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COMBINED LIFTING JACK AND PRESS

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1 Claim. (Cl. 254—8)

This invention pertains to improvements in lifting apparatus and is particularly directed to a combination lifting jack and press.

One of the objects of this invention is to provide a lifting apparatus which is adapted to handling low slung parts for automotive vehicles such as transmissions, gear cases and the like, while at the same time it is readily adjustable for high lift position for raising motor and engine blocks up over the front fenders of the motor vehicle.

Still another object of this invention is to provide an improved combination lifting apparatus and press which is adapted to a wide variety of heights of lifting and which may also be arranged to function as a press for working on automotive equipment.

Another object of this invention is to provide a simplified lifting device which may be readily adjusted for different heights of lift from low underslung ground level to relatively high position for motor raising and the like.

Further features and advantages of this invention will appear from a detailed description of the drawings in which:

Fig. 1 is a general perspective view of the apparatus incorporating the features of this invention.

Fig. 2 is a plan view of the apparatus shown in Fig. 1.

Fig. 3 is a side elevation of the apparatus shown in Fig. 2.

Fig. 4 is a rear end elevation of the apparatus shown in Fig. 3.

Fig. 5 is a fragmentary rear elevation showing the apparatus adapted for pressing operations.

As an example of one embodiment of this invention there is shown a combined lifting jack and press comprising a base plate 10 to which are rigidly fixed the side frames 11 and 12, on the outer ends of which are mounted the ground contacting rollers 13. Under the forward end of the base plate 10 are the swivel casters 14. Rigidly secured to the top surface 15 are fixed the mounting pieces 16 having bores 17 in their upper ends through which passes the pins 18 which in turn pass through bores 19 in the upright supports 20 and 21. The upright supports 20 and 21 are relatively high and are used for mounting purposes in utilizing the device in high level lifting such as lifting out motor blocks and the like from automotive vehicles. A main pivot pin 22 is supported in suitable bores 23 in the webs 24 of the members 20 and 21. On the pin 22 is pivotally mounted the side plates 25 and 26 forming the lifting arms for the device. The outer ends of the side plates 25 and 26 carry a pin 27 upon which is pivotally mounted the lifting member 28 having on its top end the work contacting saddle 29. The saddle 29 is kept in proper horizontal position for engagement of the work by apparatus comprising a crossbar 30 fixed against the rear surfaces 31 of the upright members 20 and 21, and extending across horizontally of the two upright members through arcuate slots 32 formed in the side plates 25 and 26. Intermediate the ends of the crossbar 30 and between

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the side plates 25 and 26 is an appropriate lug 32a fixed to the crossbar and having a pin 33 carrying the eyebolt 34 having the turnbuckle 35 and the eyebolt 36 in turn connected by a pin 37 to the lifting member 28. Thus, as the side plates 25 and 26 swing up and down on the pin 22 exact parallelism of the saddle 29 is maintained since the relative position of the pins 22—27 and the pins 33—37 are in parallelogram arrangement.

Adjustment of the turnbuckle 35 may vary the relative tilted position of the saddle 29 as desired.

Power for actuating the lifting arm comprising the members 25—26 is effected by a fluid pressure cylinder 38 having the piston rod or plunger 39. The back end of the cylinder 38 has a trunnion 40 which engages in a socket 41 in the T-shaped coupling 42, the top cross member of the T-shaped member 42 being pivotally mounted on a pin 43 carried in the outer ends of the support members 44 in turn attached to the upright supports 20 and 21. The piston rod likewise has its end engaged in a socket 45 in a similar T-shaped coupling 46 in turn pivotally mounted on a pin 47 carried in the side plates 25 and 26 below the pin 22.

The fluid pressure cylinder 38 may be energized by suitable manually operated pump 48 actuated by the hand lever 49 and connected through suitable flexible conduits 50 and 51 connected to the pressure chambers of the cylinder 38.

It is important to note that the entire assembly comprising the lifting arms 25—26 carried on the pin 22 and the fluid pressure cylinder 38 and its connecting members described carried on the support members 44 connected by suitable detachable bolts 52 to the frames 20 and 21 may be adjusted up and down to various positions on the upright supports 20 and 21. For example, as shown in full line in Fig. 3 the unit is shown in high position for manipulating the motor into and out of a motor vehicle. In the position shown in broken line at 53 the same unit has been moved down preferably on lower supports 54 for reaching under a motor vehicle to manipulate the transmission, gearcase clutch and the like, members from their attached position with the engine. It is also important to note that a cross member 55 may be placed across the upper ends and rigidly connected to the upright supports 20 and 21 and which contains either a flat surface 56 for abutment of the trunnion end 40 of the cylinder 38 there again or a pin such as the pin 23 may be utilized to support the upward thrust of the cylinder 38. Platen members 56 may also be secured to the upright supports 20 and 21 below the cross members 55 for supporting a work piece 57 which is to be operated on by the piston rod 39 of the cylinder 38 such as in pressing bearings into and out of automotive parts.

It is also within the scope of this invention to arrange the liftup cylinder assembly as shown in broken line in Fig. 3 wherein the cylinder 38 may be pivotally mounted at its bottom end on a suitable pin 43a carried in the mounting pieces 16 and the lower portions of the upright supports 20 and 21. The piston rod 39 of the cylinder is connected through a turnbuckle 35a to a pin 47a carried in the lifting arms 25—26. By this arrangement a direct upward thrust is provided for the arms 25—26 and the turnbuckle may be adjusted to control the overall lifting position of the arms.

There has thus been provided a combination lifting jack and press device utilizing common support members and connecting elements for carrying out all of the functions of the device.

While the apparatus herein disclosed and described constitutes a preferred form of the invention, it is also to be understood that the apparatus is capable of mechanical alteration without departing from the spirit of

the invention and that such mechanical arrangement and commercial adaptation as fall within the scope of the appended claim are intended to be included herein.

Having thus fully set forth and described this invention what is claimed and desired to be obtained by United States Letters Patent is:

In combination in a lifting jack having a base plate, side frames fixed to said base plate, ground contacting rollers on the outer ends of said side frames and under the forward end of said base plate, and upright supports of varying heights demountably secured to the top of said base plate; a main pivot pin supported horizontally in said upright supports, a lifting arm including side plates pivotally mounted on said main pivot pin, said side plates having arcuate slots adjacent said main pivot pin; a lifting pin fixed horizontally in the outer ends of said side plates parallel to said main pivot pin, a lifting member including a work contacting saddle pivotally mounted on said lifting pin, a cross bar demountably fixed horizontally across said upright supports and passing through said arcuate slots in said side plates, said arcuate slots being radially positioned relative to the

axis of said main pivot pin, a rod pivotally connected at one end intermediate the ends of said cross bar between said arcuate slots and pivotally connected at its other end to said lifting member at a point below said lifting pin so that said work contacting saddle remains in horizontal position during the swinging of said lifting member on said main pivot pin, a fluid pressure cylinder pivotally mounted at its back end on said upright supports on the opposite side thereof from said lifting arm, and a piston plunger in said cylinder extending horizontally therefrom and pivotally connected to said lifting arm side plates at a position below said main pivot pin.

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