

No. 671,663.

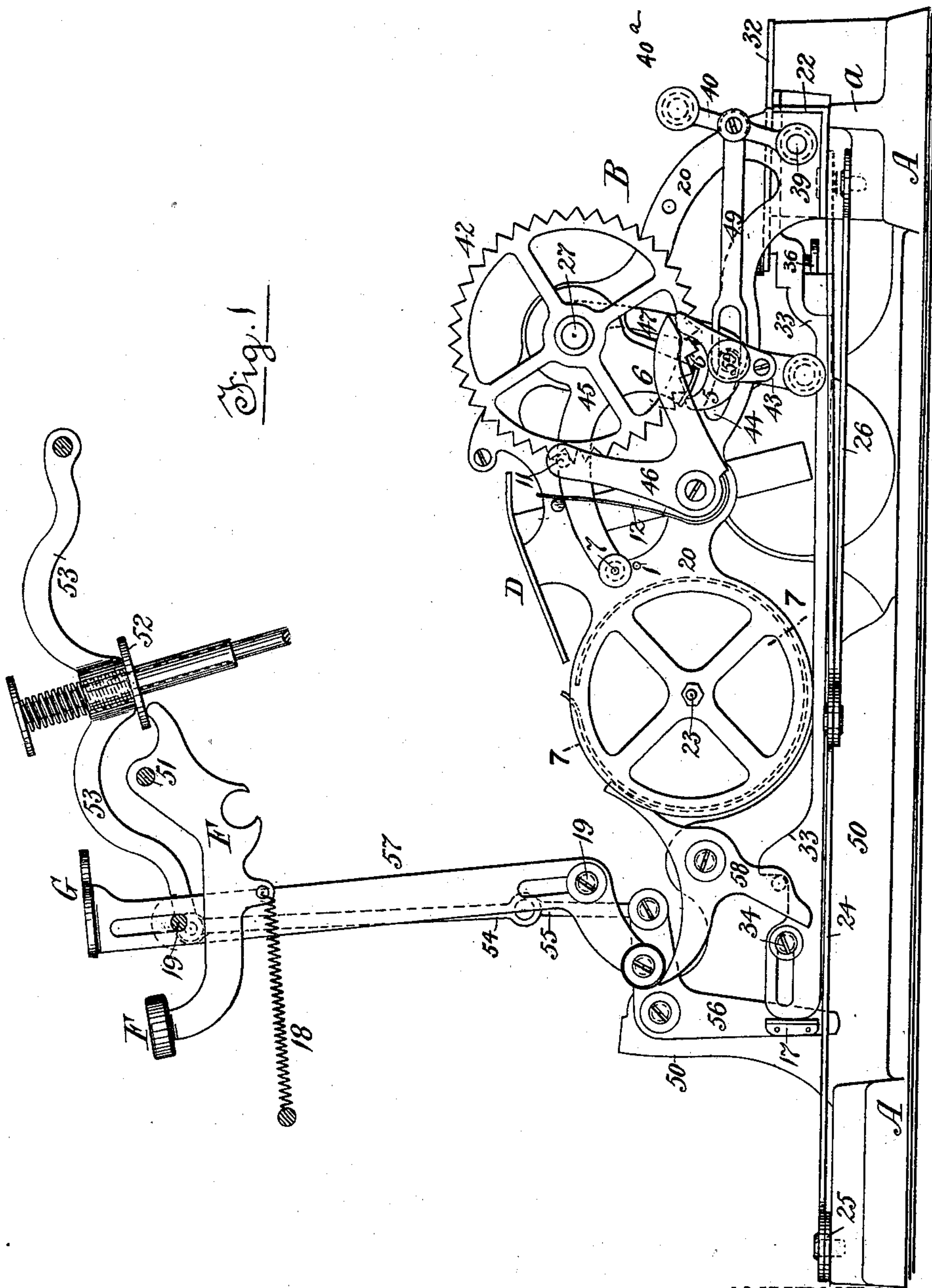
Patented Apr. 9, 1901.

H. L. ARNOLD.
TYPE WRITER.

(Application filed Feb. 27, 1890.)

(No Model.)

4 Sheets—Sheet 1.



INVENTOR:

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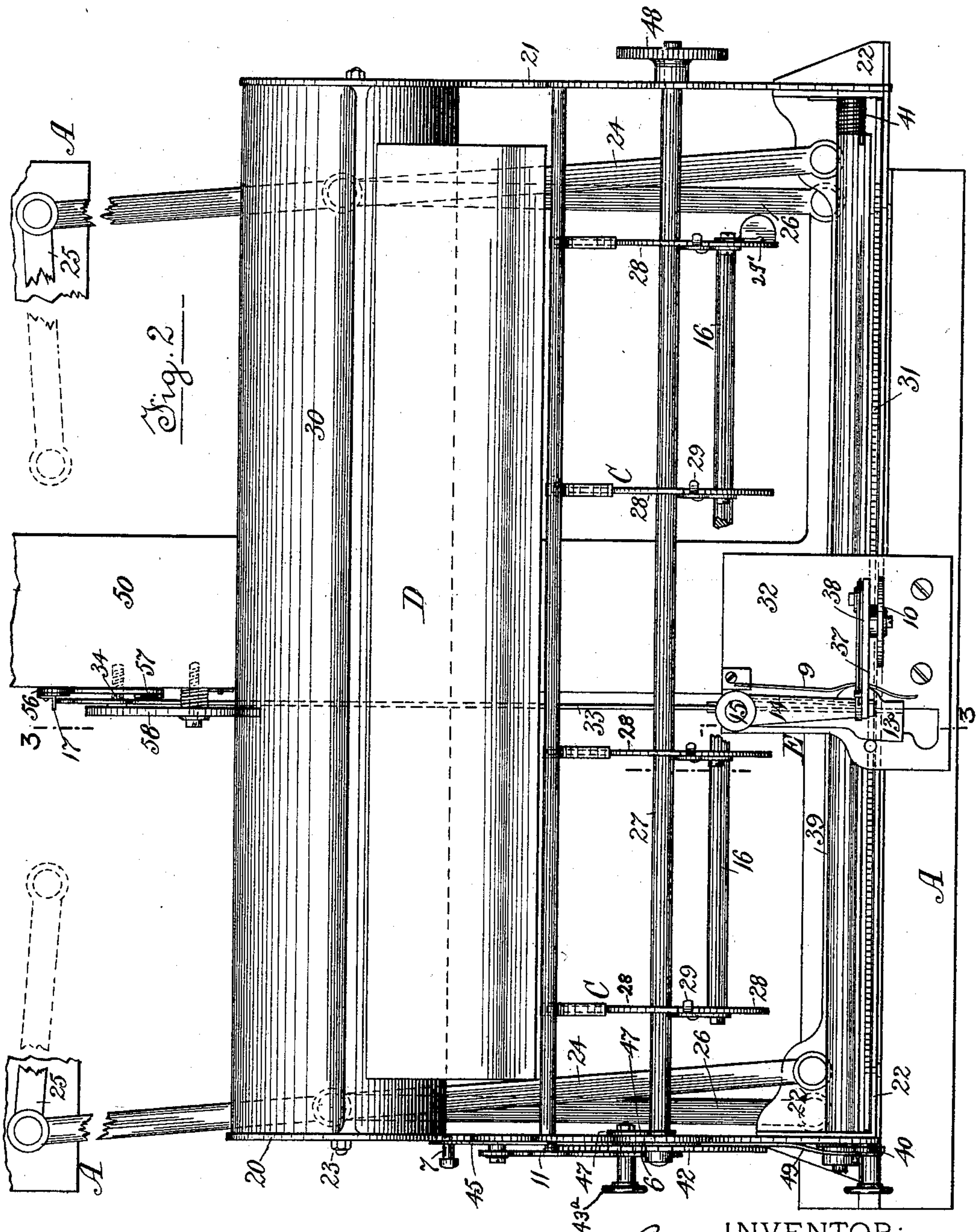
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(Application filed Feb. 27, 1890.)

(No Model.)

4 Sheets—Sheet 2.



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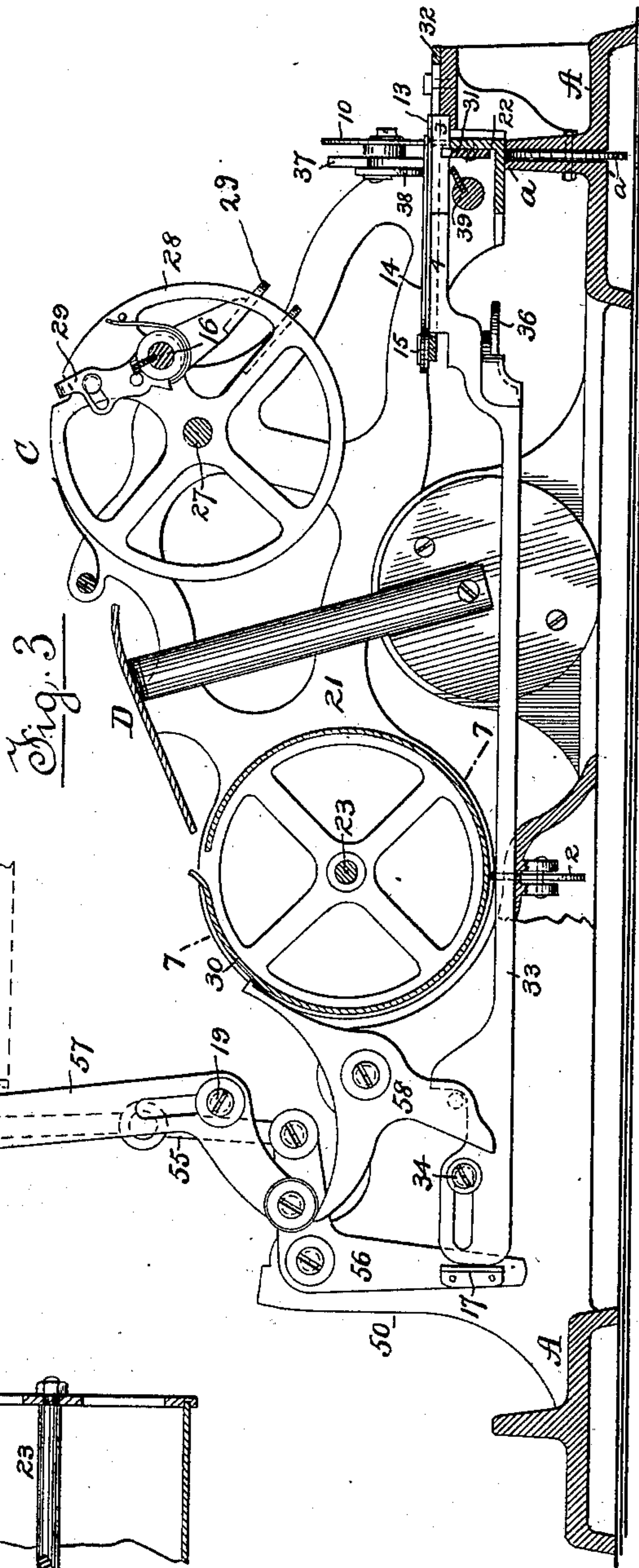
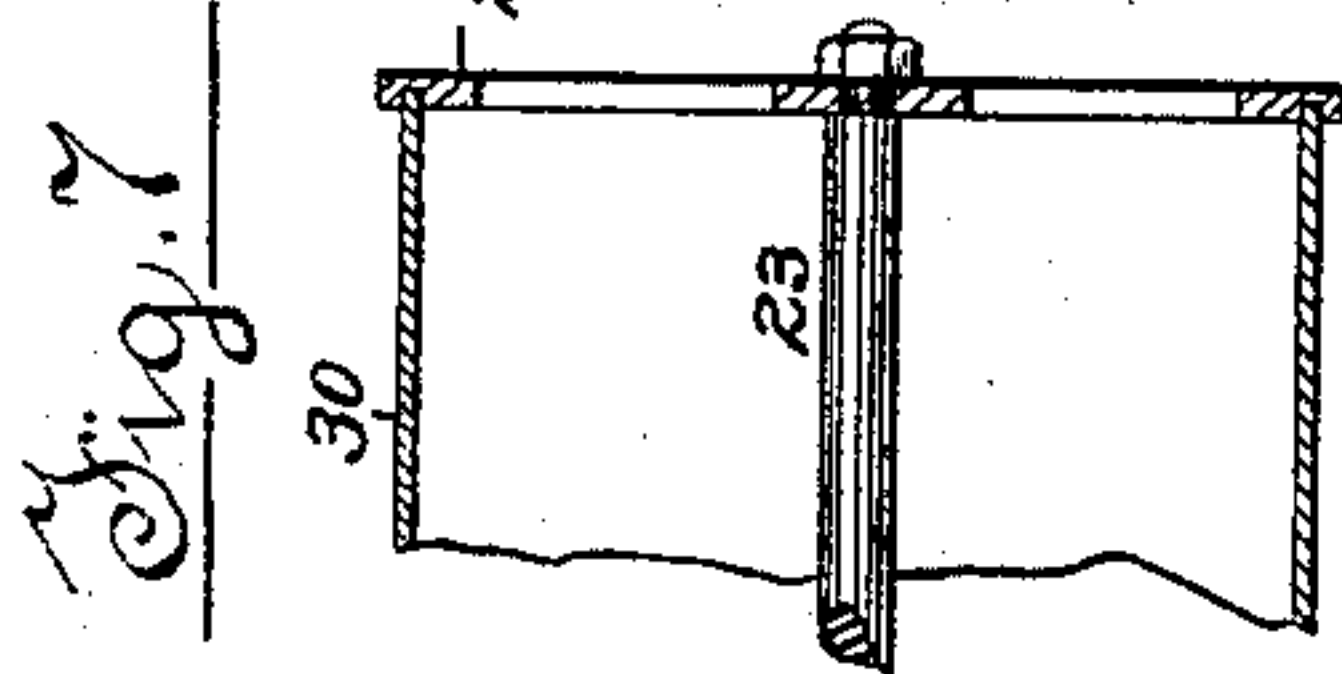
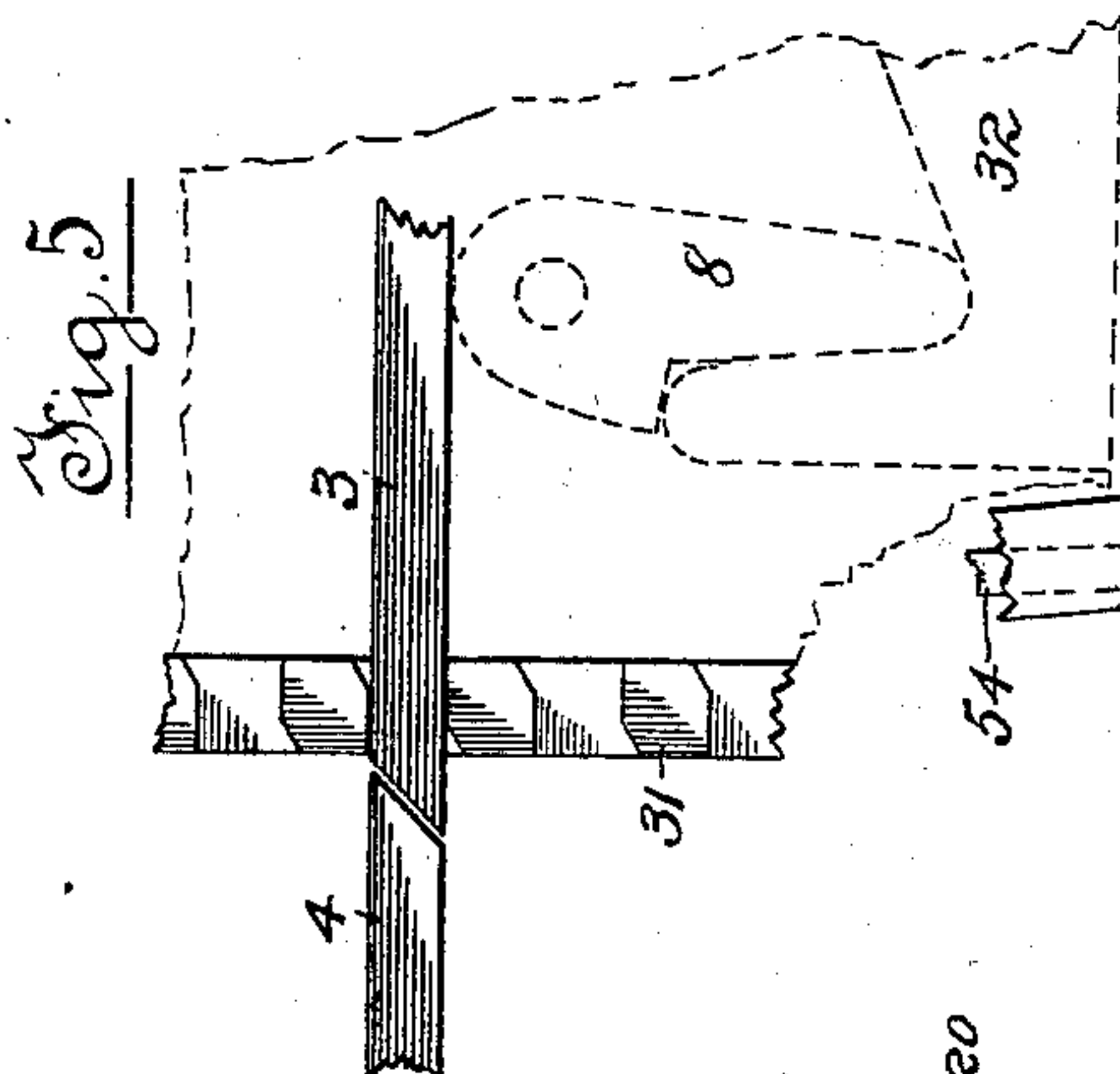
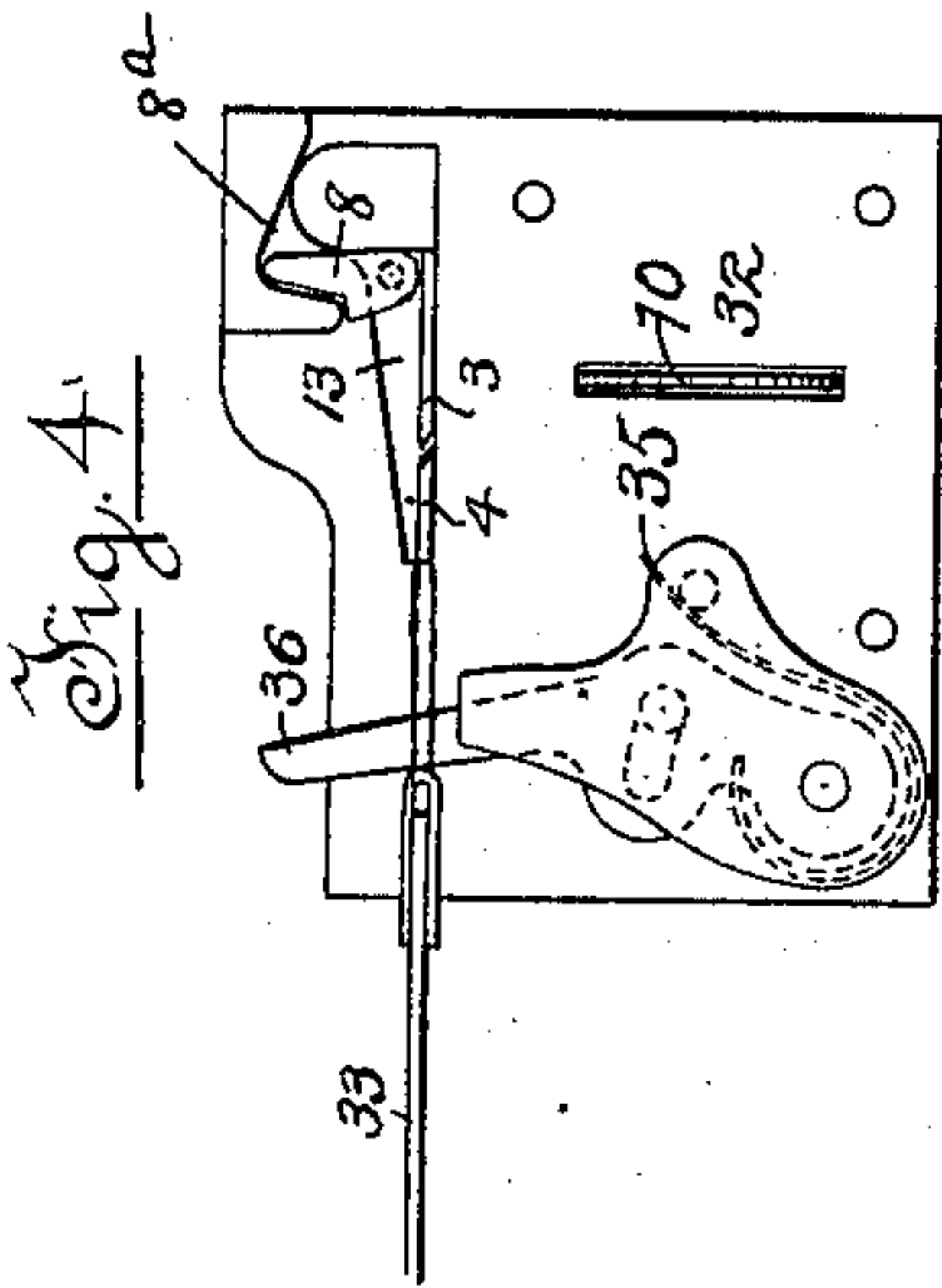
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4 Sheets—Sheet 3.



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No. 671,663.

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(No Model.)

4 Sheets—Sheet 4.

Fig. 8.

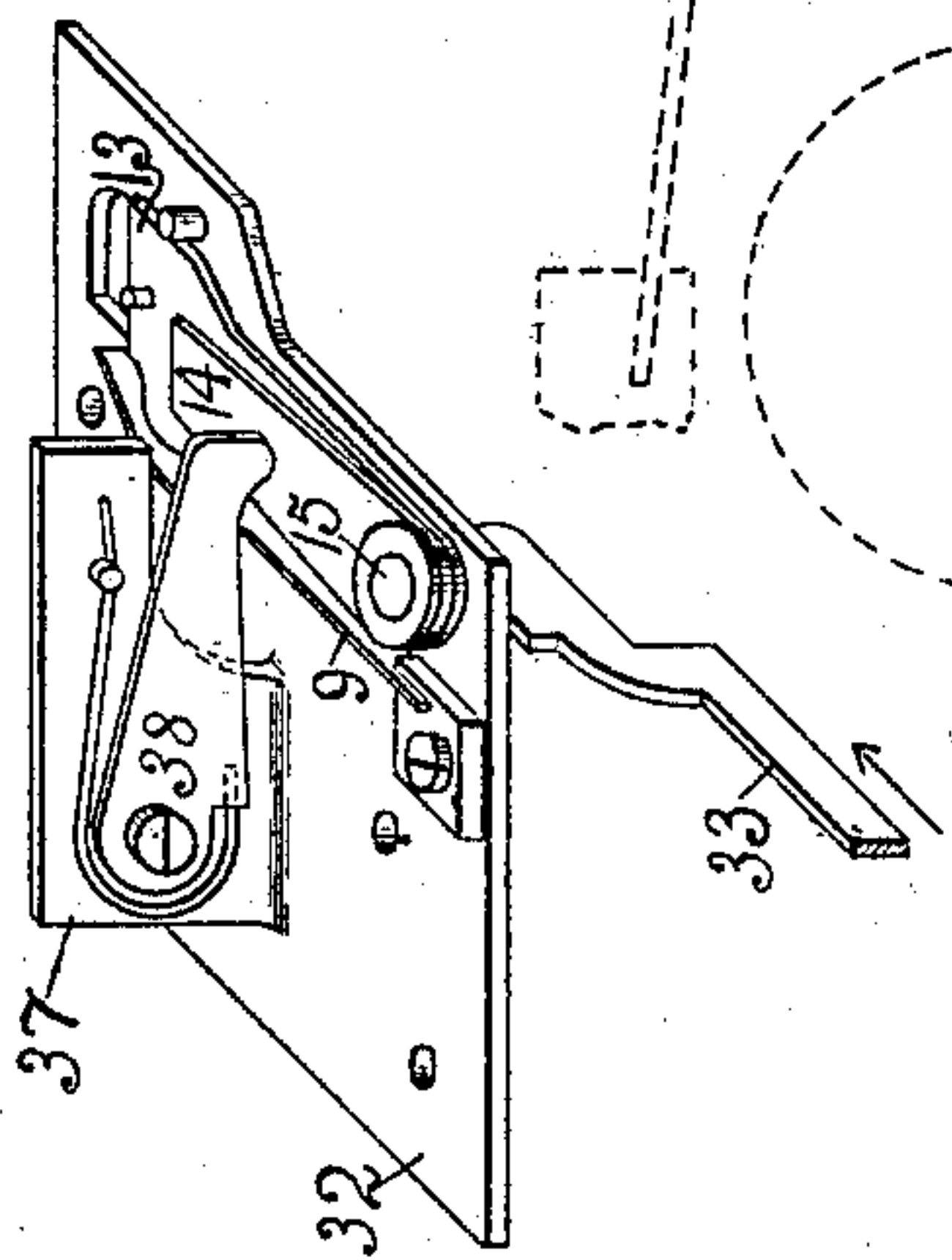


Fig. 6.

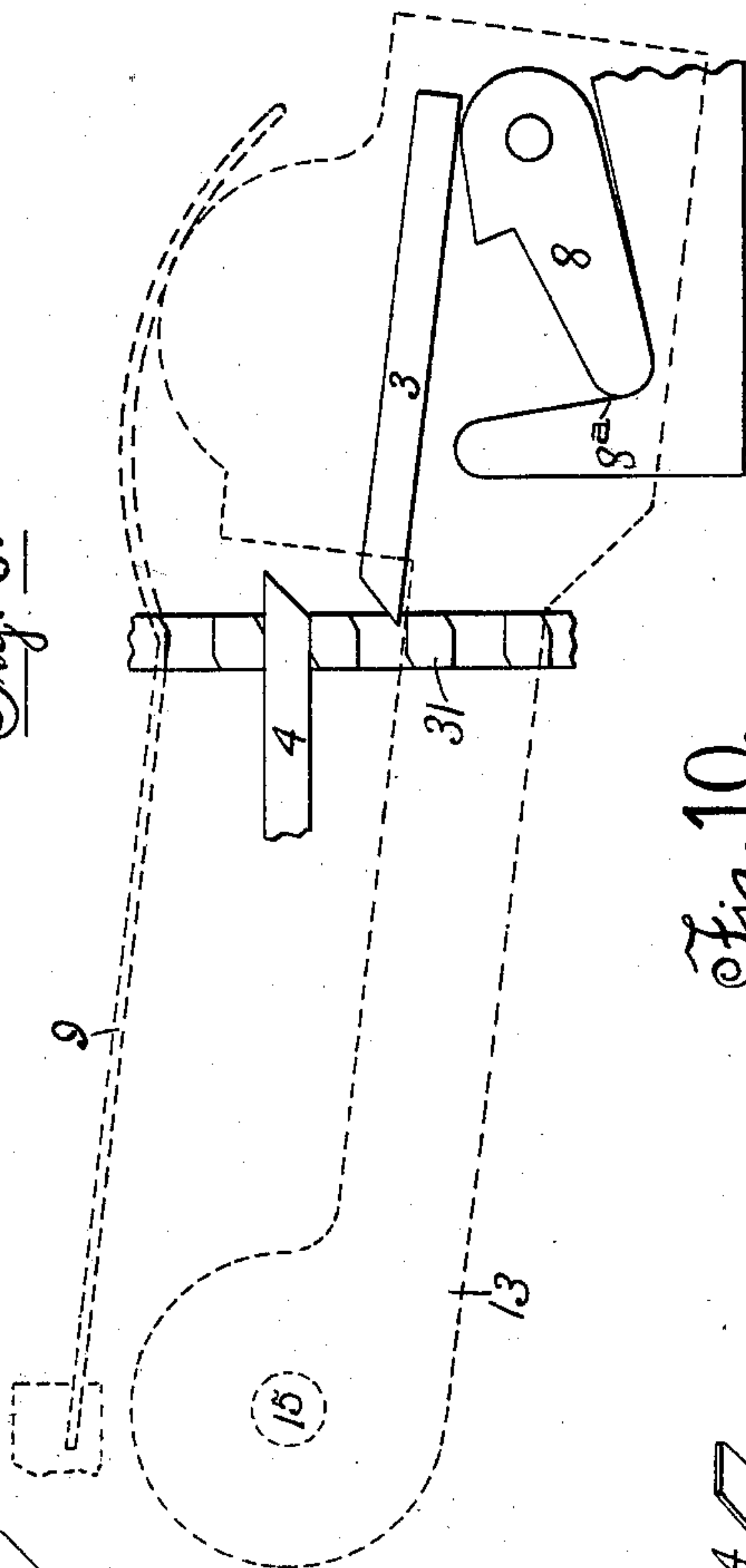


Fig. 10.

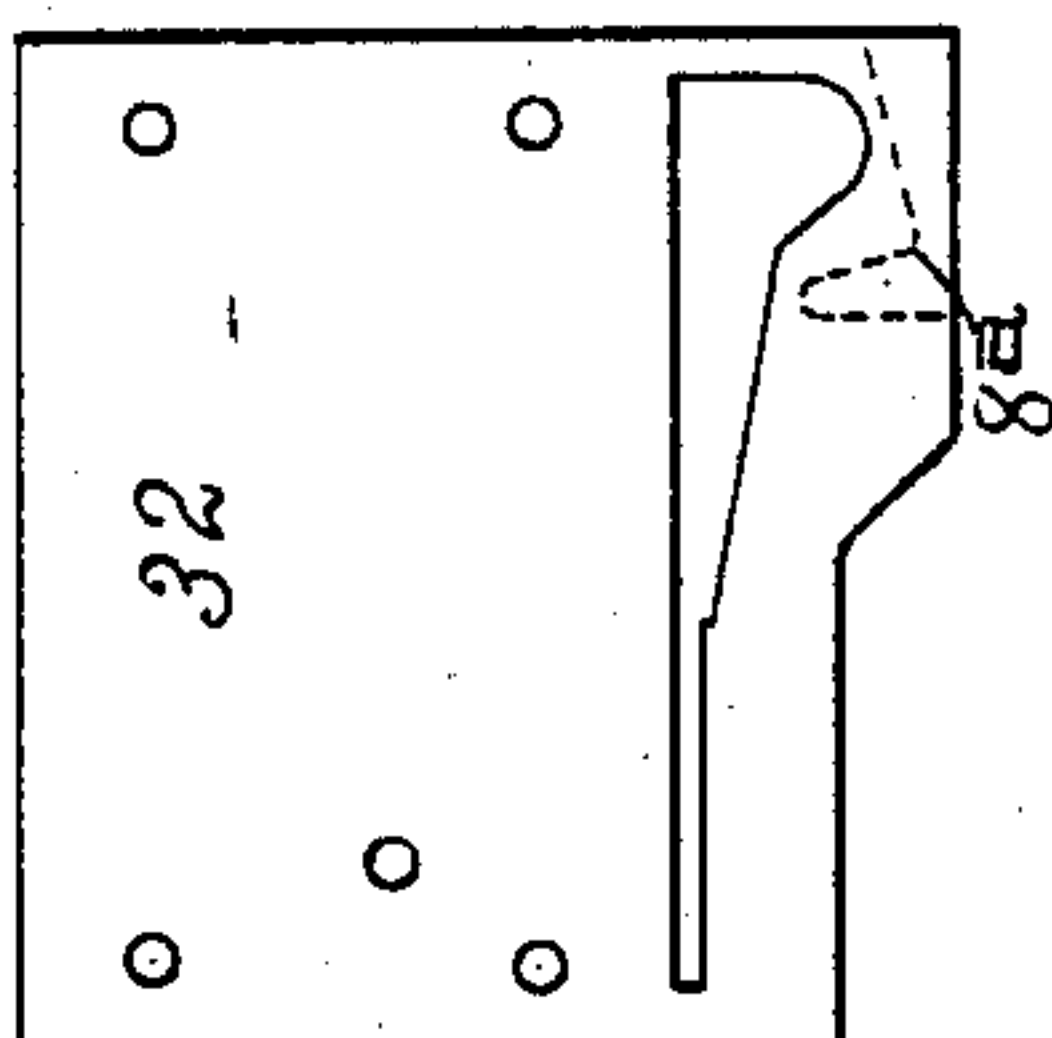
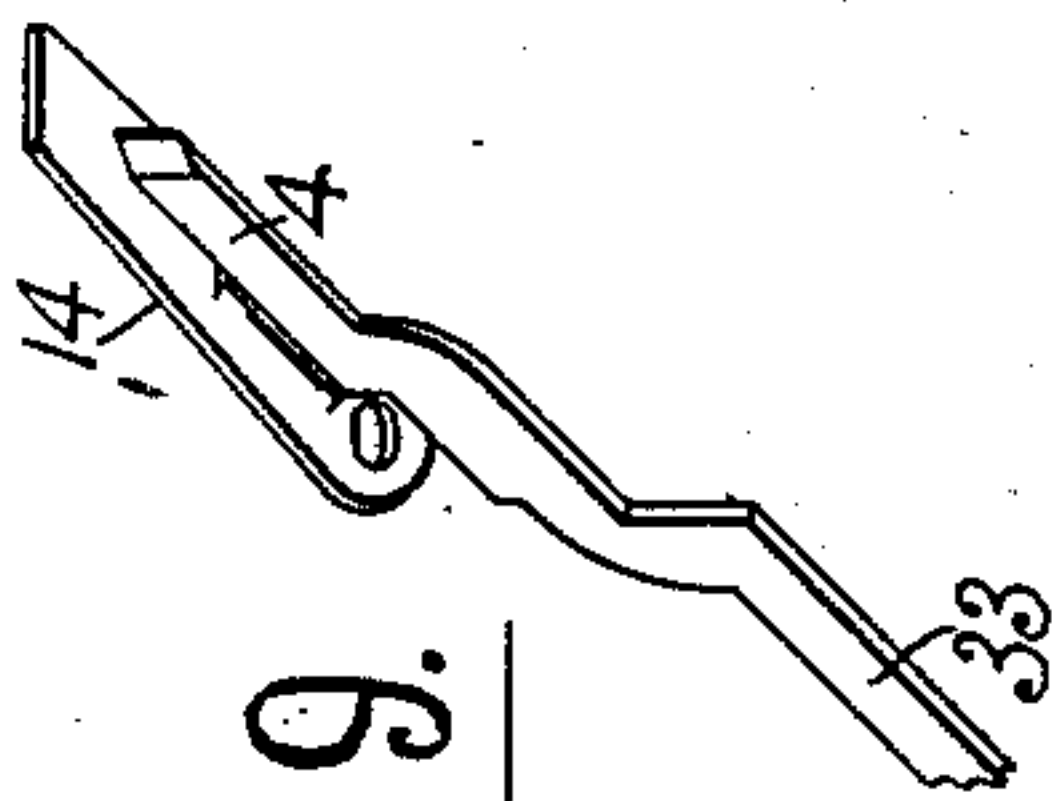


Fig. 9.



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UNITED STATES PATENT OFFICE.

HORACE L. ARNOLD, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE UNION
TYPE WRITER COMPANY, OF NEW JERSEY.

TYPE-WRITER.

SPECIFICATION forming part of Letters Patent No. 671,663, dated April 9, 1901.

Application filed February 27, 1890. Serial No. 341,953. (No model.)

To all whom it may concern:

Be it known that I, HORACE L. ARNOLD, a citizen of the United States, residing in Brooklyn, Kings county, and State of New York, have invented certain new and useful Improvements in Type-Writers, fully set forth in the following description and represented in the accompanying drawings.

This invention relates generally to type-writers, but more particularly to the paper-carriage thereof—that is to say, to the device that supports the paper on which the characters are printed and by which the paper is fed along step by step, so as to provide the proper space between the different letters of a word and between the words and by which the paper is fed for the line-space to provide a proper distance between the contiguous lines of characters; and it is the object of the present invention, among other things, to so improve this part of type-writers that a simple and effective carriage-moving mechanism is produced and its construction and operation simplified.

To this end my invention consists in the various features of construction and combinations of devices hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, which illustrate so much of the type-writer as is necessary to a proper understanding of the present invention, Figure 1 is a side elevation thereof. Fig. 2 is a plan view, the carriage being broken away and foreshortened. Fig. 3 is a transverse sectional elevation taken on the line 3 3 of Fig. 2. Fig. 4 is a bottom plan view of the feeding device and supporting-plate. Figs. 5 and 6 are enlarged horizontal sectional details of the feeding device, illustrating different positions thereof. Fig. 7 is a sectional detail, on the line 7 7 of Fig. 1, of a portion of the paper-carriage. Fig. 8 is a perspective view of carriage-feeding devices. Fig. 9 is a perspective bottom view of a feeding dog or detent. Fig. 10 is a plan of a fixed plate for supporting the carriage-feeding devices.

Before entering into a detailed description of the construction and operation of the present improvements it may be stated that the

paper-carriage proper—that is to say, the means for supporting the sheet of paper in position to be acted upon by the types and the means for securing the paper to the carriage so that it will partake of the movements of the carriage—may be of any form of construction. As shown in the present case the carriage consists of two side or end plates connected together by suitable horizontally-arranged bars, the whole forming a stiff and rigid structure. The paper-carriage thus formed by the side or end pieces and the horizontal connecting-bars is supported to move in right lines above the bed-plate of the machine upon antifriction-rolls and is guided in its movements by connections with a pair of parallel bars pivotally mounted on the base-plate. Upon one side of the carriage there is a paper-holding device for grasping or holding the paper, so that it will be held firmly to the carriage and will partake of its movements and of the movements of the line-spacer, and upon the opposite side there is provided a tubular holder for the paper, in which the paper is confined and from which it is fed or drawn upon each movement of the line-spacer. Between the grasping device and the tubular holder there is provided a support or table for the paper that is stationary with respect to the carriage. At one side of the carriage there is provided a rack connected thereto, that is engaged by the carriage-feeding device as it is moved by the operation of the type-keys or the spacing bar or key. In conjunction with the rack and the feeding device coacting therewith there is provided a disengaging-bar mounted in the carriage and having an operating-handle at one or both ends thereof, by which the rod is moved to cause the disengagement of the feeding device from the rack, and thus render the carriage free therefrom and free to be moved back and forth to any position within its range of movement desired. With the paper-holding device there is provided a line-spacer, by which the holding device is moved to carry or feed the paper bodily over the support or table, so as to present a fresh surface in position to be printed upon by the types. With the actuator of the line-spacer there is provided a connection with the dis-

engaging-bar, by which at the time the line-spacing is being effected the disengaging-bar is moved to disengage the carriage-feeding device from its rack, so that the carriage is
 5 free to be moved back and forth to any position within its range of movement, so that by one movement of the hand both the line-spacing and the release of the carriage are effected and the hand still holding the line-
 10 space actuator may move the carriage to any desired longitudinal position. The particular line-spacing device shown is provided with means by which the space through which the paper is moved may be varied, so that
 15 the space between the lines of characters may be varied.

The drawings illustrate a single character or type key, a universal bar common to all of the keys and its connection for operating
 20 the carriage-feeding device, and a spacing-bar and its connection for operating the same device, the said key and universal spacing-bars and their connections being illustrative of one mode of imparting the desired motion
 25 to the feeding device of the carriage, which mode is particularly applicable to the arrangement of type-keys shown, and so far as the key is concerned only shows so much thereof as is necessary to understand its con-
 30 nection with such feeding device, the construction and mode of operation of the keys and type-bars and their immediate connections forming no part of the present invention.

35 With this general understanding of the nature of the improvements a detailed description thereof will now be given.

The type-writer is provided with a base-plate A, upon which its different parts are support-
 40 ed and by which it may be secured to a table or other proper support, said base-plate having along its rear side a supporting-flange *a* for a paper-carriage B. The paper-carriage consists of an open framework provided by
 45 two end plates 20 21, that are connected together at the rear and bottom by an angular bar 22 and at their front by a tie-bar 23, the whole forming a light, rigid, and compact structure. The rear of the carriage rests
 50 upon and rides over the supporting-flange *a*, which may contain antifriction-rolls *a'* to lessen the friction between them. The forward portion of the carriage is supported by a centrally-arranged guide, which may likewise
 55 contain an antifriction-roll 2. The carriage is guided in substantially right lines back and forth by what is known in mechanics as a modification of "Scott Russell's parallel motion," consisting of a pair of parallel bars
 60 24, one end of each of which is pivoted to the rear end of the carriage, and their opposite ends are each pivotally connected by links 25 to the front portion of the base-plate. There are provided radius-bars 26, that are
 65 each pivotally connected at one end to the center of each bar 24 and at their opposite ends to the rear of the base-plate, the construction

and arrangement of the parallel and radius bars being such that the carriage in its back-and-forth motion is guided in substantially
 70 right lines and the true alinement of the characters printed upon the paper insured. The end plates 20 21 of the carriage provide bearings for a revoluble shaft 27, that supports
 75 a paper holding and moving device C, which consists in the construction shown of a plurality of disks 28, secured to the shaft, provided with a gripper 29 for grasping the edge
 80 of the paper. These grippers are each formed by a plate that is splined to the gripper-shaft 16, one alongside of each of the holding-disks 28, the shaft being mounted in bearings in
 85 said disks and having an arm 29' at one end, also rigidly connected thereto, by which the gripper-shaft and grippers may be rocked to open them for the insertion of the edge of
 90 the paper that is to be held by the holding-disks. The free end of each of the grippers is bent at right angles to the body portion to form the gripper proper, and this end extends across a recess in the periphery of the
 95 disk and normally rests against one wall of the recess in gripping position under the force of a spring connected with the gripper. When the edge of the paper is gripped by the grippers, the holding-disks form a reel upon
 100 which the paper is wound to any desired extent. The forward part of the carriage sustains a tubular holder 30, having along its upper edge a longitudinal opening through which the paper may be inserted within the
 105 holder, so as to be coiled more or less therein, and at one side of the opening there is provided an overlying lip that forms a guide to properly direct the edge of the paper within the holder. The tubular holder 30 is formed
 110 of sheet metal, and the inner sides of the plates 20 21 are each provided with an annular recess in which either end of the holder is seated, the tie-bar 23 passing centrally through the holder and forming a convenient
 115 means of confining the holder within said annular recesses and between the end plates.

The importance of forming a light paper-carriage which at the same time shall be rigid
 115 and compact is a great desideratum in this class of machines, and the present structure as well as meeting these desirable features is also of simple construction. The provision
 120 of the tubular holder and the mode described of seating its ends in recesses in the sides of the end plates impart all the necessary rigidity to the carriage with the angular bar 22 that is requisite. The tubular character of
 125 the holder also imparts strength to the structure, as well as lightness.

The space between the tubular holder and the holding device C of the carriage is occupied by a support or table D, over which the
 130 paper is drawn and held by the holding device in position for the imprint of the types. This table consists of a suitably-shaped plate secured near its center to the upper end of an inclined flanged post rising from the base-

plate of the machine and is high enough to allow the end plates of the carriage to pass under it, so as not to interfere with the back-and-forward movements of the carriage. The particular function of the post and the table, other than that of supporting the paper, need not be further described, as the same is not herein claimed. The rear side of the carriage supports a rack-bar 31, that is secured to the vertical flange of the angular bar 22, so that its teeth are free to be engaged by the feeding device, hereinafter referred to. Near the center of the rear of the machine there is provided a plate 32, overlying a portion of the angular bar and rack-bars and secured in place upon a bracket rising from the base-plate. This plate supports and forms a guide for the carriage-feeding device E, that coacts with the rack-bar of the carriage. This feeding device consists of a pair of pawls 3 4, one rigidly connected to the under side of a carrier 13 and the other similarly connected to a second carrier 14, partially overlying the other carrier. These pawls are in the form of a divided detent, one portion acting solely as a detent and the other sometimes as a detent and sometimes as a pawl to effect the character-space feed of the carriage. The carrier 14 is carried at the end of a reciprocating rod 33 and is rigidly secured thereto, so as to move as one piece, the end of the rod merging in and forming the pawl 4, as is seen in Fig. 3. The front end of the carrier 14 carries a stud 15, on which is pivoted a carrier 13, carrying the pawl 3. Both carriers are adapted to reciprocate back and forth over the surface of the plate 32, their respective pawls extending through a suitable P-shaped opening in the plate, so as to project a short distance below its under side in engagement with the teeth of the rack-bar 31. The pawl of the carrier 14 extends through said opening in the plate, and that carrier is by the straight edge of said P-shaped opening, Figs. 4 and 10, guided in right lines back and forth in the reciprocating movement of the carriers. This opening in the plate 32 is gradually enlarged, so that the other pawl and its carrier 13 may have a lateral motion, as well as a reciprocating one. Normally the two pawls occupy the same vertical plane in alinement with each other and their abutting edges are inclined, so that the one pawl cannot leave the rack until the other is fully in engagement therewith. Both of these pawl-carriers are connected to be moved in unison from the keys or from the universal bar of the machine or from the spacing-bar through the rod 33, one end of which is rigidly connected to the movable plate 14 and the other end guided by a stud 34, that passes through a slotted opening in the end of the rod and is tapped into an arm 50, rising from the base-plate of the machine, by which stud and the pawl moving in the straight opening in the plate 32 the carrier and rod are guided and moved in right lines.

The movement of the keys and of the spacing-bar may be transmitted to the rod 33 in any convenient manner, varying as the character of machine may vary. In the present illustration a key F is shown as mounted at its heel upon a pivot 51, with an extending toe in position on being rocked to bear upon and move a vertically-movable collar 52, that in turn raises a universal bar 53. This bar is pivotally mounted at one end to a fixed portion of the machine and at the other end is connected, through a pair of links 54 55, to the short arm of a bell-crank 56, that is pivoted to the side of the arm 50. The long arm of the bell-crank carries a right-angular projecting flange 17, that is in position to bear against the forward end of the rod 33, which flange, upon the movement of the key and the described connections, is rocked against said rod and through it reciprocates the pawl-carriers of the carriage-feeding mechanism. The key may be returned to its normal position after each vibration by a spring 18. The spacing-bar G is fixed to the upper end of a vertically-reciprocating bar 57, that is held and guided in such movement by studs 19, passing through slotted openings therein, said studs being tapped into some fixed part of the machine. The lower end of the bar 57 is turned forward and at this end carries a roll in position to bear upon one arm of a bell-crank 58, that is also pivoted to the side of the arm 50, the other arm of the bell-crank having a stud engaging with a projection or the end of a recess formed in the rod 33. Upon the movement of the spacing-bar downwardly the bell-crank 58 will be rocked and the rod 33 reciprocated. Of course in the movement of the rod 33, either by the keys or by the spacing-bar, it and the bell-cranks 55 56 will be returned to their normal positions by a spring, against the force of which the rod 33 is moved, as will presently appear. The connections described between the rod and the bell-cranks is such that either bell-crank may be moved to effect the reciprocation of the bar.

Upon the under side of the plate 32 there is provided a spring 35 in position to be placed under tension upon the rearward reciprocation of the carriers and the rod 33. This spring bears upon an arm 36, that is pivoted at one end with its free end extending in rear of the rod 33, so that upon the rearward movement of the rod in the movement of the carriers the rod will bear against the arm and compress its spring, the tendency of which is to return the carriers and its rod to their forward normal position. The carrier 13 is borne upon laterally by a suitable spring 9, which tends to move the carrier and its pawl 3 laterally the distance of one tooth when disconnected from the rack in a direction contrary to that in which the carriage is advanced to effect the character-spacing as soon as that pawl is moved back into engagement with the rack. This carrier also carries upon its

under side an arm 8, that is pivotally connected thereto, its free end extending into and engaging with a recess in the under side of the plate 32. Said arm 8 forms a lever, 5 its free end adapted to rock in the recess or curved notch 8^a, formed in the edge of a boot-shaped plate which is attached to the under surface of the plate 32, as the pawl-carrier 13 is reciprocated rearwardly and is moved laterally under the pressure of the spring 9. On 10 the return reciprocation of this carrier by the energy of the spring 35 the arm 8 by reason of the seating of its free end in its recess compels the carrier against the tension of the spring 9 to assume its former position with 15 its pawl 3 in alinement with the companion pawl 4. Thus the carrier is made to assume its former position independent of the shape of the opening in the plate, which in some cases might be depended upon to effect this alinement of the pawls—as, for instance, when a driving-spring is connected directly to the carriage, as is usual in some type-writing machines. In the forward normal position of 25 the pawl-carriers their pawls are in alinement and the pawl 3 in engagement with a tooth of the rack, as in Fig. 5. Upon the rearward reciprocation of the carriers the pawl 3 will be moved from engagement with that tooth and the pawl 4 moved into engagement therewith. As soon as this takes place the spring 9 will commence to move the pawl 3 and its carrier laterally to one side of the line of 30 movement of the other pawl. In this latter movement of the pawl in the case of uniform spacing, as in Fig. 6, its end will pass into position to engage with the next succeeding tooth of the rack. Upon the reverse movement of the carriers the pawl 3 will engage 35 with the said succeeding tooth of the rack-bar, and immediately upon this engagement the pawl 4 will move from the rack-bar, so that the pawl 3 in continuing its movement will by the action of the arm 8 and tension of the spring 40 35 return to its normal position in alinement with the pawl 4, forcing the carriage forward one step, and in reaching its normal position the pawl enters the straight part of the opening in the plate 32, so that the carriage is positively 45 locked against lateral movement at the end of said forward motion. The plate 32 carries a bracket 37, rising therefrom, that supports on its rear side an antifriction-roll 10, that projects through a slot in the plate and 50 rests upon the edge of the vertical flange of the angular bar 22 and prevents contact with the underside of the plate 32. This bracket also supports on its front side a pivotally-mounted spring-pressed arm 38, whose free 55 end overlies and is in position to bear upon the surface of the carrier 14 to hold it and the other carrier with their pawls in position to properly engage with the rack. The said arm, however, is yielding against the pressure of said arm 38, so as to permit the pawls 60 and their carriers to be raised enough to disengage the pawls from the rack and entirely

free the carriage, so that it may be moved back and forth to any position desired. To 70 effect this disengaging of the pawls from the rack, there is provided a disengaging-bar 39, that is mounted at the rear of the carriage between the end plates thereof and at one side of the rack-bar and upon the under side 75 of the pawls. This bar extends the length of the carriage and is pivotally mounted in the end plates thereof and is provided with an extended edge normally lying at one side of its axis and is adapted to be rocked, so as to bring said extended edge upward in contact 80 with the under side of one or the other of the pawls and rock or raise the pawls out of engagement with the rack-bar. The bar is formed by a rod having a longitudinal recess in which is secured a radially-extending blade. 85 The movement of the disengaging-bar is effected by hand through an arm 40, rigidly connected to one end of the bar, preferably upon the outside of the carriage, and having a grasping-piece 40^a within convenient reach 90 of the operator, so that he may rock the same. The bar may be borne upon by a spring 41, so as to hold it out of contact with the pawls and to return it to such position after it has been rocked for the purpose of disengaging 95 the pawls from the rack-bar. In this mode of disengaging the pawls from the rack-bar, so that the carriage is free to be moved back and forth, such movement may be imparted to the carriage through the medium of the 100 arm 40 while the operator has hold of it and as soon as he has rocked the bar. Of course this arm may be located upon either end of the carriage, or it may be duplicated at each end, so that the operator may use either hand 105 to effect the release of the carriage and to move it back and forth.

The means for effecting the movement of the paper-holding device so as to present other or fresh portions of the paper in position upon the table and herein called the 110 "line-spacer" will now be described.

The revoluble shaft 27 of the paper-holding device at one side of the carriage extends through the end plate and is provided with a 115 toothed or ratchet wheel 42, rigidly connected thereto. Below this toothed wheel 42 there is an arm 43, having a pawl 5, adapted to engage with the teeth of said wheel. This arm has a finger-piece 43^a and is provided with a 120 stud 59, that projects through a slotted opening 44 in one of the end plates and is connected thereby to one end of a radius-arm 47, that is at its opposite end loosely mounted upon the shaft 27, the pawl-arm 43 being adapted 125 to be rocked upon said stud independent of the arm 47. The slot 44 is concentric with the center of the axis of the toothed wheel and is of sufficient length to permit the pawl to be vibrated through the maximum distance 130 necessary to rotate the wheel to the desired extent. Coacting with this wheel there is a guard 6, arranged concentric with the axis thereof and overlying a portion of its teeth,

which guard is mounted at the end of an arm 45, loosely hung from the shaft 27 and having an extension carrying a pin 7 at its end, adapted to engage with holes or recesses in the face of the end plate. The position of this guard with respect to the pawl determines the point at which the pawl shall engage with the wheel, and consequently the extent of rotation imparted to said wheel by the movement of the pawl-arm 43, which is a constant one. The construction is such that when the guard and its arm is in the position shown in Fig. 1 the pawl will ride for a portion of its vibration upon said guard out of contact with the toothed wheel; but upon continuing its further movement it will drop from the guard into engagement with the wheel and rotate it to the end of the vibrating movement of the pawl. When the guard and arm is moved to its changed position, the pawl will almost immediately leave the guard and engage with the ratchet-wheel, so that it is rotated to the maximum distance. This change of position of the guard and its arm will be effected by grasping the end of the pin 7 and disengaging it from the recess in the plate and rocking the arm downward, so that the pin is engaged with the adjacent recess 1. The toothed wheel is provided with a stop-pawl formed by a pin 11 at one end of a bell-crank 46, that is pivoted to the side of the end plate and having a suitable spring 12, whose tendency is to hold the stop-pin in engagement with the teeth of the wheel. The opposite end of the bell-crank overlies and extends into the path of a finger projecting from the pawl-arm 43, which upon the rocking of such pawl-arm upon the stud 59 in a direction the reverse of the feeding movement of the arm the finger of said pawl-arm is brought against the end of the bell-crank, so as to rock it on its pivot and disengage its stop-pin 11 from the toothed wheel, so that the paper-holding device and said toothed wheel may be rotated in either direction free of the line-spacer. This rotation may be effected through a handpiece 48, secured to the opposite outer end of the revoluble shaft 27. (See Fig. 2.) As soon as it is desired to move the paper-holding device by means of the line-spacer the act of vibrating the pawl so as to move the toothed wheel will withdraw the finger from engagement with the bell-crank and allow its stop-pin 11 to again engage with the teeth of said wheel. The spring-pressed stop pawl or pin 11 serves to prevent any accidental rotation of the ratchet-wheel during the course of the writing and while the line-spacing driving-pawl is maintained out of engagement with the ratchet-wheel by the interposed movable guard. The said ratchet-wheel, and hence the paper-holder feeding or carrying device, may, however, be turned by hand in either direction by the wheel 48 while the stop-pawl or check 11 is in engagement with said ratchet-wheel by reason of the fact that the driving-pawl

is normally out of engagement with the ratchet-wheel, and during such rotation the stop-pin or check bobs in and out of the spaces of said ratchet-wheel, the teeth and spaces of said wheel being radially formed and permitting of this action; but when it may be desired to turn the paper holding and feeding device, including the ratchet-wheel, without having the pawl or check-spring in and out of the spaces of the ratchet-wheel, and thus secure an easier and a noiseless action, the said stop-pin may be held out of engagement with the ratchet-wheel by the finger on the driving-pawl, as hereinbefore explained.

As it is desirable to free the carriage from its feeding device at the same time the line-spacer is operated, so that the carriage may while the operator is still holding the line-space actuator be moved back or forth and the paper brought into position for the commencement of a new line or paragraph, the line-spacer is connected with the disengaging-bar 39 to permit this operation. Thus the pawl-arm 43 is connected by a link 49 to the arm 40 of the disengaging-bar, so that each time the pawl-arm is vibrated to rotate the line-spacing wheel the disengaging-bar will be rocked to free the pawls from the rack-bar. One end of the link 49 is pivotally connected with the arm 40, and the opposite end is slotted to embrace the stud 59, connecting the pawl-arm with the radius-arm 47, by which construction the disengaging-bar and its arm 40 may be rocked independently of and without disturbing the position of the pawl-arm or of the line-spacer.

What is claimed is—

1. The combination of the paper-holding device, a toothed wheel secured thereto, a bell-crank its one arm having a stop-pawl engaging said wheel and its other arm free thereof, a pawl-arm having a feed-pawl for engagement with said wheel, and a finger mounted to engage said other arm of the bell-crank to free the paper-holding device of the stop-pawl, as set forth.

2. The combination of a base-plate having a rear supporting-flange, a paper-carriage formed of a pair of end plates connected at the rear with an angular bar that rests and rides upon the rear flange of the base-plate, and at the front by a tubular holder and a tie-bar passing through the holder, and a centrally-arranged roll mounted in the base-plate upon which the holder of the carriage rests and rides, substantially as described.

3. In a type-writer, the combination of a paper-carriage, a rack-bar fixed thereto with its teeth uppermost, a horizontally-reciprocating feeding device mounted above the rack-bar and movable transversely across the same, a disengaging-bar mounted upon the carriage below the feeding device and of a length substantially equal to length of travel of the said carriage, and means for rocking said disengaging-bar on its longitudinal axis to raise the

feeding device out of engagement with the rack-bar in any position of travel of the paper-carriage, substantially as described.

4. In a type-writer, the combination of a paper-carriage, a rack-bar fixed thereto with its teeth uppermost, a horizontally-reciprocating feeding device mounted above the rack-bar and movable transversely across said rack-bar, a yielding arm bearing upon the feeding device, a disengaging-bar mounted below the feeding device and means for rocking the bar on its longitudinal axis to raise the feeding device against the action of said yielding arm out of engagement with the rack-bar, substantially as described.

5. In a type-writer, the combination of a paper-carriage, a rack-bar fixed thereto with its teeth uppermost, a horizontally-reciprocating feeding device consisting of a pair of carriers with detents mounted above the rack-bar and movable transversely across said rack-bar, a yielding arm bearing upon said carriers, a disengaging-bar mounted below the carriers and detents and adapted to raise the detents against the action of said yielding arm out of engagement with the rack-bar, substantially as described.

6. In a type-writer, the combination of a paper-carriage, a rack-bar fixed thereto, a feeding device for the carriage, a disengaging-bar for the feeding device consisting of a rod extending parallel with the rack-bar the length of and mounted in the end frames of the carriage and having a longitudinal recess in which is secured a radially-extending blade for engagement with the feeding device and means for rocking the bar in its longitudinal axis, substantially as described.

7. In a type-writer, the combination of a paper-carriage having a paper-holding device, a carriage-feeding device mounted upon the framework of the machine, a rocking disengaging-bar for said feeding device equal in length to the travel of the carriage and arranged upon said carriage longitudinally thereof, a line-spacer, and loose connections between said line-spacer and the said disengaging-bar for simultaneously effecting the line-spacing and rocking the bar on its longitudinal axis for disengaging the feeding device and for permitting the independent rocking movement of said disengaging-bar, as set forth.

8. In a type-writer, the combination of a paper-carriage having a paper-holding device, a carriage-feeding device mounted upon the framework of the machine, a disengaging-bar therefor, a line-spacer, and connections between the line-spacer and the disengaging-bar for moving them simultaneously, substantially as described, said disengaging-bar being mounted upon the carriage in proximity to said carriage-feeding device.

9. In a type-writer, the combination of a paper-carriage having a paper-holding device, a feeding device for the carriage, a disen-

gaging-bar therefor, a line-spacer including a pawl having a fixed range of movement and a movable guard, a slotted link connecting the disengaging-bar with the line-spacer whereby the disengaging-bar may be moved without moving the line-spacer, substantially as described.

10. In a type-writer, the combination of a paper-carriage having a paper-holding device, a carriage-feeding device, a disengaging-bar therefor, a line-spacer consisting of a toothed wheel secured to the paper-holding device, an actuating-pawl therefor, and a slotted link connecting the actuating-pawl with the disengaging-bar whereby the two are moved in unison and whereby the disengaging-bar may be moved without moving the actuating-pawl, substantially as described.

11. The combination with a paper-carriage, of a feeding mechanism therefor consisting of a divided and reciprocating detent, a spring resisting the movement of the detent in one direction, a second spring for moving one portion of the detent laterally and an arm connected with said portion for positively returning it to its normal position, substantially as described.

12. The combination with a paper-carriage, of a feeding mechanism therefor consisting of a pair of pawl or detent carriers, each having one portion of a divided detent, a supporting-plate having an opening through which the divided detent extends, a spring resisting the movement of the carriers and detent in one direction, a second spring for moving one carrier and its portion of the detent laterally and an arm connected with said carrier for positively returning it to its normal position, substantially as described.

13. In a type-writer, the combination, in a line-spacing mechanism, of a ratchet-wheel, a stop or check, a driving-pawl for turning said ratchet-wheel step by step, and means for holding said driving-pawl out of engagement with the ratchet-wheel, while said pawl is in position for the line-spacing operation.

14. In a type-writer, the combination, in a line-spacing mechanism, of a ratchet-wheel, a stop or check, a driving-pawl, and a movable guard coacting with said pawl to regulate the extent of rotation of said ratchet-wheel and to hold said pawl out of engagement with said ratchet-wheel, while said pawl is in position for the line-spacing operation, and at all positions of said movable guard.

15. In a type-writer, the combination, in a line-spacing mechanism, of a ratchet-wheel, a stop or check that permits the ratchet-wheel to be turned either way, a driving-pawl, and means for holding the same out of engagement with the ratchet-wheel, while said pawl is in position for the line-spacing operation.

16. In a type-writer, the combination, in a line-spacing mechanism, of a ratchet-wheel, the bell-crank, the stop or check thereon, and the driving-pawl carrying the finger adapted

to act on said bell-crank when the driving-pawl is moved in a direction opposite to that in which it is moved to effect line-spacing.

17. In a type-writer, the combination, in a
5 line-spacing mechanism, of a ratchet-wheel, a stop or check, a driving-pawl having a uniform range of movement and normally out of engagement with said ratchet-wheel at all
10 times, whereby said ratchet-wheel may be rotated at will independently of said driving-pawl, means for moving said pawl into engagement with the ratchet-wheel so that it may turn the latter, and means for varying the effective stroke of said pawl.

18. In a type-writer and in a line-spacing
15 mechanism, the combination of a ratchet-wheel, a pawl adapted thereto, a line-spacing regulator for altering the extent to which said wheel may be turned by said pawl at the
20 line-spacing operation, and means for causing said pawl to move into engagement with said wheel to turn the same, said pawl being normally out of engagement with said wheel at all adjustments of said line-spacing regu-
25 lator.

19. In a type-writer, the combination of a carriage having a paper-holding device, a de-

vice mounted upon the framework of the machine for feeding said carriage, a rack mounted upon the carriage and controlled by said
30 carriage-feeding device, a disengaging-bar also mounted upon the carriage and arranged in proximity to said feeding device, and a line-spacer operatively connected to said disengaging-bar.

20. In a type-writer, the combination of a
35 carriage having a paper-holding device, a device mounted upon the framework of the machine for feeding said carriage, a rack mounted upon the carriage and controlled by said
40 feeding device, a disengaging-bar mounted upon the carriage and arranged in proximity to said feeding device, a line-spacer operatively connected to said disengaging-bar, and
45 a lever mounted upon the carriage and connected to said disengaging-bar independently of said line-spacer.

In testimony whereof I have set my hand, this 14th day of January, 1890, in the presence of two witnesses.

HORACE L. ARNOLD.

Witnesses:

GEO. H. GRAHAM,
NETTIE MARLER.