(No Model.) 2 Sheets—Sheet 1.

C. H. BOYNTON.

TYPE WRITING MACHINE.

No. 522,285. Patented July 3, 1894.

Fig. 1.

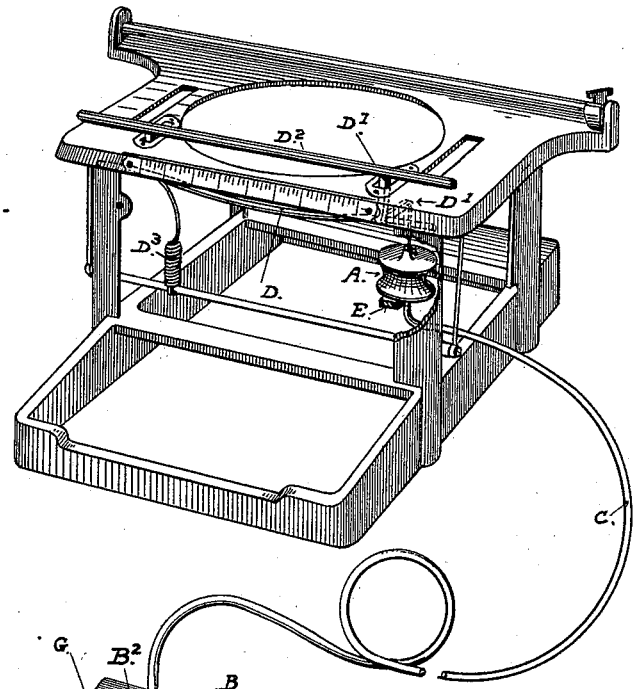


Fig. 3ª

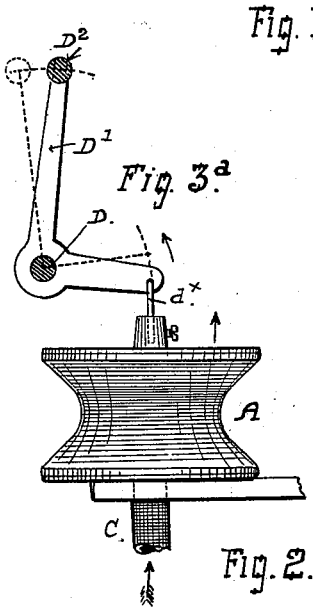


Fig. 2.

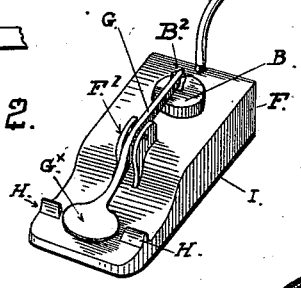


Fig. 3.

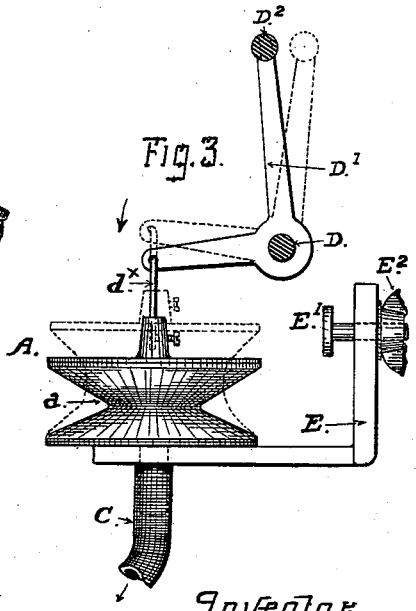
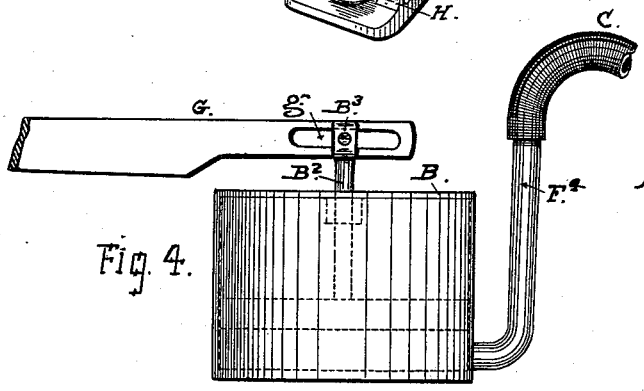


Fig. 4.



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(No Model.) 2 Sheets—Sheet 2.

C. H. BOYNTON.

TYPE WRITING MACHINE.

No. 522,285. Patented July 3, 1894.

Fig. 5.

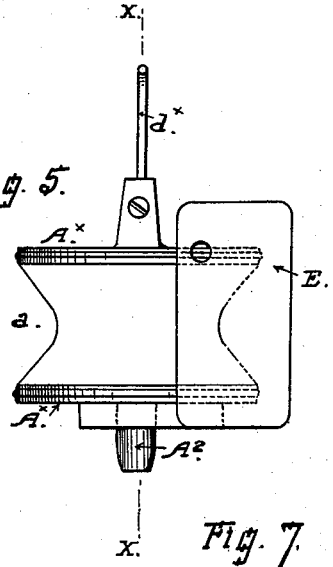


Fig. 6.

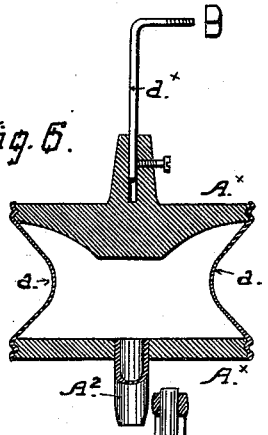


Fig. 7.

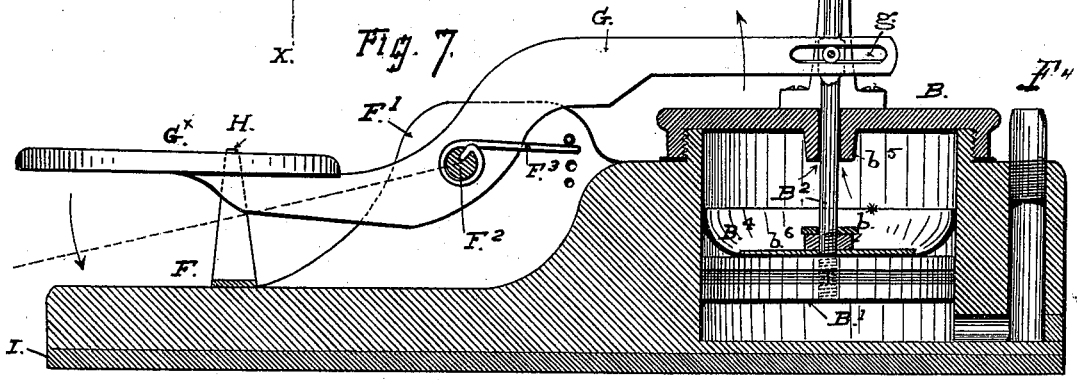
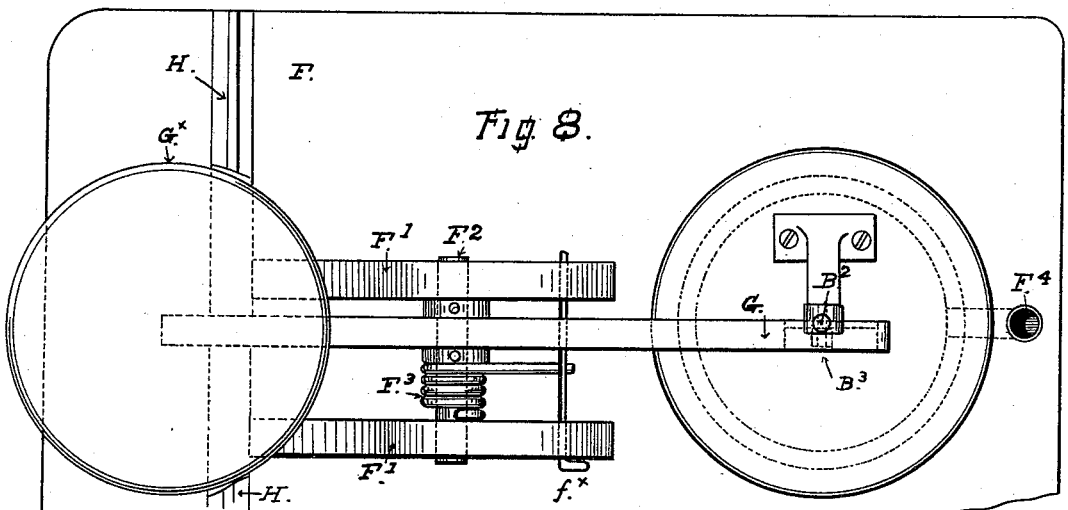


Fig. 8.



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UNITED STATES PATENT OFFICE.

CHARLES H. BOYNTON, OF OAKLAND, CALIFORNIA.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 522,285, dated July 3, 1894.

Application filed May 15, 1893. Serial No. 474,339. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. BOYNTON, a citizen of the United States, residing in the city of Oakland, county of Alameda, and State of California, have invented certain new and useful Improvements in Cylinder-Shifting Attachments for Type-Writing Machines, of which the following is a specification.

This invention relates to cylinder-shifting attachments for type-writing machines of that class or description in which the paper-carrying cylinder of the machine is shifted to change the writing from capitals to lower case letters. The purpose of such attachments is to effect or control these shifting movements of the cylinder without using the hands, so that the operator may have both hands free at all times to work the type-keys.

My present invention consists in an improved attachment comprising a pneumatic cylinder having the quality or property of expanding and collapsing under variations of pressure, a cylinder or chamber fitted with a piston to which is connected a pedal or lever for working the piston by the foot and an air-tight flexible tube of indefinite length connecting this cylinder with the pneumatic cylinder by means of which parts movements of the last-named cylinder are produced either by pressure or by suction of air through the action of the foot-actuated piston, and by suitable connections between such cylinder and the shifter-bar of the machine the movements of the cylinder are caused to shift the paper-carrying cylinder of the machine and to hold it in position for the required length of time.

The following description explains in detail the nature of these improvements and the manner in which the same is to be constructed and applied to a type-writing machine for shifting the paper-carrying cylinder by the foot of the operator.

The accompanying drawings represent the manner in which I have constructed and successfully applied my said improvements to a Remington type-writing machine, and they show a form and arrangement of the parts of my attachment in which the pneumatic cylinder is actuated by suction or by withdrawing the air from within it to a sufficient degree each time to effect the required movements by the atmospheric pressure outside. This form I have found to be the simplest and best for general use, but while here describing and illustrating such particular form and application of my attachment I do not wish to be understood as confining myself to the employment of suction alone to operate the pneumatic cylinder, because the required movements can be obtained by producing pneumatic pressure instead of a vacuum within the cylinder without materially changing the mechanical structure of the parts, as I will proceed to explain more fully hereinafter.

In the said drawings which form part of this specification:—Figure 1 represents in perspective the frame of a Remington type-writing machine and the shifter-bar and its rock-shaft with the pneumatic cylinder of my attachment in position. Fig. 2 is a perspective view of that part of my attachment which is situated on the floor beneath the table or support of the machine. The connecting tube between these two parts is also shown in these two figures. Fig. 3 is a side view on an enlarged scale of the pneumatic cylinder, the rock-shaft of the machine and connections. Fig. 3ª is a similar view showing the manner of connecting this cylinder when it is to work by pressure instead of by suction of air from within it. Fig. 4 is a similar view of the cylinder and foot-actuated piston showing a portion of the foot-lever and connecting tube. Fig. 5 is a view of the pneumatic cylinder as seen from the front of the machine. Fig. 6 is a vertical section through the same taken at about the line *x x* Fig. 5. Fig. 7 is a view in longitudinal section of that part of the attachment which is situated on the floor to operate the pneumatic cylinder, and Fig. 8 is a top view of the same part.

The part A, which I have termed, for the sake of precision, "the pneumatic cylinder," is best constructed with two solid heads $A^{\times}$ $A^{\times}$ (Figs. 5 and 6) and a body of rubber or some other suitably elastic or flexible material that will allow it to collapse or to expand to a degree sufficient to move the top head up or down. The opposite head, or bottom, is screwed to a bracket or piece E that is secured to some suitable part of the machine-frame to fix the cylinder in position.

A^2 is a nipple extending from an aperture in the bottom of the cylinder to take one end of a flexible tube C, and $d^\times$ is a rod fixed at one end in the top head and suitably formed at the other end for attaching to a bell crank D′ on the machine rock-shaft D.

D^2 is the shifter-bar of the paper-carrying cylinder, and D^3 is the coil-spring that is attached to the rock-shaft in these machines to throw the shifter-bar back to its normal position when the finger is taken off the shifter-key. As this spring is usually connected to the left-hand bell-crank of the rock-shaft I connect the cylinder A to the right-hand bell-crank.

The bracket E is provided with a clamping-screw E′ and a thumb-nut E^2 on the front plate for attaching the cylinder A to the frame of the machine. The cylinder is mounted on the horizontal foot of the bracket and the clamping-screw is arranged either to grip the flange of the front post of the frame between the head of the screw and the front-plate of the bracket, or to be inserted through a hole in the flange where the same is provided or can be made for that purpose in the frame.

B is a cylinder or chamber with closed ends either formed in or mounted upon a metal block F, and B′ is a piston fitted to work smoothly within it, suitable packing being used to make the piston air-tight.

In the present construction I fix on the top side of the piston a flexible cup-shape washer B^4 fitting closely against the sides of the cylinder, and also use suitable packing on the rim of the piston for the purpose of making that part of the cylinder beneath the piston as nearly air-tight as possible, and for the purpose as well of dispensing with a stuffing-box or packing around the piston-rod opening in the top head $B^\times$. This head has a long bearing b^5 for the piston-rod B^2 which is placed on the inside of the head for the double purpose of allowing the lever G to work close to the top of the head and of forming a stop for the piston in its upward stroke to prevent the cup-shape washer from being jammed against the top. An elastic washer b^6 is placed on the top of the nut $b^\times$ on the piston-rod both to cushion against the end of the bearing b^5 and also to prevent the entrance of air around the piston-rod when the piston is raised and a vacuum is produced in the cylinder-space beneath it. The block F is cast with lugs F′ in which are bearings for the fulcrum pin F^2. The lever G is fixed on this pin and is furnished at one end with a foot-plate $G^\times$ and at the other end is provided a slot $g^\times$ to which is fitted a stud B^3 on the end of the piston-rod, as shown in Fig. 7. This stud should have a friction-roller to work in the slot.

F^3 is a coil-spring applied to the pin of the foot-lever to act in a direction contrary to the movement produced by the operator's foot. The free end of this spring sets against a movable rod $f^\times$ that extends between the lugs F′ under the lever and is adjustable in position in order to vary the tension of the spring; a number of holes being provided in the lugs for that purpose.

F^4 is a rigid tube connecting with the cylinder-space under the piston to receive the end of the flexible tubing C. In the construction shown in Fig. 7 this connection is a passage formed directly in the block, and fitted with a nipple F^4 to take the tubing.

In the construction of bed-block and cylinder shown in Figs. 7 and 8 the aim has been to attain simplicity and durability with low cost of manufacture, but I do not desire to be understood as confining my invention to such particular form of block and cylinder in one piece. In some cases it may be found more convenient with the facilities at hand to make the cylinder a separate structure as shown in Fig. 4 and then mount it upon a block and also to apply the foot-lever in a different manner to work the piston.

H is a foot-rest on the bed-block, on which the operator rests the foot when not working the pedal.

I is a rubber sole on the bottom of the block F to prevent the block from slipping too easily on the floor, as it is desirable that the block should retain its position without being permanently fixed to the floor.

From the modification shown in Fig. 3^a it will be seen that the attachment can be readily made to operate by pressure instead of by suction, as it is only necessary to connect the cylinder A to the opposite side of the rock-shaft and then so to arrange and connect the foot-lever to the piston of the cylinder B that the piston will be forced downward by the pressure of the foot on the pedal, in such case a sufficient body of air is confined in the cylinder-space under the piston and in the tubing to expand the cylinder A and produce the required length of movement in the part connected to the cylinder with a short movement or a light degree of pressure on the foot-lever. The construction first described is preferred by me, however, chiefly because it is believed to be more delicate in action or more quick in responding to the movement of the foot, and is less liable to get out of order.

It should be observed that the attachment is capable of being connected to other parts or mechanism of a machine to move or control them by the foot, such, for instance, as the spacing-bar, thus leaving the two hands of the operator at liberty to work the printing-keys; and such connection can be readily made by an intelligent mechanic without special direction.

When properly constructed this attachment is applied to a machine by connecting the pneumatic cylinder to that part of the machine where the movement of its top head will throw or move the paper-carrying cylinder, or other part to be controlled, without in-

terfering with other parts and mechanism of the machine, and the bed-block F is set upon the floor. By using a flexible tubing of indefinite length, as shown at C Figs. 1 and 2, this part of the attachment can be placed any where under the machine where it will be most convenient for the operator.

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

1. A pneumatic cylinder-shifting apparatus for type-writing machines, comprising a pressure-cylinder having a movable piston, a foot-lever attached to said piston to move it in one direction, and a spring applied to move it in the contrary direction, a pneumatic cylinder fixed on the frame of the machine having a head which is movable under variations in the pneumatic pressure produced in the cylinder, a rod connecting the said head with the shifter-bar, or part of the machine to be moved, and a flexible tube connecting said pneumatic cylinder on the machine with the pressure-producing cylinder, said parts being adapted for attachment to a type-writing machine, substantially as described for operation as set forth.

2. In a type-writing machine, the combination, with the shifter-bar of the paper-cylinder carriage, of a pneumatic cylinder adapted by expansion or by collapse to move the carriage, as described, a pressure cylinder having a movable piston and provided with a lever to move the piston and a connecting tube between the pneumatic cylinder and the pressure cylinder; whereby the movements of said piston by compressing or exhausting the air in the pneumatic cylinder are caused to move the paper-cylinder carriage on the frame, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

CHARLES H. BOYNTON. [L. S.]

Witnesses:

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EDWARD E. OSBORN.