No. 794,262. PATENTED JULY 11, 1905.

F. E. TEN EYCK.

PNEUMATIC LIFTING JACK.

APPLICATION FILED FEB. 11, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

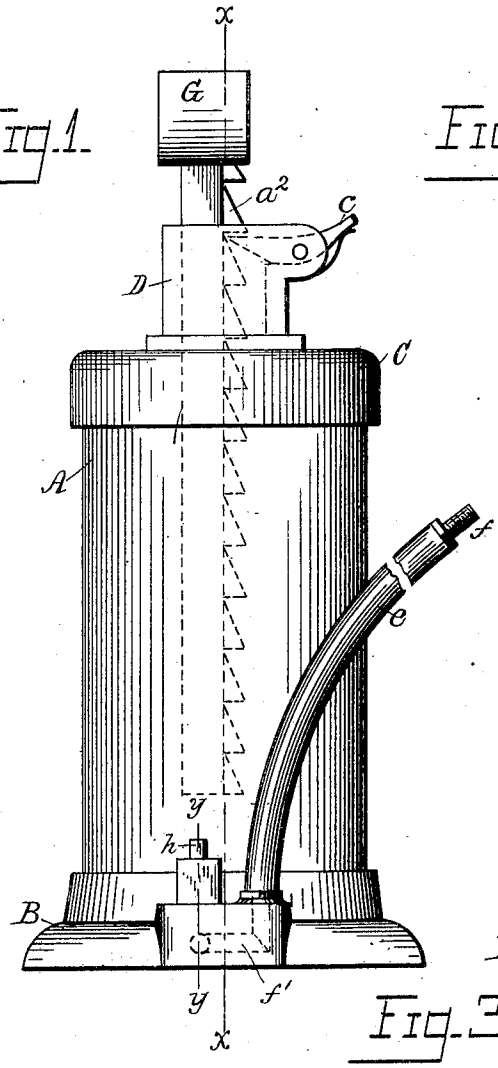


Fig. 2.

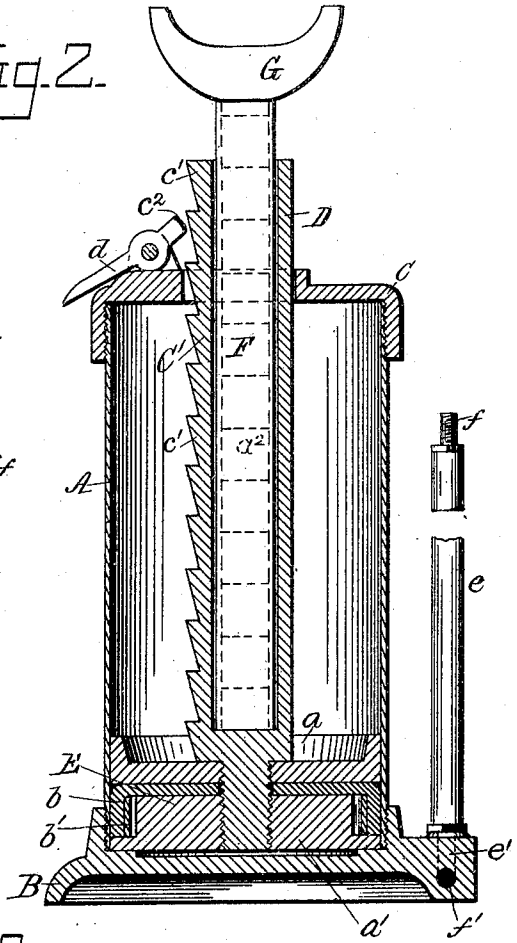


Fig. 3.

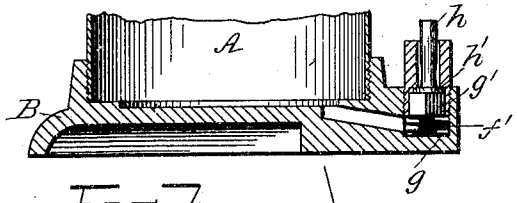
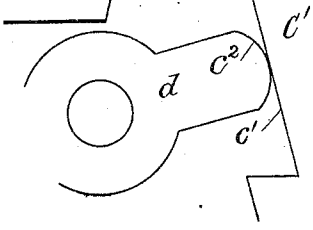


Fig. 7.



Witnesses:

James Lattimore

F. R. Davies.

Inventor:

Frank E. Ten Eyck

by W. C. Jardinton

his Attorney.

PHOTO-LITHOGRAPHED BY SACKETT & WILHELMS LITHO. & PTG. CO. NEW YORK

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2 SHEETS—SHEET 2.

Fig. 4.

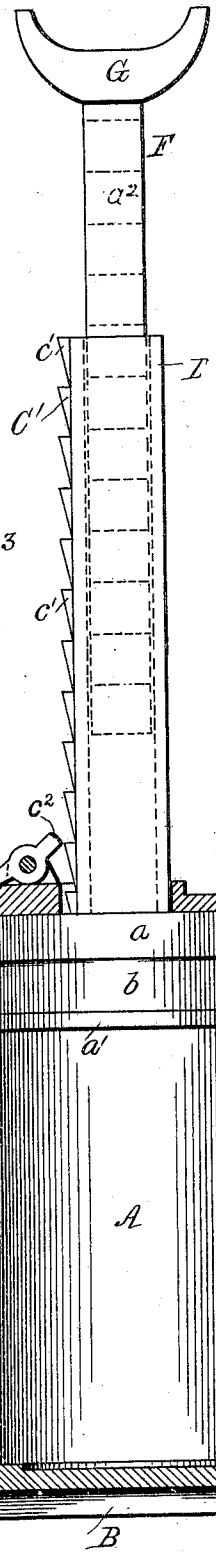


Fig. 5.

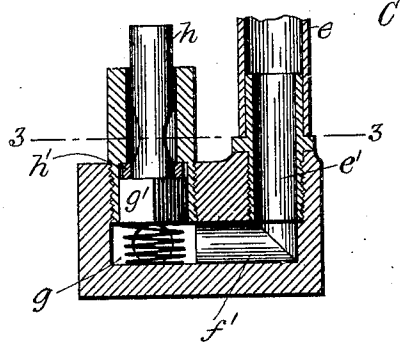
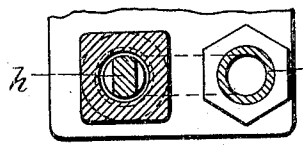


Fig. 6.



Witnesses:

James Lattimore

F. P. Bowers

Inventor:

Frank E. Ten Eyck

by W. C. Jirdinston

his Attorney.

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No. 794,262. Patented July 11, 1905.

UNITED STATES PATENT OFFICE.

FRANK E. TEN EYCK, OF AUBURN, NEW YORK.

PNEUMATIC LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 794,262, dated July 11, 1905.

Application filed February 11, 1905. Serial No. 245,230.

To all whom it may concern:

Be it known that I, FRANK E. TEN EYCK, a citizen of the United States, residing at Auburn, in the county of Cayuga and State of New York, have invented certain new and useful Improvements in Pneumatic Lifting-Jacks, of which the following is a full and exact description.

My invention relates to that class of jacks operated by air or liquid compression, and has for its object the production of a lifting-jack that will comprise in a small and compact body great power and ease of operation and adjustment.

In the drawings, Figure 1 is an elevation showing the jack closed. Fig. 2 is a section and part elevation on the line x x of Fig. 1. Fig. 3 is a detail section on the line Y Y of Fig. 1. Fig. 4 is a section and part elevation showing the operative parts raised. Fig. 5 is a detail section. Fig. 6 is a detail section on the line 3 3 of Fig. 5, and Fig. 7 is a diagrammatic detail.

A is a cylindrical casing secured to a base B and a cap C.

D is a hollow piston-rod secured at its lower end to a piston E. The piston E is composed of plates a and a', holding between them a disk b, made of leather or other flexible and suitable material, the edge of the disk being bent as shown and fitting snugly against the inner circumference of the cylinder A. A flat spring b' is employed to preserve the proper engagement of the disk with the side of the cylinder. The peripheral faces of the disks a a' are of considerable breadth in order to add to the stability of the jack and to minimize any tendency of the parts to lateral movement when in a raised position.

Within the hollow piston-rod D is a supporting-bar F, having attached to its upper end a bracket G, upon which will rest the object to be raised. A spring-controlled dog c is pivoted between lugs upon the hollow piston-rod D and engages with rack-teeth a^2 on a side of the supporting-bar F to hold the latter in any desired elevated position.

On a side of the piston-rod D is a rack-bar C', having inverted teeth c'. The rack-bar C' may be integral with the piston-rod D or it may be made separately and attached thereto in any suitable manner. A dog d is pivoted in lugs upon the cap C and is normally out of engagement with the rack-teeth c'. The face c^2 of the dog d is so shaped that but a minimum of its surface ever engages with a face of any of the teeth c' when in contact, as shown in Fig. 7. Consequently while the dog d will hold the piston-rod D securely when in use and the piston-rod is raised but a small amount of pressure is required to release the dog and allow the piston-rod to descend.

Air is forced into cylinder A and beneath the piston E through a tube e, connected to an inlet e' in the base B. The end of the tube e attached to the source of air-supply is provided with an ordinary bicycle-valve f. An air-passage f' leads from the inlet e' through the base B and opens into the cylinder A beneath the piston E. At g the air-passage f' is enlarged to accommodate a valve g' of similar construction and operation to the valve f, except that the valve-stem h projects above the casing. It occasionally happens that the washer h' in the valve g' when the valve is opened to exhaust air in the cylinder by pressing on the valve-stem h will stick to the valve-seat and so prevent the passage of air. To overcome this difficulty, I cut away the valve-stem h, as shown, so that when the valve-stem h is pressed down to exhaust air from the cylinder A and the washer should stick against the valve-seat there will be a sufficient space between the edge of the opening in the washer and the cut-away part of the stem h to permit the air to readily escape.

When it is desired to use the jack, it is first placed beneath the object to be moved. The supporting-bar F is raised to the desired height by hand or until the bracket G contacts with the object and is so held by the dog c engaging with one of the teeth a. Air is then pumped through the tube e and the passage f' into the cylinder A beneath the piston E, raising the latter and the piston-rod D, carrying with them the supporting-bar F and the bracket G and raising the object with which the latter is in contact. When the desired height has been

reached, the pumping is stopped and the weight of the object raised is sustained by the cushion of air beneath the piston E. If at any time, however, leakage or other causes should tend to lessen the air in the cylinder, so that the piston will descend and lower the object raised below the desired position, the dog *d* is tilted into contact with the face of the nearest of the inverted teeth on the piston-rod, and any further downward movement is at once checked. When the object raised is to be lowered and the dog *d* is in engagement with the rack-bar C′, the dog *d* is released, and a pressure of the foot or hand upon the valve-stem *h* will open the valve, allowing the air in the cylinder A to exhaust and the piston G to descend to its first position. The jack can then be removed from beneath the object with which it has been used, and by disengaging the dog *c* from the teeth *a* on the supporting-bar F the latter will drop back to its normal place in the piston-rod D.

It will be observed that the slow exhaustion of the air from the cylinder A because of the small size of the air-passage *f*′ permits a slow descent of the piston and connected parts that sustain the object raised, preventing all jar or shock caused by a sudden release of the air in large volume.

The supporting-bar F can be removed entirely from the piston-rod D, and the latter can be used as a supporting-bar, the top being sufficiently broad and strong to support the object to be raised.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A lifting-jack having a rack-bar with inverted teeth, and means to contact with the face of the teeth to hold the rack-bar when the latter is raised.

2. A lifting-jack having a rack-bar with inverted teeth, and a dog to contact with the face of the teeth to hold the rack-bar when the latter is raised.

3. A lifting-jack having a rack-bar with inverted teeth, and a dog to engage therewith, the face of the dog shaped to present a minimum of its surface to engage with the face of the teeth on the rack-bar.

4. In a pneumatic lifting-jack, the combination of a cylinder, a piston in the cylinder, and a piston-rod having a series of rack-teeth.

5. In a pneumatic lifting-jack, the combination of a cylinder, a piston in the cylinder, and a hollow piston-rod having a series of rack-teeth.

6. In a pneumatic lifting-jack, the combination of a cylinder, a piston in the cylinder, a piston-rod having a series of rack-teeth, and means to contact with the rack-teeth to hold the piston-rod in a raised position.

7. In a pneumatic lifting-jack, the combination of a cylinder, a piston in the cylinder, a piston-rod having a series of rack-teeth, and a dog to contact with the rack-teeth to hold the piston-rod in a raised position.

8. In a pneumatic lifting-jack, the combination of a cylinder, a piston in the cylinder, a piston-rod having a series of inverted rack-teeth, and a dog to contact with the face of said teeth to hold the piston-rod in a raised position.

9. In a pneumatic lifting-jack, the combination of a cylinder, a piston in the cylinder, a hollow piston-rod having a series of inverted rack-teeth, and a dog to contact with the face of said teeth to hold the piston in a raised position.

10. In a pneumatic lifting-jack, the combination of a cylinder, a piston in the cylinder, a piston-rod having a series of inverted rack-teeth, a dog to contact with the face of said teeth, the face of the dog shaped to engage a minimum of its surface with the face of the rack-teeth.

11. A pneumatic lifting-jack having in combination a cylinder, a piston in the cylinder, a hollow piston-rod, rack-teeth on the piston-rod, a supporting-bar in the piston-rod, teeth on the supporting-bar, and a dog on the piston-rod to engage the teeth on the supporting-bar.

12. A pneumatic lifting-jack having in combination a cylinder, a piston in the cylinder, a hollow piston-rod having a series of rack-teeth, a supporting-bar in the piston-rod, teeth on the supporting-bar, and means to engage with the teeth on the piston-rod and the teeth on the supporting-bar to hold the piston-rod and the supporting-bar in a raised position.

13. A pneumatic lifting-jack having in combination a cylinder, a piston in the cylinder, a hollow piston-rod having a series of rack-teeth, a vertically-adjustable supporting-bar in the piston-rod, teeth on the supporting-bar, a dog on the cylinder to contact with the teeth on the piston-rod, and a dog on the piston-rod to engage with the teeth on the supporting-bar.

14. A pneumatic lifting-jack having in combination a cylinder, a piston in the cylinder, a hollow piston-rod having a series of inverted rack-teeth, a vertically-adjustable supporting-bar in the piston-rod, teeth on the supporting-bar, a dog on the cylinder to contact with the face of the teeth on the piston-rod, and a dog on the piston-rod to engage the teeth on the supporting-bar.

15. A lifting-jack having in combination a cylinder, a base therefor, a piston in the cylinder, a hollow piston-rod having inverted rack-teeth, a cap on the cylinder through which the piston-rod moves, a vertically-adjustable supporting-bar having rack-teeth, a dog on the piston-rod to engage said teeth,

and a dog on the cap to engage with the teeth on the piston-rod.

16. A pneumatic lifting-jack having in combination a cylinder, a piston in the cylinder, a hollow piston-rod having a series of rack-teeth, a supporting-bar in the piston-rod, and a supporting-bracket on the supporting-bar.

In testimony whereof I hereunto set my hand, this 6th day of February, 1905, in the presence of two attesting witnesses.

FRANK E. TEN EYCK.

Witnesses:

WM. CHAUNCEY GATES,

D. L. TULLER.