

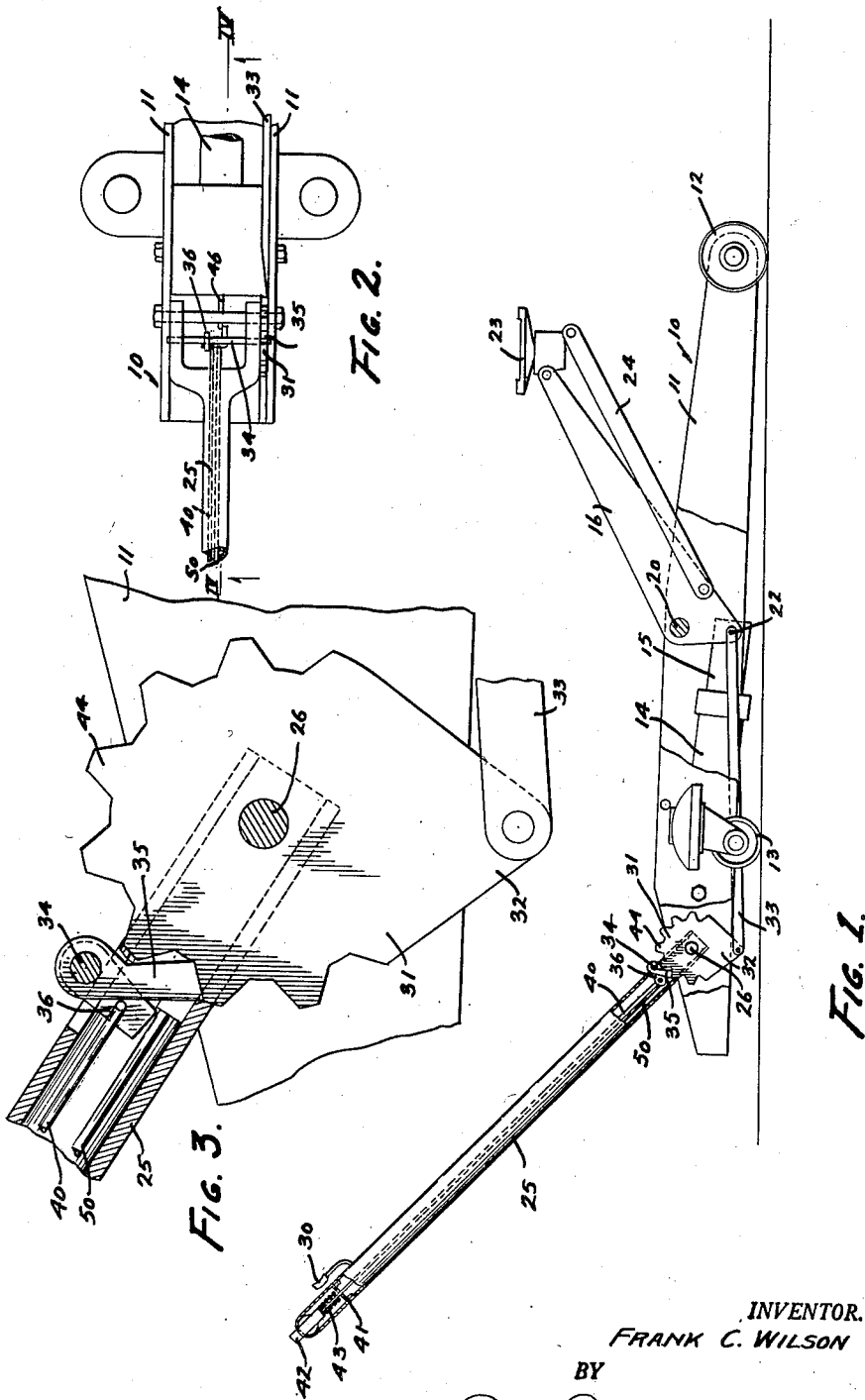
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F. C. WILSON
HYDRAULIC JACK

2,789,788

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2 Sheets-Sheet 1



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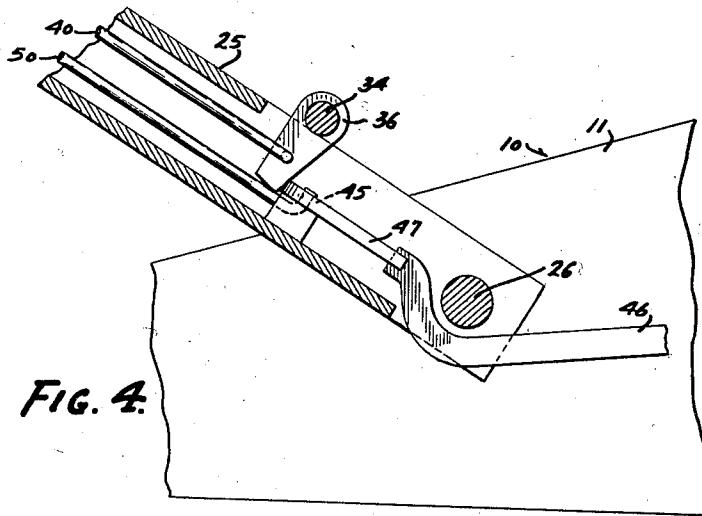


FIG. 4.

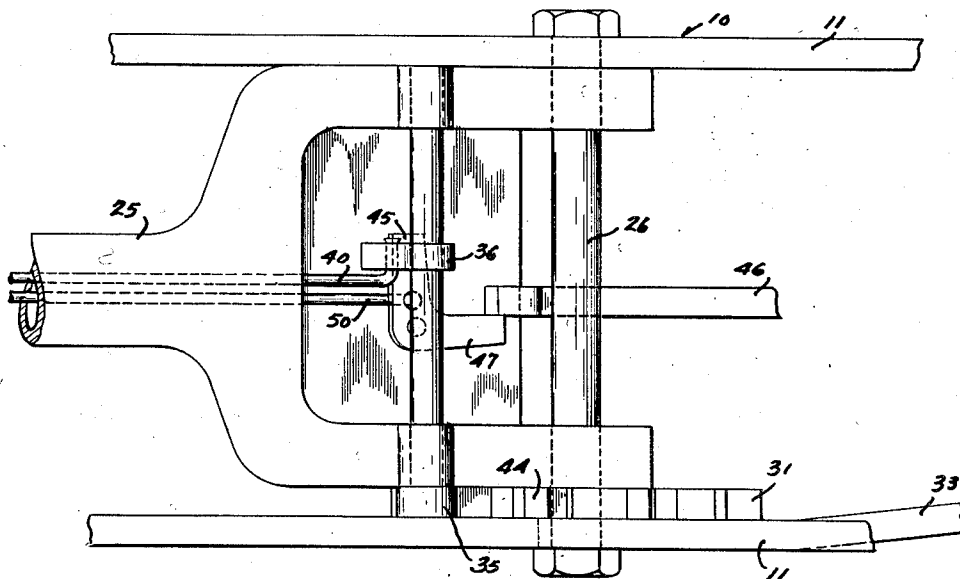


FIG. 5.

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HYDRAULIC JACK

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4 Claims. (Cl. 254—2)

My invention relates in general to hydraulic jacks and more particularly to the type used in the automobile industry.

It is desirable to quickly elevate the lifting arm of such a jack to the point of contact with the work before the load is raised. This is sometimes accomplished by having two separate cylinders, the one of larger area for quickly elevating the lifting arm, and the smaller one of such size as to produce the necessary lifting power. Such a construction, however, requires intricate valve and actuating mechanisms, and the employment of two separate cylinder systems.

The principal object of my invention is to provide mechanical means for quickly elevating the lifting arm to a point of contact with the load to be lifted.

Another object is to provide such means which are independent of the hydraulic system, but which will when actuated place the hydraulic system in condition for immediate operation when it is desired to lift the load.

A further object is to provide means connected with the usual pump actuating handle for operating the quick lifting mechanism.

A further object is to provide ratchet means for actuating the lifting arm having an engaging pawl so designed that when the lifting arm contacts the load to be lifted, further actuation of the ratchet means will cause the pawl to become disengaged from the teeth of the ratchet wheel thus avoiding an attempt to raise the load by means of the ratchet device.

Moreover, my device is simple in design and of durable construction.

Furthermore, means are provided for locking the hydraulic pressure release means of the jack while operating the quick lifting means.

The above objects and advantages have been accomplished by the device shown in the accompanying drawings, of which:

Fig. 1 is a side elevation of a jack embodying my invention, portions thereof being broken away;

Fig. 2 is a fragmentary plan view thereof;

Fig. 3 is an enlarged sectional fragmentary view showing the ratchet means;

Fig. 4 is an enlarged fragmentary side sectional view of my invention showing the pressure release locking means; and

Fig. 5 is a fragmentary plan view of the mechanism shown in Fig. 4.

The jack shown in the accompanying illustration comprises a jack frame 10 having spaced frame members 11 mounted on supporting wheels 12 and caster wheels 13.

The jack is provided with a customary hydraulic cylinder 14 having the usual plunger 15. The lifting arm 16 of the jack is pivoted at 20 to the side members 11. The lower end 21 of the arm extends downwardly and is pivotally connected to the forward end of the hydraulic ram 15 by means of the pivot pin 22. The usual swivel rest pad 23 is carried at the forward end of the lifting arm, and an auxiliary lifting arm 24 connects the pad

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with the lower part of the lifting arm 16 in customary manner whereby a parallelogram is formed thus causing the pad to maintain its vertical axis during movement.

The usual pump actuating handle 25 is provided for the jack and is connected by the usual means (not shown) to the pump cylinder 14 and hydraulic reservoir (not shown) for raising the load in the usual and customary manner. This handle is mounted upon a pivot pin 26 carried by the frame of the jack, and the handle carries the usual hydraulic release lever 30.

My invention comprises a segmentary ratchet wheel 31 mounted upon the handle pivot 26. This ratchet wheel is formed with a downwardly extending arm 32 which is pivotally connected to an actuating link 33. The actuating link extends forwardly and is connected to the pivot 22 connecting the plunger with the lifting arm. The ratchet wheel is located preferably on the inside of one of the side frame members 11 and between the side member and the lower end of the pump actuating handle. A pawl shaft 34 is pivotally carried by the lower end of the pump actuating handle and a ratchet pawl 35 is attached to the outer end of this shaft in such position where it will register with the ratchet wheel. The pawl shaft 34 carries a ratchet lever 36 which is arranged preferably centrally of the actuating handle 25. The pawl lever extends inwardly toward the central portion of the handle and a pawl actuating rod 40 is attached thereto at its lower end. The upper end of this rod passes through a bearing clip 41 carried at the upper end of the handle and is attached to an actuating button 42 secured to the upper end of the rod and extending through the handle. A helical spring 43 is disposed between the bearing plate 41 and the lower end of the button 42, whereby the ratchet pawl is normally disengaged from the ratchet.

The ratchet wheel is provided with a number of V-shaped ratchet teeth 44 having outwardly flaring surfaces. The pawl engaging surfaces are arranged at such an angle that when engaged by the pawl the lifting arm may be elevated and the plunger withdrawn part-way from the cylinder. However, when the swivel rest pad reaches the load and further upward movement of the lift arm is attempted through the medium of the engaged ratchet pawl, the angle of the engaging ratchet pawl surface is such that the ratchet pawl will be forced out of engagement with the teeth of the ratchet wheel, whereby it will be impossible to elevate the load through the quick acting device. As a further precaution against transferring the load supported by the jack to the quick lifting device, I provide the usual pressure release arm 47 with a lock arm 45 extending at substantially right angles to the release means 46 and which is normally in the path of movement of the ratchet lever 36. The release arm is actuated by the usual actuating rod 50 which is extended upwardly through the actuating handle and is connected for actuation to the release lever 30.

It will be obvious that when the actuating rod 50 is pushed to cause the release arm to actuate the hydraulic release lever, the lock arm 45 will be moved toward the ratchet lever and cause the ratchet pawl to be disengaged with the ratchet wheel before the jack is released to lower the load.

From the foregoing, it will be obvious that when the jack equipped with my invention is placed under, for instance, an automobile, the swivel pad may be elevated with substantially one downward movement of the actuating handle after the ratchet pawl has become engaged with one of the adjacent teeth, thus enabling the operator with one single stroke to raise the pad up to and in contact with the surface of the load to be lifted. During such elevating movement, the plunger will be drawn outwardly within the cylinder, and hydraulic fluid will be drawn into

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the cylinder which will thereby be filled when the jack is to be operated to elevate the load. Since the swivel pad is elevated to the load by one stroke of the actuating handle, and since the cylinder is filled with oil, the load may be immediately lifted by actuating the pump (not shown) of the jack.

What is claimed is:

1. The combination with a hydraulic jack having a lifting arm and a pivotally mounted actuating handle, of mechanical arm-lifting means comprising a ratchet wheel rotatably mounted upon the pivot of the actuating handle, a ratchet wheel arm carried by said ratchet wheel, said ratchet wheel having a series of teeth each having an inclined working surface, a manually actuated ratchet pawl pivotally carried by said actuating handle and having its forward end engageable with said ratchet teeth, the angular coacting surfaces of said pawl and engaged tooth being such as to become automatically disengaged when the lifting arm is subjected to pressure above a predetermined amount, and link means connecting said ratchet wheel arm with said lifting arm, whereby downward movement of said actuating handle may be used to cause said lifting arm to be elevated only to the point of contact with the load to be lifted.

2. The combination with a hydraulic jack having a lifting arm and a pivotally mounted actuating handle, of mechanical arm-lifting means comprising a ratchet wheel rotatably mounted upon the pivot of the actuating handle, a ratchet wheel arm carried by said ratchet wheel, said ratchet wheel having V-shaped teeth, a manually actuated ratchet pawl pivotally carried by said actuating handle and having its forward end engageable with said ratchet teeth, the angular coacting surfaces of said pawl and engaged tooth being such as to become automatically disengaged when the lifting arm is subjected to pressure above a predetermined amount, and link means connecting said ratchet wheel arm with said lifting arm, whereby downward movement of said actuating handle will cause said lifting arm to be elevated to a point of contact with the load to be lifted.

3. The combination with a hydraulic jack having a

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lifting arm, a pivotally mounted actuating handle, and a hydraulic release mechanism, of mechanical arm-lifting means comprising a ratchet wheel rotatably mounted upon the pivot of the actuating handle, a ratchet wheel arm carried by said ratchet wheel, said ratchet wheel having a series of teeth each having an inclined working surface, a manually actuated ratchet pawl pivotally carried by said actuating handle and having its forward end engageable with said ratchet teeth, the angular coacting surfaces of said pawl and engaged tooth being such as to become automatically disengaged when the lifting arm is subjected to pressure above a predetermined amount, link means connecting said ratchet wheel arm with said lifting arm, and a lock arm carried by said hydraulic release means for engagement with said lifting means, whereby said lifting means will be thrown out of engagement before said release means is actuated.

4. The combination with a hydraulic jack having a lifting arm, a pivotally mounted actuating handle, and a hydraulic release mechanism, of mechanical arm-lifting means comprising a ratchet wheel rotatably mounted upon the pivot of the actuating handle, a ratchet wheel arm carried by said ratchet wheel, said ratchet wheel having a series of teeth each having an inclined working surface, a manually actuated ratchet pawl pivotally carried by said actuating handle and having its forward end engageable with said ratchet teeth, the angular coacting surfaces of said pawl and engaged tooth being such as to become automatically disengaged when the lifting arm is subjected to pressure above a predetermined amount, link means connecting said ratchet wheel arm with said lifting arm, and a lock arm carried by said hydraulic release means for engagement with said lifting means, whereby said lifting means will be thrown out of engagement before said release means is actuated.

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