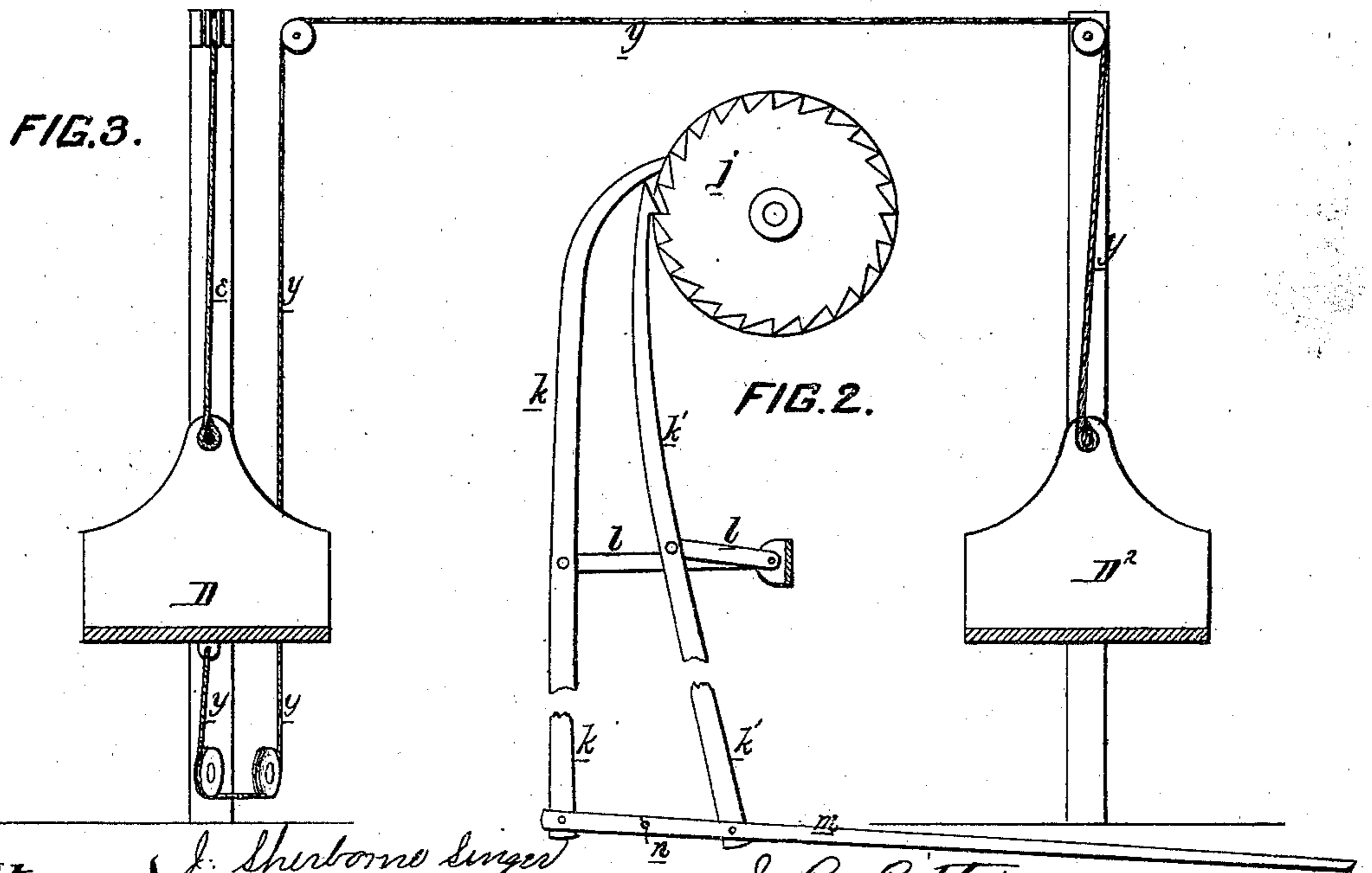
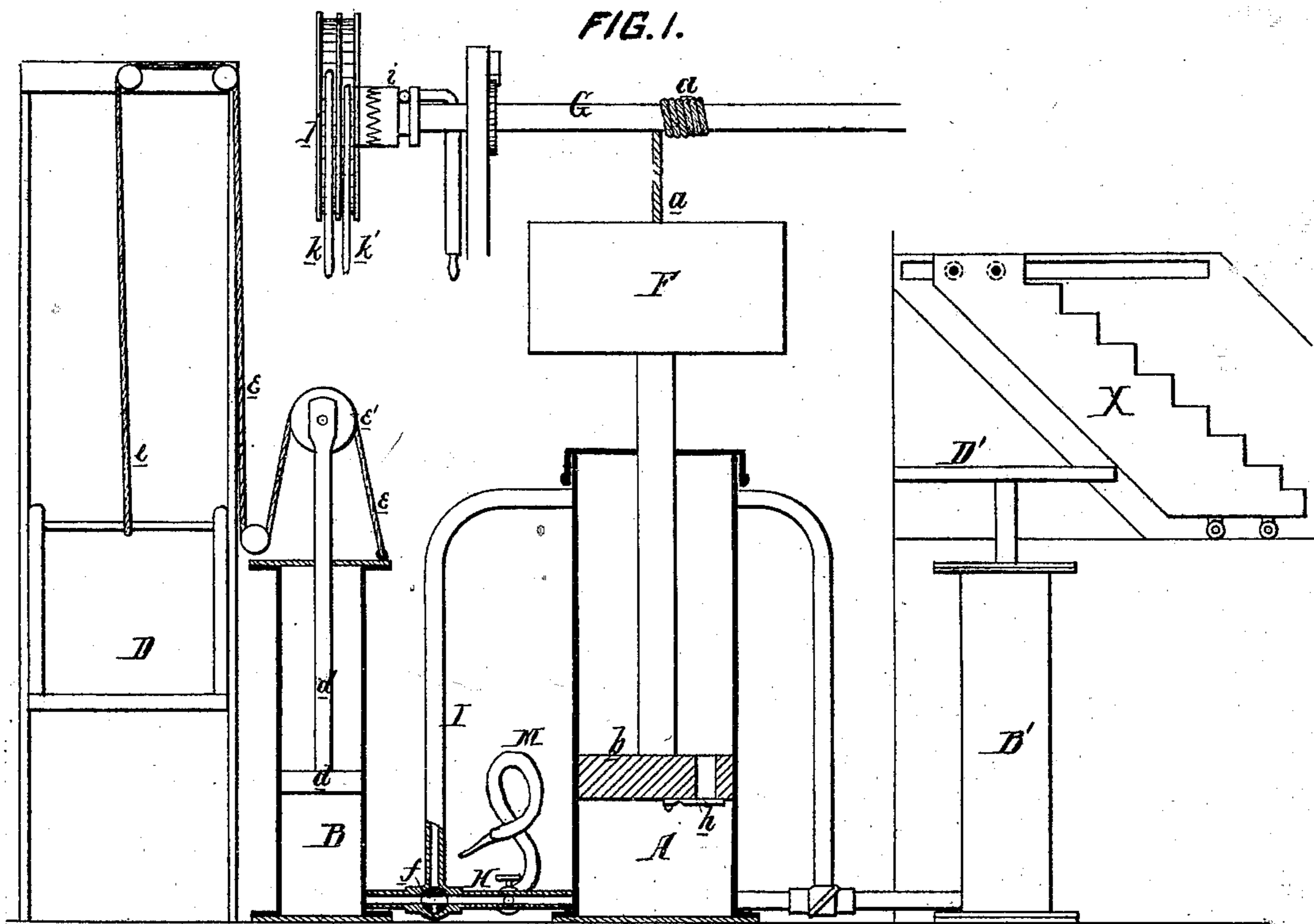


J. R. RITTER.

Hydraulic Hoisting Apparatus.

No. 133,257.

Patented Nov. 19, 1872.



Witnesses { J. Shurtowne Singer  
Thomas McShain

J. R. Ritter  
by his atty. Howson and Son

# UNITED STATES PATENT OFFICE.

JACOB R. RITTER, OF READING, PENNSYLVANIA.

## IMPROVEMENT IN HYDRAULIC HOISTING APPARATUS.

Specification forming part of Letters Patent No. 133,257, dated November 19, 1872.

*To all whom it may concern:*

Be it known that I, JACOB R. RITTER, of Reading, Berks county, State of Pennsylvania, have invented certain Improvements in Hydraulic Hoisting Apparatus, of which the following is a specification:

The object of my invention is to produce an hydraulic hoisting apparatus for raising and lowering light loads in buildings where steam power or mechanism for pumping water into the apparatus is not available; and I accomplish this object by combining two communicating cylinders, A and B, having pistons and piston-rods, with a hoist, D, and weight F, as plainly shown in Fig. 1, the weight F, which is the motive power for the hoist, being secured to the upper end of the piston-rod of the main cylinder and suspended by a rope or chain, *a*, from a windlass, G, by turning which the weight can be elevated. On releasing the weight it will act upon the column of water in the cylinder A beneath the piston *b*, and will force the same through the connecting-pipe H into the cylinder B, the piston and piston-rod *d* of which will be elevated, as will also the hoist D, the rope or chain *e* of the latter being acted upon by a pulley, *e'*, at the upper end of the rod *d* in such a manner as to impart double the extent of movement to the hoist that is imparted to the said piston-rod. When the hoist has been thus raised to its full extent the weight F will cease to descend, and, when desired, the hoist can be lowered by its own weight by simply turning the three-way cock *f* in the connecting-pipe H to such a position as to permit the water beneath the piston in the cylinder B to flow out of the latter, through the connecting-pipe and through a discharge-pipe, I, into the cylinder A above the piston.

The smoothness and regularity of motion of the hoist and other advantages attained by the use of the weight as a motive power are so fully described in a separate application which I have made for a patent that further allusion to them here will be unnecessary.

The returning of the water into the cylinder A after utilizing the same in the cylinder B obviates the necessity of pumping a fresh supply into the former cylinder and enables the apparatus to be operated with a very limited

quantity of water. The latter, when the piston *b* and weight are elevated, will pass through an opening in the said piston covered by a check-valve, *h*, opening downward into the lower portions of the cylinder, so that when the piston again descends the water may be forced into the cylinder B to again elevate the hoist. It will be understood that the number of times the hoist can be elevated by one descent of the weight F will depend upon the relative capacities of the two cylinders.

The weight is, as before mentioned, elevated by winding its rope or chain *a* upon a windlass, G, and the latter is released in order that it may turn freely and thus permit the descent of the weight by means of a clutch and lever, *i*, which connect it to the weight-elevating appliances. The latter may be a simple pulley upon the windlass-shaft when power can be obtained, but this apparatus has been designed more especially for use in warehouses and stores where power is not available; and in such case I prefer to use the devices illustrated in Figs. 1 and 2 for turning the windlass and elevating the weight by hand. These consist of a double ratchet-wheel, *j*, hung to the windlass-shaft and operated by two long pawls, *k* and *k'*, held against the ratchet by vibrating arms *l* and hung to an operating-lever, *m*, at either side of its fulcrum *n*, so that the said pawls may act alternately and thus turn the ratchet-wheel nearly continuously when the lever is vibrated first in one direction and then in the other. The leverage gained by the use of this mechanism is such that a very heavy weight can be slowly raised with comparatively little exertion.

Two or more cylinders, B, may be combined with one cylinder, A, and weight for the purpose of operating separate hoists. In Fig. 1, for instance, an additional cylinder, B', and hoist D' are represented. The latter is, in the present instance, connected directly to the piston-rod of its cylinder, and would be only available for elevating goods from the cellar to the first floor of a building or from one story to another.

Where economy of space is an object, and a special hatchway cannot be constructed for the elevator, the latter may be arrayed beneath a stair-way, X, as shown in Fig. 1, the

said stair-way being mounted on wheels or otherwise arrayed so that it can be moved to one side to make way for the elevator.

Another plan of operating two hoists simultaneously from a single cylinder, B, is illustrated in Fig. 3. In this case the supplementary hoist D<sup>2</sup> is coupled to the hoist D by a rope or chain, y, passed around pulleys in a manner which will be readily understood without explanation, so that the two hoists must rise and fall simultaneously.

A hose, M, Fig. 1, is connected to a branch of the connecting-pipe H, and is intended for use in case of fire, a forcible stream being forced through the same from the cylinder A on simply releasing the weight and thus obtaining a pressure upon the column of water.

I claim as my invention—

1. A hoisting apparatus in which the operating-weight is suspended from a windlass, G, or its equivalent, by which it may be elevated and released, substantially as herein described.

2. The combination, substantially as described, with the cylinder A and weight of a piston, b, furnished with a check-valve, and a water-discharge pipe or pipes, I, communicating with the said cylinder above the piston.

3. The combination, substantially as described, of a cylinder, B', and hoist, D<sup>1</sup>, with a movable stair-way, K, for the purpose set forth.

4. The combination of the cylinder B and the hoists D D<sup>2</sup>, coupled together and operated by the cylinder, as set forth.

5. The hose M, connected to and communicating with the cylinder A or with a pipe leading therefrom, for the purpose specified.

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

J. R. RITTER.

Witnesses:

WILLIAM P. BARD,  
WASHINGTON RICHARDS.