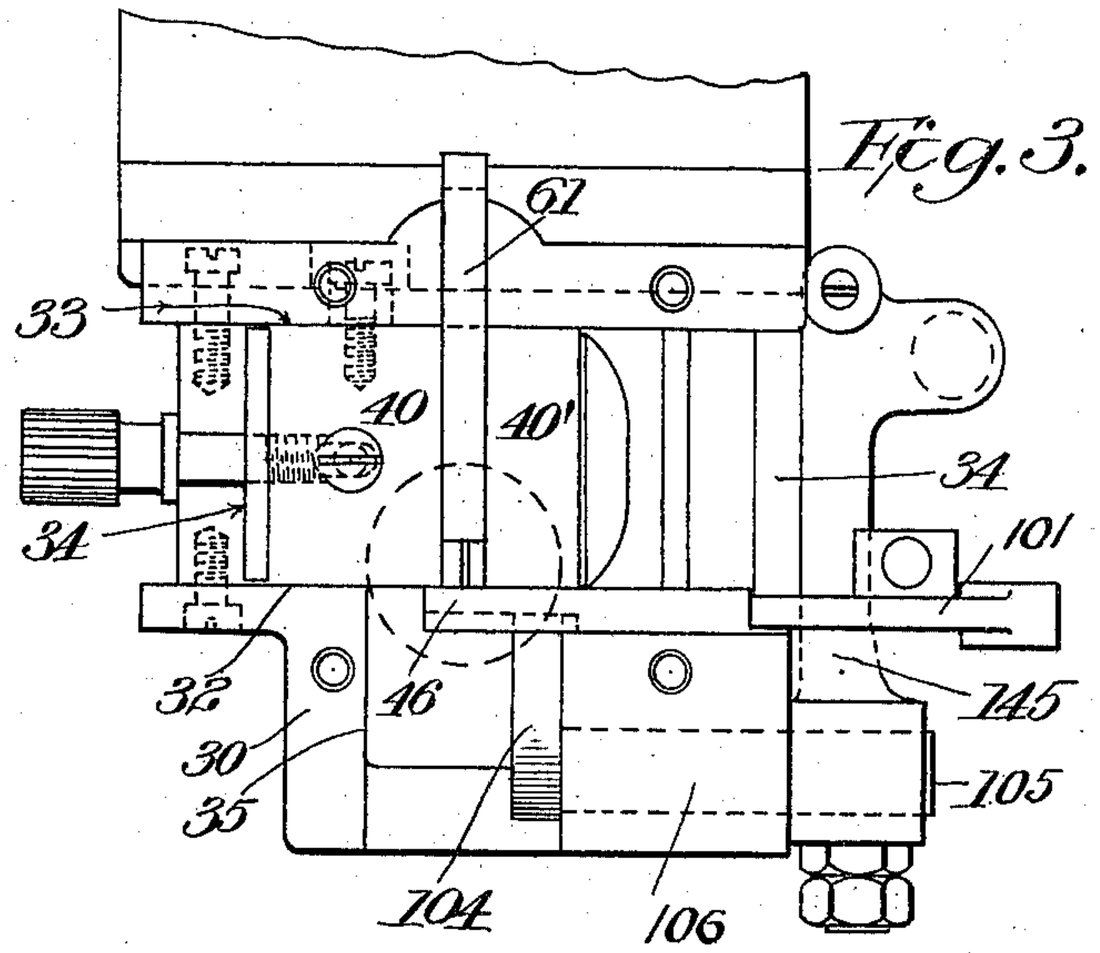

Fig. 4.

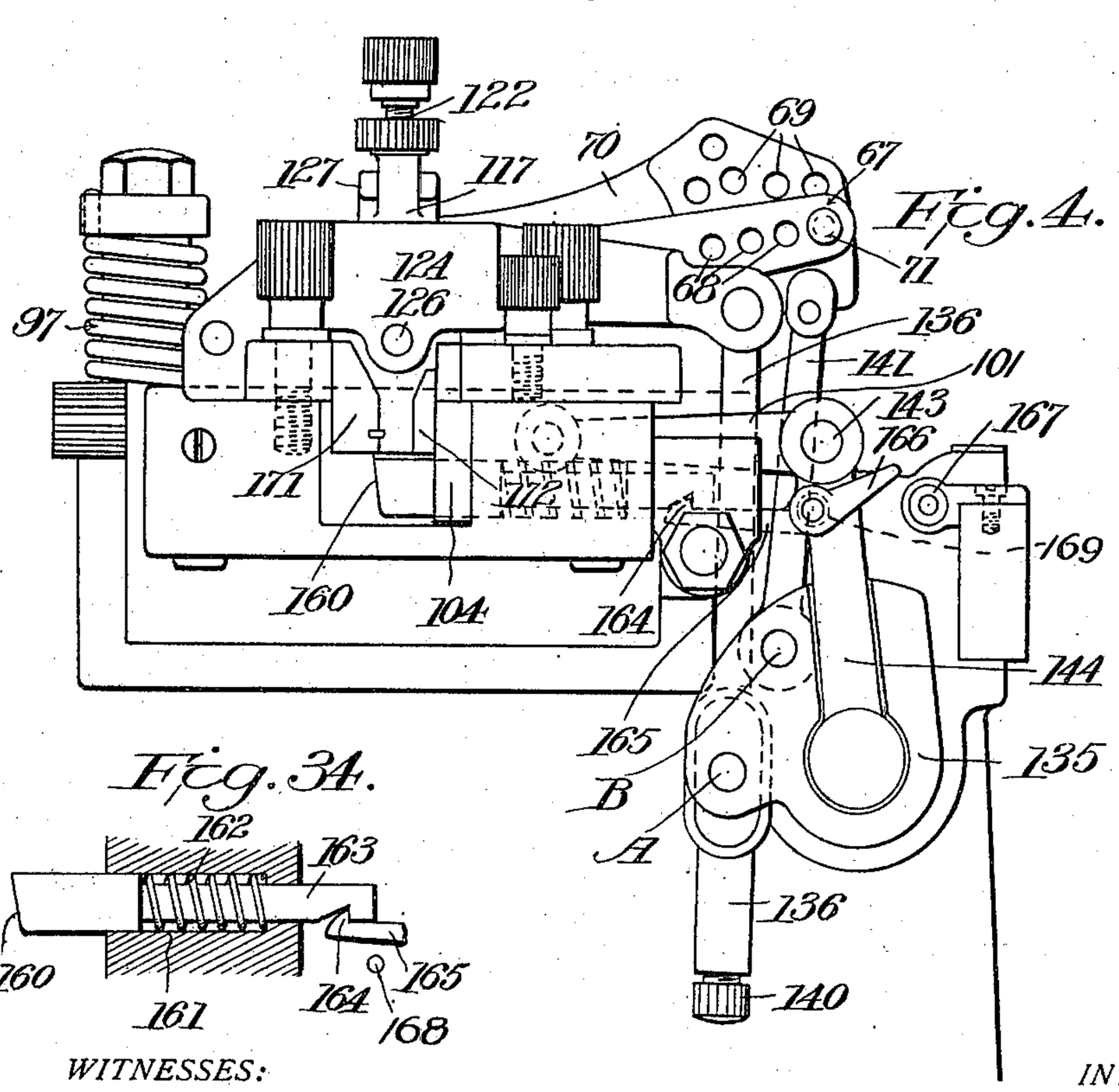

Fig. 34.

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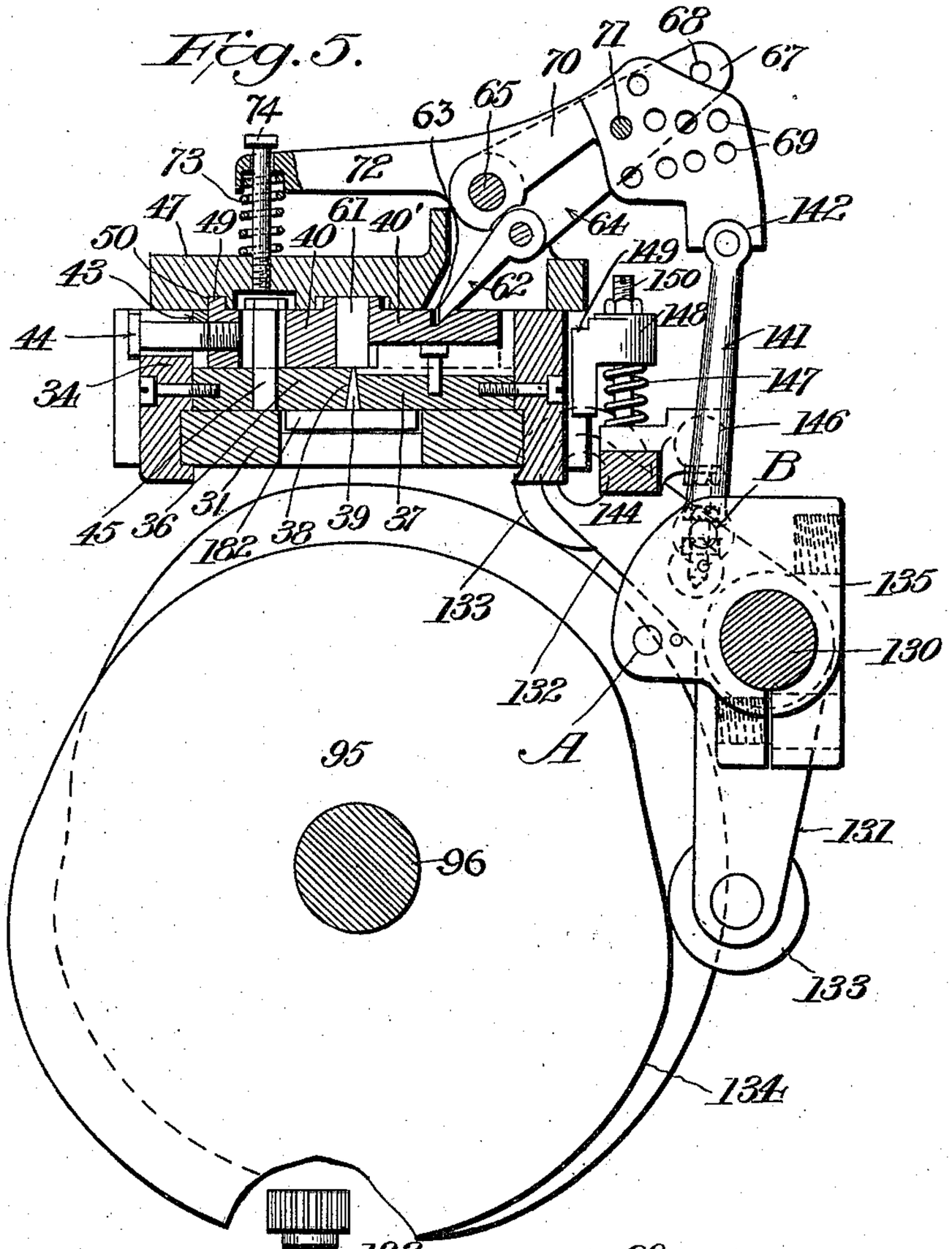
8 SHEETS—SHEET 4.

Fig. 5.



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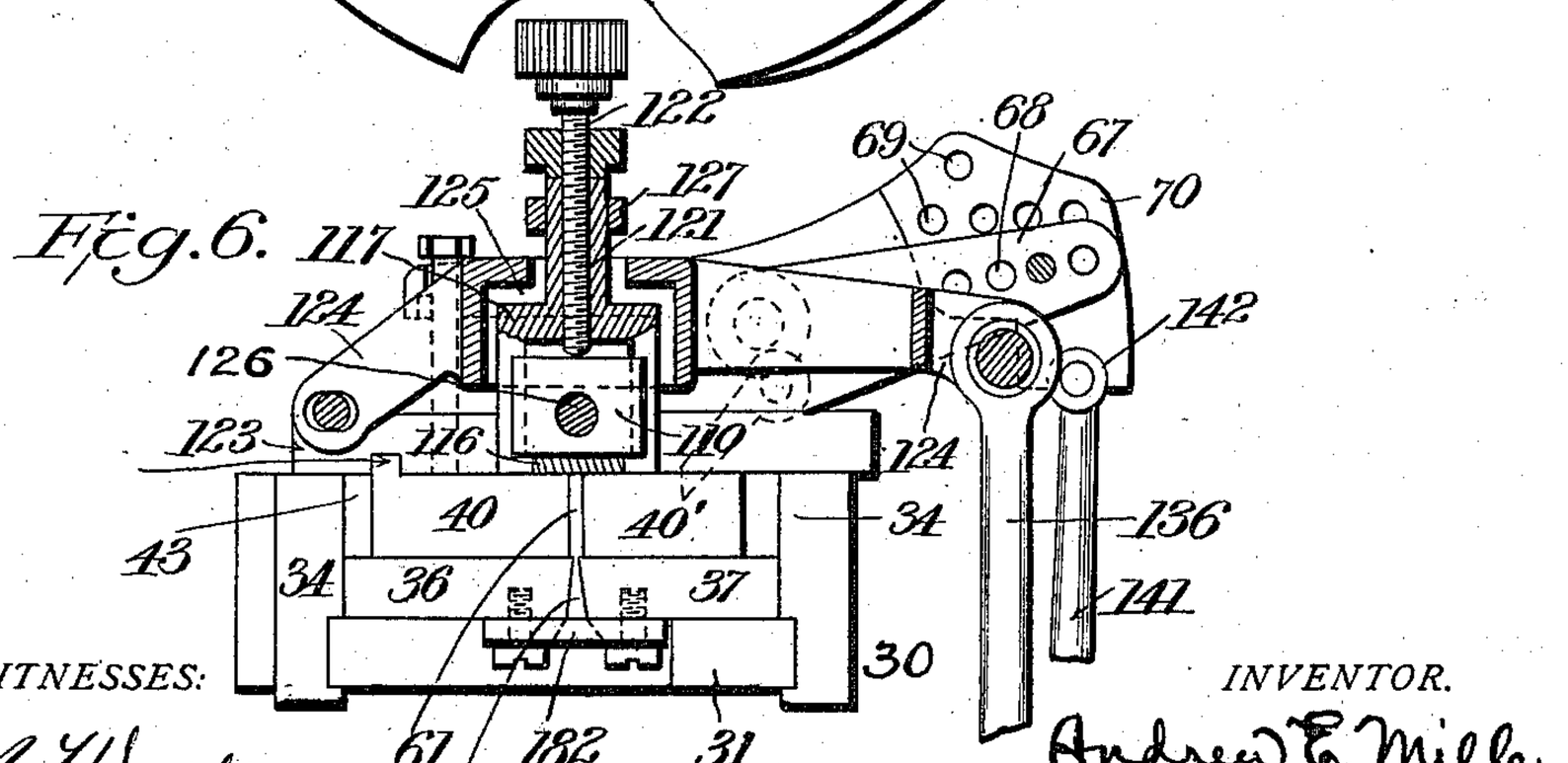

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8 SHEETS—SHEET 5.

Fig. 7.

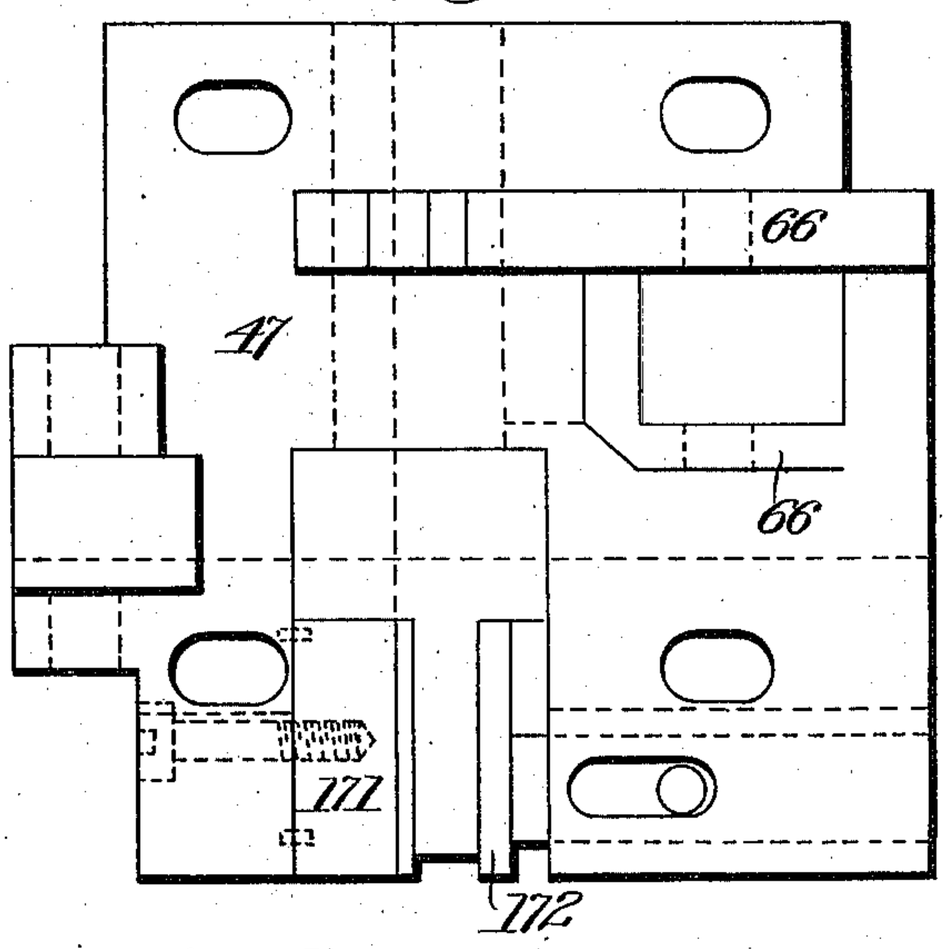


Fig. 11.

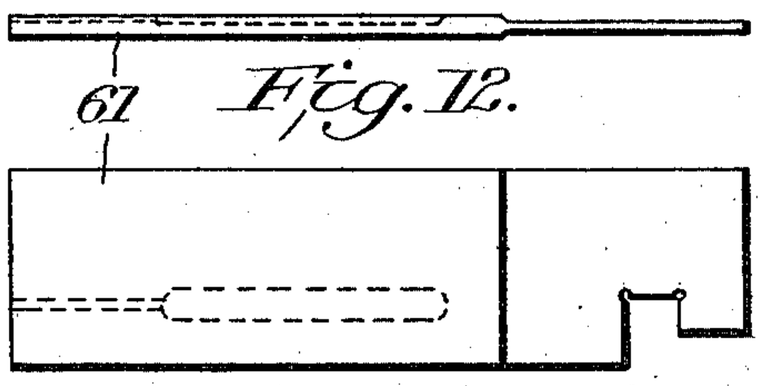


Fig. 12.

Fig. 15.

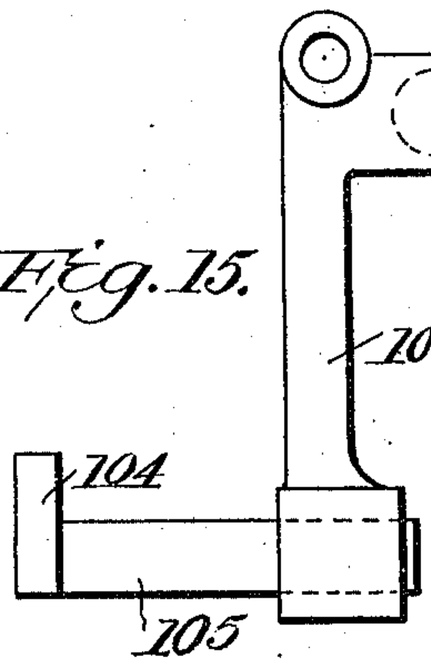


Fig. 8.

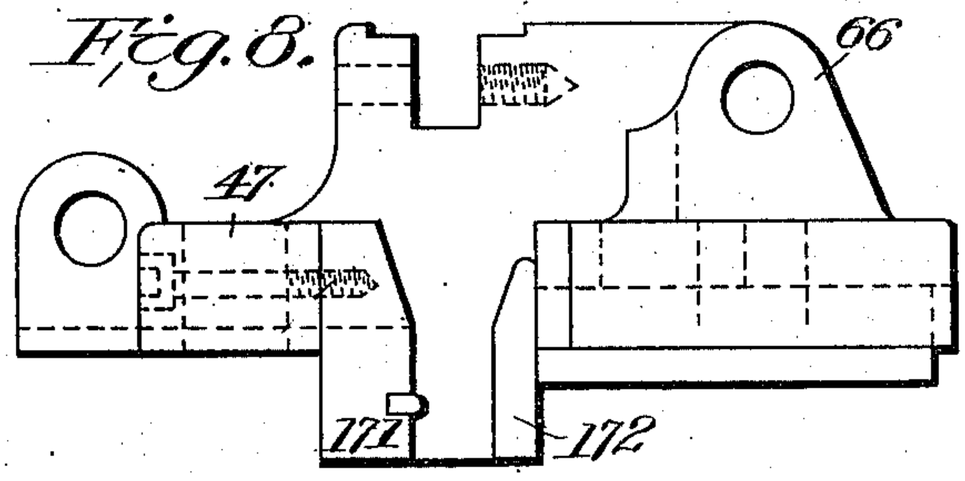
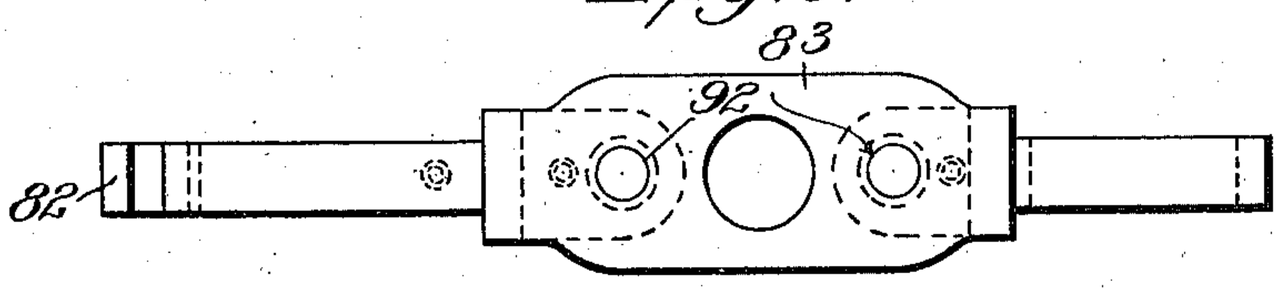


Fig. 9.



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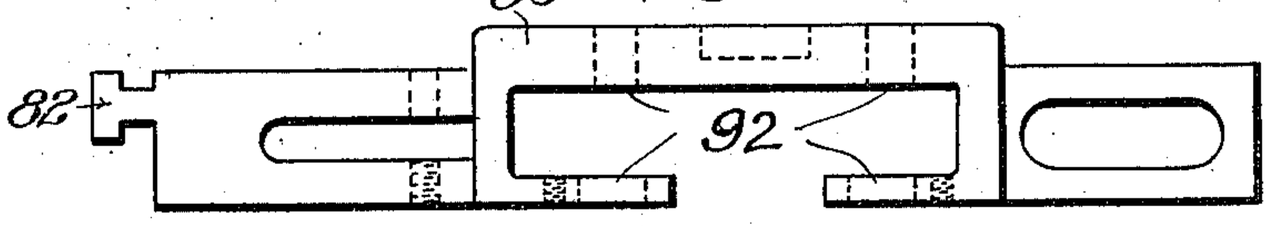

Fig. 13.

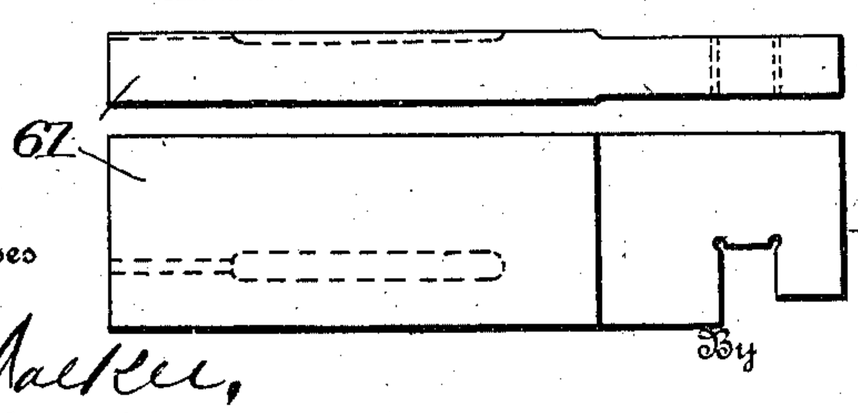

Fig. 14.

Witnesses

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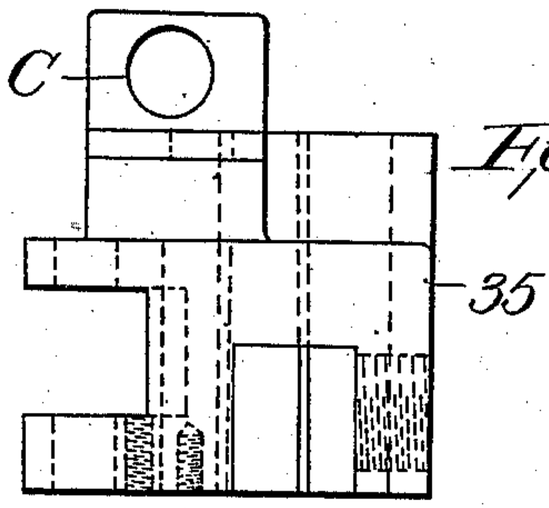
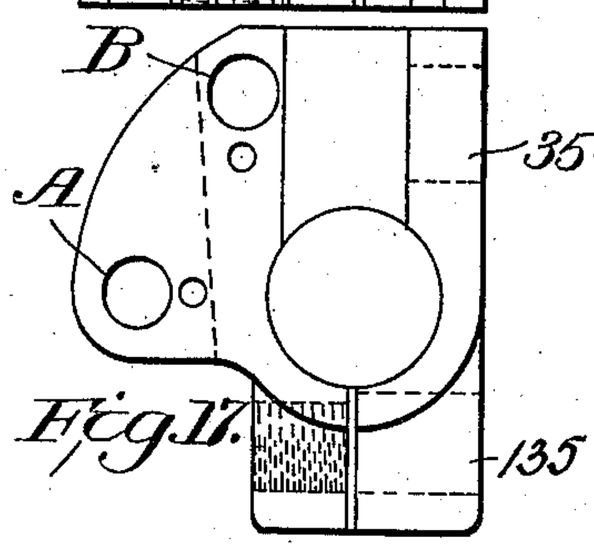


Fig. 16.



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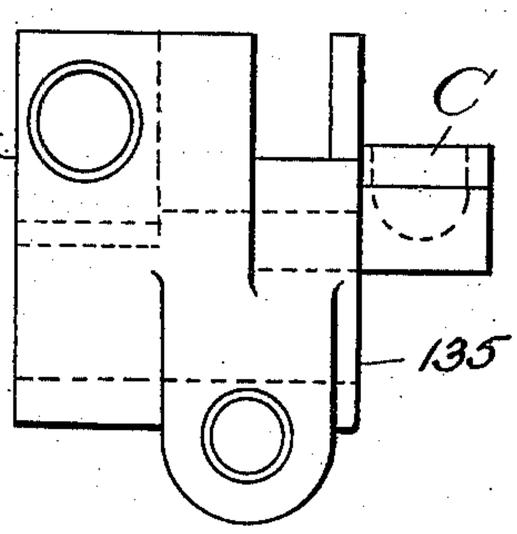

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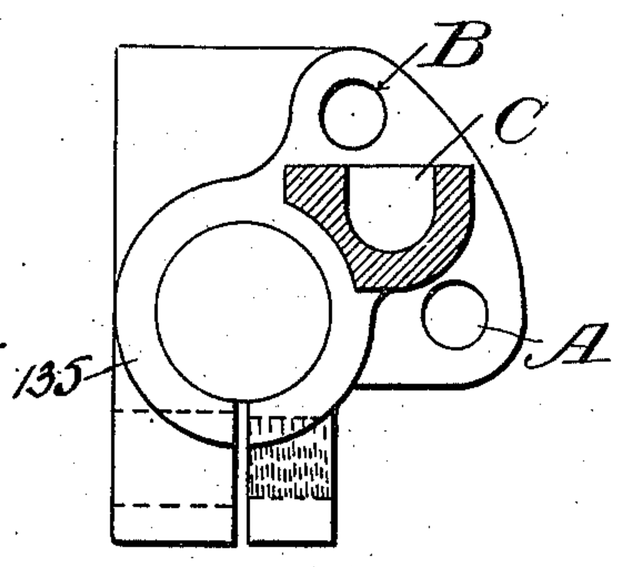

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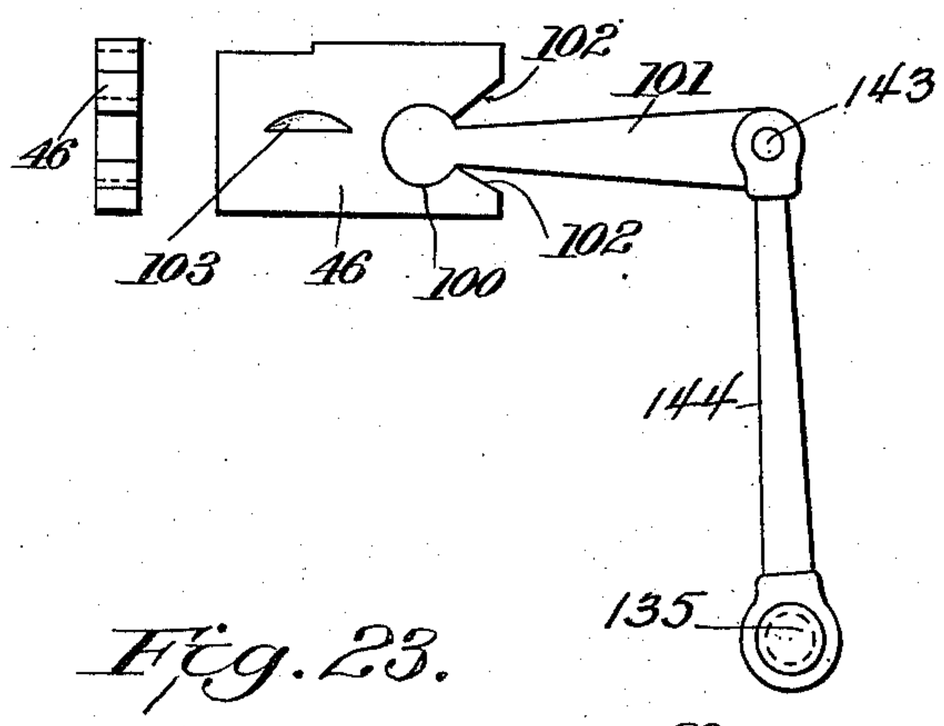

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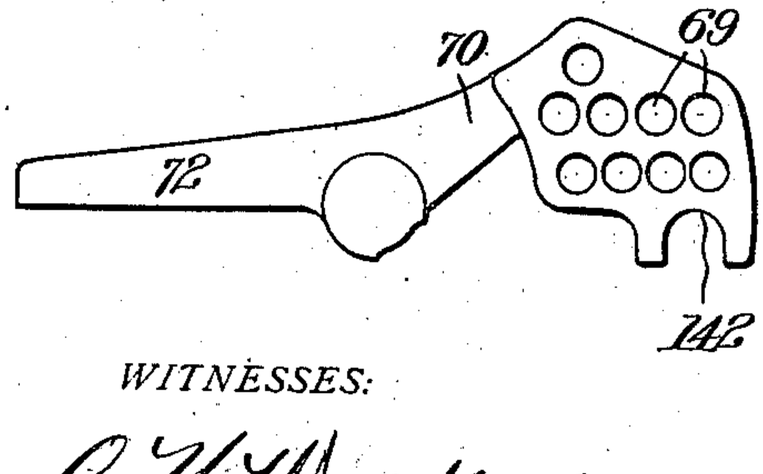

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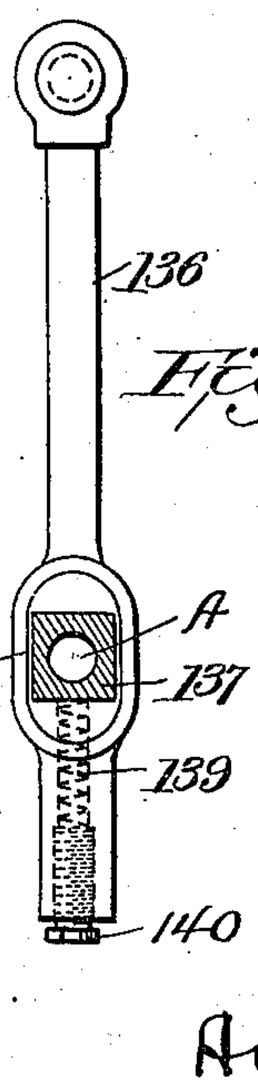

Fig. 22.

Fig. 20.

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8 SHEETS—SHEET 7.

Fig. 24.

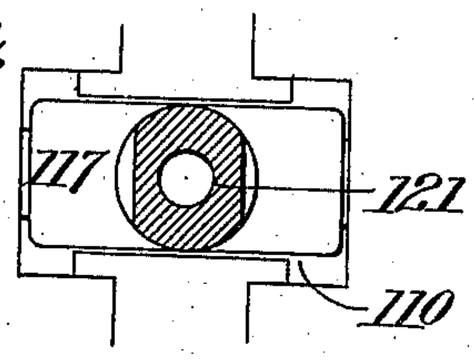
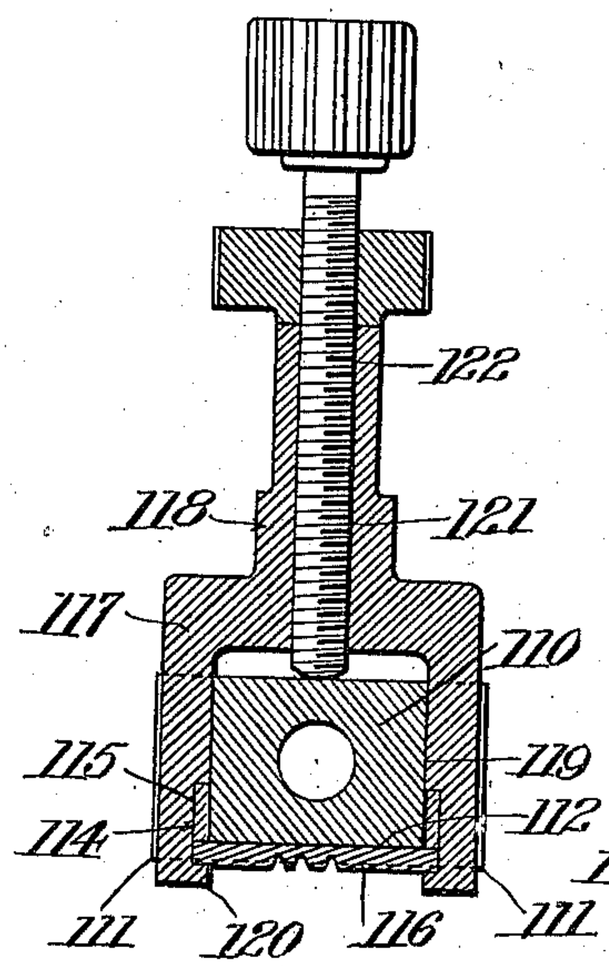


Fig. 25.



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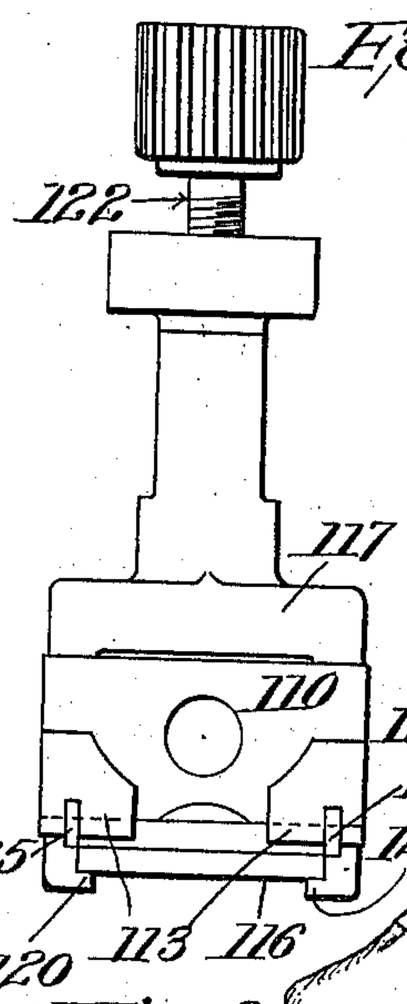
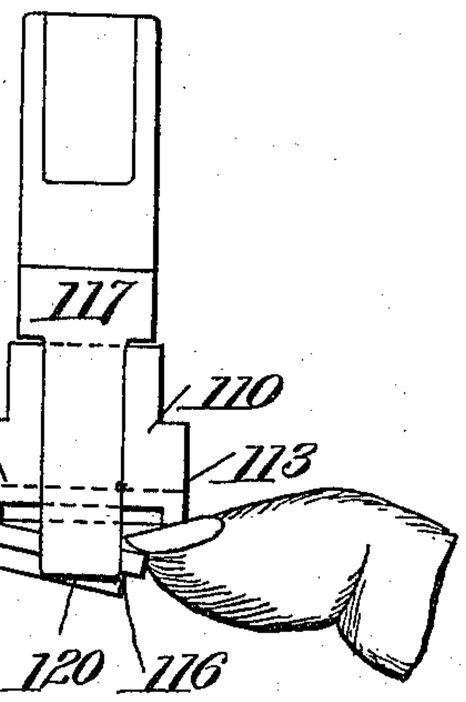


Fig. 27.



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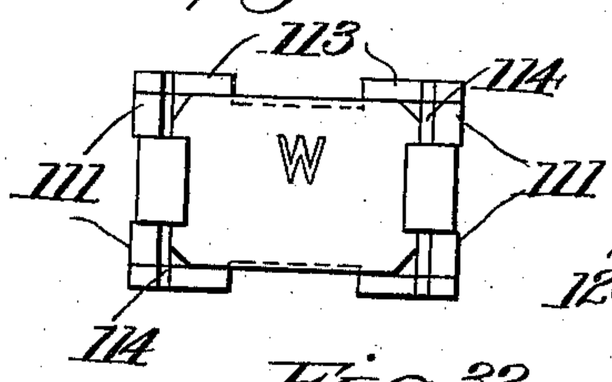

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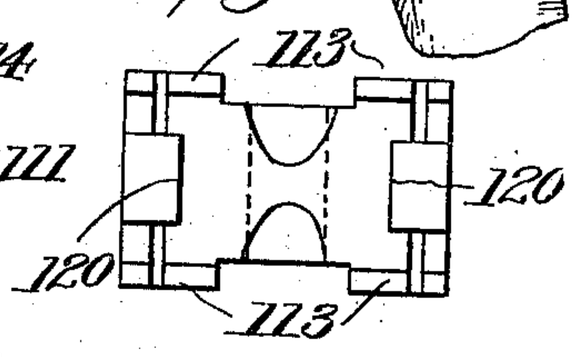
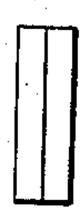


Fig. 30.



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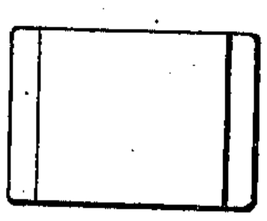


Fig. 32.

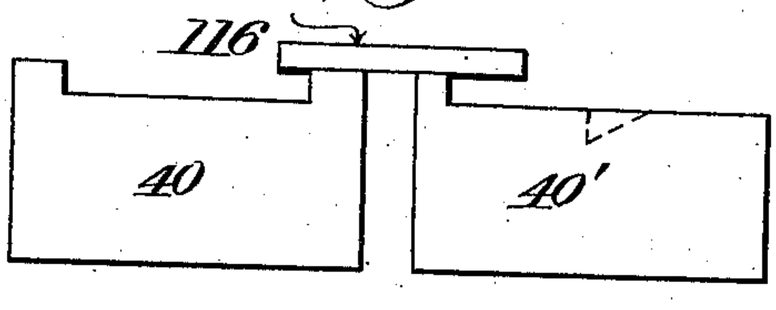
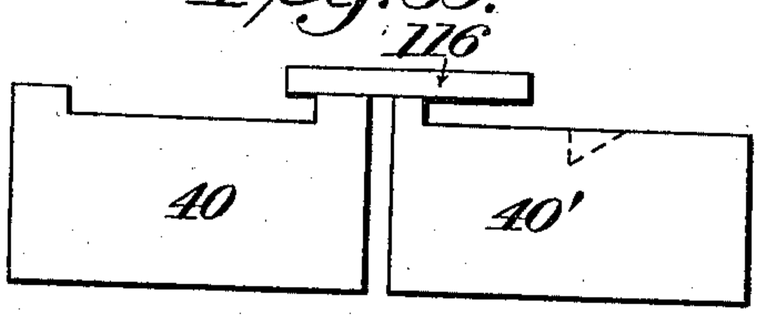


Fig. 33.



Witnesses
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8 SHEETS—SHEET 8.

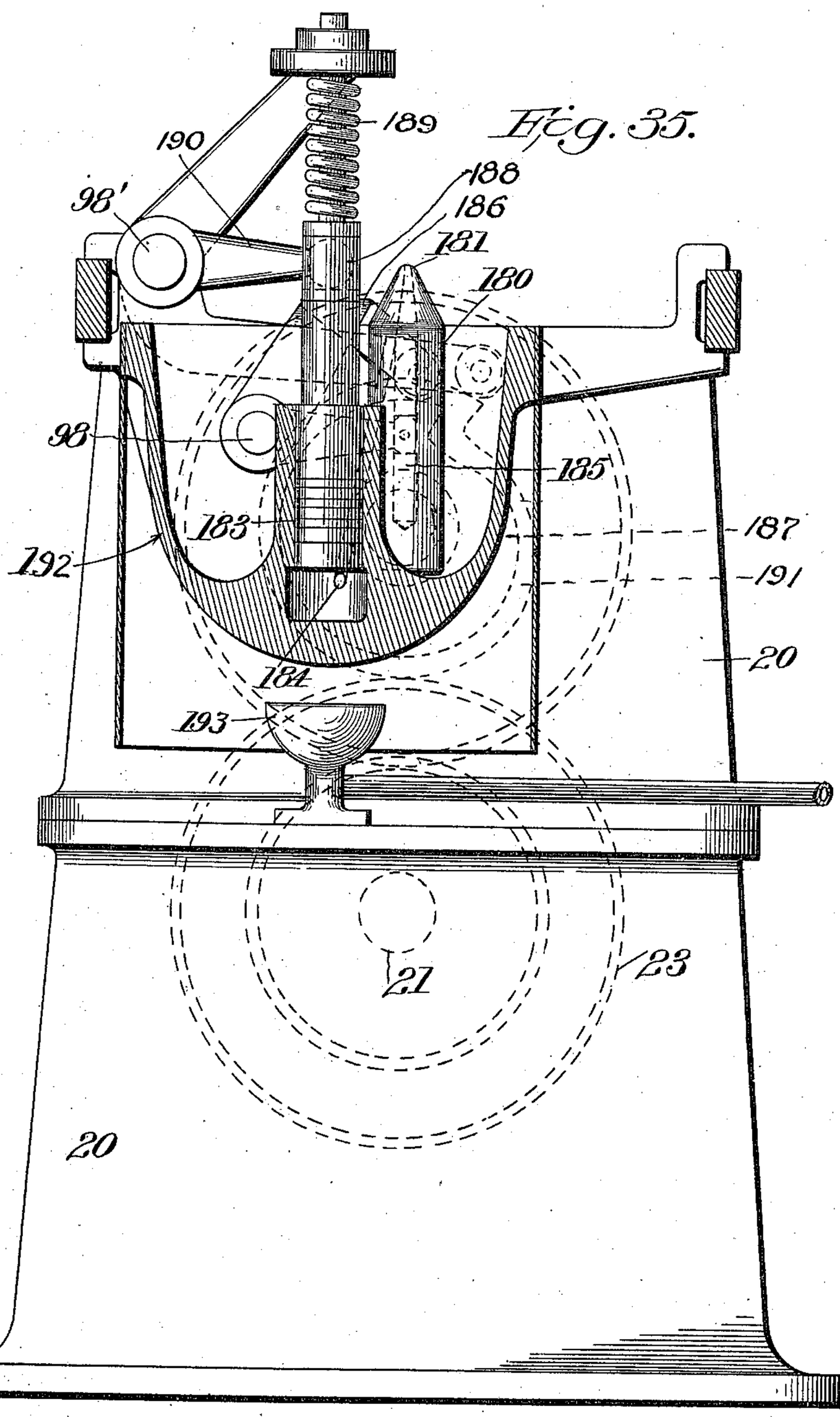

Fig. 35.

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UNITED STATES PATENT OFFICE.

ANDREW E. MILLER, OF BALTIMORE, MARYLAND, ASSIGNOR TO NATIONAL COMPOSITYPE COMPANY, OF BALTIMORE, MARYLAND, A CORPORATION OF DELAWARE.

MACHINE FOR CASTING TYPE.

963,790. Specification of Letters Patent. **Patented July 12, 1910.**

Application filed January 16, 1909. Serial No. 472,680.

To all whom it may concern:

Be it known that I, ANDREW E. MILLER, of Baltimore, in the county of Baltimore City, State of Maryland, have invented certain new and useful Improvements in Machines for Casting Type, of which the following is a specification.

This invention relates to the art of type making in which are produced individual type characters, such as body, and display letters, borders, ornaments, spaces, quads, and the like, that are used in type composition.

Heretofore the business of the type founder and printer have been conducted separately and wholly distinct. The printer has been dependent upon the type founder for supplies of movable type, and in consequence the procuring of "sorts" or the addition to fonts of only a portion of its type characters has been attended with inconvenience, delay and expense.

The present invention has for one of its objects to overcome these difficulties by extending the domain of the printer by enabling him, in addition to producing the printed matter, to produce the type instrumentalities by which that matter may be obtained.

A further object is to advance the art by enabling the printer to maintain perfectly faced type, whereby the printed product is always of the highest standard.

A further object is to provide a machine capable of producing various sizes and styles of type of the highest standard quality; to replenish "sorts" at will; and to permit the recasting of old and worn out type into new and more desirable faces.

A further object is to provide such an organization or combination of the principal elements involved as will enable the desired type to be produced without skilled labor.

A further object is to produce a mold constructed of a minimum number of parts and so arranged as to permit of rapid adjustment for changes in the size of the type body, or of the character on said body, without necessitating the employment of skilled or experienced operators.

A further object is to provide improved means for regulating the size of the mold cavity, whereby the changes in the size of the cast may be readily and quickly accomplished.

A further object is to provide a mold capable of casting type bodies of all sizes and styles, and means arranged to automatically conform to the differences in size of the cast for securely closing the mold cavity during each casting operation.

A further object is to provide a mold formed of loosely mounted, normally stationary sections, and means for rigidly locking the same, said locking means being adjustable to changes in the size of the mold cavity.

A further object is to provide means whereby the size or style of the cast may be readily and quickly changed at will, and the casting operation carried on at relatively high speed irrespective of the size or style of the cast.

A further object is to provide improved means for ejecting the type after each casting operation.

A further object is to provide an improved mold slide for closing the mold cavity.

A further object is to provide improved means for breaking the jets from the type after the latter have been ejected from the mold.

A further object is to provide improved means for accurately placing the matrix in proper position with relation to the mold cavity.

A further object is to provide improved means for injecting molten metal into the mold cavity.

A further object is to provide improved means for operating the various moving parts in time with each other, and to so construct said parts as to automatically adjust themselves to changes in the size of the mold cavity.

The invention will be hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawings:—Figure 1 is a top plan view illustrating my improved machine for casting type. Fig. 2 is an enlarged longitudinal sectional view with parts broken away. Fig. 3 is a top view of the mold with the top plate removed. Fig. 4 is a front end view of the mold. Fig. 5 is a transverse sectional view illustrating the mold construction and showing positions assumed after a cast and while the type is being ejected. Fig. 6 is a front end view

of the mold showing positions of parts during the casting operation, parts being shown in section. Fig. 7 is a plan view of the top plate illustrating positions of the gage blocks. Fig. 8 is a front end view thereof. Figs. 9 and 10 are detail top and side views of the ejector bar. Figs. 11, 12, 13 and 14 are detail top and side views of two sizes of body ejectors. Fig. 15 is a top view of the end block locking member. Figs. 16, 17, 18 and 19 are detail top, end, side and sectional views, respectively, illustrating the main operating member. Fig. 20 is a detail side view illustrating the end block and its operating elements. Fig. 21 is an end view of said block. Fig. 22 is a view of the operating link for the matrix holder lever. Fig. 23 is a detail illustrating the gage lever. Figs. 24 and 25 are detail transverse and longitudinal sectional views of the matrix holder and its adjuncts. Fig. 26 is a side view thereof. Fig. 27 is an end view illustrating manner of removing matrix. Fig. 28 is a bottom plan view illustrating matrix in position. Fig. 29 is a similar view with the matrix removed. Figs. 30 and 31 are end and side views respectively, illustrating a quad matrix. Figs. 32 and 33 are detail views illustrating different adjustments of the mold. Fig. 34 is a detail view of the jet breaker. Fig. 35 is a view illustrating the metal injecting mechanism.

Referring to the drawings, 20 designates a supporting standard in which is mounted the main drive shaft 21 provided with a pulley 23 adapted to be connected with any suitable source of power.

The mold mechanism comprises a mold base 30 which is of substantially box-form, being provided with a bottom plate 31, front and rear walls 32, 33, respectively, and end walls 34, said parts being united in any suitable manner. The front wall 32 is broken away as indicated at 35, to permit of the discharge of the type from the mold after each casting operation and in a manner to be later set forth. Resting on the bottom plate of the mold base are two jet plates 36, 37, said plates being secured in position in any suitable manner, the contiguous edges of said plates being separated and beveled as indicated at 38 to form a jet cavity 39. Mounted on the jet plates are the type mold blocks 40, 40′, the latter being provided with a key way 41 to receive a key 42 secured to the top face of jet plate 36. Interposed between the block 40 and the contiguous end wall 34 is a filler block 43 which is of such proportions as to give the desired bodywise dimensions to the mold cavity. In this connection it will be noted that a plurality of filler blocks 43 of different predetermined sizes, conforming to the various body-wise sizes of standard type, are employed, said filler blocks being interchangeable. The mold block 40 is adjusted through the medium of an adjusting screw 44 mounted in the end wall 34, a set screw 45 serving to lock the said block in its adjusted position. Thus in order to secure the proper body-wise adjustment of the mold cavity it is only necessary for the operator to select the filler block 43 of proper dimensions, and after placing the same in position, adjust the mold block 40 with relation thereto. It will be noted, however, that the block 40 remains stationary after the adjustment and during the casting operation. The front of the mold cavity is covered by an end block 46 which is arranged to reciprocate between the front end wall 32 and the contiguous end of the mold block 40′. The mold blocks 40, 40′, and the end block 46 are covered by a top plate 47 which rests upon the top edges of the walls 32, 33, and is provided with guide shoulders 48 which engage the side faces of said walls. The underside of said top plate 47 is also provided with a groove 49 to receive a shoulder 50 formed on the outer edge of mold block 40, whereby said top plate will move with said mold block when the latter is adjusted to conform to any desired changes in the size of the mold cavity. The mold base 30 is supported by a base plate 51 pivotally mounted at 52 in the standard 20, said mold base being connected to said base plate in any suitable manner, not shown. By means of this arrangement the mold parts may be readily swung to one side when it is desired to make an examination of the other parts of the machine.

The body ejector 61 is mounted to reciprocate between the mold blocks 40, 40′, and said block 40′ is yieldingly held against said ejector by means of a pawl 62 engaging a notch 63 in the top face of said mold block. Said pawl is pivotally mounted in a mold clamp lever 64 which in turn is pivotally supported by a pin 65 mounted between ears 66 carried by the top plate 47. Said lever at its free end is forked, as indicated at 67, the members of said fork being provided with a plurality of alined openings 68. The lever 64 is designed to be so adjusted as to bring the openings 68 successively into register with any one of a plurality of gage openings 69 formed in one end of a clamp gage lever 70, a suitable pin 71 serving to hold said levers 64 and 70 in any adjusted relation. By this arrangement the position of the mold block 40′ is accurately adjusted to conform to desired changes in the size of the mold cavity. The lever 70 is also pivotally supported by pin 65 and is provided with a projecting arm 72 which is normally held elevated by a spring 73. Said spring preferably encircles a pin 74 which is provided with a head to limit the movement of lever 70 under the influence of said spring.

Said spring 73 acting through the mold clamp gaging lever 70 and the mold clamp lever 64 holds the mold block 40′ normally against the side of the ejector so as to tightly close the mold cavity during the casting operation.

As before stated the body ejector 61 is mounted to reciprocate between the mold blocks 40, 40′, and in practice said ejector is of a thickness conforming to the proper body-wise size of the type that it is desired to cast, and definitely proportioned with relation to the filler block 43. A plurality of such ejectors are employed, each of a different body size, and interchangeable, whereby one may be substituted for the other when it is desired to change the bodywise size of the cast. The jet ejector 80 is mounted to reciprocate in the jet cavity 39, the same jet ejector being preferably used for all sizes of type. The type ejector 61 is provided with a notch 81 adapted to fit over the T-end 82 of a reciprocating ejector bar 83, the jet ejector being provided with a similar notch 84, adapted to fit beneath said T-end. The setwise size of the mold cavity is obtained by limiting the backward throw of the ejector 61, and for this purpose I provide an abutment 85 secured to the forward end of an adjusting screw 86, said screw being controlled by an index wheel 87 which is provided with graduations conforming to the various predetermined adjustments, and arranged to register with a stationary pointer 88. The screw 86 is embraced by a split sleeve 89 which is provided with threaded bosses 90 forming a set gage nut, said bosses being brought together or separated, as the case may be, by a threaded rod 91.

The ejector bar 83 is provided with bearings 92 in which are mounted rollers 93 arranged to engage opposite actuating faces 94 of a cam 95 mounted on a shaft 96 and arranged to move said ejector forward in its rejecting movement, the return movement of said ejector being assisted by a spring 97. Said cam is carried by a shaft 98 mounted in standard 20, said shaft being driven through the medium of suitable gearing 99 operatively connected with the drive shaft 21.

The end block 46 is provided with a circular opening 100 to receive the correspondingly shaped head of an operating link 101, the end of said block being cut away, as indicated at 102, to permit of the rocking movement of said block. Said end block is also provided on its front face with a groove 103 which is normally engaged by the pawl-like projection 104 of an end-block clamp 105 which is mounted to oscillate in a suitable barrel 106 formed in the mold base.

The matrix mechanism comprises a matrix box 110 having its corners provided with ears 111 projecting below the plane of the backing surface 112 to form flanges 113, said flanges being provided with coinciding slits 114 to receive small bars 115 extending across the ends of said box. The flanges 113 and bars 115 form a pocket to receive the matrix 116. Said matrix box is constructed to fit between the yolk-like arms 117 of a matrix clamp 118, said arms being recessed at 119 to receive said box and to form lips 120 to fit over the edge of the matrix. Said clamp is also provided with a bore 121 in which works a clamping screw 122 which serves to engage the back of the matrix box to lock the latter in position in said clamp. Pivoted between ears 123 of the top plate 47 is a matrix holding lever 124, the same being provided with an elongated opening 125 to receive the matrix box 110 and its clamp 118. Said matrix is pivotally mounted in the opening 125 by means of a pin 126. The matrix clamp is guided in its movement by a guide 127 which is forked at one end 128 to receive the upper portion of said clamp, the other end of said guide being provided with a slot to receive an eye-bolt 129 pivotally mounted in the top plate 47. The guide plate is held to its guiding position by any suitable means, such as a nut.

Mounted in the standard 20 is a rock shaft 130 provided with arms 131, 132, in the extremities of which are mounted antifriction rollers 133, which engage cam surfaces 134 on the cam 95′, whereby said rock shaft will be oscillated. Secured upon the rock shaft 130 is an operating member 135 which is pivotally connected at A to a link 136 which at its upper end is secured to the free end of the matrix holder lever 124. The pivotal connection between the operating member 135 and link 136 is effected through a take-up block 137 slidingly mounted in a recess 138 in said link and provided with a suitable opening to receive the pivot pin. A spring 139 acting against said take-up block permits of a slight excess movement of member 135, thereby insuring an accurate seating of the matrix over the mold cavity. The tension of said spring is regulated by an adjusting screw 140. The mold clamp gage lever 70 is also provided with a link 141 also connected with the operating member 135 at B, the upper end of said link being rounded and engaging a corresponding recess 142 in said gage lever. The end-block link 101 is pivotally connected at 143 to a lever 144 secured to the rock shaft 130 the operating member 135 being provided with a recess to accommodate said lever. To the end-block clamp 105 is secured one end of an arm 145 which is connected by a link 146 with the operating member 135 at C. A spring 147 is carried by a spring socket 148 mounted in a recess 149 in the mold base, said spring serving to normally hold said clamp in en-

gagement with said end-gate, the tension of spring 147 is regulated by any suitable means, preferably a screw 150.

The jet breaker comprises a plunger 160 mounted in a barrel 161 in the mold base and normally projected by a spring 162 encircling the shank 163. The outer end of said shank is provided with a notch or ratchet 164 adapted to be engaged by a pawl 165 pivotally mounted on the end-block lever 144. Said pawl is provided with a finger 166 arranged to engage a stop 167, whereby said pawl will be disengaged from said plunger. The movement of said pawl is limited by a pin 168 and a spring 169 serves to retain the same in proper position to reengage said plunger upon the return movement of lever 144.

The type after the casting operation, are discharged upon a type way (not shown) in the usual and well known manner, passing between gage blocks 171, 172. The block 171 is permanently secured to the mold base and in alinement with the "line" of the character on the matrix. The block 172 is of T-shape, the shank thereof being adjustably secured to the mold base by any suitable means. After the type have been ejected from the mold and the jet broken, the roughened portion caused by breaking off the jet may be smoothed off in any of the ways well known in the art.

The pump or metal injecting mechanism is of any suitable or preferred structure. I have illustrated, however, a casing 180 provided with the usual nipple 181, in juxtaposition with the nipple plate 182; and a piston chamber 183 communicating with said nipple through a channel 184. The usual choker valve 185 is mounted to reciprocate in said casing, being operated by a bell-crank lever 186, the free end of which engages with a cam 187 secured to shaft 96. The pump plunger 188 is normally under the tension of a spring 189 and is moved against the force of said spring by means of a bell-crank lever 190 one arm of which engages said plunger, the other arm engaging a cam 191 mounted beside the cam 187. By this arrangement the choker and pump plunger are operated in time with each other. The pump casing 192 is supported on the standard 20, whereby the pump may be kept in line with the mold cavity when the latter is adjusted to vary the size of the cast. The type metal is kept in a molten condition in any suitable manner, a burner 193 being illustrated for this purpose.

The operation is as follows:—The burner 193 is first lighted for the purpose of bringing the type metal to a molten condition and to maintain the same in this state. The type ejector of the desired body-wise size, and the jet ejector 80 are then attached to the ejector bar 83 and interposed between the mold blocks 40, 40′, and the jet plates, respectively. The filler block corresponding to the bodywise size of the ejector is then inserted in position and the mold section 40 moved up thereagainst by its adjusting screw, to a position that accurately establishes the proper bodywise adjustment for the mold cavity. At the same time the gage block 172 is adjusted to conform to the size of the mold cavity. Thus the mold cavity is adjusted to the proper bodywise size and the type way is also adjusted to conform thereto. The setwise size of the mold cavity is obtained by adjusting the wheel 87 to bring the proper markings in register with the pointer 88, thereby moving the abutment 85 to such a position as will interrupt the movement of the ejector at the proper point to give the required size to the mold cavity. The matrix is then placed in the matrix box 110 and the latter secured in position in the matrix-holder lever 124, the connection between lever 64 and gage lever 70 having been adjusted to conform to the adjustment of the mold block 40. The machine is then ready for a cast, the front of the mold being closed by the end-block 46, the back by the ejectors 61 and 80, the mold block 40′ and the end block being rigidly held by their respective clamping devices, the top of the mold being closed by a matrix. Immediately after the metal has been injected into the mold the end gate clamp is first withdrawn and the matrix holder lever 124, by reason of the spring 139 of the take-up block 137 is slightly raised. Immediately the end-block clamp is disengaged, the end block is withdrawn by lever 144 and the mold clamp gage lever 70 is raised against the tension of spring 73, thereby retracting the pawl 62 and leaving the mold block 40′ free to yield slightly to the ejector 61 which is now moved forward to eject the finished type from the mold. Meanwhile the matrix holder lever 124 has been further elevated to insure ample clearance for the type. As the end-gate lever 144 is operated to withdraw the end block, the jet breaker plunger 160 is withdrawn to compress its spring, and when released by the trip, will be impelled forwardly, striking a sharp blow against the jet which projects into the line of travel of said plunger, breaking said jet off close to the type body. The rough portion left after breaking off the jet may be finished off by any of the well known devices designed for that purpose, as heretofore stated.

The parts are so timed in their operation that after ejecting the type, the ejector is withdrawn to its normal casting position, the pressure against spring 73 is removed and the latter through the pawl 62, forces the mold block 40′ against the ejector; the matrix holder lever 124 is operated to re-

place the matrix in casting position, the end block is moved to close the mold, and then clamped in position, and the pump again operated, each step following in the order named, after which the operation is repeated as before described. The operation above outlined is that which is required for the casting of a single type character, and is continued as long as it is desired to cast type of the particular size and style for which the mold is set. When it is desired to change the bodywise size it is only necessary to substitute an ejector 61 and filler block 43, of the requisite dimensions and relative proportions; to adjust the abutment 85 for the proper setwise size, and to place the proper matrix in the matrix box 110. Obviously these changes will require but two or three minutes at the outside, and the machine is then ready for the casting operation. If it is desired to change the setwise size without altering the bodywise size, it is only necessary to adjust the abutment 85. It will also be understood, of course, that the matrix is readily changed at will.

It is apparent that the range of the machine is unlimited and that all sizes of type, from the largest to the smallest, and provided with any desired type character can be accurately cast, and the changes in the size of the cast accomplished with an expenditure of a minimum amount of time and labor, and without necessitating the presence of skilled or experienced operators.

Having thus explained the nature of my said invention, and described the manner of constructing and using the same, although without attempting to set forth all of the forms in which it may be made, or all of the modes of its use, I declare that what I claim is:—

1. In a machine for casting type, a mold comprising spaced apart disconnected mold blocks, means for supporting said blocks in operative relation, an ejector mounted to reciprocate between said blocks, and predetermined means for engaging the outer face of one of said blocks for adjusting the latter to vary the body size of the mold cavity.

2. In a machine for casting type, a mold comprising adjustably mounted normally stationary mold blocks, an ejector mounted to reciprocate between said blocks, and predetermined means for engaging the outer face of one of said blocks to vary the size of the mold cavity.

3. In a machine for casting type, a mold comprising mold blocks, an ejector mounted to reciprocate between said blocks, predetermined means for adjusting one of said mold blocks to vary the size of the mold cavity, locking means for the other mold block, and means for operating said locking means to permit temporary lateral play of the other mold block.

4. In a machine for casting type, an adjustable mold including a plurality of mold blocks, an ejector mounted to reciprocate between said blocks, locking means engaging one of said blocks, and means for periodically withdrawing said locking means to permit a slight lateral play of said blocks.

5. In a machine for casting type, a mold comprising spaced apart normally stationary mold blocks, an ejector working between said blocks, and means for periodically holding one of said blocks yieldingly against said ejector.

6. In a machine for casting type, a mold comprising spaced apart normally stationary mold blocks, an ejector working between said blocks, means for periodically holding one of said blocks yieldingly against said ejector, and means for adjusting the other block to vary the size of the mold cavity.

7. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector working between said blocks, and a yieldingly mounted finger for holding one of said blocks normally against said ejector.

8. In a machine for casting type, a mold comprising spaced apart mold blocks, one of which is provided with a groove, an ejector working between said blocks, and a yieldingly mounted finger engaging said groove to hold the block containing the same normally in engagement with said ejector.

9. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector working between said blocks, a yieldingly mounted finger for holding one of said blocks normally against said ejector, and means for adjusting said finger with relation to said block.

10. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector working between said blocks, a mold clamp lever provided with means for engaging one of said mold blocks, and means for operating said lever.

11. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector working between said blocks, a mold clamp lever, a pawl carried thereby, and means for holding said pawl yieldingly in engagement with one of said mold blocks.

12. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector working between said blocks, a mold clamp lever provided with means for engaging one of said mold blocks, and a mold clamp gage adjustably connected with said mold clamp lever.

13. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector working between said blocks, a mold clamp lever provided with means for engaging one of said mold blocks, a mold clamp gage, a spring acting on one end of said gage, and means for adjustably con-

necting said lever with the other end of said gage.

14. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector working between said blocks, a mold clamp lever having a forked end, a pawl carried by said lever and engaging one of said mold blocks, and a mold clamp gage engaging the forked end of said lever.

15. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector working between said blocks, a mold clamp lever provided with means for engaging one of said blocks, a mold clamp gage adjustably connected with said lever, and a single pivot pin common to said lever and said gage.

16. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector working between said blocks, a mold clamp lever provided with means for engaging one of said mold blocks, a spring pressed mold clamp gage adjustably connected with said lever, and means for periodically rocking said gage against the tension of its spring.

17. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector working between said blocks, a mold clamp lever provided with means for engaging one of said blocks, a mold clamp gage, a spring acting on one end of said gage, means for adjustably connecting said lever with the other end of said gage, and means for periodically rocking said gage against the tension of its spring.

18. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector working between said blocks, a mold clamp lever having a forked end, a pawl carried by said lever and engaging one of said mold blocks, a spring pressed mold clamp gage engaging the forked end of said lever, and means for periodically rocking said gage against the tension of its spring.

19. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector working between said blocks, a mold clamp lever provided with means for engaging one of said blocks, a pivoted lever having a gage at one end, a spring engaging the opposite end of said gage lever, means for adjustably connecting said mold clamp lever with said gage, and means for limiting the movement of said gage lever under the tension of its spring.

20. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector working between said blocks, a mold clamp lever provided with means for engaging one of said blocks, a pivoted gage lever provided with a plurality of gage openings arranged in definite relation, said mold clamp lever being provided with a plurality of alined openings arranged to register with said gage openings, and a pin constructed to be passed through said openings when the latter coincide.

21. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector working between said blocks, a mold clamp lever provided with means for engaging one of said blocks, a pivoted gage lever provided with a plurality of gage openings at one end and arranged in definite relation, said mold clamp lever being provided with a plurality of alined openings arranged to register with said gage openings, a pin constructed to be passed through said openings when the latter coincide, a spring acting upon said gage lever, and means for periodically rocking said gage lever against the tension of its spring.

22. In a machine for casting type, a mold comprising spaced apart normally stationary mold blocks, an ejector working between said blocks, means for periodically holding one of said blocks yieldingly against said ejector, and means including a filler block of predetermined dimensions for adjusting the other mold block to vary the size of the mold cavity.

23. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector working between said blocks, means for periodically holding one of said blocks yieldingly against said ejector, a stationary abutment, and a filler block of predetermined dimensions interposed between said abutment and the other mold block.

24. In a machine for casting type, a mold comprising spaced apart normally stationary mold blocks, an ejector working between said blocks, a stationary abutment, and a filler block interposed between said abutment and the outer face of one of said mold blocks, said filler block being definitely proportioned with relation to the proportions of said ejector.

25. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector working between said blocks, means for periodically holding one of said blocks yieldingly against said ejector, a stationary abutment, and a filler block interposed between said abutment and the other mold block, said filler block being definitely proportioned with relation to the proportions of said ejector.

26. In a machine for casting type, a mold comprising a mold base of box-like form, mold blocks located therein, predetermined means for adjusting one of said blocks to vary the size of the mold cavity, a top plate covering said mold base, matrix mechanism mounted thereon, and means for adjusting said top plate to conform to the adjustment of said mold block.

27. In a machine for casting type, a mold comprising a mold base of box-like form,

a pivotally mounted base plate to which said base is secured, mold blocks located therein, predetermined means for adjusting one of said blocks to vary the size of the mold cavity, and a top plate covering said base.

28. In a machine for casting type, a mold including a mold base of box-like form, mold blocks located therein, predetermined means for adjusting one of said blocks to vary the size of the mold cavity, a top plate covering said mold base, means for adjusting said top plate simultaneously with the adjustment of said mold block, and matrix mechanism carried by said top plate.

29. In a machine for casting type, a mold comprising a mold base of box-like form, mold blocks located therein, predetermined means for adjusting one of said blocks to vary the size of the mold cavity, a top plate covering said mold base, said top plate engaging said adjustable block and movable therewith, and matrix mechanism carried by said top plate.

30. In a machine for casting type, a mold comprising a mold base of box-like form, mold blocks located therein, predetermined means for adjusting one of said blocks to vary the size of the mold cavity, said adjustable mold block being provided with a flange, a top plate provided with a recess receiving said flange, and matrix mechanism carried by said top plate.

31. In a machine for casting type, a mold comprising a mold base, mold blocks supported thereby, means for adjusting one of said mold blocks to vary the size of the mold cavity, a top plate covering said mold blocks, means for adjusting said top plate to conform to the adjustment of said adjustable block, and matrix mechanism carried by said top plate.

32. In a machine for casting type, a mold comprising a mold base, mold blocks supported thereby, means for adjusting one of said blocks to vary the size of the mold cavity, a top plate covering said mold blocks, matrix mechanism carried by said top plate, and means for adjusting said top plate simultaneously with said adjustable mold block.

33. In a machine for casting type, a mold comprising mold blocks, an adjusting screw engaging one of said blocks to move the latter, and predetermined means for limiting the range of adjustment of said screw.

34. In a machine for casting type, a mold comprising mold blocks, an ejector mounted to reciprocate between said blocks, an adjusting screw engaging one of said blocks to move the latter, predetermined means for limiting the range of adjustment of said screw, and means for permitting temporary lateral play of the other block.

35. In a machine for casting type, a mold comprising mold blocks, an ejector mounted to reciprocate between said blocks, an adjusting screw engaging one of said blocks to move the latter, and a filler block for limiting the range of adjustment of said screw, said filler block being definitely proportioned with relation to said ejector.

36. In a machine for casting type, a mold comprising jet plates, mold blocks supported thereby, an ejector, means for periodically permitting a slight lateral play of one of said mold blocks, and means carried by one of said jet plates for guiding the last mentioned mold block in its movement.

37. In a machine for casting type, a mold comprising jet plates, one of said jet plates being provided with a rib, mold blocks supported by said jet plates, an ejector, and means for permitting a slight lateral play of one of said mold blocks, the last mentioned block being provided with a groove receiving said rib.

38. In a machine for casting type, a mold, a pivotally supported matrix holder lever, a swinging matrix box pivotally carried by said lever and constructed to support a matrix, and means for operating said lever, said matrix box being free to move independently of said lever as the latter is operated.

39. In a machine for casting type, a mold, a matrix holder lever provided with an elongated opening, a matrix box removably mounted in said opening and constructed to support a matrix, and means for operating said lever, said matrix box being free to move independently of said lever as the latter is operated.

40. In a machine for casting type, a mold, a matrix holder lever provided with an elongated opening, a matrix box constructed to support a matrix, a pivot pin supporting said box in said opening, and means for operating said lever, said matrix box being free to move independently of said lever as the latter is operated.

41. In a machine for casting type, a mold, a matrix holder lever pivotally supported at one end, means engaging the other end of said lever to periodically rock the same, and a matrix box pivotally supported intermediate of the ends of said lever and constructed to receive a matrix.

42. In a machine for casting type, a mold, a pivotally supported matrix holder lever, a swinging matrix box pivotally supported in said lever and constructed to receive a matrix, a matrix clamp constructed to secure the matrix in said box, and means for operating said lever, said matrix box being free to move independently of said lever as the latter is operated.

43. In a machine for casting type, a mold, a matrix holder lever, a matrix box pivotally supported by said lever and constructed to receive a matrix, a matrix clamp provided with arms constructed to receive said box, a

clamping screw coöperating with said arms, and means for operating said lever, said matrix box being free to move independently of said lever as the latter is operated.

44. In a machine for casting type, a mold, a matrix holder lever, a matrix box pivotally supported by said lever, and constructed to receive a matrix, a matrix clamp having a yoke-like portion the arms of which are recessed to receive said matrix box, and means for operating said lever, said matrix box being free to move independently of said lever as the latter is operated.

45. In a machine for casting type, a mold, a matrix holder lever, a matrix box pivotally supported by said lever and constructed to receive a matrix, a matrix clamp constructed to secure the matrix in said box, a guide engaging said clamp, and means for operating said lever, said matrix box being free to move independently of said lever as the latter is operated.

46. In a machine for casting type, a mold, a matrix holder lever, a matrix box pivotally supported by said lever and constructed to receive a matrix, a matrix clamp constructed to secure the matrix in said box, a removable guide plate provided with a forked end engaging said clamp, and means for operating said lever.

47. In a machine for casting type, a mold, a matrix holder lever, a matrix box pivotally supported by said lever and constructed to receive a matrix, a matrix clamp constructed to secure the matrix in said box, a guide plate having one end constructed to guide said clamp, a pivotally supported eye bolt engaging the other end of said guide, and means for operating said lever.

48. In a machine for casting type, a matrix box provided with ears, and bars connecting said ears to form a matrix receiving pocket.

49. In a machine for casting type, a matrix box of rectangular form having its corners provided with ears, and bars connecting said ears to form a matrix receiving pocket.

50. In a machine for casting type, a matrix box provided with flanges having coinciding slots, and bars secured in said slots and connecting said ears.

51. In a machine for casting type, a matrix box provided with ears, and bars connecting said ears to form a matrix receiving pocket, said box being also provided with an opening to receive a pivot pin.

52. In a machine for casting type, a matrix box provided with ears, bars connecting said ears to form a matrix receiving pocket, and means for clamping a matrix in said pocket.

53. In a machine for casting type, a matrix box provided with flanges having coinciding slots, bars secured in said slots and connecting said flanges to form a matrix receiving pocket, and means for clamping a matrix in said pocket.

54. In a machine for casting type, a matrix box provided with ears, bars connecting said ears to form a matrix receiving pocket, a matrix clamp provided with arms having recesses to receive said box, said arms being also provided with lips to fit over the edges of said pocket, and a clamping screw carried by said clamp and constructed to engage said box.

55. In a machine for casting type, a mold provided with a loosely mounted mold block, means for periodically exerting a yielding pressure upon said block, a matrix lever provided with means for supporting a matrix, and means for operating said lever and simultaneously controlling the pressure upon said mold block.

56. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector working between said blocks, a mold clamp lever provided with means for engaging one of said blocks, a matrix holder lever provided with means for supporting a matrix, and means for simultaneously operating said mold clamp lever and said matrix holder lever.

57. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector working between said blocks, a mold clamp lever, a pawl carried thereby, means for holding said pawl yieldingly in engagement with one of said blocks, a matrix holder lever provided with means for supporting a matrix, and means for simultaneously operating said mold clamp lever and said matrix holder lever.

58. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector working between said blocks, a mold clamp lever provided with means for engaging one of said blocks, a mold clamp gage adjustably connected with said mold clamp lever, a matrix holder lever provided with means for supporting a matrix, and means for simultaneously operating said gage and said matrix holder lever.

59. In a machine for casting type, a mold including a slidable end block, a clamp, means normally tending to hold said clamp in engagement with said block, and means for periodically moving said clamp in opposition to said holding means.

60. In a machine for casting type, a mold including a slidable end block, an oscillating clamp, means normally tending to hold said clamp in engagement with said block and means for periodically moving said clamp in opposition to said holding means.

61. In a machine for casting type, a mold including a slidable end block, a clamp member, a spring for holding said clamp member normally in engagement with said

block, and means for periodically disengaging said clamp.

62. In a machine for casting type, a mold including a slidable end block, an oscillating clamp provided with a pawl-like finger, means tending to hold said finger normally in engagement with said block, and means for periodically disengaging said finger in opposition to said holding means.

63. In a machine for casting type, a mold including a slidable end block, an oscillating clamp provided with a pawl finger, a spring for holding said finger normally in engagement with said block, and means for periodically disengaging said finger.

64. In a machine for casting type, a mold including a slidable end block having a groove in its front face, an oscillating clamp provided with a finger, means tending to hold said finger in engagement with the grooved portion of said block, and means for periodically moving said clamp in opposition to said holding means.

65. In a machine for casting type, a mold including a slidable block, a clamp normally engaging said block, means for periodically disengaging said clamp, a matrix holder lever provided with means for supporting a matrix, and means for successively operating said block and lever.

66. In a machine for casting type, a mold including a slidable end block, a clamp member, a spring for holding said clamp member normally in engagement with said block, means for periodically disengaging said clamp, a matrix holder lever provided with means for supporting a matrix, and means for successively operating said block and said lever.

67. In a machine for casting type, a mold provided with spaced apart mold blocks, a body ejector interposed between said blocks, a jet ejector also interposed between said blocks, and a reciprocating cross-head, said ejectors being constructed to removably engage opposite points of said cross head.

68. In a machine for casting type, a mold provided with spaced apart mold blocks, a reciprocating ejector bar provided with a T-end, a body ejector mounted between said mold blocks, a jet ejector, said ejectors being provided with notches arranged to engage opposite projections of said T-end, and means for adjusting said mold blocks to conform to the size of said body ejector.

69. In a machine for casting type, a mold formed of a plurality of relatively adjustable spaced apart mold blocks, an ejector interposed between said blocks, a reciprocable ejector bar with which said ejector is detachably connected, whereby ejectors of different sizes may be substituted at will, and means for adjusting said mold blocks to conform to the size of the ejector, said adjusting means including a filler block of predetermined dimensions.

70. In a machine for casting type, a mold formed of a plurality of relatively adjustable spaced apart mold blocks, an ejector bar, an ejector detachably connected with said ejector bar and interposed between said mold blocks, whereby ejectors of different sizes may be substituted at will, and means for adjusting said mold blocks to conform to the size of the ejector, said adjusting means including a filler block definitely proportioned with relation to the proportions of the ejector employed.

71. In a machine for casting type, a mold comprising spaced apart mold blocks, an ejector interposed between said blocks, means for intermittently reciprocating said ejector, means for holding one of said mold blocks yieldingly against said ejector while the latter is at rest, and means for periodically withdrawing said holding means to permit a slight lateral play of said mold block while the ejector is moving.

72. In a machine for casting type, a mold formed with normally stationary spaced apart mold blocks, an ejector interposed between said blocks, means for intermittently reciprocating said ejector, a yieldingly mounted finger for holding one of said mold blocks against said ejector while the latter is at rest, and means for retracting said finger to permit a slight play of the mold block while the ejector is moving.

73. In a machine for casting type, a mold formed with normally stationary spaced apart mold blocks, an ejector interposed between said blocks, means for intermittently reciprocating said ejector, a mold clamp lever, means carried thereby for holding one of said mold blocks against said ejector while the latter is at rest, and means for periodically operating said lever to remove the pressure from said mold block while the ejector is moving.

74. In a machine for casting type, a mold formed with normally stationary spaced apart mold blocks, an ejector interposed between said blocks, means for intermittently reciprocating said ejector, means for holding one of said blocks yieldingly against said ejector while the latter is at rest, means for permitting a slight play of said block while the ejector is moving, and means for varying the position of the other mold section to vary the size of the mold cavity.

75. In a machine for casting type, a mold formed with normally stationary spaced apart mold blocks, an ejector interposed between said blocks, means for intermittently reciprocating said ejector, a yieldingly mounted finger for holding one of said mold blocks against said ejector while the latter is at rest, means for slightly retracting said

finger to permit a corresponding play of said mold block while the ejector is moving, and means for varying the position of the other mold block to vary the size of the mold cavity.

76. In a machine for casting type, a mold including spaced apart normally stationary mold blocks and a movable end block, a clamp for said end block, a rock shaft and a single member on said rock shaft for successively operating said block and clamp.

77. In a machine for casting type, a mold including a movable end block, a rocking clamp therefor, a rock shaft, and a single member carried by said rock shaft for successively operating said block and clamp.

78. In a machine for casting type, a mold including a movable end block, a rock arm provided with a finger arranged to engage said block, a rock shaft, and a single member carried by said rock shaft for successively operating said block and clamp.

79. In a machine for casting type, a mold including a movable end block, a clamp therefor, a rock shaft, an end-block lever connected with said shaft and with said end block, and means carried by said rock shaft for operating said clamp.

80. In a machine for casting type, a mold including a movable end block, a clamp therefor, a rock shaft, means operated by said rock shaft for actuating said end block, an operating member secured to said rock shaft, and a link actuated thereby and connected to operate said clamp.

81. In a machine for casting type, a mold including a movable end block, a spring pressed clamp therefor, a rock shaft, means actuated by said rock shaft for operating said block, an operating member secured to said rock shaft, and a link actuated thereby and arranged to releasingly operate said clamp in opposition to the spring pressure.

82. In a machine for casting type, a mold including a movable end block, a clamp therefor, a rock shaft, means actuated by said rock shaft for operating said end block, an operating member secured to said rock shaft, a link actuated thereby and arranged to operate said clamp, a block secured to said mold, and a spring carried by said block and bearing against said lever.

83. In a machine for casting type, a mold including spaced apart mold blocks, an ejector working between said blocks, a rock shaft, a matrix holder lever operated by said rock shaft, and a plurality of cams supported by a single actuating member and arranged to actuate said ejector and said rock shaft.

84. In a machine for casting type, a mold including spaced apart mold blocks, an ejector working between said blocks, a rock shaft, an operating member carried by said shaft, a matrix holder lever connected with said operating member, and a plurality of cams supported by a single actuating member and arranged to actuate said ejector and said rock shaft.

85. In a machine for casting type, a mold including spaced apart mold blocks, and an end block, an ejector working between said mold blocks, a rock shaft, connections between said rock shaft and said end block, an operating member carried by said rock shaft, a matrix holder lever connected with said operating member, and a plurality of cams supported by a single actuating member and arranged to actuate said ejector and said rock shaft.

86. In a machine for casting type, a mold including spaced apart mold blocks, and an end block, an ejector working between said mold blocks, a matrix holder lever, a rock shaft for operating said end block and said matrix holder lever, and a plurality of cams supported by a single actuating member and arranged to actuate said ejector and said rock shaft.

87. In a machine for casting type, a mold including spaced apart mold blocks, and an end block, a clamp for said end block, an ejector working between said mold blocks, a matrix holder lever, a rock shaft for operating said end block, said clamp, and said matrix holder lever, and a plurality of cams supported by a single actuating member and arranged to actuate said ejector and said rock shaft.

88. In a machine for casting type, an adjustable mold including a plurality of mold blocks, an ejector mounted to reciprocate between said blocks, a rock shaft, and means controlled by said rock shaft for permitting a slight lateral play of one of said blocks.

89. In a machine for casting type, an adjustable mold including a plurality of mold blocks, an ejector mounted to reciprocate between said blocks, a rock shaft, means controlled by said rock shaft for permitting a slight lateral play of one of said mold blocks, and a plurality of cams supported by a single actuating member and arranged to actuate said ejector and said rock shaft.

90. In a machine for casting type, a mold comprising spaced apart mold blocks, one of which is provided with a groove, an ejector working between said blocks, a yieldingly mounted finger engaging said groove, a rock shaft, means controlled by said rock shaft for actuating said finger, and a plurality of cams supported by a single actuating member and arranged to actuate said ejector and said rock shaft.

91. In a machine for casting type, an adjustable mold including spaced apart mold blocks, an ejector mounted to reciprocate between said blocks, a mold clamp lever provided with means for engaging one of

said mold blocks, a rock shaft for operating said mold clamp lever, and a plurality of cams supported by a single actuating member and arranged to actuate said ejector and said rock shaft.

92. In a machine for casting type, a mold including a plurality of spaced apart mold blocks, an ejector mounted to reciprocate between said mold blocks, a mold clamp lever provided with means for engaging one of said mold blocks, a mold clamp gage adjustably connected with said mold clamp lever, a rock shaft connected with said mold clamp gage, and a plurality of cams supported by a single actuating member and arranged to actuate said ejector and said rock shaft.

93. In a machine for casting type, a mold including spaced apart mold blocks, an ejector mounted to reciprocate between said mold blocks, a mold clamp lever provided with means for engaging one of said mold blocks, a mold clamp gage adjustably connected with said lever, a single pivot pin common to said lever and gage, a rock shaft connected with said gage, and a plurality of cams supported by a single actuating member and arranged to actuate said ejector and said rock shaft.

94. In a machine for casting type, a mold including spaced apart mold blocks, an ejector mounted to reciprocate between said mold blocks, a mold clamp lever provided with means for engaging one of said blocks, a mold clamp gage, a spring acting against one end of said gage, means for adjustably connecting the said lever with the other end of said gage, a rock shaft arranged to rock said gage against the tension of its spring, and a plurality of cams supported by a single actuating member and arranged to actuate said ejector and said rock shaft.

95. In a machine for casting type, a mold including spaced apart mold blocks, an ejector mounted to reciprocate between said blocks, a matrix holder lever provided with means for supporting a matrix, a rock shaft for operating said lever, means controlled by said rock shaft for permitting a slight lateral play of one of said mold blocks, and a plurality of cams supported by a single actuating member and arranged to actuate said ejector and said rock shaft.

96. In a machine for casting type, an adjustable mold including spaced apart mold blocks, and an end block, an ejector mounted to reciprocate between said mold blocks, a rock shaft constructed to operate said end block, means controlled by said rock shaft for permitting a slight lateral play of one of said mold blocks, and a plurality of cams supported by a single actuating member and arranged to actuate said ejector and said rock shaft.

97. In a machine for casting type, a mold including spaced apart mold blocks, and an end block, an ejector mounted to reciprocate between said mold blocks, a clamp for said end block, a rock shaft constructed to operate said end block and clamp, means controlled by said rock shaft for permitting a slight lateral play of one of said mold blocks, and a plurality of cams supported by a single actuating member and arranged to actuate said ejector and said rock shaft.

98. In a machine for casting type, a mold including spaced apart mold blocks, and an end block, an ejector mounted to reciprocate between said mold blocks, a clamp for said end block, a matrix holder lever provided with means for supporting a matrix, a rock shaft constructed to operate said end block, said clamp, and said matrix holder lever, means controlled by said rock shaft for permitting a slight lateral play of one of said mold blocks, and a plurality of cams supported by a single actuating member and arranged to actuate said ejector and said rock shaft.

99. In a machine for casting type, a mold including an end block, a jet breaker, an end-block lever, and means carried by said lever for actuating said jet breaker.

100. In a machine for casting type, a mold including an end block, a spring pressed jet breaker, an end-block lever for operating the end block, and means carried by said lever for actuating said jet breaker.

101. In a machine for casting type, a mold including an end block, a lever for operating the same, a spring-pressed jet breaker, a pawl carried by said lever and arranged to engage said jet breaker to move the same in a direction to compress its spring, and means for periodically disengaging said pawl.

102. In a machine for casting type, a mold including spaced apart mold blocks, an ejector working between said blocks, a matrix holder lever, a rock shaft constructed to operate said lever, molten metal mechanism, and means for operating said ejector, said rock shaft, and said molten metal mechanism in time with each other.

103. In a machine for casting type, a mold including spaced apart mold blocks, and an end block, an ejector working between said mold blocks, a rock shaft, connections between said rock shaft and said end block, an operating member carried by said rock shaft, a matrix holder lever connected with said operating member, molten metal mechanism, and means for operating said ejector, said rock shaft, and said molten metal mechanism in time with each other.

104. In a machine for casting type, a mold including spaced apart mold blocks, and an end block, an ejector working between said mold blocks, a matrix holder lever, a rock shaft for operating said end block and said matrix holder lever, molten metal mechan-

ism, and means for operating said ejector, said rock shaft, and said molten metal mechanism in time with each other.

105. In a machine for casting type, a mold including spaced apart mold blocks, and an end block, a clamp for said end block, an ejector working between said mold blocks, a matrix holder lever, a rock shaft for operating said end block, said clamp, and said matrix holder lever, molten metal mechanism, and means for operating said ejector, said rock shaft, and said molten metal mechanism in time with each other.

106. In a machine for casting type, a mold including spaced apart mold blocks, one of which is provided with a groove in its top face, a yieldingly mounted finger engaging said grove, an ejector working between said mold blocks, a rock shaft for actuating said finger, molten metal mechanism, and means for operating said ejector, said rock shaft, and said molten metal mechanism in time with each other.

107. In a machine for casting type, a mold including spaced apart mold blocks, and an end block, an ejector mounted to reciprocate between said mold blocks, a clamp for said end block, a matrix holder lever provided with means for supporting a matrix, a rock shaft constructed to operate said end block, said clamp and said matrix-holder lever, means controlled by said rock shaft for permitting a slight lateral play of one of said mold blocks, molten metal mechanism, and means for operating said ejector, said rock shaft, and said molten metal mechanism in time with each other.

108. In a machine for casting type, a mold including a plurality of independent spaced apart normally stationary mold blocks provided with complemental casting faces, an ejector working between said blocks, one of said blocks being constructed to have a slight play with relation to said ejector, means for imparting an intermittent movement to said ejector, molten metal mechanism and means for locking the free mold section against movement during the operation of said molten metal mechanism.

109. In a machine for casting type, a mold provided with a plurality of normally stationary mold blocks one of which is constructed to have slight play, an ejector for said mold, an end block arranged to close the mold cavity, means for imparting an intermittent movement to said ejector, molten metal mechanism, and means for locking said mold block and said end block against movement during the operation of said molten metal mechanism.

110. In a machine for casting type, a mold provided with spaced apart mold blocks, an ejector for said mold, one of said blocks being constructed to move relative to said ejector, a resilient locking device for the last mentioned mold block, means for imparting intermittent movement to said ejector, molten metal mechanism, and means for rendering said locking device operative during the operation of said molten metal mechanism.

111. In a machine for casting type, a mold provided with spaced apart mold blocks, an ejector mounted between said blocks, an end block for closing the mold cavity, a spring pressed locking device for engaging the outer face of said end block, molten metal mechanism, and means for rendering said locking device operative during the operation of said molten metal mechanism.

112. In a machine for casting type, a mold provided with a plurality of normally stationary mold blocks one of which is arranged to have a slight lateral play, an ejector, means for imparting an intermittent movement to said ejector, an end block arranged to close the mold cavity, resilient locking devices for said mold block and said end block, and means for rendering said locking devices operative during the operation of the molten metal mechanism.

113. In a machine for casting type, a mold including an end block, a clamp therefor, a matrix holder lever provided with means for supporting a matrix, a rock shaft, and an operating member carried by said rock shaft and provided with means to successively operate said clamp and said lever.

114. In a machine for casting type, a mold including an end block, a clamp therefor, a matrix holder lever provided with means for supporting a matrix, a mold clamp gage, a rock shaft, an operating member carried by said rock shaft and provided with means to successively operate said clamp, said gage, and said lever.

115. In a machine for casting type, a mold including an end block, a clamp therefor, an ejector for the mold, a matrix holder lever provided with means for supporting a matrix, a rock shaft, an operating member carried by said rock shaft and provided with means to successively operate said clamp and said lever, and a plurality of cams supported by a single actuating member and arranged to operate said ejector and said rock shaft.

116. In a machine for casting type, a mold including an end block, a clamp therefor, an ejector, a matrix holder lever, a mold clamp gage, a rock shaft, an operating member carried by said rock shaft and provided with means for successively operating said clamp, said gage, and said lever, and a plurality of cams supported by a single actuating member and arranged to operate said ejector and said rock shaft.

117. In a machine for casting type, a mold including an end block, a clamp therefor, a matrix holder lever, a mold clamp gage, an

ejector, a rock shaft, an operating member carried by said rock shaft and provided with means to successively operate said clamp, said gage, and said lever, molten metal mechanism, and means for operating said cam, said rock shaft, and said molten metal mechanism in time with each other.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

ANDREW E. MILLER.

Witnesses:

EDWARD L. BASH,

ROBERT H. CARR.