(No Model.) 2 Sheets—Sheet 1.

J. E. BARRY.

HYDRAULIC ELEVATOR.

No. 473,811. Patented Apr. 26, 1892.

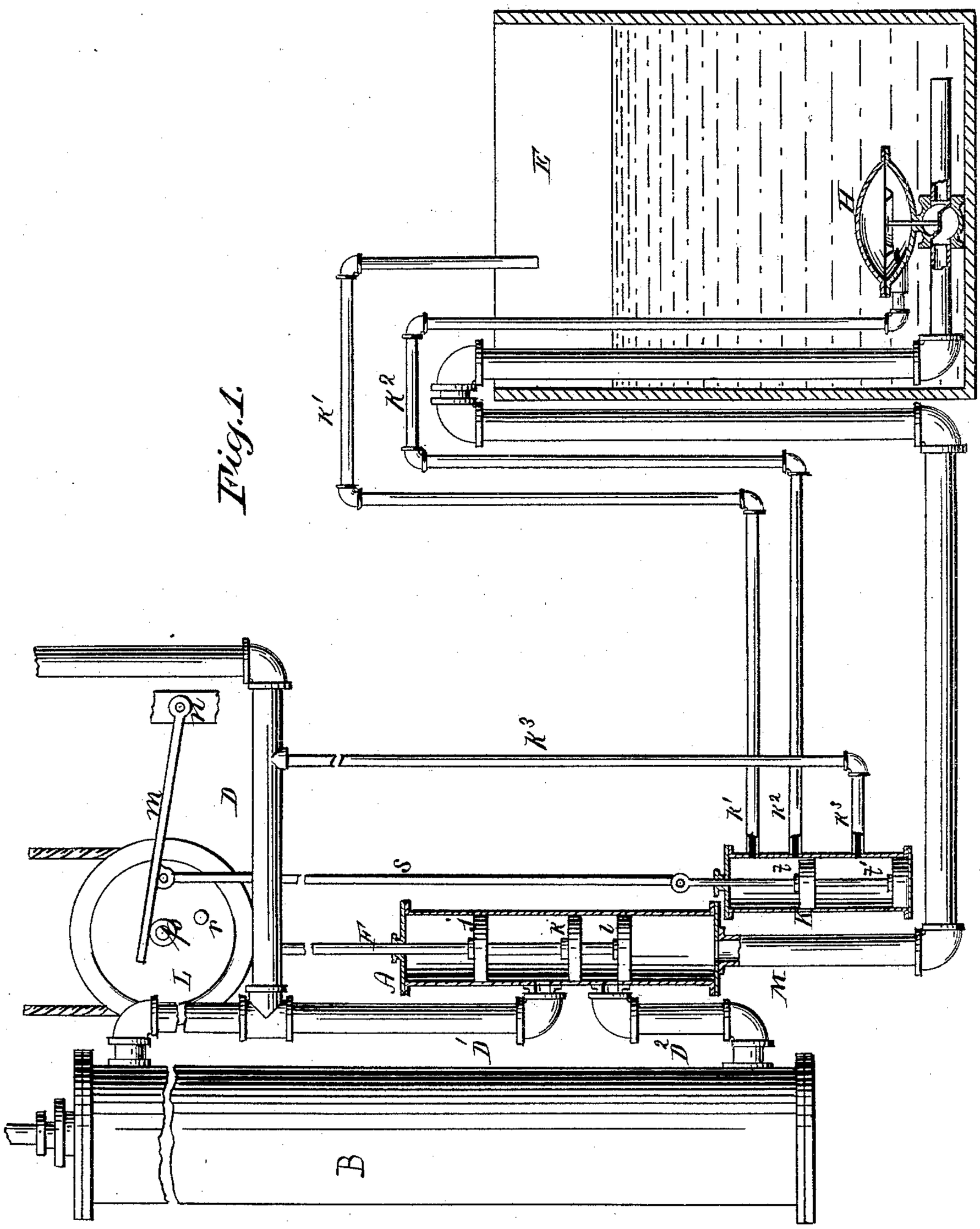

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

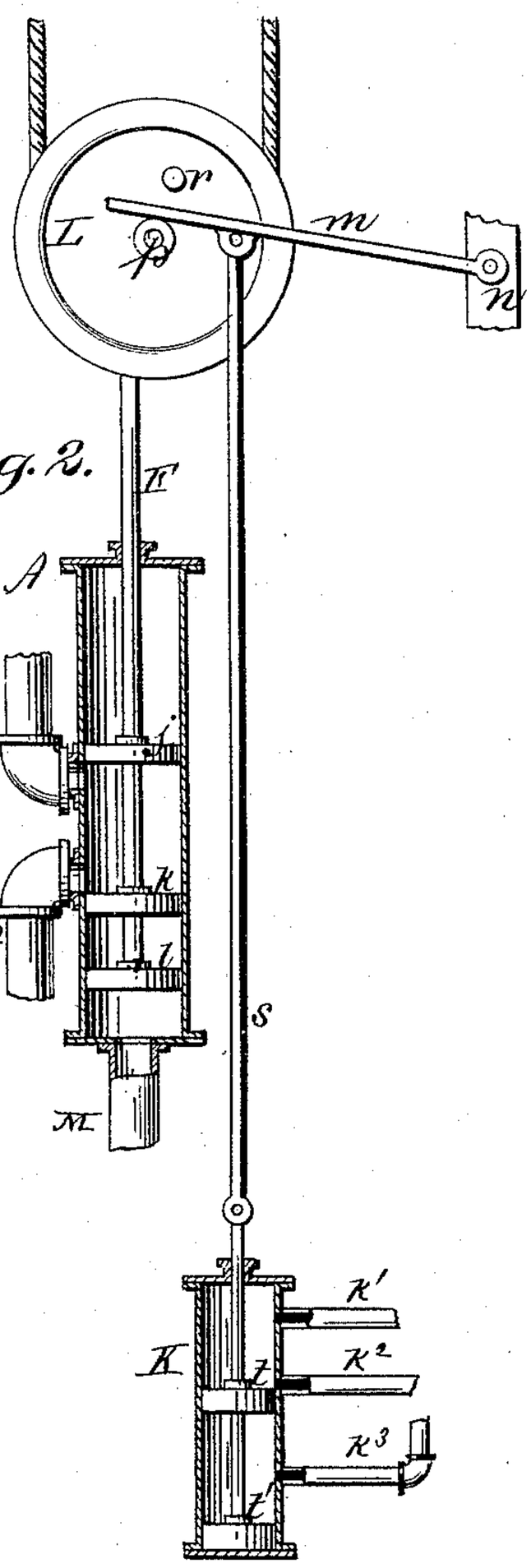
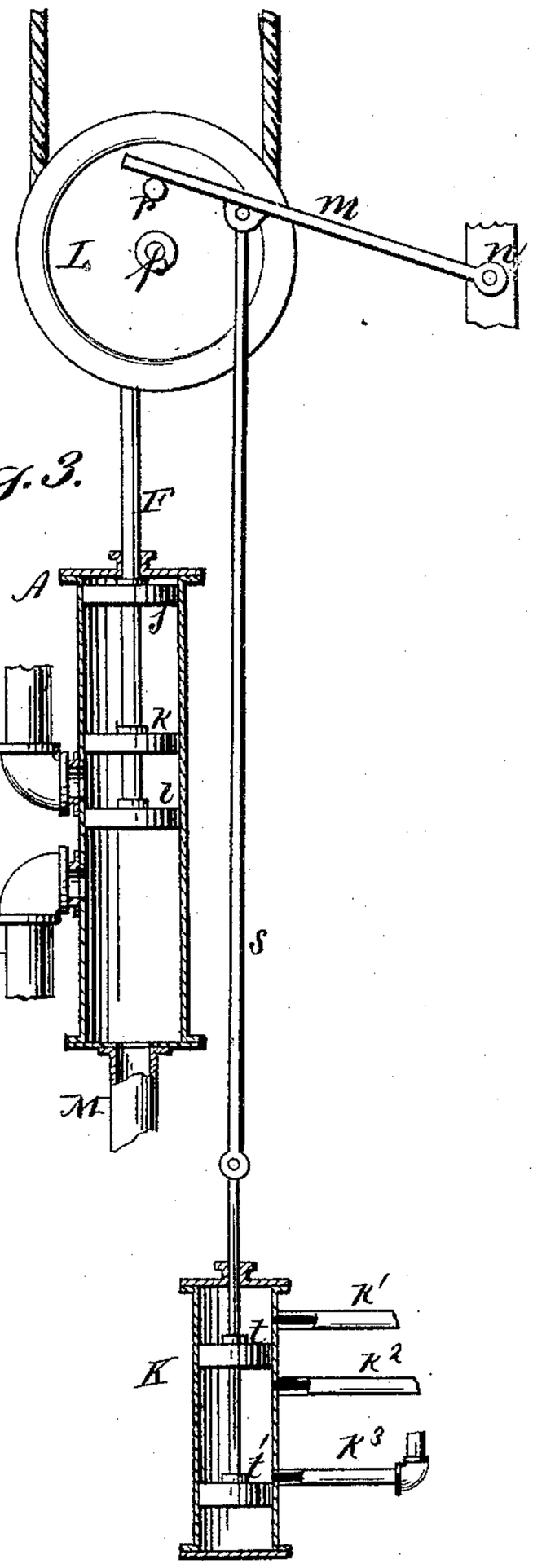


Fig. 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOSEPH E. BARRY, OF NEW YORK, N. Y.

HYDRAULIC ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 473,811, dated April 26, 1892.

Original application filed April 10, 1891, Serial No. 388,410. Divided and this application filed August 5, 1891. Serial No. 401,789. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH E. BARRY, of the city, county, and State of New York, have invented a new and useful Improvement in Hydraulic Elevators, of which the following is a specification.

My invention relates to elevators which are operated by means of a piston passing up and down through a long cylinder under the pressure of water, the different operations being effected by the movements of a valve-rod, with several disks upon it, operating in an operating-valve which is connected with the top and bottom of the water-cylinder. The fault connected with such hydraulic elevators not heretofore overcome has been the scraping or sawing noise heard at the stopping and starting of the elevator during its ascent. The cause of this noise is the discharge of the water under high pressure through the narrow opening at some one of the ports of the operating-valve as the edge of the disk on the valve-rod passes such port. The noise occurs just after the elevator starts in ascending and just before it stops in ascending—that is, while the port through which the water is passing under high pressure is throttled. It is not feasible to operate a valve-rod quickly enough to prevent this noise.

My invention claimed herein is a form or development of a general invention described and claimed in an application heretofore made by me, being Serial No. 388,410, filed April 10, 1891, and of which application this present application is a division.

Its specific object is the application of such general invention to the common form of operating-valves now in use, so as to avoid the necessity of new operating-valves for plants already established.

It consists, in general, of the combination, with such operating-valve, of another valve or cock working in connection with such operating-valve and controlling through the main water-pressure the opening and closing of the valve in the discharge-pipe. By this means the point at which the noise is caused is removed from the operating-valve to the valve in the discharge-pipe, and so may be placed at any convenient point in the building where it will not cause annoyance, and also by this means the noise may be greatly lessened by the form of valve to be used in the discharge-pipe.

In the accompanying drawings, in which the same characters indicate analogous parts, Figure 1 represents the apparatus complete with all the parts in the positions assumed while the elevator is at rest. Fig. 2 shows the position of the operating-valve and of the additional valve when the piston is ascending and the elevator descending, and Fig. 3 their position when the piston is descending and the elevator ascending.

B is an ordinary water-cylinder full of water and connected through pipe D to a tank on the roof or other water-supply under pressure and having within it a piston and piston-rod attached to one end of a rope, the other end of which supports the elevator, so that as the piston descends the elevator ascends and as the piston ascends the elevator descends. The pipe D′, open both to the upper part of the water-cylinder B and to the inlet-pipe D, opens into the operating-valve A. The pipe D^2 connects the bottom of the water-cylinder B and the operating-valve A. Pipe M is the discharge-pipe and is open to the bottom of the operating-valve A. This pipe M passes into the discharge-tank E and has a valve H situated in it to be operated by the main water-pressure. The valve H may be placed at any other convenient point in the discharge-pipe, the object being to remove it from any place where the noise would cause annoyance.

In the drawings the valve H is shown as operated by a flexible diaphragm, the operation being such that when the pressure of the water is open through the pipe k^2 underneath the diaphragm the water presses the diaphragm and the valve H attached to it upward and thus opens the valve H, so that the water may be discharged from the water-cylinder B into the tank E. When the water-pressure is relieved underneath the diaphragm of the valve H, the elasticity of the diaphragm causes the valve H to close. Other forms of valves to be operated by the water-pressure will easily suggest themselves in place of the valve H.

The valve A is operated by the operator in the elevator through the wheel L moving the

rod F, to which are affixed three disks *j*, *k*, and *l*, moving in the operating-valve A. This is the ordinary operating-valve.

To apply my invention, I add an additional valve K, also operated by the operator's wheel L, and the valve H, operated by the main water-pressure through the additional valve K. A rod *m* is pivoted to some fixed point *n* and has its free end resting upon the hub *p* of the operator's wheel L. A pin *r* is fixed eccentrically upon the operator's wheel L and raises the rod *m* when the elevator is ascending, Fig. 3. The rod *m* is connected by the connecting-rod *s* to the two disks *t* and *t'* within the valve K. The valve K is a small cylinder having three openings to the pipes k', k^2, and k^3. Of these pipes k^3 leads to the water-supply, so as to be always under pressure—for example, to pipe D. k^2 leads underneath the diaphragm of valve H, and k' leads to the top of the tank E or to any other convenient point, its object being merely to make an opening from the upper part of the valve K.

The apparatus operates in the following manner: When the elevator is to be made to ascend, the valve-rod F and the pistons *j*, *k*, and *l* in the operating-valve A are placed in the position shown in Fig. 3. In such position the pressure of the water from the tank or other source of supply is open through the pipe D, the pipe k^3, the valve K, and the pipe k^2 underneath the diaphragm of the valve H. The water-pressure thus raises the valve H in the discharge-pipe, and the water then discharges through the pipe D^2, the operating-valve A, and the pipe M from below the piston in the water-cylinder B, and this causes the elevator to ascend. When the motion is to be stopped, the parts are placed in the position shown in in Fig. 1. In such position there is no outlet for the water underneath the piston in the water-cylinder B, and therefore the piston and the elevator stop. The pressure of the water is also shut off from the pipe k^2 and is relieved through the pipe k', so that the valve H also closes the outlet from the discharge-pipe M. When the elevator is to be made to descend, the parts are placed in the position of Fig. 2. In such position the water has free circulation through the pipes D' and D^2 and the operating-valve A, and the elevator descends by gravity. In such position the valve K and the valve H are in the same position as that of Fig. 1, no water being discharged from the discharge-pipe M.

Figs. 2 and 3 represent the extreme movements of the operating-wheel L, the former the position of descent and the latter of ascent of the elevator. In changing from the position of Fig. 2 to that of Fig. 1, or vice versa, the pin *r* passes around the end of the rod *m*, and hence the disks *t* and *t'* in the valve K do not move. Other devices—*e. g.*, a three-way cock—may be substituted for the valve K to accomplish the purpose. The disks and pistons within the valve K and within the operating-valve A and other different connections should be so placed with reference to each other that the pressure should not be open through the pipe k^2 so as to raise the valve H until the disk *l* in the operating-valve A has opened a passage from the pipe D^2 into the operating-valve A widely enough to prevent the noise occurring there.

I claim as my invention—

In hydraulic elevators, the combination of an operating-valve, a separate positively-operated valve in the discharge-pipe, a pipe leading from such valve in the discharge-pipe to the water-pressure, and another valve or cock operating in connection with the operating-valve, through which the valve in the discharge-pipe is operated by the main water-pressure.

In witness whereof I have hereunto set my name this 28th day of July, 1891, in the presence of two witnesses.

JOSEPH E. BARRY.

Witnesses:
SALTER S. CLARK,
ARTHUR E. WALRADT.