

E. S. DUNAVANT.
MOLD AND OPERATING MECHANISM FOR TYPE MACHINES.
APPLICATION FILED JULY 26, 1906.

959,323.

Patented May 24, 1910.

5 SHEETS—SHEET 1.

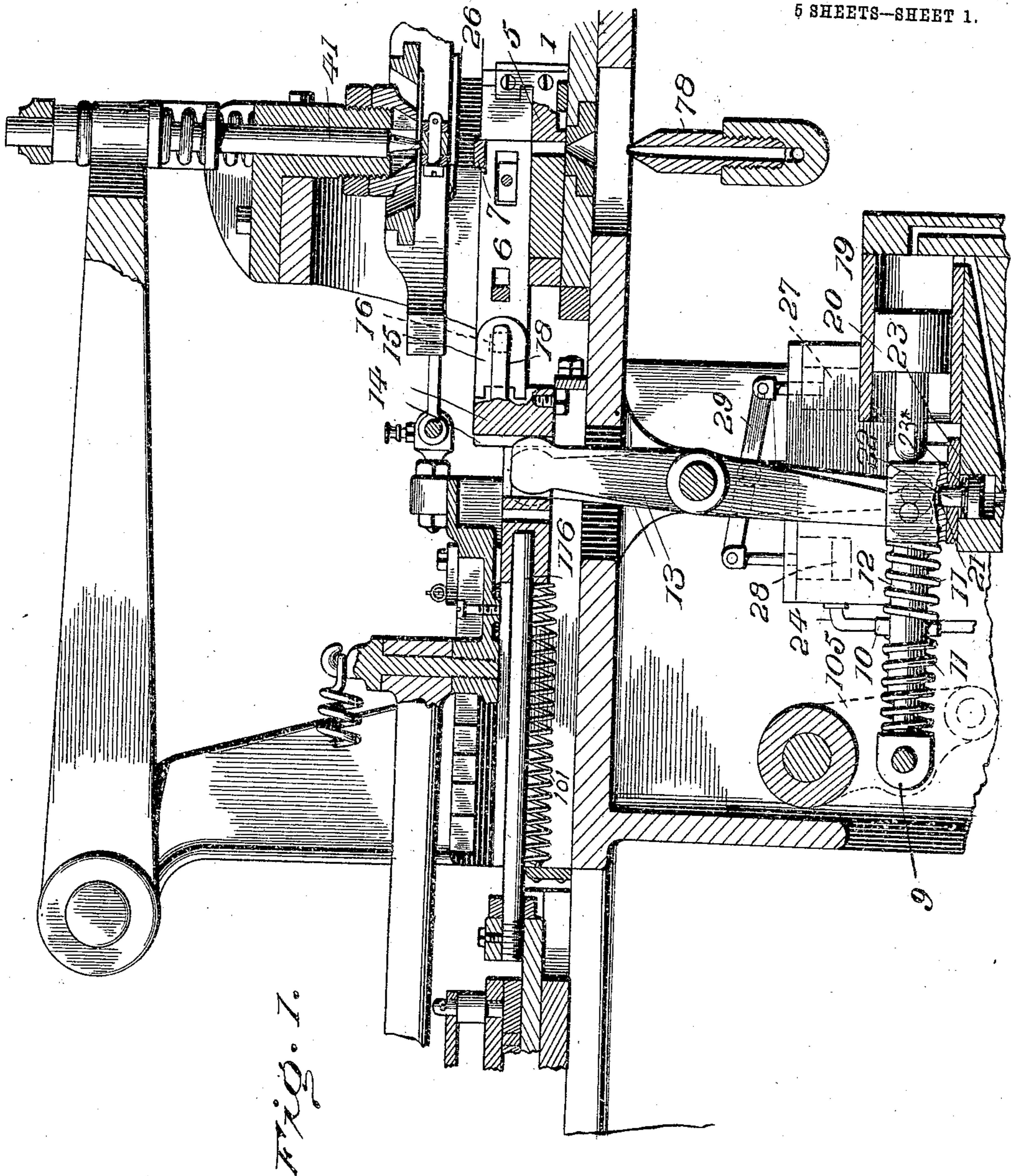


Fig. 1.

Witnesses

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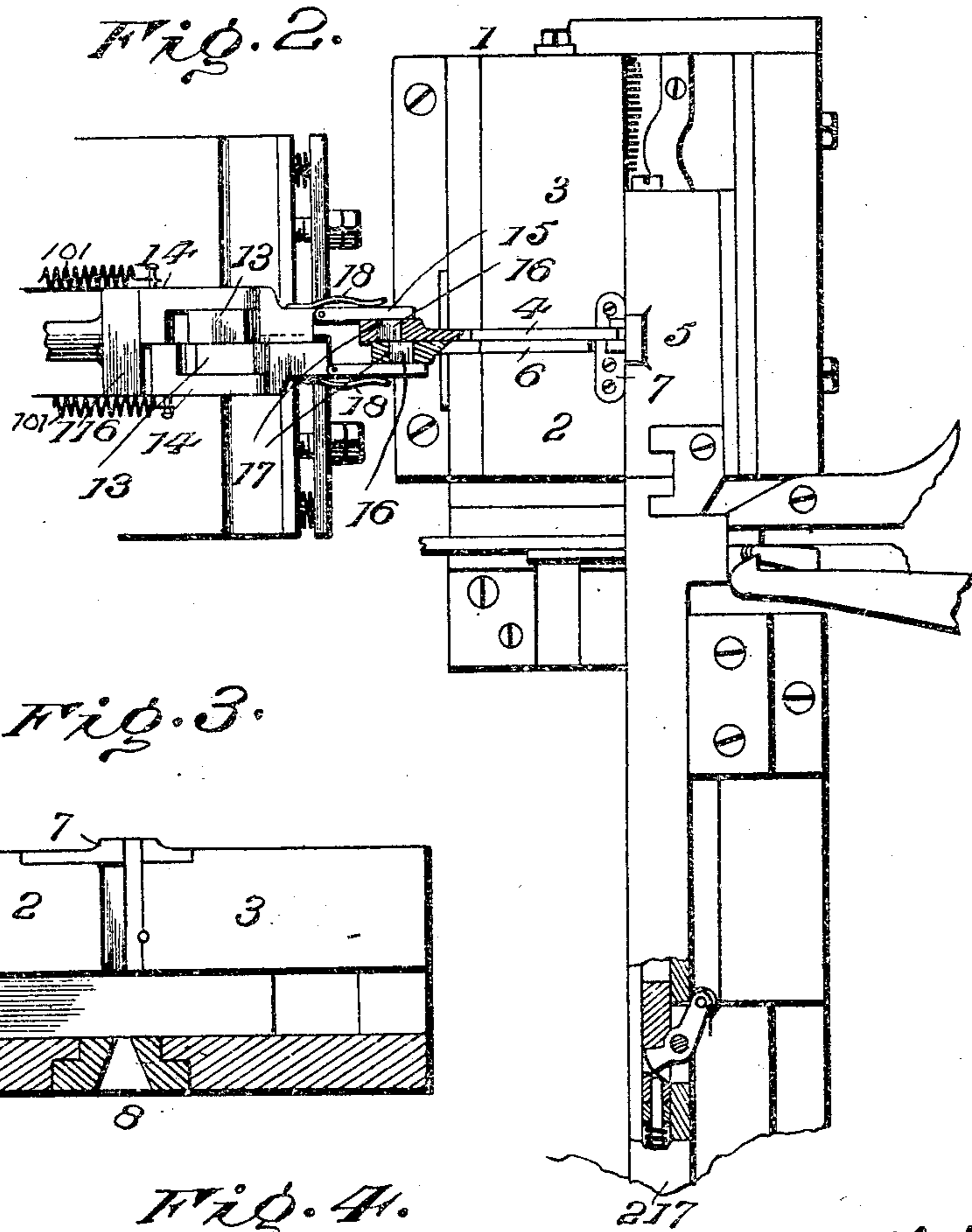
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Fig. 6.

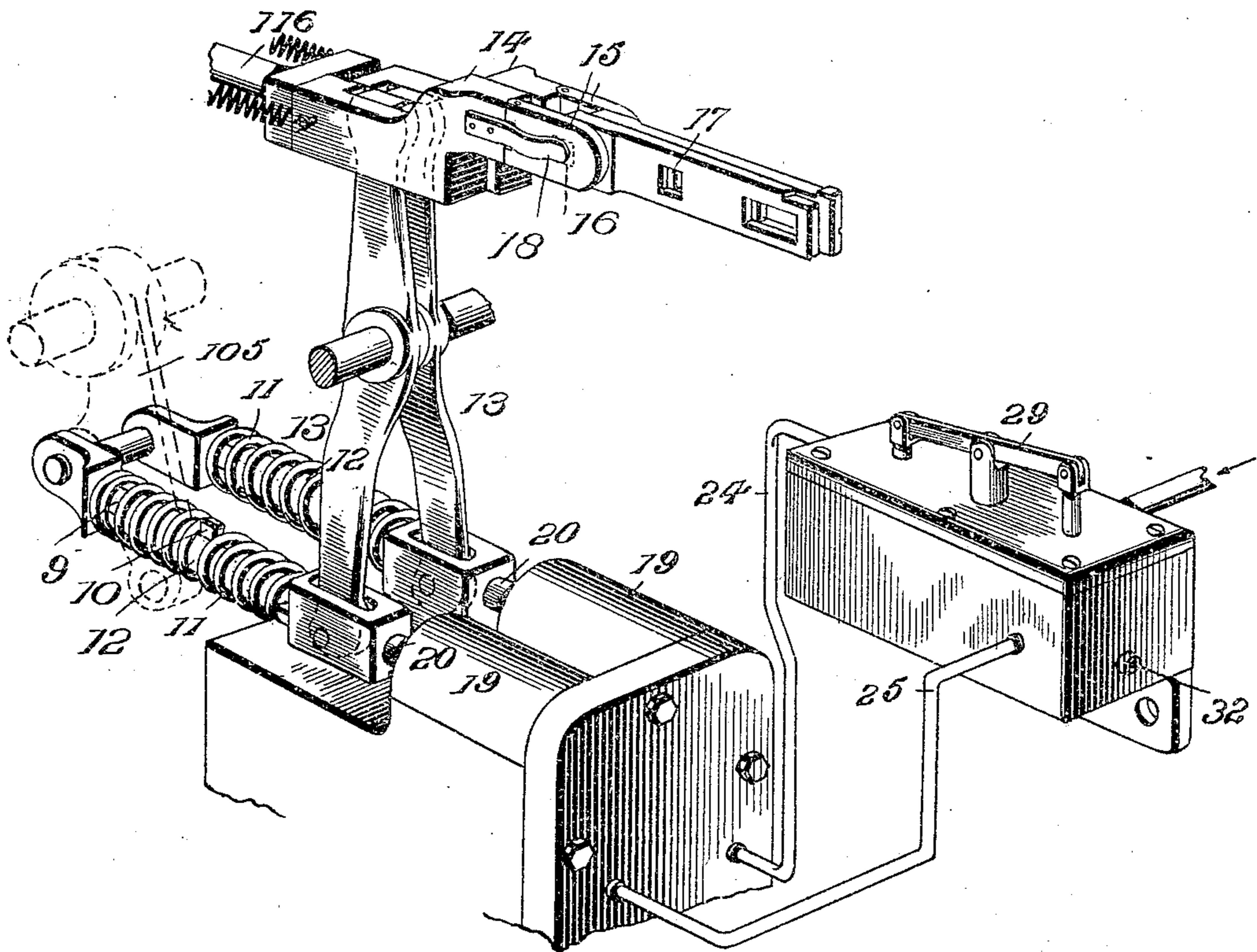
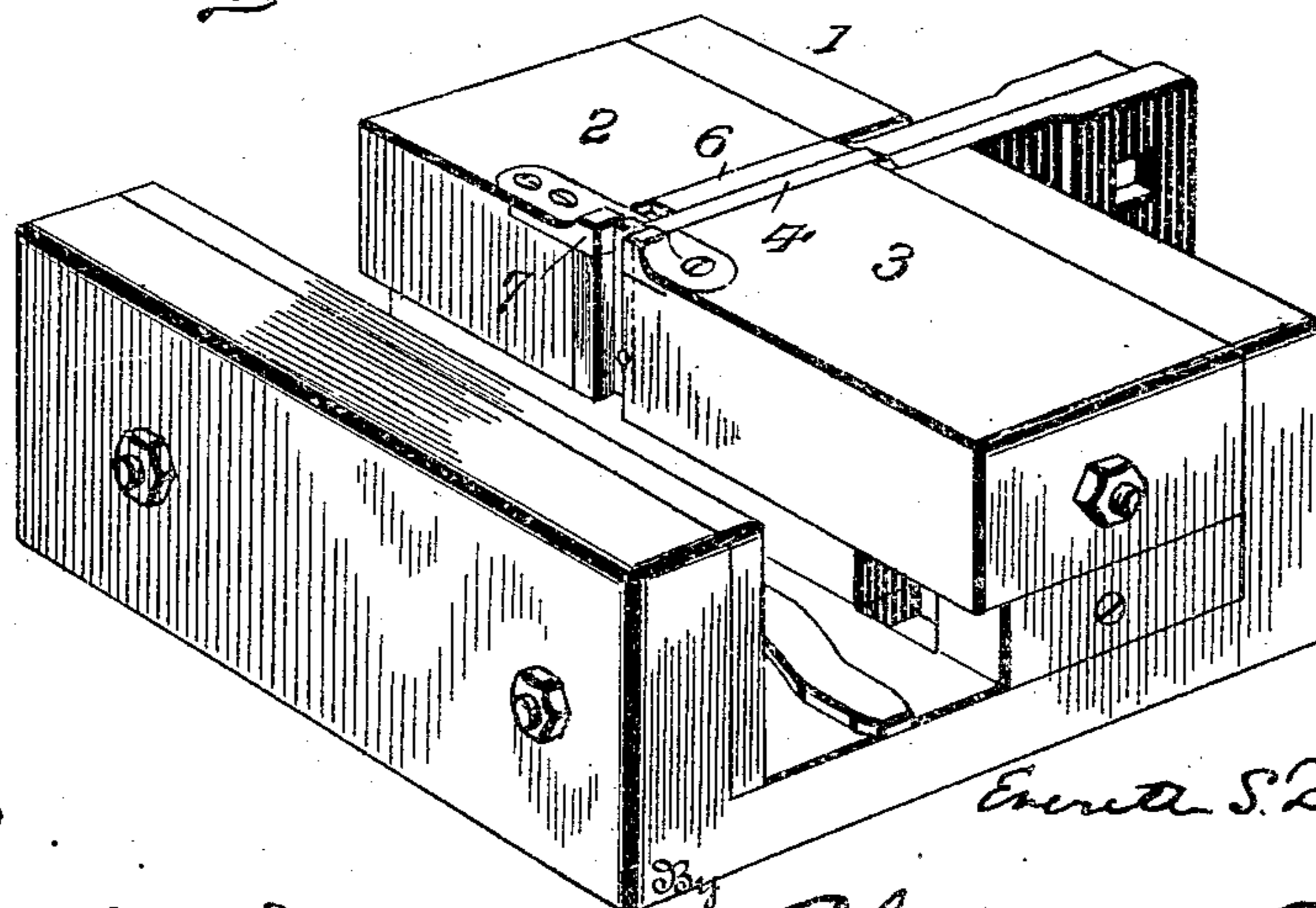


Fig. 7.



Witnesses

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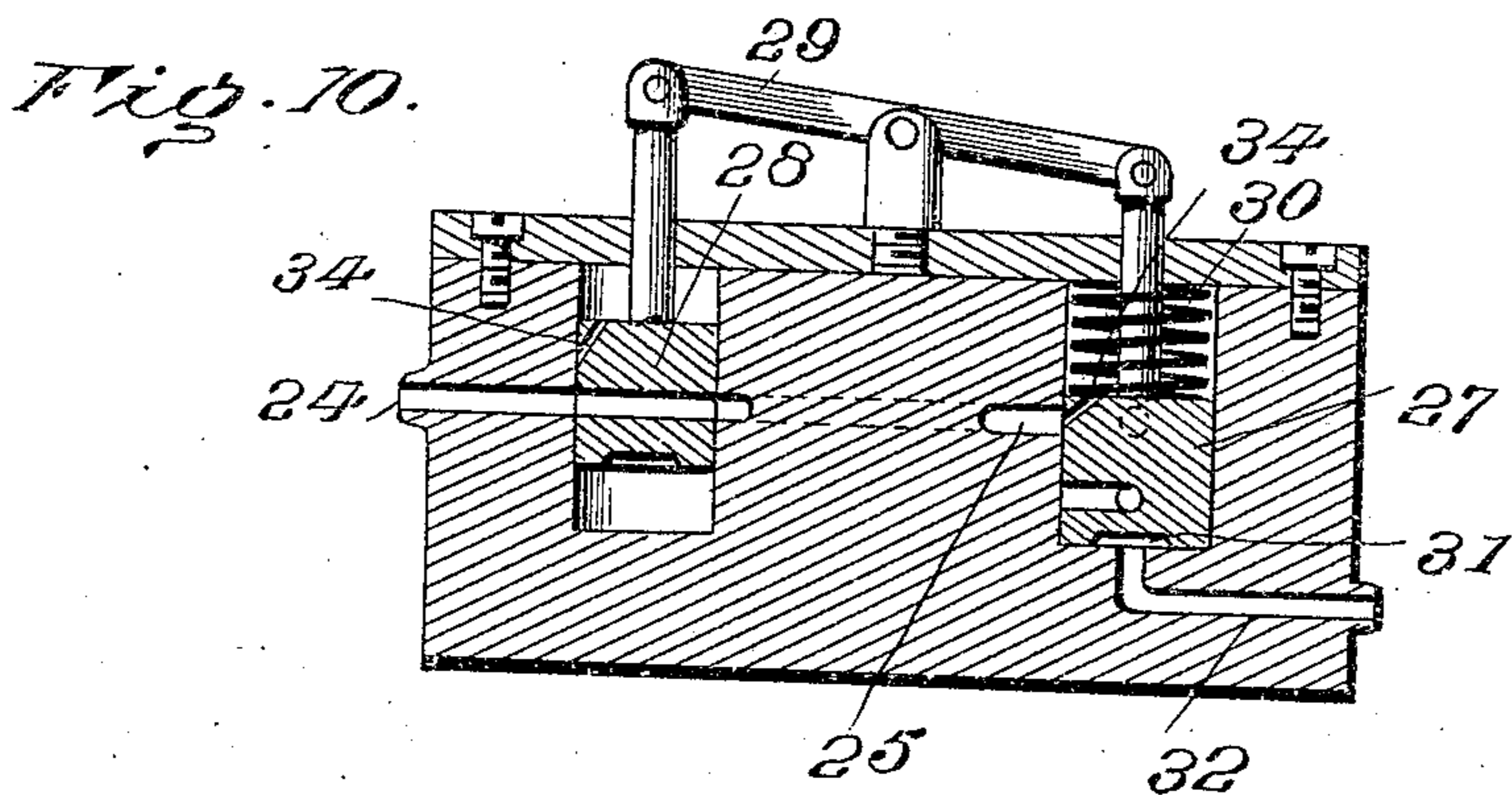
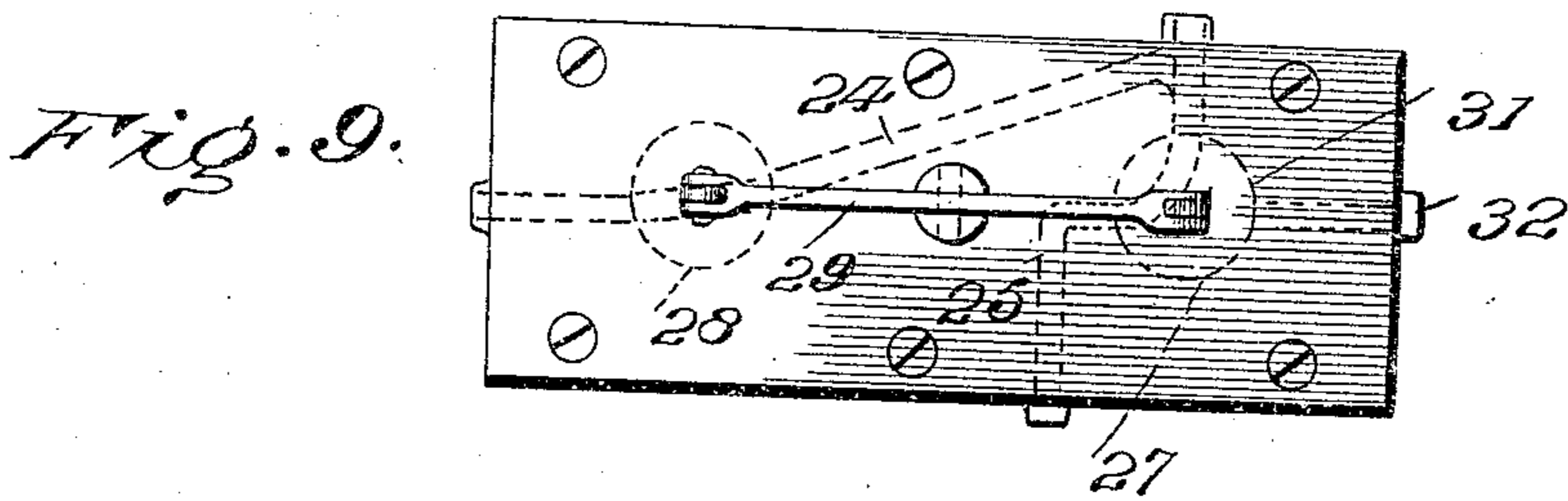
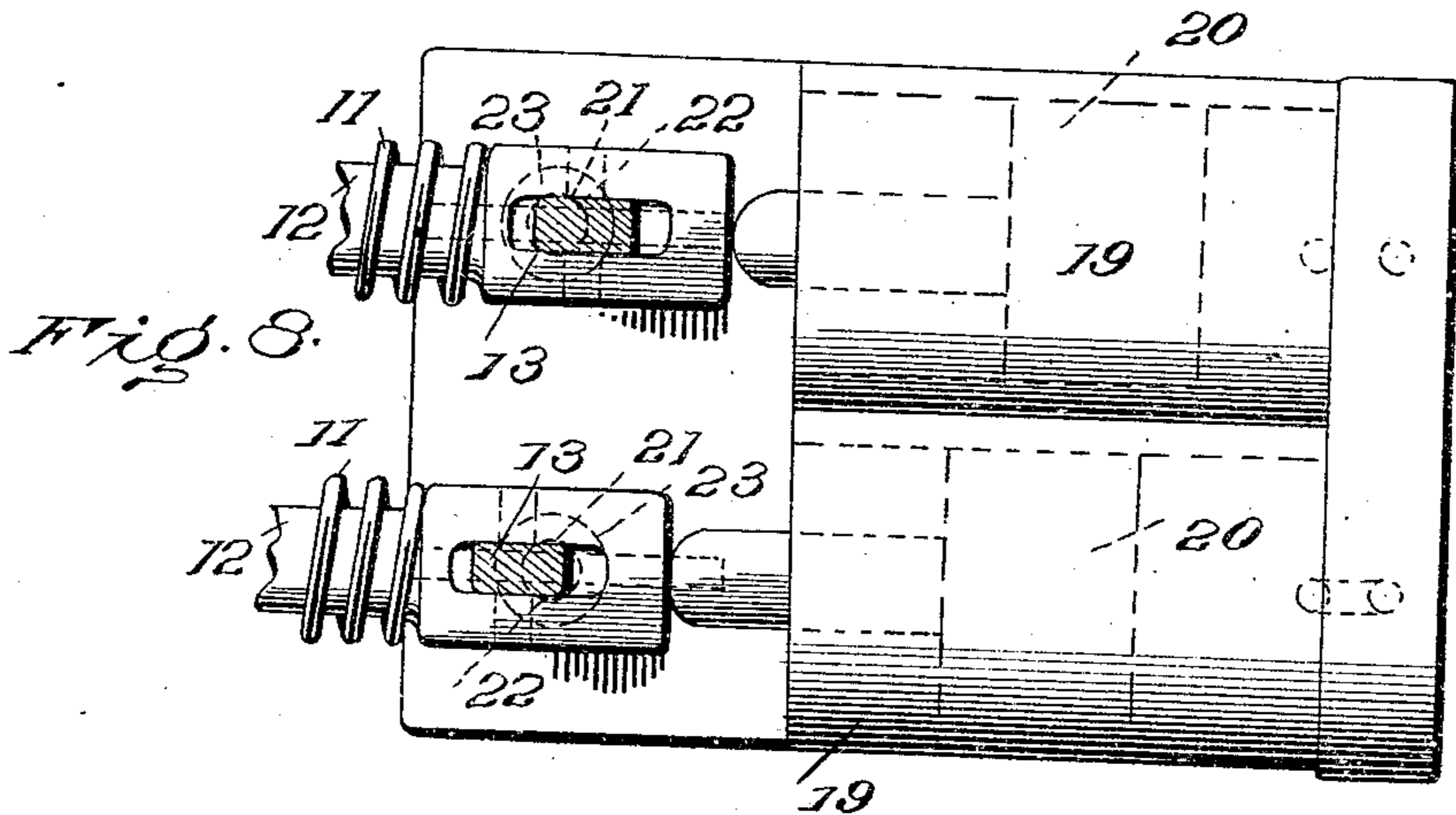
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5 SHEETS—SHEET 4.



Witnesses

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5 SHEETS—SHEET 5.

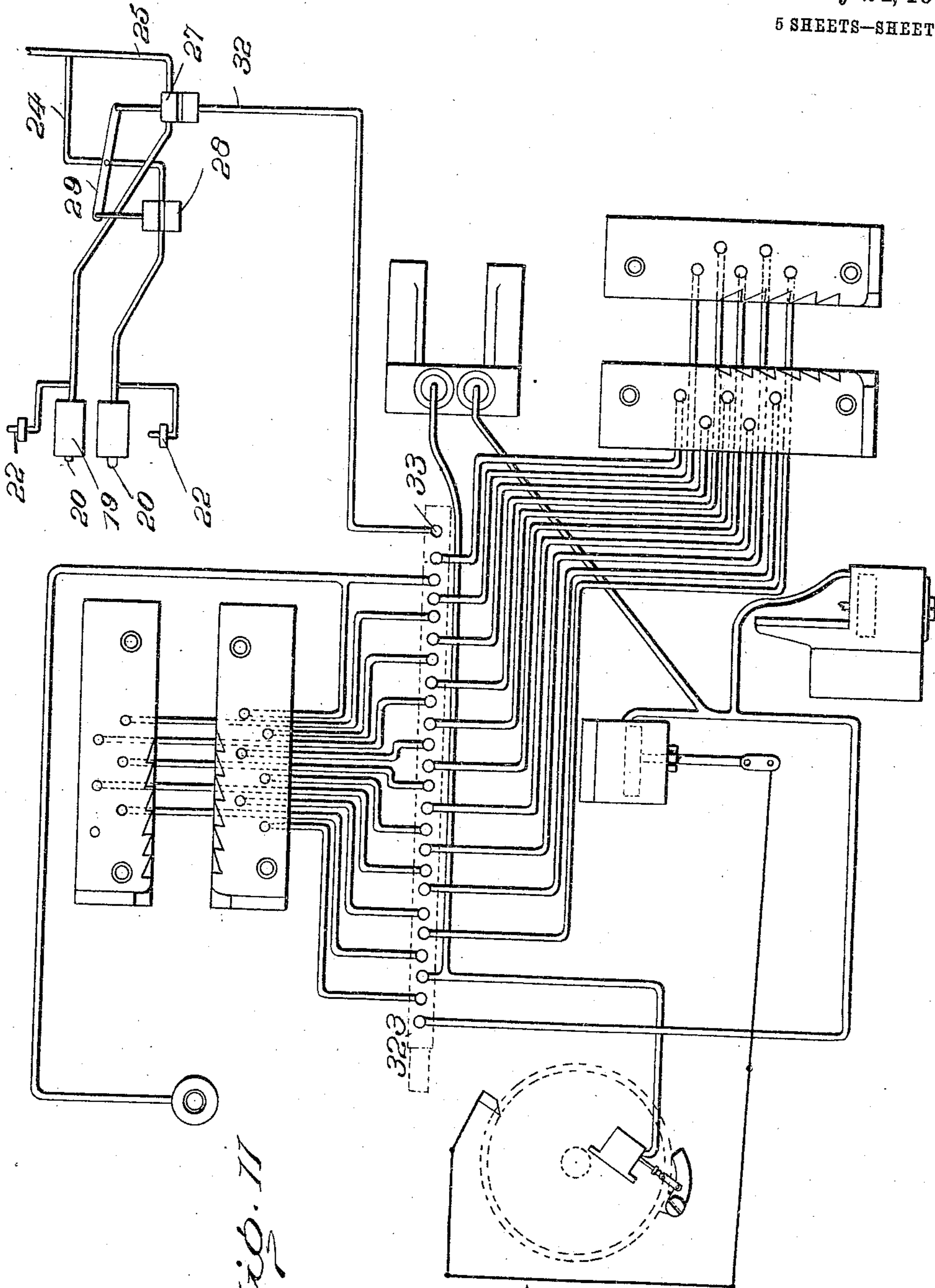


Fig. 11

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UNITED STATES PATENT OFFICE.

EVERETT S. DUNAVANT, OF LOUISVILLE, KENTUCKY, ASSIGNOR TO LANSTON MONO-TYPE MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF VIRGINIA.

MOLD AND OPERATING MECHANISM FOR TYPE-MACHINES.

959,323.

Specification of Letters Patent.

Patented May 24, 1910.

Application filed July 26, 1906. Serial No. 327,912.

To all whom it may concern:

Be it known that I, EVERETT S. DUNAVANT, of Louisville, county of Jefferson, State of Kentucky, have invented a certain
5 new and useful Improvement in Molds and Operating Mechanism for Type-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompany-
10 ing drawings, forming a part of this specification, and the figures of reference marked thereon.

This invention relates more especially to the class of type molds employed in connection with automatic type casting and composing machines, such as the monotype, wherein a series of matrices is arranged for the separate and successive application of its members to a single body-mold, the latter
15 provided with means for regulating or adjusting the size of the cavity to correspond with the character or space designated by the selected matrix, and it has for its principal object to so increase or enlarge the
20 capacity of the mold that either short or full body types may be produced as desired.

To this end the invention consists broadly in equipping the mold with a plurality of independently movable mold blades arranged
30 in juxtaposition between side blocks, the casting face of one mold blade of normal or full height and that of the other of shorter height and operating beneath an overhang or projection on the side block, the arrangement being such as to present two available
35 mold cavities of different capacities, the one of full longitudinal dimension, open at one end for the reception of the matrix and dimensioned laterally by the adjustment of the primary or long face mold-blade for
40 character or full body type, and the other closed at one end by the overhang, the latter constituting the end wall, and dimensioned laterally by the short face or supplemental
45 mold blade, for short body space type or quads.

The invention also includes means for selectively setting the mold for either variety of type and for automatically controlling
50 said selective means.

It also includes minor features pertaining to the construction and arrangement of parts

all as hereinafter fully described and pointed out in the claims.

In the accompanying drawings illustrating a preferred form of embodiment of the invention specially adapted for use in connection with one of the monotype machines.

Figure 1 is a vertical section of a portion
60 of the type casting and composing machine, with the improvements applied thereto. Fig. 2 is a top plan view of a portion of the machine including the mold and substituted type carrier. Fig. 3 is a sectional view of
65 the mold. Fig. 4 is a detail perspective showing mold blades in position for character type. Fig. 5 is a similar view of the mold arranged for short type or quads. Fig. 6 is a top plan view of the mold blade
70 actuating devices including part of the type machine with which they are immediately connected. Fig. 7 is a detail perspective of the mold detached, the cross-block being omitted. Fig. 8 is a top plan view of the
75 transfer motors. Fig. 9 is a top plan view of the control valves for the transfer motors. Fig. 10 is a vertical section of the control valves, Fig. 9. Fig. 11 is a diagrammatic
80 view showing the air connections.

Corresponding numerals in the several figures designate like parts.

For purposes of illustration the invention is shown applied to the machine of Patent No. 633,088, dated Sept. 12, 1899, to which
85 reference may be had for a full disclosure of its construction and operation.

It will suffice for present purposes to refer only to those parts with which the improvements have direct connection, such as
90 lever 105 for transmitting the ejecting movement to the mold-blade; adjustable stop rod 116 for gaging the position of the mold-blade when retracted for dimensioning the mold; type carrier slide 217; and cross-bar
95 323 of the pneumatic controlling system. In addition mention may be made of the two way movable die case 26 provided with a series of matrices and operating to present any one opposite the mold; the center-
100 ing pin 41 for clamping the selected matrix upon the mold while the cast is being made, and the movable pump nozzle 78 through which molten metal is injected into the mold.

The numerals heretofore given are those found in the prior patent designating corresponding parts.

The mold 1, aside from the improvements to be described, may be of any approved construction, such as that shown, provided with side blocks 2, 3, movable mold blade 4, and a movable cross-block 5. The form illustrated is substantially that of Patent No. 752,814, dated Feb. 23, 1904, but, as will be apparent, other constructions are admissible.

Heretofore the mold has been equipped with a single mold blade herein denominated the primary mold-blade, and when a blank matrix was presented and clamped upon its open end the space or quad cast would of necessity be shoulder high, that is, it would be the full length of the mold cavity and shorter than character type by an amount equal to the depth of the drive only.

As the drive is necessarily shallow and the blank type are not subjected to the same pressure, in printing, as the character type, a slight longitudinal movement suffices to bring their ends into the plane of the printing surface, resulting in an undesirable marring of the printed impression. Attempts have heretofore been made to overcome this defect by constructing the mold-blade in sections, superposed one upon the other, and providing means whereby, when character type were to be produced, the two sections would be locked together and thus caused to operate the same as the integral mold blade; but when blank type were required, the upper section would be advanced to close the end of the mold, and the type cast against the under face of the projected section would be shortened an amount equal to the thickness of the projected part of the upper section. It has been discovered, however, that similar and equally good results can be secured and without otherwise interfering with the normal functions of the machine by the introduction of a second or supplemental mold blade alongside of the primary mold-blade thereby providing separate mold cavities for character type and short quads or space type, which end is attained as follows: The side blocks 2, 3, being set or adjusted to present an opening double the thickness of the primary mold-blade 4, a second or supplemental mold-blade 6 is inserted beside the first. The casting face or end of this supplemental mold-blade is somewhat less than shoulder high, that is, it is cut away or reduced on its upper edge below the matrix receiving surface of the primary mold blade 4, the deficiency being supplied by a projection 7 formed upon or secured to the side block 2. The underside of this projection 7 is fitted to the upper face of the supplemental mold blade 6, with the side next the cross-block in the plane of the contacting face of the latter or parallel

thereto, and the face next the primary or normal mold-blade 4 in the plane of the contacting faces of the two mold-blades, the object being to form metal tight joints between said projection on the one hand and the supplemental mold blade, primary mold blade and cross-block on the other.

The parting line of the two mold-blades is preferably located in a plane bisecting the jet opening 8 so that metal may be injected in front of either mold blade while the other is maintained in its extreme forward position. As thus arranged if the supplemental mold blade is advanced beneath projection 7 until its casting face contacts with the cross block, and it is there held, its side next the primary mold-blade 4 will serve in lieu of the side block 2, to form one face of the mold cavity in front of the primary mold-blade and of which the latter constitutes the dimensioning element. The mold is now in condition to form full body or character type in the usual manner, that is to say, the cross-block being in position, the mold-blade 4 adjusted and the selected matrix clamped, molten metal is injected through the jet opening, after which the primary mold-blade is advanced flush with the cross-block and the type ejected into the carrier. When, however, it is desired to cast a low body space type or quad, it is only necessary to retain the primary mold-blade 4 in its forward or ejecting position and adjust the supplemental mold-blade for dimensioning purposes, so that when the molten metal is injected the type will be cast within the cavity now formed in front of the supplemental mold blade 6 instead of the primary mold-blade and of which the overhang or projection 7 constitutes one end wall. It is evident that the type thus cast will be shorter than any blank cast in front of the primary mold blade, and that the degree will be determined by the thickness of said projection or the remoteness of its under face measured from the plane of the matrix seat on the mold. It will thus be seen that the mold is provided with a single casting chamber divided into two longitudinal operating sections or portions, the one competent to produce short body type as defined by the end wall and covered by the movement of the supplemental mold-blade and the other competent to produce long or full body type and defined by the opening for the reception of the matrix and covered by the movement of the primary mold blade.

Various forms of mechanism may be applied for controlling the relative positions of the two mold blades and applying the dimensioning adjustments to either, as required, and the preferred form illustrated by way of example is specially adapted to the requirements of the particular machine, to the end that the designating action may

be derived from the same perforated strip which controls the other mechanisms. To this end each mold blade is separately coupled with the prime mover of this branch of the machine, to wit, lever 105. It is to be borne in mind that in the machine of the prior patent this lever is moved to advance the mold blade for ejecting the type, and, on its return, deposits the mold-blade against the previously adjustable stop rod 116 for dimensioning the mold for the next cast.

Lever 105 is connected through a double compression member (such as a rod 9 carrying cross pin 10 located between opposing spring 11 on sleeve 12) with two transmitting members, such as levers 13. Each lever 13 engages one of two slides 14 arranged to abut against the stop rod 116 or a cross head applied thereto, and each slide is in turn coupled with one of the mold-blades, as by a pivoted member 15 provided with a projection 16 for entering the cross-pin hole 17 in the mold blade, a spring 18 serving to hold said pivoted member in engagement and permit its withdrawal for the removal of the mold. The means described are substantially duplicates of the single actuating mechanism of the prior patent, and are competent to transmit the ejecting and adjusting movements to the two mold-blades separately, hence it is only required that competent means be supplied for holding either mold-blade in its extreme forward position, to fully develop the functions of the mold controlled by the other mold-blade.

Although, as is obvious, manually controlled shifting and locking devices might be applied for positioning and holding one mold-blade stationary while the other remained in action, the preferred plan is one in which this locking action is automatically performed, and, by preference, by the controlling record strip of the machine. Such a mechanism is illustrated comprising a motor and locking pin for each mold-blade, and a valve mechanism controlled by a perforation in the record strip for admitting pressure to said motors alternately as required, the arrangement being such that the motor connected to the supplemental mold-blade is normally under pressure and its locking pin engaged, to advance the supplemental mold-blade and hold it in position against the pressure of retracting spring 101 and one spring 11, so that the primary mold-blade may be operative for casting full body or character type of different dimensions; and when a short body type is to be formed, the special perforation in the record strip, by admitting pressure to the motor devices of the valve mechanism, will cause the latter to transfer pressure to the motor of the primary mold-blade and release the supplemental mold blade so that the former will in turn be locked and the latter released and

brought into action. Opposite each transmitting member 13 is arranged a motor consisting of a cylinder 19 and piston 20, the latter in position to engage its member 13 when pressure is admitted to the cylinder. Each transmitting member 13 is also provided with a socket 21 for the reception of a locking pin 22 carried by or coupled with a piston 23 whose cylinder is in open communication with the cylinder 19 of its motor so that when pressure is admitted to the motor the pin 22 will be projected to lock and hold the transmitting member 13, and with it the mold-blade connected therewith, in its forward position. The motor of the locking pin is also provided with means, such as retracting spring 23*, to assist in its withdrawal. Means are also provided for designating which mold-blade shall be locked and which adjusted in connection with each cast made, that is to say, for determining whether the type shall be of the long or short body variety. In the preferred construction this function is performed by a valve mechanism provided with two passages 24, 25, each leading from the source of pressure to one of the motor cylinders 19. Each passage 24, 25, is controlled by a valve 27 or 28 adapted to intercept the flow of air and open an exhaust when in one position, and close the exhaust and admit pressure when in another position. The two valves 27, 28, are connected for simultaneous movement through lever 29, and one of them, 27, is provided with a retracting spring 30 and motor, the latter represented by the piston end of the valve working in a cylinder 31 communicating, through duct 32, with the port 33 of cross bar 323 with which the special signal perforation coöperates.

Normally valve 28 stands with the passage 24 open, thus admitting pressure to the motor of the supplemental mold-blade and holding the latter in its forward position with the locking bolt engaged, while valve 27 closes the passage 25 leading to the motor of the primary mold-blade and opens exhaust passage 34, thus reducing pressure in said motor and permitting the withdrawal of its locking bolt, leaving the primary mold-blade free to respond to its actuating devices. This condition is maintained so long as port 33 is retained closed by an imperforate section of the record strip and pressure is thus withheld from the valve motor 31. The special perforation in line with port 33 is usually associated with those for the spaces or quads, although it may be used in connection with any type signal, in which case it will operate to extinguish the character designated thereby. When said special perforation is brought into registry with port 33 pressure will be at once admitted to cylinder 31, thereby causing a

shifting of valves 27, 28, so as to admit pressure to the motor of the primary mold-blade, thus advancing and locking the latter, at the same time opening exhaust passage 34 and closing supply passage 24, thereby taking off pressure in the motor of the supplemental mold-blade and permitting the withdrawal of its locking pin so that said supplemental mold-blade will be responsive to its actuating devices.

Inasmuch as the use of the double mold construction herein described involves a delivery of the type at either of two adjacent points in the travel of the type carrier it is obvious that the capacity or range of the latter should be correspondingly increased which can readily be accomplished by so proportioning and adjusting the clamping members of the type carrier that when presented in front of the mold, in position to receive the type delivered by either mold-blade, they shall open sufficiently to uncover both mold cavities.

The preferred form of type carrier shown is that illustrated in Patent No. 625,998, dated May 30, 1899, minus the diagonal rib for elevating and depressing it, as these movements are not included in the machine illustrated.

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is:—

1. In a type casting machine provided with movable matrices and clamping means, the combination therewith of a long and short body mold provided with a casting chamber comprising two longitudinal sections defined by a cross-piece or bridge and adjacent matrix receiving opening at one end; and a plurality of independently movable members one for each section adapted to occupy their respective sections.

2. In a type casting machine such as described and in combination with its movable matrices and clamping devices for the selected matrix, of a long and short body mold adapted for the production of long or short body type as desired, the same including a single casting chamber comprising adjacent longitudinal sections defined by an end wall partially closing said chamber, a primary mold blade movable across the open section to wholly or partially occupy the latter and a supplemental mold-blade movable across the closed section to wholly or partially occupy the same.

3. A type mold provided with a plurality of mold-blades cooperating with a single casting chamber, said mold blades being disposed in lateral sequence between opposing side walls and each contacting with one of said side walls only.

4. A type mold provided with a plurality of independently movable mold blades disposed in parallel relation and in lateral

sequence between the opposite side walls of a common casting chamber and means for adjusting or positioning said mold-blades so that either may cover the adjacent side wall while the other dimensions the chamber formed between the first named mold blade and the opposite side wall.

5. A type mold provided with side blocks, a movable cross block and a plurality of mold-blades arranged side by side between and in sequence with the side blocks and means for advancing either mold blade to cover the casting face of the adjacent side block and for positioning the other mold blade to dimension the casting chamber formed between the side of the advanced mold blade and the side block opposite thereto.

6. A long and short body type mold provided with an overhang or projection on the side wall of its casting chamber and a plurality of mold-blades in said chamber.

7. A long and short body type mold provided with a projection or overhang partially bridging the mold-blade channel and a plurality of independently movable mold-blades in juxtaposition within said channel, one of said mold-blades extending beneath the bridging projection.

8. A type mold provided with an overhang or projection on one of the side blocks partially bridging the mold-blade channel, and primary and supplemental mold-blades in juxtaposition within said channel, the primary mold-blade overlapping the end and the supplemental mold-blade extending beneath said overhang or projection.

9. A long and short body type mold provided with a single casting chamber the side walls whereof are composed in part of two independently movable mold-blades each adapted to enter said chamber and occupy a section thereof to one side of the line of movement of the other mold-blade.

10. A long and short body type mold provided with a casting chamber partially closed at one end to present an opening of less area than said chamber for the reception of a matrix, and a plurality of movable members forming in part the side walls of said chamber and each movable laterally thereof the one beneath the closed end section and the other across the open end section of said chamber.

11. A long and short body type mold provided with a single casting chamber partially closed at one end to present an opening of less area than said chamber for the reception of a matrix, and a plurality of sections or mold-blades forming part of the side walls of said chamber and movable in parallel planes transverse of the chamber, one in line with the closed and the other with the open section of the casting chamber.

12. A long and short body type mold provided with a single casting chamber partially closed at one end, a single jet opening and a plurality of independently movable mold-blades.

13. A long and short body type mold provided with a single casting chamber comprising two contiguous longitudinal sections of which one is closed and the other open at one end for the reception of a matrix and means adapted to occupy or close off either of said sections, to produce long or short body type as desired.

14. A long and short body type mold provided with a single casting chamber comprising two longitudinal sections or portions defined by a bridge or overhang at one end and an adjacent opening for the reception of a matrix, and a plurality of mold-blades one for each section of the casting chamber and movable transversely of the latter to either occupy or dimension their respective sections of said chamber.

15. In a type casting machine provided with type dimensioning or gaging means and in combination therewith a long and short body mold provided with a plurality of independently movable mold blades, and means for coupling said mold blades with said dimensioning or gaging means.

16. In a type casting machine provided with movable matrices, clamping devices therefor and type dimensioning or gaging means, and in combination therewith, a mold adapted to produce either long or short body type provided with a plurality of independently movable mold-blades, separately coupled with the dimensioning or gaging means.

17. In a type casting machine provided with matrix presenting and holding devices and type dimensioning or gaging means, and in combination therewith a long and short body mold provided with a plurality of mold blades each separately coupled with the type dimensioning or gaging devices, and means for advancing and holding one mold-blade while the other is adjusted.

18. In a type casting machine the combination with a long and short body type mold provided with independently movable mold-blades, of means for separately advancing and holding either of said mold blades for designating the kind of type, and separate means for adjusting the other mold-blade, for dimensioning the type.

19. In a type casting machine equipped with a long and short body mold provided with primary and supplemental mold blades and in combination therewith, means for advancing the mold-blades, selective means for retaining either mold-blade in its advanced position, and dimensioning or gaging devices for positioning the movable mold-blade.

20. In a type casting machine provided

with a long and short body mold equipped with primary and supplemental mold-blades for designating the kind and controlling the dimensions of the type to be cast, and in combination therewith the following elements, to wit; a dimensioning or gaging mechanism common to the two mold blades; actuating devices coupled with both mold-blades for effecting the ejecting movements and selective means for determining the character of the type to be formed, operating to lock or retain one mold-blade in adjusted position while the other mold blade is under control of the dimensioning or gaging mechanism.

21. In a type casting machine the combination of the following elements, to wit; a long and short type body mold provided with a plurality of mold-blades disposed side by side between and in sequence with the side blocks; and means for controlling the relative positions of said mold-blades.

22. In a type casting machine the combination of the following elements to wit; a long and short type body mold provided with a plurality of mold-blades disposed side by side between and in sequence with the side blocks; and automatic means for separately controlling the relative positions of the mold-blades in the casting chamber.

23. In a type casting machine the combination of the following elements, to wit; a long and short type body mold provided with a plurality of mold-blades; independent actuating devices coupled with said mold-blades for adjustment in dimensioning the mold; and means for locking either mold-blade in its advanced position within the casting chamber.

24. In a type machine the combination of the following elements, to wit; a long and short type body mold provided with a plurality of mold-blades; means for advancing and locking each mold blade separately; and means for adjusting the unlocked mold blade to dimension the mold.

25. In a type machine the combination of the following elements, to wit; a long and short type body mold provided with a plurality of mold-blades; means for advancing and locking each mold-blade separately; adjusting means common to the two mold-blades for dimensioning the mold; and means for controlling the advancing and locking devices to designate the mold-blade to be acted upon thereby.

26. In a type machine the combination of the following elements, to wit; a long and short type body mold provided with a plurality of mold-blades; means for locking or holding either mold-blade; adjusting devices acting on the unlocked mold blade to dimension the mold cavity; and automatic control mechanism for said locking or holding means.

27. In a type machine provided with matrix centering and clamping device, mold dimensioning devices and a control system governed by a record strip and in combination therewith the following elements, to wit; a long and short type body mold provided with a plurality of mold-blades operating to designate the variety and dimension the type produced; means for locking or holding either mold-blade in advanced position within the casting chamber; means for adjusting the unrestrained mold-blade to dimension the mold-cavity; and automatic means under the control of the record strip for governing the action of the mold-blade locking or holding means.

28. In a type machine the combination of the following elements, to wit; a long and short body type mold provided with a plurality of mold-blades; dimensioning devices for adjusting or gaging the mold-blades; a plurality of motors, one for each mold-blade in position to advance the latter; and selective control devices for said motors.

29. In a type machine the combination of the following elements, to wit; a long and short type body mold provided with a plurality of mold-blades; means for adjusting the mold-blades to dimension the mold; locking devices for the mold-blades; and means for effecting the application of said locking devices to the mold-blades alternately.

30. In a type machine the combination of the following elements, to wit; a type mold provided with a plurality of mold-blades; automatic means for adjusting either mold-blade to dimension the mold cavity controlled thereby; a lock-out for each mold-blade; a motor coupled with each lock-out; and a valve mechanism controlling said motors.

31. In a type machine the combination of the following elements, to wit; a type mold provided with a plurality of mold-blades; mold-blade gaging devices for dimensioning the mold-cavity; motor devices for advancing the mold-blades; and locking devices coupled with the said motor devices for retaining the mold-blade in position while the cast is being made.

32. In a type machine the combination of the following elements, to wit; a mold provided with a plurality of mold-blades; a motor for each mold-blade; a valve mechanism controlling said motors; and a motor device for the valve mechanism controlled by the record strip.

33. In a type casting machine provided with a mold adjustable for long or short body type and in combination therewith adjusting means adapted to be automatically controlled by a special signal on the record strip or controller for selectively determin-

ing the longitudinal dimensions of the mold cavity at the time the cast is made.

34. In a type casting machine the combination of the following elements, to wit; a mold provided with means for varying the longitudinal dimensions of its cavity, to produce either long or short body type; devices for actuating said dimension varying means; and means for automatically controlling said actuating devices including a piston coupled with a port, the latter controlled by the record strip.

35. In a type casting machine, the combination of the following elements, to wit; a mold; means for varying the longitudinal dimensions of the mold cavity, to produce long or short body type; actuating devices for said mold dimensioning means; and selective controlling means for said actuating devices including an actuating piston coupled with a port, the latter controlled by a special perforation or signal on the record strip.

36. In a type casting machine provided with a mold, the longitudinal dimensions of whose casting cavity are variable to produce either long or short body type, a plurality of movable matrices and automatic means for selectively presenting individual matrices to the mold, including a series of ports controlled by perforations in a record strip or controller, and in combination therewith, means also governed by the record strip or controller for varying the longitudinal dimensions of the mold, the same including a piston coupled with a port additional to those pertaining to the matrices and in position to register with special signal perforations in the record strip.

37. In a type casting machine and in combination with the mold thereof, means for automatically varying the longitudinal dimensions of the mold cavity, to produce long or short body type, adapted to be controlled by a special signal or perforation in the record strip or controller and including in its construction an actuating piston coupled with a controlling port.

38. In a type casting machine provided with a series of movable matrices, a mold, means for varying the lateral dimensions of the mold cavity; and a series of ports governed by perforations in a record strip or controller and coupled with means for selectively presenting the matrices and dimensioning the mold, and in combination therewith, means for varying the longitudinal dimensions of the mold cavity, to produce either long or short body type, and actuating devices for said last named dimensioning means including a piston coupled with a special port additional to the first named series and controlled by special perforations in the record strip.

39. In a type casting machine the combination of the following elements, to wit; a plurality of matrices; means for presenting individual matrices to a common casting
5 point including selective positioning devices controlled by distinctive signals in a pattern or record strip; a mold provided with means for varying the longitudinal dimensions of its casting chamber, to produce either long

or short body type; and actuating devices 10 for said mold dimensioning means controlled by a special signal in the pattern or record strip for selectively determining the longitudinal dimension of the casting chamber.

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Witnesses:

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