

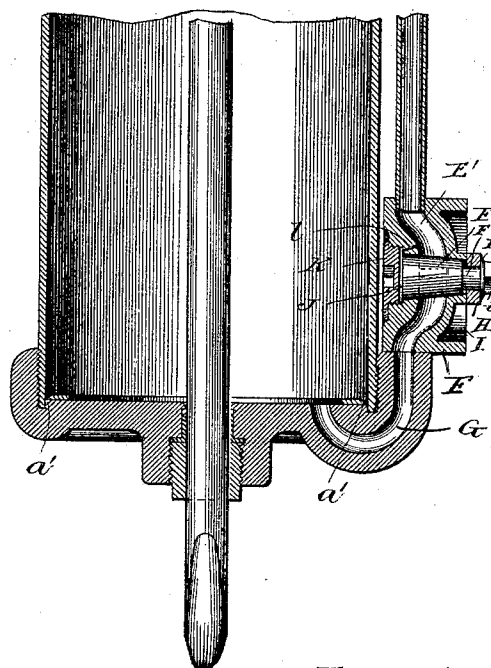
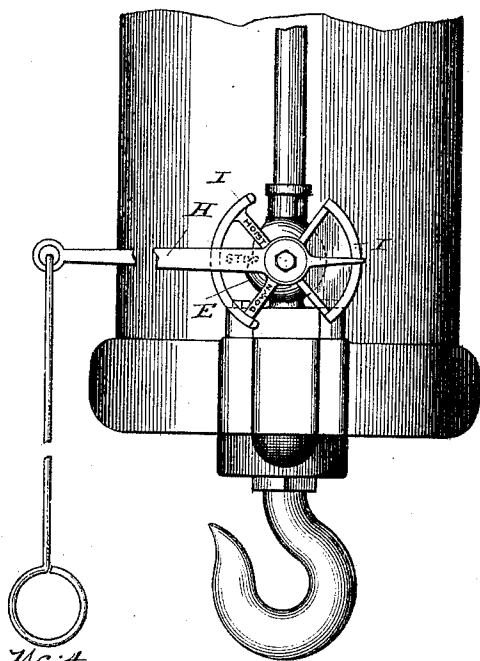
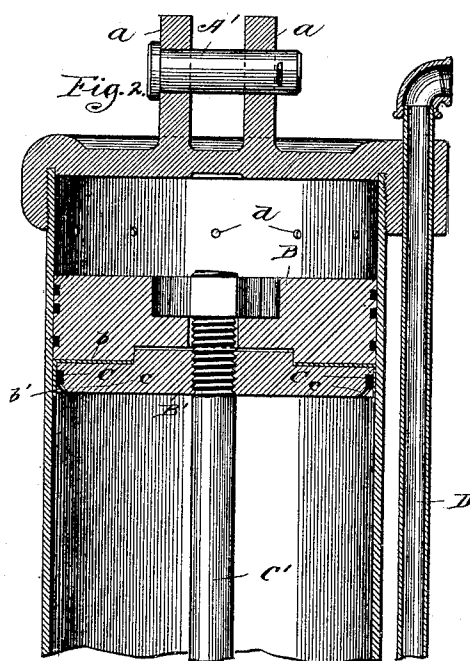
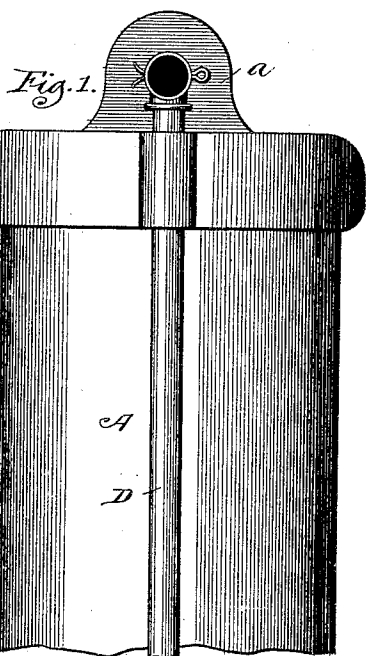
(No Model.)

3 Sheets—Sheet 1.

C. WEATHERSON.  
AIR HOIST.

No. 465,008.

Patented Dec. 15, 1891.



Witnesses,  
J. Mann,  
C. C. Knuthman

Inventor,  
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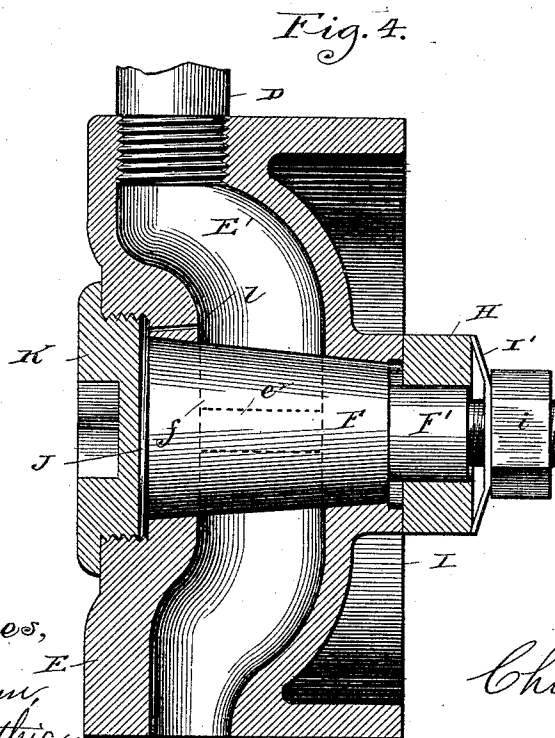
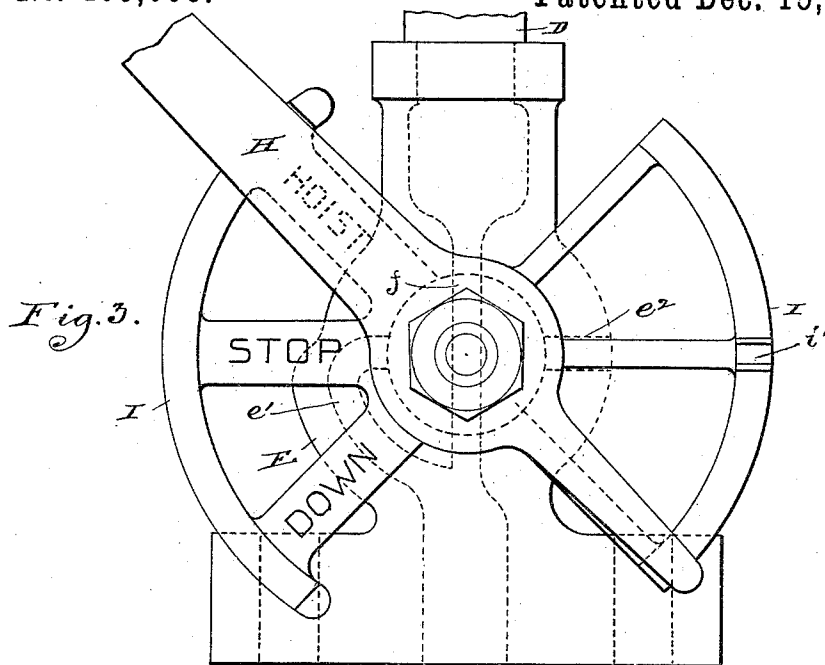
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3 Sheets—Sheet 2.

C. WEATHERSON.  
AIR HOIST.

No. 465,008.

Patented Dec. 15, 1891.



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(No Model.)

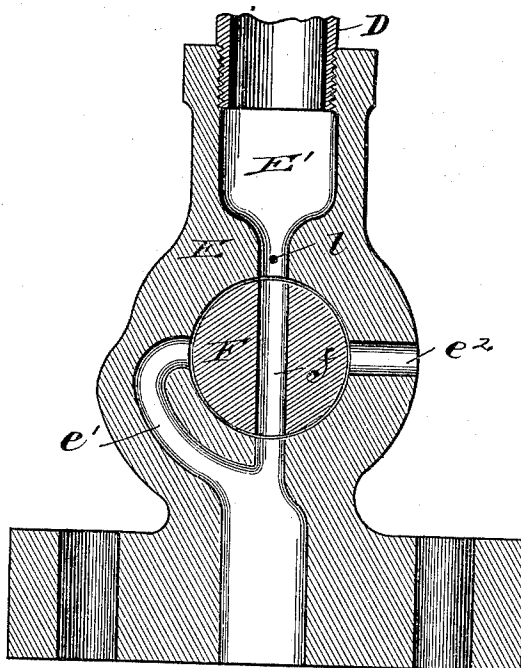
3 Sheets—Sheet 3.

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*Fig. 5.*



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# UNITED STATES PATENT OFFICE.

CHRISTOPHER WEATHERSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO HIMSELF  
AND THE CHICAGO FORGE AND BOLT COMPANY, OF SAME PLACE.

## AIR-HOIST.

SPECIFICATION forming part of Letters Patent No. 465,008, dated December 15, 1891.

Application filed May 27, 1889. Serial No. 312,242. (No model.)

*To all whom it may concern:*

Be it known that I, CHRISTOPHER WEATHERSON, a citizen of the United States, residing at Chicago, Illinois, have invented certain new and useful Improvements in Air-Hoists, of which the following is a specification.

This invention relates to a hoist in which air under pressure is admitted to a power-cylinder having a reciprocating piston therein and a piston-rod projected beyond the cylinder-head to afford means for attaching the load to be moved. The supply and exhaust of air are controlled by suitable valves, and in the particular construction shown the air is admitted through a supply-pipe having a three-way valve therein, and a lever is connected to the valve-stem, so that the latter may be turned in its three positions in order to hoist the load, to hold it suspended, and to lower it.

The invention consists in the constructional features.

In the drawings, Figure 1 is a side elevation of the device, a section thereof removed. Fig. 2 is a vertical section through the power-cylinder and supply-pipe. Fig. 3 is a front view of the hoisting-lever and showing the valve-passages in dotted lines; and Fig. 4 is a cross-section through the valve-casing, the valve showing in side elevation. Fig. 5 is a vertical sectional elevation through the valve.

A represents the cylinder, which will be proportioned to the amount of power required. When it is designed to use the hoist for transporting loads along a way, the upper cylinder-head may have the integral lugs *aa* to support the attaching-bolt *A'*. The piston is preferably constructed in two longitudinal sections *B B'*, and a leather gasket *b* is inserted between the sections, an edge *b'* of the gasket being turned down between the edge of the section *B'* and the wall of the cylinder. This edge *b'* is beveled, and a beveled channel *a'* is formed in the inner face of the head to receive the packing without injury thereto.

In order to keep the piston packed, I form the annular chamber *C* in the periphery of section *B'* and provide slots *c*, communicating with the interior of the chamber, whereby air is admitted into the annular chamber and

the packing is forced into contact with the cylinder-wall.

In order to admit atmospheric air into the cylinder above the piston, the former is provided at a suitable distance from its upper end with apertures *d*, through which the air enters freely during the downward movement of the piston and escapes freely during its upward movement until the piston cuts off the escape by covering the apertures. The air which is thus prevented from escape forms a cushion to the piston at the limit of its upward stroke and prevents jarring or shock.

*C'* is the piston-rod, the end of which outside the cylinder may be provided with a hook to adapt it to engage the load.

*D* is the supply-pipe, through which air under pressure will be forced.

*E* is the valve-casing, into which the supply-pipe *D* is screwed. This casing is bored to form a seat for the valve *F*, the latter being of the conical-plug type and having the aperture *f* and the stem *F'*.

*E'* is a passage through the casing *E*, one end of said passage communicating with the supply-pipe and the other with a passage *G*, formed in the cylinder-head and opening into the cylinder. The passage *E'* has a branch *e'*, which terminates at the valve-seat, and opposite the mouth of this passage another *e''*, which delivers into the outer atmosphere.

Instead of the three-way valve above described, it is evident that a simple valve may be used to control the admission of the air to the cylinder and a separate exhaust may be used; but I prefer the construction shown, inasmuch as it simplifies the operation, only one operating-lever being necessary to secure both movements of the piston.

*H* is the operating-lever, which is keyed on the valve-stem and confined by a spring-washer *I'*, held by the nut *i* on the threaded end of the stem, whereby the valve is held tightly to its seat.

*I* is a guide, which may be the continuous flange of the valve-casing, as shown in Figs. 2 and 4, or said flange may be segmental, as shown in Figs. 1 and 3. The lever is preferably secured to the valve-stem in such manner that one of its ends shall project so as

to ride upon the guide I, and the latter is provided with a locking-notch *i'*, which is adapted to receive a suitable locking projection on the end of the lever, so that when the lever is brought to a horizontal position it is locked by the pressure of the spring-washer, the resiliency of which permits the lever to be freed by a slight outward pull. This lever will preferably be so secured to the valve-system that at the limit of the movement of the lever the valve-aperture registers with passage E' and the air is permitted to enter the cylinder and cause the movement of the piston to lift the load. The lever being brought to a horizontal position, the further supply of air is cut off, but the piston is held at its upward limit and the load suspended. If the hoist be used to move the load along a way, the air-supply pipe may be flexible to permit of said movement. When it is desired to lower the load, the lever is brought down, and the branch *e'* of passage E' registers with the valve-aperture, and the air is permitted to escape through the passage *e*<sup>2</sup>. Some difficulty is encountered in the use of valves of this class because of their tendency to work out of their seats and thus permit leakage. To

hold the valve closely to its seat, I provide an air-chamber J at the base of the valve, which may be conveniently done by hollowing out the casing and fitting into threads in the wall of the cut-away portion a screw-plug, as K. An aperture *l* is made in the casing to permit air to pass into the chamber at the base of the valve, and thereby the latter is held closely to its seat and all leakage prevented.

This hoist may be used either as a stationary or as a movable hoist and for all purposes to which such devices are commonly applied.

I claim—

In an air-hoist, the combination of the power-cylinder and a pipe for supplying air under pressure thereto, a valve located in said pipe, an operating-handle secured to the stem of the valve, a guide or bearing for said handle having thereon a locking-notch, and a locking projection on the handle adapted to enter said notch, and a spring secured against the lever to permit the locking and unlocking thereof, substantially as described.

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Witnesses:

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