

No. 836,053.

PATENTED NOV. 13, 1906.

A. SCHIEPE.
ROTARY CASTING MACHINE.

APPLICATION FILED DEC. 16, 1905.

5 SHEETS—SHEET 1.

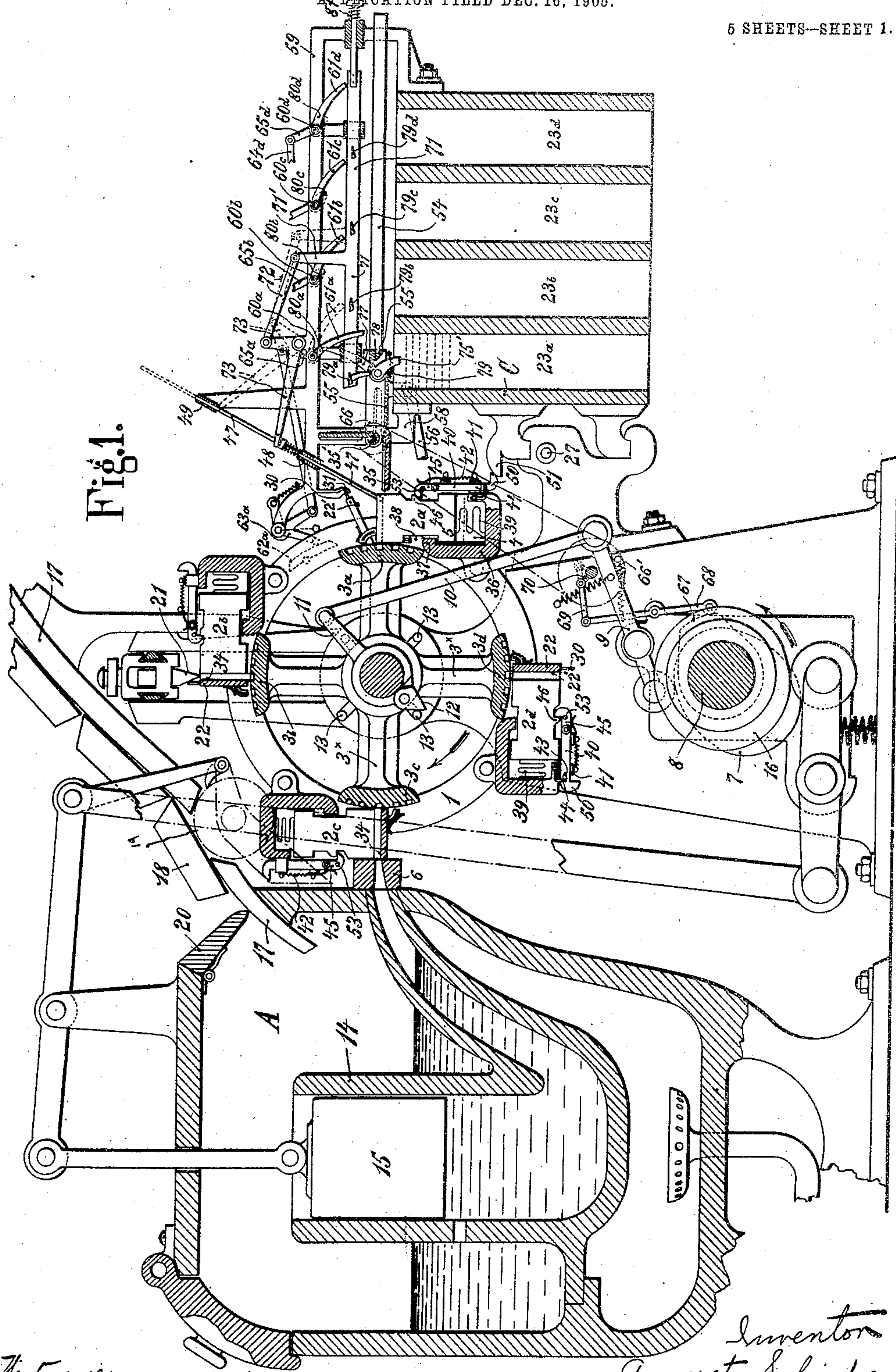


Fig. 1.

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6 SHEETS—SHEET 2.

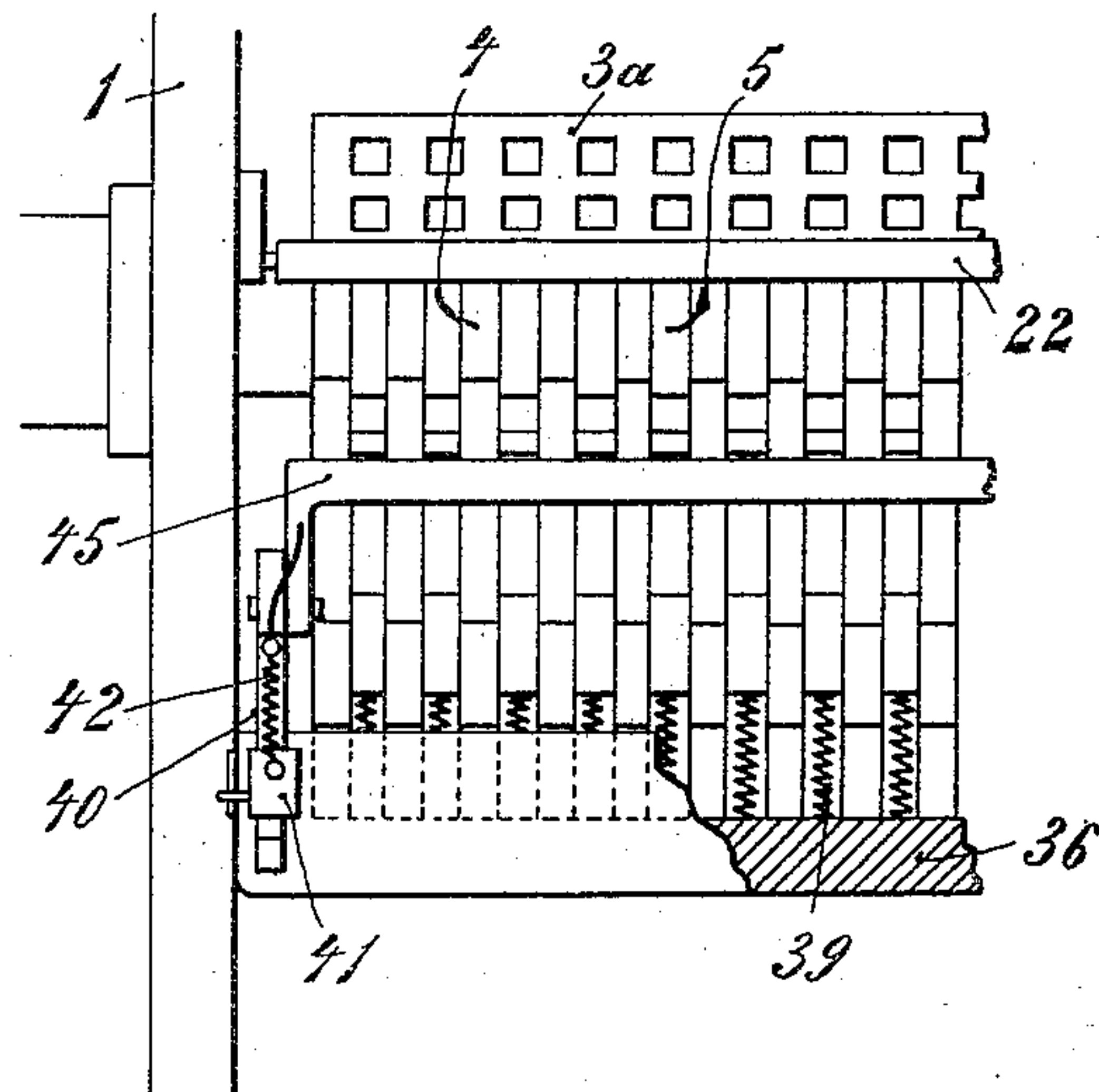


Fig. 2.

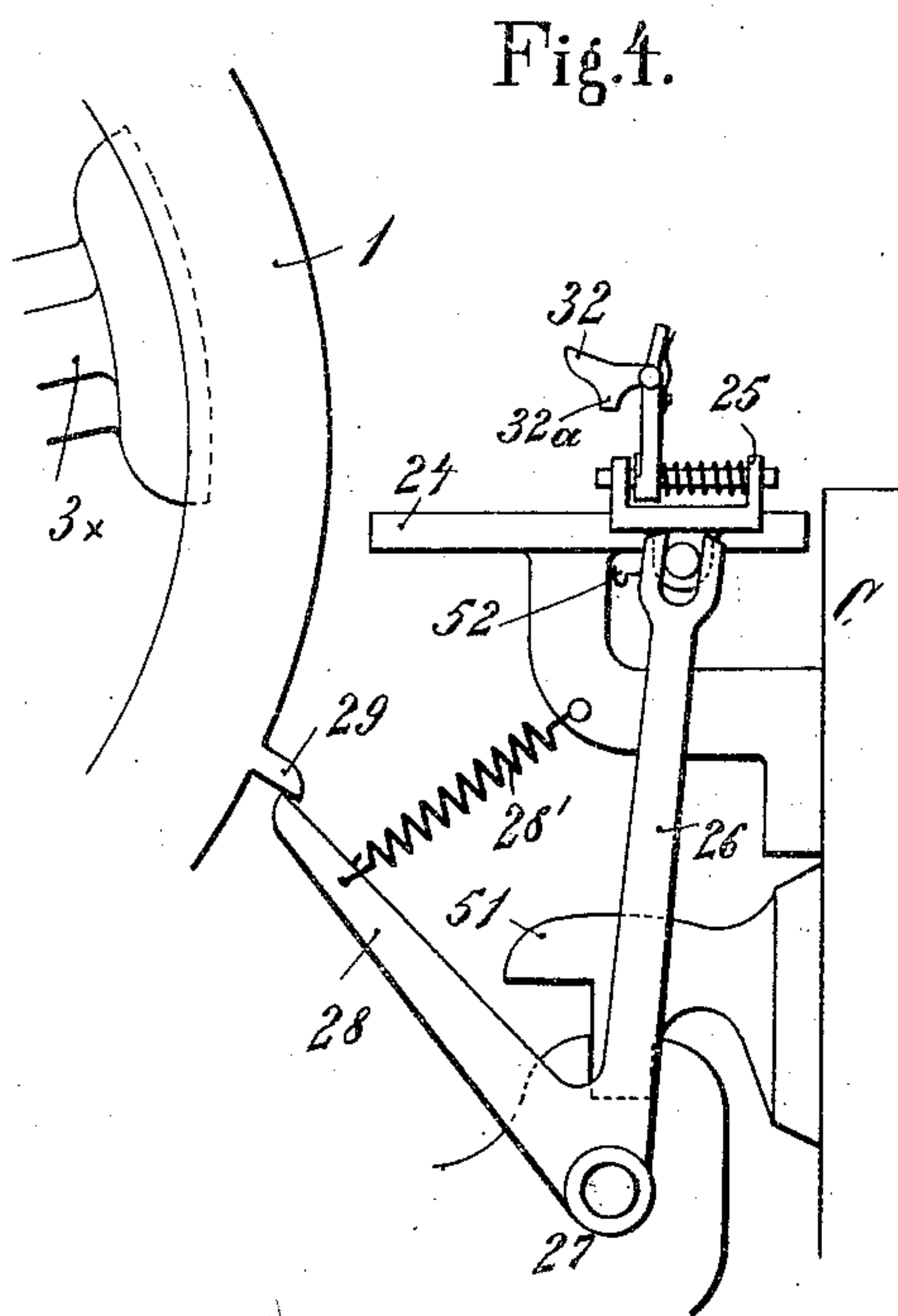


Fig. 4.

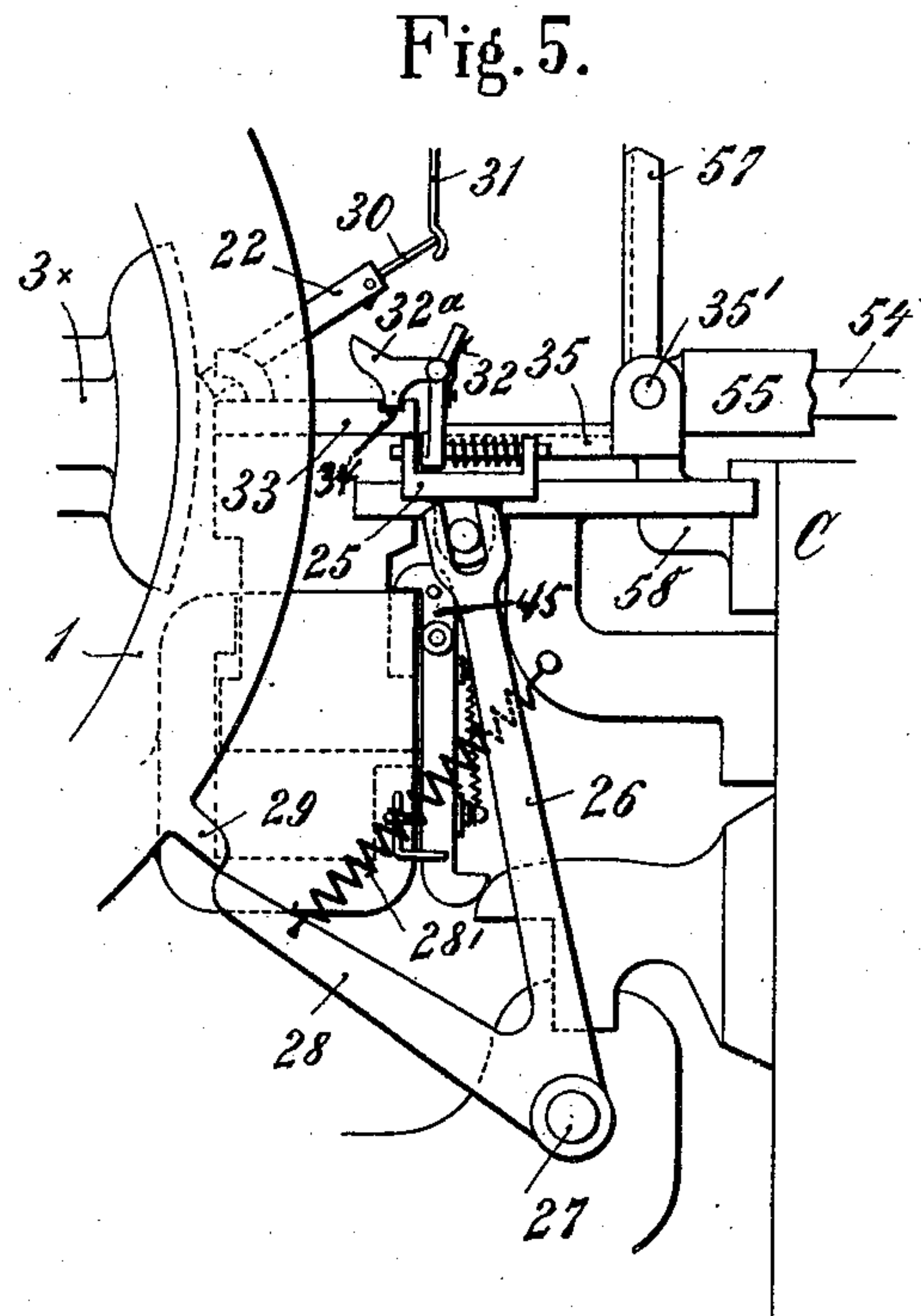


Fig. 5.

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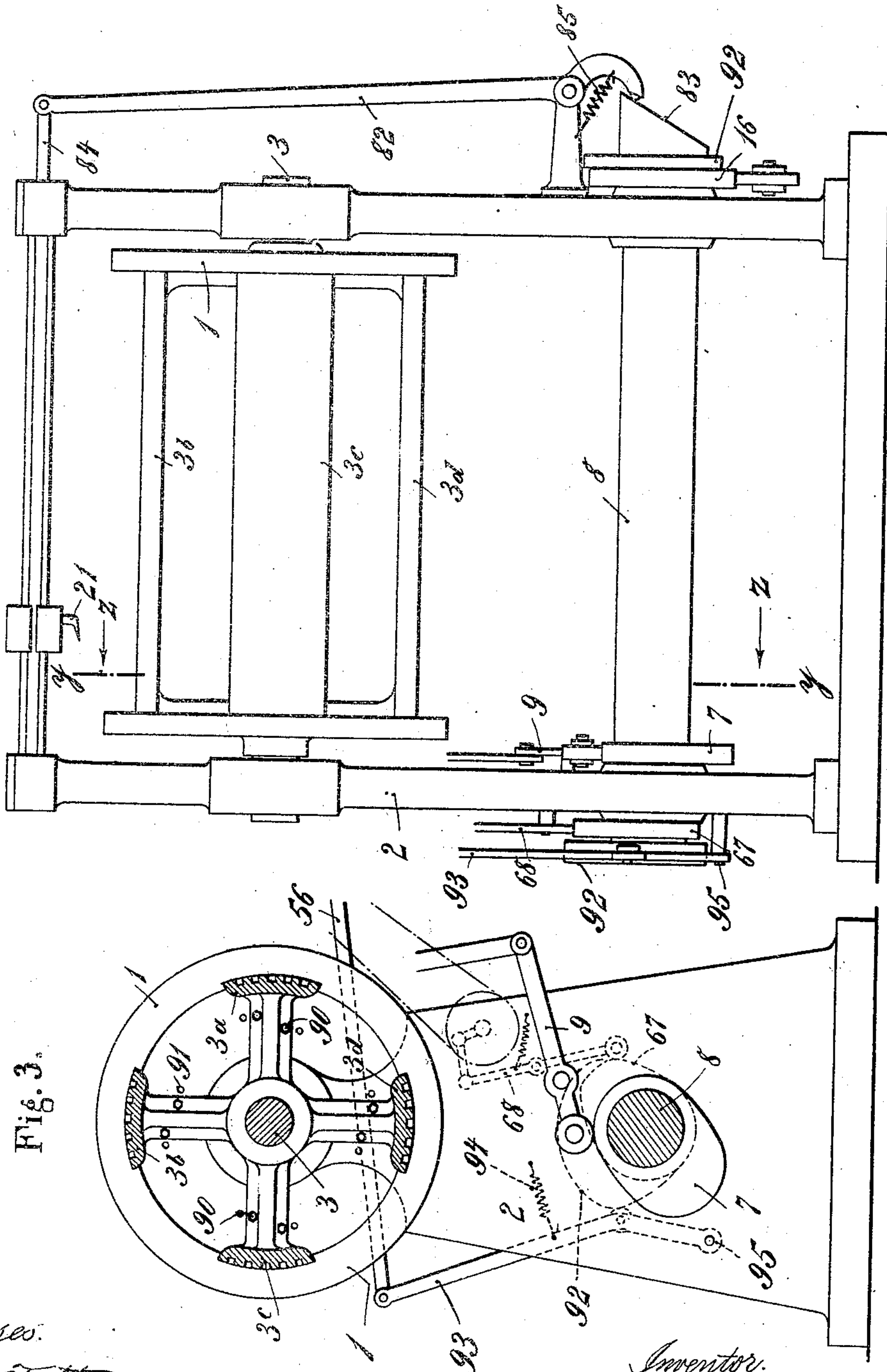
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6 SHEETS—SHEET 3.

Fig. 9.



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6 SHEETS—SHEET 4.

Fig. 8.

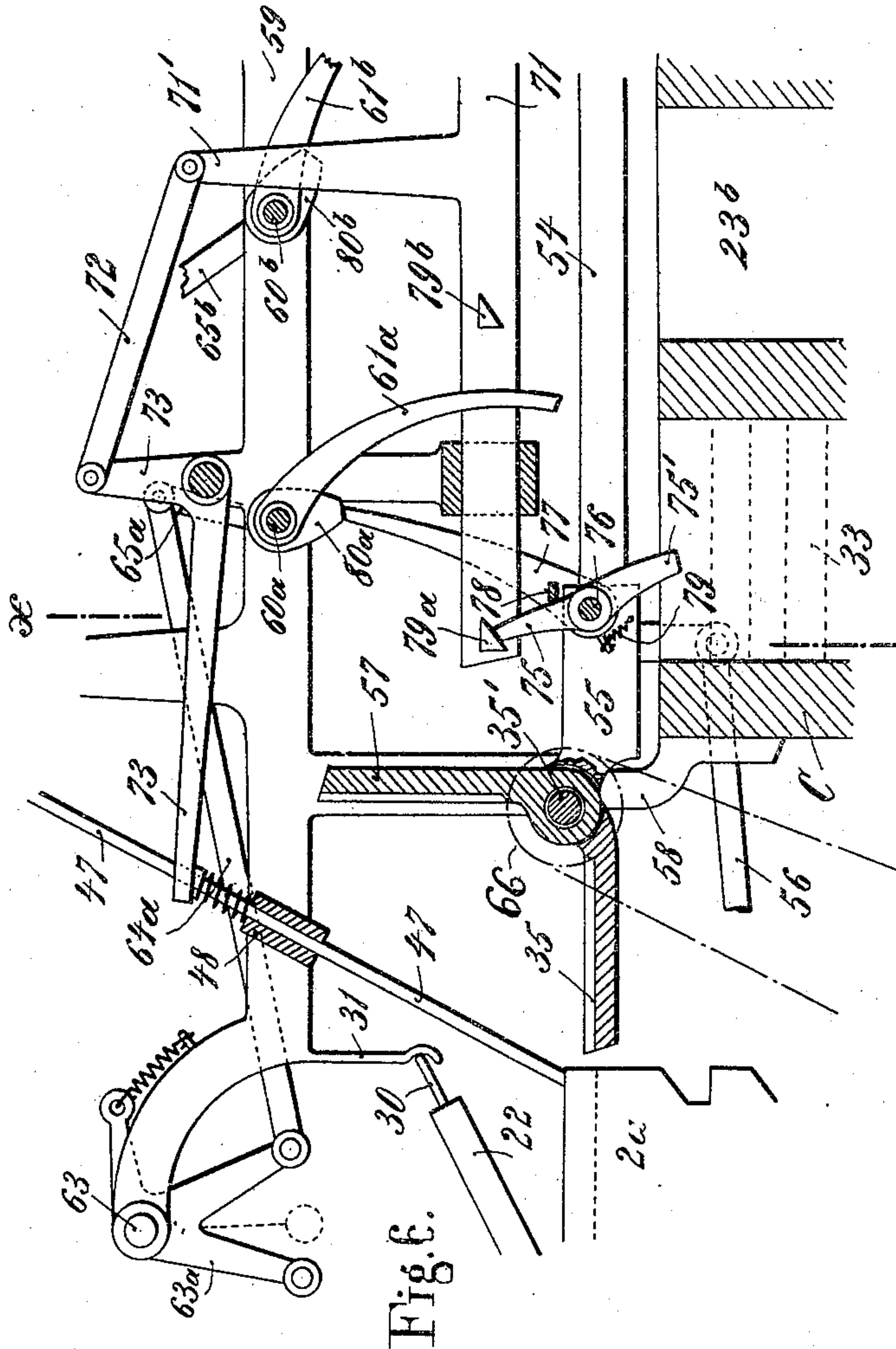
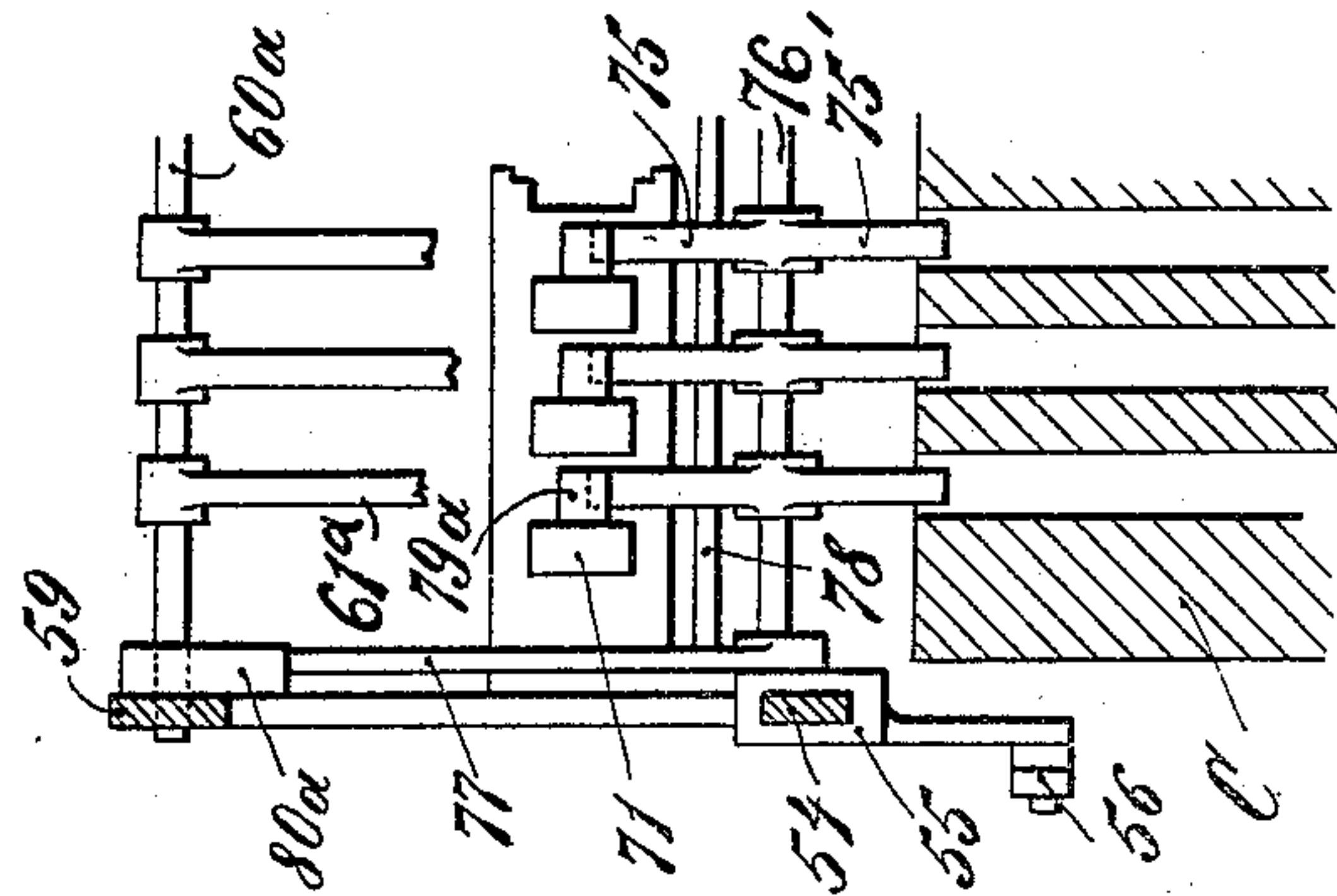
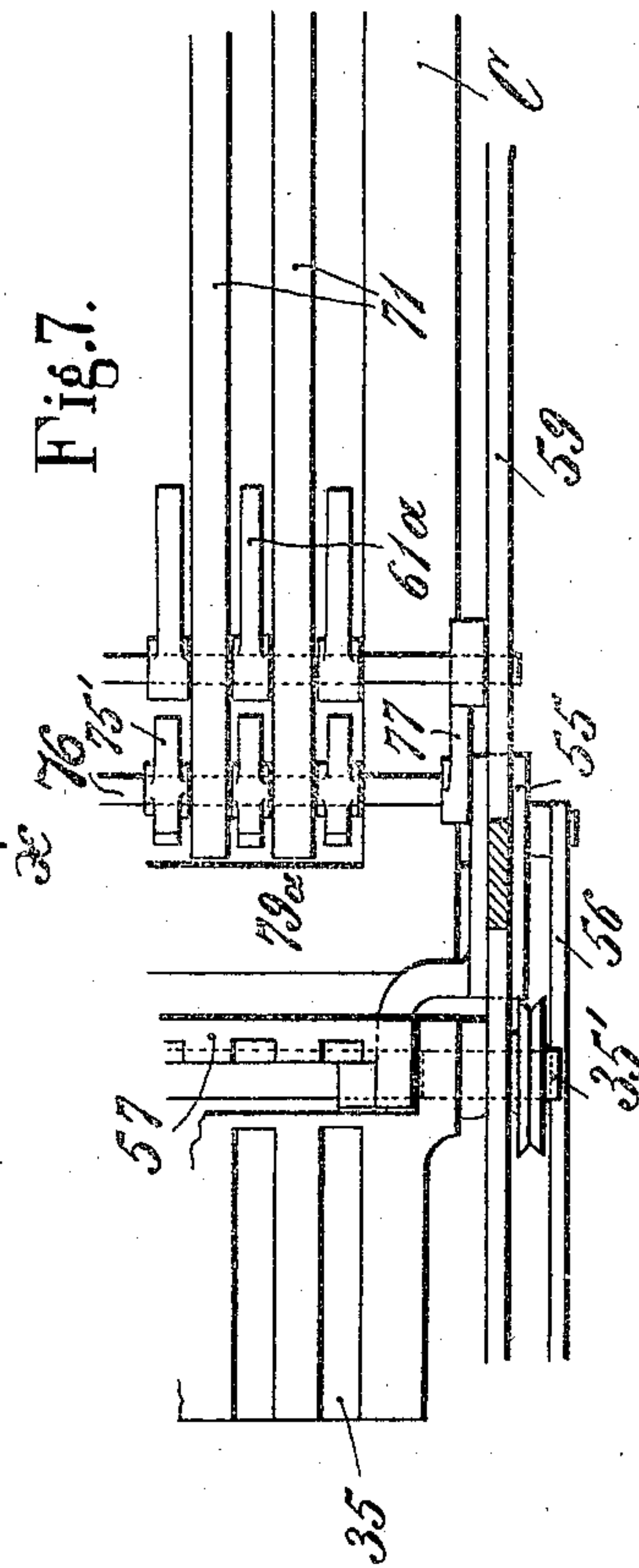


Fig. 6.

Fig. 7.



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6 SHEETS—SHEET 6.

Fig. 10.

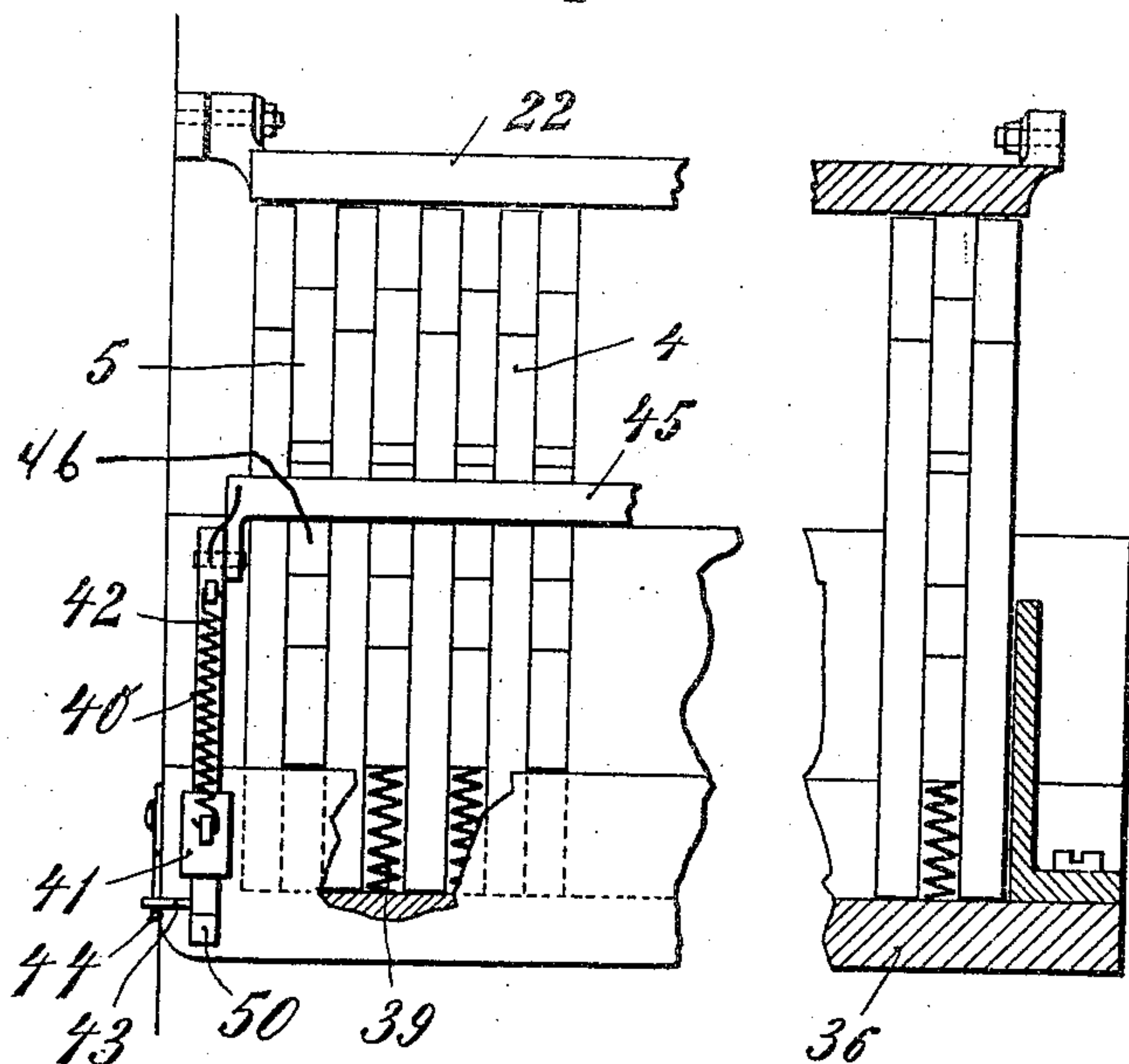


Fig. 11.

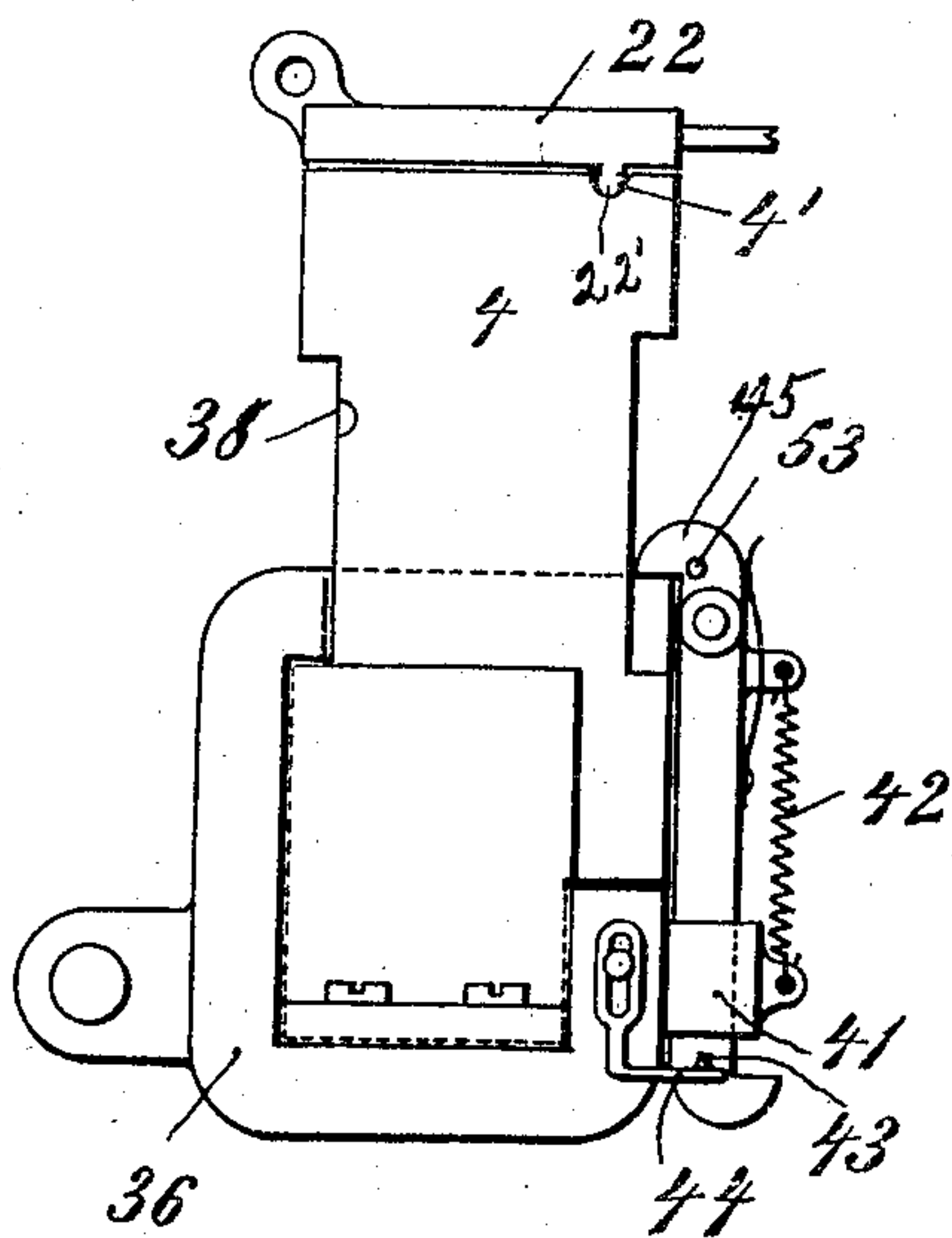
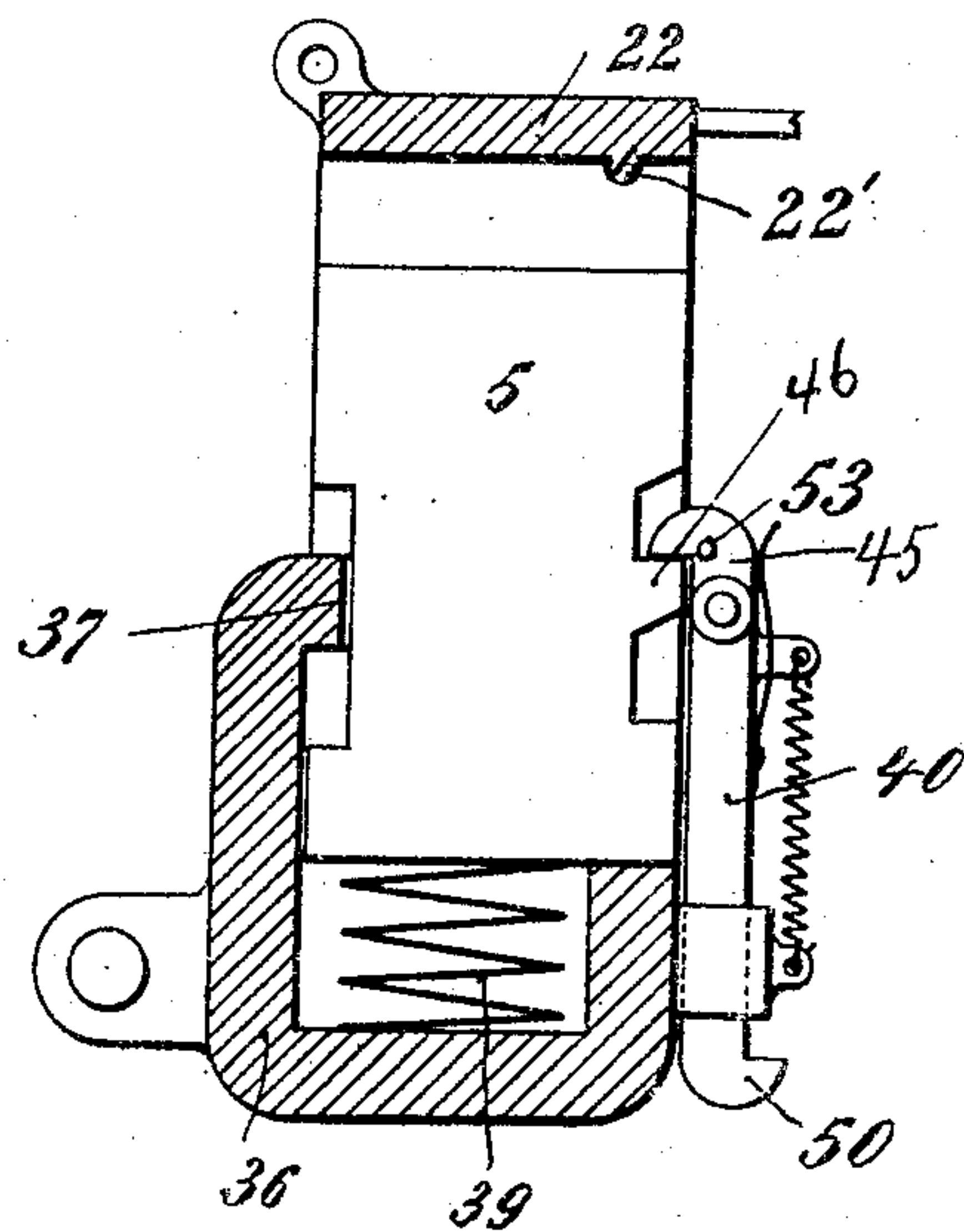


Fig. 12.



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UNITED STATES PATENT OFFICE.

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ROTARY CASTING-MACHINE.

No. 836,053.

Specification of Letters Patent.

Patented Nov. 13, 1906.

Application filed December 16, 1905. Serial No. 292,097.

To all whom it may concern:

Be it known that I, AUGUST SCHIEPE, engineer, a subject of the Emperor of Germany, and a resident of Berlin S. W., Blücherstrasse 67, in the Empire of Germany, have invented certain new and useful Improvements in Rotary Casting-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in rotary casting-machines for casting small articles, especially type, of readily-fusible metal; and more particularly the invention relates to that class of machines in which a number of molds of the same or different articles arranged, preferably at equal distances, around the periphery of a revolving mold frame or wheel are brought in succession into position for casting, when the mold-frame is revolved intermittently, whereupon after a certain number of partial revolutions, during which the cast articles have sufficient time to cool, the said articles are taken out of the molds at another place or by means of a device are enabled to fall out of their own accord.

The object of my improvements is to arrange groups of molds or groups of rows of molds on the mold-frame, the molds or the rows of molds of each group being capable of forming articles of different kind, or, in case of types being cast, types of different font. Said groups can be so adjusted on the mold-frame that during the intermissions of the revolution of the frame always the same mold or row of molds of each group stops in front of the metal-supply, while the other molds or rows of molds of each group will not come in a position in which they can receive a charge of molten metal. By this arrangement I can cast type of different font without exchanging any parts of the machine by merely adjusting the groups of molds. In the preferred form the mold for the type consists of a section for the shaft of the type, which section is stationary on the mold-frame, and of a section forming a matrix for the head of the type. In this case the matrices for the molds of each group are arranged on a com-

mon plate adjustable on the mold-frame and relatively to the shaft-section, so that types of different font are cast by merely adjusting said matrix-plate.

In addition the machine may be fitted with a device by means of which individual molds can be thrown in or out of action, so that when desired or necessary only certain of the articles for which molds are provided on the mold-frame will be cast. This device is automatically operated by the types piled up in a magazine and comes into action when said magazine is filled. The invention also consists in a novel construction of the molds which are formed by a plurality of plates arranged in a mold-block and extending alternately to different heights, a cover being provided to close the spaces between the plates.

The machine is well adapted for the casting of printers' type, and when so used it is preferably so arranged that a whole set of type is cast at once, either at each partial revolution or at each full revolution of the mold-frame. In the former the whole of the molds for a complete set of type must be arranged in a row, while in the latter they must be arranged in several groups uniformly distributed over the surface of the frame.

The machine when used for type-casting can be directly combined with a type-setting machine with type-magazine, the type being delivered from the molds into the channels of the magazine.

A type casting and setting machine provided with the above improvements unites the advantages of ordinary type-setting with those of the linotype-machine. It obviates the disadvantages of the existing type of casting and setting machine in which at the expense of the output each individual type conveyed direct from the mold to the angle-hooks must be allowed time enough to cool. At the same time it has this advantage over the line-casting machine, that corrections are easily made by changing single letters, whereas in such machines a new line has always in such case to be set and cast.

In the accompanying drawings is shown a type-casting machine constructed in accordance with this invention, with a composing-magazine and with devices for conducting the type into the channels leading to the magazine and for throwing out of action the molds for any character when the correspond-

ing channel of the magazine is full. The action of the machine is entirely automatic.

Figure 1 is a longitudinal section of the machine. Fig. 2 is a detail elevation of the casting-wheel. Fig. 3 is an end elevation of the same. Fig. 4 is a detail view illustrating the means for withdrawing the cast type from the mold. Fig. 5 is a similar view of the same parts shown in a different position. Fig. 6 is an enlarged side view of the mechanism for distributing the type into the channels of the magazine. Fig. 7 is a plan of Fig. 6. Fig. 8 is a cross-section of Fig. 6 on the line *x x*. Fig. 9 is a rear elevation of that part of the machine comprised in the rotating casting-wheel and side frames therefor. Fig. 10 is an enlarged view of the mold-block. Fig. 11 is a side view of Fig. 10, and Fig. 12 a cross-section thereof.

Similar characters of reference refer to similar parts throughout the different views.

The machine illustrated as an example in the accompanying drawings consists of a mold-frame or casting-wheel 1, a melting apparatus A for the supply of metal to the molds, a magazine C having several chambers for the different types, and mechanism to receive the latter from the molds and to distribute them to the proper chambers. The parts of the machine are mounted on a common base-plate.

The mold-frame 1 is rotatably mounted on a shaft 3, supported in standards 2 2.

In the present instance the molds for a set of type are arranged in four groups, with an equal number of mold-blocks 2^a 2^b 2^c 2^d, spaced at equal distances on the periphery of the wheel or mold-frame 1, which is moved intermittently through an arc of ninety degrees at a time. The several groups of molds arrive in constant succession in front of the casting-nozzle of the melting apparatus A. Assuming the total number of characters making up a full set of type as one hundred in round figures, then each mold-block 2 ("a," "b," "c," "d") will contain twenty-five type-molds.

The mold-blocks 2 ("a," "b," "c," "d") contain only the molds for the shafts of the type, the matrices for the type-heads being provided on separate plates 3^a, 3^b, 3^c, and 3^d. To enable the machine to cast and set different fonts without having to change any of the parts, each of the plates 3 ("a," "b," "c," "d") contains several rows of matrices, so that corresponding rows on the several plates constitute together a full set of type of the same font. The type-plates are mounted on the wheel 1 by means of arms 3^x, with the intervening spaces, so as to correspond in position with the mold-blocks 2^a 2^d. The arms 3^x are adjustable on the wheel 1, so that the matrices of any given font of type can be set in position.

In the example shown such adjustment of

the plates 3 ("a," "b," "c," "d") with their arms 3^x is effected by means of screws 90, which pass through the arms 3^x and can be screwed into one of the screw-threaded holes 91, Fig. 3. The distance of the holes 91 from each other corresponds to the distance of the matrices of each of the plates 3 ("a," "b," "c," "d") from each other.

The mold for the shaft of each type is constituted in each of the mold-blocks 2^a 2^d by two plates 4, Figs. 2, 3, 10, 11, and 12, as lateral boundaries, the upper surface of a plate 5, and a cover 22. The details of the mold-blocks will hereinafter be more fully described.

Below the wheel 1 there is mounted in the standards 2 2 a main driving-shaft 8, having a cam 7 mounted thereon at its side. The cam 7 operates the mold-frame 1 through the intermediate levers 9, 10, and 11, so as to bring each mold-block in turn in front of the nozzle of the melting apparatus. For this purpose the lever 11 is rotatably mounted on the shaft 3 and has a clutch 12 jointed thereto. The latter is formed with a circular portion frictionally engaged by the shaft 3 and a projecting portion. By the downward movement of the lever 11 the clutch 12 is turned on the shaft 3 into the position shown in Fig. 1, in which its projecting end engages one of the four arms 13, arranged on the mold-frame 1, which is turned thereby through a quarter-revolution, whereby each mold-block in turn is brought in front of the nozzle of the melting apparatus. During the return movement of the lever 11 the clutch 12 is turned in a similar way into a position which permits its projecting portion to slip between the next one of the arms 13 and the shaft 3, whereby it will be brought into a position ready to engage said arm. The mold-frame has a clockwise movement, as will readily appear from the drawings and the above description.

The metal is introduced into the molds in the usual manner by forcing it out through a mouthpiece 6 by means of a piston 15, working in a cylinder 14 of the melting apparatus A, after the molds have been placed in position. The piston is actuated by an eccentric 16 through a suitable connecting-rod. The mouthpiece 6 may be made of two parts, which can be drawn sidewise out of the way of the mold-blocks to enable the casting-wheel to turn. Such devices are already known and need no illustration.

In connection with the melting apparatus an automatic feed is provided for supplementing the charge of metal, the temperature of which is maintained constant. This feed device comprises a sloping surface 17, on which are placed the bars of metal 18, which in the upper part of the slope descend by gravity, while in the lower part they are moved onward by means of a roller 19, which is actuated by a train of gearing receiving

motion from the driving-lever gear of the piston 15 or in any other convenient way. The mechanism is so arranged that a fresh bar is delivered into the melting vessel at intervals after a corresponding quantity of the contained charge has been used up. The feed-aperture is closed by a flap 20, normally pressed upward by a spring from beneath and which gives way under the weight of an advancing bar of metal, the flap automatically reclosing as soon as the bar has passed through.

On turning the wheel 1 the waste head of metal corresponding to the casting-funnel 6 is removed by means of a transversely-moving plane 21, located above the mold-frame 1, which plane can be actuated in a suitable manner to move out and back again each time the wheel is brought to a standstill.

The actuating mechanism for the plane is illustrated in detail in Fig. 9. A lever 82 is pivotally mounted on the standard 2. It has its lower arm engaged by a cam 83, arranged on the shaft 8, its upper arm being connected, through a link 84, with the plane 21. A spring 85 tends to pull the lower arm of the lever 82 into engagement with the cam 83 and to hold the plane 21 in its retracted position. The surface of the cam 83 is so formed that at each revolution of the shaft 8 and while the mold-frame 1 is at a standstill the plane will perform a forward and rearward motion, whereby the dead head of the types is removed.

On turning the wheel through another ninety degrees the type characters just smoothed by the plane arrive in front of the magazine C, into which they are delivered by a special device. In this position also the mold-blocks are made ready for the succeeding casting operation by throwing into action those molds which correspond with the unfilled channels of the magazine. The removal of the type characters from the machine and their distribution to the corresponding channels 23 ("a," "b," "c," "d") of the magazine are affected by the following device:

The magazine C is supported on suitable brackets of the standards 2 2. On the rear side of the magazine C is a pair of guide-rails 24, Figs. 4 and 5, upon which a slide 25 can be moved to and fro by means of a lever 26. The two levers 26 may be mounted on a common shaft 27, which is turned to the left, Fig. 5, after each quarter-revolution of the mold-frame by means of a lever 28, acted upon by a lug 29 on the casting-wheel 1 or by means of any other suitable device. At the same time the cover 22 of the mold-block is raised, Figs. 1, 5, and 6, by the impact of a laterally-mounted lug 30 on a fixed stop 31. A pawl 32, Figs. 4 and 5, which is elastically mounted on the slides 25 and extends the full width of the mold-block, en-

gages under the cover 22, its claw 32^a engaging in the signatures 34, provided in the usual manner on the type characters 33. The instant the mold-block is stopped the mold-frame and its lug 29 arrive in such a position as to release the lever 28, Fig. 5, whereby under the influence of the spring 28' the lever 26 and slides 25 return toward the right, the type characters 33 being carried onward by the pawl 32 and guided onto a ledge 35, Figs. 1, 5, and 6, which is provided with grooves in which the type characters are held in proper order and distance.

The signatures 34 on the type characters, in which the pawl 32 engages, are formed by means of a rib 22' on the cover 22 of the mold-block and extending the full width of the latter. The partition-walls 4, Figs. 2, 10, 11, and 12, are also provided with recesses 4', since otherwise the lid would not lie flat. The pawl 32 therefore engages also in these recesses, and if the partition-walls were fixed it would be impossible to grip the type, as the pawl 32 would slide on the fixed front edges of the recesses 4' of the partitions and become disengaged from the type. This, however, is prevented by raising the type a little before the pawl has receded by lifting the plates 5. The type characters, however, are not raised by more than one-half their thickness, so that they still remain in the grooves bounded laterally by the partitions 4. The manner in which this raising is effected will be hereinafter fully explained.

The mold-blocks are arranged as follows: Each block consists principally of the box 36, mounted between the two plates of the mold-frame 1, Figs. 2, 10, 11, and 12, and having the section shown in Fig. 12. The box contains a number of alternate loosely-mounted plates 4 and 5, which are held within the same by means of side plates arranged on both sides of the box 36. The plates 4 rest on the bottom and are prevented from rising by a nose 37 on the box, which nose engages in a recess 38 on the rear side of each plate 4 and 5. The plates 5 rest on springs 39, Figs. 1 and 10, and when exposed to the action of these latter are raised thereby till the lower edge of the recess 38 strikes against the nose 37 of the box 36, Fig. 1. In this position the top surfaces of the plates 5 are on the same level as those of the plates 4. When, however, the plates 5 are depressed a distance equal to the thickness of the type characters, a channel is formed between each adjoining pair of plates 4 and the intermediate plate 5, which channel is formed into a complete mold unit for a type-shaft by placing the cover 22 in position. A device is also provided for enabling each of the plates 5 to be depressed independently of all the others in order that only such type characters may be cast as there is still room for in the corresponding channel of the magazine. On

either side of the mold-block a rail 40 is mounted so as to slide in a guide 41 and is subjected to the influence of a spring 42, which usually retains it in the lowest position, limited by the lugs 43 and 44. (See 5 2^a, Figs. 1 and 10, 11, and 12.) A spring-pressed pawl 45, extending across the full width of the mold-block, is mounted on the upper ends of the rails 40, which when the 10 plates 5 are set in the position shown in Fig. 1 (right-hand side) rests underneath a nose 46 on each plate 5. If, however, one or more of the plates 5 be depressed, the pawl recedes from their noses 46, but falls back 15 over these noses and then holds the depressed plates 5 in their lowest position. The springs 42 must therefore be strong enough to hold the whole of the plates 5 down against the pressure of the springs 39. The pressing 20 down of the plates 5 corresponding to the type to be cast is effected automatically by means of rods 47, which are mounted so as to be longitudinally slidable in guides 48 49 and are actuated by a suitable train 25 of levers. The movement of the rods is of course preferably the same for all thicknesses of type characters, though the extent to which the plates 5 have to be depressed varies according to that thickness. Conse-

30 quently in the arrangement adopted the rods 47 depress the type characters only a constant uniform distance, while the pawl 45 opposes them for a certain distance and then depresses each of the plates 5 with which it 35 engages until contact is made between the lugs 43 and 44, the latter being made adjustable according to the thickness of the type. Toward the end of the movement of the mold-frame 1 a nose 50 on each rail 40 en- 40 counters a fixed stop 51, whereby the rails 40 are raised a little in relation to the mold-block, which is still moving with the mold-frame. The plates 5 that were depressed the previous time are raised accordingly, 45 together with the type 33 lying thereon, Fig. 5, so that the said type are engaged by the pawl 32 in the manner described above and can be drawn out by the same. According as the lugs 44 are set higher or lower, the 50 noses 50 on the rails 40 strike against the stops 51 sooner or later, so that the rails 40, together with the pawl 45, are raised more or less, but in all cases to the same level, so that an equal amplitude of movement of the rods 55 47 is sufficient to enable the plates 5 to be engaged by the pawl 45. As the mold-frame then moves farther, the noses 50 disengage from the stops 51 and the rails 40 are pressed down by the springs 42 until the lugs 43 and 60 44 meet and cause the plates 5, engaged by the pawl 46, to be drawn down by this latter.

It is necessary that the whole of the plates 5 depressed in the one operation should be released before the next setting. This can 55 be effected, for instance, by drawing back

the pawl 45 after the type characters have been gripped by the extracting-pawl 32. For this purpose the lever 26 is provided with a spring-pressed pawl 52, Figs. 4 and 5, which slides over a finger 53 on the pawl 45 70 during the forward movement, but engages with the same during the return stroke of the lever 26, and thus draws the pawl 45 back so far that the pawl 52 slips from the finger 53.

The next stage is to follow the movement 75 of the type characters assembled on the ledge 35 on their way to the corresponding channel. The magazine possesses as many rows of channels 23 ("a," "b," "c," "d") as there are mold-blocks on the mold-frame— 80 namely, four in the present instance. The number of channels in each row corresponds to the number of molds in each mold-block. Therefore, assuming that one hundred char- 85 acters (in round figures) go to make a full set of type, then with four mold-blocks and rows of channels each mold-block will contain twenty-five molds, and each row of channels will contain twenty-five channels. It is assumed that the type characters from the 90 mold-block 2^a are conducted into the channel 23^a, those from 2^b into 23^b, those from 2^c into 23^c, and those from 2^d into 23^d. Above the magazine C and to the side of same are 95 mounted, one on each side, two rails 54, on which is guided a slide 55, which extends transversely across the magazine and is moved to and fro over the whole of the same by means of a rod 56 at each stoppage. On 100 this slide 55 is pivotally mounted a ledge or shelf 57, formed like the ledge 35 and held in the upright position shown by means of a weak spring. The ledge 35 is pivoted on lateral girders 58 by means of trunnions se- 105 cured in ear-lugs 35', mounted on its ends, while the slide 55 in its front position lies between the ear-lugs 35' in such manner as to bring the pivot-axes of the two ledges 35 and 57 to alinement one with the other. The 110 two ledges serve the purpose of turning the type characters (which lie with their heads to the left hand in the mold-block and are delivered to the ledge 35 in the same posi- 115 tion) around, so that they can be distributed to the magazine-channels with their heads on the right-hand side, their faces being thus 120 turned toward the compositor working at the setting apparatus on the right, whereby he can check the setting. The turning operation is effected by turning the ledge 35 to 125 the right while the slide 55 is in its foremost position, as shown in Fig. 1. In this movement it encounters the ledge 57 and forces this also round to the right until the horizontal position is reached, after which it re- 130 turns to its original position after the succeeding mold-block has been brought into place in front of it. The type characters remain on the ledge 57, which are held down by their weight.

The oscillation to and fro of the ledge 35 in order to bring it into the requisite position for taking up the type from the mold-block and delivering the collected type to the ledge 57 is effected in the following manner:

Upon each end of the ledge 35 is provided an ear-lug 35' integral therewith, while extending outwardly from each of said ear-lugs is a trunnion (shown in dotted lines in Fig. 7) whereby the ledge is pivotally mounted in the frame 58. In order to secure means for oscillating the ledge 35, one of said trunnions is elongated, so as to extend through and beyond its bearing in the frame 58. Upon this extended trunnion is fastened the chain-wheel 66. (See Fig. 6.) Supported within the standards 2 (see Fig. 1) is a second chain-wheel 66', from which the chain-wheel 66 receives its motion by means of a chain, as shown in Fig. 1. Rigidly attached to the shaft on which the chain-wheel 66 is mounted is a crank 70, by means of which and through connecting-levers 68 and 69 an oscillating movement is transmitted to chain-wheel 66' from the cam 67. Extending from a point near the circumference of the chain-wheel 66' to the cam-lever 68 in such a way as to maintain a counteraction between the two is a tension-spring by means of which the oscillations of cam-lever 68 are caused to be transmitted to the ledge 35. During the movement toward the right the trunnions of the shelf 57, which is mounted on the slide 55, are momentarily in the same axis as those of the ledge 35, and the ledge 57 itself being in the upright position is carried along by the ledge 35 and pressed down against the force of its spring, the type lying on the ledge 35 being thus transferred in a turned position to the ledge 57.

The movement of the slide 55 and its shelf 57 on the rails 54 and across the magazine 23^{ad} is also effected from the shaft 8. For this purpose cams 92, one on each side of the machine, are mounted on said shaft and are adapted to rock levers 93, pivotally mounted on the standards 2 of the frame of the machine at 95 and held in engagement with the cams 92 by a spring 94. At their free ends the levers 93 are connected to the levers 56, connected with the slide 55, as stated before. Now the slide 55 and the shelf 57 are normally held in their position away from the mold-frame 1—that is, referring to Fig. 1, at the right-hand side of the magazine 23. When, however, the mold-frame 1 comes to a standstill and the shelf 35 is turned into its horizontal position, the cams 92 will come into operation and rock the levers 93, and thereby move the slide 55 to the left into the position shown in Fig. 1. Upon further rotation of the shaft 8 and after the type has been delivered to the shelf 57 the latter will be moved back again by the action of the spring 94.

For the purpose of transmitting the types to their proper compartment I provide the following mechanism: On a frame 59 above the magazine a shaft 60 ("a," "b," "c," "d") is mounted above each row of channels, and on each shaft is mounted a row of prongs 61, ("a," "b," "c," "d,") arranged like a comb. The prongs 61 ("a," "b," "c," "d") are usually maintained in a raised position. For this purpose each of the shafts 60 ("a" to "d")—for instance, 60^a—is provided with a crank-lever 65^a, which by a connecting-rod 64^a is connected with one arm of the bell-crank lever 63^a, having its fulcrum at 63, the other arm being actuated by a spring to move the connecting-rod 64^a to the left, and thereby the prongs 61^a into their retracted position. According, however, as the type characters lying on the ledge 57 are to be conducted into one or the other of the rows of channels, so one or the other of the prongs is swung downward—e. g., 61^a, Fig. 1—whereby as the slide 55 moves back the type lying on the ledge 57 remains hanging on the prongs and falls off into the channels. The downward swing of the prongs is effected by four curved pieces 62 on the casting-wheel, one of which pieces—for instance, 62^a—engages with a third arm of the lever 63^a toward the end of each quarter-revolution and turns this lever in such a manner as to cause the connecting-rod 64^a and the lever 65^a to turn the shaft 60^a and swing downward the row of prongs 61^a mounted thereon. Only the one curved piece 62^a is shown in the drawings. The others are arranged in suitable positions.

In order to set the mold-block so that only such type characters are cast as there is room for in the unfilled channels, the following mechanism is used: It has been already stated that the pressing down of each separate disk 5 of the mold-block is effected by a rod 47. Assuming the number of type characters in each mold-block as being twenty-five, there must be twenty-five of these rods 47. Above the magazine C and longitudinally of the machine are mounted rails 71, equal in number to the number of channels in each row—namely, twenty-five—so that each rail 71 extends over four channels 23, ("a," "b," "c," "d.") Each rail 71 is connected, by means of a separate train of levers 71' 72 73, with the rod 47, that effects the adjustment of the mold units on the several mold-blocks in which the type characters for the four channels 23 ("a," "b," "c," "d") appertaining to the rail 71, are cast, and a rod 47 is depressed when the corresponding rail 71 is moved. The slide 55 carries a row of twenty-five pawls 75, each of which pivots freely on the fixed shaft 76 and is provided with a rearward extension 75' of such weight as to tend to keep the pawls upright. At either end of the fixed shaft 76 and immediately

within the side frame 55 a lever 77 is mounted to oscillate thereon. Upon these levers 77 is mounted a rail 78, extending transversely across the row of pawls 75.

5 The lever 77 is under the influence of a spring 79, which tends to press it toward the left, so that the rail 78 normally holds down the front ends of the pawls 75, as shown in dotted lines in Fig. 1, whereas they turn
10 themselves upright when the lever 77, and with it the rail 78, is pressed back. To correspond with the pawls 75 a number of lugs 79 ("a," "b," "c," "d") are provided on the rails 71, arranged over the rows of channels
15 23, ("a," "b," "c," "d.") If a pawl 75 turns itself upright during the forward movement of the slide 55, it will encounter the nearest lug—for example, 79^a, Fig. 1, of the corresponding rail—and therefore carries the
20 rail 71 along with it, and through the medium of the train of levers 72 73 effects the downward movement of the corresponding stud 47, and consequently the setting of the corresponding mold unit by depressing the disk 5.
25 On each shaft 60 ("a," "b," "c," "d") is fixed a cam 80, ("a," "b," "c," "d.") which when depressed, as at 80^a, stands in the way of the lever 77, and thereby holds this back during the forward movement of the
30 slide 55 against the action of the spring 79. This setting of the cams—for example, 80^a—is effected concurrently with the downward swinging of the prongs 61^a on the same shaft
35 by means of the curved piece 62^a on the mold-frame. If the lever 77 is turned back by meeting the cam, then the pawls 75 are released by the rail 78, so that they can assume under the influence of the weight 75' an upright position, the rear ends entering the underlying
40 channels of the magazine. They will therefore carry along the bars 71 and set the type-molds, as explained above. If, however, any of these channels are full up to the edge, the corresponding pawl cannot turn
45 upright, the corresponding bar 71 is not carried onward, and the mold for the type character in question is not set, so that this character is not cast. As the movement proceeds the lever 77 disengages from the cam 80^a and
50 the pawls 75 are knocked away from the lugs 79^a by the rail 78, so that the further movement of the slide 55 is not opposed. The rails 71 then move back under the influence of the springs 81 and draw on the train of levers 72 73, which are followed by the rods 47
55 under the influence of springs. The levers 77 and cams 80 may be arranged in duplicate symmetrically to the longitudinal axis of the machine.

60 Since the same devices serve to set the mold units in all the mold-blocks and to conduct away the type cast therein, it is necessary in view of the different breadth of the individual type characters, and therefore of the
65 disks 5, to select the thickness of the partition-

walls 4 between each pair of disks 5 in such a manner that the type-molds in the same position in the several mold-blocks shall be exactly in the same vertical plane. In order to facilitate this adjustment, the mold-block is
70 constructed and arranged systematically, (according to the typographical point system or in centimeters.)

Referring to the figures, the operation of the machine is as follows: Toward the end of
75 the quarter-revolution of the mold-frame 1 the cover 22 of the mold-block 2^a coming into position opposite the ledge 35 will be raised by the abutment 31, and the discharging-prongs 61^a and the cam 80^a of the chan-
80 nel-row corresponding to the mold-block 2^a are swung downward by the corresponding curved piece 62. At the same time the ledge 35, which up to this time was in its upright position, is brought by the chain-wheel 66
85 into its horizontal position, and the extracting-pawl 32 is inserted under the cover 22 of the mold-block, the slide 25 being moved by the lever 26 28 and the abutment 29 to the left, Fig. 5. Finally, the nose 50 strikes
90 against the lug 51, Fig. 5, so that the bar 40, and with it the plates 5, together with the type characters resting thereon, are raised a little. Immediately after this the lever 28
95 is freed and by means of the pawl 32 engaging in the signatures 34 of the type-characters draws the type out of the mold-block. Hereupon the pawl 52 draws the
100 pawl 45 back a short time, so that the plates 5 are freed and are able to rise completely. The slide 55, which was in its extreme position on the right during the rotation of the
105 mold-frame, is now moved by the lever 56 to the front. The lever 77 meets the cam 80^a and is forced back, so that the pawls 75 are released by the rail 78 and turn upright in so far as they are not over channels full of type, in which case their rearward ends rest on the
110 uppermost type. The upright pawls 75 immediately afterward come in contact with the lugs 79^a of the corresponding rails 71, so that these are carried onward, and the rods 47 are depressed by the train of levers 72 73, and the plates 5 depressed far enough for the
115 pawl to slip over the noses 46. Concurrently with the forward movement of the slide 55 the casting-mouthpiece 6 is brought into position.

All the parts are now in the position shown in Fig. 1. The lever 77 is on the point of
120 disengaging from the cam 80^a and of striking the pawls 75 from the lugs 79^a. As the machine turns farther the piston 15 is first driven downward and metal is forced into the mold-block 2^c. At the same time the
125 ledge 35 is turned and the type characters are transferred to the ledge 57. Immediately the mold-frame 1 is stopped the plane 21 comes into action and makes a forward and return stroke. The return movement of
130

the slide 55 can begin directly the type has been laid on the ledge 57. As the ledge passes under the prongs 61 the type characters are taken off and fall into the conduits 23^a. The slide 55 moves into its extreme right-hand position and remains there until the next mold-block 2^b has come into position before the magazine. After the prongs 61^a have performed their task of striking the type off the ledge they are swung upward again, the lever 63 sliding off the curved piece 62^a as the mold-frame continues to turn. The shelf 35 remains in its upright position until the next following mold-block 2^b has come into position. As the mold-frame 1 commences to move again, the nose 50 disengages from the lug 51, the rails 40 move downward until the lugs 43 44 come into contact, and the plates 5 are pressed down completely by means of the pawl 45.

The above-described operation is repeated as each mold-block comes in front of the ledge 35, except that a different set of prongs 61, cams, as 80, and strikers, as 79, come into action.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

30 1. In a type-casting machine, the combination, with an intermittently-rotating mold-frame, of a mold-block, mounted on said mold-frame, and having a cavity with adjustable walls adapted to form the shaft of the type, a plurality of matrices adapted to form the head of the type, means to adjust one of said matrices in front of said cavity for the shaft, means to supply molten metal to said cavity, and means to remove the cast type 40 from said cavity.

2. In a mold for type-casting machines, the combination, with a mold-block, of a plurality of plates supported side by side in said block, and extending alternately to different heights, means to adjust the depth of the cavities formed by said plates, and means to cover said plates so as to form separate cavities between the same.

3. In a mold for type-casting machines, the combination, with a mold-block, of a set of stationary plates extending to the same height, intermediate plates arranged between said stationary plates, springs tending to press said intermediate plates with their margins in line with the margins of said stationary plates, an adjustable stop for said intermediate plates, and means to cover said plates so as to form separate cavities between the same.

60 4. In a type-casting machine, the combination, with an intermittently-rotating mold-frame, a mold-block mounted on said mold-frame, a plurality of plates supported side by side in said block and extending alternately to different heights, means to cover said

plates so as to form separate cavities between the same providing a mold for the types, means to supply liquid metal to said cavities, a magazine having a section for each of the types formed in said cavities, 70 means to remove the cast types from said cavities, and to conduct the same to their proper sections, and means automatically operated by the types piled up in the different sections to put a cavity out of operation 75 when its section is filled.

5. In a type-casting machine, the combination, with an intermittently-rotating mold-frame, of a mold-block mounted on said mold-frame, a plurality of plates supported 80 side by side in said block, and extending alternately to different heights, means to cover said plates so as to form separate cavities between the same, providing a mold for the types, means to supply liquid metal to 85 said cavities, a magazine having a section for each of the types formed in said cavities, means to remove the cast types from said cavities, and to conduct the same to their proper sections, and means automatically 90 operated by the types piled up in one of the sections to cause the lower one of the plates forming the mold for said section to adjust itself at even height with the adjacent plates.

6. In a type-casting machine, the combination, with an intermittently-rotating mold-frame having rows of type-molds mounted thereon, of a nozzle arranged adjacent to said mold-frame, means to supply molten metal through said nozzle, means to adjust said 100 rows of molds and nozzle relatively to each other in such a way that one of the molds of one of the rows stops during the intermissions of the rotation in front of the nozzle, a magazine comprising a series of sections for 105 each row of the molds, means to remove the cast types from said molds, and means to conduct the types to the section of the magazine corresponding to the series of operative molds. 110

7. In a type-molding machine, the combination with a rotating mold-frame, of a group of mold units arranged in rows upon the mold-frame, each of which mold units comprises a head portion and a shank portion and means for varying the sizes of the shank portions. 115

8. In a type-casting machine, the combination with the mold-frame, of a mold-block, a plurality of plates supported side by side 120 in said block, and extending alternately to different heights, means to adjust the depth of the cavities formed by said plates, and means to cover said plates so as to form separate cavities between the same. 125

9. In a type-casting machine, the combination with the mold-frame, of a mold-block, a set of stationary plates extending to the same height, intermediate plates arranged between said stationary plates, springs tend- 130

ing to press said intermediate plates with their margins in line with the margins of said stationary plates, an adjustable stop for said intermediate plates, and means to cover said
5 plates so as to form separate cavities between the same.

10. In a type-casting machine, the combination with an intermittently-rotating mold-frame having rows of type-molds mounted
10 thereon, a nozzle arranged adjacent to said mold-frame, means to supply molten metal through said nozzle, means to rotate said mold-frame in such a way that the rows of molds successively stop during the intermis-
15 sions of the rotation in front of the nozzle, a magazine comprising a series of sections for each row of the molds, means to remove the cast types from said molds, and means to conduct the type to the section of the maga-
20 zine corresponding to its mold.

11. In a type-casting machine, the combination with an intermittently-rotating mold-

frame having rows of type-molds mounted thereon, a nozzle arranged adjacent to said mold-frame, means to supply molten metal
25 through said nozzle, means to rotate said mold-frame in such a way that the row of molds successively stop during the intermissions of the rotation in front of the nozzle, a magazine comprising a series of sections for
30 each row of molds, means to remove the cast types from said molds, automatic means to invert the type after its removal from its mold, and means to conduct the type to the section of the magazine corresponding to its
3 mold.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

AUGUST SCHIEPE.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASPER.