

(No Model.)

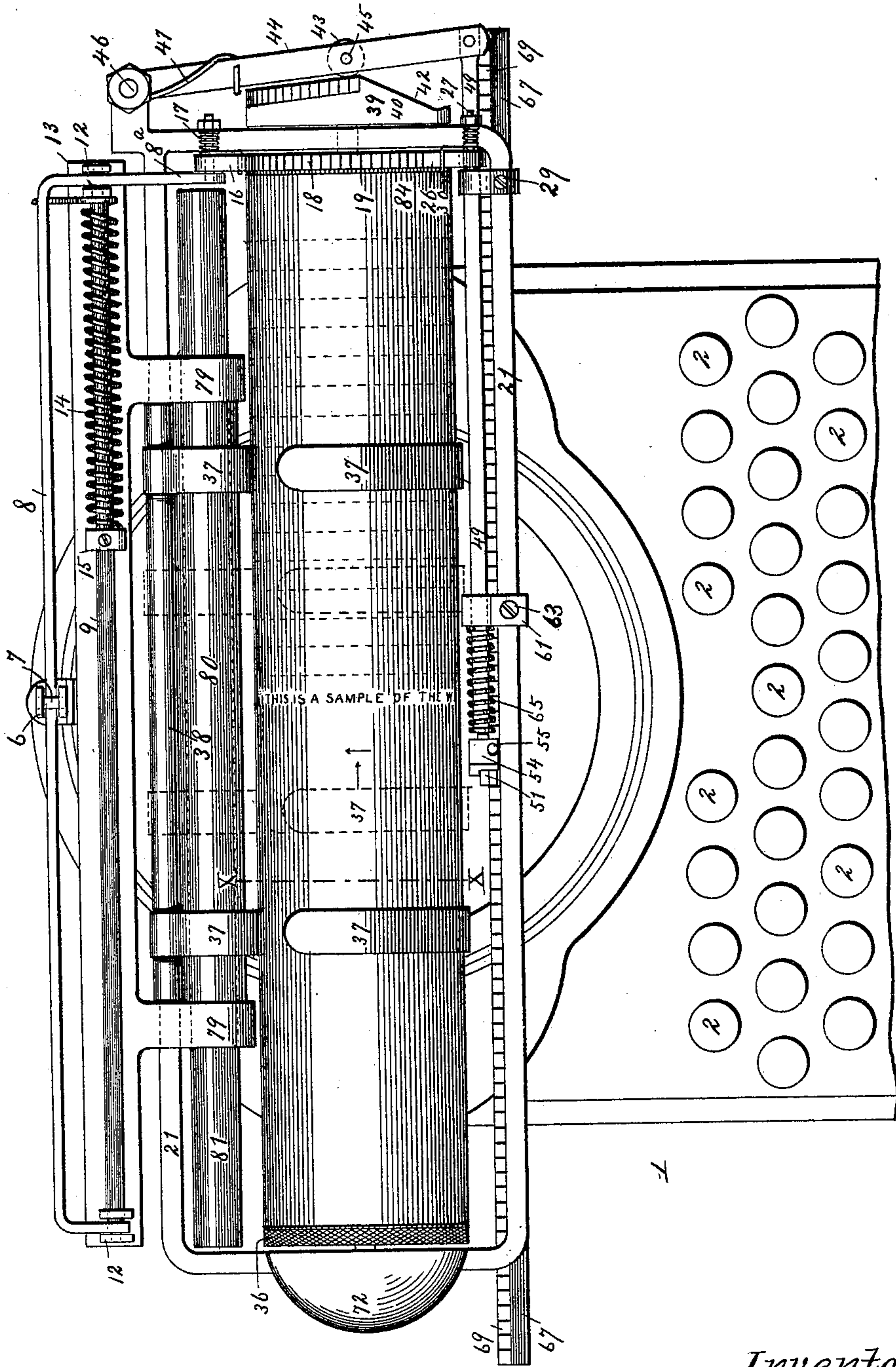
4 Sheets—Sheet 1.

W. H. STEWART.  
TYPE WRITING MACHINE.

No. 584,966.

Patented June 22, 1897.

Fig. 1.



Witnesses:

J. H. Church  
J. H. Church

Inventor:  
W. H. Stewart

By J. H. Church  
Atty.

(No Model.)

4 Sheets—Sheet 2.

W. H. STEWART.  
TYPE WRITING MACHINE.

No. 584,966.

Patented June 22, 1897.

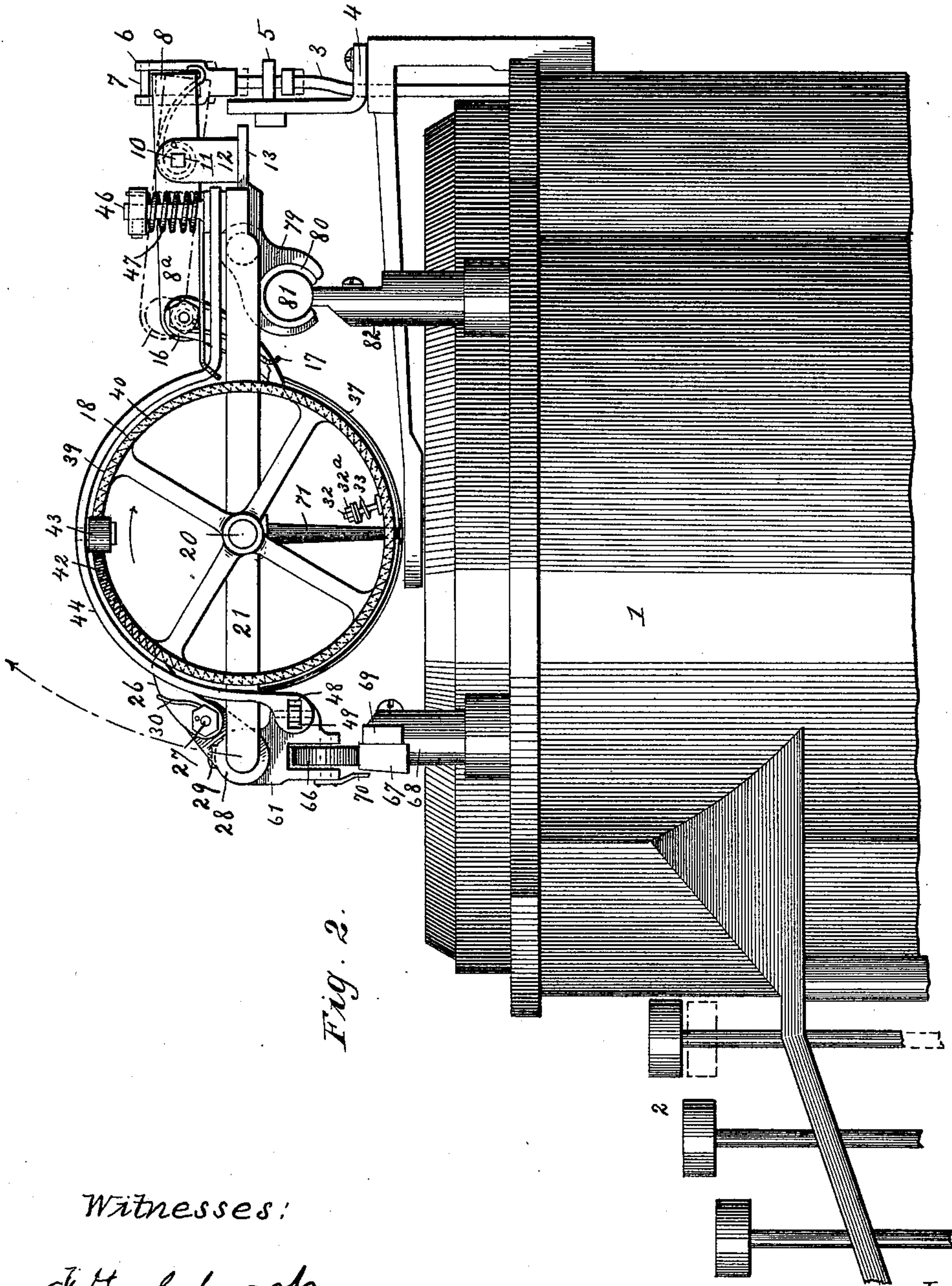


Fig. 2.

Witnesses:

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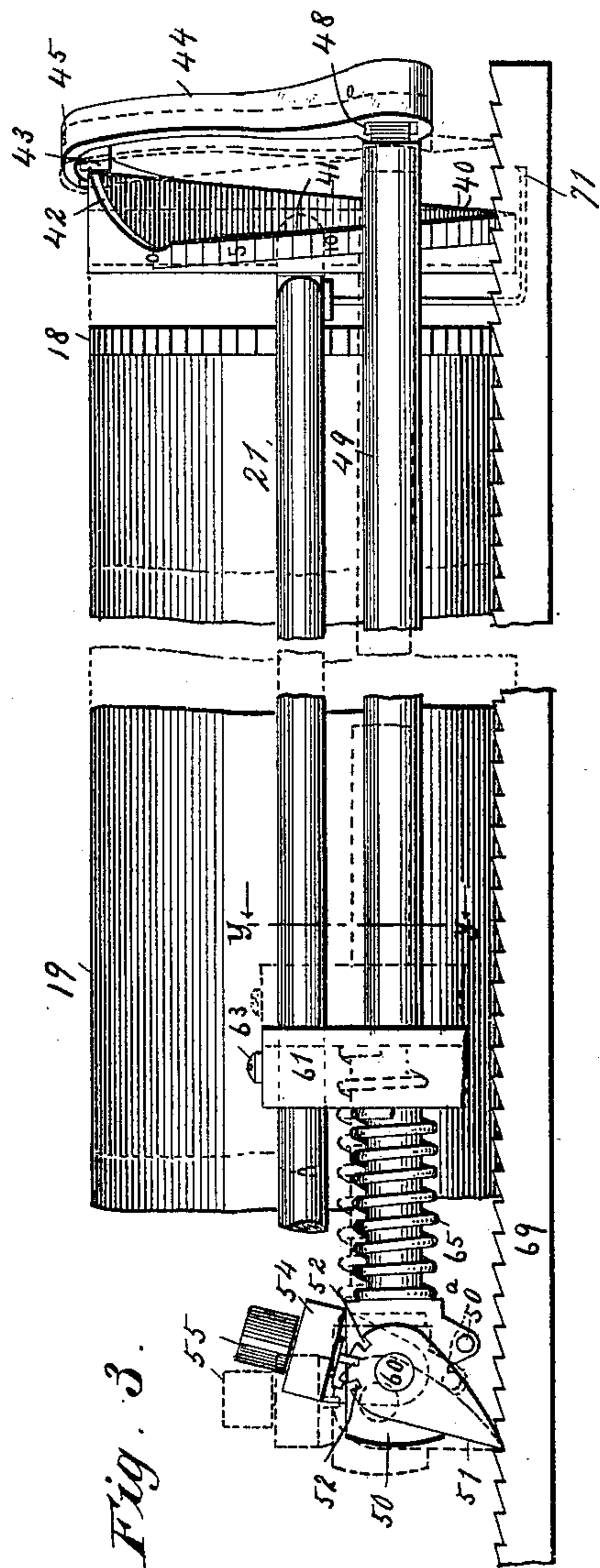


Fig. 3.

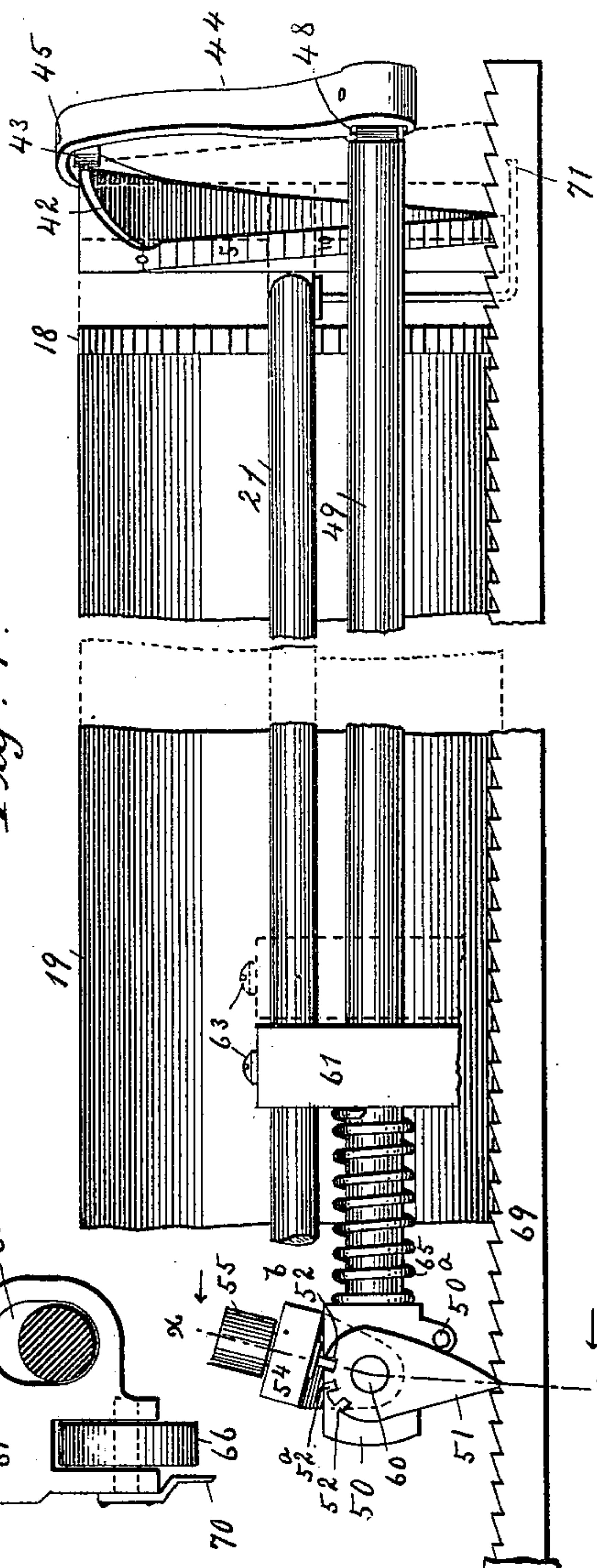


Fig. 4.

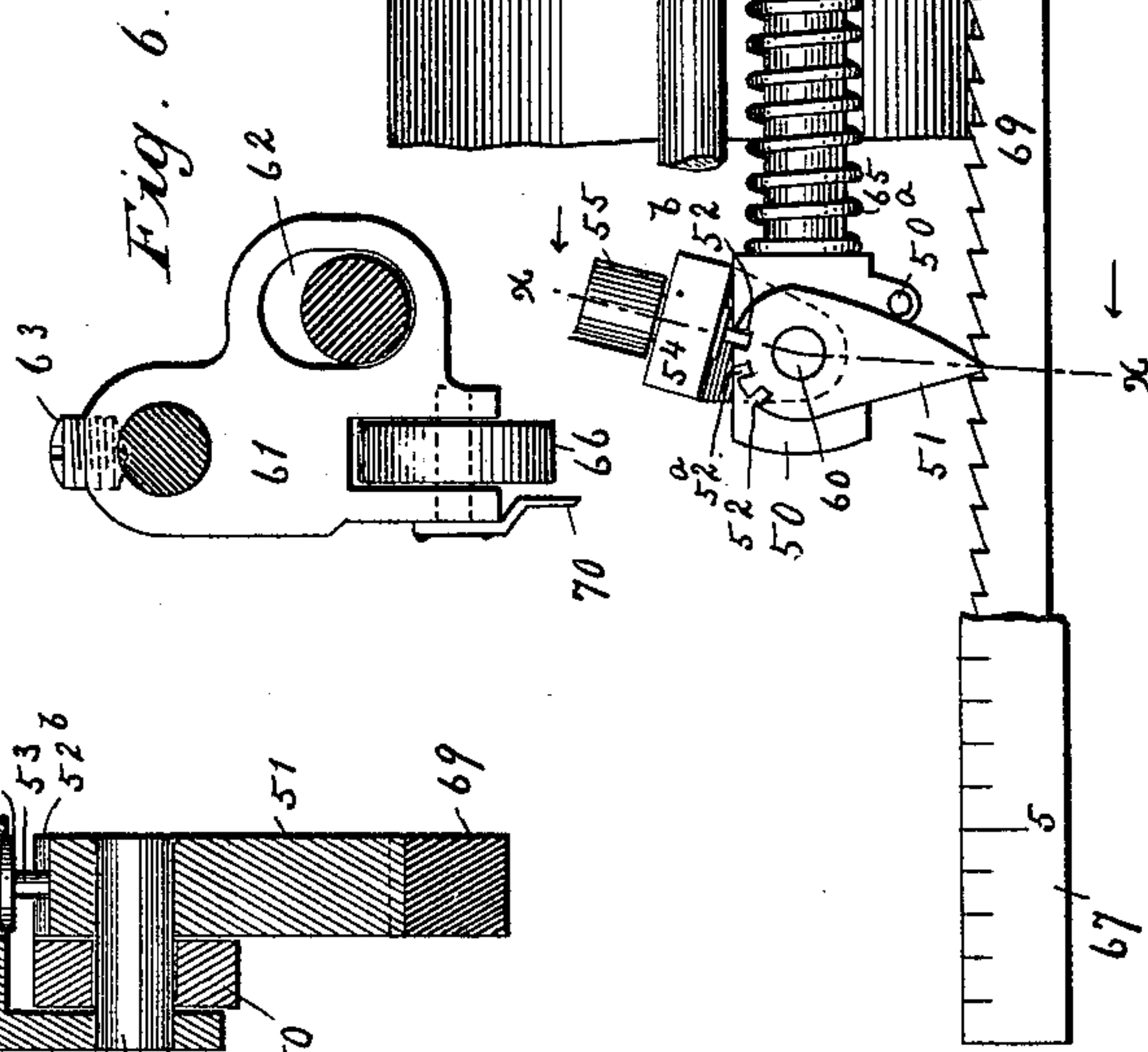


Fig. 5.

Witnesses:

F. H. Schuch  
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TYPE WRITING MACHINE.

No. 584,966.

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Fig. 9.

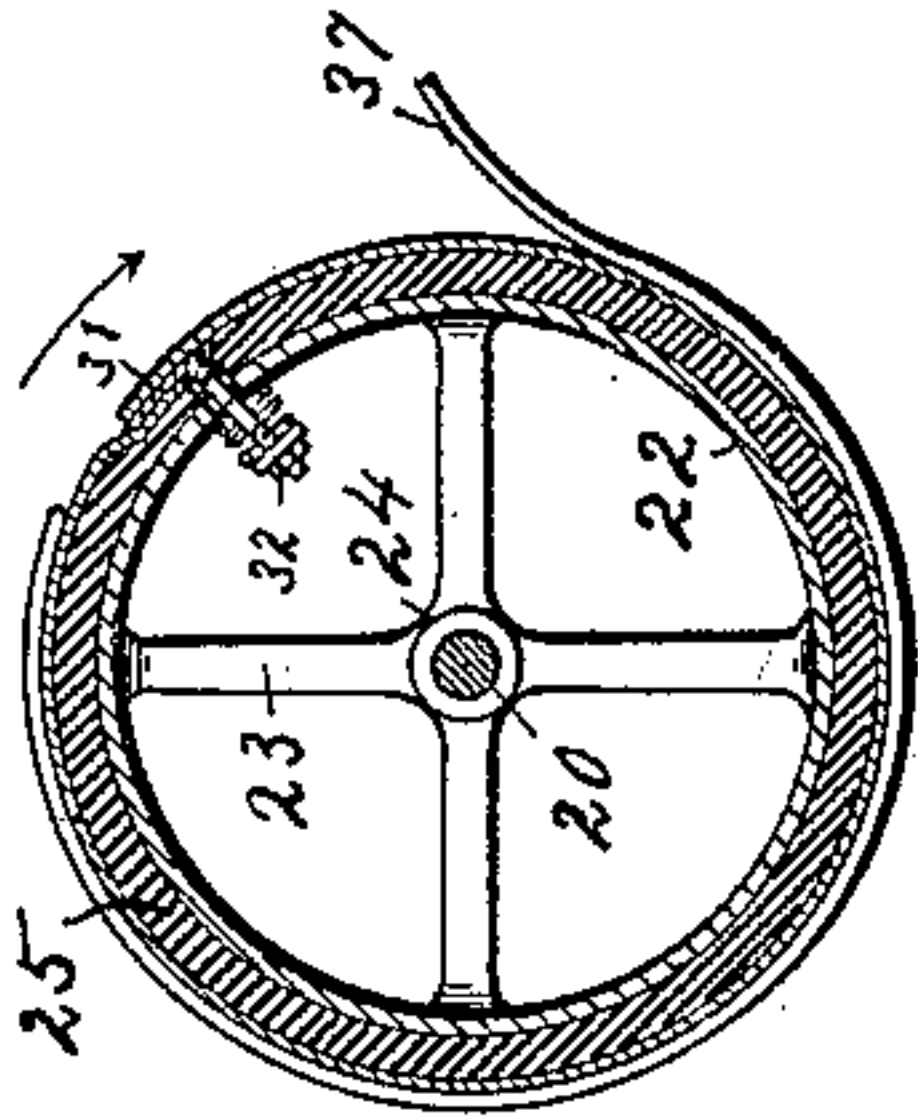


Fig. 8.

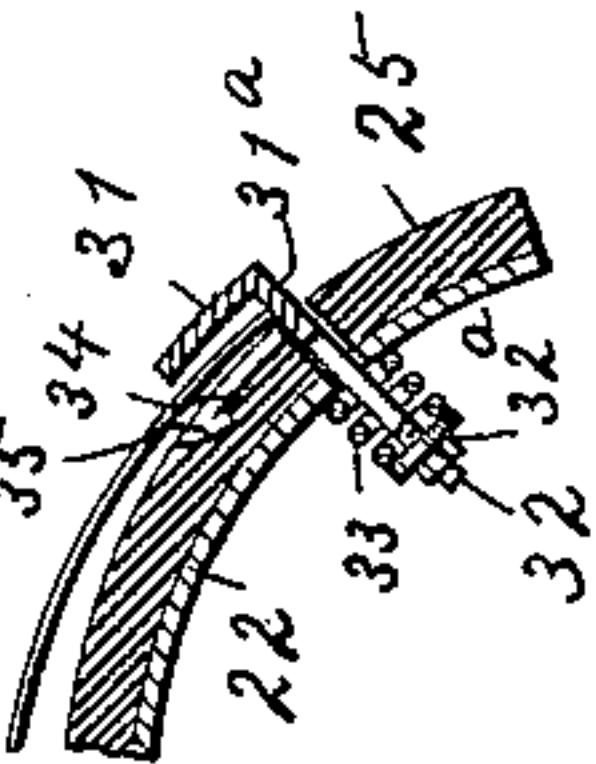


Fig. 7.

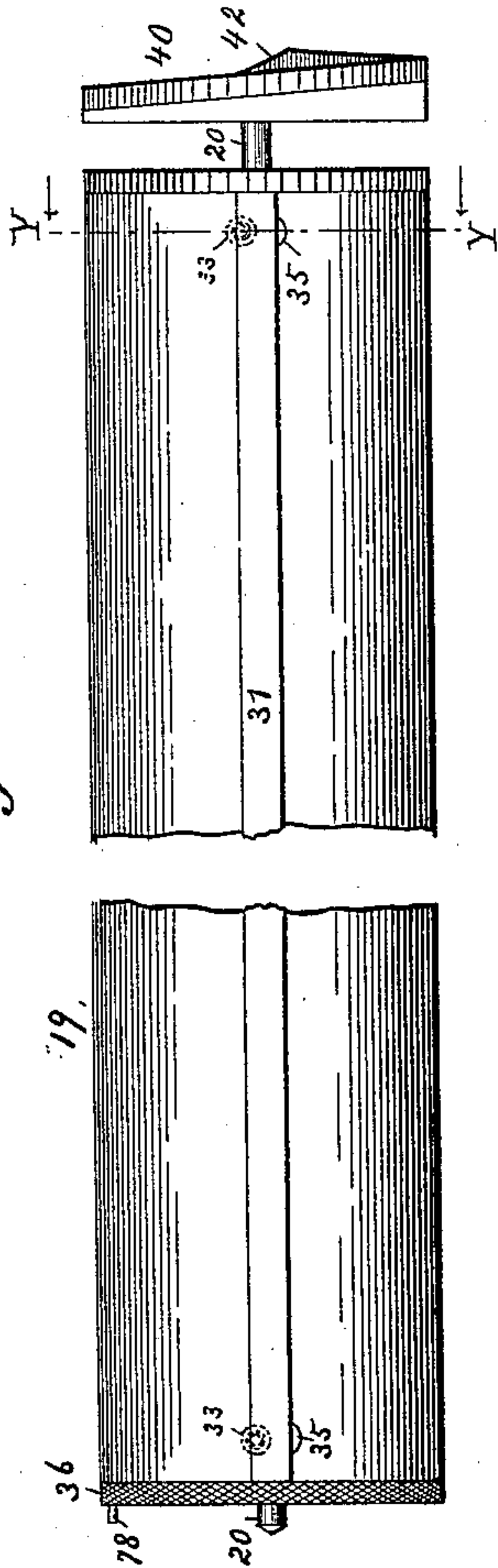


Fig. 11.

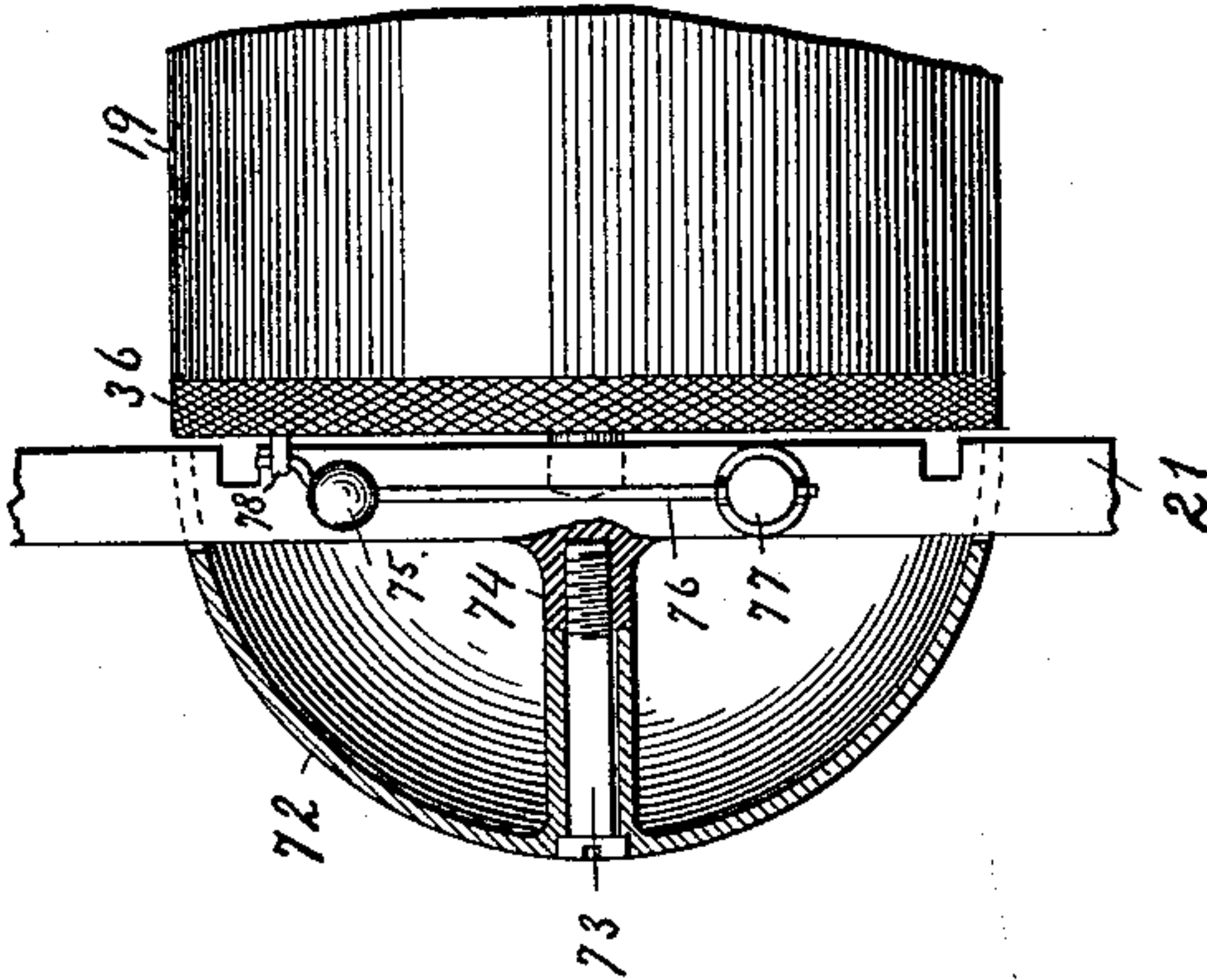


Fig. 10.

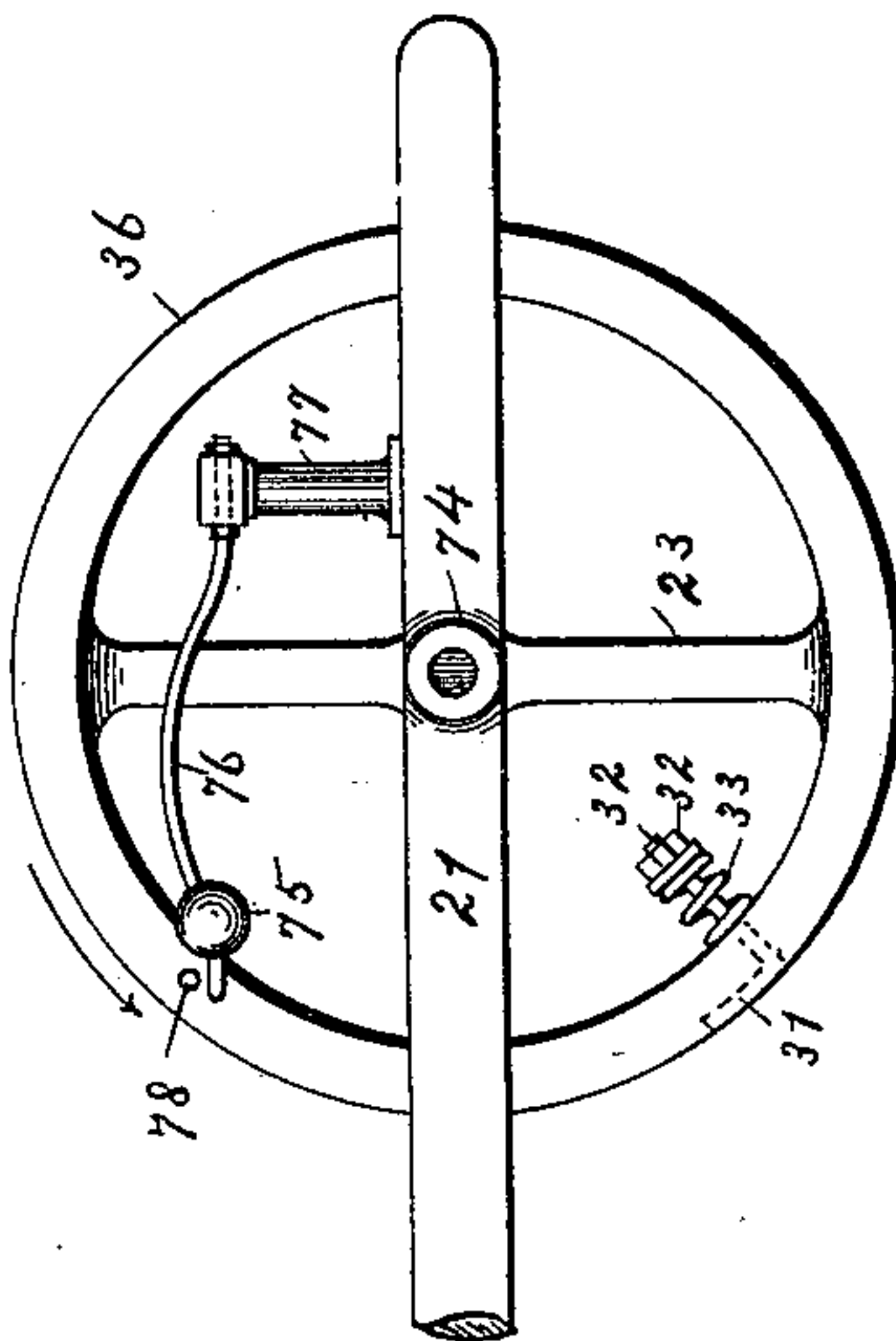
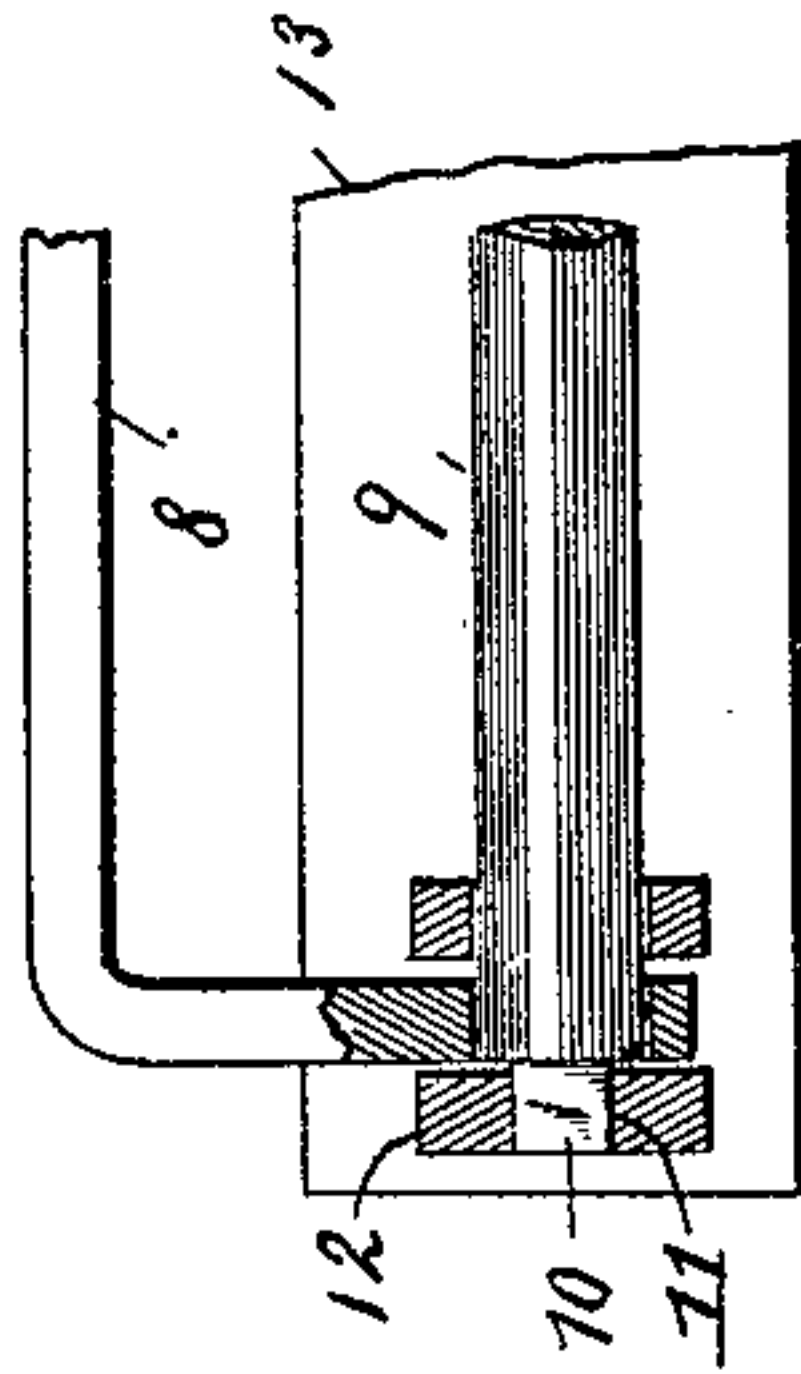


Fig. 12.



Witnesses:

*J. H. Schuch*  
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Inventor:  
W. H. Stewart

By *J. H. Schuch* Atty.



# UNITED STATES PATENT OFFICE.

WILLIAM H. STEWART, OF KANSAS CITY, KANSAS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO GEORGE P. GROSS, OF KANSAS CITY, MISSOURI.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 584,966, dated June 22, 1897.

Application filed March 20, 1893. Serial No. 584,141. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. STEWART, a citizen of the United States, residing at Kansas City, in the county of Wyandotte and State of Kansas, have invented certain new and useful Improvements in Type-Writers, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in type-writers; and my object is to arrange the spacing mechanism in such a manner that the cylinder carrying the paper to be printed upon will be automatically revolved after the printing of each character thereon and also receive its lateral movement automatically for the beginning of each line, thus relieving the operator of the time and inconvenience now required in shifting the carriage backward for the beginning of each new line. As there are usually from twenty-five to thirty type-written lines on each sheet, it is obvious that considerable more work can be performed in a given length of time by automatically shifting the carriage with the cylinder that carries the paper than by performing that function by hand.

With this object in view the invention may be said to consist in the novel arrangement and combination of parts hereinafter described, and pointed out in the claims.

Referring now to the drawings which illustrate the invention, Figure 1 represents a plan view of a type-writer, partly broken away, provided with my improvements. Fig. 2 is a side elevation of same with the action of the character-spacing mechanism indicated by dotted lines. Fig. 3 is a broken front elevation of the automatic line-spacing mechanism adjusted to move the cylinder forward two spaces after each revolution, said movement being indicated by dotted lines. Fig. 4 is a broken front elevation of same adjusted to move the cylinder forward three spaces after each revolution, said movement being indicated by dotted lines. Fig. 5 is a vertical section of the adjustment for the line-spacing mechanism, taken on line *xx* of Fig. 4. Fig. 6 is a sectional detail view taken on line *yy* of Fig. 3. Fig. 7 is a broken plan

view of the paper-carrying cylinder. Fig. 8 is a broken cross-section of same, showing the paper-clamp raised to receive the edge of the sheet. Fig. 9 is a cross-section of the cylinder, taken on line *xx* of Fig. 1, with a sheet of paper thereon in position for printing. Fig. 10 represents an end view of the cylinder and its carriage with the bell removed to show its hammer and the manner in which it is operated. Fig. 11 shows a plan view of same with the bell in section. Fig. 12 is a broken plan view of one end of the rocker-bar.

In carrying out my invention I employ a type-writer 1, of ordinary or preferred construction, provided with operating-keys 2, connected in the usual manner (which is not shown in the drawings) to a vertical rod 3, that passes up through guides 4 and 5 and controls the action of the character-spacing mechanism hereinafter described.

Secured to the upper end of the vertical rod is a small bifurcated casting 6, having a cross-pin 7, which closes the upper end of the bifurcated portion and retains in position a rocker-bar 8, that is slidably arranged therein. Said rocker-bar extends longitudinally about the length of the cylinder and is bent at right angles at each end in order that it may be pivotally mounted upon a rod 9, secured from turning by its square ends 10 in square openings 11 in lugs 12, which are located near the opposite ends of a longitudinal flat bar 13, forming part of the carriage. The end portion 8<sup>a</sup> upon the right-hand side of the rocker-bar extends beyond its pivotal point and terminates near the end of the cylinder. Said end portion 8<sup>a</sup> is normally held in a depressed position by a coiled spring 14, located near one end of rod 9, provided with a rigidly-secured collar 15, in which one end of the spring is fastened. Its opposite end extends rearwardly beneath the longitudinal portion of the rocker-bar and normally holds that portion in an elevated position.

Pivotally secured to the end portion 8<sup>a</sup> of the rocker-bar is pawl 16, that is yieldingly held in engagement, by a coiled spring 17, with a ratchet-wheel 18, rigidly secured to the adjacent end of a hollow paper-carrying cylinder 19. Said cylinder is rigidly mounted



upon a shaft 20, journaled at each end of a carriage 21. The space for each character as it is printed upon the paper is accurately determined by the teeth on the ratchet-wheel 18, which revolves the cylinder the proper distance after each key is struck.

As the circumference of the cylinder which I employ is equal to the width of the paper usually written upon, it necessarily follows that its diameter is somewhat greater than the cylinders now in general use. So in order to overcome any undue heaviness which might retard the rapidity of its movements I construct it of a tube 22, carried at each end by arms 23, having centrally-disposed hubs 24, through which shaft 20 extends. Cylinder 19 is provided with the customary rubber covering 25 to increase the friction between it and the paper it carries and also to protect the type from injury when it contacts therewith.

In order to increase the precision of the movements of the cylinder as it revolves step by step and prevent pawl 16 from turning same too far when the machine is operated, I locate a friction-pawl 26 diametrically opposite pawl 16. Said pawl is carried by a pivot 27, rigidly secured to a lug 28, which in turn is secured to the front bar of the carriage by a set-screw 29. The loose end of friction-pawl 26 is yieldingly held in engagement with the ratchet-wheel by a coiled spring 30, the tension of which determines the pressure at which the friction-pawl shall bear against the ratchet-wheel.

31 indicates a clamp which extends the length of the cylinder for the purpose of securing one edge of the paper in position thereon. Said clamp is provided near each end with threaded pins 32, that project through to the interior of the cylinder and are engaged by nuts 32<sup>a</sup>, which regulate the tension of springs 33, interposed between said nuts and the inner surface of the cylinder to normally hold the clamp down in a recess 34, which extends the length of the cylinder.

In order that the clamp may be quickly raised for the placing of the paper, I form depressions 35 in the surface of the cylinder for the insertion of the finger-nail beneath the clamp, so that it may be quickly raised. After the edge of the paper has been placed beneath the clamp the latter is released and the springs 33 draw it firmly down upon the paper. The cylinder is then revolved by turning its disk 36 until the paper assumes the proper position thereon. Clamp 31 is constructed of an angle-plate, which imparts stiffness thereto, and its vertical portion 31<sup>a</sup> acts as a gage for squarely placing the paper upon the cylinder.

37 indicates two circular spring-clamps, which assist in retaining the paper in position upon the cylinder. Said clamps are slidably arranged upon a sleeve 38 on the rear bar of the carriage, so that they may accommodate the different-length sheets or envelopes to be printed upon.

Simultaneous with the completion of each revolution of the cylinder it is moved forward with the carriage, in the direction indicated by the arrow in Fig. 1, for the beginning of a new line by an automatic spacing mechanism, a part of which consists of a cam-wheel 39, rigidly mounted upon the right-hand end of the cylinder-shaft. Said cam-wheel is provided with a rim 40, the outer face portion of which is formed into a cam 41, that approximates the shape of a screw-thread, which extends around almost the entire circumference of the wheel and has its opposite ends connected by an incline portion 42, which in conjunction with other parts hereinafter described rapidly completes each revolution of the cylinder and moves it forward, together with the carriage, for the beginning of every new line.

43 indicates a frictionless roller that is yieldingly held in contact with cam 41 by a spring-actuated curved arm 44, to which the roller is operatively secured by a pin 45. Said arm is pivotally secured at its rear end to the carriage by a pin 46, encircled by a coiled spring 47, the lower end of which extends forwardly and is bent around said arm to force it back toward the cam. The forward end of the curved arm is provided with a slot 48, in which is pivotally secured a longitudinal rod 49, having a rectangular head 50 rigidly secured to its opposite end. This head is provided at its under side with a projection carrying a pin 50<sup>a</sup> for a purpose hereinafter described. Pivotaly secured to the face portion of head 50 is a pawl 51, with notches 52, 52<sup>a</sup>, and 52<sup>b</sup> arranged in its upper circular portion. These notches are engaged one at a time by a pin 53, that passes up through the horizontal portion of a lug 54 and terminates in a cylindrical head 55. Said pin is provided near its lower end with a collar 56, against the upper surface of which impinges a coil-spring 57, located in a recess 58 within the horizontal portion of lug 54. This lug also has a vertical portion 59, that extends down behind the rear of head 50 and is rigidly secured to the pivot 60, upon which is loosely mounted the pawl 51.

Rod 49 is secured from lateral movement by a casting 61, having a vertically-arranged slot 62, through which said rod extends. This construction permits of a slight upward movement of the pawl end of the rod when sliding over the ratchet-bar. Casting 61 is provided with a circular opening through which extends the front bar of the carriage and is secured thereon by a set-screw 63.

65 indicates an expansion-spring coiled around rod 49, between its rectangular head and casting 61, for the purpose of assisting spring 47 to move the carriage forward step by step for the beginning of each new line.

The lower forked end of casting 61 carries a roller 66, which travels upon a track 67, supported by posts 68, projecting from the top of the machine. Secured to the rear side



of track 67 and extending the full length thereof is a ratchet-bar 69, the notches of which are engaged by pawl 51, when the machine is in operation, in order to move the carriage forward one or more spaces. Track 67 has a scale inscribed upon its face portion in order that any line upon the paper may be reached by moving the carriage back or forth until the pointer 70 is opposite the proper line of said scale.

The position of a particular character on any line may be determined by the scale upon the rim of the cam-wheel, so when it is necessary to correct one or more characters the cylinder is revolved until the line of the scale which is in alinement with said character is brought opposite a pointer 71, secured to one end of the carriage for that purpose.

In order that the operator will be notified just before the completion of each line of printed matter upon the paper, I secure a bell 72, by means of a screw 73, to a boss 74, projecting from the left end of the carriage in line with the cylinder-shaft. Said bell is rung by a hammer 75, secured near the outer end of a spring-arm 76, which is rigidly secured in the upper end of a post 77, fastened to the carriage. The outer end of spring 76 extends a slight distance beyond the hammer in order that it may be engaged and operated by a pin 78, which projects from the end of the cylinder.

Formed integral with the longitudinal flat bar 13 of the carriage are two arms 79, which carry a sleeve 80, adapted to slide back and forth upon a rod or track 81, supported near its opposite ends by posts 82, to which it is rigidly secured. In order to prevent sleeve 80 from contacting with the reduced upper ends of said posts when it is moved back and forth, I leave its underside open, as shown in Fig. 2.

That part of the carriage in which the cylinder is journaled is hinged at its rear portion to arms 79 in order that it may be raised upwardly should it be desirable to read that portion of the printed matter beneath the cylinder or for the purpose of gaining access to the type.

The operation of the machine is substantially as follows: The cylinder is revolved until it occupies the position shown in Fig. 9. The longitudinal clamp is then raised and the edge of the paper inserted thereunder until it is square with the vertical portion of the clamp, which is then released and the cylinder again revolved until the paper is brought around beneath the circular spring-clamps and the zero-mark upon the cam-wheel scale is opposite the frictionless roller. This brings the longitudinal clamp slightly in advance of the point at which the type contacts, and the carriage is drawn back until the upper end 84 of the paper is only a sufficient distance in front of the contact-point of the type to allow for the necessary margin

at the top of the paper. If only two spaces are desired between the lines to be printed upon the paper, the adjusting device for pawl 51 is set so that its pin engages the middle notch upon said pawl. When a key is pushed down, the vertical rod draws down the rear end of the rocker-bar and causes its front end, together with pawl 16, to raise up against the tension of coiled spring 14. After the impression of the character has been made upon the paper and the key released this operation is reversed and pawl 16, which in the meantime has been held in engagement with the ratchet-wheel, revolves said wheel, together with the cylinder and paper, the distance of one notch upon the ratchet-wheel preparatory to receiving another impression from one of the type. This operation is repeated until the operator is notified of the approach of the end of the line by the ringing of the bell. Should this occur at the end of a word, the spacing-key is operated until the inclined portion 42 is brought around in contact with the frictionless roller, which, owing to the pressure exerted thereby upon said inclined portion, rapidly completes the revolution of the cylinder. As the longitudinal clamp is diametrically opposite the incline portion of the cam-wheel it is carried past the contact-point of the type to the position it assumed at the beginning of the line.

It will be noticed by referring to Fig. 3 of the drawings that when the widest point of the cam-wheel has reached the frictionless roller it has forced said roller, together with the arm to which it is journaled, and the rod 49, with its attachments, outwardly a distance equal to three of the notches upon the ratchet-bar. This outer movement of rod 49 compresses the coiled spring thereon, so when the inclined portion of the cam-wheel contacts with the frictionless roller said spring, assisted by the spring-actuated curved arm, forces rod 49 back one space, when the pin projecting from its rectangular head contacts with pawl 51 and locks the latter from further backward movement. As this occurs at the time the inclined portion of the cam-wheel has passed a distance equaling one-third its length beyond the frictionless roller, coiled spring 65, which is still considerably compressed, shoves against casting 61 and forces it, together with the carriage to which it is secured, forward the remaining two notches, by which time the cam-wheel has been revolved until the zero-mark thereon is again opposite the frictionless roller. If a space equivalent to three lines is to be left between each printed line upon the paper, the adjusting device is set so that its pin engages the forward notch upon pawl 51, as shown in Fig. 4. This throws the lower portion of said pawl against pin 50<sup>a</sup>, which locks the pawl, so when rod 49, together with its pawl, is drawn forward three notches said rod cannot recede, and the full force of coil-spring



65 is exerted against casting 61 and forces it, together with the carriage, the length of the above-mentioned number of notches.

When it is desirable to move the carriage backward for any cause, the pawl is turned on its pivot until notch 52 is engaged by the pin of the adjusting device. This holds the lower point of the pawl out of engagement with the teeth on the ratchet-bar and permits the carriage to be readily moved in either direction.

It will be understood from the above description that the carriage is only moved forward the length of the space desired at the commencement of each line instead of backwardly almost its entire length, as the present construction necessitates, and though it were not provided with the automatic mechanism herein described the fact that it has so short a movement forward for the beginning of each line would alone increase the rapidity of the machine.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A type-writing machine, comprising a rotatable cylinder or platen around which the paper is wrapped, a ratchet-wheel mounted at one end of same, a rocker-bar bent at right angles at each end, a rod upon which the rocker-bar is pivotally mounted, lugs having square openings to receive the square ends of the rod, a coiled spring which encircles said rod, one end of which is secured to a collar upon the rod, its opposite end passing beneath the longitudinal portion of the rocker-bar, a spring-actuated pawl carried by the forwardly-projecting arm of the rocker-bar, which yieldingly engages the ratchet-wheel, and a vertical rod which operatively connects the rocker-bar to the keys of the machine, substantially as described.

2. A type-writing machine comprising a rotatable cylinder around which the paper is wrapped, a ratchet-wheel mounted at the end of same, a rocker-bar bent at right angles at each end, a longitudinal rod upon which the rocker-bar is pivotally mounted, lugs having square openings to receive the square ends of the rod, a coiled spring which encircles said rod, one end of which is secured to a collar upon the rod, its opposite end passing beneath the longitudinal portion of the rocker-bar, a spring-actuated pawl pivotally secured to the forwardly-projecting arm of the rocker-bar, which yieldingly engages the ratchet-wheel, a vertical rod which operatively connects the rocker-bar to the keys of the machine, and a spring-actuated friction-pawl engaging the ratchet-wheel to determine positively the extent of its rotatable movement, substantially as described.

3. In a type-writing machine, a platen, a longitudinal paper-clamp consisting of a bar arranged flatly against the external face of the platen, an arm or gage extending radially into a longitudinal groove in same, pins project-

ing inwardly from said gage, nuts engaging the inner ends of said pins, and expansion-springs spirally encircling said pins and bearing at their opposite ends against the nuts and inner face of the platen, in combination with one or more circular spring-clamps, and a sleeve upon the rear bar of the carriage, upon which the spring-clamps are slidably arranged, substantially as set forth.

4. In a type-writing machine, a rotating cylinder, a cam-wheel rigidly secured to one end of the cylinder-shaft, a curved arm yieldingly held in contact with said cam-wheel, together with mechanism through the instrumentalities of which the carriage carrying the cylinder is shifted to space for a new line, substantially as described.

5. In a type-writing machine, a rotating cylinder, a cam-wheel rigidly secured to one end of the cylinder-shaft, a curved arm pivotally secured to the adjacent end of the carriage, a frictionless roller carried by said arm, a spring for holding the roller against the cam-wheel, in combination with suitable mechanism by means of which the carriage is shifted to space for a new line, substantially as described.

6. In a type-writing machine, a platen, a cam-wheel rigidly mounted upon the shaft of the platen, having a scale upon its periphery and side portion, and a pointer which is secured to the adjacent end of the carriage whereby the position of a character on any line may be determined, substantially as described.

7. In a type-writing machine, a rotating platen, a cam-wheel rigidly secured to the shaft thereof, a curved arm yieldingly held in contact with said wheel, a rod one end of which is pivotally secured to the free end of the curved arm, a pawl carried by the opposite end of the rod, a rack-bar which is engaged by said pawl, whereby the carriage is shifted to space for a new line, substantially as set forth.

8. In a type-writing machine, a rotating platen, a cam-wheel rigidly mounted upon one end thereof, a curved arm pivotally secured to the adjacent end of the carriage, a frictionless roller carried by said arm, a spring for contacting the roller with the cam-wheel, a rod one end of which is pivotally secured to the free end of the curved arm, a pawl pivotally secured to the opposite end of the rod, a pin also carried by the rod and projecting into the path of the pawl, a rack-bar which is engaged by said pawl, a spring encircling the rod and pressing at one end against a part of the carriage and at its opposite end against the head of said rod, forcing the pin thereon against the pawl, which fulcrums against the rack-bar and thereby shifts the carriage to space for a new line, substantially as described.

9. In a type-writing machine, a hollow printing cylinder or platen, a paper-clamp extending longitudinally of the same, and con-



sisting of a bar arranged flatly against the external face of the cylinder, an arm extending radially into a longitudinal groove in the same, and pins projecting inwardly from said arm, nuts engaging the inner ends of said pins, and expansion-springs spirally encircling said pins and bearing at their opposite ends against the inner face of the cylinder and the said nuts, substantially as described.

10 10. In a type-writing machine, a traveling carriage, a printing cylinder or platen mounted therein, a rack-bar fixed with relation to the carriage, a rod carried by said carriage, a pawl carried by the same and engaging the rack-bar, means for automatically adjusting said rod longitudinally, and mechanism, using said pawl as a fulcrum, for shifting the carriage to space for a new line, substantially as described.

20 11. In a type-writing machine, a traveling carriage, a printing cylinder or platen mounted therein, a rack-bar fixed with relation to the carriage, a rod carried by said carriage, a pawl pivotally carried by the same, and engaging the rack-bar, means for automatically adjusting said bar longitudinally, and a spring mounted upon said bar and utilizing the pawl as a fulcrum for shifting the carriage to space for a new line, substantially as described.

30 12. In a type-writing machine, a traveling carriage, a printing cylinder or platen mounted therein, a rack-bar fixed with relation to the carriage, a rod carried by the carriage, a pawl pivoted thereto, a pin projecting into the path of the pawl and also carried by the rod, means for automatically adjusting said rod longitudinally and then for forcing said pin back against the pawl, which thus provides a fulcrum and causes the carriage to advance to space for a new line.

45 13. In a type-writing machine, a traveling carriage, a printing cylinder or platen mounted therein, a rack-bar fixed with relation to the carriage, and a rod carried by the carriage, a pin projecting therefrom, a pawl pivoted thereto, means for automatically adjust-

ing said rod longitudinally, and a spring mounted thereon, and exerting its pressure against a part of the carriage and said pin, to cause the latter to bear against the pawl, which fulcrums against the rack-bar and thereby shifts the carriage to space for a new line.

14. In a type-writing machine, a traveling carriage, a printing cylinder or platen mounted therein, a rod carried by the carriage, a rack-bar fixed relative to said carriage, a spring-actuated lever pressing backward the rod, a pin projecting from said rod, a pawl pivoted to said rod, means for overcoming the resistance of the spring-actuated lever and adjusting longitudinally the rod and thereby advancing the pawl to a new and more advanced engagement with the rack-bar, and a repressed spring exerting its power against the pawl as a fulcrum and a part of the carriage to assist the spring-actuated lever at the proper time in shifting the carriage to space for a new line, substantially as described.

15. In a type-writing machine, a traveling carriage, a printing cylinder or platen mounted therein, a rack-bar relatively fixed with respect to the carriage, a rod carried by the carriage, and extending through a vertical slot in a part of the same, a head secured to the rear end of the rod, a pin projecting therefrom, a pawl pivoted to said head; said pawl engaging the rack-bar and provided at its opposite end with notches, a lug also pivoted to said head, a spring-actuated pin carried thereby and engaging one or another of the notches of the pawl to lock it in the required position, and instrumentalities for utilizing the pawl as a fulcrum to shift the carriage and space for a new line, substantially as described.

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

WILLIAM H. STEWART.

Witnesses:

H. E. PRICE,  
THOMAS JONES.