(No Model.) 5 Sheets—Sheet 1.

C. L. SHOLES.

TYPE WRITING MACHINE.

No. 568,630. Patented Sept. 29, 1896.

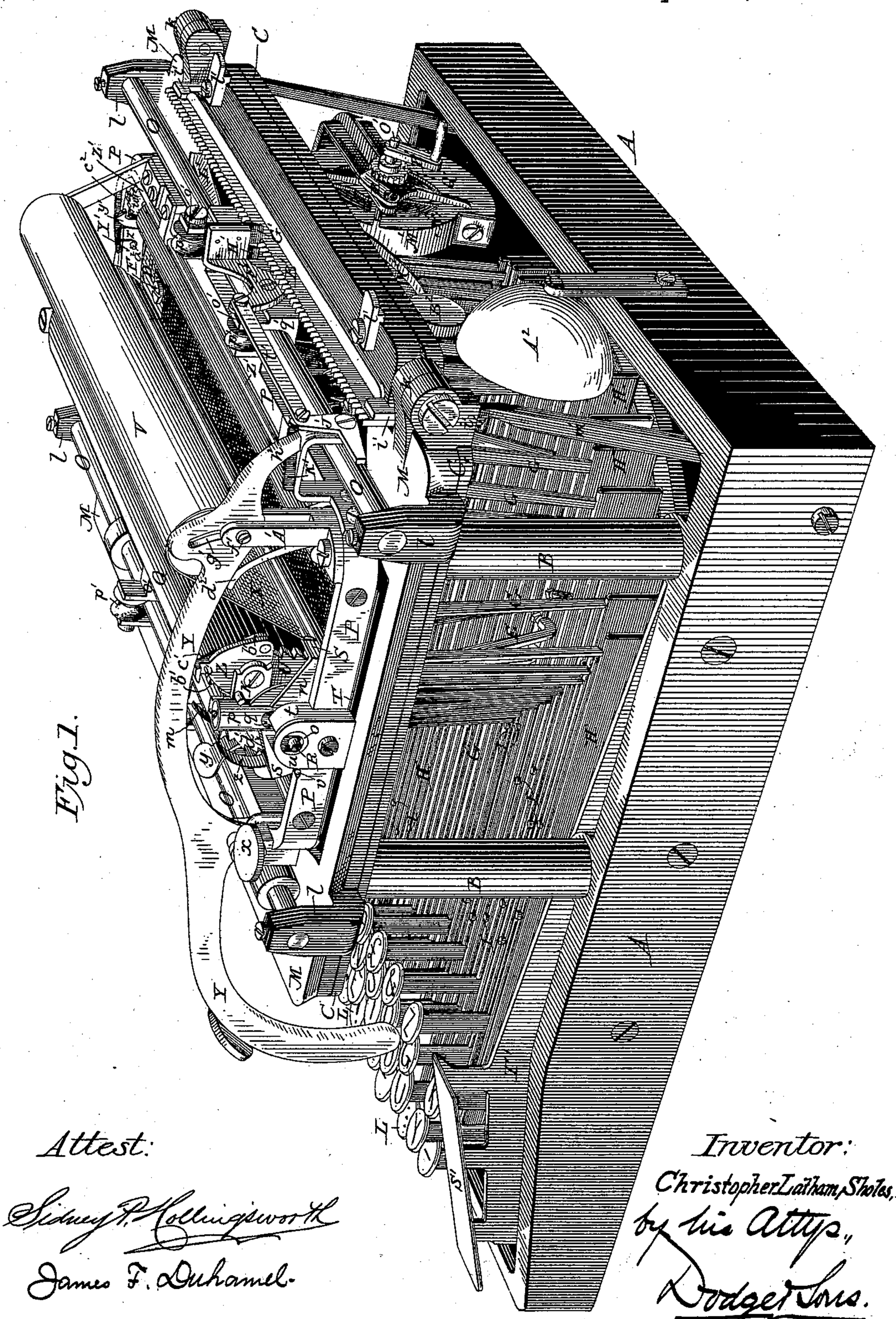

Fig. 1.

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Inventor:

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by his Attys.,

Dodger Sons.

(No Model.)

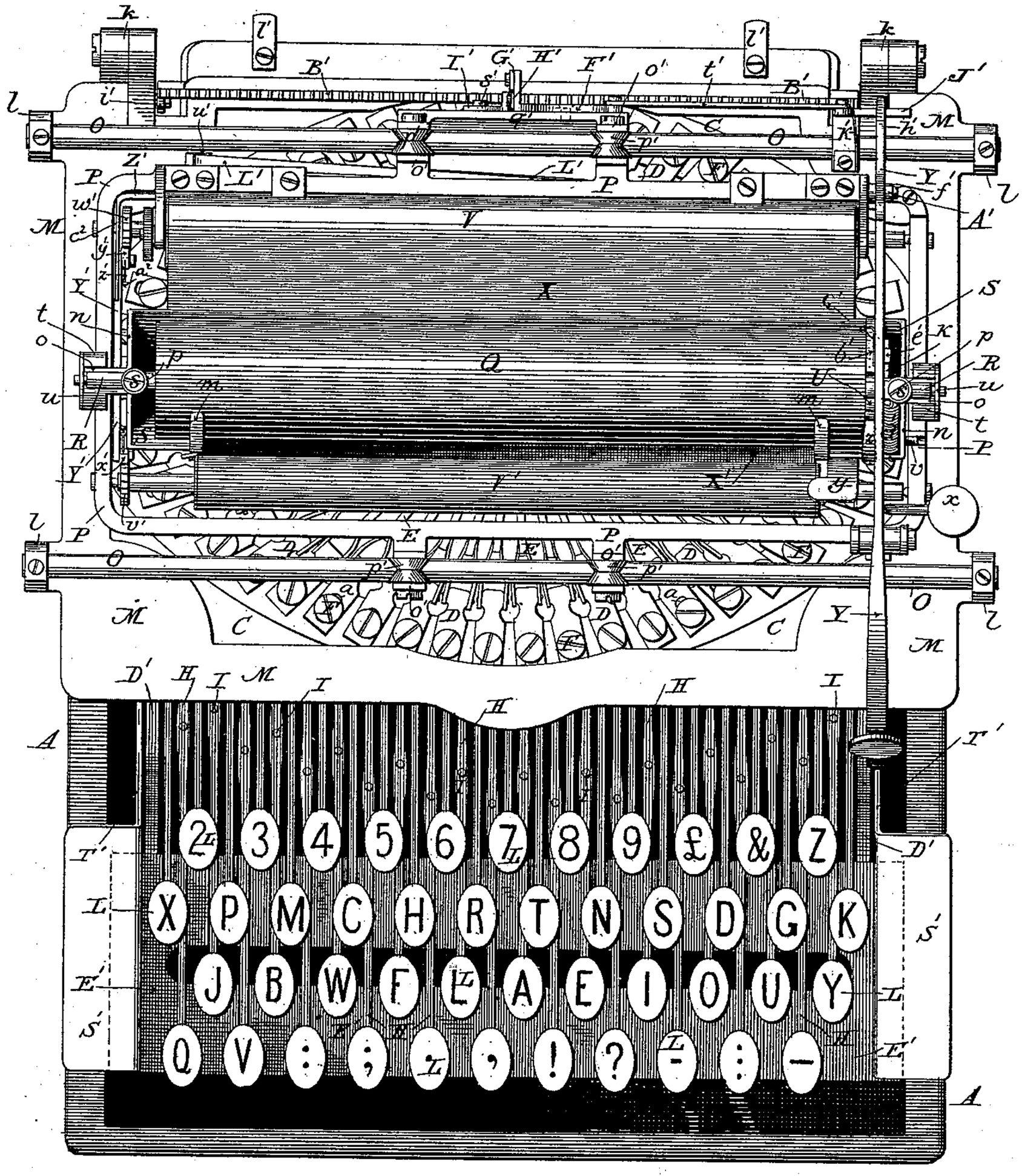
5 Sheets—Sheet 2.

C. L. SHOLES.

TYPE WRITING MACHINE.

No. 568,630. Patented Sept. 29, 1896.

Fig. 2.



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(No Model.)

5 Sheets—Sheet 3

C. L. SHOLES.

TYPE WRITING MACHINE.

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Fig. 3.

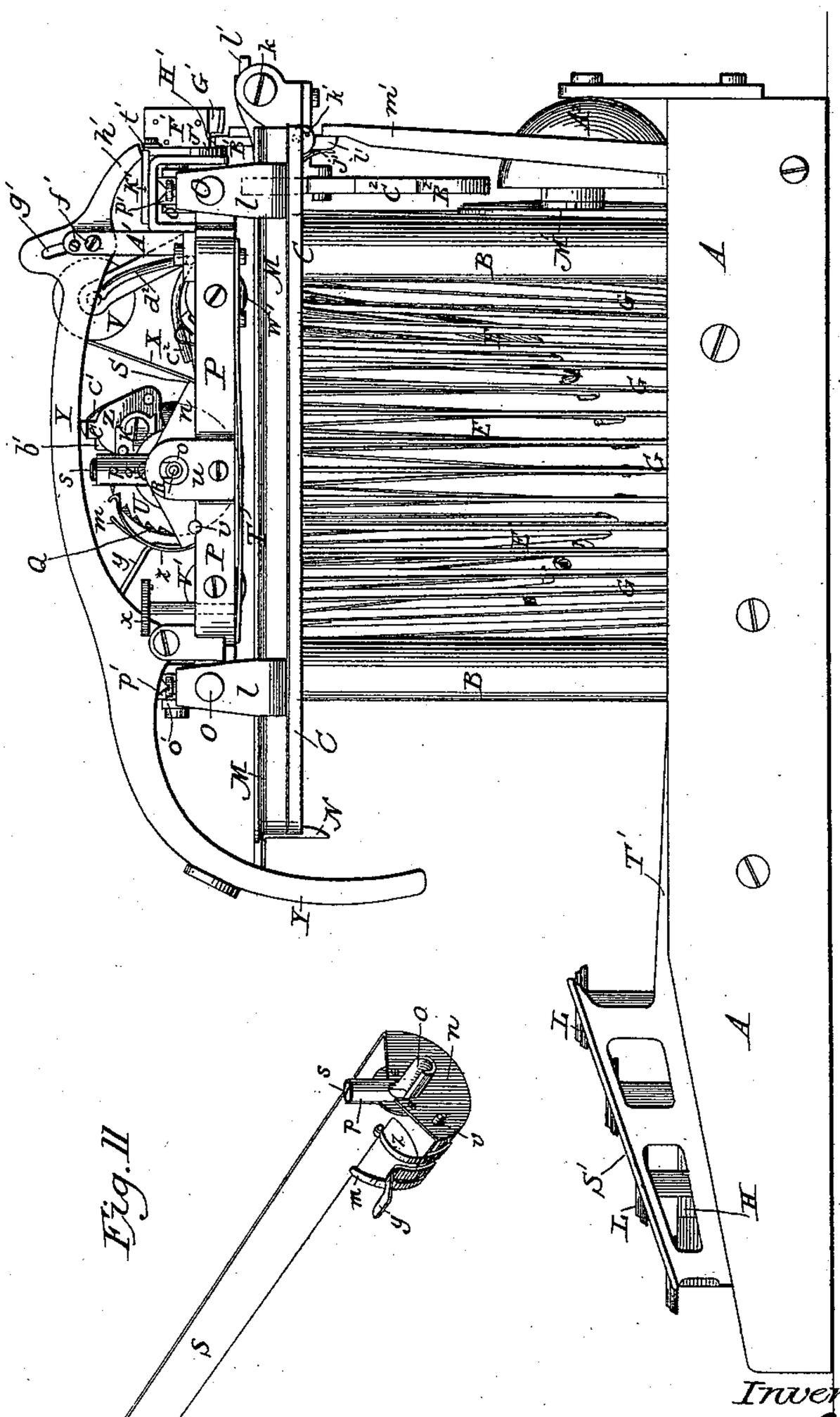
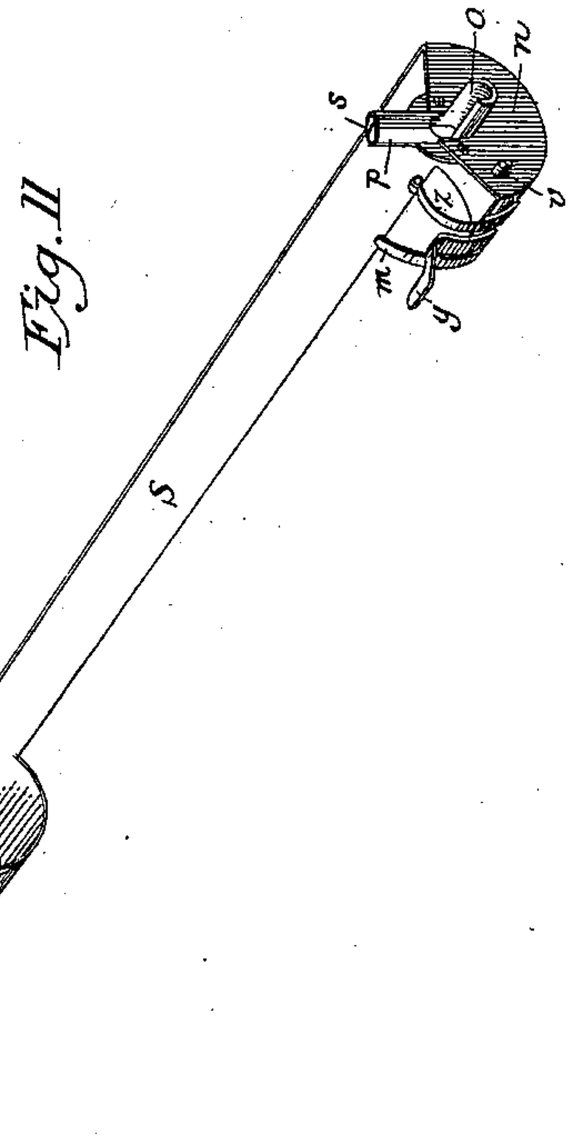


Fig. 11



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(No Model.) 5 Sheets—Sheet 4.

C. L. SHOLES.

TYPE WRITING MACHINE.

No. 568,630. Patented Sept. 29, 1896.

Fig. 4.

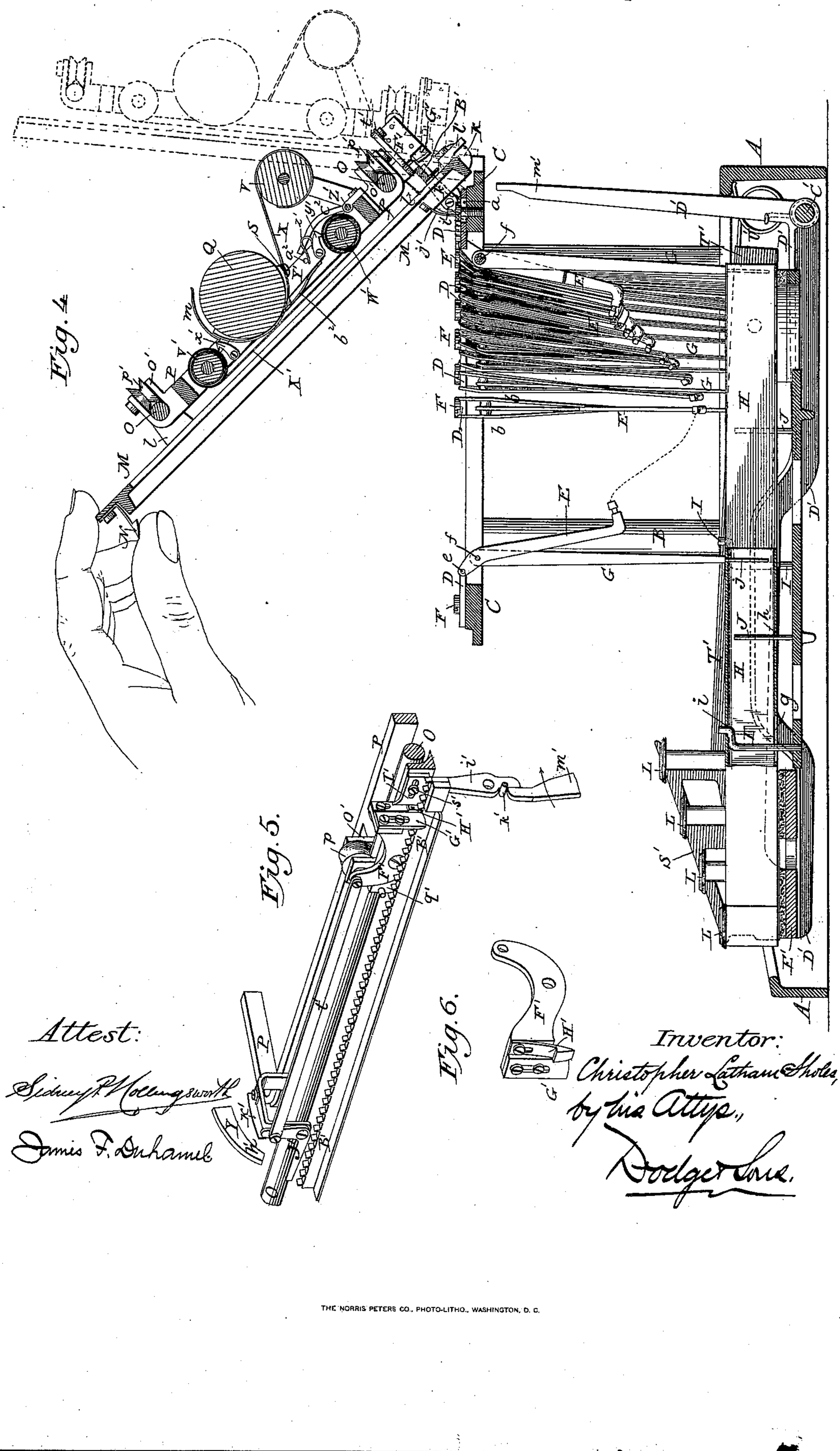

Fig. 5.

Fig. 6.

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(No Model.) 5 Sheets—Sheet 5.

C. L. SHOLES.

TYPE WRITING MACHINE.

No. 568,630. Patented Sept. 29, 1896.

Fig. 7.

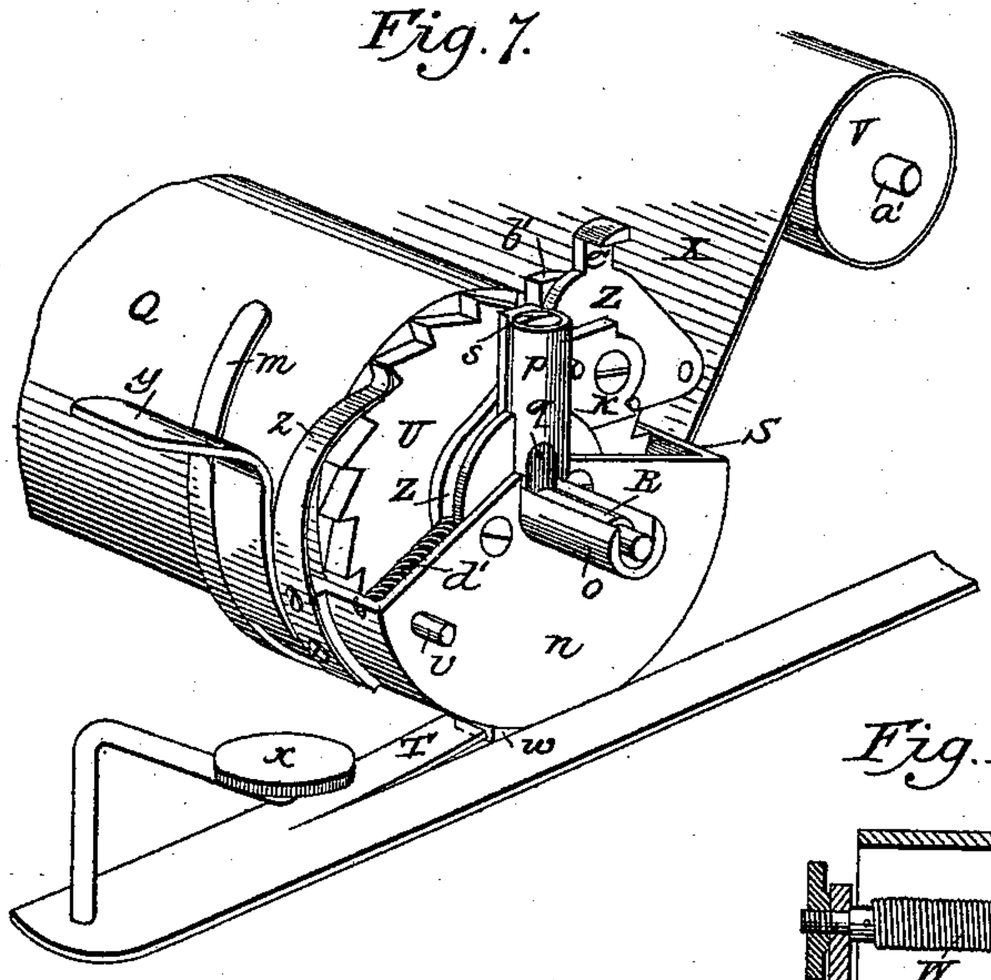


Fig. 8.

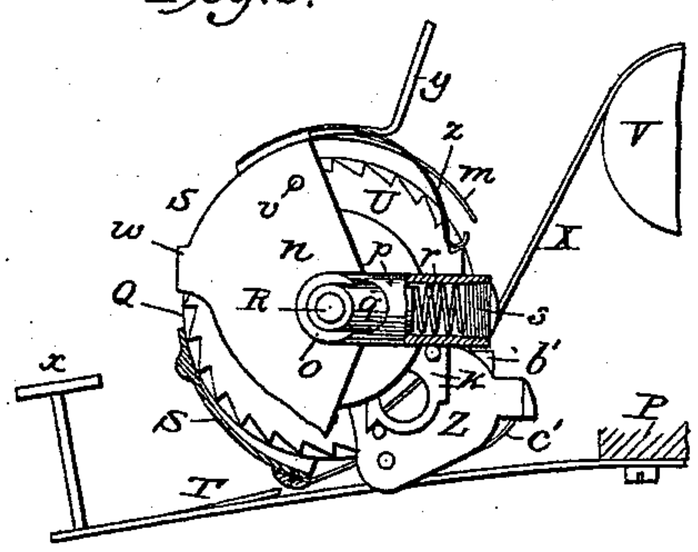


Fig. 12

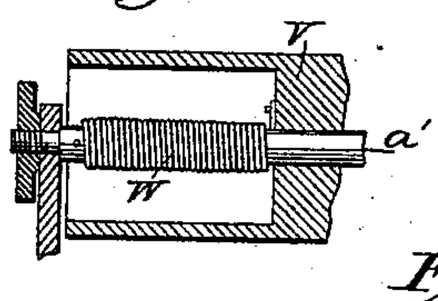


Fig. 9.

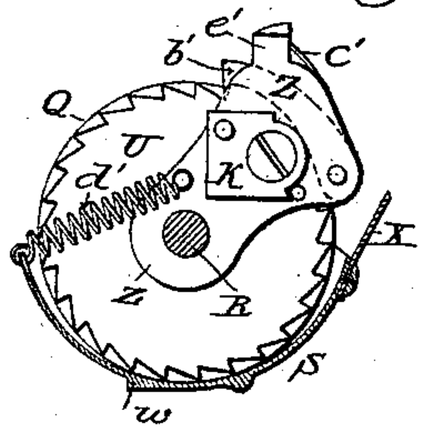


Fig. 10.

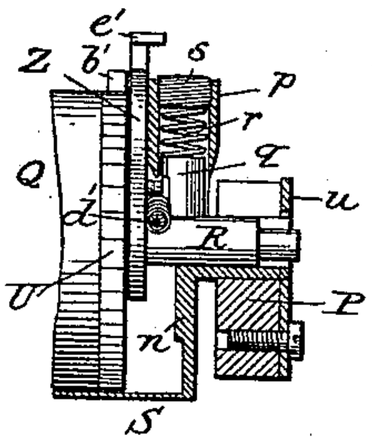


Fig. 13.

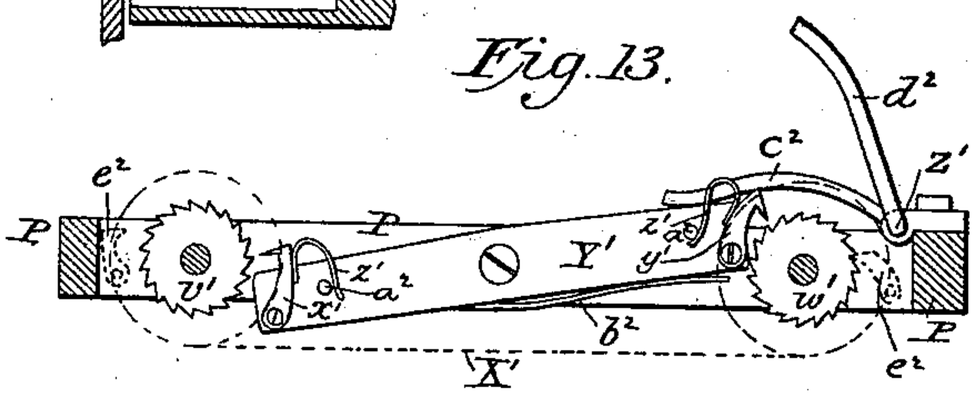


Fig. 14.

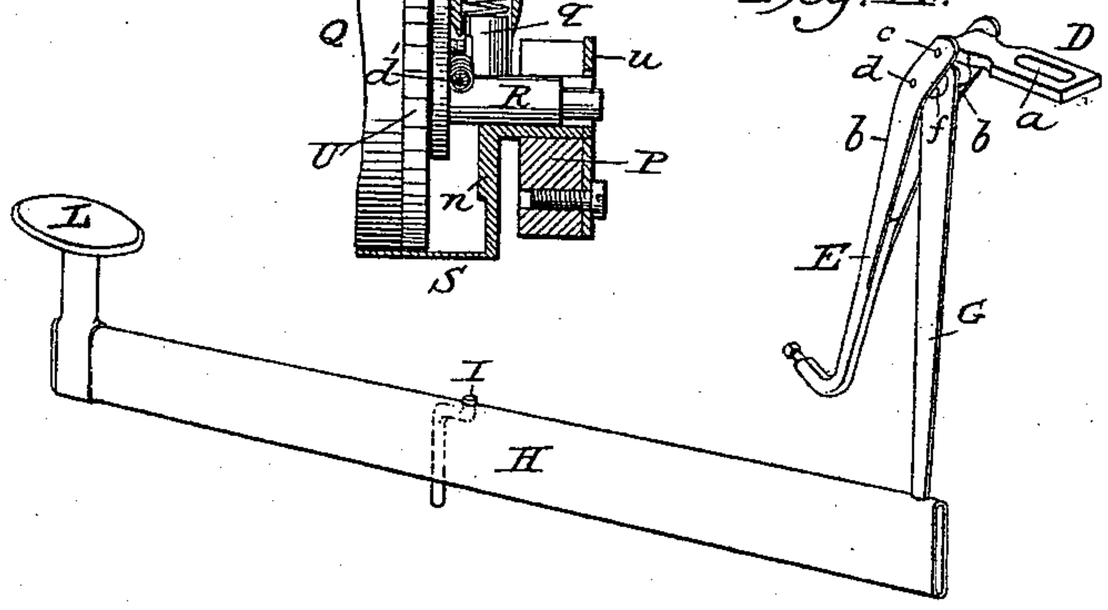
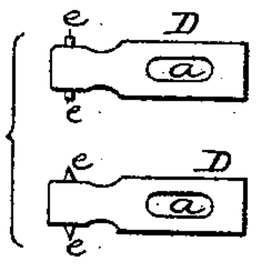


Fig. 15.



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Inventor:

Christopher Latham Sholes,

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UNITED STATES PATENT OFFICE.

CHRISTOPHER LATHAM SHOLES, OF MILWAUKEE, WISCONSIN, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE WYCKOFF, SEAMANS & BENEDICT, OF NEW YORK.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 568,630, dated September 29, 1896.

Application filed September 11, 1889. Serial No. 323,589. (No model.)

To all whom it may concern:

Be it known that I, CHRISTOPHER LATHAM SHOLES, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to type-writing machines; and it consists in a variety of features, details, and improvements which will be hereinafter fully set forth.

In the drawings, Figure 1 is a perspective view of my improved machine; Fig. 2, a top plan view of the same; Fig. 3, a side elevation; Fig. 4, a vertical central section from front to rear; Figs. 5 to 15, inclusive, views illustrating details which will be hereinafter referred to and explained.

The present invention is designed to increase the efficiency of type-writers and to render the same compact, simple, and durable in construction, special reference being had to facility of inspecting and correcting the work of printing as it progresses and of access to the type-bars, type, &c. These desirable results and other benefits are secured by the construction which I will now explain.

A indicates a rectangular base from which four posts B rise to a suitable height to support a horizontal bed or platform C, to which are applied the type-bar blocks or clips D, to which latter the type-bars E are pivoted or hung. This main frame A B C may be cast in one integral body or built up of parts, as found expedient.

The type-bar clips or blocks D each consists, as shown in Figs. 2, 4, 13, and 14, of a flat plate with a longitudinal slot *a* from its upper to its lower face and with a T-head at its inner end, the lateral arms of the T-head being either of cylindrical or of conical form, as preferred. Each block or clip is secured in place upon the bed or platform C by means of a screw F, passing through the slot *a* and entering a threaded hole in the bed B.

As shown in Figs. 1 and 2, the bed or platform C is formed with an elliptical opening extending nearly from front to back and end to end, said opening being made to allow the proper movements of the type-bars, as in other machines.

It has been customary prior to my invention to arrange the blocks or type-bar supports in a circle; but I have found that by adopting the elliptical arrangement I am enabled to lessen the height of the machine materially without in any degree impairing its efficiency. In order to attain this result, it is of course necessary to vary the lengths of the type-bars to accord with the distance of their respective pivots from the common central printing-point, the longest bars being at the extremes of the longer axis of the ellipse, the shortest at the ends of the shorter axis, and those bars at intermediate points varying proportionally in length.

If desired, the height of the machine may be reduced even more than indicated by cutting away or dropping down the rear portions of those key-levers directly below the longer type-bars, so that the latter may descend to the proper point even with the low frame. This cutting away of the key-levers is indicated in Fig. 4.

In connection with the peculiar form of clip or block shown in Figs. 13 and 14, which I prefer to use, I employ a type-bar of the form shown in Figs. 4 and 14, that is to say, bifurcated in its rear portion to form spring-arms *b b*, each of which is formed with two perforations or sockets *c* and *d*. The perforations or sockets *c* are to receive the lateral arms *e* of the block or clip D, and the perforations *d* are to receive the pivot or joint pin *f*, by which the link or push-bar G, connecting the type-bar E with its key-lever H, is connected with the type-bar.

In practice I prefer to head or rivet the ends of the joint-pin *f* after it is placed in position, partly to guard against its accidental displacement and partly to reduce the spreading capacity or separability of the arms *b b*, which may still possess sufficient elasticity, however, to compensate for any wear that may take in the eyes *c* or the pivot-arms *e*.

If the pivot-arms *e* be made conical, as suggested, the type-bars will preserve accurately their working adjustment and be free from lost motion or play, regardless of the wear of

the pivots or eyes, the elasticity of the arms *b b* causing them to bear constantly upon the pivots on all sides.

The free ends of the type-bars are bent at right angles to the bodies thereof and furnished each with its appropriate character, as usual.

H indicates a key-lever, of which there is one for each type-bar. The preferred construction of these levers is illustrated in Figs. 2, 4, and 14, by reference to which it will be seen that each lever consists of a strip of sheet metal, bent or folded longitudinally into the form of a flat tube, combining lightness and strength or stiffness in the direction in which the strain is brought upon them.

Each lever is formed with an elongated slot or opening *g* in its lower side at the point where it is to be pivoted; also with a small hole or perforation *h* in its lower side at suitable distance from the slot *g*, and finally with a hole or perforation *i* in its upper side directly above the slot *g*, the purpose of which openings will presently appear.

Extending across the base A from side to side is a plate or cross-bar thereof, carrying two sets of upright pins or posts I and J.

The posts I are each formed with an offset or shoulder near the upper end, which forms a bearing-point or fulcrum for the key-lever which straddles the post, as indicated in Figs. 4 and 13, the slot or elongated opening *g* permitting the key-lever to pass over and to freely rock or tip upon the post, and the opening *h* serving to receive the upper end of the post, which prevents side or end play of the lever at that point.

The pins J pass through the perforations *i* and act as guides to prevent lateral play of the key-levers at points some distance from their fulcrums, the posts I and pins J thus serving jointly to retain the key-levers and their finger-buttons in their proper positions.

The finger-buttons of the key-levers are arranged in several tiers, four being indicated in the drawings, and the posts I for the levers of each tier are placed at the same relative point between the finger-buttons and push-bars of all the levers, so that each key-lever will have precisely the same leverage as all the others. In this way a perfectly even stroke is assured for all the characters.

Owing to the passage of the supporting-posts and guide-pins through or into the key-levers, it is unnecesary to employ guide-pins or reeds between the levers and the levers can be arranged very close together, thereby rendering the machine compact and permitting the use of a large number of key-levers side by side.

Although it is not essential to do so, I find it advantageous to make the finger-buttons L elliptical in form, as shown in Fig. 2, as I thereby secure greater clearance between them and lessen the liability to strike two with the same finger. The greater separation also enables the operator to distinguish the characters more readily.

As above intimated, the type-bars E are pivoted or hung at their rear ends and are connected at a point in advance of their pivots with their respective key-levers by means of push-bars or links G, which are pin-jointed to the type-bars.

The lower end of each push-bar G is shouldered, as shown in Fig. 4, and terminates in a stem *j*, which passes through a perforation in the upper side of the key-lever and thereby forms a connection between the two, the stem being of such length as will preclude accidental displacement when the parts of the machine are properly assembled. At the same time this connection and the manner of supporting the key-levers permit the ready removal and replacement of any key-lever or push-bar, or both.

M indicates a skeleton top or frame upon which the platen or paper roll and its attendant parts are mounted, and which is connected with the bed or platform C by hinges K at the rear side, said hinges permitting the top or frame M to be lifted up or thrown back to expose its under side and the under faces of the parts mounted upon it. By this arrangement convenient access to the type-bars, inking ribbon or sheet, and other parts is afforded, which is a quite important provision.

To prevent the top or frame M from falling back in case the front of the machine be lifted or the rear be dropped down, I provide a locking device to lock its front or forward part to the bed or top C. This locking device may be of any convenient or suitable construction, as, for instance, like the common cupboard-door latch, but I prefer the simple spring-hook N. (Shown in Figs. 3 and 4.) This hook may be readily disengaged from the edge of top C by the thumb or finger in the act of taking hold of frame or top M to lift it, and, being beveled, it will readily ride over and enter again into engagement with the edge of top C.

Rising from the hinged top or frame M are posts *l*, two at each end, and from each post at one end to the corresponding post at the opposite end extends a rod or bar O, the two rods or bars being thus parallel with each other and with the front of the machine. These rods or bars O serve as ways to support and guide a traveling carriage P, in which are mounted the paper-roll or platen, and parts connected or coöperating therewith, including an inking sheet or ribbon and rolls between which the same is stretched and upon which it is wound.

The platen Q is here represented as a smooth cylinder covered with rubber and having a central shaft R, the ends of which project beyond the ends of the roll and form journals, upon which the roll is supported and turns.

S indicates a shield or clamp (best shown in

Figs. 7, 8, 9, 10, and 11) which serves to hold the paper or other sheet to be written upon closely against the platen or roll Q at the forward edge of said clamp. The two ends of the shield or clamp S conform quite closely in curvature to the circumference of the roll and extend through longer arcs than the intervening portion, a curved arm or finger *m* being continued upward and farther around the roll, as shown in Figs. 7 and 11, to guide the sheet and to cause it to fall back over the platen as the work progresses.

The shield or clamp S is formed with end plates *n*, from each of which a journal *o* of U shape projects concentric with the curved end portions of the shield, or substantially so. These U-shaped or tubular journals are designed to receive within them the journals or end of shaft R of the platen and to serve as the journals of the combined platen and paper clamp or shield.

To cause a proper clamping of or pressure upon the sheet between the platen and the shield or clamp, the end plates of the latter are furnished with tubular case or housing *p*, within which is placed a plunger or stem *q*, and above the stem a spring *r* and adjusting-screw *s*.

By setting down the screw more or less the compression of the spring may be regulated and the plunger or stem *q* caused to press with greater or less force upon the journals or ends of shaft R, thereby pressing them down into the U-shaped journals *o* of the shield and pressing the platen against the shield or clamp with whatever force is deemed advisable, in addition to the weight of the platen itself.

The heads of the screws, being at the tops of the cases or housings *p*, are convenient of access to the operator and may be readily adjusted if necessary, though such adjustment is seldom required.

The housings *p* are represented in the drawings as made separate from the end plates of the clamp or shield and attached thereto by screws; but it is apparent that the latter may be made separable at any point which will permit the insertion of the ends of shaft Q into the tubular journals *o*, this being the only necessity for making them detachable; or the shaft Q may be passed longitudinally through the tubular journals.

The tubular journals *o* are supported in bearings *t* on the end bars of the traveling carriage P, and are retained in said bearings by clips or yokes *u*, made fast to the frame, as shown.

Projecting from one end of the shield or clamp S is a pin or stud *v*, which engages with the frame or carriage P and limits the rotation of the shield upon its journals in a downward direction at the forward side. It is further furnished with a lug *w*, which, when the shield or clamp is in its normal position, is engaged by a spring-catch or locking-plate T, one end of which is made fast to the frame of the traveling carriage and the other end of which is provided with a finger button or key *x*, by which the catch T may be depressed and thrown out of engagement with the lug *w*, thereby leaving the shield or clamp S free to be moved upward at the forward side. A finger-piece *y* is made fast to the shield, by which to thus turn it when desired.

U indicates a ratchet-wheel made fast to the end of platen or to its shaft, so as to turn with the platen, but which is held against backward rotation by means of a spring dog or detent *z*, made fast to the shield S. The spring-detent *z* also serves to prevent the platen from being carried by momentum beyond the proper point, and by reason of its engagement with the radial face of the ratchet-teeth causes the platen-roll to turn in unison with the shield when the latter is turned. If, however, the roll be directly acted upon and turned forward or in the proper direction to feed the paper for the usual line of spacing, the shield being locked to the carriage-frame cannot turn with the platen, and the beveled faces of the ratchet-teeth will ride forward under the spring-detent *z*.

When it is desired to inspect the line being printed, or to make a correction therein, it is only necessary to depress the button *x* and to throw up the finger-piece *y*, the former releasing the shield and the latter causing it to turn, and, by reason of the engagement of the detent *z* with the ratchet-wheel U, to carry with it the paper or other sheet held between the platen and the shield. In this way the line is brought directly into view without the necessity of lifting the carriage or even the roll.

To cause the prompt return of the platen and shield and the paper or sheet to the precise positions occupied before the guard and roll are thus turned, I provide a roller V, Figs. 1, 2, 3, 4, and 12, within which is a coiled spring W, one end of which is made fast to the roller, while the other end is attached to a shaft or spindle *a'*, passing through the roll and serving as an axle upon which the latter turns, and I connect the rear edge of the shield or clamp S with the circumference of roller V by an apron or web X, as shown in Figs. 1, 2, 3, 4, 7, and 8.

The spring is put under suitable tension or compression, according to the way in which it is wound, to draw constantly upward on the rear edge of the shield S, and thereby to hold the stop-pin *v* normally in contact with the frame of the carriage P. If now the shield and roll or platen be turned together, the apron, which is wound upon the roller V somewhat, will be drawn or unwound therefrom, and in being thus drawn off will turn roller V in opposition to the force of its spring W, thereby winding it more tightly.

As soon as the finger-piece *y* is released the spring turns the roller *v* back to its original position, winding the web or apron back

upon it and thereby drawing the shield and platen back to their first positions and carrying the paper or sheet with them. The apron serves the important function of supporting the paper sheet and guiding it during the simultaneous movements of the platen and shield, as well as that of connecting the spring-roller and the shield to transmit the spring action from one to the other.

For the purpose of turning the platen-roll and feeding the paper forward for the line-spacing, I pivot to the frame of carriage P a lever Y, Figs. 1, 2, and 3, and in the path of said lever I arrange a dog carrier or plate Z, to which is attached a hook-shaped dog b', which is kept in engagement with the teeth of ratchet-wheel U by a light spring c'.

The dog carrier or plate Z is mounted and swings upon the projecting end of shaft R, close beside the ratchet-wheel U, the dog b' being pivoted to the side of said carrier and thus brought directly in plane with the ratchet-wheel. The dog-carrier Z is drawn forward and the dog is caused to advance over the teeth of the ratchet-wheel U by means of a spring d', one end of which is attached to the carrier and the other end to the shield or paper-clamp S, as shown in Figs. 2, 7, and 9.

A block K, pivotally attached to dog-carrier Z, may be turned to present either its end or its side face to the housing p, and these are at such distances from the pivot of the block as to permit the platen to be turned only one tooth or two teeth, as will be understood upon referring to Figs. 2, 7, 8, and 9.

As best shown in Figs. 7, 9, and 10, the dog carrier or plate Z is formed or furnished with an upward extension e', terminating in a rounded head directly beneath and in line with the lever Y, as shown in Figs. 1, 2, and 3, and in rear of the pivot of said lever, which pivot is located at the forward side of the platen-carriage, as shown in said figures. The fore end of lever Y bends down in front of bed or platform C close to the keyboard, and is consequently in convenient position to be grasped by the operator without carrying his hand any considerable distance from the keyboard. The rear end of the lever plays between the two members of a bifurcated guide-post A', and is limited as to its vertical movement by a pin or screw f', passing through the post and through a slot g' in the lever. (Seen in Figs. 1 and 3.) The extreme rear end of lever Y terminates in a finger h', which serves to bear upon and actuate a trip-lever, by which the spacing-dogs, hereinafter described, are lifted clear of the space rack or bar to permit the ready return of the carriage to its starting-point.

B' indicates the rack-bar, which is carried by two upright arms i', pivotally supported in the top frame M. The lower ends of said arms extend downward below the bed or platform C and are pressed backward by springs j', made fast to said frame, and shown in Figs. 3 and 4. The throw of the arms in one direction is limited by stop-pins k', one of which shows in Fig. 4, and in the opposite direction by blocks l', which project from the rear of hinged top frame M and serve by their contact with the rear edge of bed or platform C to limit the upward or backward movement of the hinged top, as indicated by the dotted lines in Fig. 4.

Extending from side to side of base A, parallel with its front and rear, is a rock-shaft C', preferably carried upon point screws or centers and bearing at or near each end an elbow-lever D'. Each elbow-lever D' consists of a long horizontal arm, extending to the front of the machine, and an upright arm m', the upper extremity of which bears against the rear face of the lower end of one of the rack-supporting arms i', as shown in Figs. 1, 3, 4, and 5. The levers D' are connected at their front ends by a board or plate E', the upper surface of which is advisedly faced with felt, rubber, or other material to deaden sound and prevent wear, said board extending beneath the forward ends of all the key-levers II, as shown in Figs. 2 and 4, so that if any key-lever be depressed the board will be similarly depressed, the long arms of the levers D' thrown down, and their upright arms moved forward against the lower ends of arms i', thereby throwing the rack-bar B' backward.

As soon as the pressure is taken off board E' the latter is lifted by the springs j', acting through the arms i' and levers D', the rack being at the same time restored to its normal position.

As represented in the drawings, the carriage P is provided at front and rear with lugs or ears o', in which are mounted V-grooved rollers p', which travel upon the rods O, said rollers causing the carriage to travel freely upon the rods and the V shape of the grooves preventing transverse play upon the rods. It is deemed advisable to employ these rollers in practice because of the lighter propelling-spring that can be used for the carriage, but they are not essential. At the rear of the carriage and attached to the lugs o', under the construction illustrated in the drawings, is a plate q', to which is pivoted an elbow-lever F', one end of which is formed with a lateral plate or offset, as best shown in Figs. 2, 5, and 6.

Secured to the face of the lateral offset or lever F', or made integral therewith, is a rigid dog G', the lower end of which is beveled on its rear face to produce a sharp knife-edge, with a straight front face to bear against the vertical faces of the teeth of rack-bar B'. Likewise secured to the face of the offset of lever F' by the side of dog G' is a spring-dog H', the lower end of which is of the same form as that of dog G', but which tends constantly to spring forward out of alinement with the latter to the extent permitted by an adjust-

able stop I′, secured to plate q' by means of a screw s', passing through an elongated hole or slot in the stop, as shown in Figs. 5 and 6.

J′ indicates a second elbow-lever pivoted to the frame of carriage P, one arm of which lever is connected by a bar or rod t' with the tail or rear arm of lever F′ and the other arm of which is arranged directly beneath and in the path of descent of the finger h' of the hand-lever Y. This lever J′ is the trip-lever hereinbefore referred to, and its free arm projects sufficiently to permit its depression by hand independently of the lever Y, so that the spacing-dogs may be disengaged from the rack to permit the carriage to be receded without turning the platen or paper-roll.

It will be seen that the lever F′ may be so located or made with arms of such length as to render unnecessary the lever J′ and connecting bar or rod t'; but the arrangement shown is deemed best.

From the foregoing explanation it will be understood that the paper is advanced for line-spacing by lifting the forward end of lever Y, thereby causing said lever to press upon and move back the dog carrier or plate Z, and that the same movement of the lever carries its rear finger h' into contact with the trip-lever J′, disengaging the dogs from the rack and permitting the carriage to be moved back to its starting-point by a lateral movement of the lever Y. In this way a single operation produces several distinct results and much time is saved.

A spring K′ acts upon one of the levers F′ J′, the latter, as represented in the drawings, to keep the spacing-dogs in engagement with the rack-bar B′. The rack-bar B, being thrown forward, stands normally in alinement with spring-dog H′, which yields to the superior force of the propelling-spring of carriage P and thereby permits the carriage to advance and move rigid dog G′ into alinement with the spring-dog. When, however, the rack-bar B′ is moved back, the tooth previously engaged by the yielding dog becomes engaged by the fixed dog, while the yielding dog, being released, springs forward the space of one tooth. The rack-bar being again allowed to spring forward, the spring-dog enters in front of the next tooth of the rack and, yielding as before, permits the carriage to advance the space of one tooth, and so on for each depression of board E′.

The carriage is drawn forward by means of a strap or band L′, which passes over a guide-roller u' and winds upon the exterior of a cam-shaped shell M′, containing a spring N′, Fig. 1, one end of which is made fast to the shell or spring-case and the other end of which is attached to a central arbor O′, carried in suitable supports on the main frame of the machine. The arbor carries a crank P′, by which it may be turned to give the spring its requisite degree of compression, and a ratchet-wheel Q′, with which engages a dog or detent R′, pivoted to one of the supports of arbor O′.

For the purpose of spacing between words or without printing a character I provide two space-keys S′, each carried by a lever T′, pivoted in the base A and extending across the board E′, so that if either key S′ be depressed it will cause the depression of the board and movement of the rack-bar. The rear end of each lever T′ is depressed by a spring U′, which serves to elevate the finger-plate and to maintain it at convenient elevation to be struck by the fingers of the operator.

The space-keys are made in the form of flat plates and are inclined upward toward the rear to correspond with the plane of the series of type-lever keys, as shown, one at either side of the keyboard.

If preferred, the space-keys may be directly applied to the board E and the levers T′ and springs U′ dispensed with.

In this machine I employ a broad inking sheet or apron instead of the narrow ribbon commonly used, and I mount said apron upon rollers supported in and movable with the platen-carriage. Instead of moving or winding said ribbon lengthwise of the platen, I arrange it to wind transversely thereto, as will be understood upon referring to Figs. 2, 3, 4, and 13, in which V′ and W′ indicate rolls carried upon pivot-points or in bearings in the frame of carriage P, the former in front and the latter in rear of platen-roll Q, and with their lower faces on line with that of the platen-roll, or nearly so.

The inking sheet or apron X′ passes from the under side of one roll to the under side of the other, and is wound from one to the other in the act of advancing the paper or printing sheet for the commencement of a new line. To accomplish this result, the roll V′ is furnished with a ratchet-wheel v' and the roll W′ is furnished with a ratchet-wheel w', and between the two ratchet-wheels there is a pivotal bar Y′, carrying at one end a hook-shaped dog x' and at the other end a similar dog y', one or the other of which acts upon one or the other of the ratchet-wheels v' w' each time the lever Y is actuated to turn the platen-roll. When either of the dogs x' y' is in operative position, the other should be thrown out of action, which may be done by placing its actuating-spring z' behind instead of in front of the pin a^2, against which such spring bears, and thereby holding the dog back and out of contact with its ratchet-wheel.

The bar Y′ is pivoted at a point midway between its ends and its rear end is thrown upward by a spring b^2 with force sufficient to cause dog x' to turn ratchet-wheel v', when the two are permitted to come into engagement. To depress the rear end of the bar in opposition to the spring b^2, a rock-shaft Z′ is carried in suitable bearings at the back of carriage P and provided with two arms c^2 d^2,

the former arranged to bear upon the rear end of bar Y′ and the latter arranged beneath and in the path of the rear end of lever Y, so that as the latter descends it shall bear upon and depress arm d^2, causing it to turn the rock-shaft Z′, throw down arm c^2, and thereby depress the rear end of bar Y′.

A pawl e^2 will be thrown into engagement with whichever of the ratchet-wheels v' w' may be in operation to prevent its being turned backward by its actuating-dog as the latter rises.

Any other convenient means for actuating the ribbon-rolls known and used prior to my invention may be substituted for that shown and described.

A^2 indicates a bell or gong attached to the base A, and B^2 a bell-hammer carried by a spring-arm C^2, pivoted to the frame of the machine and having a short angular arm which is engaged and released by the carriage just before the latter completes its travel, thereby giving notice to the operator that the end of the line is near.

Many of the details of the machine may be varied or departed from without affecting others or departing from the spirit and scope of my invention. Thus the spring W may be made strong enough to hold the shield or clamp S against turning with the platen, or the spring and roller and the apron may be entirely omitted.

Having thus described my invention, I claim—

1. In a type-writing machine, a tubular key-lever.

2. In a type-writing machine, a tubular key-lever formed of sheet metal bent or folded into shape.

3. In a type-writing machine, the combination of a type-bar, a tubular key-lever, and a fulcrum-post extending upward within the tubular key-lever.

4. In combination with a tubular key-lever, having slot *g*, and perforation *i;* shouldered post I, extending through said slot and perforation, substantially as described and shown.

5. In combination with a key-lever, having slot *g*, and holes *i* and *h;* post I, and guide-pin J.

6. In combination with a platen-roll and its ratchet-wheel, a dog-carrier provided with a dog to engage with and turn said wheel, and a block carried by the dog-carrier and having two faces at different distances from the pivot of the block, whereby either of said faces may be brought into action and the movement of the dog-carrier thereby varied.

7. In combination with hand-lever Y, having a slot *g′;* post A′; and screw *f′*, passing through the slot and into the post.

8. In combination with a traveling carriage, a spring for moving the same; an arbor to which one end of said spring is attached; a crank and a ratchet-wheel carried by the arbor; a shell or case attached to the other end of said spring; a band connected at one end with the carriage and at the other end with the shell or case; and a dog or pawl carried by a fixed part of the machine, adapted to engage the ratchet-wheel and thereby to hold the arbor against backward rotation.

In witness whereof I hereunto set my hand in the presence of two witnesses.

CHRISTOPHER LATHAM SHOLES.

Witnesses:

H. J. DESMOND,

GEO. B. SHOLES.