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SIDE PLATE PRESS

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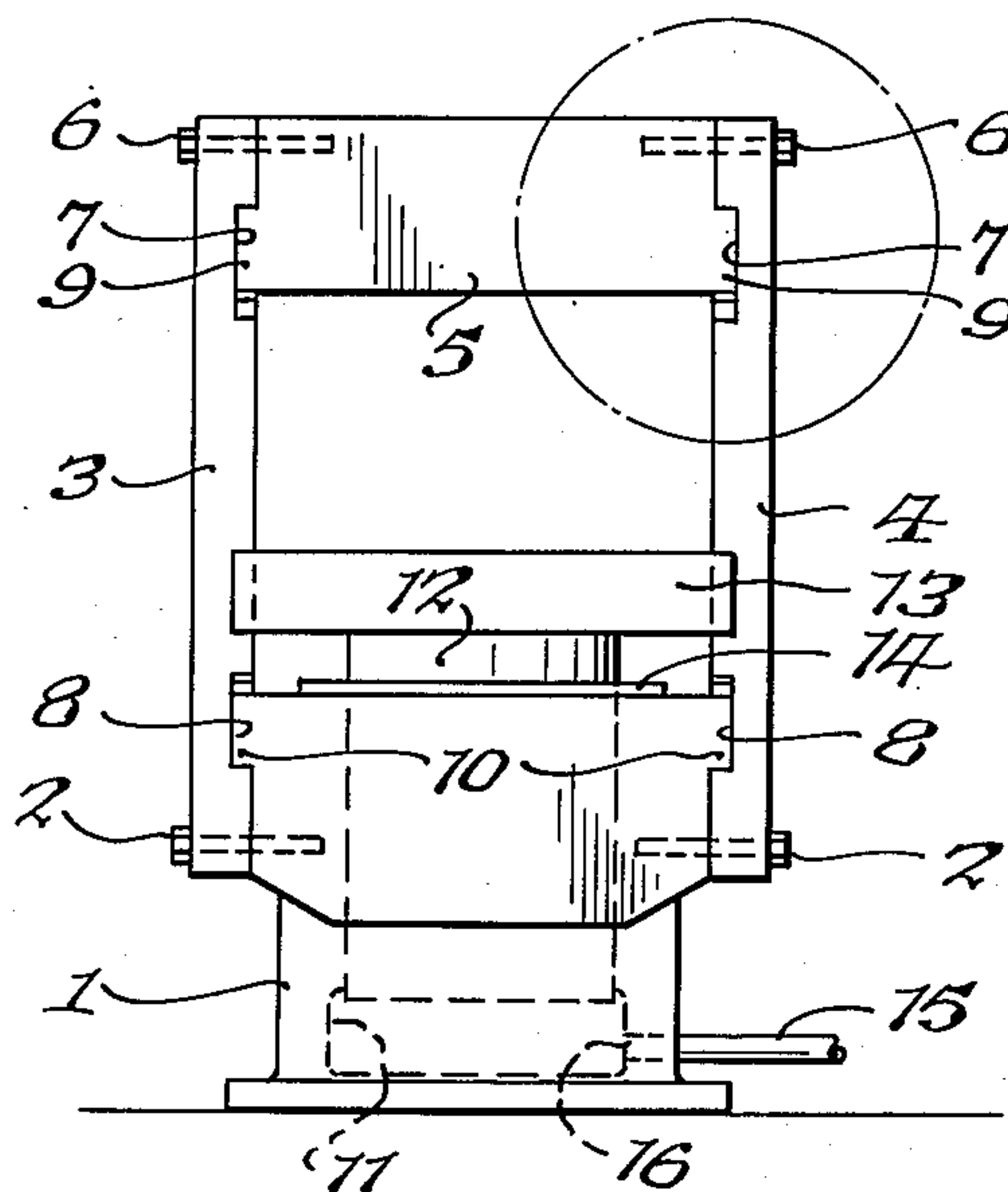


Fig. 1.

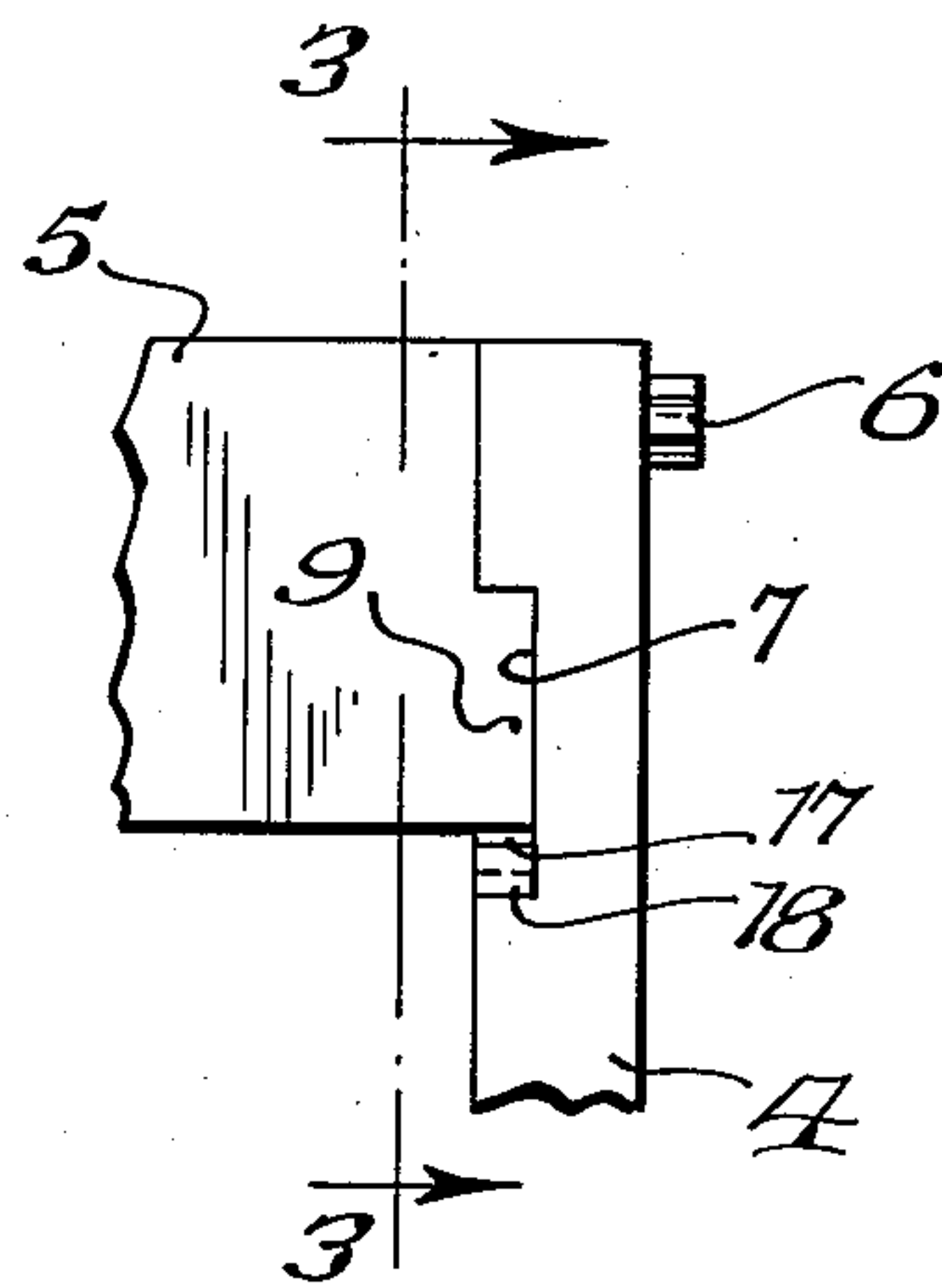


Fig. 2.

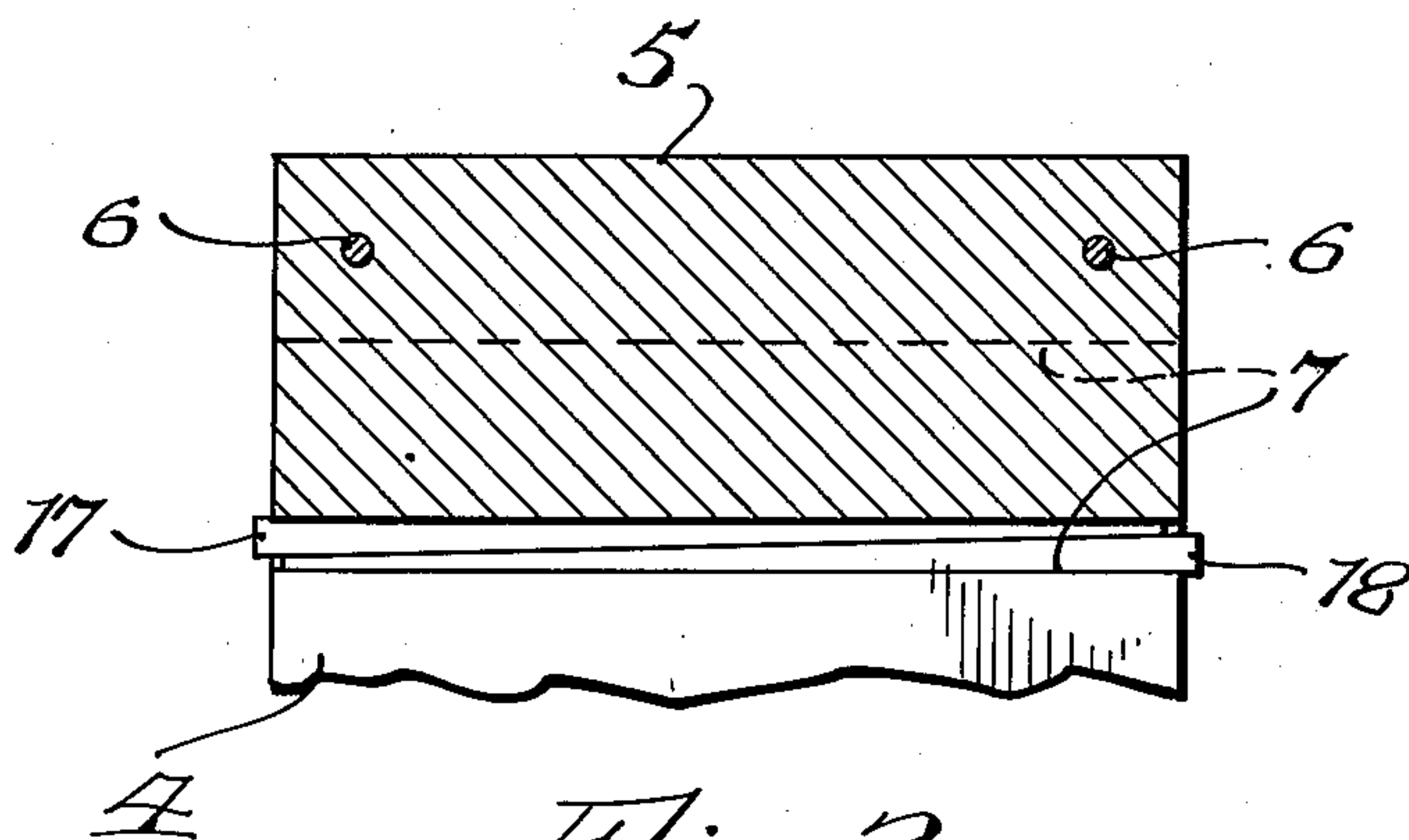


Fig. 3.

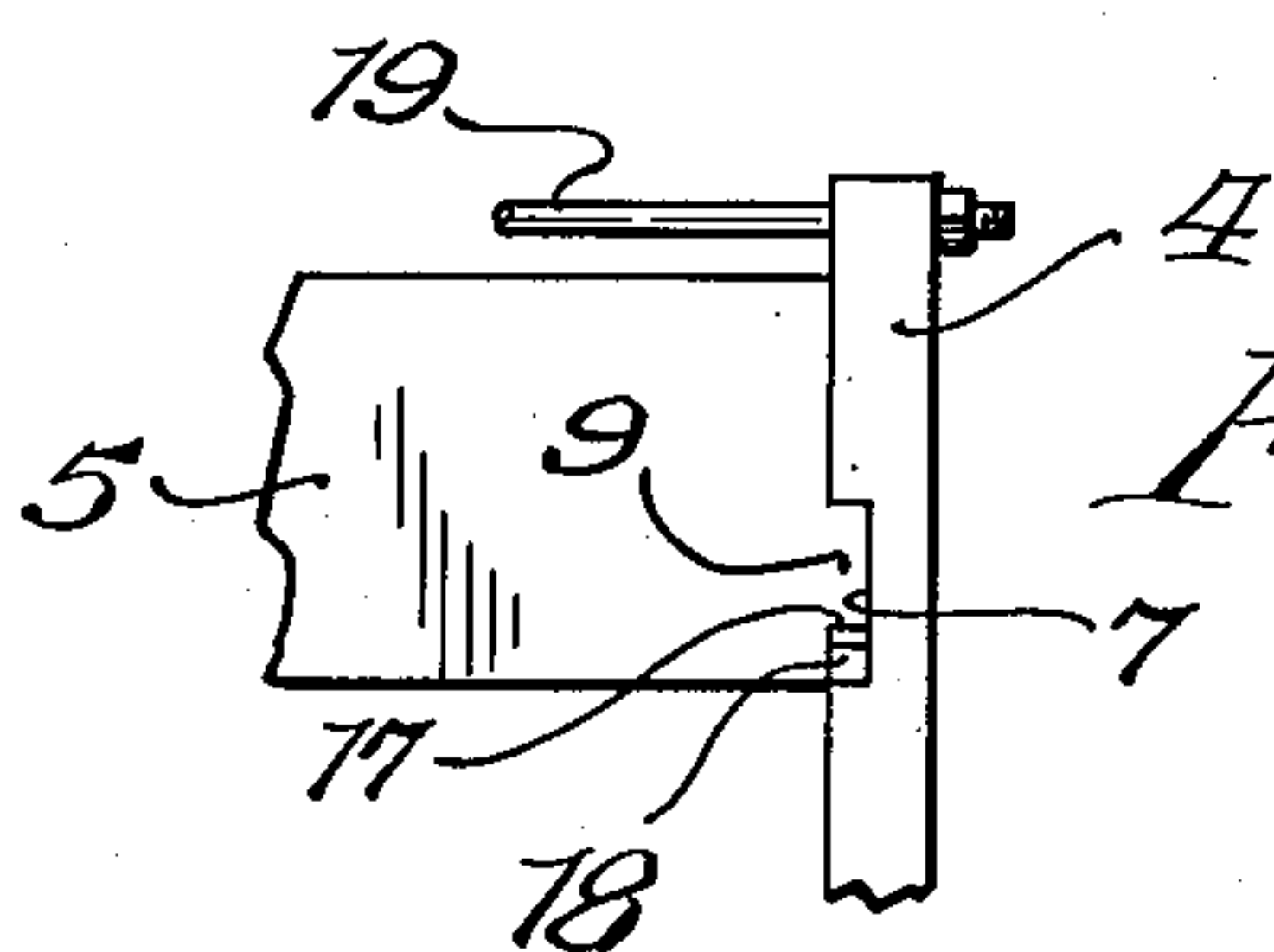


Fig. 4.

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SIDE PLATE PRESS

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6 Claims. (Cl. 100—269)

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This invention relates to hydraulic presses, and particularly to the type having heavy side plates arranged in spaced, side by side, parallel relation, a press head between and connecting the plates at one end, and a ram and platen between and connecting the plates near the other end. Presses of this type are illustrated for example in my prior Patents No. 2,013,587 granted Sept. 3, 1935 and No. 2,062,043 granted Nov. 24, 1936.

An object of this invention is to provide an improved side plate press construction, which will reduce the amount of accurate machining necessary to fit the head and base to the side plates, in which the connections between the platen and the head and base will not become loose while the press is under normal operating pressure; in which relative motion between the side plates and the head and base will be avoided while the press is in operation; in which any wear or permanent set may be compensated for in a simple manner; in which the cost of the construction will be reduced, and which will be relatively simple, practical and inexpensive.

Other objects and advantages will be apparent from the following description of one embodiment of the invention, and the novel features will be particularly pointed out hereinafter in connection with the appended claims.

In the accompanying drawings:

Fig. 1 is a front elevation of a press constructed in accordance with this invention;

Fig. 2 is an elevation on a larger scale of a portion of the same corresponding to that which is enclosed within the dot and dash circle of Fig. 1;

Fig. 3 is a sectional elevation through the same, the section being taken approximately along the line 3—3, Fig. 2, and

Fig. 4 is a front elevation, on the scale of Fig. 1, of a corner of a press also constructed in accordance with this invention, but illustrating a modification thereof.

In the embodiment of the invention illustrated in Figs. 1 to 3, the press of the side plate type includes a base 1 having attached to opposite sides thereof, by means such as bolts 2, a pair of heavy side plates 3 and 4 which upstand from the base in a parallel relation. The upper ends of the plates are connected by an interposed press head 5, to the ends of which the plates 3 and 4 are secured by screws 6. The inside faces of the plates 3 and 4 are provided near the top with transverse grooves or channels 7 and with similar transverse grooves 8 near the

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bottom. A projecting key or rib 9 extends from front to rear across each end face of head 5 and each rib or key enters a slot 7 to act as an integral key that prevents vertical movement of the head 5 along the vertical plates 3 and 4. Similarly, the base 1 carries parallel ribs 10 at opposite sides which extend from front to rear and are received in the channels 8, so as to act as keys that limit relative, vertical movement between the plates 3 and 4 and the base 1.

Within the base 1 is a hydraulic cylinder 11 that opens upwardly through the top of the base, and a piston 12 which depends from the under face of the platen 13 and telescopes closely within the cylinder 11 to form the hydraulic machine by which the platen may be elevated and lowered. A packing gland or device 14 may be provided around the piston 12 at the upper end of the cylinder 11 to limit escape of operating fluid from cylinder 11. A pipe 15 is connected to the base 1 and communicates with a port 16 which opens into the lower end of the cylinder 11. Fluid under pressure, controlled by a suitable valve, is admitted to cylinder 11 through pipe 15 to cause the platen to rise, but is cut off and the cylinder vented when the platen is to be lowered. To this extent, the press is a typical side plate press such as shown in my prior patents above identified.

Each groove 7 is made vertically wider than the rib 9, and a pair of tapered wedges 17 and 18 are disposed face to face in superposed relation between one side of each slot 7 and a side face of the rib 9 so as to act as shims and take up space between the rib and the side wall of the groove or slot. The wedges 17 and 18 are tapered from end to end and, as arranged, the tapers in the wedges of each pair run in opposite directions, as shown in Fig. 3. The tapers are supplementary, in that when arranged as shown in Fig. 3, the upper and lower faces of the assembled wedges are, in all sliding positions, always parallel to each other, and the abutting faces of the wedges are somewhat diagonal, or an acute angle to the parallel faces. With such an arrangement, no matter how much the wedges of a superposed pair are slid along one another, the upper and lower faces of that pair of wedges will always be parallel to each other, and will abut flat against the under or side face of the rib 9 and also abut flat against the bottom side wall of the slot 7.

As the wedges of a pair are moved endwise toward or from each other, the upper and lower parallel faces of the pair will be caused to sepa-

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rate or approach each other and thus determine the effective vertical dimension of the pair. These wedges 17 and 18 run lengthwise of the slot 7 in which they are disposed, which would be from front to rear of the press. While the press is being assembled, a pair of wedges is inserted endwise into each slot 7, which causes pressure on the side faces of ribs 9 and forces ribs 9 against the opposite side walls of the slots 7. This takes up all play and provides a very tight and secure connection. A similar arrangement of tapered wedges may be and preferably is provided between the upper faces or the ribs 10 and the upper side walls of slots 8.

It will be observed that with this improvement the keyways, grooves or slots 7 and 8 in the side plates are machined wider than is necessary, but with the side walls of the keyways or slots made parallel to the keys or ribs 9 and 10 of the head and base. The width of each keyway or slot 7 and 8 need not be accurate, but can vary slightly, and in each such excess space there is provided two superposed tapered keys or wedges 17 and 18 inserted in the relative positions shown in Figs. 2 and 3, with their tapers extending in opposite directions. When pressure is put on the press, these wedges may be further driven in endwise, to take up all excess play, and then the press will be completely free from any relative motion between the side plates and the keys of the head and base. If any wear or permanent set should occur to increase the clearance, the tapered keys can be driven in further to take up this additional clearance.

The tapered wedges are preferably provided below the press head and while this should be ample to take up slack, the pairs of wedges also are preferably inserted above the keys 10 in the slots 8 to make accurate machining of the slot widths unnecessary. When the press is under pressure the base 1 and head 5 tend to separate; with this arrangement the high pressure exerted in a press operation will be resisted without high pressures on the tapered wedges. The really high pressures will be directly between the ribs 9 and 10 and the side plates. The wedges 17 and 18 in the slots 7 and 8 are then, while free from heavy pressures, driven in tightly in order to take up any play. This makes it unnecessary to accurately machine the widths of the keyways or slots 7 and 8.

In Fig. 4 a modification is illustrated in which the bolts 19 that couple the side plates 3 and 4 to the head 5 pass above and outside of the head, and to make this possible, the side plates 3 and 4 extend a short distance above the head, and the bolts 19 pass through such extensions. The head also extends along the side plates at least to the edges of slots 7 along which the wedges lie, so as to prevent the keys from dropping out laterally should they become loose.

It will be observed that not only do the widths of the keyways, slots or grooves in the side plates require no accurate machining, but the keys themselves do not have to be accurately machined in vertical width. This reduces the necessity of working to such close tolerances, which is expensive machining.

It will be understood that various changes in the details and arrangements of parts, which have been herein described and illustrated in order to explain the nature of the invention, may be made by those skilled in the art within the principle and scope of the invention, as expressed in the appended claims.

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I claim:

1. A hydraulic press comprising a pair of heavy side plates arranged with their inside faces side by side and parallel to each other but spaced apart, a press head extending between the inside faces of and connecting the side plates adjacent corresponding ends thereof, a ram head extending between the inside faces of the plates and connecting the side plates adjacent their opposite corresponding ends, each plate having channel-shaped slots in its inside face extending transversely thereof and located a substantial distance from the adjacent end of the plate, each head having a rib extending transversely thereof on the faces, said head abutting the side plates and said rib being received in a slot of said side plate, a pair of slightly tapered keys disposed in superposed relation in each slot between a side edge of each slot and the rib in each slot, the superposed keys having outside faces and abutting faces and having supplemental tapers so that the outside faces of the keys, opposite their abutting faces, will always be parallel, said outside faces of said keys abutting a side of the slot and head, said keys being adjustable endwise of themselves and lengthwise of the slot, to wedge the rib in each slot against a side wall of each slot.

2. A hydraulic press comprising a pair of heavy side plates arranged with their inside faces side by side and parallel to each other but spaced apart, a press head extending between and abutting the inside faces of and connecting the side plates adjacent corresponding ends thereof, a ram head extending between and abutting the inside faces of the plates and connecting the side plates adjacent their opposite corresponding ends, each plate having channel-shaped slots in its inside face, said slots extending transversely thereof and located a substantial distance from the adjacent end of the plate, each head having end faces having a rib extending transversely thereof on said end faces abutting the side plates, each said rib being received in and extending along the slot of said side plate which it abuts, a pair of keys disposed face to face in each slot with both superposed on each other between a side wall of the slot and a side face of the rib in that slot, said keys being slightly tapered from end to end lengthwise along said slot, and in opposite directions, the abutting faces between the keys being in planes normal to the bottom of that slot, and the faces of the keys opposite from said abutting faces being parallel to each other and to the side wall of the slot.

3. A hydraulic press comprising a pair of heavy side plates having confronting faces spaced apart and parallel to each other, a press head and a ram head extending between the faces of and connecting said side plates adjacent opposite ends of the plates and having end faces abutting the faces of said plates, a platen between the heads, a piston in said ram head and operating said platen, each plate having a transversely extending channel-shaped slot in the portion of a face against which each end face abuts and each head having on each end face a rib entering each slot, a pair of superposed keys disposed in each slot between a side wall of each slot and a side face of the rib in that slot, each key being tapered from end to end and having the tapers extending in opposite directions along the slot in which they are disposed, said keys having abutting faces and outside faces, the faces of the keys opposite the abutting faces being parallel, and the abutting faces between the keys being disposed in

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planes normal to the bottom of the slot in which those keys are disposed.

4. A hydraulic press comprising a pair of heavy side plates disposed face to face but spaced apart and parallel, each having a transverse channel-shaped slot on its face towards the other plate and adjacent each end, a press head and a ram head extending between and connecting said plates and each having a rib on its end face received in a groove of a side plate which it abuts, a pair of superposed keys in each slot, each tapered from end to end and in opposite directions lengthwise along the slot in which they are disposed, said pair of keys being disposed between said rib and a side wall of said slot, one key being disposed along said side wall and the other along a side of the rib in that slot, the faces of the keys which engage said rib and slot side wall being parallel to each other.

5. A press construction comprising a plate having a channel-like slot extending transversely across a face thereof, a member abutting endwise against said face of said plate and having a rib on its end face entering said slot, a pair of superposed, tapered keys in said slot between the side wall of the slot and the side of said rib, one of the keys extending along and abutting said rib and the other key extending along and abutting said slot side wall, the tapers of the keys being in opposite directions, the faces of the keys which engage the side walls of the channel slot and rib being parallel to each other, and the abutting faces between the keys being in planes normal to the bottom wall of the channel slot.

6. A hydraulic press construction comprising a pair of heavy side plates disposed face to face but

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spaced apart and parallel, each having a transversely extending channel-like slot on its face confronting the other plate and adjacent each end, a press head and a ram head extending between the adjacent faces of and connecting said plates near opposite ends thereof and covering said slots, each head having a rib on each end extending into the slot which that end covers, a pair of superposed keys in each slot, each tapered from end to end and in opposite directions lengthwise along the slot in which they are disposed, each pair of keys being disposed between a rib and a side wall of the slot in which they are placed, one key of the pair being disposed along and abutting said slot side wall and the other along and abutting a side of the rib in that slot, the faces of the keys which engage said rib and slot side wall being parallel to each other, and the abutting faces between the keys being in planes normal to the bottom wall of the slot in which these keys are disposed.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,285,600	Blake	Nov. 26, 1918
2,062,043	Stacy	Nov. 24, 1936

FOREIGN PATENTS

Number	Country	Date
471,188	Germany	Feb. 8, 1929
726,570	Germany	Oct. 16, 1942