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[Second Edition.]



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A.D. 1866. 1st DECEMBER. N<sup>o</sup> 3163.

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## Type-writing Machine.

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**LETTERS PATENT** to John Pratt, of Greenville, Alabama, United States of America, now of Regent Square, in the County of Middlesex, Gentleman, for the Invention of "**AN IMPROVED PTEROTYPE, OR MACHINE FOR WRITING WITH TYPE.**"

Scaled the 14th May 1867, and dated the 1st December 1866.

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**PROVISIONAL SPECIFICATION** left by the said John Pratt at the Office of the Commissioners of Patents, with his Petition, on the 1st December 1866.

I, JOHN PRATT, of Greenville, Alabama, United States of America, now of  
5 Regent's Square, in the County of Middlesex, Gentleman, do hereby declare the nature of the said Invention for "**AN IMPROVED PTEROTYPE, OR MACHINE FOR WRITING WITH TYPE,**" to be as follows:—

These operations are requisite to all machines for writing with type; first, it is necessary to bring any one of a number of type at will and in arbitrary  
10 succession to one common point; second, to form a colored or other legible character at that common point; third, to feed the paper across the common point, so as to make the proper intervals between the letters and words.

For those machines which do not write on an endless strip of paper, but back and forth, so as to form pages, a device is also necessary for readily and  
15 speedily bringing the paper back to its starting point, and at the same time moving it in a direction at right angles with the lines, so as to make the required distances between the said lines.

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In my impressed writing machine I employ a case composed of two open rectangular frames, the one mounted upon the other, so as to cause the side elevation of the machine to have an L shape. A number of key levers strung upon a centre wire passing across the horizontal frame extend from front to back its interior length. Across and above the key levers near the angle of the L are two oscillating rods which operate the type. At the opposite extremity of the horizontal frame are a number of keys, which are square or round blocks resting upon the key levers or attached to them, and working in holes in a board above them. Between the centres or fulcra of the key levers and the said oscillating rods is a thin oscillating rod, which I shall call rod "three"; this rod operates the type hammer and causes the feed of the paper across the common point, that is to say, the point where the hammer strikes the type. These three oscillating rods are all operated by the said key levers. On the extreme right hand of the horizontal frame are two or preferably three key levers, which fulfil the fourth operation of the machine.

The type in my machine are formed in relief on the face of a metal plate, in which they are ranged in parallel rows in a rectangular (preferably a square) figure. The type is direct (not reversed as printers' type), and faces towards the keys. The plate is preferably moved in a vertical plane, its position being at the top of the L case; this plate is moved primarily by the said key levers, which levers operate the two oscillating rods first named. With one of the said rods the type plate is connected by a vertical rod, at the upper end of which this plate is secured, being supported at its back by a metal bar resting in a socket in the upper cross piece of the upright portion of the L case. The oscillating rod with which the type plate is connected in the manner described gives to said plate a vertical movement only, which movement is upward or downward according to the movement of the rod. As all the characters must be brought to one common point, and as said characters are arranged over a square area and not in a single line, it is obvious that this vertical movement is not sufficient. A lateral movement is applied to the plate by the other oscillating rod, said movement being to the right or left according to the movement of the said rod; the vertical movement of this oscillating rod is converted into lateral movement by a bell-crank lever attached to the upright part of the frame above mentioned, which bell-crank lever is connected with its respective oscillating rod of a vertical link, and with the vertical rod to which the type plate is attached by a horizontal link. All the connections above mentioned of the links and type plate rod with the oscillating rods are made by means of universal joints of india-rubber. When only one of the oscillating rods is moved by the key levers the movement of

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the plate is vertical or lateral according to the rod employed ; when both rods are moved the resultant or compound movement of the type plate is diagonal. By varying the relative amount of movement of the two oscillating rods the direction of the type plate is equally varied, and any character may be  
5 moved to the common point; this variation in the movement of the oscillating rods is effected by adjusting screws which pass vertically through the key levers and impinge against the under surface of the sides of the oscillating rods ; the oscillating rods are oscillated directly by these screws. The key levers have each the same amount of movement, yet communicate a different  
10 amount of movement to the oscillating rods according as their respective adjusting screws project more or less. The centre of the type plate is at the common or impression point, and the characters upon the plate must travel different distances and directions to reach it; those characters accordingly which are farthest from the centre of the plate have the screws in the key levers  
15 which control them projecting farthest, and those nearest the centre have their screws projecting least. The oscillating rods and therefore the plate must not only be moved a certain distance, but stopped when that distance is accomplished ; this is effected either by means of resistance springs or by having adjusting screws under both sides of the oscillating rods, so that said  
20 rods may be stopped as well as impelled by said screws, or both methods of stopping the plate may be employed in conjunction. The oscillating rods may either be parallel to each other, and each extend across the whole number of key levers, so that each lever shall operate both rods, and therefore each key lever control a separate character, or the said oscillating rods may each extend  
25 only half the lateral space occupied by the key levers, each being operated singly by one key lever, so that it is necessary to depress two key levers in order to move the two oscillating rods and bring any one type to the common or impression point.

The second operation of the machine, namely, the impression, is effected by  
30 means of a hammer having a face equal in extent of surface to a single type, and which by its stroke presses against the type a sheet of carbonized paper in contact with a sheet of writing paper. The hammer is operated by oscillating rod "three;" said hammer works in bearings attached to a bar above rod "three," and is connected with rod "three" by a bar of metal or wood hinged to  
35 its butt. The hammer may be either thrown directly against the plate by the depression of a key lever, after the manner of a pianoforte hammer, or preferably it may be retracted from the plate against a spring and let fly when the key lever has accomplished its full movement. In the latter arrangement the bar above mentioned terminates at its lower end in a catch or shoulder

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which engages the end of an arm projecting forward from the middle of rod "three." The depression of a key lever causes this arm to descend and retract the hammer from the plate against a spring. The end of the arm which engages the catch projects upwards, so as to have an excentric movement, and to act like a cam or the hopper of a pianoforte. The upper part of said projecting arm at a certain stage of the movement pushes the rod attached to the hammer off the catch, and the hammer is impelled against the type plate by the spring. The exact moment when the hammer is let slip is determined by an adjusting screw passing through said bar and impinging against the face of said projecting arm. When the key lever and rod "three" return to their stationary positions the projecting arm of rod "three" again engages the catch, the hinged bar opposing only a slight friction to the return of the rod "three." Instead of furnishing the said rod attached to the hammer with a catch alternately engaging and slipping off the said projecting arm of rod "three," the rod "three" itself may be furnished with a shoulder passing along its whole length and resting on a series of hoppers mounted one on each of the said key levers; in this case the said spring will operate the rod "three." When a key lever is depressed the corresponding hopper will raise the rod "three" against said spring and slip from under the said shoulder when it has been fully depressed, allowing said rod "three" to return to its stationary position. In this arrangement the rod attached to and governing the hammer rests upon and is operated by the rod "three," and when rod "three" is impelled by said spring to its stationary position it throws the hammer against the type plate.

The third operation of my machine, or the feeding of the paper across the common point is effected thus:—A square frame which I shall call the page frame slides in vertical grooves in the sides of the upright part of the L case; in parallel horizontal grooves in the upper and lower sides of this frame a second frame slides laterally, which I shall call the line frame. The contained and containing frames are in the same plane with the type plate; the horizontal movement of the line frame is effected by means of a square or triangular metal rod which I shall call the feed rod rotating in vertical bearings in the upper and lower sides of the upright part of the L case, and moved by means of a spring. I preferably employ a spring formed of an india-rubber cord operating a lever terminating in a toothed sector which engages a pinion at the upper or lower extremity of the said feed rod; the movement of this rod is communicated to the line frame by a pulley and cord, said pulley rotating with but not on the said feed rod upon which it slides freely, being carried up or down the same by an arm projecting from the page

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frame. The movement of the feed rod is regulated by an escapement wheel at its lower end, and a crutch connected by a link with a vertical arm projecting from rod "three;" the same movement of the rod "three" which causes the hammer stroke causes also an oscillation of the pallets and a movement of the escapement wheel and line frame. The carbonized and writing paper is held in a clamp formed of two slips of wood bound together by india-rubber cords; this clamp rests loosely on projections formed at the top of the line frame, whence it may be removed for a new sheet of paper.

The fourth operation of the machine, or that by which the paper is brought to its starting point for a new line and at the same time moved at right angles to said lines is effected thus:—In order that the line frame may return for a new line the escapement wheel must be freed from the pallets. for this purpose the crutch is mounted on a lever, which while the escapement is in operation is held at the requisite distance from the wheel by a spring. When a line is completed the said lever is withdrawn from the wheel by a link connected with a bell-crank lever, which is also connected by a second link with one of the key levers in such a manner that the depression of said key lever causes the said retraction of the lever which supports the crutch. To reverse the movement of the feed rod so as to bring back the line frame to its starting point another key lever must be depressed, which is connected by a link with a bell-crank lever which moves the lever, heretofore described as terminating in a toothed sector engaging a pinion at the end of the feed rod. This bell-crank lever moves the said lever and sector in a direction the reverse of that in which it is moved by the spring and brings back the line frame to its starting point. To move the page frame upwards in its grooves so as to make the requisite distances between the lines, either a separate lever may be employed, or the same lever may be used which effects the disengagement of the pallets and escapement wheel. The page frame which is sustained in any position in its vertical grooves by means of friction applied by a spring, a button and screw has a rack attached to its right-hand vertical side. A lever working in bearings formed in its extremity and attached to the right-hand side of the L case has a pawl projecting upwards from its movable end; this pawl is prevented from falling into the teeth of the rack by a small block attached to the said lever, against which block said pawl is slightly pressed by a spring; a link rod connects the said lever with a key lever. The movement of the latter causes the pawl to move forward and upward, so that it engages the rack and elevates the page frame the distance of one tooth, which makes the distance between two lines. When the key lever is released the pawl moves down and back from the rack, so

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that the rack is disengaged after each movement, and the page frame is free to be moved down as well as up at any stage of the writing. This alternate engagement and disengagement of the rack is effected by the oblique movement of the end of the pawl, which obliquity is caused by its position at the movable end of its lever, and by the block which stops it from falling into the 5 teeth of the rack, and causes it to move as if affixed to the said lever.

**SPECIFICATION** in pursuance of the conditions of the Letters Patent, filed by the said John Pratt in the Great Seal Patent Office on the 31st May 1867.

**TO ALL TO WHOM THESE PRESENTS SHALL COME**, I, JOHN 10 PRATT, of Greenville, Alabama, United States of America, now of Regent Square, in the County of Middlesex, Gentleman, send greeting.

**WHEREAS** Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the First day of December, in the year of our Lord One thousand eight hundred and sixty-six, in the thirtieth year of Her 15 reign, did, for Herself, Her heirs and successors, give and grant unto me, the said John Pratt, Her special licence that I, the said John Pratt, my executors, administrators, and assigns, or such others as I, the said John Pratt, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time, and at all times thereafter during 20 the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "**AN IMPROVED PTEROTYPE, OR MACHINE FOR WRITING WITH TYPE,**" upon the condition (amongst others) that I, the said John Pratt, my executors or administrators, by an instrument 25 in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent. 30

**NOW KNOW YE**, that I, the said John Pratt, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

Three operations are requisite to a machine for writing with type; first, it 35

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is necessary to bring any one of a number of type at will and in arbitrary succession to one common point; second, to form there a colored or other legible character; third, to move or feed the paper so as to make the proper intervals between the letters and words.

- 5 For a machine which is not designed to write on an endless strip of paper, but back and forth so as to form pages, a device is also necessary for bringing the paper back to its starting point, and also for moving it in a direction at right angles with the lines so as to make the required distances between the said lines.
- 10 I now proceed to describe the manner in which these operations are performed in my machine, reference being had to the accompanying Drawings, making a part of this Specification.

## DESCRIPTION OF THE DRAWINGS.

- Figure 1 is a plan of the machine with the top 1 of the frame removed;  
15 Figure 2 is a front elevation; Figure 3 is a longitudinal vertical section on the line 2, 2, Figure 1; Figure 4 is a longitudinal section on the same line showing the opposite side of the machine; Figure 5 is a plan of the key levers and oscillating rods or plates; Figures 1<sup>a</sup>, 2<sup>a</sup>, 4<sup>a</sup>, 5<sup>a</sup> and 6 refer to modifications herein-after described. The same numerals refer to corresponding  
20 parts of the machine.

In my improved type-writing machine I employ a case 3 composed of two rectangular frames mounted one upon the other so as to give the side elevation an L shape. A number of key levers 4 having cloth lined holes 5 for their fulcra, and strung upon a wire 6, supported on brackets 7, extend from front to  
25 back the interior length of the case, and are manipulated by socket keys 8, which work piston fashion in holes formed in the keyboard 9, guide pins 9<sup>a</sup> passing through slots in the ends of said levers or between them serve to keep them in their places. Across and above the key levers are three oscillating rods or plates 10, 11, 12, working on centre wires 13 in cloth lined, or india-  
30 rubber lined holes formed in the sides of the case, or preferably in separate blocks, as shown in Figure 5<sup>a</sup>; these three oscillating plates are all operated simultaneously by each of the key levers (except those employed for the fourth operation) and perform the three operations first named; the types which are not reversed like printers' type are formed in relief on the face of a metal plate 14,  
35 on which they are arranged in parallel rows, or preferably converging downward with a radius equal in length to a rod 15 to which the type plate is attached; the type plate is secured by means of elastic glue or rivets to the upper end of rod 15, and is kept slightly pressed by a spring 16 against a

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metal bar 17 resting in a cloth-lined socket formed in the upper part 1 of the case, the bar serving as a smooth backing for the plate to slide against, and a solid support while receiving the strokes of the hammer herein-after described; the type plate is operated by the two oscillating plates 10, 11, acting in combination; it is connected with plate 10 by the rod 15, which is attached to it by means of a wire link 18 working in an india-rubber joint 19; this joint like all the rubber joints employed in my machine is either a simple perforated block of rubber attached by glue; or a rubber-lined perforation formed in wood to receive a link. With the oscillating plate 11 said type plate is connected by the bell-crank lever 20 working on a centre wire 21, or on a vellum hinge, and by the wire links 22 and 23; these links work in india-rubber joints 24, 25, 26, 27. The oscillating plate 10 moves the type plate vertically, the oscillating plate 11 moves it laterally, the vertical movement of said plate 11 being converted into lateral movement by means of said bell-crank lever and links 22, 23. When both the oscillating plates are moved together the resultant motion of the type plate is diagonal, and by varying the relative amount of their movement the direction of the type plate is also varied; this variety of movement is effected by means of adjusting screws 28 passing vertically through the key levers in such a position as to impinge against a margin of the oscillating plates when the said key levers are operated; the key levers have all the same amount of movement, but by means of these screws communicate each a different amount of movement to the oscillating plates; the type plate when stationary has its centre at the point where the impression is made, and the different types are each controlled by two of said adjusting screws, which project more or less according to the distance of the type they control from the said point. When the combined movement of the plates 10, 11, is transmitted to the type plate the variety in amount of movement imparted to the oscillating plates produces variation in the direction of the movement of the type plate, and thus by means of said screws all the types may be so adjusted as to be brought to the point where the impression is made by simply depressing the keys through their full movement. The type plate is stopped by resistance springs 29 pressing against vellum hinged tongues or levers 30, between which are pins 31 fixed in the axes of the oscillating plates; said tongues 30 are prevented from neutralizing the pressure of each other by fixed projections 32. Instead of these resistance springs the type plate may be checked at the end of its movement by employing four adjusting screws in each key lever, one under each margin of the oscillating plates.

∴ The oscillating plates 10, 11, may be either parallel to each other, as shown






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in Figures 1, 2, 3, 4, 5, and extend across the whole number of key levers, so that each lever shall operate both plates and exert a complete control over a given type, or they may each extend only half the lateral space of the key levers, each being operated singly by one key lever so that it is necessary to  
5 depress two keys simultaneously in order to bring any given type to the common or impression point. In this arrangement a given key lever will control a row of characters, and the number of levers need be only equal to the number of horizontal and vertical rows, that is, to twice the square root of the number of types.

10 Figures 1<sup>a</sup>, 2<sup>a</sup>, 4<sup>a</sup>, 5<sup>a</sup>, and 6 exhibit this arrangement of levers and other modifications of the machine dependant upon or independent of that arrangement. Similar parts in these Figures are represented by the same numerals as those employed in the first five Figures. Twelve keys and key levers 4 control the 36 types on the plate, on which letter I is employed for the  
15 numeral 1 and letter O for the cipher. The six keys on the left operate the oscillating plate 11, the six keys on the right the oscillating plate 10; the movement communicated by each key lever being regulated as before by adjusting screws 28, and transmitted to the type plate in the same manner. A modification of the resistance springs is employed to check the type plate  
20 in these Figures, which may also be employed in the first described arrangement of levers. These springs, Figures 1<sup>a</sup>, 2<sup>a</sup>, 4<sup>a</sup>, press upon broad oscillating vellum hinged plates 30 connected with the oscillating plates 10, 11, by pins 33 moving in holes formed in board 34, and placed one on each side of the axis of the oscillating plates whose movement in any direction is thus  
25 resisted. Since in this arrangement each key controls a row of type instead of one type, there will be an error caused by the arc described by the link 22 during the vertical movement of the plate, a given type in the upper and lower rows being drawn to the left of the point where the impression is made. In other words, if one of the left-hand keys be kept depressed and the extreme  
30 left vertical row, for example, be thereby brought to the said point, and then the right-hand keys be successively depressed, the types M, S, will be under the point of the type hammer; but the types A, G, Y, 6, will be more or less deflected to the left; this deflexion I compensate by the following mechanism. The bell-crank lever 20 is hinged by a vellum hinge to another lever 35 hinged  
35 similarly to the side of the case. The latter lever is connected with the oscillating plate 30 (which stops the vertical movement of the type plate) by a wire link 36 working in india-rubber joints. The counter arc described by the plate 30 compensates the arc of the link 22. The two arcs being both caused by the movement of oscillating plate 10 are produced in exact ratio,

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and in proportion as the type plate is deflected from a vertical right line the compensating movement is increased; the levers immediately controlling the type plate may also be modified in form and arrangement. The plate may be attached to the apex of a triangular frame, the other angles of which are attached by universal joints one to each of the contiguous sides of the oscillating plates 10, 11, or the type plate instead of being attached directly to the rod 15 or triangle above described may be attached to the end of a short radial rod capable of being moved like the tongue and clapper of a bell in any direction in a single plane, said plane forming part of the surface of a sphere, and said rod being moved by a system of levers and links similar to that already described.

My machine is equally applicable to stenographic characters as to these in common use. For stenographic purposes one single character may be employed of such form that by bringing any desired portion of said character to the common point a great variety of forms such as are suitable for reporting may be obtained, I employ for my stenographic plate a figure of this  or any equivalent form. This figure by being moved in different directions and to various distances gives many characters, as, for example; . By adding a figure or figures of an equivalent form as  the number of characters may be greatly multiplied.

The second operation that is for producing the impression is effected by a hammer 36<sup>a</sup> operated by oscillating plate 12; the hammer by its stroke pressing against the types, a sheet of paper or cloth saturated with carbonic or other ink held in contact with a sheet of writing paper. To the butt of the hammer is hinged on a centre wire or preferably with a vellum hinge a bar 37 furnished with a catch 38. A projecting arm 39 of the plate 12 engages this catch when a key lever is depressed, and retracts the hammer and bar against a lever 40, which is pressed by a rubber spring 41 against a stop 42, which prevents the spring from pressing the hammer when stationary against the type plate. When the key has been depressed through its whole movement and a given type brought to the point of impression the catch slips off the arm 39 and the hammer is impelled by the spring 41 against the type through the intervention of said lever 40, which impinges against the projection 42<sup>a</sup> of said bar. The slip of the catch is caused by the oblique or excentric movement of the arm 39, and the moment when said arm pushes off the catch is determined by the adjusting screw 42<sup>b</sup>. The catch is caused to re-engage the arm by any suitable spring, or a weight affixed to the end of bar 37. Instead of operating the hammer by a spring it may be operated directly by the force

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of the finger as in the piano. Again instead of giving it an alternating movement by the excentric device described, an analogous arrangement may be adopted imparting to each key lever an excentric movement. This modification is shown in Figure 4<sup>a</sup>. The bar 37 instead of having a catch is furnished with a slot 43, which receives the arm 39. Each key lever is furnished with a hopper 44 constructed like a pianoforte hopper, and preferably tipped with metal instead of black-leaded. Upon these hoppers rests the oscillating plate 12, having a metal shoulder or flange 45 extending its entire length. When a key is depressed the corresponding hopper moves obliquely upward until the key movement is completed, when it slips from the flange, and the spring 41 brings it suddenly back to its stationary position and at the same time drives the hammer against the type plate; when the key is released the hopper returns to its stationary position. The adjusting screw 42 determines the moment when the hopper should slip from the flange. The advantage of this modification is that there is always a hopper in position for action, and it is therefore not necessary as in the other arrangement to release a key before striking the next. These different hammer actions may be used interchangeably with either of the two arrangements of key levers described.

In describing the third and fourth operations reference is again first had to Figures 1, 2, 3, 4, 5. The paper is moved as the writing progresses by the same key stroke which performs the first two operations already described. An open frame 46 slides in vertical grooves in the sides of the case, being sustained at any point by the friction spring 47, Figure 2<sup>a</sup>; or button 48. Its movement, herein-after described, spaces the pages of writing. Within this frame sliding laterally in grooves is another frame 49, whose movement spaces the lines of writing. At the top of this frame are forks 50, in which rests loosely a clamp 51 which holds the paper, and which is formed of two slips of wood bound together by rubber bands 52, in the manner shewn in the Drawings.

A square or triangular metal rod 53 rotating in bearings 54, 55, is furnished with a pulley wheel 56 which moves with it, carrying the frame 49 along its grooves by the cord 57. Motion is imparted to said rod and pulley through the toothed sector 58, which engages the pinion 59; this sector is moved by the india-rubber spring 60. The movement is regulated by the escapement wheel 61 and the crutch 62, which is oscillated by the oscillating plate 12, with a vertical arm of which it is connected by the link 63. The leverage of these parts and the position of the clutch are so adjusted that a depression of the keys so slight as not to operate the hammer is sufficient to operate the feed movement, and thus a space may be made with any key without a corre-

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sponding impression. The pulley wheel is carried up and down the rod 53, by the frame 46, from which wires 64 project above and below said pulleywheel or preferably a wire loop 64, Figures 4<sup>a</sup> and 2<sup>a</sup>, entering a groove in said pulley wheel, and thus the frame 49 is moved laterally at any vertical position. In Figure 1<sup>a</sup> is shown a slight modification of this part of the feed 5 arrangement, the crutch 62 being placed at the back of the escapement wheel, and therefore having its arm 65 bent at right angles, the other parts of the escapement being identical with that described in the first five Figures.

To reverse the movement of rod 53 the escapement wheel must be freed 10 from the pallets; for this purpose the crutch is mounted on a vellum-hinged tongue or lever 66, the position of which is determined by the spring 67, adjusting screw 68, and stop block 69, against which said adjusting screw impinges. Lever 66 is connected by a link 70 with a bell-crank lever 71, and this bell-crank lever by a link 72 with vertical arm 73 of key lever 74. The 15 depression of the key lever retracts the lever 71 and the crutch from the escapement wheel, and the key is kept depressed until key 76 is struck, key lever 75 operates through a link rod 76, a vellum hinged bell-crank lever 77 which engages a slot in the end of the lever 78 terminating in the toothed sector 58, and the depression of said key lever moves the sector in such a 20 direction as to reverse the motion of the rod 53 and bring back the frame 49 to its position at the right of the frame 46 for a new line; the manipulation of this key lever also elevates frame 46 so as to make the requisite space between the lines; this it does by operating the pawl 79 through the link rod 80. The said pawl is vellum hinged to a lever 81, its position being 25 determined by the spring 82 and adjusting screw 83, so that it is kept just clear of the rack 84 of the frame 46. When the controlling key lever is depressed the pawl engages the rack and lifts the frame 46 the required distance, and when released the pawl by its oblique movement leaves the rack always free, so that the frame 46 may be lowered at any stage of the 30 writing.

The mechanism to reverse the feed movement is varied in Figures 1<sup>a</sup>, 2<sup>a</sup>, 4<sup>a</sup>. The clutch 62 is mounted on a lever 66 of the same general construction as that first described, but is directly connected by a link 72 with a vertical arm 73 of key lever 74, the depression of which frees as before the escapement 35 wheel. The pinion 59 is placed at the upper end of the rod 53, and the toothed sector 58 placed at the top of the case working in bearings affixed to the under surface of the upper cross piece of said case, and is operated as before by a bell-crank lever 80 working upon the same metal bearings as the

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pawl and lever 79, 81. The india-rubber spring 60 is attached to said bell-crank lever instead of lever 58. In this modification a separate key lever 85 is employed to operate the pawl.

Having thus fully described and ascertained the nature of my said Invention, and shown how the same may be conveniently and advantageously carried into practice, I do not confine myself to the exact details herein described and illustrated in the accompanying Drawings, as these may be considerably varied without departing from the principles of my Invention; but I claim:—

First, moving, adjusting, and controlling the type plate for the purpose and  
10 substantially in the manner described.

Second, making legible impressions corresponding to the types by a hammer operated substantially in the manner described.

Third, making the requisite spaces between letters and words substantially in the manner described.

15 Fourth, reversing the movement of the frame 49 and bringing it to its starting point substantially in the manner described.

Fifth, raising the frame 46 substantially in the manner described.

Sixth, the general arrangement and combination of the parts of a type-writing machine, constructed and operating substantially as described.

20 In witness whereof, I, the said John Pratt, have hereunto set my hand and seal, this Thirtieth day of May, in the year of our Lord One thousand eight hundred and sixty-seven.

JOHN PRATT. (L.S.)

Witness,

25 GEORGE HASELTINE,  
Civil Engineer,  
No. 8, Southampton Buildings,  
London, W.C.

FIG. 1.

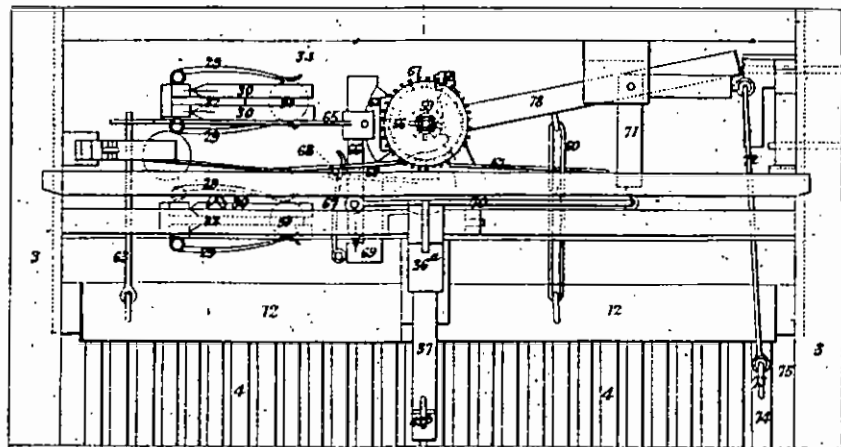


FIG. 2.

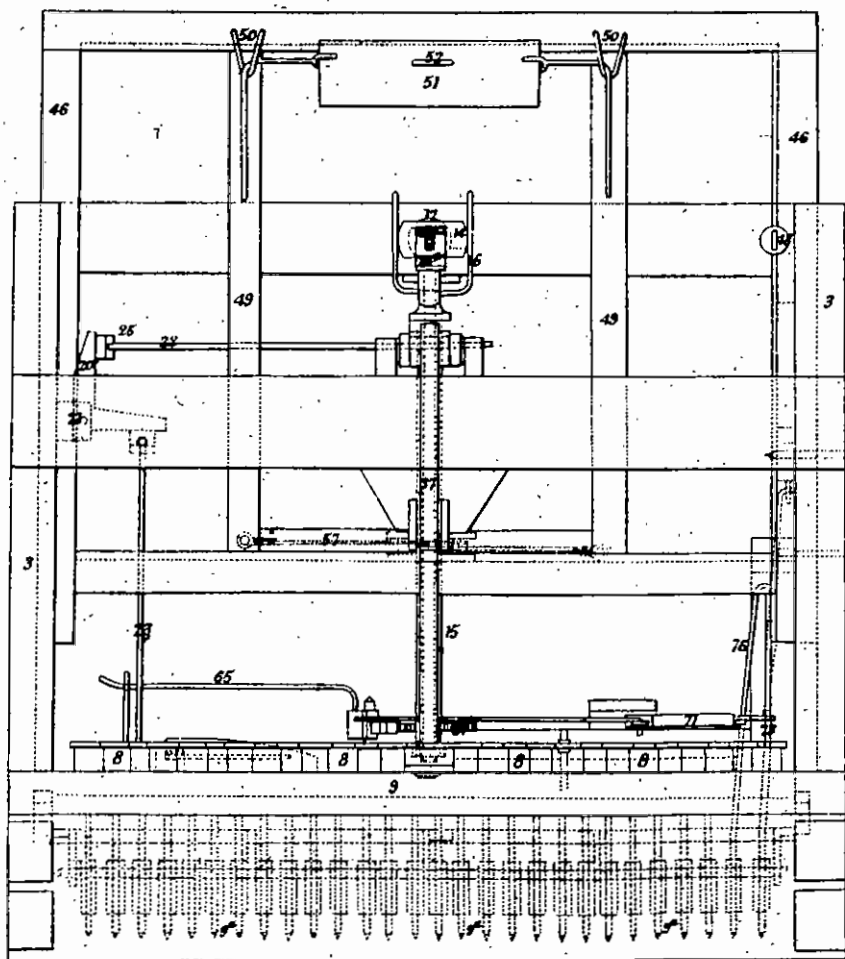
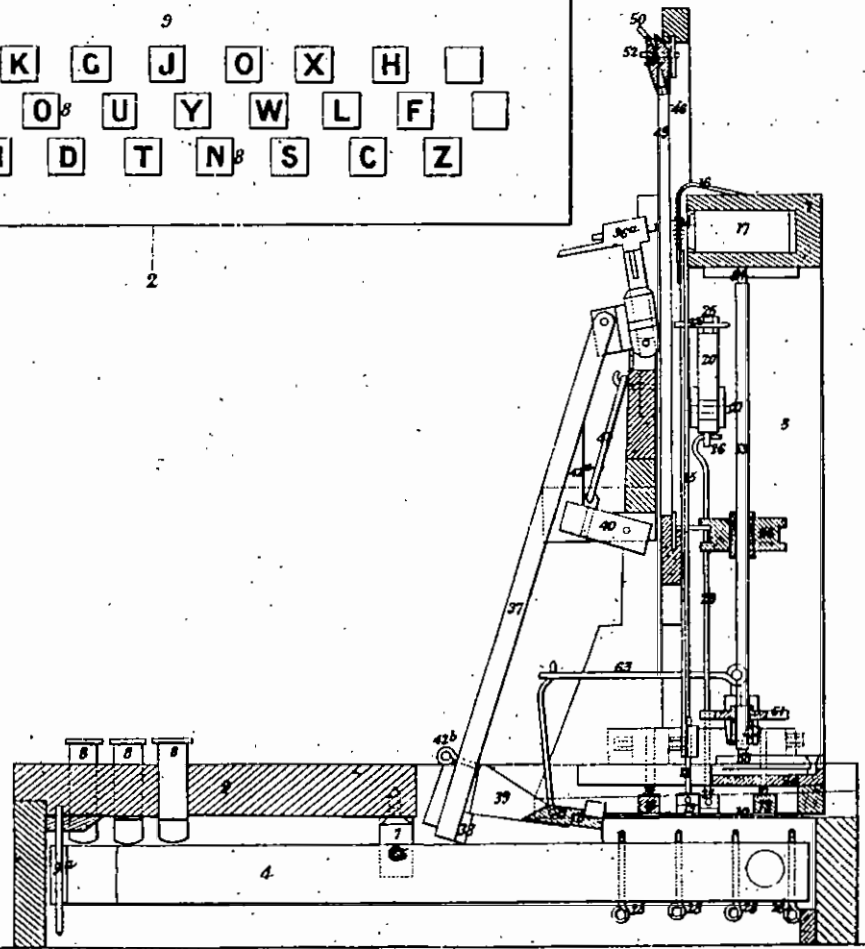
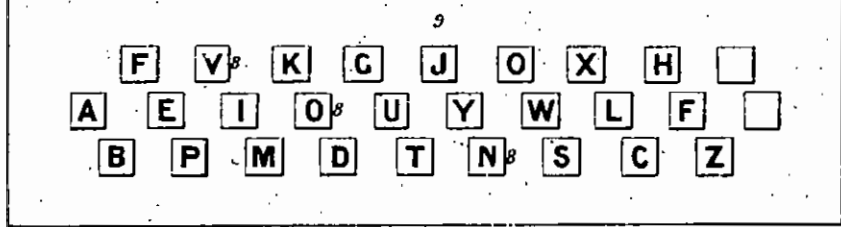


FIG. 3.



The filed drawing is not colored

FIG. 5.

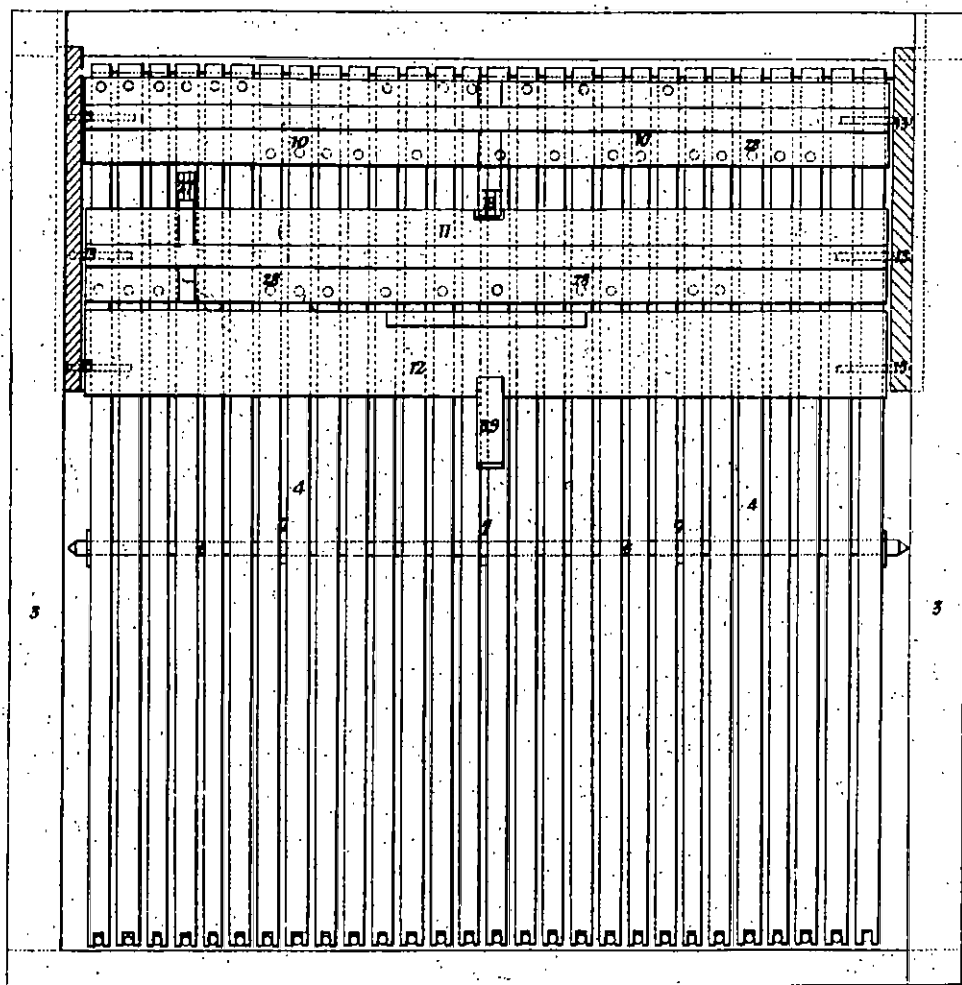


FIG. 4.

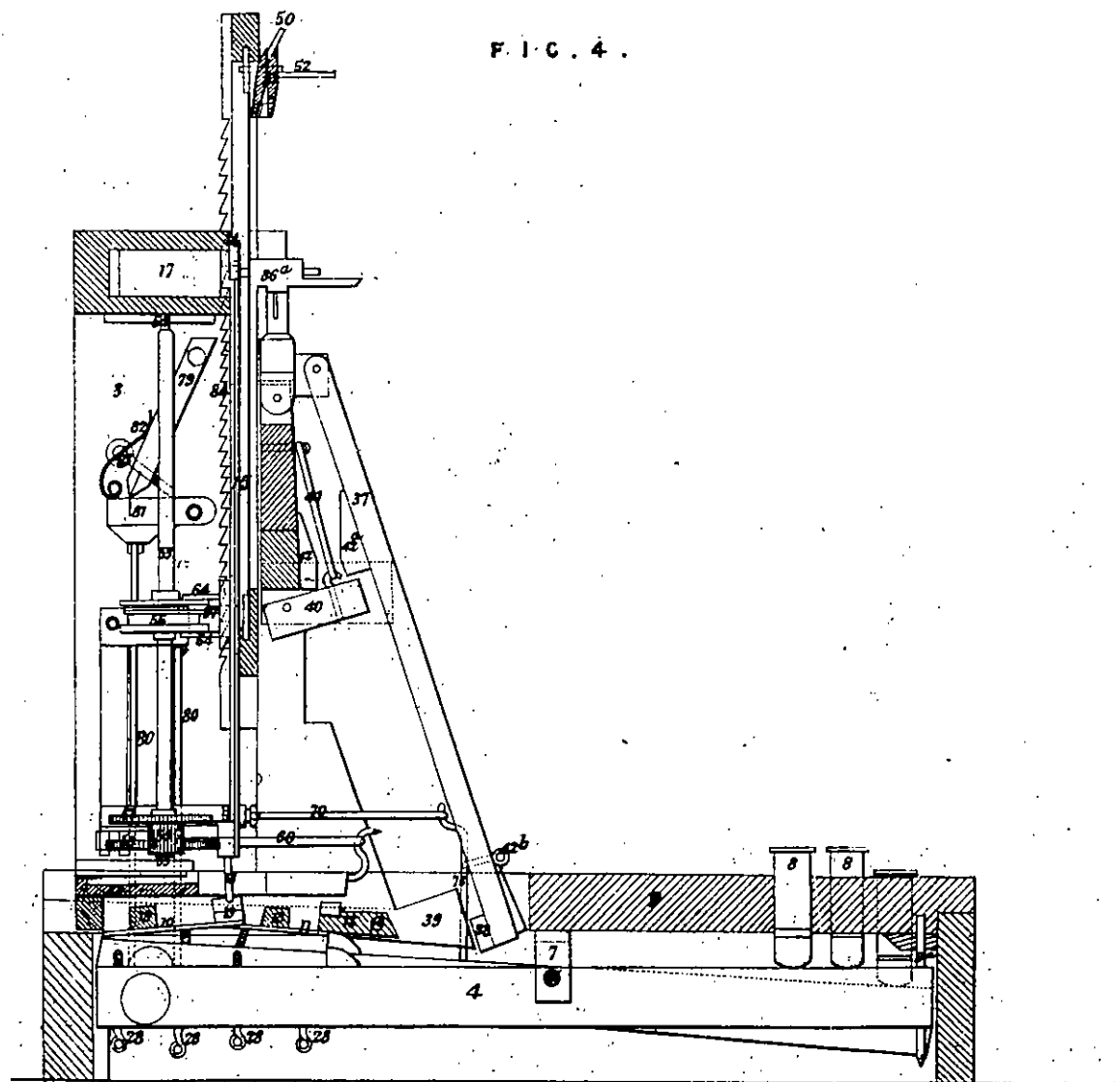


FIG. 1A.

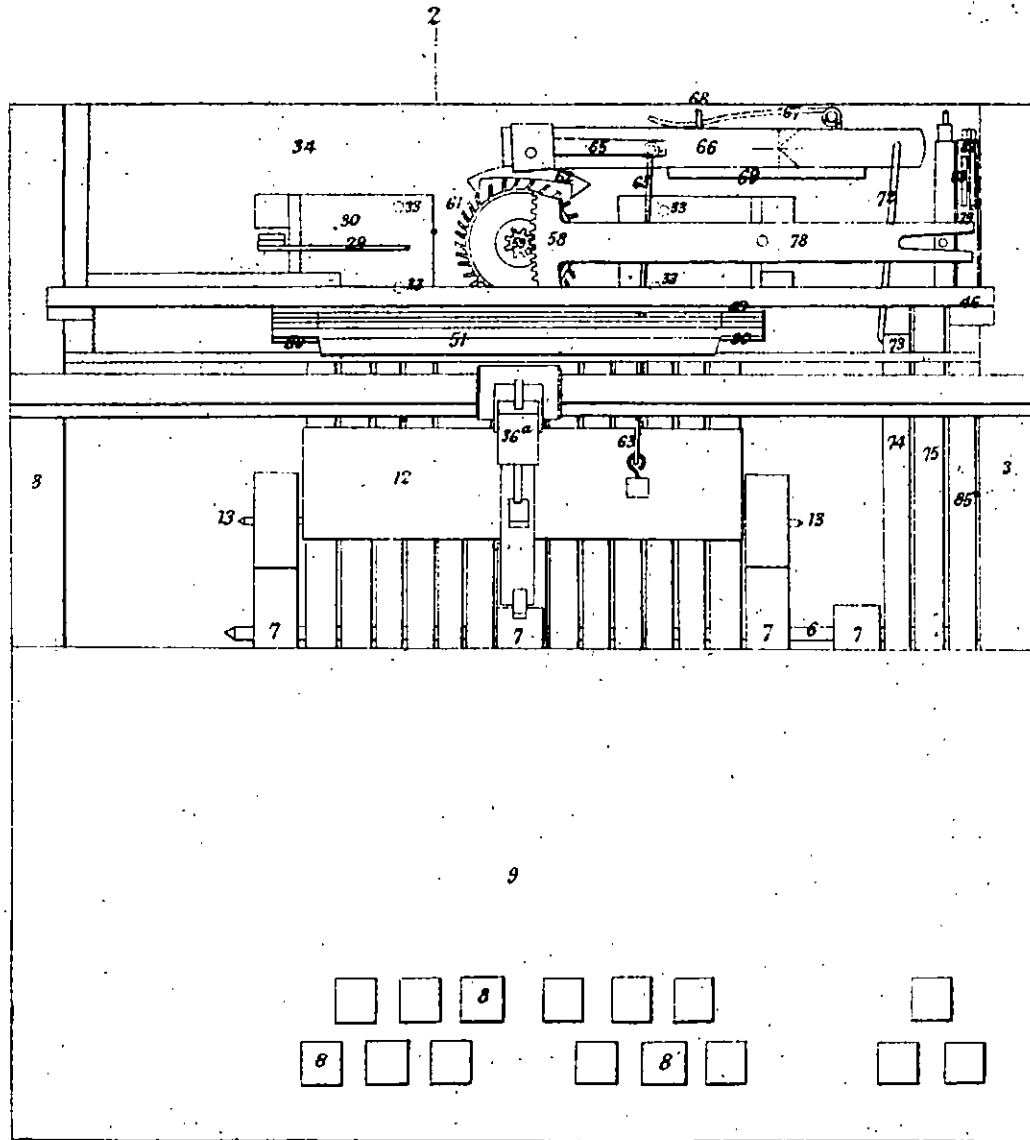


FIG. 5A.

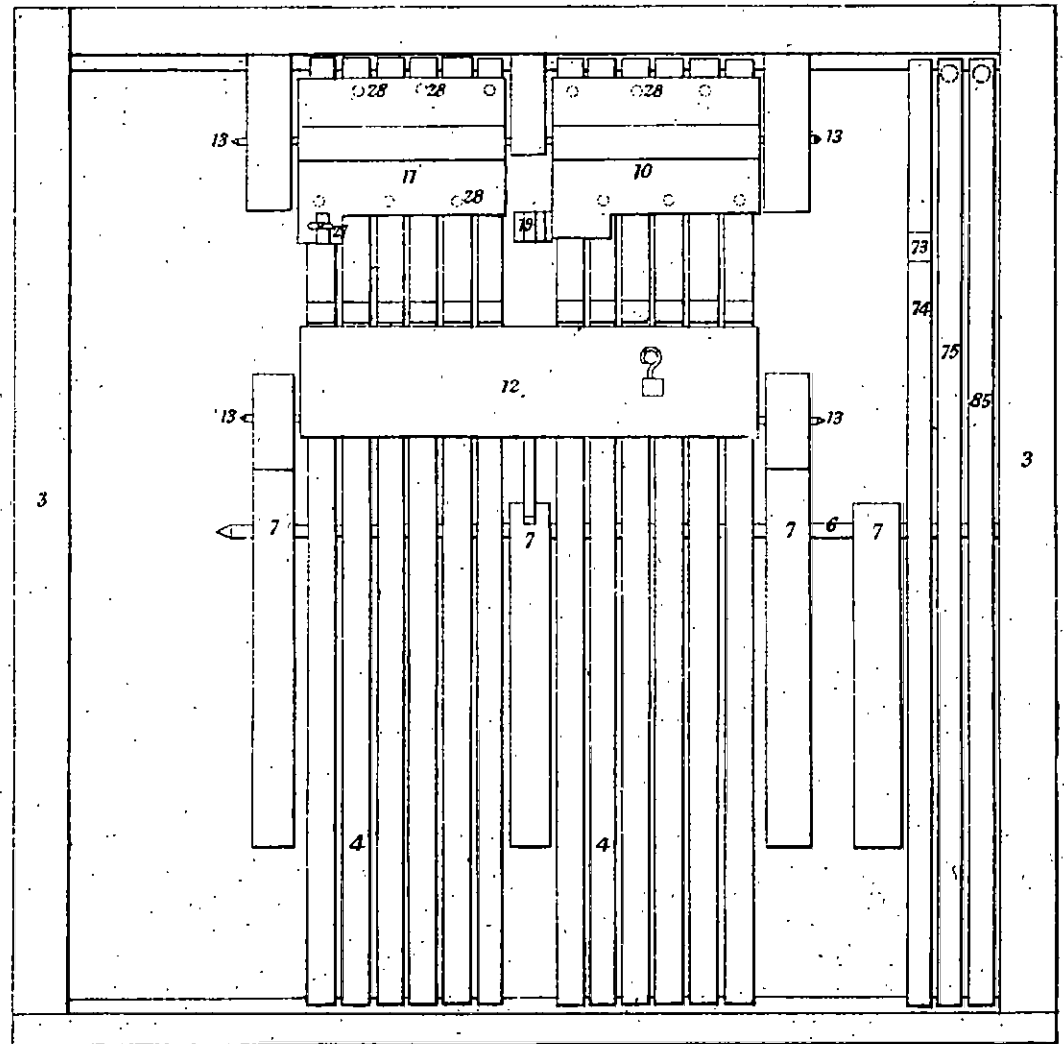




FIG. 2<sup>A</sup>.

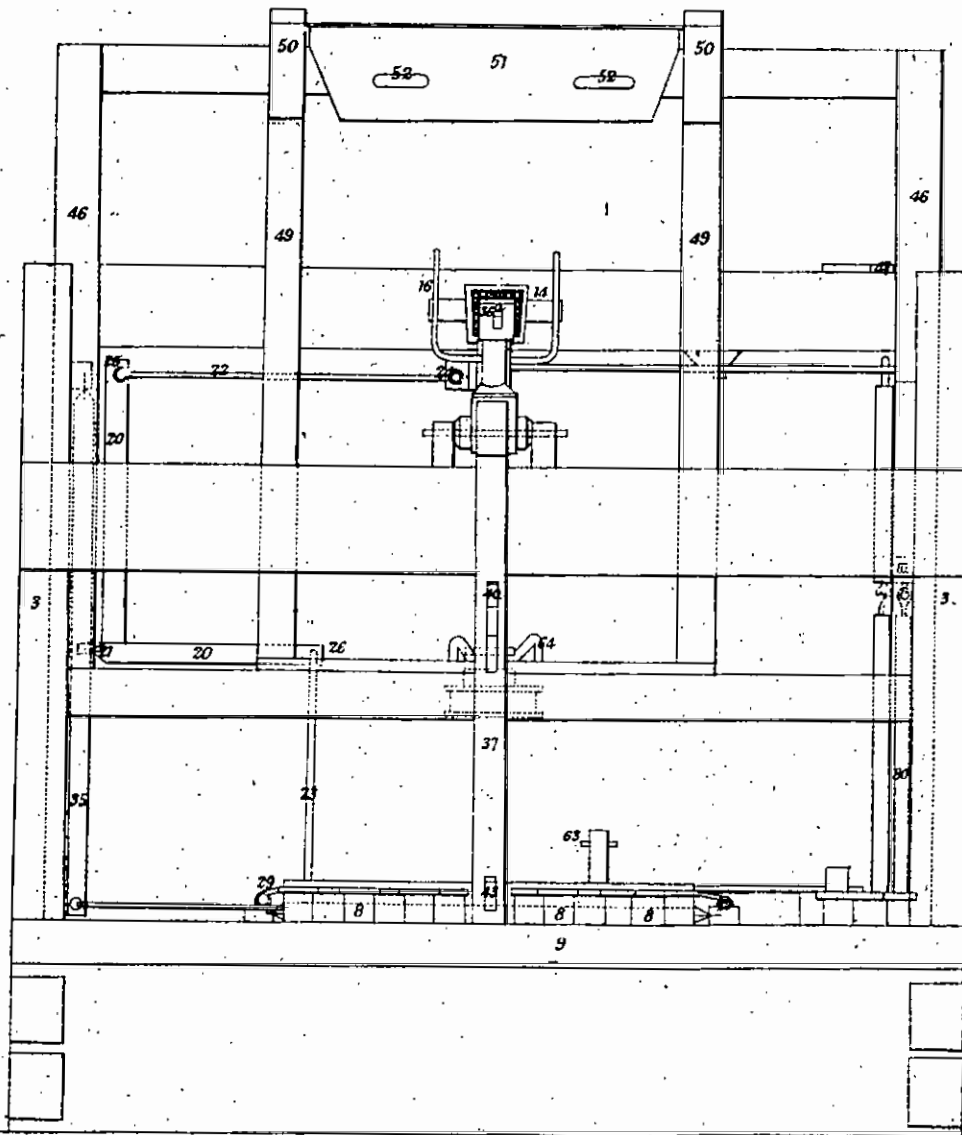


FIG. 6.

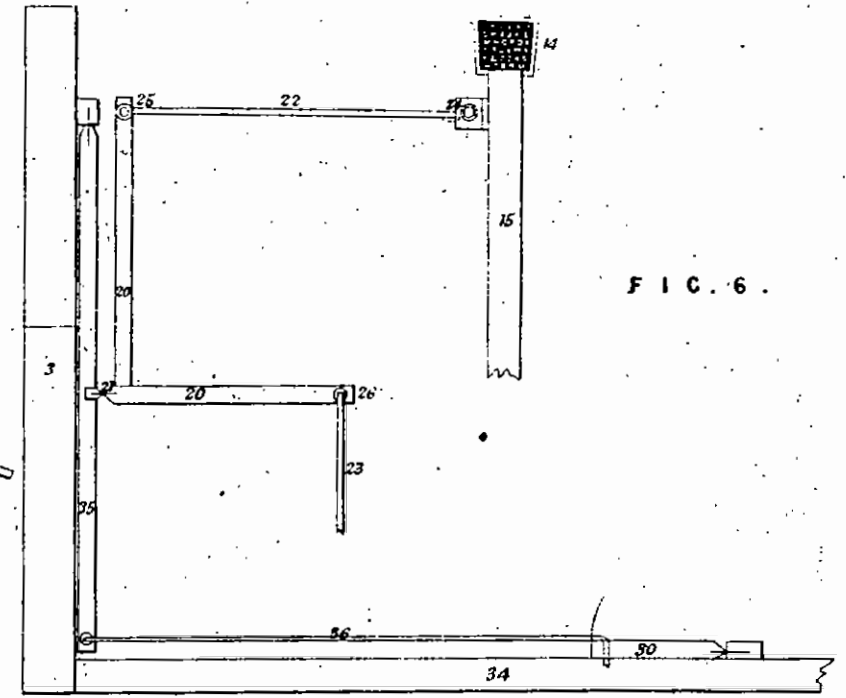


FIG. 4<sup>A</sup>.

