

No. 837,639.

PATENTED DEC. 4, 1906.

C. H. F. PLUMMER & J. E. L. BLACKMORE.

TYPE WRITING MACHINE.

APPLICATION FILED NOV. 5, 1904.

4 SHEETS—SHEET 1.

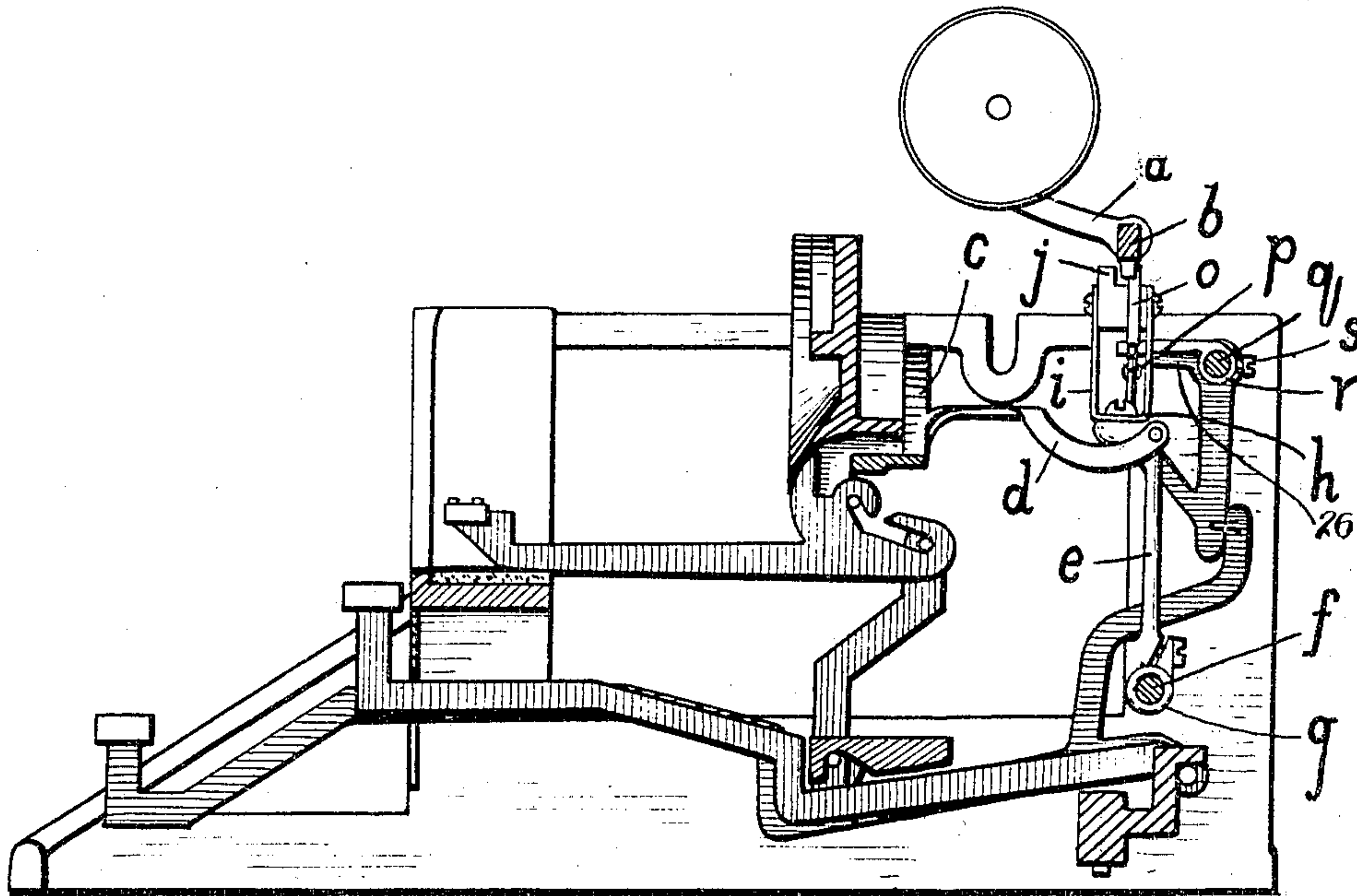


Fig. 1.

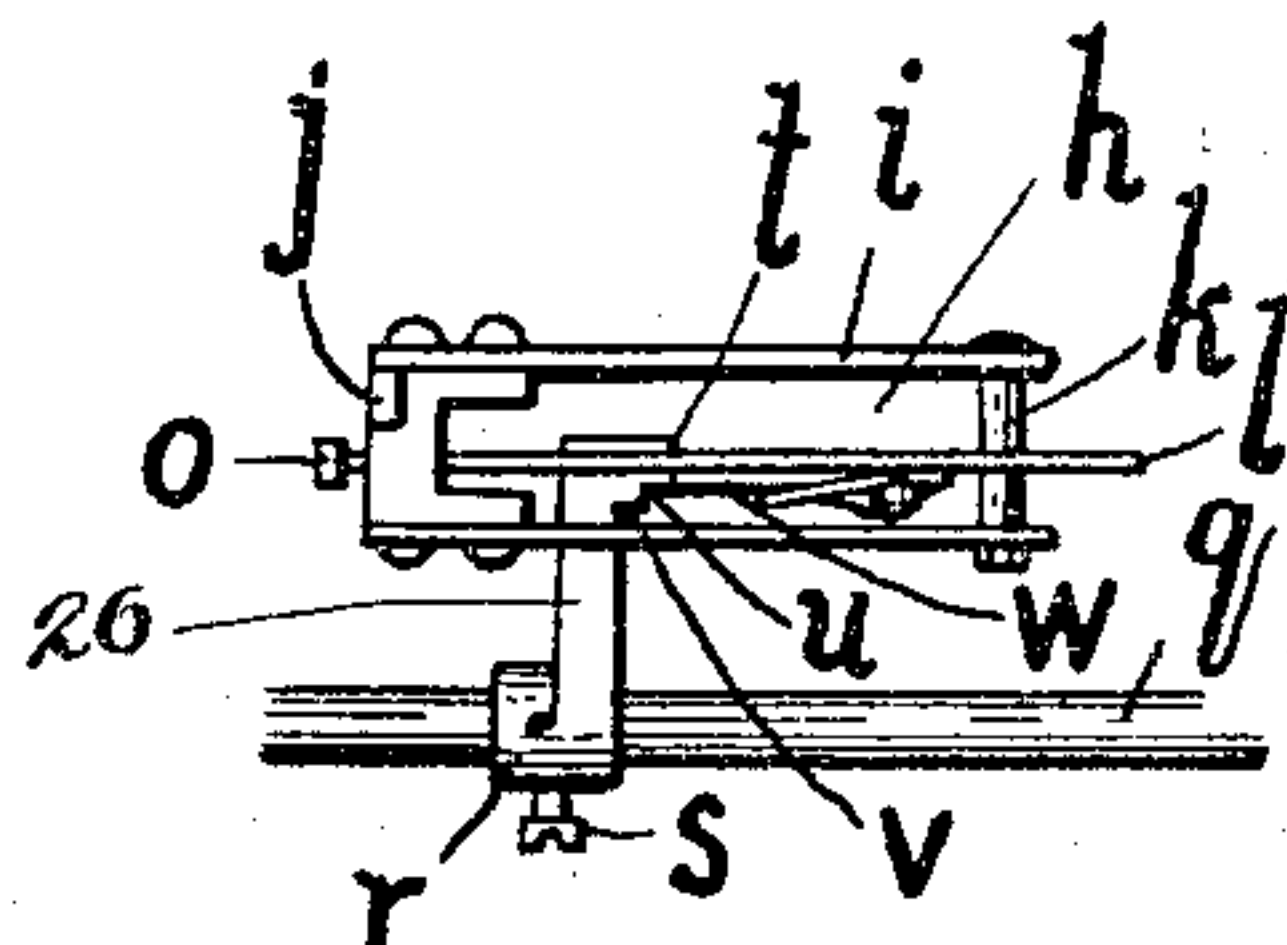


Fig. 11.

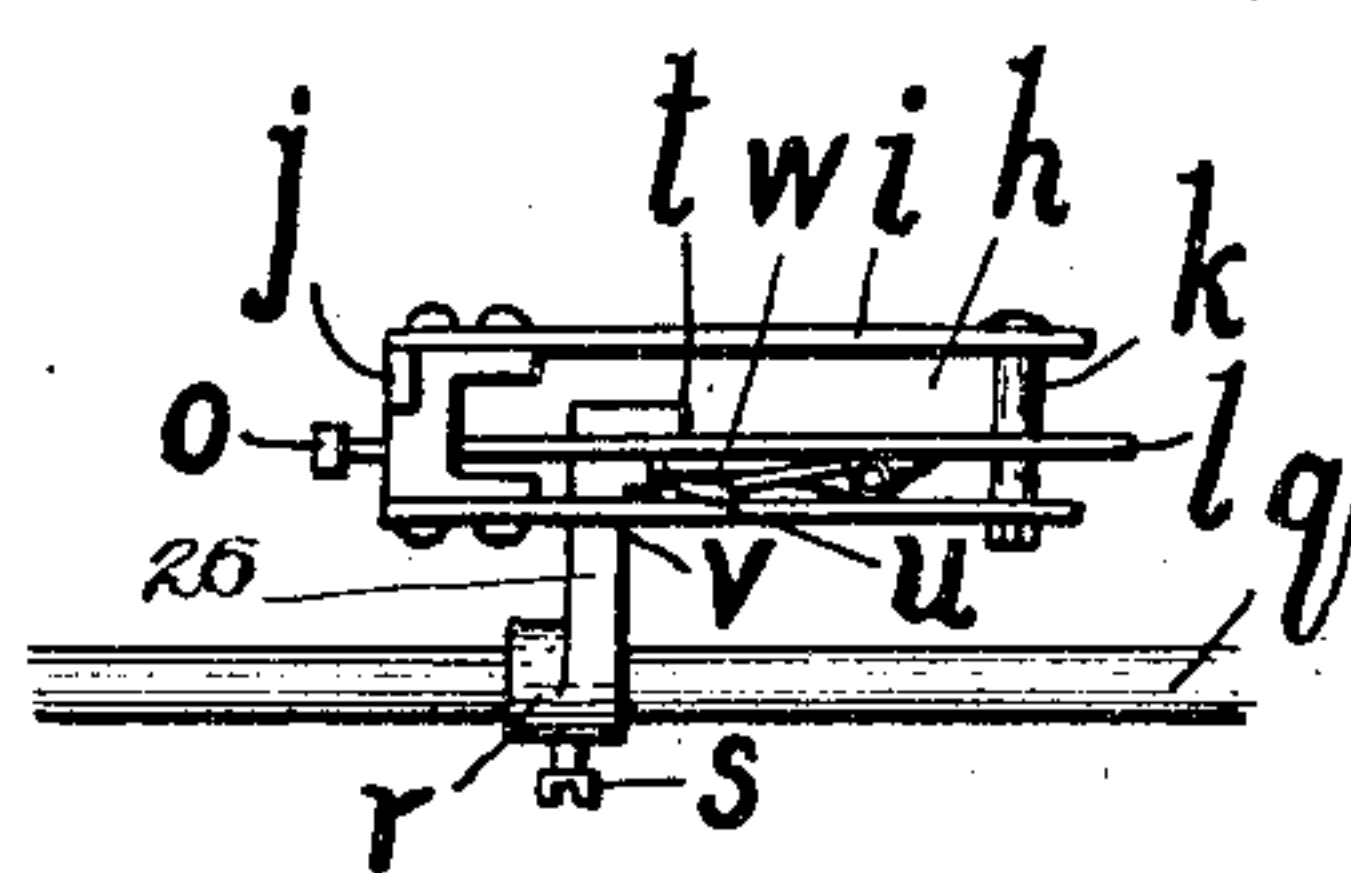


Fig. 12.

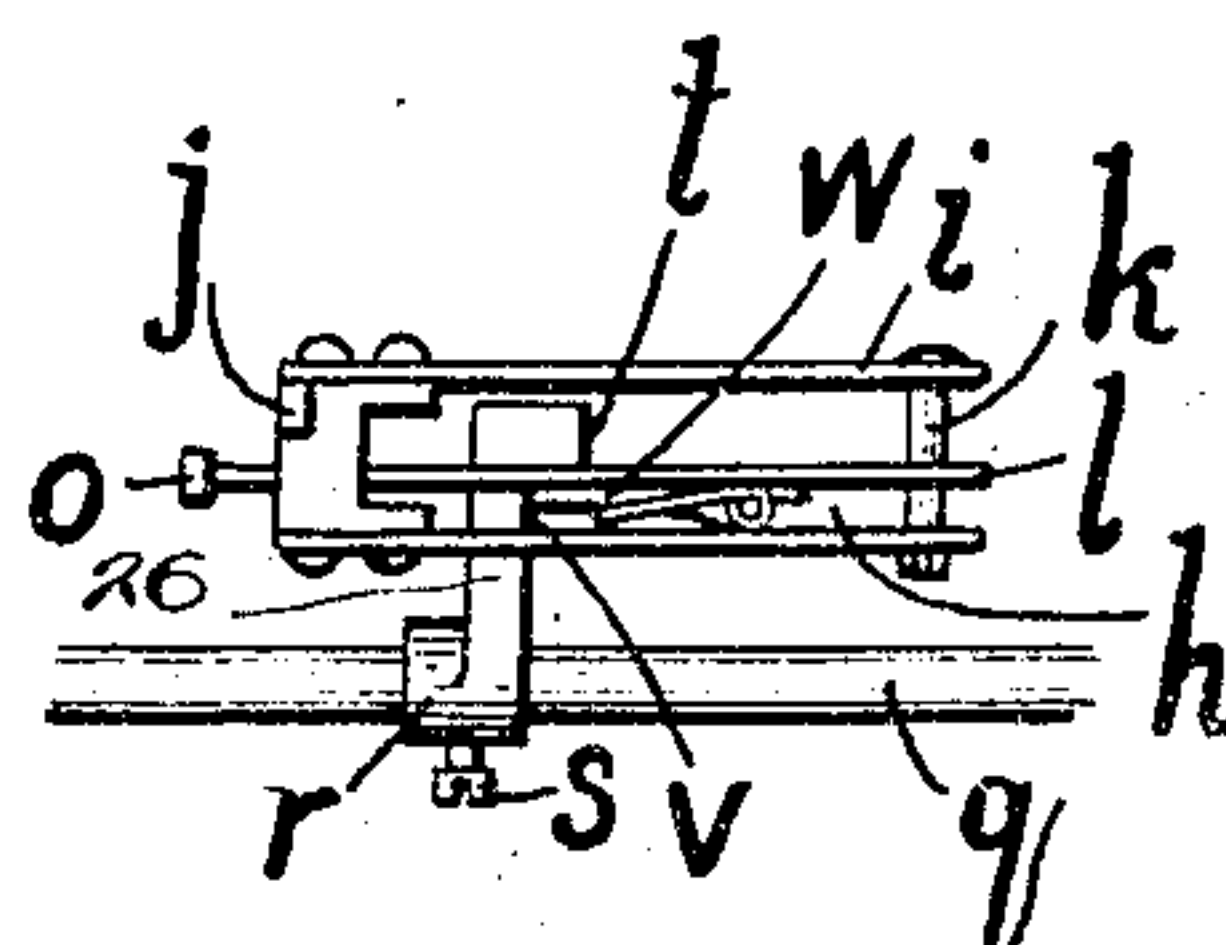


Fig. 13.

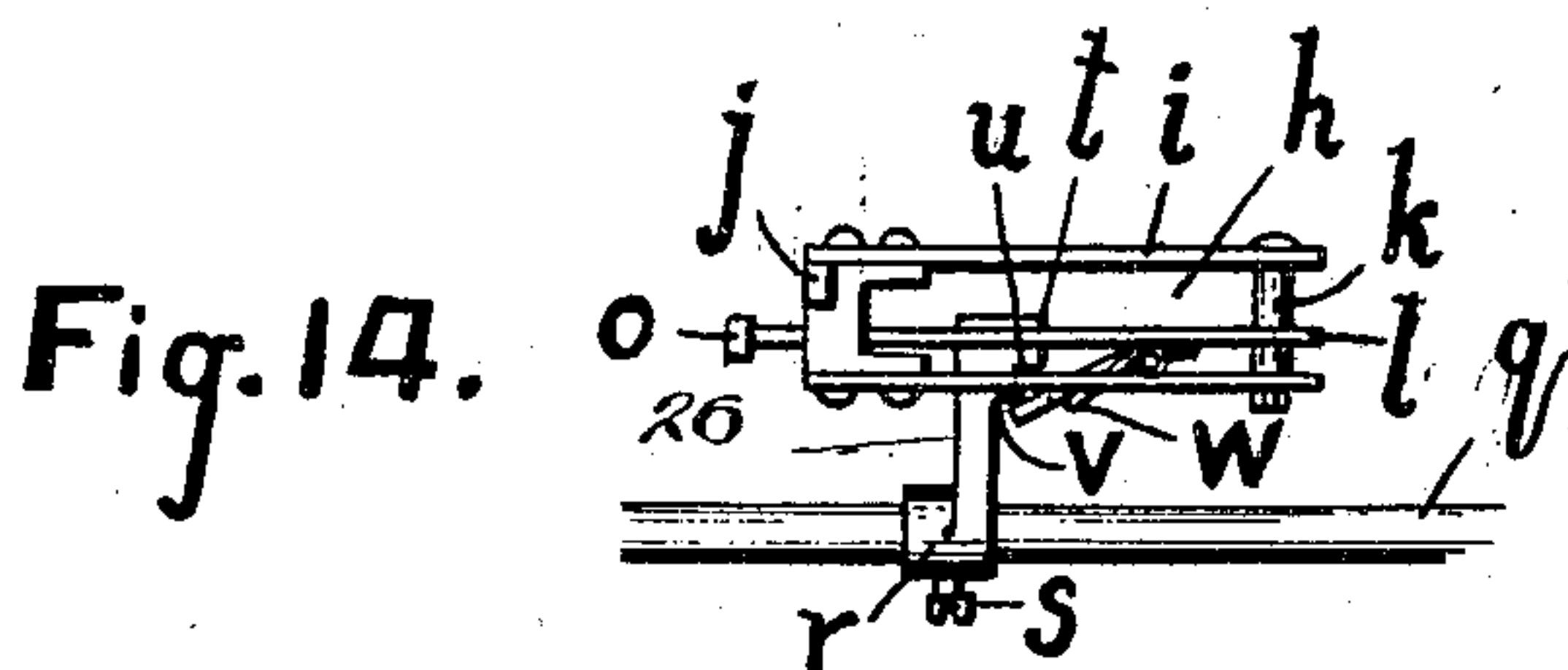


Fig. 14.

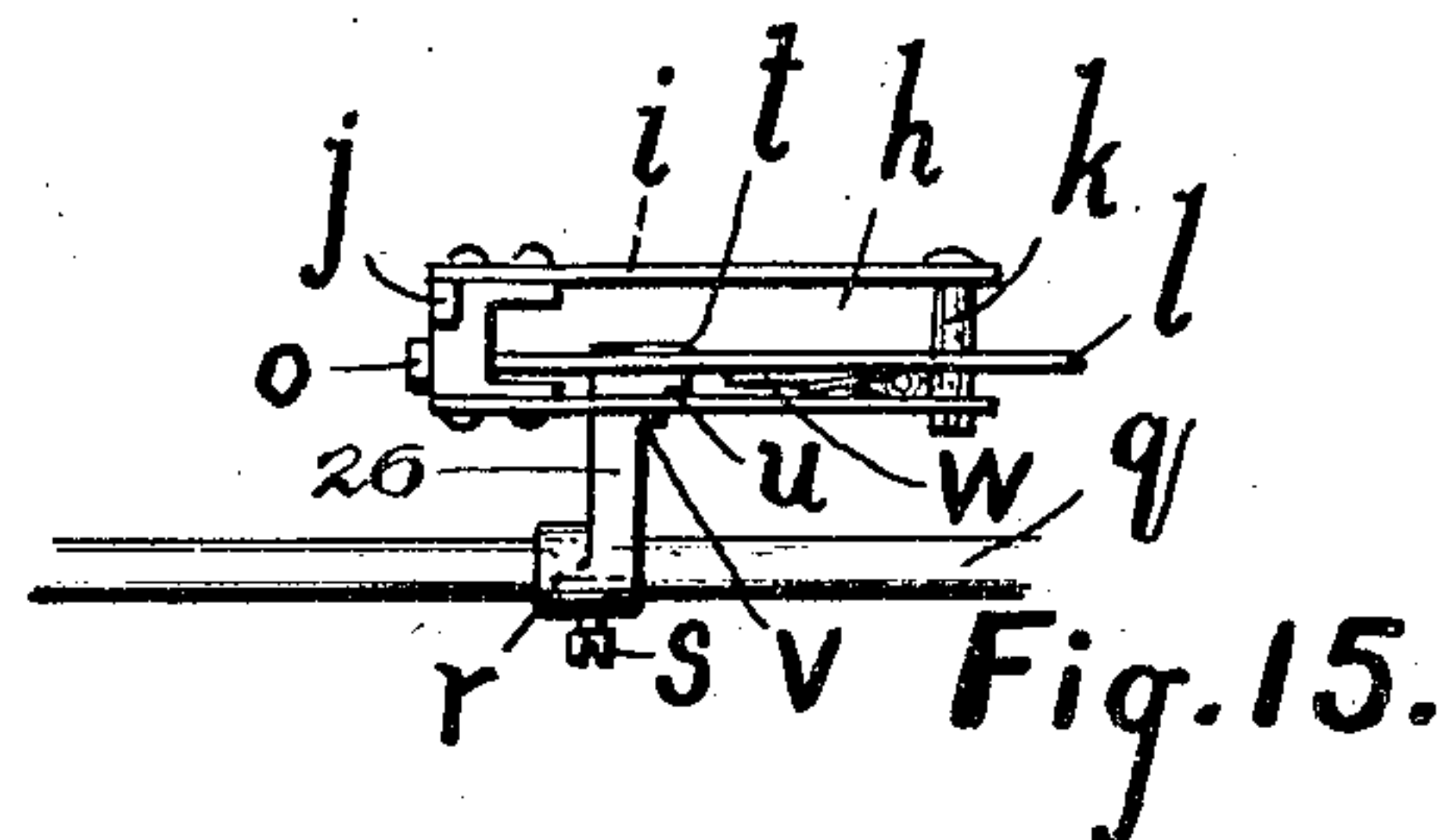


Fig. 15.

Witnesses.

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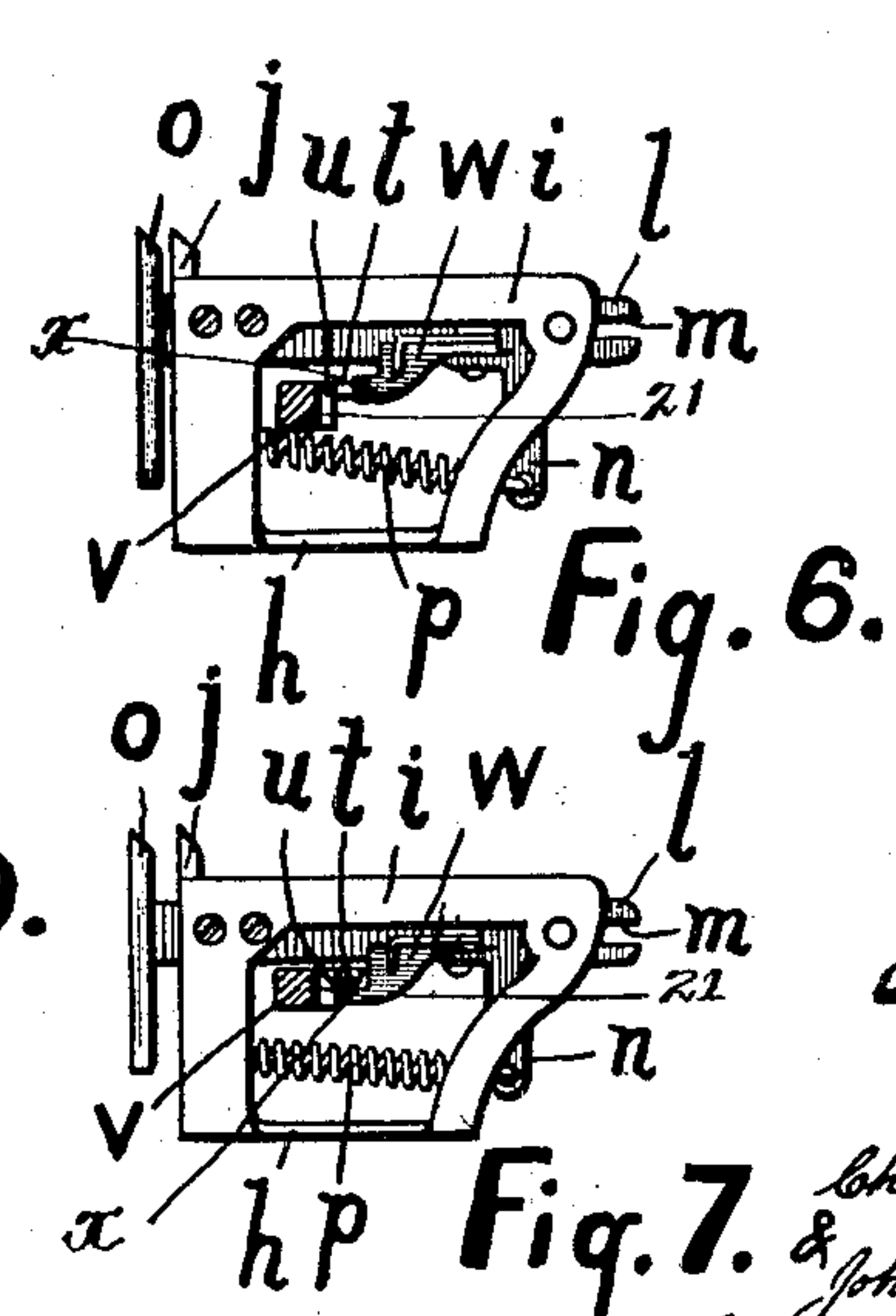
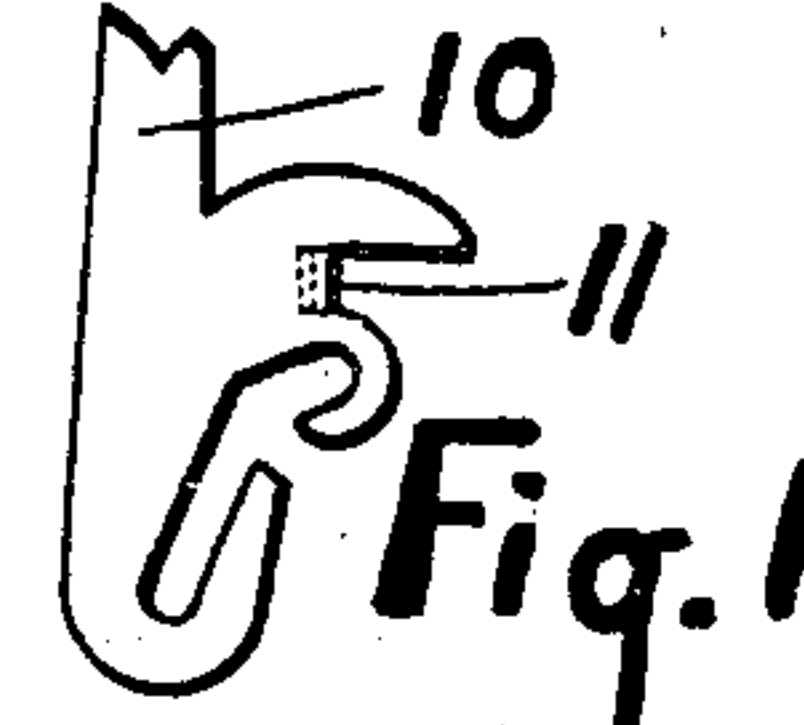
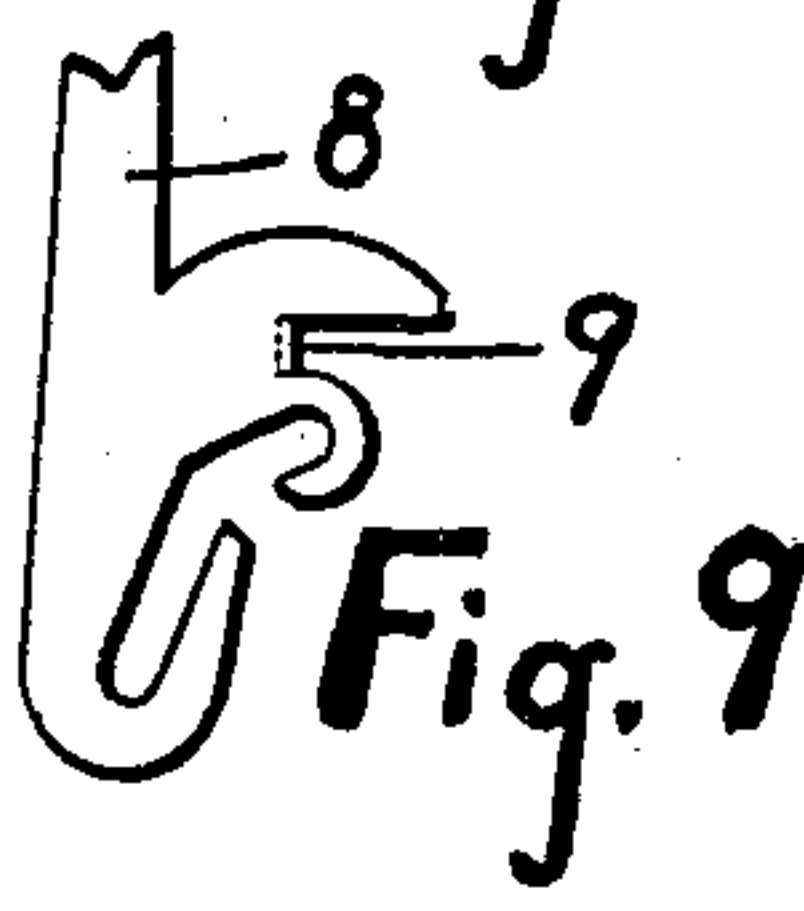
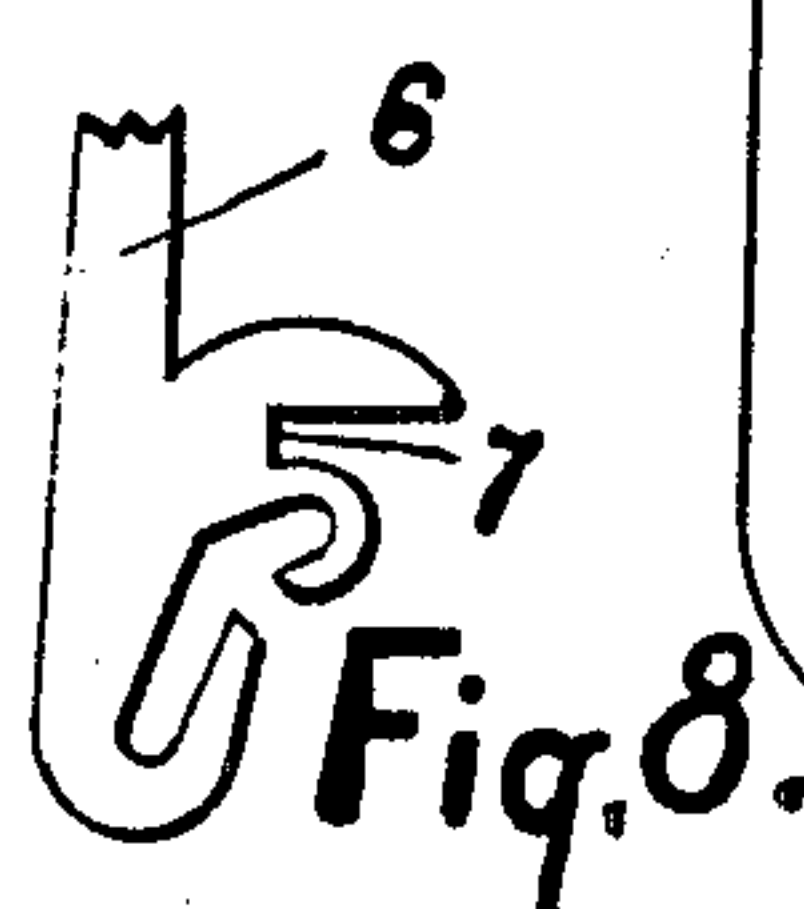
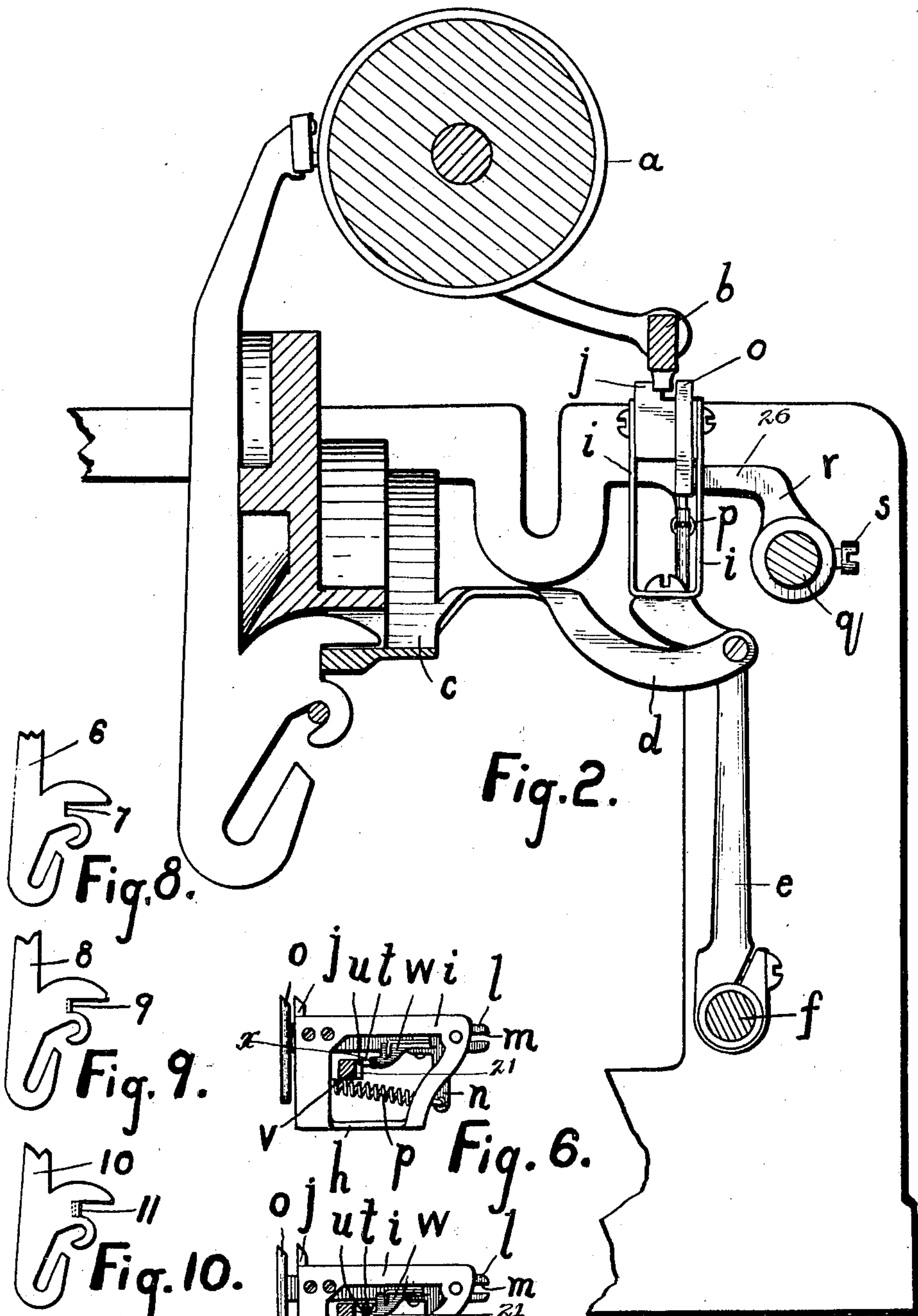
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TYPE WRITING MACHINE.

APPLICATION FILED NOV. 5, 1904.

4 SHEETS—SHEET 2.



Witnesses.

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TYPE WRITING MACHINE.

APPLICATION FILED NOV. 5, 1904.

4 SHEETS—SHEET 3.

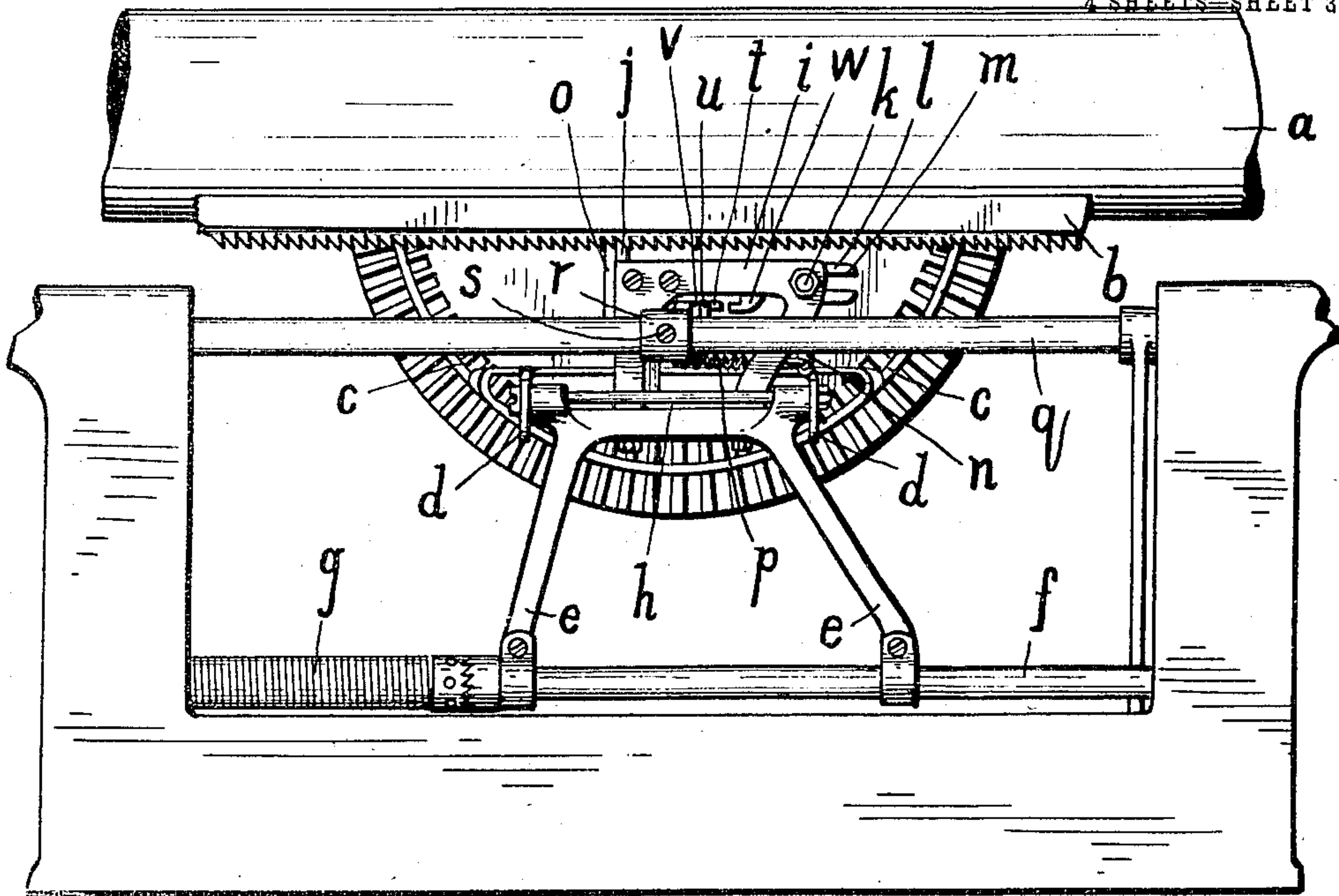


Fig. 3.

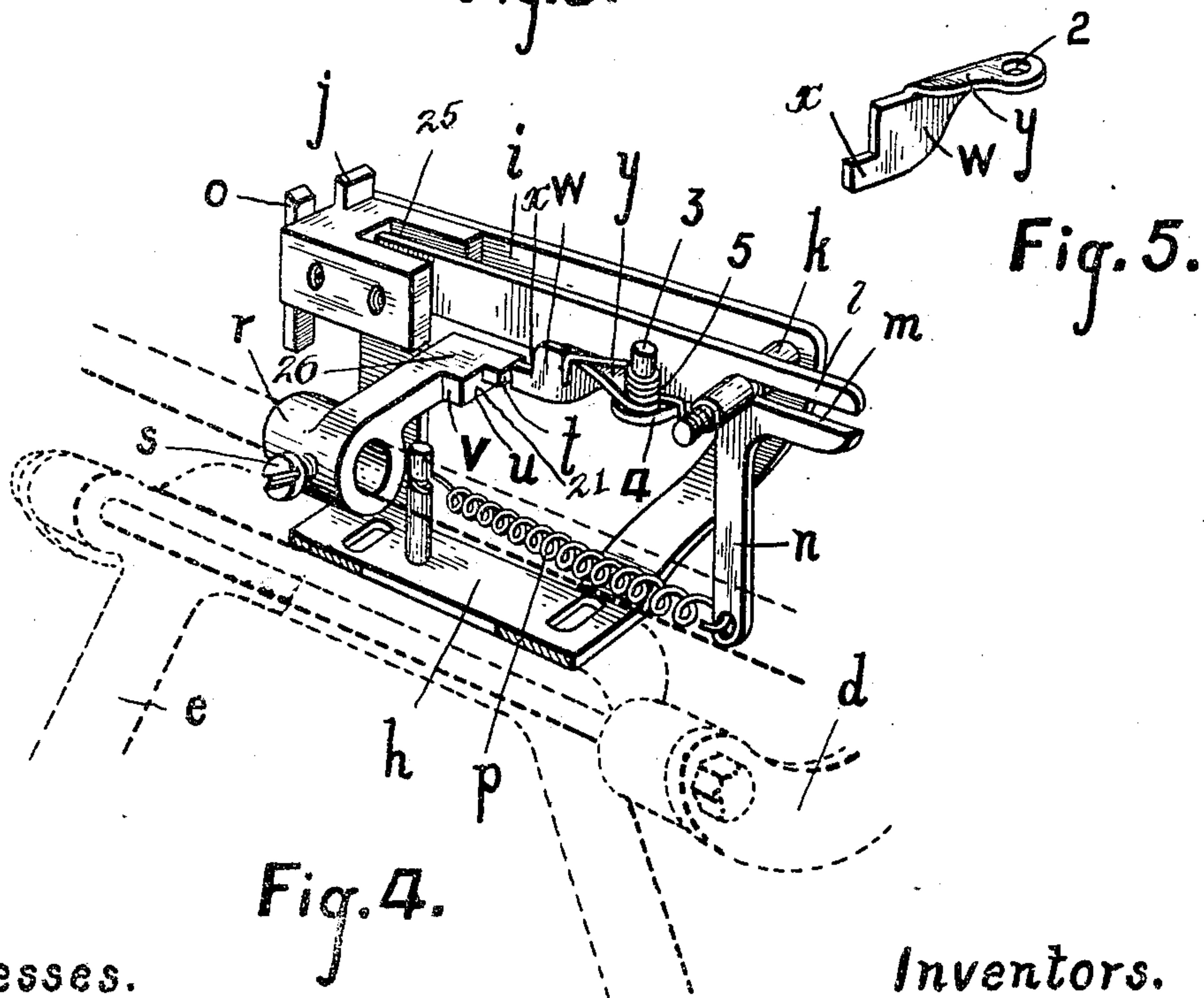


Fig. 5.

Fig. 4.

Witnesses.

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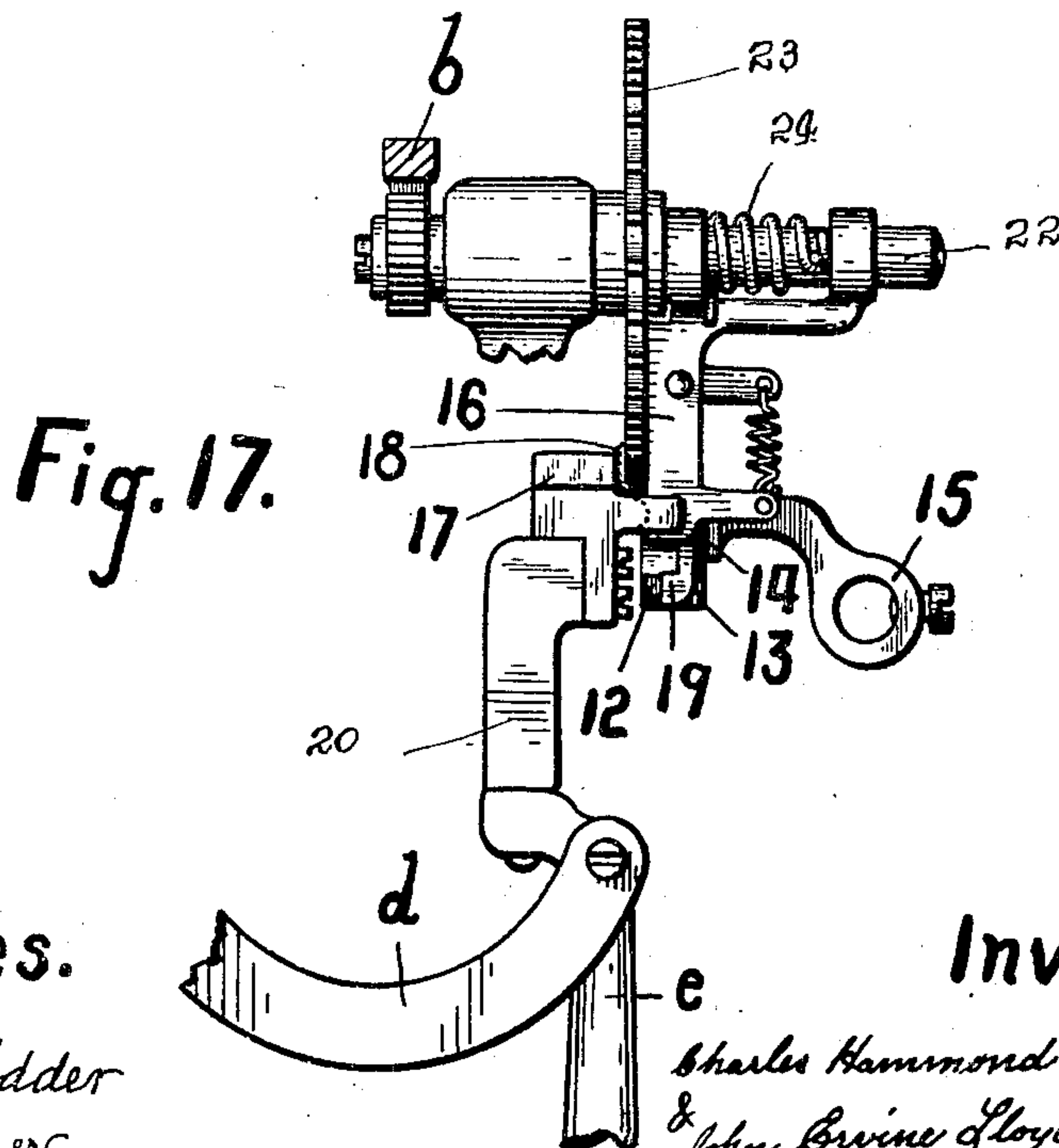
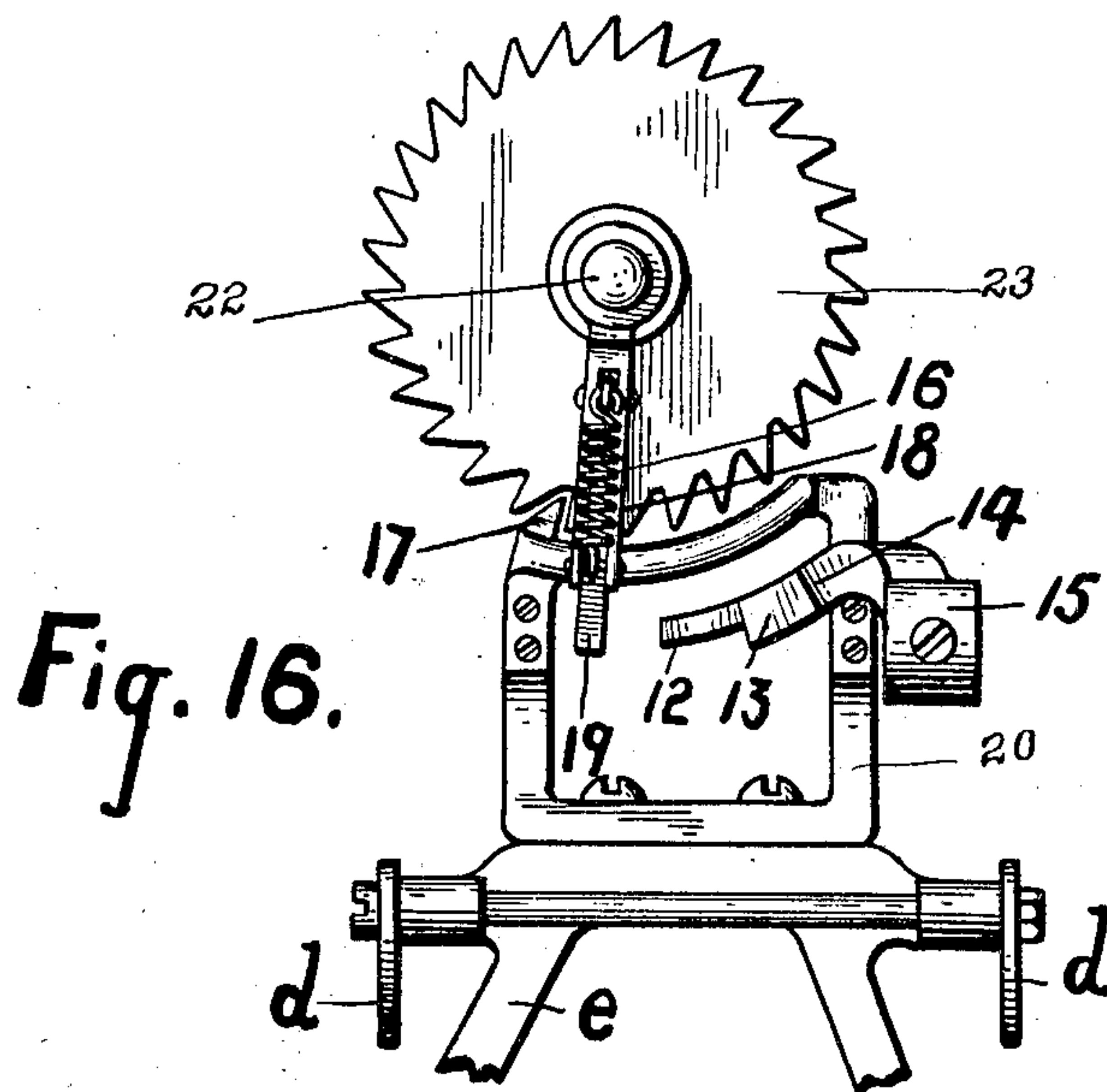
PATENTED DEC. 4, 1906.

C. H. F. PLUMMER & J. E. L. BLACKMORE.

TYPE WRITING MACHINE.

APPLICATION FILED NOV. 5, 1904.

4 SHEETS—SHEET 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

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MORE ASSIGNOR TO SAID PLUMMER.

TYPE-WRITING MACHINE.

No. 837,639.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed November 5, 1904. Serial No. 231,589.

To all whom it may concern:

Be it known that we, CHARLES HAMMOND FORD PLUMMER, residing at 109 Madison avenue, in the city of Toronto, county of York, Province of Ontario, and JOHN ERVINE LLOYD BLACKMORE, residing at Montreal, in the district of Montreal, Province of Quebec, in the Dominion of Canada, subjects of the King of Great Britain, have invented certain new and useful Improvements in Type-Writing Machines and the Like, of which the following is a specification.

This invention relates to improvements in type-writing machines and the like, as described in the present specification and illustrated by the accompanying drawings, that form part of the same.

This invention consists, essentially, of a carriage having a constant propelling agent, an escapement mechanism controlling the movements of said carriage, a universal bar, a plurality of sets of levers actuating said universal bar at different distances of travel for each set respectively and regulating, through said bar, the operation of the escapement mechanism, and means connected with the spacing member of the escapement mechanism for stepping the same correspondingly with the travel of the said bar.

The objects of the invention are to devise an arrangement of parts which shall obviate the necessity of crowding the larger characters into spaces suitable for medium-width characters and the spreading of smaller characters to fill spaces suitable for the medium letters and whereby the typing of conjunctions and articles—such as “and,” “or,” “an,” and “the”—may be accomplished in one operation and provide uniformity of spacing in the finished copy.

In the drawings, Figure 1 is a cross-sectional view of the machine, showing the arrangement of parts connecting the escapement mechanism with the keyboard. Fig. 2 is a cross-sectional view, on an enlarged scale, of the parts to the escapement, the operating-lever, and the intermediate connections. Fig. 3 is a rear view of the machine in elevation. Fig. 4 is a perspective view, on an enlarged scale, of the escapement mechanism and stepping device. Fig. 5 is a perspective detail, on an enlarged scale, of the dog shown in Fig. 4 as engaging the stepping de-

vice. Fig. 6 is a side view of the escapement mechanism, showing the dog in engagement with the stepping device for the spacing in printing a letter of a minimum width. Fig. 7 is a side view of the escapement mechanism, showing the dog in engagement with the stepping device for the spacing in printing the capital of the same letter. Fig. 8 is a detail of the operating portion of a lever forming one of a set controlling the spacing for a minimum-width letter. Fig. 9 is a detail of the operating portion of a lever forming one of a set controlling the spacing for a letter of greater width. Fig. 10 is a detail of the operating portion of a lever forming one of a set controlling the spacing for a letter of still greater width. Fig. 11 is a plan view from above of the escapement mechanism, showing the spring-held dog in position engaging a step for a character requiring one space. Fig. 12 is a plan view from above of the escapement mechanism, showing the spring-held dog engaging a step for a character requiring two spaces. Fig. 13 is a plan view from above of the escapement mechanism, showing the spring hold dog engaging a third step for a character requiring three spaces. Fig. 14 is a plan view from above of the escapement mechanism immediately subsequent to the return of the universal bar on the release of the key. Fig. 15 is a plan view from above of the escapement mechanism subsequent to the carriage assuming its normal position. Fig. 16 is a view in elevation of a rotary form of escapement mechanism from the rear of the machine and the stepping device in a slightly-modified form. Fig. 17 is a side view of the mechanism shown in Fig. 16.

Like characters of reference indicate corresponding parts in each figure.

In the present specification the invention is shown as applied to a type-writing machine of the visible-writing class and a particular form of escapement mechanism.

a is the carriage of the machine, having the rack *b* secured thereto in the usual manner in the particular class of machine illustrated. The carriage *a* is subject to a constant spring-pull in one direction, as customary in type-writing machine construction.

c is the universal bar, formed in the shape of a crescent and rigidly secured to the

bracket *d* and supported by the said bracket in proximity to the type-bars of the machine.

e is a fork fixedly secured to the rod *f*, which is journaled in suitable bearings in the frame of the machine adjacent to the bottom in the sides. The fork *e* carries at the top thereof the escapement mechanism and pivotally supports the bracket *d*.

g is a spring encircling the rod *f* toward one end thereof and exerting a pressure circumferentially to return the fork *e* to its inner position subsequent to being forced rearwardly.

h is a plate secured to the fork *e* and forming part of the frame *i* of the escapement mechanism. *j* is the retaining-pawl projecting upwardly at one corner of said frame and fixedly secured thereto. *k* is a pin rigidly secured in the sides of said frame and extending thereacross.

l is a sliding bar longitudinally slotted at *m*. The pin *k* extends through the slot *m* and supports the bar at that end. The bar *l* at its other end extends through the slot 25 in the frame and carries at its extremity the spacing-pawl *o*.

n is an arm extending from and rigidly secured to or forming part with the bar *l* at the slotted end.

p is a spiral spring secured at one end to the arm *n* and at its other end to a projecting pin from the frame and remaining at a tension to exert a constant spring pull in the direction of the pawls on the sliding bar *l*.

q is a rod journaled in suitable bearings in the sides of the frame of the machine to the rear of the escapement mechanism and utilized as part of the shift-key mechanism by means of levers connecting it with the keyboard of the machine, as customary in machines of the "Underwood" type.

The description of the parts and their uses thus far in this specification has been confined to mentioning their position in relation to one another, as the type of machine described is the Underwood, and its construction is known and is very adaptable for the purposes of this invention.

26 is the stepping device, having the steps *t*, *u*, and *v* and the step *t* reduced at 27 for a portion of its width to the level of the next succeeding step *u*. The stepping device 26 is rigidly secured or forms part with the sleeve *r*, which is secured firmly on the rod *q* by the set-screw *s*. The stepping device 26 is thus secured on the rod *q* immediately to the rear of the escapement mechanism, into the proximity of which it extends. *w* is a dog having the projecting tooth *x* from its lowermost extremity and a wing *y*, having an orifice 2 therethrough. The dog *w* is pivotally swung from the post 3, projecting upwardly from the rigid extension 4 from the bottom of the bar *l*, and its tooth *x* is adapted to engage the steps *t*, *u*, and *v*, respectively,

at the movement of the bar *l*. An inward pressure is exerted on the dog *w* by the spring 5, which encircles the post 3 immediately above the wing *y* from the dog, and has one end thereof caught on the edge of the extension 4 and the other pressing inwardly on the forward portion of the dog. It will be thus seen that the stepping device 26 is constantly in a fixed position, except when raised upwardly by the turning of the rod *q*, and as the frame of the escapement mechanism is actuated by the movement of the universal bar, as usual in this class of machine, the said frame will be in different positions in relation to the stepping device, according to the distances of travel of the universal bar. The movement of the frame rearwardly will bring the tooth *x* into position to engage one or other of the steps *t*, *u*, or *v* or the reduced portion 21 of the step *t*, as will be more fully explained in describing the operation of the machine.

The levers or type-bars as they are here shown operating the universal bar are in sets—that is to say, the letters of the alphabet of minimum width, such as "i" and "l" form one set, while the "a" and "u" and such letters form another set, and the "w" and "m" and such letters form another set, and as many more sets may be introduced as desired.

The operating portion of the levers is particularly illustrated in Figs. 8, 9, and 10. 6 is a lever forming one of a set for such letters of the alphabet as "i" and "l", having the portion 7, which abuts the universal bar *c* at each pressure on the key, connected with said lever. The operation of the key will bring the lever to an upward position, and the portion 7 will then contact with the universal bar and actuate it so as to move the frame of the escapement mechanism rearwardly to a limited extent, but sufficient to allow of the engagement of the particular step in the stepping device by the dog *w* to space the letters "i" or "l." 8 is a lever forming one of a set of such letters of the alphabet as "a" or "b." In the lever 8 the portion 9 is of greater breadth as compared to the portion 7, as indicated by the dotted line in the drawings. This additional metal will insure the travel of the frame of the escapement mechanism for a sufficient distance to bring the dog into alinement to engage the step *u*. 10 is a lever forming one of a set for such letters of the alphabet as "w" and "m," and in the portion 11 it will be seen that there is still greater breadth of metal, and consequently the universal bar will be moved to a greater extent. The frame of the escapement mechanism will consequently be carried to a greater distance rearwardly sufficient to bring the dog *w* in alinement to engage the step *v* to permit of sufficient space for the greater width letters. This of course can be

carried on as far as desirable, according to the width of the type used—that is, by adding more steps or increasing the depth of the steps.

5 In Figs. 16 and 17 a modified form of construction is shown. 12, 13, and 14 are the steps in the stepping device extending from a rod to the rear of the escapement mechanism in a similar manner as explained in the
10 foregoing description. 17 is the retaining-pawl to engage the rack and hold the carriage during the operation of printing and is fixedly secured to the frame 20, extending upwardly from the fork *e* and moving rear-
15 wardly and inwardly therewith. 18 is the spacing-pawl secured to the arm 16, pivotally arranged on the shaft 22 of the toothed wheel 23. The arm 16 is spring-held by the spiral spring 24 encircling the shaft 22 to the face
20 of the wheel 23, so as to keep the spacing-pawl 18 in engagement with the toothed wheel until forced from engagement therewith by the rearward movement of the frame 20. The arm 16 on the release of the pawl 18
25 has the necessary force from the circumferential tendency of the spring 24 to swing around until the dog 19, pivoted in the arm, engages one or other of the steps 12, 13, or 14. The return of the fork *e* to its normal
30 position puts the spacing-pawl in engagement with the wheel and releases the retaining-pawl 17, and the movement of the carriage returns the pawl 18 to its starting-point. In this description of the modified form of con-
35 struction the rotary escapement mechanism is not explained in detail; as the said mechanism is well known and in use in such type-writing machines as the Underwood, and it is only to illustrate the adaptability of the present
40 invention to different forms of escapement mechanism that the particular figures are shown in the drawings and mentioned in the specification.

The addition of the stepping member to
45 the parts of a type-writing machine will in no way affect the successful operation, as in any event some form of stop is required to arrest the movement of the bar *l*.

In the operation the pressure on a key
50 brings the type-lever to an upward position and at the same time into contact with the universal bar, which it moves and, consequently the frame of the escapement mechanism. In printing the letter "i" the key
55 for that letter is pressed, which moves the universal bar and the frame of the escapement mechanism rearwardly, causing the retaining-pawl *j* to enter into engagement with the rack. The spacing-pawl *o*, which has
60 been in engagement with the rack, is carried with the rearward movement of the frame and released from engagement. The spring pull on the bar *l* now causes the said bar to slide and throw the pawl *o* outwardly from the
65 frame until arrested by the tooth of the dog

w coming into contact with the step *t*. The release of pressure from the key permits the return of the universal bar, and the spring *g* encircling the rod *f* insures such return by forcing the fork *e* to its inward position. This
70 action causes the spacing-pawl *o* to engage the rack and releases the retaining-pawl *j*, leaving the pawl *o* to be returned by the travel of the carriage. The step *t* has per-
75 mitted the pawl *o* to move outwardly from the frame only to the extent of one tooth on the rack, so that when the carriage brings the pawl *o* to abut the frame the said carriage has moved the minimum space. The opera-
80 tion for a letter of greater width is precisely similar, with the exception that the greater breadth of metal in the lever forces the uni-
85 versal bar, and consequently the frame of the escapement mechanism, to a greater distance rearwardly. This places the latter so
85 that the step *u* of the stepping device is in position to be engaged by the dog *w* on the release of the spacing-pawl *o* at the pressure on the key. In order that the tooth of the
90 dog *w* may pass the step *t* on the return of the frame inwardly, the spring permits its outward movement from the bar *l*, and im-
95 mediately on the said bar *l* assuming its first position the dog will spring to its place ready for the next operation. The operation for
95 letters or type of still greater width is exactly the same, as the increase in the breadth of metal will cause the dog to engage the tooth
100 *v*. The spring-held dog *w* is forced outwardly from the bar *l* by the steps *t* and *u* in the operation just described and is returned
105 as explained. In order to print articles, conjunctions, or prepositions at one operation and from the same type-bar, the step or steps
105 may be made of greater depth to permit the bar *l* to move farther on the release of the spacing-pawl *o*. Capitals in the English
110 alphabet, with the exception of a few, such as "L" and "T," require the same spaces as the small letters, but in the particular letters
110 mentioned the capital requires two spaces, whereas the small letter requires only one. It has been explained that the step *t* is reduced
115 to the level of the step *u* for one-half of its width, thus making it possible by altering the position of the stepping device through
115 the rotation of the rod *q* to have the dog *w* engage the reduced portion of the step *t* in place of the step proper. The rod *q*, as ex-
120 plained in the foregoing description, is used in connection with the shift-key mechanism. Consequently when a capital letter is required this rod is always operated. In the remain-
125 ing steps there will be no trouble in this respect, as there is no reduction of level in the surface thereof.

The modification illustrated in Figs. 16 and 17 is shown to exemplify how the device may be applied to another form of escape-
130 ment mechanism used in the Underwood

type-writing machine. In this particular mechanism the escapement is of a rotary character, and the changes in construction are only slight modifications necessary to make the device applicable.

It must be understood that without departing from the spirit of the invention changes may be made in the construction of the stepping device to suit the various constructions of escapement mechanisms, and it may also be said in the same connection that the levers operating the universal bar may be any of the intermediate levers between the key and the type, for in numerous machines on the market there is no standard for the position of the universal bar, and this invention has to do particularly with the movement of the said bar by certain levers having connection with the keys.

The advantages of the machine are manifest to every one accustomed either to the use of type-writing machines or receiving copy therefrom, as the spacing throughout will be much improved and a correct space may be left for such letters as "m" and "w" as compared with the letters "a" and "u." Also it is possible to print conjunctions, articles, and prepositions—such as "and," "the," "or," "of," and "to"—at the pressure of one key and have the same spaced off correctly.

What we claim as our invention is—

1. In a type-writing machine and the like, the combination with a carriage having a constant propelling agent, an escapement mechanism, a universal bar, and a rod journaled in suitable bearings in the frame of the machine and forming part of the shifting mechanism, of a plurality of sets of levers actuating said universal bar to different distances of travel for each set respectively and regulating through said bar the operation of the escapement mechanism, a stepping member rigidly secured to the aforesaid rod and extending therefrom into proximity with the spacing member of the escapement mechanism and having the first step thereof reduced for a portion of its width to the level of the next succeeding step, and a spring-held dog pivotally secured to the spacing member of the escapement mechanism and engaging the said stepping member, as and for the purpose specified.

2. In a device of the class described, in combination, a carriage having a constant propelling agent, an escapement mechanism controlling the movement of said carriage, a universal bar, a rod journaled in suitable bearings in the frame of the machine and

forming part of the shifting mechanism, a plurality of sets of levers actuating said universal bar to different distances of travel for each set respectively and regulating through said bar the operation of the escapement mechanism, a stepping member suitably secured and extending into proximity with the spacing member of the escapement mechanism and having one of its steps reduced to the level of the next succeeding step, and means attached to said spacing member for engaging each of said steps at the operation of the key and lever coacting with its particular step, as and for the purpose specified.

3. In a device of the class described, in combination, a carriage having a constant propelling agent, an escapement mechanism having a spring-held sliding member, a universal bar moving rearwardly at each operation of a key, a set of levers actuating said universal bar to a requisite distance to operate said escapement mechanism, a set of levers actuating said bar to a greater distance than the aforesaid set, a stepping member suitably secured and extending into proximity with said sliding member and having its steps correspondingly arranged to the different distances of travel of said bar in direct relation to said sliding member, and a dog secured to the sliding member and engaging said steps, as and for the purpose specified.

4. In a type-writing machine, the combination with a plurality of sets of levers, operating-keys therefor and a universal bar variably moved by the different sets, of a spring-operated platen-carriage, an escapement mechanism therefor operated by the variable movement of said bar, and comprising a yielding pawl provided with a controlling member, and a stepped member coacting with said pawl member whereby a variable feed of the carriage is effected.

Signed at Toronto, in the county of York, in the Province of Ontario, in the Dominion of Canada, this 10th day of January, 1905.

C. H. F. PLUMMER.

Witnesses:

P. W. PLUMMER,

J. C. McMILLAN.

Signed at Montreal, in the district of Montreal, in the Province of Quebec, in the Dominion of Canada, this 16th day of January, 1905.

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