

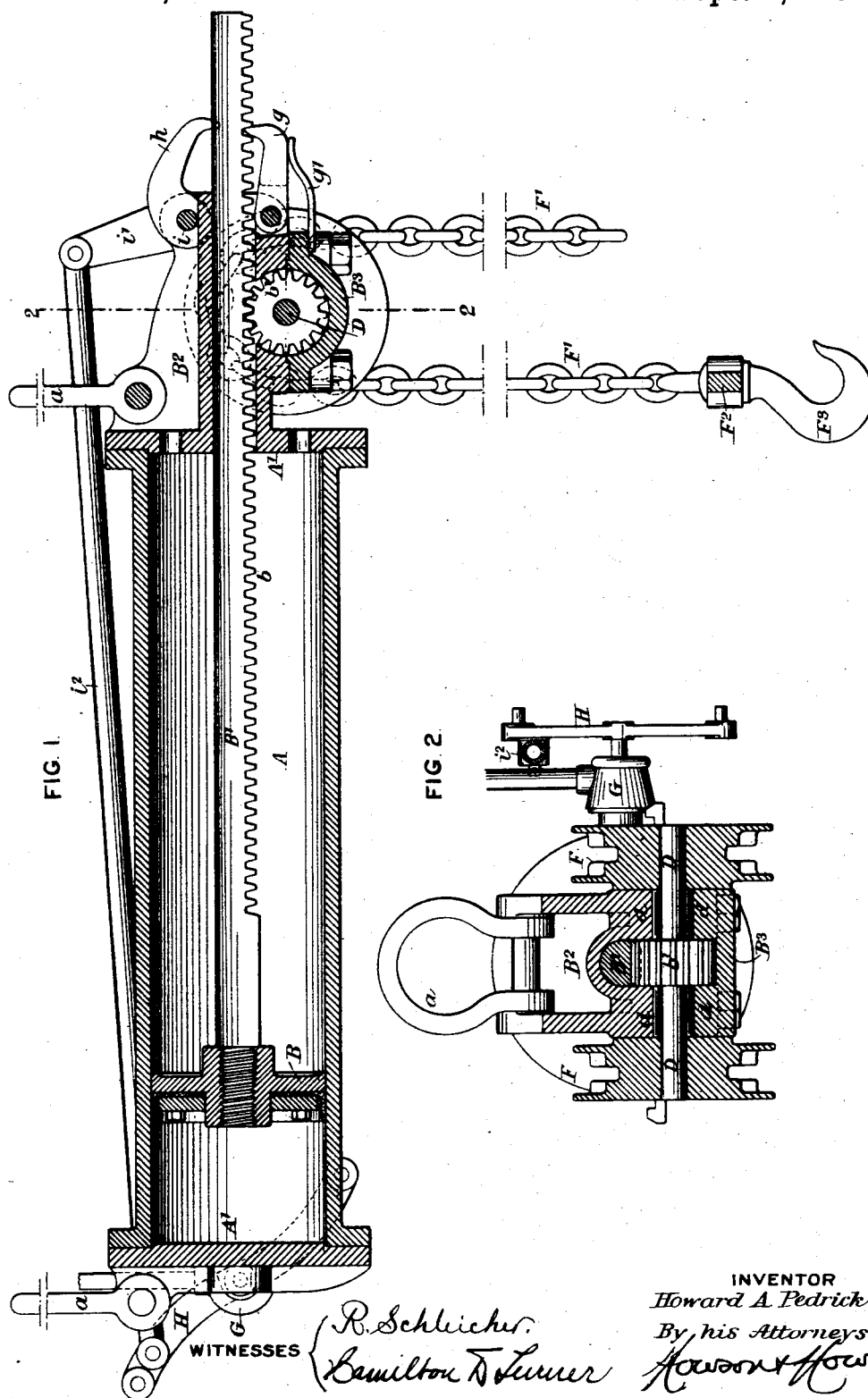
(No Model.)

3 Sheets—Sheet 1.

H. A. PEDRICK.
HOISTING APPARATUS.

No. 525,561.

Patented Sept. 4, 1894.



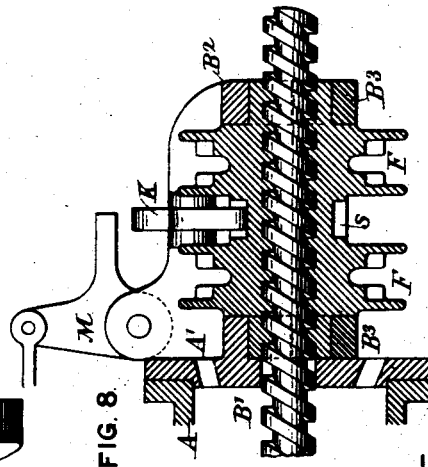
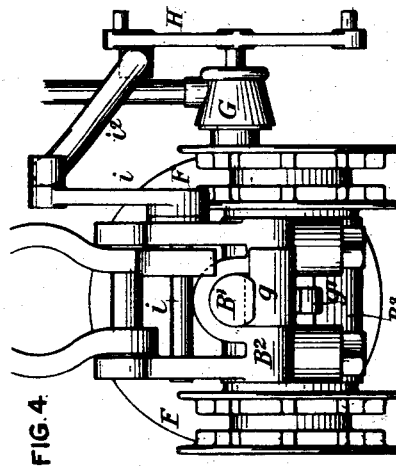
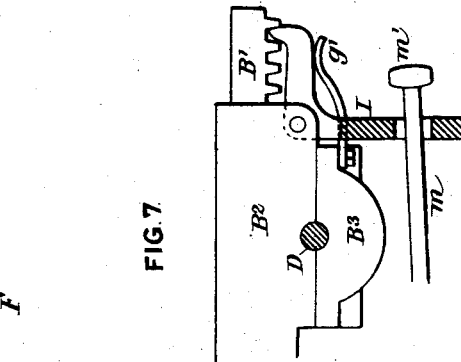
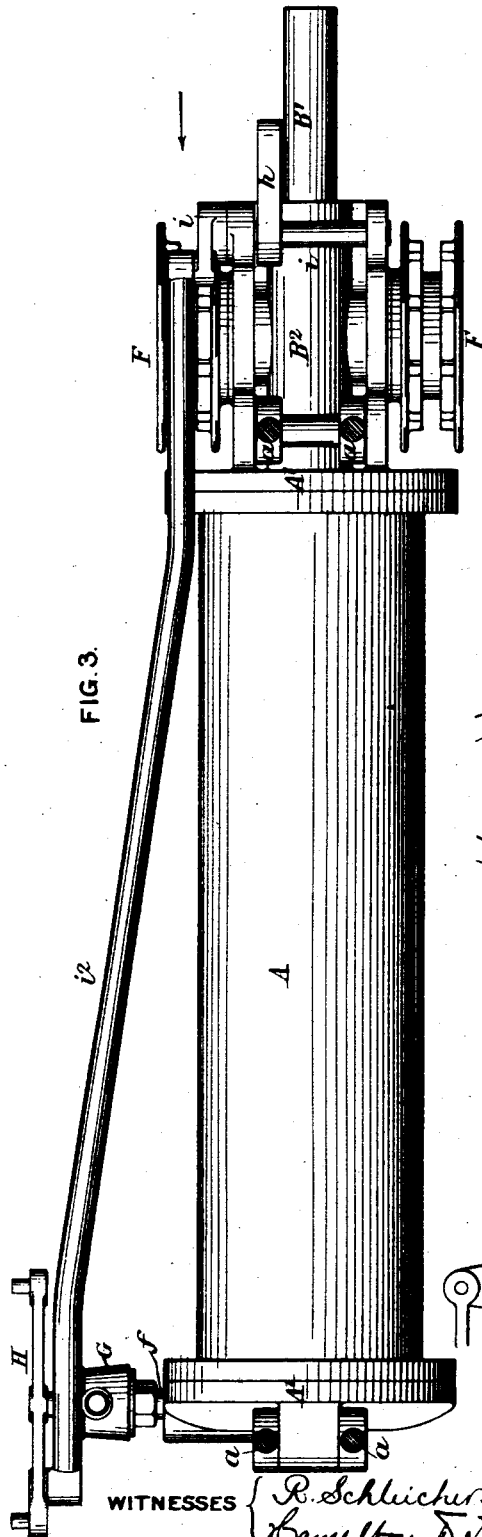
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INVENTOR
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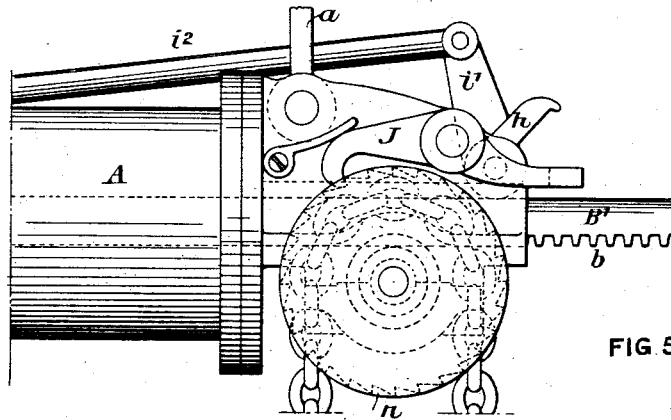
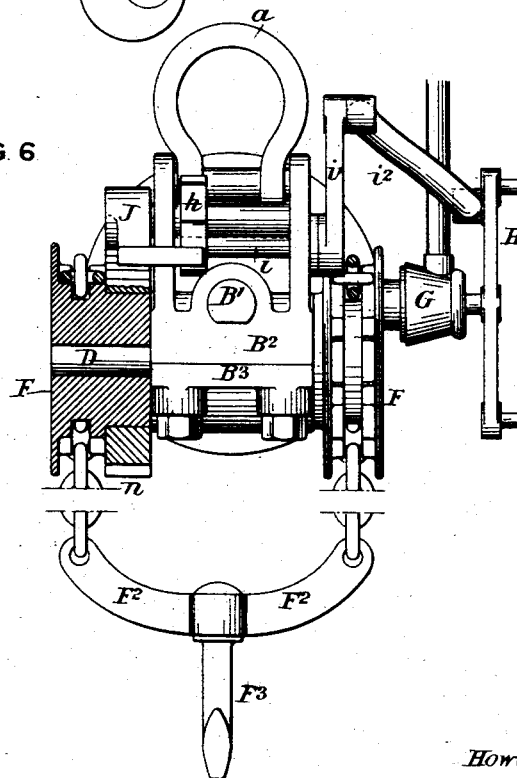


FIG 5.

FIG 6



WITNESSES

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UNITED STATES PATENT OFFICE.

HOWARD A. PEDRICK, OF PHILADELPHIA, PENNSYLVANIA.

HOISTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 525,561, dated September 4, 1894.

Application filed January 15, 1894. Serial No. 496,931. (No model.)

To all whom it may concern:

Be it known that I, HOWARD A. PEDRICK, a citizen of the United States, residing at Philadelphia, Pennsylvania, have invented certain Improvements in Hoisting Apparatus, of which the following is a specification.

One object of my invention is to so construct a hoisting apparatus intended for operation by compressed air or equivalent motive fluid that the hoisting device will occupy the least possible amount of vertical space so as to provide for the maximum amount of lift which the height of the roof or ceiling will permit, a further object being to provide for the rigid locking of the hoisting mechanism so as to maintain the load in any desired position for any desired length of time without, however, interfering with the raising or lowering of the load from the position of rest.

A still further object is to provide for the operation of the hoist, either for raising or lowering, as well as for the locking and unlocking of the same by the manipulation of a single lever. These objects I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1, is a longitudinal section, partly in elevation, of a hoisting device constructed in accordance with my invention. Fig. 2, is a transverse section of the same on the line 2—2 Fig. 1. Fig. 3, is a plan view partly in section. Fig. 4, is an end view looking in the direction of the arrow Fig. 3. Fig. 5, is a side view illustrating a modification of part of the invention. Fig. 6, is an end view of the same partly in section; and Figs. 7 and 8, are diagrams illustrating other modifications.

A represents the cylinder of the hoist having opposite heads A' each of which is preferably provided with a link *a* so that the cylinder can be hung to the ceiling or roof structure of the room or apartment in which the hoist is to be used and can thus be as close as possible to said ceiling or roof so as to occupy but little vertical space and permit of the maximum amount of hoist.

To the cylinder is adapted a piston or plunger B secured to the inner end of the piston rod B' which has formed on its under side a rack *b* engaging with a pinion *b'* upon the hoisting shaft or spindle D, the latter turn-

ing in roller bearings *d* formed in a box B² projecting from the front head of the cylinder, and in a cap B³ applied to the under side of said box, the box also constituting a guide for the piston rod and both box and cap being chambered for the reception of the spur pinion *b'*.

Each end of the hoisting shaft D has secured to it a chain wheel F for the reception of the hoisting chain F', the loop of this chain depending on one side of the hoisting wheels and the ends of the chain depending on the other side and being connected to the yoke F² of the hoisting hook F³ so that the outward movement of the piston B will cause the shaft D and its chain wheels to turn forward and raise the hoisting hook while inward movement of the piston will cause a reverse movement of the shaft and its hoisting wheels and a lowering of the hook.

The compressed air or other motive fluid under pressure is admitted to the rear end of the cylinder A through a pipe *f* through which the flow of the motive fluid is controlled by an ordinary two-way valve contained in the valve chest G, the stem of said valve having a lever H, the arms of which may be provided with suitable pendent ropes or chains so that said lever can be readily manipulated from the floor of the room or apartment in order to cause it to assume either of three positions, and thus either admit the compressed air to the rear end of the cylinder A, cut off the flow of air thereto, or permit of the escape of air therefrom. In the first case, the piston will be projected and the load raised, and in the second case the air will be confined in the cylinder and the load will remain suspended, while in the third case the air will be exhausted from the cylinder and the load will be permitted to descend. In order, however, to positively lock the load in any position to which it has been raised or lowered and in which it is desired to permit it to remain for any considerable length of time, I employ a detent *g* hung to the box B² at the front end of the cylinder A and held in engagement with the rack *b* on the under side of the piston rod by means of a spring *g'*, and in order to effect the automatic removal of said detent from engagement with

the rack prior to the lowering of the load I employ a trip arm *h* hung to a shaft *i* which is mounted in bearings on the box *B*² and has an arm *i'* connected by a rod *i*² to one arm of the valve operating lever *H*. The detent *g* projects laterally beyond the piston rod *B'* as shown in Fig. 4, and the trip arm *h* is adapted to act upon this projecting portion of the detent when the trip arm is lowered the detent being thus depressed and the piston rod released, this operation taking place upon such movement of the valve operating lever *H* as will permit of the escape of the air from the rear end of the cylinder.

A modified form of the device is that shown in Fig. 7 in which the detent is in the form of a bell crank lever *I*, one arm of which engages with the rack of the piston rod, the other arm being slotted for the passage of a rod *m*, which has a head *m'* adapted, upon the retraction of the rod, to effect such movement of the detent as will withdraw it from engagement with the rack, the spring *g'* acting as before.

In Figs. 5 and 6 I have illustrated another form of detent the rack in this case being in the form of a ratchet wheel *n* secured to one of the chain wheels *F* and the detent consisting of a lever *J* one arm of which engages with the ratchet wheel and is acted upon by the spring *g'*, the other arm being acted upon by the tripper arm *h*.

The mounting of the shaft *D* in bearings carried by the head of the hoisting cylinder provides an extremely compact and efficient form of support and thus enables me to avail myself of the advantages due to the disposal of the hoisting cylinder horizontally and close to the ceiling or roof beams.

An even more compact arrangement may, if desired, be adopted as shown in Fig. 8 by locating the hoisting wheels transversely in respect to the cylinder and mounting them upon or forming them integral with a nut engaging directly with a thread or threads cut upon the piston rod *B'* so that as the latter is projected the hoisting wheels will be turned in one direction and when the piston rod is retracted, will be turned in the opposite direction. In this case the detent lever *K* may conveniently be arranged transversely to the cylinder, and adapted to act upon a circular rack *s* formed between the two hoisting wheels, the tripper being in the form of a lever *M*.

It will be observed that the hoisting shaft, its bearings, pinion and hoisting wheels, are all carried by the head of the cylinder, so that the entire structure is single and self-contained and is ready for use immediately upon suspending it from its support by means of the links *a*, and the entire structure can be transported, set up, or removed, without disturbing the relation of any of the parts to each other.

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

1. The combination of the cylinder and means for mounting the same horizontally, with a hoisting wheel shaft adapted to bearings formed upon the cylinder head, a piston and piston rod, and means whereby the reciprocation of said piston rod is caused to effect the rotation of said hoisting shaft, the whole constituting a single, self-contained structure substantially as specified.

2. The combination of the cylinder, its piston and piston rod having a rack, means for mounting said cylinder horizontally, the hoisting shaft adapted to bearings formed upon the head of the cylinder, the hoisting chain adapted to wheels on said shaft, and a pinion carried by the shaft, and engaging with the rack of the piston rod, the whole constituting a single, self contained structure, substantially as specified.

3. The combination of the hoisting cylinder, the piston therein hoisting mechanism operated by said piston and having as one of its elements a rack, a detent engaging with said rack, and serving to lock the same and prevent the descent of the load, a valve for controlling the flow of motive fluid to and from the cylinder, a lever for operating said valve and means whereby the movement of said lever necessary to exhaust the motive fluid from the cylinder is caused to move the detent out of engagement with the rack, substantially as specified.

4. The combination of the hoisting cylinder, its piston having a rod with rack thereon, a hoisting shaft with pinion engaging the rack, a detent engaging with said rack to prevent the descent of the load, a valve controlling the flow of motive fluid to and from the hoisting cylinder, an operating lever for said valve, and means whereby the movement of said lever in order to exhaust the motive fluid from the cylinder is caused to effect the release of the detent from engagement with the rack of the piston rod, substantially as specified.

5. The combination of the hoisting cylinder and its piston, hoisting mechanism operated by the movement of said piston and having as one of its elements a rack, a detent engaging with said rack, and serving to lock the same so as to prevent the descent of the load, a trip arm for moving said detent out of engagement with the rack, and means for operating said trip arm, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HOWARD A. PEDRICK.

Witnesses:

FRANK BECHTOLD,
WILLIAM A. BARR.