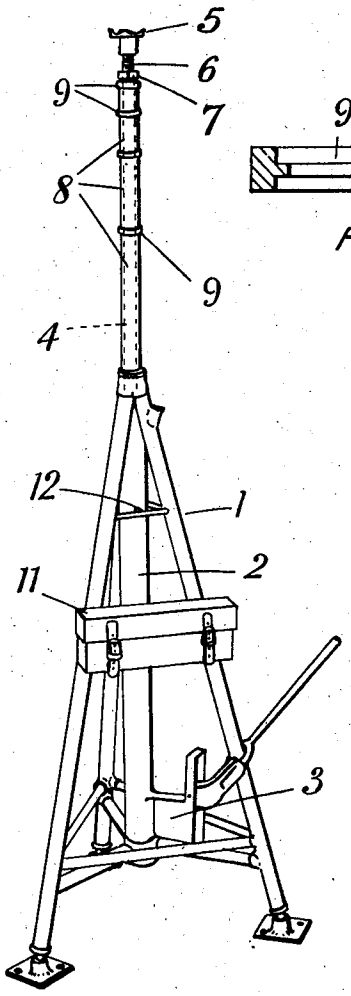
Sept. 10, 1940. J. S. ROTHERY 2,214,440

HYDRAULIC JACK

Filed Feb. 17, 1940

FIG. 1



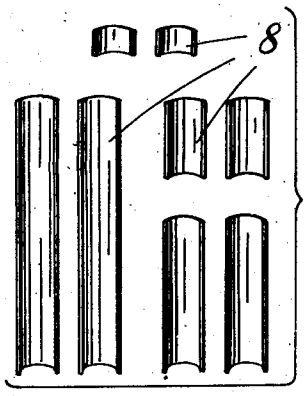


FIG. 2

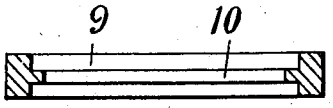


FIG. 3

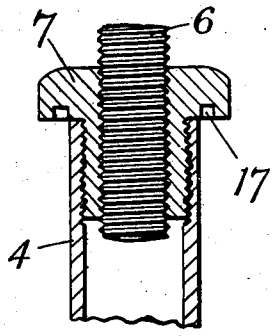


FIG. 4

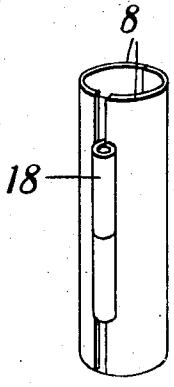


FIG. 5

Inventor

JAMES S. ROTHERY

by

Attorney

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2,214,440

HYDRAULIC JACK

James Stewart Rothery, London, England, assignor to Servisales Limited, London, England, a British company

Application February 17, 1940, Serial No. 319,523
In Great Britain June 29, 1938

4 Claims. (Cl. 254—93)

This invention relates to hydraulic jacks and concerns more particularly means for locking the jack when in use to prevent the slow sinking of the ram which sometimes occurs when the load is left on the jack for a long time and to enable the oil pressure to be released whilst maintaining the load.

The invention also includes a novel method of storing the oil or other fluid used in the jack as well as details hereinafter described.

The invention is particularly designed for use as an aeroplane jack but is suitable for use with motor cars and for other purposes where loads are to be lifted and maintained in raised position.

The frame of the jack may be of any desired kind and the pump therefore may be hand and/or foot operated, or the fluid pressure applied by any other suitable means.

The means according to the invention comprises strut members adapted to be removably applied to the extended ram to make such engagement with the top of the ram (or with an element attached thereto) and with a part of the jack at the cylinder end of the ram as positively to hold the ram against movement into its cylinder; and the jack according to the invention comprises a combined hydraulic jack and a locking means comprising grooved collars around the ram and strut members adapted to be interposed between and engaged by the collars in such a manner that the said members and the collars positively hold the ram against movement into its cylinder.

The strut members are preferably of semi-circular cross section so that when mated in pairs they form tubes but each pair of members is different in length from any other pair so that by appropriate selection of a pair of members or superposing selected pairs the best locking means for the work in hand can be obtained. Fractional adjustments, i. e., adjustments less than the effective height of the smallest pair of elements, can be obtained by providing the jack with a screw crutch.

The pump is preferably mounted on the jack and the frame of the jack is preferably tubular to form the storage chamber for the oil, portions of the frame having suitable valves to control the oil flow, and a box or bag may be provided on the frame to hold the strut members and securing means for them if securing means other than elements around the jack ram are used.

The invention will now be described with reference to the accompanying drawing wherein:

Fig. 1 is a perspective view of a jack with its extended ram held against collapse by the present strut members;

Fig. 2 is a perspective view of a set of pairs of strut members, the scale to which the said members are drawn in this figure being larger than that to which they are drawn in Fig. 1;

Fig. 3 is a sectional elevation of one of the locking collars;

Fig. 4 is a detail, in sectional elevation, of the top of the ram and certain elements thereat; and

Fig. 5 is a perspective view of two mated strut members hinged together.

The framework 1 of the jack is of tubular form and supports a cylinder 2 and a pump 3. A ram 4 working in the cylinder is provided with a crutch 5 at its top, said crutch having a screw-threaded shank 6 which can be made to enter, more or less, a nut 7 at the top of the ram (Figs. 1 to 4).

The ram is extended by operating the pump. The jack when supporting a load tends to collapse but the jack illustrated is prevented from so doing by the provision around the extended ram of the strut members 8 and the locking collars 9. The strut members are of semi-cylindrical form. They are paired but each pair is of different length from any other. The collars 9 are located around the ram and when not in use lie one on top of another at the cylinder end of the ram, i. e., on top of the frame 1.

The strut members are applied to the extended ram by mating the pairs and so manipulating the collars 9 that the tops and bottoms of the said struts press against the central, internal flanges 10 of the collars. In this manner the collars lock the struts in substantial contact with the ram and against outward collapse. The bottom collar rests on the top of the cylinder 2 whilst the top collar thrusts against the underside of the nut 7. If desired, the nut 7 may be recessed (at 17, Fig. 4) in its underside to act in a manner analogous to a collar.

In order to make fractional adjustments, i. e., adjustments less than the length (the vertical dimension) of the smallest pair of struts, the shank 6 of the crutch is turned so as more or less to enter the nut 7, as previously explained.

The frame 1 is made of hollow tubing so connected to the pump that the tubing provides the container for the oil. Preferably, the cylinder has an exhaust conduit 12 near its top and the conduit leads to the interior of the tubular framework. Thus, when the ram has made a predetermined out-stroke pressure fluid is able to leak

into the reservoir and further outward movement of the ram stopped.

The framework is provided with a box or bag 11 for the struts 8 when out of use.

Each pair of struts instead of comprising two separate members may comprise two members hinged together as shown at 18, Fig. 5.

The crutch may be of any suitable form known in the art.

What I claim is:

1. In combination with a hydraulic jack including a cylinder, a ram movable in the cylinder, and means operative in the cylinder for elevating the ram, of a pair of semi-cylindrical bodies adapted when correlated to provide members to encircle and substantially contact the ram above the cylinder to provide positive stops between the cylinder and the upper end of the ram to prevent downward movement of the ram regardless of the pressure.

2. A construction as defined in claim 1 wherein the pair of semi-cylindrical bodies are removable whereby other pairs of relatively different lengths may be substituted therefor.

3. A construction as defined in claim 1 wherein the mating semi-cylinders are hingedly connected together to be opened to receive the ram and closed about the ram.

4. A construction as defined in claim 1 wherein means are provided to bear on the cylinder of the jack to receive and maintain the mating cylinders in proper relation on the ram.

JAMES STEWART ROTHERY.