Sept. 16, 1952 V. P. GRIER 2,610,824

PORTABLE FLUID OPERATED LIFTING JACK

Filed March 3, 1948 2 SHEETS—SHEET 1

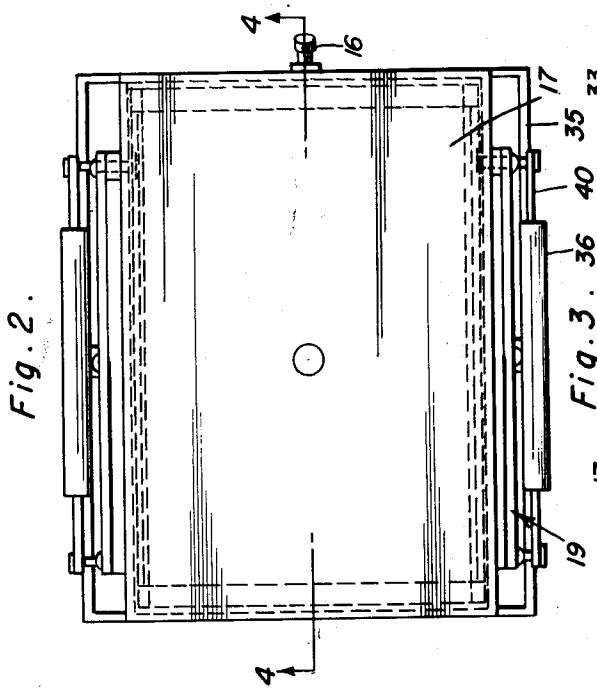



Fig. 2.

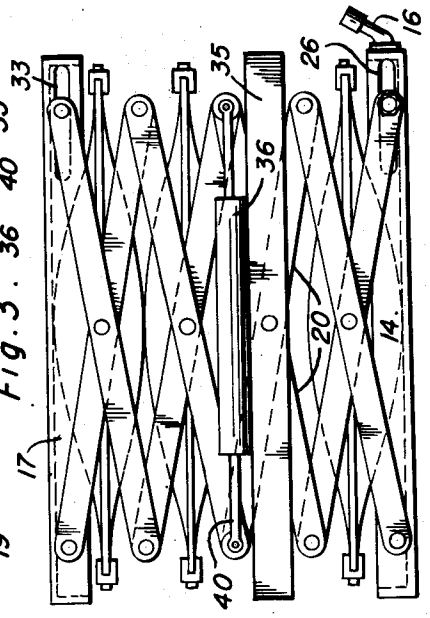



Fig. 3.

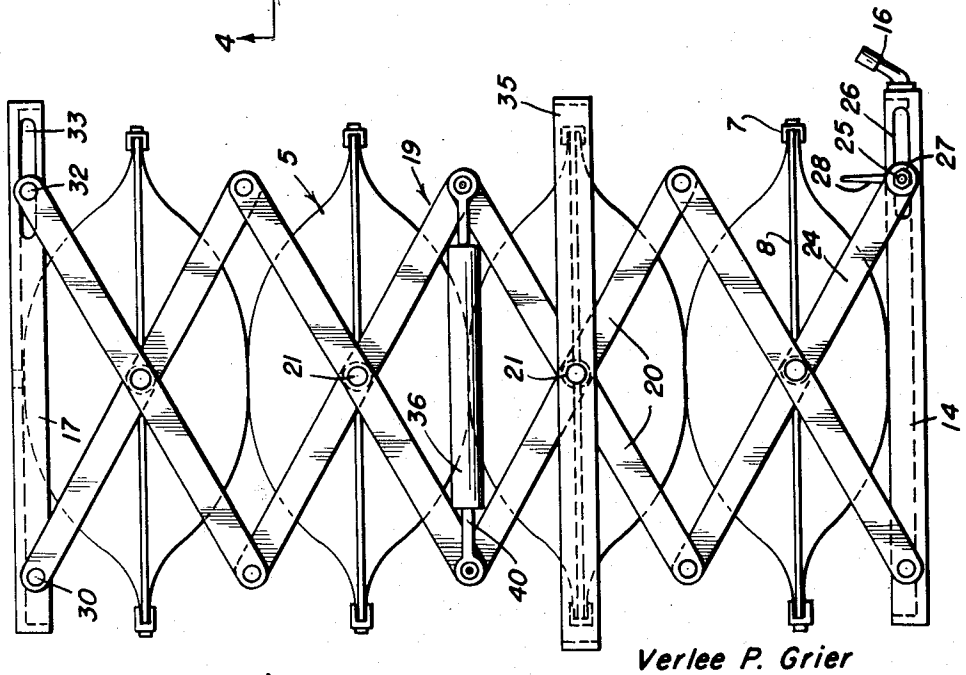



Fig. 1.

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PORTABLE FLUID OPERATED LIFTING JACK

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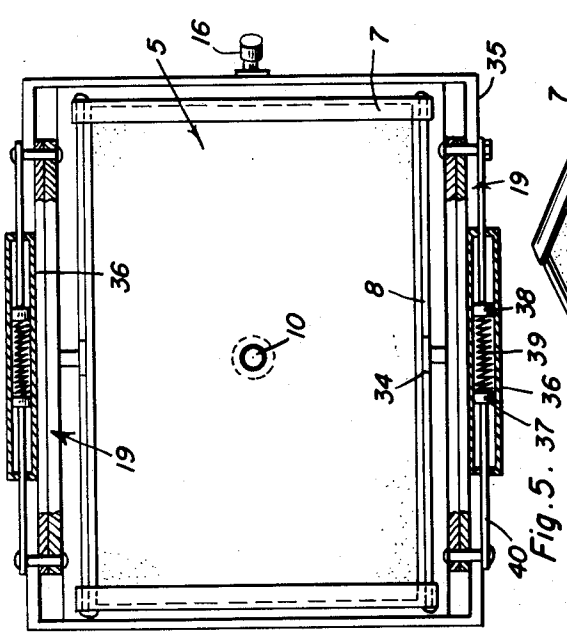


Fig. 5.

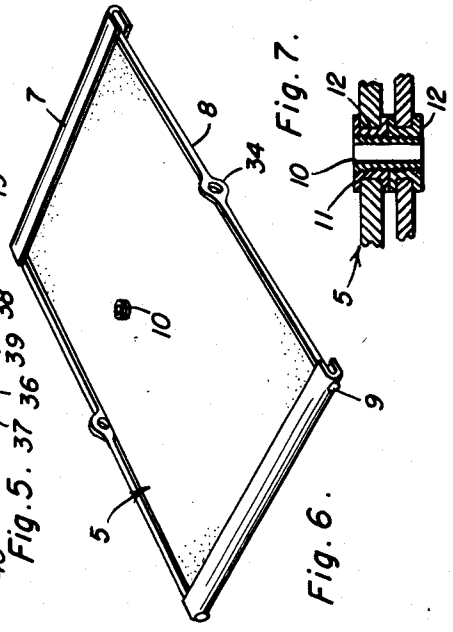


Fig. 6.



Fig. 7.

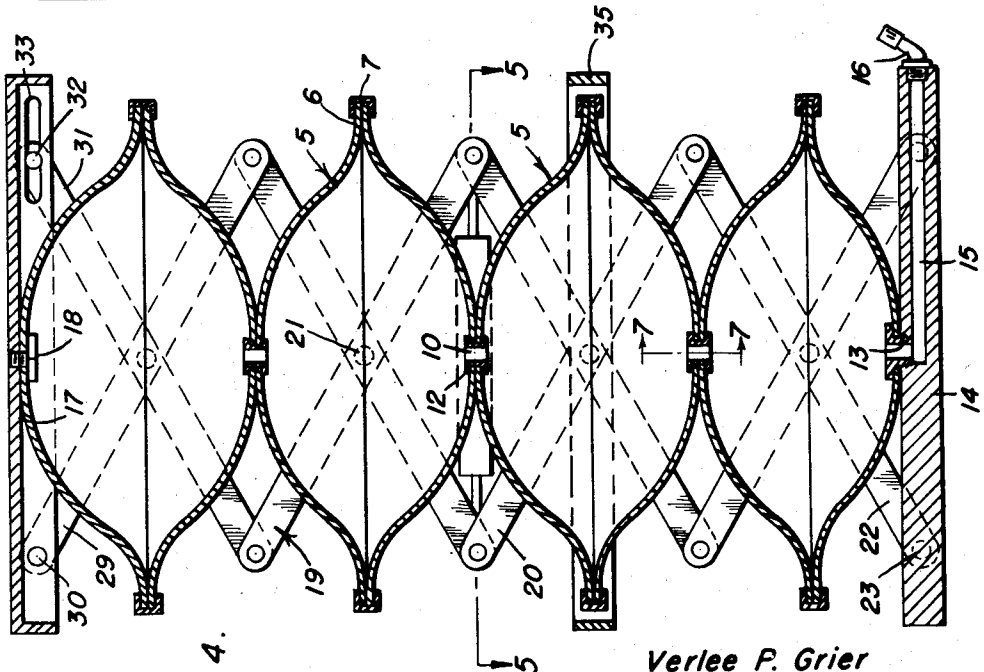


Fig. 4.

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# UNITED STATES PATENT OFFICE

2,610,824

## PORTABLE FLUID OPERATED LIFTING JACK

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Application March 3, 1948, Serial No. 12,732

3 Claims. (Cl. 254—93)

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The present invention relates to new and useful improvements in jacks and more particularly to a portable fluid jack for use as a lift for heavy objects wherever a supply of compressed air is available.

An important object of the invention is to provide a plurality of superposed inflatable bags having interconnecting fluid passages at their opposed surfaces whereby compressed air supplied to one of the bags will simultaneously inflate all of the bags and providing a platform on the top of the uppermost bag on which an object to be lifted is supported for raising and lowering movement during inflation and deflation of the bags.

A further object of the invention is to provide a plurality of inflatable bags of rectangular or similar shape to provide parallel side edges and enclosing the side edges of the bags in a rigid frame connected to a lazy tong structure in which the bags are positioned as a means of holding the bags against lateral tilting or shifting movement.

A further object of the invention is to provide a device of this character of simple and practical construction, which is strong and durable, efficient and reliable in use, relatively inexpensive to manufacture and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side elevational view showing the bags inflated to raise the jack;

Figure 2 is a top plan view;

Figure 3 is a side elevational view showing the jack in collapse or lowered position;

Figure 4 is a vertical sectional view taken substantially on a line 4—4 of Figure 2;

Figure 5 is a horizontal sectional view taken substantially on a line 5—5 of Figure 4;

Figure 6 is a perspective view of one of the inflatable bags; and

Figure 7 is a fragmentary enlarged sectional view through one of the nipples connecting the bags to each other.

Referring now to the drawings in detail wherein for the purpose of illustration I have disclosed a preferred embodiment of invention, the numeral 5 designates an inflatable bag generally and which is constructed of a section of flat tubing of rubber or other suitable heavy material to provide a bag of substantially rectangular or

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other polygonal shape having parallel side edges and end edges, the end edges of the bag shown at 6 being inserted in channel-shaped bars 7 and suitably sealed therein to seal the ends of the bag.

A pair of bars 8 also extend along the side edges of the bag with their ends secured in the channel bars 7 adjacent the end portions thereof by bolts or the like 9 to thus provide a frame for the marginal edges of the bag.

A plurality of the bags 5 are secured to each other in superposed relation by nipples 10 having flanged rubber sealing washers 11 threaded on each end of the nipples and positioned in openings 12 of the adjacent upper and lower surfaces of the superposed bags.

The bottom of the lowermost bag is provided with an inlet nipple 13 threaded in the top of a base plate 14 and communicating with a lateral passage 15 therein and to the outer end of which an air hose coupling 16 is secured.

The upper surface of the uppermost bag 5 is secured to the underside of a platform 17 by means of a bolt or the like 18 to support the platform on top of the bags.

The base 14 and platform 17 are connected to each other at their side edges by lazy tong devices 19 composed of cross links 20 pivotally connected at their ends to each other and also pivotally connected intermediate their ends by rivets, pins or the like 21 in the usual manner. The lowermost link 22 of each lazy tong device is pivoted to the base 14 by a fixed pin 23 and having the lower end of its companion link 24 provided with a pin 25 slidable in a longitudinal slot 26 at the adjacent side edge of the base. A nut 27 is threaded on pin 25 for engagement by a wrench or tool 28 to tighten the nut against the side of the base to hold the lazy tongs in a raised position.

Likewise, the free end of one of the upper links 29 is pivoted to the platform 17 by a fixed pin 30 and the free end of its companion link 31 is provided with a pin 32 working in a slot 33 in the side of the platform.

The central portion of the bars 8 at the side edges of the bags are formed with openings 34 in which the center pins 21 of the lazy tong devices are received to provide a rigid connection for the opposite side edges of the bags with each of the lazy tongs.

The pair of lazy tong devices 19 are also rigidly connected with each other by means of an open rectangular shaped frame 35 having its side edges also connected to the center lazy tong pins 21,

the frame 35 bracing the structure against lateral tilting of the lazy tongs or lateral shifting movement of the bags. Any desired number of the frames 35 may be provided depending upon the number of inflatable bags used in the construction of the jack.

Each lazy tong is also provided with a cylinder 36 having a pair of pistons 37 and 38 working therein and between which a coil spring 39 is positioned. Piston rods 40 extend outwardly from the opposite ends of the cylinder and are pivotally attached to a pair of the pins connecting the ends of links 20.

In the operation of the device the inflatable bags are normally collapsed by springs 39 which spread the pins at the ends of links 20 outwardly to cause a lowering of the lazy tongs 19.

The bags 5 and lazy tongs 19 are collapsed into a compact form as shown in Figure 3.

The jack is raised by attaching hose coupling 16 to a supply of compressed air which simultaneously inflates all of the bags 5 to thus raise platform 17 and which at the same time, raises the lazy tongs to lift an object placed on the platform.

In view of the foregoing description taken in conjunction with the accompanying drawings it is believed that a clear understanding of the construction, operation and advantages of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. A jack comprising a plurality of rectangular-shaped superposed inflatable bags having communicating air passages, a base supporting the bottom of the bags, a platform on top of the bags, a rigid frame enclosing the edges of each bag, a lazy tong device at opposite sides of the bags and connecting the platform to the base, means connecting the frames to the lazy tongs, and means for supplying compressed air to the bags.



2. A jack comprising a plurality of superposed inflatable bags having communicating air passages, a base supporting the bottom of the bags, a platform on top of the bags, each of said bags being constructed of a flat rectangular-shaped expansible body, a rigid frame surrounding the sides and ends of each bag and including a pair of channel frame members having the ends of the bag sealed therein, a pair of lazy tong devices at the sides of the bags and connected to the sides of the frames, and means for supplying compressed air to the bags.

3. A jack comprising a plurality of superposed inflatable bags having communicating air passages, a base supporting the bottom of the bags, a platform on top of the bags, each of said bags being constructed of a flat rectangular-shaped expansible body, a rigid frame surrounding the sides and ends of each bag and including a pair of channel frame members having the ends of the bag sealed therein, a pair of lazy tong devices at the sides of the bags and connected to the sides of the frames, a rigid horizontal frame surrounding the bags and lazy tongs and connected thereto, and means for supplying compressed air to the bags.

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