Feb. 17, 1970 E. A. LAFRENIERE 3,495,527

HYDRAULIC PRESS

Filed July 10, 1968 2 Sheets-Sheet 1

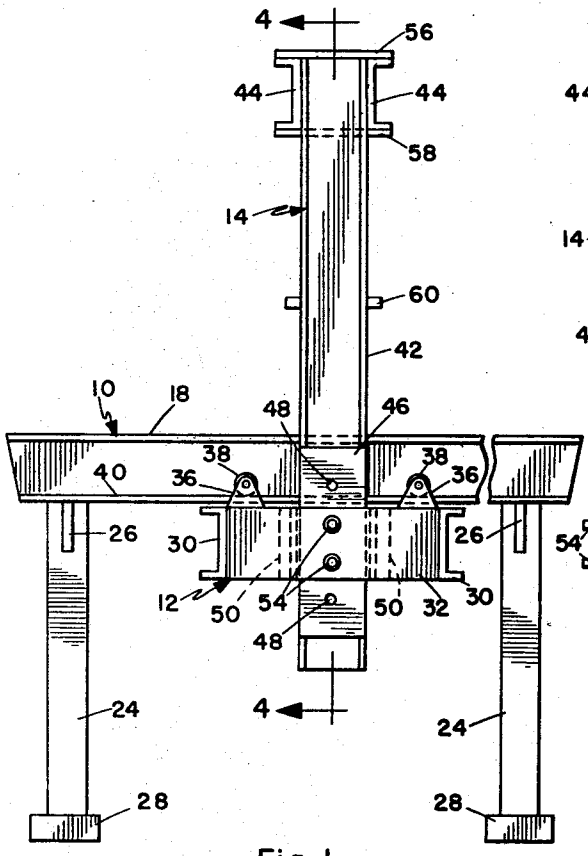


Fig. 1

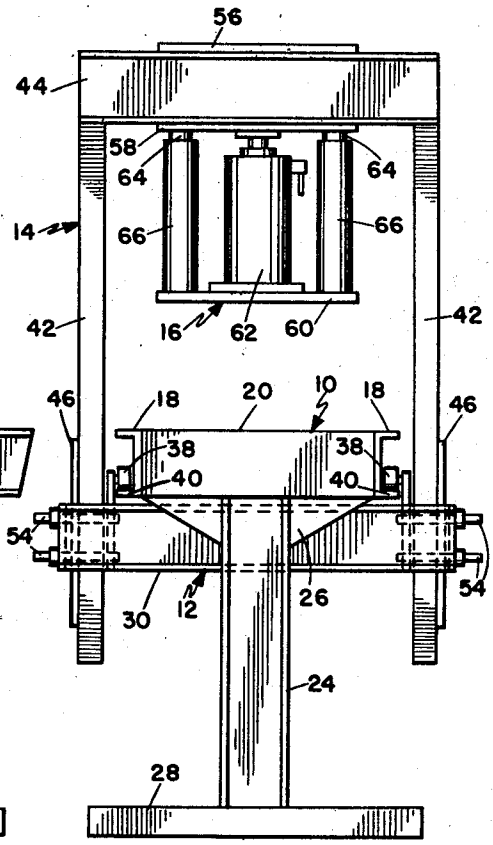


Fig. 2

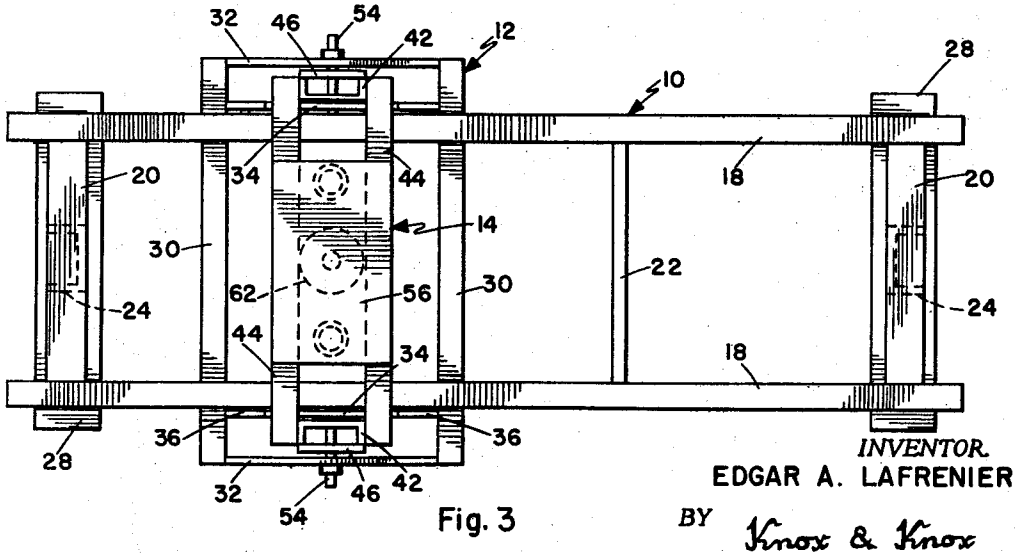


Fig. 3

INVENTOR.
EDGAR A. LAFRENIERE
BY Knox & Knox

Feb. 17, 1970 E. A. LAFRENIERE 3,495,527

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Filed July 10, 1968 2 Sheets-Sheet 2

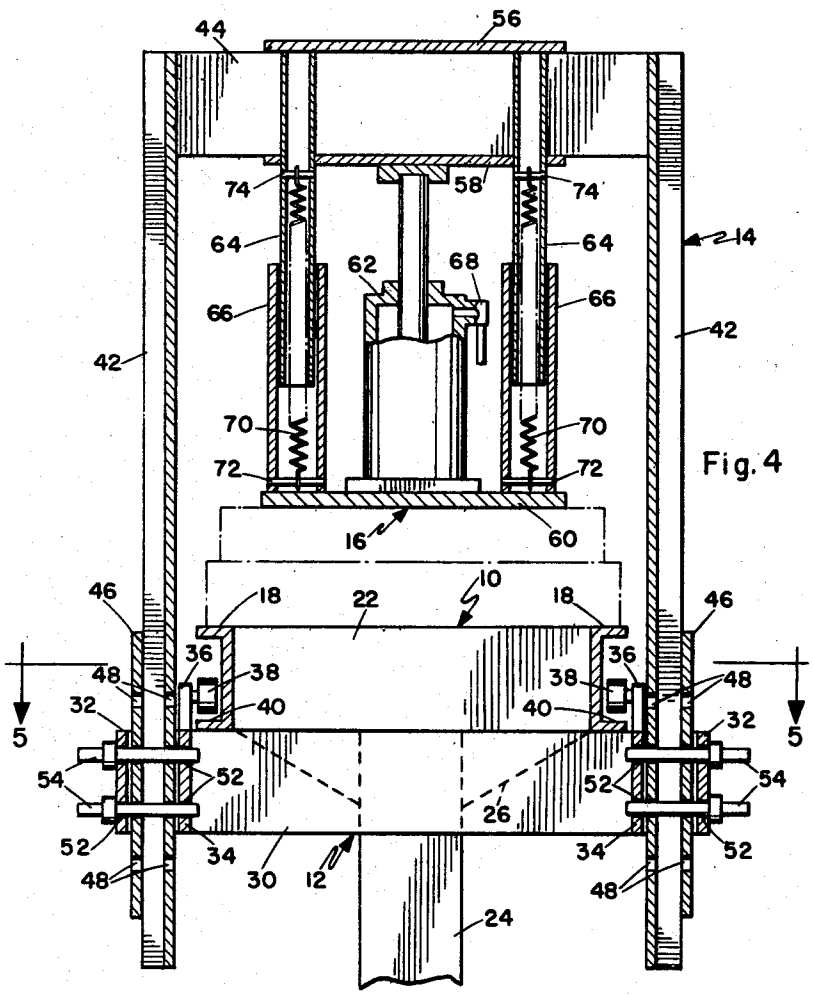


Fig. 4

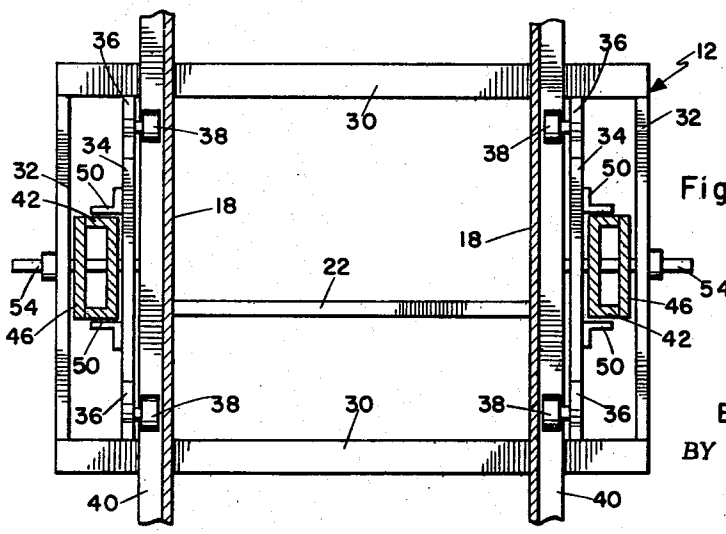


Fig. 5

INVENTOR.
EDGAR A. LAFRENIERE
BY Knox & Knox

United States Patent Office

3,495,527
Patented Feb. 17, 1970

3,495,527

HYDRAULIC PRESS

Edgar A. Lafreniere, Rte. 3, Grafton, N. Dak. 58237

Filed July 10, 1968, Ser. No. 743,872
Int. Cl. B30b 1/32; B21j 13/00
U.S. Cl. 100—226 6 Claims

ABSTRACT OF THE DISCLOSURE

The press has a hydraulically powered head carried on an arch type frame mounted on a roller carriage, which rolls to any position along a work bed. The working pressure load is carried entirely by the closed structure of the frame and carriage against the bed and the rollers support only the weight of the frame and carriage. Adjustment means are provided for adjusting the height of the frame and the hydraulic unit can be used to position the frame at the required height.

BACKGROUND OF THE INVENTION

The present invention relates to presses and related machinery and specifically to a hydraulic press.

Most hydraulic presses have a unitary rigid frame on which is a fixed or movable work table or bed. One particular type has a press head which slides or rolls back to an inoperative position, to provide clear access to the work area. In working position the pressure load is carried through the slide or roller structure, necessitating very rugged construction of these parts.

SUMMARY OF THE INVENTION

The press described herein has an elongated work bed on which is mounted a roller carriage passing below the bed. On the carriage is an arch-like frame extending over the bed and carrying the hydraulic pressure head assembly. When pressure is applied the carriage is lifted against the bed, relieving the rollers of the load. The frame is vertically adjustable on the carriage to accommodate a variety of work and the hydraulic unit can be used to raise or lower the frame to the required position. Return springs are coupled to the pressure head to raise the head after a pressure stroke, which permits the use of a simple single action jack for the hydraulic actuator. The press is operable at an infinite number of positions of the carriage along virtually the entire length of the bed.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a side elevation view of the press;

FIGURE 2 is an end elevation view thereof;

FIGURE 3 is a top plan view thereof;

FIGURE 4 is an enlarged sectional view taken on line 4—4 of FIGURE 1; and

FIGURE 5 is a sectional view taken on line 5—5 of FIGURE 4.

Similar characters of reference indicate similar or identical elements and portions throughout the specfication and throughout the views of the drawings.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The press comprises, basically, an elongated bed **10**, a carriage **12** mounted on the bed, a frame **14** supported by the carriage and a pressure head **16** suspended from the frame.

Bed **10** has a pair of horizontal parallel side rails **18** made from steel channel with the flanges turned outwardly, the side rails being secured together by cross members **20** at the ends and by intermediate cross members **22** spaced as necessary. The bed is supported on legs **24**

secured below cross members **20** and reinforced by gussets **26**, the lower ends of the legs having large feet **28** to support the press in a stable manner.

Carriage **12** comprises a pair of cross beams **30** secured at opposite ends in spaced parallel relation by outer end plates **32**, and by tie plates **34** equally spaced a short distance inwardly from the outer end plates. Each tie plate **34** has a pair of upwardly projecting brackets **36** adjacent the cross beams, each bracket carrying a freely rotatable roller **38**. The carriage is suspended below bed **10**, with the rollers **38** riding on top of the lower flanges **40** of side rails **18**, so that the carriage can roll the full length of the bed between legs **24**. Clearance between the carriage and the underside of the bed is just sufficient for free longitudinal movement of the carriage.

The frame **14** is an arch-like structure having a pair of vertical side posts **42** joined at the top by double cross members **44** all of which may be of steel channel. At the lower ends the side posts have reinforcing plates **46** with vertically spaced holes **48** in coaxial pairs through the posts and reinforcing plates. The posts extend downwardly through the carriage **12** between end plates **32** and tie plates **34**, straddling the bed **10**, the tie plates having guide rails **50** spaced to hold the posts in vertical sliding alignment. End plates **32** and tie plates **34** have coaxially aligned holes **52** spaced to correspond with the holes **48**, the frame being held in place by retaining pins **54** passed through the end plates, the reinforcing plates **46**, the posts **42** and the tie plates on each side of the carriage. Two pins are shown on each side, but a single pin could be used depending on strength requirements. By providing additional holes **48** in the posts **42**, the frame may be adjusted vertically as required and locked at each position by the pins **54**. At the top of frame **14** the cross members **44** are connected by an upper web plate **56** and a lower web plate **58** to support the head **16**.

The head comprises a rigid pressure plate **60**, which is connected to the lower web plate **58** by a hydraulic actuator **62** having a vertical operating stroke. Extending downwardly from upper web plate **58** and through the lower web plate are two struts **64**, parallel to and spaced on opposite sides of the actuator **62**. On top of pressure plate **60** are upwardly extending sleeves **66** which are telescopically slidable over struts **64** and stabilize the head. The actuator **62** may be a dual action type but is shown as a simple single action type with the power stroke in the downward direction. The pressure connection **68** at the top of actuator **62** may be coupled to a manually pumped pressurizing unit, or a pressure reservoir with suitable return means, the specific type not being important. To raise the pressure plate after a stroke, return springs **70** are installed in sleeves **66** and are connected between pins **72** through the sleeves and pins **74** through struts **64**. Coil type tension springs are indicated, but other spring arrangements may be equally suitable for contracting the telescopic elements.

In use the work piece **76** is placed on the bed **10**, as indicated in broken line in FIGURE 4, and suitable support or mounting means being used as needed. The carriage and frame assembly may be rolled clear of the work area to facilitate setting up, then rolled back over the workpiece for the press operation. When the actuator **62** is operated, the pressure plate **60** is forced down on the workpiece **76**, which causes the frame to be lifted slightly until the carriage bears on the underside of side rails **18**, as in FIGURE 4. Rollers **38** are lifted clear of flanges **40** and carry none of the working load the stress being applied through the closed rectangular structure of the frame and carriage. When the pressure is released the return springs **70** will lift the pressure plate **60** and the carriage will be lowered to rest again on rollers **38**.

When it is necessary to raise or lower the frame **14** to accommodate a particular workpiece, the actuator **62** can be used to assist. With a suitable block or support in place on the bed **10**, the pressure plate **60** is lowered to rest on the support and take the weight of the frame, so that retaining pins **54** can be removed. The actuator is then used to adjust the frame to the required position and the retaining pins replaced. Pressure is then relased and the press is ready for operation. Since the structure of even a small press is rather heavy, this is a distinct advantage.

The roller mounted carriage and frame assembly can be used at any position along the bed and is easily movable by hand.

Several pieces of work could be set up at different positions on the bed and the press unit moved to each in turn, or to several positions on a large piece of work.

It is understood that minor variation from the form of the invention disclosed herein may be made without departure from the spirit and scope of the invention, and that the specification and drawings are to be considered as merely illustrative rather than limiting.

What is claimed is:

1. A hydraulic press, comprising:

an elongated bed having parallel side rails;

a carriage suspended below said bed and having supporting rollers riding on said side rails;

an upwardly arched frame secured to said carriage and straddling said bed;

and a vertically adjustable hydraulic actuator mounted on the underside of said frame, over said carriage and bed, said actuator having a pressure plate on the lower end thereof;

whereby the press is capable of compressing work placed between said pressure plate and said bed at an infinite number of positions of said carriage along the virtually complete length of said elongated bed.

2. The structure of claim **1**, wherein said frame is vertically adjustable on said carriage.

3. The structure of claim **1**, wherein said frame has vertical side posts, said carriage having guide means through which said posts are vertically slidable, and retaining means securing said frame at selected positions on said carriage.

4. The structure of claim **1**, and including return means connected between said frame and said pressure plate, to raise the pressure plate when said actuator is inactive.

5. The structure of claim **4**, wherein said return means comprises telescopic struts secured between said frame and said pressure plate substantially parallel to the axis of said actuator, and contracting spring means in said struts.

6. The structure of claim **1**, wherein said carriage, as supported by said rollers, has portions thereof spaced very slightly below said bed enabling only limited freedom of upward motion of the carriage, whereby operation of said actuator causes the carriage to be lifted against the underside of said bed and relieves the load from said rollers.

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BILL J. WILHITE, Primary Examiner

U.S. Cl. X.R.

100—257, 266, 269; 72—446