

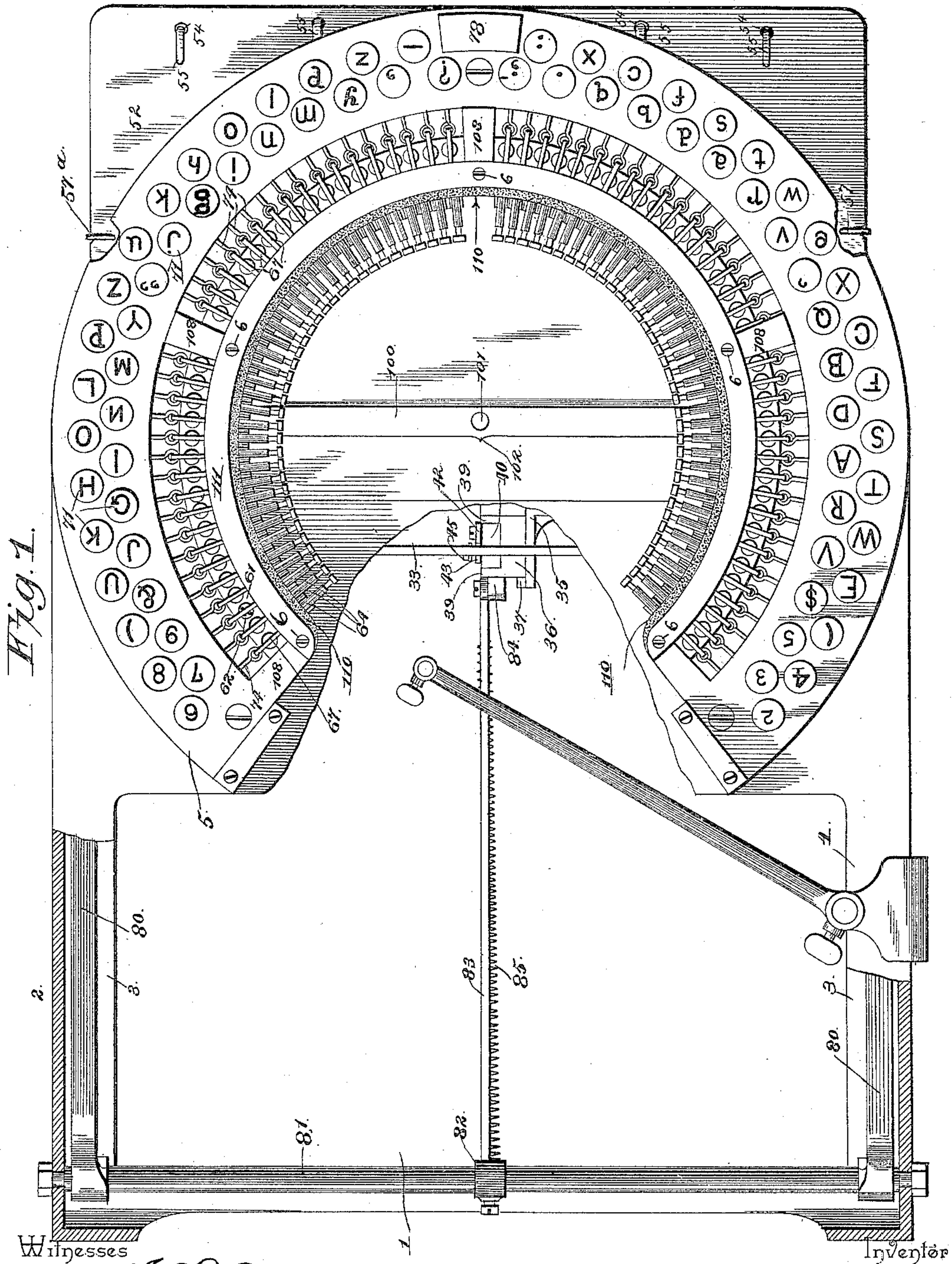
(No Model.)

4 Sheets—Sheet 1.

J. W. PIERCE.
TYPE WRITING MACHINE.

No. 446,638.

Patented Feb. 17, 1891.



Witnesses

Inventor

M. Fowler

By His Attorneys,

R. W. Bishop.

C. A. Snow & Co.

Jesse W. Pierce

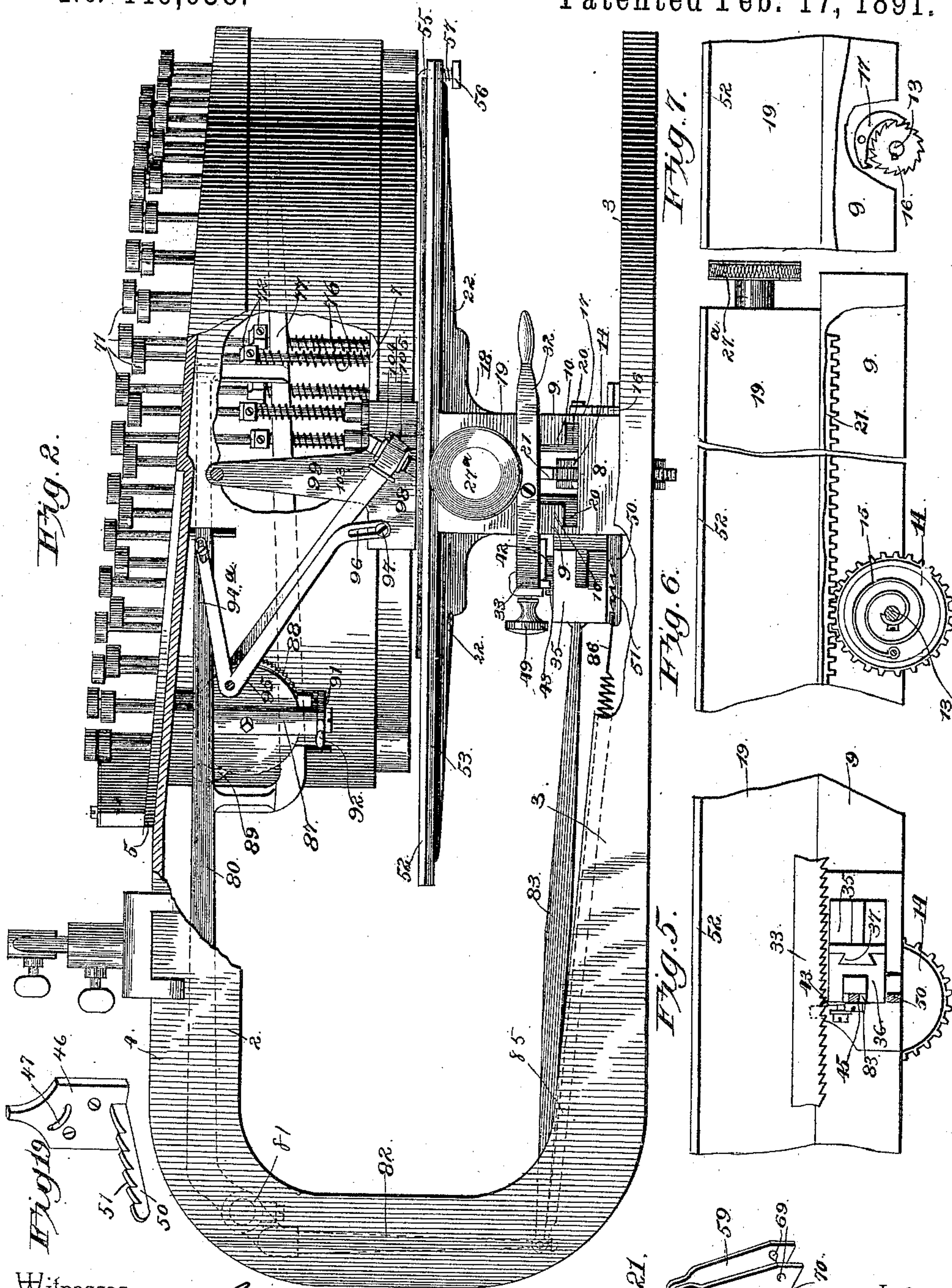
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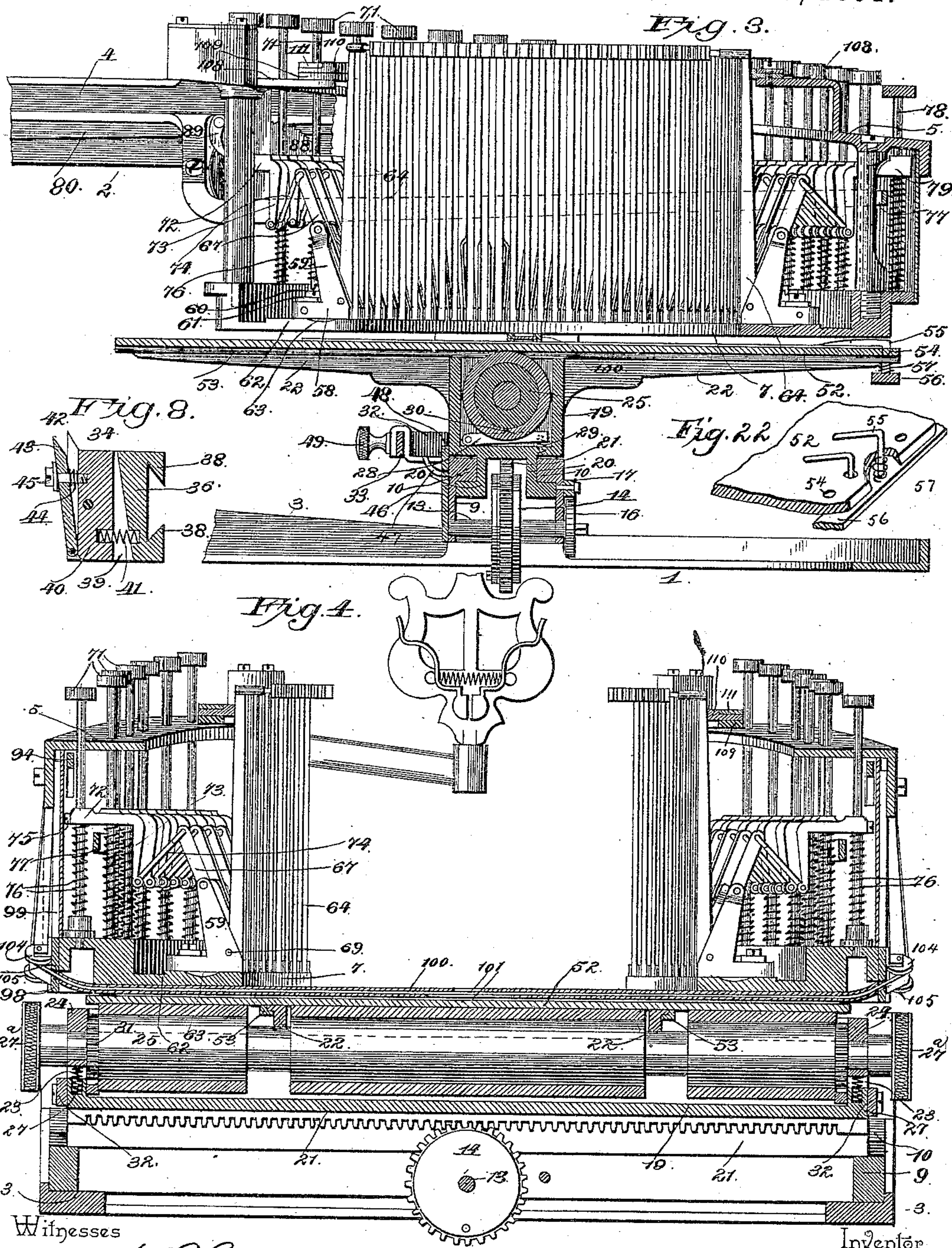
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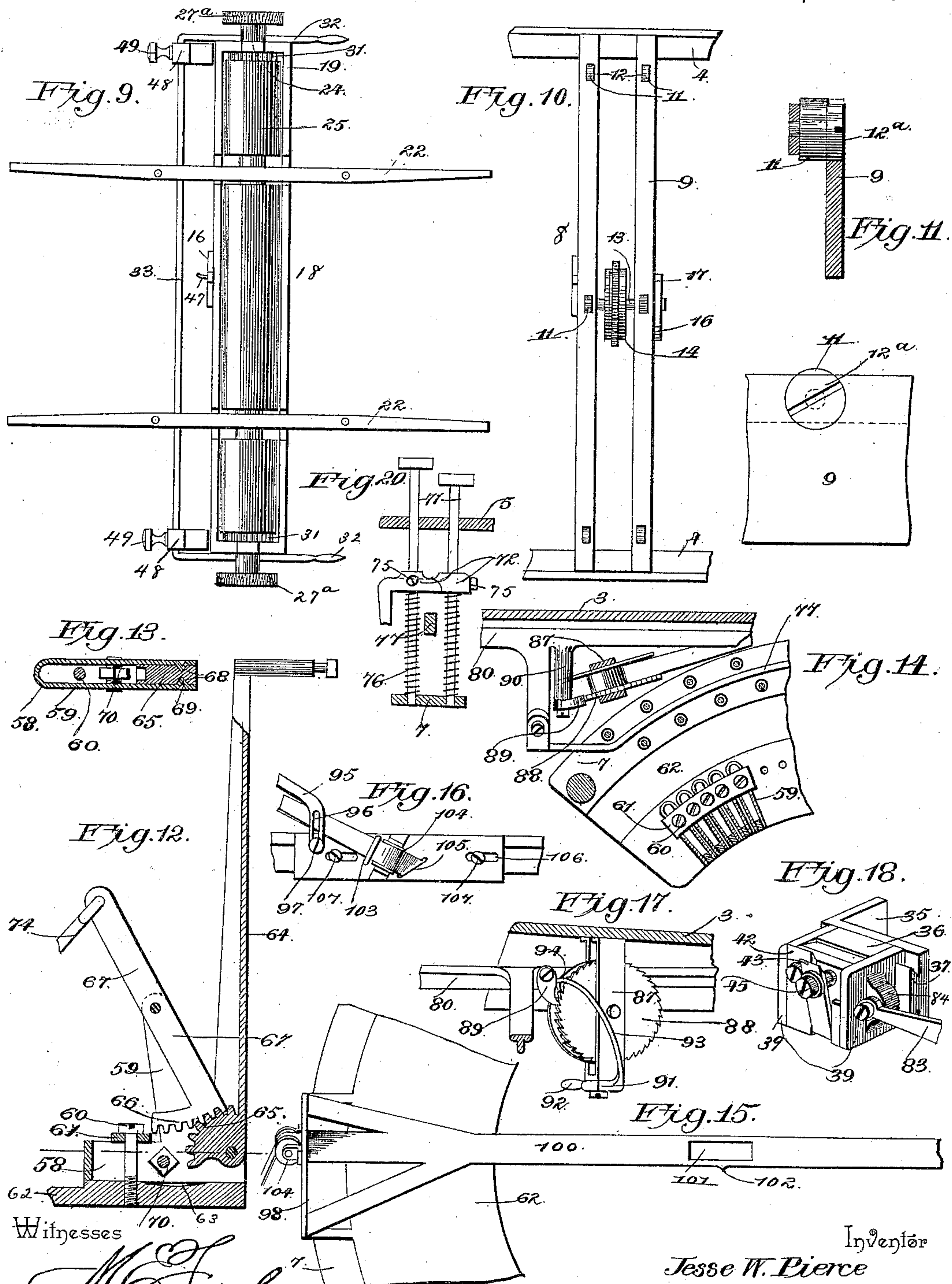
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UNITED STATES PATENT OFFICE.

JESSE W. PIERCE, OF BELTON, TEXAS.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 446,638, dated February 17, 1891.

Application filed October 9, 1889. Serial No. 326,442. (No model.)

To all whom it may concern:

Be it known that I, JESSE W. PIERCE, a citizen of the United States, residing at Belton, in the county of Bell and State of Texas, have
5 invented a new and useful Type-Writer, of which the following is a specification.

My invention relates to improvements in type-writers; and it consists in certain novel features hereinafter described and claimed.

10 In the accompanying drawings, Figure 1 is a plan view of my improved type-writer, a part of the feed-plate being broken away. Fig. 2 is a side view of the same with a part broken away. Fig. 3 is a central vertical section of
15 the machine. Fig. 4 is a similar view on a larger scale and taken at right angles to Fig. 3. Fig. 5 is a detail view of the spacing device, a part being shown in section. Figs. 6 and 7 are detail views of the tension device
20 for moving the carriage. Fig. 8 is a detail sectional view showing the spacing-pawl. Fig. 9 is a plan view of the carriage. Fig. 10 is a plan view of the support or guide for the carriage. Fig. 11 is two views of the rollers
25 over which the carriage moves. Fig. 12 is a side view, on a larger scale, of the type-bar and the lever for depressing the same. Fig. 13 is a plan view of the type-bar and the hanger. Fig. 14 is a detail plan view of a
30 portion of the ribbon-reel and its connections. Fig. 15 is a plan view of the supporting-strip through which the ribbon runs. Fig. 16 is a view of a modified form of the devices for moving the ribbon over and away from the
35 line of printing. Fig. 17 is a detail view of the ribbon-reel and the devices for actuating the same. Fig. 18 is a detail perspective view of the spacing-pawl. Fig. 19 is a detail view of the stop-plate which limits the lateral
40 movement of the carriage. Fig. 20 is a view showing the manner in which the keys act on the spacing-ring. Fig. 21 is a detail perspective view of the hanger. Fig. 22 is a perspective detail of two of the paper-retaining
45 fingers and a section of the feed-plate.

In carrying out my invention I employ a base-plate 1, on the upper side of which I secure the supporting frame 2. This supporting-frame is substantially U-shaped in both
50 plan view and side view and consists of a casting of suitable size provided with the lower arms 3 and the upper arm 4, as shown.

The upper arms 4 are provided at their front ends with the inwardly-projecting circular flange 5, and below this flange I secure by suitable bolts or other fastenings 6 an annular
55 plate 7. The keys are mounted in the flange 5, and the plate 7 and the type-bars are supported by the said plate 7, as will be hereinafter more particularly referred to. 60

Near the front end of the frame I provide the transverse guide or support 8, which consists of the two parallel bars 9 9, provided on their inner sides at their upper edges with the inwardly-projecting ribs 10. The carriage moves over these ribs 10, and is provided on its under side with hooks which engage the same, so as to hold the carriage thereto. In order to reduce the friction between the carriage and the support, I provide
65 the rollers 11, which are arranged in recesses 12 in the ribs and project slightly above the ribs, as shown. The journals of these rollers are formed by the shanks of screws 12, which are inserted transversely through the ribs
70 and the axial openings of the rollers and have their extremities engaging threaded openings in the inner sides of the ribs. The heads of the screws are arranged flush with the outer sides of the support, and the said heads serve
75 to prevent the rollers slipping outward from the recesses. The upper portion of the screw-head is cut away, so as to lie flush with the upper surface of the rib, and thus close the
80 outer end of the recess. 85

Between the parallel bars composing the support I arrange a shaft 13, which has its ends journaled therein. A hollow gear-wheel 14 is mounted on this shaft, and a spring 15 is coiled around the shaft within the said wheel
90 and has its ends secured to the shaft and the wheel, respectively. This gear-wheel 14 engages a rack-bar 21 on the bottom of the carriage, and the spring rotates the said wheel in the operation of the device, so that the carriage will be fed laterally, as will be readily understood. The front end of the shaft 13 projects forward through the front bar of the carriage-support and is made angular, so as to be engaged by a wrench. A ratchet-disk
95 100 16 is secured on the front end of the shaft and is engaged by a pawl 17, pivoted on the support above the ratchet-disk, so as to prevent backward movement of the same. In

practice the spring unwinds when the carriage moves in one direction, so as to automatically feed the carriage across the machine. When the carriage is moved in the reverse direction, the spring will be again wound. When the tension of the spring has diminished, the shaft 13 is rotated, so as to give the spring the desired tension, as will be readily understood.

The carriage 18 consists of a box 19, having an open top and provided on its bottom at its side edges with the hooks or cleats 20, which engage under the ribs 10 of the carriage-support, and thereby hold the carriage to its support and guide the same in its movements. The box is further provided on its under side and along its central longitudinal line with a rack-bar 21, which is engaged by the gear-wheel 14 in the movement of the carriage, as will be readily understood. On its upper side and near its ends the box is provided with the transverse rails 22, and these rails are engaged by suitable ribs or cleats on the under side of the feed plate or platen.

In the ends of the box or carriage I form notches 23, in which I arrange the vertically-sliding journal-boxes 24, and in these journal-boxes I mount the journals of the feed-roller 25. The journal-boxes 24 are normally projected upward, so as to hold the feed-roller in frictional contact with the feed-plate by the springs 27, seated in the lower ends of the notches 23 and bearing on the journal-boxes 24. The feed-roller is provided with a rubber surface, so as to exert a strong frictional contact on the feed-plate and also to deaden the sound produced in the operation of the machine. The journals of the feed-roller are projected beyond the carriage and are provided with operating knobs or handles 27^a, as clearly shown. Within the box or carriage, at the ends of the same, I arrange the transverse levers 28, which are pivoted at their rear ends to the carriage and have their front ends normally projected upward by the springs 29, arranged between the same and the floor of the box. The levers are provided on their upper edges with projections or teeth 30, which engage ratchet-disks 31 at the ends of the feed-roller, so as to prevent backward movement of the said roller and also to insure the proper spacing between the lines.

On the ends of the carriage I pivot the levers 32, the rear ends of which are connected by a bar 33, having ratchet-teeth on its lower edge, and the said bar may be formed integral with the levers, or it may be formed separate therefrom and then connected thereto. This ratchet-bar 33 moves over and is engaged by the spacing-pawl 34, as will be readily understood. The said spacing-pawl consists of a base-plate 35, a sliding block 36, mounted on the base-plate, and a fixed and a loose tooth carried by the said block. The base-plate 35 is a small L-shaped bracket secured to the rear side of the carriage-support and

provided on its rearwardly-projecting arm with a dovetailed rib 37, and the block 36 is provided on one side with the ribs or cleats 38, which engage the said rib 37, and thereby allow the said block to slide on the base-plate. The block is provided with the lateral ears or lugs 39, and between these lugs I pivot a plate 40, the lower end of which is normally projected outward by a spring 41, arranged between the same and the side of the block 36. The teeth 42 43 are secured to this block 40, and the tooth 42 is arranged nearer the carriage-support than the tooth 43 and is rigidly secured to the said block 36. The tooth 43 is pivoted at its lower end to the said block 40, and its upper end is pressed slightly away from the said block by a spring 44, arranged between the said tooth and the block or plate 40, and coiled around a set-screw 45, secured in the said plate 40 and passing through the tooth, the head of the said screw serving to limit the movement of the said tooth.

On the rear side of the carriage-support, adjacent to the spacing-pawl, I secure a plate 46, which is provided at its upper end with a pin or stop 47, against which the check-plates 48 are adapted to impinge, so as to limit the travel of the carriage. These check-plates are adjustably secured to the ratchet-bar 33 by the set-screws 49, so that they may be shifted along the said bar to any desired point, as will be readily understood. The plate 46 is provided at its lower edge with the rearwardly-projecting arm 50, having notches 51 in its upper edge, the purpose of which will presently appear.

The feed-plate 52 is a flat rubber plate of suitable size, and is provided on its under side with the cleats or ribs 53, adapted to engage the rails 22 on the carriage, and thereby hold the feed-plate on the carriage and at the same time allow it to move upon the carriage and guide it in said movement. At the front end of the feed-plate I form a series of perforations 54, in which I mount the L-shaped fingers or clamping-arms 55, the longer arms of which extend inward over the feed-plate and are adapted to pass over the edge of the paper. The lower ends of the clamping-fingers are connected by a bar 56, and the fingers are held normally against the feed-plate by the springs 57, arranged around the shorter arms of the fingers between the feed-plate and the bar 56. By this arrangement the paper will be firmly clamped to the feed-plate, and in order to hold the other end of the paper to the feed-plate I provide the pins or hooks 57^a in the edges of the feed-plate and extend an elastic band or similar device over the feed-plate and the paper between said pins.

The plate 7 is provided at its inner edge with a depressed shelf 62, and the hangers 58 are secured on the said shelf. These hangers consist, substantially, of U-shaped bars provided on their upper edges with the integral standards 59, and they are secured to the shelf

by means of a screw or bolt 60, passed through a plate 61, arranged over the hanger, through the hanger, and into the shelf 62, and the said shelf is provided with a slight depression 63, which is arranged so as to come about under the center of the hanger, as shown most clearly in Fig. 12. This construction causes the pressure on the hanger to be concentrated at the ends of the same, and consequently reduces the liability of the hanger to tip and renders the bearing very firm. The type-bar 64 is pivoted in the front end of the hanger and is provided at its lower end with the segmental gear 65, and the said segmental gear is engaged by a similar gear 66 on the lower end of a lever 67, which is fulcrumed between the upper ends of the standards 59, as clearly shown.

The type-bar is provided at its lower end in its opposite sides with the conical recesses 68, which are engaged by the conical spurs 69, formed in the hanger by striking up the sides of the same, as shown most clearly in Fig. 13. The sides of the hanger are connected by a right and left threaded bolt 70, having its ends screwed into the sides of the hanger in rear of the type-bar. As the hanger wears, this right and left threaded bolt can be rotated, thereby drawing the sides of the hanger together and taking up the wear on the pivot, at the same time preserving the alignment.

The shanks of the keys 71 are mounted vertically in the flange 5 and the plate 7 of the supporting-frame and are arranged in two circular series outside of the type-bars. Between the flange 5 and the plate 7 I secure to the key-shanks the brackets 72, which are provided at their inner ends with the depending arms 73, and the lower ends of these arms 73 are connected with the upper ends of the levers 67 by the links 74, as clearly shown. The brackets 72 are adjustably secured to the keys by the set-screws 75, so that they can be adjusted to a higher or lower point of said keys to take up wear and to regulate the stroke, and a coiled spring 76 is arranged around the key below the bracket, so as to hold the key normally elevated and to return it to its raised position after it has been depressed.

The spacing-lever is provided with a ring 77, which passes between the two series of keys and is depressed by the brackets 72 when the keys are depressed. The brackets of the inner series of keys have their outer ends arranged over the ring, while the brackets of the outer series of keys extend inward over the said ring, as shown in Fig. 20. I also provide a spacing-key 78, which is arranged at the front end of the machine and is provided with a lug 79, adapted to impinge on the spacing-ring 77, and thereby actuate the same.

The spacing-lever is a substantially U-shaped bar having its front portion formed into the spacing-ring 77 and its rear portion

into arms 80, the ends of which are secured to the rock-shaft 81, journaled in the supporting-frame. To the center of this rock-shaft 81 I secure the depending vibrating arm 82, and to the lower end of this vibrating arm 82 I pivot the rear end of a pitman 83, the front end of which is pivoted to a lug 84 on the rear side of the block 36. The extremity of the arm 82 depends slightly below the pitman 83, and a spring 85 has its rear end secured to the said extremity and its front end provided with a horizontal loop 86, engaging one of the notches 51 in the arm 50. By this arrangement when the spacing-lever is depressed the rock-shaft will be rotated, so that the spacing-pawl will be drawn rearward by the vibrating arm and the pitman, and upon releasing the pressure on the key the spring 85 will return the spacing-pawl to its initial position. The tension of the spring can be readily adjusted by engaging the loop at the front end of the same in the various notches 51, as will be readily understood.

The ribbon reels or spools are journaled in brackets 87, secured to the under side of the flange 5 near the center of the frame and the rear ends of the series of keys, and the said spools are provided with the ratchet-disks 88 at their inner sides, which are engaged by the pawls 89, pivoted to lateral arms 90 on the spacing-lever. On the lower ends of the brackets 87 I pivotally mount the detents 91, which consist of the lever 92 and the arm 93, extending upward from the end of said lever and having its extremity bent inward around the edge of the ratchet-disk 88 and bearing on the pawl 89. The end of the arm 93 is further provided with a tooth or projection 94, which is adapted to engage said ratchet-disk to prevent backward movement of the same.

The spacing-lever is provided with a small extension or branch 94^a, to which I secure by a pin-and-slot connection the front end of the upper arm of the angle-lever 95, the said angle-lever being fulcrumed on the supporting-frame. The longer arm of this angle-lever extends forward and downward and has its extremity slightly curved and provided with a longitudinal slot 96, engaging a pin or stud 97 on the outer side of a plate 98, forming the end of the ribbon-carrier. This plate 98 is provided with a standard or upwardly-projecting arm 99, which is pivoted at its upper end to the supporting-frame, as shown. It will be understood, of course, that one of these plates 98 and angle-levers 95 is provided on each side of the machine, and these plates 98 are connected by the parallel strips or bars 100, having their ends secured to the said plates and provided at their centers with the registering openings 101 and on the rear edge with the point or indicator 102. The ribbon is wound on the reels or spools and passes from the same to a bail or guide 103, secured on the plate 98, and then over a pulley 104 on said plate, after which it passes

through a slot 105 in the plate and enters the space between the strips 100, as is shown most clearly in Fig. 4. The type-head will strike the ribbon through the opening 101 and form the impression on the paper.

Instead of pivoting the plates 98 by means of the standards 99, as shown in Fig. 2 and as just described, the plates could be mounted, as shown in Fig. 16, in which they are provided with longitudinal slots 106, engaging studs or pins 107 on the outer side of projections of the shelf 7.

The flange 5 is provided at various points with the inwardly-projecting arms 108, having their outer ends connected by a ring 109, and on this ring I arrange a packing or cushion 110, adapted to receive the force of the blow exerted by the upward motion of the type-bar, and this packing or cushion is held in place by a curved clamping-plate 111, secured on the said packing ring 110. The construction and arrangement of the several parts of my machine being thus made known, the operation of the same will, it is thought, be readily understood.

The paper is clamped on the feed-plate and the keys then depressed, so as to operate the proper type-bars to print the desired matter. The check-plates 48 are adjusted so as to allow the proper margin on each edge of the paper, and as the projection or stop 47 is in the center of the machine the paper will be always in the middle of the feed-plate. As each key is depressed the bracket secured thereto will be drawn downward, and the downward movement of the said bracket will be transmitted through the link 74 directly to the lever 67, and the said lever consequently vibrated on its pivot, so that the segmental gear 66 will be caused to act on the gear 65, and thereby throw the type-bar downward, so that the type-head will strike through the opening 101 into the ribbon and form the desired impression on the paper. The bracket, secured to the key will depress the spacing-ring, and thereby actuate the spacing-lever and its connections to draw the sliding block 36 rearward. The ratchet-bar 33 is normally engaged by the loose tooth 43 of the spacing-pawl, and when the sliding block 36 is drawn rearwardly the fixed tooth 42 is drawn into engagement with the said bar. Upon releasing the pressure on the key the spring around the key raises the same, and the spring 85 acts on the arm 82 and the pitman 83, so as to return the sliding block 36 to its initial position, thereby throwing the loose tooth into engagement with the ratchet-bar and disengaging the fixed tooth therefrom. When the sliding block was drawn rearward, the spring 44 threw the loose tooth outward a distance equal to the space between two adjacent teeth of the ratchet-bar, so that upon the return of the block the loose tooth engaged a different point of the said bar, and it was free to move until the loose tooth was carried against the plate 40. This motion is imparted

to the bar and the carriage by the spring-actuated hollow gear-wheel, as will be readily understood. The carriage is thus fed across the path of the type step by step as each key is operated. When a line has been completed, the motion of the carriage will be arrested by the check-plate 48 coming into contact with the stop 47, and the carriage is then returned to its initial position. To return the carriage to its initial position the levers 32 are depressed, thereby raising the rack-bar out of engagement with the spacing-pawl, and the carriage may be then returned by hand to the opposite side of the machine. The spring 41 allows the pivoted plate 40 to swing, and thereby reduces the wear on the rack-bar and the teeth, if it should be attempted to return the carriage without first raising the rack-bar. As the carriage is returned to its initial position the feed-roller is manually rotated, so as to move the feed-plate the proper distance to secure the proper spacing between the lines. The levers 28, engaging the ratchet-disk 31 at the ends of the feed-roller, effectually prevent the feed-plate slipping from its position and insure uniformity of the lines. It will be observed, furthermore, that when the key is depressed to print a letter the spacing-lever is also depressed, and the angle-lever 95 thereby thrown downward and the plate 98 consequently caused to swing rearward, thereby bringing the ribbon into the path of the type-face. Upon releasing the pressure of the key and allowing the spacing-lever to return to its former position the ribbon will be thrown forward from over the line being printed, and the said line consequently displayed, so that the work may be viewed at all times.

It will be seen from the foregoing description, taken in connection with the accompanying drawings, that I have provided a type-writer in which the several parts are compactly arranged and in which the work can at all times be viewed by the operator. The printing is accomplished on a flat surface, so that the type faces wear evenly, and any number of sheets may be placed in the machine at one time, and the time usually lost in removing and inserting new sheets thus saved.

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

1. The combination of the base-plate 35, having a rib 37, the sliding block having a groove engaging said rib, the vibrating plate carried by said block, and the fixed tooth and the loose tooth secured to the said plate, as set forth.

2. The combination of the block 36, the vibrating plate carried by said block, the spring 41, arranged between the block and the lower end of the plate, and the fixed tooth and the loose tooth secured to said plate, as set forth.

3. The combination of the supporting-frame, the carriage mounted thereon and carrying a

ratchet-bar, the spacing device on the frame, consisting, essentially, of a sliding block and pawls carried thereby and adapted to engage the ratchet-bar on the carriage, the circular series of keys in the upper portion of the frame, the rock-shaft journaled in the rear end of the frame and having a depending vibrating arm at its center, the pitman connecting said arm with the sliding block, the spring secured to said arm and the frame, and the spacing-lever projecting forward from the rock-shaft and having a spacing-ring adapted to be depressed by the keys, as set forth.

4. The plate 46, provided at its lower edge with a rearwardly-projecting arm 50, having notches 51 in its upper face, in combination with the space-lever and a spring 85, having a loop 86, adjustably connecting said space-lever with said notches, as set forth.

5. The combination of the box or carriage, the feed-roller mounted therein and provided with ratchet-disks at its ends, the levers pivoted in the ends of the box and provided on their upper edges with the teeth or projections adapted to engage the ratchet-disk, and the springs arranged between the bottom of the box and the lower edge of the lever, as set forth.

6. The combination of the carriage, the feed-plate mounted thereon, and the feed-roller mounted in sliding bearings in the carriage and in frictional contact with the under side of the feed-plate, as set forth.

7. The combination of the carriage, the feed-plate mounted thereon, the sliding journal-boxes in the end of the carriage, the feed-roller journaled in the said boxes and in frictional contact with the under side of the feed-plate, and the springs arranged between the bottom of the carriage and the under side of the journal-boxes, as set forth.

8. The ribbon-supporting device consisting of parallel strips or bars provided at their centers with vertical openings, in combination with means, substantially as described, for moving said bars laterally after each stroke of a key, as set forth.

9. The combination of the vibrating plates, the parallel strips connecting said plates, the inking-ribbon moving through said plates and between said strips, and mechanism for vibrating said plates, as set forth.

10. The combination of the frame, the vibrating plates mounted on the sides of the same, the spacing-lever, and the angle-lever fulcrumed on the frame and having its opposite ends respectively connected to the spacing-lever and the vibrating plate, as set forth.

11. The combination of the frame, the vibrating plates mounted thereon, the slots 105, the pulleys on the plates adjacent to said slots, the guides 103 on the plates, and mechanism for vibrating the plates, as set forth.

12. The combination of the frame, the brackets 87, secured thereto, the ribbon-reels mounted in said brackets and having ratchet-disks on their sides, the spacing-lever, the

pawl carried by said lever and engaging the ratchet-disks of the ribbon-reels, and the detents mounted on the hangers and adapted to throw the pawl out of engagement with the ratchet-disk, as set forth.

13. The combination, with the ribbon-reel and the pawl to actuate the same, of the detent having its end acting on the pawl and provided with a projection adapted to engage the ribbon-reel, as set forth.

14. The combination of the vertically-disposed type-bars arranged in a circular series and provided at their lower ends with segmental gears, the keys arranged around the type-bars, and the levers between the keys and the type-bar and having their inner ends provided with segmental gears engaging the gears on the type-bars and having their outer ends connected with the keys, as set forth.

15. The combination of the type-bars, the keys, the brackets secured to the keys, the centrally-pivoted levers connected to the type-bars at one end, and the links connecting the other ends of said levers with said brackets, as set forth.

16. The combination of the circular series of type-bars, the double circular series of keys, the spacing-ring between the shanks of the keys in said two series, the brackets adjustably secured to the keys and adapted to impinge on said ring, the springs on the key-shanks below said brackets, the levers actuating the type-bars, and links connecting said levers with said brackets, as set forth.

17. The combination of the hangers having integral standards rising from their upper edges, the type-bars fulcrumed in the hangers and having segmental gears at their ends, the levers pivoted between the upper ends of the standards and provided with segmental gears engaging the gears on the type-bars, the vertically-sliding keys, and links connecting said keys with the outer arms of the levers, as set forth.

18. The combination of the carriage-support having ribs on its inner sides provided with horizontal circular recesses in their sides opening into their upper edges, the rollers arranged in said recesses and projecting slightly above the said edges, and the screws secured in the ribs and having their shanks forming the journals of the rollers and their heads fitting said openings and bearing against the rollers, as set forth.

19. The combination of the feed-plate, the fingers mounted therein, the bar connecting the lower end of the fingers, and the springs arranged around the fingers between the plate and the bar, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JESSE W. PIERCE.

Witnesses:

E. G. SIGGERS,

DAVID P. WOLHAUPT.