Aug. 18, 1936. E. K. JOHANSEN ET AL 2,051,447

PRESS

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Fig. 2.

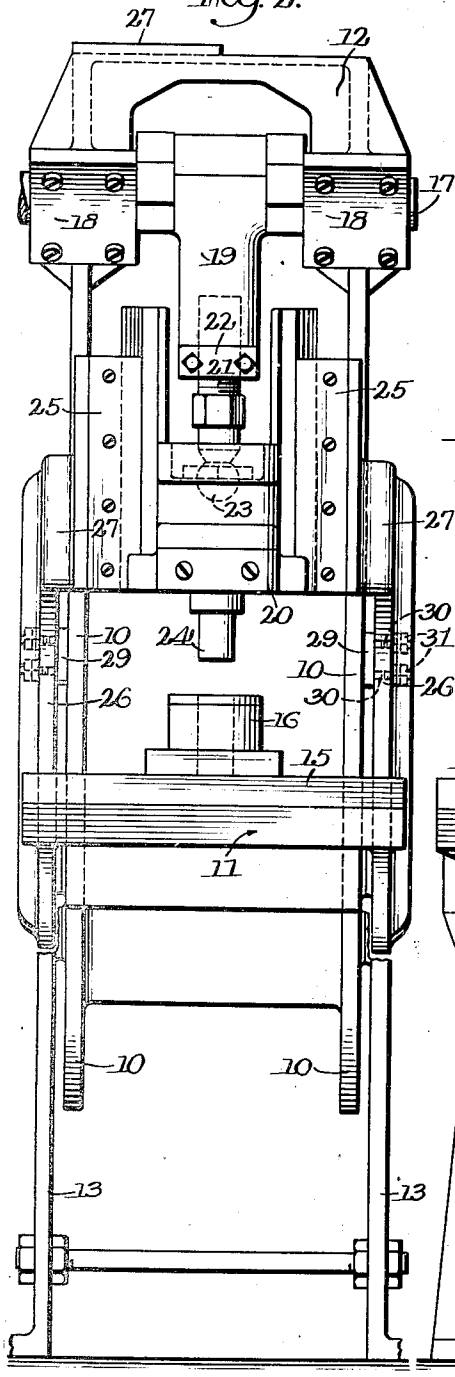
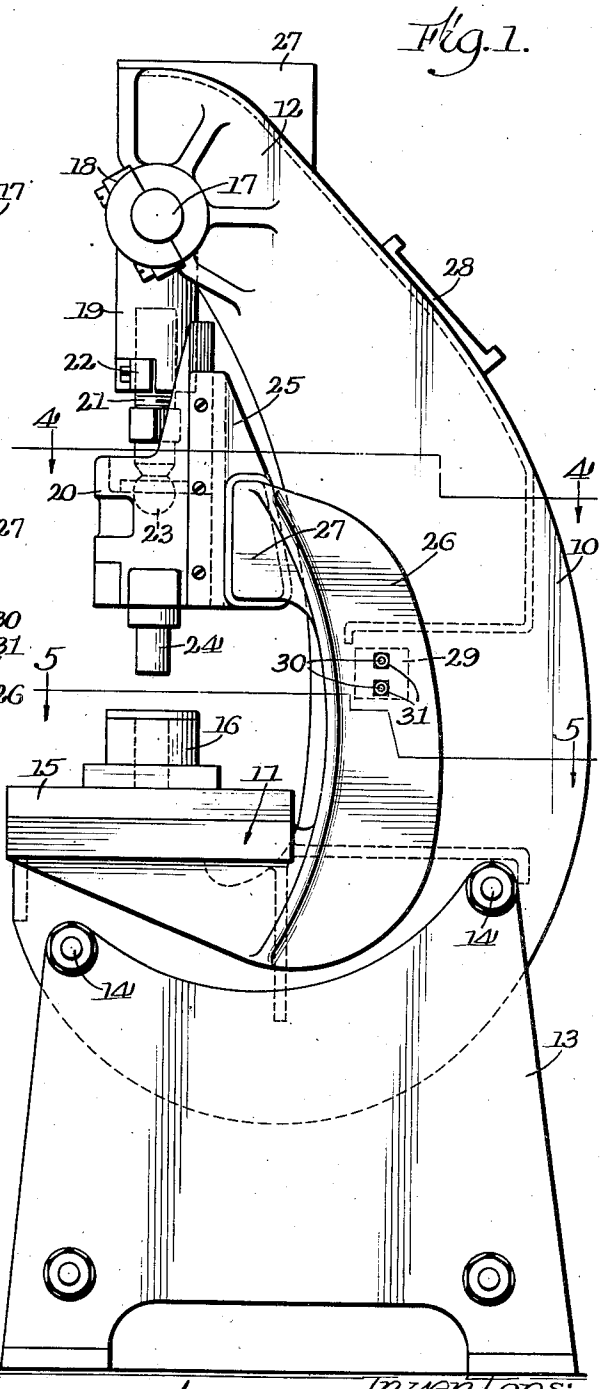


Fig. 1.



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Fig. 4.

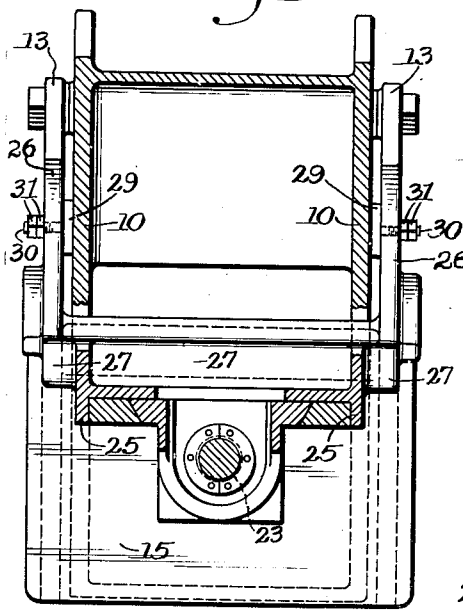
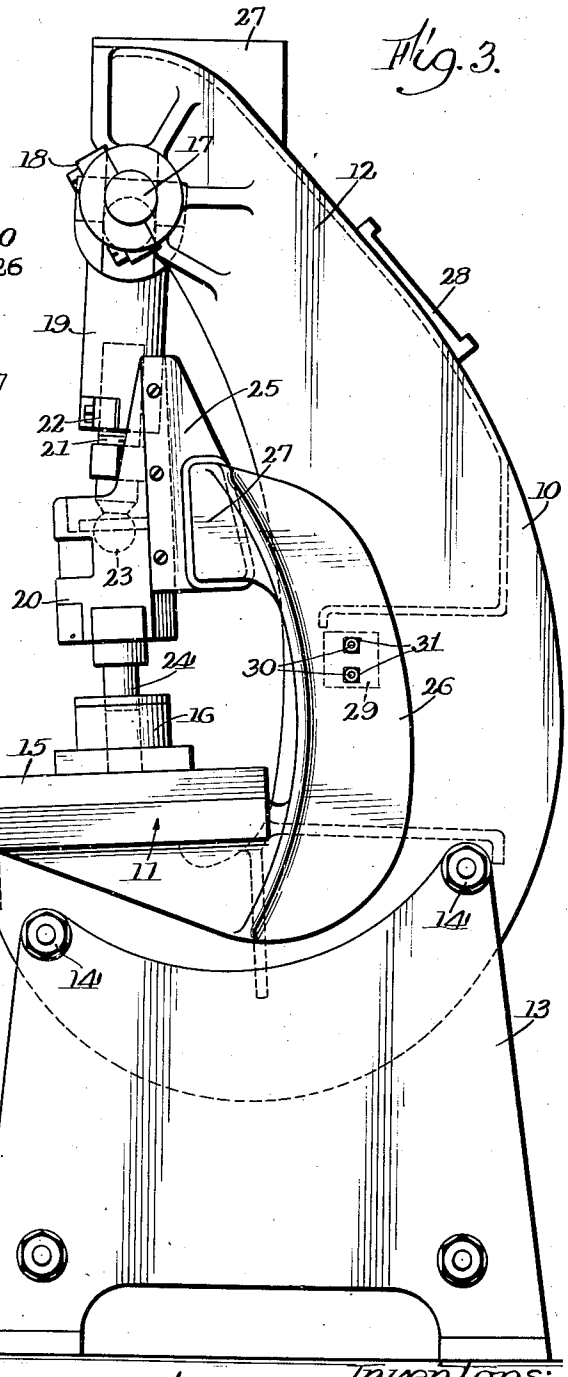


Fig. 3.



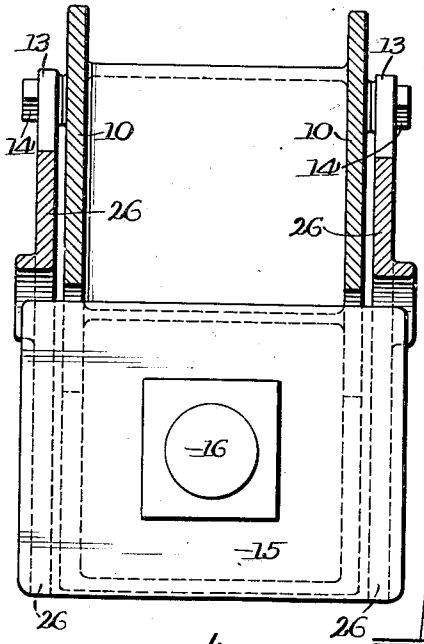


Fig. 5.

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UNITED STATES PATENT OFFICE

2,051,447

PRESS

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Application August 30, 1935, Serial No. 38,505

10 Claims. (Cl. 164—102)

This invention relates to improvements in presses of the type commonly know as a C frame type.

In presses of this character, and due to the working stress of the slide upon the work and bed of the press, the frame generally springs, with the result that the slide and bed are moved out of working alinement, and in the case of cutting dies when the slide ascends, damage is caused by the edges of the dies scraping or snapping against each other. Furthermore, in the case of metal forming operations the bringing of the slide out of proper alinement with the press bed, which is caused by the deflection in the press frame, under working stress, results in inaccuracies in the work, and also undue wear on the dies.

It is one of the objects of the present invention to overcome these difficulties and objections and to provide in a press of this character, improved means for maintaining the parts in proper working alinement.

A further object of the invention is to eliminate undue wear on the guiding means for the slide, which wear is caused by the deflection of the frame of the press, further, constant strain over a period of hard use causes the frame to become set in such deflected position with a resultant constant misalinement of the working parts. To provide means to overcome these several and other objections, such as lubrication because of undue wear, is another object of this invention.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts, hereinafter more fully described and claimed, and as shown in the accompanying drawings illustrating this invention and in which

Figure 1 is a side elevation of a machine of this character constructed in accordance with the principles of this invention.

Figure 2 is a left hand end elevation of Figure 1.

Figure 3 is a view similar to Figure 1, showing the parts in their extreme position, that is with portions of the machine deflected under the working stress of the slide.

Figure 4 is a detail, horizontal, sectional view taken on line 4—4, Figure 1.

Figure 5 is a detail, horizontal, sectional view taken on line 5—5, Figure 1.

The press consists essentially of a body portion 10 of the type generally known as a substantially C shaped frame, having a base 11 and an upper portion 12 formed in any desired or suitable manner, and the body thus constructed is supported upon a suitable base 13 being held in position by suitable anchoring means, such as bolts or tie rods 14.

Supported upon the base 11 is a bed 15 and mounted upon the bed is a suitable die 16.

The numeral 17 designates an operating shaft which is journaled in suitable bearings at the upper end 12 of the frame and these bearings may, if desired, embody removable portions 18.

The shaft 17 may be a crank shaft or may be provided with an eccentric and connected to the shaft is a link 19, which in turn is connected to a slide 20. The connection between the link 19 and the slide 20 is preferably an adjustable connection such as a bolt 21 having a portion threaded into the link 19, and 22 designates a clamp which may be employed for securing the connection 21 in its adjusted position.

This connection 21 is pivoted to the slide 20, such as by means of a swivel connection 23 and carried by the slide 20 is a die or tool 24 which co-operates with the die 16 on the bed 15.

The slide 20 moves in guides 25, and by means of these guides the slide is maintained in working alinement with the bed 15 of the press.

In presses of this character it has been found that the operating stress of the slide 20 upon the work resting upon the bed 15 has a tendency to, and does, when the stress of the slide is very great, exert such a strain upon the bed of the press that a portion of the press frame 10 will be deflected and the bed of the press will be moved out of working alinement with the slide 20. The result of this is that there will not only be an inaccuracy in the work, but the dies and tools will become injured and considerable stress and strain will also be exerted upon the guides 25.

Therefore, in order to overcome these objections, the guides 25 are supported independently of the frame or body of the press. That is to say, the guides 25 are not secured directly to the press frame.

To that end supports 26 are provided, one preferably adjacent each side of the press frame, to which the guides 25 are respectively secured, and the supports may be connected by a suitable cross bar or member 27, which latter is also free from the press frame.

The supports 26 may be connected to the frame in any suitable manner, such as being

formed integral with the frame as shown in the drawings or may be formed separately and secured to the frame in any desired or suitable manner, the point of anchor or the securing of the supports to the frame is preferably at the bottom of the frame and beneath the bed 15.

With this construction it will be manifest that when the slide exerts a working stress upon the work supported by the bed and upon the bed 15, and if such stress is great enough, the base of the frame as well as the bed 15 will be moved out of working alinement with the slide 20, and if the guides 25 are anchored or secured directly to the frame 10, it will be manifest that such deflection or springing of the frame will move the parts to the position shown in Figure 3, and there would not only be a misalinement of the parts, but the slide would bind in the guides 25.

However, by mounting the guides 25 in the manner contemplated with this invention, it will be clearly seen that the supports 26 will always maintain the guides 25 in proper working relation with the bed of the press and will always cause the slide 20 to be maintained in proper working alinement, regardless of the amount of deflection of the bed of the press or the springing of the frame.

This is accomplished by reason of the fact that when the bed is deflected under such stress, the supports 26 will also be deflected from the position shown in Figure 1 to the position shown in Figure 3, and as the guides 25 are secured to the supports 26 and as the supports 26 are not sprung or deflected, the guides 25 will always be maintained in proper working relation with the bed 15 and the slide 20 will be maintained in proper working alinement.

The deflection or change of the angle of the slide 20 with respect to the connecting rod 21 will be permitted by means of the pivot or swivel joint 23.

As soon as the stress on the frame is relieved and the parts spring or move back to their normal position, the supports 26 will also be moved back to their normal positions as well as the guides 25, at the same time that the bed 15 is moving back to its normal position, and all of these parts will be maintained in proper working alinement.

Obviously, ribs or reinforcing means may be provided wherever necessary, and a suitable supporting surface 27 may be provided on the frame for the driving mechanism, such as the motor, and a supporting surface 28 may also be provided for supporting the bearing for the driving gears or shafts.

The frame 10 may be mounted for adjustment with respect to the supporting base 13, so as to change the angle of inclination or position of the frame 10 with respect to the supporting base, as is customary in machines of this character.

In order to prevent the slide guide, as well as the slide from being moved out of proper working alinement with the die supporting bed by the tendency of the frame springing or becoming distorted laterally, or by the tendency of the bed to tilt downwardly on one end, under the stress of the operation of the slide upon the work, suitable means such as blocks or plates 29 may be provided between the spaced portions of the frame and the supports 26, at any suitable point above the press bed, to substantially fill such space. These blocks or elements 29 may be of any suitable size and may be adjustably secured to either the support 26 or the frame 10.

In the present exemplification of the invention the blocks are adjustably secured to the support 26 by means of screws 30, and nuts 31 are provided to hold the screws in their adjusted position. These blocks 29 form surfaces which are secured to one of the parts and move over the other part when the frame is sprung or deflected by the operating stress of the slide. Any number of these blocks 29 may be provided, and any other means for accomplishing these results may be employed.

While in the present exemplification of the invention the press is shown and described as having the slide 20, operated by a power driven shaft, it is to be understood that the invention is applicable to any form of press, such as a press wherein the slide is operated by toggles or by hydraulic or other means.

While the preferred form of the invention has been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:—

1. In a power press, a substantially C shaped frame, a die supporting bed, a slide, actuating means for the slide, a guide for the slide, supporting means for the guide connected to the guide and frame, said means also operating to maintain the lower face of the slide parallel with the die supporting surface of said bed in the event of the deflection of the die bed supporting portion of the frame under the working stress of the slide upon said bed.

2. In a power press, a frame, a die supporting bed, a slide, actuating means for the slide, a guide for the slide, and means for maintaining in proper working alinement the slide, the guide and the die supporting bed, said means being connected with the guide.

3. In a power press, a frame, a die supporting bed, a slide, means for reciprocating the slide, a guide for the slide, and means for maintaining in proper working alinement the slide, the guide and the die supporting bed in any deflected position of the bed caused by the springing of the frame under the working stress of the slide upon the bed.

4. In a power press, a frame, a bed, a slide, means for reciprocating the slide, a guide for the slide, and means connected with the guide for maintaining the guide and slide in proper working alinement with the bed in the event of the springing of the frame and the deflection of the bed under the working stress of the slide, the said means at all times affording unobstructed access to the bed.

5. In a power press, a frame, a bed, a slide, means for reciprocating the slide, a guide for the slide, said guide being separate from the frame, and means disposed between the guide and frame for supporting the former from the latter, the said means also operating to maintain the slide and guide in proper working relation, in the event the said bed is deflected and the said frame is sprung, under the working stress of the slide.

6. In a power press, a frame, a bed, a slide, means for reciprocating the slide, a guide for the slide, and means for supporting the guide, said guide and frame being capable of relative

movement, one with respect to the other, whereby the effect of any deflection of the bed under the working stress of the slide, will be neutralized with respect to a misalinement of the slide and guide with respect to the bed.

7. In a power press, a frame of substantially C shape, a bed supported by one end of the frame, slide operating means adjacent the other end of the frame, a slide actuated by said means and cooperating with the bed, a guide for the slide separate from the frame, and means connecting the guide with the frame, the said means operating to maintain the guide and slide in working alinement with respect to the press bed, in any deflected position of the bed with respect to the said frame, due to the working stress of the slide upon the bed.

8. In a power press, a frame, a bed, a slide, means for operating the slide, a guide for the slide, means for supporting the guide from the frame, the last said means also operating to maintain the guide and slide in proper working alinement with the bed, in the event of the springing of the frame and the deflection of the bed in one direction under the working stress of the slide, and additional means for maintaining the slide and bed in working alinement in the event of the springing or deflection of said frame in another direction.

9. In a power press, a frame, a bed, a slide, a guide for the slide, said guide being separate from the frame, means disposed between the guide and frame for supporting the former from the latter, a portion of the last said means and the said frame being relatively movable, the said means also operating to maintain the slide and guide in proper working alinement in the event the said bed is deflected and the frame is sprung under the working stress of the slide, and means co-operating with the frame and the first recited means and forming a guide for that one of them which is movable and operating to maintain the slide and guide in proper working alinement with the bed in the event the frame is deflected in another direction.

10. In a power press, a frame, a bed, a slide, a guide for the slide, said guide being separate from the frame, means disposed between the guide and frame for supporting the former from the latter, the said means also operating to maintain the slide and guide in proper working alinement in the event the said bed is deflected and the frame is sprung under the working stress of the slide, and means co-operating with the frame and the first recited means for maintaining the slide and guide in proper working alinement with the bed in the event the frame is deflected in a direction intersecting the plane of the first recited deflection, the last recited means embodying an element disposed between the first said means and said frame, carried by one and movable over the other.

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