No. 897,959. PATENTED SEPT. 8, 1908.

T. CAHILL.

TYPE WRITING MACHINE.

APPLICATION FILED FEB. 28, 1901.

5 SHEETS—SHEET 1.

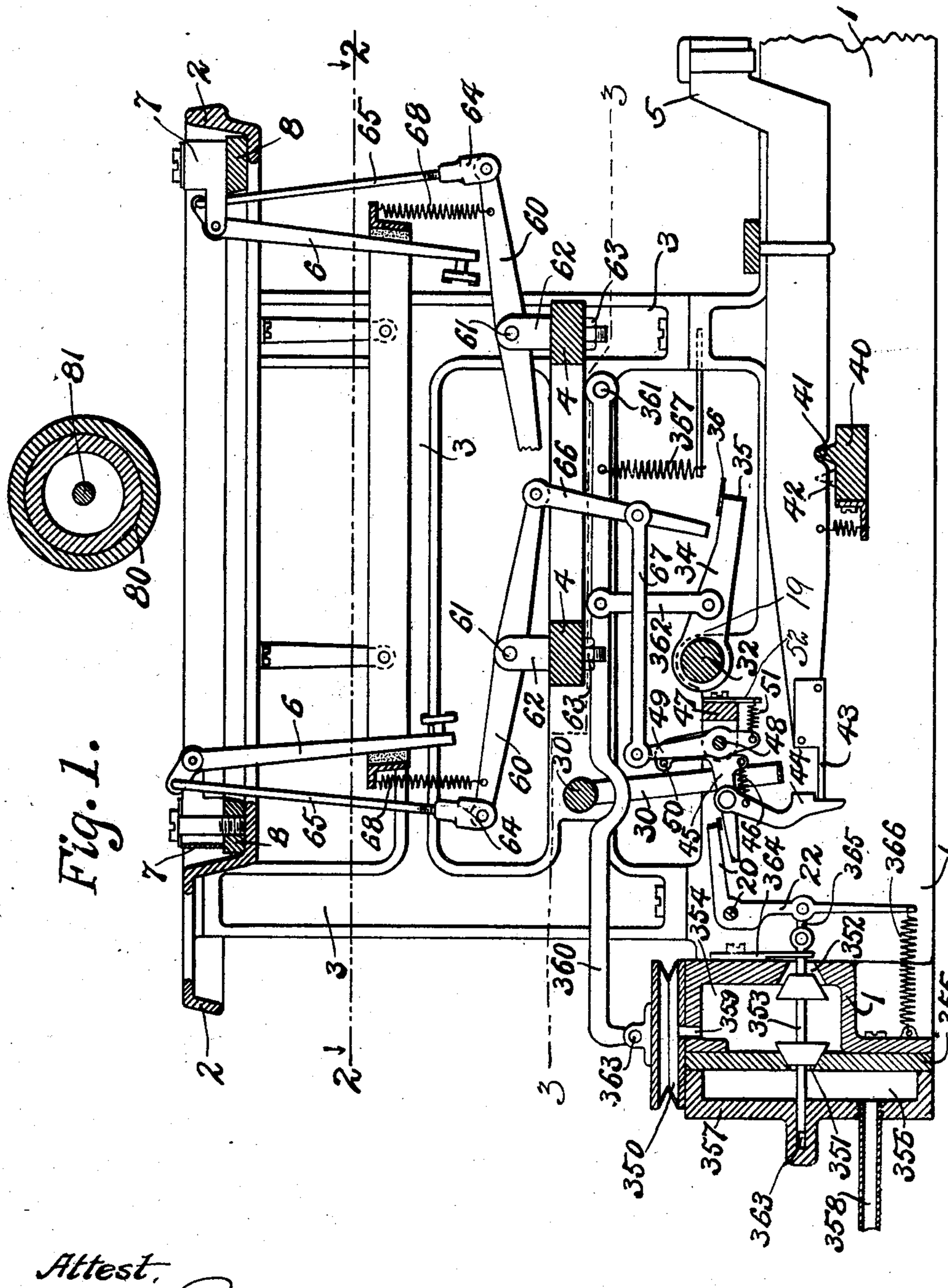

Fig. 1.

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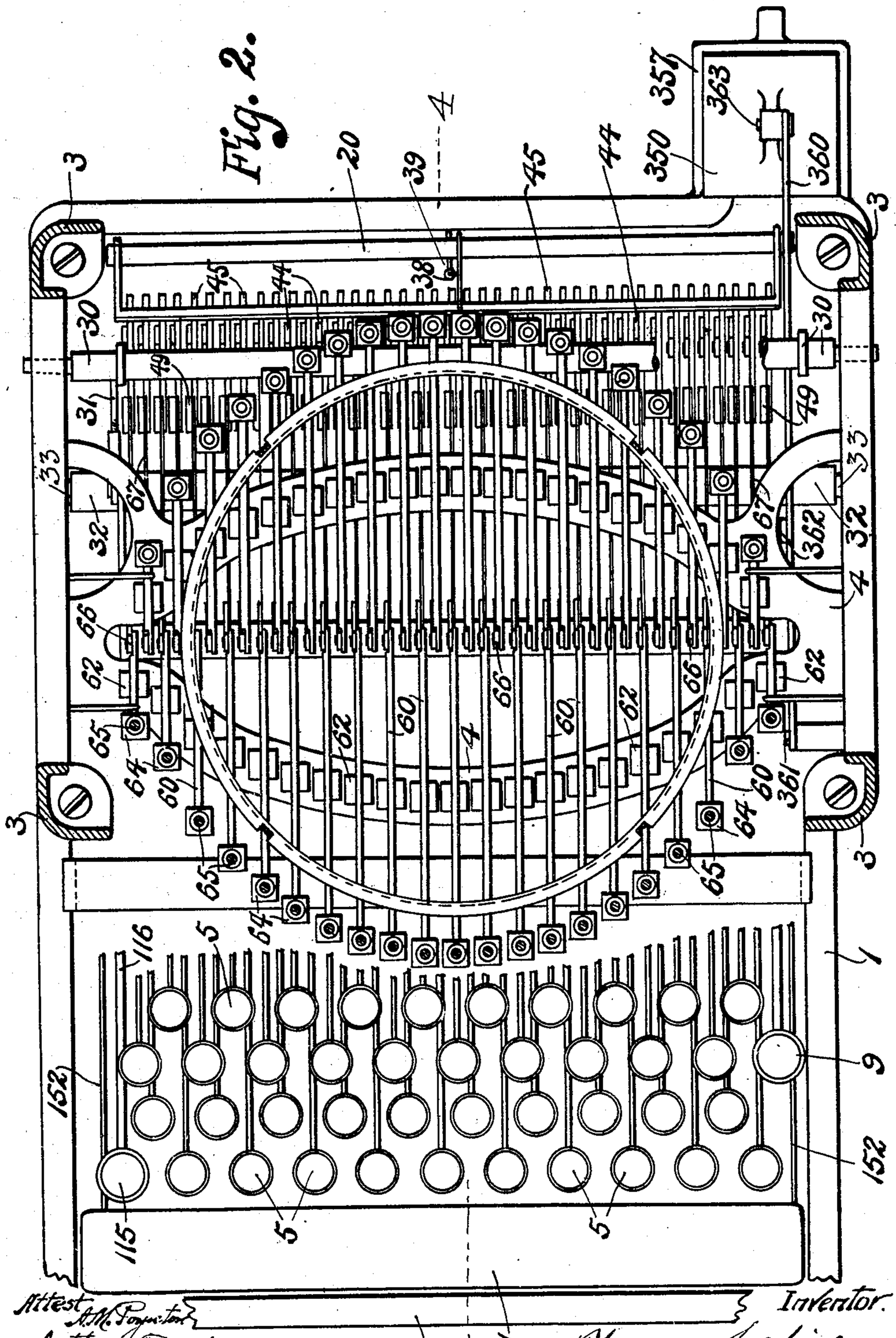
TYPE WRITING MACHINE.

APPLICATION FILED FEB. 23, 1901.

5 SHEETS—SHEET 2.

Fig. 2.



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5 SHEETS—SHEET 3.

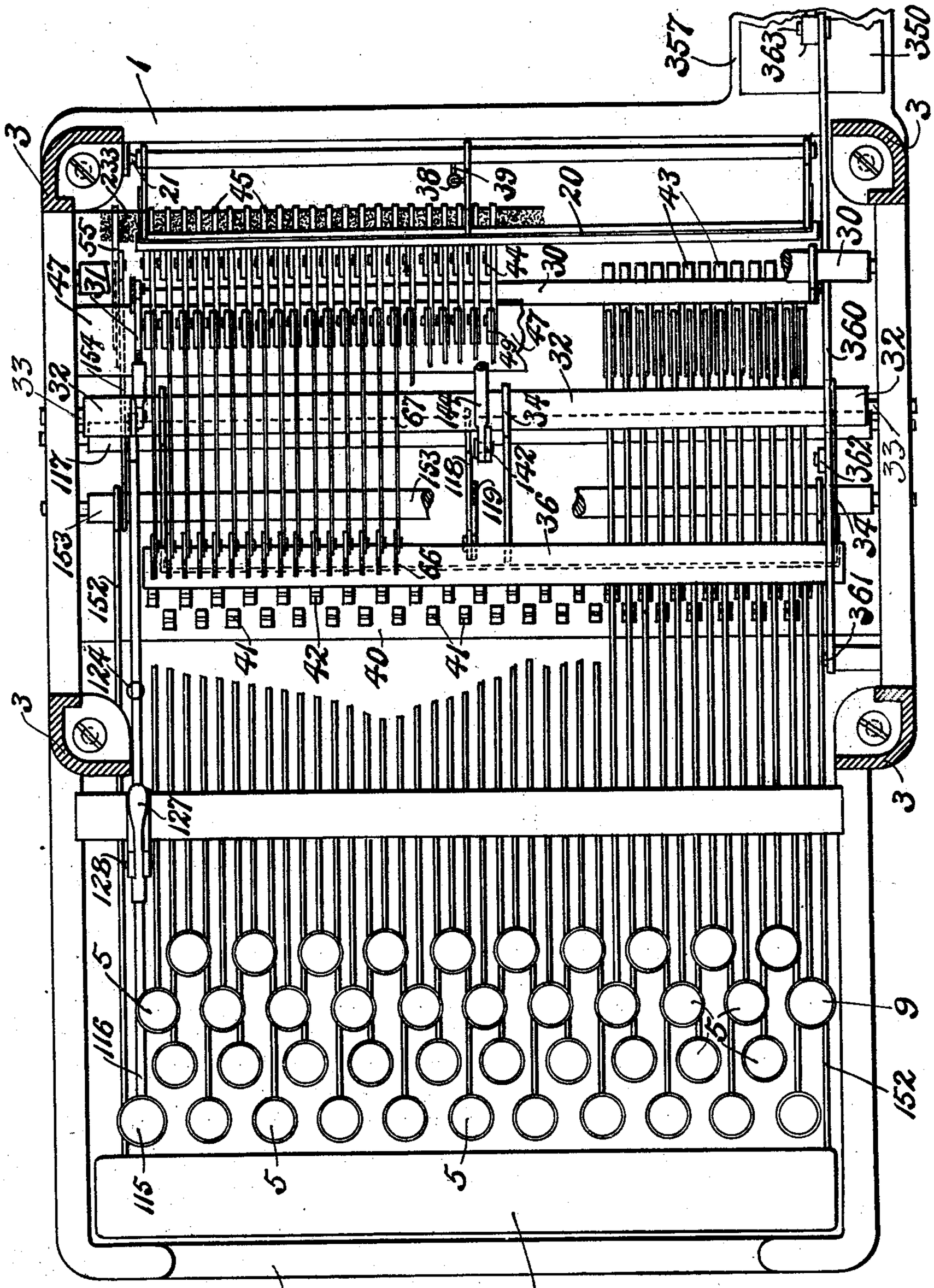

Fig. 3.

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6 SHEETS—SHEET 4.

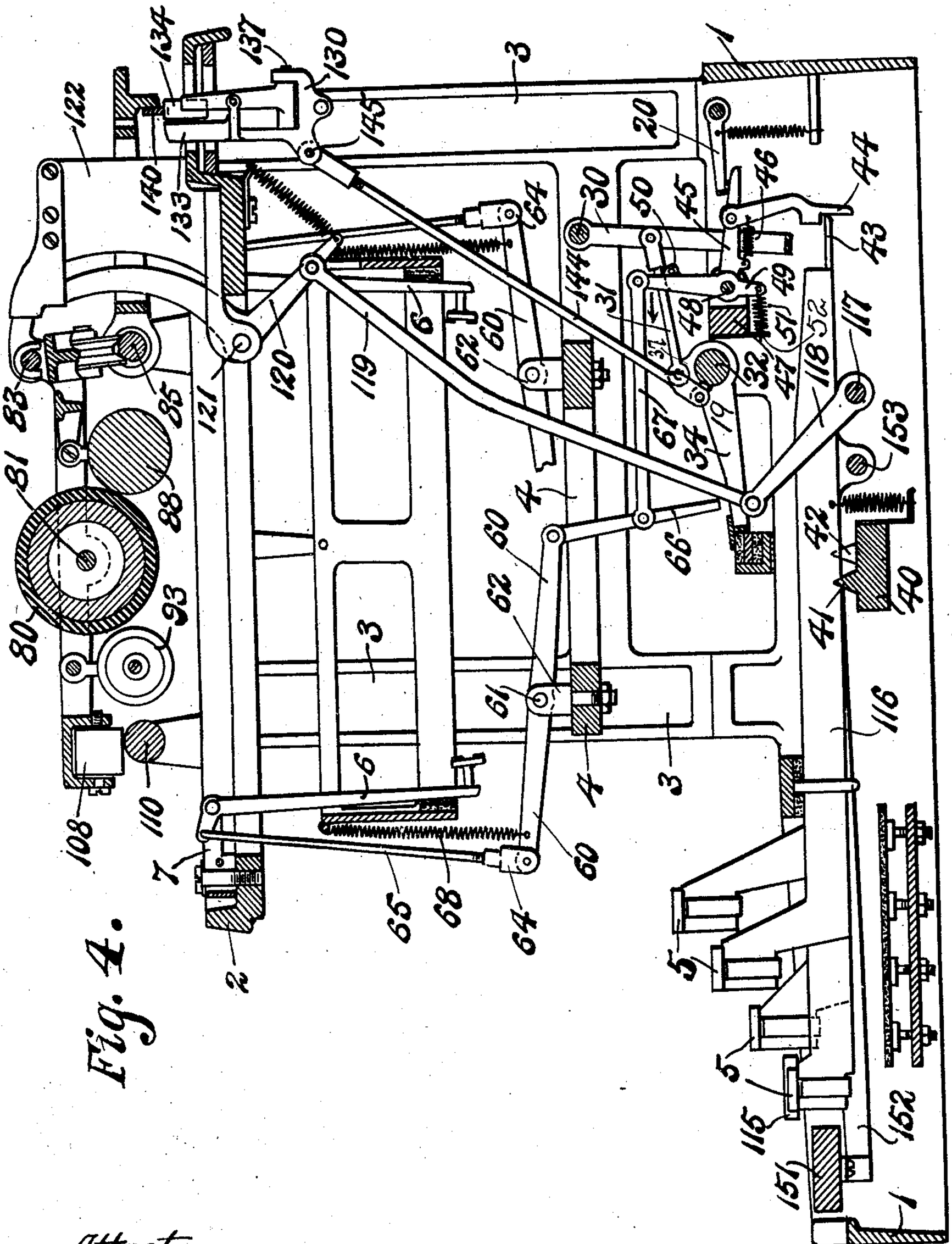

Fig. 4.

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No. 897,959. PATENTED SEPT. 8, 1908.

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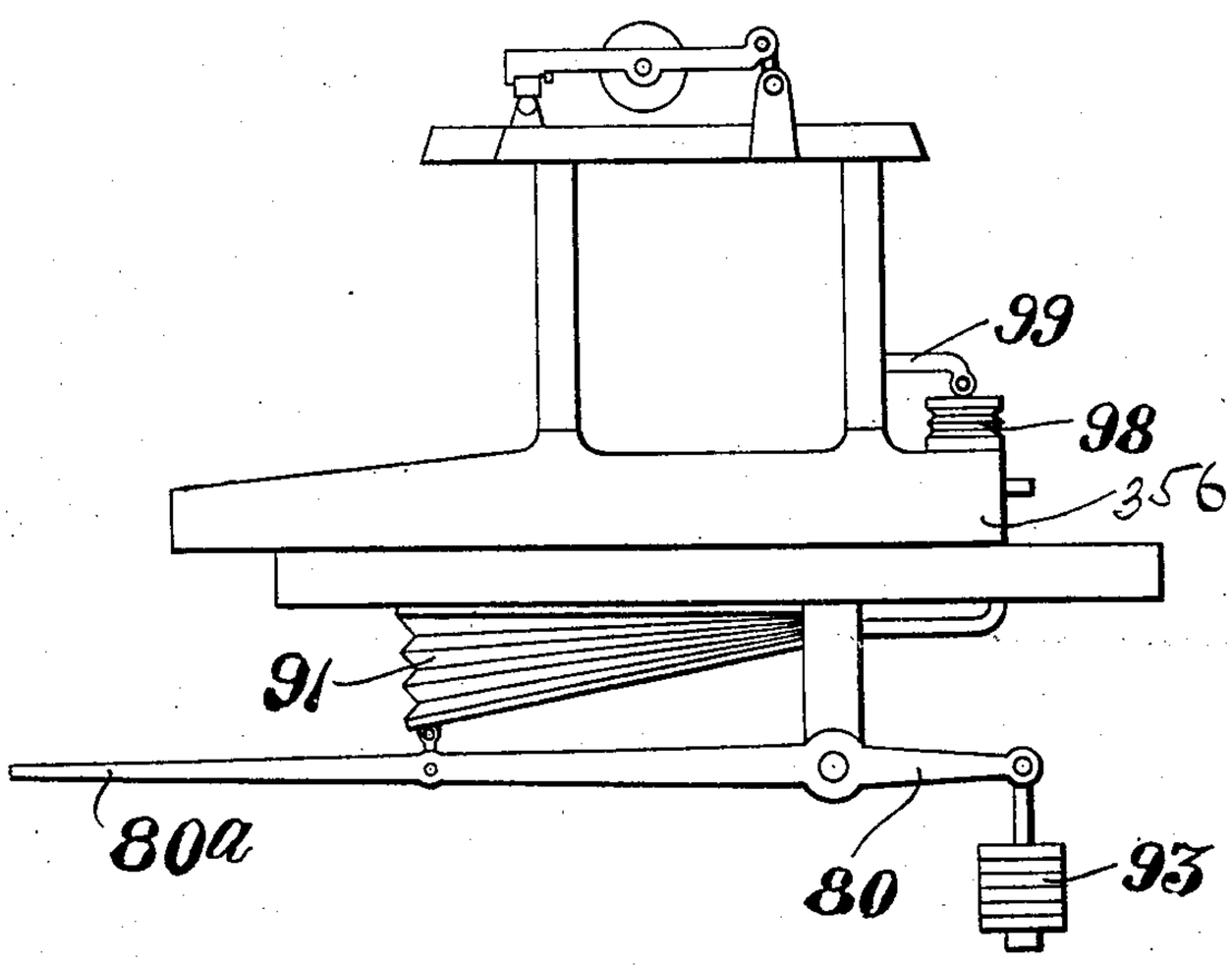
TYPE WRITING MACHINE.

APPLICATION FILED FEB. 28, 1901.

5 SHEETS—SHEET 5.

Fig. 5.



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Inventor:
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UNITED STATES PATENT OFFICE.

THADDEUS CAHILL, OF NEW YORK, N. Y., ASSIGNOR TO ELLIS SPEAR, JOHN T. SCHAAFF, E. HILTON JACKSON, AND JOSEPH J. DARLINGTON, TRUSTEES.

TYPE-WRITING MACHINE.

No. 897,959. Specification of Letters Patent. Patented Sept. 8, 1908.

Application filed February 28, 1901. Serial No. 49,265.

To all whom it may concern:

Be it known that I, THADDEUS CAHILL, a citizen of the United States and of the city, county, and State of New York, temporarily residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Type-Writing Machines and other Similar Instruments, of which the following is a specification.

The object of my invention is to make a simple type-writing machine, which is operated by pneumatic or other fluid power, the fingers of the operator serving only to call that power into action instead of serving to do all the work. And my invention consists in the parts, improvements and combinations hereinafter described and specifically set forth in the statement of claim at the end hereof.

The structure illustrated in the accompanying drawings resembles in many respects the structure of the machine illustrated in my pending application No. 735,813, filed November 4, 1899; but in other respects clearly set forth in the statement of claim at the end hereof the mechanism illustrated herein is novel.

In the accompanying drawings Figure 1 is a sectional view, partly in elevation, illustrating a machine constructed to embody my invention; Fig. 2 is a horizontal section on the line 2, 2, of Fig. 1, the type-bars being omitted; Fig. 3 is a horizontal section on the line 3, 3, of Fig. 1, and in this view certain portions of the mechanism are broken away in order to expose other parts to view; Fig. 4 is a longitudinal vertical section on the line 4, 4, of Fig. 2. Fig. 5 is a diagrammatic elevation illustrating one means of supplying compressed or rarefied air for operating the pneumatic power device.

Similar letters refer to similar parts in all the drawings.

In these drawings, 1 is the bed-plate; 2 is the top-plate; 3, 3, the sides, bolted to the bed-plate and carrying the top-plate; 4 is the fulcrum-plate, attached to the side-plates, 3, 3; 5, 5, are the keys; 6, 6, the type-bars, mounted by means of hangers, 7, 7, screwed to the hanger-ring 8, in the usual fashion.

350 is the pneumatic power device, arranged in the manner hereinafter described, to actuate the type-bars.

19 is the motor-frame actuated by the pneumatic power device 350, and serving as a medium between said power device and type-bars.

20 is the motor-controlling frame which acts when a key is depressed, to bring the pneumatic power device 350, before mentioned, into action to operate the type-bar corresponding to the key depressed.

30 is the releasing frame, actuated by the pneumatic power device 350 aforesaid, and acting to free the key-actuated latch 44, thereby to release the motor-controlling frame 20, the type-bar, and spacing dogs, to permit the same to return to their normal positions in advance of the release of the key.

The movement of the type-bars is controlled by the keys; that is to say, when any key is depressed, the corresponding type-bar is caused to operate; but the type-bars are not actuated by the keys; they are actuated by the power device before mentioned. The keys 5, 5, are fulcrumed upon the bar 40, which is provided with two rows of fulcrum points 41 and 42; the front row 41, serving for the two front rows or banks of keys, while the rear fulcrum points 42, serve for the two rear rows or banks of keys. The use of the two rows of fulcrum points is to approximately equalize the leverages of the keys. Each of the key levers, 5, 5, is furnished at the rear with a metal extension piece, 43, which is so shaped as to act upon the latch 44, and to leave room for the releasing frame 30 to operate. Overlying each of the key extensions 43 is a latch 44, pivoted to the bell-crank 45, and held by a contractile spring 46, in engagement with the key extension 43. The bell-cranks 45, are mounted in a milled bar 47, on a rod 48. Corresponding to each of the bell-cranks and mounted side by side with it in the same slot in the milled bar 47, is an arm 49, upon which a pin 50 in bell-crank 45 acts, when the key is depressed, to throw the arm in the direction of the arrow in Fig. 4. The arm 49 is held normally in engagement with the pin 50, by the contractile spring 51 attached to the plate 52. Corresponding to the type-bars is a set of levers 60, 60, which for distinction's and convenience's sake we may term type-bar-corresponding levers. Each of these levers is fulcrumed upon a pin 61, set in the milled slot in the top of the hanger 62, which hanger is furnished with a screw-threaded shank which enters a hole in the fulcrum plate 4, and is held fast therein by a

retaining nut 63. The fulcrums of the type-bar corresponding levers 60, 60, are preferably disposed in an elliptical or quasi-elliptical fashion, and they are made preferably of varying lengths, as illustrated, for example, in Fig. 2, so that when their outer ends are connected by coupling nuts 64 pivoted to the type-bar-corresponding levers and screw-threaded to receive the rod, wire or link 65 connected with the corresponding type-bar, their inner ends lie in juxtaposition. To the inner end of each of said type-bar-corresponding levers is hinged or pivoted a movement-receiving arm, 66, which is connected by a link 67, with the arm 49, before mentioned. The movement-receiving arms, 66, lie in proximity to the striking surface of the oscillating motor frame 19, but normally clear of it. Said motor frame 19, as I have constructed it (though the details of construction may be altered very widely according to the judgment of the constructor,) consists of a center rod or shaft 32, pivoted on hardened points 33, and having arms 34, 34, brazed or silver-soldered to it. To these arms is attached a front piece, 35, of sheet metal, arranged on edge, with another piece 36 silver-soldered, brazed or otherwise suitably attached thereto, and acting to give movement to the movement-receiving arms 66, 66. By these means I obtain a maximum of strength with a minimum of inertia, which I have found by much experience to be of some importance in securing the necessary rapidity of operation without an undue amount of noise and vibration; but while I consider these details of construction of some importance in securing the best results, I do not at all limit myself to them in the carrying out of the broader features of my invention.

20 is, as aforesaid, the valve-controlling frame, which consists of (*a*) an axial shaft fulcrumed by means of points 21, 21, set in the bed-plate, (*b*) a front part overlying the horizontal arms of all the bell-cranks, 45, 45; (*c*) horizontal arms connecting said front part with the axial shaft; and (*d*) a vertical arm 22, which is connected to operate the valves hereinafter described by which the power device 350 is controlled. Any key then, when depressed, connects the corresponding type-bar with the motor frame, and also operates the valves of the power device 350, to bring said power device into action to operate the motor frame 19 and the type-bar connected therewith. In other words, each key, when depressed by the operator in front of the center, rises back of the center, and through the latch 44, bell-crank 45, and pin 50, gives movement to the arm 49, and the link 67, throwing the movement receiving arm 66 connected with one end of the type-bar-corresponding lever 60, (whose other end is connected by the nut 64 and link 65 with the short arm of the type-bar-corresponding to the key depressed) over the motor-frame 19; and at the same time said bell-crank 45, acting upon the valve-controlling frame 20, brings the power device 350 into action, so that it gives movement to the type-bar 6, corresponding to the key depressed, throwing said type-bar from its normal position towards the printing point.

As the type-bar moves towards the printing point, the releasing frame 30, which is connected by a link 31 with the arm 37 of the motor-frame, strikes the latch 44, throwing it off of the key-extension 43, thereby permitting the valve-controlling frame 20 to return to its normal position, to cut off power from the pneumatic power device 350; whereupon said power device and all the parts operated thereby (the type-bar, spacing mechanism, releasing frame, etc.) return to their normal positions in advance of the release of the key. The effect of which is that clean printing is insured, as the power is cut off from the type-bar before it strikes, leaving it free to rebound from the paper, and a further and more important result is that the operator does not have to release one key before depressing another, but is able to use a legato or connected touch, similar to that ordinarily used in playing a pianoforte or organ, whereby a great increase in speed and comfort of operation is obtained.

Having thus shortly described the general features of construction and operation of the mechanism, let us examine more narrowly the details of the pneumatic construction, as the same are illustrated in the drawings.

350, as before said, is the power bellows or pneumatic; 351, 352, are the valves set upon the stem 353 in the valve chest 354, which chest is formed by screwing the plate 355 onto the back of the bed-plate 1.

356 is the wind-chest, which is formed by screwing the casting 357 onto the back of the plate 355. The wind-chest is supplied with air under pressure from a suitable bellows or other source, by the pipe 358. The valve-chest 354 communicates by the port 359 with the interior of the pneumatic 350. A lever 360 centered at 361, is connected by a link 362, with one of the arms 34 of the motor-frame. One end of said lever is connected at 363 with the pneumatic 350. The valve stem 353 has one end guided by a hole 363 in the casting 357, and the other by a hole in the bracket 364 which is screwed to the inner face of the rear wall of the bed-plate 1. Said valve-stem 353 is connected by a link 365 with the vertical arm 22 of the frame 20, which is operated by the keys in the manner already described. The contractile spring 366 holds the valves in their normal posi-

tions illustrated in Fig. 1 with the valve 351 closing the port between the wind-chest and valve-chest, while the valve 352 leaves the port between the valve chest and the external atmosphere, open; in which condition of things the bellows is kept collapsed, and the motor-frame held in its normal position by the contractile spring 367 attached to the lever 360. But when any one of the keys 5 is depressed, said key, rising back of its fulcrum, acts through the latch 44 on the corresponding bell-crank 45, which throws the corresponding movement-receiving arm 66 over the top 36 of the motor-frame in the manner already described, and at the same time acting on the frame 20, gives movement through the link 365 to the valve-stem 353, moving the valve 351 off of its port, so as to permit compressed air to pass from the wind-chest into the valve-chest 354 and pneumatic 350, moving at the same time the valve 352, so that it closes the port between the valve-chest and the external atmosphere; whereupon the pneumatic 350 expands and through the lever 360 and link 362, gives movement to the motor-frame. As the type-bar moves towards the printing-point the releasing frame 30 acts, in the manner already described, upon the latch 44, moving it off from the key-extension 43, whereupon the bell-crank 45, frame 20, valve-stem 353 and valves 351, and 352, return to their normal positions under the influence of gravitation and the returning spring 366, upon which the valve 352 opens connection between the valve-chest 364 and the external atmosphere, the valve 351 closes the port between the valve-chest and the wind-chest; and the pneumatic 350 immediately collapses under the influence of gravitation and the returning spring 367, so that the motor-frame, the releasing frame 30, and the spacing mechanism, return to their normal positions; the movement-receiving arm 66 and the type-bar 6, returning also to their normal positions—all in advance of the release of the key.

The power bellows 91, for supplying wind to the pneumatic 350, may be located on the bottom of the table on which the type-writer sits or in any other convenient position, being connected by a pipe with the wind-chest 356. A handle 80 or 80[a], projecting into a position in front of the machine at the side of the operator's chair may be used, so that by pressing down at the end of the line with one hand upon the handle, he can fill the bellows with air to write the next line. When the bellows is thus filled with air the inlet-valve (not shown in the drawings) closes to prevent the escape of the air, and the weight 93, attached to the lever 80, tending to shut the bellows, give the air which it contains the necessary pressure.

The devices which I have figured in the drawings are shown in illustration of my invention; but numerous variations and modifications may be made without departing from certain essential features, combinations, or sub-combinations set forth in the statement of claim at the end hereof.

I have illustrated my power device as applied to a machine of the general character described in my before-mentioned pending application No. 735,813, filed November 4, 1899; but it may be applied to any other suitable form of type-writing machine whatever.

My invention may be applied to other machines than type-writers. To give one illustration out of many, the character-corresponding levers 60, instead of being employed to operate type-bars, might be connected to actuate the matrix-releasing escapements of a Mergenthaler linotype machine, or to operate the type-freeing devices or the type-controlling devices or the key-corresponding devices of any other suitable sort of key-board printing instrumentality whatever. I desire full protection for all the uses to which my invention may be applied, and do not dedicate or abandon any part whatever of it to the public.

I have shown a single motor-frame with the controlling devices therefor, serving for a whole type-writer, or for all the character-corresponding devices in an alphabet. This I consider convenient and economical; but two or more devices each similar to the one I have illustrated in the drawings may be used, each controlling one or more type-bars or other character-controlling devices.

Instead of using a power bellows, a cylinder and piston might be employed. Instead of using a single handle as 80 or 80[a], to fill the bellows with wind, adapted to be operated by one hand, two such handles may be used, one on one side of the machine and the other on the other side, and connected by the same rock-shaft. Or a foot-bellows may be used, either independently of the hand-operated bellows, or together with it. Numerous other modifications may be made without departing from the essentials of my invention, set forth in the statement of claim at the end hereof.

I wish it to be understood that it is not my intention to dedicate or abandon any part of my invention to the public, but that I wish full protection for all that is new with me.

What, therefore, I claim as of my own invention and desire to secure by Letters Patent hereunder, is:

1. In combination in a typewriting machine, (*a*) a plurality of type-bars, striking to a common printing-center; (*b*) a pneumatic motor device common to a plurality of said type-bars for actuating said type-bars, each as required; (*c*) keys at the key-board; (*d*) means operated by said keys, whereby the different type-bars to which the motor afore-

said is common are connected with said motor device, each type-bar as required; and (*e*) valve mechanism, controlled by said keys, whereby said pneumatic motor device is brought into action, when a key is depressed, to actuate the type-bar corresponding to the key depressed.

2. In combination in a typewriting machine, (*a*) a plurality of type-bars, striking to a common printing-center; (*b*) a pneumatic motor device common to a plurality of said type-bars for actuating said type-bars, each as required; (*c*) keys at the key-board; (*d*) valve mechanism for controlling said pneumatic motor device; and (*e*) a valve-controlling frame, common to a plurality of keys, each of said keys acting, when depressed, through said valve-controlling frame, upon the valve mechanism aforesaid, to bring the pneumatic motor device aforesaid into action to operate the type-bar corresponding to the key depressed.

3. In combination in a type-writing machine, (*a*) a type-bar; (*b*) a pneumatic power device for actuating said type-bar; (*c*) a valve, for controlling said pneumatic power device; (*d*) a key at the key-board, acting when depressed to bring the pneumatic power device aforesaid into action to operate the type-bar; and (*e*) means acting to permit said valve to return to its normal position in advance of the release of the key, thereby to permit said pneumatic power device and the type-bar operated thereby to return to their normal positions in advance of the release of the key, so that another key may be depressed to print while the key first depressed is still held down.

4. In combination in a type-writing machine, (*a*) a type-bar; (*b*) a pneumatic power device for actuating said type-bar; (*c*) a valve, for controlling said pneumatic power device; (*d*) a key at the key-board; (*e*) a releasable connection intermediate said key and the valve aforesaid, wherethrough said key, when depressed, operates said valve to bring the pneumatic power device aforesaid into action; and (*f*) means acting when said key is depressed, on said releasable connection to permit said valve to return to its normal position in advance of the release of said key; said valve acting by such return movement to permit the pneumatic power device aforesaid to return to its normal position; said pneumatic power device serving by such return movement to permit the type-bar to return to its normal position; whereby another key may be depressed to print while the key first depressed is still held down.

5. In combination in a type-writing machine, (*a*) a type-bar; (*b*) a pneumatic power device for actuating said type-bar; (*c*) a valve, for controlling said pneumatic power device; (*d*) a key at the key-board; (*e*) a releasable connection intermediate said key and the valve aforesaid, wherethrough said key, when depressed, operates said valve to bring the pneumatic power device aforesaid into action; said power device serving as it impels the type-bar, to act upon the releasable connection aforesaid, to permit the valve operated by the key depressed, to return to its normal position in advance of the release of said key; said valve acting by such return movement to permit the pneumatic power device aforesaid to return to its normal position; said pneumatic power device serving by such return movement to permit the type-bar to return to its normal position; whereby another key may be depressed to print while the key first depressed is still held down.

6. The combination, in a typewriting machine, of (*a*) typebars striking to a common printing center; (*b*) typebar-corresponding levers equal in number to said typebars; said typebar-corresponding levers being levers of the first order and arranged in two oppositely-extending rows; (*c*) movement-receiving arms connecting the proximate ends of the typebar-corresponding levers of the two oppositely extending rows aforesaid; the remote ends of said typebar-corresponding levers being connected with the typebars; (*d*) a motor frame common to a plurality of the typebars aforesaid; (*e*) a pneumatic motor device for giving movement to said motor frame—(*f*) valve mechanism controlling said pneumatic power device; and (*g*) a plurality of keys at the keyboard, each acting when depressed to bring one of the movement-receiving arms aforesaid into operative relation with the motor frame aforesaid to receive movement therefrom; said key acting also on the valve mechanism aforesaid to bring the pneumatic power device aforesaid into action to give movement to the motor frame aforesaid, thereby to actuate a typebar.

7. The combination, in a typewriting machine, of (*a*) typebars striking to a common printing center; (*b*) typebar-corresponding levers equal in number to said typebars; said typebar-corresponding levers being levers of the first order and arranged in two oppositely extending rows; (*c*) movement-receiving arms connecting the proximate ends of the typebar-corresponding levers of the two oppositely extending rows aforesaid; the remote ends of said typebar-corresponding levers being connected with the typebars; (*d*) a motor frame common to a plurality of the typebars aforesaid; (*e*) a pneumatic motor device for giving movement to said motor frame; (*f*) valve mechanism controlling said pneumatic power device; (*g*) a plurality of keys at the keyboard, each acting when depressed to bring one of the movement-receiving arms aforesaid into operative relation with the motor frame aforesaid to receive movement therefrom; said key acting

also on the valve mechanism aforesaid to bring the pneumatic power device aforesaid into action to give movement to the motor frame aforesaid, thereby to actuate a typebar; and (*h*) automatic releasing mechanism, whereby when a key is depressed the valve mechanism and movement-receiving arm is controlled by said key are left free to return to their normal positions in advance of the release of said key, so that another key may be depressed to print while the key first depressed is still held down.

8. In combination, in a typewriting machine (*a*) a plurality of typebars striking to a common printing center; (*b*) a vibratory frame, for giving movement to a plurality of said type bars, each typebar as required; (*c*) a pneumatic motor device, for actuating said vibratory frame; (*d*) keys at a keyboard; and (*e*) connections controlled by the keys aforesaid, whereby the typebars aforesaid are connected, each as required, with the vibratory frame aforesaid, to receive movement therefrom.

9. In combination, in a typewriting machine (*a*) a plurality of typebars striking to a common printing center; (*b*) a vibratory frame, for giving movement to said typebars, or a plurality of them, each typebar as required; (*c*) a pneumatic motor device, for actuating said vibratory frame; (*d*) keys at a keyboard; (*e*) connections controlled by the keys aforesaid, whereby the typebars aforesaid are connected, each as required, with the vibratory frame aforesaid, to receive movement therefrom; and (*f*) valve mechanism, also controlled by said keys, whereby the pneumatic motor device aforesaid is brought into action, when a key is depressed, to actuate the vibratory frame aforesaid and typebars connected therewith by the key depressed.

10. In combination, in a typewriting machine (*a*) a plurality of typebars striking to a common printing center; (*b*) a vibratory frame, for giving movement to said typebars, or a plurality of them, each typebar as required; (*c*) a pneumatic motor device, for actuating said vibratory frame; (*d*) keys at a keyboard; (*e*) connections controlled by the keys aforesaid, whereby the typebars aforesaid are connected, each as required, with the vibratory frame aforesaid, to receive movement therefrom; and (*f*) releasing means, whereby, when a key is depressed and the typebar corresponding thereto connected with the vibratory frame aforesaid, said typebar is disconnected from said frame and permitted to return to its normal position in advance of the release of said key.

11. In combination, in a typewriting machine (*a*) a plurality of typebars striking to a common printing center; (*b*) a vibratory frame, for giving movement to said typebars, or a plurality of them, each typebar as required; (*c*) a pneumatic motor device for actuating said vibratory frame; (*d*) keys at a keyboard; (*e*) connections controlled by the keys aforesaid, whereby the typebars aforesaid are connected, each as required, with the vibratory frame aforesaid, to receive movement therefrom; (*f*) valve mechanism, also controlled by said keys, whereby the pneumatic motor device aforesaid is brought into action, when a key is depressed, to actuate the vibratory frame aforesaid and the typebar connected therewith by the key depressed; and (*g*) releasing mechanism, whereby when a key is depressed and the typebar corresponding thereto actuated by the pneumatic motor device aforesaid through the vibratory frame aforesaid, said typebar and said vibratory frame are permitted to return to their normal positions in advance of the release of the key, so that another key may be depressed to print while the key first depressed is still held down.

12. In combination, in a typewriting machine (*a*) a plurality of typebars striking to a common printing center; (*b*) a pneumatic motor device for actuating said typebars, each as required; (*c*) keys at a keyboard; (*d*) means operated by said keys whereby, when a key is depressed, the typebar corresponding thereto is brought into operative relation with the motor device aforesaid to receive movement therefrom; (*e*) valve mechanism for controlling the pneumatic motor device aforesaid; (*f*) a valve-operating frame, common to a plurality of the keys aforesaid and operated by said keys when they are depressed; (*g*) a releasable connection between said key and the valve-operating frame aforesaid, wherethrough when a key is depressed, movement is communicated from said key to said valve-operating frame, to operate the valve-mechanism aforesaid; and (*h*) means acting—when a key is depressed and the valve mechanism aforesaid operated thereby and the typebar corresponding to said key actuated by the pneumatic motor aforesaid—on the releasable connection intermediate the key depressed and the valve-operating frame aforesaid, to permit said frame to return to its normal position in advance of the release of the key depressed; the valve mechanism operated by said frame serving when said frame thus returns to its normal position to permit the motor aforesaid and the typebar operated thereby to return to their normal positions.

13. In combination in a typewriting machine (*a*) a plurality of typebars striking to a common printing center; (*b*) a pneumatic motor device for actuating said typebars, each as required; (*c*) keys at a keyboard; (*d*) means operated by said keys whereby, when a key is depressed, the typebar corresponding thereto is brought into operative relation with the motor device aforesaid to receive movement therefrom; (*e*) valve mechanism

for controlling the pneumatic motor device aforesaid; (*f*) a valve-operating frame, common to a plurality of the keys aforesaid and operated by said keys when they are depressed; (*g*) a releasable connection between said key and the valve-operating frame aforesaid, wherethrough when a key is depressed, movement is communicated from said key to said valve-operating frame, to operate the valve mechanism aforesaid; and (*h*) a releasing frame acting—when a key is depressed and the valve mechanism aforesaid operated thereby and the typebar corresponding to said key actuated by the pneumatic motor aforesaid—on the releasable connection intermediate the key depressed and the valve-operating frame aforesaid, to permit said frame to return to its normal position in advance of the release of the key depressed; the valve mechanism operated by said frame serving when said frame thus returned to its normal position to permit the motor aforesaid and the typebar aforesaid operated thereby to return to their normal positions.

14. In combination, in a typewriting machine (*a*) a plurality of typebars striking to a common printing center; (*b*) a vibratory frame for giving movement to said typebars or a plurality of them, each typebar as required; (*c*) a pneumatic motor device for actuating said vibratory frame; (*d*) keys at a keyboard; (*e*) means operated by said keys whereby when a key is depressed the typebar corresponding to said key is brought into operative relation with the vibratory frame aforesaid, to receive movement therefrom; (*f*) valve mechanism operated by said keys; (*g*) a releasable connection between each key and the valve mechanism operated by said key; and (*h*) means acting—when a key has been depressed and the valve mechanism aforesaid has been operated by said key through the releasable connection aforesaid and the type bar corresponding to said key has been actuated by the pneumatic motor device aforesaid through the vibratory frame aforesaid—on the releasable connection aforesaid to permit the return of the valve mechanism operated by the key depressed and the vibratory frame and motor device aforesaid to their normal positions in advance of the release of the key depressed; whereby another key may be depressed to print while the key first depressed is still held down.

15. In combination, in a typewriting machine (*a*) a plurality of typebars striking to a common printing center; (*b*) a vibratory frame for giving movement to said typebars or a plurality of them, each typebar as required; (*c*) a pneumatic motor device for actuating said vibratory frame; (*d*) keys at a keyboard; (*e*) means operated by said keys whereby when a key is depressed the typebar corresponding to said key is brought into operative relation with the vibratory frame aforesaid, to receive movement therefrom; (*f*) valve mechanism operated by said keys; (*g*) a releasable connection between each key and the valve mechanism operated by said key; and (*h*) a power-operated releasing-frame acting—when a key has been depressed and the valve mechanism aforesaid has been operated by said key through the releasable connection aforesaid and the typebar corresponding to said key has been actuated by the pneumatic motor device aforesaid through the vibratory frame aforesaid—on the releasable connection aforesaid to permit the return of the valve mechanism operated by the key depressed and the vibratory frame and motor device aforesaid to their normal positions in advance of the release of the key depressed; whereby another key may be depressed to print while the key first depressed is still held down.

16. In combination, in a typewriting machine (*a*) a plurality of typebars striking to a common printing center; (*b*) a vibratory frame for giving movement to said typebars or a plurality of them, each typebar as required; (*c*) a pneumatic motor device for actuating said vibratory frame; (*d*) keys at a keyboard; (*e*) means operated by said keys whereby when a key is depressed the typebar corresponding to said key is brought into operative relation with the vibratory frame aforesaid, to receive movement therefrom; (*f*) valve mechanism operated by said keys; (*g*) a releasable connection between each key and the valve mechanism operated by said key; and (*h*) a releasing frame, connected with the vibratory frame aforesaid and acting—when a key has been depressed and the valve mechanism aforesaid has been operated by said key through the releasable connection aforesaid and the typebar corresponding to said key has been actuated by the pneumatic motor device aforesaid through the vibratory frame aforesaid—on the releasable connection aforesaid to permit the return of the valve mechanism operated by the key depressed and the vibratory frame and motor device aforesaid to their normal position in advance of the release of the key depressed; whereby another key may be depressed to print while the key first depressed is still held down.

17. In combination, in a typewriting machine (*a*) a typebar; (*b*) a pneumatic power device; (*c*) a key at the keyboard; (*d*) a member operated by said key; (*e*) a releasable connection intermediate said key and said key-operated member; (*f*) means actuated by the key, through the key-operated member aforesaid, for connecting the typebar with the pneumatic motor aforesaid when the key is depressed; (*g*) valve mechanism, also operated by the key, through the key-operated member aforesaid, whereby when the key is

depressed the pneumatic motor device aforesaid is brought into action to operate the typebar corresponding to the key depressed; and (*h*) means acting, when the key has been depressed and the typebar set in motion by the pneumatic motor device aforesaid, to release the connection between the key and the key-operated member aforesaid so as to permit said key-operated member, with the parts controlled thereby, to return to their normal positions in advance of the release of the key depressed, whereby another key may be depressed to print while the key first depressed is still held down.

18. In combination, in a typewriting machine, (*a*) a plurality of typebars striking to a common printing center; (*b*) a pneumatic power device for actuating said typebars, each as required; (*c*) keys at a keyboard; (*d*) means operated by said keys whereby, when a key is depressed, the typebar corresponding thereto is connected with the pneumatic motor device aforesaid, to receive movement therefrom; (*e*) valve mechanism operated by the keys, aforesaid, and serving, when a key has been depressed and the typebar corresponding thereto connected with the pneumatic motor aforesaid, to bring said motor into action to operate said typebar; and (*f*) releasing mechanism, operating, when a key has been depressed and the typebar corresponding thereto connected with the motor aforesaid and set in motion by said motor, to permit the valve mechanism aforesaid, the pneumatic motor aforesaid and the typebar aforesaid to return to their normal positions in advance of the release of the key depressed; whereby another key may be depressed to print while the key first depressed is still held down.

19. In combination, in a typewriting machine, (*a*) a plurality of typebars striking to a common printing center; (*b*) a pneumatic power device for actuating said typebars, each as required; (*c*) a plurality of keys at a keyboard; (*d*) key-operated members corresponding to said keys respectively; (*e*) releasable connections intermediate said keys and said key-operated members, whereby said keys transmit motion to said key-operated members, respectively; (*f*) a connection between each of said key-operated members and the corresponding typebar, whereby when a key is depressed, the corresponding typebar is brought into operative relation with the motor device aforesaid to receive movement therefrom; (*g*) valve mechanism for the pneumatic motor device aforesaid, operated by the keys aforesaid; and (*h*) means acting—when a key has been depressed and the typebar corresponding to said key connected with the pneumatic motor device aforesaid and set in motion thereby—on the releasable connection between said key and the corresponding key-operated member aforesaid, to permit said key-operated member and the parts controlled thereby to return to their normal positions in advance of the release of the key depressed.

20. In combination, in a type-writing machine, (*a*) a plurality of type-bars, striking to a common printing center; (*b*) a pneumatic motor device, common to a plurality of said type-bars, for actuating said type-bars, each as required; (*c*) keys at the key-board; (*d*) means operated by said keys, whereby the different type-bars to which the motor aforesaid is common are connected with said motor device, each type-bar as required; (*e*) valve mechanism, controlled by said keys, whereby said pneumatic motor device is brought into action, when a key is depressed, to actuate the type-bar corresponding to the key depressed; (*f*) a reservoir of air under pressure, connected with said type-writing machine, for operating the pneumatic motor-device aforesaid; and (*g*) means for maintaining the pressure in said reservoir.

21. In combination, in a type-writing machine, (*a*) a plurality of type-bars, striking to a common printing center; (*b*) a pneumatic motor device, common to a plurality of said type-bars, for actuating said type-bars, each as required; (*c*) keys at the key-board; (*d*) means operated by said keys, whereby the different type-bars to which the motor aforesaid is common are connected with said motor device, each type-bar as required; (*e*) valve mechanism, controlled by said keys, whereby said pneumatic motor device is brought into action, when a key is depressed, to actuate the type-bar corresponding to the key depressed; (*f*) a reservoir of air under pressure, connected with said type-writing machine, for operating the pneumatic motor device aforesaid; and (*g*) means for maintaining the pressure in said reservoir, including a member, located within convenient distance of the key-board, so that it can be operated by the operator, while seated at the machine.

22. In combination, in a typewriting machine, (*a*) a plurality of type-bars, striking to a common printing center; (*b*) a pneumatic motor device, common to a plurality of said type-bars, for operating said type-bars, each as required; (*c*) keys at the key-board; (*d*) valve mechanism for controlling said motor device; (*e*) a valve-controlling frame, common to a plurality of keys, each of said keys acting, when depressed, through said valve-controlling frame, upon the valve mechanism aforesaid to bring the pneumatic motor device aforesaid into action to operate the type-bar corresponding to the key depressed; (*f*) a reservoir of air under pressure, connected with said type-writing machine, for operating the pneumatic motor device aforesaid; and (*g*) means for maintaining the pressure in said reservoir.

23. In combination in a type-writing ma-

chine, (*a*) a plurality of type-bars, striking to a common printing-center; (*b*) a pneumatic motor device, common to a plurality of said type bars for actuating said type-bars, each as required; (*c*) keys at the key-board; (*d*) valve mechanism for controlling the pneumatic motor device aforesaid; (*e*) a valve-controlling frame, common to a plurality of keys, each of said keys acting, when depressed, through said valve-controlling frame, upon the valve-mechanism aforesaid, to bring the pneumatic motor device aforesaid into action to operate the type-bar corresponding to the key depressed; (*f*) a reservoir of air under pressure, connected with said typewriting machine, for operating the pneumatic motor device aforesaid; and (*g*) means for maintaining the pressure in said reservoir, including a member, located within convenient distance of the key-board, so that it can be operated by the operator, while seated at the machine.

24. In combination, in a type-writing machine, (*a*) a type-bar; (*b*) a pneumatic power device for operating said type-bar; (*c*) a valve, for controlling said pneumatic power device; (*d*) a key at the key-board, acting when depressed to bring the pneumatic power device aforesaid into action to operate the type-bar; (*e*) means acting to permit said valve to return to its normal position in advance of the release of the key, thereby to permit said pneumatic power device and the type-bar operated thereby to return to their normal positions in advance of the release of the key, so that another key may be depressed to print, while the key first depressed is still held down; (*f*) a reservoir of air under pressure, connected with said type-writing machine, for operating the pneumatic motor device aforesaid; and (*g*) means for maintaining the pressure in said reservoir.

25. In combination in a type-writing machine, (*a*) a type-bar; (*b*) a pneumatic power device for actuating said type-bar (*c*) a valve for controlling said pneumatic power device; (*d*) a key at the keyboard, acting when depressed to bring the pneumatic power device aforesaid into action to operate the type-bar; (*e*) means acting to permit said valve to return to its normal position in advance of the release of the key, thereby to permit said pneumatic power device and the type-bar operated thereby to return to their normal positions in advance of the release of the key, so that another key may be depressed to print while the key first depressed is still held down; (*f*) a reservoir of air under pressure, for operating the pneumatic power device aforesaid; and (*g*) means for maintaining the pressure in said reservoir, including a member, located within convenient distance of the key-board, so that it can be operated by the operator while seated at the machine.

26. In combination, in a typewriting machine, (*a*) a type-bar; (*b*) a pneumatic power device for actuating said type-bar; (*c*) a valve for controlling said pneumatic power device; (*d*) a key at the key-board; (*e*) a releasable connection intermediate said key and the valve aforesaid, wherethrough said key, when depressed, operates said valve to bring the pneumatic power device aforesaid into action; and (*f*) means acting when said key is depressed on said releasable connection to permit said valve to return to its normal position in advance of the release of said key; said valve acting by such return movement to permit the pneumatic power device aforesaid to return to its normal position;[1] said pneumatic power device serving by such return movement to permit the type bar to return to its normal position; whereby another key may be depressed to print while the key first depressed is still held down; (*g*) a reservoir of air under pressure, for operating the pneumatic power device aforesaid; and (*h*) means for maintaining the pressure in said reservoir.

27. In combination, in a type-writing machine, (*a*) a type-bar; (*b*) a pneumatic power device for actuating said type-bar; (*c*) a valve for controlling said pneumatic power device; (*d*) a key at the key-board; (*e*) a releasable connection intermediate said key and the valve aforesaid, wherethrough said key, when depressed, operates said valve to bring the pneumatic power-device aforesaid into action; (*f*) means acting, when said key is depressed, on said releasable connection to permit said valve to return to its normal position in advance of the release of the key; said valve acting by such return movement to permit the pneumatic power device aforesaid to return to its normal position; said pneumatic power device serving by such return movement to permit the type-bar to return to its normal position; whereby another key may be depressed to print while the key first depressed is still held down; (*g*) a reservoir of air under pressure, for operating the pneumatic power device aforesaid; and (*h*) means for maintaining the pressure in said reservoir, including a member, located within such convenient distance of the key-board that it can be operated by the operator while seated at the machine.

28. In combination, in a type-writing machine, (*a*) a type-bar; (*b*) a pneumatic power device for actuating said type-bar; (*c*) a valve for controlling said pneumatic power device; (*d*) a key at the key-board; (*e*) a releasable connection intermediate said key and the valve aforesaid, wherethrough said key, when depressed, operates said valve to bring the pneumatic power device aforesaid into action; said power device serving as it impels the type-bar to act upon the releasable connection aforesaid, to permit the valve operated by the key depressed to re-

turn to its normal position in advance of the release of said key; said valve acting by such return movement to permit the pneumatic power device aforesaid to return to its normal position; said pneumatic power device serving by such return movement to permit the type-bar to return to its normal position; whereby another key may be depressed to print while the key first depressed is still held down; (*f*) a reservoir of air under pressure, for operating the pneumatic motor-device aforesaid; and (*g*) means for maintaining the pressure in said reservoir.

29. In combination in a type-writing machine, (*a*) a type-bar; (*b*) a pneumatic power device for actuating said type-bar; (*c*) a valve for controlling said pneumatic power device; (*d*) a key at the key-board; (*e*) a releasable connection intermediate said key and the valve aforesaid, wherethrough said key, when depressed, operates said valve to bring the pneumatic power device aforesaid into action; said power device serving as it impels the type-bar, to act upon the releasable connection aforesaid to permit the valve operated by the key depressed to return to its normal position in advance of the release of said key; said valve acting by such return movement to permit the pneumatic power device aforesaid to return to its normal position; said pneumatic power device serving by such return movement to permit the type-bar to return to its normal position; whereby another key may be depressed to print, while the key first depressed is still held down; (*f*) a reservoir of air under pressure, for operating the pneumatic motor device aforesaid; and (*g*) means for maintaining the pressure in said reservoir, including a member, located within convenient distance of the key-board, so that it can be operated by the operator while seated at the machine.

30. In combination in a typewriting machine having a main frame, (*a*) a plurality of type bars striking to a common printing center; (*b*) a pneumatic power device, common to a plurality of said type bars for actuating said type bars, each as required; (*c*) keys at a keyboard; (*d*) a wind-chest, attached to the main frame of said typewriting machine; (*e*) valve mechanism controlling the flow of air between said wind-chest and the pneumatic power device aforesaid, said valve mechanism being itself controlled by the keys aforesaid.

31. In combination in a typewriting machine having a main frame, (*a*) a plurality of type bars striking to a common printing center; (*b*) a pneumatic power device, common to a plurality of said type bars for actuating said type bars, each as required; (*c*) keys at a keyboard; (*d*) a wind-chest, attached to the main frame of said typewriting machine; (*e*) valve mechanism controlling the flow of air between said wind-chest and the pneumatic power device aforesaid, said valve mechanism being itself controlled by the keys aforesaid; (*f*) a reservoir of air, for supplying the necessary wind to the wind-chest and pneumatic motor device aforesaid and suitably connected therewith; and (*g*) means for maintaining the requisite pressure in said reservoir.

32. In combination in a typewriting machine having a main frame, (*a*) a plurality of type bars striking to a common printing center; (*b*) a pneumatic power device, common to a plurality of said type bars for actuating said type bars, each as required, (*c*) keys at a keyboard; (*d*) a wind-chest, attached to the main frame of said typewriting machine; (*e*) valve mechanism controlling the flow of air between said wind-chest and the pneumatic power device aforesaid, said valve mechanism being itself controlled by the keys aforesaid; (*f*) a reservoir of air, for supplying the necessary wind to the wind-chest and pneumatic motor device aforesaid and suitably connected therewith; (*g*) means for maintaining the requisite pressure in said reservoir; and (*h*) a member located within a convenient distance of the keyboard, so that it can be operated by the operator while seated at the machine, to charge the air reservoir aforesaid.

33. In combination in a typewriting machine having a main frame, (*a*) a plurality of type bars striking to a common printing center; (*b*) a pneumatic power device, common to a plurality of said type bars for actuating said type bars, each as required; (*c*) keys at a keyboard; (*d*) a wind-chest, attached to the main frame of said typewriting machine; (*e*) valve mechanism controlling the flow of air between said wind-chest and the pneumatic power device aforesaid, said valve mechanism being itself controlled by the keys aforesaid; (*f*) an air reservoir, attached to the table or cabinet on which the typewriting machine stands, said reservoir being connected pneumatically with the wind-chest aforesaid; and (*g*) means for charging said reservoir including a member located within convenient distance of the keyboard, so that it can be operated by the operator while seated at the machine, to charge the air reservoir aforesaid.

34. In combination in a typewriting machine having a main frame (*a*) a plurality of type bars striking to a common printing center; (*b*) a pneumatic power device common to a plurality of said type bars for operating said type bars, each as required; (*c*) keys at the keyboard and means operated by said keys whereby the different type bars to which the motor device aforesaid is common are connected with said motor device, each type bar as required; (*d*) a wind-chest, attached to the main frame of said typewriting

machine; (*e*) valve mechanism controlling the flow of air between said wind-chest and the pneumatic power device aforesaid, said valve mechanism being itself controlled by the keys aforesaid.

35. In combination in a typewriting machine having a main frame (*a*) a plurality of type bars striking to a common printing center; (*b*) a pneumatic power device common to a plurality of said type bars for operating said type bars, each as required; (*c*) keys at the keyboard and means operated by said keys whereby the different type bars to which the motor device aforesaid is common are connected with said motor device, each type bar as required; (*d*) a wind-chest, attached to the main frame of said typewriting machine; (*e*) valve mechanism controlling the flow of air between said wind-chest and the pneumatic power device aforesaid, said valve mechanism being itself controlled by the keys aforesaid; (*f*) a reservoir of air, for supplying the necessary wind to the wind-chest and pneumatic motor device aforesaid and suitably connected therewith; and (*g*) means for maintaining the requisite pressure in said reservoir.

36. In combination in a typewriting machine having a main frame (*a*) a plurality of type bars striking to a common printing center; (*b*) a pneumatic power device common to a plurality of said type bars for operating said type bars, each as required; (*c*) keys at the keyboard and means operated by said keys whereby the different type bars to which the motor device aforesaid is common are connected with said motor device, each type bar as required; (*d*) a wind-chest, attached to the main frame of said typewriting machine; (*e*) valve mechanism controlling the flow of air between said wind-chest and the pneumatic power device aforesaid, said valve mechanism being itself controlled by the keys aforesaid; (*f*) a reservoir of air, for supplying the necessary wind to the wind-chest and pneumatic motor device aforesaid and suitably connected therewith; (*g*) means for maintaining the requisite pressure in said reservoir; and (*h*) a member located within a convenient distance of the keyboard, so that it can be operated by the operator while seated at the machine, to charge the air reservoir aforesaid.

37. In combination in a typewriting machine having a main frame (*a*) a plurality of type bars striking to a common printing center; (*b*) a pneumatic power device common to a plurality of said type bars for operating said type bars, each as required; (*c*) keys at the keyboard and means operated by said keys whereby the different type bars to which the motor device aforesaid is common are connected with said motor device, each type bar as required; (*d*) a wind-chest, attached to the main frame of said typewriting machine; (*e*) valve mechanism controlling the flow of air between said wind-chest and the pneumatic power device aforesaid, said valve mechanism being itself controlled by the keys aforesaid; (*f*) an air reservoir, attached to the table or cabinet on which the typewriting machine stands, said reservoir being connected pneumatically with the wind-chest aforesaid; and (*g*) means for charging said reservoir including a member located within convenient distance of the keyboard, so that it can be operated by the operator while seated at the machine, to charge the air reservoir aforesaid.

38. In combination, in a typewriting machine having a main frame, (*a*) a plurality of type bars striking to a common printing center; (*b*) a pneumatic motor device, common to a plurality of said type bars for operating said type bars, each as required; (*c*) keys at the keyboard and means operated by said keys whereby each key when depressed acts to bring the corresponding type bar into operative relation to the pneumatic motor device aforesaid, so that it receives movement therefrom; (*d*) a wind-chest attached to said main frame; (*e*) an air reservoir attached to the table or cabinet on which the typewriting machine stands; (*f*) valve mechanism controlling the flow of air between said reservoir and the pneumatic power device aforesaid, said valve mechanism being itself controlled by the keys aforesaid; and (*g*) means for charging the reservoir aforesaid, including a member located within convenient distance of the keyboard, so that it can be operated by the operator while seated at the machine, to charge the reservoir aforesaid.

39. In combination, in a typewriting machine having a main frame, (*a*) a plurality of type bars striking to a common printing center; (*b*) a pneumatic motor device common to a plurality of said type bars for operating said type bars, each as required; (*c*) keys at the keyboard and means operated by said keys whereby each key when depressed acts to bring the corresponding type bar into operative relation to the pneumatic motor device aforesaid to receive movement therefrom; (*d*) a wind-chest on the main frame of the typewriting machine aforesaid and (*e*) a valve controlling the passage of air between said wind-chest and the pneumatic power device aforesaid, said valve being operated by one or more of the keys aforesaid when the same are depressed.

40. In combination in a typewriting machine having a main frame, (*a*) a plurality of type bars striking to a common printing center; (*b*) a pneumatic motor device common to a plurality of said type bars for operating said type bars, each as required; (*c*) keys at the keyboard and means operated by said keys whereby each key when depressed acts

to bring the corresponding type bar into operative relation to the pneumatic motor device aforesaid to receive movement therefrom; (*d*) a wind-chest on the main frame of the typewriting machine aforesaid; (*e*) a valve controlling the passage of air between said wind-chest and the pneumatic power device aforesaid, said valve being operated by one or more of the keys aforesaid when the same are depressed; and (*f*) releasing means whereby the valve aforesaid is permitted to return to its normal position in advance of the release of the key, thereby to permit the pneumatic power device and the type bar to return to their normal positions in advance of the release of the key, whereby another key may be depressed to print while the key first depressed is still held down.

41. In combination in a typewriting machine having a main frame, (*a*) a plurality of type bars striking to a common printing center; (*b*) a pneumatic motor device common to a plurality of said type bars for operating said type bars, each as required; (*c*) keys at the keyboard and means operated by said keys whereby each key when depressed acts to bring the corresponding type bar into operative relation to the pneumatic motor device aforesaid to receive movement therefrom; (*d*) a reservoir of air; (*e*) a valve controlling the passage of air between the said reservoir and the pneumatic power device aforesaid, said valve being operated by one or more of the keys aforesaid, when the same are depressed.

42. In combination, in a typewriting machine having a main frame, (*a*) a plurality of type bars striking to a common printing center; (*b*) a pneumatic motor device common to a plurality of said type bars for operating said type bars, each as required; (*c*) keys at the keyboard and means operated by said keys whereby each key when depressed acts to bring the corresponding type bar into operative relation to the pneumatic motor device aforesaid to receive movement therefrom; (*d*) a reservoir of air; (*e*) a valve controlling the passage of air between the said reservoir and the pneumatic power device aforesaid, said valve being operated by one or more of the keys aforesaid, when the same are depressed; and (*f*) releasing means whereby the valve aforesaid is permitted to return to its normal position in advance of the release of the key depressed, thereby permitting the pneumatic motor device and the type bar to return to their normal positions in advance of the release of the key, whereby another key may be depressed to print while the key first depressed is still held down.

43. In combination, in a typewriting machine having a main frame, (*a*) a plurality of type bars striking to a common printing center; (*b*) a pneumatic motor device common to a plurality of said type bars for operating said type bars, each as required; (*c*) keys at the keyboard and means operated by said keys whereby each key when depressed acts to bring the corresponding type bar into operative relation to the pneumatic motor device aforesaid to receive movement therefrom; (*d*) a reservoir of air and means for maintaining the requisite pressure therein; and (*e*) a valve controlling the passage of air between said reservoir and the pneumatic power device aforesaid, such valve being operated by one or more of the keys aforesaid when the same are depressed.

44. In combination, in a typewriting machine having a main frame, (*a*) a plurality of type bars striking to a common printing center; (*b*) a pneumatic motor device common to a plurality of said type bars for operating said type bars, each as required; (*c*) keys at the keyboard and means operated by said keys whereby each key when depressed acts to bring the corresponding type bar into operative relation to the pneumatic motor device aforesaid to receive movement therefrom; (*d*) a reservoir of air attached to the table or cabinet on which the typewriting machine rests; and (*e*) a valve controlling the passage of air between said reservoir and the pneumatic power device aforesaid; said valve being operated by one or more of the keys aforesaid when the same are depressed.

45. In combination, in a typewriting machine having a main frame, (*a*) a plurality of type bars striking to a common printing center; (*b*) a pneumatic motor device common to a plurality of said type bars for operating said type bars, each as required; (*c*) keys at the keyboard and means operated by said keys whereby each key when depressed acts to bring the corresponding type bar into operative relation to the pneumatic motor device aforesaid to receive movement therefrom; (*d*) a reservoir of air attached to the table or cabinet on which the typewriting machine rests; (*e*) a valve controlling the passage of air between said reservoir and the pneumatic power device aforesaid; said valve being operated by one or more of the keys aforesaid when the same are depressed; and (*f*) releasing means, whereby the valve aforesaid is permitted to return to its normal position in advance of the release of the key, thereby to permit the pneumatic motor device and the type bar to return to their normal positions in advance of the release of the key, so that another key may be depressed to print while the key first depressed is still held down.

46. In combination, in a typewriting machine having a main frame, (*a*) a plurality of type bars striking to a common printing center; (*b*) a pneumatic motor device common to a plurality of said type bars for operating said type bars, each as required; (*c*) keys at the keyboard and means operated by said keys

whereby each key when depressed acts to bring the corresponding type bar into operative relation to the pneumatic motor device aforesaid to receive movement therefrom; (*d*) a reservoir of air; (*e*) a valve controlling the passage of air between the said reservoir and the pneumatic power device aforesaid, said valve being operated by one or more of the keys aforesaid, when the same are depressed; and (*f*) means for charging said reservoir with air, including a member located within convenient distance of the keyboard, so that it can be operated by the operator while he is seated at the machine, to charge said reservoir.

47. In combination in a typewriting machine having a main frame, (*a*) a plurality of type bars striking to a common printing center; (*b*) a pneumatic motor device common to a plurality of said type bars for operating said type bars, each as required; (*c*) keys at the keyboard and means operated by said keys whereby each key when depressed acts to bring the corresponding type bar into operative relation to the pneumatic motor device aforesaid to receive movement therefrom; (*d*) a reservoir of air attached to the table or cabinet on which the typewriting machine rests; (*e*) a valve controlling the passage of air between said reservoir and the pneumatic power device aforesaid; said valve being operated by one or more of the keys aforesaid when the same are depressed; and (*f*) means for charging said reservoir with air, including a member located within convenient distance of the keyboard, so that it can be operated by the operator while he is seated at the machine, to charge said reservoir.

In testimony whereof I have hereunto set my hand at Washington, in the District of Columbia, this twenty-eighth day of February, A. D. 1901, in the presence of the subscribing witnesses, whose names are hereto affixed.

THADDEUS CAHILL.

Witnesses:
H. L. BISSELLE,
D. W. SMITH.