

C. OWENS.
EMBOSSING MACHINE.
APPLICATION FILED JULY 31, 1908.

347,397.

Patented Jan. 25, 1910.

4 SHEETS—SHEET 1.

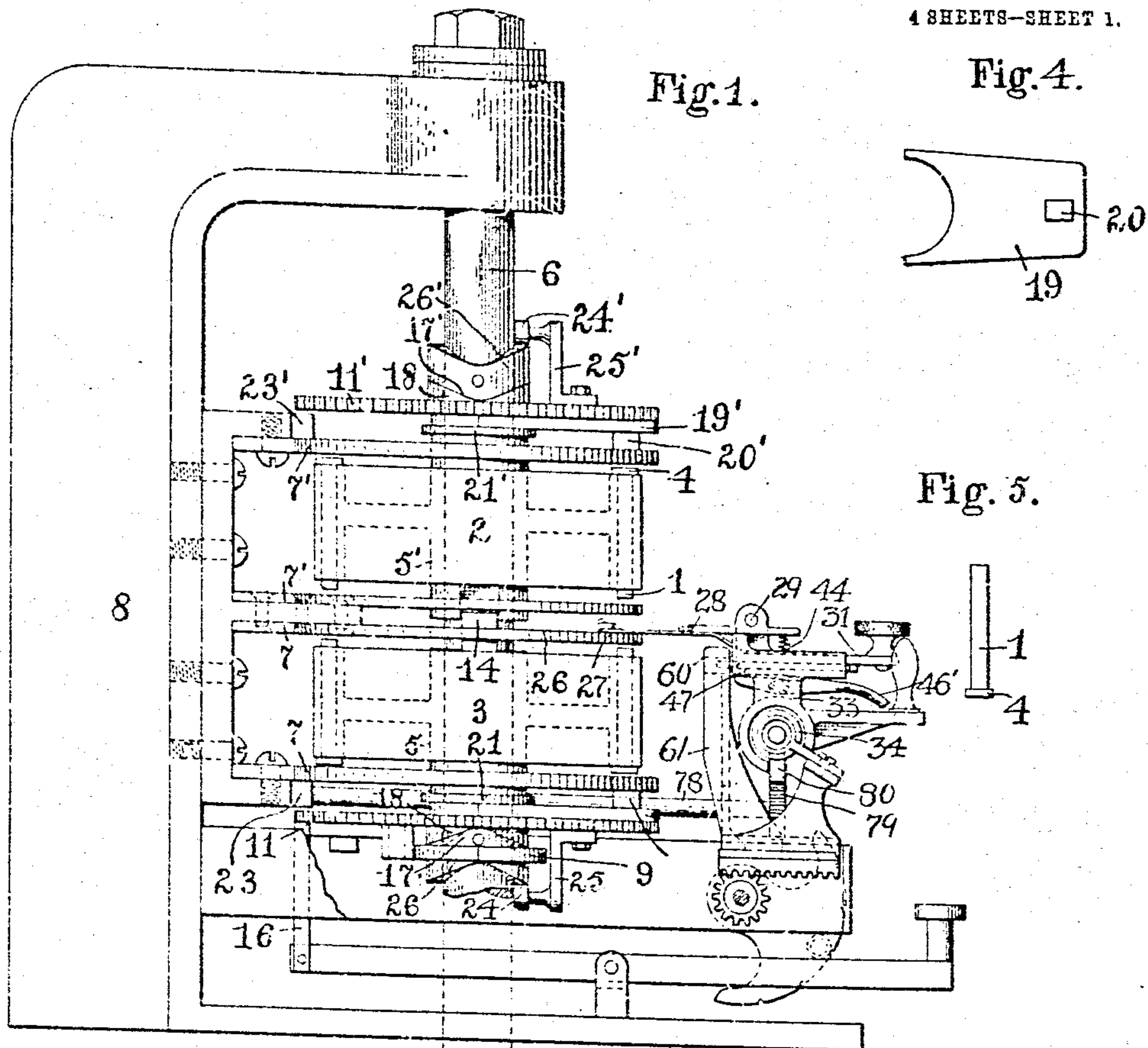


Fig. 1.

Fig. 4.

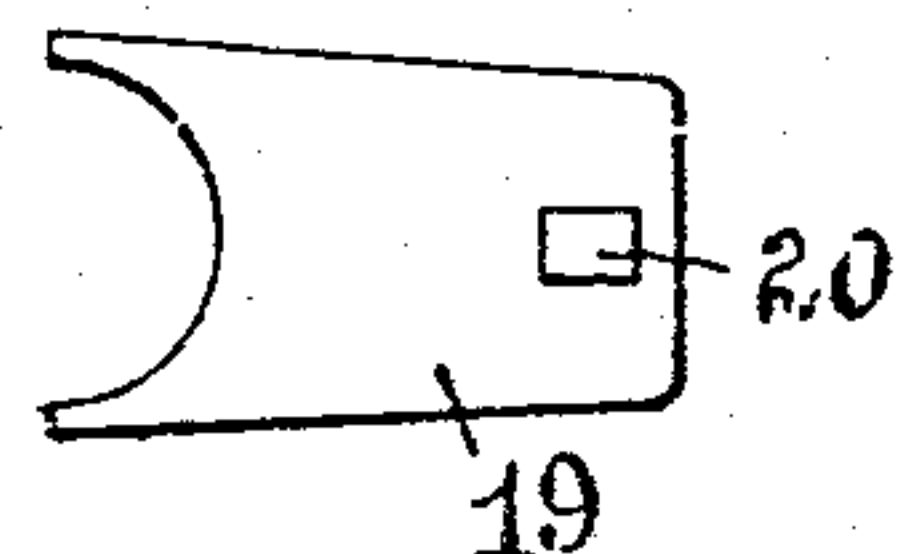


Fig. 5.

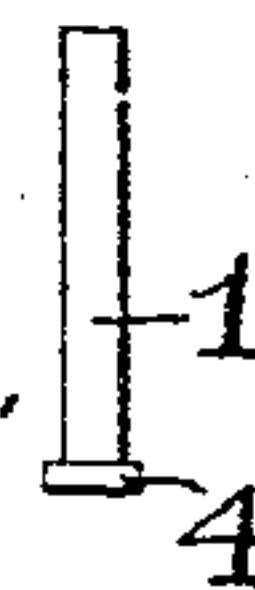


Fig. 2.

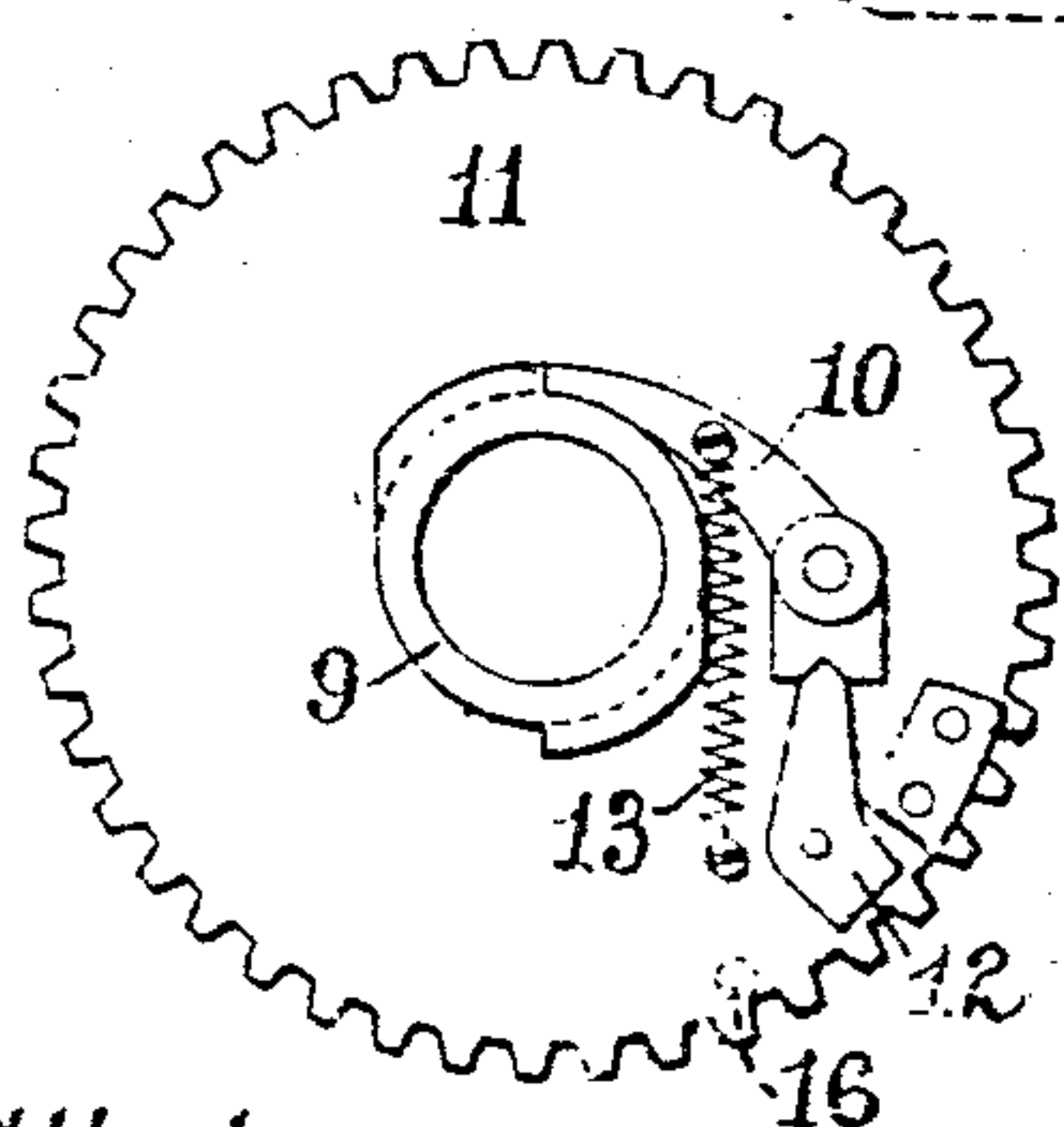
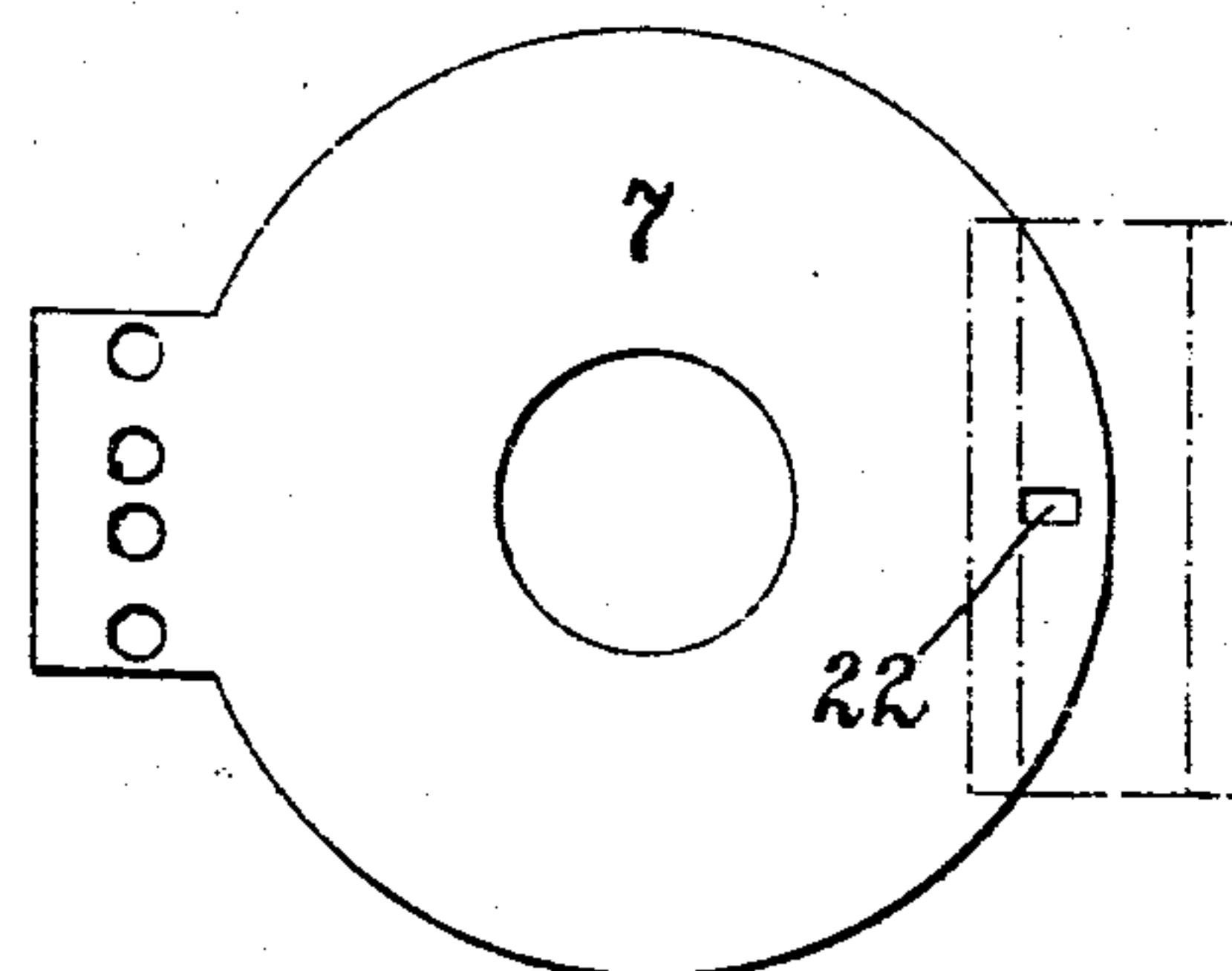


Fig. 3.



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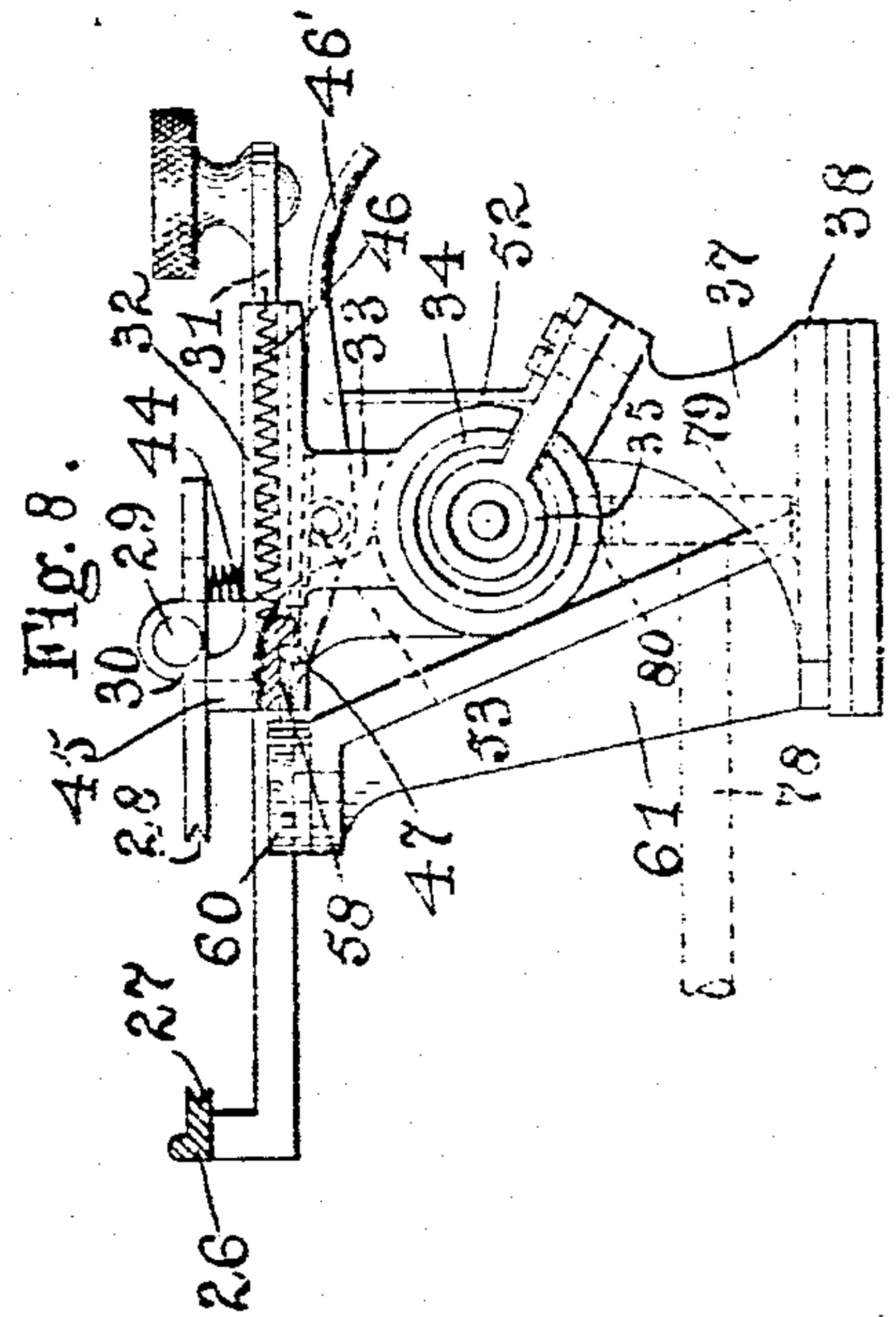
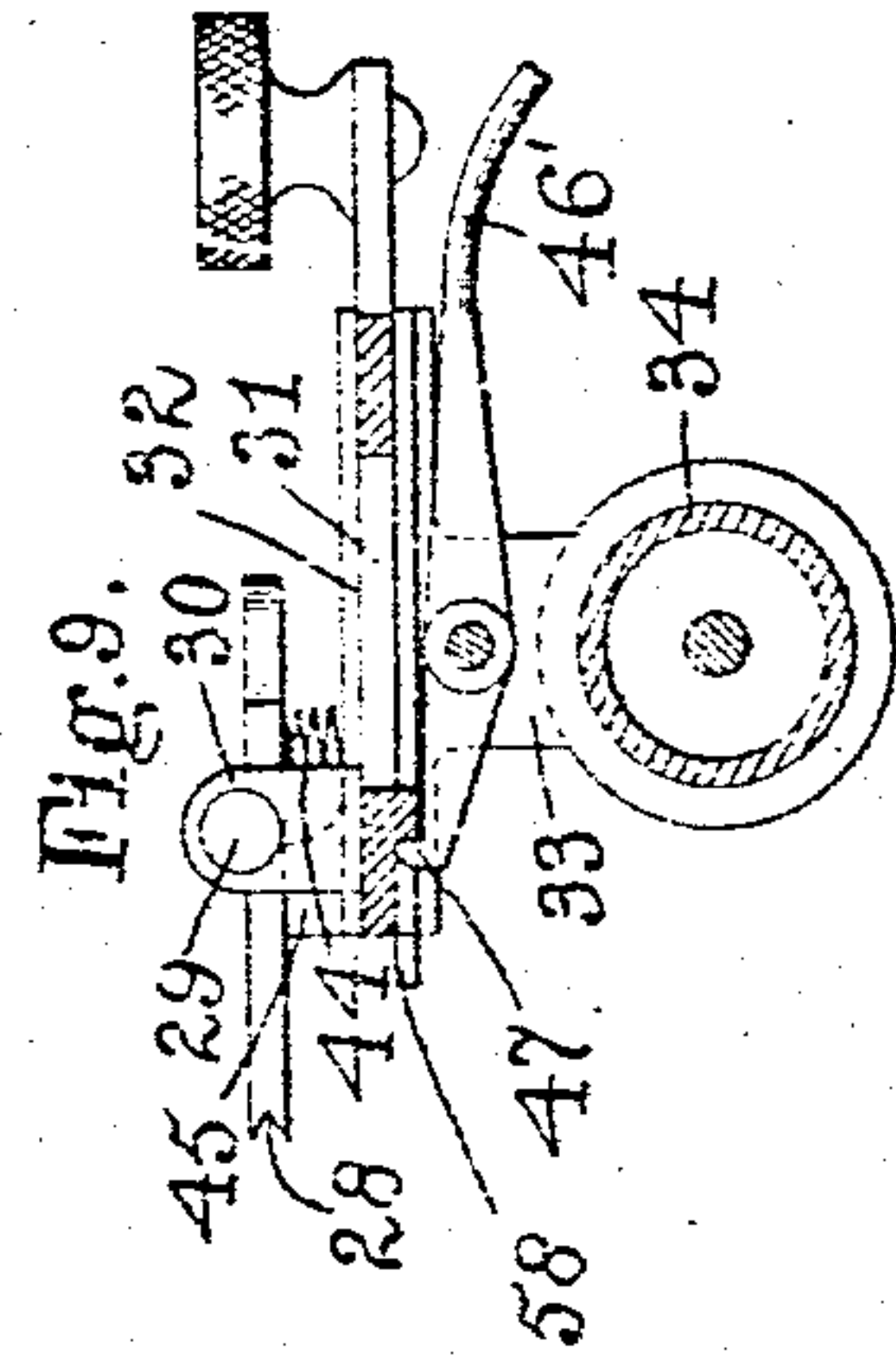
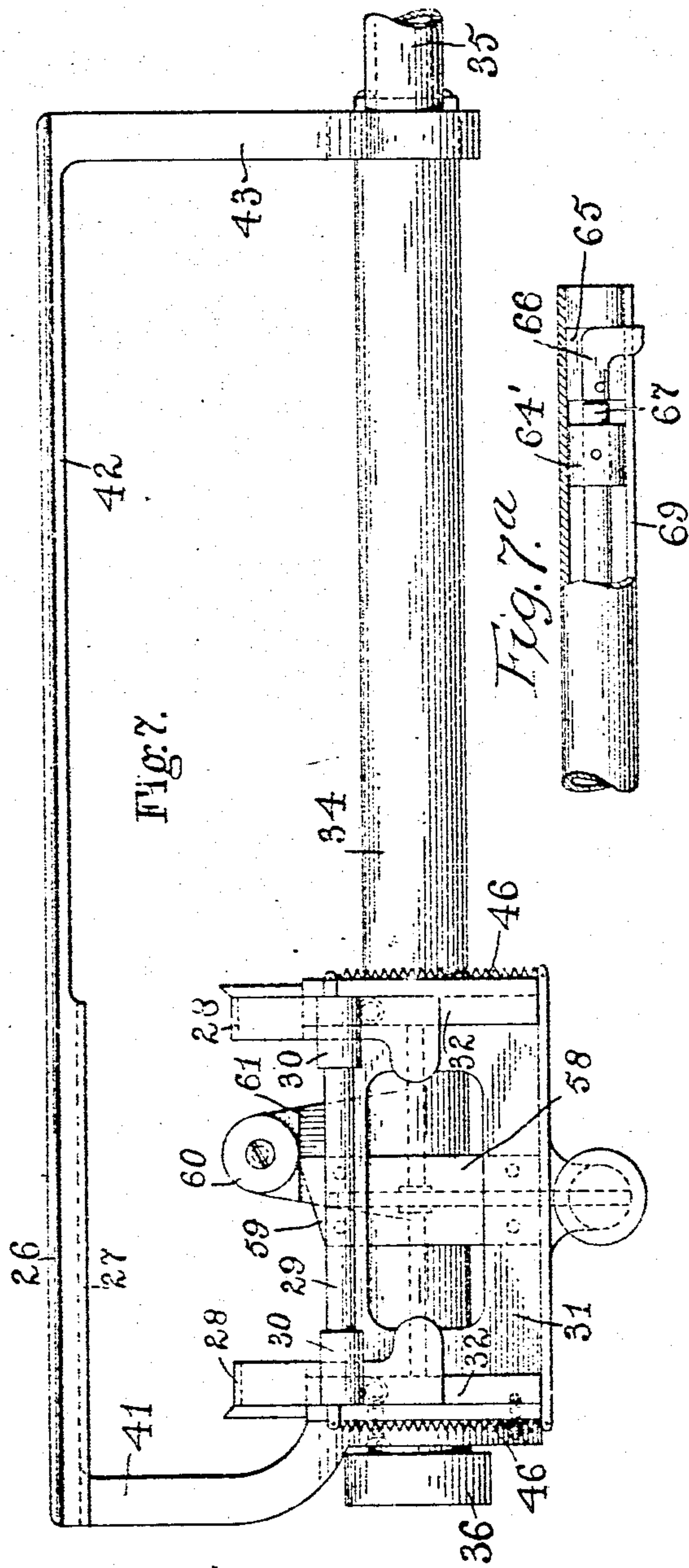
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947,397.

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4 SHEETS—SHEET 3.



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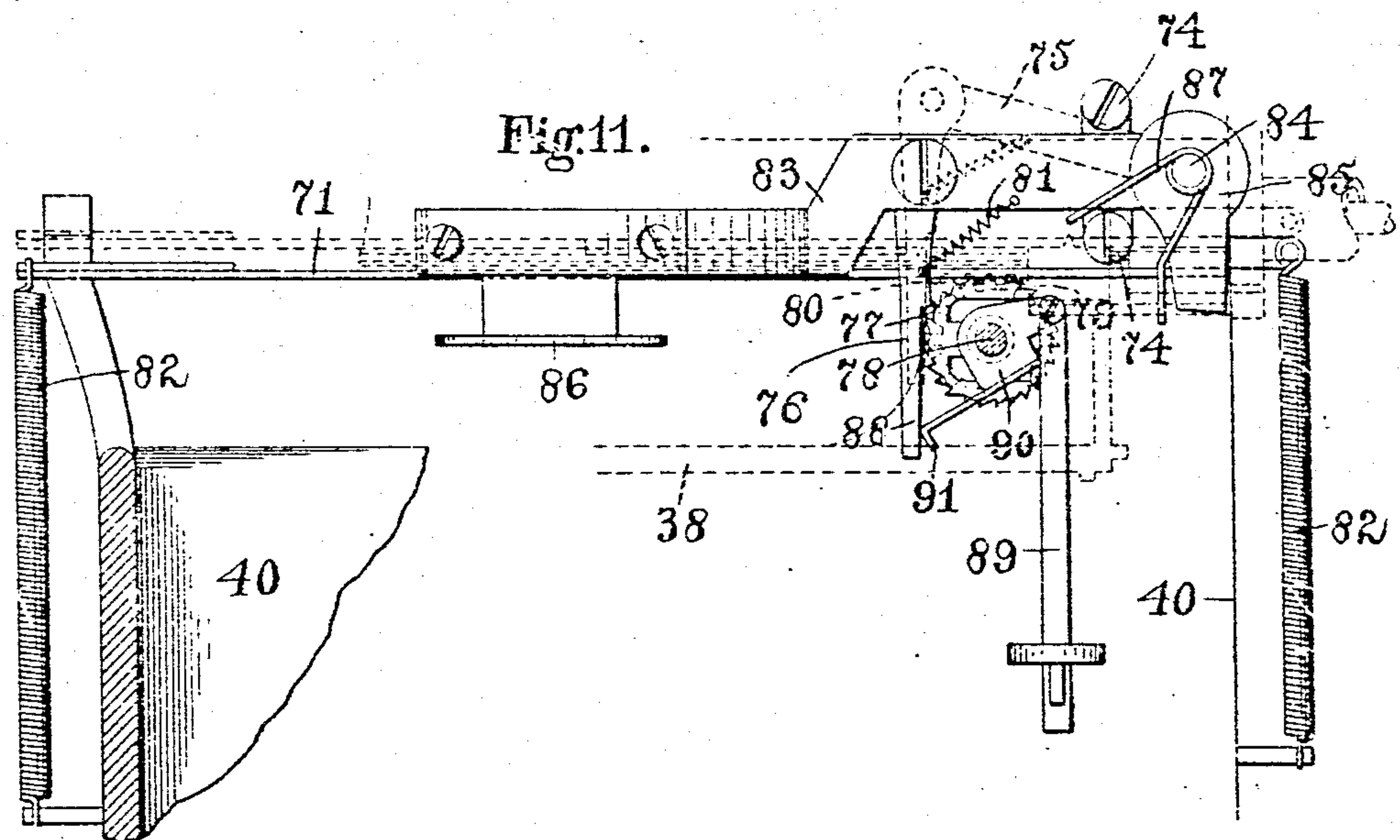
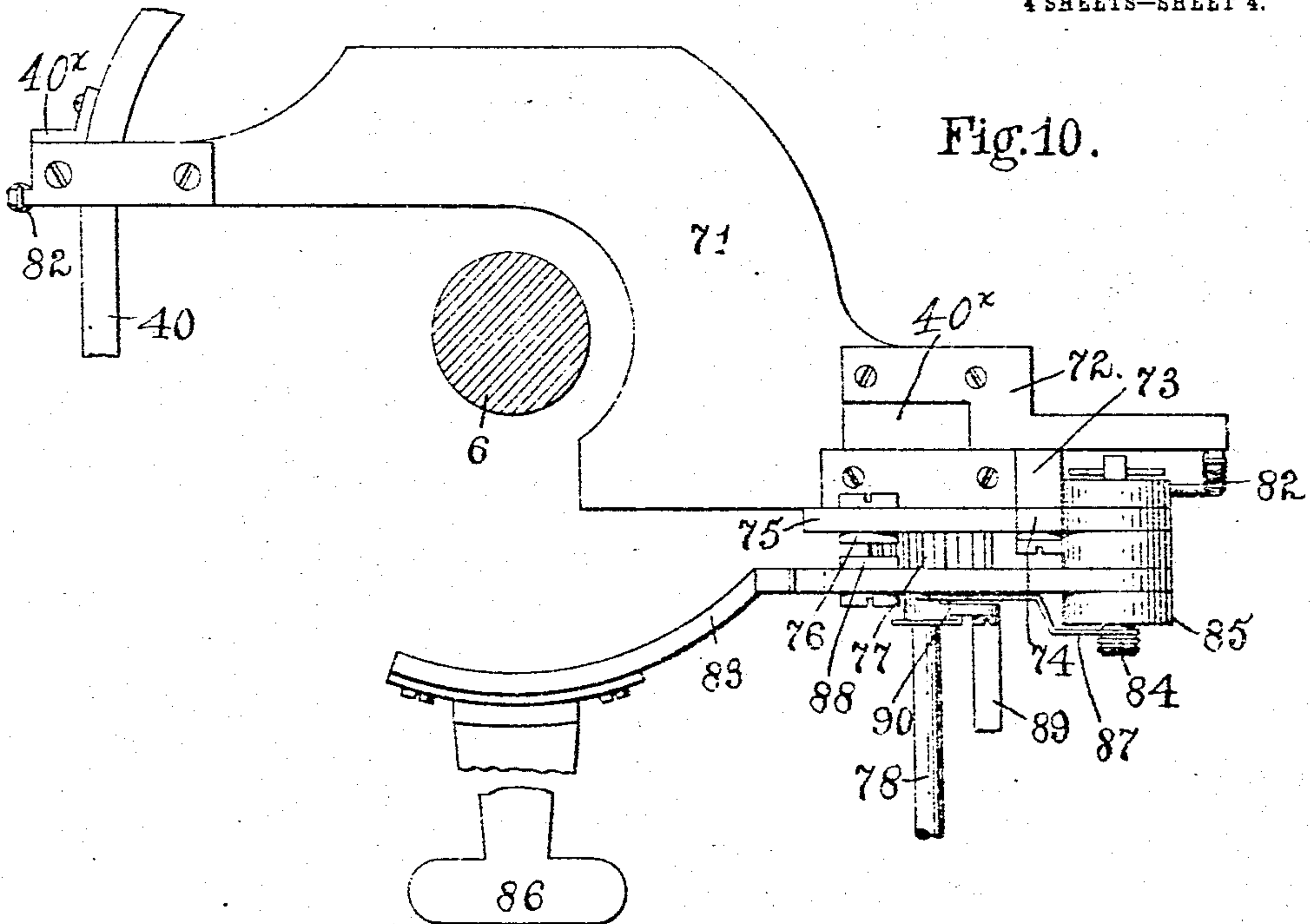
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

CHARLES OWENS, OF CHATTANOOGA, TENNESSEE.

EMBOSSING-MACHINE.

947,397.

Specification of Letters Patent.

Patented Jan. 25, 1910.

Application filed July 31, 1908. Serial No. 446,336.

To all whom it may concern:

Be it known that I, CHARLES OWENS, a citizen of the United States, residing at Chattanooga, Tennessee, have invented certain new and useful Improvements in Embossing-Machines, of which the following is a specification.

My invention relates to machines for embossing plates or material, more particularly for use in addressing or mailing machines for printing addresses or names upon the articles or magazines to be sent out to subscribers.

The invention relates to the general form of machine disclosed in an application for Letters Patent of the United States, filed by me October 2, 1907, #395,656.

One part of my invention claimed herein relates to the axial arrangement of the two series of dies or their carriers and the means associated therewith for operating and controlling the action of said members, and another part of my present invention relates to means for holding the material or blanks to be embossed, and for carrying them to and from the point at which the embossing is done.

The invention consists in the features and combination and arrangement of parts hereinafter described and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side view of a machine embodying my invention. Fig. 2 is a bottom plan view of a part of the mechanism of my machine. Figs. 3, 4 and 5 are views of detail parts. Fig. 6 is a front view of a part of the machine with the carriage for the plates or material to be embossed associated therewith. Fig. 6^a is a detail view of the cam 68. Fig. 7 is a plan view of the carriage shown in Fig. 6. Fig. 7^a is a detail view of a catch device. Fig. 8 is a side elevation of a detail portion of the carriage in its relation to the die carriers. Fig. 9 is a sectional detail view. Fig. 10 is a detail plan view of part of the escapement mechanism for the carriage. Fig. 11 is a front view of a part of the escapement mechanism and associated parts.

In these drawings 1 indicates the dies arranged in two series, one above the other in die carriers 2, 3. These dies are adapted to slide freely through the carriers or drums being arranged in two circular series and each die having a headed end at 4, the heads

of the upper dies overlying the upper surface of the upper carrier or drum, while those of the lower dies underlie the lower surface of the lower carrier or drum. The drums are secured to sleeves or hubs 5, 5', adapted to rotate on the drive shaft 6. These drums rotate between plates 7, 7', there being a pair of these plates for each drum and all of the plates being rigidly secured to the frame 8. The die carriers or drums are rotated from the shaft 6 through toothed wheel 9, fixed on the said shaft and a pawl 10 pivotally secured to the under face of a plate 11, hereinafter referred to as the impression plate. 11' indicates a similar impression plate for the upper series of dies. The impression plate 11 is secured to the sleeve 5 and it carries also a pivoted stop 12 engaging the pawl 10 pivoted to the impression plate. The pawl is normally held in engagement with the toothed wheel to partake of the revolution thereof by a spring 13 so that the impression plate together with the lower drum 3 will be rotated from the toothed wheel so long as the pawl 10 remains in engagement therewith, and this rotary motion is communicated in unison to the upper drum through the interlocking or clutch members of the sleeve 5, 5' at 14.

The rotary motion of the impression plate and die carriers is controlled from a keyboard, one of the key levers of which is shown at 15, there being one key lever for each character, and each key lever being connected with a stop, one of which is indicated at 16. Now when the proper key lever is operated its stop 16 will be elevated into the path of the pivoted stop 12 on the impression disk, and this stop by contacting with the stop pin will swing the driving pawl 10 out of engagement with the tooth wheel 9 to stop the rotary movement of the impression plate, and consequently of the drums which are connected therewith. As soon as the rotary motion is arrested the upper and lower impression plates 11, 11' will be operated in a direction axially of the shaft 6, toward each other, this being effected by the cam surfaces 17, 17', secured to the shaft 6, said cam surfaces working against complementary cam surfaces 18, 18' fixed to the impression plates 11, 11' respectively. The impression plates have associated therewith punch plates 19, 19' carrying punches 20, 20', the said punch plates having biturcated ends embracing the sleeves

5 and 5', and being borne upon by the flanges 21, 21' on the sleeves 5, 5', so that said punch plates partake of the axial movement of the impression plates so that the punches will engage the dies which are axially in line therewith, and thus move the said dies toward each other to emboss the plates or material upon which the characters are to be printed. These punches however remain axially in line with the printing point and with each other, for which purpose they pass through openings as at 22 in the stationary frame plates 7, 7'. In other words, the punches do not partake of the rotary movement of the die carrier drums.

In order that the die carrier drums may be accurately registered in their arrested position I provide each impression plate with a series of notches, one for each die, and as soon as the die carriers with the impression plates begin to move axially toward each other the said impression plates will engage the registering stops 23, 23', on the frame by means of the appropriate notch of the impression plate, i. e., the one corresponding to the key operated passing into engagement with the registering stop. This will hold the drum accurately in position to center the opposing dies in relation to each other for making an accurate and sharp impression in the metallic or other plate which is to be printed or embossed.

In order to return the impression plates, together with the die carriers to their open or normal position after the impression has been made, I provide rollers 24, 24' on brackets 25, 25' secured to the impression plates, which rollers engage the surfaces 26, 26' which are of similar shape to the cam surfaces 17, 17' before described. It will be understood that the dies at the printing point pass through openings in the adjacent frame plates 7, 7', all the other dies bearing with their ends upon the plates between which the die carriers rotate. That is to say, the dies of the drum 2 bear upon the opposing inner face of the frame plates 7, 7' while those of the lower carrier 3 bear and slide upon the opposing inner faces of the plates 7, and while the impression plates and die carriers have axial movement the said die carriers simply slide upon all of the dies excepting the two opposing dies which have been brought to the printing point, and these dies are caused to move toward each other by the punches when the impression plates and die carriers are moved axially toward each other.

Holding and feeding mechanism for the printing plates.—For feeding the printing plates, or rather the blanks to be embossed to the printing point, and for holding them for the action of the dies thereon, I provide carrier and holding means which comprise a jaw or member 26 Figs. 1, 7 and 8 hav-

ing a groove 27 in its inner face or edge to receive one edge of the blank and a pair of jaws 28 similarly grooved to receive the other edge of the blank, such blank being indicated in dotted lines Fig. 3. The jaws 28 are supported upon a shaft or bar 29 in turn supported in bearings or ears 30 extending up from a plate 31 arranged to slide in guides 32 in a frame or bracket 33 which is pivotally mounted, it being connected for this purpose with a tube or sleeve 34 which is arranged to slide upon a tubular track or guide bar 35 which is supported at one end in a bracket 36, and at an intermediate point is connected with a bracket 37 Figs. 6 and 8 slipped in the guide tube 35, these brackets being carried by a movable plate or support 38 having flanges guided in ways 39 of the fixed frame 40. The jaw 26 at one end is supported by a frame 41 connected with the bracket 33 Fig. 7 and at its other end an extension 42 of said jaw is supported from the tubular carrier member 34 by the arm or bracket 43. The jaw 26 being carried by a pivotally supported bracket 33 is permitted to have slight swinging movement up and down with said bracket and the jaws 28 also partake of this movement, and in addition they are permitted to have pivotal movement independent of the swinging movement of the jaw 26, for which purpose they turn about the axis of the support or rod 29. They are normally held in the same horizontal plane with the jaw 26 by a spring or springs 44 and their normal position is determined by the stops 45 on the bracket 33. The plate 31 is under tension of springs 46 tending to move the plate together with the jaws 28 toward the jaw 26 to securely hold the blanks to be embossed between them. The plate is held, however, normally in retracted position by means of a catch pivoted to the bracket 33 and having a hooked end 47 to engage the edge of the said plate and thus the jaws 28 are held in open or retracted position in relation to the jaw or member 26.

The hopper for holding a supply of blanks to be embossed is indicated generally at 49, Fig. 6, it having a base or bottom portion 50 and a front wall 51 slightly raised in relation to this bottom provides an opening through which the blanks one by one may be drawn from the bottom of the pile. The hopper is open on its sides so that the jaws 26, 28 may engage the side edges of the blanks to feed them from the hopper. This hopper is located, of course, to one side of the printing point and supposing that the jaws 28 are held in retracted position by the catch 47 and the carriage consisting of the bracket 33 and the tube or sleeve 34 is shifted toward the right by hand, Fig. 6, the jaws will get in position adjacent the opposite edges of the lowermost blank in the hopper

and in the final part of the movement of the carriage the tail end 46' of the catch 47 will ride upon the cam piece 52 secured to the bracket 37 and said catch will be moved in opposition to its spring 53 so as to release the plate 31 and allow said plate, under the action of the springs 46, to move and carry the jaws 28 toward the jaw 26 so as to grasp in the notches or grooves of the said jaws the edges of the printing plate and this having been done the carriage is moved toward the left by hand to withdraw the lowermost blank from the pile in the hopper and to carry the same to the printing point between the die carriers ready for the operation of the proper key and the making of the impression thereby as above described.

In order to accurately position the carriage with the blank held thereby in relation to the printing point for the purpose of making the impression, or the first impression at the beginning of the line of printing, I provide a stop 53' pivotally mounted on a post 54 adjacent the die carrier drums, the said stop being held normally in position by a spring 55 with its shoulder 56 against a stop 57 on the post. This stop co-acts with a plate or stop arm 58 secured to the sliding plate or jaw carrying member 31. The die carrier 2 is indicated in dotted lines in Fig. 6. As the carriage is moved toward the left after having grasped with its jaws the blank to be printed, the stop arm 58 will ride freely over the stop 53' owing to the latter yielding, but after the stop arm has passed over the pivoted yielding stop 53 the latter resumes its normal position under tension of the spring 55 and then by simply giving the carriage a slight movement toward the right the edge of the stop arm 58 will contact with the stop 53' and thus the carriage will be located in position so as to hold the blank in proper relation to the printing point for making the impression or for beginning a line of such impression.

It will be observed that the stop arm 58 being secured to the sliding plate 31 partakes of the movement thereof and in the action just described the said stop arm is in its advanced position corresponding to the advanced position of the plate 31 or in other words its nearest position to the opposing jaw 26, this being due to the said plate having been released from its catch 47 and being moved forward toward the jaw 26 by its springs 46 and therefore the stop arm 58 is in position to perform the actions just described, of contacting with the stop 53 which is yieldable in one direction but rigid in the other. But in the movement above described where the carriage is moved by hand toward the right to grasp a fresh blank it will be seen, as hereinafter described, that then the plate 31 being held back by its catch 47 will hold the stop arm 58 in such a

retracted position as to permit it to pass by the stop 53 without contacting therewith. The blank having now been brought to the printing point the keys of the embossing machine are operated corresponding to the letters it is desired to emboss and the printing or embossing goes on in a manner substantially analogous to that performed in a typewriter, the carriage being given a step by step movement for letter spacing. The means for doing this will be hereinafter described. After the embossing has been accomplished the carriage is moved by hand farther toward the left, and in this movement the inclined end 59 of the stop arm 58 will strike against a stud or roller 60 carried by a bracket 61 fixed to the frame 38 in any suitable manner, and this contact will result in moving back or outwardly the sliding plate 31 thus retracting the jaws 28 outwardly away from the jaw 26, and releasing the embossed plate so as to fall away from the carriage into any suitable receptacle. The point at which the discharge of the stencil takes place is indicated in Fig. 6 between the lines $x-y$.

When the carrier plate 31 has been moved outwardly as just described it will be grasped and held in this retracted position with the jaws open by means of the catch 47 and the parts will now be in position to throw the carriage by hand or automatically if desired to the extreme right hand position to take a fresh plate from the hopper, and as above described, on this movement the stop arm 58 will pass by the stop 53 without contacting therewith because of the retracted position of the stop arm 58. As the right hand movement is being completed the cam 52 acting upon the tail end of the catch 47 will release the plate 31 and allow it to fly forward under the tension of its springs 46, so that the jaws 28 will grasp a fresh blank between themselves and the jaw 26 and the operations above described may then be repeated.

I will now describe the means for effecting the letter space movement of the carriage when it has been shifted to the printing point to begin the embossing and which escapement movement results from the operation of the keys as in an ordinary typewriter. In order to place the carriage under a certain amount of tension during the step by step automatic feeding action I arrange a spring 62 within the tube 35 of the carriage, said spring encircling a rod or plunger 63 arranged within the tube and having a collar 64' pinned to it against which the spring bears. To the right of its center the plunger 63 is also provided with a collar 64 and also associated with this end of the rod or plunger there is a plug 65 within the tube 35, to which plug is pivoted a latch 66 and the collar 64' has a projection 67 working

against this latch. There is also a catch 68 on the end bracket 69 of the main tube 34 of the carriage. Now when the carriage is moved to its extreme right hand position the catch 68 will assume a position at the right of the latch 66 so that when the carriage is moved toward the left to bring the blank to the printing point the catch 68 will, by engaging the latch 66, move the plunger rod 63 and compress the spring 62 by means of the collar 64 bearing thereon, and this spring will take up any lost motion in the escapement mechanism and insure the accuracy of the step by step movement of the carriage by placing the same under a slight spring resistance preventing overthrow in the step by step movement. The tube 35 is of course slotted longitudinally at 69 and through this slot the latch 66 and catch 68 engage each other. When the carriage is brought in position where the embossing takes place the spring, as above described, will act to take up any lost play in the escapement mechanism, and after the blank has been embossed and the carriage moved slightly beyond the embossing or printing point the latch 66 will free itself from the catch 68 because it has then arrived at the enlarged or cam shaped portion 70 of the slot 69, and as the catch and latch have inclined surfaces the latch, under the pressure between these parts, will move laterally into the enlarged space 70 and thus free itself from the catch 68 and immediately the back pressure on the carriage will be released so that the carriage may then be shifted by hand to its extreme left hand position for the discharge of the embossed plate at the point *x-y*.

Automatic feed mechanism.—I utilize the movement of the parts which effect the impression for the purpose of feeding the carriage step by step. The impression is made by certain of the parts closing with respect to each other and then opening again, and it is this action which I utilize for the operation of the carriage feed. I employ a plate 71 which rests upon the upper side of the lower impression plate 11. This plate 71 carries a bracket extending upwardly as at 72 and on this bracket is a stud 73 supporting rollers 74 between which extends a lever 75. This lever has attached thereto a pawl 76 which engages a ratchet wheel 77 on a shaft 78 to which is also fixed a toothed wheel 79 meshing with the rack 80 fixed to the tube 34 of the carriage. The pawl is held in engagement with the ratchet wheel by a spring 81. The plate 71 is drawn downwardly by springs 82. When the impression is being made the lower impression plate rises and this through the plate 71 raises the lever 75 and lifts the pawl 76 so that said pawl gets a new hold on the ratchet wheel and is ready to turn the same when the impression has been completed and the impres-

sion members separate. That is to say, when the dies move away from each other the lower impression plates move downwardly and the springs 82 then draw down the plate 71, thus operating the lever 75 downwardly and causing the pawl 76 to turn the ratchet wheel and through the toothed wheel and rack to advance the carriage one step toward the left for the spacing of the carriage for the next letter or impression. In other words the feed mechanism for the carriage is set by the movement of the parts in making the impression and it is operated to advance the carriage one step after the impression has been made and the parts are in the act of separating. Incidentally it may be pointed out that the plate 71 by bearing upon the lower impression plate and being under spring tension, serves to place the same under a certain amount of frictional restraint and thus overcomes to some extent the momentum of the machine.

The action just described of feeding the carriage takes place as before pointed out against the tension of the spring 62 in the carriage which thus prevents overthrow and lost motion.

40 are standards to hold the plate 71 from revolving with the impression plate.

In order to operate the feeding mechanism by hand and not as the result of operating one of the keys which controls the impression mechanism, I employ a lever 83 pivotally held by the same pin 84 in the bracket 85 which holds the lever 75, this finger lever 83 having a finger piece 86 by which it may be depressed against the tension of its spring 87. It carries a pawl 88 to engage the ratchet wheel above described and by operating this finger piece 86 and lever 83 the carriage may be given a step by step movement by hand. When it is desired to release both pawls for the return of the carriage a lever 89 is operated, which turns the pawl releaser 90 so that its end 91 by engaging with both pawls will throw them out of engagement with the ratchet and the carriage may then be returned to the right.

It will be seen from the above that I provide a carriage which may have a quick throw in bringing the blank to the impression point and in removing the blank from said point for its discharge and which carriage will have a step by step movement automatically as the keys are operated for the letter spacing action. For line spacing the main plate or base 38 has movement in the frame as at 39 and it is provided with teeth on its under side 92 engaged by the gear wheels 93 on a shaft 94. This shaft has upon it a plate or disk 95 provided with notches 96 engaged by a detent 97. The shaft may be turned to set the carriage in or out by a finger piece 96', and it will be held in different positions for line spacing by the

detent 97 engaging the notches 96. It will be observed also that the carriage besides having its longitudinal and lateral movement is permitted also a slight rotary motion sufficient to enable the jaws to accommodate themselves to the necessary horizontal position of the plate while the impression is being made, the jaws 28 as above described being pivotally mounted upon the carriage.

10 I claim as my invention:—

1. In combination a pair of rotary die carriers coaxially arranged and having dies arranged parallel with the axis of the rotary carriers, means for rotating the carriers, arresting means, a constantly rotating cam member having its power transmitting surfaces directed axially thereof, and a cooperating member to transmit the power of the cam in a direction axially in respect thereto, substantially as described.

2. In combination a pair of rotary die carriers coaxially arranged and having dies arranged parallel with the axis of the rotary carriers, means for rotating the carriers, arresting means, and a constantly rotating cam member arranged coaxially with the die carriers and having its power transmitting surfaces directed axially thereof, and a cooperating member to transmit the power of the cam in a direction axially in respect thereto, substantially as described.

3. In combination a pair of rotary die carriers coaxially arranged and having their dies arranged parallel with the axis of rotation, a pair of cam members coaxially arranged, a cooperating member for each cam member, a power transmitting device coaxial with the carriers and between each cooperating member and the dies belonging thereto said transmitting devices being moved axially, and means for constantly rotating the coaxial cam members, substantially as described.

4. In combination a pair of rotary die carriers coaxially arranged and having their dies arranged parallel with the axis of rotation, a pair of cam members coaxially arranged, a cooperating member for each cam member, a power transmitting device between each cooperating member and the dies belonging thereto, and means for constantly rotating the coaxial cam members, said power transmitting device consisting of an impression plate arranged coaxially in respect to the cams and carriers, substantially as described.

5. In combination a pair of coaxial die carriers, a punch for each, a pair of coaxial impression plates arranged at the outer sides of their respective carriers, and a pair of cam members arranged coaxially of the carriers and impression plates, driving means for the cams and carriers, and arresting devices for the carriers, substantially as described.

6. In combination a pair of coaxial die carriers having dies movable parallel with the axis of rotation, driving means, arresting means, and die closing means comprising rotary cam members coaxial with and at the outer sides of their respective carriers with power transmitting devices coaxial with and between said carriers and the cam members, substantially as described.

7. In combination in apparatus of the class described, a shaft, a pair of die carriers arranged on the said shaft, a clutch device between the die carriers, means for giving one of the die carriers rotary movement, which movement is transmitted to the other die carrier through the clutch device, and means concentric with the die carriers for closing them automatically when the rotary movement is arrested, substantially as described.

8. In combination in a machine of the class described, a shaft, a pair of rotary die carriers thereon, sleeves connected with the rotary die carriers and having a clutch device between them to transmit rotary movement from one to the other and allow said sleeves to have sliding movement on the shaft while maintaining their engagement, means for rotating the die carriers, means for arresting the rotary movement, and means for automatically closing the die carriers, said rotating and closing means being arranged concentric with the axis of the die carriers, substantially as described.

9. In combination a shaft, a pair of die carriers arranged coaxially thereon, a clutch device between the die carriers whereby they rotate in unison, means for rotating the die carriers, and a pair of cams, one for each die carrier, for giving the said carriers their closing movement, said cams being arranged concentric with the axis of the die carriers, substantially as described.

10. In combination with means for making the impression, a reciprocatory carriage for the blanks to be impressed, said carriage having jaws one at each edge of the blank movable toward and from each other in the same plane with the blank for gripping the blanks and for conveying them, and means for automatically opening and closing said jaws in the reciprocatory movement of the carriage, the opening movement discharging the blanks and the closing movement gripping them, substantially as described.

11. In combination with means for making the impression, a hopper or holder for the blanks, a reciprocatory carriage for the blanks having means thereon to engage the side edges of the blanks for holding and conveying them, and means for automatically opening and closing the said blank engaging and holding means as the carriage is reciprocated, whereby the blanks will be automatically taken from the hopper and

delivered to the printing point to receive the impression and then released for their discharge, substantially as described.

12. In combination with impression means, 5 a carriage for the blanks having jaws to grip the blanks at their side edges and convey them, a hopper or holder for the supply of blanks, means for closing the jaws upon a blank when the carriage is moved to the 10 hopper, said jaws holding the blank while being carried to the impression point and while the impression is being made, and means for automatically opening the jaws for the discharge of the blank therefrom 15 when the carriage is moved to carry the blank from the impression means, substantially as described.

13. In combination impression means, a hopper arranged to one side of the same, a 20 carriage having gripper jaws, means for closing the said gripper jaws upon a blank at the hopper and for conveying them, said jaws holding the blank to transfer the same to the printing point for the impression, 25 and means whereby the jaws are opened for the release of the impressed blank when the carriage with the blank is moved beyond the impression point, substantially as described.

14. In combination with means for making the impression, a carriage comprising a pair of opposing jaws to grip the blank between them, one of said jaws having movement toward and from the other, a catch 30 or detent for holding said jaw in retracted position, means for releasing the said detent when the carriage is moved to present the jaws to the edge of a blank at the hopper, means for moving the movable jaw to 40 grip the blank between itself and the opposing jaw when the detent is operated, and means for retracting the movable jaw when the carriage is moved to carry the said jaws to one side of the impression point, substantially as described. 45

15. In combination with impression means, a carriage for the blanks comprising a pair of jaws movable toward and from each other to grip the blanks by engaging their opposite edges, one of said jaws having yielding movement in respect to the impression means and in the direction in which the impression is made to allow the blank to assume a proper position between the dies 50 for the impression, substantially as described. 55

16. In combination with impression means, jaws for holding the blanks to receive the impression, one of said jaws being pivotally 60 mounted to yield in the direction in which the impression is made and allow the blank to assume a proper position between the dies when said dies contact therewith, substantially as described. 65

17. In combination with impression means

including dies, a pair of jaws for holding the blank one engaging one edge and the other engaging the other edge, a swinging support for said jaws upon which one of the said jaws is pivotally and yieldingly mounted to allow the blank to assume a proper position to receive the impression when the dies contact therewith, substantially as described. 70

18. In combination with impression means, 75 a carriage comprising a pair of jaws, one of which has movement toward and from the other, detent means for holding the movable jaw in retracted position, a hopper, means for releasing the detent when the 80 carriage is moved to present the jaws to a blank at said hopper, a cam piece connected with the movable jaw, and a stud or bearing with which the said cam piece contacts when the carriage is moved away from the printing point after the blank has received the impression, whereby the movable jaw is retracted to release the blank, substantially as described. 85

19. In combination with impression means, 90 a pair of jaws for gripping the blanks to present them to the impression means, a tubular rod upon which the said jaws are supported, a rod upon which the tubular rod is adapted to slide, said tubular rod having 95 also pivotal movement on its supporting rod, one of the said jaws being pivotally mounted, substantially as described.

20. In combination with impression means a carrier for the blank, a hopper, connections 100 for operating the said carrier step by step, stop means whereby the carrier may be set in position to begin its step by step movement, jaws on the carriers for gripping a blank, and means for opening and closing the said 105 jaws automatically as the carrier is reciprocated to grasp and release the blank, said carrier being adapted to be moved by hand from the hopper to the stop for registering the carriage to begin its step by step movement, substantially as described. 110

21. In combination with impression means, a hopper for the blanks, a carrier to receive printing plates in the hopper adapted to be reciprocated by hand, connections for moving 115 the said carrier step by step automatically, a registering stop against which the carrier is set to begin its automatic step by step movement, said stop being yielding to allow the carrier to pass thereby in one direction, but to furnish a rigid stop for the carrier in the opposite direction, substantially as described. 120

22. The combination with impression means a hopper, a carrier for the blanks 125 having gripping means to engage the lowermost blank of the pile in the hopper, said carrier being mounted to have reciprocatory movement, means for closing the gripping means when the carrier is moved to 130

the hopper, said gripping means holding the blanks by their opposite edges while being transferred to the impression means and while the impression is being made, and means for releasing the gripping means when the carrier is moved in the same direction to a point beyond the impression means, substantially as described.

23. In combination impression means, a carrier for the blank, means for giving the said carrier step by step movement automatically, said carrier being adapted also to be moved by hand, and a resistance device with means for automatically connecting the same with and disconnecting it from the carrier at predetermined points in the movement thereof, said resistance device applying a tension or back pressure to the carriage while the same is being moved step by step through the automatic means, whereby overthrow will be prevented, substantially as described.

24. In combination with impression means, a carriage for the blanks, connections for moving the carriage step by step automatically, and a tension spring with means for picking up and releasing the said tension spring at certain points in the movement of the carriage, substantially as described.

25. In combination with impression means, a hopper, a carriage having jaws to take the blanks from the hopper and transfer them to the impression means, a stop against which the carriage is registered to hold the blank in proper position to begin the impression, a tension spring for applying back pressure to the carriage, means for giving the carriage a step by step movement automatically against the tension of this spring, and means for automatically connecting and disconnecting the spring from the carriage at certain points in the movement thereof, substantially as described.

26. In combination impression means, a carrier for the blanks, a tubular rod serving as a guide for the carrier, a spring within the said rod, a rod within the tubular rod with which the spring is connected, and catch means between the carrier and the spring rod within the tube for applying the tension of said spring to the carriage and releasing it therefrom at certain points in the movement of the carriage, and means for automatically giving the carriage a step by step movement, substantially as described.

27. In combination impression means, a hopper, a carriage having gripping jaws to engage and carry the blanks from the hopper, a support for said carriage upon which it reciprocates, means for giving the carriage a step by step movement in the direction of its movement from the hopper for letter spacing, and means for moving the said support step by step in a direction transverse to the direction of movement of

the carriage, for line spacing, substantially as described.

28. In combination two rotary die carriers having mating dies, an impression plate rotating with and movable axially in relation to one of the die carriers, means for arresting the rotary movement of the carriers and the impression plate, means for moving the impression plate axially to make the impression by closing the mating dies, a carrier for the blanks and connections for giving the said blank carrier a step by step movement, said connections being operated by the axial movement of the impression plate, substantially as described.

29. In combination impression means including the die carriers, one of which, together with its impression plate, is movable, a carrier for the blanks and connections for giving the said carrier a step by step movement, said connections being operated by the movement of the impression plate, said connections including a plate bearing upon the surface of the impression plate and serving as a check or brake for the rotary movement of the die carrier, substantially as described.

30. In combination impression means, a carriage for the blanks, connections for giving the said carriage a step by step movement, said impression means including a rotary and axially movable impression plate adapted to move to close the dies, said movable impression plate operating to set the connections ready to move the blank carrier, which connections operate the impression plate when the die carrier returns to normal position, substantially as described.

31. In combination impression means including rotary series of dies and their carriers, a carrier for the blanks, means for giving the carrier step by step movement, said connections being operated by the impression means and including a plate bearing on a part of the impression means to serve as a check or brake to the rotary movement of the impression means, substantially as described.

32. In combination impression means including the dies operating upon opposite sides of the blank and in a complementary manner and means for holding the blanks by gripping their opposite edges, said holding means having a yielding quality to permit the blank to adjust itself in a plane at right angles to the movement of the dies when contacting with the blank, substantially as described.

33. In combination the coaxially arranged die carriers, key connections, a stop to be projected by the key connections for arresting the rotary movement of the die carriers, and a cam coaxially arranged in relation to the die carriers for closing the dies as a result of the arresting of the carriers, substantially as described.

34. In combination with dies, a pair of jaws to hold the blank between them, said jaws engaging the opposite edges of the blank, movable supporting means for the said jaws whereby said jaws may jointly yield when the impression is made and one of said jaws having an additional yielding movement, and in respect to the other jaw, substantially as described.

10 35. In combination carriers having mating dies, means for rotating the carriers, an impression plate rotating with the carriers and movable axially, a carrier for the blanks

and connections for giving the said carrier a step by step movement, said connections including a member bearing upon the surface of the impression plate and serving as a check or brake for the rotary movement of the die carrier.

In testimony whereof, I affix my signature 20 in presence of two witnesses.

CHARLES OWENS.

Witnesses:

ELEANOR A. SHIRES,
MAY IDE.