

(No Model.)

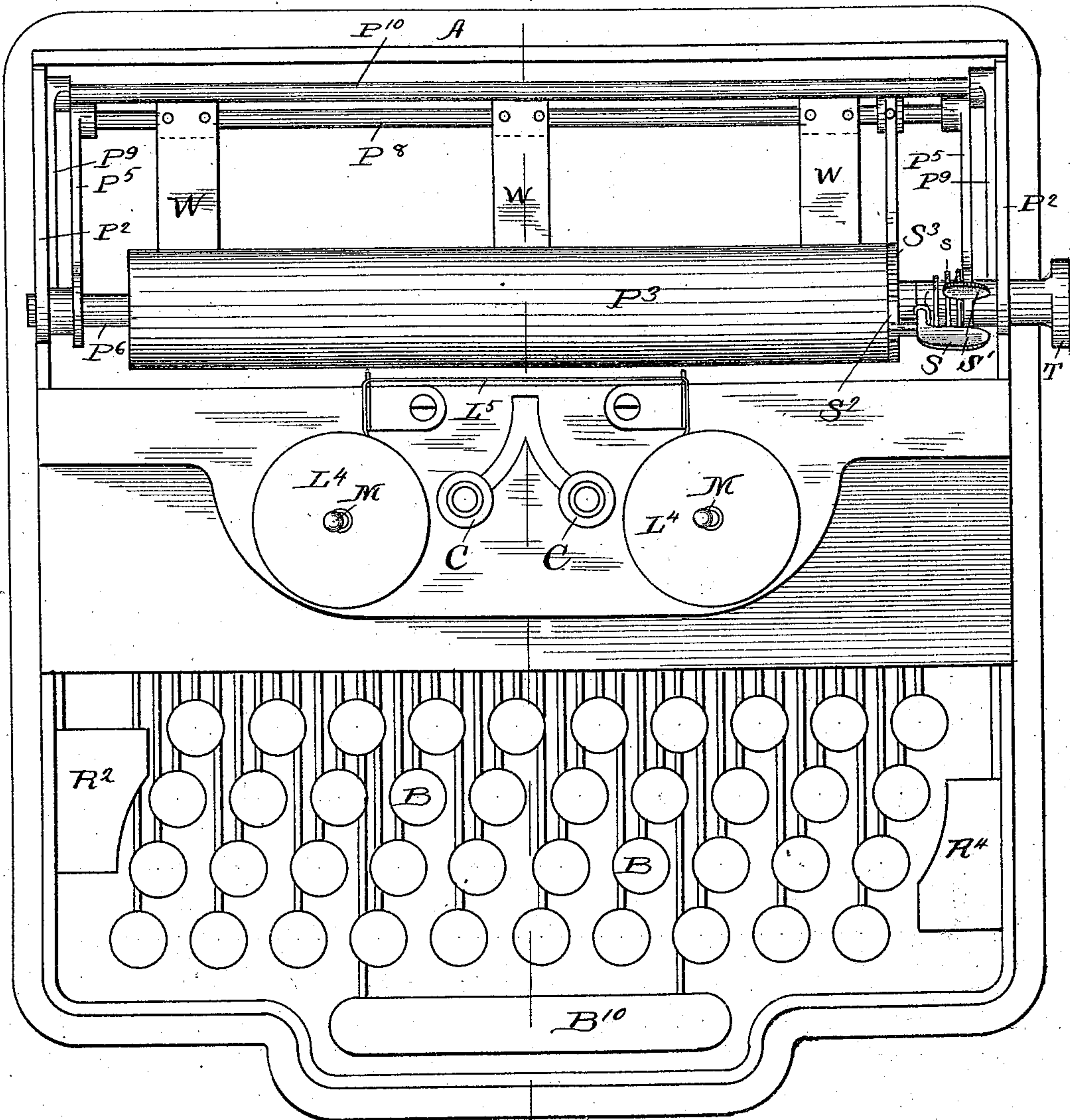
6 Sheets—Sheet 1.

S. J. SEIFRIED.
TYPE WRITING MACHINE.

No. 548,726.

Patented Oct. 29, 1895.

Fig. 1.



Witnesses:
Lew. C. Curtis
A. W. Munday,

Inventor:
Samuel J. Seifried.
By Munday, Curtis & Adeock,
His Attorneys.

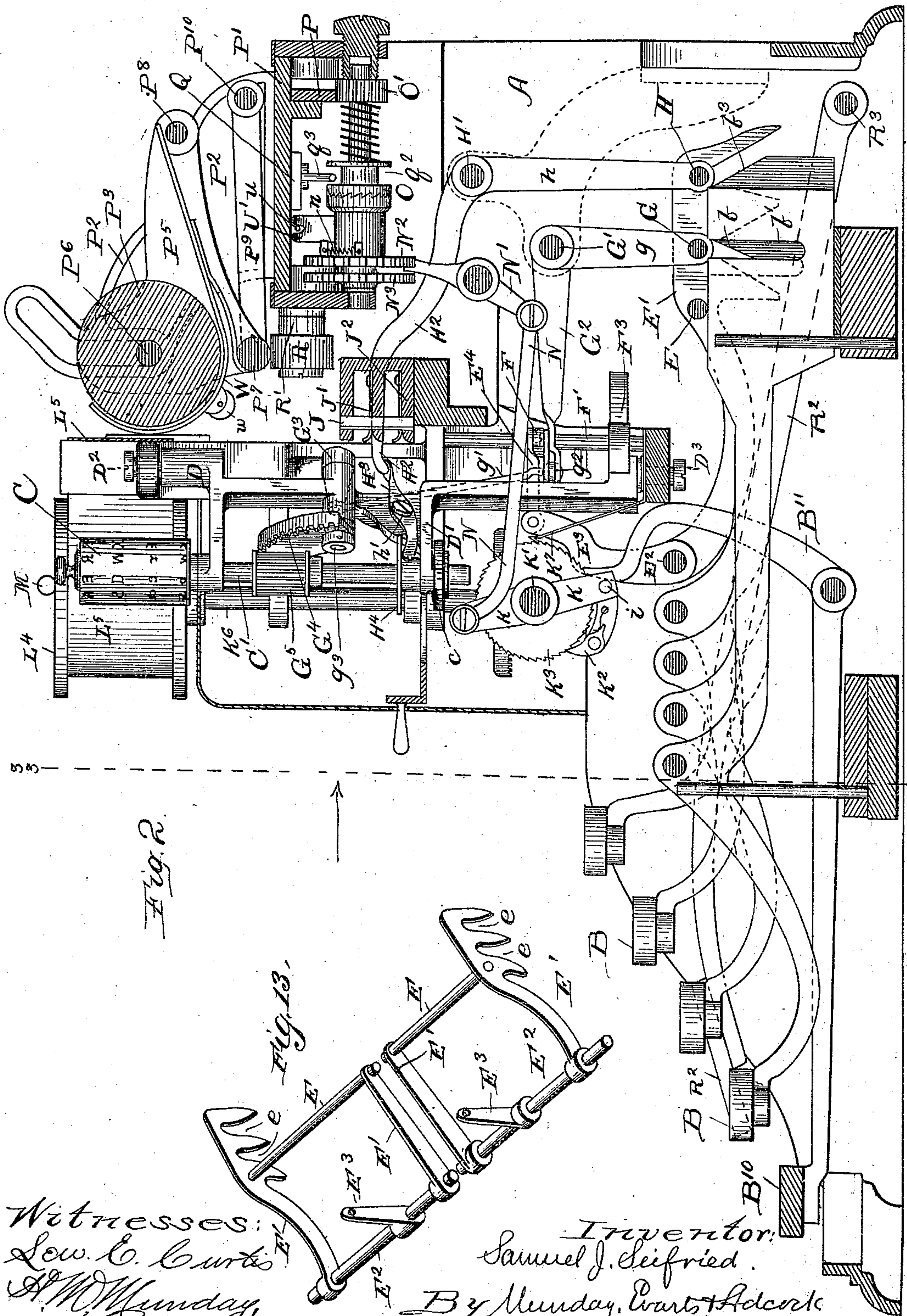
(No Model.)

6 Sheets—Sheet 2.

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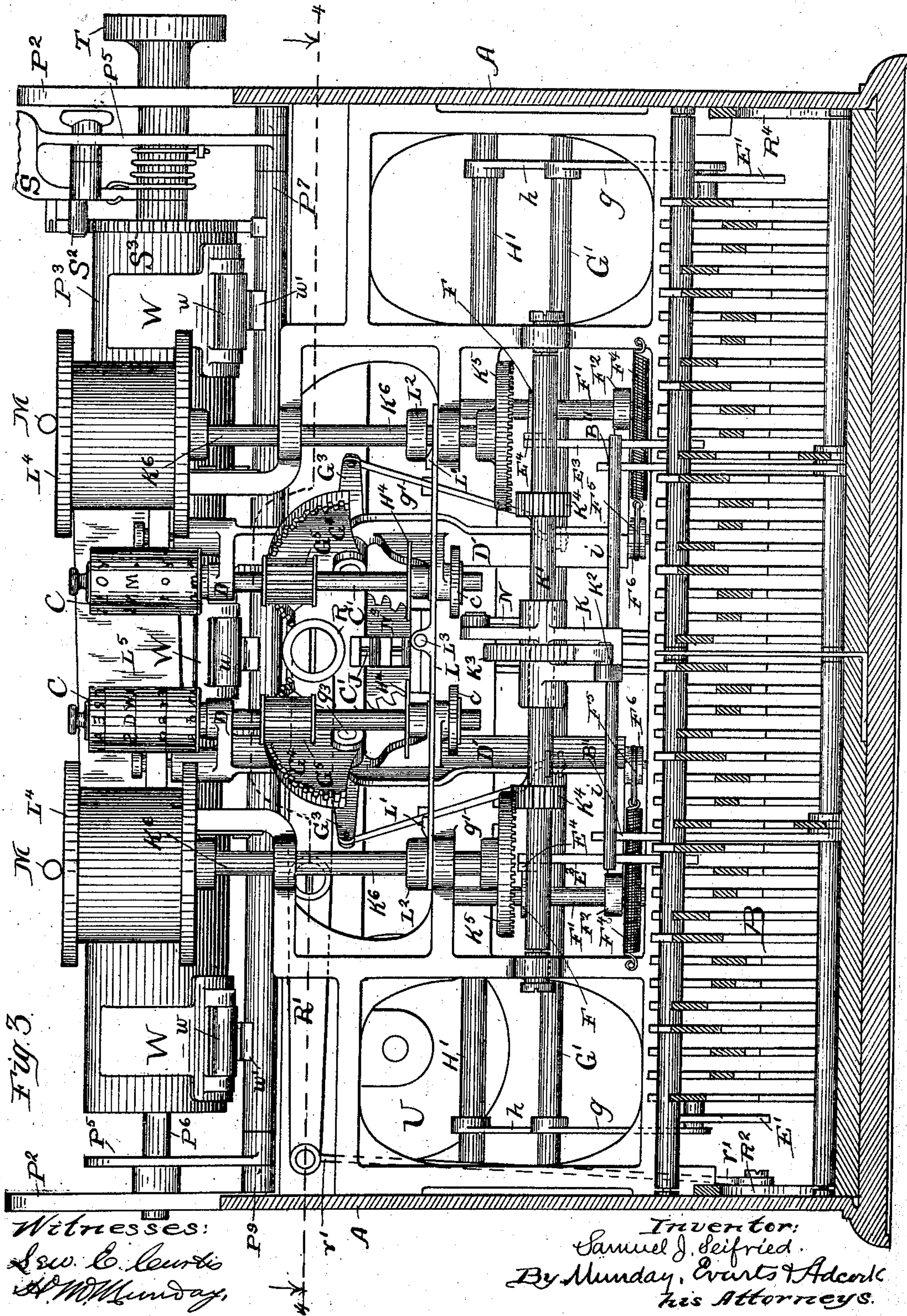
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6 Sheets—Sheet 3.

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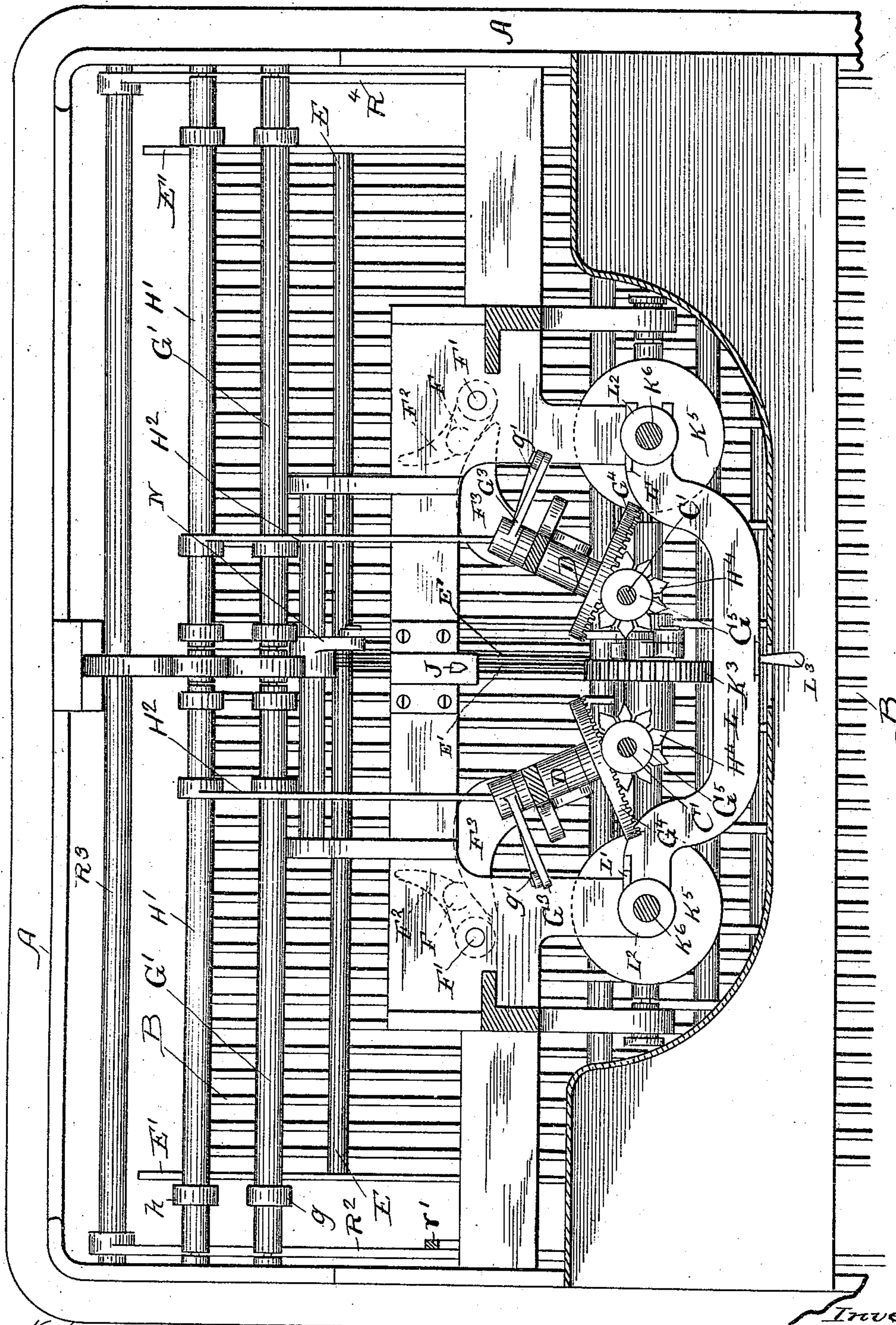
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6 Sheets—Sheet 4.

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TYPE WRITING MACHINE.

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Patented Oct. 29, 1895.



Witnesses:
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Fig. 4

Inventor.
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(No Model.)

6 Sheets—Sheet 5.

S. J. SEIFRIED.
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No. 548,726.

Patented Oct. 29, 1895.

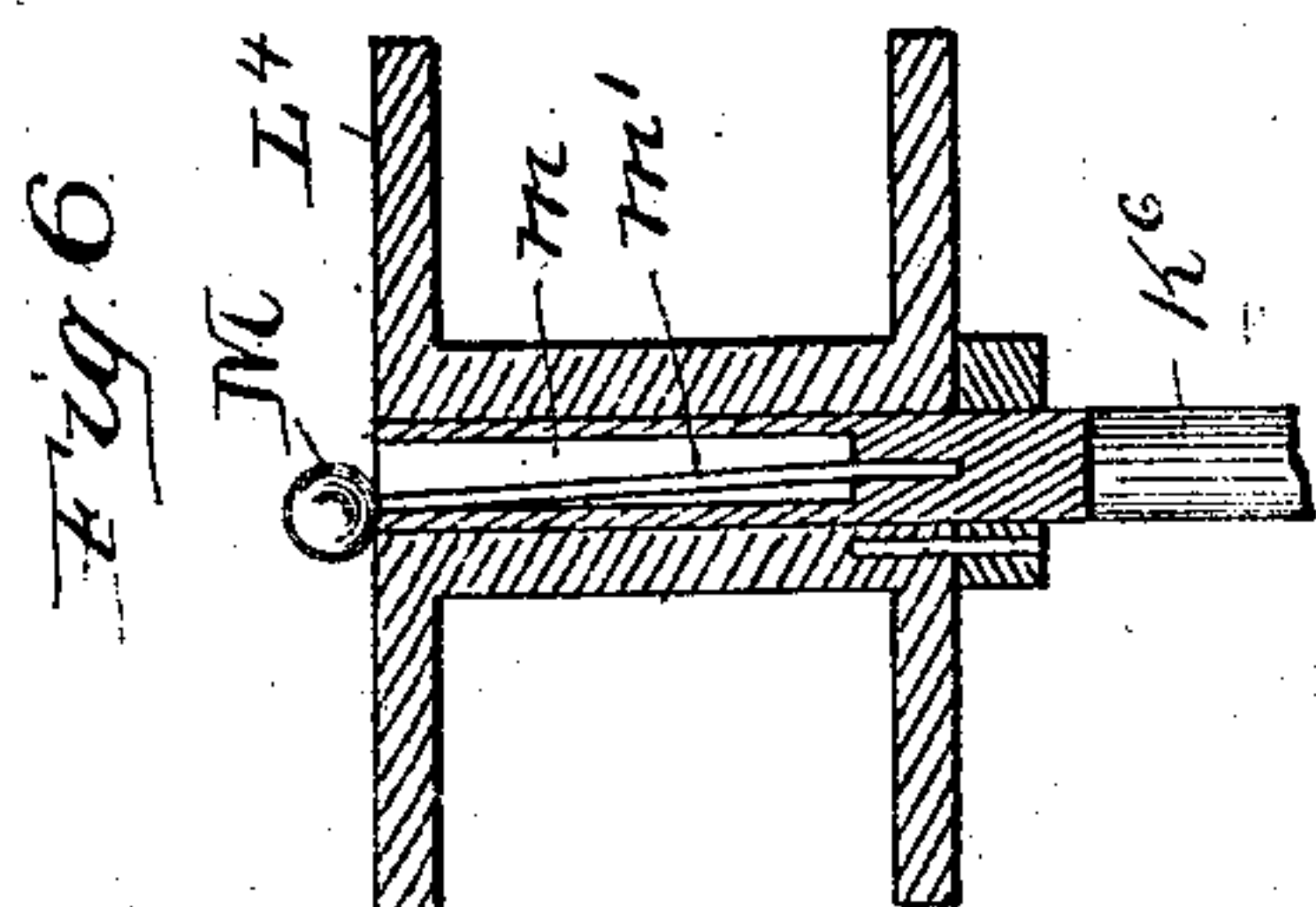
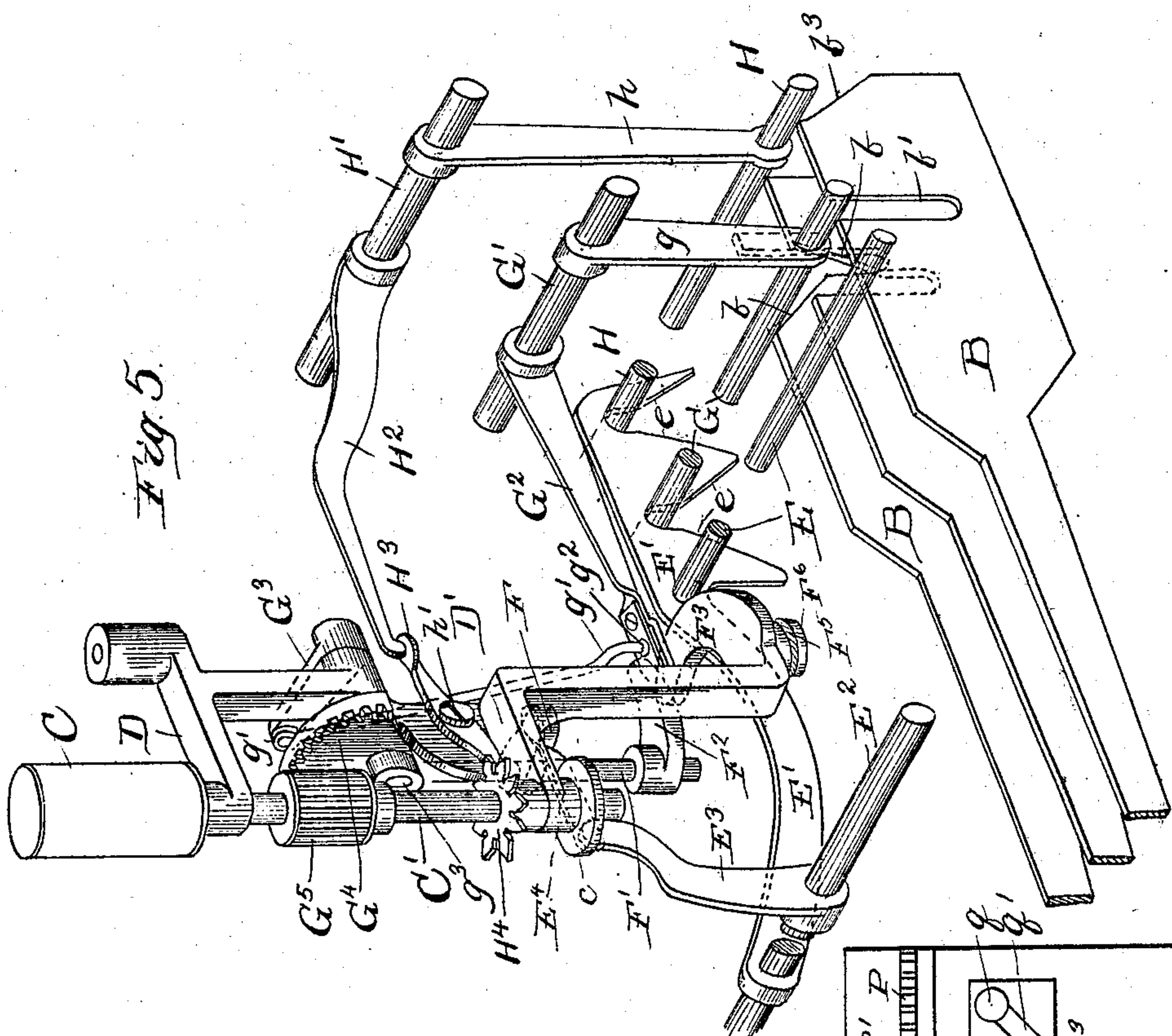
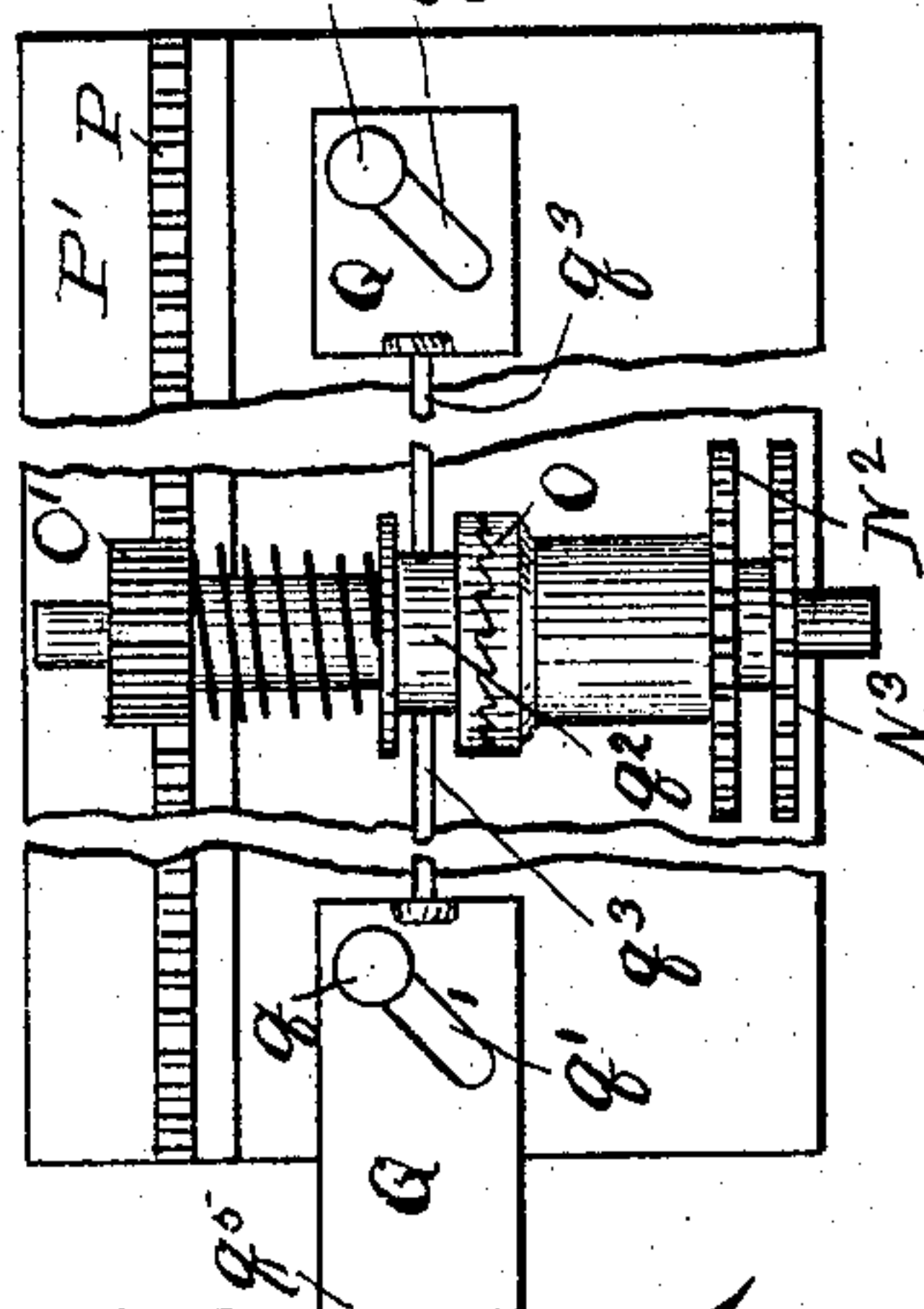


Fig 7.



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His Attorneys.

(No Model.)

6 Sheets—Sheet 6.

S. J. SEIFRIED.
TYPE WRITING MACHINE.

No. 548,726.

Patented Oct 29, 1895.

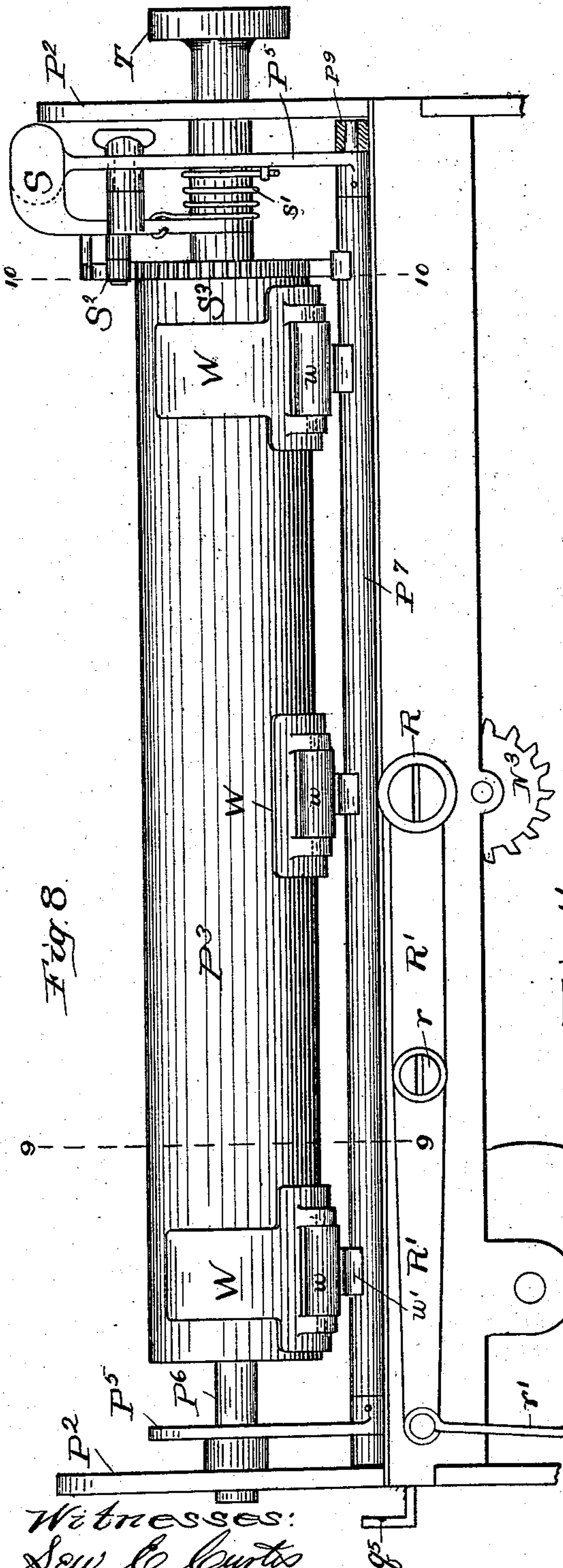


Fig. 8.

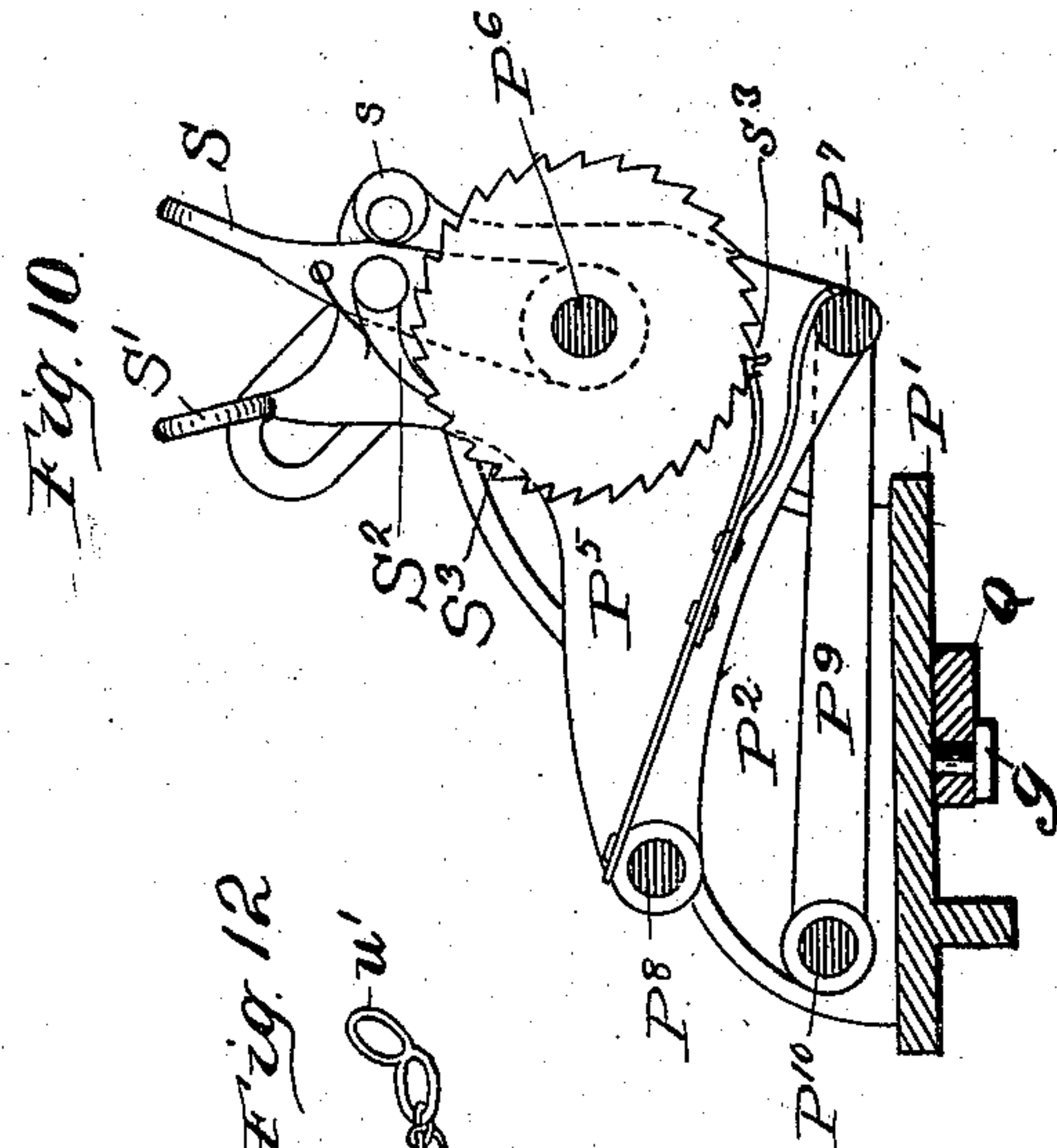


Fig. 10.

Fig. 12.

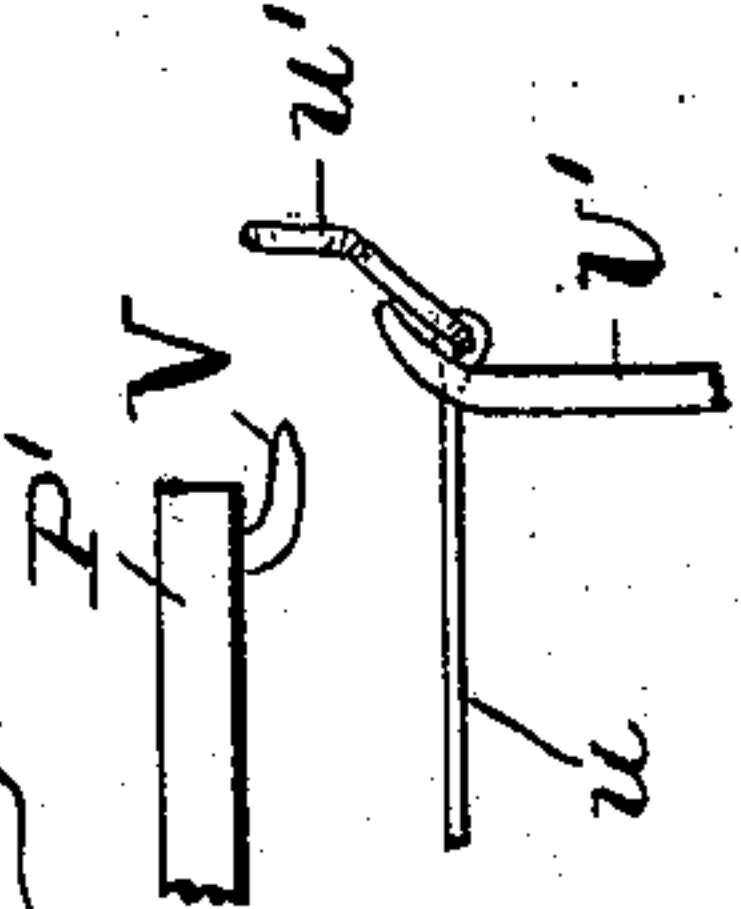


Fig. 11.

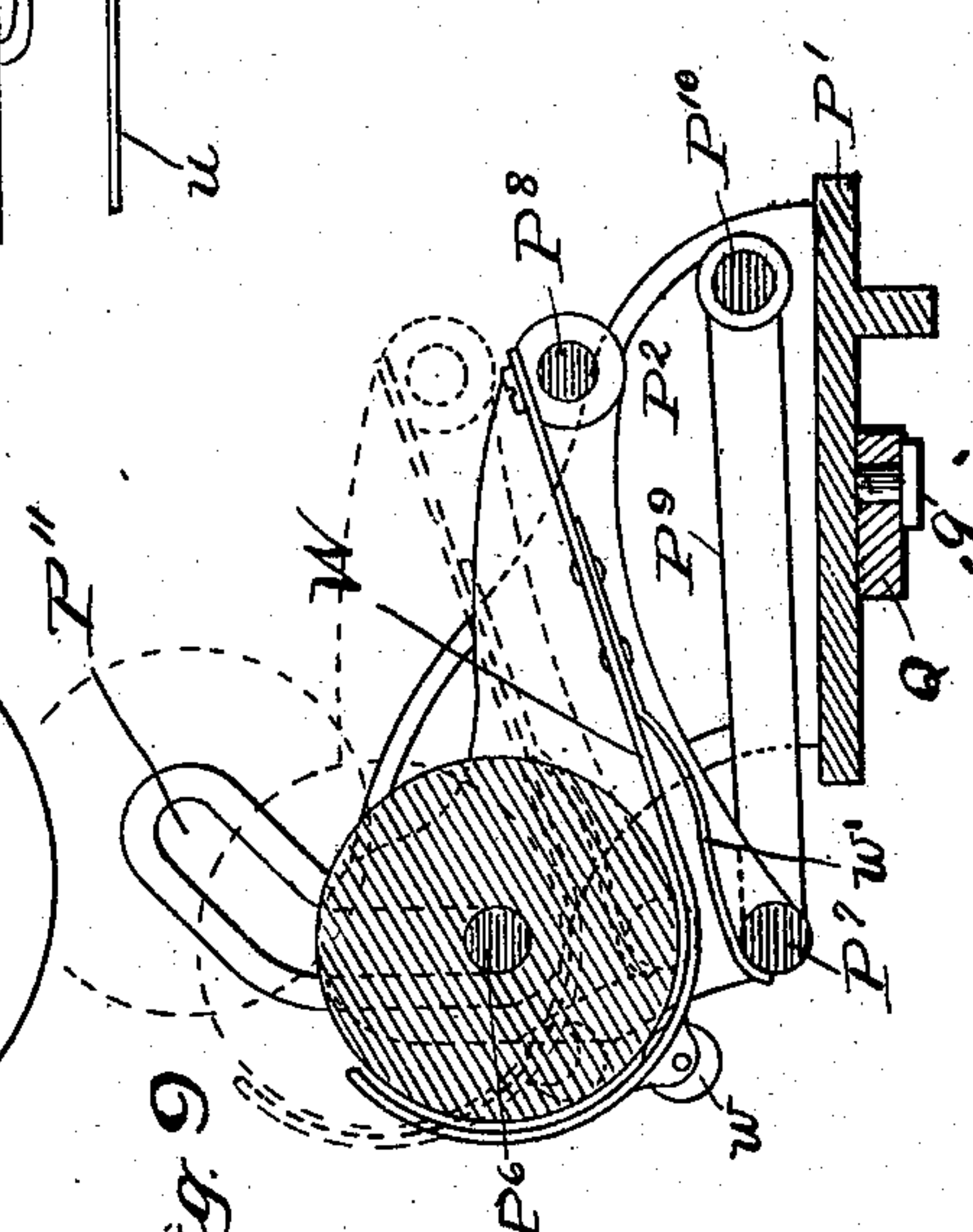


Fig. 9.

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Inventor:
Samuel J. Seifried.
By Munday, Coats & Adeock,
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UNITED STATES PATENT OFFICE.

SAMUEL J. SEIFRIED, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE MUNSON
TYPE WRITER COMPANY, OF SAME PLACE.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 548,726, dated October 29, 1895.

Application filed April 19, 1893. Serial No. 471,004. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL J. SEIFRIED, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Type-Writers, of which the following is a specification.

In this invention I have endeavored to produce a durable, efficient, and simple machine in which the type are carried upon cylinders adapted to be both rotated and shifted to bring the different type into printing position.

The invention is an improvement upon previous machines of this class, and is especially adapted to be used where manifolding is desired, and some of the principal changes made from prior machines have had this object primarily in view.

In my improvement I move the type-cylinder against the paper with considerable force, so that the impression may be carried through the several thicknesses used in manifolding without difficulty and produce the same effect as is obtained from the type-lever of the Remington machine. This result is secured by mounting the cylinder in a frame supported upon a pivot whose axis is parallel to that of the cylinder and swinging said frame with a quick movement to bring the cylinder against the paper. The construction which I have adopted is calculated to retain the cylinder thoroughly under control during the swinging movement and to avoid any displacing of it through inertia or centrifugal action due to the swinging, and I prefer to position it vertically and to support the frame upon vertical pivots, so that it may move horizontally. The invention further includes novel means for swinging the frame and mechanism for rotating and mechanism for shifting the cylinder to bring the different characters into printing position.

In order to reduce to the minimum the amount of rotation and shifting by the type-cylinder necessary to bring all the characters into play, I prefer, instead of the single type-cylinder heretofore employed, to use two cylinders, each of which bears a portion of the type characters, and to mount such cylinders in separate swinging frames, such as that already alluded to, the several keys being

adapted to operate only the cylinder which is furnished with its corresponding type. Herein is another important feature of the invention.

All these points of improvement are fully set forth below and also disclosed in the drawings, and in the latter—

Figure 1 is a plan of the machine. Fig. 2 is a vertical section on the line 2 2 of Fig. 1. Fig. 3 is a vertical section on the line 3 3 of Fig. 2. Fig. 4 is a horizontal section on the line 4 4 of Fig. 3. Fig. 5 is a diagrammatic view illustrating the type-cylinder frame and the devices for actuating it and for moving the type-cylinder to present the desired character. Fig. 6 is a section of one of the ribbon-spools and its support. Fig. 7 is a detail plan of a portion of the paper-carriage, the clutch whereby it is fed, and the devices for opening the clutch. Fig. 8 is a front view of the carriage. Figs. 9 and 10 are sections of the carriage on the lines 9 9 and 10 10, respectively. Figs. 11 and 12 are detail views of a portion of the machine. Fig. 13 is a perspective of a portion of the cylinder-frame-actuating mechanism.

In said drawings, A represents the frame of the machine, and B B are the keys.

C C are the type-cylinders, two being preferably employed for the reason already stated, although all the characters can be placed upon one of them, if desired. The characters are arranged in any convenient way upon the cylinders, preferably in horizontal rows one above another. Each cylinder is vertically positioned upon a vertical shaft C', having bearings in brackets D D', which are pivoted upon coinciding short pivots D² D³, supported in stationary parts of the machine, the axis of the pivots being parallel to that of the cylinder. The cylinder-shaft has freedom both to rotate and to slide in its bearings. The brackets stand normally at an angle, as shown, and being joined at their outer ends by the cylinder-shaft form a frame adapted to swing and to carry the cylinder forcibly against the paper.

For the actuation of the cylinder-frame in making an impression the following construction may be employed: Across the top of the series of keys or such of them as are represented by the characters upon the cylinder,

and in such close proximity thereto as to insure its being lifted by each and every one of them when struck, is the rod E, which is secured in a lever E', fast upon the rock-shaft E². Extending upwardly from this shaft is a crank-arm E³, connected by the rod E⁴ with the crank F upon a stationarily-supported vertical shaft F', carrying a cam F², which engages with another cam F³ upon the lower extremity of bracket D' of the wheel-frame. These cams have a rolling contact with one another, and when any of the keys are operated the consequent lifting of the rod E causes a rocking of shaft E², and also a rocking of the vertical shaft F, and this results in the actuation of cam F³ by cam F² and in the swinging of the cylinder-frame from its normal to the operating position. The impulse thus given the frame is a quick one by reason of the nature of the actuating devices, and it also becomes more rapid as the cylinder approaches the paper, so that the impact or blow imparted is one which will insure any reasonable amount of manifolding. The arc of the cylinder through which the wheel moves is also of sufficient length to allow it to acquire considerable momentum and thus to insure an efficient impression. The frame is brought back after each impression by the spring F⁴ and cord F⁵ winding upon the pulley F⁶ upon the lower end of the frame.

The positioning of the cylinder on an axis parallel to that of the frame is an advantageous feature in that there is no tendency by the swinging of the cylinder and frame to throw the cylinders out of position, as there would be if the pivots were not parallel; but of course I do not wish to be limited to this feature except in such of the claims as are expressly confined thereto.

Where two type-cylinders are employed, they are located at either side of the impression-point and swing toward the same in opposite directions, and they are precisely alike, except that one bears one half of the characters and the other bears the remaining characters. The keys on the right side of the machine operate the cylinder upon that side and those upon the left side operate the left cylinder. In order to avoid injurious contact by the cylinders with each other, which might occur if keys upon both sides of the machine should be struck simultaneously, I provide upon each of the cylinders' axes rubber disks c, which are calculated to collide at such times and prevent any contact by the cylinders with each other.

In order to turn the cylinders to bring different type into position for action, I employ the following mechanism: The key-levers B of such of the type as require rotation of the cylinder are slotted downwardly from their upper edges, so as to form an incline or cam b, adapted, when the key is struck, to move a cross-bar G either forward or back, according to the direction in which rotation is required. The cams b incline some in one di-

rection and some in the reverse direction, so as to give the proper movement to the bar G. Said bar is suspended by links g from a rock-shaft G', journaled in the sides of the machine, and the links being rigid with the shaft the latter is rocked and lifts an arm G², also fast on the shaft. From the swinging end of arm G² extends upwardly a connecting-rod g', joined to the arm by a universal joint g³, located in line with the axis of the swinging frame, and said rod is united at its upper end to a crank G³, mounted upon the axis g³ of a crown-segment G⁴, which meshes with a lantern-wheel G⁵, fast upon the axis of the type-cylinder. With this construction it will be seen that the striking of the key will result in shifting the bar G either forward or back, according to the direction of the cam b of the key, and that a rocking of shaft G' will be caused thereby, which will lift arm G² and crank G³ and oscillate the crown-segment, and the latter will actuate the lantern-wheel and the type-cylinder shaft. Of course it will be understood that the keys of those letters which require no rotation of the type-cylinder are also made in such manner as to have no effect upon the bar G, and one method of avoiding action upon said bar is by providing the keys with a straight-sided slot b'. It will also be understood that the cylinder is rotated back to its normal position during the return of the frame, inasmuch as during such movement the actuating devices of the crown-segment are returned, as hereinafter set forth; also, that the cams b are adapted to cause the amount of rotation by the type-cylinder which is requisite to bring the desired character into action by giving the cams a greater or less inclination.

For the purpose of shifting the type-cylinder along its axis in order to bring the characters located in different rows into operating position I employ the following: Such of the keys as do not require this operation of the type-cylinder are shortened, so that they do not come in contact with a cross-bar II, which is suspended over the keys by links h from a rock-shaft H', journaled in the sides of the machine. Those of the keys, however, which do require the shifting of the type-cylinder are beveled upon their ends, as at b³, and thereby enabled to swing the bar II upon its links and rock the shaft II' and cause a depression of the crank-arm II², fast upon said shaft, and a swinging upon its pivot h' of lever H³, on which the end of arm II² rests. The front end of lever H³ sets under the star-wheel H⁴, mounted upon the shaft of the type-cylinder, and is adapted to apply a lifting power to the shaft by such connection. After the impression the bar II is moved back to its normal position, as hereinafter stated, and this results in the withdrawal of the lifting power from the type-cylinder shaft, so that it falls to its normal position by gravity. The contact-point of arm II² with lever H³ is located in the axial line of the swinging frame.

The lever E' at its rear end is notched upon its under surface with inverted-V notches, as shown at e. These notches are so located as to insure their setting down over the cross-bars G and H, whatever may be their position, when the lever falls to its normal position, and they are adapted to move said bars to their positions of rest, as will be readily seen. Of course the lever E' is raised so as not to interfere with the bars upon the striking of the keys, and this movement is timed slightly in advance of the movement of the bars.

In order to bring the cylinders into accurate registering position at the time of making the impressions, I provide the following devices: Upon the shaft of the type-cylinder is a star-wheel H⁴, already mentioned. The notches of this wheel are Y-shaped, so that as the frame approaches the operating-point they will straddle a stationary vertical guide-pin J and enable the latter as it enters the notches to turn the cylinder-shaft slightly, if that should be necessary, and properly center the type to be impressed with reference to the printing center. This centering of the cylinder preparatory to the impressions is specially important, because the diameter of the paper-holding platen varies with the number of thicknesses of paper present upon it, and such variations result in bringing forward the plane of the printing center with each additional thickness of paper put upon the platen, and such changes in the plane at which the impression is made would, unless means were taken to prevent the same, result in variations in the spacing of the characters. By my centering device, however, the type are brought absolutely and unerringly in front of the printing center, regardless of the thickness of paper on the platen, and the evil referred to is thereby overcome. I also employ means whereby the horizontal alignment of the impressions may be preserved with certainty. These means are adapted to position the type-cylinder accurately in the proper horizontal plane, and consist of two pairs of guides J' and J², having their front ends beveled away from each other, so that the points of the star-wheel H⁴ will enter between them and thus be lifted or depressed to the proper plane to secure accuracy of alignment. Two pairs of these guides are employed, one pair acting upon the star-wheel when the cylinder-shaft is swinging in its normal plane and the other pair acting when the shaft is swinging in its elevated plane. Of these guides the under one J² of each pair is rigid, so that it will act positively in lifting the cylinder. The upper one of each pair J' is preferably made of spring metal, so that it may yield to the impact of the star-wheel at the instant of contact and yet possess power enough to force the wheel down upon the under guide in season before the making of the impression. These upper guides are also adapted to overcome any rising momentum which the star-

wheel may acquire by contact with the under guides.

I now proceed to describe the mechanism for controlling the movement of the ribbon. When the crank-arm E³ is actuated by the striking of a key, it encounters a pin or cross-rod i upon the lower end of a lever K, loose upon a cross-shaft K', and swings such end of the lever forward. Attached to this lever is a spring-depressed pawl K², which meshes with the ratchet-wheel K³ and through said ratchet-wheel rotates the shaft K'. Mounted upon shaft K' are pinions K⁴, each meshing with a crown-wheel K⁵, supported upon the lower ends of the vertical spool-shafts K⁶. These shafts K⁶ are adapted to be lifted so as to disengage the crown-wheels from their actuating-pinions, and for this purpose I provide a slide L, moving in stationary ways and furnished with two bevel-faced cams L', which are adapted to enter under the collars L², mounted upon the spool-shafts, and lift them sufficiently to effect the disengagement. The cams are so located as to render them alternating in their action—that is to say, when the slide is moved in one direction it will lift one spool-shaft and when moved in the opposite direction it will lift the other one. By this construction I am enabled to reverse the movement of the ribbon whenever necessary by simply moving the slide, and the latter is preferably provided with an arm L³, whereby it may be moved, and which extends through the front of the case, so as to be readily accessible. It will be noticed in Fig. 3 that one of the spools L⁴ is disengaged and stands in a somewhat higher plane than the other spool, so that the ribbon L⁵ is drawn from one to the other in a direction inclined downward from the horizontal. This inclination is, of course, reversed when the other spool is winding up the ribbon, so that the impressions are not likely to be made upon the same points in the ribbon and the amount of work of which the latter is capable is therefore increased. The ratchet K³ is prevented from moving backward by the spring-stop K⁷.

For the purpose of holding the ribbon in place on the shaft I employ the construction particularly illustrated at Fig. 6. The upper end of the spool-shaft is hollowed out, as shown at m, and in the bottom of this recess I secure a spring-wire m', which extends to the top of the shaft, where a ball M or other enlargement made sloping upon its under surface is secured to it. The spring has a tendency to keep the ball in position where it projects over the spool somewhat, and in this way the ball is caused to exert a sufficient holding power upon the spool to keep it in place. This holding power is, however, readily overcome when the spool is lifted by hand, so that no preparatory work of any kind is requisite when the spool is to be changed or removed. The device is also automatic in resuming its acting position upon the replacing of the spool.

The devices which control the movements of the carriage are also actuated from the lever K, already described, and which, as we have seen, is moved at each stroke of the key.

From the upper end of this lever a connecting-rod N extends and is joined to the lower end of a swinging lever N', stationarily pivoted at its center and engaging at its upper end with the usual escapement-wheels N² N³.

n is the spring acting upon the loose wheel N². This escapement being of the ordinary construction, I do not enlarge upon its description here, and it acts upon the carriage in the ordinary manner through the medium of the normally-closed clutch O upon the shaft carrying the escapement-wheels, the pinion O', also upon said shaft, and the rack P, carried by the paper-carriage, the bed of which is shown at P'.

The spacing-key is shown at B¹⁰, and it swings the arm B¹¹ forward against the pin or rod i and thus, through the mechanism already described, carries motion to the carriage.

For the purpose of releasing the carriage, so that it may be moved by hand in either direction, I provide it with a longitudinal bar Q, which is movably secured to the carriage-bed by studs q' passing through the diagonal slots q' in the bar. Along its under surface this bar carries a wire-guide q³, which is carried down far enough so that its horizontal portion shall lie in the annular groove q² of the movable part of the clutch O. With this construction when it is desired to release the carriage the operator pushes upon the projecting end q⁵ of the bar Q, and thereby slides the bar and its guide-wire in a diagonal direction and to the extent permitted by the slots. This movement is sufficient to cause a drawing apart of the clutch O, which leaves the carriage free to move to any extent desired.

The carriage-bed is provided with uprights P² at each end, and the impression roller or platen P⁶ is supported in a frame which is journaled in these uprights. This frame consists of the vertical end pieces P⁵, in which the shaft P³ of the impression-roller is journaled, and the cross-bars P⁷ and P⁸. The frame is also connected by two arms P⁹ to a shaft P¹⁰, journaled in the uprights P² and to which the arms P⁹ are rigidly secured, and as said arms are pivotally joined to the ends of the cross-bar P⁷ the forward part of the carriage is free to be raised. This raising is in part for the purpose of bringing the impression-platen upon a level with the upper-case letters, which are located on the upper part of the type-cylinders, and so that such letters may be impressed, and hence it is desirable that this movement should be in a straight vertical plane for at least a part of the distance, in order that the platen in its raised position may occupy the same position relative to the type-cylinder as it does when in its lower position, in which the lower-case characters are printed. To secure this verti-

cal movement of the platen, its journals are made to pass through guide-slots P¹¹ in the uprights of the carriage. As will be seen from the drawings, these guide-slots are vertical for part of their length, so that the platen is compelled to retain its distance from the type-cylinders during the portion of the movement necessary to position it for upper-case printing, and this upward movement is imparted to it by mechanism presently to be described. The upper portions of the slots are inclined from the vertical and are intended to permit the further raising of the roller by hand for the purpose of reading the written matter or making corrections therein.

The platen is normally sustained by the bar P⁷, resting upon a roller R, supported upon one end of a lever R', pivoted to a stationary cross-brace of the machine at r, and this lever is actuated to lift the platen, as already described, by the connecting-rod r', extending from the end of lever R' down to the key R². This key is fast upon a shaft R³, and a second key R⁴ at the other side of the machine is also joined to said shaft, so that the lifting devices may be operated by either hand.

S indicates a thumb-lever loosely mounted upon the axis of the platen-roller, whereby the operator may turn the roller for spacing the lines. The companion thumb-piece S' is stationary and formed upon the end piece P⁵ of the carriage, and serves to limit the movement of the lever S in one direction. The cam s regulates the extent of the rotation and the spring s' throws the lever back after each operation. Motion is carried from lever S to the roller by means of the spring-pressed pawl S² and ratchet S³. The ratchet is locked by a spring-stops s³. T represents the usual thumb-wheel for rotating the roller in putting in paper.

When the paper-carriage is removed from the machine, it is essential to retain control of the cord attached to the spring-drum which feeds the carriage, because if that is not done the spring of the drum is apt to be broken. To remedy this evil I have devised the following: U is the spring-drum, and u the cord or flexible connection whereby the drum draws the carriage. The cord is provided at its end with the metal device shown at u', and which is preferably in the form of a double eye, the two parts of which are slightly inclined relative to one another, and the cord is secured to one part. A stationary forked retainer U' is also provided and located at the point where the cord should be secured upon the removal of the carriage. This retainer stands vertically with one of its limbs on either side of the cord, and with its limbs also bent over toward the direction in which the eye approaches it. The carriage is provided with a hook V, open toward the eye and moving in a line with the upper opening thereof. By these devices it will be seen that if the eye and cord are in the grasp of the fork, as shown at Fig. 11, and the carriage

is slid back into the machine the hook upon the carriage will catch in the upper opening of the eye and thus be automatically connected to the drum. It will also be seen that
 5 when the carriage is taken out of the machine the fork will automatically engage and hold the eye, while the carriage-hook will detach itself from the eye and the carriage be free to be taken away. The retainer maintains its
 10 hold upon the cord until the carriage is replaced.

For the purpose of guiding and creating the necessary friction upon the paper I use the usual sheet-metal guides W, and each of them
 15 is provided with an antifriction-roller w. They are secured to collars located upon the cross-rod P⁸, and are held up in acting position by the spring w' bearing upon the rod P⁷. The center guide W is shortened, so as not to cover
 20 the printing.

It will be noticed that by locating the universal joint g², which connects the swinging end of arm G² with the connecting-rod g', operating the crown-wheel in rotating the type-
 25 cylinder, in the axial line of the swinging frame I avoid imparting any rotation to the cylinder during the swinging of the frame except such as is required in the proper positioning of the character to be impressed. The
 30 universal joint in this location is also desirably free from friction or binding, much more so than it would be if located at one side of said axial line.

In the practical working of the machine I aim to impart both the necessary rotation and the necessary longitudinal movement to the type-cylinder during the first portion of the swinging movement of the frame, so that the cylinder will be in a state of rest relative to
 35 the frame as it approaches the printing-point and be in better condition to have its inaccuracies of positioning corrected by the registering devices than it would be if the rotation or sliding movement had not terminated
 40 prior to the action of the registering devices.

The contact between levers H² and H³ is also located in the axial line of the swinging frame, so that such contact may continue, notwithstanding the changes in position by
 50 the frame.

I claim—

1. In a type writer, a vertical type cylinder mounted in a horizontally swinging support adapted to carry the cylinder into printing
 55 contact with the paper, substantially as specified.

2. In a typewriter a rotatable vertical type cylinder mounted in a swinging support adapted to actuate the cylinder in the printing, the axis about which the support swings being vertical and parallel to that of the cylinder, means for actuating the support and means for rotating the cylinder, substantially
 60 as specified.

3. In a typewriter, a rotatable and longitudinally shifting vertical type cylinder, mounted in a swinging support adapted to

actuate the cylinder in the printing, the axis about which the support swings being vertical and parallel to that of the cylinder, in
 70 combination with means for actuating the support, means for rotating the cylinder and means for shifting the cylinder, substantially as specified.

4. In a typewriter a longitudinally-shifting
 75 vertical type cylinder mounted in a swinging support adapted to actuate the cylinder in the printing, the axis about which the support swings being vertical and parallel to that of the cylinder, in combination with means for
 80 actuating the support and means for shifting the cylinder, substantially as specified.

5. In a typewriter the combination of a rotatable and longitudinally movable vertical type cylinder with a swinging support in
 85 which such cylinder is mounted and which is adapted to actuate the cylinder in printing, an axis for such support, parallel to the cylinder axis, means for rotating the cylinder, means for shifting the cylinder longitudinally,
 90 means for actuating the swinging support, means for correcting the horizontal position of the cylinder and means for correcting its vertical position, substantially as specified.

6. In a typewriter the combination with a
 95 longitudinally moving type cylinder and a swinging support in which such cylinder is mounted, of means for correcting the longitudinal position of the cylinder preparatory to an impression consisting of the guides J'
 100 J² one of which is a spring, and a projection upon the shaft of the cylinder adapted to enter between said guides, substantially as specified.

7. In a typewriter the combination with a
 105 longitudinally moving type cylinder and a swinging support in which such cylinder is mounted, of means for correcting the vertical position of the cylinder preparatory to an impression consisting of the positive guide J², a
 110 coacting spring guide J', and a projection upon the shaft of the cylinder adapted to enter between said guides, substantially as specified.

8. In a type writer the combination with a
 115 longitudinally moving type cylinder and a swinging support in which such cylinder is mounted, of means for correcting the vertical position of the cylinder preparatory to an impression consisting of a projection upon the
 120 shaft of the cylinder and stationary horizontal guides adapted to admit said projection between them, one of said guides being of spring metal, substantially as specified.

9. The combination with the type cylinder
 125 having a swinging movement essentially as set forth and having a projecting device H⁴ secured upon its axis, of a rigid under guide J² and spring upper guide J', such guides coacting with each other in forcing the cylinder
 130 to the proper horizontal plane substantially as specified.

10. In a type writer a vertical type cylinder mounted in a support adapted to swing hori-

zontally with a quick motion in carrying the cylinder to the printing center, the axis of said support being parallel to that of the cylinder, in combination with said support and means essentially such as described whereby such quick movement is imparted to said support, substantially as specified.

11. In a type writer a type cylinder mounted in a support adapted to swing with a quick motion in carrying the cylinder to the printing center, the axis of said support being parallel to that of the cylinder, in combination with said support, the rolling cams and means whereby one of said cams is actuated from the keys, substantially as specified.

12. The combination with a type cylinder and its lifting devices and a swinging frame in which the same are supported, of a lever actuating said lifting devices, and joining the same in the axial line of the frame, substantially as specified.

13. The type cylinder and its shaft, the disk H^4 on said shaft, and the lever H^3 , all mounted in a swinging frame in combination with said frame, and means for swinging the frame and means for actuating said lever H^3 , substantially as specified.

14. The combination with the type cylinder and its swinging frame, of the keys having cams b^3 , the swinging cross bar H , links h , rock shaft H' , arm H^2 , pivoted lever H^3 mounted in the frame, and the wheel H^4 upon the cylinder shaft, substantially as specified.

15. The combination with a type cylinder and its rotating devices, and a swinging frame in which the same are supported, of means for actuating said rotating devices joined thereto by a free joint located in the axial line of the frame, substantially as specified.

16. The combination of a type cylinder and its rotating devices all mounted in a swinging frame, an operating arm G^2 receiving motion from the keys and united to said devices by a universal joint located in the axial line of the frame, and said frame, substantially as specified.

17. The combination with the rotatable type cylinder and its swinging frame, of the keys having cams b , cross bar G , links g , shaft G' , arm G^2 , rod g' , crank G^3 , segment G^4 and lantern wheel G^5 , substantially as specified.

18. The combination with the type cylinder and its swinging frame, of the keys B , the cross bar E actuated by the keys, the lever E' , the rock shaft E^2 , arm E^3 , rod E^4 , crank F , shaft F' , cam F^2 , and cam F^3 upon the frame, substantially as specified.

19. The combination of the cross bars E , G and H with the lever E' , the cross bar E serving to operate said lever, and said lever acting to return cross bars G and H to their normal positions, substantially as specified.

20. The combination of swinging cross bars G and H , each adapted to be actuated by some of the keys, and the notched lever E' setting down over said cross bars after each impres-

sion and returning them to their normal positions, substantially as specified.

21. The combination with the vertical spool shafts and their actuating gears of the slide L and its cams L' adapted to lift said shafts so as to disengage the gearing, substantially as specified.

22. The combination with the vertical type cylinder of an impression roller journaled in vertical slots in the carriage uprights, the carriage, and means for raising the roller in said slots to bring it opposite the upper characters of the cylinder, substantially as specified.

23. The combination of a longitudinally movable type cylinder, a swinging support in which the same is mounted, means for shifting the cylinder longitudinally, and means for raising the impression roller, essentially as set forth.

24. In a type writer the combination of two separate vertical type cylinders, each carrying a portion of the type characters and each supported in a horizontally swinging frame, such frames being adapted to carry the cylinders to a common printing center, substantially as specified.

25. In a typewriter the combination of two separate type cylinders each carrying a portion of the type characters and each mounted in a swinging frame, said frames being adapted to carry the cylinders to a common printing center, and being located one at each side of said center, substantially as specified.

26. In a typewriter the combination of two swinging frames carrying type cylinders and adapted to present such cylinders at a common printing center, such frames being provided with means for preventing collisions between the type cylinders, substantially as specified.

27. In a typewriter the combination of two swinging frames carrying type cylinders mounted upon vertical shafts, and adapted to present such cylinders at a common printing center, the cylinder shafts being provided with means for preventing collisions between the cylinders, substantially as specified.

28. In a typewriter the combination of two swinging frames carrying type cylinders mounted upon vertical shafts, and adapted to present such cylinders at a common printing center, the cylinder shafts being provided with rubber disks adapted to prevent collisions between the cylinders, substantially as specified.

29. In a type writer a vertical type cylinder mounted in a horizontally swinging support, such support having its axis located laterally of the printing center and carrying the cylinder into printing contact, substantially as specified.

SAMUEL J. SEIFRIED.

Witnesses:

H. M. MUNDAY,
EMMA HACK.