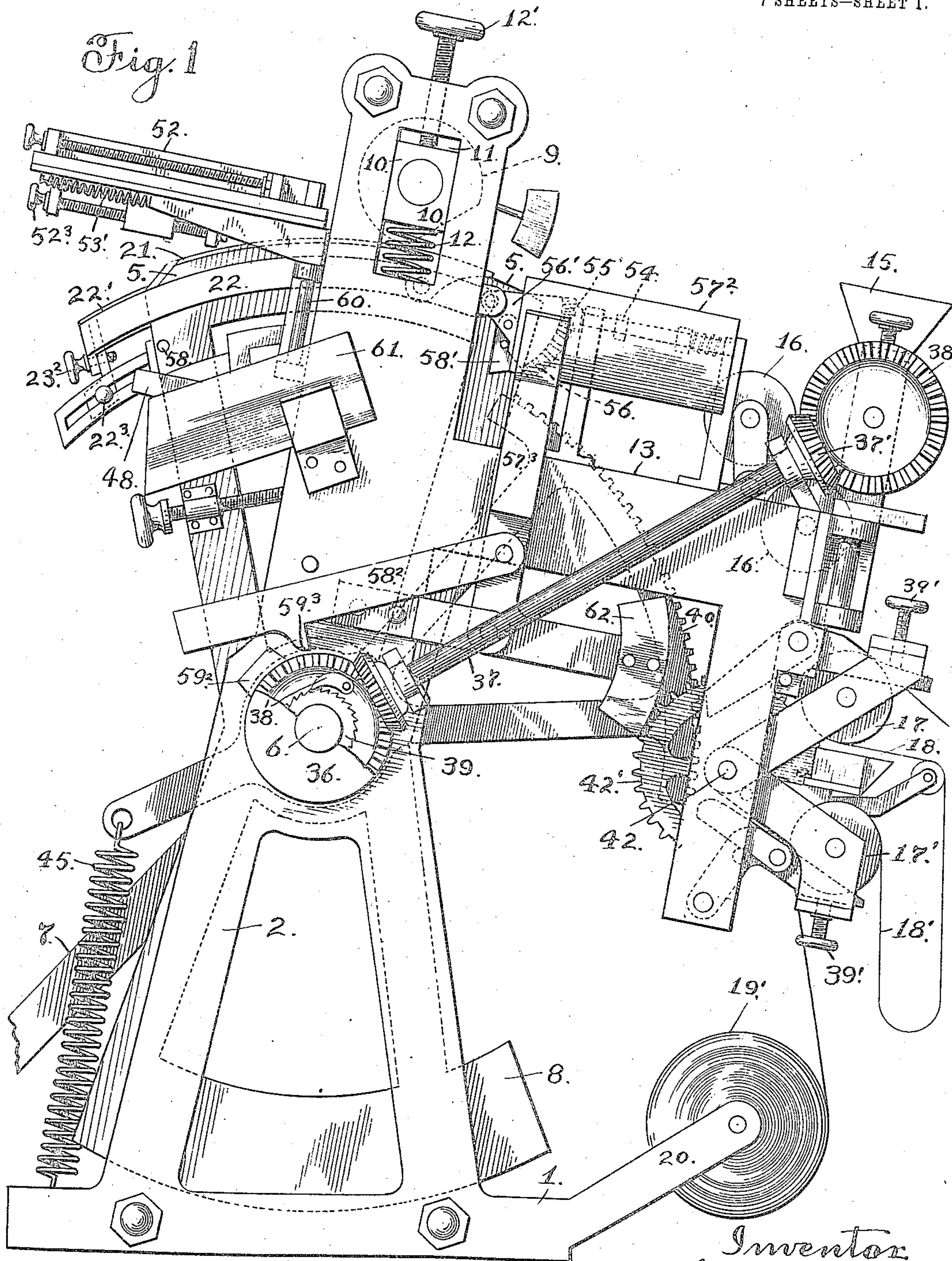


No. 810,743.

PATENTED JAN. 23, 1906.

G. H. GIHON.
PRINTING APPARATUS.
APPLICATION FILED APR. 3, 1905.

7 SHEETS—SHEET 1.



Witnesses.
Arthur F. Slee.
J. Compton.

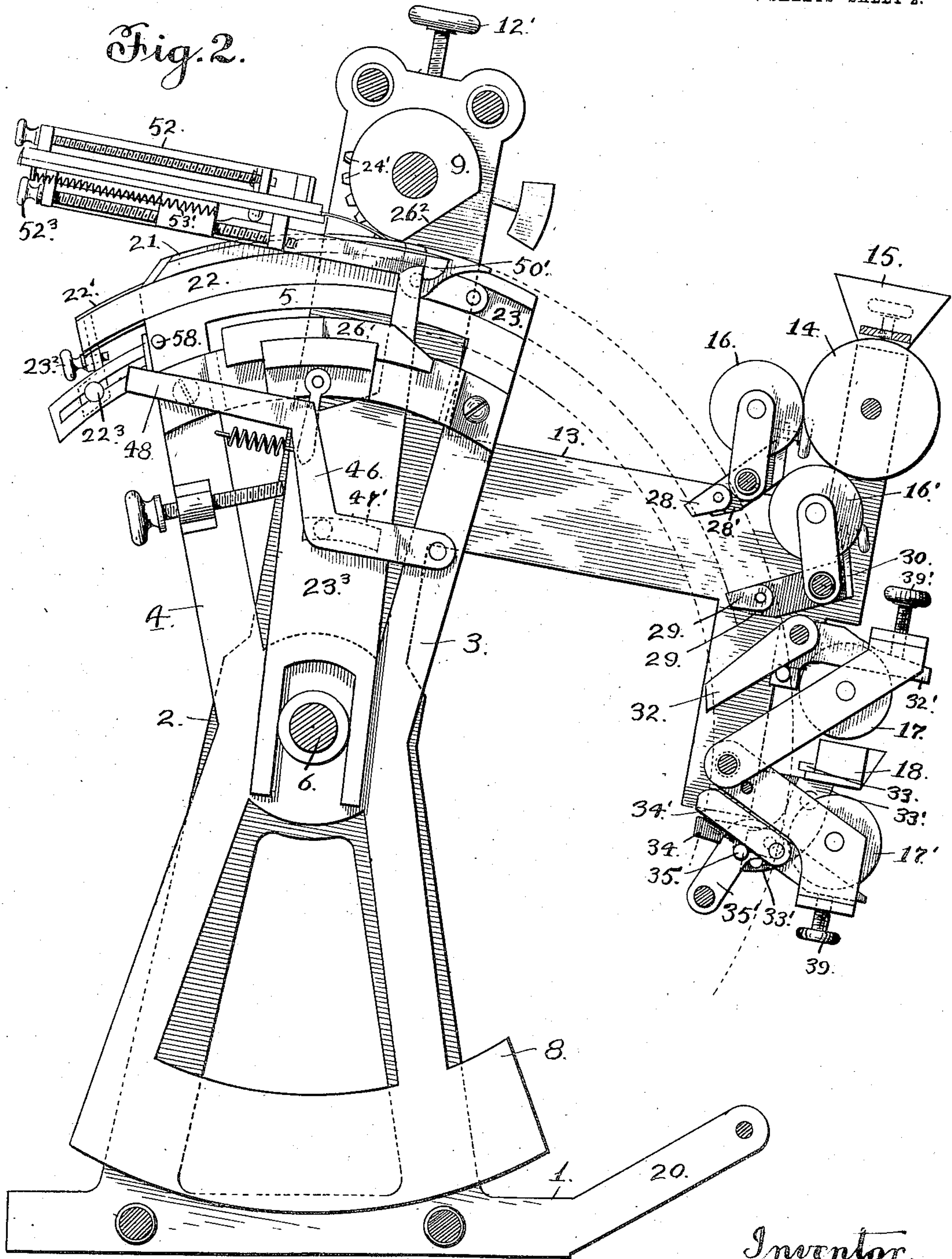
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7 SHEETS—SHEET 2.



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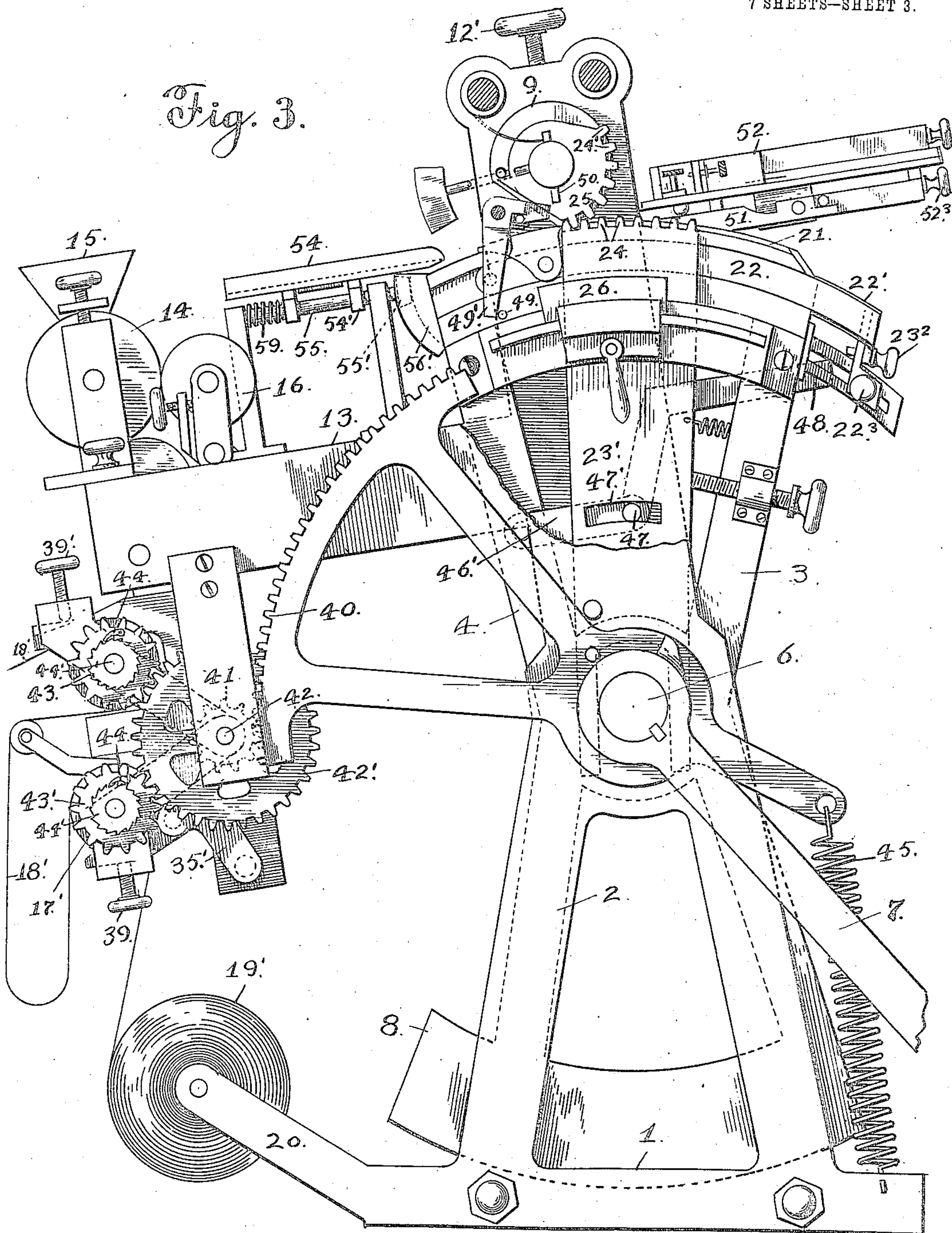
No. 810,743.

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7 SHEETS—SHEET 3.

Fig. 3.



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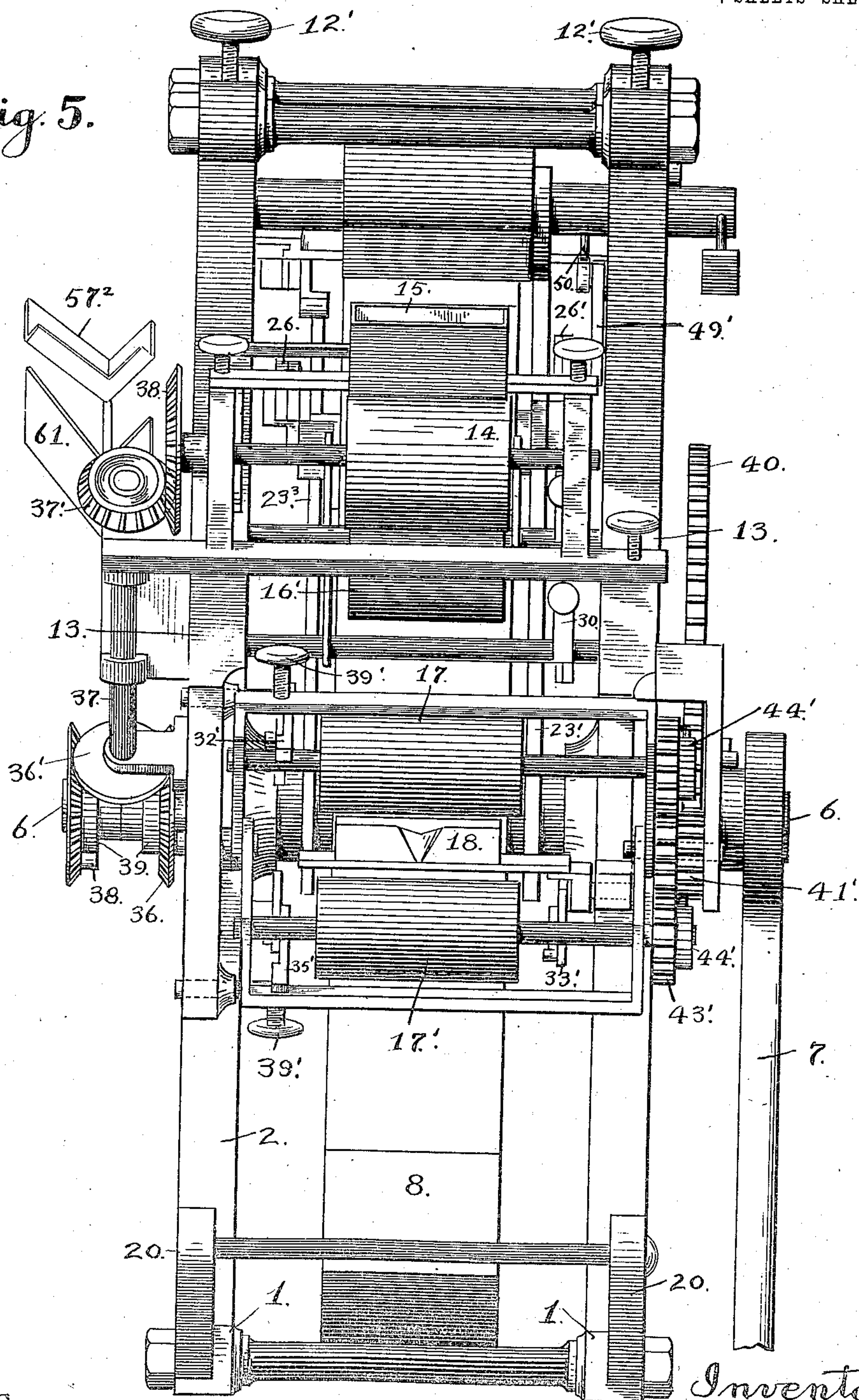
No. 810,743.

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APPLICATION FILED APR. 3, 1905.

7 SHEETS—SHEET 5.

Fig. 5.



Witnesses.
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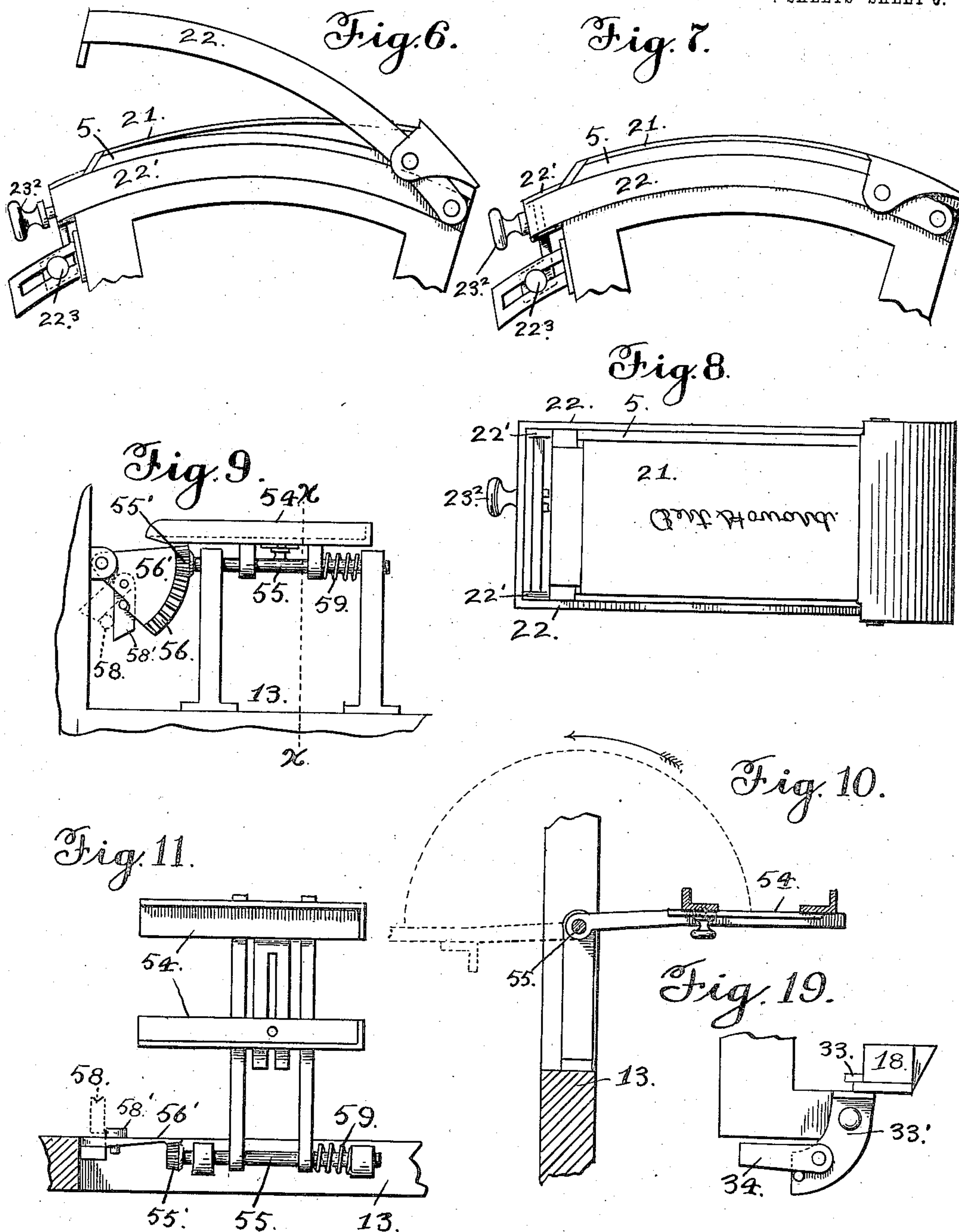
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7 SHEETS—SHEET 6.



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APPLICATION FILED APR. 3, 1905.

7 SHEETS—SHEET 7.

Fig. 12.

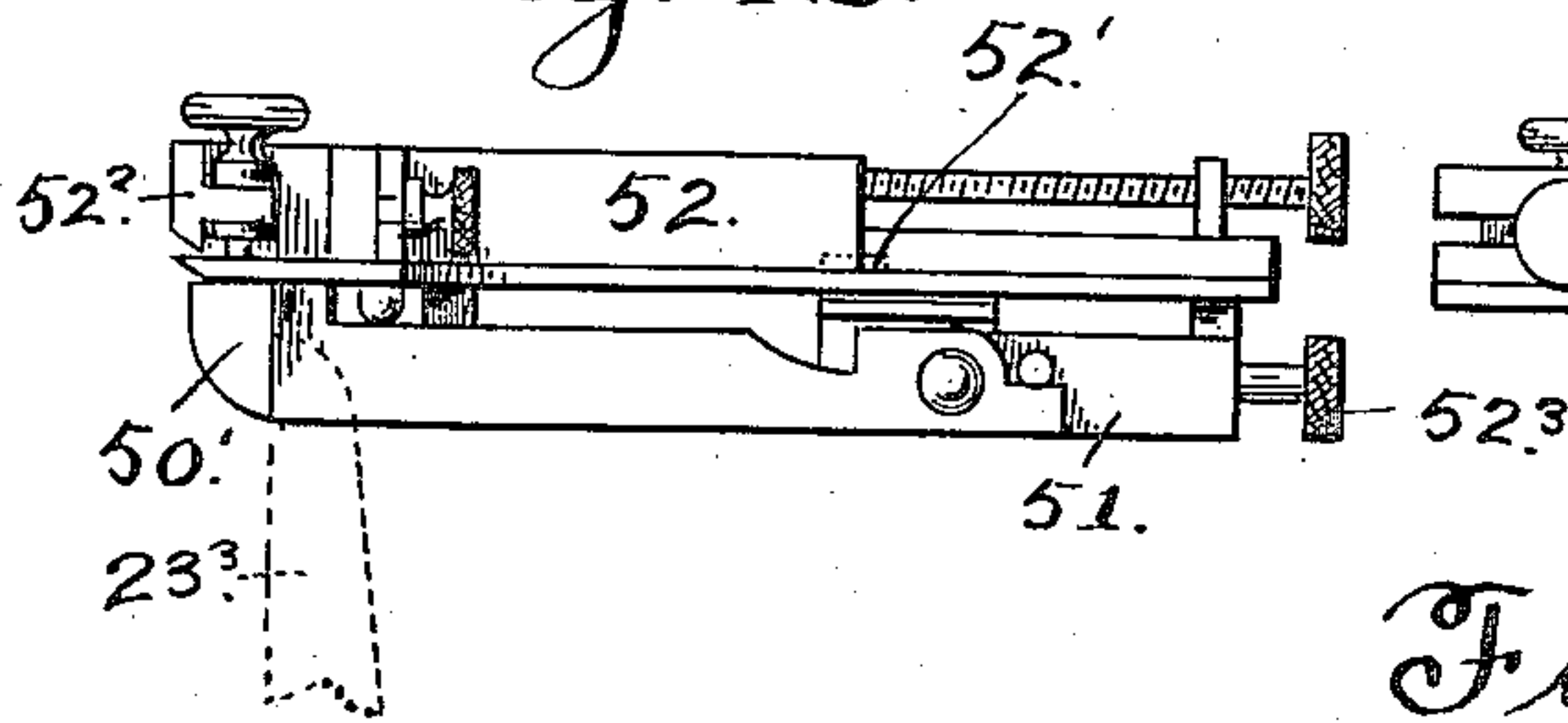


Fig. 13.

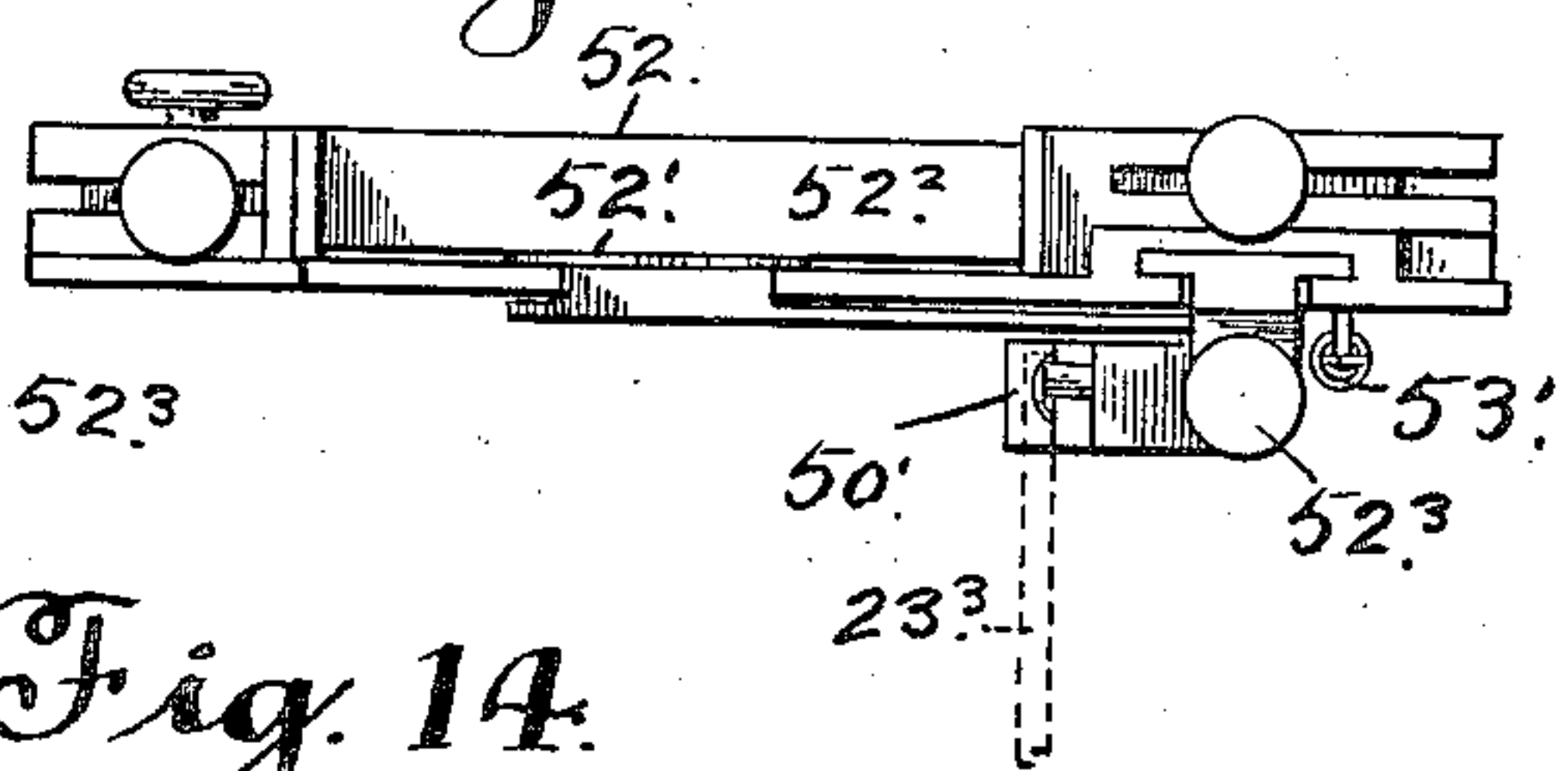


Fig. 14.

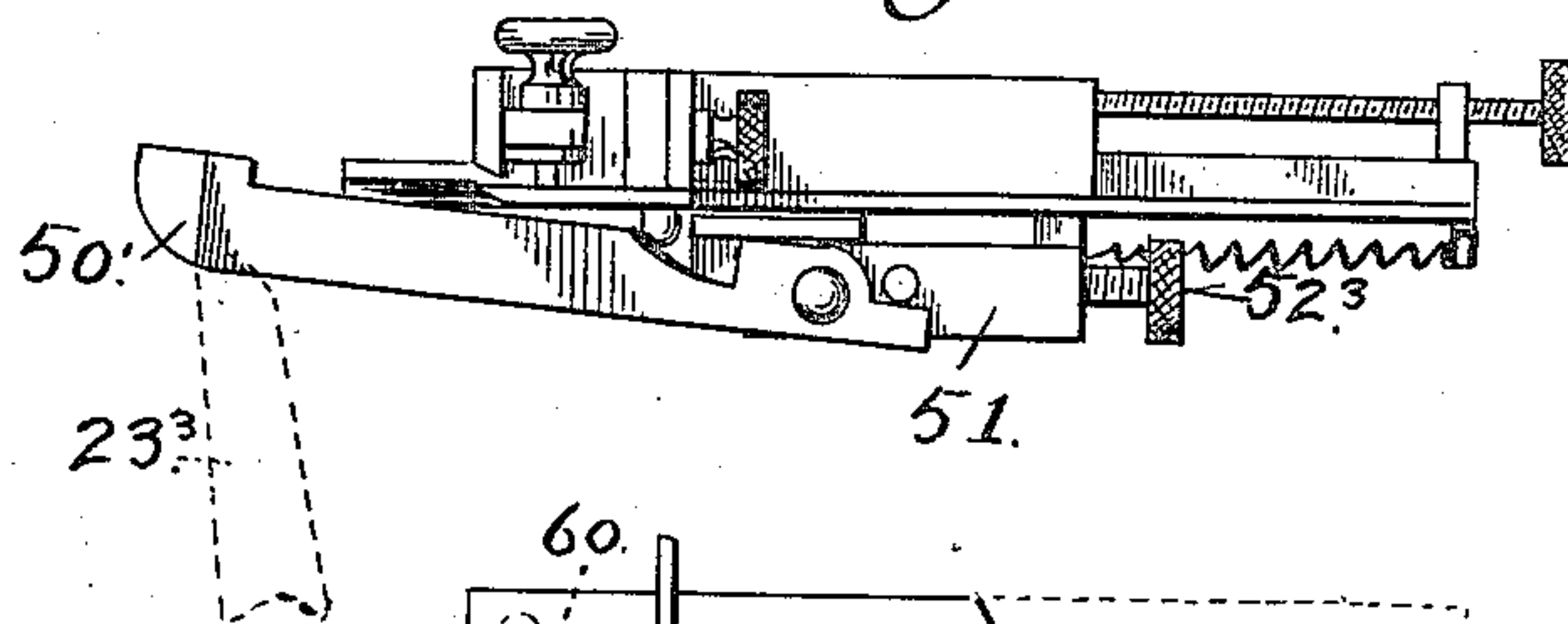


Fig. 15.

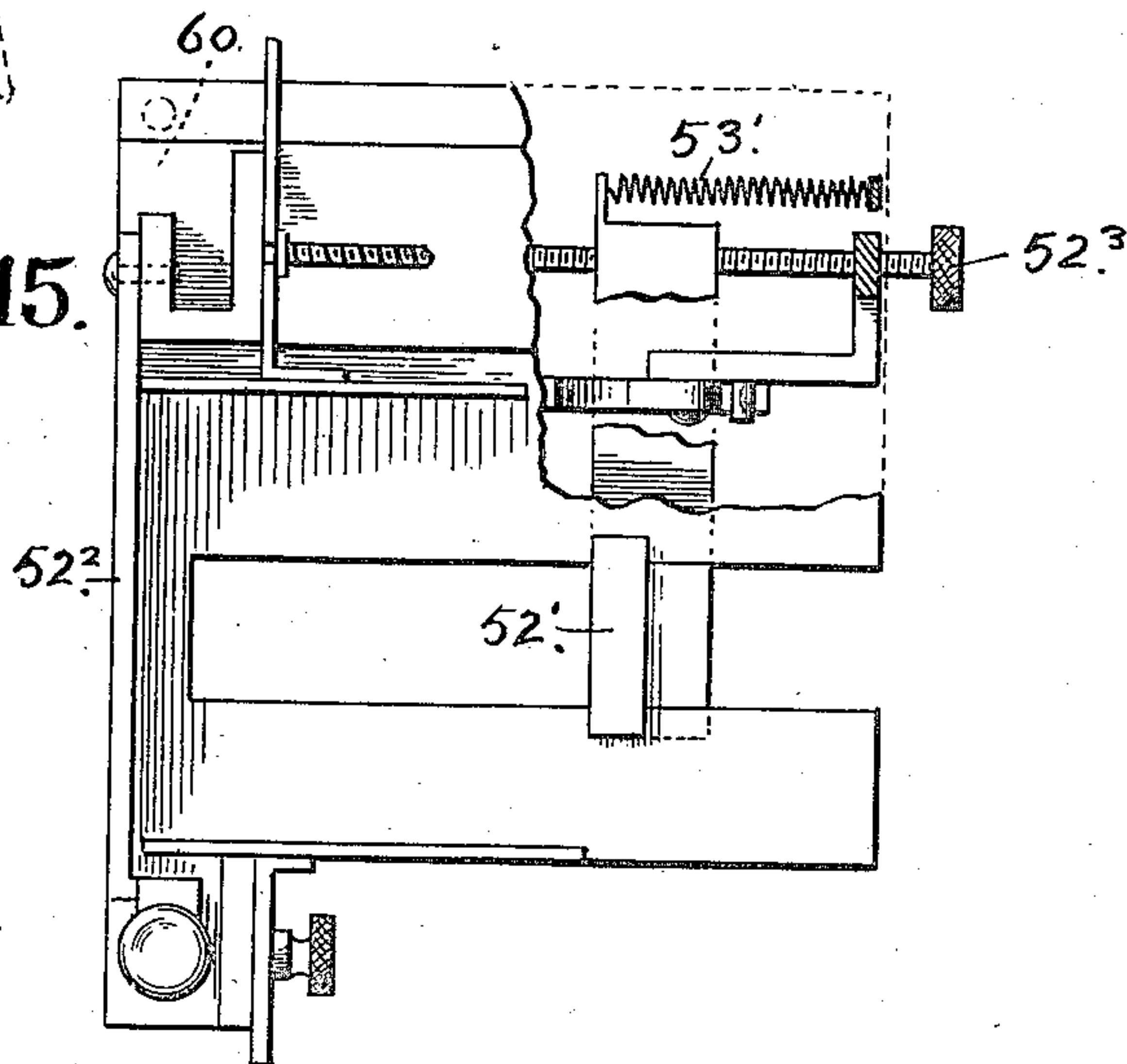


Fig. 16.

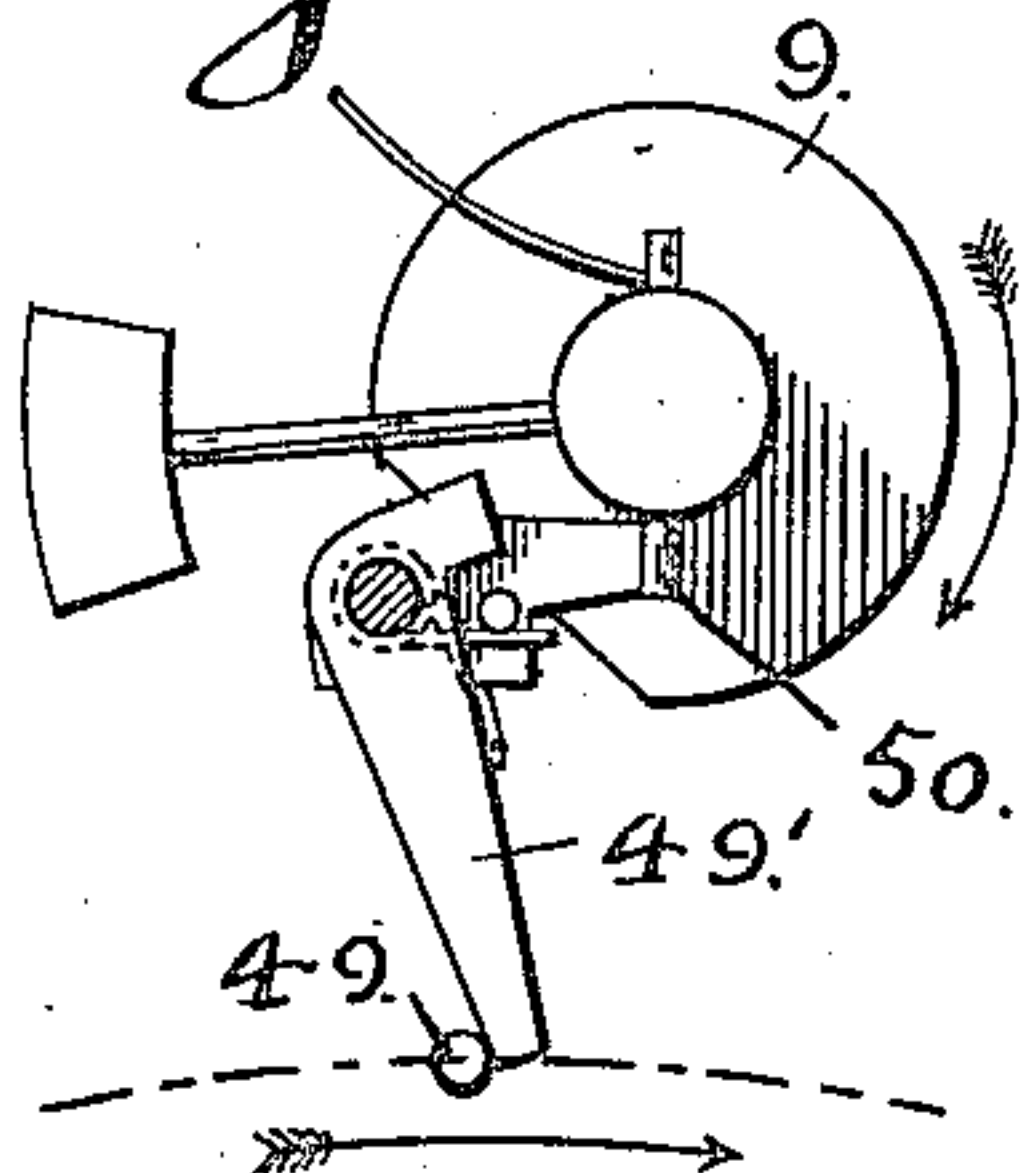


Fig. 17.

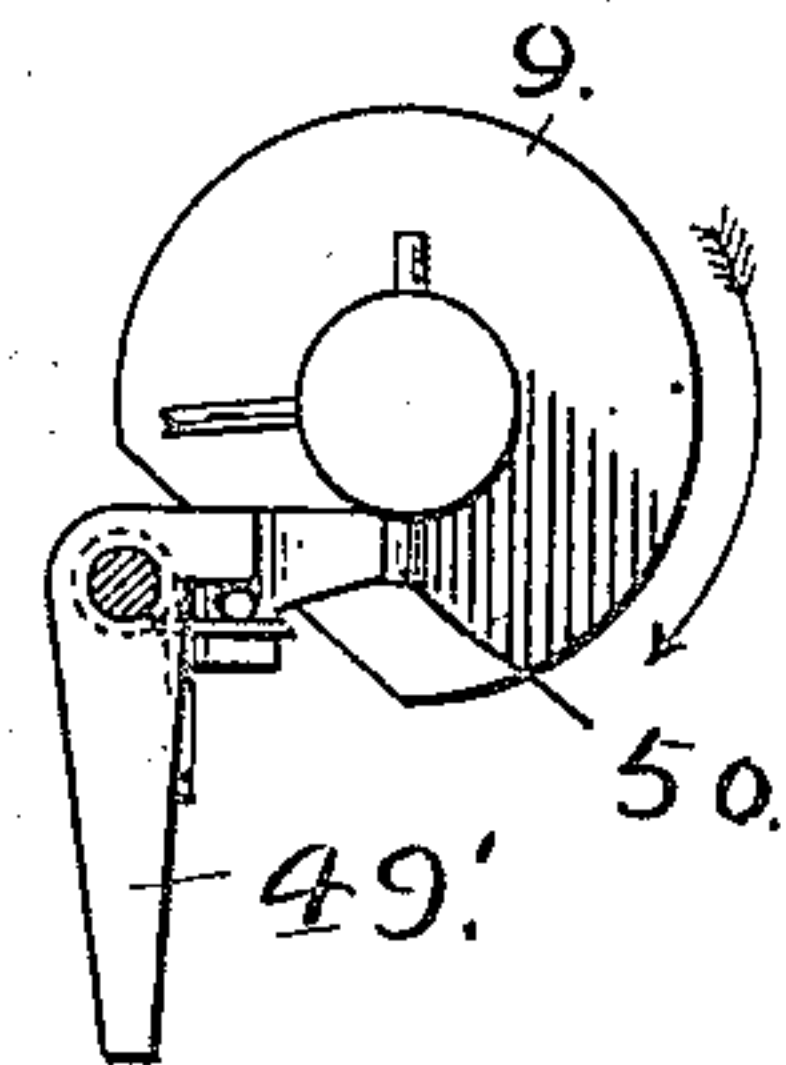
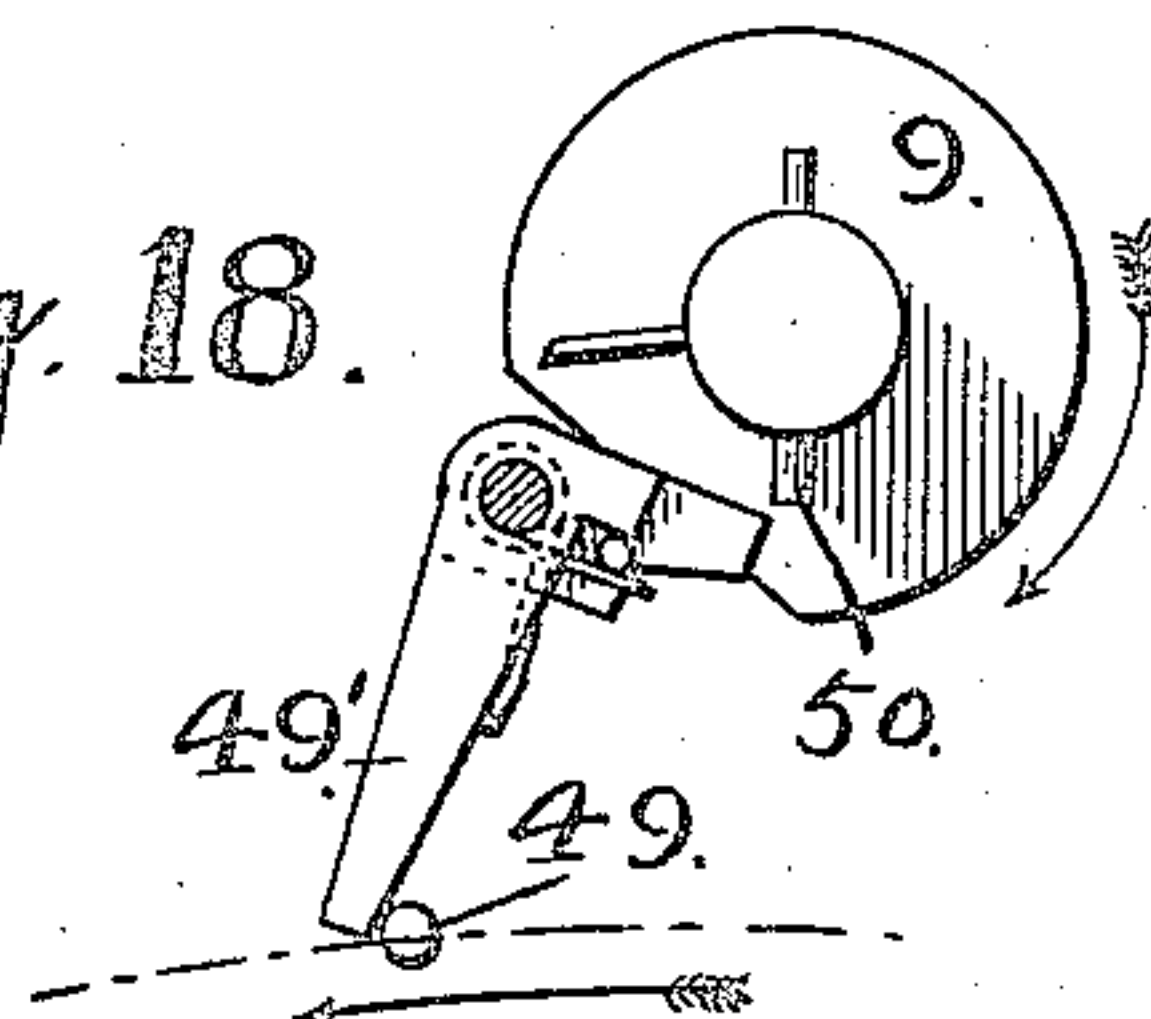


Fig. 18.



Witnesses:
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UNITED STATES PATENT OFFICE.

GEORGE H. GIHON, OF SAN FRANCISCO, CALIFORNIA.

PRINTING APPARATUS.

No. 810,743.

Specification of Letters Patent.

Patented Jan. 23, 1906.

Application filed April 3, 1905. Serial No. 253,442.

To all whom it may concern:

Be it known that I, GEORGE H. GIHON, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Printing Apparatus; and I hereby declare the following to be a full, clear, and exact description of the same.

The present invention relates to certain new and useful apparatus for printing from engraved copper plates—such as are used for printing visiting-cards, wedding-invitations, and notices generally—the object thereof being to take the place of the handwork commonly employed to print from such engraved plates, thereby enabling to be done mechanically the work ordinarily performed as hand operation.

The essential features of the invention comprise means for applying ink to the surface of a held engraved plate, removing the excess or surplus of ink therefrom, wiping, cleaning, and polishing the surface of the held engraved plate, and returning the inked plate into position to be acted on by the impression-roller, with means for automatically feeding the card on which the impression is to be made onto the held inked plate as the same is moved beneath the impression-roller, and means for delivering the card. The steps involved being, first, the inking of the plate; second, the removal of the surplus ink from the face thereof and the cleaning and polishing the plate's surface; third, returning the inked plate to its original position; fourth, delivering a card to be printed onto the plate as the same is carried beneath the impression-roller. To carry out these steps, it is essential that what shall hereinafter be termed the "plate-carrier" or "carrier-frame" be mounted to oscillate within a suitable frame, the various steps enumerated being performed as the carrier-frame is thrown forward and returned to its original position.

By the hereinafter-described invention the work of printing from an engraved copper plate is materially simplified and the output materially increased over what can be done by handwork, a decided advantage for the use of the machine being the uniformity with which the cards are printed and the rapidity with which the work is done.

To comprehend the invention, reference

should be had to the accompanying sheets of drawings, wherein—

Figure 1 is a side view in elevation of the apparatus, the parts being properly positioned, said view being from the right hand of the machine. Fig. 2 is a similar view of the machine with the right-hand side plate, the main frame thereof removed, the paper-roll being also detached. Fig. 3 is a view similar to that disclosed by Fig. 1 of the drawings looking at the machine from the left-hand side thereof. Fig. 4 is an end view in elevation of the machine viewed from its feed end. Fig. 5 is an end view in elevation of the machine viewed from the forward end thereof, said view illustrating the relative position of the ink-rollers, the wiping-rollers, and cleaning device and the web of paper used for wiping and polishing the surface of the held engraved plate, said web of paper being actuated or advanced by the rotation of the frictional wiping-rollers. Fig. 6 is a detail side view in elevation of the bed for the holding of the engraved copper plate, the lock-lever for securing the said plate from which an impression is to be made being illustrated in raised position. Fig. 7 is a similar view of the said parts, the lock-lever being illustrated as closed for the clamping of the engraved copper plate to its bed. Fig. 8 is a top plan view of the means illustrated by Figs. 6 and 7 of the drawings, the copper plate being shown in position and clamped to the bed. Fig. 9 is a detail side view in elevation of the swinging card-receiver for the printed card, the means for swinging the said receiver being shown in position. Fig. 10 is a detail vertical sectional view, in end elevation, of the said swinging card-receiver, the section being on line *x x*, Fig. 9 of the drawings. Fig. 11 is a top plan view of the said swinging card-receiver. Fig. 12 is a detail side view in elevation of the feeder mechanism for the cards. Fig. 13 is a rear end view in elevation of the mechanism disclosed by Fig. 12 of the drawings. Fig. 14 is a detail side view of the feed mechanism, the pivoted arm being drawn out on its full stroke for the removal of a card from the bottom of the stack of cards within the feed-frame. Fig. 15 is a detail top plan view of the mechanism disclosed by Figs. 12, 13, and 14 of the drawings. Figs. 16, 17, and 18 are detail end views, in side elevation,

showing the impression-roller in different positions. Fig. 19 is a detail view of the reservoir for the cleaning fluid, disclosing the felt wiper arranged in advance thereof and the
 5 pivoted lever carrying the feed-reservoir and the arm pivoted thereto for depressing the feed-lever on the forward stroke of the plate-carrier.

In the drawings the numeral 1 is used to
 10 indicate any suitable form of a supporting-base, from which preferably spring the two vertical side plates 2. These plates are suitably spaced, and between the same works the swinging or oscillating plate-carrier, which
 15 consists of the vertical segmental side pieces 3 4, united at their upper end by the curved bed-plate 5. The swinging plate-carrier is mounted on or secured to the cross-shaft 6, which passes through the side plates of the
 20 main frame, and to one projecting end thereof is attached the handle 7. The plate-carrier is held in vertical position by means of the counterweight 8. Above the bed-plate of the carrier is located the impression-roller
 25 9, which impression-roller is journaled in slide-blocks 10, said slide-blocks working in the vertical guideways 11 of the side plates of the main frame, being held upward by the tension of the springs 12. The impression-roller is regulated as to position by means of
 30 the adjusting-screws 12'.

From the frame-plates of the machine or press forwardly extend the supporting-brackets or bracket-plates 13, which bracket-plates
 35 support the ink-supply roller 14, the ink-reservoir 15, the inking-rollers 16 and 16' for applying ink to the surface of the plate held on the bed of the swinging carrier.

Below the ink-applying rollers the wiping-
 40 rollers 17 and 17' are located, there being arranged between these rollers the reservoir 18 for the holding of a cleaning compound substance. Over the surface of the wiper-rollers 17 and 17' works the endless web of paper 18',
 45 which is fed from a roll 19', held in the brackets 20, projecting forwardly from the base of the machine.

At the feed end of the machine and immediately above the plate-carrier is arranged
 50 the feed mechanism for delivering the cards to be printed to the machine, which cards are automatically fed onto the held engraved plate as the plate-carrier is moved on its return forward stroke.

From the foregoing brief outline of the machine it will be observed that the following steps are carried out. First, the plate-carrier on its forward stroke has the surface of the held engraved plate properly inked; second, on the continued movement of its forward stroke the excess or surplus ink is removed from the surface of the held plate and the said surface wiped dry and polished, the third step being the return of the plate-car-

rier to its normal position, the fourth action
 65 being on the renewed forward stroke of the plate-carrier the delivery of the card to be printed onto the held plate as the carrier is moved beneath the impression-roller, the arrangement of the parts being such that the
 70 impression-roller is thrown out of operation on the first forward stroke of the plate-carrier and is placed into operation on the return stroke of the said carrier, so that as the plate-carrier makes its second or return forward
 75 stroke the card to be printed is fed onto the held plate and an impression of the held previously-inked plate is made and the printed card automatically ejected from the bed of the plate-carrier. These various steps and
 80 the operation of the mechanism in each step of the machine or press will now be described more in detail, thereby giving a clear understanding as to the working of the means for carrying out successively each step of the machine's operation. 85

As previously stated, the swinging or oscillatory plate-carrier with its counterweight is mounted within the main frame of the machine or press, Fig. 2 of the drawings, and as
 90 the same is moved forward the engraved plate held on the bed thereof is inked, wiped, and polished. For the carrying out of the first operation of the machine it is necessary that the engraved copper plate 21, from
 95 which an impression is to be made, be beveled or grooved on its ends in order that the same may be held down or onto the bed-plate 5 of the plate-carrier or carrier-frame by means of the pivoted clamp-levers 22, which levers are
 100 regulated as regards the length of the plate from which an impression is to be made by means of the slides 22', which work in beveled ways 23 in the sides of the bed-plate 5 of the carrier-frame, which slides and clamp-
 105 levers are held in locked position by means of suitable thumb-screws 23², Figs. 6 and 7 of the drawings. The adjustment of the slides 22' is controlled by sliding backward or forward and held in place by thumb-screw 22³.
 110 After the engraved plate has been properly clamped and secured to the bed-plate 5 of the oscillatory carrier the said carrier is then ready to be swung over in a forward direction by means of the motion imparted to the
 115 cross-shafts 6. Previous to moving or swinging forward the carrier-frame it is necessary that the vertically-movable slide-plates 23³ and 23' be depressed, the purpose of which is to move the rack portion 24 of the
 120 slide-plate 23' from engagement with the rack-teeth 24' of the mutilated gear 25, secured on the shaft of the impression-roller 9. By thus depressing the vertical slide-plates 23³ and 23' the held plate 21 is permitted to
 125 pass beneath the flattened portion 26² of the impression-roller 9 without movement or rotation being imparted to the said roller. The

slides 26 and 26', secured, respectively, to the vertical side pieces 3 and 4 of the oscillating plate-carrier, are each composed of two parallel sections, which may be so adjusted by being moved inward and outward as to control the inking of the plate proportionately to the size thereof or the matter engraved thereon.

As the movement of the plate-carrier is continued beyond the impression-roller 9 the slide 26 first engages with the arm 28 and depresses the same, which, acting against a stud projecting from the pivoted lever 28', throws over the upper ink-roller 16 and places the same onto the held engraved plate 21, so as to give an initial inking to the surface of the said held plate, the lower ink-applying roller being actuated by the said slide 26, bearing against the hinged arm 29, which in turn bears onto a stud 29', projecting from the pivoted lever 30, which throws over the said lower ink-roller 16' and causes the same to bear onto the surface of the said held plate and supply thereto the requisite quantity of ink. It will be understood that the ink-applying rollers are inked from the main ink-roller 14, which in turn receives its inking from the ink-reservoir 15, held thereabove. As the slide 26 is carried beyond the means for actuating the ink-applying rollers the said rollers are automatically returned to their normal position onto the main ink-roller 14 by the tension of the coiled springs 31, which act to force the levers 28' and 30 outwardly.

It is obvious that all ink applied to the surface of the held engraved plate must be removed therefrom, excepting such portion of the ink as fills the cuts in the surface of the said plate. This removal of the ink is accomplished by the endless web 18' of absorbent paper, which web is forced against and over the surface of the engraved plate 21 by means of the rubber wiping-rollers 17 and 17'. These rollers are actuated by the slide 26' acting first against the hinged arm 32, which as depressed engages a stud projecting from the pivoted lever 32', which lever as depressed throws inward the upper wiping-rollers 17 and forces the web of paper against the surface of the held plate, which paper gives an initial wiping to the surface of the engraved plate as moved in contact therewith by the continued forward stroke of the carrier-frame. Immediately below the upper wiping-roll is located the reservoir 18 for the holding of any suitable cleaning compound, which reservoir supplies moisture to the felt wiper 33. This reservoir is mounted on a pivoted arm 33', which arm is thrown over so as to place the felt wiper 33 against the surface of the held plate, the movement of which wiper is accomplished by the slide 26' on left side engaging the arm 34. This arm as depressed bears against a stud projecting from

the said pivoted arm 33' and by depressing the same forces over the upper end thereof and causes the felt wiper 33 to bear against the surface of the held plate and moisten the same. The purpose of thus moistening the plate is that the properties of the cleaning compound thus applied to the held plate may better remove or cut such ink as adheres to the surface of the said plate after being carried past the first wiper-roller 17. The movement of the plate-carrier being continued, the said slide 26' bears onto the hinged arm 34', which as depressed bears against or onto the stud 35, projecting from the pivoted lever 35', which lever as thus depressed depresses the lower wiper-roller 17', which in turn forces a new surface of the paper web onto the surface of the held engraved plate, which by frictional contact therewith thoroughly wipes and polishes the surface of the said plate. The surface of the rolls 17 and 17' is composed of rubber, the frictional quality of which is sufficient when the rolls are rotated to advance the web of paper proportionately to the rotation of the said rolls. The plate is now in condition to be printed from; but before doing so the said plate-carrier must be restored to its original position, it being returned by a reverse movement being imparted to the shaft 6. It is essential that the main ink-applying or fountain roll 14 be kept revolving in one direction only, which is accomplished by means of the gear 36, loose on the main shaft 6 of the machine, engaging with gear-pinion 36', mounted on the lower end of the longitudinal shaft 37, which shaft at its upper or outer end carries a pinion 37'. This pinion meshes with the gear 38, which is secured to the end of the shaft carrying the main ink or fountain roll 14. The roller is thus caused to rotate on the forward stroke of the plate-carrier by means of pawls 38' engaging with the ratchets 39, secured to the cross-shaft 6, Fig. 1 of the drawings.

It will be understood that the levers which actuate the roller-wipers 17 and 17' are adjustable by means of suitable thumb-screws 39', which work in the frame of the said wipers for the purpose of adjusting the pressure of the said rollers onto the surface of the engraved plate held by the plate-carrier, and it will be understood that it is the gripping qualities of the rubber surface of the said wiping-rollers which causes to be moved or advanced forwardly the web of paper. These roller-wipers have rotary motion imparted thereto by means of the segment-rack 40, which meshes with a small cog-pinion 41, mounted on a shaft 42, to which is secured a cog-gear 42'. This gear 42' meshes with the pinions 43 and 43', mounted, respectively, on the shafts carrying the wiping-rollers. The pinions 43 and 43' are held locked to the shaft of the respective wiping-rollers by means of

the pawls 44, which engage with the ratchet or ratchet-wheels 44', secured to the shafts of the said wiper-rollers. By this form of connection the said wiper-rolls are only driven in one direction, being held locked against movement on the return movement of the carrier-frame. It will be understood that the segment-rack 40 is loose on the main shaft of the machine and is oscillated with the swinging movement of the said plate-carrier by a dog on the main shaft engaging-pin on segment-rack. This segment-rack is returned or restored to position by the tension of the spring 45, which connects the tail extension thereof to the bed of the machine, while the plate-carrier is returned to its position by operator. It will also be understood that the said vertical slide-plates are depressed prior to the forward movement of the plate-carrier by means of the levers 46 46', which are pivoted to the inner surface of the respective side plates of the machine. These levers at their inner ends are connected by a cross-rod 47, which extends through a slot 47', cut in each of the depressible slide-plates. One of the pivoted levers is provided with a continuation 48, which forms a handle. This handle when depressed throws downward the inner ends of the pivoted levers, which in turn, bearing onto the vertical slide-plates, move the same downward. These vertical slide-plates, it will be understood, are arranged within the carrier-frame, the lower end of each lever slide-plate being bifurcated, so as to straddle the rotatable shaft 6 of the machine.

The moment the plate-carrier has been restored to its normal position, with the held engraved plate wiped and polished, the operation of printing from the inked plate may be proceeded with. For this purpose the depressible vertical slide-plates 23³ and 23' are raised by lifting the handle 48, which places the rack portion of the slide-plate 23' in mesh with the teeth of the mutilated gear 25 of the impression-roll. As the plate-carrier is then swung forward the projecting stud 49 on the left side of the carrier-frame engages with a dog 49', Figs. 16, 17, and 18 of the drawings, said dog in turn engaging with a pin 50 on the impression-roller shaft and being depressed for the purpose of allowing the impression-roller to rotate when brought into mesh with rack portion of the vertical slide-plate 23'. Simultaneously with this movement of the impression-roller the vertical slide-plate 23³ on the right side of the press engages with the outer section 50' of the slide 51. This slide 51 is regulated by the adjusting-screw 52, which accommodates the slide to cards of varying size. The outer ends 52' of the slide-section 50' engages the edge of the lowermost card of the stack placed in the feeder-frame 52' and forces the same forward beneath the

gate 52², said gate being for the purpose of permitting only one card at a time to pass to the impression-roller. The slide-section 50' is pivoted to the slide 51 at one end, so that the same may be swung or raised upward to release the depressible slide-plate when card is in bight of the impression-roller. The card is carried forward with the movement of the carrier-frame by the sliding card-feeder 52', which is actuated by the movement of the slide 51. When the card is in the bight of the impression-roller, the vertical slide-plate 23³ is released from engagement with the pivoted section 50', and the slide 51 is returned to its normal position by the tension of the springs 53'. As the cards pass from under the impression-roller the same are delivered onto the swinging card-receiver 54, which receiver is held to the arms 54'. These arms are secured to the rock-shaft 55 on the right-hand side of the press, said shaft being provided with a cog-pinion 55', which engages with the rack 56 of the segment-plate 56', pivoted to the main frame of the machine. The purpose of this rack is to operate the pinion 55' to partly rotate the shaft 55 in order to swing the receiver 54 to deliver the engraved card 57 to the tilting platform 57². The pivoted segment-plate 56' is actuated by means of a pin 58, projecting from the right side of the plate-carrier, engaging an arm 58', depending from the said segment-plate 57'. After the card has been deposited on the platform 57² the said swinging receiver 54 is returned to its proper position by means of the tension of the spiral spring 59, which surrounds the shaft 55.

The tilting platform 57² is secured to the bracket 57³, pivoted to an arm 58² forwardly projecting from one side of the main frame. The said bracket 57³ is thrown over toward the feed end of the machine by means of the pivoted lever-arm 58², which is drawn inward by a dog 59² on the main shaft engaging the shoulder 59³ of the lever-arm 58². As thus thrown over the platform 57² is tilted to deposit the printed card onto the holder 61. The moment the dog 59² has been carried past the shoulder 59³ the tilting platform 57² is returned to normal position by the weight 62, secured to the outer portion of the pivoted bracket 57³.

For the purpose of enabling the engraved plate 21 to be removed from the plate-carrier or a plate to be printed from to be readily attached thereto it is preferable that the card-feeder be arranged to swing clear of or to one side of the press, so as to be out of the way, thereby permitting free access to the plate-carrier and the clamping means for the engraved plate. For this purpose the frame 52 of the card-feeder mechanism is attached to one side of the press-frame by any suitable hinge 60. Being thus connected, the

card-feeder may be swung laterally and clear of the plate-carrier.

Having thus described the invention, what is claimed as new, and desired to be protected by Letters Patent, is—

1. In a press for the described purpose, the combination with the frame thereof, of a plate-carrier mounted to rock or oscillate within the same, of means carried thereby for clamping an engraved plate to the said carrier, an impression-roller held within the frame above the plate-carrier, of inking means arranged at the forward end of the press, of wiping-rollers and cleaning device located below the inking means, of devices for actuating the inking means on the forward stroke of the plate-carrier to ink the surface of the plate carried thereby and for operating the wiping-rollers and cleaning device to remove the surplus ink therefrom and polish the surface of the plate, of means for returning the plate-carrier to its normal position after the polishing of the surface of the inked plate, a card-feeder for supplying cards to be printed, means carried by the plate-carrier for actuating the card-feeder and the impression-roller on the return forward stroke thereof, and devices for operating said means to coact respectively with the card-feed mechanism and the impression-roller.

2. In a press for the described purpose, the combination with the main frame thereof, of an oscillatory plate-carrier mounted to swing therein, of clamping means carried thereby for holding an engraved plate thereto, of devices for inking, wiping and polishing the surface of the held plate on the forward stroke of the oscillatory plate-carrier, and means carried by the said carrier for actuating the inking, wiping and polishing devices on the forward movement of the said plate-carrier.

3. In a press for the described purpose, the combination with the main frame, of an impression-roller mounted therein, a rack-gear secured to the impression-roller, of an oscillatory plate-carrier working within the main frame, means carried thereby for the clamping of an engraved plate thereto, a vertically-movable rack-plate carried by the plate-carrier, and devices for moving the same in and out of mesh with the gear of the impression-roller.

4. In a press for the described purpose, the combination with the main frame of an oscillatory plate-carrier arranged to swing within the said frame, an impression-roller mounted in the main frame above the plate-carrier, of card-feeding mechanism, a vertically-movable slide-plate carried by the plate-carrier for actuating the card-feeding mechanism, and devices for raising and lowering said slide-plate to place the same into and out of engagement with the said card-feeding mechanism.

5. In a press for the described purpose, the

combination with the main frame thereof, of the oscillatory plate-carrier, of means for clamping an engraved plate thereto, of the ink-supplying rolls for inking the surface of the held plate, devices carried by the plate-carrier for actuating said rolls to ink the surface of the held plate on the forward stroke of the plate-carrier, and means for adjusting the pressure of said inking-rolls.

6. The combination with the oscillatory plate-carrier, of means for clamping an engraved plate thereto, of inking-rolls for applying ink to the surface of the held plate on the forward stroke of the plate-carrier, and an adjustable slide carried by the plate-carrier for actuating the said ink-applying rolls on the forward stroke of the plate-carrier.

7. In a press for the described purpose, the combination with the oscillatory plate-carrier, of the wiping-rolls for removing the surplus ink applied to the surface of an engraved plate held to the plate-carrier and polishing the surface of said plate, of devices carried by the plate-carrier for forcing the wiping-rolls toward the held plate on the forward stroke of the plate-carrier, a web of paper working over the wiping-rolls and advanced by the frictional engagement of the said rolls therewith, and means for imparting rotation to the inking-rolls.

8. In a press for the described purpose, the combination with an oscillatory plate-carrier, of means for clamping an engraved plate thereto, a web of paper for removing the surplus ink applied to the surface of the held plate, of devices for forcing the paper onto the surface of the inked plate during the forward stroke of the carrier-plate, and means for advancing the web of paper over the surface of the plate.

9. In a press for the described purpose, the combination with an oscillatory plate-carrier, of means for clamping an engraved plate thereto, a web of paper for removing the surplus ink applied to the surface of the held plate and polishing the surface thereof, of rolls for forcing the web of paper against the surface of the plate, mechanism for rotating the rolls for advancing the web by frictional contact, and means for moistening the surface of the held plate with a suitable cleaning compound.

10. In a press for the described purpose, the combination with an oscillatory plate-carrier, of the wiping-rolls, a web of paper, working over the face thereof, of devices for throwing the rolls toward the surface of the inked plate to place the paper thereon during the movement of the carrier-plate, of mechanism for actuating the rolls to impart travel to the web of paper.

11. In a press for the described purpose, the combination with the main frame, of the impression-roller mounted therein, of an oscillatory plate-carrier working within the

main frame, card-feed mechanism for delivering cards to be printed, devices carried by the plate-carrier for actuating the card-feed mechanism and imparting rotation to the impression-roller, a swinging receiver for the printed cards, and means for operating said swinging receiver to deliver the printed cards onto a suitable holder.

In testimony whereof I have hereunto affixed my signature in the presence of witnesses.

GEORGE H. GIHON.

Witnesses:

N. A. ACKER,
D. B. RICHARDS