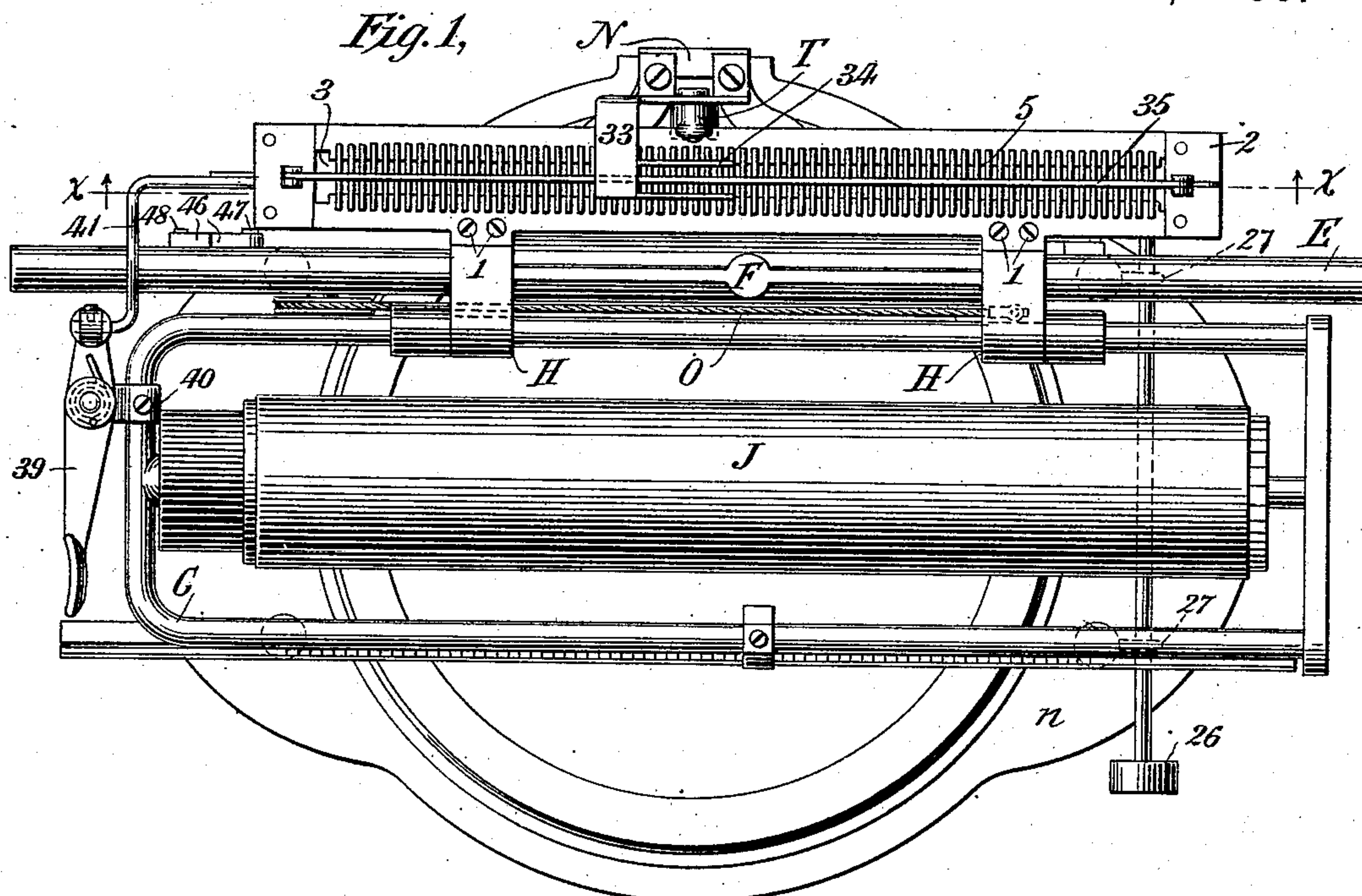


2 Sheets—Sheet 1

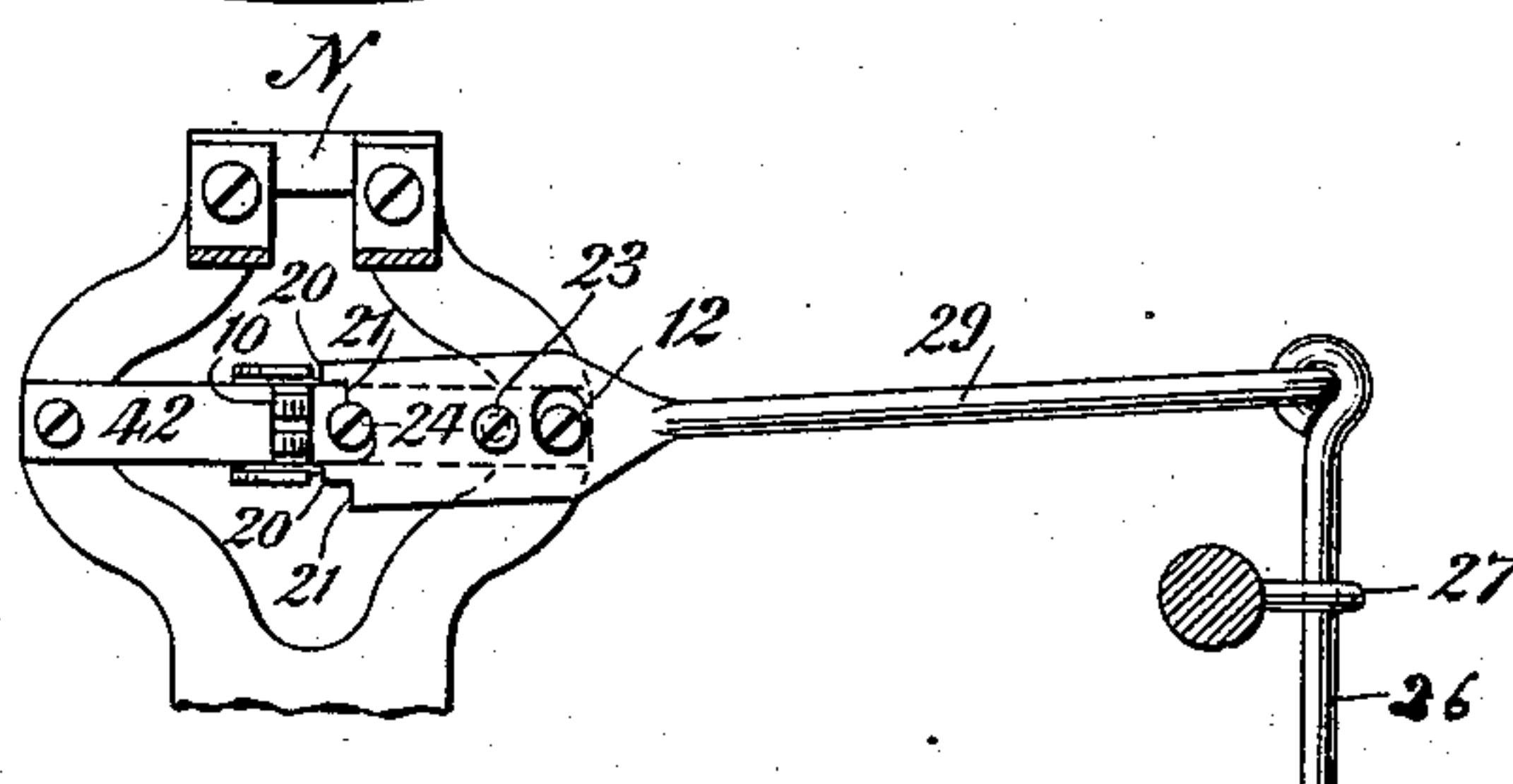
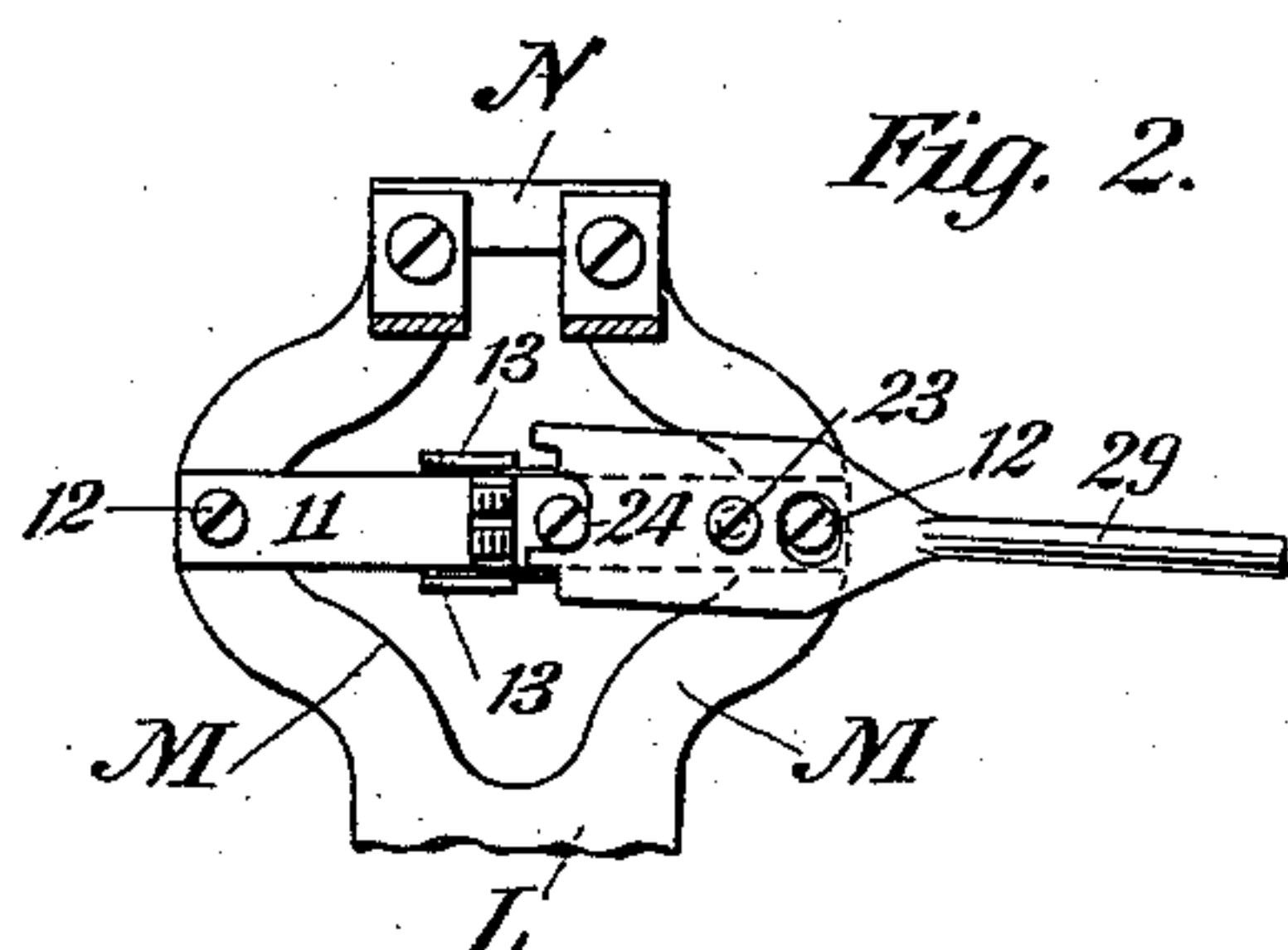
No. 572,737.

Patented Dec. 8, 1896.

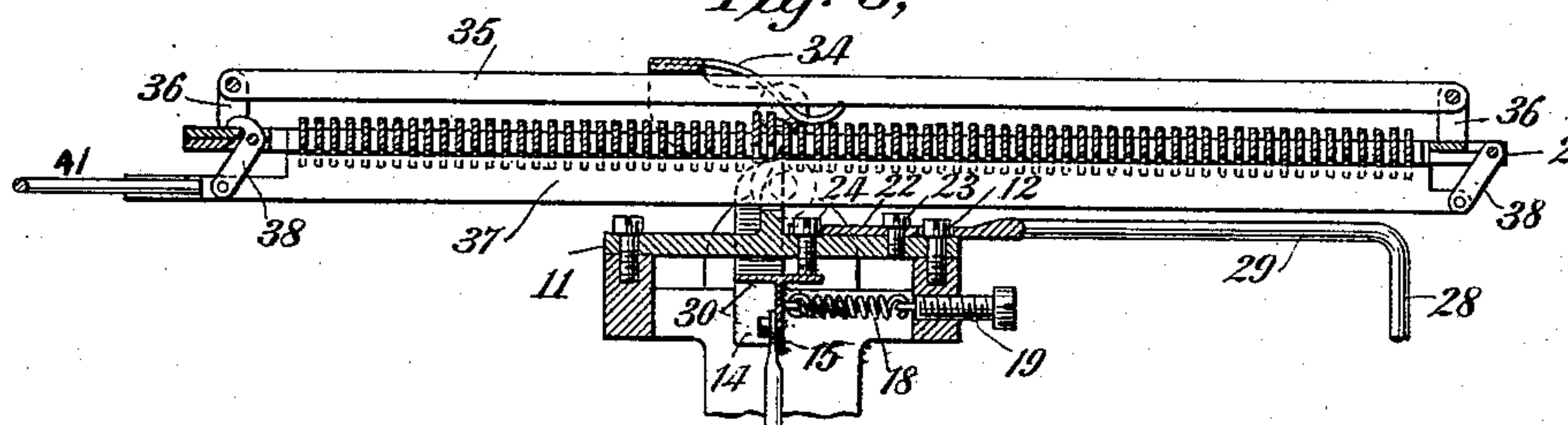
*Fig. 1,*



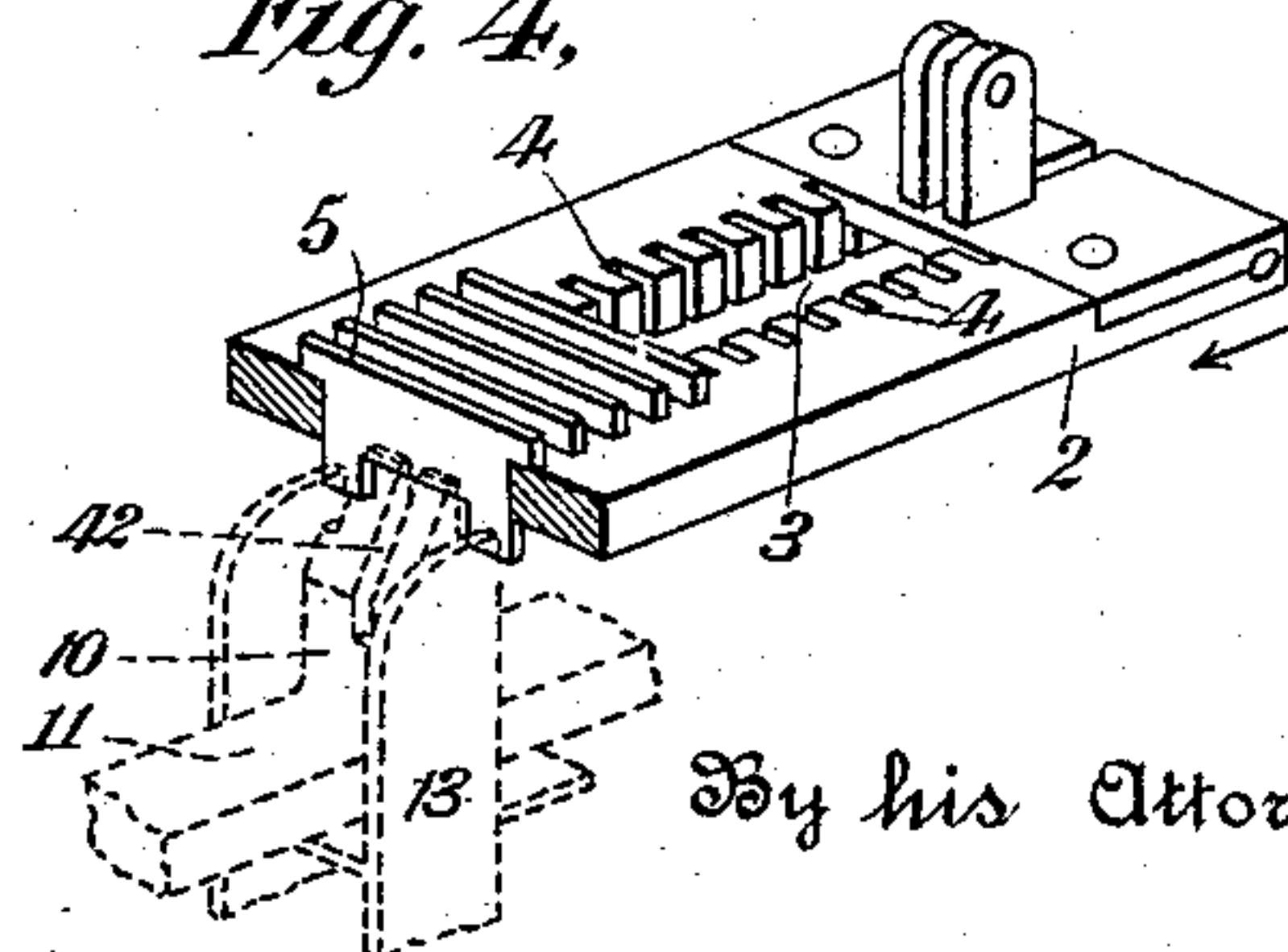
*Fig. 2.*



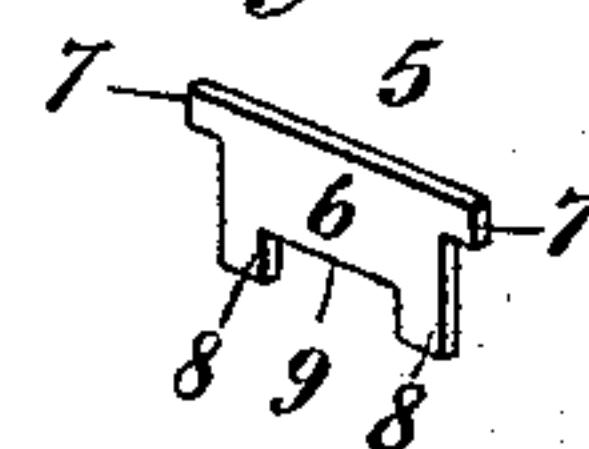
*Fig. 3,*



*Fig. 4,*



*Fig. 5.*



Witnesses  
C. E. Ashley  
J. W. Lloyd.

By his Attorney

Inventor  
Chas. W. Walker  
Jacob Felbel



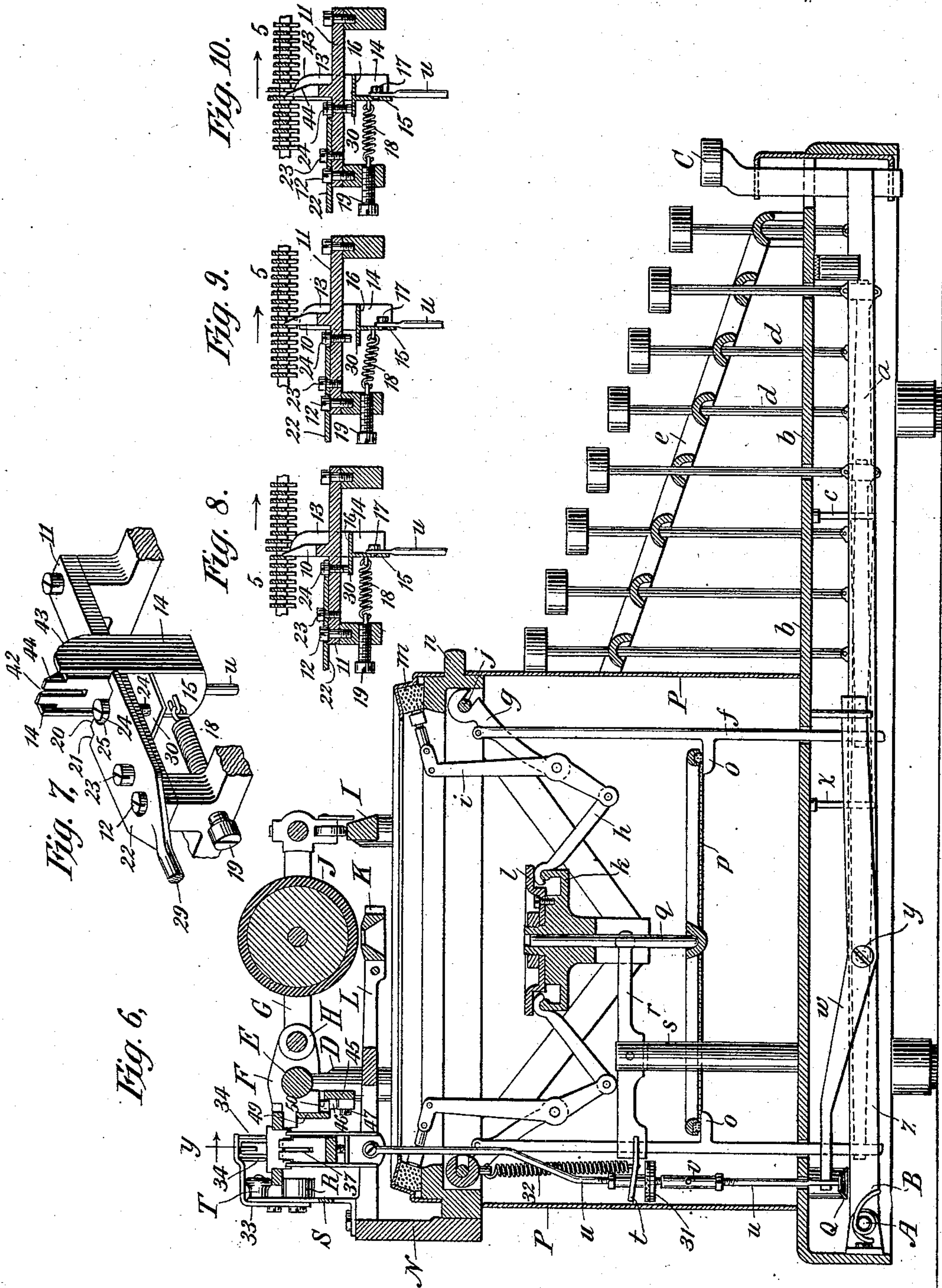
(No Model.)

2 Sheets—Sheet 2.

C. W. WALKER.  
TYPE WRITING MACHINE.

No. 572,737.

Patented Dec. 8, 1896.



Witnesses  
C. E. Ashley  
H. W. Lloyd

Inventor  
Chas. W. Walker  
By his Attorney  
Jacob Felbel



# UNITED STATES PATENT OFFICE.

CHARLES W. WALKER, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE  
YOST WRITING MACHINE COMPANY, OF NEW YORK, N. Y.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 572,737, dated December 8, 1896.

Application filed September 14, 1894. Serial No. 522,976. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES W. WALKER, a citizen of the United States, and a resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My improvement in type-writing machines relates particularly to the letter-spacing or paper-carriage feeding or escapement mechanism, and has for its main objects to provide a construction of rack and dogs whereby better results may be obtained than heretofore, while at the same time endowing the machine with new or more extended capacities, as will hereinafter more fully appear.

To these ends my invention consists in the various features of construction and combinations of devices referred to in the following description and more particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a top plan view of a portion of a "Yost" type-writing machine embodying my improvements. Fig. 2 is a detail view, in top plan, of the dogs and the double-spacing switch, shown in two positions, on the left with the parts adjusted for single spacing and on the right with the parts set for double spacing. Fig. 3 is a vertical section through the feeding mechanism, taken at the line *x x* of Fig. 1. Fig. 4 is a partial perspective view, enlarged, of the feed-rack and the dogs, the latter being shown in dotted lines. Fig. 5 is a perspective view of one of the teeth of the feed-rack detached. Fig. 6 is a central vertical section of the machine shown at Fig. 1 with the keyboard added. Fig. 7 is an enlarged partial perspective view of the feeding and holding dogs and the double-spacing switch with their supporting devices. Figs. 8, 9, and 10 are detail views, in vertical section on the lines *y y* of Fig. 6, to illustrate the mode of operation of the letter-spacing mechanism.

In the various views the same part will be found designated by the same numeral or letter of reference, the former being generally used in connection with the new parts and the latter with the old parts.

*a* designates the key-levers, arranged beneath the base-plate *b* and supported by fulcrum-pins *c*, depending from said plate. At the front end of each key-lever is a finger-key *d*, the stem of which passes through a hole in a bridge-plate *e* and through a perforation in the base-plate, while at the rear end of the lever is connected the lower end of a thrust-rod *f*, which passes up through a hole in the base-plate and at its upper end is connected to the type-movement, consisting of the links *g* and *h* and the type-bar *i*, the link *g* being hooked upon a circular fulcrum-wire *j* at one end and at its other end pivoted to the type-bar, and the link *h* being fulcrumed at one end upon an annulus *k*, having a cover *l*, and at the other end being pivoted to the lower end of the type-bar, the type of which rests normally against a circular ink-pad *m*, which is supported upon a top plate *n*.

The vertical thrust or connecting rods *f* are arranged in a circle and have inwardly-projecting radially-arranged fingers *o*, upon which rests a circular universal bar *p*, from the center of which extends upwardly a guided pin or spindle *q*, to which is loosely connected the inner end of a lever *r*, fulcrumed on a post *s* and loosely connected at its outer end by a fork *t* to a vertical connecting rod or link *u*, made preferably of two parts screw-threaded at their adjacent inner ends and united by a turnbuckle *v*. The upper end of the connecting-rod *u* is attached to the feeding-dog, to be presently described, and the lower end is connected to an actuating-lever *w*, fulcrumed in a depending pin *x* and pivotally connected at *y* to a centrally-arranged spacing-lever *z*, fulcrumed at *A* and having a returning-spring *B* and a finger-key *C*.

Rising from the top plate *n* at the rear and at each side is a post *D*, and upon these posts is secured the guide-rod *E* of the carriage *F*, which slides thereon and to forward ears of which the platen-carrier *G* is hinged, as at *H*, the back rod of the carrier passing through perforations in said ears. The front rod of the platen-carrier is provided with a small roller which travels upon a track *I*, mounted upon short posts extending up from the top



plate and provided at its front with a scale to coöperate with a pointer on the carriage in the usual way.

Directly beneath the platen J is a type-guide K, supported at the inner end of an arm L, which at its rear outer end is forked or branched, as at M, and formed with an integral vertical portion N, which is screwed to the back edge of the top plate.

In order to avoid confusion, I have omitted from the drawings the paper-table, the line-spacing mechanism, the pressure-roller, the paper-guides, the bell mechanism, and various other parts employed in or about the platen-carrier of the kind of machine illustrated. I have shown at O, however, the carriage-pulling cord, which, as customary, is attached at one end to the carriage and at the other end to a spring-drum arranged at the left-hand side of the machine within the casing P, but not shown.

To the rear side of the carriage F is screwed, as at 1, a long bar or frame 2, which is slotted lengthwise for nearly its whole extent, as seen at 3. On opposite sides of the longitudinal slot 3 the bar or frame is formed with a number of equidistant transverse slots 4, cut vertically and arranged so that the series of slots on one side register exactly with the series of slots on the opposite side. In each pair of opposing slots is loosely fitted or arranged a feed-tooth 5, consisting of a body portion 6, shoulders 7 7, which rest upon the solid or unslotted portions of the bar or frame and prevent the tooth from falling through, depending lugs or projections 8 8 at the ends, and an intermediate notch or cut-away 9.

10 is a rigid or holding dog integral with or securely fastened to a horizontal bar or plate 11, which is attached by screws 12 to the upper side of the branching members of the guide arm or holder L. The upper end of the dog 10 is beveled or thinned to enter between any two adjacent feed-teeth and normally intercept one of the same (that on the right, considered from the front of the machine) by engaging the body portion 6 thereof, as will presently more fully appear.

Embracing the rigid dog and its supporting-bar and adapted to slide vertically and also to vibrate or move laterally is the feeding-dog 13, which comprises two vertical parallel plates or members 14 and vertical and horizontal transverse tie plates or members 15 and 16, respectively.

The feeding-dog is attached by means of the vertical plate 15 to the upper end of the two-part adjustable connecting rod or link *u* by a screw 17, and to said dog at said plate 15 is connected one end of a coiled spring 18, the other end of which is attached to a tension adjusting-screw 19, occupying a threaded hole in one of the branches of the guide-holder. The function of this spring is to move the feeding-dog toward the left (viewed from the back of the machine) when said dog is pulled down out of engagement with the rack-teeth.

This lateral movement of the feeding-dog is limited by stops 20 or 21, the former restraining the movement to one letter-space distance and the latter to the distance of two letter-spaces, according to which of the stops may be in use. The said stops are formed on the inner end of a lever or plate 22, pivoted at 23 on the rigid dog-holder or bar 11, the stop or stops 20 being at the extreme end of the lever, and the stop or stops 21 being arranged back thereof the distance from center to center of two adjacent feed-teeth.

Either of the stops 20 21 may be adjusted to coöperate with the dog, as it may be desired to obtain either single or double spacing, by simply vibrating the lever or plate 22, which has a limited movement by reason of the presence of the head of a screw 24, occupying a notch or cut-away 25 at the end of said lever. The said lever or switch may, if desired, be manipulated by hand at the back of the machine, or it may be operated by the key 26, extending in front of the platen-carrier, the said key being in the form of a push-rod sliding in guides or bearings 27, and connected at its rear end to the downwardly-bent portion 28 of an arm 29, attached to or formed of a piece with the said lever. When the key is pushed rearwardly, the single-spacing stops 20 are adjusted for use, and when the key is pulled forwardly the double-spacing stops 21 are brought into operative position, as illustrated more particularly at Fig. 2.

The downward movement of the feeding-dog is limited by the extent of depression of the connecting-rod *u*, which at its lower end bears upon a flat returning-spring Q, while the upward movement of said dog is limited by the point of the screw 24, against which an extension 30 of the plate 16 strikes.

On the connecting-rod *u* is a circular abutment 31, having preferably a leather facing for the fork *t* to strike upon when the finger-keys *d* are actuated. The said abutment has a tubular interiorly-threaded shank, whereby it may be adjusted vertically upon the threaded connecting-rod, so that the downward movement of the feeding-dog may begin at any desired time relatively to the types. In the adjustment shown the lost motion of the fork is such that the types will very nearly reach the guide before the connecting-rod and the feeding-dog are pulled down by said fork. To the fork is connected an independent returning-spring 32.

The rear end of the rack-bar 2 is supported upon a fixed stud R, projecting inwardly from a bracket S, which bears also a small roller T, overlying said rack-bar.

Screwed upon the bracket S is an arm or bracket 33, which is bent to project forward and support two light spring-fingers 34, adapted to press down upon the successive individual teeth of the rack as they approach the dogs, and thus insure their proper presentation thereto. If for any reason an oncoming tooth should be stuck in its slot or guide in a



raised position, the said spring-fingers will operate to force down such tooth into proper position for action thereupon of the dogs, the operative ends of said fingers working on the right-hand side of said dogs (viewed from the front) and being upwardly curved or bent at an angle to have a sort of wedging effect upon the top of the tooth.

In order to prevent accidental detachment of the teeth, a rod 35 is arranged above the teeth, but at such an elevation as not to interfere with the proper working of the teeth. The distance between the under side of said rod and the top surface of the rack-teeth is in practice slightly less than the depth of the teeth measured from the top edge to the bottom of the projection 8, and hence it is impossible to lift out any tooth while the rod is in place. The rod is supported in ears 36 at each end of the rack-bar by means of screws, so that said bar may be readily removed when it may be desired to obtain access to any one or more of the teeth for cleaning, repairing, adjusting, or removing.

For the purpose of disconnecting the teeth from the dogs to permit the carriage to run independently of the latter a release-key mechanism is employed, comprising a bar 37, hung by obliquely-arranged pivoted links 38 from the rack-bar, a spring-actuated finger-lever 39, pivoted on a bracket 40 on the platen-carrier, and an intermediate connecting-rod 41, attached rigidly at one end to the bar and pivotally attached at the other end to the finger-lever, in line with the platen-carrier hinge, so that the latter may be freely turned up and down for inspection of the work without interference by the release-key mechanism.

The release-bar 37 stands in the cut-aways 9 and close at its upper edge to the bottom edges of the body portions 6 of the teeth, the rigid dog being slotted or bifurcated at 42 to accommodate said bar, and when the outer end of the finger-lever is pressed in the said bar is raised and in turn lifts the entire set of independent rack-teeth high enough to escape the dogs, whereby the carriage may be moved rapidly in either direction, onward by the spring-drum and backward by hand. When the finger-lever is released, the spring at the pivot thereof will restore the releasing mechanism to its initial position and the rack-teeth will drop by gravity to their normal or working position.

I shall now describe more particularly the mode of operation of the letter-spacing mechanism.

If the connecting-rod *u* be pulled down either by means of the spacing-key or by one of the character-keys, the feeding-dog 13 will be drawn down out of engagement with the rack, as illustrated at Fig. 9; but at this time there is no motion of the carriage, owing to the pressure of the body portion 6 of one of the teeth against the face of the rigid or holding dog 10. As soon as the feeding-dog is thus depressed its spring 18 draws it toward the

left (viewed from the back of the machine) and against its stop 20 or 21, according to the position of the switch. Upon the upward movement of the connecting-rod *u*, due to the release of the spacing-key or character-key, the upper end of the feeding-dog will strike the bottom edges of the projections 8 8 of the next tooth and lift said tooth to a height such that the body portion 6 will be carried above the plane of the uppermost edge of the rigid dog, or, in other words, until the notch or cut-away 9 is brought into alinement with the top or point of said dog, whereupon, under the action of the carriage-driving spring, the rack-bar and the connected parts will all move toward the right or in the direction indicated by the arrow at Fig. 10, this view being presented to illustrate the feeding movement, the feeding-dog being shown as having lifted the tooth to the proper extent to permit it to escape by the top of the holding-dog. When the feed has occurred, the dogs and the rack assume the relationship shown at Figs. 3, 4, and 8. During the carriage feed the faces of the projections 8 8 of the next tooth, which is down, strike first against the feeding-dog, thus causing it to move either one space or two spaces, according whether single or double spacing is being done, in the direction of movement of the rack, and simultaneously stretching its spring 18, and then said tooth at its body portion 6 strikes against the face of the upper part of the fixed dog, as shown at Fig. 8, thus effecting a stoppage of the rack, the paper-carriage, &c. In the normal positions of the dogs and rack the body portion 6 of one of the teeth presses against the face of the rigid dog and the projections 8 8 press against the face of the yielding dog; but the rigid dog serves to hold the rack and the carriage.

When the switch is set so that the stop 21 is to act, the feeding-dog, when pulled down out of the rack, is drawn laterally by its spring the distance of two teeth on the rack, and hence when said dog is permitted to rise it lifts two adjacent oncoming teeth, whereby the feed-rack and the carriage are permitted to move two letter-spaces at one operation, the rigid dog engaging only every second or alternate tooth.

The feeding-dog, it will be observed, is of a width sufficient to lift two teeth at a time, and the top of said dog is beveled or rounded as at 43 and the rigid dog as at 44, in order that the teeth may be successively lifted or wedged up thereby when the carriage is returned or run back toward the right for the commencement of a new line.

The following advantages result from my improved construction of rack and dogs: The teeth of the rack, being loose, independent, and detachable, permit of the removal of any injured, worn, or broken tooth and its replacement by a new tooth in a moment's time and practically at no expense, which is a great desideratum when it is borne in mind that in



the previous construction of racks, wherein the teeth are all formed integral with a bar, an entirely new rack had to be substituted if one of the teeth should become worn or destroyed. Owing to the fact that in the return movement of the rack the dogs are obliged to lift only one tooth at a time, this movement is in practice almost entirely free from sound. The rack works absolutely with no "drop;" i. e., the carriage does not move a particle on the downward stroke of a key, thus conducing to better spacing between letters. The construction also permits of double spacing between the letters of a word and between words at any time and without the necessity of depressing the space-key simultaneously with the last letter of a word, as heretofore. The construction also provides an instantaneous "take up;" that is to say, the carriage may be arrested by the dogs and rack at exactly the locality at which the carriage may be when the hand pressure or pull is removed, instead of moving on one or two spaces, as in most of the prior machines. This instantaneous stoppage also occurs immediately the pressure is removed from the release-key when this device is used to run the carriage rapidly in either direction. From the fact that the teeth are movable, any combination of spacing that may be desired can be arranged for, as, for instance, all the teeth from the fifth tooth to the tenth may be removed, and all the teeth from the fifteenth tooth to the twentieth may be removed, and all the teeth from the thirtieth tooth to the fortieth may be removed, so that in doing tabular or other work the writing may be proceeded with up to the fifth tooth, when the carriage will at once move from the fifth tooth to the tenth. Then the writing may be proceeded with up to the twentieth tooth, when the carriage will jump from the twentieth tooth to the thirtieth, and so on, in accordance with the arrangement of the teeth.

In order to prevent the carriage from escaping from the guide-rod E either when going forward or backward, I have fastened to the back of the posts D a bar 45, which at each end bears a catch 46, having a pivot 47, the free end of the catch resting upon a pin 48. Fastened to the rear side of the carriage F is a vertical bar 49, having a lug 50, which is arranged in the plane of the catches and adapted on one side to engage with the catch at one end and on the other side to engage with the catch at the other end, thus limiting the total length of travel of the carriage on the guide-rod. When, however, it may be desired to remove the carriage, the pivoted catches may be swung around and permitted to drop by gravity, whereupon the carriage may be easily slid off.

Although I have shown my invention embodied in a Yost type-writing machine, it will of course be understood that it is equally applicable to other machines.

Various modifications in details of con-

struction and arrangement may be made without departing from the gist of my improvements.

The feed-rack may be attached to any form or construction of carriage, and the feeding-dog may be actuated by means entirely dissimilar from those herein shown.

As some of my improvements may be employed without others, I do not therefore wish to be considered as limiting myself to a machine embracing all of the various features of improvement devised by me.

What I claim as new, and desire to secure by Letters Patent, is—

1. A carriage feed-rack comprising a series of independently-movable feed-teeth consisting each of the body portion, the shoulders, the projections, and the cut-away, and a suitable supporting and guiding frame for said teeth.

2. The combination with a carriage feed-rack, comprising two parallel bars having an intermediate longitudinal slot and formed with a series of pairs of opposing vertical slots, and comprising also a series of independent, vertically-movable feed-teeth having each a body portion, shoulders, projections, and a cut-away, of a permanently-fixed holding-dog adapted to engage the body portion of each tooth, and a vertically and laterally movable spring-actuated feeding-dog adapted in upward movements to engage the under sides of said projections and successively lift each tooth, and adapted also to be engaged by the faces of the said projections, during the step-by-step feeding movements of the rack, and be moved thereby laterally to its normal position.

3. The combination with the carriage feed-rack, having independent vertically-movable feed-teeth, a holding-dog, a vertically and laterally movable spring-actuated feeding-dog, a pivoted switch having the stops 20 and 21, and a finger-key connected to said switch for moving either one of said stops into operative relation to said feeding-dog.

4. The combination with a feed-rack having independent vertically-movable feed-teeth comprising each a body portion, shoulders, projections, and a cut-away, of a permanently-fixed holding-dog, a feeding-dog consisting of two side members connected together and embracing said holding-dog, means for depressing said feeding-dog, a spring for moving said dog laterally at the time of depression, a stop for limiting its lateral movement, a spring for elevating said feeding-dog, and a stop for limiting its elevation.

5. The combination with the carriage feed-rack comprising two separated bars having a series of opposed vertical slots, and independent, vertically-movable feed-teeth consisting each of a body portion, shoulders, projections and a cut-away, of a fixed holding-dog, a vertically and laterally movable feeding-dog, a connecting-rod attached at its upper end to said feeding-dog, a space-key



connected to said rod at its lower end, a type-movement, thrust-rods, character-keys, a circular universal bar, a vertical spindle mounted in the center thereof, a lever connected at one end to said spindle and at its other end loosely connected to said connecting-rod, a spring for said spindle-lever, a spring for moving the feeding-dog laterally, and a spring for moving the connecting-rod and the feeding-dog vertically.

6. The combination with the carriage feed-rack having independent vertically-movable gravity-retained feed-teeth comprising each a body portion, lateral shoulders and downward projections, and suitable dogs for co-operating therewith, of means for forcing down said feed-teeth and insuring their proper presentation to the dogs in the event of said teeth accidentally sticking in their guides or ways.

7. The combination with the carriage feed-rack having independent vertically-movable teeth adapted to return by gravity and comprising a body portion, lateral shoulders and downward projections, and suitable dogs co-operating therewith, of spring-fingers arranged above said teeth and acting to force them down into proper working position relatively to said dogs in case said teeth should accidentally stick in their guides or ways.

8. The combination with a carriage feed-rack having a series of independent vertically-movable feed-teeth, and suitable dogs for co-operating therewith, of a release-bar hung beneath said teeth and adapted to simultaneously lift all of said teeth out of operative relation to said dogs.

9. The combination with a carriage feed-rack having a series of independent vertically-movable feed-teeth, and suitable dogs for co-operating therewith, of a release-bar hung beneath said teeth by obliquely-arranged

links pivoted to said rack, the spring-actuated finger-lever, and the intermediate connecting-rod.

10. The combination of a carriage feed-rack having independent vertically-movable feed-teeth consisting each of a body portion, shoulders, projections and a cut-away, a holding-dog bifurcated at its upper end, a feeding-dog, and a liftable release-bar arranged within said bifurcated portion of the holding-dog and with its upper edge occupying the cut-away portions of the entire series of teeth.

11. The combination with the carriage-feeding mechanism, of the connecting-rod *u* made in two parts and having threaded ends which are united by a turnbuckle *v*, the adjustable abutment 31 having a threaded shank or part whereby the said abutment may be screwed up or down on one portion of the said two-part connecting-rod, the spring-actuated spindle-lever connected at one end to engage said abutment and at its other end to the spindle, the universal ring, thrust-rods, the type-movement, and the character-keys.

12. The combination, with an escapement mechanism comprising a series of independently-movable feed-teeth, and means for moving one of the said teeth at a time to produce letter-spacing of the carriage, of a release-bar mounted in proximity to said series of feed-teeth and extending for the length of the same, and adapted to simultaneously move all of said feed-teeth out of operative relation to the means by which they are normally individually actuated.

Signed at Bridgeport, in the county of Fairfield and State of Connecticut, this 11th day of September, A. D. 1894.

CHARLES W. WALKER.

Witnesses:

FANNY McLAREN,

ARTHUR B. PARTRICK.