Dec. 15, 1959 E. HÄNNI 2,916,987

PRESS

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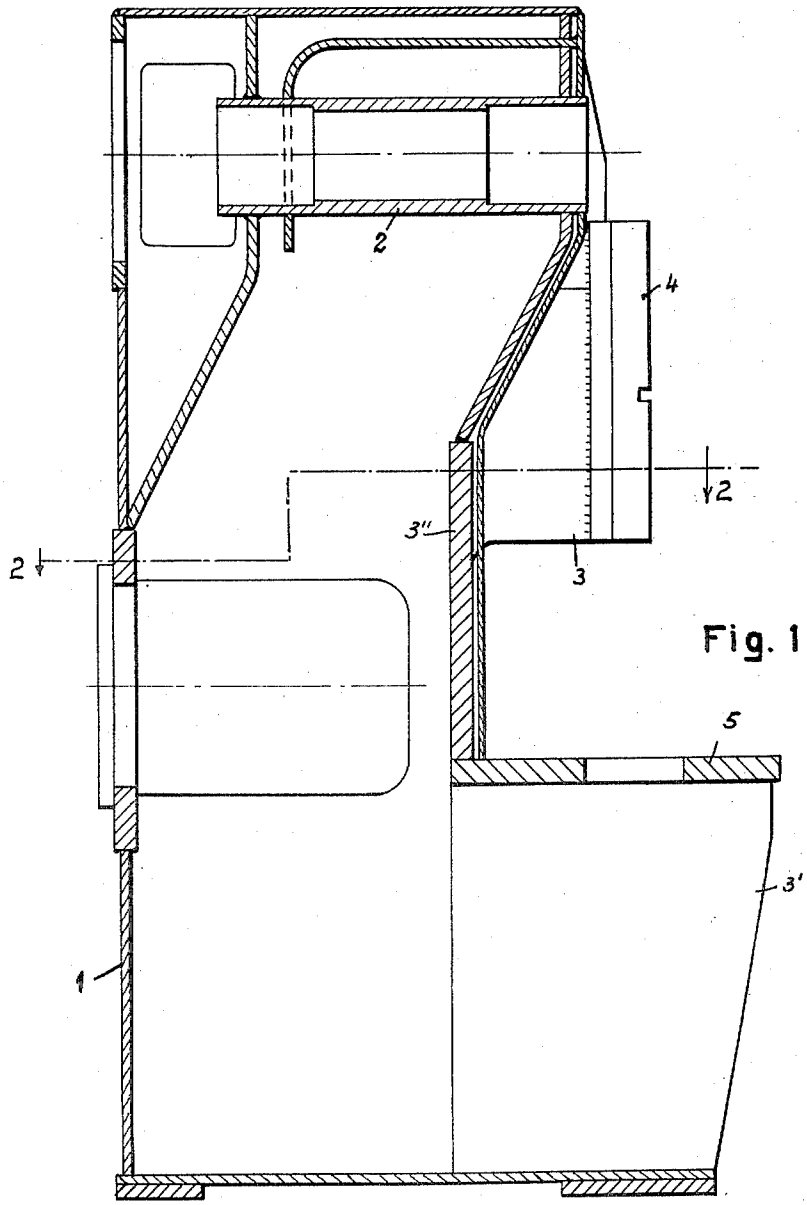


Fig. 1

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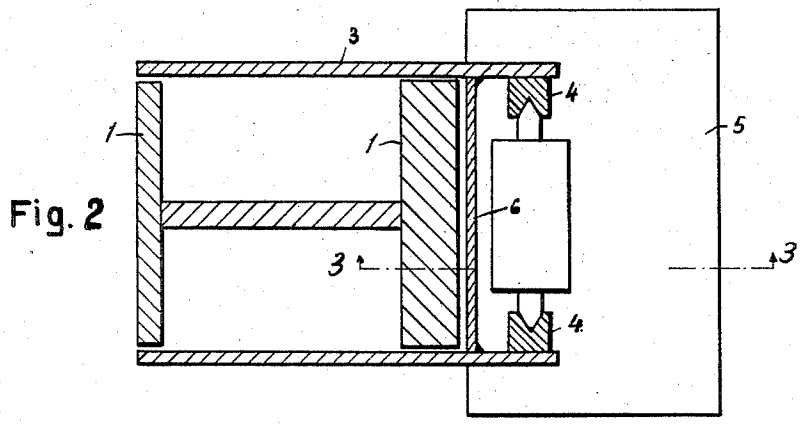
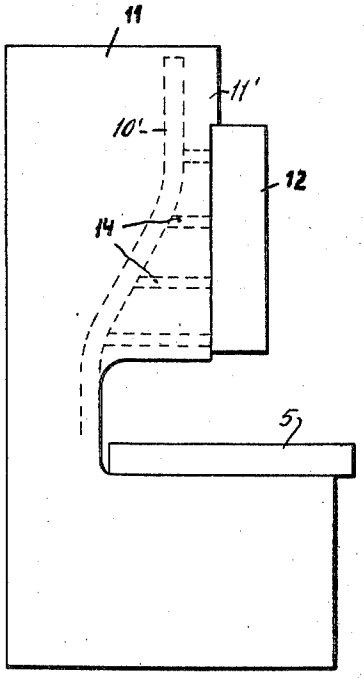


Fig. 2



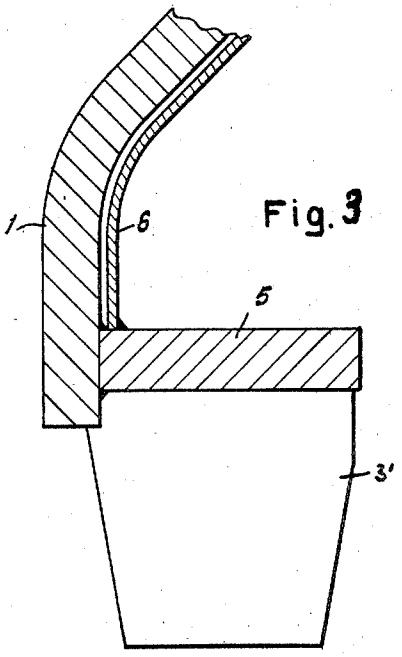


Fig. 3

Fig. 4

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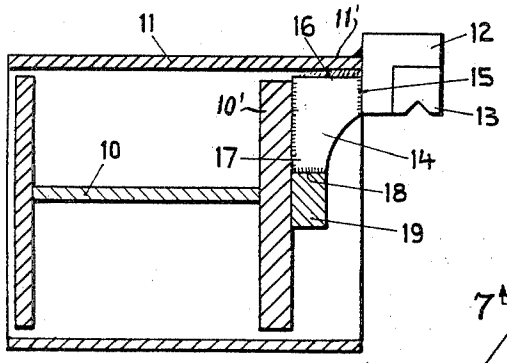


Fig. 5

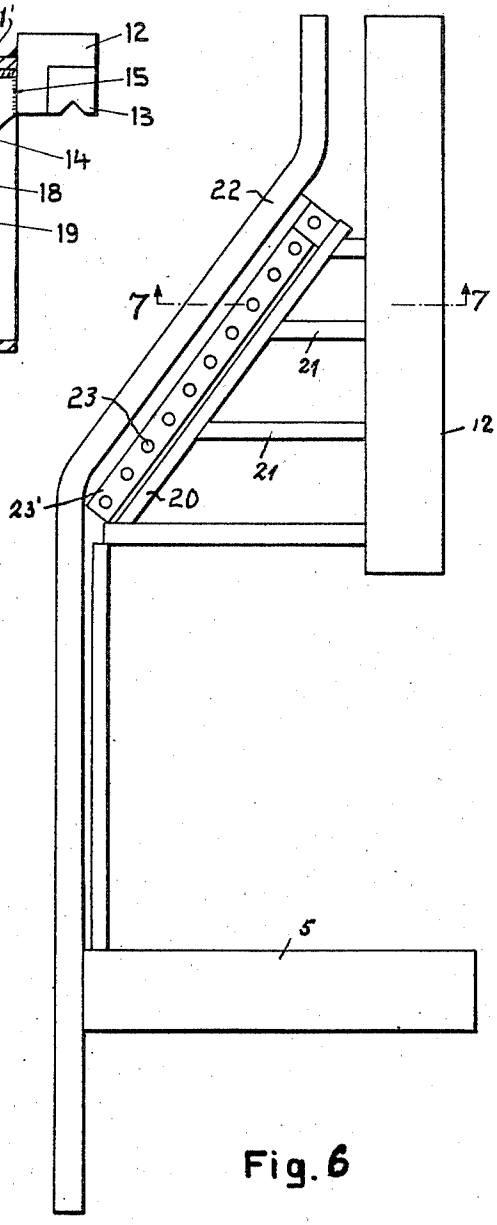


Fig. 6

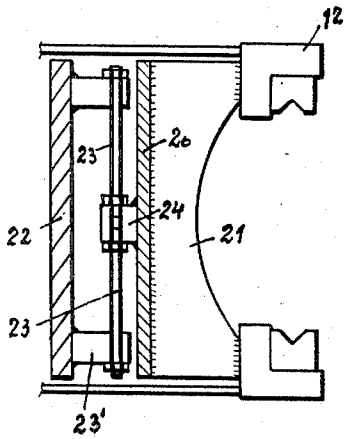


Fig. 7

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PRESS

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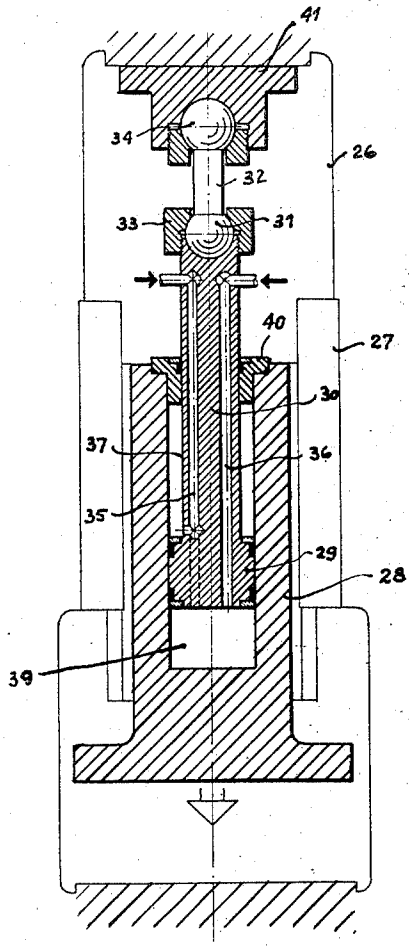


Fig. 9

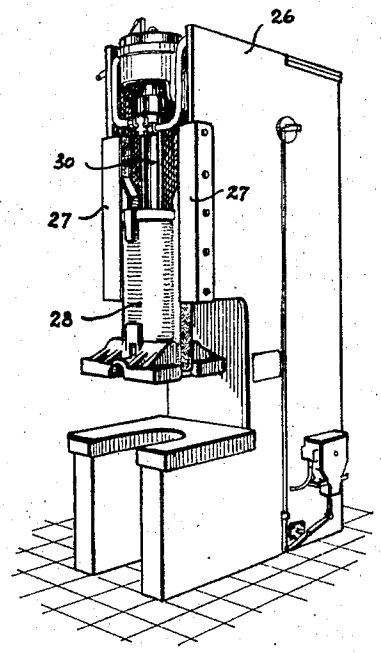


Fig. 8

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PRESS

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Claims priority, application Switzerland July 18, 1953
6 Claims. (Cl. 100—231)

The present invention relates to a press, for example an eccentric press of the open front type. The press comprises a main frame, a bed and a ram which is movably mounted in guides. The known presses of the open front type have the guides of the ram directly mounted on the main body which is so disadvantageous that when the main body of the press is deflected by the applied load the guides connected to the same are moved out of their perpendicular position in relation to the table. The tool consequently gets out of alignment and wears out. The object of the present invention is to overcome this disadvantage.

The press in accordance with the invention comprises a main frame which absorbs the pressing-force acting on the conventional ram, and a separate supporting frame provided apart from the main frame, for carrying the guides of the ram.

Various embodiments of the invention will now be described by way of example with reference to the accompanying drawings wherein:

Fig. 1 is a schematic view of a press in vertical section,

Fig. 2 is a section along the line 2—2 in Figure 1,

Fig. 3 is a detailed section along the line 3—3 of the Figure 2 of a modified form of the device,

Figures 4 and 5 are a side view and horizontal sectional view of a further embodiment of the invention.

Figures 6 and 7 are a side view and horizontal sectional view of another modification wherein Figure 7 shows a partial sectional view along the line 7—7 of Figure 6,

Fig. 8 is a perspective view of a hydraulic press, and

Fig. 9 is a vertical section of the press shown in Fig. 8.

Referring now to the diagrammatic view in Figure 1, the press includes a main frame 1 comprising longitudinal and reinforcing stays or struts. The frame supports above a tube 2, in which in conventional manner a shaft for a crank or for an eccentric press member (not shown) is disposed. Furthermore, a supporting frame including lateral supporting elements 3 which form the lateral walls of the press is provided. Each of these lateral supporting elements 3 carry vertical guide members 4 in which a ram, not shown, is guided. In this construction the supporting upper portion of the main frame which absorbs the pressure is disposed spaced from the upper portion of the supporting frame. The guides can, therefore, not be influenced by the resulting deflection of the main frame.

Each of the supporting elements 3 is secured to the supporting portion 3' which is fixed to the lower end of a bed. Bed 5 is connected to the main frame 1 by means of massive stays 3'. The guide members 4 and the table 5 are disposed perpendicular to one another, as they are connected to one another by the supporting elements 3 which are independent from the influence of the pressing force. The guides do not suffer in any way from the deformation of the main frame.

The absorption of the resulting lateral pressure of the press member in the plane of the guides can take place in several ways. For example, a connecting means 6 is provided in Figure 3 between the two supporting walls 3. Together with the connecting means 6, the supporting walls form a rigid U-frame, which can be considered as fixed on the table-top, absorbing simultaneously the lateral pressures.

The modification illustrated in the Figures 4 and 5 comprises also a main frame 10. Two lateral walls 11 constitute a supporting frame and carry on the upper supporting portion 11' the supports 12 for the guides 13, in which a ram (not shown) is mounted. Furthermore, flexible horizontal connecting plates 14 are provided in tiers, one on top of the other, which act as elastic elements. These supporting plates are fixed to the support 12 and to the upper supporting portion of frame 11 by means of the welding connections 15 and 16 as well as to the upright supporting portion 10' of frame 10 and to a central column 19 by means of the welding connections 17 and 18. The column 19 is secured to the front part of the main frame and extends upwardly. Lateral forces acting in the horizontal plane are transferred in a horizontal plane direct from the connecting plates 14 to the main frame while the deformation or vibration of the main frame in a vertical plane is not carried over to the guides. A further embodiment of the invention is illustrated in the Figures 6 and 7. A supporting plate 20 is provided, which carries the horizontal connecting plates 21. These plates are disposed in tiers one on top of the other. The connection between the front plate 20 and the main frame 22 is effected by the bolt means 23 which is stressed by torsion. The front part of the main frame carries supporting bracket 23'. Another supporting bracket 24 is disposed in the middle of the front plate 20 and is provided with a threaded bore. The screw-bolts 23 are introduced from opposite sides through bores in brackets 23' and into the threaded bores of the supporting bracket 24 and secured on to the same. In this way an elastic connection in vertical direction is attained.

In Figures 8 and 9 the construction described above is employed in a hydraulic press. The frame of the press is designated with 26, which is provided with guides 27. In these guides 27 a force-cylinder 28 is mounted for vertical movement. The cylinder 28 includes a piston 29, of which the piston rod 30 extends upwardly. The top end of the piston rod 30 is connected to a ball 31 of a joint 32. The ball 31 is fastened by means of a nut 33 to the piston rod, so that the joint can be swung in a vertical plane. The other end of the joint 32 carries a further ball 34 which is mounted in the frame 34 in similar manner as the ball 31 for movement in a vertical plane.

The piston rod includes longitudinal bores 35 and 36, which are connected at their upper ends to a pressure source, for example a pump. The conduit 35 leads to the cylinder space 37 above the piston 29, whereas the conduit 36 leads to the cylinder space 39 below the piston 29. Liquid flowing through the conduit 35 enters the cylinder space 37, which is closed above by a plug 40. Due to the pressure the piston is forced downwards and supplies power. The retraction of the cylinder is effected by relieving the conduit 35 and putting the lead 36 under pressure. The liquid flows into the space 39 and relieves the space 37 as the liquid can flow out through the lead 35.

The pressing forces on the cylinder 38 are absorbed by a rigid supporting frame 41, whereas the guides 27 are carried by separate supporting elements. Due to the joint connection 32 between the piston rod 30 and the

rigid frame 41, the guides 27 are not influenced by the pressing-forces.

I have described preferred embodiments of my invention, but it is understood that this disclosure is for the purpose of illustration and that various omissions or changes in shape, proportions and arrangement of parts, as well as the substitution of equivalent elements for those herein shown and described may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

What I claim is:

1. A press frame comprising, in combination, a main frame including a bed portion and a supporting upright portion for supporting a press member opposite said bed portion; a supporting frame having a supporting upright portion located in the region of said supporting portion of said main frame; substantially vertical guide means for said press member secured to said supporting portion of said supporting frame; and connecting means connecting said supporting portions and being flexible in one direction in a vertical plane to permit relative displacement of said supporting portions when said main frame is deformed by the press force, and being rigid in a horizontal plane to transmit transverse forces acting on said guide means from said supporting frame to said main frame.

2. A press frame comprising, in combination, a main frame including a bed portion and a supporting portion having a tubular means for supporting a press member opposite said bed portion for turning movement about an axis; a supporting frame having a supporting portion located in the region of said supporting portion of said main frame; a pair of guide members for the press member located in a plane perpendicular to said axis, said guide members being secured to said supporting portion of said supporting frame; and connecting means connecting said supporting portions and being flexible in one direction to permit relative displacement of said supporting portions in one direction when said main frame is deformed by the press force, and being rigid in another direction transverse to said guide members and to said axis to transmit from said supporting frame to said main frame transverse forces produced by said press member and acting on said guide members.

3. A press frame comprising, in combination, a main frame including a bed portion and a supporting upright portion having a tubular means for supporting a press member opposite said bed portion for turning movement about a horizontal axis; a supporting frame having an upright supporting portion located in the region of said supporting portion of said main frame; a pair of substantially vertical guide members for said press member secured to said supporting portion of said supporting frame; and horizontal plate means fixedly secured to said supporting portions and connecting the same, said plate means being flexible in a vertical plane to permit relative displacement of said supporting portions when said main frame is deformed by the press force, and being rigid in a horizontal plane transverse to said guide members to transmit from said supporting frame to said main frame lateral forces produced by said press member and acting on said guide members.

4. A press frame comprising, in combination, a main frame including a bed portion and a supporting upright portion having a tubular means for supporting an eccentric press member opposite said bed portion for turning movement about a horizontal axis; a supporting frame having an upright supporting portion located in the region of said supporting portion of said main frame; a pair of substantially vertical guide members for said press member secured to said supporting portion of said supporting frame; and a plurality of horizontal plates arranged in tiers and fixedly secured to said supporting portions and connecting the same, said plates being flexible in a vertical plane to permit relative displacement of said supporting portions when said main frame is deformed by the press force, and being rigid in a horizontal plane transverse to said guide members to transmit from said supporting frame to said main frame lateral forces produced by said eccentric member and acting on said guide members.

5. A press frame comprising, in combination, a main frame including a bed portion and a supporting upright portion having a tubular means for supporting a press member opposite said bed portion for turning movement about a horizontal axis; a supporting frame having an upright supporting portion located in the region of said supporting portion of said main frame; a pair of substantially vertical guide members for said press member secured to said supporting portion of said supporting frame; an upright supporting plate located intermediate said supporting portions; horizontal torsion bolt means connecting said supporting plate with said supporting portion of said main frame; and a plurality of horizontal connecting members arranged in tiers and connecting said supporting portion of said supporting frame with said supporting plate, said connecting members being flexible in a vertical plane to permit together with said torsion bolt means relative displacement of said supporting portions when said main frame is deformed by the press force, and being rigid in a horizontal plane transverse to said guide members to transmit from said supporting frame to said main frame lateral forces produced by said eccentric member and acting on said guide members.

6. A press frame as set forth in claim 5 and including a pair of outer brackets secured to said supporting portion of said main frame spaced in horizontal direction, and an inner bracket located intermediate said outer brackets and secured to said supporting plate; and wherein said torsion bolt means include two threaded bolts passing through said outer brackets and threaded into said inner bracket.

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