(No Model.)

W. SCOTT.

Cushioning Device for Printing Presses.

No. 239,402. **Patented March 29, 1881.**

Fig. 1

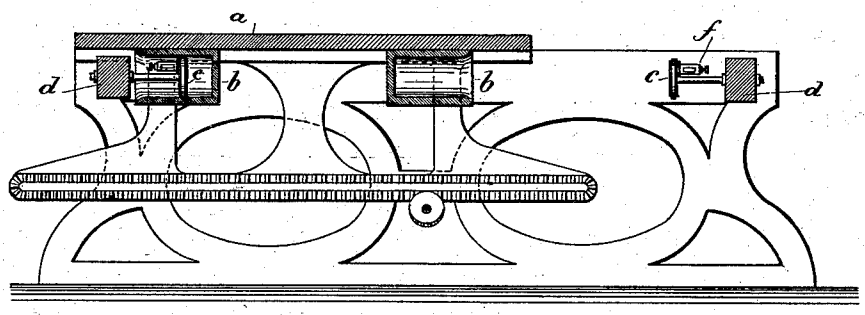


Fig. 2.

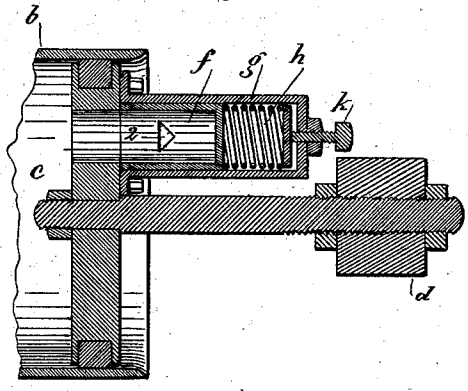


Fig. 4.

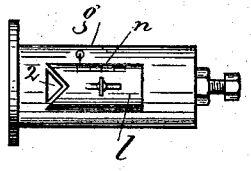
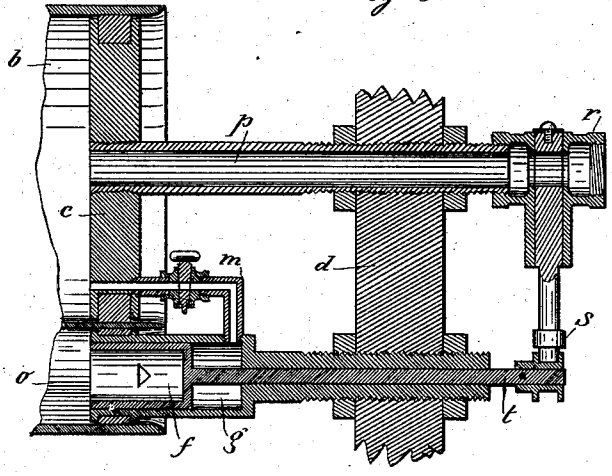


Fig. 3.



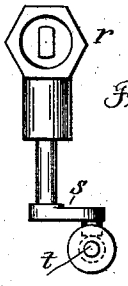


Fig. 5.

Witnesses

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WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

CUSHIONING DEVICE FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 239,402, dated March 29, 1881.

Application filed January 8, 1881. (No model.)

To all whom it may concern:

Be it known that I, WALTER SCOTT, of Plainfield, in the county of Union and State of New Jersey, have invented an Improvement in Cushioning Devices for Printing-Press Beds, of which the following is a specification.

In some printing-presses the bed is reciprocated and carries the form beneath the impression-cylinder. The momentum of the bed has been arrested at each end by a cylinder on the bed passing upon a plunger or piston that is sustained upon the frame, and the confined air acts as a cushion. There has been an escape-pipe from the piston provided with a cock or valve to confine more or less air, according to the speed with which the press is running, and this cock or valve has been regulated by a governor, the object being to close the cock sooner and confine a greater amount of air in the cushioning-cylinder when the press is running fast than when it is running slow, for when moving fast there is greater momentum to be overcome than when the press is running slowly.

My present invention relates to the combination, with the cushioning-cylinder and plunger or piston, of an automatic valve that closes more quickly when the press is running fast than when it is running slowly, and hence the amount of air confined will be in proportion to the momentum of the bed and form, that have to be stopped by the cushioning action of the confined air. By this improvement the governor or other means for closing the air-escape with greater or less rapidity, according to the speed, are dispensed with, and the cushioning device is made automatic.

In the drawings, Figure 1 is a vertical section of the reciprocating bed and the cushioning devices. Fig. 2 is a section, in larger size, of one of the pistons. Fig. 3 is a similar view of the cushioning device in a slightly-modified form. Fig. 4 is an external view of the slide or cover.

The bed *a* is to be reciprocated in any usual manner, and near each end are the cushioning-cylinders *b b*, and *c c* are the pistons or plungers, supported upon the frames *d d* of the printing-press. These parts are to be of any well-known or desired character or proportion. Upon either the cylinder-head or upon the piston or plunger I provide an automatic valve, *f*, sliding within a cylinder, *g*, and resisted by a suitable spring, *h*. In Fig. 2 I have shown the spring *h* as of metal, within the cylinder *g*, and *k* is a screw and follower to adjust the pressure of the spring. There is an opening, 2, through both the valve *f* and the cylinder *g*. This opening is, by preference, triangular, as shown. The parts are so made and adjusted that when the press is moved very slowly the air will pass out of the cylinder *b* through the opening 2, and will not accumulate sufficiently to move the valve *f* endwise against the action of the spring *h;* but if the speed is greater there is not time enough for the air to escape from the cylinder *b*, and the pressure increases and moves the valve endwise, closing the opening 2 more or less, and the faster the motion of the bed the sooner the air will be shut into the cylinder *b*, and the greater will be the cushioning action to overcome the momentum of the press at the end of the stroke, and by the expansion of the air to aid in starting the bed in the opposite direction. In consequence of this construction the press will run very uniformly without any governor, and when the press is turned slowly by hand in adjusting the parts of the printing-machine there will be little or no cushioning action.

In Fig. 4 the automatic valve is shown as provided with an adjustable cover, *l*, to the hole 2 through the cylinder, so that the size of that hole may be reduced by adjusting said cover more or less over the hole. If the hole is small the pressure will accumulate within the cylinder *b* more rapidly than when the hole is the full size; hence the valve will be moved more quickly and the cushioning action increased. By regulating the position of this cover *l* and adjusting the strength of the resisting spring the action of this automatic cushioning device can be regulated with accuracy. An index should be provided, as at *n*, to denote the position to which the cover *l* should be moved when using a form of a given weight, as it is to be understood that the opening for the escaping air will require to be contracted when heavy forms are used, and the reverse.

In the place of a metal spring to resist the end motion of the automatic valve, any other

suitable device, such as a weight or lever, may be used; or the air may form a spring, if admitted from the cylinder *b* into the confined space within the cylinder *g* at the end of the valve *f*, as seen at *m*, the amount being regulated by a cock.

In Fig. 3 I have shown the automatic valve as acted upon by pressure of the air in a second cylinder, *o*, and its action would be the same as before described if the air in the main cylinder was provided with an escape through this valve *f*; but under some circumstances it may be most convenient to provide a tubular rod, *p*, for the piston *c*, and introduce a cock or valve, *r*, at the end thereof, and to use the end motion of the automatic valve to open and close such cock. This is shown as effected by means of a crank or arm *s*, (see Fig. 5,) upon the rod of the valve that is moved by the rod *t* of the automatic valve *f*, the parts being adjusted so as to close the valve *r* at the proper time, in proportion to the speed of the press, and thereby confine more or less air to form the cushioning device.

My improvement is available with cushioning apparatus where the plungers are upon the reciprocating bed and the cylinders on the frame, and also where both cylinder and plunger are upon the frame, and the bed comes into contact with either the cylinder or the plunger, or presses thereupon by an intermediate connecting device.

I am aware that a valve opening inwardly has been used with the cushioning device of a printing-press to admit air into the cylinder and prevent any suction action as the cylinder is drawn off the piston.

I claim as my invention—

1. In combination with the printing-press bed and the cushioning cylinders and pistons, an automatic valve that is acted upon by the accumulation of air-pressure, and closes the outlet and confines the atmosphere in proportion to the speed of movement and the cushioning action required, substantially as set forth.

2. In combination with the printing-press bed and its cushioning cylinder and piston, the automatic sliding valve *f*, having an opening, 2, and the adjustable spring *h*, acting upon the said valve, substantially as set forth.

3. The combination, with the reciprocating printing-press bed and its cushioning cylinder and piston, of an automatic valve that closes the air-outlet with greater or less rapidity, in proportion to the speed of movement, and an adjustable device for closing the air-opening more or less, substantially as set forth.

4. The combination, with the cylinder and plunger forming the cushioning device in a printing-press, of an automatic valve and a movable cover that regulates the opening for the escape of air, substantially as set forth.

5. In combination with the printing-press bed and the cushioning cylinders and pistons, an automatic valve that is acted upon by the accumulation of air-pressure, and closes the air-outlet with more or less rapidity in proportion to the speed of movement, and a movable cover that regulates the opening for the escape of air, substantially as set forth.

Signed by me this 30th day of December, A. D. 1880.

WALTER SCOTT.

Witnesses:
D. T. LYONS,
GEORGE R. W. KITTSON.