Nov. 29, 1927. 1,650,818

H. C. BUFFINGTON ET AL

PRESS BOLSTER ADJUSTMENT

Filed Nov. 29, 1926

Fig. 1.

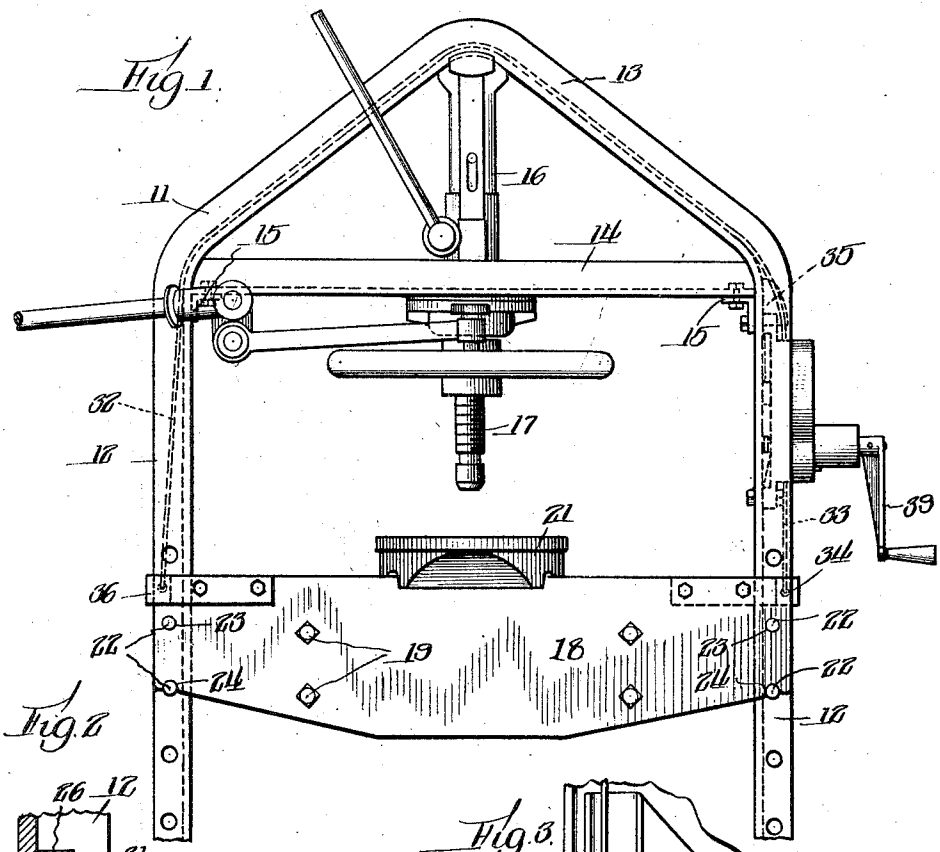


Fig. 2.

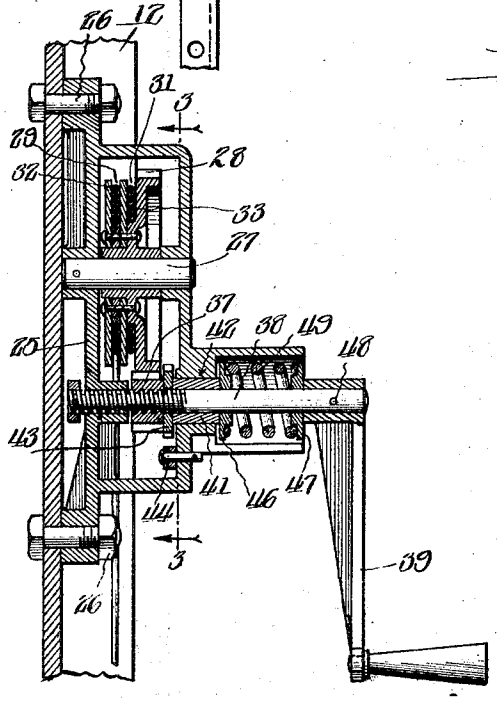
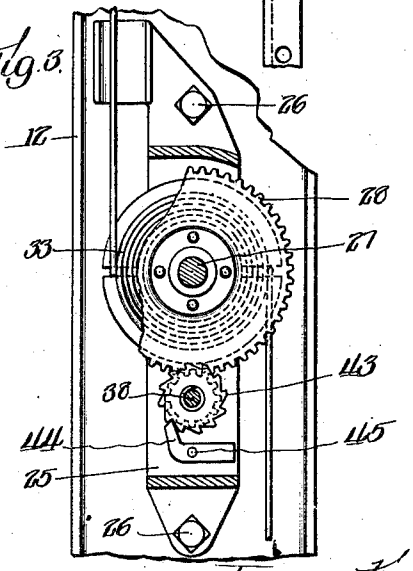


Fig. 3.



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UNITED STATES PATENT OFFICE.

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PRESS BOLSTER ADJUSTMENT.

Application filed November 29, 1926. Serial No. 151,489.

The present invention aims to provide improved and novel means for adjusting the bolsters or work-supporting members of presses, which change of position is more or less frequently required to accommodate different classes or types of work.

In operating presses, there is an element of danger in that the operator may forget or neglect to insert the bolster-supporting pins or other sustaining means after the adjustment of the bolster has been effected, and, when such a contingency occurs, and the load is imposed on the bolster by the descent of the ram, it will give away, unless it has been unduly expensively constructed, with likelihood of injury to the operator or others.

The present invention makes it possible to accomplish the required adjustment in such a manner, that, should the workman fail or omit to introduce the usual bolster-supporting pins, the downward working pressure of the ram against the work and bolster will cause the latter to descend without danger of falling or of breaking the supporting means, such as cables.

To permit those skilled in this art to understand the invention from its various aspects, in the accompanying drawing forming a part of this specification, a present desirable and preferred embodiment of the invention has been illustrated in detail and for simplicity the same reference characters have been applied to like parts throughout the several views of the drawing.

In this drawing:

Figure 1 is an elevation of the upper portion of the improved press;

Figure 2 is an enlarged, vertical section through the bolster adjusting means; and

Figure 3 is a vertical section on line 3—3 of Figure 2.

The press frame includes a bent channel-bar 11 having its flanges disposed outwardly, the bar being bent to provide a pair of parallel uprights 12, 12 equipped at their lower ends with suitable supporting feet, not shown, the central part of the bar forming an inverted, V-shaped section 13 connecting together the two uprights, the latter being joined together also at their upper ends by a horizontal channel-bar 14 secured to them in any approved manner, as by appropriate brackets 15, 15, a strut 16 being interposed between the apex of the frame and such cross-bar.

The vertically-arranged ram 17 is equipped with suitable operating means, well-known in the art and hence requiring no further description, to effect its descent and rise.

As is customary in structures of this kind, the bolster includes a pair of side-plates 18, of which only one is shown in the drawing, connected together as by bolts 19, and other intervening means, so that they may be used and moved as a unit, such bolster having a work rest or block 21 thereon to accommodate certain types of work.

Each end of the bolster is supported on the frame by a pair of removable pins 22, 22 extending through registering holes in the flanges of the frame uprights and one occupying a hole 23 in each bolster plate and the other a substantially semi-circular centering recess 24 in the bottom edge of each such plate.

A casting 25 is bolted at 26, 26 to one of the frame uprights and it has a stationary shaft 27 fixedly mounted therein as a support for a revoluble gear 28 to which disc means are fastened forming a pair of deep sheaves 29 and 31 designed to accommodate a pair of cables 32 and 33 secured thereto and adapted to be wound on and unwound or paid out equally from the sheaves as the latter turn in unison.

Cable 33 extends down to and is fastened to a bracket 34 on the rear bolster-plate which is of such shape as to reach around the back flange of the corresponding frame upright; and the other cable 32 reaches over a guide 35, over the top of the frame between its flanges, and down to a bracket 36 mounted on the front bolster-plate and projecting part way around the adjacent frame member 12, such cable 32 being secured in approved fashion to the last mentioned bracket.

Obviously, as the double sheave is turned in the one or the other direction, the cables will be wound up or taken in equal amounts to raise the bolster horizontally or paid out in similar manner to permit its descent, it

being understood, of course, that the bolster-supporting pins must be taken out first to allow such adjustment of the bolster.

Gear 28 is in mesh with a small nut-gear 37 having a coarse, threaded hole extended through it, such nut having square, quick pitch, threaded engagement with a similarly-threaded shaft 38 equipped at one end with an operating-handle 39.

Such shaft 38 is journaled or revoluble in a sleeve 41 slightly longer than and rotatable in its bearing 42 in the casting.

A friction ratchet-wheel 43 is interposed between the nut-gear 37 and the adjacent end of sleeve 41, such element 43 fitting over the shaft, but not having threaded engagement therewith, so that it is capable of slight lengthwise movement thereon.

A pivoted dog or pawl 44 is in constant cooperation with the teeth of the ratchet-wheel, being held yieldingly in such relation because it is fulcrumed at 45 at one side of its center of gravity.

Shaft 38 has two collars 46 and 47 thereon, bearing respectively against one end of sleeve 41 and against the hub of the handle 39 which is pinned to the shaft at 48, a coiled, expansion spring 49 being interposed between the collars and tending to force them apart, the collars and cooperating spring being housed within an appropriately-shaped part of the casting 25.

Assuming that the supporting pins 22 have been removed or taken out and that it is desired to raise the bolster to a new position of adjustment, the operator turns the handle 39 in a clockwise direction and the nut 37, being held against rotation by the pull of the two cables 32 and 33 through the gear 28, the shaft 38, by reason of its threaded engagement with the now stationary gear-nut 37, travels inwardly, thereby compressing the spring 49 which causes the ratchet-member 43 to be pressed tightly or squeezed firmly between the nut-gear 37 and the end of the sleeve 41.

As the spring is thus compressed, the turning tendency of the nut 37 and its gear is increased until finally the gear 28 is revolved with the shaft, winding the two cables on the sheaves and lifting the bolster to the desired position, and during such action, the ratchet-member 43 is also rotated, because it is compressed between the nut-gear and the sleeve, both of which revolve with the shaft, the pawl 44 riding over the ratchet-teeth during such operation.

When the handle is released, the locking dog 44 prevents the ratchet-element from turning backward, since its friction with the other parts, due to the action of the spring, is greater than the force or power imposed on the gear-nut, due to the load that has been lifted.

Should the workman neglect to insert the bolster-pins in their holes and should pressure be applied to work on the bolster by the press-ram, the added pull or strain on the cables would increase the tendency of the gear 28 and its intermeshing nut-gear 37 to rotate, and, when this effect is increased sufficiently, it will cause the gear-nut to slip on the face of the ratchet-member, because the force exerted on the gear-nut is now sufficient to overcome the friction caused by the spring, thus removing or eliminating any possibility of the cables or lifting mechanism being broken because of neglect or indifference on the part of the operator.

Of course, if the bolster-supporting pins are properly inserted, the above-specified action does not occur, the pins themselves taking the load.

When it is desired to lower the bolster, the pins having been removed, it is only necessary to turn the operating handle in a counter-clockwise direction rotating the screw-shaft slightly in the gear-nut thus causing the spring to release enough to permit the gear-nut to slip on the ratchet-member.

So the weight of the boiler will cause its own descent, and it is frequently desirable to insert the lower bolster-supporting pins in the apertures of the frame corresponding to the new position of a bolster, whereby, when the latter reaches them, it will be centered lengthwise and in proper location for the easy insertion of the remaining pins.

Many minor mechanical changes may be made in this structure without departure from the heart and essence of the invention as defined by the appended claims.

We claim:

1. In a press, the combination of a press-frame, a ram, means to operate said ram, a bolster vertically adjustable on said frame, means to support said bolster on said frame, and means to adjust said bolster when said supporting-means are inoperative and of a power sufficient to lift the bolster but yieldable to prevent breakage if a substantial pressure is applied to the bolster by the ram.

2. In a press, the combination of a press-frame, a ram, means to operate said ram, a bolster vertically-adjustable on said frame, means to support said bolster on such frame, and friction means to adjust said bolster when said supporting means are inoperative and of a power sufficient to lift the bolster but adapted to yield to prevent breakage if a substantial pressure is applied to the bolster by the ram.

3. In a press, the combination of a press-frame, a ram, means to operate said ram, a bolster adjustable on said frame, means to support said bolster on said frame, friction means to adjust said bolster when said supporting means are inoperative, and means to

lock said bolster adjusting means to maintain the bolster in position, said friction means being constructed to yield in spite of said lock to prevent breakage if a substantial pressure is applied to the bolster by the ram.

4. In a press, the combination of a press-frame, a ram, means to operate said ram, a vertically-adjustable bolster, means to support said bolster in adjusted position, and means to adjust said bolster when said supporting means is inoperative including a bearing, a sleeve longer than and rotatable in said bearing, a threaded shaft in said sleeve, a gear-nut on said shaft, a ratchet-member loose on said shaft between one end of said sleeve and said gear-nut, a holding pawl cooperating with said ratchet-member, an operating handle for said shaft, and a spring acting on the opposite end of said sleeve and on said shaft.

5. In a press, the combination of a press-frame, a ram, means to operate said ram, a vertically-adjustable bolster, means to support said bolster in adjusted position, and means to adjust said bolster when said supporting means is inoperative including cables connected to the opposite ends of said bolster, revoluble sheave means with which said cables coact, a gear rigid and revoluble with said sheave means, a bearing, a sleeve longer than and rotatable in said bearing, a threaded shaft in said sleeve, a gear-nut on said shaft in mesh with said gear, a ratchet-member loose on said shaft between one end of said sleeve and said gear-nut, a holding pawl cooperating with said ratchet-member, an operating handle for said shaft, and a spring acting on the opposite end of said sleeve and on said shaft.

6. In a press, the combination of a press-frame, a ram, means to operate said ram, a vertically-adjustable bolster, means to support said bolster in adjusted position on said frame, and means to adjust said bolster when said supporting means is inoperative, including an actuating mechanism on one side of said frame connected to the corresponding end of the bolster and connected to the opposite end of the bolster by a cable extended over the top of the frame and down the other side thereof to the bolster.

7. The combination of a press-frame, a ram movably mounted thereon, means to operate said ram, a bolster adjustable on said frame, means to support said bolster on said frame in adjusted position comprising two supporting pins for each end of the bolster, one such pin of each pair occupying registering apertures in said frame and bolster, the lower edge of the bolster resting on the companion pin which also occupies an aperture in said frame, means to adjust the position of said bolster when said supporting means are rendered inoperative, and a movable handle to operate said adjusting means.

8. The combination of a press-frame, a ram movably mounted on said frame, means to operate said ram, a bolster adapted to support the work and adjustable on said frame, means to support said bolster on said frame in adjusted position, means to adjust said bolster and to support the weight thereof during such adjustment, and a movable handle to operate said adjusting means.

9. The combination of a press-frame, a ram movably mounted on said frame, means to operate said ram, a bolster adapted to support the work and adjustable on said frame, means to adjust said bolster, a movable handle to operate said adjusting means, and means to support said bolster in adjusted position comprising pins supported by said frame and occupying recesses in the under side of said bolster.

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