

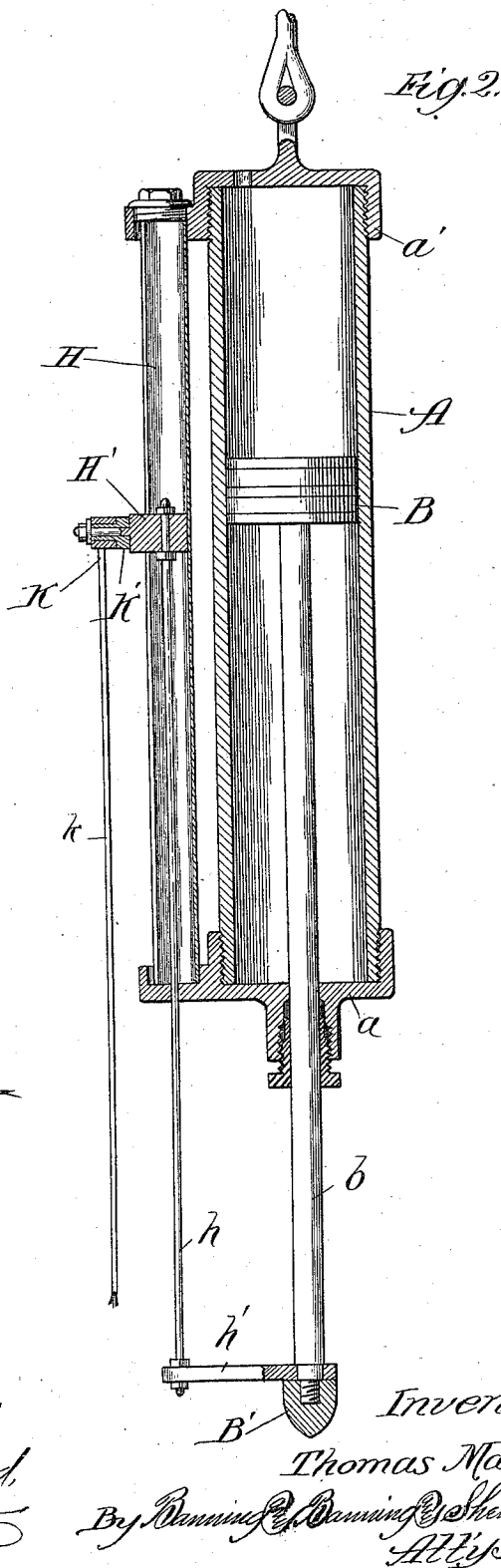
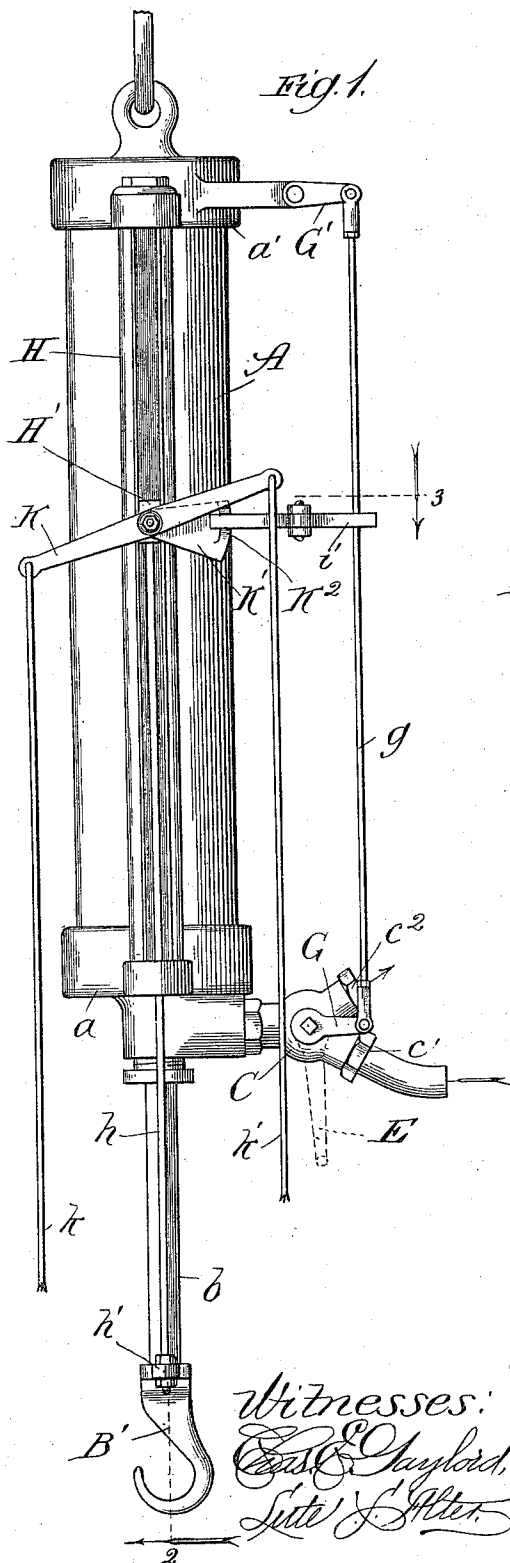
(No Model.)

2 Sheets—Sheet 1.

T. MASON.
ELEVATOR OR HOIST.

No. 579,400.

Patented Mar. 23, 1897.



(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

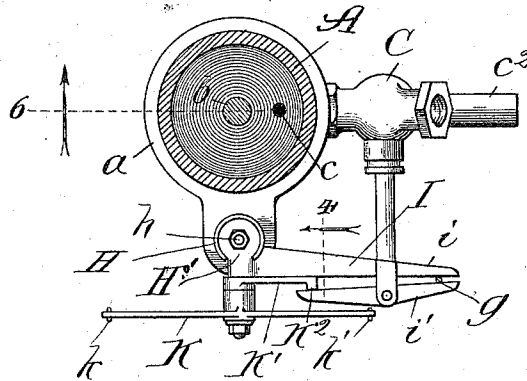


Fig. 4.

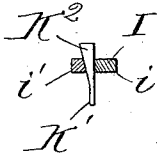


Fig. 5.

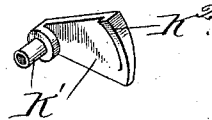
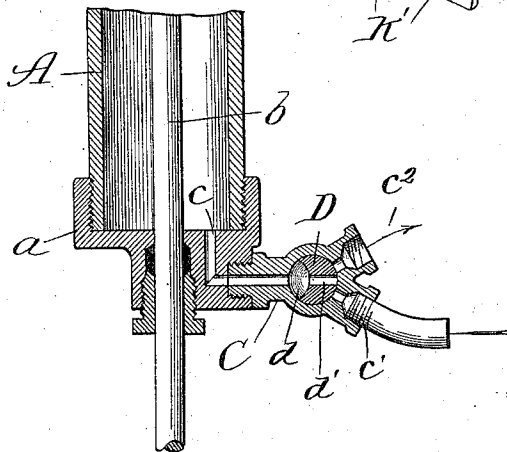


Fig. 6.



Witnesses:

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UNITED STATES PATENT OFFICE.

THOMAS MASON, OF TOPEKA, KANSAS.

ELEVATOR OR HOIST.

SPECIFICATION forming part of Letters Patent No. 579,400, dated March 23, 1897.

Application filed May 25, 1896. Serial No. 592,933. (No model.)

To all whom it may concern.

Be it known that I, THOMAS MASON, a citizen of the United States, residing at Topeka, Shawnee county, Kansas, have invented certain new and useful Improvements in Elevators or Hoists, of which the following is a specification.

My invention relates particularly to elevators or hoists that are used in combination with mechanism adapted to be operated by fluid-pressure; and it relates especially to the mechanism by which the load is automatically maintained at any desired or predetermined position.

The object of my invention is to provide a simple, economical, and efficient elevating or hoisting mechanism; and the invention consists in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of my improvement; Fig. 2, a vertical sectional elevation of the same, taken on line 2 of Fig. 1, looking in the direction of the arrow; Fig. 3, a transverse sectional view taken on line 3 of Fig. 1; Fig. 4, a sectional detail of a portion of the mechanism, taken on line 4 of Fig. 3; Fig. 5, a perspective view of the cam-lever for operating the gripping-jaws, as hereinafter described; and Fig. 6, a longitudinal sectional view of a portion of the mechanism, showing the three-way controlling-valve through which fluid-pressure is admitted to or exhausted from the operating-cylinder.

In illustrating and describing my improvements I have seen fit to describe and show them in connection with one form of elevator or hoist; but I do not desire to be limited strictly to this form, as my improvements are applicable to all forms of fluid-pressure elevators by merely changing or arranging them to suit different circumstances and conditions.

In constructing my improvements I make a cylinder A of the desired size, shape, and strength to hold the operating parts in position and resist the internal fluid-pressure. In this cylinder is arranged a movable piston B, which is provided with a piston-rod b, extending out through what for convenience I term the "lower end" of the cylinder. This

cylinder is provided with the usual heads a a' and the other necessary mechanism. For the purpose of raising or lowering a load I provide the lower end of the piston-rod with a hook B', to which the load may be attached as desired or to which a cable may be attached, which is in any convenient manner secured to a cage or skip of an ordinary elevator.

In order to admit and exhaust fluid-pressure at desired times, I provide the lower portion of the cylinder or the cylinder-head a with a controlling-valve C, which is provided with a channel or passage c, through which air is admitted or exhausted from the cylinder underneath the movable piston. This valve-casing is provided with two openings or passages c' c². The passage c' may be connected by means of a suitable pipe with any suitable source of fluid-pressure. I prefer for economy and operation to use compressed air. The educt or exhaust passage c² may be connected by means of a pipe to any point where it is desired to discharge the air. This valve is provided with a suitable tapered plug D, that has a slot or channel d at one side thereof of sufficient width to always keep a portion of it in alinement with the passage c. At right angles with this passage is a second or transverse passage d', which, when the plug is vibrated by means hereinafter described, brings the passage into alinement with either the inlet or exhaust passage. When brought into alinement with the inlet-passage fluid under pressure flows into the cylinder to operate the movable piston, and consequently raises the load. When this transverse passage is brought into alinement with the exhaust-opening c², the fluid-pressure in the cylinder is permitted to exhaust therefrom, and the load—if there be any on the piston-rod—will cause the same to descend. In order to operate this valve at the desired time, I provide it with a handle E, (shown in dotted lines in Fig. 1,) which the operator may move from side to side as desired, so as to vibrate the valve to admit fluid-pressure to the cylinder or allow it to be exhausted therefrom.

In the use of fluid-pressure elevators it is often desirable and necessary to maintain the load, skip, or cage at a desired or predeter-

mined position. In order to accomplish this, I provide the valve-plug with a handle portion G and connect with it a rod *g*, (though a cable, wire, cord, or rope may be used,) which may be led to any desired position, but I prefer in this kind of a hoist, as is shown in Fig. 1, to lead it and connect it with a second lever G', which is pivoted, preferably, to the upper cylinder-head. It will thus be seen that the movements of this rod control the operations of the controlling-valve. Arranged adjacent to the cylinder and preferably in a tube H is a sliding block H', which is connected with the piston-rod, by means of a rod *h* and bar *h'*, so that this sliding block partakes of the same movements as the main piston. Secured to this sliding block is a gripper I, which has one rigid jaw *i* and a vibrating jaw *i'*, pivoted thereto, both of such jaws being arranged in such position that they grasp the rod G between them, as is clearly shown in Fig. 3 of the drawings.

Pivoted to the sliding block H is a vibrating actuating-lever K, provided with two ropes or cords *k k'*, that are led to a suitable position, so as to be grasped and operated by an employee or operator. Connected with this operating-lever is a second cam-lever K', arranged so as to vibrate simultaneously with it, and which has its free end provided with a cam-surface *k²* and arranged between the gripping-jaws, as shown in Fig. 3. When the cam-lever is vibrated into the position shown in Figs. 1, 3, and 4, the jaws are closed and caused to grip the rod and operate the controlling-valve.

The operation of the parts is as follows: The load is secured to the hook above described and the operator moves the controlling-valve into position, so as to admit the proper supply of compressed air. This causes the piston to travel upwardly and raise the load to any desired position, when the controlling-valve may be moved to its closed position and all further supply of fluid-pressure shut off. To automatically maintain the load in this position, the operator pulls down the cord *k'*, which action serves to cause the grip to grasp the operating-rod *g*, which action connects the movable parts of the elevator with the controlling-valve. If, through leakage or otherwise, fluid-pressure is diminished in the cylinder, the load will cause the piston to drop and the grip to move the rod *g* and depress the lever G on the controlling-valve to such a position as to admit a fresh supply of fluid-pressure, until the load on the piston is balanced by the fluid-pressure underneath, or until an excess of pressure is admitted to the cylinder to cause the piston to rise, which action will also raise the sliding block and grip and operate to close the controlling-valve.

The principal advantage of my improvements, and one that will be readily appreciated by those skilled in the art or those who have occasion to use elevators or hoists in which compressed air is directly used as the

motive power, is that a load, cage, or skip may be kept in any predetermined or desired position as long as there is a sufficient supply of fluid-pressure.

While I have described my invention with more or less minuteness as regards details, and as being embodied in certain precise forms, I do not desire to be limited thereto unduly any more than is pointed out in the claims. On the contrary, I contemplate all proper changes in form, construction, and arrangement, the omission of immaterial parts and the substitution of equivalents, as circumstances may suggest or necessity render expedient.

I claim—

1. In mechanisms of the class described, the combination of a cylinder, provided with a reciprocating piston arranged to be actuated by fluid-pressure, a controlling-valve through which fluid-pressure is admitted and exhausted from the same, means for primarily operating such valve, and auxiliary mechanism for such valve arranged to be connected with or disconnected from a movable part of the mechanism to operate the valve and automatically sustain a load in a desired position, substantially as described.

2. In mechanisms of the class described, the combination of a cylinder provided with a reciprocating piston arranged to be actuated by fluid-pressure, a controlling-valve through which fluid-pressure is admitted or exhausted from the cylinder, means for primarily operating such valve, and auxiliary mechanism composed of a sliding block connected with the piston, and gripping mechanism, arranged to connect the piston with the controlling-valve to operate the same by the movements of the piston and automatically sustain a load in a desired position, substantially as described.

3. In mechanisms of the class described, the combination of a cylinder, a piston movably mounted therein arranged to be operated by fluid-pressure, a rod on such piston extending out through one end of the cylinder, means for connecting the piston with a load to be operated, a controlling-valve for such cylinder through which the fluid-pressure is admitted to or exhausted from the cylinder, supplementary means for operating the controlling-valve and by the movements of the piston to automatically maintain a load in a desired position and which consists of a sliding block connected with the piston-rod, a wire rod, cable or similar mechanism, gripping mechanism arranged to grasp the wire, &c., and means for operating the gripping mechanism and for connecting it with the controlling-valve to operate the same, substantially as described.

4. In mechanism of the class described, the combination of a cylinder, a piston movably mounted therein arranged to be operated by fluid-pressure, a rod on such piston extending out through one end of the cylinder, means

for connecting the piston to a load to be operated, a controlling-valve arranged at one end of the piston through which fluid under pressure is admitted or exhausted from the cylinder, means by which such valve is operated to admit or exhaust fluid-pressure from the cylinder, supplementary means for operating such controlling-valve by the movements of the piston to maintain the load in the desired position and which consists of a

sliding block connected with the piston-rod, gripping mechanism therein, means for operating the same, and a rod or similar mechanism arranged to be grasped by the gripping mechanism and connected with the controlling-valve, substantially as described. 15

THOMAS MASON.

Witnesses:

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