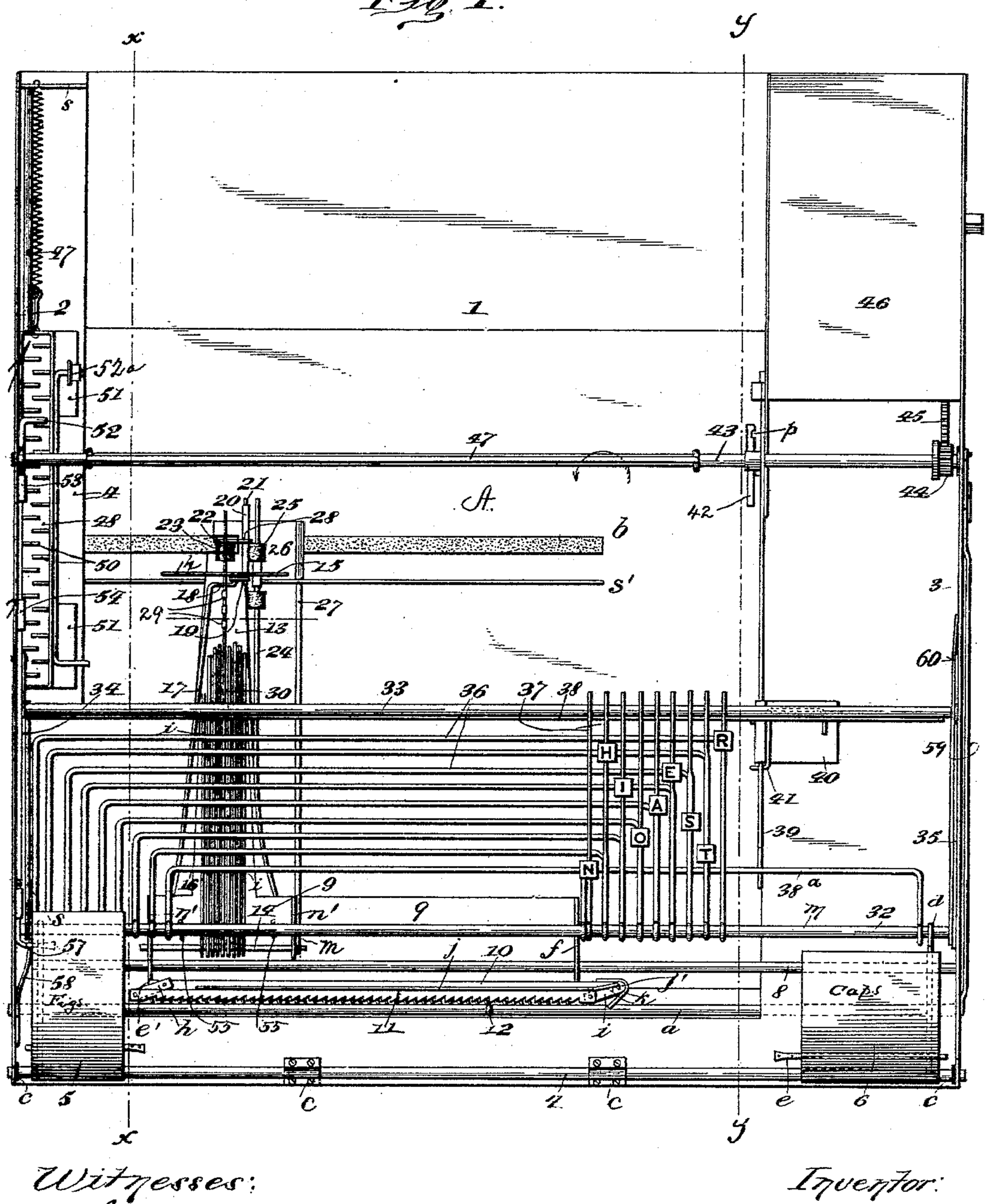
(No Model.) 4 Sheets—Sheet 1.

B. F. PALMER.

TYPE WRITING MACHINE.

No. 597,015. Patented Jan. 11, 1898.

Fig. 1.



Witnesses:
Thos. L. Gatches.
J. Roy Cockrum

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(No Model.) 4 Sheets—Sheet 2.

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TYPE WRITING MACHINE.

No. 597,015. Patented Jan. 11, 1898.

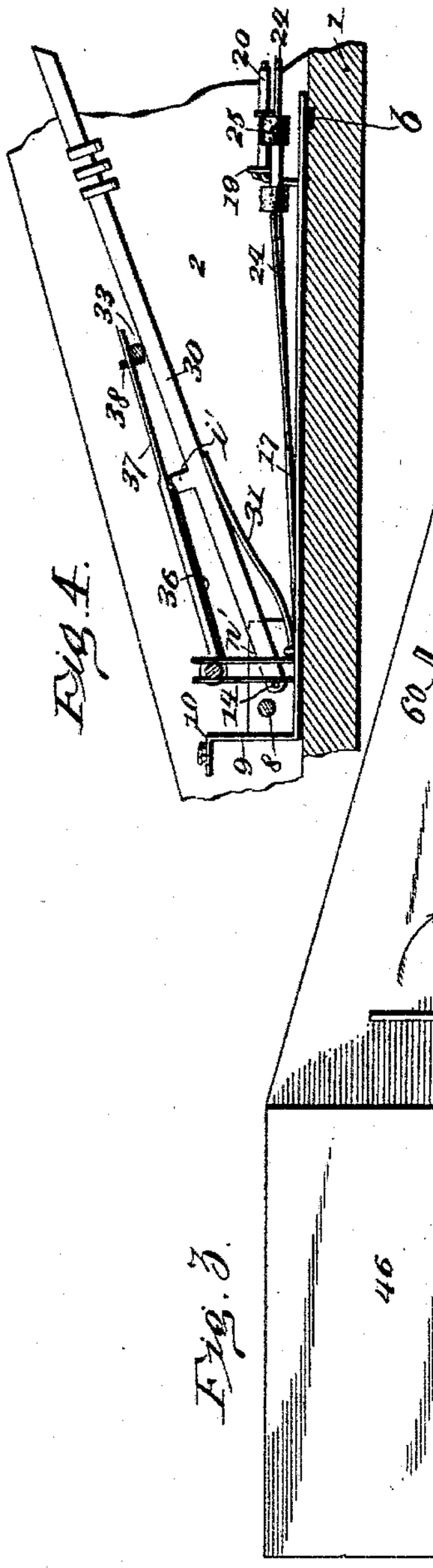

Fig. 1.

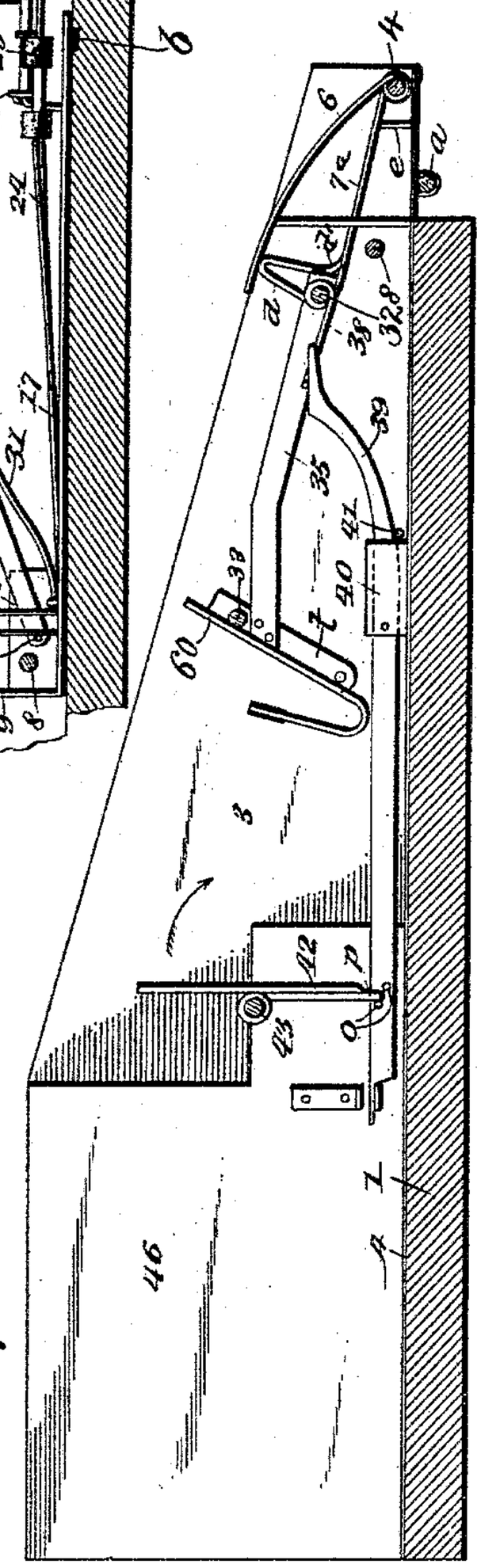

Fig. 3.

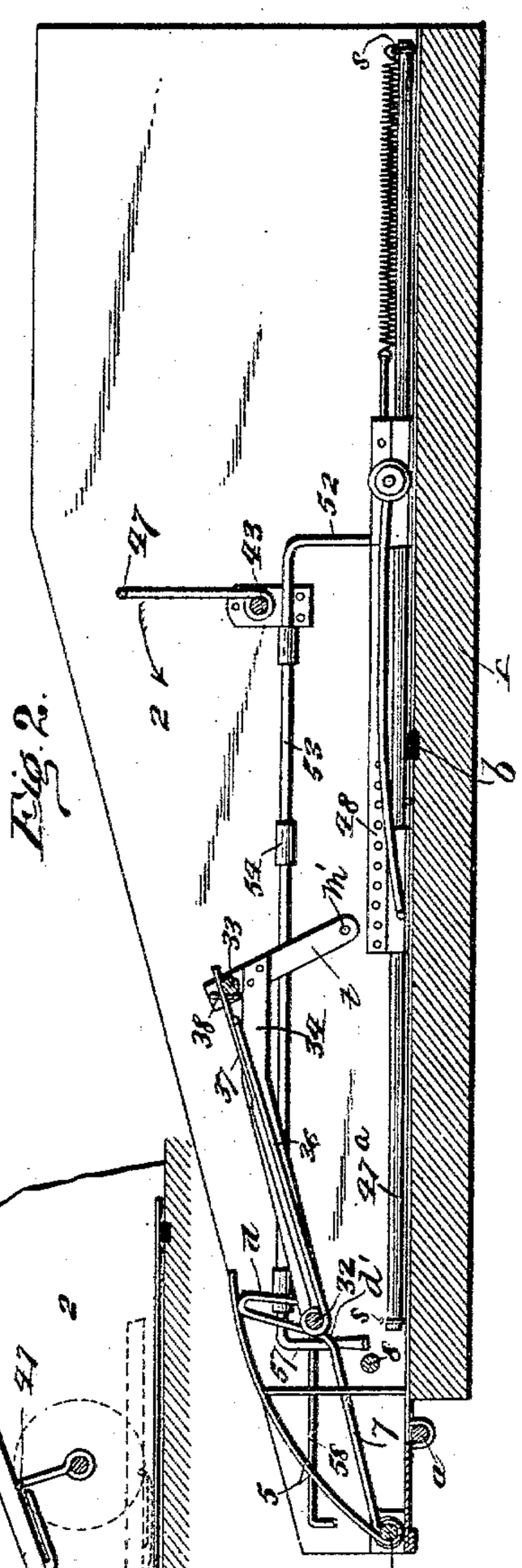

Fig. 2.

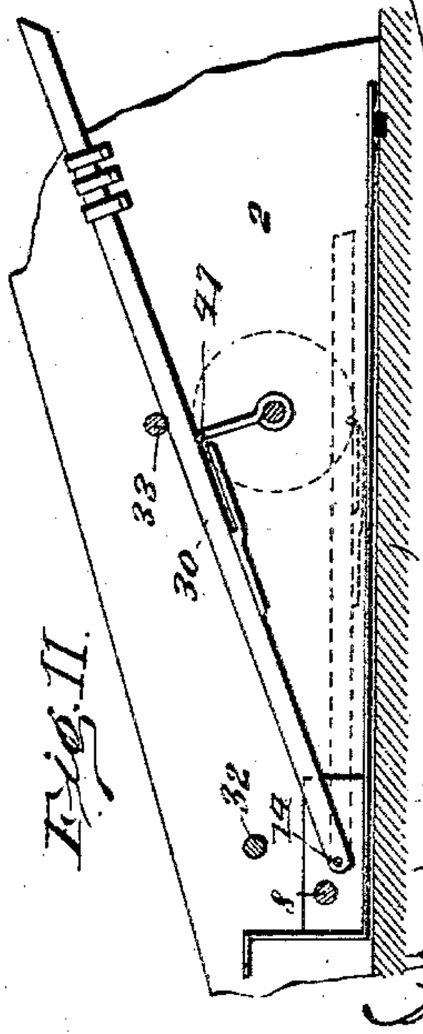

Fig. 4.

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(No Model.) 4 Sheets—Sheet 3.

B. F. PALMER.

TYPE WRITING MACHINE.

No. 597,015. Patented Jan. 11, 1898.

Fig. 6.

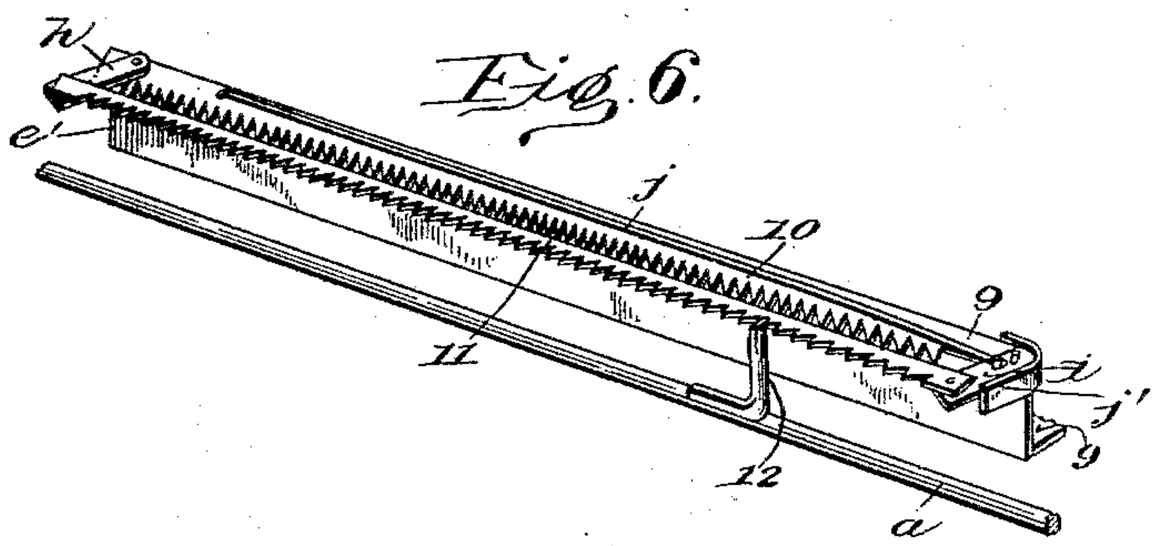


Fig. 5.

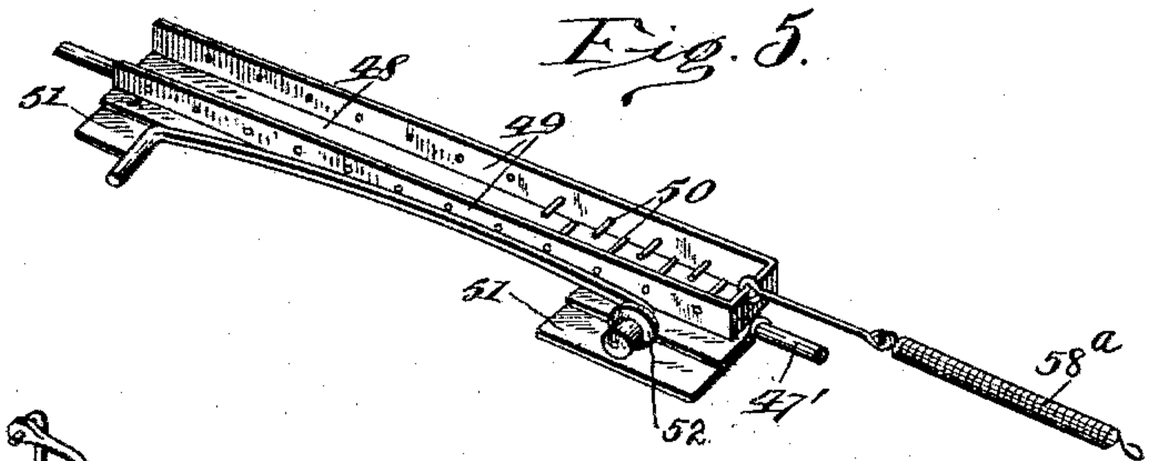


Fig. 9.

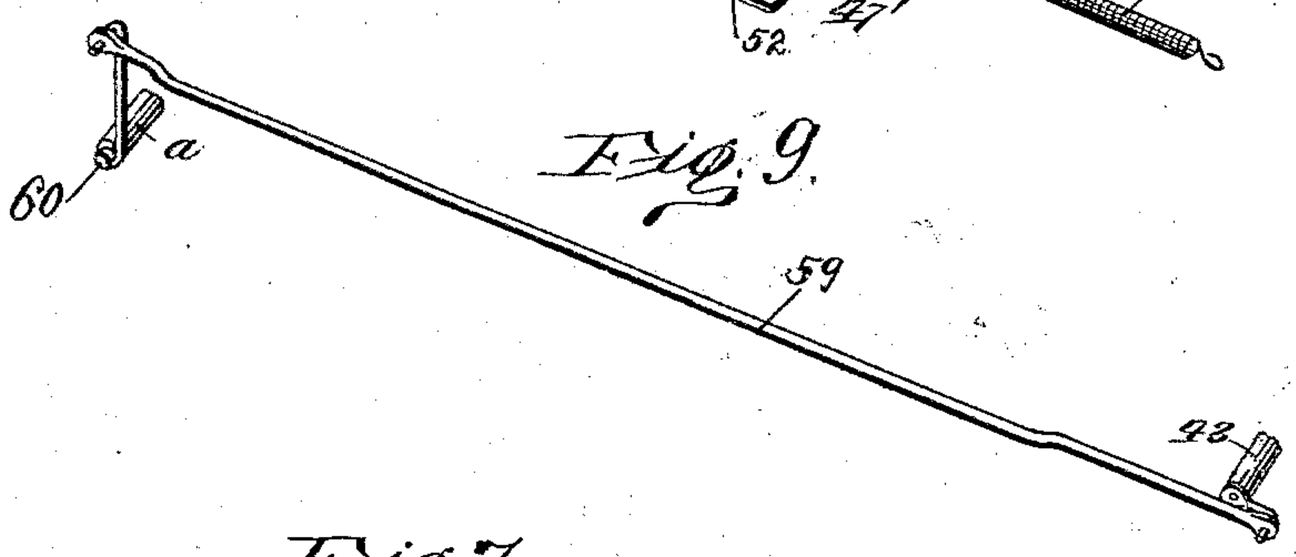


Fig. 7.

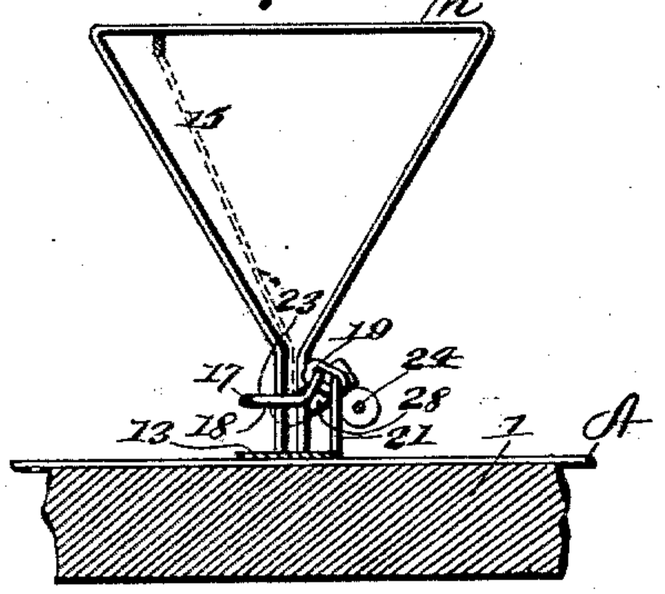


Fig. 8.

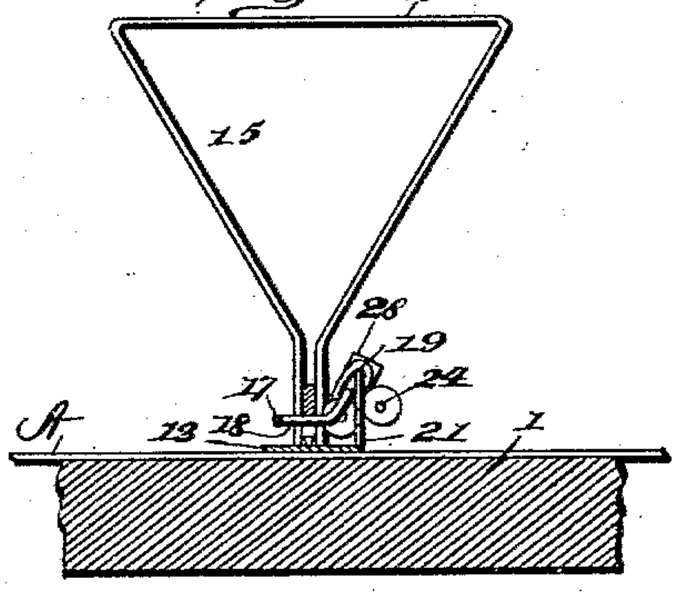
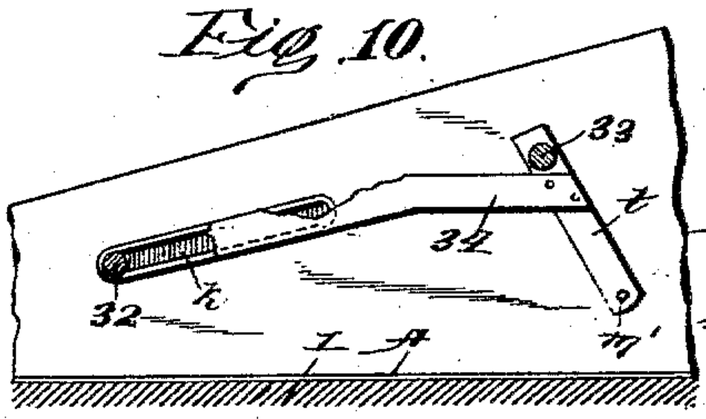


Fig. 10.



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(No Model.) 4 Sheets—Sheet 4.

B. F. PALMER.

TYPE WRITING MACHINE.

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Fig. 12.

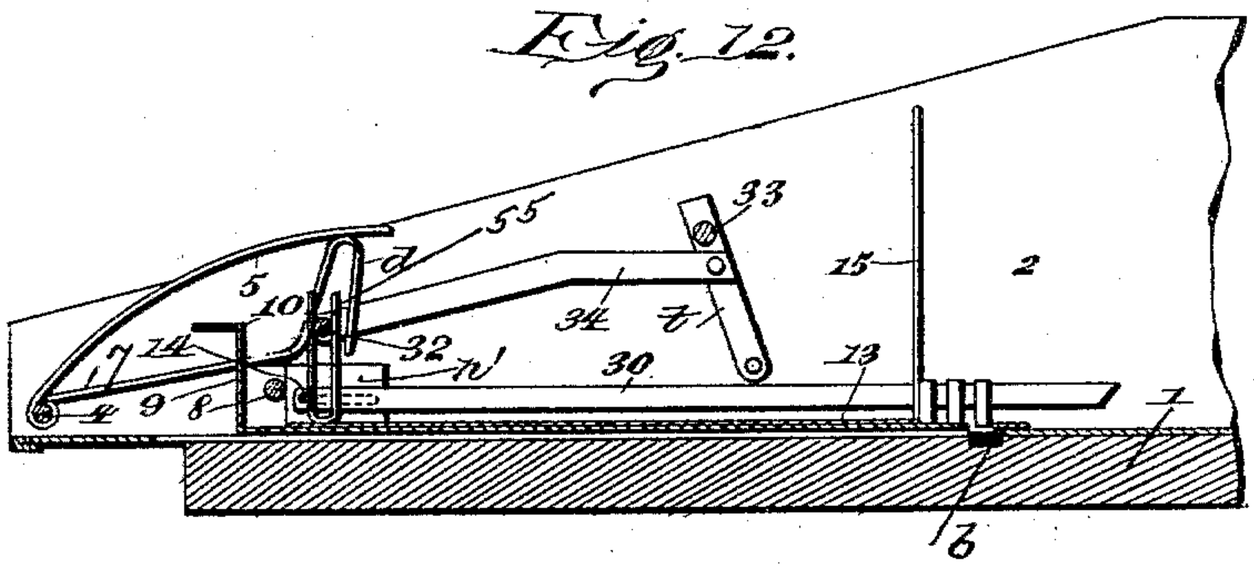


Fig. 13.

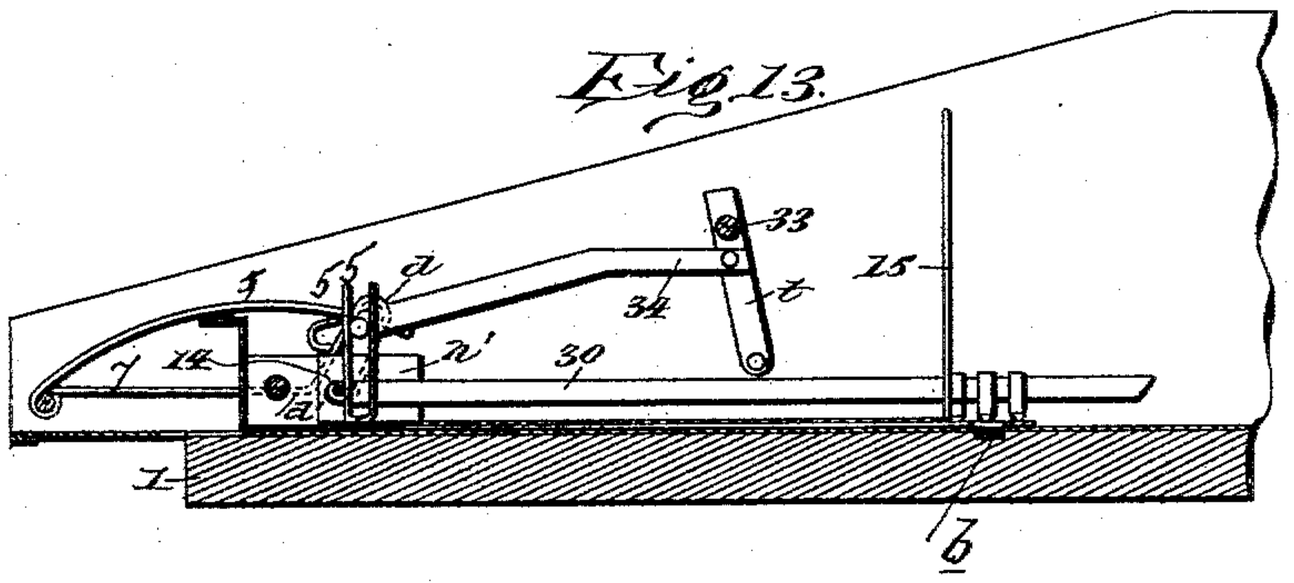
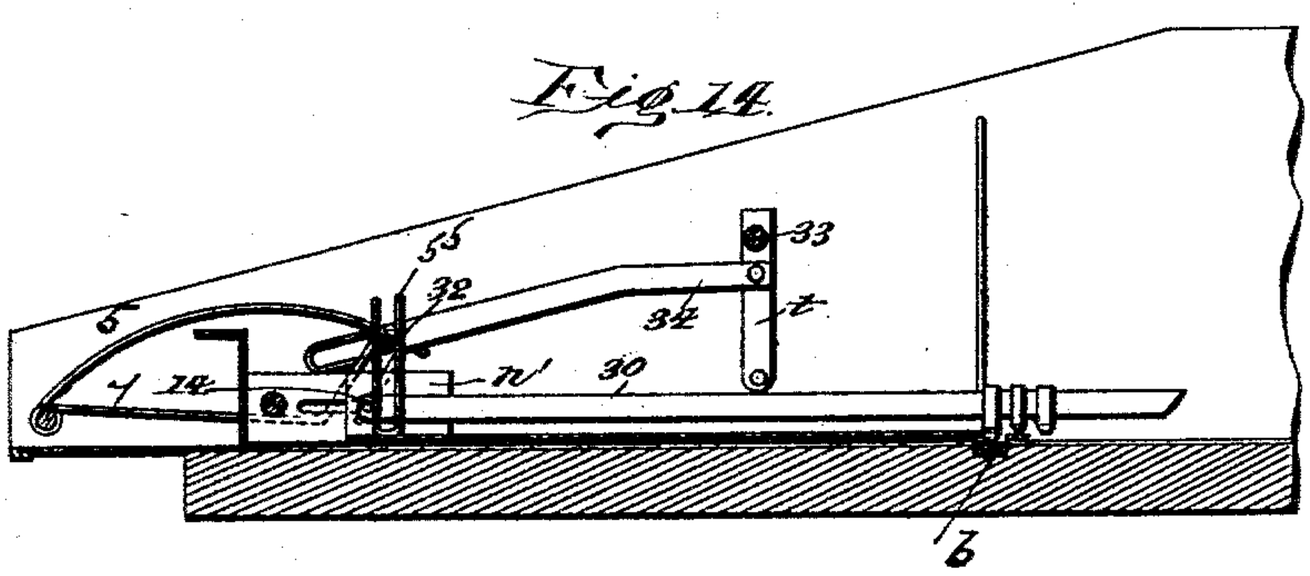


Fig. 14.



Witnesses:
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H. T. Bright

Inventor:
B. Franklin Palmer:
by Frederick P. Benjamin
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UNITED STATES PATENT OFFICE.

B. FRANK PALMER, OF PHILADELPHIA, PENNSYLVANIA.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 597,015, dated January 11, 1898.

Application filed February 25, 1896. Serial No. 580,656. (No model.)

To all whom it may concern:

Be it known that I, B. FRANK PALMER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Type-Writing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is a type-writing machine of novel construction having for its chief objects simplicity of form and action, economy in its mechanical construction, lightness in weight, strength, and durability, and of that class in which the writing is in plain sight of the operator at all times.

To attain the objects above set forth, I employ, generally speaking, a rectangular case in which are contained a flat platen or bed, a movable type-carriage, a series of parallel type-bars, an automatic paper-line adjuster, a condensed keyboard in which the keys are operated by a stylus, an automatic inking-pad, and a device for striking the type-bars to secure the necessary impressions.

In the drawings, which form a part of this application, Figure 1 is a plan view of my machine. Fig. 2 is a section on line *x x* of Fig. 1. Fig. 3 is a section on line *y y*, Fig. 1. Fig. 4 is a detail showing one of the type-bars. Fig. 5 is a detail of the paper-carrying and spacing mechanism. Fig. 6 is a detail of the mechanism for moving the type-carriage. Figs. 7 and 8 are details showing the inking-pad in different positions. Fig. 9 shows the crank which operates the rocking shaft carrying the dog. Fig. 10 is a detail showing the bearings for the keyboard-frame. Fig. 11 shows a modified form of type-bar. Figs. 12, 13, and 14 are side views, partly in section, of the type-bars and shifting mechanism on an enlarged scale.

Like letters and numerals of reference indicate like parts in the several views.

The frame of my type-writing machine consists of the bed 1, which may be of metal or wood, and side pieces 2 and 3, secured to the bed in any suitable manner that will not obstruct the upper surface thereof. The front and rear of the bed are left open. Near the front edge of the bed 1 in a recess extending the full width of the bed and having bearings in the sides 2 and 3 is a round rod *a*, for a purpose hereinafter explained. In a plate A about midway between its front and rear edges and extending across the plate is a platen *b*, which is raised slightly above the plane or surface of the bed, as shown in Fig. 3.

Secured to the bed 1 is the plate A, composed of steel, aluminium, or other suitable material, and in the plate is a longitudinal slot or recess to accommodate the platen *b*, which extends above the surface of said plate.

Along the front edge of the bed 1 extends a rod 4, which is mounted in the sides 2 and 3 and in bearings *c* and has a rocking motion imparted to it by the crank 59. Secured to the rod 4 near either end and extending upwardly and forwardly therefrom at different angles are shift disks or plates 5 and 6 for upper-case letters and figures. Secured to the rod 4 under the disks 5 and 6 and at corresponding angles thereto are arms 7 7^a, which are bent to form shoulders *d'* and terminating in hooks *d*, adapted to grasp the rod 32 when said arms are depressed. Springs *e e*, secured to the bed 1, hold the arms normally above the rod 32. These shift disks or keys are used to throw the type-carriage rearwardly to present the upper-case letters or the numerals, respectively, in position to be used. By pressing down on a disk the arm under that disk is thrown downward, its shoulder *d'* strikes the rod 32 and throws it back, causing a corresponding movement of the type-carriage, which is carried on said rod, and the hooked end *d* of the arm limits the backward movement of said rod. By making the arm under one disk longer than the other it will be seen that the longer arm will carry the rod 32 backward farther than the shorter arm. When the type-writer is in its normal position, the type on the ends of the type-bars are in use, and these are the small or lower-case letters. If it be desired to print the upper-case or capital letters, the shift disk or key having capitals indicated on its face or upper side and the shorter arm under it are depressed and the carriage is caused to move backwardly one point until the capital letters, which are the middle characters on the type-bars, are brought over the notch 28 in the leaf 26, when they are in position for use. If it be desired to print the

numerals, the disk having such characters on its face and the longer arm under it are depressed, when the carriage is thrown backward two points and the numerals are in position for use.

At the rear of the rod 4 is a fixed bar 8, supported at either end in the sides 2 and 3, upon which moves the type-carriage mechanism. This mechanism consists of an L-shaped plate 9, having its horizontal part formed with upturned ends e' f, through holes in which the rod or bar 8 passes and supports the plate above the platen. The plate 9 is provided along its front edge with a flange g, to which is secured the ratchet-bar 10. Pivoted in the top of said bar 10 at either end are short arms h i, to the outer ends of which is pivoted the ratchet-bar 11, the teeth of which are set at an angle opposite to the angle of the teeth in the plate or bar 10. A spring j, secured to the top of the bar 10 and having its free end playing between two small pins k k on the arm i, serves to hold apart the ratchet-bars 10 and 11, as the normal action is to throw outward the bar 11. This action of the spring j is overcome by the dog 12, which is rigidly secured to the rod a, the rocking motion of which causes the dog to engage the teeth of the ratchet-bars. As the dog is disengaged from the teeth in the bar 11 the spring j causes a forward movement of the latter, so that when the dog returns it engages a different tooth, and a movement of the type-carriage mechanism to the right results. A detent j' on the right-hand end of the bar 10 limits the forward movement of the arm i.

Between the upturned end e' of the plate 9 and a guide-rod m, secured to said plate about two inches from said end, is the alinement-arm 13, having upturned edges n' n', through holes in which is a rod 14, which also passes through a longitudinal slot in the end e' of the plate 9 and under the guide-rod m. The arm 13 is supported throughout its length by the vertical part 16 of the plate 9. At the rear end of the arm 13 is the wire triangular-shaped alinement-yoke 15. To the left-hand edge of the part 16 of the plate 9 is secured one end of a spring-lever 17, the free end of which is normally above the arm 13 and is bent at right angles to form an arm 18, the end of which engages a link 19 on the end of a sleeve 20, which turns upon and is supported by a rod 21, secured to the part 16 of the plate 9. On the end of the sleeve 20 opposite the link 19 is an arm for carrying the inking-pad 23, which turns with the sleeve as it is partially revolved by the spring-lever 17 acting on the link 19. To the right-hand edge of the part 16 of the plate 9 is secured one end of a spring-rod 24, near the free end of which is carried an ink-supply pad 25, which comes in contact with the pad 23 when the latter is depressed. To prevent the ink-pads from touching the platen or the paper, I place under them a leaf 26 of thin metal, which is secured to a rod 27, which in turn is secured to and supported by the plate 9. A square notch 28 is cut in the leaf 26 directly under the striking-point of the types 29 on the type-bars 30, the diameter of said notch being sufficient to permit but one of the types to strike the paper at the same stroke. To secure a clear impression from the type struck, the rod b in the platen and bed is raised slightly above the face of the platen in the slot provided for that purpose, which causes a ridge in the paper along the line of writing. The ridge at this point also relieves the type not used from the full force of the blow on the leaf 26.

Attached to the platen A and extending across the same is a rod s', upon which slides the plate 9 as it moves from left to right.

The type-bars 30, one of which is shown complete and eight cut off in Fig. 1, are of thin steel, with a vertical diameter from six to eight times the thickness. Said bars are hinged on the rod 14 and are normally held at an angle above the platen by springs 31, which are secured to the arm 13 between the upturned edges n' n', there being a spring for each bar. The cross-piece h of the yoke 15 limits the height at which the bars are held by the springs. On the upper edge of each type-bar is a lug i', arranged so that no two lugs are opposite each other.

Above the type-bars is a frame composed of horizontal rods 32 and 33 and vertical rods 34 and 35. The rod 32 has sliding bearings in the tracks or ways k, secured to the inside of the sides 2 and 3 of the frame, as shown in Fig. 10. The rod 33 is rigidly supported in the upper ends of the brackets t, the lower ends of which are pivoted on the pins m' in the sides of the frame. The rods 34 and 35 connect the rod 32 with the brackets t. Within the space formed by the rods 32, 33, 34, and 35 is arranged a series of parallel bent rods or wires 36, corresponding in number to the type-bars, which are hinged on the rod 32. Each of the rods 36 contacts with one of the lugs i' on the type-bars, so that when a rod is depressed a corresponding depression takes place in the type-bar. To the bent rods 36 are secured keys H E R I A S N O T, representing the letters on the type-bars, which contact by means of the lugs i' with said rods, respectively, so that when said keys are depressed a corresponding depression takes place in the rods 36. Vertical rods 37, the upper ends of which rest in a notched plate 38 on the rod 33 and the lower ends rest upon the rod 32, are secured to the rods 36 and serve as supports therefor and cause them to return to their normal positions after being depressed.

Placed under the rods 36 so that it rests upon them is a spacing-bar 38^a, which is also hinged to the rod 32 and rests on the forward end of a lever 39, as clearly shown in Fig. 3. This lever 39 is fulcrumed in an angle-plate 40, which is secured to the bed of the machine,

and the forward end of the lever is supported by a spring 41, one end of which is attached to the plate 40. Near the rear end of the lever 39 and at right angles therewith are two small pins *o o*, which serve as detents for the trigger 42, one end of which is notched, so that the trigger may pass said detents when the lever is depressed at its forward end. The trigger 42 is rigidly secured to a revolving rod 43, having bearings in the sides 2 and 3 of the frame. On the right-hand end of the rod 43 is mounted a pinion 44, which meshes with the driving-pinion 45 of a motor 46. Said motor may be of any convenient type and forms no part of this invention.

A bent arm 47 is rigidly secured to the rod 43, and as it revolves with said rod in the direction shown by the arrows in Figs. 1, 2, and 3 it strikes the ends of the type-bars 30 and causes them to descend in the alinement-yoke and strike the paper, as shown by dotted lines in Fig. 7, when the said type-bars have been brought within the path of the revolving arm 47. In order to bring the type-bars within the path of the arm 47, a slight touch only is required on the keys H E R, &c., which, acting on the bent rods 36, causes them to depress the type-bars through contact with the lugs *i'*.

The paper carrying and adjusting mechanism is composed of a rod 47ª, having bearings in uprights *s*, secured to the bed of the machine at the left-hand side. Sliding on the rod 47ª is a paper-holding frame, consisting of the plate 48, having upturned flanges 49, in which are inserted at right angles with said flanges and on the inner side thereof pins 50, as shown in Fig. 1. Below the paper-holding frame and secured to the rod 47ª are plates 51, between which and the frictional roller 52 the paper is inserted and is held in place by frictional contact. Engaging the pins 50 is a downwardly-extending arm 52 (see Fig. 2) of a rocking lever 53, which is supported by brackets 54 on the side 2 of the machine. This rocking lever has on its opposite end a downwardly and forwardly extending arm 57, which is moved backward when the plate 9 is moved to the extreme left side or starting-point, causing a corresponding movement of the arm 52 on the other end of the lever. A spring 58, attached to the side 2 of the frame, returns the arm 57 to its normal position when the plate 9 is moved to the right. It will be seen that the effect of this action is to release the arm 52 from engagement with one of the pins 50 each time the carriage is brought back to the starting-point at the left-hand side of the machine. As soon as the arm 52 is released from one of the pins 50 the tension of the spring 58ª moves the plate 48 until the arm 52 catches on the next pin and the paper is carried up one line.

It will be seen that the rods 36 constitute a bank of type-bar levers which are moved forward or backward with the rod 32, to which they are hinged. As the rod 32 is connected with the rod 33 by means of the bars 34 and 35, any forward or backward movement of the former rod will be communicated to 33, and vice versa. The spring 60, the free end of which bears against the rod 33, holds it toward the front of the machine, which is the normal position of the frame, composed of the rods 32 and 33 and the bars 34 and 35 and the bank of type-bar levers 36. Each type-bar has three characters, the lower-case letters being nearest the end of the bar, the capital letters being next, and the figures and punctuation-marks next. In the arm 13, which carries the type-bars, are two pairs of vertical posts 55, which straddle the rod 32, so that the forward or backward movement of said rod causes a corresponding movement in the arm 13, and hence the type-bars 30 may be adjusted so that the capital letters or the numerals will be brought directly over the notch in the leaf 26, as desired.

Having described the construction of my machine, I will now describe its operation.

The paper-carrier is brought forward until the arm 52 engages the last pin 50, and the paper is inserted between the roller 52ª and the plates 51 and pushed forward until the line or point at which it is desired to begin the writing is directly under the notch 28. The keys are then depressed by a stylus held in the right hand, a light touch only being required to carry the rods 36 against the end of the lever 39 with sufficient force to raise the opposite end of said lever, so that the trigger 42 will pass the pins *o o* through the notch in the end of the trigger for that purpose. The power extended to the rod 43 from the motor 46 through the pinions 44 and 45 will cause the rod to rotate, carrying with it the arm 46 and the trigger 42. The same movement that depressed the lever 39 also depressed one of the type-bars 30 through the action of one of the rods 36 striking one of the lugs *i* on said type-bar, so that the outer end of said bar is brought within the line of the path of the revolving arm 46, the revolution of which carries the said type-bar downward in the alinement-yoke, in contact with the ink-roller 23, and through the notch 28 to the paper. On each revolution of the rod 43 a crank 59, which is connected with said rod on the outside of the side 3 of the frame and at its opposite end with a crank-pin 60 on the end of the rod *a*, (see Fig. 9,) is revolved and a rocking movement imparted to said rod *a*, which causes the dog 12 to move in and out of engagement with the teeth on the bar 11. When it is desired to space between words or letters, the rod 38 is depressed without touching the keys. To use the capital letters, the disk containing such letters is depressed, which causes a corresponding depression of the arm 7 under such disk, when the shoulder *d'*, pressing against the rod 32, causes a forward movement of said rod until it is checked by the hook *d* on the end of said arm 7.

It will be apparent that my construction

permits the use of as many type-bars as may be required and that any form of motor may be employed.

Having described the construction and operation of my type-writing machine, what I claim as new, and desire to secure by Letters Patent, is—

1. In a type-writing machine, the combination with a platen of a movable type-bar carriage, a series of bars secured to and moving with said carriage having types thereon, means for inking said type, a series of rods acting on said type-bars respectively, a revolving arm for depressing the type-bars as presented to it and means for operating said arm, substantially as described.

2. In a type-writing machine, the combination with a platen, of a movable carriage, a series of type-bars secured thereto, an inking device supported by said carriage and operated by said type-bars, a series of rods for partially depressing the type-bars, keys secured to said rods, a revolving arm for further depressing the type-bars and a motor for operating said arm, all as set forth.

3. In a type-writing machine, the combination with a platen of a movable carriage, means for operating said carriage, a series of type-bars secured thereto, an inking device supported by said carriage and operated by said type-bars, a series of rods for partially depressing the type-bars, type-keys secured to said rods, a revolving arm for further depressing the type-bars, means for operating said arm, and an alinement device having a passage for the type-bars, all substantially as set forth.

4. In a type-writing machine the combination with a platen, a movable type-bar carriage, means for moving said carriage, an inking device supported on said carriage and operated by the type-bars, a series of type-bar-depressing rods and keys secured thereto, a revolving arm for further depressing the type-bars, means for operating said arm, an alinement device having a passage for the type-bars and a paper-holding and line-spacing mechanism substantially as described.

5. In a type-writing machine the combination with a platen of a movable type-bar carriage, means for moving said carriage, a series of type-bars secured to said carriage, an inking device supported on the carriage and operated by the type-bars, a series of type-bar-depressing rods and keys secured thereto, means for further depressing said type-bars, an alinement device, a paper-holding and line-spacing mechanism and means for shifting the type-carriage forward and backward, substantially as set forth.

6. In a type-writing machine of the character described, a flat platen, a movable type-carriage, means for operating said carriage, type-bars supported in said carriage, an inking device attached to the type-carriage and automatically operated by the type-bars, alinement device secured to the type-carriage, a series of rods for partially depressing the type-bars, an arm for completing the depression of said bars, a motor for operating said arm, a lever for releasing said arm, a paper-holding and line-spacing mechanism operated by the type-carriage, and means for shifting the type-carriage forward or backward, substantially in the manner and for the purposes described.

7. In a type-writing machine of the character described, a flat platen, a movable type-carriage, means for operating said carriage, type-bars supported in said carriage, an inking device attached to the type-carriage and automatically operated by the type-bars, an alinement-yoke, a series of rods adapted to partially depress the type-bars, a keyboard connected with the said rods, a revolving arm for completing the depression of said type-bars, a motor for operating and a lever for releasing the type-depressing arm, means for depressing said lever in combination with a paper-holding and line-spacing mechanism, substantially as set forth.

8. In a type-writing machine, a flat platen, a type-carriage adapted to move horizontally across said platen by means of an escapement, a rocking shaft, a crank connecting said rocking shaft with a revolving rod driven by a motor, type-bars supported in said carriage, an inking device composed of a rod carrying one or more ink-pads, attached to said carriage and automatically operated by the type-bars, a series of rods corresponding with the number of type-bars and adapted to partially depress the same, a series of keys connected with said rods, a type-bar-depressing arm, a motor for operating and a lever for arresting and releasing said arm, means for depressing said lever, arms for shifting the type-carriage forward and backward, disks connected with said arms and having indicated thereon the letters, numerals or other characters corresponding with the types used, in combination with a paper-holding and line-spacing mechanism substantially as described.

9. In a type-writing machine, a flat platen, a type-carriage adapted to move horizontally across said platen, means for operating said carriage, type-bars supported in said carriage, an arm for depressing said type-bars, a motor for operating and a lever for detaining and releasing said arm, in combination with a paper-holding and line-spacing mechanism composed of a crank-lever operating on a rack-bar against the tension of a spring, and a friction-roller, all substantially as and for the purposes set forth.

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

B. FRANK PALMER.

Witnesses:
J. ROSS COLHOUN,
M. LARMAN.