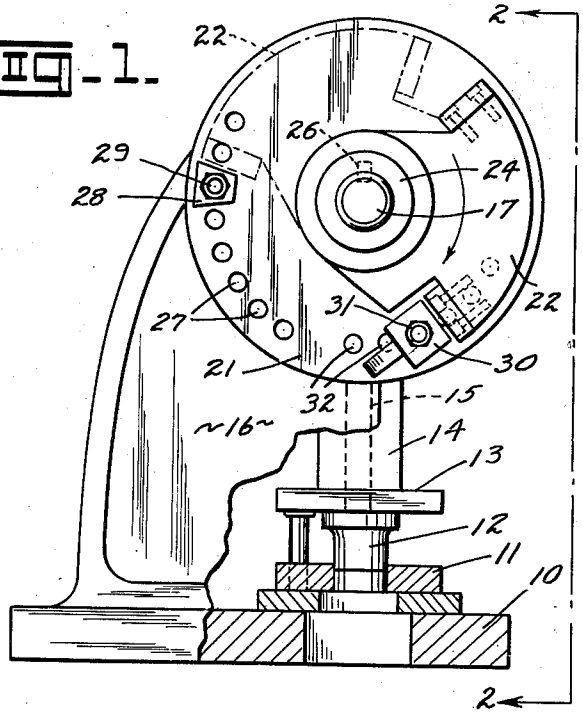
May 17, 1949. H. P. HUNTER 2,470,561

PRESS

Filed April 17, 1947

FIG. 1.



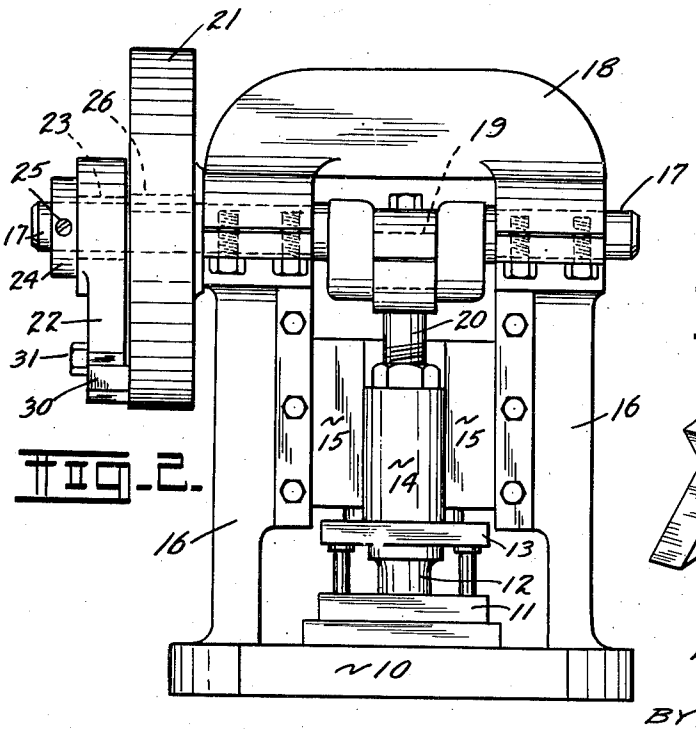
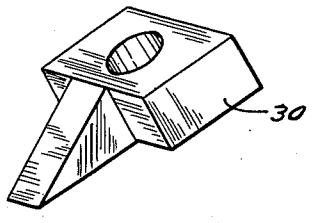


FIG. 2.

FIG. 3.



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Patented May 17, 1949

2,470,561

UNITED STATES PATENT OFFICE

2,470,561

PRESS

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Application April 17, 1947, Serial No. 742,055

6 Claims. (Cl. 164—102)

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This invention relates to a press and more particularly to a press having auxiliary means thereon for imparting striking action to the reciprocating members of the press so as to substantially increase the ability of the press to handle heavier metals.

The principal object of the invention is the provision of a press such as used for stamping metal articles with appropriate dies wherein means is incorporated for increasing the effective stamping ability of the press.

A further object of the invention is the provision of means for rendering light presses capable of stamping heavy gauge metals.

A still further object of the invention is the provision of means applicable of stamping presses for imparting striking force to the die engaging portions of the press to insure the continuing cycle of travel of the said die engaging portions and thus avoid stopping or stalling the press.

The improvement in press constructions shown and described herein enables a light weight press such as, for example, that commonly rated as a ten ton press to be employed in stamping considerably heavier metals and thereby achieving the efficiency of a much heavier press such as, for example, one rated at seventy-five or one hundred tons or greater.

The principle of operation of the improvement in press construction as disclosed herein relates to the provision of a weight normally revolved by the press and pivoted to the crank shaft thereon and so arranged that at such time as the press stalls as when the die carrying portions thereof engage metal to be stamped thereby, the weight continues its travel by reason of its momentum and engages an appropriate portion of the press with a striking force sufficient to drive the die carrying portions of the press through the metal engaging cycle and thereby prevent the press from stalling. When applied to light weight presses, the invention enables them to successfully punch, draw or form metals considerably heavier in gauge and/or considerably greater in area than the press would otherwise be capable of handling. The utilization of the striking force of the weight enables the full energy of the momentum of the traveling weight to be utilized effectively.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it

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being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

The invention is illustrated in the accompanying drawing, wherein:

Figure 1 is a side elevation of a press with parts broken away and parts in cross section, and illustrating the application of the striking weight thereto.

Figure 2 is a front plan view of the press shown in Figure 1 and taken on line 2—2 thereof.

Figure 3 is an enlarged perspective view of the striking block comprising a portion of the press shown in Figures 1 and 2.

By referring to the drawings and Figure 1 in particular it will be seen that a press has been disclosed which includes a bolster plate 10 having a die 11 positioned thereon, a punch 12 engaging the die and carried by a punch holder 13. The punch holder 13 is mounted on a slide 14 which in turn is mounted for reciprocal vertical movement in oppositely disposed channels 15 affixed in turn to and forming portions of the main frame 16 of the press. The upper portion of the main frame 16 of the press is provided with journals in which a crank shaft 17 is rotatably positioned and a head 18 completes the usual press construction.

The crank shaft 17 has a crank 19 located inwardly from the outermost ends thereof and a connecting rod 20 is engaged upon the crank 19 and adjustably affixed to the slide 14 heretofore referred to. Thus, rotating motion of the crank shaft 17 will cause the slide 14 to reciprocate vertically in the channels 15 thereby moving the punch 12 into and out of registry with the die 11.

It will be obvious that the description of the press so far is that of a conventional press. As is custimary in presses of the type disclosed, a fly wheel 21 is mounted on the crank shaft 17 and means (not shown) is provided for imparting rotating motion to the fly wheel so that the press is operable. The novelty in the present disclosure relates to a momentum utilizing striking weight 22 journaled as at 23 on the crank shaft 17 and preferably positioned adjacent the fly wheel 21 and retained on the crank shaft 17 by means of a collar 24 which is affixed to the crank shaft 17 by means of a pin 25. The fly wheel 21 is keyed to the crank shaft 17 by means of a key 26 engaging appropriately formed keyways in the fly wheel 21 and the crank shaft 17.

By referring to Figure 1 of the drawings in particular, it will be seen that the fly wheel 21 is provided with a plurality of radially spaced openings 27 and that a bracket 28 is bolted or otherwise affixed to the fly wheel 21 by means of a bolt or similar device 29 engaging one of the openings 27. It will thus be seen that when the fly wheel revolves in a clockwise direction, as illustrated in Figure 1 of the drawings, the bracket 28 will engage one side of the weight 22 as it is shown in dotted lines in Figure 1 and thereby cause the weight 22 to rotate with the fly wheel 21. The fly wheel 21 is also provided with a striking block 30 which is shown in enlarged detail in the perspective view of Figure 3 of the drawings and the striking block 30 is mounted on the fly wheel 21 by reason of a bolt or similar device 31 engaging one of a series of openings 32 also radially spaced in the fly wheel 21 in a manner similar to the series of openings 27 heretofore referred to. It will thus be seen that the weight 22 is capable of movement between the bracket 28 and the striking block 30 and that the degree of movement of which the weight 22 is capable is sufficient to enable it to move from registry with the bracket 28 where it normally rests (as shown in dotted lines in Figure 1) into forceful striking engagement with the striking block at such times as the fly wheel 21 slows down or stops (as shown in solid lines in Figure 1) as is likely to occur when the punch 12 of the press engages unusually heavy material and overcomes the normal striking power of the press and thereby stalls. When such stalling action occurs, the weight 22 continues to travel by reason of its momentum and by reason of its being freely pivoted on the crank shaft 17 and it leaves its normal position of engagement with the bracket 28 and travels clockwise until it forcefully strikes the striking block 30 thereby imparting a substantial striking force to the fly wheel 21, crank shaft 17 and the reciprocating portions of the press to the end that the punch 12 is forcefully driven through its metal engaging cycle despite the unusual area of the metal handled or the unusual thickness or gauge thereof.

It will be obvious to those skilled in the art that the weight 22 may take a form other than that shown and described heretofore, such as, for example, it may be formed as a fly wheel loosely affixed to a crank shaft of a press so that it is capable of turning through a sufficient degree of motion at such time as the crank shaft slows or stops and then engage the same so as to impart striking force thereto. A fly wheel so arranged on a crank shaft could, for example, have a wide keyway so as to enable the fly wheel to be capable of at least one hundred eighty degrees of rotation on the fly wheel and thereby forming an equivalent structure to that heretofore described herein.

Thus, a so called light press equipped with the invention is capable of effectively handling materials of a thickness or gauge and/or area substantially greater than the press would otherwise be capable of successfully handling. Driving motors of increased size are not required for the vastly increased range of operations of the press, as the accumulated power stored in the form of momentum in the traveling weight 22 is used in an effective striking form to carry the metal engaging portions of the press through the metal shaping, punching or stamping operation.

It will be obvious to those skilled in the art that a press equipped with the device of the invention will immediately upon completing the punching, drawing or stamping operation resume its normal operating cycle, the fly wheel 21 in effect catching up with the weight 22 so that it immediately resumes its normal position in registry with the bracket 28 and is hence ready for operation even on the next succeeding stroke of the press.

It will also be obvious to those skilled in the art that the invention disclosed herein completely changes the heretofore normal capacity ratings of various presses as they depended solely on the motive power of the press for its punching, drawing or stamping operation, whereas the device disclosed herein utilizes the striking force of the original momentum of the weight applied to the crank shaft.

It will thus be seen that the several objects of the invention are achieved by the device disclosed herein and that punch presses and various other presses known in the art may be advantageously equipped with the device of the invention to enable them to handle efficiently and easily metal stampings and the like of greater area and/or weight and/or thickness or gauge than has heretofore been believed possible.

Having thus described my invention, what I claim is:

1. In a press including a pair of dies and means for moving one of the said dies with respect to the other, said means comprising a crank shaft having a fly wheel thereon, means for imparting striking force to the moving parts of the said press at such times at they slow down or stop, said means comprising a weight pivoted to the crank shaft of the said press, means on said fly wheel in the path of said weight, the said weight freely movable between the said means on the fly wheel so that it is normally revolved with the fly wheel by the said means and is capable of moving to strike the said means when the fly wheel slows down or stops.

2. In a press having a crank shaft and metal forming means operable thereby, and a fly wheel keyed to the said crank shaft, a weight rotatably positioned on the said crank shaft, a bracket on said fly wheel in the path of the said weight and a striking block on the said fly wheel in the path of the said weight, the bracket adapted to engage the said weight and cause it to revolve with the said fly wheel, the said weight being freely movable in an arc between the said bracket and the said striking block so that upon the fly wheel moving slower than the said weight the said weight will engage the said striking block to impart striking force to the said fly wheel.

3. In a press having reciprocally mounted work engaging means and rotatable means operatively connected with the said work engaging means for moving the same, means for imparting a hammer-like blow to the said work engaging means and comprising a weight rotatably mounted on the said rotatable means, blocking means on the rotatable means in the path of the said weight so that the weight is revolved thereby with the said rotatable means and so that the weigh will continue to revolve when the rotatable means stops revolving and thereby impart a striking blow to the said blocking means, the rotatable means and the work engaging means of the press.

4. In a punch press means for imparting striking movement to the work engaging members thereof, said means including a weight rotatably

mounted on the crank shaft of the said punch press and adjacent the fly wheel thereon, a bracket on the said fly wheel in the path of the said weight for rotating the said weight with the fly wheel, a striking block on the said fly wheel in the path of the said weight and spaced with respect to the said bracket so that the weight will strike thereagainst when the said fly wheel slows down or stops, the said bracket and the said striking block being adjustably positioned on the said fly wheel.

5. In a press including a pair of dies and means for moving one of the said dies with respect to the other, said means comprising a crank shaft having a fly wheel thereon, means for imparting striking force to the moving parts of the said press at such times as they slow down or stop, said means comprising a weight pivoted to the crank shaft of the said press, means on said fly wheel in the path of said weight, the said weight freely movable between the said means on the fly wheel so that it is normally revolved with the fly wheel by the said means and is capable of moving to strike the said means when the fly wheel slows down or stops, the said means on the fly wheel being positioned thereon to receive the impact of the weight thereagainst at the point of sufficient resistance to slow down the fly wheel.

6. In a press having reciprocally mounted work engaging means and rotatable means operatively connected with the said work engaging means for moving the same, means for imparting a hammer-like blow to the said work engaging means and comprising a weight rotatably mounted on the said rotatable means, blocking means on the rotatable means in the path of the said weight so that the weight is revolved thereby with the said rotatable means and so that the weight will continue to revolve when the rotatable means stops revolving and thereby impart a striking blow to the said blocking means, the rotatable means and the work engaging means of the press, the said blocking means being positioned on the rotatable means so as to receive the striking blow of the said weight at the point of sufficient resistance to slow down the rotatable means.

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