

P. J. BORGER.  
HYDRAULIC ELEVATOR.

No. 181,761.

Patented Aug. 29, 1876.

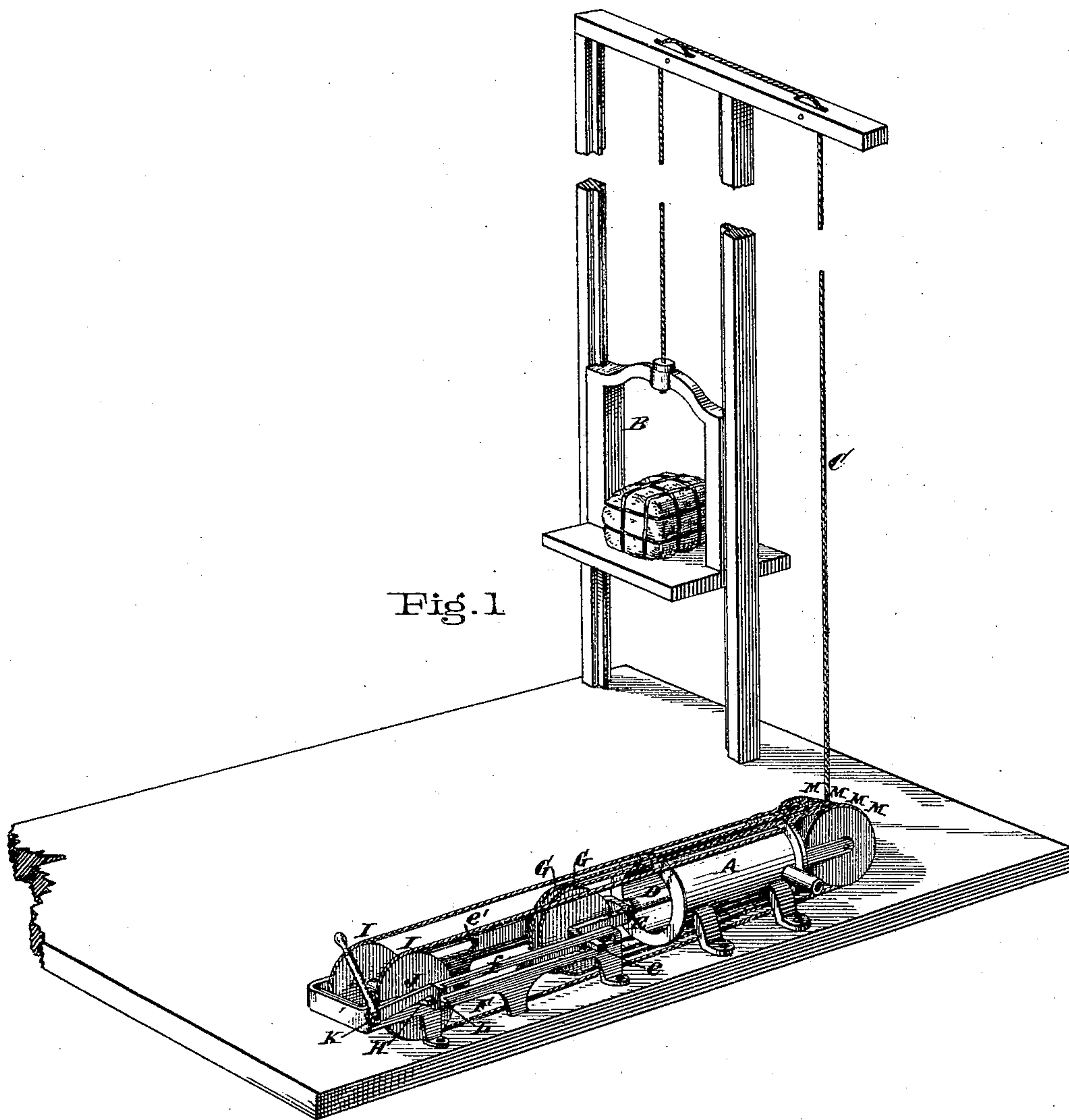


Fig. 1

Attest

*Wm. L. Coates*  
Wm. L. Coates.

Inventor

*Peter J. Borger*  
By *F. Millward*  
Attorney

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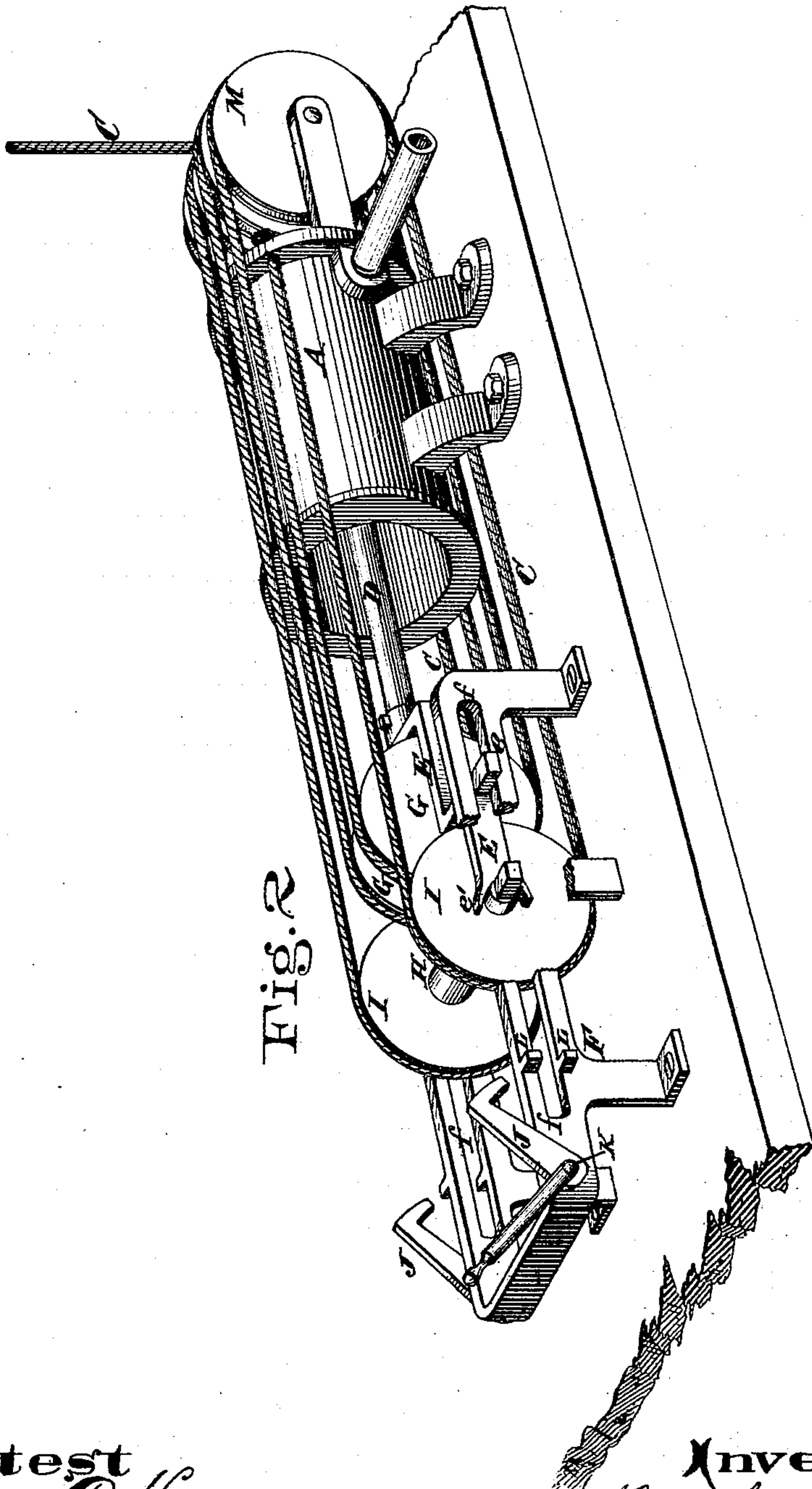


Fig. 2

Attest  
*Wm. D. Coates*  
*Wm. D. Coates*

Inventor  
*Peter J. Borger*  
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Attorney



# UNITED STATES PATENT OFFICE.

PETER J. BORGER, OF CINCINNATI, OHIO, ASSIGNOR TO LANE & BODLEY,  
OF SAME PLACE.

## IMPROVEMENT IN HYDRAULIC ELEVATORS.

Specification forming part of Letters Patent No. **181,761**, dated August 29, 1876; application filed  
March 9, 1875.

*To all whom it may concern :*

Be it known that I, PETER J. BORGER, of Cincinnati, Hamilton county, State of Ohio, have invented an Improvement in Hydraulic Elevators, of which the following is a specification:

My invention has for its object the construction of a hydraulic elevator, which shall be adapted for a change of stroke to suit the load, the long stroke being adapted to raise a heavy load, with a certain consumption of water, and the short stroke to raise a light load, with a corresponding decrease in the consumption of water; and my invention consists in such a construction and arrangement of the sheaves on one end of the cylinder that they are divided into two sets of any desired number each, one set fixed to the cross-head of the piston-rod, so as to always move with it, and the other set adapted for connection with, or disconnection from, said cross-head set, so that the detachable set may remain localized, and act alone as idlers, or may travel with the cross-head set, and thus act as multiplying-sheaves, to give a long stroke to the platform, with a short stroke of the piston.

My invention further consists of peculiar devices for securing and releasing the detachable set of sheaves.

Figure 1 is a perspective view of my machine, with the detachable set of sheaves localized. Fig. 2 is a perspective view of the machine with the detachable set of sheaves released from the localizing device, and in position to travel with the piston.

A is the cylinder, adapted to receive the supply of water and pressure for the operation of the platform. B is the platform, and C the hoisting-rope. D is the piston-rod, and E the cross-head. F is a frame, which includes the ways *f*, on which the cross-head E moves, the cross-head having projections *e*, to fit and move in the ways. In the cross-head E the sheave-wheels G G are journaled to freely revolve, and a shaft, H, is provided, upon which the sheave-wheels I I revolve, the shaft being rectangular at the ends, or otherwise adapted to slide in the ways *f*.

Hooks J, secured to a cross-shaft, K, so as to swing, are provided, to engage, as shown in Fig. 1, over the ends of the shaft H, so as to station this shaft when necessary, the hooks being so arranged, in connection with projections L in the frame F, as that when the shaft H is localized or rendered stationary by the dropping of the hooks, the outer edges of the hooks will be in contact with the projections L, and thus a solid lock is provided, which relieves the hooks from the strain of the machine.

When the hooks are raised the shaft H is permitted to occupy a place in the concave bearings *e'* of the cross-head, as seen in Fig. 2, and to travel with said cross-head, the weight of the load acting to keep the shaft H properly in place in bearings *e'*.

The pulleys or sheave-wheels G G I I connect by rope C with the set of sheave-wheels M M M M, which are suitably stationed to receive the rope and conduct it to the platform.

When the sheaves I I are stationed as in Fig. 1, they simply act as conducting-sheaves or idlers, and do not affect the velocity of the platform or the velocity of the piston, and in this arrangement the traveling sheaves G G suffice to give the platform four times the velocity of the piston. The full stroke is then given to the piston, and the full power of the machine to raise a heavy load is developed.

When the shaft of the sheaves I I is secured to the cross-head E, so as to travel with it, all the sheaves G G I I act to increase the speed of the platform, and the platform receives a velocity of eight times that of the piston, and the power of the machine thus lessened, is adapted to raise a light load with a proportionate decrease in use of water.

Thus I avoid the necessity of using a cylinder full of water for each elevation of the platform, as is customary in hydraulic elevators used heretofore.

I claim—

1. In a hydraulic elevator, the combination of traveling sheaves G G and sheaves I I,

adapted to be localized, or to be connected so as to move with the sheaves G G, substantially as and for the purpose specified.

2. The combination of the set of sheaves G G, set of sheaves I I, and connecting-hooks J, operating substantially as and for the purpose specified.

3. The combination of set of sheaves G G, set of sheaves I I, hooks J J, and projections

L, operating substantially as and for the purpose specified.

In testimony of which invention I hereunto set my hand.

PETER J. BORGER.

Witnesses :

EDGAR J. GROSS,  
J. L. WARTMANN.