April 19, 1955 L. W. RUPPERT 2,706,525

STOP FOR THE ADJUSTABLE SCREW OF A PUNCH PRESS RAM

Filed July 5, 1951

FIG. 1

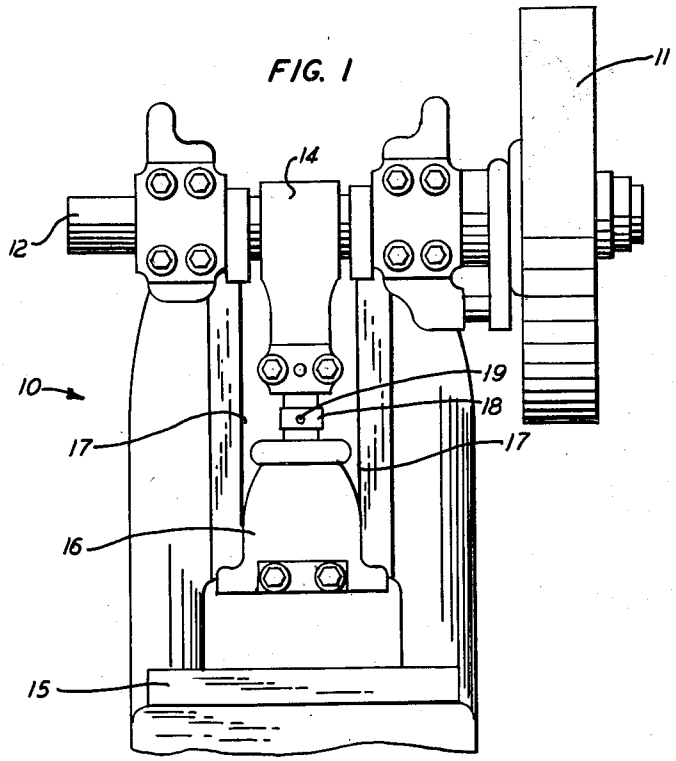


FIG. 2

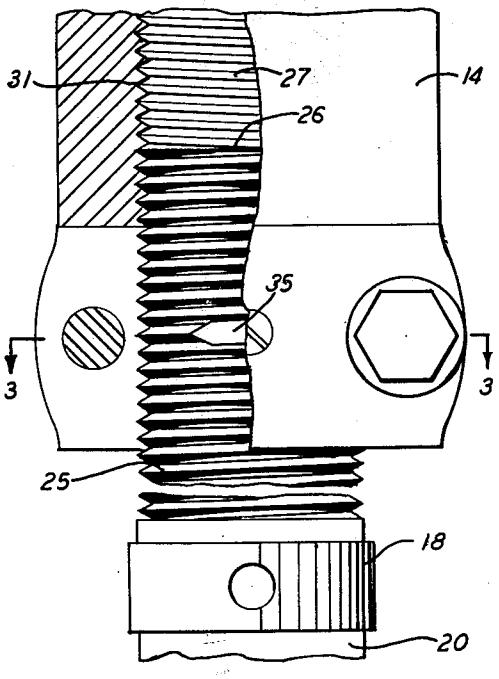
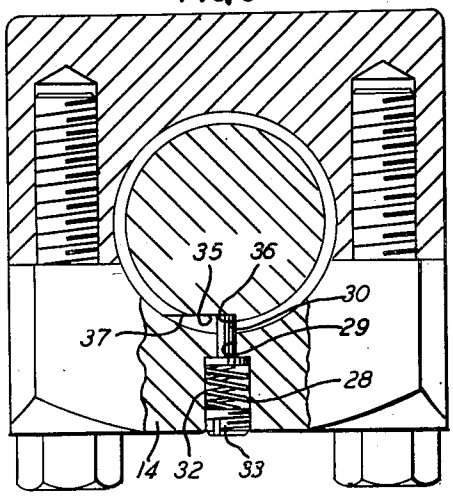


FIG. 3



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STOP FOR THE ADJUSTABLE SCREW OF A PUNCH PRESS RAM

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1 Claim. (Cl. 164—106)

This invention relates to stops for adjustable threadedly supported, suspended elements and more particularly to stops for adjustable rams of punch presses.

In various types of punch presses a threaded shank with right and left hand threads interposed between members of a ram provides adjustment of the ram relative to the stationary bed or tool holder of the press. During rotation of the threaded element in the standard presses, there is nothing to indicate how far the ends of the threaded element extend into the members of the ram. It is therefore possible for the person setting up the press to adjust the threaded element to a position in which only a few convolutions of the threads remain in the members of the ram and these few threads are insufficient to absorb the thrust of the work stroke of the press. If the press is operated under these conditions threads will, no doubt, be stripped from both ends of the element and the members of the ram rendering the press useless.

It is the object of the present invention to provide a stop which is simple in structure yet highly efficient in stopping an adjustable threadedly supported element in its holder against further movement out of the holder beyond a given position.

With this and other objects in view, the invention comprises a stop mechanism including a holder having a continuous internal thread for a given distance therein from its lower end, an element having a thread receivable for interengagement with the thread of the holder and extending substantially continuously from one end of the element to a point a given distance from the end excepting at a recess which interrupts the thread a given distance from the end of the element and is adapted to receive a member carried by the holder and normally urged inwardly to stop the element against further downward movement when entering the recess.

To illustrate the present embodiment of the invention a press with a reciprocating ram has been selected. The ram has two members adjustably connected to each other by the threaded element. A spring pressed pin carried by the holder or upper member of the ram is spring pressed and so positioned that it will extend through the valley between two convolutions of the thread to ride upon the top of the thread of the element to enter the recess. The formation of the recess includes a shoulder at one end thereof to engage the stop pin, stopping further movement of the element downwardly while a cam-like portion at the other end of the recess permits a reverse motion of the element so that it may again be moved upwardly into the threaded aperture of the ram.

Other objects and advantages will be apparent from the following detailed description when considered in conjunction with the accompanying drawing wherein:

Fig. 1 is a front elevational view of a press embodying the invention;

Fig. 2 is an enlarged fragmentary front elevational view of a portion of the ram and element, portions thereof being shown in section; and

Fig. 3 is a horizontal sectional view taken along the line 3—3 of Fig. 2.

Referring now to the drawings, attention is first directed to Fig. 1 which illustrates a press **10** selected to illustrate the invention. The press has the conventional flywheel **11** on the crank-shaft **12** driven in the usual manner. A holder or upper member **14** of a ram is mounted on the crank-shaft **12** and caused to reciprocate relative to a stationary work support **15**. A lower member **16** of the ram is disposed between guides **17** to assure movement of this member of the ram in a given path relative to the stationary support **15**. The members **14** and **16** of the ram are connected to each other by a threaded element **18**. The central portion of the threaded element **18** may be provided with the conventional apertures **19** to receive a tool suitable for rotating the element in either direction. Furthermore, the lower portion **20** of the element may be provided with the conventional left-hand threads for connection with the member **16**.

The features embodying the invention include the thread **25** of the upper portion of the element **18** which extends from the upper end **26** through the major portion of the upper portion of the element. This thread of the element is arranged for interengagement with the thread **27** within the holder or upper ram member **14**.

The holder or ram member **14** has aligned apertures **28** and **29** to receive a headed pin **30** at a position where the pin will extend through the valley **31** between adjacent convolutions of the thread **27**. In this manner the inner end of the pin will ride on the outer edge of the thread **25** during rotation of the element **18**. A spring **32** is positioned in the aperture **28** to engage the head of the pin **30** and compressed by a screw **33** mounted in a threaded outer portion of the aperture whereby the pin will be urged inwardly under a predetermined pressure.

At a given position along the thread **25** or at a selected convolution of the thread, a recess **35** is formed. The recess is provided with a shoulder **36** at one side thereof to abut against the pin **30** and a cam-like portion **37** at the other side thereof to cause the pin to ride back onto the outer edge of the thread **25**.

Considering now the function of the invention, let it be assumed that the person setting up the press desires to lower the tool mounted on the under surface of the member **16**. There is nothing to indicate the position of the ends of the element **18** in their respective members **14** and **16**. However, it is impossible for the person making the adjustment to move the members **14** and **16** beyond safe limits. This is assured by the stop pin **30** and the recess **35**. The stop pin **30**, riding on the thread **25** under the force of the spring **32**, is in readiness at all times to enter the recess **35** when brought into registration with the pin. When this has been accomplished, the element is firmly held against further rotation to lower the element **18** and with it the member **16**. While the element **18** is in this position, there remains a sufficient number of convolutions of the thread **25** in interengagement with the convolutions of the thread **27** to withstand the thrust of the press. Furthermore, the element is in readiness for reverse adjustment due to the cam formation **37** of the recess **35**, permitting immediate rotation of the element so that it will move upwardly into the holder or ram member **14** and farther into the member **16**.

It is to be understood that the above-described methods and circuits are simply illustrative of the application of the principles of the invention. Various other possible modifications of these methods and circuits, embodying the principles of the invention and falling within its spirit and scope, will occur to those skilled in the art.

What is claimed is:

In a press having a crank shaft rotatable to actuate a ram comprising upper and lower members connected by an adjustable element, means movably connecting said lower member to said adjustable element, a threaded connection between the upper member and the element including a safety stop comprising a recess formed longitudinally in one portion of the thread of the element with a substantially radially extending shoulder at one end of the recess, and a spring pressed stop pin carried by the upper member and normally urged to ride on the thread of the element to enter the recess, when moved into registration therewith, to stop movement of the element downwardly beyond a safe limit of interengagement with threads of the element and upper member, the recess also having a cam portion adjacent the other end thereof whereby the pin will be retracted from the recess by the cam portion and whereby the element may be

freely moved upwardly and downwardly for a limited distance.

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