Aug. 29, 1961 L. F. REISIG 2,998,224

END LIFT

Filed Aug. 8, 1958 2 Sheets-Sheet 1

FIG. 1.

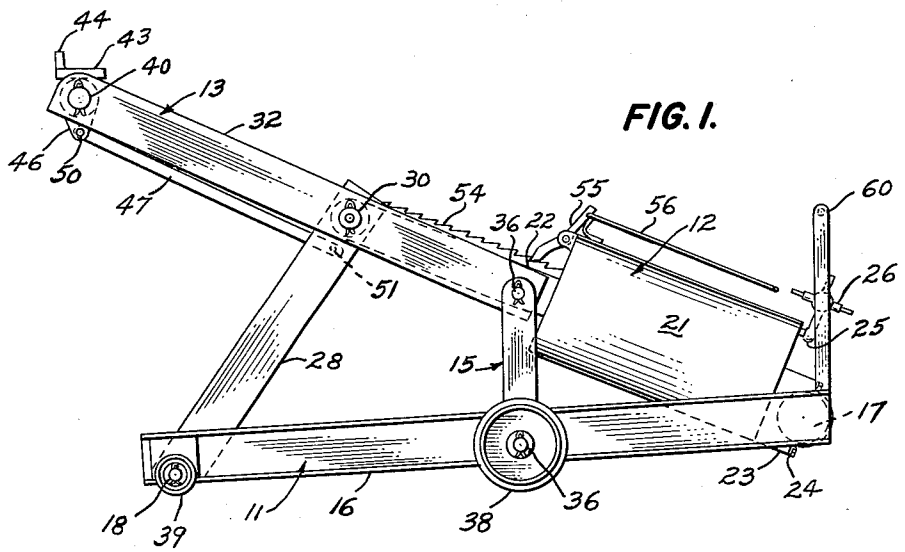
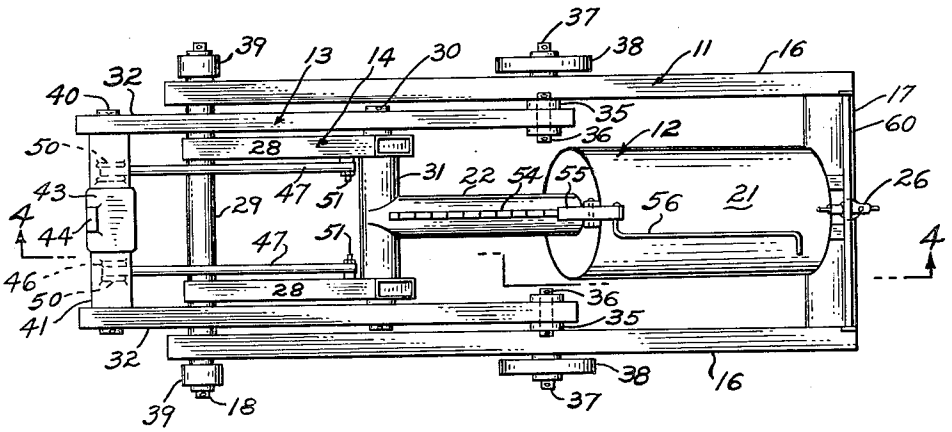


FIG. 2.



INVENTOR.
Leopold F. Reisig

BY
Mason & Graham
Attorneys

Aug. 29, 1961 L. F. REISIG 2,998,224

END LIFT

Filed Aug. 8, 1958 2 Sheets-Sheet 2

FIG. 3.

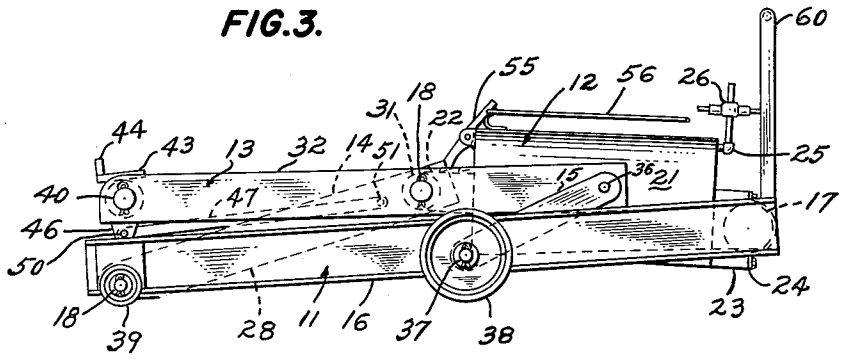
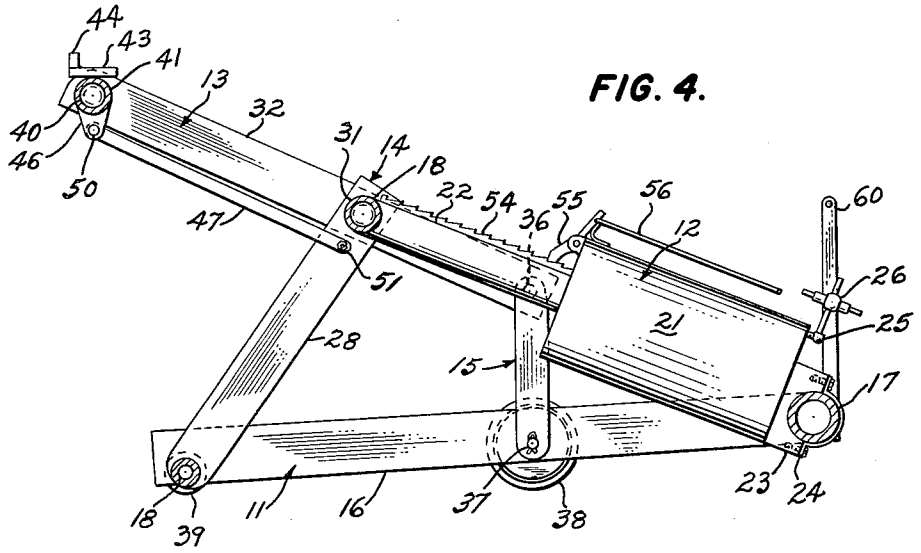


FIG. 4.



INVENTOR.
Leopold F. Reisig

BY Mason & Graham

Attorneys

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2,998,224

END LIFT

Leopold F. Reisig, 245 W. Foothill Blvd., Arcadia, Calif.

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6 Claims. (Cl. 254—8)

This invention has to do with portable lifts or jacks designed for lifting an entire end of a motor vehicle using fluid pressure as the motive force.

An object of the invention is to provide a novel and improved vehicle lift or lifting jack particularly designed for use in garages, service stations and the like to elevate the front or rear end of an automobile.

In recent years it has been customary to use lifts which engage and apply the lifting force to the bumper. However, this type of device cannot be safely used with many of the newer automobiles due to the possibility of damaging the bumper and adjacent portions of the vehicle body. Another disadvantage of such lifts is that they cannot lift the vehicle high enough to enable placing a pair of stands under the frame upon which the vehicle can be balanced. It therefore is a particular object of the invention to provide a novel and improved lift or lifting jack which is designed to engage and apply the lifting force to the frame of the vehicle, or the axle thereof, at any desired point to obtain maximum elevation of the vehicle as a whole, and to leave ample clearance between the device and other parts of the vehicle.

A further object is to provide such a device which can be used for lifting or elevating a vehicle at either the end or at the side.

Still another object is to provide a unique construction which enables a relatively compact device to lift an object relatively high above the supporting ground or floor.

Another object is to provide a device which can be stored in a minimum space by standing on end.

A further object is to provide a device which is readily portable and can be maneuvered easily by a single person.

These and other objects will be apparent from the drawings and the following description. Referring to the drawings:

FIG. 1 is a side elevational view of a device embodying the invention, the device being shown in elevated position;

FIG. 2 is a plan view of the device in the position of FIG. 1;

FIG. 3 is a view similar to FIG. 1, but showing the device in collapsed or lowered position; and

FIG. 4 is a central longitudinal sectional view showing the device in raised position.

More particularly describing the invention, in general the device comprises a wheeled base or main frame **11**, a piston-cylinder unit **12**, a lifting frame or lifting arm assembly **13**, a supporting frame or supporting lever assembly **14** extending between the lifting arm assembly and the base frame, and a linkage mechanism **15** between the lifting arm assembly and the base frame.

The base frame comprises a pair of side members **16** which may be channel sections as shown, and these are connected at their rear ends by a tubular cross member **17** which is welded or otherwise secured in place. At their front ends the side members **16** are connected by an axle **18** which may be secured to the side members in any conventional manner.

The piston-cylinder unit **12** comprises a cylinder **21** and a piston therein (not shown) having a projecting piston rod **22**. The cylinder is mounted for pivotal movement about the cross member **17**, and for this purpose is shown provided with two bearing blocks **23** and straps **24**. Preferably the cylinder is so mounted

that the axis is somewhat higher than the longitudinal axis of the cross member **17** upon which it is mounted.

The cylinder is provided with an air inlet-exhaust pipe **25** controlled by a two-way valve **26** to which an air supply hose may be connected.

The supporting lever assembly includes a pair of laterally spaced tubular supporting levers **28** of rectangular cross section which are integral with a sleeve **29** mounted for rotation on the shaft **18**. The rear ends of levers **28** are connected by a shaft **30** upon which is rotatably mounted a sleeve **31**. The forward end of the piston rod joins or is made integral with the sleeve.

The lifting arm assembly includes a pair of laterally spaced tubular arms **32** of rectangular cross section, which are supported at a point intermediate their ends, but somewhat closer to their rear ends than their front ends, upon the supporting lever assembly **14**. Shaft **30** extends through and beyond levers **28** and has its ends journalled in the lifting arms **32**. The rear ends of the lifting arms are connected to the base frame by the previously mentioned link means **15** which comprises a pair of links **35** pivotally connected at their upper ends by a pin **36** to the rear end of each lever **32** and pivotally mounted at their lower ends upon an axle **37** passing through the main frame side elements **16**. These axles carry the main ground-engaging wheels **38**. Auxiliary wheels **39** are provided on the end portions of shaft **18**.

The front end of the lifting arm assembly **13** includes a transverse shaft **40** extending between the arms **32** and a sleeve **41** rotatable thereon. The sleeve carries an object-engaging plate **43** which may be provided with an upstanding abutment **44**. In order to maintain the plate **43** properly oriented in substantially horizontal position as the lifting arm assembly is raised and lowered, the sleeve **41** is provided with a pair of depending bifurcated brackets **46** which are connected by links **47** with supporting levers **28**, the links being pivoted at **50** and **51**, respectively.

For the purpose of locking the device in elevated position, the piston rod **22** is shown provided on its upper surface with a series of teeth **54** adapted to be engaged by a spring-biased latching pawl **55** carried on the cylinder. A pawl release lever **56** is provided.

In the operation of the device, with the lift in lowered position as shown in FIG. 3, it may be readily moved under a vehicle to be raised by manipulation of a handle **60** provided at the rear of the base frame. Air under pressure is then admitted to the cylinder **21** and this will cause the piston-cylinder unit to expand, moving the parts from the position of FIG. 3 to that of FIG. 1. The latching pawl prevents retraction or collapse of the unit until the pawl is released.

Although I have illustrated and described a preferred form of my invention, I contemplate that various changes and modifications can be made therein without departing from the invention, the scope of which is indicated by the following claims.

I claim:

1. In a lift, a base frame adapted to be supported on a ground or floor surface, a piston-cylinder unit mounted at the rear end of said base frame for pivotal movement about an axis transverse of said base frame and normal to its own axis, a lifting frame, a supporting frame pivotally mounted at its front end at the front end of said base frame and pivotally mounted at its rear end intermediate the ends of said lifting frame, said piston-cylinder unit extending forwardly of said rear end of said base frame and being pivotally connected at its front end to said lifting frame upon the axis of pivotal connection between said supporting frame and said lifting frame, and link means of substantial length

connecting the rear end of said lifting frame to said base frame, said link means being pivotally connected at one end to the rear end of said lifting frame and being connected at its other end to said base frame for pivotal movement about a fixed axis, said lifting frame having an object-engaging and supporting member at its front end.

2. A lift as set forth in claim 1 in which the link means connecting the rear end of said lifting frame to said base frame is shorter than said supporting frame.

3. A lift as set forth in claim 1 in which the combined length of said piston-cylinder unit, when retracted, and said supporting frame is somewhat greater than the distance between their axes of pivotal mounting whereby said unit and said supporting frame always remain above a position of direct alignment.

4. In a lift, a base frame having a front axle and a rear cross member, a piston-cylinder unit mounted on said cross member for pivotal movement about the longitudinal axis thereof, a supporting frame pivotally mounted on said front axle and extending rearwardly thereof, a lifting frame pivotally mounted intermediate its ends upon the rear end of said supporting frame, said piston-cylinder unit extending forwardly of the rear of said base frame and being pivotally connected at its front end to said lifting frame upon the axis of pivotal connection between said supporting frame and said lifting frame, link means connecting the rear end of said lifting frame to said base frame at a region intermediate the ends thereof forwardly of the lowered position of the rear end of said lifting frame, said link means being pivotally connected at one end to the rear end of said lifting frame and being connected at its other end to said base frame for pivotal movement about a fixed axis, said link means being of substantial length but shorter than said supporting frame, and an object-engaging member carried upon the forward end of said lifting frame.

5. A lift as set forth in claim 4 in which said supporting frame comprises a tubular member on the front axle of said base frame and a pair of laterally spaced rearwardly extending elongated members integral with said tubular member.

6. In a lift, a wheeled base frame having a front axle and a rear cross member, a piston-cylinder unit mounted on said cross member for pivotal movement about the longitudinal axis thereof, a supporting frame including a tubular member pivotal on said front axle and a pair of laterally spaced rearwardly extending elongated members integral with said tubular member, a lifting frame comprising a pair of laterally spaced arms connected by a cross member at their front ends and pivotally mounted intermediate their ends upon the rear end of said elongated members of said supporting frame, said piston-cylinder unit extending forwardly and being pivotally connected at its front end to said lifting frame upon the axis of pivotal connection between said supporting frame and said lifting frame, link means pivotally connected between the rear ends of the arms of said lifting frame and said base frame, an object-engaging plate mounted on the cross member of said lifting frame for pivotal movement about an axis transverse of said lifting arms, and linkage means connected between said plate and said supporting frame for tilting said plate in response to movement of said lifting frame.

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