

No. 711,358.

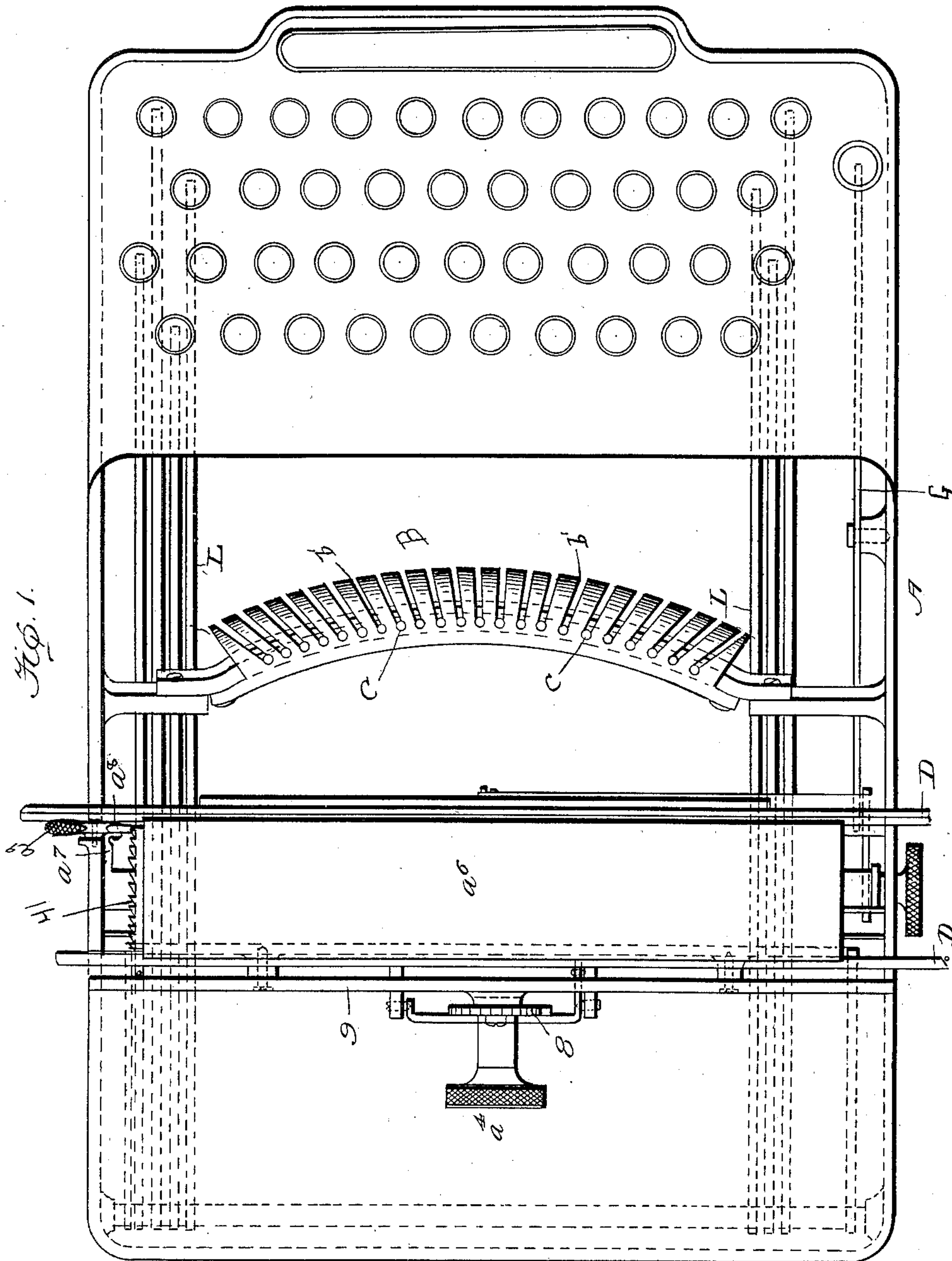
Patented Oct. 14, 1902.

J. A. SMITH.
TYPE WRITER.

(Application filed May 14, 1901.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses

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Walter J. Estabrook

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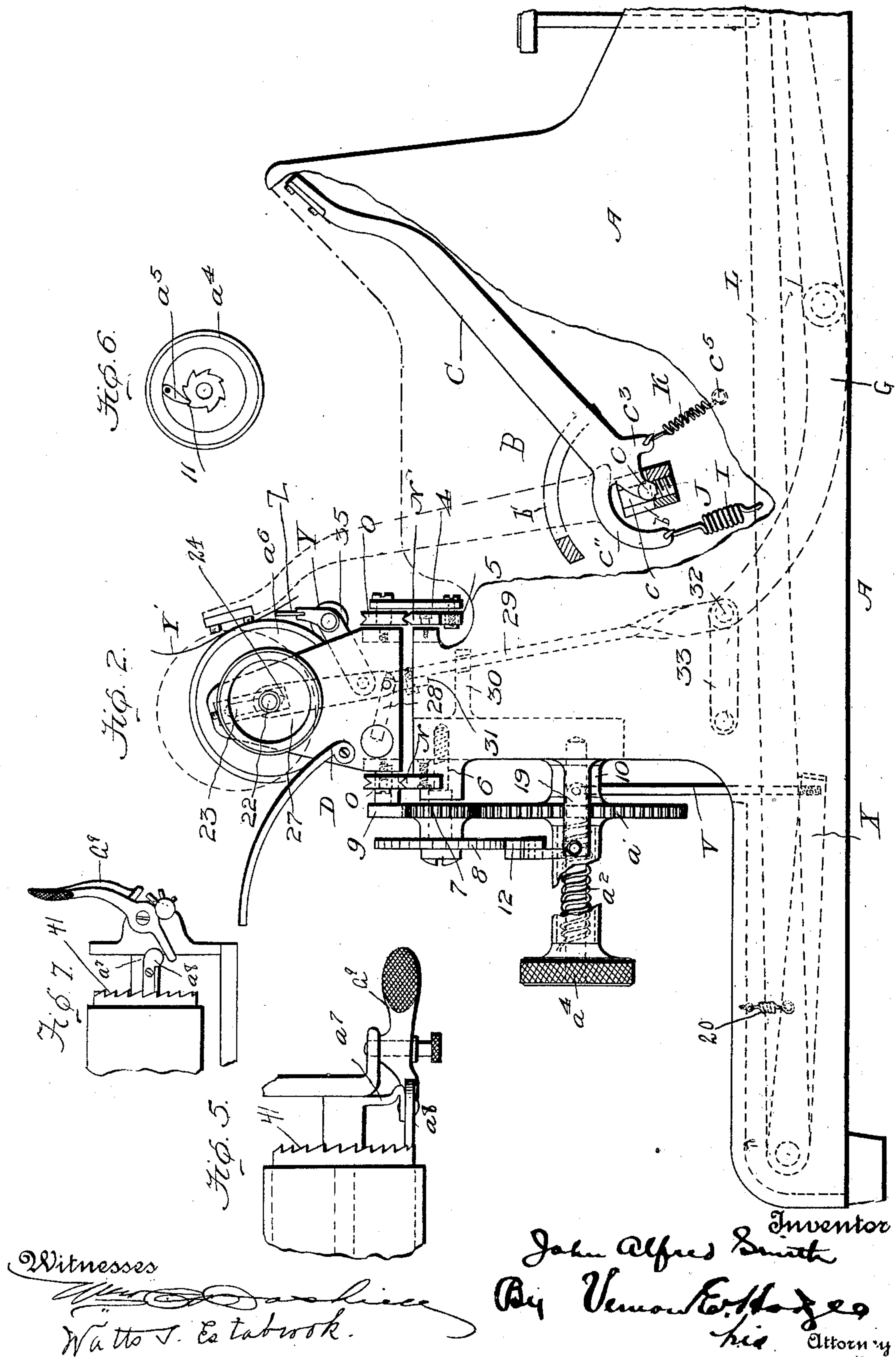
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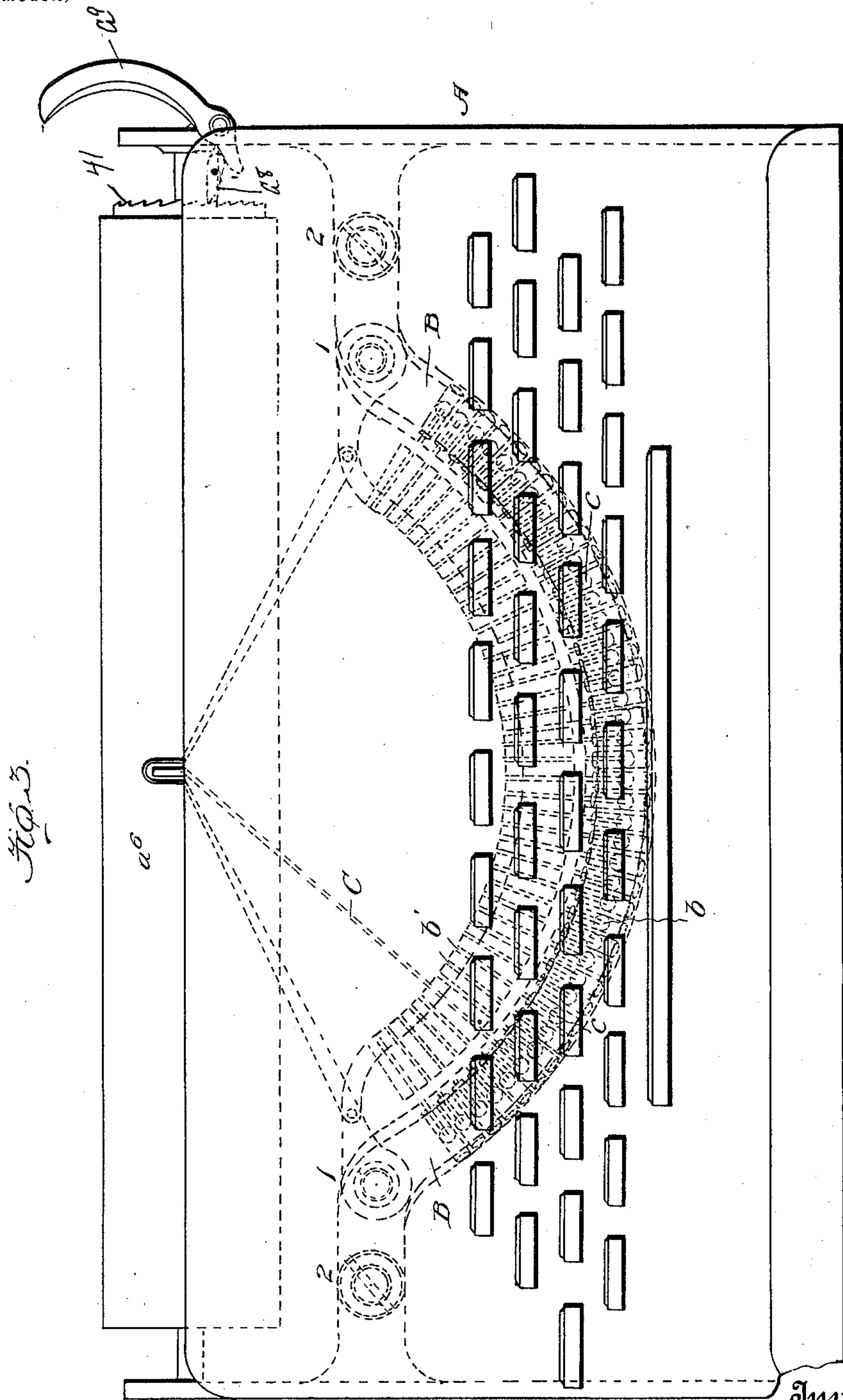
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4 Sheets—Sheet 3.



Witnesses

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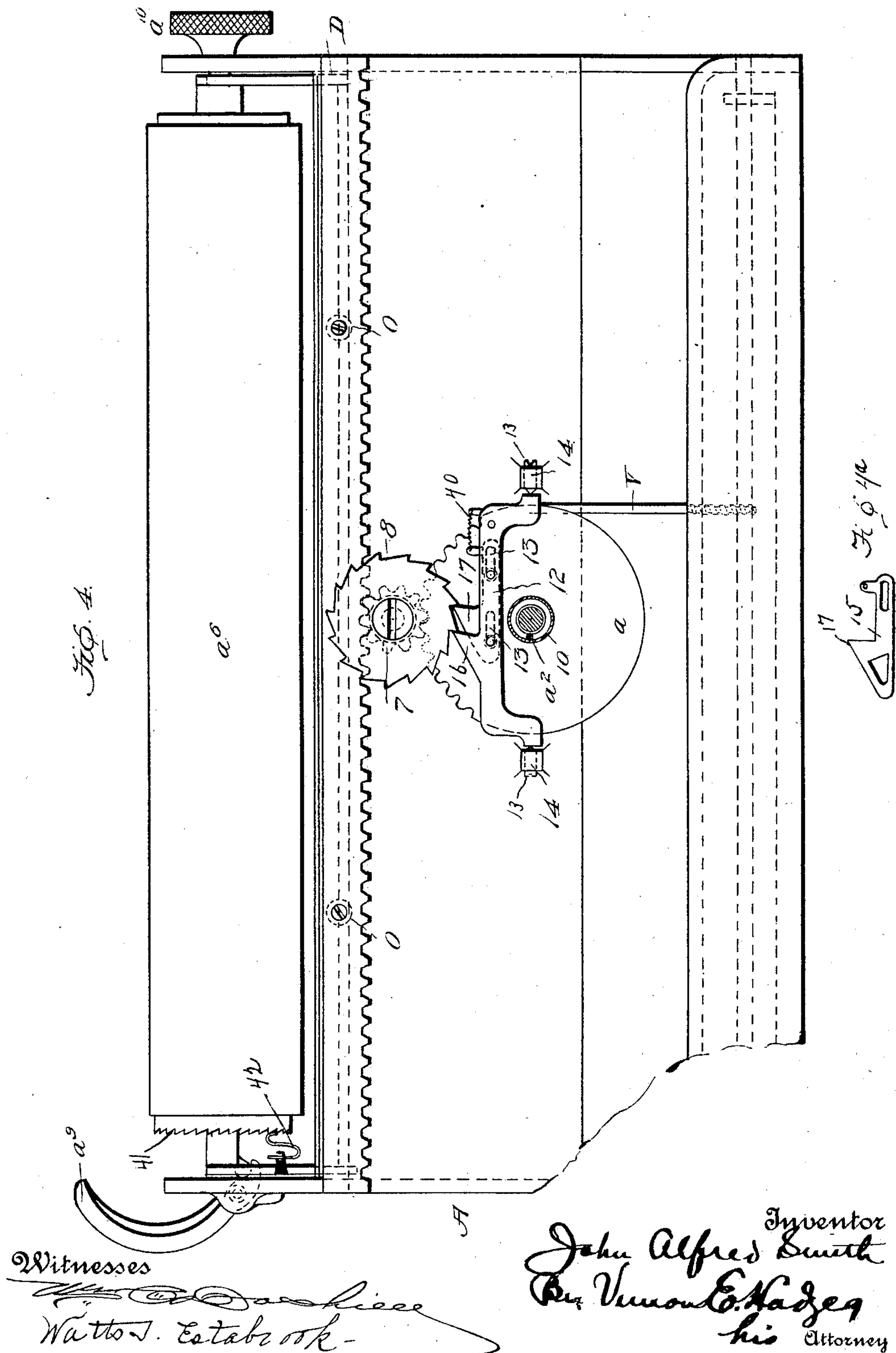
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4 Sheets—Sheet 4.



UNITED STATES PATENT OFFICE.

JOHN ALFRED SMITH, OF DERBY, CONNECTICUT.

TYPE-WRITER.

SPECIFICATION forming part of Letters Patent No. 711,358, dated October 14, 1902.

Application filed May 14, 1901. Serial No. 60,195. (No model.)

To all whom it may concern:

Be it known that I, JOHN ALFRED SMITH, a citizen of the United States of America, residing at Derby, New Haven county, State of Connecticut, have invented certain new and useful Improvements in Type - Writers, of which the following is a specification.

My invention relates to an improvement in type-writers.

10 A primary object is to provide a simple, light, and inexpensive machine which can be placed on the market at a comparatively small price and, furthermore, one in which the writing is always visible without the operator being compelled to raise and lower the carriage when he wishes to inspect what has been last written.

In the accompanying drawings, Figure 1 is a plan view of my improved type-writer. Fig. 2 is a view in side elevation, parts being broken away to show the internal construction. Fig. 3 is a view in front elevation, and Fig. 4 is a view in rear elevation. Fig. 4^a is a view of slotted slide 15. Fig. 5 is a detail in plan showing the line-space mechanism. Fig. 6 is a view of the knob *a*⁴, showing the locking-pawl; and Fig. 7 is a view in side elevation of the parts shown in Fig. 5 on a slightly-smaller scale.

30 A represents the frame of the machine, which may be made of sheet metal, cast or otherwise constructed, as desired, and it comprises front, rear, and sides, the latter extending upward at or near the center of the frame to house and guard and afford support for the working parts of the machine, and especially the type-bars when at rest.

B indicates a type-bar support. This is preferably made in two sections, as shown in Fig. 3, curved in the arc of a circle and secured together, as at 1 1, and to the sides of the machine, as at 2 2. This bed has a series of grooves *b b'* cut therein in alinement in the two sections, one for each type-bar, to form guides for the latter as they swing up and down and to insure the bars dropping out of the path of one another as fast as they are released. Cylindrical sockets *c c* are formed at points near the inner end of each of these grooves *b*, and in the lower ends of these cylindrical sockets cup-shaped bearings J are screwed. These bearings are made of the

hardest steel, at their inner ends at least, and are removably screwed into place, they having cup-shaped sockets at their upper ends. 55

C are the type-bars. These are preferably made of spring-steel of suitable thickness to fit and swing freely in and out of the grooves *b b*, and their width is such that they are prevented from turning or twisting in the grooves. 60

As the grooves are of greater length than the swing of the type-bars they always afford a guiding means for the type-bar from the beginning of its movement to the end thereof.

On its lower end each type-bar is provided with a ball-bearing *c'*, adapted to be slipped down through the cylindrical socket *c*, bored in the type-bed to receive it, and to rest upon the cup-shaped seat or socket formed in the upper or inner end of the screw-bearing J, 70

thereby forming a species of ball-and-socket joint for the type-bar. An arm *c''* extends forward from each type-bar and a lug *c*³ rearward. Links I extend downward from each of these forwardly-projecting arms *c''*. These links are extensible and preferably in the form of spiral springs of sufficient tension to swing the type-bar and cause the imprint of the type thereon upon the paper. Each link is connected with a key-lever L, so that as the lever is 80

depressed the motion is transmitted through the extensible link to the key-bar. In this way it is manifest that the key-bars are operated with uniformity regardless of the stroke upon the key, as the depression of the key through the key-lever gives tension to the link, which in turn vibrates the type-bar. Thus motion is communicated through the link, and the function of that link is to absorb the motion and prevent too sudden and severe a thrust of the type-bar which would result from a more direct and less yielding means of connection or communication of power between the two. As a convenient means for returning the type-bar to its normal position draw-back springs K K are employed, the latter extending from the lugs *c*³ to some stationary part—as, for instance, a rod *c*⁵, extending across from side to side of the machine. When it is desired to remove one of these type-bars, it is simply necessary to unhook the springs I and K⁵ therefrom and slide it out through the cylindrical sockets *c*, and to insert one the reverse only is necessary. To adjust the aline-

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ment or compensate for wear, a slight turn may be given to the cup-shaped bearing J without necessitating the removal of the type-bar. In this manner the adjustment, alinement, and renewal of parts is rendered easy and convenient and can be done by a person having ordinary skill without the necessity of employing a mechanic or one skilled in the manufacture of type-writers to make these slight alterations. Each type-bar may carry one or more characters, as the case may be, and in the present instance two only are shown.

D represents the carriage. This carriage carries the paper roll or platen a^6 and also the paper-feed roll Y, between which two rolls the paper Y' is held. The carriage D also carries a scale-bar Z, as shown in Fig. 2. The paper or platen roll a^6 has the usual crown-ratchet 41 on the right-hand end and a knob a^{10} on the left-hand end by which it may be turned, and on the right-hand end a line-space lever a^9 is provided for spacing the roll or platen through the pawl-yoke a^7 and line-space pawl a^8 by the act of returning the carriage to the right when the operator pushes his thumb or finger against the line-space lever a^9 . The roll or platen is held from backward movement by a spring-catch or similar means 42. The carriage is provided with rollers O O, by which it is mounted on rails N N', secured to the frame of the machine, and by means of these rollers and rails the carriage may be shifted back and forth or moved space by space, as the case may be. The carriage is kept from jumping the track by means of the depending arm 4 and roller 5, which travels against the lower edge of the rail N'. The carriage is moved forward by the following mechanism: A screw-stud 6 extends rearward from the center of the frame of the machine. On this stud the combined pinion 7 and ratchet-toothed escapement-wheel 8 is revolvably supported. The teeth of the pinion are intermeshed with the teeth of the rack-bar 9 on the carriage, on the one hand, and at the same time with the teeth of tension-wheel a' , mounted on the stud 10, projecting from the frame of the machine, on the other hand. A tension coil-spring a^2 is connected with gear-wheel a' at one end and with a knob a^4 , loosely mounted on the outer end of the stud 10, at its opposite end. This knob a^4 constitutes a winding-knob for applying tension to the coil-spring, and it is provided with a locking-pawl a^5 , which locks it to the shaft, as at 11, when the desired tension is given to the spiral spring. In this way it will be seen that no spring-drum, as ordinarily employed, is required, and that the usual strap is dispensed with, and in lieu thereof a direct application of power is brought upon the carriage and a much more uniform tension on the carriage than heretofore results. The escapement mechanism consists, in addition to escapement-wheel 8, of the rock-bar 12, which is pivoted in adjustable bearings 13 13 in arms 14 14 on either side of stud 10, and the slotted

slide 15, which has loose sliding connection with rock-bar 12, it being returned to its normal position by spring 40. Each of these parts 12 and 15 have a similarly-shaped tooth or projection 16 17, respectively. As these teeth are rocked back and forth in the spacing of the letters one tooth or projection 16 or 17 is always in engagement with a tooth of the escapement-wheel 8, thus permitting of the step-by-step motion only, and when the carriage is pulled back for the next line to be printed the pinion 7 turns independently of wheel 8 after the usual manner of these escapement mechanisms, this feature being so common it not being deemed necessary to show it in the present application. Connected with the rock-bar is the inwardly-projecting arm 19, and from the inner end of this arm 19 the escapement-link V extends downward to the universal bar X, and a spring 20 exerts a constant upward impulse upon this universal bar, normally throwing the rock-bar into the position shown in Fig. 2 out of engagement with the teeth of wheel 8 and the tooth or projection on the slide 17 into engagement with said teeth. The downward movement of the universal bar, caused by striking a key or the space-bar, swings tooth 16 into engagement with teeth of the wheel 8 and tooth 17 out, and so on, one tooth always holding the wheel until the other is in position to catch it when it turns the distance of a tooth.

The platen is shifted for upper and lower case in the following way: The journals 22 22 of the platen fit and turn in elongated diagonally-disposed guide-slots 23 23 in opposite ends of the carriage-frame. In the upper and lower ends of these slots are the adjustable V or U shaped bearing-blocks 24, adapted to receive the journals 22 22 in either of their extreme positions accordingly as the platen is up or down for large or small letters. The adjustment of the bearings is to exactly correspond to the relative distance apart of type on the type-bar, so that the extreme positions of the platen bring it opposite and in position to receive the imprint of one letter or the other, as the case may be. The journals of the roller likewise turn in the arms 27 27. These arms are connected together by the cross-bar 28, and a thrust-bar 29, passing loosely through a guide 30 at the center of the machine, has a roller 31 on its end, upon which said cross-bar 28 bears and travels when the platen is raised by the upward movement of the thrust-bar. The lower end of the thrust-bar is supported on a rod 32, and this is held in position by links 33 33. Shift-key lever G at one side of the machine is connected with rod 32 and operated to raise the platen, the weight of the latter and other parts connected therewith causing them to resume their normal position when pressure is removed from the shift-key. The clamping-roller 35 is connected with the arms 27 27.

From the foregoing it will be seen that the

parts of the type-writer are few, simple, and devoid of complications and that the writing is visible, the key-bars readily removable or adjustable, excessive jar to the type-bars is avoided, and that the tension upon the carriage is positive, direct, and uniform.

It is evident that slight changes might be made in the form and arrangement of the several parts described without departing from the spirit and scope of my invention, and hence I do not wish to limit myself to the exact construction herein set forth; but,

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

1. The combination with the frame of a type-writer, a carriage having a rack thereon, and a combined pinion and escapement-wheel, the pinion in engagement with the rack, of a gear-wheel in mesh with the pinion, means for applying tension thereto, an escapement comprising a rock-bar and sliding spring-actuated slide loosely connected together, the movement of the slide being parallel with the axis of movement of the rock-bar, and the rock-bar and slide each having a tooth adapted to be engaged by the teeth of the escapement-wheel.

2. The combination with the frame of a type-writer, a carriage having a rack thereon, and a combined pinion and escapement-wheel, the pinion in engagement with the rack, of a gear-wheel in mesh with the pinion, means for applying tension thereto, an escapement comprising a rock-bar and sliding spring-actuated slide loosely connected together, the movement of the slide being parallel with the axis of movement of the rock-bar, and the rock-bar and slide each having a tooth adapted to be engaged by the teeth of the escapement-wheel, an escapement-link connected with the rock-bar and a universal bar to which the link is connected.

3. The combination with the frame of a type-writer, and a carriage having a rack-bar thereon, of a pinion in engagement with the rack, a gear-wheel in engagement with the pinion, means for applying tension to the gear-wheel, an escapement comprising a rock-bar and sliding spring-actuated slide loosely connected together, the movement of the slide being parallel with the axis of movement of the rock-bar, and the rock-bar and slide each having a tooth adapted to be engaged by the teeth of the escapement-wheel.

4. The combination with the frame of a type-writer having track-rails thereon, a carriage having rollers which travel on said rails, and a rack on the carriage, of a combined pinion and escapement-wheel, the pinion in engagement with the teeth of the rack, a gear-wheel the teeth of which mesh with the teeth of the pinion, a knob, means for locking the latter, a spring extending from the knob to the gear-wheel, pivoted escapement mechanism operating in connection with the

escapement-wheel, and means for swinging this escapement mechanism back and forth.

5. The combination with the frame of a type-writer, a carriage and a rack on the carriage, of a combined pinion and escapement-wheel, the pinion in engagement with the teeth of the rack, a gear-wheel the teeth of which mesh with the teeth of the pinion, a knob, means for locking the latter, a spring extending from the knob to the gear-wheel, pivoted escapement mechanism operating in connection with the escapement-wheel, and means for swinging this escapement mechanism back and forth.

6. The combination with a frame having a guide at or near the center thereof, and a carriage mounted to move on the frame, the ends of the carriage having elongated guides therein, of a platen the journals of which have sliding connection with said guides, a thrust-bar sliding through the guide on the frame, and means for raising said thrust-bar.

7. The combination with a frame having a guide at or near the center thereof, and a carriage mounted to move on the frame, the ends of the carriage having elongated guides therein, of a platen the journals of which have sliding connection with said guides, a thrust-bar sliding through the guide, arms in which the journals turn, a cross-bar connecting these arms, a thrust-bar passing loosely through the guide, a roller on the thrust-bar on which the cross-bar travels when the platen is raised, and a shift-key lever for raising the platen.

8. The combination with a frame having a guide at or near the center thereof, and a carriage mounted to move on the frame, the ends of the carriage having elongated guides therein, of a platen the journals of which have sliding connection with said guides, a thrust-bar sliding through the guide, arms in which the journals turn, a cross-bar connecting these arms, a thrust-bar passing loosely through the guide, a roller on the thrust-bar on which the cross-bar travels when the platen is raised, and a shift-key lever for raising the platen, a rod on which the lower end of the thrust-bar is supported, and links for holding said rod in position.

9. The combination with the frame of a type-writer and the carriage mounted to slide thereon, the ends of the carriage having elongated slots disposed diagonally therein, of the platen, the journals of which turn and are capable of sliding in the slots, arms in which the journals turn, a cross-bar connecting the arms, a thrust-bar having a roller on its upper end on which said cross-bar bears and slides when the platen is raised, and means for raising the thrust-bar.

10. The combination with the frame of a type-writer and the carriage mounted to slide thereon, the ends of the carriage having elongated slots disposed diagonally therein, of the platen, the journals of which turn and are capable of sliding in the slots, arms in which

the journals turn, a cross-bar connecting the
arms, a thrust-bar having a roller on its up-
per end on which said cross-bar bears and
slides when the platen is raised, and means
5 for raising the thrust-bar, and paper-clamp-
ing roll having pivoted connection with said
arms.

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

JOHN ALFRED SMITH.

Witnesses:

DANIEL E. MCMAHON,
ALFRED JOHNSON.