

**No. 672,523.**

Patented Apr. 23, 1901.

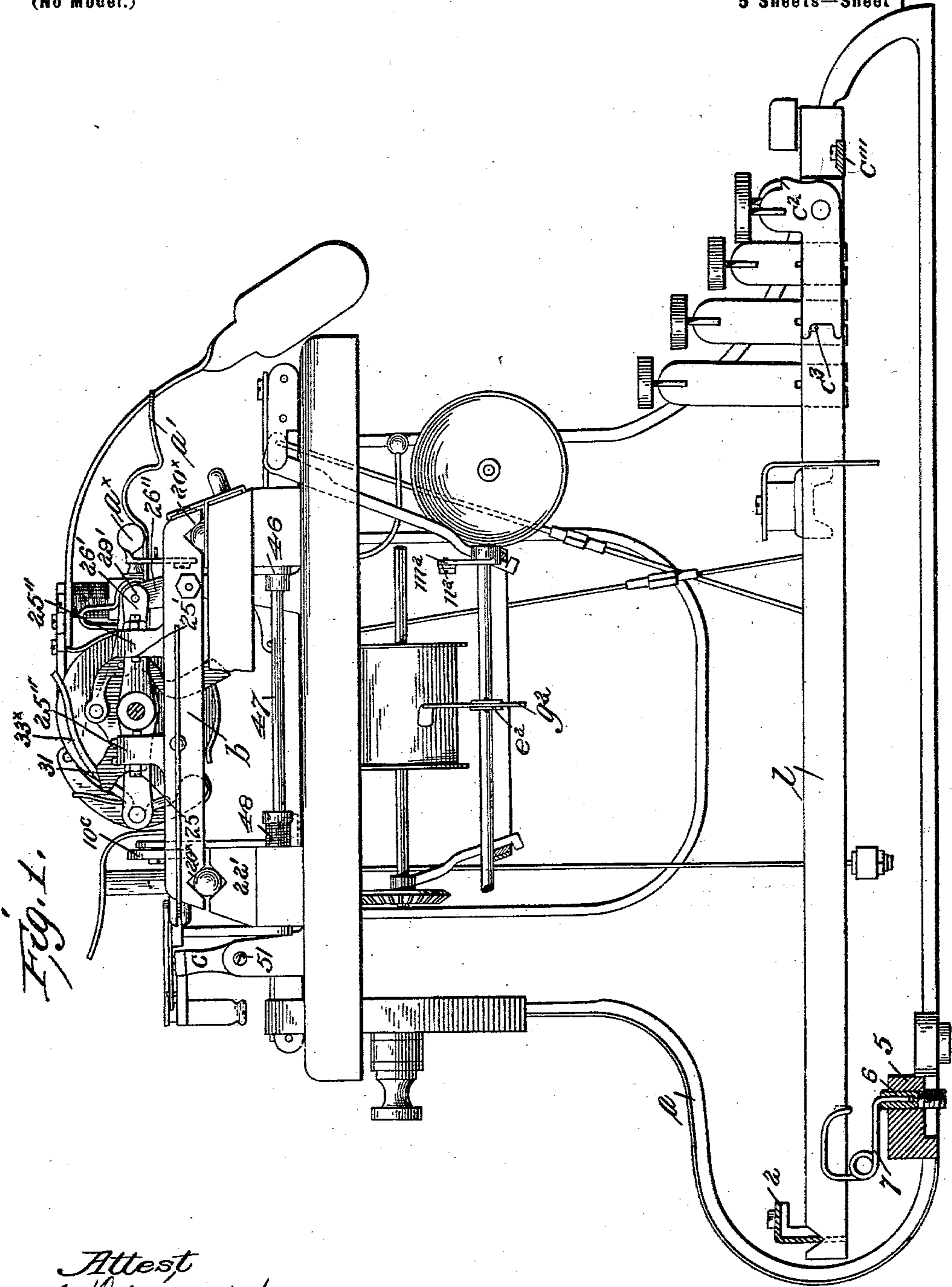
**W. R. FOX & G. J. BARRETT.**

TYPE WRITER.

(Application filed Oct. 1, 1898.)

(No Model.)

5 Sheets—Sheet 1



Attest  
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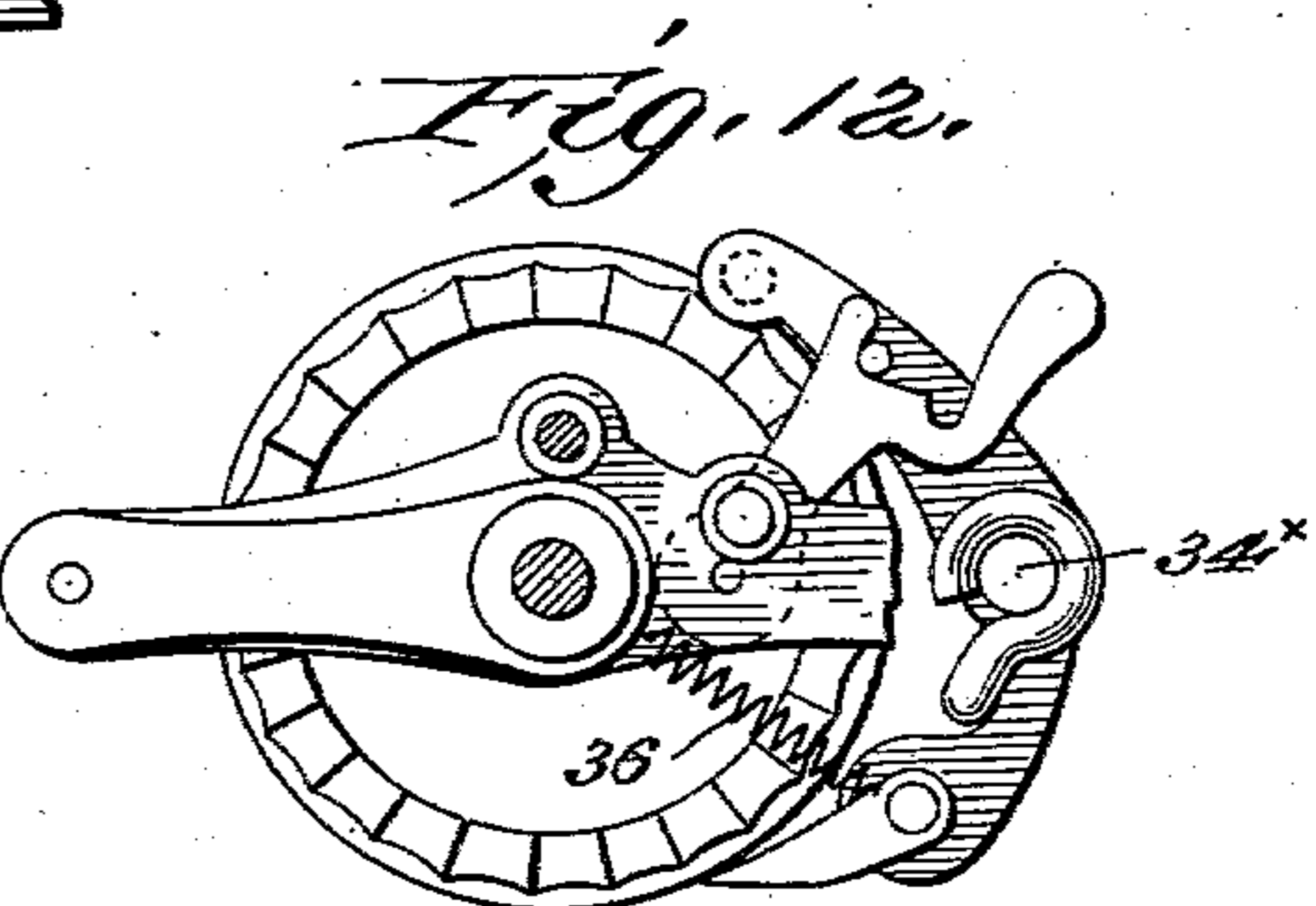
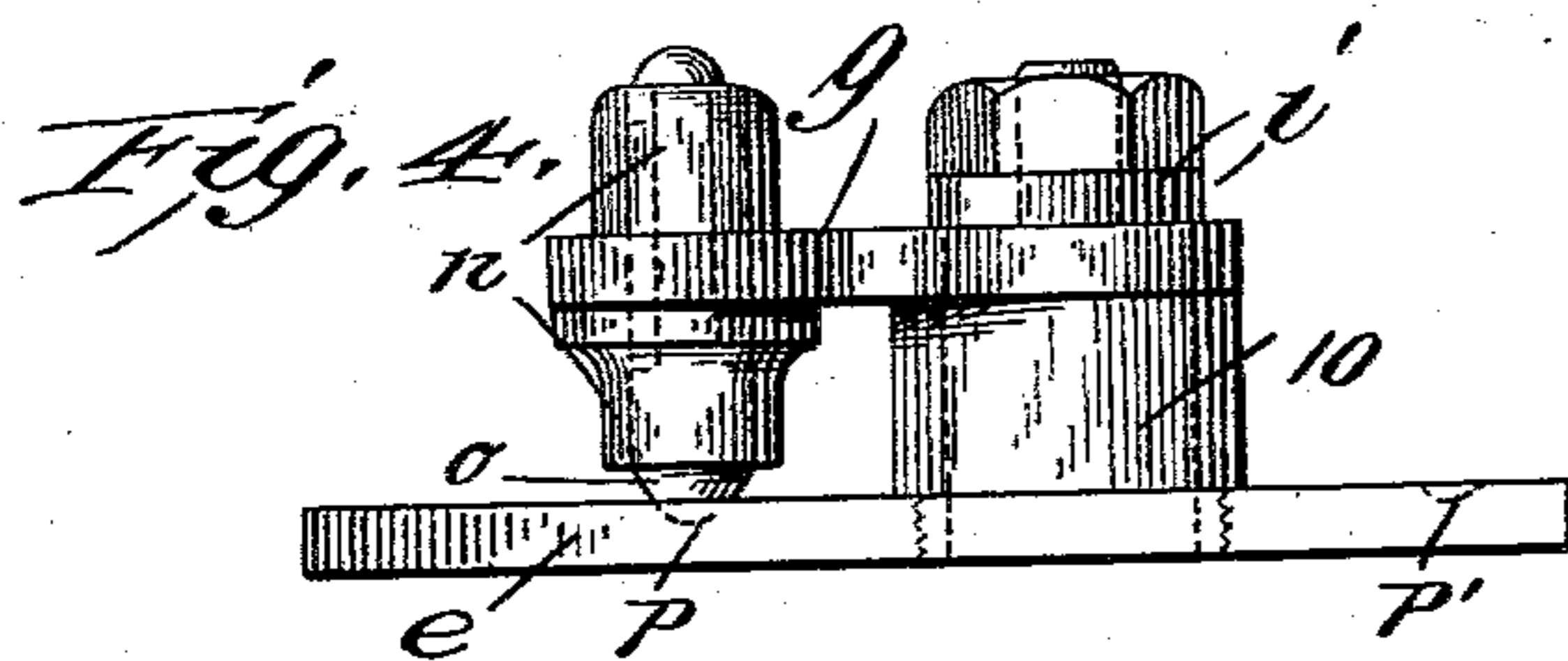
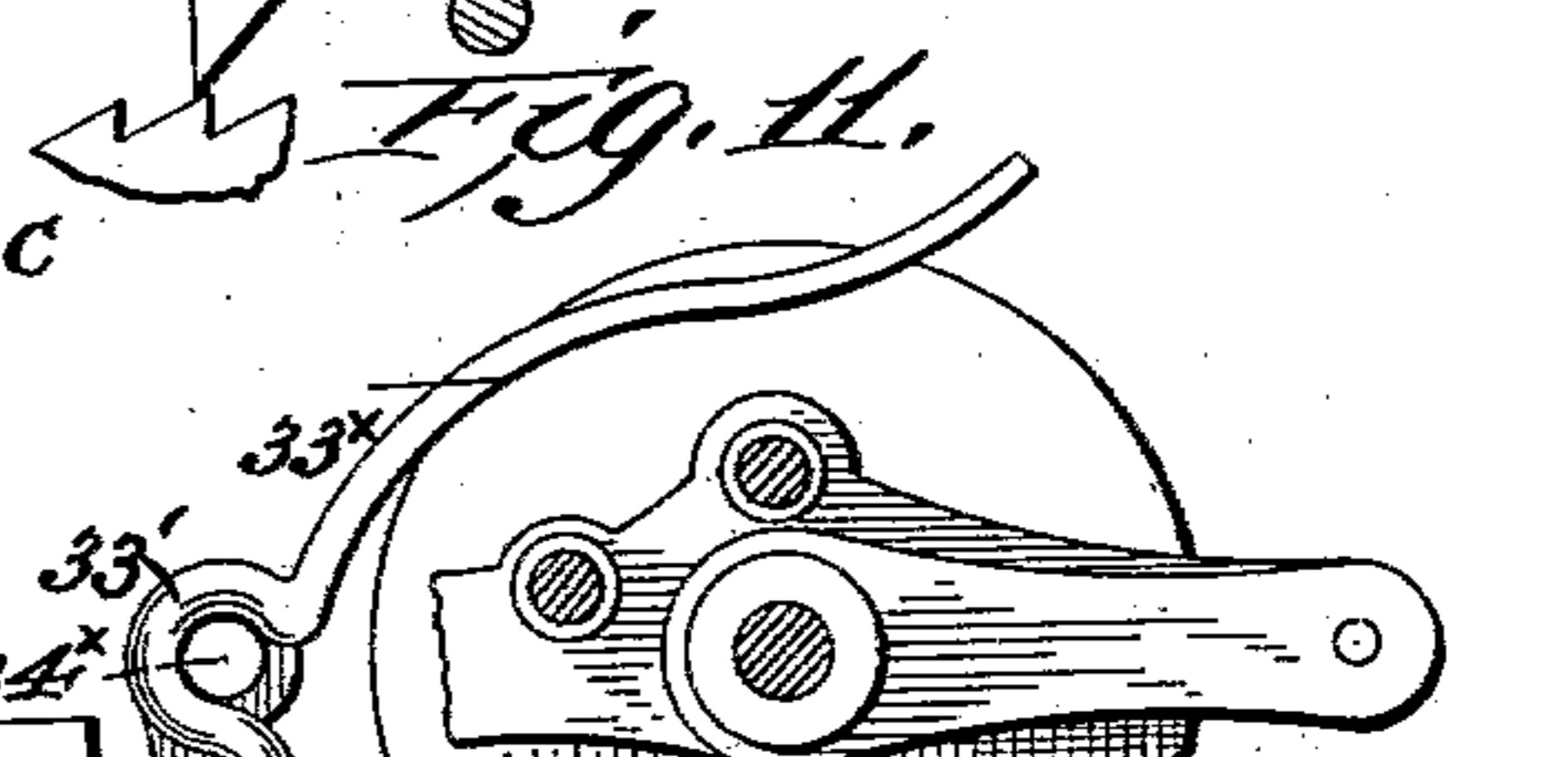
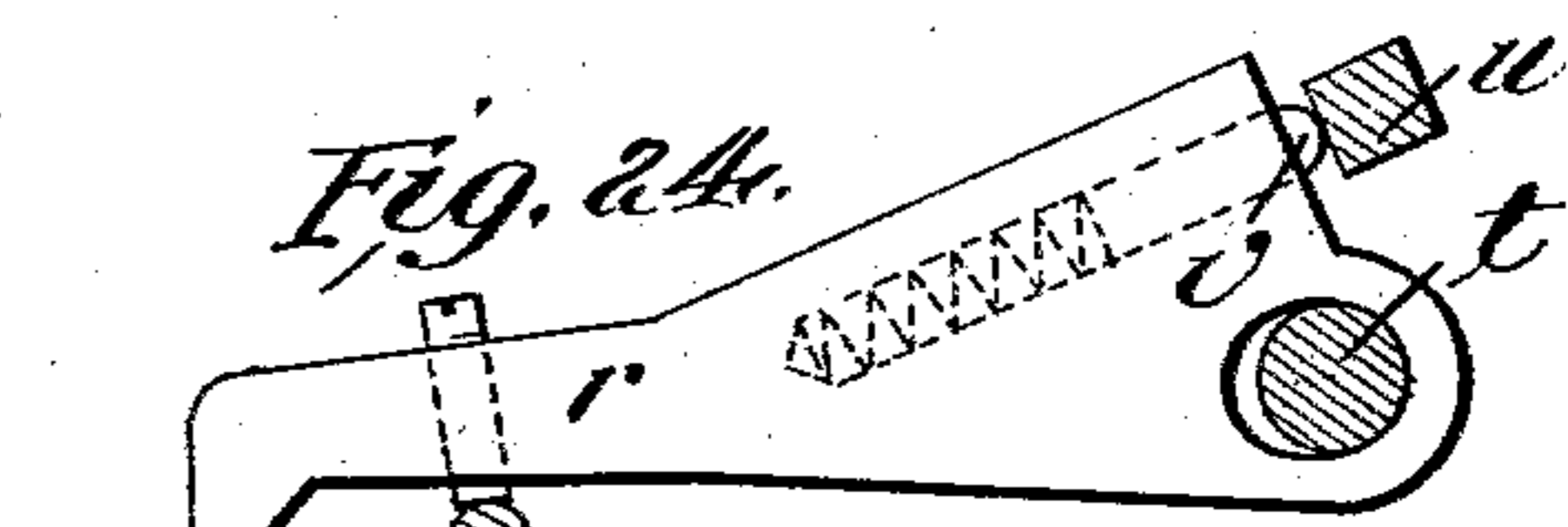
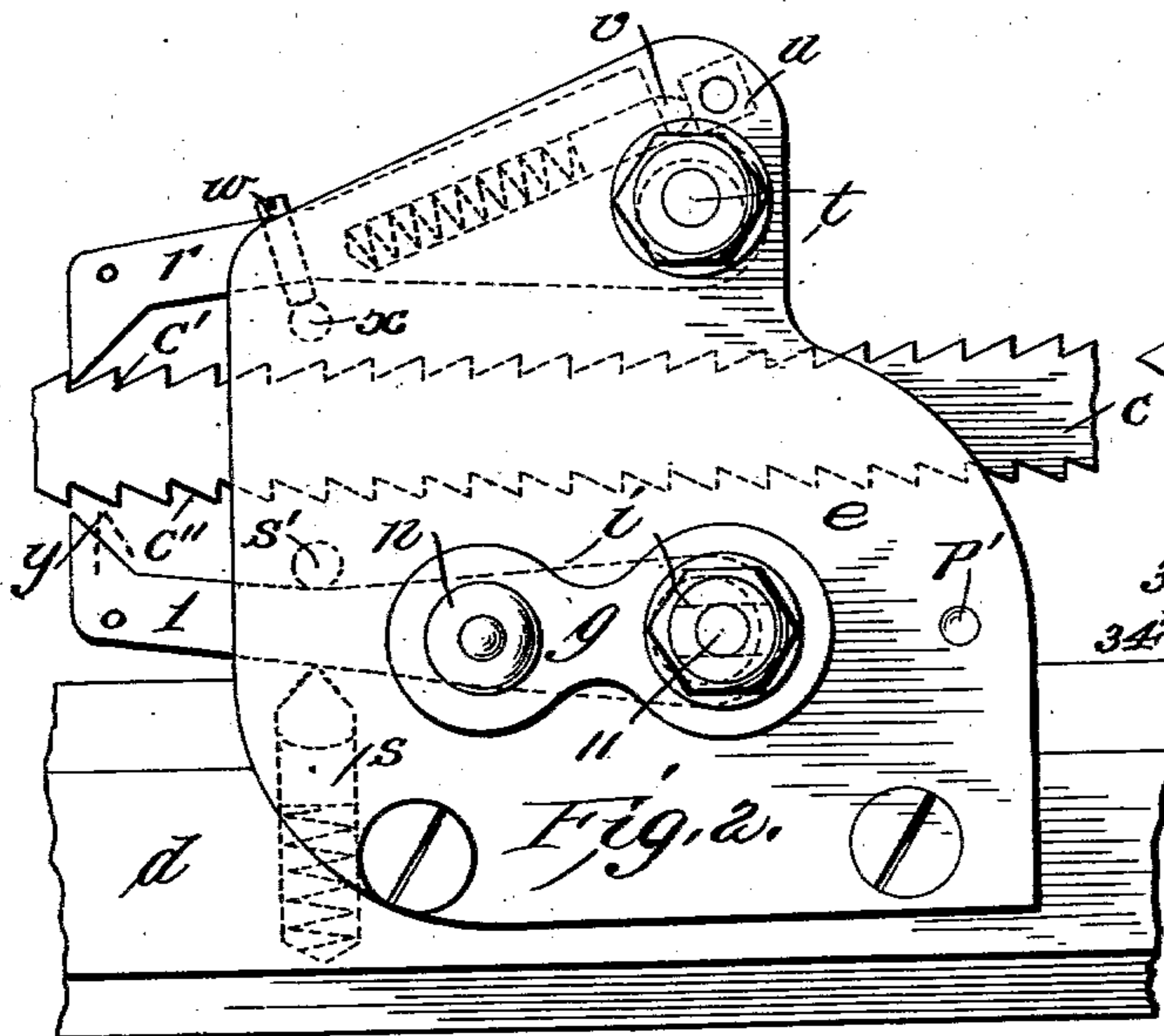
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No. 672,523.

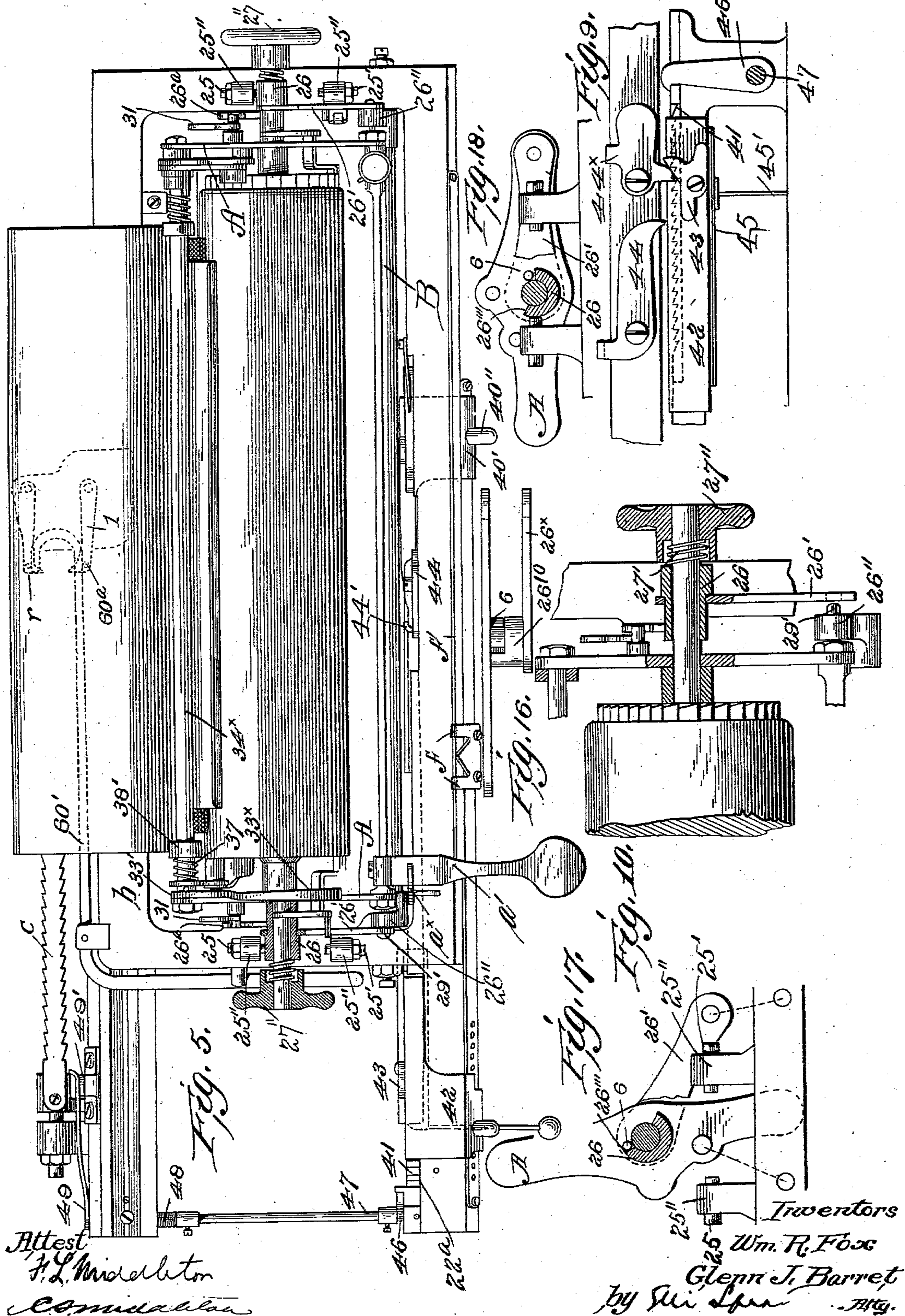
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W. R. FOX & G. J. BARRETT.  
TYPE WRITER.

(Application filed Oct. 1, 1898.)

(No Model.)

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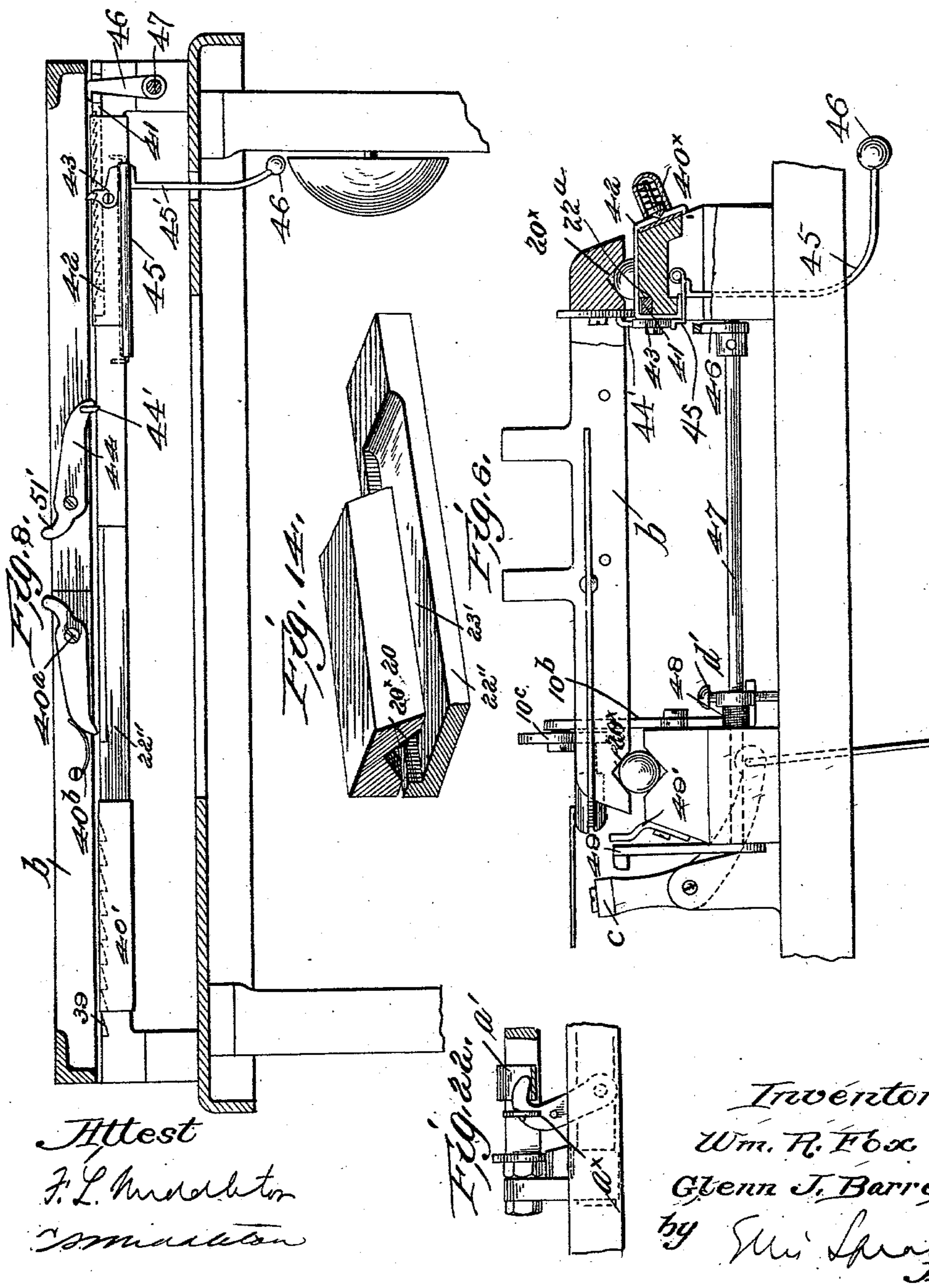
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(No Model.)

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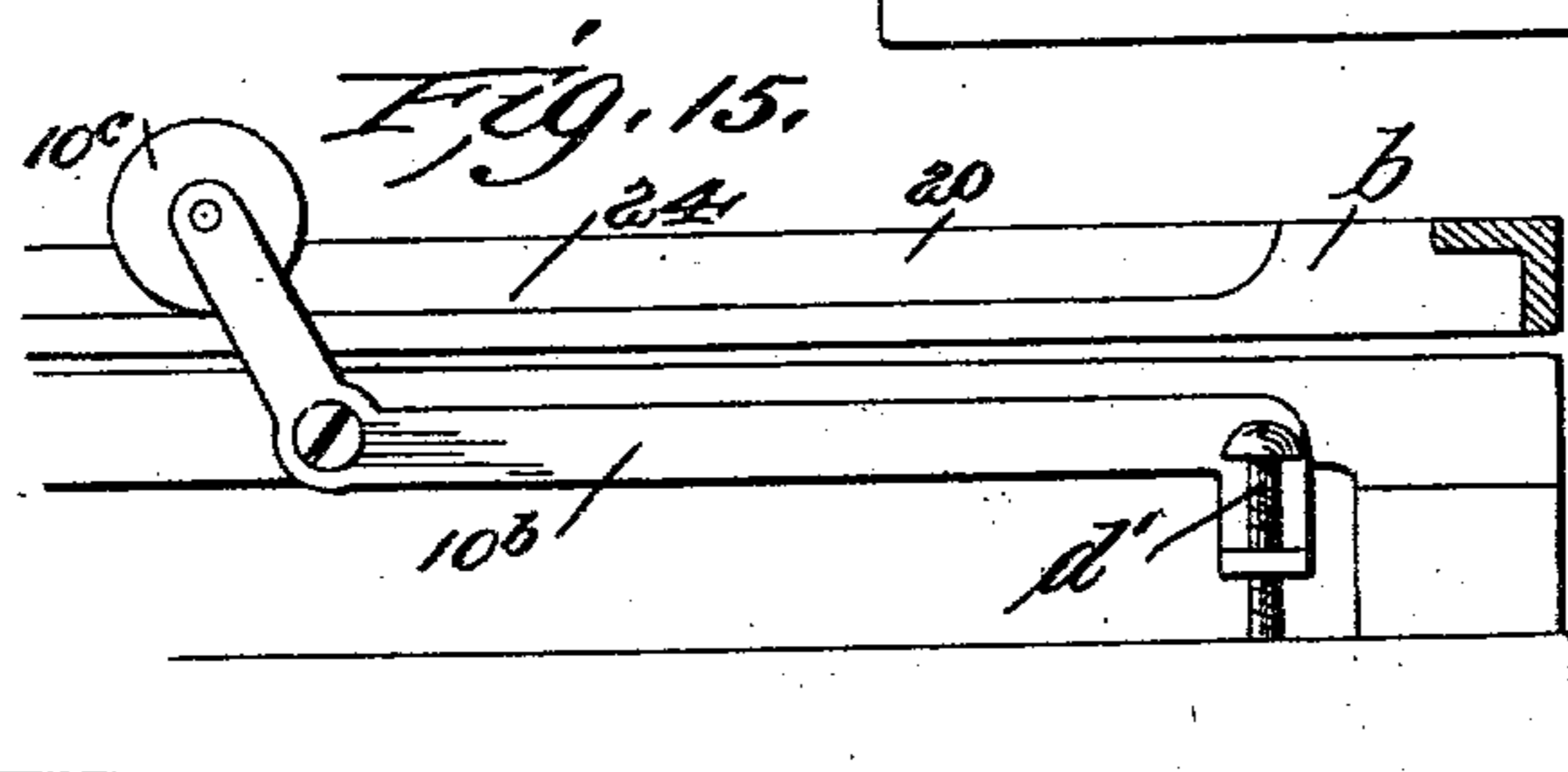
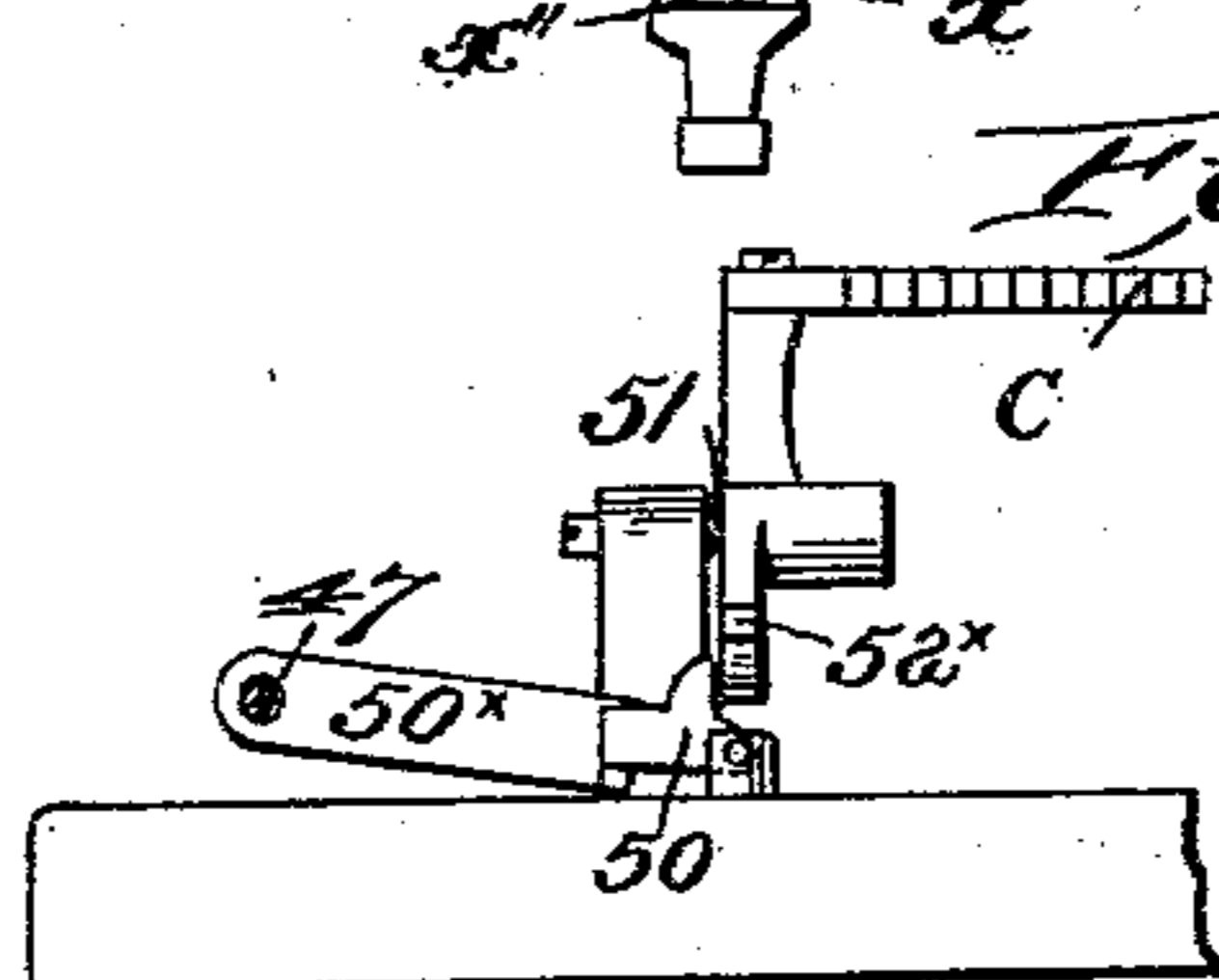
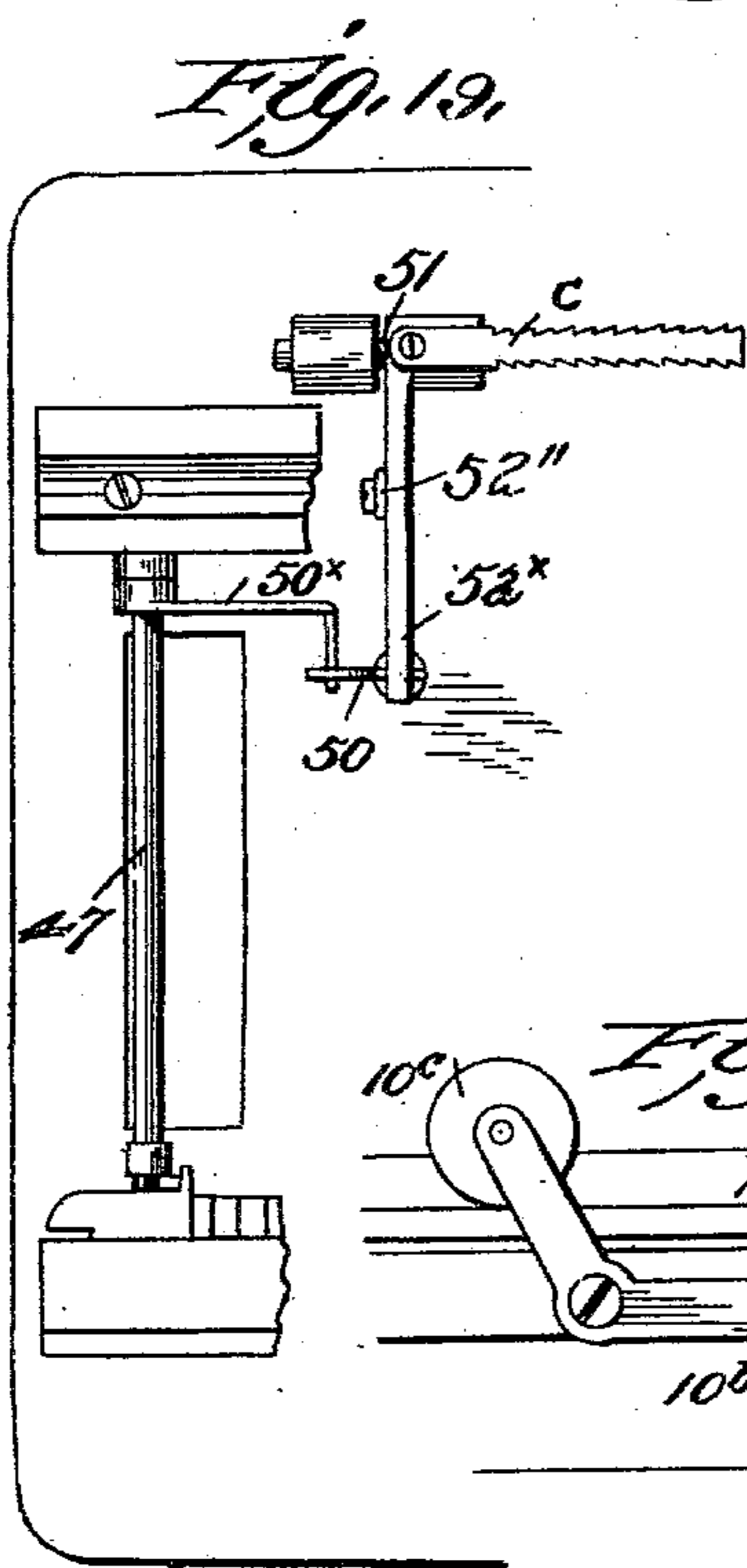
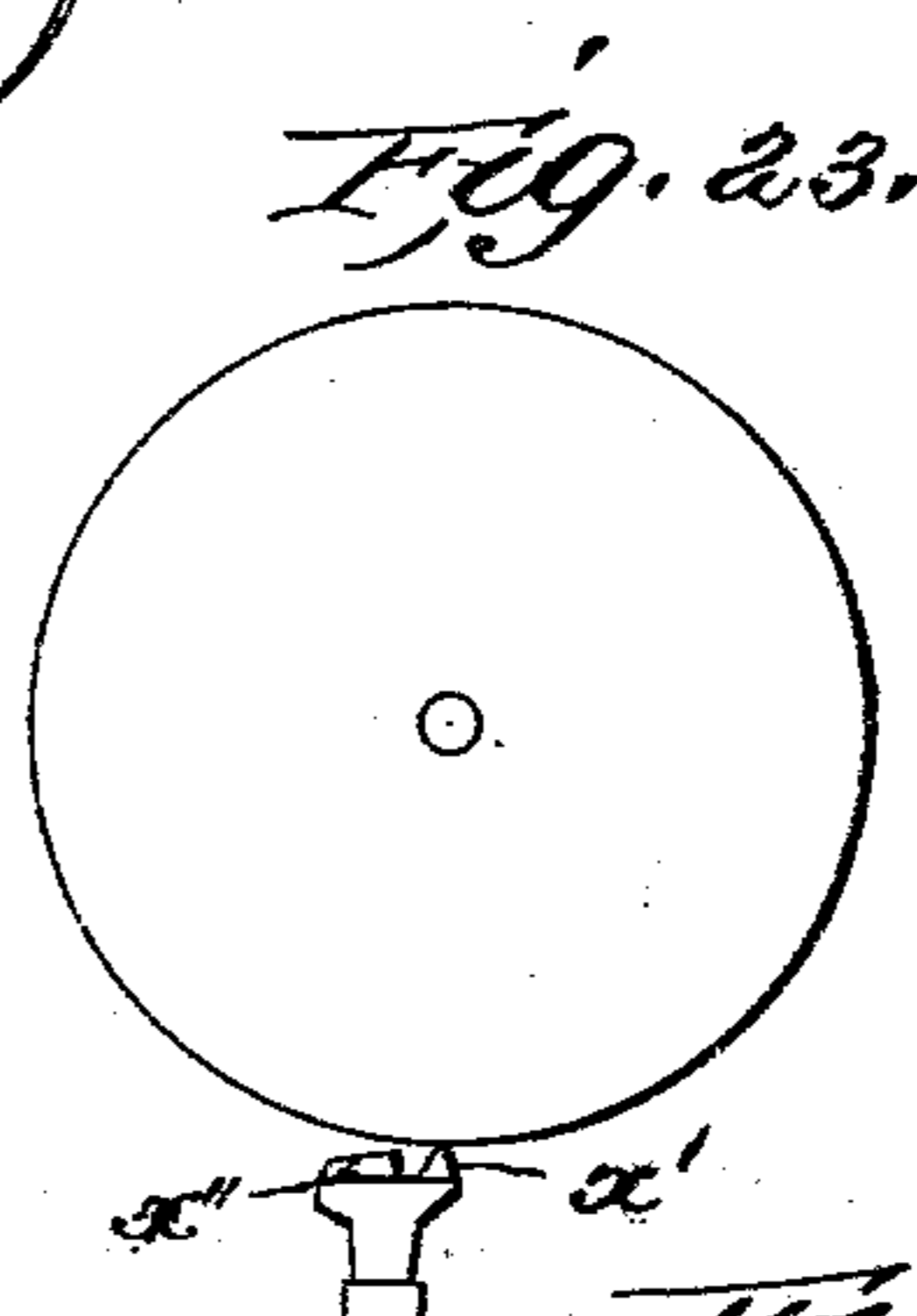
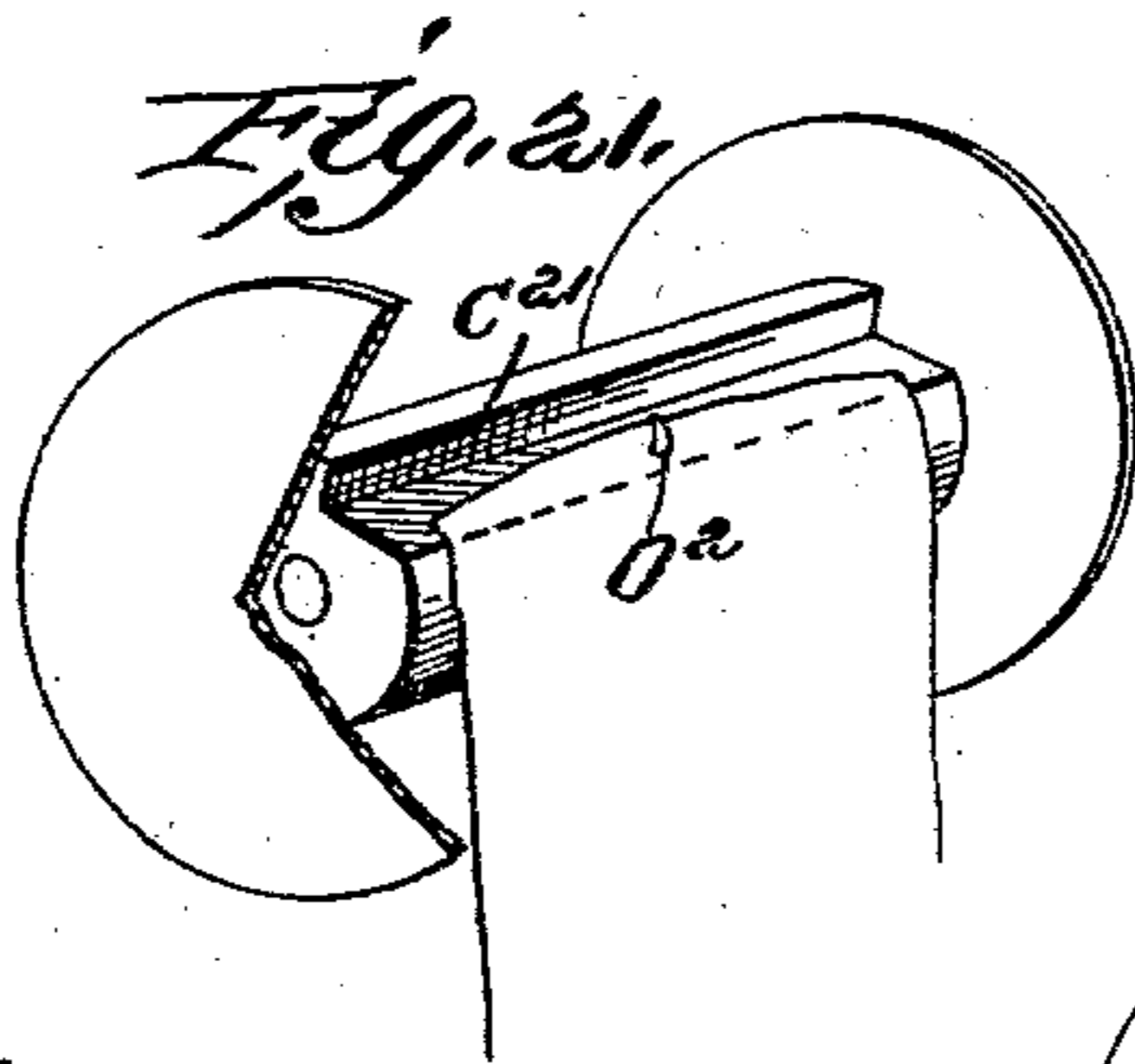
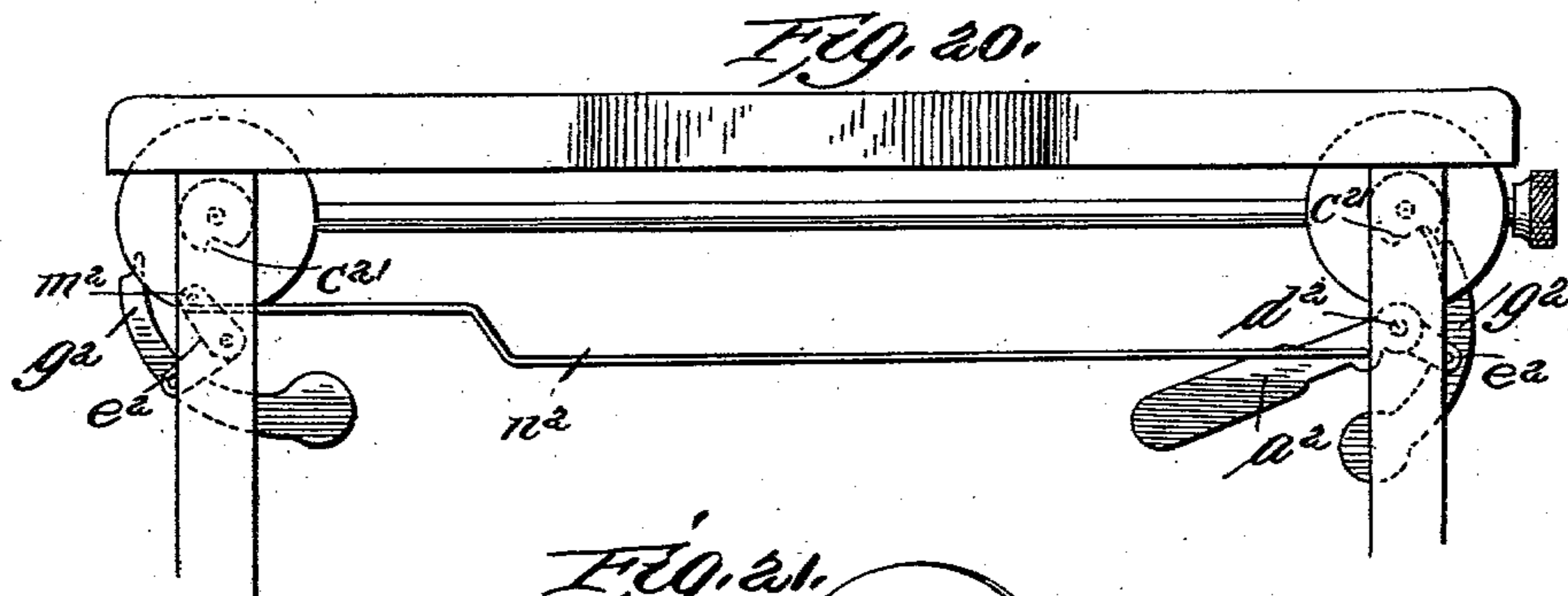
W. R. FOX & G. J. BARRETT.

TYPE WRITER.

(Application filed Oct. 1, 1898.)

(No Model.)

5 Sheets—Sheet 5.



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# UNITED STATES PATENT OFFICE.

WILLIAM R. FOX AND GLENN J. BARRETT, OF GRAND RAPIDS, MICHIGAN,  
ASSIGNORS TO THE FOX MACHINE COMPANY, OF SAME PLACE.

## TYPE-WRITER.

SPECIFICATION forming part of Letters Patent No. 672,523, dated April 23, 1901.

Application filed October 1, 1898. Serial No. 692,399. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM R. FOX and GLENN J. BARRETT, citizens of the United States, residing at Grand Rapids, Kent county, Michigan, have invented certain new and useful Improvements in Type-Writers, of which the following is a specification.

Our invention relates to type-writers; and it is designed to improve the general construction and operation of the same, the improvements herein specified relating chiefly to the carriage mechanism.

To this end the invention includes an escapement mechanism adapted to be readily changed from regular to speed adjustment, the mechanism also being constructed so that the carriage will be retained when pushed back at the very mark of graduation to which it is moved and will not slip back under the tension of the carriage-spring the distance of one or two graduations before being arrested.

It also includes a lock for the printing mechanism operated when the end of a line has been reached and an adjustable device for controlling the same.

It further includes a signaling device to denote when the ribbon has been unwound from the ribbon-spools.

It also includes the several details of construction, as will be hereinafter described, and particularly pointed out in the claims.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the type-writer with parts in section. Fig. 2 is a detail plan view of the escapement mechanism. Fig. 3 is a sectional view thereof. Fig. 4 is a detail view of a part of this mechanism. Fig. 5 is a plan view of the carriage. Fig. 6 is a detail end view of the carriage and a portion of the frame with parts in section. Fig. 7 is a detail view of the platen-shift key. Fig. 8 is a view of the inner side of the front rail of the carriage. Fig. 9 is a similar view showing a modification of the bell-ringing mechanism. Fig. 10 is a detail view, partly in section, of the mechanism which allows the platen to be removed bodily. Figs. 11 and 12 are views of the left and right hand ends of the platen, respectively. Fig. 13 is a detail view of the link-supports for the

platen. Fig. 14 is a detail of the front track-rail and the front of the carriage. Fig. 15 is a detail view of the means for holding down the back of the carriage. Figs. 16, 17, and 18 are views of details. Figs. 19 and 19<sup>a</sup> show a modification of the means for locking the printing mechanism. Fig. 20 is a view of the semaphore mechanism. Fig. 21 is a view of one of the ribbon-spools, and Fig. 22 is a view of the lock for holding down the platen. Fig. 23 is a view showing the dash-type-bar head carrying the dash-type in its relation to the platen. Fig. 24 is a detail view of the escapement-pawl.

The frame of the machine has a carriage *b* slidably mounted thereon, to the rear of which the escapement mechanism is located, which comprises a double-face oscillating rack-bar *c*, mounted upon a shaft journaled in studs projecting from the top of said frame and a detent and pawl for engaging the same carried by the carriage. Our improvement in the escapement mechanism relates particularly to the arrangement of this pawl and detent, the rack-bar being oscillated as described in Patent No. 614,943, previously granted to us.

To the face of the rear side *d* of the carriage-frame a flat plate *e* is secured by suitable screws, which projects beyond said frame and extends across the rack-bar *c*.

Through a sleeve 10, screwed into the plate *e*, a pin 11 passes, which has a flange 12 abutting the under side of the sleeve 10, and a reduced threaded upper portion extends above the sleeve 10, to which a horizontal arm *g* is clamped by means of a washer and nut *i*. The lower end of the pin is provided with an enlarged head, between which and the flange 12 the detent *l* is pivoted on said pin, this portion of the pin being arranged slightly eccentric to the part that passes through the sleeve. The arm *g* carries at its end a vertical sleeve *n*, in which a spring-pressed plunger *o* is held, the lower or pointed end of which is designed to engage either one of the oppositely-arranged depressions *P P'* in the face of the plate *e*. When the plunger is seated in the depression *P*, the detent is held in such a position that its engaging point is directly opposite the point of the pawl *r* which

is in engagement with the teeth  $c'$  of the rack-bar  $c$ . A spring-pressed plunger  $s$ , held in a horizontal socket in the rear bar of the carriage, presses the detent toward the rack-bar until it bears against a stop-pin  $s'$ , depending from the plate  $e$ .

The pawl  $r$  is mounted upon the eccentric portion of a pin  $t$ , depending from the plate  $e$  and provided with a reduced threaded stem, which passes through said plate and is surmounted by a nut and washer to retain the pin in place. The rear portion of the pawl is provided with a slightly-elongated slot, through which the pin  $t$  passes. From the plate  $e$  to the rear of the pivot-pin  $t$  a post  $u$  depends, against which a spring-plunger  $v$ , held in a socket in the pawl  $r$ , bears. This socket extends at an angle to the rack-bar  $c$ , and the pressure of the spring against the plunger tends to force the pawl both forward or in the direction of the feed of the carriage and into engagement with the teeth  $c'$  of the rack. To secure a fine engagement of the pawl with the teeth  $c'$  of the rack-bar, a screw-pin  $w$  extends transversely through the former and finds a bearing against a post  $x$ , depending from the plate  $e$ . By this means the movement of the pawl toward the rack-bar may be regulated. The pawl while in engagement with the rack-bar is forced by the carriage tension against the resistance of the plunger carried thereby into its extreme rearward position, pressing the front wall of its elongated slot against the pivot-pin  $t$ . On the depression of a key-bar the pawl is freed from the teeth  $c'$  by the rack-bar rocking toward the detent, when the plunger carried by said pawl at once forces the same forward until the rear wall of the elongated slot bears against the pivot-pin. By reason of the cam portion on this pin or its eccentricity the amount of movement the pawl may have can be varied. On the forward rock of the rack-bar the pawl is adapted to snap forward under the impulse of its plunger only a sufficient distance (about one one-hundredth of an inch) to bring the engaging point thereof just past the tooth of the rack from which it is released. The forward movement of the carriage is prevented on the depression of the key-bar by the detent engaging a tooth of the rack  $c''$ , directly opposite to the one in the rack  $c'$  from which the pawl has just been released. Upon the return of the key-bar the rack-bar also returns, but as the pawl has snapped ahead it cannot come back in the same tooth as before. Hence the carriage must move ahead until the pawl strikes the wall of the next tooth. Under ordinary conditions the feed of the carriage does not take place until the return of the key-bar; but for very rapid writing it is necessary to have the feed of the carriage take place when the key is depressed, and this is secured by swinging the arm  $g$  around until the plunger  $o$  is seated in the depression  $P'$ . As the pin  $l$  is turned upon the swinging of

the arm  $g$ , its eccentric portion is brought toward the rear, which draws the detent rearwardly, so that its point will be in the position indicated at  $y$  or with its engaging point to the rear of the engaging point of the pawl. With the parts in such a position, on the depression of a key-bar the rack-bar will be rocked forwardly out of engagement with the pawl, and as the engaging point of the detent is in the rear of the tooth of the rack  $c''$ , directly opposite that of the rack  $c'$  from which the pawl has just been released, the carriage will spring forward until the wall of said tooth in the rack  $c''$  engages said detent. The movement of the carriage brings the engaging point of the pawl in a position when the key is released and the rack-bar returns to just engage the next tooth of the rack  $c'$ , and the carriage steps forward only the distance permitted by the elongated slot, which, as before stated, is very slight, being only about one one-hundredth of an inch. The eccentricity of the pivot of the pawl  $r$  permits the latter to be adjusted to increase or diminish its longitudinal movement.

The detent  $l$  has no movement whatever under carriage tension in either of the arrangements of escapement mechanism, while the pawl has exactly the same amount of movement in both the reverse and ordinary arrangement of escapement mechanism.

The infinitesimal movement of the pawl  $r$  longitudinally of the rack is merely to make doubly sure the proper operation of the escapement mechanism, as this will operate if the pawl has no movement parallel with the rack-bar, as it is clear that unlike the ordinary escapement mechanism the feed of the carriage does not depend upon the movement of a pawl member, but upon the relative positions of the engaging points of the pawl and detent. It will be understood that if both the pawl  $r$  and detent  $l$  were fixed as to longitudinal movement and that if the engaging point of the pawl was when set for ordinary feed an infinitesimal distance (say one one-hundredth of an inch) in advance of the engaging point of the detent the escapement-action would be secured. The cardinal feature of the escapement is that the carriage feeds without carrying either the pawl or detent along with it, and these parts act to arrest the carriage at the end of its step. This being true, to secure a reverse feed it is merely necessary to change the relative arrangement of the engaging points of the pawl and detent. It does not require the provision of means to first lock one member of the engaging pawls, so that when the parts are set for one escapement-action, it will perform the function of a rigid detent, while the other pawl will be free, and then to reverse this arrangement releasing the member previously locked and locking the previously-free member to secure the reverse feed, as has been done, nor the provision of three pawls, nor the provision of means for giving the rack-bar an

irregular movement—i. e., causing it to move in different paths to secure different carriage-feeds.

The key-bars 1 are all fulcrumed at their rear ends upon the edge of the vertical member of an angular bracket 2, extending from side to side of the frame *a*. Beneath the bars and in advance of their fulcrum-points is a bar 5, extending from side to side of the frame, provided with a plurality of openings, into which are threaded the vertical sockets 6, each one of which receives the end of one of the coil-springs 7, one of which is provided for supporting each key-bar. By adjusting the sockets in the bar 5 the individual tensions of the springs may be varied, so that a uniform touch may be secured.

The platen-carriage *b* has V-shaped grooves 20×20 in its lower face at the front and rear, while the rear track 22' has a V-shaped groove in its face and the front track 22'' has a flat space centrally thereof at 23', Fig. 14, which allows the carriage to center itself. At 24, Fig. 15, the carriage has a depression in which the wheel 10<sup>c</sup> works to hold the carriage against vertical displacement. The bell-crank lever 10<sup>b</sup>, pivoted to the track-frame, supports this wheel, and an adjusting-screw *d'* at the end of the lever serves to vary the pressure of the wheel upon the carriage, the said adjusting-screw bearing upon the track-frame. At the front the carriage is held down by projections *f* on each side of the pointer, which hooks over the upper edge of the scale *f'*, Fig. 5. The platen-carriage is non-shiftable from front to rear and the platen is adapted to have free movement, being supported for this purpose upon link mechanism substantially the same as that disclosed in our application, Serial No. 609,332. In order to limit the front and rear shifting movement of the platen, we provide adjustable screw-stops 25 and 25', which are supported in lugs 25'' on the carriage. These stops strike against the bushing 26, which surrounds the platen-shaft. In order to allow the platen to be removed readily from its supporting mechanism, we make the links 26', which connect the platen-shaft with the rocking arms 26'', detachable from the said arms. The links are held in engagement with pins 29' on the said arms by means of springs 27', surrounding the platen-shaft and arranged between the finger-wheels 27'' and the bushings 26, which are adapted to slide on the platen-shaft and are connected with the links 26'. The supporting-link in rear of the platen (marked 26<sup>a</sup>) is forked at its upper end to receive the pin 26<sup>b</sup> on the cross-bar A of the platen-frame, and the pin and link are maintained in connection by a spring-catch 31, which is pivotally mounted on the link 26<sup>a</sup>. In order to remove the platen, the links 26', with the bushings 26, are pressed outwardly, so that the forward ends of the links are detached from the pins on the rocking arms, and the spring-catches 31 having been previously thrown back to release the

connection between the rear links and the platen-frame the platen is entirely free to be lifted out of the machine. In replacing the platen the pins on the platen-frame are simply pressed down and the spring-catches yield under pressure to allow the pins to drop into the recesses in the upper ends of the rear links, and the forward perforated ends of the links 26' having been alined with the pins on the rocking arms the said links 26' will be forced into engaged position by the springs. The rocking arms which carry the pins at the front are connected with the rock-shaft B, and this is in connection with the platen-shifting key, as in the application above referred to. The link-supporting mechanism for the platen allows the same to be shifted forwardly and backwardly independent of the carriage and to be turned and lifted to expose the printing in a manner similar to that described in the aforesaid application.

In order to manipulate the feed-roller *y'*, we provide a lever 33<sup>x</sup>, having a loop 33', embracing the bar 34<sup>x</sup> of the platen-frame at one end of the machine and running to the opposite end, where it is bent up and terminates in an eye embracing the other end of said cross-bar, so that pressure on the arm 33<sup>x</sup> of this lever will remove the feed-roll bodily from the platen. The feed-roll is held against the platen by the spring 36 at the right-hand side of the machine, which is a fixed spring, and at the left-hand side of the machine by the spring 37 encircling the cross-bar 34<sup>x</sup>, and this spring can be adjusted by a collar 38' connected therewith.

The marginal stop comprises notches 39, cut into the track, and a sliding plate 40', movable on the track 22'' and fixed in any desired position to cover more or less of the notches by a spring-stop held in the casing 40'' and similar to the stop 40<sup>x</sup>. (Shown in Fig. 6.) The pawl which coacts with this marginal stop-plate and the notches is pivoted at 40<sup>a</sup> to the inner side of the front rail of the carriage, and it is under tension of the spring 40<sup>b</sup>, which presses its point down upon the track-rail. At the opposite end of the track-rail 22'' the groove 22<sup>a</sup> is formed, in which a rack 41 is arranged to slide. The plate 42 covers more or less of this rack, according to its adjustment, and this plate carries a small trip 43, one end of which is adapted to be struck by the pawl 44 or by the depending end of a pawl 44<sup>x</sup>, arranged in advance of the pawl 44, as shown in Fig. 9, on the carriage, while the other end of the trip 43 rests on the swinging plate 45, pivoted underneath the track-rail and supporting the arm 45', carrying the bell-hammer 46. When the trip 43 is struck by the projection 44' of the pawl 44, pivoted to the carriage, Fig. 8, or by the pawl 44<sup>x</sup>, Fig. 9, it will depress the swinging plate, elevate the bell-hammer, and upon the release of the trip 43 the plate, with the bell-hammer, will drop back and strike

the bell. As shown in the latter figure, the incline of the trip 43 extends in the rear of its pivot, so that the pawl will ride up on it easily, and when it has reached the top of the incline the trip will be instantly released. When the pawl 44 slides off the top of the guard-plate 42, it engages one of the teeth of the rack-bar 41, and the movement of this rack-bar under the tension of the carriage and its spring will move the arm 46 in the same direction. This arm is on a transverse shaft 47, journaled in the track-frame and under tension of the spring 48, which holds the shaft against movement which might result from the movement of the carriage back and forth. The rear end of this shaft has a lever 49, which extends upwardly and inwardly, so that when the rack-bar is moved and the arm 46 and rock-shaft 47 are operated this lever will be brought up between the stud 49' on the rear track-rail and the escapement-rack C. As in the application referred to, this rack has oscillating movement about the center 51 in order to effect the escapement-action, and upon raising the lever 49 in front of this rack its oscillation will be prevented and the keys and printing mechanism will be locked against further action.

A modification of the locking mechanism is shown in Figs. 19 and 19<sup>a</sup>, in which an arm 50<sup>x</sup> is shown as fixed to the shaft 47. This arm has an angular end which extends beneath a pivoted catch 50, pivoted in a stud projecting from the frame. This catch normally rests to one side of an extension 52<sup>x</sup> of the arm, which is connected to the link 52'' for rocking the rack. On the rocking of the shaft 47, as before described, the catch 50 is thrown up beneath the extension 52<sup>x</sup> in such a position as to prevent the downward movement thereof, and in this manner the keys and printing mechanism are locked.

The pawl 44 of the carriage operates the alarm mechanism before it operates the rack-bar to lock the machine, and if it is desired to print one or more letters in order to finish a word after the signal has been given the operator simply presses on the pawl 44 at its tail end 51', so that the pawl will be lifted out of action and the machine will not be locked.

The slide or guide-plate 42 may be held rigidly in position, the spring-stud, heretofore mentioned, being adapted to fit in a depression in the scale. When the platen is lifted to expose the printing, it will be supported in this elevated position by the links and by a pin 32<sup>a</sup>, Fig. 13, which bears upon the upper part of the standard or post 32<sup>b</sup> of the carriage-frame.

In order to form a stop for the turning movement of the platen when it is elevated, we provide a pin 6, Figs. 16, 17, and 18, on the platen-frame, working in a cut-away portion of the bushing 26, which surrounds the platen-shaft and which is connected with the link 26'. When the platen is elevated, this pin strikes against the shoulder 26''' on the bushing and

forms the stop and rest for the platen and holds it from tipping forward. By means of this stop the platen may be supported in its elevated position either when the shift-key is depressed or when it is not. The shift-key comprises a supplemental portion carrying the finger-disk and pivoted to the forward end of the key-lever, Figs. 1 and 7, a connection running from said lever to the rocking arm 26'', as described in the before-mentioned Patent No. 614,943. The rear end of the supplemental piece being forked and limited in its movement by a stop-pin c<sup>3</sup>, the forward end of the supplemental piece has a projection c<sup>3</sup>, and by first depressing the key-lever through the finger-key by a direct downward action on the finger-key the shifting of the platen will be effected, and then by tilting the supplemental piece by a forward movement of the key the projection on the supplemental piece will be pressed under the projecting ledge c''' on the frame and the platen will be held for upper-case printing.

In Fig. 5 the double-acting-escapement release-arm is shown in dotted lines, which is used in connection with an underscoring-key, the type-head of which is shown in Fig. 23. Upon the depression of this key the rack-bar c is rocked forwardly in the usual way to free the pawl r therefrom, which will bring the rack c'' thereof into engagement with the detent. The release-arm 60', which is pivoted to the carriage, bears against a pin 60<sup>a</sup>, projecting from the face of the detent, and on tilting the front end of this arm away from the carriage the detent is pushed out of engagement with the rack-bar and the carriage is freed, so that it may be moved back and forth to draw the underscoring-line.

The type-head shown in Fig. 23 has on the face thereof in the place usually occupied by lower-case character a dash-type  $\alpha'$ , arranged parallel with the platen, and in the space usually occupied by the upper-case character a dash-type  $\alpha''$ , extending transversely in relation to the platen. It will be understood that this type-head is carried by an ordinary type-lever. On the depression of its respective key the character  $\alpha'$  will be brought against the paper on the platen, and by manipulating the lever 60' the carriage may be freely reciprocated back and forth to draw a line longitudinally of the platen. If the platen is rocked into upper-case position when this key (the underscoring-key) is operated, the character  $\alpha''$  will be brought against the paper. By then turning the platen a vertical line will be drawn. It will be understood that the lower dash character is so arranged that it will print just below the ordinary line of printing. The arm 60' has its extreme end in engagement with the pawl r, and by tilting the front end of this arm toward the carriage it will disengage the pawl from the rack, as described in Patent No. 614,943, granted to us. The detent l has turning movement under tension of the spring-plunger s to permit it

being pushed out of its ordinary position when it is desirable to entirely release the carriage. When the end of the lever 60' is pressed toward the carriage-frame, the pawl 5 will be disengaged from the rack-bar, and as the detent is normally out of engagement therewith the carriage may be moved freely back and forth. However, when a key is depressed the rack is rocked out of engagement 10 with the pawl and into engagement with the detent, and in this position it is held as long as the key is held depressed. With the parts in this position if the end of the lever 60' is moved away from the carriage it will press 15 the detent out of engagement with the rack, and the rack having been moved out of the path of the pawl by the depression of a key and being held in this position as long as the key is depressed it will be seen that the car- 20 riage is free to be reciprocated freely back and forth. If the dash-type key is the one depressed, this type will be pressing against the platen and will draw a line as the carriage is moved.

For holding the platen firm when drawing the carriage back and forth, as in underseor- ing or in writing a vertical line, a catch  $\alpha^x$ , Figs. 1 and 22; pivoted to the inner face of the front rail 22', having a laterally-extending 30 finger-piece, is provided. This catch is provided with a hook designed to engage the handle or arm  $\alpha'$ , fixed to the front bar of the platen-frame and extending horizontally therefrom, which is used for raising the platen 35 to inspect the work.

For indicating when the end of the ribbon has been reached on either of the spools a semaphore  $\alpha^2$  is provided, which is fixed to the end of a shaft  $d^2$ , extending between the front 40 and rear bars of the base-frame, at one side thereof. The semaphore normally rests parallel with the front bar of the frame, to the rear of the same. At the other side of the carriage a shaft similar to the shaft  $d^2$  also 45 extends between the front and rear bars of the frame.

Fixed centrally of each of the shafts  $d^2$  and extending radially therefrom is a double arm  $e^2$ , between the members of which a vertical 50 arm  $g^2$  is centrally pivoted. The lower end of these arms  $g^2$  are weighted to throw the upper ends thereof, which are provided with small flat lateral projections, against the central parts of the ribbon-spools on the ribbons 55 wound thereon.

The core of each spool is provided with a longitudinal kerf  $e^{21}$  in its periphery, and when the ribbon is almost completely un- 60 wound from either spool the rear wall of the kerf in that spool will engage the lateral projection of the arm  $g^2$ , and as the spool so engaging the arm continues to turn in the un- winding movement of the ribbon the arm  $g^2$  will be depressed and turn the shaft  $d^2$ , which 65 if it be the shaft carrying the semaphore will operate the same directly, or if it be the op- posite shaft it will operate the semaphore

through an arm  $m^2$ , fixed to said shaft and connected by a link  $n^2$  to the semaphore. A pin  $O^2$ , located centrally of this kerf, is adapt- 70 ed to engage the end of the ribbon and hold the same to the spool. This central connec- tion of the ribbon to the spool insures an even pull thereon.

As shown in Fig. 1, the connection between 75 the type-bars and the key-levers is a direct one.

We claim—

1. In combination, in a type-writer, a dou- 80 ble-face rack-bar, a pawl engaging one face thereof, a detent engaging the opposite face thereof held rigidly in all engagements with said bar as to longitudinal movement and means for shifting the relation of the engag- 85 ing points of said pawl and detent longitudi- nally of the rack-bar to permit the carriage to feed substantially one full step on the de- pression of the key or one full stop after the key is released, substantially as described.

2. In combination, a frame, a carriage, un- 90 der tension, a rack-bar carried by one of said members, a single pawl and detent carried by the other member engaging said rack to feed the carriage step by step, said escape- ment members being disengaged by the opera- 95 tion of a key whereby said carriage will feed under said tension while both said detent and said pawl are free of said rack-bar substan- tially a full step, substantially as described.

3. In combination, a frame, a carriage un- 100 der tension, a rack-bar having its opposite faces toothed carried by said frame, a single pawl engaging one face of the rack-bar and a detent engaging the opposite face thereof, both being carried by said carriage, said pawl 105 and detent being held in position independ- ently of each other and means for position- ing the escapement members relatively to each other to permit the carriage to feed while said escapement members are all out of en- 110 gagement, substantially as described.

4. In combination, the double-face rack-bar, the pawl and detent adapted to engage there- 115 with, an eccentric pivot for said detent and means for adjusting said pivot fixed thereto and means for retaining the same in its ad- justed position, substantially as described.

5. In combination the frame, the carriage, the double-face rack-bar supported from said 120 frame, a plate carried by the carriage extend- ing horizontally across said rack-bar, a pawl pivoted to said plate, a pin secured to said plate having an eccentric portion, a detent pivoted on the eccentric portion of said pin and an arm arranged above said plate and se- 125 cured to said pin for adjusting the same, sub- stantially as described.

6. In combination, the frame, the carriage, the double-face rack-bar supported from said 130 frame, a plate carried by the carriage extend- ing horizontally across said rack-bar, a pawl pivoted to said plate, a pin secured to said plate having an eccentric portion, a detent pivoted on the eccentric portion of said pin,

an arm secured to said pin for adjusting the same, and means carried by said arm adapted to engage the plate to hold said arm and pivot in their adjusted positions, substantially as described.

7. In combination, the frame, the carriage, the double-face rack-bar supported from said frame, a plate carried by the carriage extending horizontally across said rack-bar, a pawl pivoted to said plate, a pin secured to said plate having an eccentric portion, a detent pivoted on the eccentric portion of said pin, an arm secured to said pin for adjusting the same, and means carried by said arm adapted to engage the plate to hold said arm and pivot in their adjusted positions, said means comprising a spring-plunger carried by said arm adapted to engage recesses in said plate.

8. In combination, the frame, the carriage, the rack-bar, the plate extending from the carriage across the same, a pawl pivoted to said plate on one side of said rack, a sleeve screwed in said plate on the opposite side of the rack, a pin extending through said sleeve having a flange abutting the under side of said sleeve, an eccentric portion below said flange and an enlarged head, a detent pivoted on said eccentric portion of the pin, a reduced portion of the pin extending above said sleeve, an arm rigidly secured thereto, and a spring-plunger carried thereby adapted to engage a recess in said plate, substantially as described.

9. In combination, a frame, a carriage, a rack-bar carried by one of said members, a pawl and a detent carried by the other member adapted to engage said rack-bar, said pawl and detent being held in position independently of each other and maintaining in all adjustments of said parts the same relative movement in the direction of the carriage-feed, independent of said feed and means for adjusting the relative arrangement of the engaging points of said pawl and detent to give an ordinary or reverse feed to said carriage, substantially as described.

10. In combination, a frame, a carriage, a rack-bar carried by one of said members, a pawl and detent carried by the other member engaging said rack-bar, said detent being fixed as to independent movement in the direction of the carriage-feed during all the escapement actions, and means for adjusting said detent relatively to said pawl to permit the carriage to feed substantially a full step when disengaged from said pawl with said detent free of said rack, substantially as described.

11. In combination, the frame, the carriage, the rack-bar, the plate carried by the carriage extending across said rack-bar, a pawl loosely pivoted to said plate, a spring-plunger carried by said pawl and a post-bearing for said plunger depending from said plate, substantially as described.

12. In combination, a frame, a carriage, a platen and platen-frame, means for holding

the platen-frame to the carriage, said means permitting the platen to be raised or tilted, the arm extending from the platen-frame, and the catch, independent of the means for securing the platen-frame to the carriage secured to said carriage and adapted to engage said arm to hold said platen from raising or tilting, substantially as described.

13. In combination the frame, the rocking bar having its opposite edges toothed, the carriage carrying a pivoted pawl and detent adapted to engage the opposite sides thereof and a pivoted release-lever adapted to be operated to throw either the pawl or the detent out of engagement with said bar substantially as described.

14. In combination, the carriage, the platen, the track-frame and roller for holding the carriage down and the lever pivoted to the track-frame with means for adjusting the lever for varying the pressure of the roller on the carriage and the carriage upon the track-frame, substantially as described.

15. In combination, the carriage having a depression, the wheel or roller running in said depression, a bell-crank lever carrying the roller and pivoted to the track-frame, and means for adjusting the lever, substantially as described.

16. In combination, the platen, the carriage, the link mechanism for supporting the platen, comprising the link 26' connected with the platen-shaft and adapted to be shifted longitudinally thereof, and means for holding said link in normal position, substantially as described.

17. In combination, the platen, the carriage, the link mechanism between the platen and carriage, said link mechanism comprising a link in front and a link in rear of the platen-shaft, both links being detachable to permit the removal of the platen said front link being held normally in place by spring tension, substantially as described.

18. In combination, the platen, the carriage, and link mechanism connecting the carriage and platen, said link mechanism comprising a link connected with the platen-shaft and adapted to shift longitudinally thereof to be detached from its connection and the spring about the platen-shaft to hold the link in normal position, substantially as described.

19. In combination, the platen, the carriage, the link mechanism supporting the platen upon the carriage and comprising a link 26', the rocking arm 26'' for shifting the platen from upper to lower case, said arm having a detachable connection with the link and yielding means for holding the link in normal position, substantially as described.

20. In combination, the platen, the carriage, the rocking arm 26'' for shifting the platen having a laterally-extending pin, and a link 26' engaging said pin and adapted to shift longitudinally of the platen-shaft to be detached from said pin, substantially as described.

21. In combination, the platen, the carriage, the link-supporting mechanism comprising the shifting link 26' adapted to shift longitudinally of the platen to be detached from its connection, the finger-wheel on the platen-shaft and the spring interposed between said wheel and the link, substantially as described.

22. In combination, the platen, the feed-roller, the cross-bar of the platen-frame and means for manipulating the feed-roller comprising the lever 33<sup>x</sup> having the loop 33' embracing the cross-bar of the platen-frame, said lever having an arm extending to the opposite end of the machine and bent up in the form of an eye and a spring encircling the cross-bar of the platen-frame and connected with the lever said spring having a collar by which its tension may be regulated, substantially as described.

23. In combination, the carriage, the platen, the pawl moving with the platen, the adjustable plate on the front bar of the track-frame, the trip carried by said plate, the swinging plate pivoted to the track-frame fixed as to movement longitudinally of said frame and arranged to be operated by the trip, the bell-hammer on the swinging plate and a bell-substantially as described.

24. In combination, the carriage for the platen, the track-frame, the adjustable plate on the track at the front of the machine, the trip on said plate, the pawl on said carriage to operate the trip, the swinging plate adapted to be operated by the trip in the different positions thereof, said plate being pivoted beneath the track-frame, the bell-hammer on the plate and the stationary bell adapted to be struck thereby, substantially as described.

25. In combination, the platen, the carriage, the track-frame, the lock for the printing mechanism and means for controlling said lock comprising a rack-bar, a pawl on the carriage to engage the same, a guard-plate for shielding more or less of the rack-bar from the pawl and connections from the rack-bar to the lock, substantially as described.

26. In combination, the platen, the carriage, escapement mechanism including a swinging rack-bar, and means for locking said rack including a pawl on the carriage, a slidable rack adapted to be engaged by said pawl and connections interposed between the slidable rack and said swinging rack-bar, substantially as described.

27. In combination, the carriage, the platen, the track-frame, the adjustable plate on the track-frame carrying the signal-dog, connections therefrom to the alarm, the rack-bar, the lock for the printing mechanism, connections from said rack-bar to the lock and a pawl on the carriage for operating the alarm-dog and the rack-bar, said rack-bar being exposed more or less by the adjustable plate, substantially as described.

28. In combination, the frame, the carriage,

the printing mechanism, the escapement mechanism including a swinging rack-bar, means for checking said bar to prevent the swinging thereof, a pawl carried by said carriage, a slidable rack adapted to be engaged thereby, a rock-shaft carrying said checking device and an arm carried by said rock-shaft, extending in the path of said slidable rack, substantially as described.

29. In combination, the platen, the carriage, the supporting-links for the platen adapted to permit the elevation of the same to expose the printing and a fixed supporting-standard 32<sup>b</sup> on the carriage adapted to be engaged by the pin 32<sup>a</sup> on the supporting-link, said pin being to one side of the axis of the platen to support the platen in its elevated position, substantially as described.

30. In combination, the platen, the carriage, the link mechanism adapted to permit the turning of the platen and its elevation to expose the printing and a stop consisting of a pin on the platen-frame and the bushing on the platen-shaft having a cut-away portion forming shoulders, substantially as described.

31. In combination, the platen, the carriage, the link mechanism connecting said parts and adapted to permit the elevation and turning of the platen, said platen turning on its axis and a stop for limiting the movement of the platen, the stop being arranged to one side of the axis of the platen, substantially as described.

32. In combination, the carriage, the platen, ball-bearings, the track-frame having a V-shaped groove at the rear and a corresponding V-shaped groove on the front bar of the carriage and a flat portion arranged centrally of the front track and cooperating with the ball-bearings held in said grooves, substantially as described.

33. In combination, the carriage, the platen, the track-frame, the alarm, the lock for the printing mechanism, the pawl at the front of the carriage for effecting the action of the alarm and the lock, an adjustable device at the front of the carriage for controlling the action of the pawl, the said pawl being accessible to the operator at the front of the machine whereby it may be thrown out of action after sounding the alarm to prevent the operation of the lock, substantially as described.

34. In combination, the frame, the rocking bar having its opposite edges toothed, the carriage carrying a pivoted pawl adapted to engage one side of said bar and a pivoted detent adapted to engage the opposite side thereof, and a release-lever pivoted to the carriage having its end extending in between said pawl and detent for pushing either of said members out of engagement with said rack-bar, substantially as described.

35. In combination in a type-writer having an escapement mechanism including the rocking rack-bar, an underscoring or dash type key adapted to operate said rocking rack-bar,

a pawl and detent to engage the same alternately and a release-bar to act upon either the detent or the pawl, substantially as described.

5 36. In combination, the carriage, the frame, the platen, the escapement mechanism, means for locking said escapement mechanism against operation and a device pivoted to the front of the carriage adapted to engage said  
10 locking means to operate the same, said de-

vice being adapted to be thrown out of the path of the locking mechanism.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM R. FOX.  
GLENN J. BARRETT.

Witnesses:

GEO. K. McMULLEN,  
WILLIAM C. HOERTZ.