(No Model.)

C. B. COTTRELL.

MEANS FOR ADJUSTING THE AIR SPRING PLUNGERS OF PRINTING MACHINES.

No. 355,865. Patented Jan. 11, 1887.

Fig. 1.

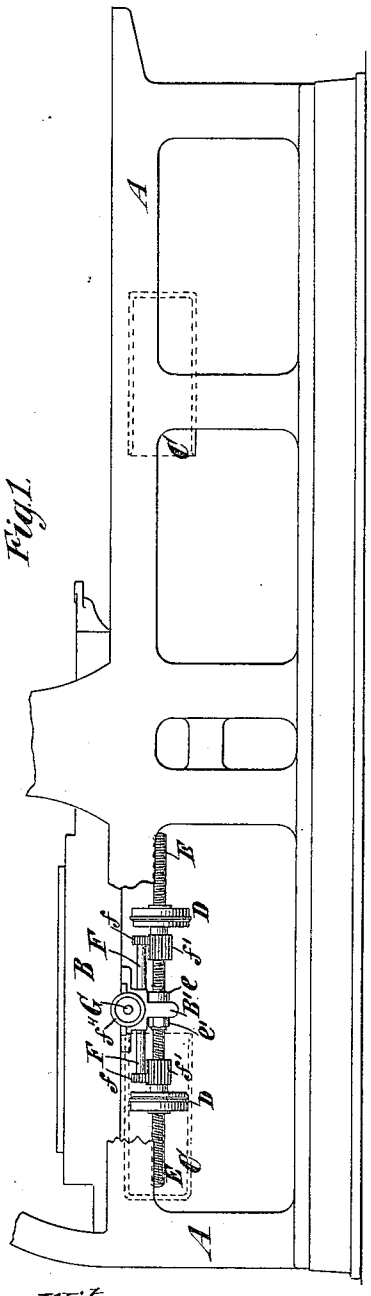


Fig. 2.

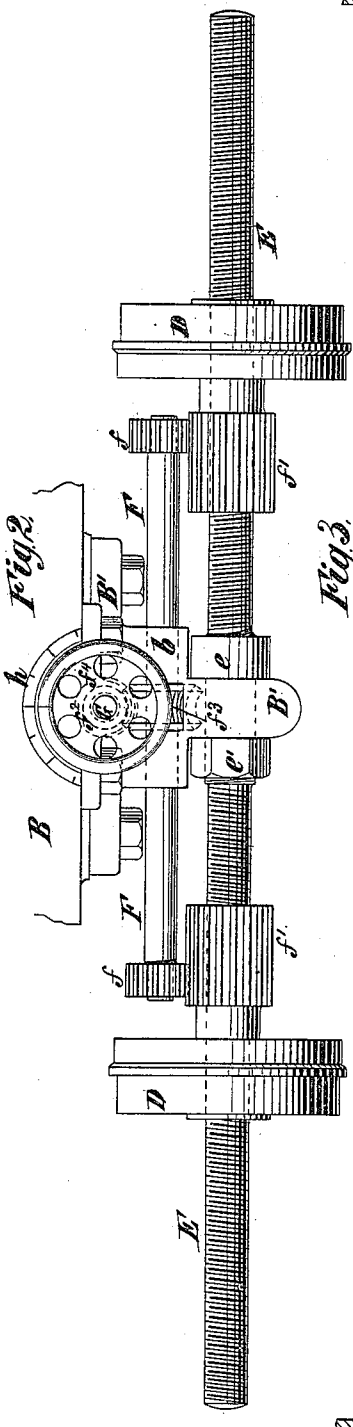
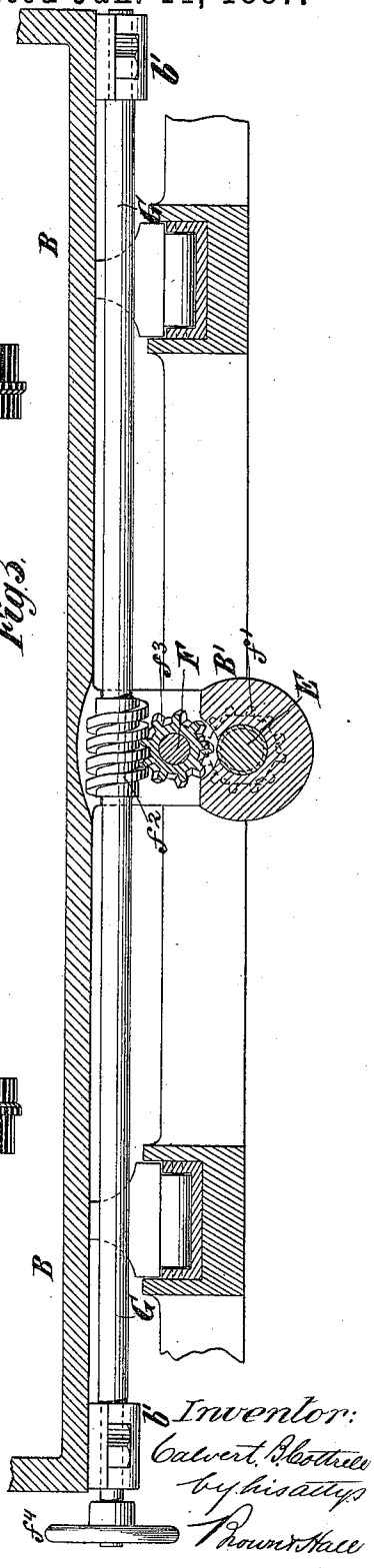


Fig. 3.



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UNITED STATES PATENT OFFICE.

CALVERT B. COTTRELL, OF STONINGTON, CONNECTICUT.

MEANS FOR ADJUSTING THE AIR-SPRING PLUNGERS OF PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 355,865, dated January 11, 1887.

Application filed May 6, 1886. Serial No. 201,274. (No model.)

To all whom it may concern:

Be it known that I, CALVERT B. COTTRELL, of Stonington, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Means for Adjusting the Air-Spring Plungers of Printing-Machines, of which the following is a specification.

In printing presses or machines having a reciprocating bed air-spring cylinders and plungers have been employed in order to cushion and gradually check the movement of the bed by means of the compressed air within the cylinders at the ends of the reciprocating movements of the bed, and such devices are shown and described in my Letters Patent No. 120,041, dated October 17, 1871. In some cases the plungers have been secured to the frame of the press at opposite ends of the travel of the bed and the cylinders have been carried by the reciprocating bed, while in other cases the cylinders have been secured to the frame and the plungers have been carried by the bed. These plungers have been made adjustable upon screw-threaded rods or supports, so as to vary their position relatively to the bed and cause them to enter the cylinders at the proper time to secure the desired result.

The object of my invention is to provide a simple and convenient means whereby the two plungers may be simultaneously and equally adjusted upon their supports, so as to cause them to act in a perfectly uniform manner at each end of the movement of the bed.

To this end my invention consists, essentially, in the combination, with a reciprocating bed of a printing-machine and oppositely-arranged air-spring cylinders and plungers for arresting its movement in either direction, of screw-threaded supports on which the plungers fit as nuts and gearing, whereby the two plungers may be turned simultaneously to adjust them lengthwise of their supports. The gearing for adjusting the two plungers will preferably be of such nature that it will not only serve to turn them simultaneously, but will lock them against turning accidentally after they have once been set to proper position. Where the plungers are carried by the bed, the two supports for the plungers may be formed by a single rod secured to the bed at about the middle of its length, and having its opposite end portions provided one with a right-hand and the other with a left-hand screw-thread.

The gearing for operating the two plungers simultaneously may advantageously consist of a shaft extending parallel with the screw-threaded rod which supports the plungers, provided at the ends with spur-pinions which engage with corresponding pinions formed upon or attached to the plungers, and a transverse shaft secured in bearings on the bed and provided with a worm engaging with a worm-wheel on the pinion-shaft.

The above-described features of construction are also included in my invention.

In the accompanying drawings, Figure 1 is a side elevation of portions of a press which embodies my invention and in which the two plungers are adjustable upon a screw-threaded rod secured to and movable with the bed. Fig. 2 is a side elevation, upon a larger scale, of a portion of the bed, together with the plungers and the devices which support them and by which they may be simultaneously adjusted; and Fig. 3 is a sectional view of the bed and gearing for adjusting the plungers, upon the same scale as Fig. 2 and in a plane transverse to the line of movement of the bed.

Similar letters of reference designate corresponding parts in the several figures.

A designates portions of the frame of the press, and B the bed, which is arranged to reciprocate thereon, and which may be operated by any form of mechanism ordinarily employed for the purpose. Such mechanism I have not shown, as it forms no part of my invention.

C designates oppositely-arranged air-spring cylinders, which are secured to the frame at opposite ends of the travel of the bed and which are shown by dotted lines.

D D designate two plungers, which are provided with packing of any suitable character and which fit snugly in the cylinders C. These plungers fit as nuts upon screw-threaded supports which are formed by a single rod, E, secured at about the middle of its length in a bracket or bearing, B′, at the lower side of the bed. As best shown in Fig. 2, the rod E has at one side of the bracket or bearing B′ a fixed collar, *e*, and at the other side thereof a nut, *e′*, and by this means the rod E is secured rig-

idly to the bed exactly in line with the cylinders C. The opposite end portions of the rod E are provided with screw-threads of reversed pitch, the thread of one end portion (the right-hand) being a right-hand thread, and the thread on the other portion (left-hand) being a left-hand thread. Consequently the plungers D, which fit as nuts on the rod E, may, by turning them in one or other direction, be moved toward or from each other. According to my invention this turning of the two plungers and their lengthwise adjustment on the rod E, which is thereby secured, is performed simultaneously by means of gearing, which not only serves to turn the plungers, but also preferably locks them against accidental turning after they are once set in proper position.

In lithographic presses it is particularly necessary to adjust the plungers in order to suit the weight of the stone which is carried by the bed, and in all presses to which they are applied it is desirable to adjust the plungers to suit the speed at which the bed is driven. The gearing here represented for the purpose comprises a shaft, F, extending parallel with the rod E, and provided at its ends with pinions *f*, which engage corresponding spur-pinions, *f'*, formed upon or secured to the plungers D, and the shaft G, which is arranged transversely to the length of the bed and is provided with a worm or screw, f^2, which gears into a worm-wheel, f^3, on the pinion-shaft F.

The pinion-shaft F is journaled in a bearing, *b*, which forms a part of the bracket or hanger B', that supports the rod E, and the cross-shaft G is journaled in bearings *b'*, secured on the under side of the bed, as shown in Fig. 3, and may be turned by a hand-wheel, f^4, at one side of the bed. The worm or screw f^2 is of such pitch that it cannot be turned through the worm-wheel f^3, and hence, while this gearing affords a convenient means of adjusting the two plungers D simultaneously, it locks the plungers against any accidental turning after they are once set in proper position. For convenience, a scale, *h*, may be provided on the side of the bed B, as shown in Fig. 2, and the exact adjustment desired may be secured by an index or mark on the hand-wheel f^4 registering on this scale.

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

1. The combination, with the reciprocating bed of a printing-machine and oppositely-arranged air-spring cylinders and plungers for arresting its movement in either direction, of screw-threaded supports on which the plungers work as nuts, and gearing whereby the two plungers may be turned simultaneously to adjust them lengthwise of their supports, substantially as herein described.

2. The combination, with the reciprocating bed and the oppositely-arranged air-spring cylinders and plungers, of screw-threaded supports on which the plungers are fitted as nuts, and gearing whereby the two plungers may be turned simultaneously to adjust them lengthwise on their supports, and are locked against turning after such adjustment, substantially as herein described.

3. The combination, with the frame and oppositely-arranged air-spring cylinders secured thereto, and the reciprocating bed, of a rod secured between its ends to the bed, and having screw-threads of reverse pitch on its two end portions, plungers fitting as nuts on the rods, and gearing carried by the bed, whereby the plungers may be turned simultaneously and held against accidental turning, substantially as herein described.

4. The combination, with the frame and oppositely-arranged air-spring cylinders secured thereto, and the reciprocating bed, of the rod E, secured between its ends to the bed and having on its opposite end portions screw-threads of reverse pitch, plungers D, fitting as nuts on the rod and comprising pinions *f'*, the shaft F, and its pinions *f*, engaging the pinions on the plungers, and the cross-shaft journaled in bearings on the bed and connected by a worm, f^2, and worm-wheel f^3 with the pinion-shaft F, substantially as herein described.

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