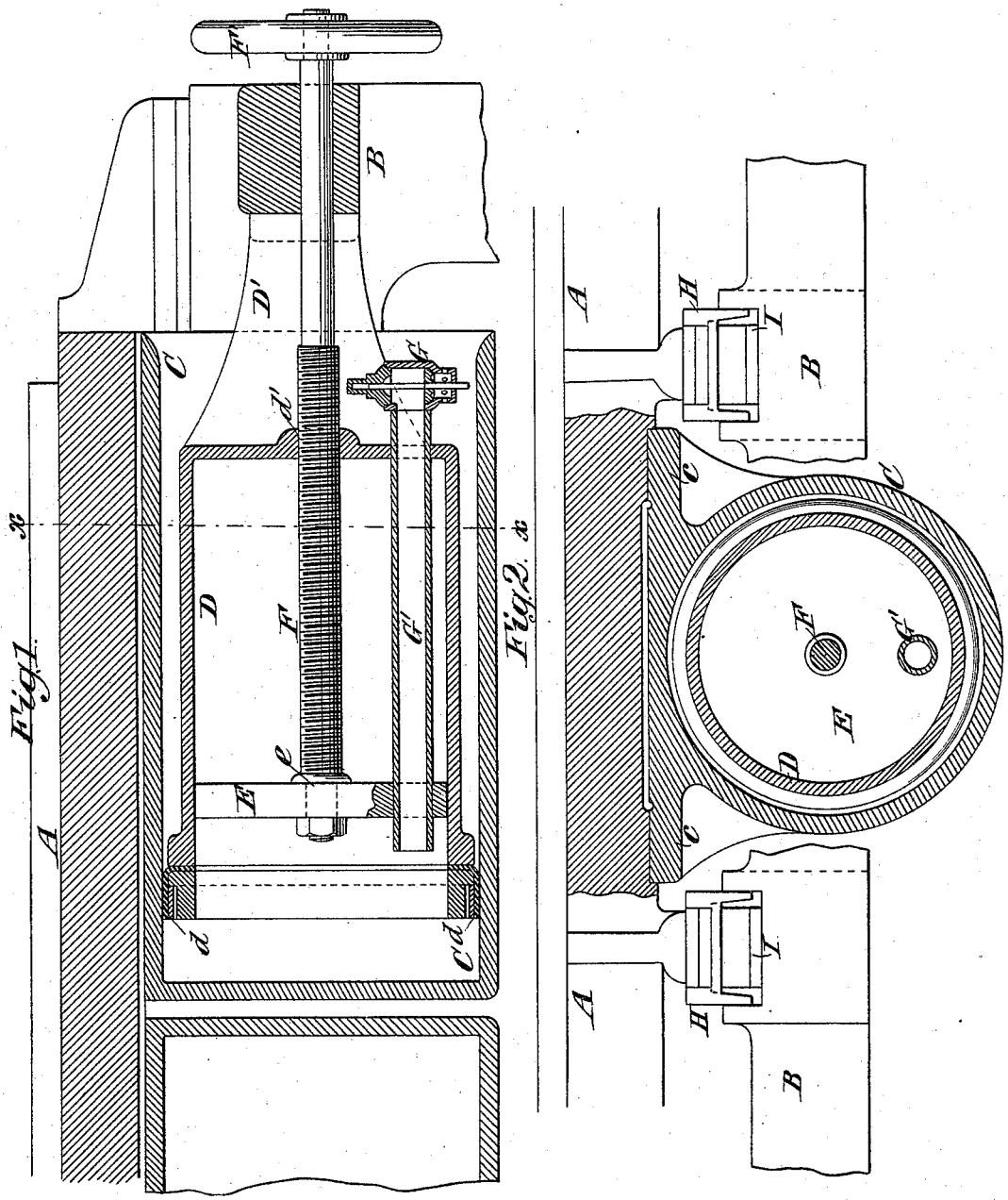
(No Model.)

C. P. COTTRELL.

AIR SPRING OR CUSHION FOR PRINTING MACHINES.

No. 383,630. Patented May 29, 1888.



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UNITED STATES PATENT OFFICE.

CHARLES P. COTTRELL, OF STONINGTON, CONNECTICUT, ASSIGNOR TO C. B. COTTRELL & SONS, OF SAME PLACE.

AIR SPRING OR CUSHION FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 383,630, dated May 29, 1888.

Application filed October 26, 1887. Serial No. 253,425. (No model.)

To all whom it may concern:

Be it known that I, CHARLES P. COTTRELL, of Stonington, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Air Springs or Cushions for Printing-Machines, of which the following is a specification.

In those printing presses or machines which comprise a rotary impression-cylinder and a reciprocating bed operated by means of a mangle motion or analogous gearing other than a crank and connection-rod, it is common to employ for arresting the bed at each end of its stroke an air spring or cushion comprising a cylinder and a plunger fitted thereto, the said parts being secured one to the bed and the other to the frame of the machine. The plunger or piston has very frequently consisted of a simple disk or head fitted upon a screw secured to the frame and the cylinder has been secured to the bed, and in such a construction the piston or head has been adjusted by turning the screw, so that with a given movement of the bed the air between the bottom of the cylinder and the piston or head will be subjected to any desired degree of pressure.

The object of my invention is to provide means whereby the quantity of air which is entrapped in the cylinder when it enters upon the plunger may be varied, so that the resistance opposed to the movement of the bed will be varied, not by varying the point at which the cylinder passes onto the plunger, but by varying the quantity of air entrapped in the cylinder by the entrance of the cylinder upon the plunger and the space wherein such air may be compressed.

The invention consists in the combination, with the bed and frame of a printing-machine, of an air-spring mechanism for stopping the bed at the end of its movement, consisting of a cylinder and a cup-shaped plunger having its open end presented toward the cylinder, one of said two parts being secured to the bed and the other to the frame, and a head fitting the interior of the cup-shaped plunger and movable lengthwise therein to vary the air-space between the cylinder and plunger. The plunger may be secured in fixed position to the frame, and the head which is fitted in the plunger may be adjusted by a screw which extends through the closed back of the plunger and is operated from the end of the machine, and a vacuum-pipe, which is provided with a vacuum-valve, may extend through the head and through the closed back end of the plunger.

In the accompanying drawings, Figure 1 is a vertical section of a portion of the bed and frame of a machine, together with the air-spring applied thereto and embodying my invention; and Fig. 2 is a transverse section upon the plane of the dotted line *x x*, Fig. 1, including also a portion of the bed-bearers and their tracks or ways.

Similar letters of reference designate corresponding parts in both figures.

A designates the bed, and B a portion of the frame.

C D are respectively the cylinder and plunger of my improved air-cushion, which are secured one to the bed and the other to the frame. In this example of the invention the cylinder C is secured to the bed A by means of flanges *c*, as shown in Fig. 2, and the plunger D is secured by a bracket, D′, to the frame B of the machine. The plunger D does not consist simply of a head or disk-like piston fitted to the cylinder, but is of cup shape, as shown in Fig. 1, having its open end presented toward the open end of the cylinder, and provided at its inner open end with a packing, *d*, of any suitable form to tightly fit the cylinder.

The novelty of my invention consists, essentially, in fitting a head, E, within the cup-shaped plunger, which is bored out to form a snug fit between the head and the interior of this plunger, and by a screw, F, I provide for shifting this head lengthwise of the plunger, so as to vary the capacity of the plunger between its open end and the head E. As here represented, the screw F, which is provided with a hand-wheel, F′, for turning it, presented at the end of the machine, is threaded in the closed back end of the plunger D at *d′*, as in a nut, and is connected with the head E at *e*, so that it may be turned in the head; and it will therefore be seen that by operating the screw in one or other direction the head E will be shifted in one or other direction lengthwise of the plunger D, and by such shifting the amount of air which will be entrapped between the plunger and cylinder at the time the cylinder

strikes the plunger in moving toward the right of the drawings will be increased or diminished, as may be desired. When the head E is shifted toward the right hand of the drawings, so as to increase the space between the open end of the plunger D and the head E, a larger volume of air will be entrapped between the cylinder and plunger when the cylinder first strikes the plunger, and a greater space will be afforded in which to compress the air, and a given movement of the cylinder upon the plunger will meet a less resistance than it would if the head E were shifted toward the open end of the plunger and a correspondingly less volume of air trapped in the cylinder C and a less space afforded wherein to compress the air.

In air-springs, as heretofore constructed, where the plunger consists simply of a head or disk-like piston upon a screw, the volume of air entrapped in the cylinder is always the same at the moment it enters upon the plunger, and the resistance opposed by such an air-spring has been varied by shifting the plunger backward or forward, so that the cylinder will strike it earlier or later in the movement of the bed.

I have represented the usual vacuum-valve, G, which in my invention is attached to the pipe G′, extending through the closed back end of the plunger D and through the head E. This pipe may be fast in the closed end of the plunger, and the head E may slide upon it as it is moved lengthwise of the plunger by the screw F.

H designates portions of the usual bearers or shoes which are upon the bed A, and I designates cross portions of the framing, which form the tracks or ways for these bearers or shoes.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the bed and frame of a printing-machine, of an air-spring mechanism for stopping the bed at the end of its movement, consisting of a cylinder and a cup-shaped plunger having its open end presented toward the cylinder, one of said two parts being secured to the bed and the other to the frame, and a head fitting the interior of the cup-shaped plunger and movable lengthwise therein to vary the air-space between the cylinder and plunger, substantially as herein described.

2. The combination, with the frame B and bed A, of the cylinder C on the bed, the cup-shaped plunger D on the frame, the head E, fitting the interior of the plunger, the screw F, for shifting the head lengthwise of the plunger, and the vacuum-pipe G′, and valve extending through the head and back of the plunger, substantially as herein described.

CHAS. P. COTTRELL.

Witnesses:
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