

I. A. WEAVER.

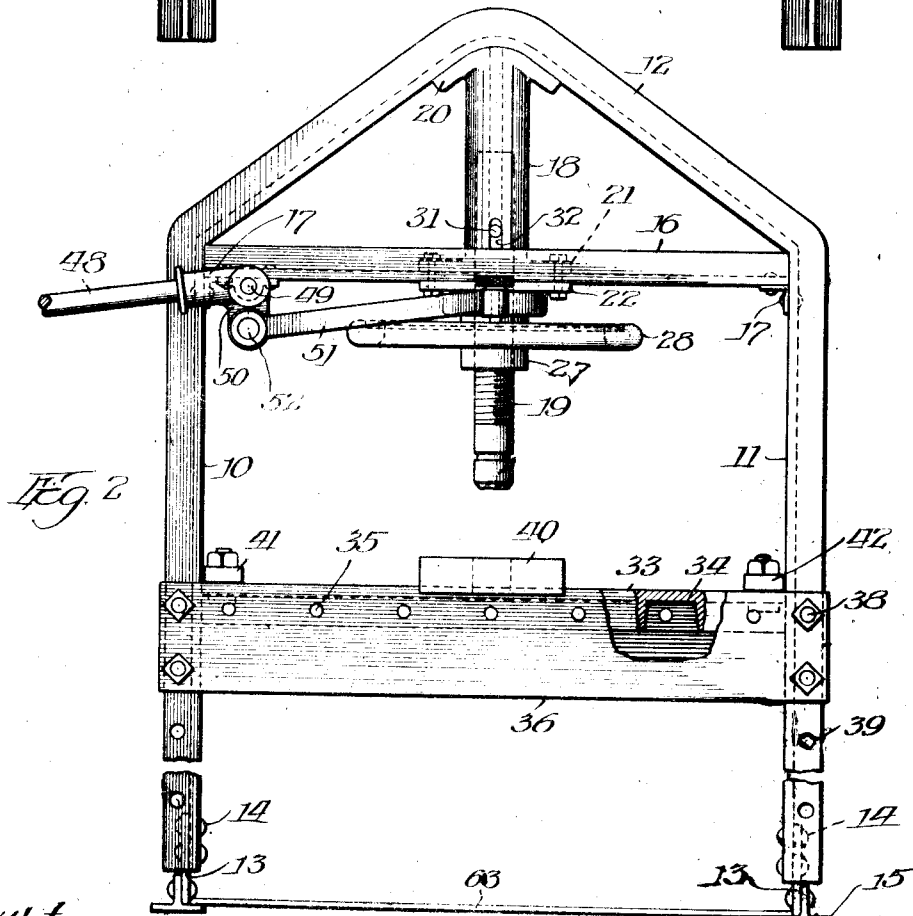
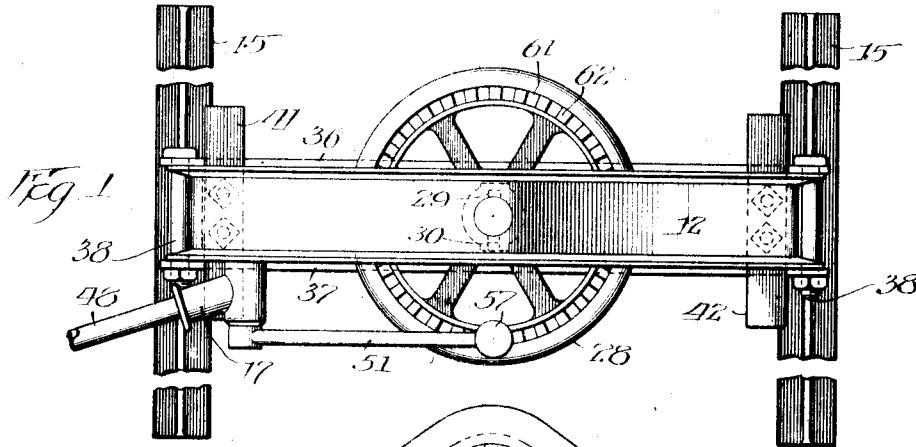
PRESS.

APPLICATION FILED DEC. 12, 1914.

1,180,896.

Patented Apr. 25, 1916.

2 SHEETS—SHEET 1.



Witnesses:
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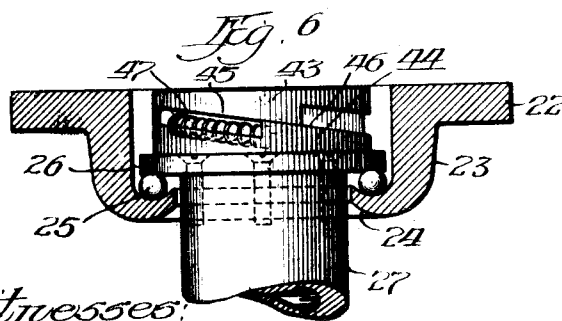
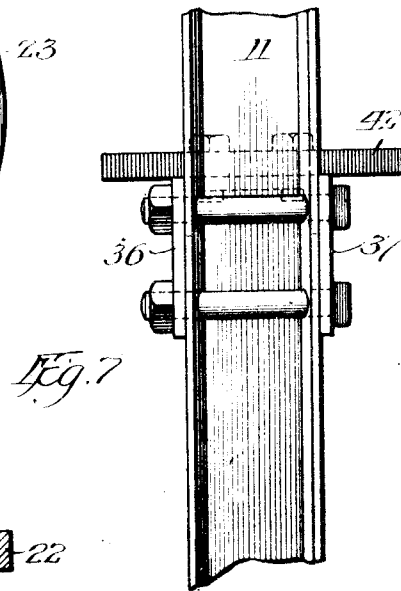
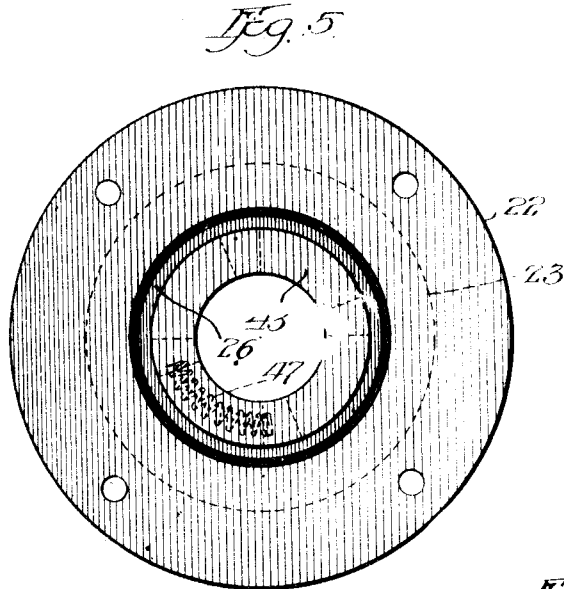
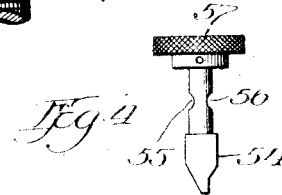
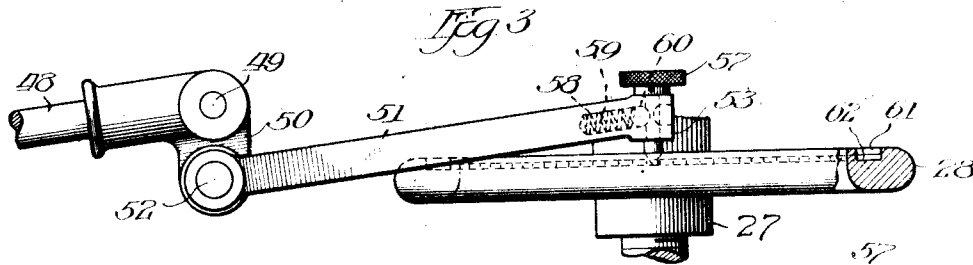
PRESS.

APPLICATION FILED DEC. 12, 1914.

Patented Apr. 25, 1916.

2 SHEETS—SHEET 2.

1,180,896.



Witnesses:

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UNITED STATES PATENT OFFICE.

IRA A. WEAVER, OF SPRINGFIELD, ILLINOIS, ASSIGNOR TO THE WEAVER MANUFACTURING COMPANY, OF SPRINGFIELD, ILLINOIS, A CORPORATION OF ILLINOIS.

PRESS.

1,180,896.

Specification of Letters Patent.

Patented Apr. 25, 1916.

Application filed December 12, 1914. Serial No. 876,804.

To all whom it may concern:

Be it known that I, IRA A. WEAVER, a citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Presses, of which the following is a specification.

The prime object of this invention is the production of a press, such for example, as 10 are conveniently employed in automobile repair-shops and garages, which is simple in structure and comprised of few parts, which is economical to manufacture and which will be quick in action on light work and 15 effective through a high leverage on heavier work.

A further feature of a structure embodying the invention resides in means for securing a quick release of the operating parts 20 upon removal of the load.

Another element of advantage is the lack of necessity of fastening the press to the floor or other support.

A still further object of the invention 25 is to provide the device with visual means to indicate when the pressing member approaches its limit of movement.

Various other features of novelty and improvement will become apparent to those 30 skilled in this art from consideration of a preferred embodiment of the invention described below and illustrated in the accompanying drawings forming a part of this specification, and throughout the various 25 views of which like reference characters refer to the same parts.

In these drawings; Figure 1 is a plan view of such desirable embodiment of the invention; Fig. 2 is an elevation of the structure; Fig. 3 is a detail illustration of the 40 pawl and ratchet mechanism; Fig. 4 is a view of the pawl; Fig. 5 is a plan view of the quick release mechanism; Fig. 6 is a vertical section through the same, and Fig. 45 7 illustrates the adjustable connection of the bolster to the frame proper.

In this embodiment of the invention the frame comprises a bar of channel cross-section bent to provide the vertical legs 10 50 and 11, which at their upper ends are connected together by the cambered or V-shaped portion or cross-member 12, the marginal flanges of such bar projecting outwardly, as is illustrated. Each leg 10 and 11 by 55 means of a gusset or bracket-plate 13 fas-

tened by means of rivets 14 against the outer face of the web of the bar has an elongated foot 15 secured thereto, which may be conveniently in the form of a T-bar with the web extended upwardly for connection with the lower end of the plate 13. 60

At their upper portions the legs 10 and 11 are connected together by a cross channel-bar 16 with its flanges presented upwardly, the opposite ends of such bar being 65 fastened to the two legs of the frame by angle brackets 17, 17, and suitable rivets. A hollow casting 18 for the reception of the upper portion of the pressing-screw 19 is interposed between the horizontal web 70 of the cross-bar 16 and the apex of the main-frame 12 and has an enlarged upper end 20 shaped to conform to the bent portion of the bar 12. Its lower end is equipped with a base 21 bolted to the 75 web 16, the casting 18 constituting a strut for the frame as well as a sliding bearing for the screw. These securing bolts also fasten to the under-face of the cross-bar 16 the circular flange 22 of an apertured member 23 provided with an inwardly-extended 80 curved flange 24 constituting a ball race for the balls 25 on which travels an overhanging plate 26 secured by screws or otherwise to the hub 27 of a round handle 28, such hub 85 being internally screw-threaded for the reception of the screw 19, the handle in effect constituting a nut for the screw. At its lower end this screw may be shaped or formed as is necessary or desirable, for the 90 attachment thereto of tools required, in the pressing work. In order to prevent the screw from turning, the interior of the casting 18 has two oppositely-disposed keyways 29 and 30 adapted to receive a cross-pin 31, 95 extended through the screw-shaft, which is visible in the lower position of the screw through an aperture 32 through the wall of the casting, as shown in Fig. 2. This hole permits the introduction and withdrawal of 100 the pin and also permits the latter to be seen so that the operator may be advised as to when the screw is approaching its limit of downward movement.

The work is adapted to be supported on a 105 bolster 33 composed of a channel-bar 34 with downwardly-presented flanges to which, by means of rivets 35, two side-plates 36 and 37 are secured, such plates being longer than the channel-bar 34 and overlapping the out- 110

wardly-disposed flanges of the legs of the main-frame to which they are attached by means of bolts 38 passing through holes in the plates 36 and 37 and the flanges of the channel-legs. In order that this bolster may be vertically adjustable for the accommodation of different kinds of work, the frame leg flanges are provided with a plurality of holes or apertures 39 so that the bolster or support may be fastened in any desired adjusted position. The bolster channel 34 is desirably centrally apertured for the accommodation of portions of the work, and, of course, the upper channel cross-bar 16 is apertured for the passage of the screw. The bolster may be supplied with a work block 40 and bolted to its opposite ends are extension-bars 41 and 42 projecting beyond the sides of the bolster, as shown in Fig. 1, for the support of long pieces of work which cannot be readily accommodated between the legs of the frame. They are also especially well adapted for the holding of pieces or structures of awkward shape to be operated upon by the screw-press.

In order to equip this structure with a quick release device, in the member 23 I employ two cooperating washers 43 and 44 having co-acting inclined or spiral faces 45 and 46 respectively, of coarser opposite pitch than that of the screw 19. In a suitable recess between these washers, a relatively light expansion spiral spring 47 is housed, which is employed for the purpose of tending to force the spiral surfaces 45 and 46 to slide on one another; that is, tending to expand the structure or force the washers apart.

For heavy work it is desirable to have means of greater leverage and to accomplish this I fulcrum a vertically-operating bell-crank handle 48 on a stud 49 secured to and projecting forwardly beyond the under surface of cross-bar 16. The short-arm 50 of such elbow-lever or handle has an arm 51 hinged or pivoted thereto at 52, such arm at its free end having a vertically apertured boss 53 accommodating a pawl 54, the shank of which is provided with two opposite notches 55 and 56 and the top end of which has a knurled handle 57 pinned thereto. This arm 51 also has a longitudinal aperture or cavity 58 therein receiving a spring 59 which presses outwardly a locking-ball 60 adapted to engage either one of the notches 55 or 56, as the case may be. Handle 28 on its upper surface is provided with a circular groove 61, the bottom of which has ratchet-teeth 62 extending upwardly only a portion of the depth of groove 61. Pawl 54 is adapted to travel in the groove 61 and co-act with the ratchet teeth 62.

Operation: The operation of this appliance is as follows: Assuming that the work is properly supported on the bolster, as for instance by means of the block 40 or the ex-

tensions 41 and 42, and that the lower-end of screw 19 has been provided with a suitable tool for the pressing operation, and assuming further that it is comparatively light work to be performed, the handle 48 will be thrown down and the arm 51 swung back so as to be out of cooperative position with relation to the ratchet or handle 28. The operator by hand then turns the handle 28 in a direction to cause a downward travel of the screw. This is quickly and easily accomplished because the handle constituting the operative-nut, as well as the screw, are supported on the group of balls 25. As soon, however, as the appliance secured on the end of screw 19 engages the work, the two washers come into action, having been turned so as to bring the highest points of their inclined surfaces into co-action during the downward feeding of the screw. That is to say, as soon as the screw engages the work, the two washers act as a thrust collar between the hub of the handle and the under-surface of the cross-bar 16 so that further turning of the handle will effect the downward pressing-operation with the strain between the work and the cross-bar, which is centrally braced, of course, by the strut or hollow casting 18. Obviously, under these circumstances, there is no strain on the ball bearing. A slight reverse pull on the handle to release the load will cause the abrupt inclines on the washers to instantly ease the strain on the handle and screw so that full release is readily accomplished. Stated differently, the inclined washers contract somewhat in opposition to the slight pressure of light spring 47 upon reversal of the turning of the handle and by such contraction, ease the load. In case heavier work is to be done by the press, the arm 51 is swung down so as to bring the pawl into co-action with the ratchet-teeth of the handle, in which position it is held by the weight of arm 51. Vertical manipulation of handle 48 will cause the horizontal turning of the handle 28 under great leverage action, the operation of the other parts of the mechanism being substantially as described above. When it is desired to release the work, the operator by turning the handle 57 simply reverses the pawl, in which new position it is held by the ball 60 under the action of its spring engaging the other one of the apertures 55 or 56. The vertical rocking of the handle 48 will now cause a reverse rotation of the handle 28 to release the load.

It should be observed that by manipulating the handle 48 in a vertical direction, there is no tendency to shift the frame and the parts mounted thereon on the floor, and; consequently, it is unnecessary to bolt or otherwise attach the feet to the floor. Attention is also summoned to the fact that the pawl 54 rides easily in the groove 61 with-

out unintentional displacement by reason of the fact that the groove is deeper than the ratchet-teeth.

From this description and illustration, it should be apparent that this embodiment of the invention is remarkably simple in structure and can be produced at relatively small cost. Its operating mechanism is powerful and is graded to conform to the character of the work to be executed. The quick release device is valuable in that it saves the operator's time and strength and it should be observed that the parts are so combined that the handle may be turned easily by reason of its ball-bearing support and that such ball-bearing is protected and is unlikely to become damaged. The operator is furthermore advised by the position of the cross-pin 31 when he is reaching the limit of the downward stroke of the screw so that there is no likelihood of his exerting useless effort with a possible unnecessary strain on the structure.

While I have herein set forth with some degree of particularity and detail a desirable incorporation of the invention in an appliance of this general character, it is to be understood that many minor mechanical changes within the scope of the appended claims may be made in this device and still retain the advantageous features of the invention. Consequently, the appended claims should be limited only as is required by the state of the prior art. In some instances it may be advisable to cross-connect the feet 15, 15, or the legs 10 and 11 by a brace or connection 63, shown in Fig. 2, although this in some cases may not be required.

I claim:

1. In a press-construction of the character described, the combination of a main-frame comprising a bar of commercial cross-section bent to provide a top cross-member and a pair of upright-legs with laterally-projecting apertured flanges, a bolster, and means adapted to be accommodated in the apertures of said leg flanges and adjustably support the bolster thereon, substantially as described.

2. In a press-construction of the character described, the combination of a main-frame comprising a bar of commercial cross-section bent to provide a top cross member and a pair of upright-legs, a cross-bar fastened to said legs, a hollow strut between said cross-member and cross-bar, a screw accommodated in said strut, and an operating-nut for said screw on the side of said cross-bar opposite said strut, substantially as described.

3. In a press-construction of the character described, the combination of a main-frame comprising a bar of commercial cross-section bent to provide a top cross-member and a pair of upright legs, a cross-bar fastened

to said legs, and a bolster adapted to support the work and vertically adjustable on said legs, a hollow strut between said cross-member and cross-bar, a screw accommodated in said strut, and an operating-nut for said screw on the side of said cross-bar opposite said strut, substantially as described.

4. In a press-construction of the character described, the combination of a main-frame comprising a channel-bar bent to provide a top cross-member and a pair of upright legs, a cross-bar fastened to said legs, a bolster vertically adjustable on the flanges of said legs, a hollow strut between said cross-member and cross-bar, a screw accommodated in such strut, and an operating-nut for said screw on the side of said cross-bar opposite said strut, substantially as described.

5. In a press-construction of the character described, the combination of a main-frame comprising a bar of commercial cross-section bent to provide a top cross-member and a pair of upright legs, a cross-bar fastened to said legs, a hollow strut between said cross-member and cross-bar, a screw accommodated in said strut, means to prevent turning of the screw in the strut and to limit its withdrawal, and an operating-nut for said screw on the side of said cross-bar opposite said strut, substantially as described.

6. In a press-construction of the character described, the combination of a frame, a screw held against rotation in said frame, an operating-nut for said screw, and pressure-transmitting means between the screw and frame constructed to release the work operated upon by the screw quicker than the action of the nut and screw alone would release it, substantially as described.

7. In a press-construction of the character described, the combination of a frame, a screw held against rotation in said frame, an operating nut for said screw, and pressure-transmitting means interposed between the nut and frame and constructed to release the work operated upon by the screw quicker than the action of the nut and screw alone would release it, substantially as described.

8. In a structure of the character described, the combination of a frame having a cross-bar, a ball-race member mounted on the under side of said cross-bar, a series of balls in said ball-race, a pressure-screw, a nut hand-wheel on said screw and supported and revoluble on said balls, and pressure-transmitting means interposed between said nut hand-wheel and frame and constructed to release the work operated upon by the screw quicker than the action of the nut and screw alone would release it, substantially as described.

9. In a press-construction of the character described, the combination of a frame, a screw held against rotation in said frame,

an operating-nut for said screw, and pressure-transmitting means between said nut and frame comprising a pair of cooperating washers with co-acting inclined surfaces adapted to release the work operated upon by the screw quicker than the action of the nut and screw alone would release it, substantially as described.

10. In a press-construction of the character described, the combination of a frame, a screw held against rotation in said frame, an operating-nut for said screw, and work-releasing pressure-transmitting means between the nut and frame comprising a pair of cooperating washers with co-acting inclined surfaces of quicker pitch than the thread of the screw, substantially as described.

11. In a press-construction of the character described, the combination of a frame, a screw held against rotation in said frame, an operating-nut for said screw, and a work-releasing pressure-transmitting means between said nut and frame including a pair of cooperating washers with co-acting inclined surfaces of quicker pitch than the thread of the screw and of opposite pitch to that of the screw, substantially as described.

12. In a press-construction of the character described, the combination of a frame, a screw held against rotation in said frame, an operating-nut for said screw, and a work-releasing pressure-transmitting means between said nut and frame including a pair of cooperating washers with co-acting inclined surfaces of quicker pitch than the thread of the screw and of opposite pitch to that of the screw, and a spring tending to shift said washers relatively to one another, substantially as described.

13. In a press-construction of the character described, the combination of a frame, a vertically-disposed screw held against rotation in the frame, a horizontal screw-operating ratchet-nut, an actuating-handle mounted to rock in a substantially vertical plane, and means whereby said handle may turn said nut, including a pawl cooperating with the nut, substantially as described.

14. In a press-construction of the character described, the combination of a frame, a vertically-disposed screw held against rotation in the frame, a horizontal screw-operating nut, an actuating-handle mounted to rock in a substantially vertical plane, and

means connecting said handle and nut to transmit the oscillatory movement of the handle into a rotating movement of the nut, substantially as described.

15. In a press-construction of the character described, the combination of a frame, a vertically-disposed screw held against rotation in the frame, a horizontal screw-operating ratchet-nut with a circular groove having ratchet-teeth at the bottom of the groove of less height than the depth of the groove, an actuating-handle mounted to rock in a substantially vertical plane, an arm hinged to said handle, and a pawl carried by said arm and adapted to fit in the nut groove, and cooperate with the ratchet-teeth, substantially as described.

16. In a press-construction of the character described, the combination of a frame, and a bolster composed of a bar of commercial cross-section and side-plates fastened thereto and overlapping said frame, substantially as described.

17. In a press-construction of the character described, the combination of a frame with apertured legs, a bolster composed of a channel-bar and side-plates fastened to the flanges of the channel-bar and overlapping the legs of the frame, and means for adjustably supporting said plate in the holes of said leg-apertures, substantially as described.

18. In a press-construction of the character described, the combination of a frame, a screw held against rotation in said frame, an operating nut co-acting with said screw, a bolster vertically adjustable on said frame, and extensions projecting laterally from the bolster near its opposite ends and adapted to assist in holding the work on the bolster, substantially as described.

19. In a structure of the character described, the combination of a frame having a cross-bar, a ball race member mounted on the under side of said cross-bar, a series of balls in said ball race, a pressure-screw, and a nut hand-wheel on said screw and supported and revoluble on said balls, substantially as described.

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

IRA A. WEAVER.

Witnesses:

ALVAREZ A. BARNES,

T. D. BUTLER.