

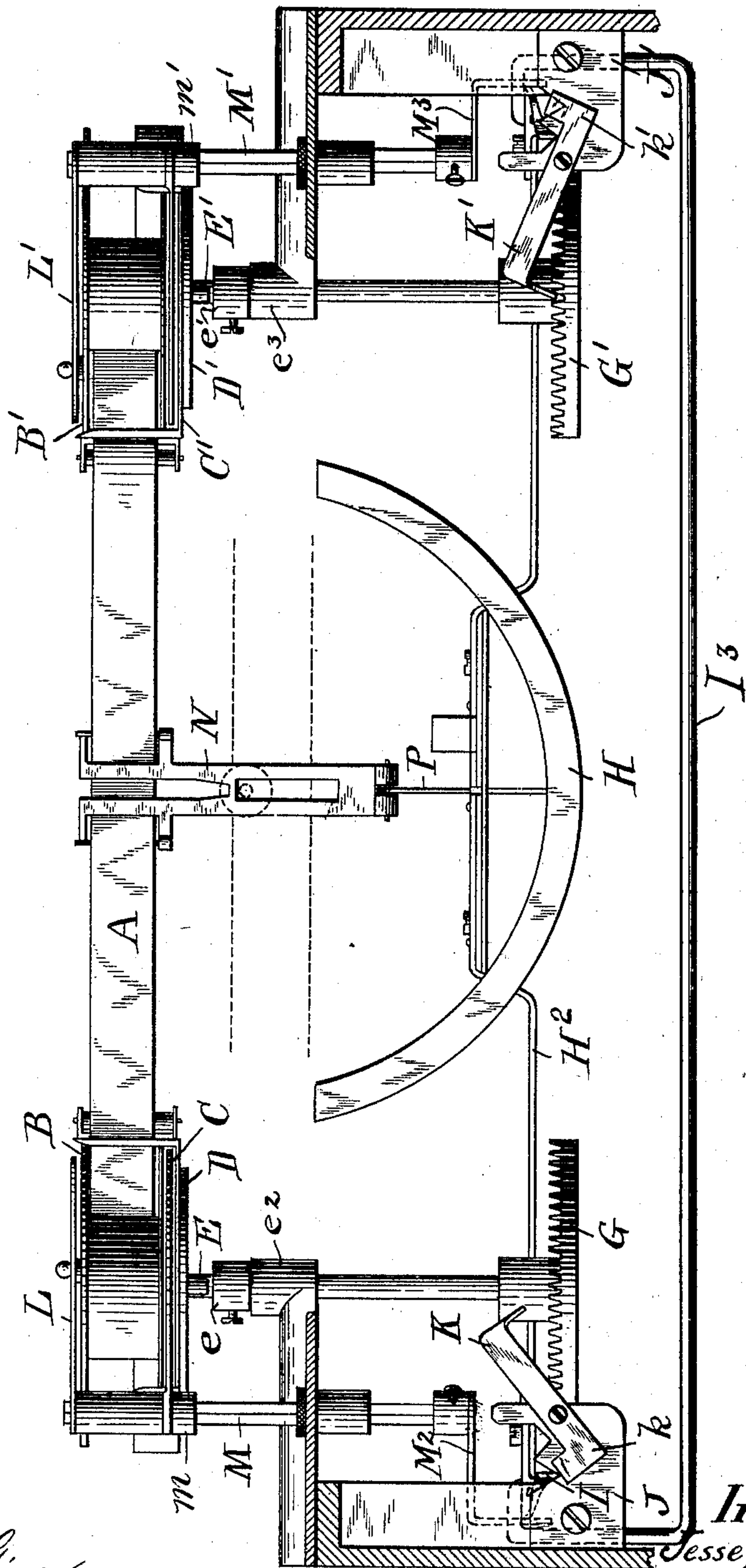
J. ALEXANDER.
TYPE WRITING MACHINE RIBBON MOVEMENT.

APPLICATION FILED AUG. 2, 1902.

NO MODEL.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses
J. B. McGirr.
R. S. Allyn

Inventor
Jesse Alexander
by R. A. Mitchell
Attorney

No. 756, 808.

PATENTED APR. 12, 1904.

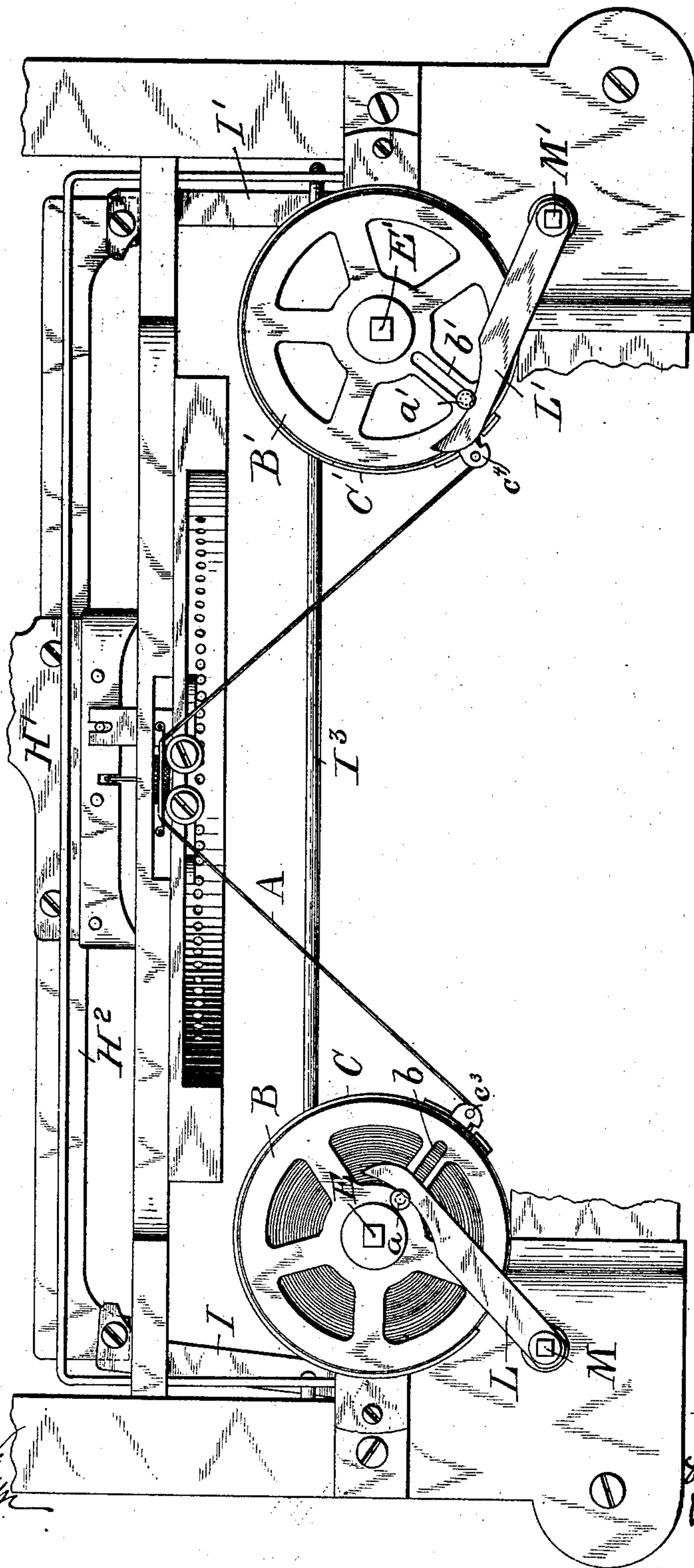
J. ALEXANDER.
TYPE WRITING MACHINE RIBBON MOVEMENT.

APPLICATION FILED AUG. 2, 1902.

NO MODEL.

4 SHEETS—SHEET 2.

Fig. 2.



Witnesses

J. B. McGirr
R. S. Allen

Inventor

Jesse Alexander
R. C. McIntosh
Attorney

No. 756,808.

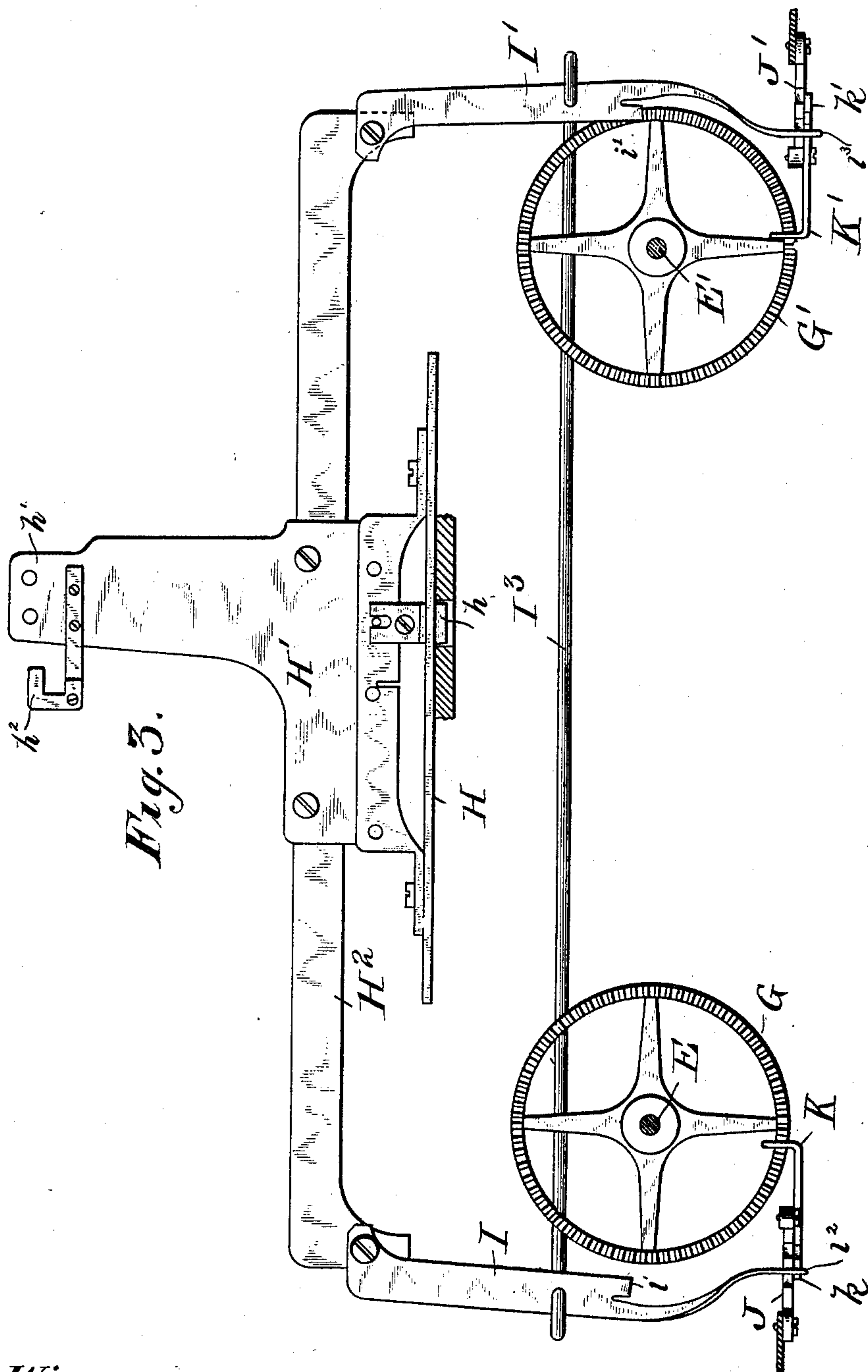
PATENTED APR. 12, 1904.

J. ALEXANDER.
TYPE WRITING MACHINE RIBBON MOVEMENT.

APPLICATION FILED AUG. 2, 1902.

NO MODEL.

4 SHEETS—SHEET 3.



Witnesses
J. B. McGirr.
R. S. Allen.

Inventor
Jesse Alexander
by R. C. Mitchell.
Attorney

No. 756,808.

PATENTED APR. 12, 1904.

J. ALEXANDER.
TYPE WRITING MACHINE RIBBON MOVEMENT.

APPLICATION FILED AUG. 2, 1902.

NO MODEL.

4 SHEETS—SHEET 4.

Fig. 4.

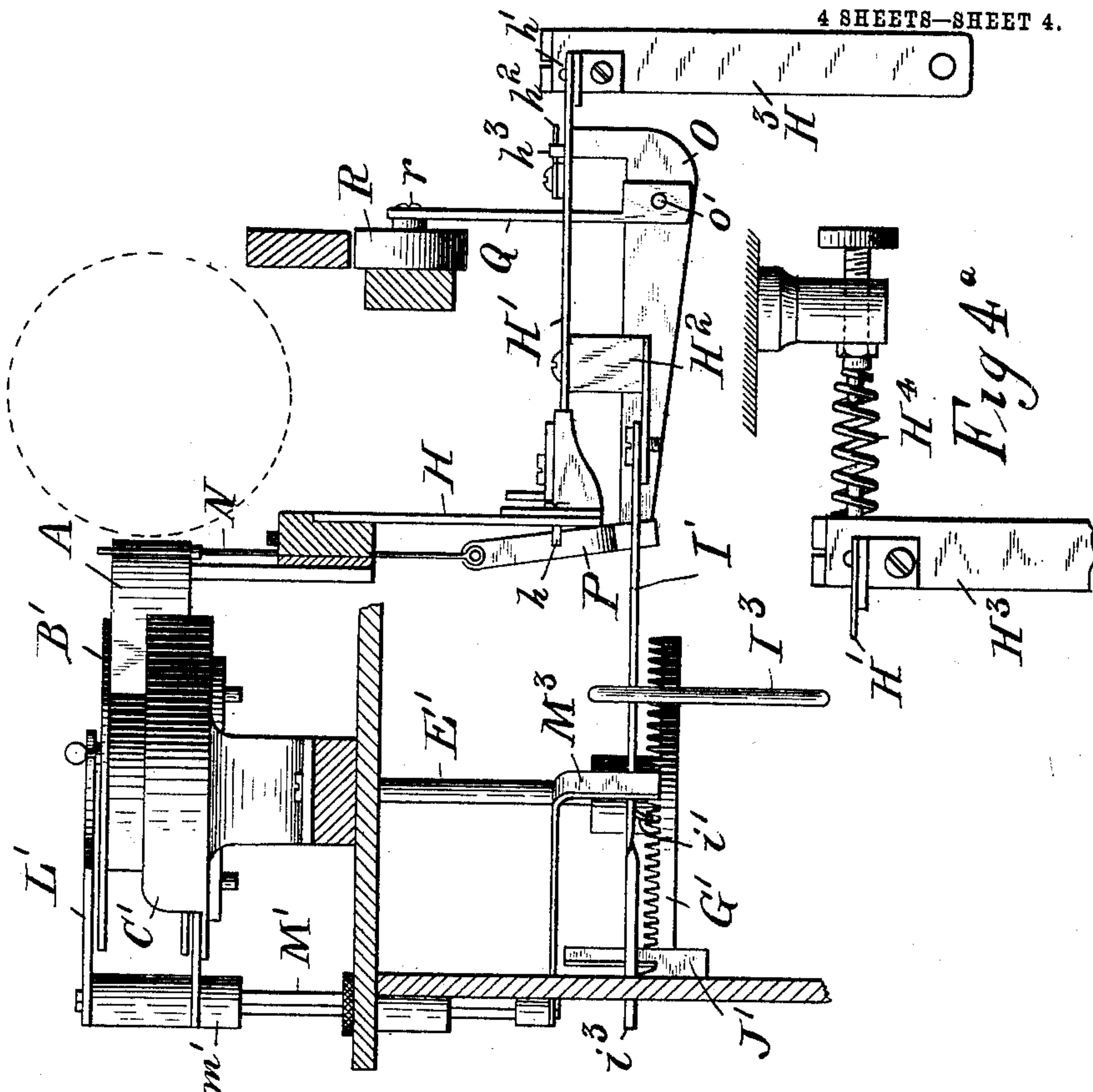


Fig. 6.

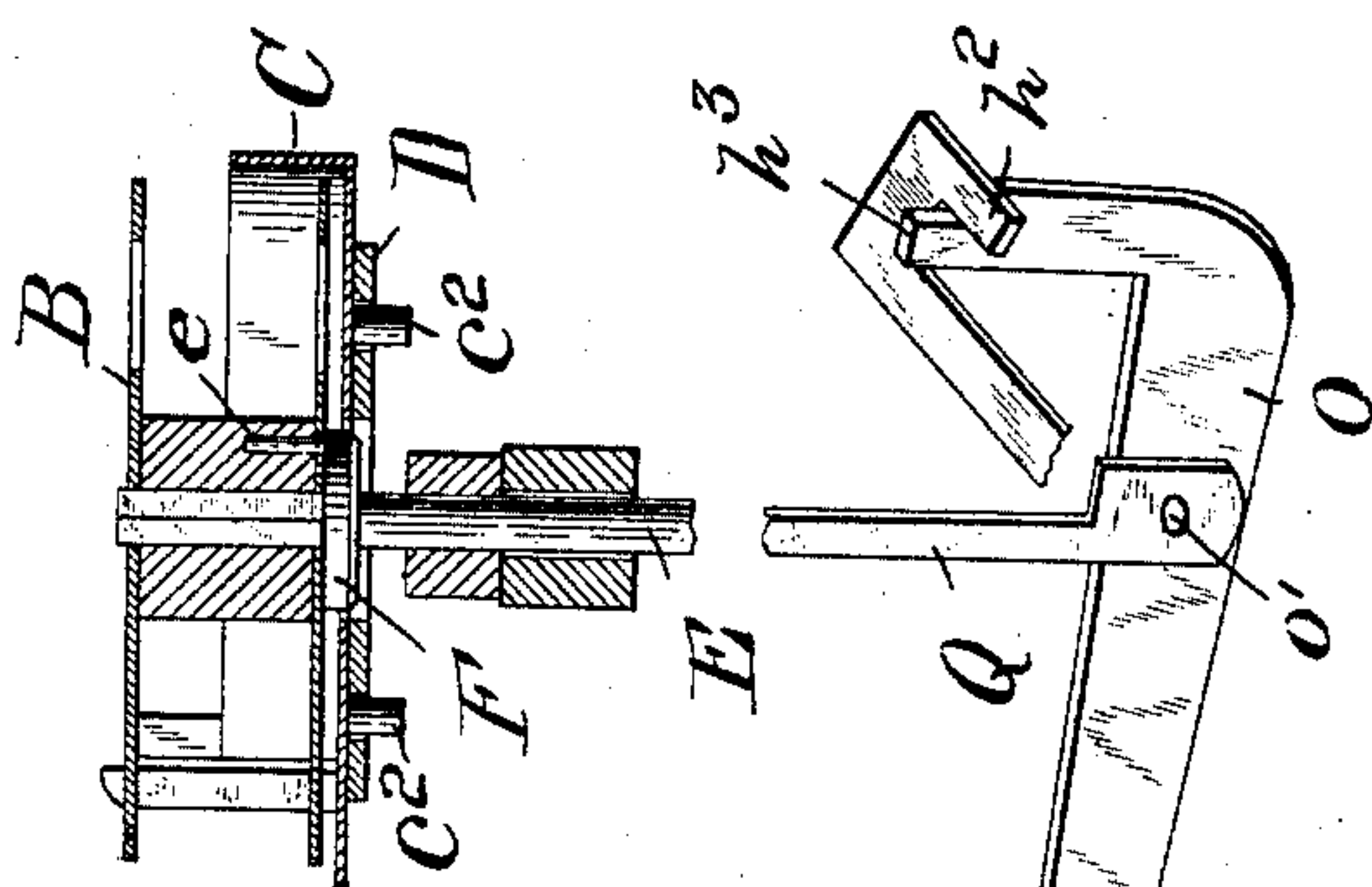
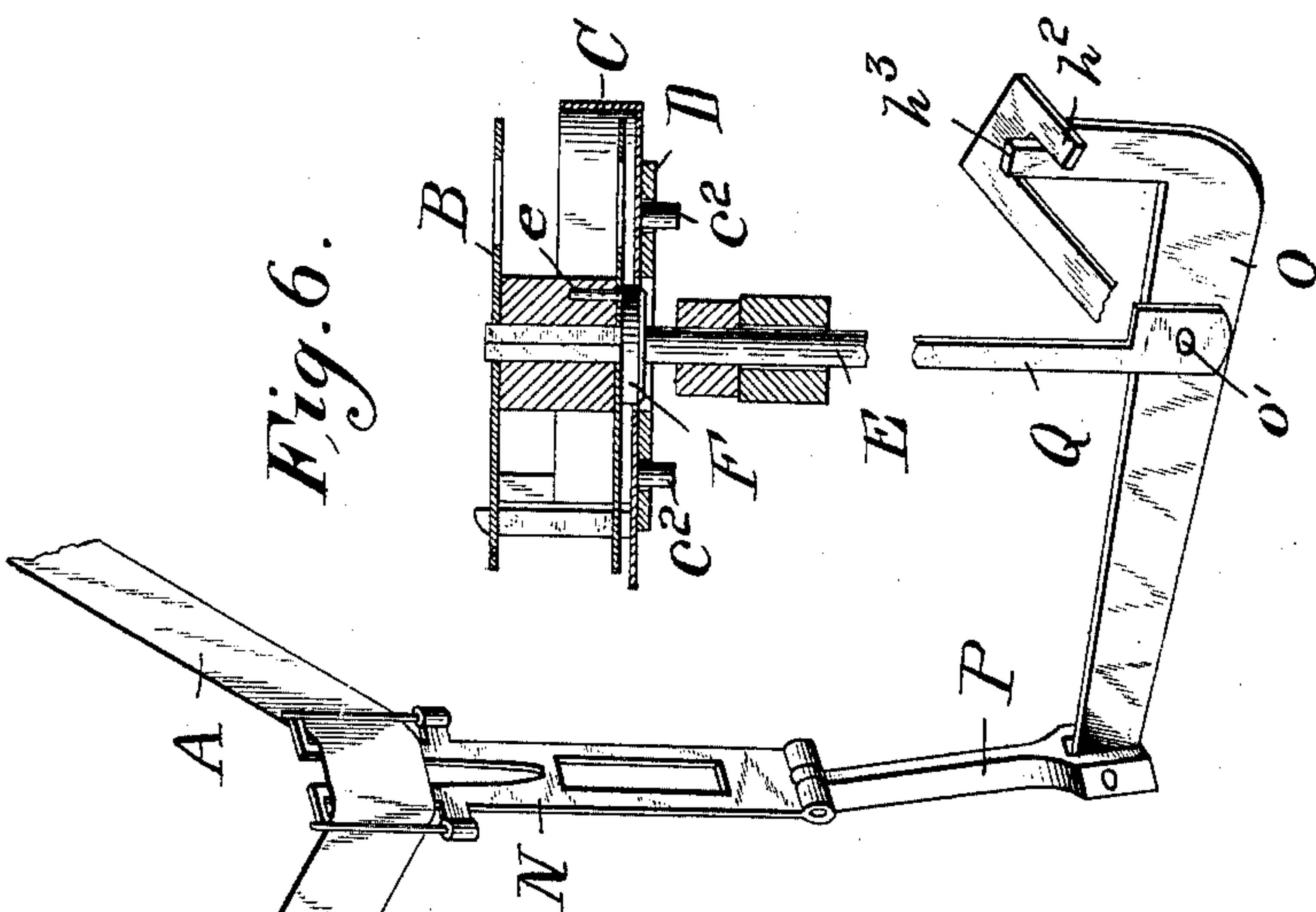


Fig. 5.



Witnesses:

J. B. McGirr.
R. S. Hylle

Inventor
Jesse Alexander
by R. A. Mitchell
Attorney

UNITED STATES PATENT OFFICE.

JESSE ALEXANDER, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF
TO ARTHUR LETTS, OF LOS ANGELES, CALIFORNIA.

TYPE-WRITING MACHINE, RIBBON-MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 756,808, dated April 12, 1904.

Application filed August 2, 1902. Serial No. 118,084. (No model.)

To all whom it may concern:

Be it known that I, JESSE ALEXANDER, a citizen of the United States, residing at Brooklyn, in the county of Kings, State of New York, have invented certain new and useful Improvements in Type-Writing Machines, Ribbon-Movement, of which the following is a full, clear, and exact description.

My invention relates to improvements in type-writing machines, and particularly to the ribbon mechanism therefor.

The object of my invention is to simplify the construction of such mechanism and to so proportion the parts of the same that they may be compactly arranged relatively to the other parts of the machine and that they may be efficient and satisfactory in operation. The ribbon mechanism will be found to be automatically reversible. The machine to which this is particularly adapted to be used is of the visible-writing type in which the line of print appears across the front face of the platen. For this purpose the ribbon is raised and lowered toward and away from the printing position. This is accomplished at the moment of printing of any type and in the manner which will be described. The parts are, moreover, so relatively situated that the ribbon has no tendency whatever to become twisted. The parts of the ribbon mechanism which require to be sometimes removed or adjusted for the purpose of removing an old ribbon and inserting a new one are also so made that they can be easily taken apart, and are nevertheless reliable in their adjustment. The ratchet-and-pawl mechanism by which the ribbon is actuated is also so constructed as to give a regular and even pull upon the ribbon and to prevent the same from being accidentally reversed.

My invention consists in the structure and arrangement of parts necessary for carrying out the above-mentioned objects, as will be hereinafter seen by inspection of the drawings and the following description.

In the four sheets of drawings, Figure 1 is a vertical projection of part of a ribbon-operating mechanism embodying my invention as in place in the frame of a machine shown partly in section. Fig. 2 is a plan view of the

ribbon mechanism and a portion of the front part of a machine. Fig. 3 is a plan view of a universal bar and the ribbon-operating ratchets and pawls. Fig. 4 is a side elevation of the ribbon mechanism as mounted in the frame of a machine, parts of which are shown and in section. Fig. 4^a is a detail of the universal-bar-return spring and a continuation of the mechanism of Fig. 4 to the right. Fig. 5 is a perspective view of the ribbon-lifting guides and levers. Fig. 6 is a detailed section and elevation of the ribbon-spool and carrier.

The ribbon A operates on the spools B B', mounted in the protecting-shells C C', which are carried by the supporting-plates D D'.

E E' are the operating-shafts upon the upper ends of which the ribbon-spools B B' are carried. The disks F F' are preferably formed integral with the shaft E and form supports at the under side of the ribbon-spool. As is common in ribbon-operating mechanism of this general character, the spool may be caused to revolve with the shaft by means of a pin e, carried by the shaft, or by a disk F. I prefer, however, to square the upper end of the shafts E E' and form the spool-hubs accordingly. The shafts E E' are provided with suitable supporting-collars e' and mounted in suitable bearings e² e³ in the frame of the machine. At the lower ends of the shafts E E' are carried crown-ratchets G G', with the teeth pointed upward. By the operation of one or the other of these ratchets the ribbon is made to travel in one or the other direction, as will hereinafter appear.

In a suitable position for coacting with any desirable form of type-bar mechanism is situated a universal bar H. By the operation of this universal bar in the customary manner of machines of this general character the ribbon-operating mechanism is set into movement. The rear part or plate H' of the universal bar H has mounted on the under side the pawl-carrier beam H². In order that the universal bar H and the plate H' at its rear part may be preserved in proper alignment during the reciprocating action, a projecting lug h may be provided at the front, operating in a slot in the frame of the machine. The

rear end h' is provided with a lug and rocks on the rock-arm H^3 . By a particular inspection of Fig. 3 the construction and operation of this portion of the mechanism may be readily seen. The pawl-arms $I I'$ are pivotally carried by the pawl-carrier beam H^2 and provided with the pawls $i i'$, which are adapted to coact with the teeth of the crown-ratchets $G G'$. As these pawls are arranged on diametrically opposite sides of their respective ratchets, it will be noted that the operation and direction of movement of the ribbon will be controlled, depending upon which pawl is in conjunction with its respective ratchet. The pawl-arms $I I'$ may be conveniently connected by means of the rod I^3 , (see Fig. 1,) whose ends are bent upward and downward to form hooks, which engage in recesses or holes in the pawl-arms. The pawl-arms have fingers $i^2 i^3$ at their outer end, which coact with notched plates $J J'$. These plates are provided with two notches, as shown particularly in Fig. 1. The weight of the pawl-arms and attached parts tend to hold the fingers $i^2 i^3$ down into the bottom of the notches. As the universal bar is operated by the type striking against it and is forced to the rear as viewed in Fig. 3 the pawl i' is drawn backward over the tops of the teeth of the ratchet G' , while the ratchet is held from revolution in that direction by means of the catch K' , which is hinged to the notched plate J' . As the spring H^4 throws the universal bar back to its normal position the pawl i' causes the crown-ratchet G' to revolve clockwise, and thus wind up the ribbon upon the spool or bobbin B' . At this time it will be noted that the left-hand ribbon-spool B is free to revolve upon its axis, the pawl i being out of engagement with the ratchet G and the catch K being also raised. The position of the catch K is determined by the fingers $i^2 i^3$, as may be seen in Fig. 1, the fingers i^2 resting when in the left-hand notch upon the rearward extension k of the catch K . The change in the direction of travel of the ribbon may be effected by simply moving the connecting-bar I^3 to the left, which brings the pawl i into engagement with the teeth of the ratchet G and releases the corresponding parts connected with the spool B' . When the pawl-arms are thus moved either to the right or left, the fingers $i^2 i^3$ ride up the sides of the notches in the plates $J J'$, in which they have been resting, and fall into the other notch. The automatic reversal of the movement of the ribbon is accomplished as will next be described.

Upon the frame of the machine, in suitable positions, (see Figs. 1 and 2,) are mounted the U-shaped frames $L L'$, preferably upon the upper ends of shafts $M M'$. The arms of these frames embrace the ribbon-spools above and below, as particularly seen in Fig. 1. The shafts $M M'$ are preferably at the upper end squared for causing the frames $L L'$ to move

with them and provided with collars $m m'$ to provide suitable supports. The lower ends of these shafts $M M'$ are provided with arms $M^2 M^3$, (see Fig. 4,) projecting downward and just outside, but in the path of movement, of the pawl-arms $I I'$. Each end of the ribbon is provided with a pin, respectively $a a'$, which project through slots $b b'$ in the ribbon-spools B and B' . The ends of these pins stand in the path of movement of the frame-arms $L L'$. If now we consider that the left-hand spool has been winding the ribbon upon it, it will be noted that when the right-hand end of the ribbon is reached the pin a' will slide out to the end of the slot b' and, causing the frame L' to move to the left, will thus, by means of the arm M^3 , throw the pawl-arm I' to the left, and thus place the pawl i' in an operative position above the teeth of the ratchet G' . At the same time, by means of the connecting-rod I^3 , the pawl-arm I and pawl i are thrown out of engagement with the ratchet G . The ribbon will then be caused to wind upon the right-hand spool until, the left-hand end of the ribbon being reached, the pin a will slide out to the end of the slot b , throw the frame L to the right, and by means of the arm M^2 , corresponding to M^3 , throw the pawl-arms to the right, reversing the mechanism.

It will be noted that as the ribbon runs in vertical planes at all times there is no likelihood of its becoming twisted or tangled when in use. Moreover, since the spools are held on vertical shafts their weight is sufficient to hold them in place. The same is true of the U-shaped frames $L L'$. The spools and the reversing-frames may be removed by simply lifting them from the ends of their respective carrying-shafts.

The protecting-shell C may have pins c^2 projecting from the base to coact with the holes or recesses in the supporting-plate D . It will thus be seen that the protecting-shells are removable in a very simple manner from their supports to provide ease in centering and readiness of access to the parts when necessary. The shell C has roller-guides $c^3 c^4$ at the point through which the ribbon passes.

At the printing position the ribbon A is supported by a suitable guide-frame N , which has a vertical reciprocating movement in the frame of the machine in front of the platen, as particularly seen in Fig. 4. This guide is caused to move upward at the printing instant in front of the type by means of the universal bar acting through the lever O , pivoted at o' , and intermediate link P . The pivot o' is carried by a stationary bracket Q , attached to the frame of the machine, preferably by means of a screw r , passing through and acting as a pivot for the roller R , constituting one element of the carriage-guide. The carriage mechanism is, however, not a part of this application and need not be herein fur-

ther described. The plate H' of the universal bar is provided with a projecting hook h^2 , which is adapted to engage the projecting finger h^3 of the pivoted lever O . Thus when the universal bar is moved rearwardly the shank of the hook h^2 moves the end of the lever O by means of the finger h^3 and, tilting the lever about its pivot o' , raises the ribbon to the printing position. The return of the universal bar, caused by the spring H^4 , when the key is released draws back the lever to its normal position by means of the hook h^2 . The weight of the parts of the ribbon-guide and connecting-link and lever of course tend to throw the ribbon to its lowest position; but this action is made positive by means of the spring H^4 .

It will be noted that with a carriage of the single-shift type the ribbon is so operated that the upper part will be used when the type is printing on the upper case and that the lower part is used when printing lower-case letters. This insures a uniform wear.

The direction of movement of the universal bar is substantially horizontal, since the pivoted action about the arm H^3 is but slight.

What I claim is—

1. A ribbon-reversing mechanism for type-writing machines comprising a horizontally-movable universal bar, a pawl-carrying beam united thereto, ribbon-spool-operating shafts, ratchet-wheels carried by said shafts, hinged pawls carried by said pawl-beam, and means controlled by the operation of the ribbon for automatically throwing one or the other of said pawls into engagement with its corresponding ratchet.

2. A ribbon-reversing mechanism for type-writing machines comprising a horizontally-movable universal bar, a pawl-carrying beam moved correspondingly thereby, ribbon-spool-operating shafts, ratchet-wheels carried by said shafts, hinged pawls carried by said pawl-beam, and means controlled by the operation of the ribbon for automatically throwing one or the other of said pawls into engagement with its corresponding ratchet.

3. A ribbon-reversing mechanism for type-writing machines comprising a horizontally-movable universal bar, a pawl-carrying beam united thereto, ribbon-spool-operating shafts, ratchet-wheels carried by said shafts, pawl-arms having hinged pawls carried by said pawl-beam, and means controlled by the operation of the ribbon for automatically throwing one or the other of said pawls into engagement with its corresponding ratchet.

4. A ribbon-actuating mechanism for type-writing machines comprising a vertical ribbon-spool-operating shaft, a ratchet-wheel carried thereby, a horizontally-reciprocating universal bar, a pawl-beam united thereto, a pawl carried thereby at each end adapted to engage

with the teeth of said ratchet and a freely-removable rod connecting the pawls.

5. A ribbon-actuating mechanism for type-writing machines comprising a vertical ribbon-spool-operating shaft, a ratchet-wheel carried thereby, a horizontally-reciprocating universal bar, a pawl-beam united thereto, pawl-arms pivoted to said pawl-beam, and pawls carried thereby adapted to engage with the teeth of said ratchet and a freely-removable rod connecting the pawl-arms intermediate their pivots and their free ends.

6. A ribbon-operating mechanism for type-writing machines consisting of a horizontally-movable universal bar, a pair of ribbon-spools having vertical axes, ratchet-wheels corresponding thereto, a pawl-carrying beam carried by said bar and extending from side to side of the machine, a pawl-arm pivoted at each end of said pawl-beam and carrying pawls for engagement with said ratchet-wheels.

7. A ribbon-operating mechanism for type-writing machines consisting of a horizontally-movable universal bar, a pair of ribbon-spools, ratchet-wheels corresponding thereto, a pawl-carrying beam carried by said bar, a pawl-arm pivoted at each end of said pawl-beam and carrying pawls for engagement with said ratchet-wheels, means for preventing the rearward movement of the operating ratchet-wheel and means controlled by one of said pawls for disengaging the preventing means when said pawl is disengaged.

8. In a ribbon mechanism for type-writing machines, a universal bar, a pawl-carrying beam operated by said universal bar, pivoted pawl-arms carried by said beam, ribbon-operating ratchet-wheels pivotally mounted, notched plates, catches pivoted to said plates adapted to prevent the rearward movement of a ratchet when it is being operated by a pawl, the end of a catch projecting by a notch in a plate and one end of a pawl-arm being adapted to coact therewith to release a catch when a pawl is disengaged.

9. In a ribbon mechanism for type-writing machines, a universal bar, a pawl-carrying beam operated by said universal bar, pivoted pawl-arms carried by said beam, ribbon-operating ratchet-wheels pivotally mounted, notched plates, one end of each of said pawl-arms resting in a notch of its corresponding plate so as to be held in position.

10. A ribbon-operating means comprising a pair of ratchets, means for operating the same, vertical shafts carrying said ratchets, the upper end of said shafts being square, ribbon-spools mounted on the square ends of said shafts, and means for automatically reversing the movement of said ribbon said means being operated by U-shaped frames, said frames being removably carried by the squared ends of vertical shafts.

11. A ribbon-operating means comprising a pair of ratchets, means for operating the same, vertical shafts carrying said ratchets, the upper end of said shafts being square, ribbon-spools removably mounted on the square ends of said shafts, and means for automatically reversing the movement of said ribbon said means being operated by U-shaped frames, said frames being removably carried by the squared ends of vertical shafts.
12. A ribbon-operating means for a typewriter including a pair of vertical ribbon-operating shafts, spools removably carried thereby, pawls for actuating said shafts, shifting arms for throwing one or the other of said pawls into operative position, vertical shafts for controlling said shifting arms, frames removably carried by the upper ends of said shafts having arms embracing their respective ribbon-spools and means controlled by the rotation of the ribbon-spools for operating the frames as the ribbon is unwound from one spool to the other.
13. A ribbon-operating mechanism for typewriting machines comprising, a universal bar, a pawl-beam carried thereby, pivoted pawls carried by said pawl-beam, vertical shafts, ratchet-wheels carried by said shafts and cooperating with said pawls, the upper end of said shafts being square, ribbon-spools removably carried thereby, and means for automatically reversing the ribbon-feed comprising pivot-frames independently of the spools but operated by the movement of the ribbon.
14. A ribbon-operating mechanism for typewriting machines comprising, a universal bar, a pawl-beam carried thereby, pivoted pawls carried by said pawl-beam, vertical shafts, ratchet-wheels carried by said shafts and cooperating with said pawls, the upper end of said shafts being square, ribbon-spools removably carried thereby, and means for automatically reversing the ribbon-feed comprising pivot-frames operated by the movement of the ribbon, said frames being removably mounted on vertical shafts.
15. A ribbon-operating mechanism for typewriting machines comprising, a universal bar, a pawl-beam carried thereby, pivoted pawls carried by said pawl-beam, vertical shafts, ratchet-wheels carried by said shafts and cooperating with said pawls, the upper end of said shafts being square, ribbon-spools removably carried thereby, and means for automatically reversing the ribbon-feed comprising pivot-frames operated by the movement of the ribbon, said frames being removably mounted on vertical shafts, and arms carried by the frame-carrying shaft to shift said pawls.
16. A ribbon-operating mechanism for typewriting machines comprising, a universal bar, a pawl-beam carried thereby, pivoted pawls carried by said pawl-beam, vertical shafts, ratchet-wheels carried by said shafts and cooperating with said pawls, ribbon-spools removably carried thereby, and means for automatically reversing the ribbon-feed comprising pivot-frames operated by the movement of the ribbon, said frames being removably mounted on vertical shafts.
17. A ribbon-operating mechanism for typewriting machines comprising, a universal bar, a pawl-beam carried thereby, pivoted pawls carried by said pawl-beam, vertical shafts, ratchet-wheels carried by said shafts and cooperating with said pawls, ribbon-spools removably carried thereby, means for automatically reversing the ribbon-feed comprising pivot-frames operated by the movement of the ribbon, and arms carried by the frame-carrying shaft to shift said pawls.
18. A ribbon-supporting construction comprising a vertical rotatable shaft, a supporting-disk carried thereby, a ribbon-spool carried by said shaft and supported by said disk, a stationary supporting-plate, a protecting-shell for said spool carried removably by said plate, means for reversing the movement of said ribbon-spool, said means being actuated by a pivoted frame, and a vertical shaft having a square end for removably carrying said frame.
19. A ribbon-supporting construction comprising a vertical rotatable shaft, a supporting-disk carried thereby, a ribbon-spool removably carried by a square end of said shaft and supported by said disk, a stationary supporting-plate, a protecting-shell for said spool carried removably by said plate, means for reversing the movement of said ribbon-spool, said means being actuated by a pivoted frame, and a vertical shaft having a square end for removably carrying said frame.
20. A ribbon-shifting mechanism comprising a vertically-movable ribbon-guide, a horizontally-movable universal bar, a pivoted arm guiding said bar at one end, a coiled spring pressing against said arm, a pivoted lever, a link for connecting said lever with said ribbon-guide said lever being directly operated by the movement of said universal bar.
21. A ribbon-shifting mechanism comprising a vertically-movable ribbon-guide, a horizontally-movable universal bar, a pivoted lever, a link for connecting said lever with said ribbon-guide said lever being directly operated by the movement of said universal bar, said ribbon-guide moving upward the same distance at all times so that the ribbon will be used on one line for one case of type and on another line for another case of type.
22. A ribbon-operating mechanism for typewriting machines comprising a horizontally-movable universal bar, a vertically-movable ribbon-guide, a pivoted lever operated by said bar, a link connecting said lever and guide, vertical ribbon-spool-carrying shafts, ratchet-wheels carried thereby, a beam carried by said

universal bar, pawl-carrying arms pivoted thereto for engaging said ratchets.

23. A ribbon-operating mechanism for type-writing machines comprising a horizontally-movable universal bar, a vertically-movable ribbon-guide, a pivoted lever operated by said bar, a link connecting said lever and guide, vertical ribbon-spool-carrying shafts, ratchet-wheels carried thereby, a beam carried by said

universal bar, pawl-carrying arms pivoted thereto for engaging said ratchets, and means operated by the movement of the ribbon for automatically shifting said pawl-arms.

JESSE ALEXANDER.

Witnesses:

L. VREELAND,
ROBT. S. ALLYN.