

(No Model.)

6 Sheets—Sheet 1.

A. T. BROWN.
TYPE WRITING MACHINE.

No. 465,451.

Patented Dec. 22, 1891.

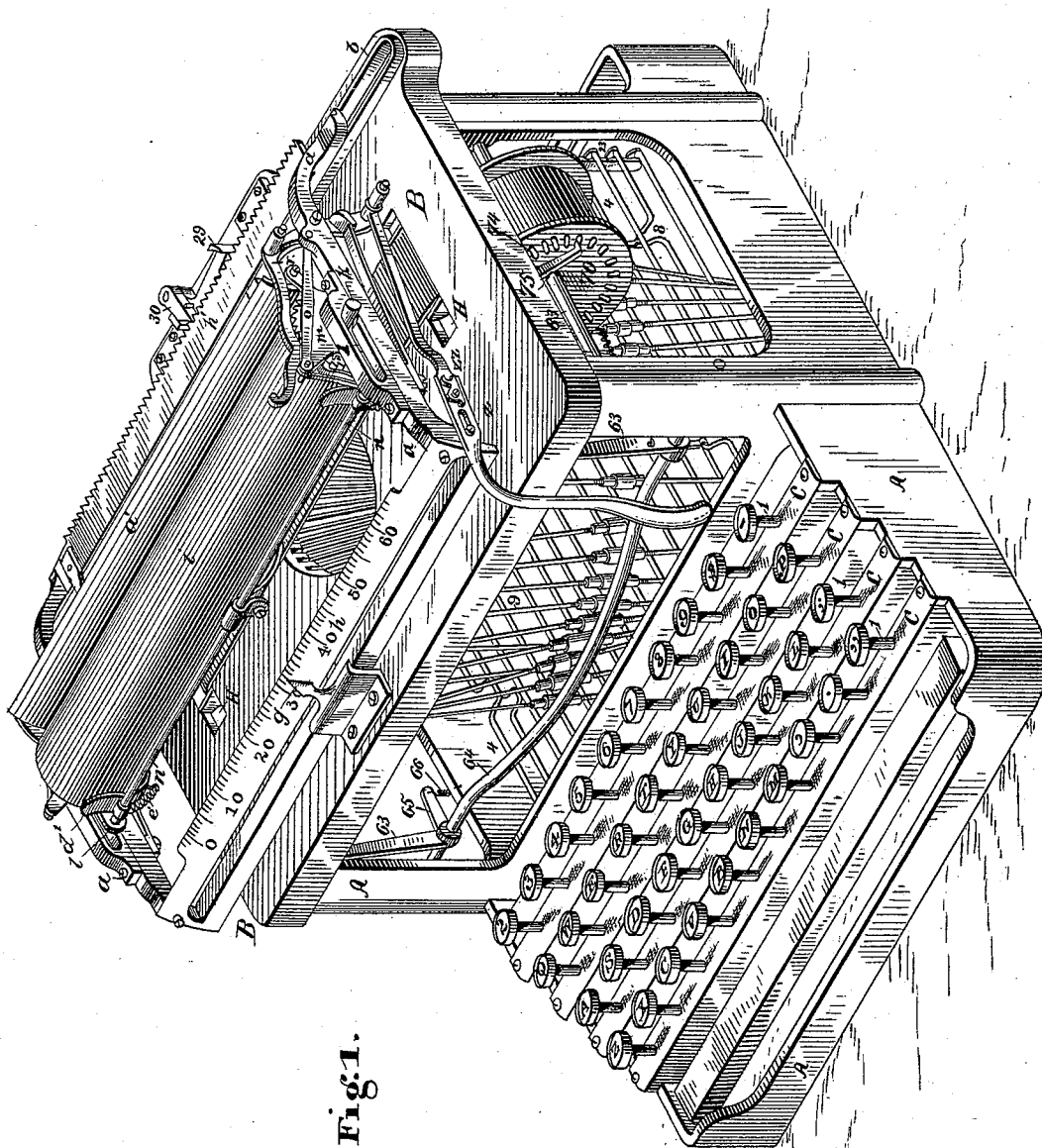


Fig. 1.

Witnesses
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By his Attorney
Wallace A. Bartlett

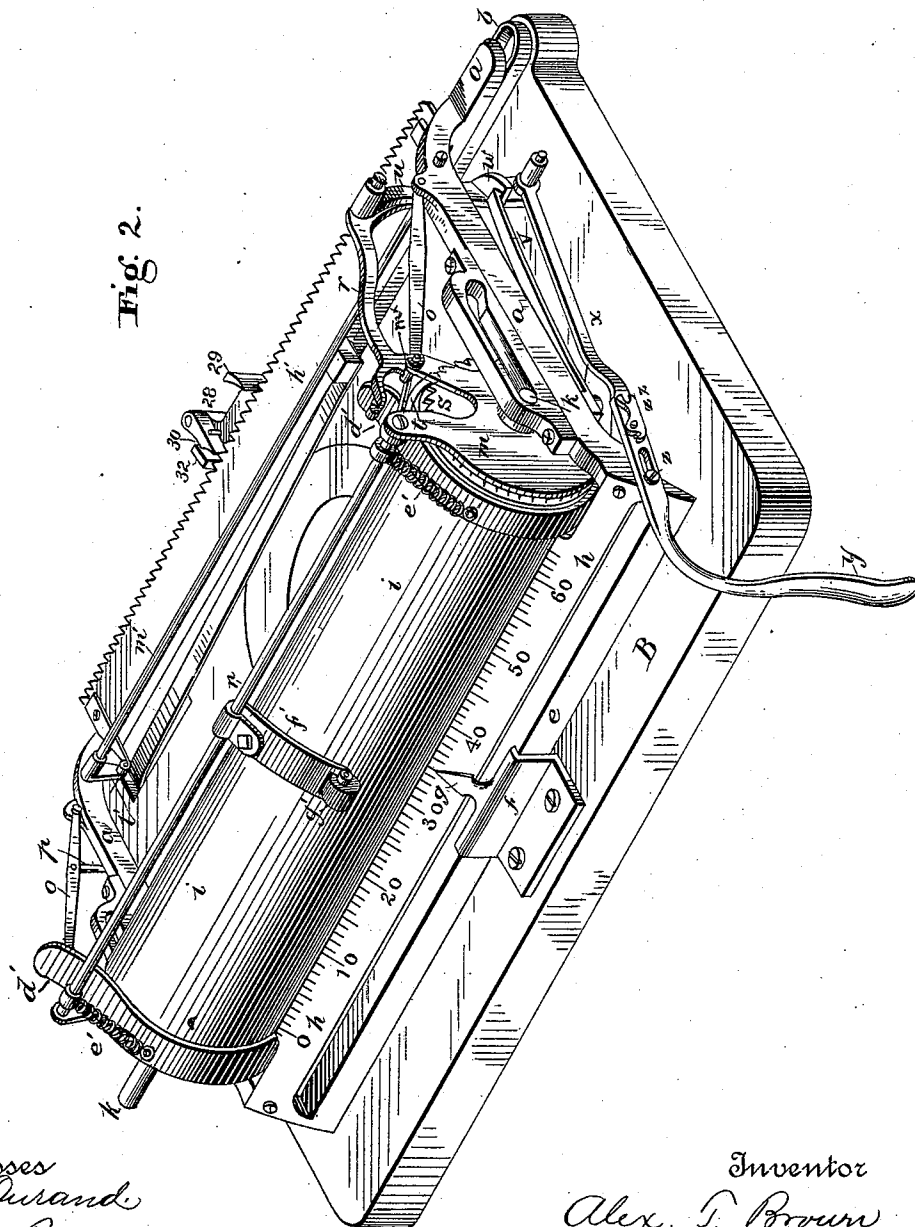
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6 Sheets—Sheet 2.

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6 Sheets—Sheet 3.

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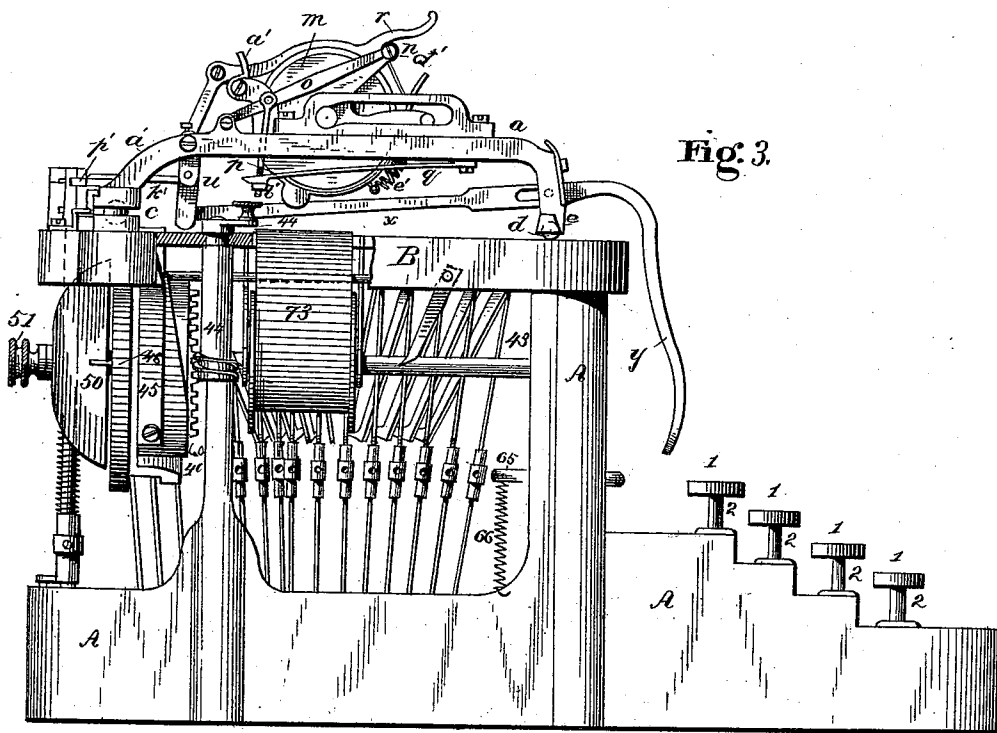


Fig. 3.

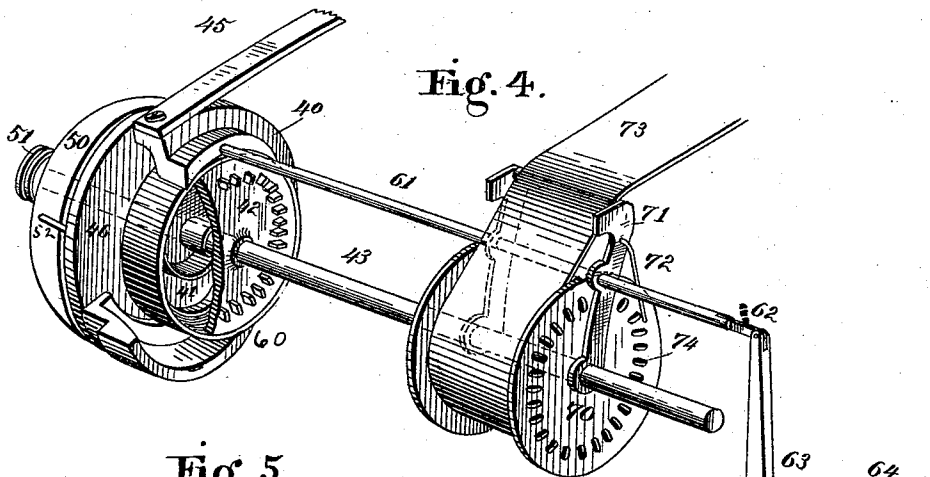
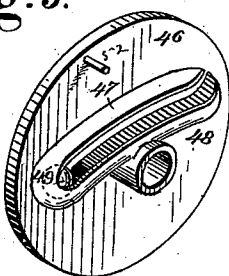


Fig. 4.

Fig. 5.



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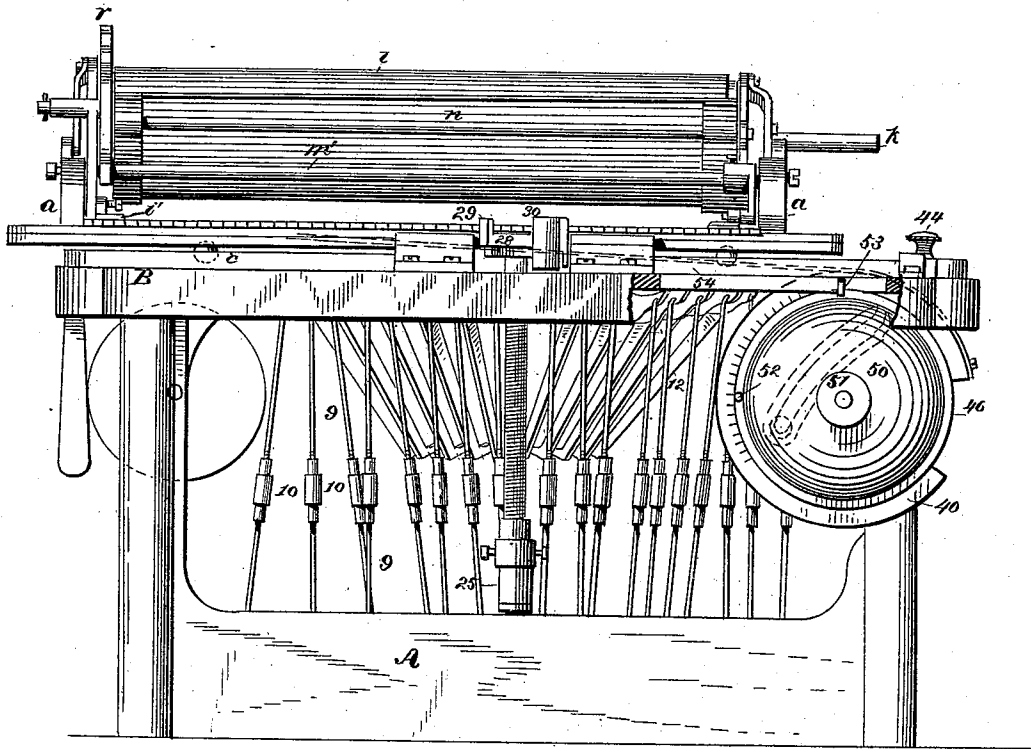


Fig. 6.

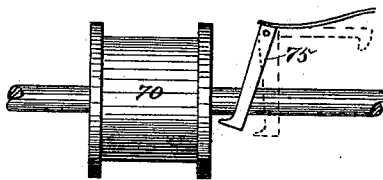


Fig. 6a.

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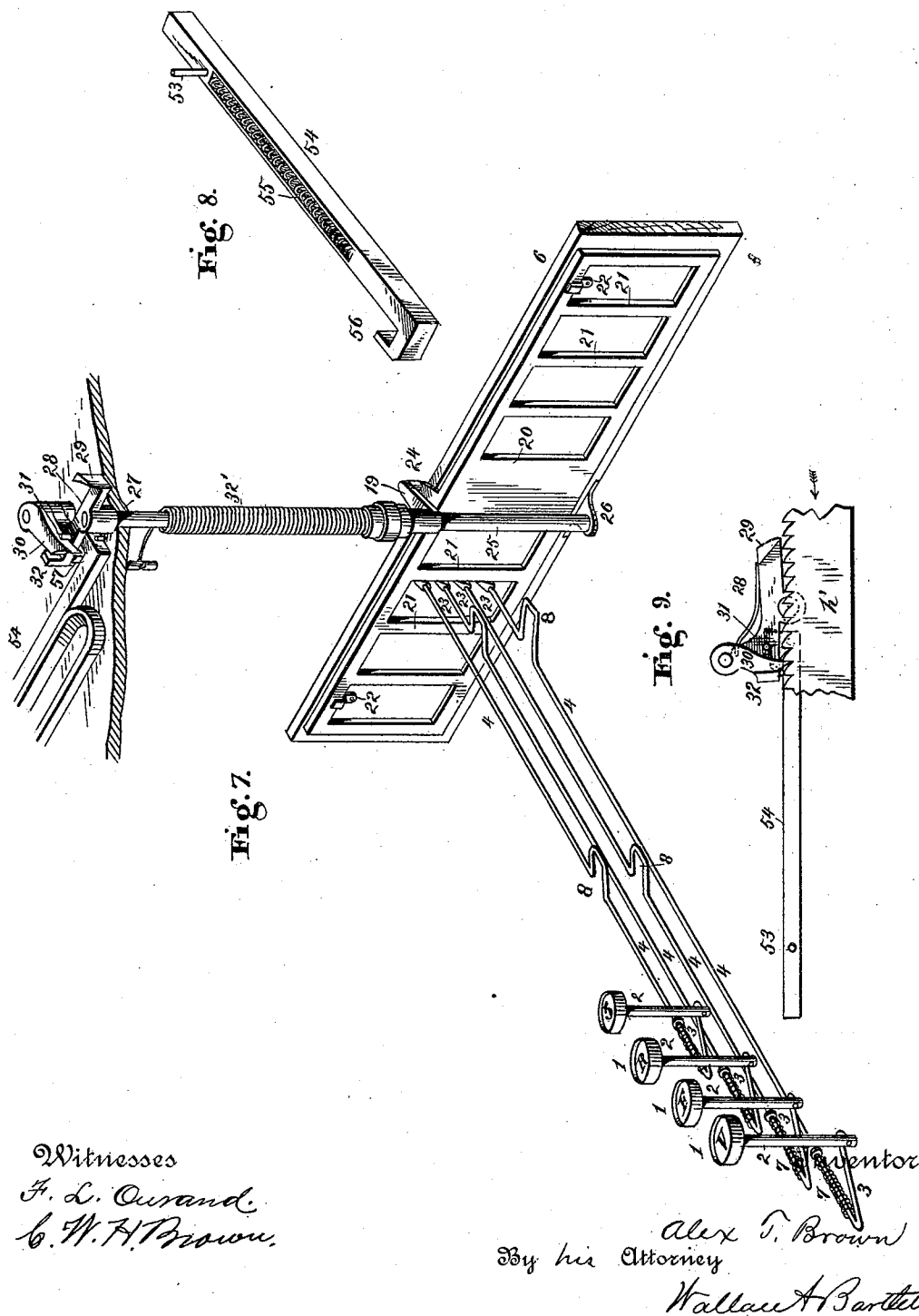
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(No Model.)

6 Sheets—Sheet 6.

A. T. BROWN.
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Fig. 10.

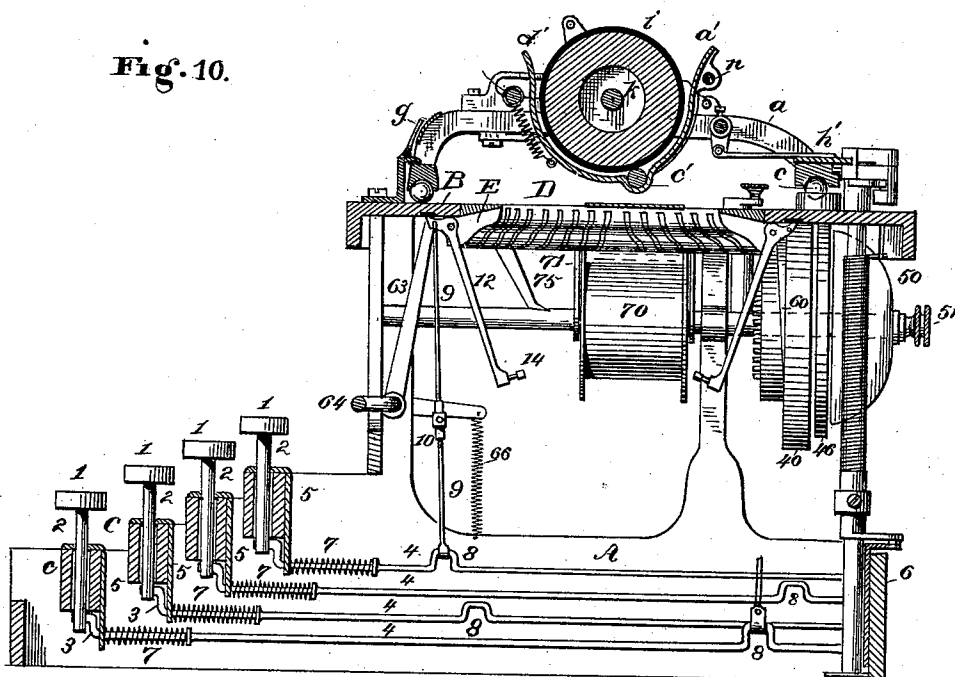


Fig. 11.

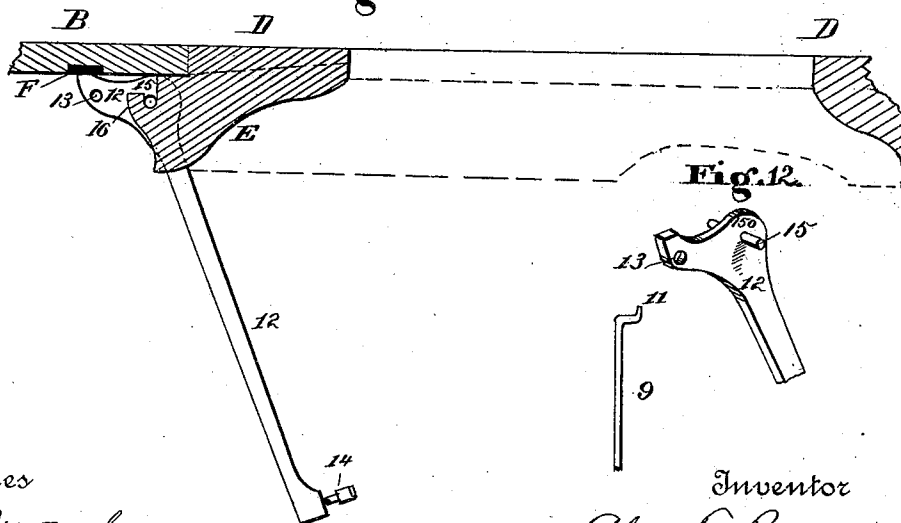
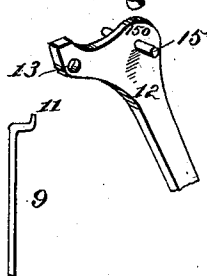


Fig. 12.



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UNITED STATES PATENT OFFICE.

ALEXANDER T. BROWN, OF SYRACUSE, NEW YORK.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 465,451, dated December 22, 1891.

Application filed November 1, 1886. Serial No. 217,700. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER T. BROWN, residing at Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to type-writing machines; and it consists in general improvements to the various parts of the machine, substantially as hereinafter indicated.

The main features of the invention and improvement may be briefly enumerated as follows: first, in the key system, the keys being connected to rock-shafts, which in turn are connected to the pivoted type-levers; secondly, in the carriage feed mechanism, the carriage being rendered operative by an escapement worked by peculiar devices connected with the rock-shafts; thirdly, in the stop mechanism by which the printing devices are rendered inoperative when a line is completed; fourthly, in the alarm mechanism, which is of peculiar construction and made to be adjusted so as to indicate the completion of a line at any desired position; fifthly, in the construction of the paper-holding roll and carriage and the mechanism by which the paper sheet is brought up for inspection; sixthly, in the ink-ribbon shifting and operating mechanism; seventhly, in the general improvements of construction and combination of parts of the machine.

In the drawings, Figure 1 is a perspective view of the type-writing machine with the paper-carrying roll or platen in working position. Fig. 2 is a perspective of the top portion of the machine with the paper-carrying platen turned into position to bring up the writing for inspection. Fig. 3 is a left-hand end elevation of the machine, parts being broken away. Fig. 4 is a perspective of the alarm and one end of the ribbon-shifting apparatus. Fig. 5 is a perspective of the bell-hammer guide. Fig. 6 is a rear elevation of the machine, parts being broken away. Fig. 6^a is a detail or diagrammatic representation of the ribbon spool and pawl at one end of the machine. Fig. 7 is a diagrammatic perspective of a set of keys, their rock-shafts, and the connections by which the escapement is op-

erated. Figs. 8 and 9 are details thereof. Fig. 10 is a cross-section about centrally through the machine, parts being omitted. Fig. 11 is a sectional detail showing the manner of hanging the type-levers. Fig. 12 is a perspective detail of a type-lever.

The reference-letter A indicates the frame of the machine, which preferably incloses the key-shafts and connections about in the manner shown. B is the top plate of said frame, on which the paper-carriage rests and has movement. The frame has supporting-bars C, in which the stems 2 of the finger-keys 1 have sliding bearings. (See Fig. 10.) Each finger-key 1 is pivotally connected at its lower end with a crank 3 of a rock-shaft 4, (see Figs. 7 and 10,) there being in the present machine one rock-shaft for each key. The rock-shafts 4 have bearings in the plates 5 and 6, which are respectively near the front and rear of the machine, and the cranks 3 on the rock-shafts are at such an angle that the depression of a key 1 will rock the shaft connected to said key, the torsional spring 7 on the shaft serving to return it to the normal position. Each rock-shaft 4 has a crank or equivalent 8 at such part of its length as will correspond with the position of the type-lever which this rock-shaft is to operate, and the crank 8 has a pitman 9, leading and pivoted to the short arm of the type-lever. These pitmen 9 are in two parts and may be lengthened or shortened by turn-buckles 10. The upper end of each pitman-rod 9 is hooked, as at 11, Fig. 12, the hook passing through a hole 13 in the short arm of type-lever 12. The printing characters 14 are on the long arms of the levers 12 and are arranged to strike toward a common center, as usual in type-writers of this class. The ring or "basket" D, which supports all the type-levers, has a series of brackets E depending from its lower surface, these brackets having hooks 16 at their ends farthest removed from the central opening of the ring. (See Fig. 11.) There will thus be a groove between each pair of brackets E, these grooves all being radial. The brackets are integral with ring D, and the grooves between them correspond in width and shape to the thickness of the type-levers 12. The type-lever 12 may have the trunnion-piece 15 cast integral therewith or may be struck out or

punched from a plate. That portion of the lever above the trunnion, as at 150, Fig. 12, is struck on a curve eccentric with the trunnion. The pitman 9 is bent at its upper end nearly at a right angle, and is then again bent in a direction about parallel with its body portion. This peculiar form of hook is much more easily applied than the common form, and when all the parts are in place is equally durable. Each type-lever 12 has trunnions 15, which trunnions are dropped into the hooks 16 of brackets E. Then when the ring D is secured to place in the top plate B of the frame the swell of the lever above the trunnions will come in contact with the lower surface of plate B and all the levers will be securely held in the hooks. A ring or cushion F, of lead, copper, rubber, or similar material, set in the lower part of the plate B, serves to diminish the noise and jar when the inner ends of the type-levers drop down. As will be plainly seen in Fig. 10, the depression of a finger-key serves to rock the corresponding shaft 4, drawing down on pitman 9 and raising the printing character 14 of type-lever 12 until it strikes through the inking-ribbon against the paper carried by roll *i*. The release of the finger-key permits the torsion-spring 7 to restore the rock-shaft, type-lever, and key to their normal positions. At the rear of the frame, just inside the plate 6, in which the ends of rock-shafts 4 are journaled, there is a grate 20, having cross-bars 21, said bars being preferably perpendicular. The grate 20 is held against the plate 6 by hooks or brackets 22. (See Fig. 7.) At the rear of each rock-shaft 4 and firmly attached thereto there is an arm or finger 23, preferably rounded at one side, which side has a bearing against one of the bars 21 of the grate. The rocking of any one of the rock-shafts, therefore, will bring this finger against the bar, and the finger, acting as a cam-lever, will force the bar and grate to one side. A projection 24 extends from one side of the grate 20. The upright shaft 25, having bearings in the frame, as at 26 and 27, has an arm 19, pivotally connected to this projection 24 of the grate by a loose pivot. The shaft 25 bears at its top a cross-bar 28, which has one tooth 29 of the verge mechanism firmly attached thereto. The other tooth 30 is a spring-tooth and is pivoted to the upper surface of bar 28 or a projection therefrom, and is by its spring pressed against the stop 31, but may be forced back so as to be held by stop 32. The shaft 25 is held by torsion-spring 32' in such position as to bring the spring-tooth 30 into engagement with a tooth of the rack *h'*, and the spring which draws the carriage will draw this rack *h'* in the direction of the arrow, Fig. 9, thus swinging the tooth 30 back against stop 32, where, as the tooth 30 can swing no farther, the rack is held by said tooth; but when a key is struck the arm 23 on the rock-shaft 4, connected to said key, bearing against one of the bars 21 of the grate 20, moves said

grate longitudinally. By means of the arm 19, connected to said grate, the shaft 25 is slightly rocked on its axis, thus carrying tooth 29 of the escapement into contact with a tooth on the rack *h'* and at the instant thereafter disengaging tooth 30 from the rack. The tooth 30 is then thrown forward by its spring until it comes against stop 31. When the key is released, the torsion-spring 32' rocks the shaft 25 (thereby moving the grate 20 back to normal position) and by the same movement engages tooth 30 with rack-bar *h'* and disengages tooth 29. As soon as tooth 29 is disengaged the pressure of rack *h'* against spring-tooth 30 presses it back against stop 32, when the movement of the rack and carriage will cease. The carriage is drawn forward, when permitted to move, by the escapement by the spring-wheel 40, driven by spring 41, said spring having one end attached to the geared disk 42 on shaft 43, which shaft is suitably supported on bearings in the frame. The disk 42 may be turned by worm 44 engaging the teeth thereon, so as to give proper tension to the spring. (See Figs. 3 and 4.) The spring-wheel 40 has a belt 45 attached thereto, which belt is attached to the paper-carriage, as is usual. A disk 46 is mounted on shaft 43 at the rear side of the spring-wheel and has a pair of guide-ribs 47 48 on its rear face, said ribs forming an inclosing trough for a ball 49. One end of the trough is open, so that the ball will project from the trough when it falls to the open end thereof. The disk 46 is held against the spring-wheel, and the bell 50 is held in proximity to the disk 46 by a nut 51 at the rear end of shaft 43, the hub of disk 46 determining the distance between the bell and disk. The spring-wheel 40 is splined, keyed, or otherwise secured to shaft 43, so as to cause said shaft to rotate therewith. By reason of frictional contact the disk 46 and the bell will also rotate with the spring-wheel.

To determine the point at which the alarm shall be given, it is only necessary to loosen the nut 51 and turn the disk 46 so that the ball 49 will be in the closed part of its trough and below the axis of said disk while the carriage is moving to print a line. The rotation of the disk will bring the ball 49 above the axis, when it will roll along the trough and strike the bell, this being the signal that the line is complete, or nearly complete. The disk 46 has a pin 52 near its periphery. (See Fig. 6.) As disk 46 rotates this pin 52 engages a projection or pin 53 on stop-bar 54, and the further rotation of the disk tends to draw this bar along against the force of its inclosed spring 55. The end of the bar 54 away from disk 46 has a hook 56. As the bar is drawn in the direction of its length the hook 56 hooks round a pin or projection 57 beneath the escapement-bar 28, and thus holds said escapement from vibration, thereby locking the shaft 25, and with it the grate 20, rock-shafts 4, and keys 1, so that the printing

mechanism cannot be operated until the paper-carriage is drawn back. (See Figs. 6 and 7.) The spring-wheel 40 has a face-cam 60, projecting toward the front of the machine. A rod 61 bears against this face-cam and is connected by a pivoted link 62 with an arm 63 on rock-shaft 64. This shaft 64 is rocked by a spring 66, connected to arm 65 and to the frame, or in other suitable manner connected so as to bring endwise pressure on rod 61. The arm 63, link 62, and rod 61 (shown in Fig. 4) are duplicated at the other end of the machine, (see perspective, Fig. 1,) so that the cam 60 will press the rod 61 forward and the spring 66 will draw both rods backward, the rods being suitably supported on the frame of the machine.

At each end of the machine there is a ribbon-spool 70, hung in a frame 71. The frame 71 is supported at the driving end of the machine by a shaft 43, and at the opposite end a corresponding shaft 83 supports the other frame and its spool. The frames 71 71 slide freely on the shafts 43 and 83, and are made to move and to retain positions parallel to each other by the mechanism just before described, these frames 71 being secured to rods 61. As the face-cam 60 revolves it will permit the oscillation of rock-shaft 64 and both ribbon-spools and their frame will be pressed toward the rear of the machine. As the ribbon 73 extends from one spool to the other through slots H in the top plate of the machine, (these slots being much longer than the width of the ribbon,) the movement of the spools and their frames will carry the ribbon with it. Thus there will be a slight movement of the ribbon sidewise with each forward movement of the paper-carriage, and this movement of the ribbon is just sufficient to pass the width of the ribbon across the printing position of the types while the paper-carriage is moving the length of the machine. This is the only movement of the ink-ribbon while the carriage is going forward—that is, a lateral movement of the ribbon equal to its width. The ribbon-reels may be held against rotation by a friction-brake, as 72, Fig. 4.

The spool 70 is shown in Fig. 10 in its rear-most position, and a spring-pawl 75 in same figure is shown in position to engage one of the notches 74, Figs. 1 and 4, in the end of said spool. The drawing back of the carriage causes the cam or shifter 60 to shift the spools and their carriages endwise, and thus engage the pawl 75 in one of the notches 74. As this engagement is at one side of the axis of the spool, the further shifting of the spool will cause it to rotate on its shaft, and thus wind the ribbon from one spool to the other a distance about equal to the width of a printing character. There is a spring dog, catch, or pawl 75 at each end of the machine, and either one or the other may be thrown into position to engage the notches 74 in spool 70, thus leaving it optional which way the ribbon shall be moved in the direction of its length.

The dogs 71 are independent of each other. Each dog is held normally at an incline, as shown at Fig. 6^a, so that its toe will engage one of the notches in the end of a spool when the spool is forced toward the dog. When the spool presses the dog back to a perpendicular position, the spool will have been turned a distance equal to the downward movement of the toe of the pawl in reaching a perpendicular from the normal inclined position. While the pawl at one end of the machine is in position to engage its spool that at the other end will be thrown entirely out (by the hand of the operator) and will remain out until it is desired to reverse the movement of the ribbon. The paper-carriage *a* is supported on the top plate B of frame A by balls *c*, running in groove or guideway *b* at the rear side of the carriage, and by a ball *d* in a groove in the bottom of front bar *e* of the paper-carriage, resting on the top of the plate B. The front bar *e* passes under a flange on gib *f*, which gib is secured to the top plate of the frame and bears an index-finger *g*. There is a similar gib at the rear to hold the rear bar of the carriage. The front bar *e* of the carriage has a scale or index, as at *h*, and runs in close proximity to this index-finger *g*. The index-finger *g* is in front of the striking position of the type, and thus points on the scale the position opposite to that in which the type will strike the paper.

The paper-holding or impression roll or platen *i* is supported so as to rotate on the axial shaft *k*. The surface of the paper-roll is of hard rubber or similar material, as usual. The shaft *k* has its bearings in the slots *l* in the end bars of the paper-carriage. These slots *l* at their rear ends are preferably slightly depressed, so as to form bearings for the shaft *k*. Shaft *k* is splined or otherwise firmly secured to the inclosing end plates *m* of the roll *i*. The plates *m* are connected by bars *n n*, which bars are parallel with the axle *k*. At each end of the carriage *a* there is a link *o*, pivoted at its rear end to the carriage *a* and at its front end pivoted to the plate *m*, to which it is in proximity at a point above axle *k*. One of these links *o* has a rod *p* pivoted thereto, and rod *p* passes through a slot or hole in spring *q* on the carriage. The rod *p* has a thread and nut below said spring, by which the tension of the spring may be adjusted. The pull of the spring *q* on rod *p* tends to depress plates *m*, and thus draws the shaft *k* back, so that it finds its seat in the depressed or rear portion of slots *l*, as in Figs. 1 and 3, unless the shaft is forced forward, as in Fig. 2, to a point where the shaft *k* is beyond a perpendicular from the forward pivots of links *o*, when the spring *q*, drawing downward on link *o* through its connections, will tend to press the shaft *k* toward the front of slots *l*. The movement of shaft *k* to the front of slots *l*, just above described, is for the purpose of exposing the printing on the paper borne by the paper roll or platen *i*. The

roll in its forward position is in close proximity to the scale-bar *h* of the carriage and the line last written is just above the edge of said scale-bar, the finger *g* indicating the position at which the types will print. To correct or replace a letter, therefore, it is only necessary to swing the paper-roll *i* forward to the position shown in Fig. 2, which may be done by drawing directly forward on shaft *k*, then move the paper-carriage to such position that the index-finger *g* comes opposite the position on the paper where the correction or impression is to be made, and then press the paper-roll back to printing position and strike the proper key. It will be seen that the forward movement of the roll on the carriage causes that side which was beneath to come to the front, the pivot at the front ends of the bars *o* being the center of motion around which the axle of the roll moves as far as it is permitted to do by the slots *l*. The single scale and index thus serve the purpose of the double or reversed index common to many kinds of type-writers.

The rotation of the paper-roll or platen *i* to shift the paper to begin on a new line is effected by the pawl *r* engaging ratchet *s* on the roll. The roll is held normally from rotation by spring-pawl *t*, Fig. 2, bearing on the teeth of the ratchet with frictional contact. Pawl *r* is hung at the rear to lever *u*, which is pivoted to the carriage and is pressed back below its pivot by spring *v*, bearing on an inclined boss *w* on said lever *u*. The draw-bar *x*, which slides longitudinally with reference to the paper-carriage, is pivotally connected to the lower end of lever *u*, and when said bar is drawn forward by its handle *y* the lever *u* is moved on its fulcrum or pivot, drawing the dog *r* with it, and thus turning the paper-roll a distance proportioned to the movement of draw-bar *x*. This movement of bar *x* may be more or less, the extreme amount of movement being determined by a stop *z*, engaging a slot in said bar and serving, also, as a support and guide to a right-line movement. A turn-button *z z* on said bar *x* may be thrown into position to limit the draw of bar *x*, so that pawl *r* will move the ratchet-wheel a distance of but one tooth, while the normal movement may be equal to the space occupied by two or more teeth. The pawl *r* is held up by a stop *m'*, Fig. 2, on plate *m* when the paper-roll is forward, as in Fig. 2, so that it does not engage the ratchet-wheel. In this forward position the paper-roll can be turned in either direction by hand against the friction of spring-pawl *t* bearing on ratchet-wheel *s*, said pawl *t* being rounded. The pawl *r* may be lifted by hand out of engagement with the ratchet-wheel *s* at any time, and will then serve as a handle for actuating rack *h'* without moving the paper-roll.

The auxiliary carriage or cradle, which contains the impression roll or platen *i*, consists of the two end plates *m m* and the longitudinal

bars *n n* and the other attachments now about to be described. The apron *a'* is attached to the rear rod *n* and follows the curve of the roll *i*, leaving a little space between said apron and said roll, into which space the sheet of paper enters. The lower edge of apron *a'* is curved to form a trough *b'*, which trough forms a cover for a small roller *c'*, which is journaled therein. This roller *c'* is just a little in rear of the position where the printing characters strike upward against the paper and serves to hold the paper snugly against the roll or platen *i*. The apron *a'* terminates in the trough *b'*; but at the ends next the plates *m m* forward extensions *d' d'* from said apron form spring-bands, which generally follow the outline of the roll *i*, but are curved outward at their upper forward ends, which are above the front rod *n*. These bands or shields *d' d'* are connected to the front rod *n* by springs *e' e'* and serve to guide the sheet after it is written, the springs holding these guides toward the roll *i* with such pressure as to cause it to lie smooth thereon. At about the middle of the front rod *n* there is a spring-plate *f'*, having a small friction-roll *g'* journaled thereto, said roll *g'* bearing on the sheet of paper as it follows the roll after the printing. The forward movement of the draw-rod *x* by means of handle *y* serves to disengage the rack-bar *h'* from its operating-pawls, said bar *h'* being connected to the lever *u* by a link *i'*, and at the other end of the bar, by a similar link *k'*, to an arm *l'*, extending downward from rock-shaft *m'*, which shaft *m'* forms the pivot of lever *u* and is secured to said lever, so as to rock with the oscillation of said lever.

It will be apparent from the foregoing description that the connections from the rock-shafts 4 to the type-levers may be made with almost any leverage, so as to operate with greater or less power, in proportion to the movement of the keys, and that the leverage may be different in the different levers, so as to cause one or more letters to strike with a greater or less force than the other letters. The rock-shafts 4 as they rock in their bearings will move with great speed, and almost any desired rapidity of movement of the type-levers and keys may be had.

The device for locking the escapement, and thereby holding the printing mechanism, while it does not prevent the movement of the paper-roll, does prevent the printing of letters after the determined end of the line is reached, and thus the last letter of the line cannot be defaced by a stroke on a key after the line is complete. The result—that of locking the printing mechanism while leaving the paper mechanism free—I believe to be new.

The power mechanism for moving the carriage, which may be the spring-wheel or any known equivalent thereof, carries its alarm into operative position at any predetermined point. The spring-wheel may be indexed, as

shown in Fig. 6, so that the alarm (and consequently the locking-stop) may be readily set to any desired position.

The ball which operates the bell may be a tongue of usual form, hung near the center of the bell, so as to fall when past the center, and preferably held by a stop from moving in the other direction. I prefer the ball in a guideway for convenience of construction, and I consider the invention to be broadly the combination of an adjustable alarm with the carriage-driving mechanism.

As the side feed of the ribbon causes the ink to be taken by the types from a portion of the surface extending in a straight line across the ribbon and as the movement of the ribbon lengthwise by the drawing back of the carriage is equal to the width of the type, it follows that the printing of successive lines exhausts the ribbon about equally of its ink.

The power mechanism connected with the spring-wheel or having any equivalent relation thereto may be any known equivalent of the cam.

The ribbon-carrier consists of the spools, guide-frames, and their support.

The sidewise movement of the belt can be positive in both directions from the carriage, or from any other part of the machine.

So far as I am aware I am the first to devise a mechanism for shifting the ribbon and its carrier laterally, thus exhausting a section straight across the ribbon before moving it lengthwise by means of the pawl or spool-shifter.

The rocking of the paper-roll forward without raising the paper-carriage enables the operator to inspect the work quickly, and while the roll is thus forward the carriage may be shifted to any desired position, the index-finger always pointing to the place on the roll where the printing will begin when the roll is pressed back, so as to be in position to receive the impression.

The arrangement by which a single index is made to show accurately the position of a letter on a sheet, both as to alignment and justification, I believe to be broadly new.

The mechanism is susceptible of many modifications, and I have already devised several which I consider the equivalents of the mechanism heretofore described herein.

I claim—

1. In a type-writing machine, the combination of a finger-key, a journaled rock-shaft connected to said finger-key, and a type-lever pivoted to the frame and operatively connected to the rock-shaft, substantially as described.

2. The combination, in a type-writing machine, of a set of finger-keys, a set of journaled rock-shafts, each shaft having a crank connection to the corresponding key, a set of type-levers, and a pitman connecting from an offset in each rock-shaft to the corresponding type-lever, as stated.

3. The combination, with a series of finger-keys, of a series of journaled rock-shafts, each shaft having crank connection with its corresponding key, offsets from the shafts differing in length and location with reference to the keys, type-levers hung in the frame, and pitmen connecting the offsets in the rock-shafts with the type-levers, substantially as described.

4. The rack-bar of the paper-carriage, an escapement consisting of a fixed tooth and a yielding tooth borne on a single bar, and an upright shaft to which said bar is secured, said upright shaft being loosely pivoted to the reciprocating grating, so as to be rocked thereby, the specified elements being combined substantially as described.

5. The combination of the keys, the rock-shafts connected thereto, the sliding grating, and stop mechanism, substantially as described, connected to the grating, whereby the grating and all the rock-shafts and keys may be locked.

6. The combination, in a type-writing machine, of adjunctive driving mechanism, substantially as described, an inking-ribbon and ribbon-carrier, a shifter which moves the inking-ribbon sidewise during the movement of the carriage in one direction, and a catch engaging the ribbon-carrier to shift the ribbon lengthwise, substantially as described.

7. The combination, with the finger-keys, of the series of journaled rock-shafts connected thereto, as described, and the train of mechanism, substantially as described, connected to and operated by the rock-shafts, by which train the escapement is operated, as set forth.

8. The rock-shafts and their finger-keys, the sliding grate having a bearing against which each one of the rock-shafts bears, an upright shaft connected to said grate, and an escapement on said shaft engaging a rack on the paper-carriage, all in combination, substantially as described.

9. The combination, with the driving-shaft, of an alarm-bell removably attached to the shaft, and a gravity-striker adjustably secured in any given relation to said shaft.

10. The upright shaft 25 and its bar 28, the fixed tooth 29 on said bar, the spring-tooth 30, pivoted on said bar, and the stops 31 32, one at each side of the spring-tooth, combined with the rack-bar on the paper-carriage and with a reciprocating grating loosely connected to an arm on the upright shaft, as described, whereby the movement of the grating rocks the upright shaft.

11. In a type-writing machine, the driving-shaft, the bell connected thereto, and the disk 46, having a guideway, and a ball in said way, said disk adjustably secured to revolve with the shaft, the combination being and operating substantially as described.

12. The combination, with the spring-wheel, the carriage, and the escapement, of an adjustable pin connected to the spring-wheel,

and a hooked bar in position to lock the escapement when actuated by the pin on the spring-wheel.

13. The combination, in a type-writer, of a power-driven carriage, an escapement for controlling the movement thereof, and a stop actuated by the driving mechanism, whereby the escapement is locked.

14. In a type-writing machine, the carriage, the escapement controlling the movement of the same, the spring-wheel connected with the carriage, as usual, a disk which may be adjustably secured to the spring-wheel, which disk carries a projecting pin, and a hooked bar with which said pin engages to draw the bar into position to lock the escapement, all in combination, as set forth.

15. The combination, with the ribbon-carrier and a shifter engaging the same to shift the ribbon sidewise during the movement of the carriage in one direction, of spring-pawls pivotally hung at each end of the machine in position to be turned into or out of engagement with the ribbon-spools.

16. The combination, with any suitable adjunctive carriage-driving mechanism of substantially the character described, of laterally-movable ribbon-spools, a shifter for said spools connected to said driving mechanism, and a brake for holding said spools against rotation.

17. The paper-carriage having a single index combined with the paper-roll, one of said parts being movable toward or away from the other, so as to expose the writing alongside the index or remove it therefrom.

18. The driving-wheel having a face-cam, in combination with the ribbon-spools spring-pressed toward said cam, as set forth.

19. The combination, in a type-writing machine, of the power driving-wheel for the paper-carriage, having a cam, a pair of ribbon-spools forced sidewise against the pressure of said cam to give sidewise movement to the ribbon while the carriage is moved forward, and a pawl engaging one of the spools to move the ribbon lengthwise as the carriage is drawn back.

20. The combination of the inking-ribbon

spools and their frames mounted on parallel shafts, a spring rock-shaft operatively connected to said frames to press the spools lengthwise on the shafts, as described, and a cam on the spring-wheel engaging a projection from the ribbon-carrier to press the spools in the other direction, substantially as described.

21. The combination, in a type-writer, of the power mechanism for moving the carriage, a ribbon and carrier engaging said carriage-driving mechanism, so as to be moved laterally thereby, a spring by which the ribbon-carrier is pressed against the same, and reversible pawls, which may be thrown into connection with the ribbon-spools, substantially as described.

22. The combination, with the paper-carriage having a single index at its front, of the paper-roll journaled in slots in the carriage, so as to be movable toward or from the index independently of the carriage movement.

23. The combination, with the paper-carriage, of the paper-roll having laterally-movable journals in the carriage, a cradle in which said roll is hung, and a connection from the cradle to the carriage by which the cradle and roll are rocked when the same are moved laterally, substantially as described.

24. The paper-carriage, the roll mounted and laterally movable therein, the cradle consisting of end plates and side bars, a link connecting one end plate of said cradle to the carriage, and a spring connection by which said link is drawn down, whereby the roll and cradle are held forward or back when pressed over the center, as set forth.

25. The combination of the escapement-rack, a lever operatively connected to said rack, and the pawl which actuates the paper-roll, hung on said lever so as to serve as an operating-handle for the same.

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

ALEX. T. BROWN.

Witnesses:

W. A. BARTLETT,
M. P. CALLAN.