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L. HOMMEL

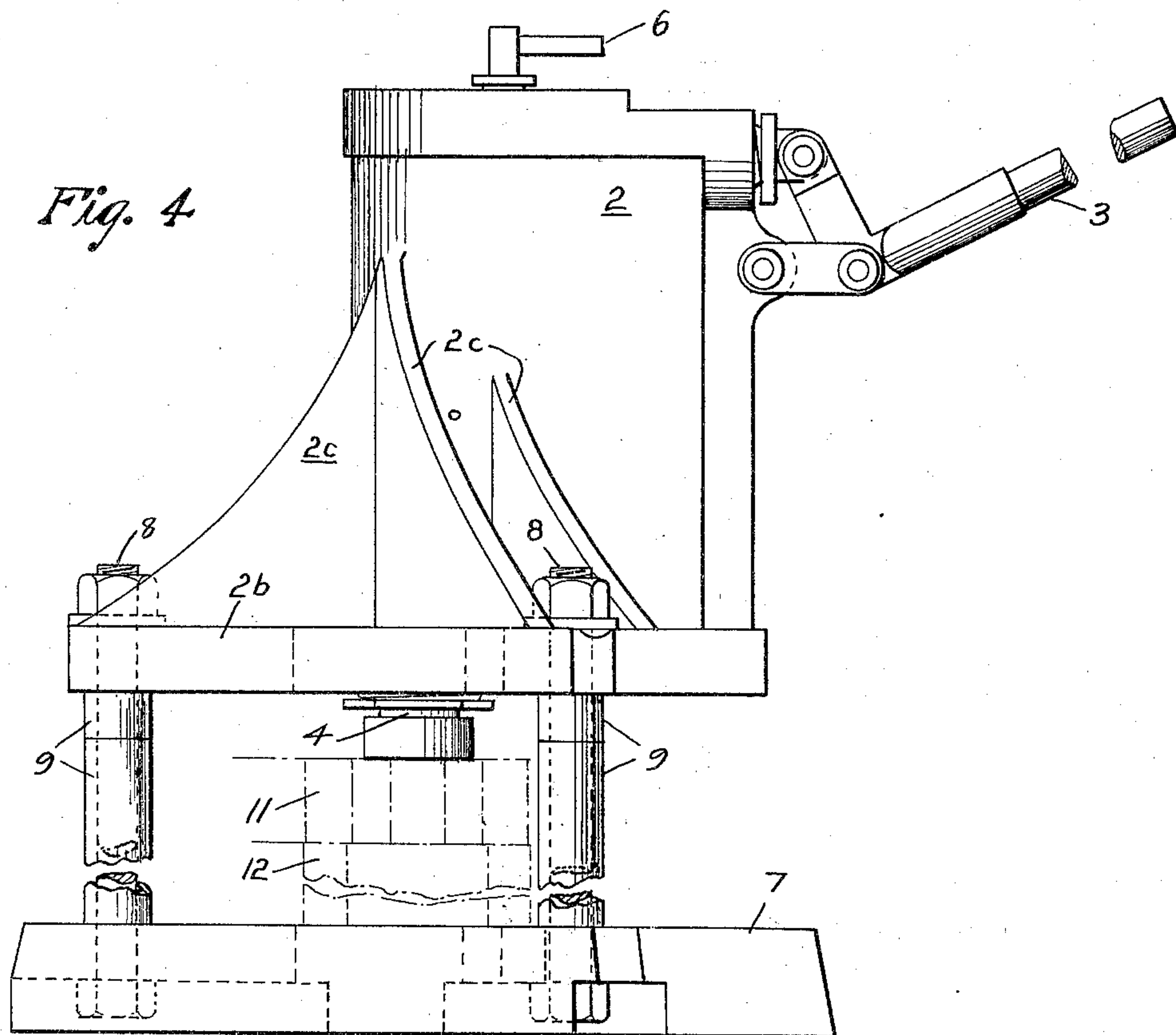
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TOOL AND WORK SUPPORT

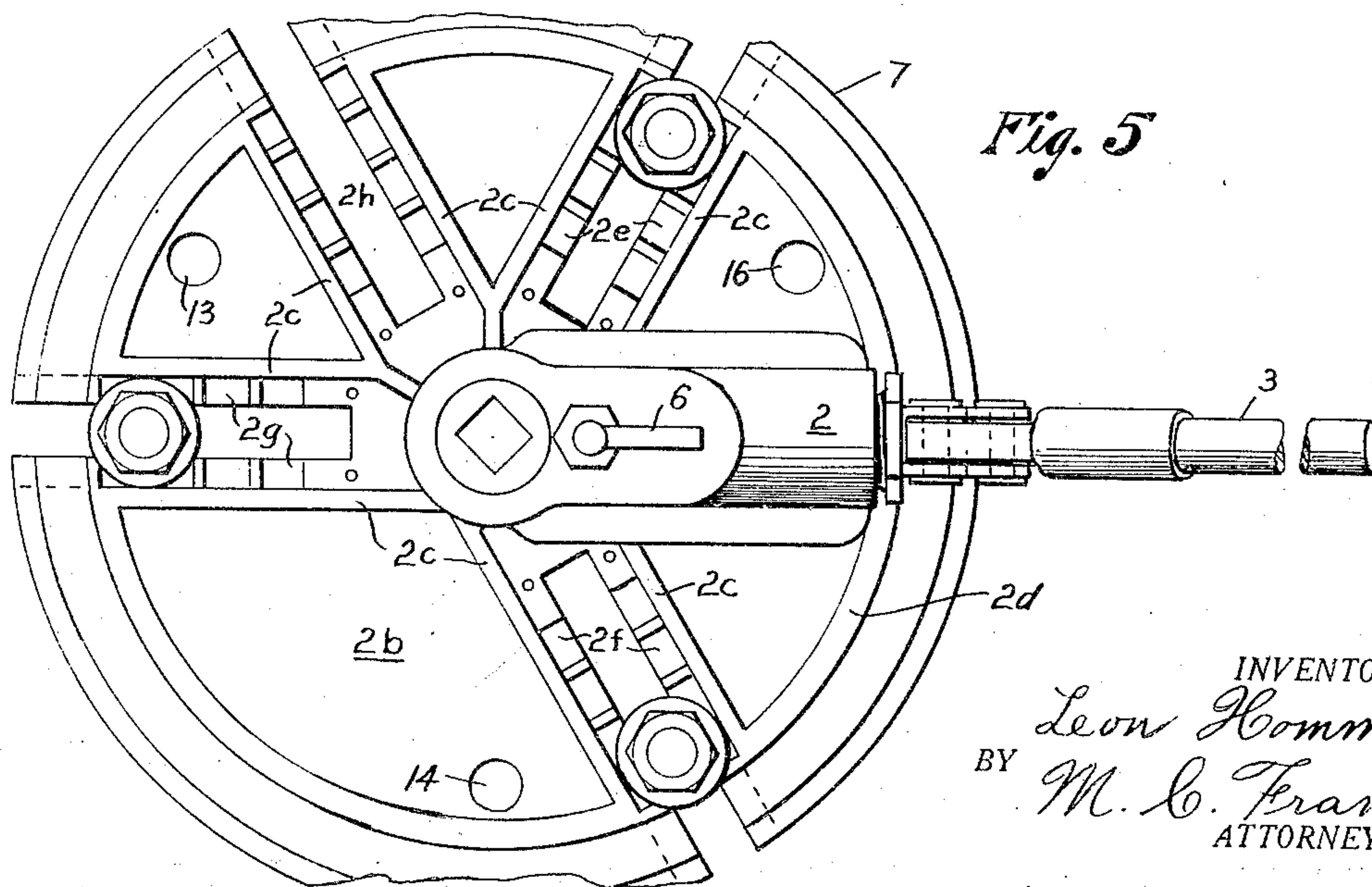
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2 Sheets-Sheet 2

*Fig. 4*



*Fig. 5*



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## UNITED STATES PATENT OFFICE

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TOOL AND WORK SUPPORT

Application filed August 23, 1927. Serial No. 214,933.

My invention relates to a support for securing a tool and its work together in operative relation, and is applied particularly to work-holders for hydraulic presses.

5 It is an object of my invention to provide a press particularly adapted for use as either a portable tool or as a non-portable bench tool. It is a further object of my invention to provide a holder particularly adapted to support the press either in position on non-portable work or to support portable work in the press.

10 It is an object of my invention to provide a generally improved holder of the described type. It is a further object of my invention to provide a holder particularly adapted for hydraulic presses of the described type.

15 Other and ancillary objects of my invention will be suggested in the following description and in the use of the device of my invention.

Referring to the drawings:

20 Figure 1 is a side elevation of a portable hydraulic press embodying my invention. A segmental fragment is broken out from the base plate and lower portion of the press to disclose a radial section thereof. Fig. 2 is a plan of the same. Fig. 3 is a detail front elevation of one of the hook-ended holding bars for supporting the work and press in operative relation.

25 Fig. 4 is a foreshortened side elevation of the press of my invention adapted for bench use; and Fig. 5 is a plan of the same.

30 My copending application, Serial No. 214,932, filed August 23, 1927, describes in detail the portable hydraulic press unit shown incorporated in the device of the present invention. The press unit consists essentially of a cast housing 2, (Figs. 1 and 2 or 4 and 5), having a liquid storage reservoir, large press cylinder 2<sup>a</sup>, and small pump cylinder, formed therein; and provided with means, including a pump handle 3, for forcing liquid from the reservoir under pressure into the large press cylinder. A press plunger 4 transforms this fluid pressure into dynamic force. A relief valve having an operating handle 6, is provided to relieve the actuating fluid pressure behind the

plunger 4. The portion of the casting 2 forming the hydraulic pressure unit is of oblong shape and is oblong in transverse section; the pressure cylinder being formed along the side of the casting at one end of the oblong section. For a fuller description of the specific press unit, reference may be had to the said copending application.

35 The integral bottom of the press unit is extended in all directions to form a circular platform 2<sup>b</sup> centering at the center of the large press cylinder 2<sup>a</sup>. The radius of the platform 2<sup>b</sup> is substantially equal to the width of the housing 2; i. e. to the length of the transverse oblong section; so that the housing extends radially from the center to the edge of the platform and forms one reinforcing brace between the press cylinder and platform. Reinforcing braces in other directions are formed by a plurality of integral radial fins 2<sup>c</sup>, which extend in a gradual taper from the head end of the cylinder 2<sup>a</sup>, down and out to a slightly raised rim 2<sup>d</sup> at the periphery of the platform 2<sup>b</sup>.

40 The platform 2<sup>b</sup> provides a support for the press; and holding means are provided for holding the platform against movement, to resist the reaction to pressure on the plunger 4. Three radial slots are formed in the circular platform 2<sup>b</sup> at angles of one hundred and twenty degrees to each other; and each of the three slots is reinforced along its edges by a pair of ribs 2<sup>e</sup>, 2<sup>f</sup>, and 2<sup>g</sup> formed as continuation of the peripheral rim 2<sup>d</sup> (see Fig. 5).

45 For bench use, the platform 2<sup>b</sup> is simply secured to a base-plate 7, (Figs. 4 and 5) by three long stout bolts 8; and is held spaced from the base-plate by sleeves 9 surrounding the bolts. When a heavy metal base-plate 7 is employed, the bolts may be received through the slots at 2<sup>e</sup>, 2<sup>f</sup>, and 2<sup>g</sup> in the platform, as shown in Fig. 5, and the work 11 to be pressed, may be supported directly upon the base-plate 7, or upon hollow or solid filler blocks 12 resting on top of the base plate. A series of various sized and shaped filler blocks provide for all ordinary uses of the press, and unusual adjustability is provided for by a series of different length sleeves to be used in place of or in addition



to the sleeves 9; longer or shorter bolts 8 being provided as required.

The entire thrust of the plunger 4 is communicated by reaction to the edges 2<sup>e</sup>, 2<sup>f</sup> and 2<sup>g</sup>, of the slots, and therefore the ribs 2<sup>e</sup> are positioned one on each side of and immediately adjacent to the rims 2<sup>e</sup>, 2<sup>f</sup> and 2<sup>g</sup>, of each slot. It is especially desirable to secure rigidity in a hydraulic press, to reduce resilient reaction to the very high pressures employed. The integral construction and ribbed reinforcing are means to this end; and, as a further tendency in this direction it is suggested that the total height of sleeves 9 employed be reduced not to exceed the requirements of the work normally encountered, and that the bolts be secured to the platform 2<sup>b</sup> as near the center thereof as the size of ordinary work will permit. The bolts may of course be moved to any desired position in the slots of the platform 2<sup>b</sup>; the plate 7 being correspondingly slotted to permit adjustment of the position of the bolts.

For a press set-up in which the heavy plate 7 is dispensed with, and the press is secured to an ordinary work bench, auxiliary means are provided for supporting the work to be pressed. This auxiliary work-holding means is adapted for adjustability along and transversely of the slots at 2<sup>e</sup>, 2<sup>f</sup> and 2<sup>g</sup>, and in order to provide full freedom of adjustability it is advisable to remove the bolts 8 from these slots. Three holes are drilled, at 13, 14, and 16 in the platform 2<sup>b</sup> near its periphery, to receive the bolts 8. No special reinforcing need be provided around these holes because the auxiliary work-holding means is adapted to resist all the thrust due to reaction of the plunger 4; the bolts 8 then being required to bear only the weight of the press plus the small force exerted upon the pump handle 3.

The auxiliary work-supporting means is constituted by a plurality of identical hook-ended holding bars 17, (Figs. 1, 2 and 3). Normally three holding bars are employed, one for each of the slots at 2<sup>e</sup>, 2<sup>f</sup>, and 2<sup>g</sup>. Each holding bar is of rectangular section and thick enough to fit non-rotatively in one of the slots, and is provided with a plurality of longitudinally-spaced transverse pins 18 projecting out on each side of the bar and adapted to ride on top of the raised rims 2<sup>e</sup>, 2<sup>f</sup>, or 2<sup>g</sup> of the slots.

The bars 17 are adjustably movable along the slots, and a plurality of transverse grooves (see Figs. 1 and 5), is provided in the rims 2<sup>e</sup>, 2<sup>f</sup> and 2<sup>g</sup>, for receiving the pins 18 of said bars to form pivotal joints between the supporting plate 2<sup>b</sup> and the bars, and so provide non-positive means for retaining the bars in adjusted position along the slots, while permitting pivotal accommodation thereof to hold objects of slightly varying sizes or irregular shapes. The hooked ends 17' of the

bars are substantially in line with the centers of pins 18 so that it is practically impossible to move the bars when a work piece 11 (Fig. 1) is held under pressure. As soon as the pressure is released the bars may be lifted slightly and moved along the slots to fit work pieces of different sizes, or may be withdrawn from the slots and reinserted with pins 18 of different elevation resting on the rims 2<sup>e</sup>, 2<sup>f</sup> and 2<sup>g</sup>, to effectively shorten the holding bars.

The bars, of their own accord, assume a vertical position, and being non-rotatable in the slots, are always in position to receive a work piece. When successive work pieces of the same size are being pressed, separate manual manipulation of each bar is not required each time a work-piece is inserted. It is merely necessary to insert the work piece from below. Of course the bars may be removed from their slots and reversed so that their hooked ends point outwardly instead of inwardly, for holding the rim of a spoked wheel at its annular-internal circumference.

A fourth slot exactly similar to the slots at 2<sup>e</sup>, 2<sup>f</sup> and 2<sup>g</sup>, is provided at 2<sup>h</sup> opposite to and in line with the slot at 2<sup>f</sup>. Where it is inexpedient to use three-point support, as when a long narrow bar is being pressed at its center, then bars 17 are used only in the two aligned slots 2<sup>f</sup> and 2<sup>h</sup>.

An important feature of the press of my invention is its adaptability to use as a portable tool, for example in disassembling small portions of automobiles or other large machines. The structure aforescribed is universal in that, by merely removing the press from its three holding bolts 8, it may be taken to the work and held in operative position thereagainst by the same hook-ended holding bars 17. As set forth in my copending application Serial No. 214,932, above referred to, the press may be operated with equal facility in any position of angularity.

In order to retain the bars 17 in adjusted position along the slots when the press is on its side or upside down, flat springs 19 (Figs. 1 and 2) are provided, one above each rim 2<sup>e</sup>, 2<sup>f</sup>, 2<sup>g</sup>, and 2<sup>h</sup>. The springs are secured at their inner ends to the top central part of the platform 2<sup>b</sup>, and extend to near the edge thereof; being spaced above the platform to permit insertion of the bars with their protruding pins 18. The springs bear down upon the pins 18 and urge them against the grooved rims 2<sup>e</sup>, 2<sup>f</sup>, 2<sup>g</sup>, or 2<sup>h</sup>.

Each spring 19 is supplemented by a backing spring 20 consisting of a slightly bowed spring bar secured to the vertical surface of the casting 2, and extending down into pressure contact with the spring 19 near the outer end thereof. The springs 20 are not shown in Figs. 2, 4 or 5, and only one is shown in Fig. 1 in order to avoid confusion in the drawings. It will be understood how-



ever, that each spring 19 is preferably backed by a supplementary spring 20.

As a further means to hold the bars 17 in position ready to receive a work piece regardless of the angularity of the press, the projecting portions of the pins 18 are cut half away to leave a flat top surface inclined, but very slightly, from the horizontal downwardly toward the hooked sides of the bars 17. When the flat springs 19 press upon the flattened tops of the pins 18, the tendency is to hold the bars in neutral position, nearly perpendicular to the plate 2<sup>b</sup> but inclined very slightly with their lower ends nearer center. Assuming that the press is to be employed in a horizontal position to pull a line-shaft pulley, the press may be held in one hand, leaving the other hand free to operate the pump handle 3. It is unnecessary to individually hold each bar 17 until the pulley has been placed under pressure. Of course, after the pulley has been placed under pressure, the press is tightly held to the pulley, leaving the operator with one hand free while pumping the lever 3 with the other hand.

The device of my invention is universal in that it is applicable to use as a fixed or movable bench tool or as a true portable press. When used as a bench press either with or without the holding bars 17, the press is always upright and the effect of the springs 19 and 20 is chiefly supplemental to the effect of gravity. If desired the springs may be removed. In general, however, it will be advantageous to leave the springs in place so that the press may be moved from the bench and used as a portable tool by merely removing it from the holding bolts 8. In order to simplify the drawings, the bolts 8 have been omitted from Figs. 1 and 2, and the springs 19 and 20 and holding bars 17 have been omitted from Figs. 4 and 5.

I have described one embodiment of my invention in detail, but it is emphasized that this embodiment is illustrative, and not inclusive of all the forms my invention may assume. Certain of the objects, or certain portions or combinations of the objects of my invention may be attained with the use of less than all its advantageous features or modifications within its purview. It is petitioned that my invention be limited only by the claims constituting its final determination.

#### I claim:

1. A hydraulic press comprising a platform having a plurality of slots therein, a hydraulic pressure unit mounted integrally on one side of said platform, and holding means adjustable along said slots on the other side of said platform, said slots extending outwardly to the periphery of the platform for the reception therein and removal therefrom of said holding means.

2. A hydraulic press comprising a platform having a plurality of slots therein, a hy-

draulic pressure unit mounted on one side of said platform, and holding means adjustable along said slots on the other side of said platform; said platform constituting one wall of said pressure unit.

3. In a press, a platform having a plurality of slots therein, a pressure ram movable through an opening in said platform, a plurality of longitudinally adjustable bars movable along said slots and adapted to be supported by said platform, holding hooks on said bars adapted to secure articles in operative relation to said ram, and cooperating means on said bars and platform for restraining said bars in adjusted position along said slots.

4. In a press, a platform having a plurality of slots therein, a pressure ram movable through an opening in said platform, a plurality of bars movable along said slots and adapted to be supported by said platform, holding hooks on said bars adapted to secure articles in operative relation to said ram, and cooperating means on said bars and platform for restraining said bars in adjusted position along said slots while permitting pivotal movement of said bars.

In testimony whereof, I affix my signature.

LEON HOMMEL.