

(No Model.)

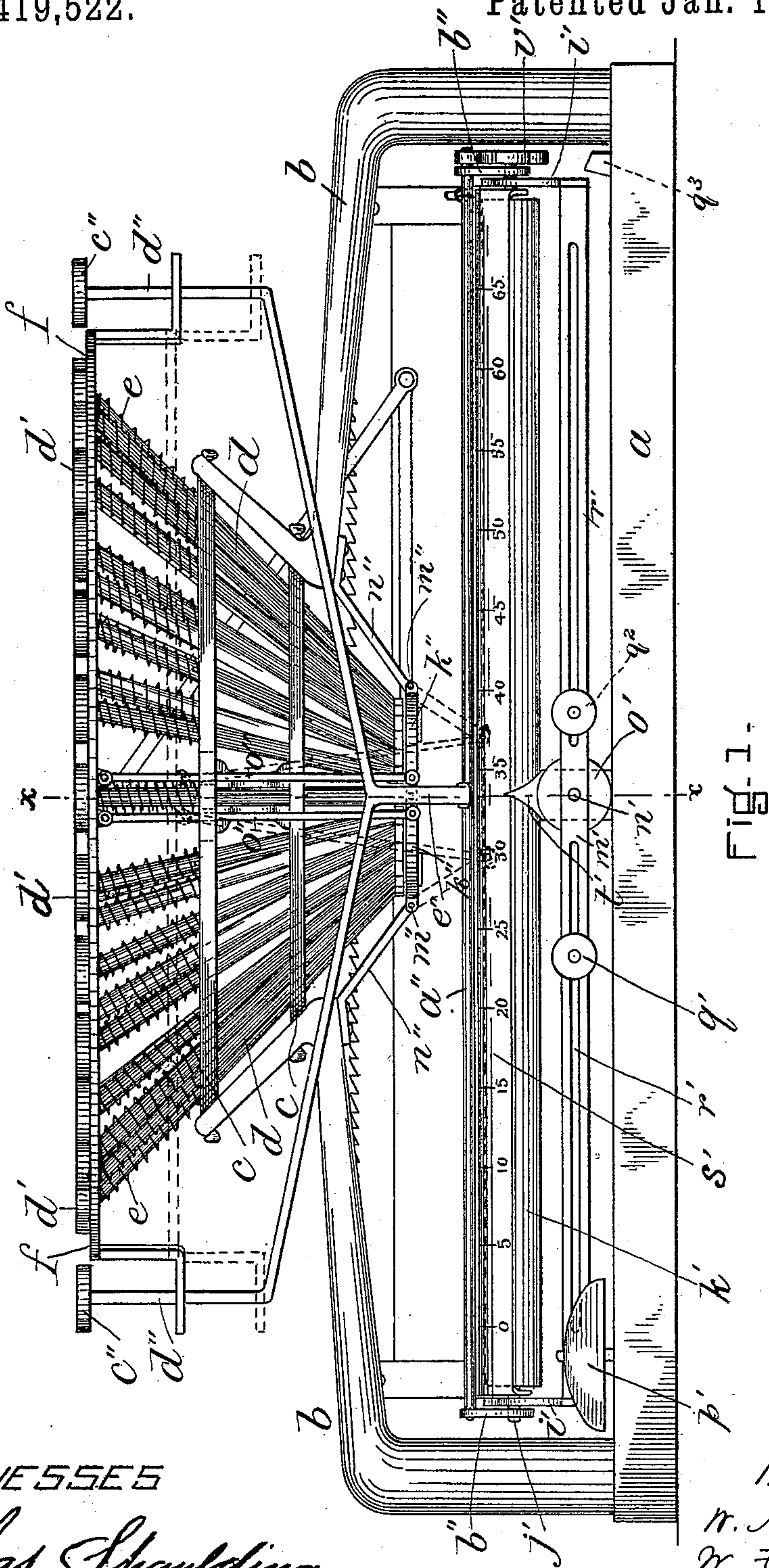
W. A. HILL & W. F. FOSS.

4 Sheets—Sheet 1.

TYPE WRITING MACHINE.

No. 419,522.

Patented Jan. 14, 1890.



WITNESSES

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Charles E. Moss

INVENTORS

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Atty.

(No Model.)

W. A. HILL & W. F. FOSS. 4 Sheets—Sheet 2.

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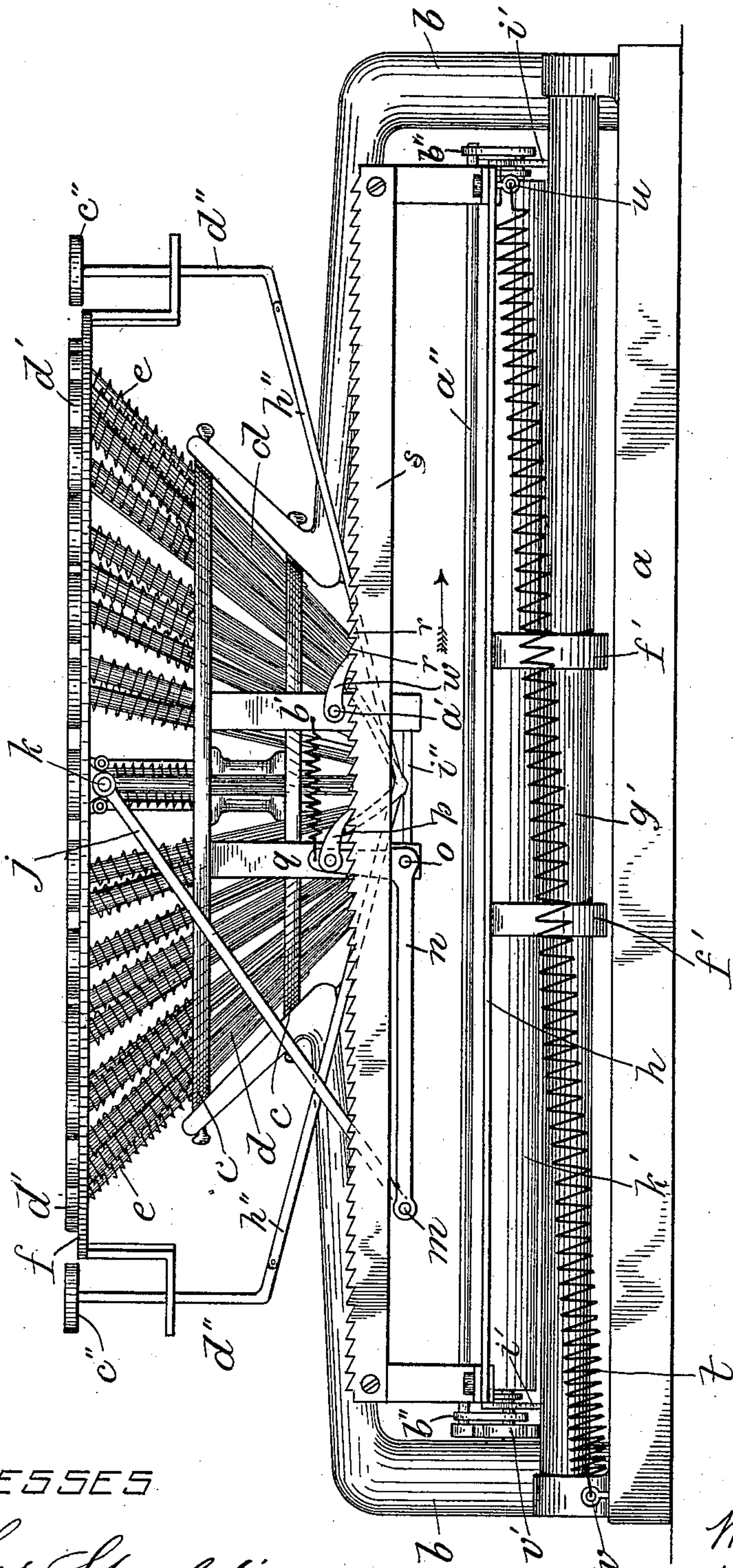


Fig. 2-

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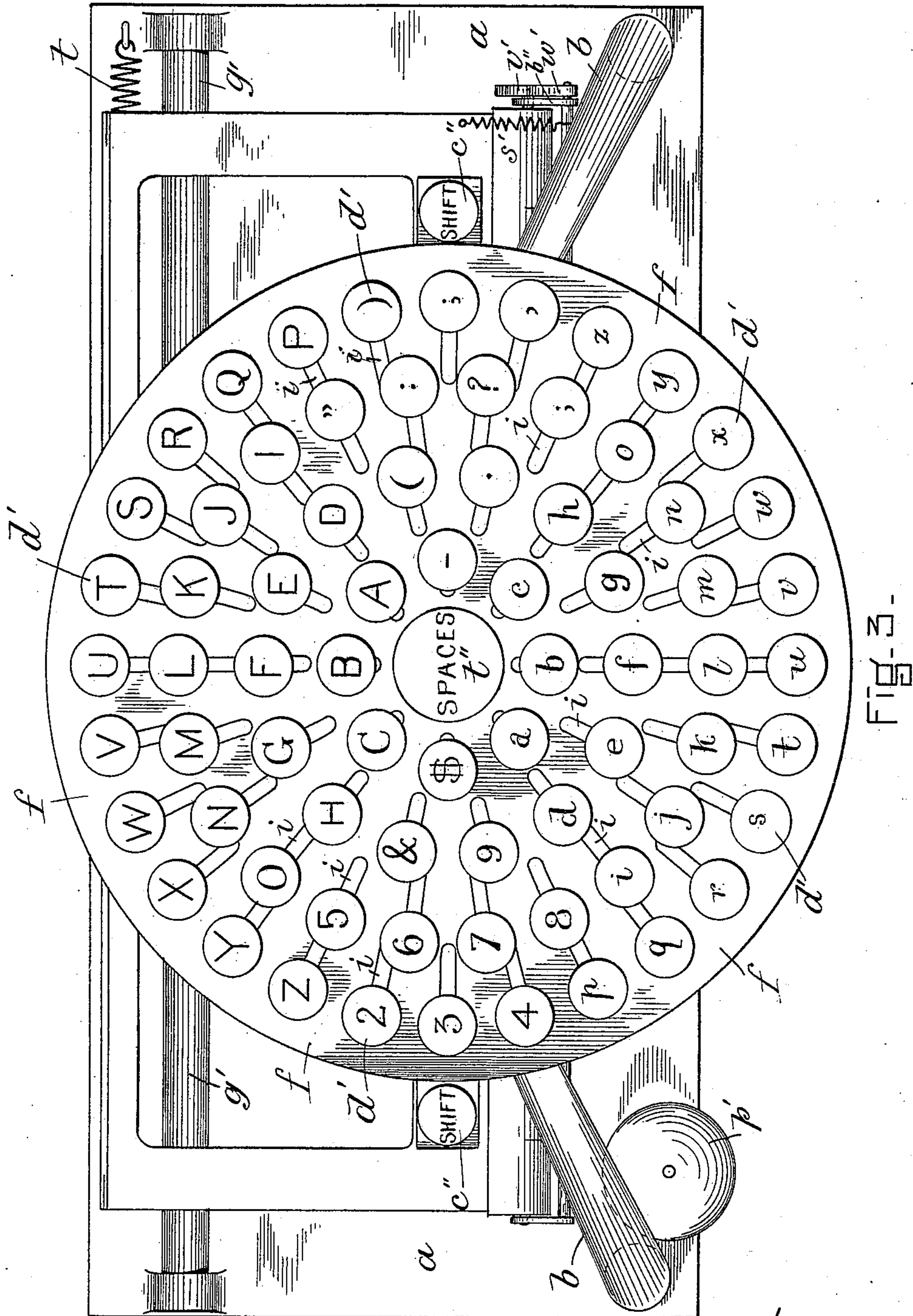
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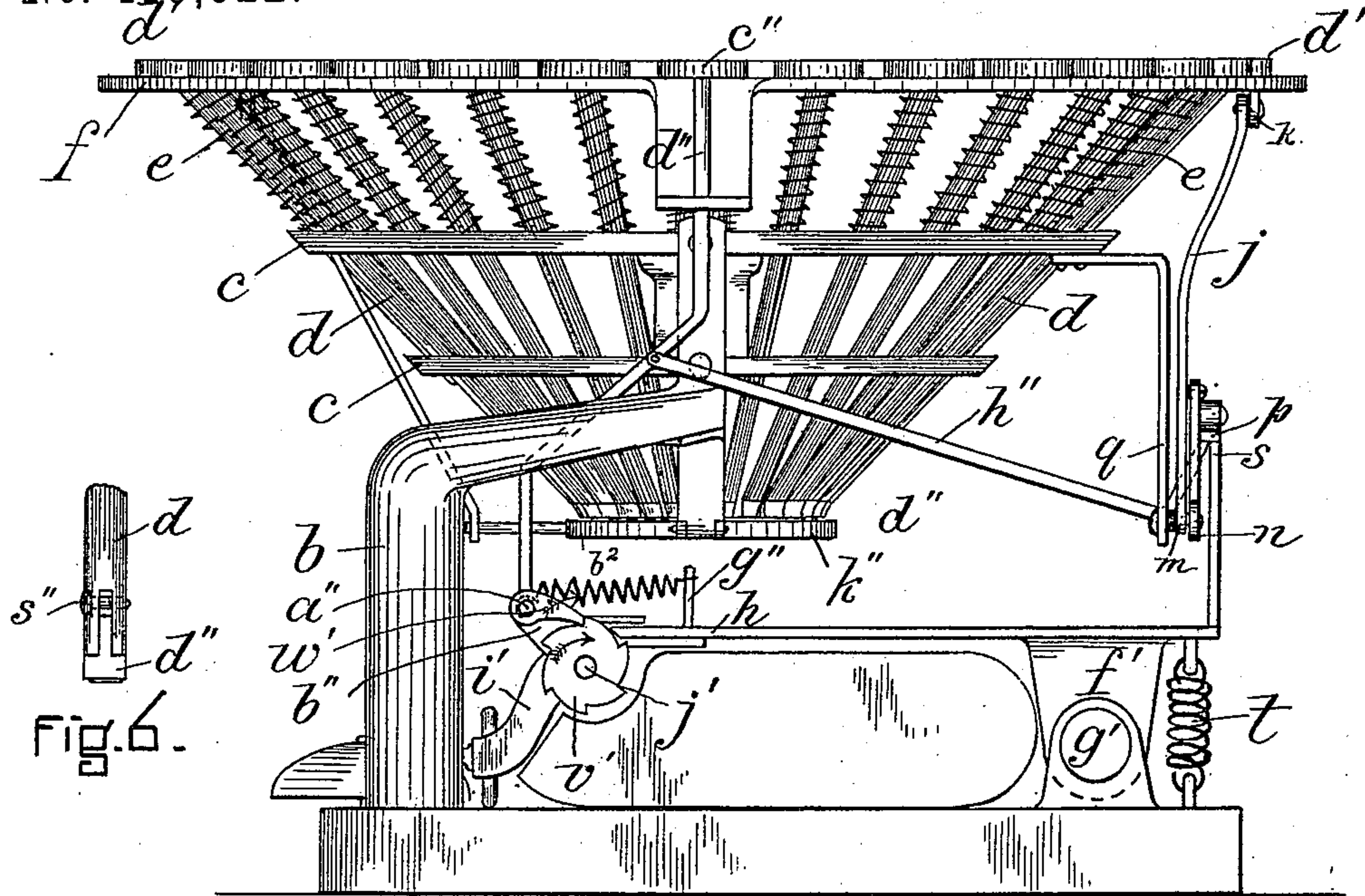


Fig. 4.

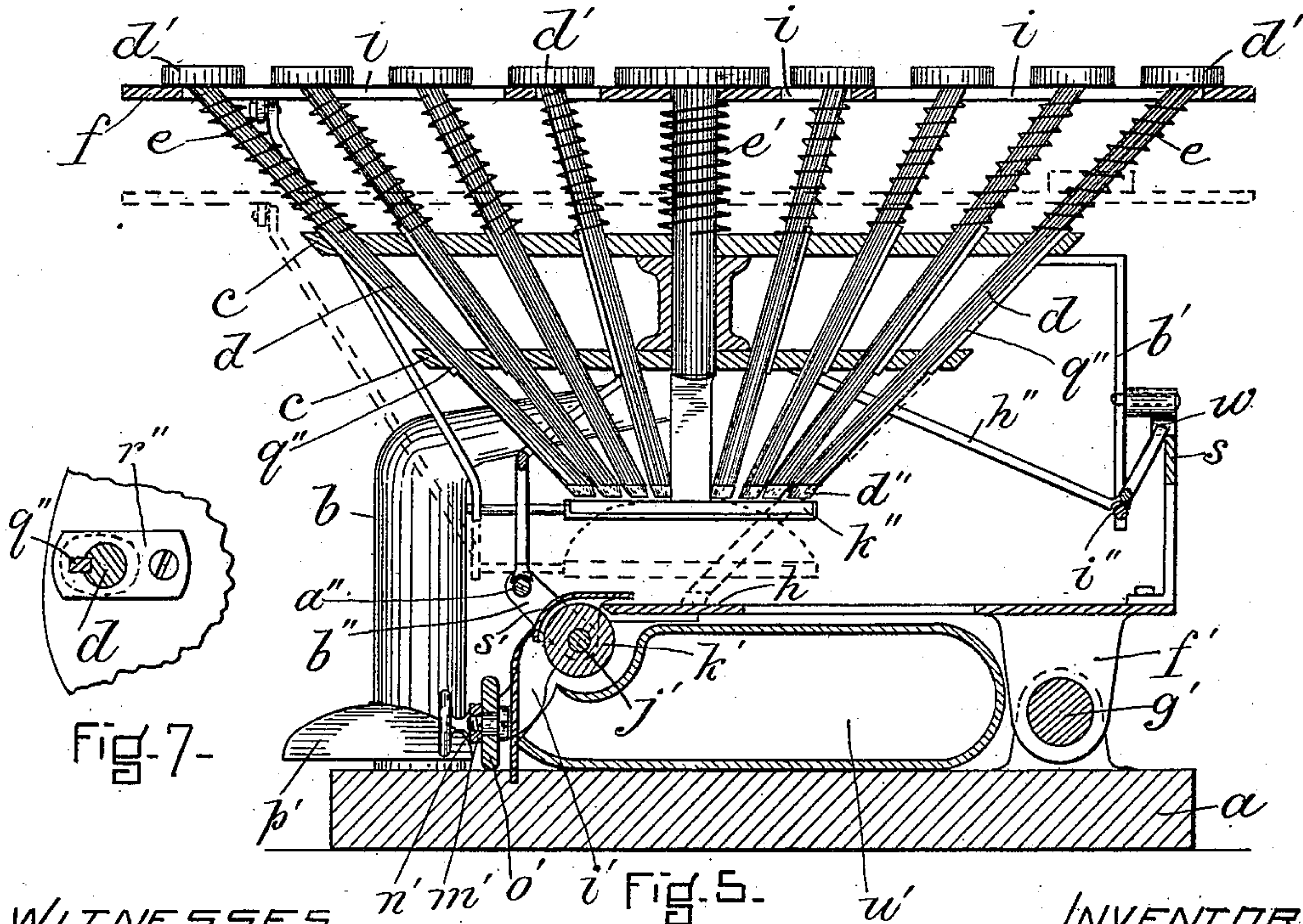


Fig. 7.

Fig. 5.

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# UNITED STATES PATENT OFFICE.

WILFORD A. HILL AND WEBSTER F. FOSS, OF WALTHAM, MASSACHUSETTS.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 419,522, dated January 14, 1890.

Application filed December 17, 1887. Serial No. 258,237. (No model.)

*To all whom it may concern:*

Be it known that we, WILFORD A. HILL and WEBSTER F. FOSS, both citizens of the United States, and both residing at Waltham, in the  
5 county of Middlesex and State of Massachusetts, have invented a new and useful Type-Writing Machine, of which the following is a specification.

This invention has for its object to provide  
10 a type-writing machine of simple construction and compact form, which shall be capable of rapid operation; and it consists in the several improvements which we will now proceed to describe and claim.

15 In the accompanying drawings, forming a part of this specification, Figure 1 represents a front elevation of our improved type-writer. Fig. 2 represents a rear elevation of the same. Fig. 3 represents a top view. Fig. 4 represents an end elevation. Fig. 5 represents a  
20 transverse vertical section on line  $xx$ , Fig. 1. Figs. 6 and 7 are detail views.

The same letters of reference indicate the same parts in all the figures.

25 In the drawings,  $a$  represents a base or support, from which rise two standards  $b$ , supporting the horizontal plates  $c$ , in which are diagonally-arranged orifices constituting bearings for the type rods or plungers  $d$ . Each  
30 rod has two bearings—one in each plate—and is adapted to slide in said bearings. The rods are supported by springs  $e$ , which are here shown as coiled upon the rods and bearing at their lower ends on the upper guide-plate  $c$  and at their upper ends against the  
35 keys  $d'$  of the rods  $d$ . It is obvious, however, that any other suitable form of spring may be adopted to support the type-rods. The rods are inclined at different angles, so that  
40 they converge from their upper to their lower ends, the arrangement being such that the printing character  $d''$  at the lower end of each rod will strike the paper-supporting bed or platen  $h$  at a point which is common to all  
45 the rods, so that each rod will present its printing character at the same spot.

$f$  represents a vertically-movable plate, which is supported under the keys  $d'$  by a central spring  $e'$  of any suitable form. When-  
50 ever a rod is depressed by downward pressure on the key or button  $d'$  at its upper end, said

key bears upon and depresses the plate  $f$ , as shown in dotted lines in Figs. 1 and 5. This movement of the plate  $f$  by the depressed type-rod without disturbance of the other  
55 type-rods is made possible by radial slots  $i$ , Figs. 3 and 5, in the plate  $f$ , through which slots the inclined rods  $d$  and springs  $e$  pass, said slots permitting the plate to move vertically without moving the rods. It will be  
60 seen, therefore, that the plate  $f$  is depressed with each type-rod and raised by the spring  $e'$  at its center, as shown in Fig. 5, upon the release of the depressed rod, these movements of the plate operating the devices presently  
65 described, which feed the paper-carriage along after the printing of each letter. Said devices, as here shown, are as follows: One end of a rod  $j$  is jointed at  $k$  to an ear on the plate  $f$ , and the other end at  $m$  to one arm of a bell-  
70 crank lever  $n$ , which is pivoted at  $o$  to a bracket  $q$ , affixed to the upper guide-plate  $c$ . To the other arm of the bell-crank lever  $n$  is jointed a pawl  $p$ , which engages ratchet-teeth  $r$  on a bar  $s$ , affixed to the paper-carriage. 75  
When the plate  $f$  is depressed, the pawl  $p$  is moved back the length of a tooth  $r$  by the movement imparted to the bell-crank lever  $n$  by the depression of the plate  $f$ . When the plate  $f$  is raised by the spring  $e'$ , a movement  
80 in the opposite direction is imparted to the pawl  $p$ , whereby said pawl is caused to move the paper-carriage in the direction indicated by the arrow in Fig. 2. The carriage is normally pulled in the opposite direction by a  
85 spring  $t$ , which is attached at one end to an eye  $u$  on the carriage and at the other end to an eye  $v$  on the base  $a$ . A loose retaining-pawl  $w$ , pivoted at  $a'$  to a bracket  $b'$ , affixed to the upper guide-plate  $c$ , engages the  
90 ratchet-bar  $s$ , and prevents the paper-carriage from being moved by the spring  $t$  while the operating-pawl  $p$  is being retracted. The paper-carriage has a substantially-horizontal plate  $h$ , to which are affixed the downwardly-  
95 projecting ears  $f'$ , which are fitted to slide on a fixed guide-rod  $g'$ . The forward portion of the plate  $h$  supports the paper at the point where the printing characters come in contact with the paper.

$i'$   $i'$  represent ears attached to the forward edge of the plate  $h$  at opposite ends of the  
100



carriage. In said ears are the bearings for the shaft  $j'$  of the paper-feeding roll  $k'$ , the upper surface of which is about flush with the paper-supporting surface of the plate  $h$ .

5 The lower ends of the ears  $i'$  are connected by a horizontal bar  $m'$ , extending the entire length of the carriage. At the center of the bar  $m'$  is a stud  $n'$ , on which is journaled a roller  $o'$ , which is arranged to run on the  
10 base  $a$ .

$p'$  represents a bell affixed to the base near one end thereof. Two screw-heads  $q'$   $q^2$  are affixed to the bar  $m'$ , and are adjustable longitudinally thereof in slots  $r'$   $r'$ . When the  
15 motion of the carriage brings the head  $q'$  in contact with the bell, the carriage is stopped and the bell is sounded, thus giving notice of the reaching of the end of the line. The screw-head  $q^2$  stops the motion of the carriage to the right by coming in contact with  
20 a lug or stop  $q^3$  at one end of the base or support  $a$ .

A curved plate  $s'$  is arranged over the paper-feeding roll to guide the paper as it passes  
25 over the periphery of said roll. The outer surface of said plate is provided with numbered marks or graduations constituting a scale, as shown in Fig. 1. A pointer  $t'$ , affixed to the base  $a$ , co-operates with said  
30 scale. The paper, passing over the roll  $k'$ , comes from a casing  $w'$ , forming a part of the carriage and located under the plate. The mouth of the casing is below the feed-roll  $k'$ , as shown in Fig. 5. Said casing protects the  
35 paper from injury by the movement of the carriage on the base or by contact with any of the parts of the machine.

The paper-feeding roll is provided at one end with a ratchet  $v'$ , with which engages a  
40 pawl  $w'$ . Said pawl is mounted on one end of a rod  $a''$ , supported by two arms  $b''$   $b''$ , which are pivoted on the shaft of the paper-feeding roll. When it is desired to feed the paper after the completion of a line, the rod  
45  $a''$  is depressed by downward pressure on one or both of the keys  $c''$   $c''$ , which are located at opposite sides of the plate  $f$ , and are attached to stems  $d''$ , which unite on a shank  $e''$ , Fig. 1, bearing on the rod  $a''$ . The depression of the keys  $c''$  causes the pawl  $w'$  to move back over the ratchet  $v'$  the length of  
50 one tooth. Upon the release of the key or keys  $c''$  a spring  $f''$ , attached at one end to the rod  $a''$  and at the other end to a stud  $g''$  on the paper-carriage, moves the pawl in the direction indicated by the arrow in Fig. 4, and causes it to rotate the paper-feeding roll  
55  $k'$ . The pawls  $p$  and  $w$  are raised to disengage them from the ratchet-bar  $s$  and permit the carriage to be moved back at the end of each line. The raising of the pawls may be effected by hand or by any suitable mechanism. We have here shown levers  $h''$  pivotally secured at their inner ends to the key-  
60 stems  $d''$ , which levers at their outer ends bear on a fixed rod or fulcrum  $i''$ , and are in-

clined upwardly to form shorter arms bearing against the pawls  $p$   $w$ , as shown in dotted lines in Fig. 2. When the keys  $c''$  are depressed, the shorter arms of the levers  $h''$  70 are raised by the tipping movement of the said levers on the fulcrum  $i''$  and raise the pawls  $p$   $w$  sufficiently to clear them from the ratchet-bar  $s$ .

$k''$   $k''$  represent ink-pads, which are pivoted at  $m''$  to brackets  $n''$ , attached to the standards  $b$ . The swinging inner ends of said pads are connected by rods  $o''$  with the actuating-plate  $f$ , so that when said plate is depressed the pads are also depressed at  
80 their inner ends, as shown in dotted lines in Figs. 1 and 5, thus permitting the depressed type-rod to pass between said pads. When the plate  $f$  rises, the pads are also raised. When the pads are in their normal position, 85 their inked upper surfaces are in contact with the printing characters at the lower ends of the rods, and the pads are depressed simultaneously with the type-rod, so that there is no scraping of any printing character on its inking-pad. 90

The type-rods are prevented from rotating by keys or splines  $q''$ , Figs. 5 and 7, attached to the rods and sliding in grooves formed either in the plates  $c$   $c$  or in bushing-plates 95  $r''$ , attached to said plates. (See Fig. 7.)

We prefer to detachably secure each type  $d''$  to its rod by a screw or rivet  $s''$ , as shown in Fig. 6, the type having a shank which is fitted in a slot in the lower end of the type-rod. 100

At the center of the series of keys is a spacing-key  $t''$ , the depression of which depresses the plate  $f$  and feeds the paper to make spaces between words without printing.

It is obvious that various changes may be 105 made in the details of construction herein shown and described without departing from the spirit of our invention.

We claim—

1. As an improvement in type-writers, the 110 combination of a series of type-carrying rods, stationary guide-plates therefor, an upper horizontal feed-actuating plate, and the series of springs bearing on the upper one of said stationary guide-plates and against the under 115 side of said feed-actuating plate, substantially as set forth.

2. As an improvement in type-writers having an upper feed-actuating plate, the combination of the paper-feeding roll having a 120 ratchet-wheel at one end, a pawl engaging said ratchet-wheel, the rod to which said pawl is connected, the spring secured to said rod, and the keys located at opposite sides of said plate and provided with stems having a shank 125 at their meeting-point bearing on said rod, substantially as set forth.

3. As an improvement in type-writers, the combination of a series of converging type-carrying rods, stationary guide-plates having 130 orifices through which said rods project, the inking-pads pivoted at one side, the feed-act-



uating plate, and the rods depending from said plate and connected to said pads, substantially as set forth.

4. The combination of a series of converging type-carrying rods, the stationary guides therefor, an actuating-plate arranged to be depressed by the depression of either rod, a series of springs located between the upper one of said stationary guide-plates and the said actuating-plate, a paper-carriage having a ratchet-bar *s*, a bell-crank lever pivoted to a fixed support depending from one of said stationary guides and carrying on one arm a pawl engaging said ratchet, and a rod connecting the other arm of said lever with the actuating-plate, as set forth.

5. The combination of the paper-carriage

having a ratchet-bar, a spring which normally impels said carriage in one direction, a positively-reciprocated pawl *p*, whereby said carriage is moved against the force of said spring, a loose retaining-pawl *w*, whereby the carriage is retained when the pawl *p* is being retracted, the keys *c''*, and the lever secured to said keys and provided with short arms engaging said pawls, substantially as set forth, whereby by depressing said keys said pawls may be simultaneously disengaged from the ratchet-bar, as stated.

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WEBSTER F. FOSS.

Witnesses:

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CHAS. E. CATER.