

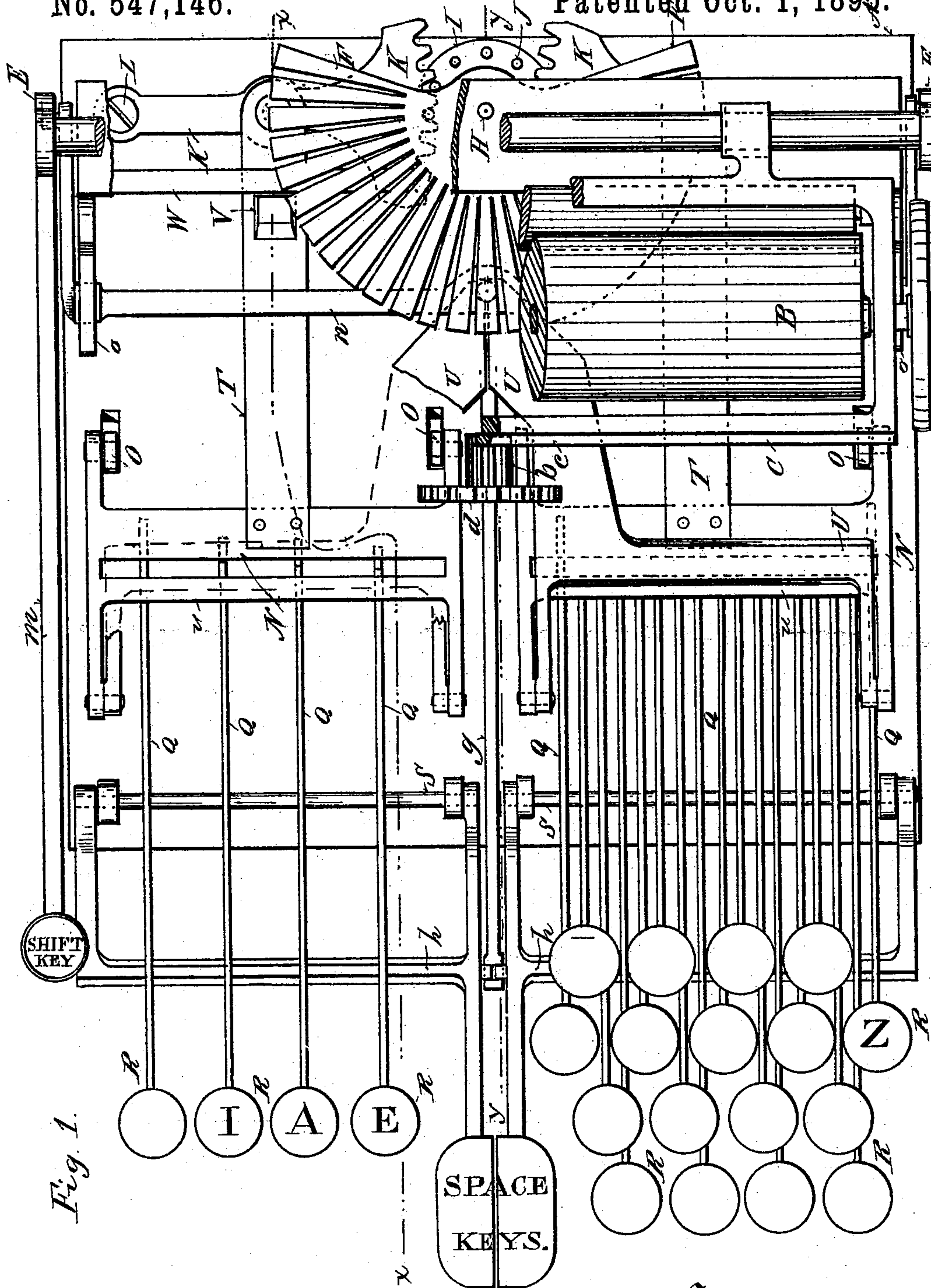
(No Model.)

4 Sheets—Sheet 1.

DE K. J. T. HIETT.
TYPE WRITING MACHINE.

No. 547,146.

Patented Oct. 1, 1895.



Witnesses
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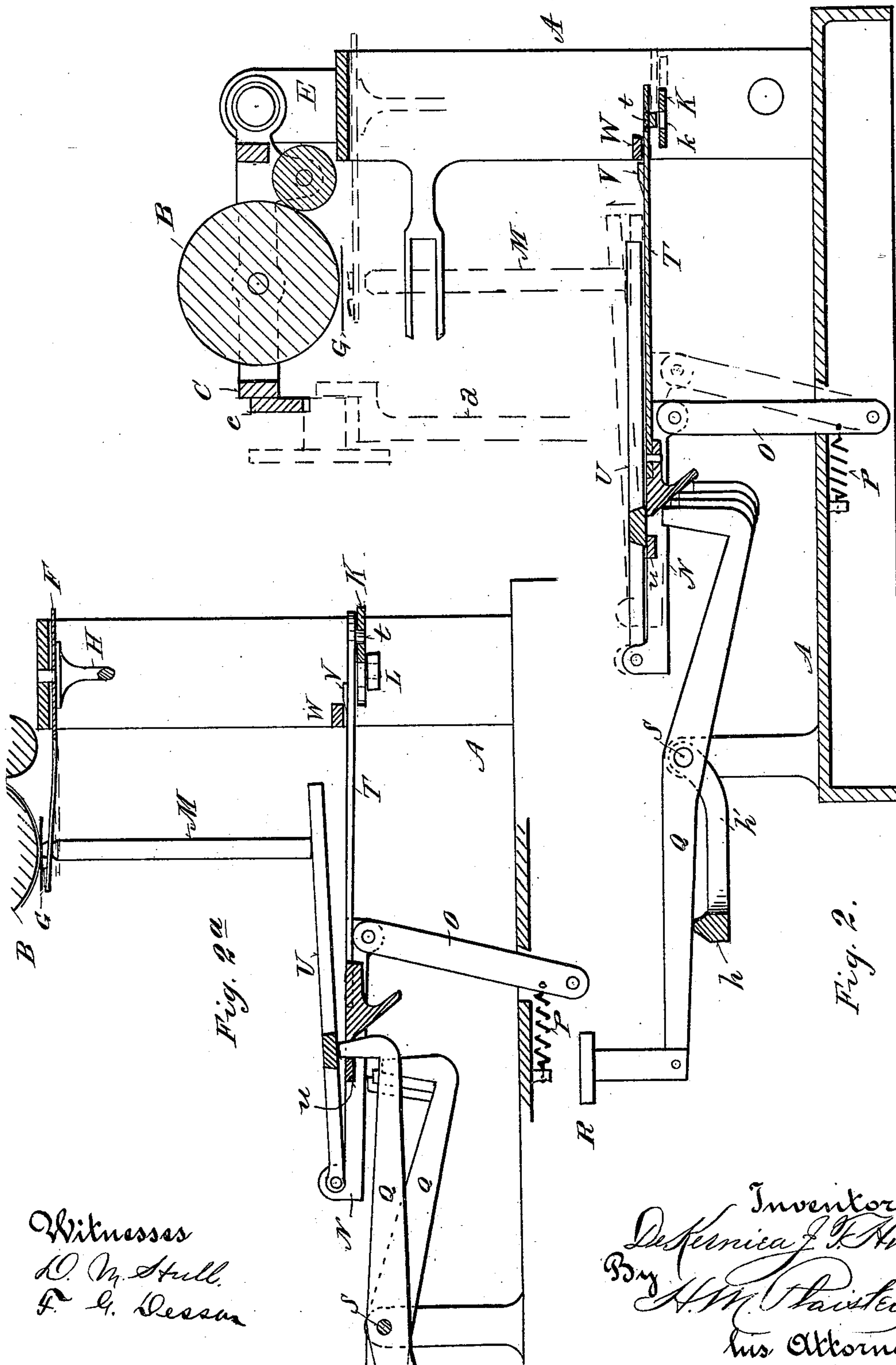
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4 Sheets—Sheet 2.

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4 Sheets—Sheet 4.

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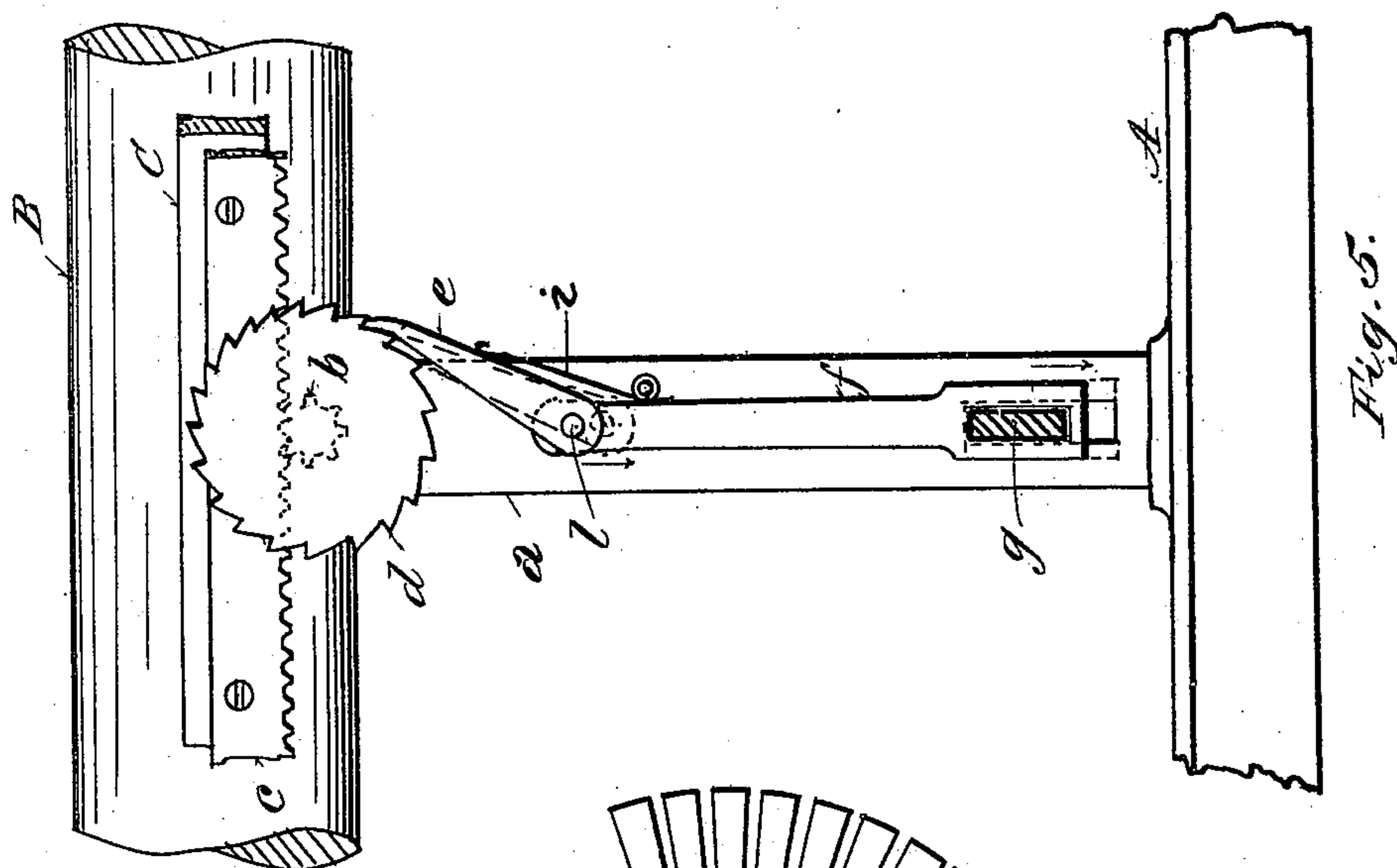


Fig. 5.



Fig. 8.

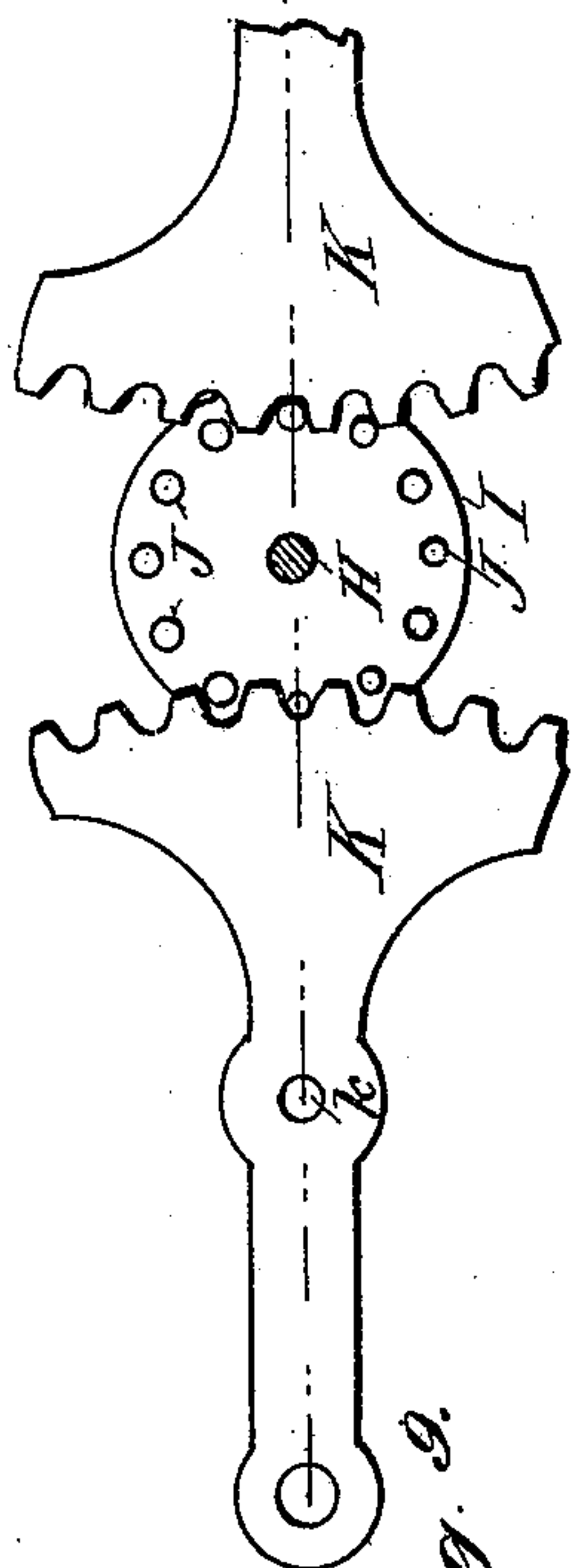


Fig. 9.

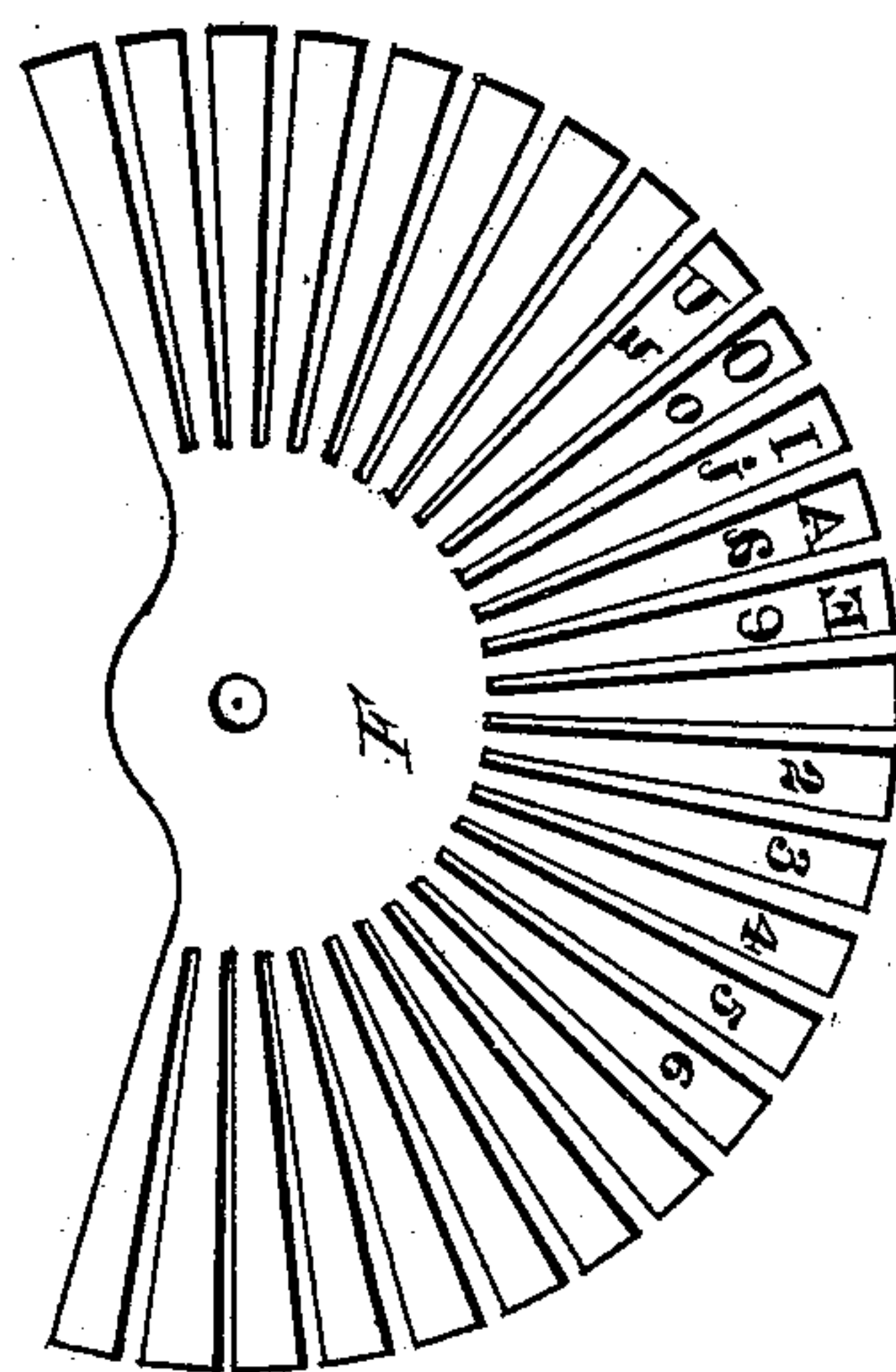


Fig. 6.

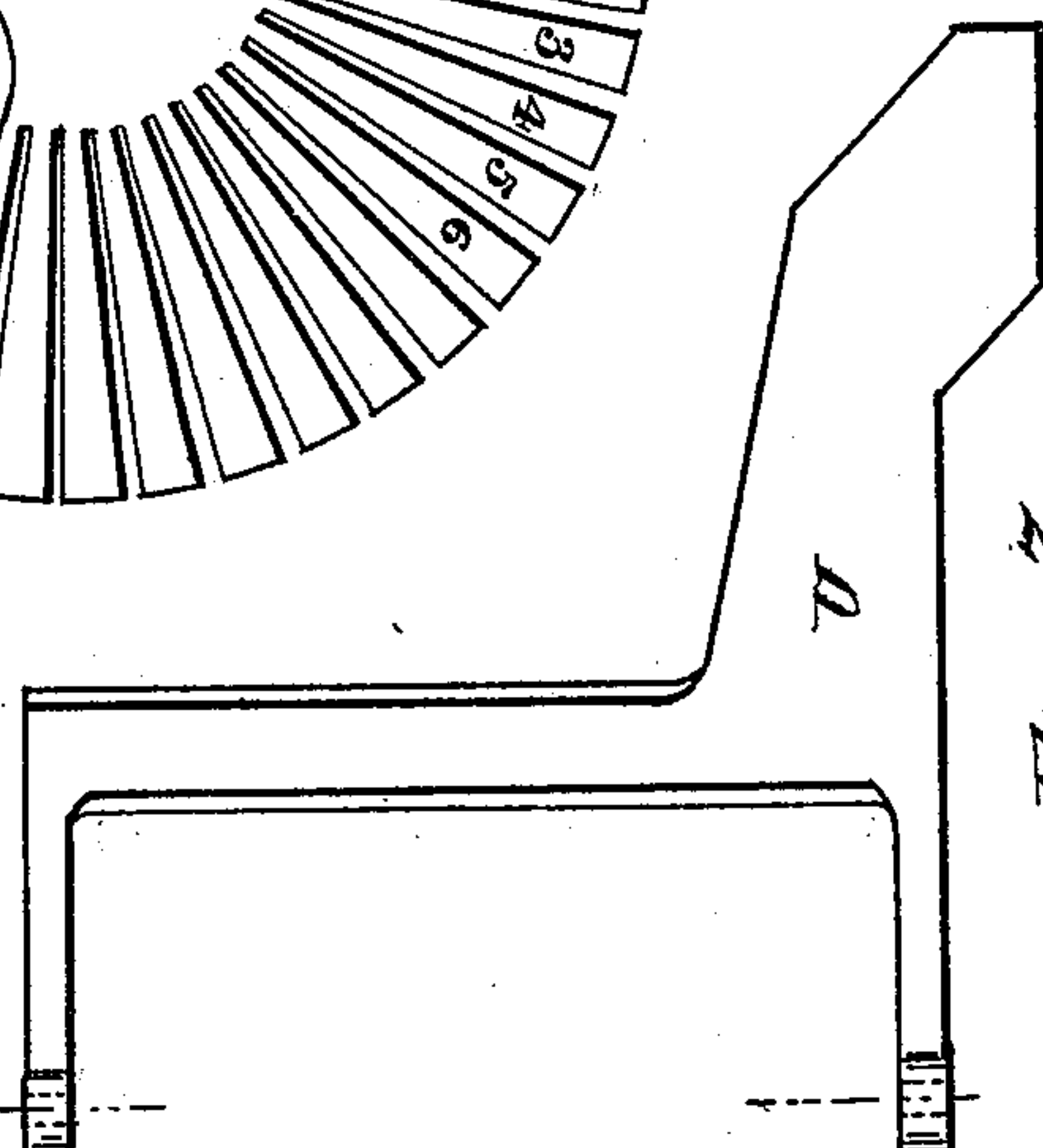


Fig. 7.

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UNITED STATES PATENT OFFICE.

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TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 547,146, dated October 1, 1895.

Application filed October 5, 1894. Serial No. 524,958. (No model.)

To all whom it may concern:

Be it known that I, DE KERNIEA J. T. HIETT, a citizen of the United States, residing at St. Louis, in the State of Missouri, 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.

This invention relates to certain new and useful improvements in type-writers.

The object of my improvements is to simplify and reduce the number of parts of a type-writer and provide a practical machine that can be put on the market at comparatively small cost.

To this end my improvements have reference to a front support for the roller-carriage to maintain operative connection while effecting forward and back adjustment, to a striker common to all the type and actuated by a shifting hammer-plate, to a hammer-plate operated at the terminal movement of each key and a movable or reciprocating piece or plate actuated by the previous movement of each key, to an inclined flange on said plate and a sliding engagement between the keys and said flange, and to other minor operating parts hereinafter described and claimed.

In the accompanying drawings, on which like reference-letters indicate corresponding parts, Figure 1 represents a plan view of a type-writer machine of my preferred construction; Fig. 2, a section near the center along the line *xx* of Fig. 1; Fig. 2^a, a similar view with the hammer-plate raised; Fig. 3, a section through the machine on line *yy*, showing the spacer-key and connections; Fig. 3^a, a front view of the striker and guide; Fig. 4, a detail of the slotted plate; Fig. 4^a, another construction for locking the movable plate; Fig. 5, a face view of the spacing mechanism; Fig. 6, a separate view of the type-plate segment; Fig. 7, a separate view of the hammer-plate; Fig. 8, a separate view of the connecting-rod, and Fig. 9 a detail of the operating-arm and disk.

Referring to the drawings, the letter A designates the frame of the machine, on the top of which is mounted the usual roller B in its carriage C, pivoted to the rear of the frame and normally supported at a front central

point, as hereinafter described. Below the roller is located a flexible plate F in the form of a sector of preferably a semicircle, bearing the type or characters to be impressed upon the paper through the interposed inking-ribbon G by means presently to be described. This plate is shown divided by radial slots to increase its flexibility in the preferred form. A vertical axle H, journaled in the frame, supports the type-plate sector and has a disk I near the lower end provided with pins J, adapted to be engaged by the toothed segment of an operating-lever arm K, pivoted at L. This arm is in duplicate on opposite sides of the machine, as shown in Figs. 1 and 9. When moved rearward, each arm rotates the type-plate characters on the opposite side toward the front under the paper and in position to be struck by a vertically-moving striker M, mounted in guides, as shown in Figs. 3 and 3^a. The means for operating the striker will be described later.

It is known that type-bars having type on their ends and mounted vertically in a circle to be rotated successively to the front is old in type-writer construction. The difficulty heretofore met with is that the momentum of the rotating cage and bars prevents its being stopped instantly at the proper point opposite the striker and kept stationary during the action of the striker. By my type-bearing plate of sheet metal or other light flexible material I reduce the weight and momentum of the revolving part, and I also instantly stop and hold the type-plate stationary during the action of the striker on the leaf or division over it through a locking mechanism now to be described.

A slotted bar N is pivoted on substantially vertical posts O, also pivoted at their lower ends to the frame, so as to carry the slotted bar and its connections rearward when the keys are operated. A spring P normally returns the posts to the front again. From the rear edge of the slot extends a downwardly-inclined flange forming a smooth chafing-surface, up which slide the rear ends of the key-levers Q when the keys R operate them on their pivot-fulcrums S. The end of the lever Q is turned up and exactly fits in the slot in the bar. When a key is operated, the first

effect will be to tilt upward the front end of the slotted bar and bring a connecting-rod T, that extends rearward over the lever-arm K, before mentioned, down into engagement with the latter by means of a stud *t*, that enters a matching-hole *k* in said lever-arm. This tilting of the slotted bar is due to its pivotal mounting on the top of the said posts O and is the first effect of the upward pressure of the key-lever on the chafing-plate. Continued pressure causes the slotted bar thus connected to the segment-arm to slide forward and rotate the type-plate till the rotation is suddenly stopped by the entrance of the key-lever into the slot. The type-plate is now stationary, as the slotted bar is locked to the key-lever. The latter continues its upward motion, however, passing through the slot and strikes a hammer-plate U, which is pivoted to an arm extension of the said bar. This flies up, shoots the striker M upward, and impresses the character on the paper. The dotted lines in Fig. 2 indicate the tilting and horizontal movements of the slotted bar, which latter is in duplicate on each side of the center of the machine. The striker is engaged by either hammer-plate. It cannot be operated by both together, as the driving-disk I can only be rotated by one of the levers at a time. The connecting-rod T of the other lever will be in its normal position, with its pin disengaged from the hole in the arm by the influence of the weight of the front end of the bar N tending to raise it out.

I have described the tilting and horizontal movements of the slotted bar when any key is operated. It remains to be seen how the proper amount of movement is given to the operating-lever to effect the proper degree of rotation of the type-plate in order to bring the corresponding character opposite the striker when a particular key is operated.

Referring to Figs. 2 and 2^a, it will be seen that the distance of travel of the lever-key upon the chafing-plate before it can enter the slot determines the distance the slotted bar moves rearward and the consequent rotation of the driving-disk and type-plate. Thus, if the key "E" be located a slight distance—say one-fiftieth of an inch (horizontally)—from the rear edge of the slot, it would move the slotted bar a like distance to the rear and rotate the type-plate a proportionate distance—say one division or leaf—to bring the character "E" over the striker. Entering the slot, the key-lever then proceeds upward and actuates the hammer-plate and striker without any possible further rotation for that type. In other words, the type-plate is rotated to the proper character by the primary movement of the corresponding key, then is locked against further rotation, while the terminal movement of the key operates the striking mechanism and effects the impression on the paper.

The letter "A," say, should have the end on its key-lever, say, two-fiftieths of an inch farther down the inclined chafing-plate. This

key will therefore move the chafing-plate a farther distance—two-fiftieths of an inch—to the rear than the key "E," and hence would rotate the type-plate a greater degree and bring another character, "A," over the striker before the end of the lever enters the slot and operates the striker. Other characters are brought to the front by locating the ends of the corresponding key-levers farther down and at varied points on the chafing-plate, thereby rotating the type-plate a corresponding and different degree for each key. On this ratio the chafing-plate slotted bar would have to travel barely more than one-half an inch (twenty-six fiftieths) to rotate the extreme rearward letter on the type-plate, "Z," over the striker, even though the twenty-six letters were connected to but one slotted bar; but half of this rearward movement is required when they are divided between two sides of the machine and corresponding operating mechanism, as illustrated in Fig. 1.

Referring to Fig. 2, it will be seen that the connecting-rod T has a projection V on its upper side that normally engages with a cross-bar W to the rear of it. This acts as a safety-catch and prevents the horizontal movement of the slotted bar and connecting-rod until a tilting movement depresses the projection to pass under the bar W. By this time the stud *t* has engaged with the hole *k* in the lever-arm and will insure rotation of the type-plate. On the return of the operating mechanism the projection will slide under the bar W and rise on the front side of it when the weight of the slotted bar and its hammer lifts the connecting-bar out of engagement with the lever-arm.

In most type-writers a strong and long spring is required to carry the roller-carriage the full length of its travel. I propose to do away with this costly spring and use only a spring sufficient to move the carriage one space or so at a time.

Referring to Figs. 3 and 5, the letter *a* designates a standard in the middle of the machine under the front edge of the carriage. A pinion *b* is rotatably mounted on a stud carried by said standard and meshing with a rack-plate *c* on the front of the carriage. A ratchet-wheel *d* is secured to the same axis as the pinion and gives a leverage in turning the latter. A pawl *e* engages with the ratchet, as shown in Fig. 5, and is pivoted to a stirrup-piece *f*, embracing a space-lever *g*, pivoted at the rear and extending out to the front, where it is engaged by transverse bars *h*, extending along under the keys of each set, so as to be acted on by them also. One of these transverse bars is used for each bank of keys, and a "space-key" is provided for each side of the machine, as shown in Fig. 1. The transverse bar has arms *h'*, by which it is pivotally mounted, as shown. When depressed by a key, the space-lever *g* pulls downward the stirrup and pawl to the next tooth of the ratchet. A spring *i* effects its engagement, and when the actuating-key is released

the pawl pushes the ratchet forward one tooth, making one space on the carriage under the action of a spring *j*, Fig. 3, upon the pivot-stud *l*, connecting the stirrup and pawl.

5 Referring to Figs. 1 and 3, I will now describe the operation of the shift-key, by which I am enabled to use more than one row of characters on the type-plate. These characters are all the same distance from the center
10 in each row, and since I have mounted the axle *H* in fixed bearings I have constructed the roller-carriage and the striker to travel back and forth (to the front and rear) on each side of the type-plate sector. I have therefore
15 pivoted the slide-rod at the rear of the carriage to a vertical post *E*, Fig. 3, at each side of the machine. The post is also pivoted at the bottom to the frame. The carriage is supported at these two rear points and on the
20 pinion *b* in front, thus forming a tripod-support. The feature in this construction is that the front of the carriage is always supported at a point opposite the striker instead of traveling along the track as the carriage progresses, as in old forms. The pinion is elongated, as shown, to allow this shifting motion
25 to the front when a character in the outer row is to be used. The shift-lever *m* is at the left of the machine and secured to or integral with one of the pivoted posts *l*, Fig. 1. The striker
30 is shifted at the same time and the same distance as the roller-carriage by means of a frame *n*, carrying the guides or the striker *M*, and having an arm extension from each end
35 of the side posts *E*, to which they are pivoted at or near the same axis as the carriage to secure like travel. The frame for the striker is slidingly supported in horizontal guides *o*. The hammer-plate *U* is extended, as shown in
40 Fig. 1, to allow it to engage with the striker at any shifted position of the latter. The striker is engaged by each of the hammer-plates, as the plan view shows the striking portions of the plate nearly meeting, and each
45 under its respective half of the striker. The latter is arranged to return by gravity after its upstroke. The type-bearing plate is returned to its zero position after each stroke of the keys by any suitable means in addition
50 to the influence of the slotted bar and connection, should it be so desired. Simplicity of construction and parts is aimed at in the form illustrated; but I do not confine myself to the exact details herein shown.

55 Fig. 4^a shows another construction for locking the movable plate or bar, one form of which is shown in Fig. 4. In Fig. 4^a the locking feature is secured by means of a projection *u'* opposite the inclined friction-surface.
60 This projection is pivotally mounted on the movable plate and is engaged with the other side of the key-lever after the latter has made its sliding movement up the inclined surface. It thus locks the plate *N* from further rearward
65 movement in the same way as the bar *u*, Fig. 4, forming the opposite side of the slot in that

figure, locks the movable plate there shown. In Fig. 4 this projection *u* is integral or fast to the movable plate and forms a portion of a slot, while in Fig. 4^a the projecting locking
70 portion *u'* is pivotally mounted on the bar, but is still opposite the inclined surface and acts together therewith in locking the plate at the end of the forward movement of the
75 key-lever up the inclined friction-surface. In other words, the locking projection may be part of the movable plate or may be part of a plate pivoted above it, such as the hammer-plate *U*.

In both constructions the locking feature
80 for the movable plate is secured, to which I lay broad claim.

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

1. A typewriter comprising a set of keys, a reciprocating bar or plate having an inclined chafing surface along its length, common to said set of keys impinging thereon at different
90 distances from one lateral edge, whereby it is moved laterally accordingly, and a secondary piece exposed to the action of said keys by the movement of said bar or plate.

2. A type-writer comprising a movable piece mounted to travel back and forth simultaneously
95 as to all portions thereof, having an inclined chafing surface transverse to its direction of movement, mechanism operatively connected with said movable piece, a hammer-plate adjacent to the said chafing surface adapted to effect the printing operation,
100 and a plurality of operative pieces impinging on said chafing surface at different distances from the edge opposite said hammer-plate, whereby a corresponding rearward travel of
105 the movable piece will be effected before the hammer-plate is actuated by said operative pieces.

3. A type-writer comprising a movable piece mounted to travel forward and back, having
110 an inclined chafing surface, a hammer-plate pivotally carried by said movable piece adjacent to said chafing surface, a limiting projection or stop being provided on one side of said piece opposite the chafing plate, adjunctive
115 devices connected to the movable piece and the hammer-plate respectively, and a plurality of operative pieces each adapted to impinge and slide on said chafing surface transversely to the movement of the hammer-plate
120 and its support till they strike said hammer-plate adjacent thereto, while the rearward motion of the movable piece and hammer-plate is limited by the engagement of said stop projection with the operative piece in
125 action.

4. A type-writer comprising a hammer-plate and its support, the latter being a horizontally reciprocating piece, and the former pivotally
130 mounted thereon on a horizontal axis, a striking mechanism to effect the printing, located adjacent to said hammer-plate to be operated

thereby at any point of its travel, and means to effect the hammer-action of said plate after the rearward movement of its support.

5 A type-writer comprising a series of oscillating type characters, a vertical striker common to all of said characters, a horizontal hammer-plate below said striker, a horizontally reciprocating support pivotally supporting said hammer-plate and controlling the
10 type mechanism, operative pieces variably connected to said reciprocating piece, each adapted to effect a distinctive rearward movement of the support and hammer-plate, and an upward movement of the latter at the limit
15 of said rearward movement.

6. A type-writer comprising a transversely slotted plate or bar having an inclined chafing plate along one side of the said slot extending downward and outward from one side of the
20 slot, a hammer-plate pivotally mounted above the said slot, an operating piece for said slotted bar and hammer-plate, and adjunctive devices operating with said plate and pieces.

7. A type-writer comprising a movable plate
25 mounted to move horizontally, provided with an inclined chafing surface and a retaining projection to serve as a lock for said plate, a hammer-plate pivoted to the movable plate, and a friction piece to bear on said chafing
30 surface and push the movable plate rearward till locked by said projection.

8. A type-writer comprising a slotted bar having an inclined chafing plate along one side of the slot, and provided with an extension fixed to the bar, a hammer-plate pivotally mounted above the slot in said bar, an
35 operating piece for said slotted bar and hammer plate, and oscillating posts to which said bar is pivoted, an operating lever under the
40 rearward end of said extension and having

an intermittent engagement therewith, substantially as described.

9. A type-writer comprising a slotted bar with an inclined plate at one edge of the slot, a lever-arm, a connecting rod from said slotted
45 bar to said arm, having a stud and hole connection with the latter, said slotted bar and rod being pivotally supported so as to tilt and effect such engagement of the rod and arm, and operating pieces adapted to slide on said
50 chafing plate toward said slot and effect the tilting and the forward movement thereof.

10. A type-writer comprising a roller carriage slidingly and pivotally mounted at its rear side and having a rack on its front side,
55 a pinion meshing with said rack and mounted in a fixed location at the middle of the machine, means to rotate said pinion intermittently to space the carriage, and a shifting lever to move said carriage axially on said
60 pinion.

11. A type-writer comprising a roller carriage slidingly and pivotally mounted at its rear side, vertical oscillating posts supporting
65 said rear side and pivoted below, and provided with an operating arm extension for the shifting key, a vertically acting striker, a sliding frame for said striker connected to the shifting mechanism, and a type-bearing
70 plate rotatably mounted in fixed bearings and interposed between said striker and the carriage roller, to bring different sets of characters into striking position.

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

DE KERNIEA J. T. HIETT.

Witnesses:

M. JACOBY,

H. M. PLAISTED.