

(No Model.)

8 Sheets—Sheet 1.

G. C. BLICKENS DERFER.
TYPE WRITING MACHINE.

No. 583,840.

Patented June 1, 1897.

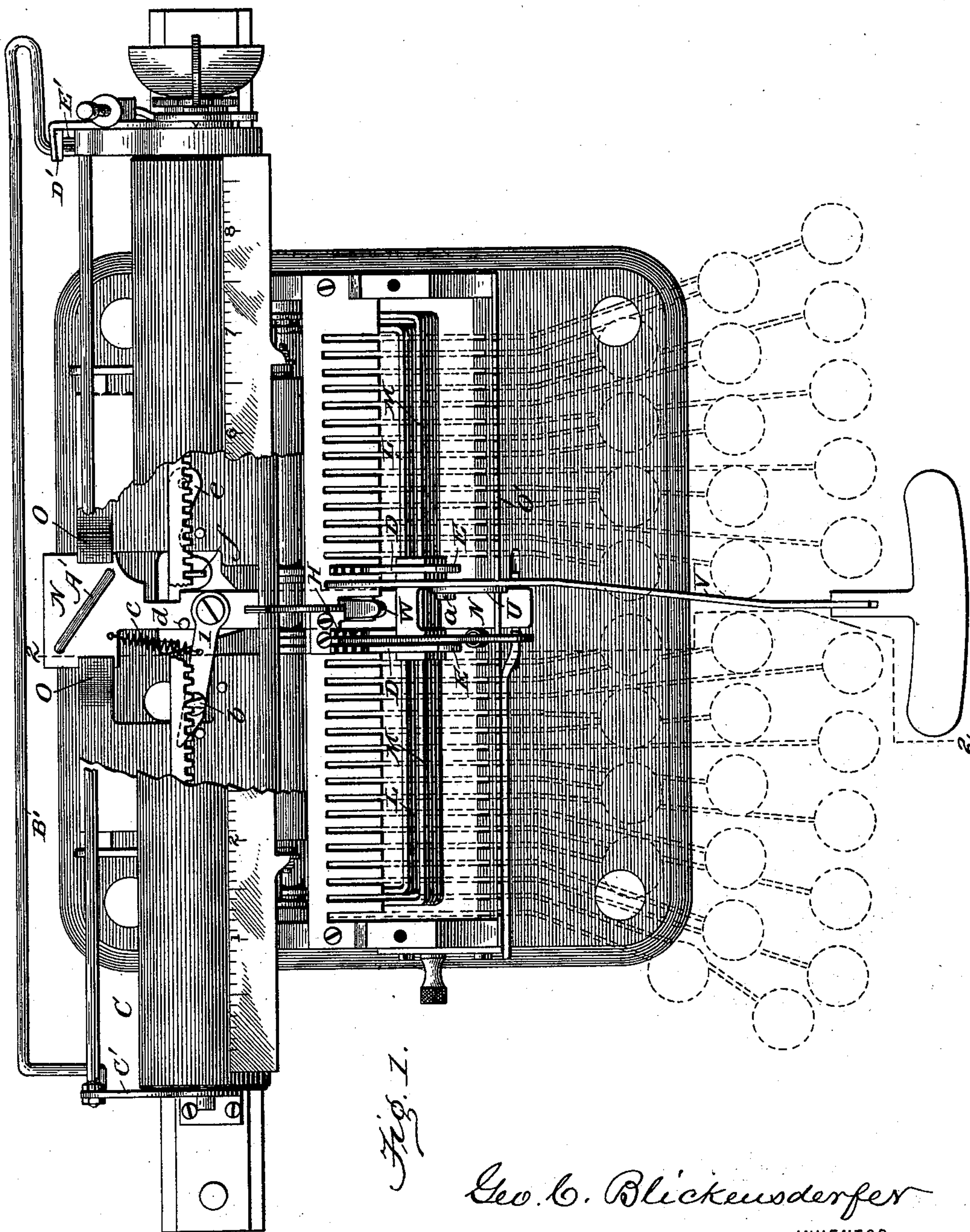


Fig. 1.

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(No Model.)

3 Sheets—Sheet 2.

G. C. BLICKENSDEKFER.
TYPE WRITING MACHINE.

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Patented June 1, 1897.

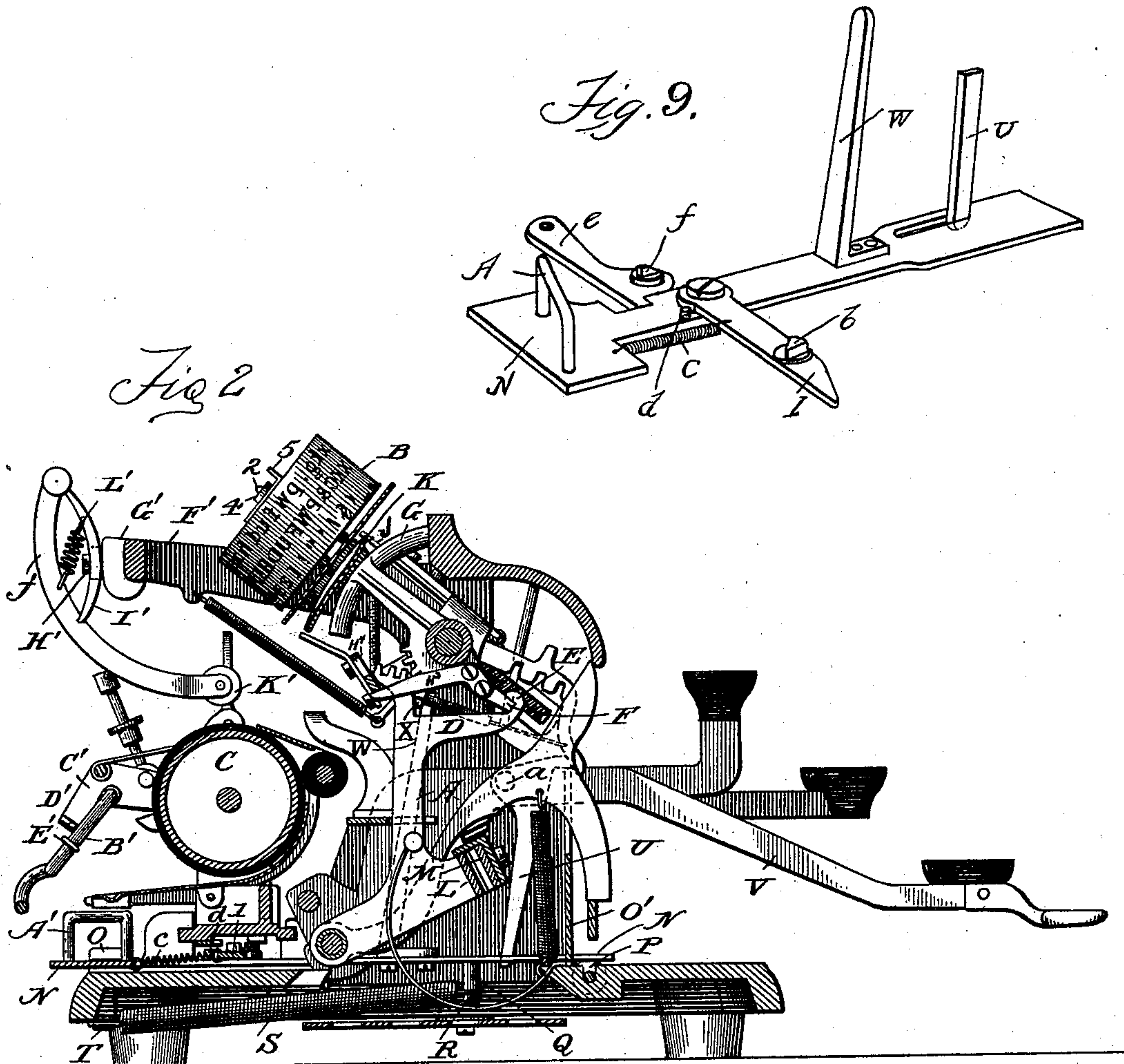


Fig. 9.

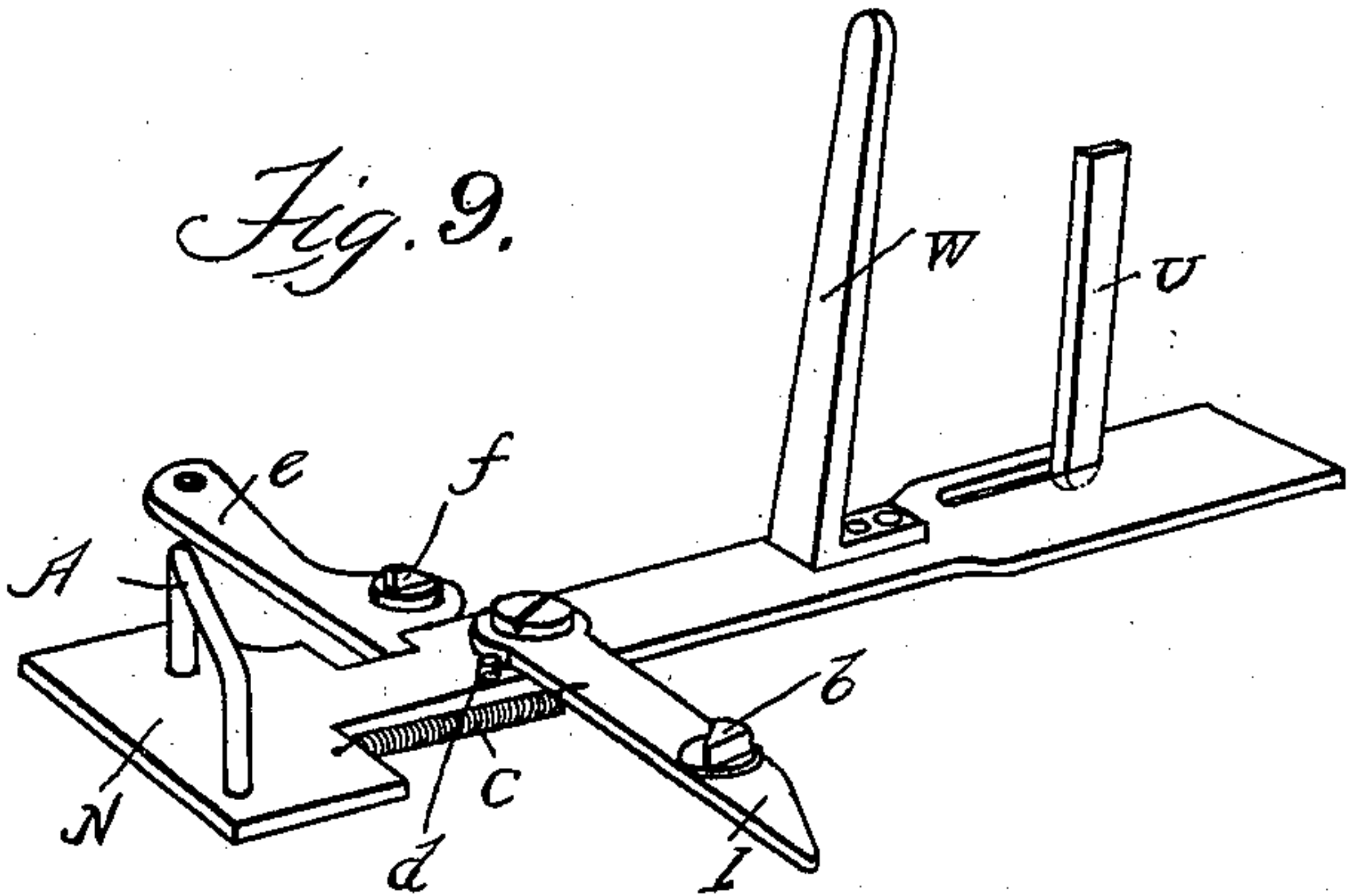
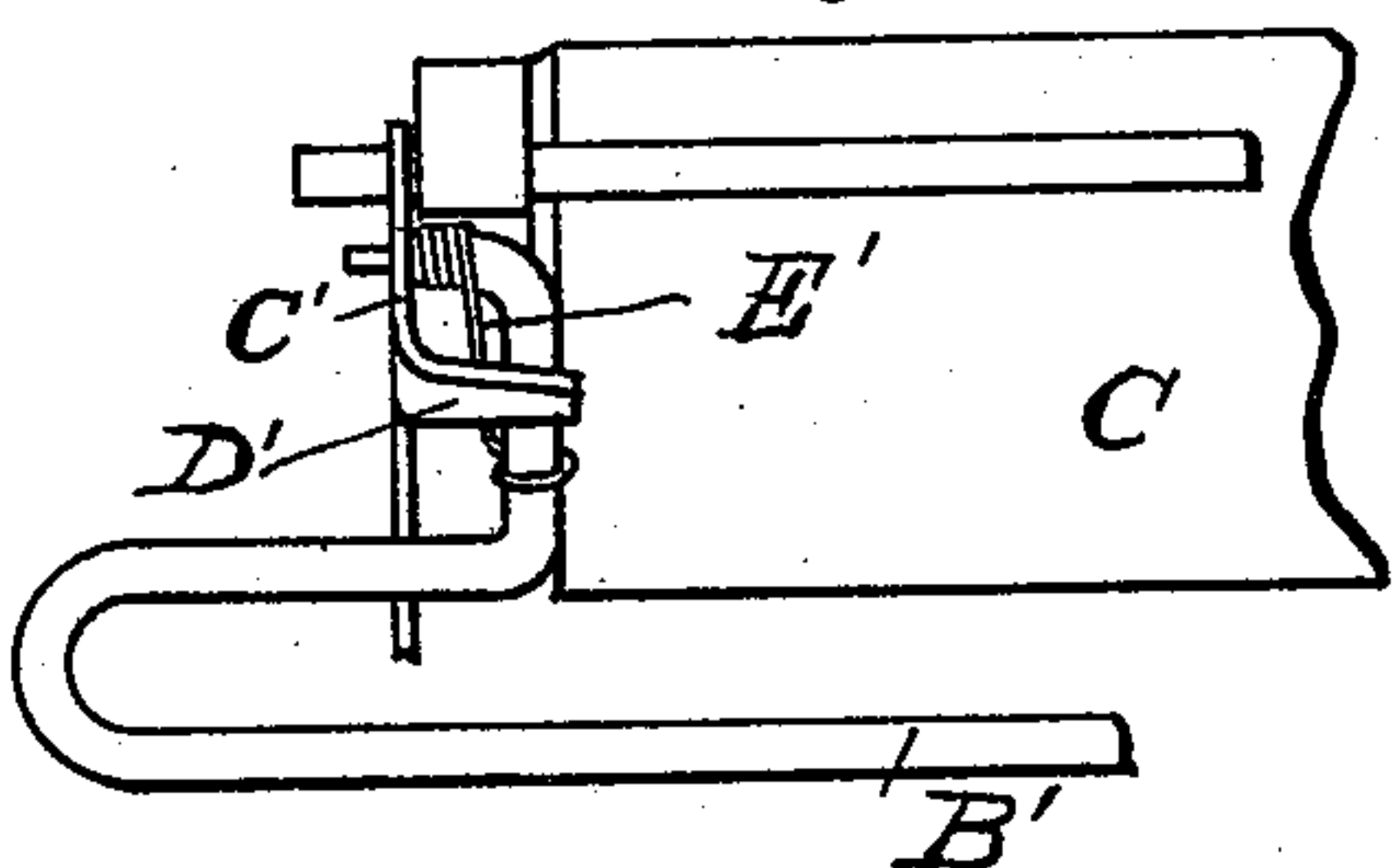


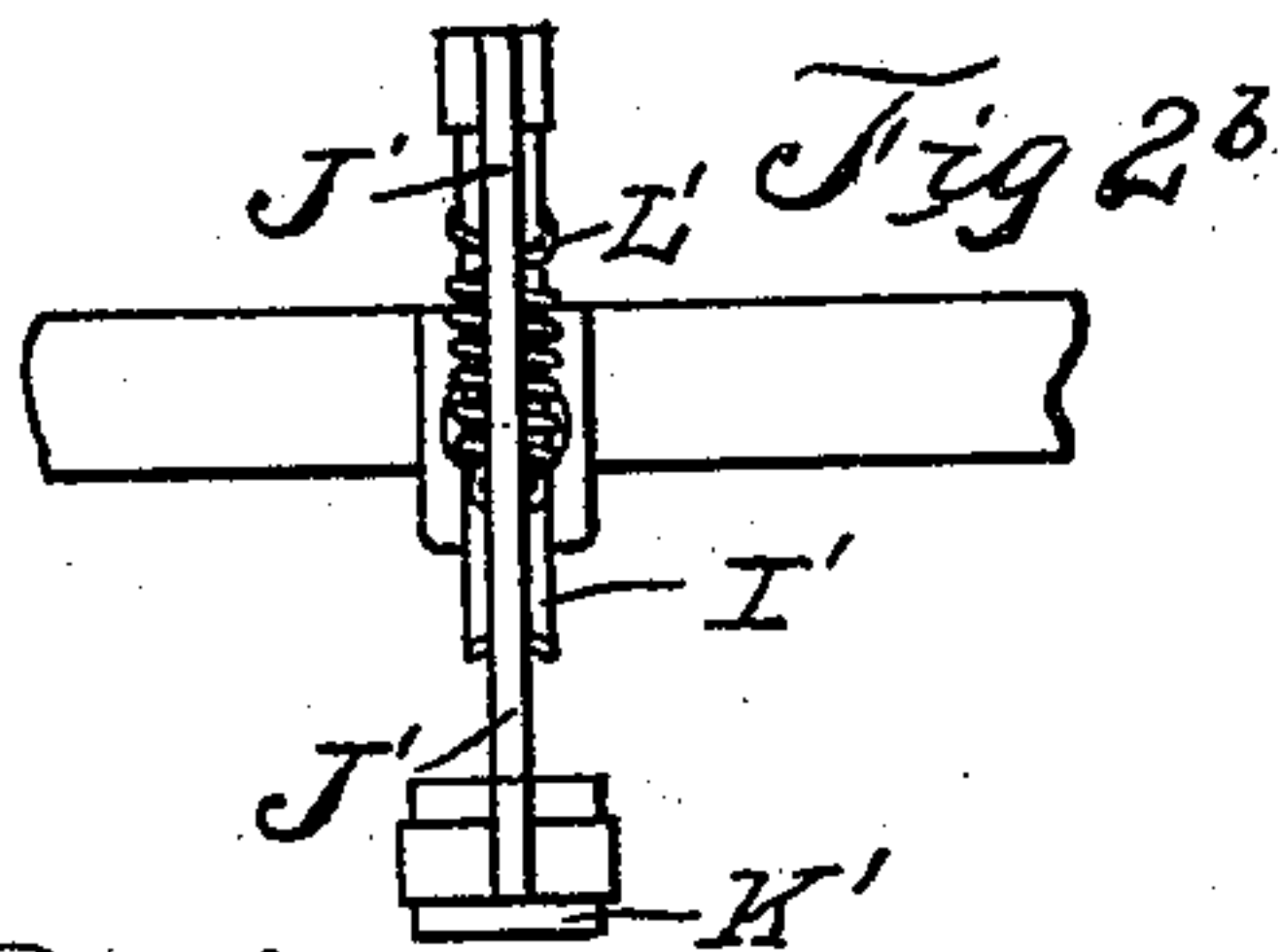
Fig. 2

Fig. 2^a.



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3 Sheets—Sheet 3.

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Fig. 3.

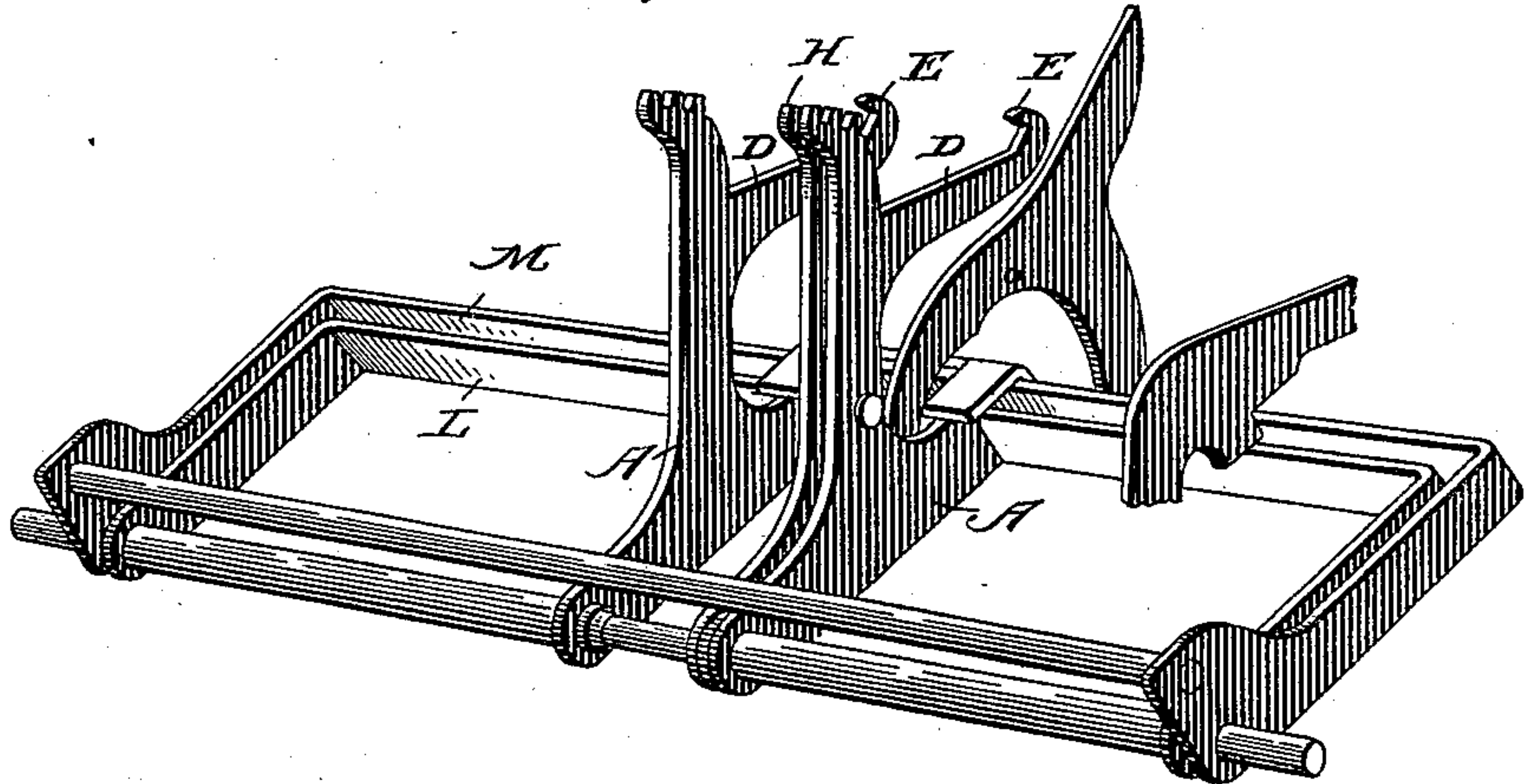


Fig. 4.

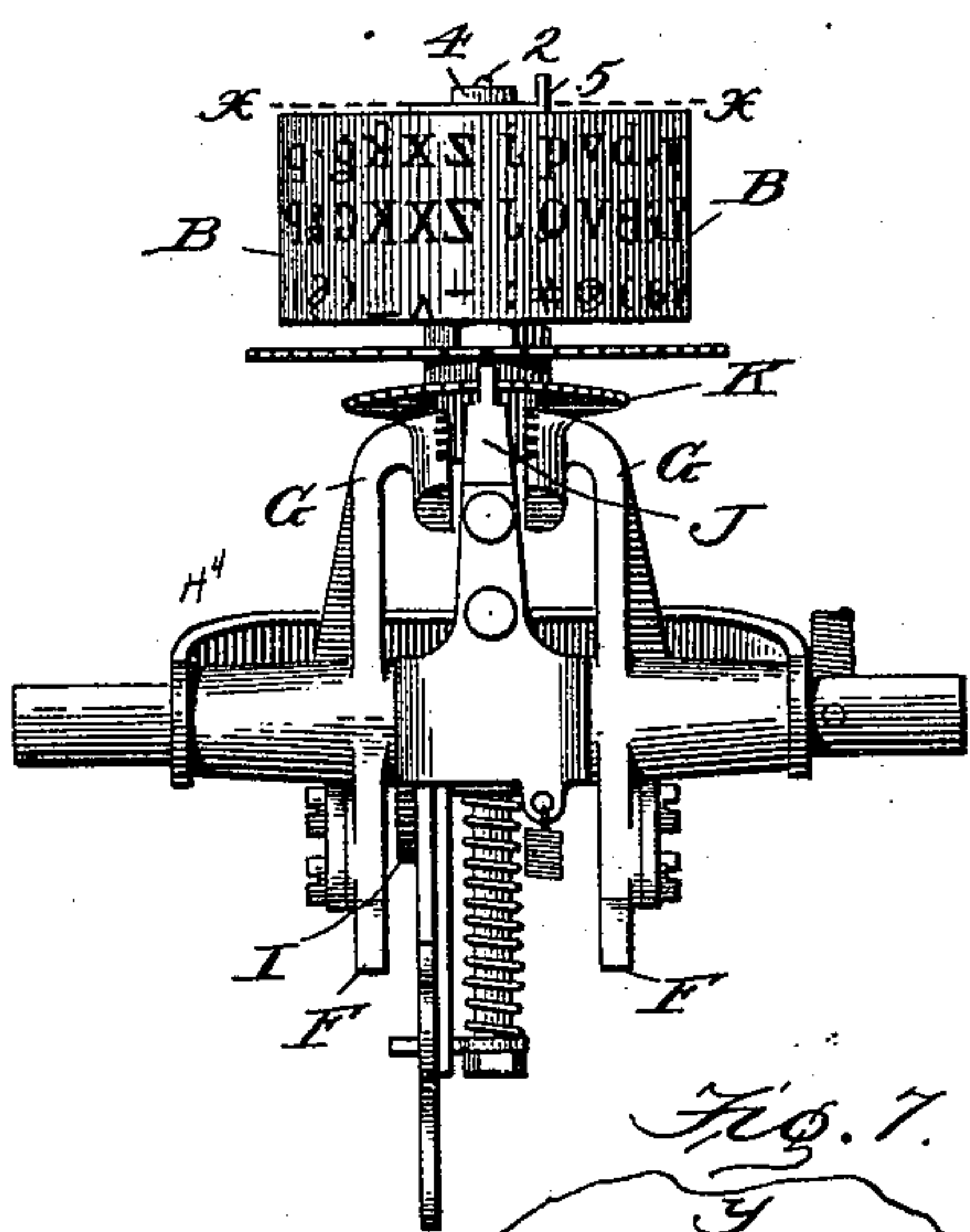
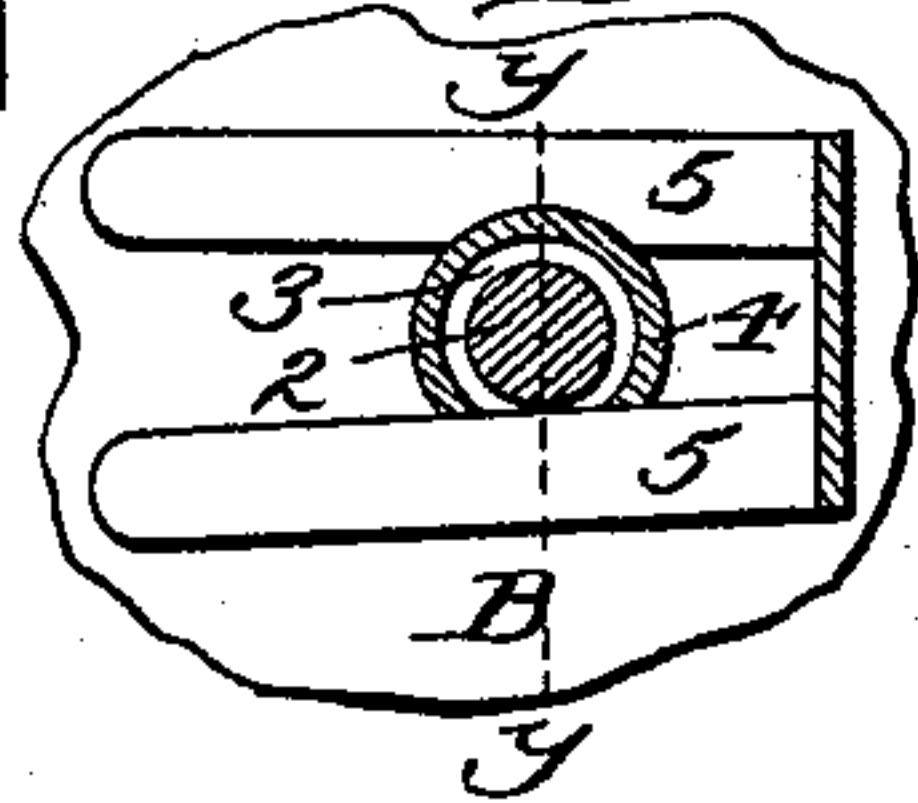


Fig. 7.



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Fig. 5.

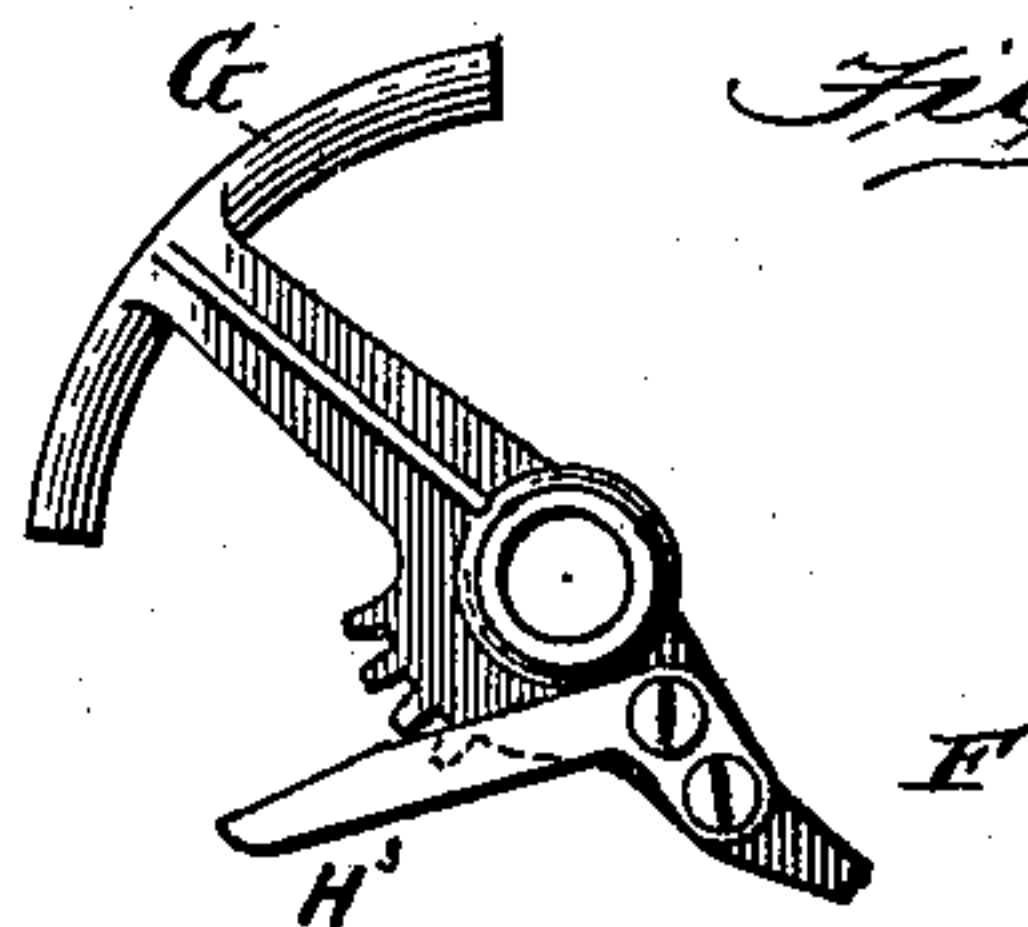


Fig. 6.

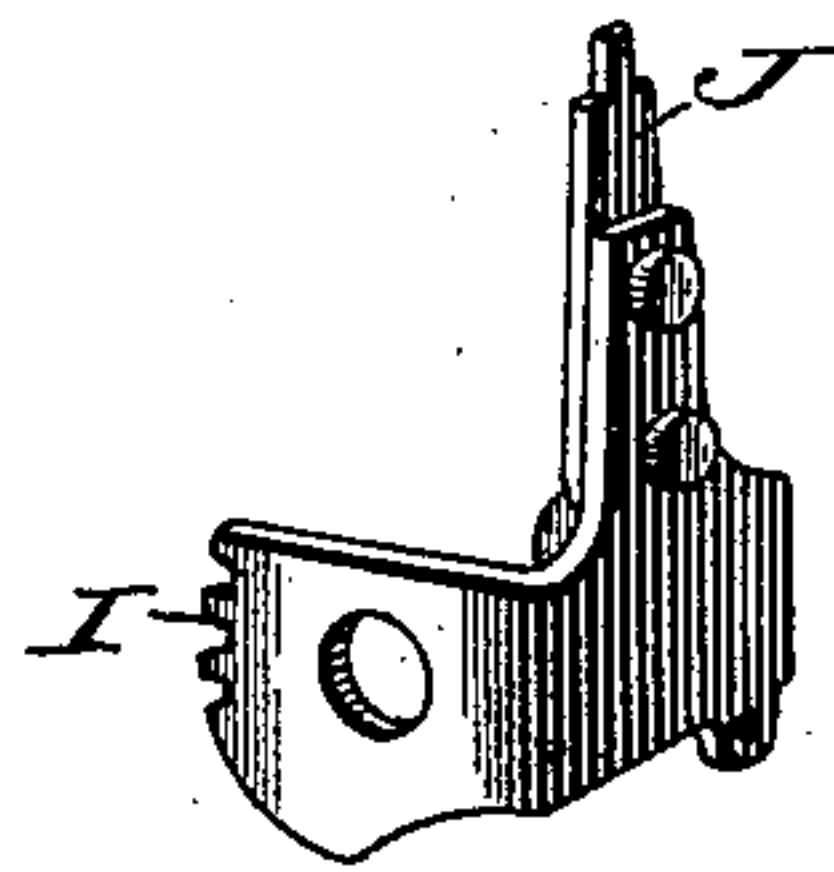
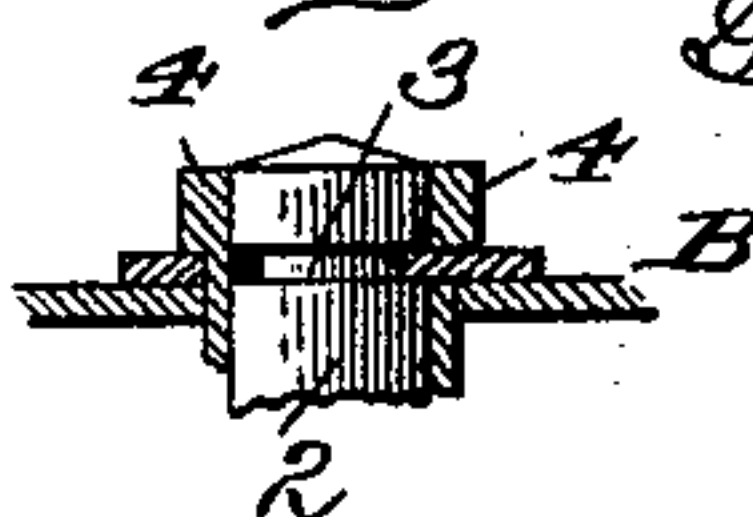


Fig. 8.



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UNITED STATES PATENT OFFICE.

GEORGE C. BLICKENSDEFFER, OF STAMFORD, CONNECTICUT.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 583,840, dated June 1, 1897.

Application filed June 11, 1896. Serial No. 595,149. (No model.)

To all whom it may concern:

Be it known that I, GEORGE C. BLICKENSDEFFER, a citizen of the United States, residing at Stamford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Type-Writing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in type-writing machines of that class in which the type and other characters are displayed upon a revoluble wheel which is caused to rotate and move longitudinally through the action of levers constituting the keyboard. The particular construction of such machines upon which my present invention is an improvement is most clearly shown and described in Letters Patent No. 472,692, granted to me on the 12th day of April, 1892.

My invention has for its objects, first, to provide means whereby accurate alinement of each character upon the cylinder or type-wheel is secured before the same is caused to descend to impress the character upon the sheet of paper carried by the paper-carriage; second, to provide certain improvements in the feed mechanism by which the paper-carriage is propelled, whereby the power applied each time for the depression of a key or the spacer-lever is stored up and utilized for the successive forward movement of the carriage, thus avoiding the necessity of a spring-escapement and the winding up of a sufficient amount of spring to throw the carriage sixty steps, (for an entire line,) relieving the dogs from undue strain, and securing economy of construction; third, in providing mechanism connected with the paper-carriage for releasing the feed promptly when it becomes necessary or desirable to move the paper-carriage in either direction by hand to any considerable extent or to entirely remove the same; fourth, in a novel construction and arrangement of the inking device, whereby simple and ready adjustment of the same may be made, and, fifth, in certain improvements in the means for removably securing in position the cylinder or type-wheel.

With these objects in view my invention consists in the novel features of construction for accomplishing the desired ends herein-after more fully described and specifically claimed.

As the Letters Patent hereinbefore referred to fully illustrate and describe all the general features of construction which are common to that machine and the one shown in this my present application, I will for the purpose of avoiding any confusion only describe in detail the particularly novel features herein, and in order that those skilled in the art may fully understand my invention I will proceed to describe the same, referring by letters and numerals to the accompanying drawings, in which—

Figure 1 is a plan view of my improved type-writer with the paper-carriage partially broken away to freely expose the feed mechanism. Fig. 2 is a cross vertical section taken at the line 22 of Fig. 1. Fig. 2^a is a rear view of the paper-carriage and the swinging bail used for releasing the carriage. Fig. 2^b is a rear elevation of the ink-roller frame and its support. Fig. 3 is a perspective view, on an enlarged scale, showing the operating bails and sectors, a portion of a key-lever, and the lever employed to move the type-wheel spindle longitudinally for positioning a field of type. Fig. 4 is a detail front or plan view of the type-wheel, frame, &c. Fig. 5 is a side view of one of the sectors by which the type-wheel is rotated. Fig. 6 is a perspective view of the sector rack and pawl by which the type-cylinder is forced downwardly to make the impression and held against rotary action during the time the impression is being made. Fig. 7 is a horizontal section, on an enlarged scale, taken at the line *xx* of Fig. 4; and Fig. 8 is a transverse central section on line *yy* of Fig. 7. Fig. 9 is a perspective of the parts which coöperate with the feed-rack on the paper-carriage to feed the same.

Similar letters and numerals of reference indicate like parts in the several figures.

I will now first describe the means through which I secure accurate alinement.

A are sectors secured to the bails, which are depressed by the key-levers and operate the mechanism by which the type wheel or cylinder B is rotated to bring any desired letter or

character into position to be impressed upon the sheet carried on the paper-carriage C, all in substantially the manner set forth in my former patent hereinbefore named, but in addition to forming the sectors, as heretofore, to simply cause the rotation of the type-wheel they are each constructed with a practically horizontal arm D, terminating in a hook E, adapted to interlock with the front end F of the lower radial extension of the segmental racks G, as most clearly shown at Fig. 2. These sectors A, as will be readily understood by reference to my former patent, are arranged each side of the middle line of the machine, and, as before stated, cause the type-wheel to rotate to the proper point to bring any given letter or character into position, whereupon the further depression of the key-lever will cause the intermediate sector H (see Fig. 3) to mesh with the sector-rack I, (see Fig. 6,) secured to the pawl J, and cause the latter to interlock with the ratchet-wheel K to prevent the further rotation of the type-wheel, (see Fig. 4), and then the further movement of the sectors and connections causes the type-wheel support to carry the type-wheel down against the sheet on the paper-carriage. In the absence of the locking-hooks E, when a key is struck there is a likelihood that the wheel will be thrown ahead a little before it commences to rotate, while with the two hooks or locks E it will be readily understood that by holding one sector rigid as the key is struck on the opposite side of the middle line of the machine the first effect or impulse is to take up the lost motion, which unlocks that sector on the type-wheel, and then commences, through the movement of the small bail L, the rotation of the wheel without any possibility of the other sector going forward until the graduation of the key-lever strikes the large ball M, which is practically at the same time that the pawl J comes into work with the ratchet K, thus locking the wheel against any further rotary movement. The other sector is now released by the continued depression of the key-lever through its action on the bail and the wheel goes downward to print. The action is the same on each side of the middle line of the machine—that is to say, if a key is struck on the right-hand side the sector on that side is first released and the one on the opposite side remains in lock with the segmental rack until it is released, as just stated, and vice versa.

H³ are short arms secured to the extensions F of the racks G, and their ends project under a yoke-frame H⁴, which is caused to vibrate with the type-wheel axis by the depression of the key-levers on each side of the machine, as hereinafter explained, and consequently as the yoke-frame is vibrated by the key-action on one side of the center it will depress the arm H³ on the other side, and thus the rack G on that side is caused to travel in unison with the corresponding rack on the other side, and vice versa.

I will now describe the improvement in the feed mechanism, which will be best understood by reference to Figs. 1 and 2, in which N is a horizontally-reciprocating plate, the rear end of which is widened up and is guided in lugs O O, cast on the frame of the machine, the front end passing through a slot in the front comb-plate O' of the frame and over an antifriction-roller P.

On the under side of the plate N, toward the front end, is formed a short stud Q, provided with a screw R for securing one end of the coil-spring S, the opposite (or rear) end of which is secured around a short stud T on the under side of the frame, the object and effect of the spring being to draw the plate N to its rearward or normal position. The plate N near its front end is provided with a short vertical slot to receive the lower end of a vibrating arm U, (see Fig. 2,) which is pivoted at a to the spacing-lever V. This arm U has a forward extension or branch, (shown by dotted lines at Fig. 2,) which overlaps and rests upon the upper edge of the front comb-plate O', and thus the rearward movement of the lower extremity of the arm U is necessarily limited, and this in turn limits the rear movement of the feeding-plate N in an obvious manner. As the spacing-lever V is depressed the arm U is caused to vibrate on its pivot a, throwing the lower end forward and necessarily carrying with it the feed-plate N, and as the spacing-lever is released the coil-spring S pulls the plate N back to its normal position, as limited by the arm U. The plate N is caused to reciprocate similarly, when the key-levers are depressed, in the following manner: Secured to the upper surface of the plate N is a rigid vertically-inclined arm W, (shown principally in dotted lines at Fig. 2,) and its upper end lies in front of a short radial spoke X, extending vertically from the hub of the type-wheel shaft, and it will be readily understood that as the depression of the various key-levers takes place and the type wheel or cylinder is rotated and thrown down to print the spoke X, the traveling toward the front of the machine and bearing against the upper end of the arm W, will cause said arm and the plate N to travel toward the front of the machine, and that when pressure is released the retracting coil-spring S will return the plate, as before explained.

Having explained how the reciprocation of the feed-plate is accomplished through the medium both of the space-lever and the key-levers, I will now explain how the proper feed of the paper-carriage is effected without the necessity of winding up for constant action any spring mechanism, and said explanation will be best understood by reference to Fig. 1. To the upper surface of the feed-plate N is pivoted an arm 1, provided with a feed-dog b, held in operative position by a coil-spring c and stop-pin d. A flat arm e is pivoted to the frame of the machine and is provided

with a short upwardly-projecting feed-stop or detent *f*. The free end of the flat arm *e* is formed with a short shouldered projection adapted to enter the side notch in the edge of the feed-plate, as clearly shown in Fig. 1, so that as the plate *N* is drawn forward by the action of the spacing or key levers the rear shoulder of the side notch in the edge of the feed-plate *N* will contact with the rear edge of the shoulder projection of flat arm *e* and cause the same to vibrate on its pivot toward the front of the machine, and as the plate *N* is returned, through the action of the coil-spring *S*, the front shoulder of the notch of the said plate *N* will return the flat arm *e* to its original position.

The under side of the base or bar *Y* of the paper-carriage is provided with a feed-rack *g*, as shown, and adapted to receive the feed-dog *b* and feed-stop or detent *f*, as clearly shown at Fig. 2. The operation is as follows: When a key-lever or the spacing-lever is depressed, the feed-plate is drawn forward, as previously explained, and the feed-dog *b* and lock or detent *f* are withdrawn from the feed-rack. On the return movement of the feed-plate under the action of the spiral spring *S* the knife-edge of the feed-dog *b* first enters a space-notch in the rack, and the continued rear movement of plate *N* causes the arm *l* to vibrate on its pivot into substantially parallelism with the rack, and consequently the distance between the dog *b* and the plate *N* is increased or extended to the extent of one space, and at the same time the detent *f* on the flat arm is carried into a notch of the rack and locks the carriage in position until another lever is depressed, when the action is repeated, so that each time a lever is released the carriage moves one notch (or space) and presents the sheet properly for the next impression, the power which operates the feed being stored up successively each time a lever is depressed, and only so much power is employed each time to bring about the necessary feed, and hence the dogs are not subjected to the unnecessary strain imposed by the aggregate or accumulated stored power existing in machines having spring-escape-ment.

The next feature of improvement which I will describe relates to the complete release-ment of the feed without the intervention of any of the operating-levers, although it will be understood that this same result (the releasement of the feed) can be accomplished through the medium of the spacing-lever, but in such case it becomes necessary for the operator to use both hands, one to operate the spacing-lever and the other to move the carriage.

My improvement enables the operator to accomplish the result by the use of one hand only. Referring to Figs. 1 and 2 of the drawing, *A'* is a stationary stiff wire staple or wicket secured to the upper surface of the rear broadened surface of the feed-plate *N*,

the outer (or rear) vertical arm of which lies within the path or sweep of a spring-bail *B'*, pivoted at its ends to the frame *C'* of the paper-carriage, and the upward movement of which is limited by a short arm *D'* on the frame. *E'* is the spring for actuating the swinging bail, one end of the spring being coiled around the horizontal pivotal end of the bail, a straight arm extending from said coils and secured by one or more coils to the vertical arm of the bail, as most clearly shown at Fig. 2^a. When it is desired to move the carriage to any extent in either direction, the wire bail *B'* is swung downwardly against the staple or wicket *A'*, forcing the feed plate and dogs inwardly until the latter are released from the rack, whereupon the carriage is free to be reciprocated, it being observed that as the bail *B'* extends from one end to the other of the carriage it is (when depressed) continuously in contact with the staple or wicket *A'*.

While I prefer the use of the staple or wicket *A'* as the strongest and most desirable, it will be understood that any other suitable device (such as an ordinary post) may be employed.

Another feature of my improvements rests in the construction and arrangement of the inking device, as will be fully understood by reference to Fig. 2. The rear portion of the top casting or frame *F'* is extended rearward to constitute a lug *G'*, which is tapped to receive a binding-screw *H'*, which passes through a longitudinal slot in a narrow slightly-curved plate *I'*, to which is pivoted or hinged one end of the ink-roller frame *J'*, in the lower bifurcated end of which is journaled the ink-roller *K'*. The lower free end of the curved plate *I'* is preferably bifurcated or notched to receive the edge of the roller-frame and prevent any lateral movement of the same. A spiral spring *I'* connects the roller-frame *J'* and the plate *I'* and gives to the former the necessary yielding action.

As the characters on the type-wheel are arranged in different fields, it will be understood that it is desirable to be able to adjust the inking-roller with some degree of nicety to secure the best results, and it is obvious that through the construction described the binding-screw can be released and the frame *J'* raised or lowered to any desired degree.

The fifth or last feature of my improvements relates to novel means for removably securing the type wheel or cylinder in position. By reference to Figs. 4, 7, and 8 it will be seen that the spindle 2, upon which the type-wheel *B* is mounted, is formed near its upper extremity with an annular kerf or groove 3, and the type-cylinder is provided with a short hub 4, one side of which is cut through in line with the groove or kerf 3 and adapted for the passage therethrough of the inside edge of one leg of a thin bifurcated metal locking-plate 5, the opposite leg being

cut concentric with the hub 4, in order that the locking-plate may be secured against accidental releasement. To release the type-wheel for removal, the locking-plate 5 is preferably turned upon the hub 4 until the leg which extends through the slot rides up onto the solid portion of the hub and is withdrawn from the annular groove or kerf in the end of the spindle, whereupon the type-wheel is perfectly free to be removed and replaced. A reverse movement of the plate 5 will enable its spring-leg to pass through the slot in the hub and into the kerf of the spindle. It will be understood that the locking-plate 5 may be released by entirely withdrawing it from the hub 4; but in practice I prefer to effect the result by turning it upon its axis, as described.

Having described the construction, operation, and advantages of my improvements, what I claim as new, and desire to secure by Letters Patent, is—

1. In a type-writing machine, in combination with the type-cylinder B mounted as described, segmental racks G, G, bails L, M, and means substantially as described for operating them, radial extensions F, F on the segmental racks, and sectors A, A arranged each side of the middle line and formed with arms D terminating in hooks E adapted to interlock with the extensions F, substantially as and for the purposes set forth.

2. In a type-writing machine, the improved feed mechanism consisting of the horizontally-reciprocating feed-plate N notched on one edge to house the end of flat arm e, feed-rack g secured to the paper-carriage, spring-arm l pivoted to the plate N and provided with dog b, flat arm e pivoted to the bed-plate

of the machine and provided with detent f, and means substantially as described for causing the reciprocation of the plate N whereby the power for operating the feed is successively stored each time an impression is made by the type-cylinder as hereinbefore set forth.

3. In combination with the horizontally-reciprocating feed-plate N provided with the pivoted spring-arm l, the flat arm e pivoted to the bed-plate, and the paper-carriage provided with the rack g and swinging spring-bail B', the wicket A' secured in position on the rear end of plate N, substantially as and for the purpose set forth.

4. In a type-writing machine, in combination with the type-cylinder B mounted in the top casting or frame F', the inking apparatus consisting of the slotted plate I' secured by binding-screw H' to the lug G', the roller-frame J' pivoted to the plate I' and provided with the inking-roller K' and spring L' connecting the frame J' and plate I' substantially as and for the purposes set forth.

5. In a type-writing machine, the means for removably connecting the type-cylinder to its spindle consisting of the spindle 2, having the annular groove or kerf 3, the hub 4 secured to the type-cylinder and slotted at one side, and the bifurcated spring locking-plate 5, adapted to pass through the slot in hub 4 and into the kerf 3, substantially as hereinbefore described.

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

GEORGE C. BLICKENSDECKER.

Witnesses:

WILLIAM H. WEBB,
CLARENCE L. REID.