

(No Model.)

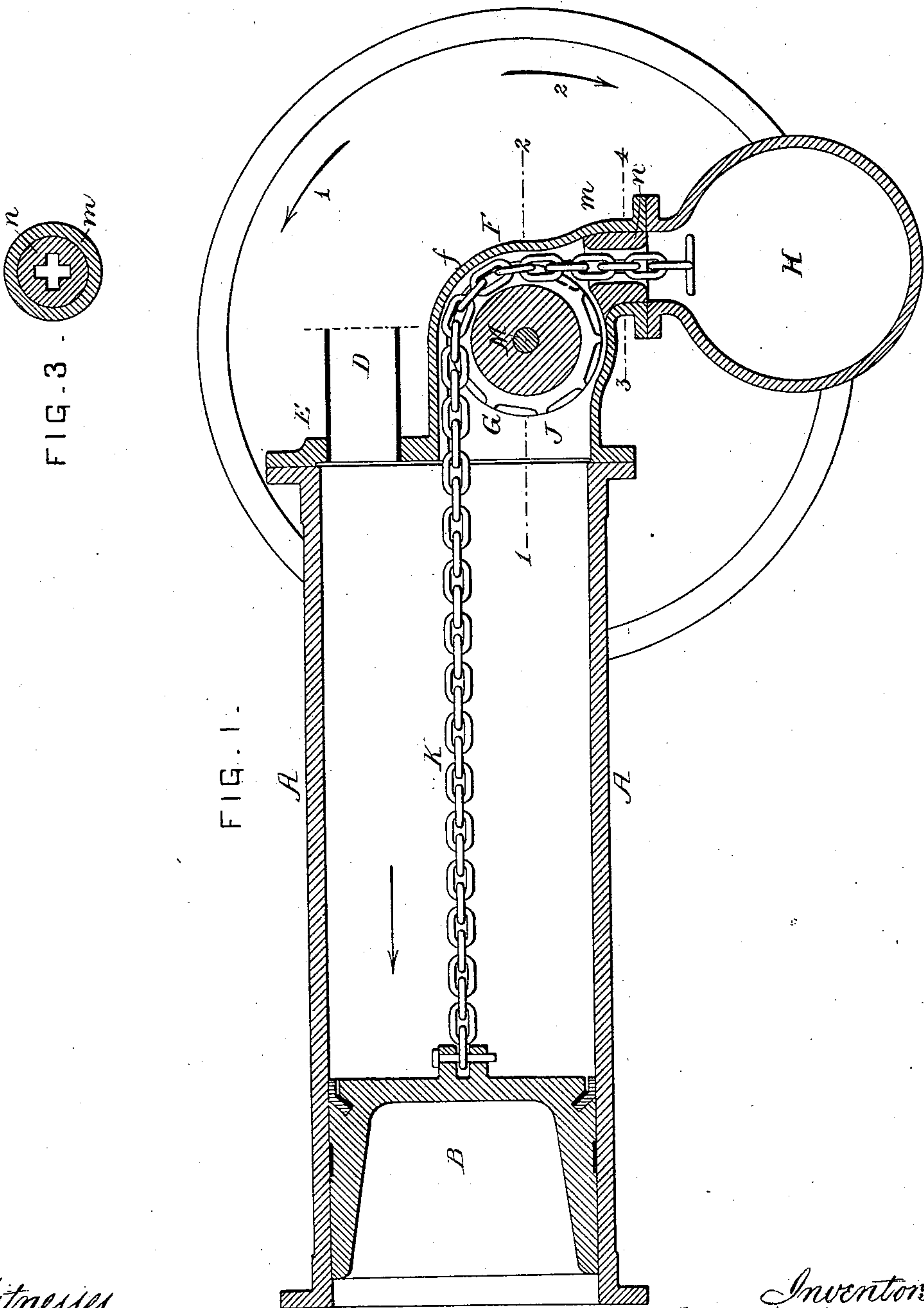
2 Sheets—Sheet 1.

J. L. FERRELL & M. R. MUCKLÉ, Jr.

Hydraulic Elevator.

No. 243,237.

Patented June 21, 1881.



Witnesses
David Williams

Inventors:
Joseph L. Ferrell
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UNITED STATES PATENT OFFICE.

JOSEPH L. FERRELL AND M. RICHARDS MUCKLÉ, JR., OF PHILADELPHIA,
PENNSYLVANIA.

HYDRAULIC ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 243,237, dated June 21, 1881.

Application filed December 24, 1880. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH L. FERRELL and M. RICHARDS MUCKLÉ, Jr., citizens of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Hydraulic Elevators, of which the following is a specification.

Our invention relates to improvements in that class of elevators in which a piston contained in a cylinder and under the influence of water under pressure is caused to impart a rotary motion to a driving-shaft, our improvements being too fully described and claimed hereinafter to need preliminary explanation.

Figure 1, Sheet 1, is a sectional elevation of our improved hydraulic elevator; Fig. 2, a section on the line 1 2; Fig. 3, a section on the line 3 4; and Fig. 4, a diagram illustrating a modification of our invention.

In Figs. 1, 2, and 4, A is a cylinder, to which is adapted a properly-packed piston, B, pipes, passages, and appliances common to machines of this class being used for introducing water under pressure into the cylinder and for expelling it therefrom, D being, in the present instance, the inlet and outlet pipe.

On the cylinder-cover E is a casing, F, the chamber J within which communicates with the interior of the cylinder. To a branch, m, of this casing F is secured a vessel, H, forming a chamber which communicates, through a throat-piece, n, contained in the branch m, with the chamber J and with the interior of the cylinder.

A shaft, M, is adapted at one end to a closed bearing, a, and passes through a bearing, a', and through an appropriate stuffing-box, b, both bearings forming, by preference, part of the casing F. If desired, the shaft may project through both sides of the casing F, in which case the bearing a must be provided with a stuffing-box, in the same manner as the bearing a'. The shaft M is the driving-shaft, and is combined, through the medium of any suitable system of gearing or belting and other appliances, with the cage or other object to be elevated.

To the shaft M, between the two bearings, is secured a chain-wheel, G—that is, a wheel having depressions adapted to the links of a chain,

K, one end of which is connected to the piston B at a central point, the chain passing over the wheel G, through the throat-piece n, and terminating within the vessel H. As shown in Fig. 1, the piston has completed, or very nearly completed, its movement in the direction of the arrow, the shaft M has been turned in the direction of the arrow 1 by the action of the traversing-chain on the chain-wheel G, and the cage or other object has been elevated by the shaft M through the medium of suitable gearing. As soon as the water in the cylinder is relieved from pressure and is permitted to escape the weight of the cage will turn the shaft M in the direction of the arrow 2, and the chain-wheel and chain will draw the piston toward the cover E, the slack chain being meanwhile deposited in the vessel H.

In order to prevent the chain from being twisted as it passes from the vessel H the throat-piece has a cruciform passage, (shown in Fig. 3,) this passage being of such a size that while the chain will pass freely through it the chain will always be presented to the wheel G free from kinks, and in a condition for the links to at once take their proper places in the recesses of the wheel. As a still further preventive of the distortion of the chain, and as a precaution against possibility of dislodgement of its links from the recesses of the wheel, we make a portion, f, of the casing F concentric with the wheel, so that while this portion is never in contact with the edges of the links, under ordinary circumstances, it will prevent any accidental dislodgment. The chain, as it traverses through the chamber J from the end of the cylinder to the outlet, is guided by the groove p, formed in the casing F, from the throat-piece to the point where the said casing is secured to the cylinder. When the chain is properly made and the wheel properly adapted to the chain the latter is not liable to become twisted or to be dislodged from the recesses of the wheel. Indeed, there might be one general chamber for receiving the wheel and chain instead of two chambers; but the above precautions are adopted with the view of preventing any accident.

In the modification Fig. 4, a pulley is attached to the piston, and the chain passes

round this pulley, one end of the chain being secured to the cylinder-cover, and the other end passing round the pulley and into the receptacle H, as in the plan above described.

5 We claim as our invention—

1. The combination, in hydraulic hoisting apparatus, of the following elements, namely: a cylinder having a packed piston, a chain attached at one end to the said piston and free
10 at its outer end, a wheel adapted to the chain and secured to a driving-shaft, and a chamber or chambers for inclosing the chain-wheel and receiving the chain, the said chamber or chambers communicating with the cylinder, all sub-
15 stantially as set forth.

2. The combination of the wheel G and chain K, and chambers J and H, with a throat-piece intervening between the two chambers, and having a cruciform opening for the guidance of the chain, all substantially as set forth. 20

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOSEPH L. FERRELL.

M. RICHARDS MUCKLÉ, JR.

Witnesses:

HENRY HOWSON, Jr.,

HARRY SMITH.