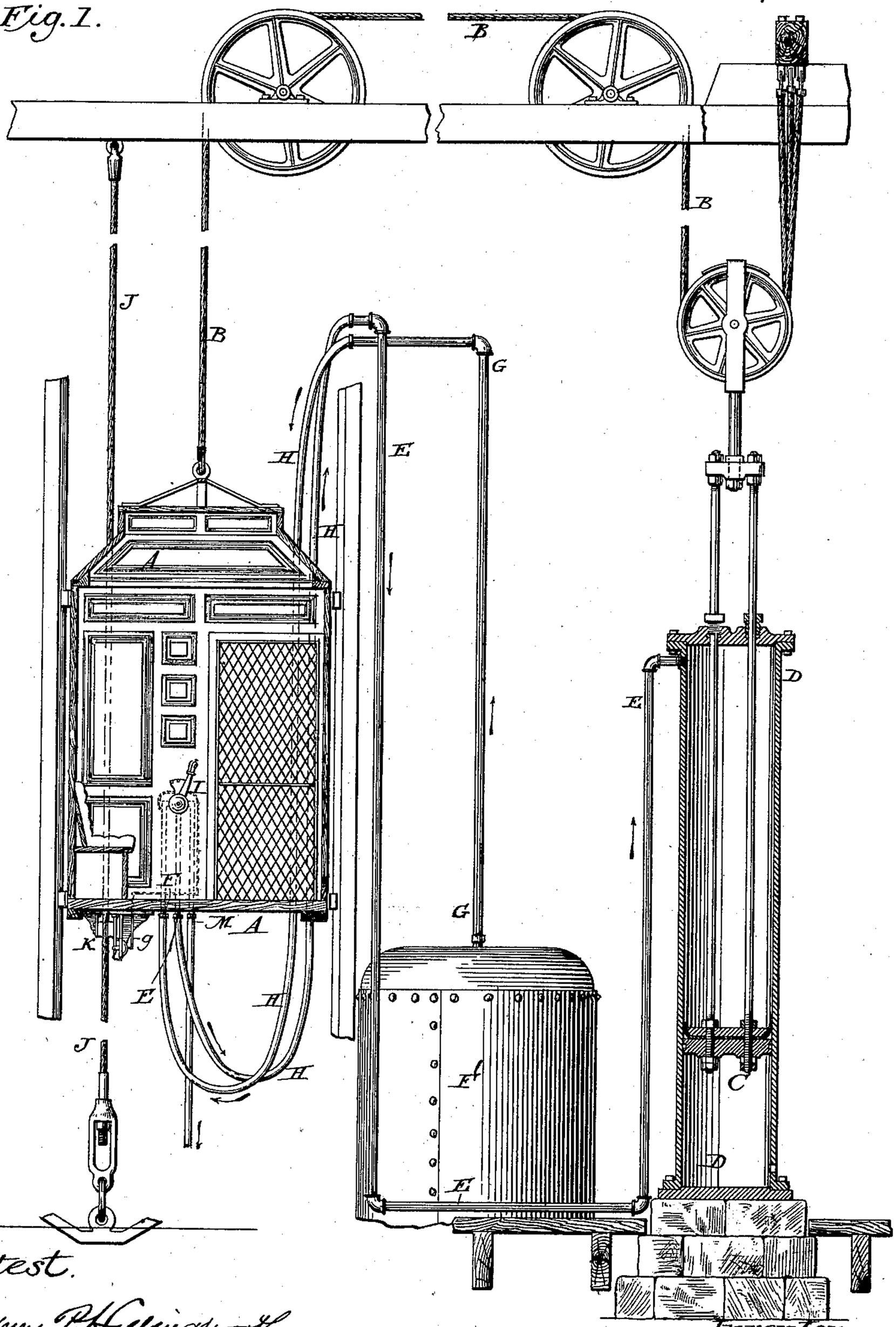
(No Model.) 2 Sheets—Sheet 1.

W. S. JOHNSON.

ELEVATOR.

No. 384,169. Patented June 5, 1888.

Fig. 1.



Attest.

Sidney P. Hollingsworth

H. R. Kennedy.

Inventor.

W. S. Johnson.

By Phil T. Dodge. Atty.

(No Model.)

2 Sheets—Sheet 2.

W. S. JOHNSON.

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Fig. 2.

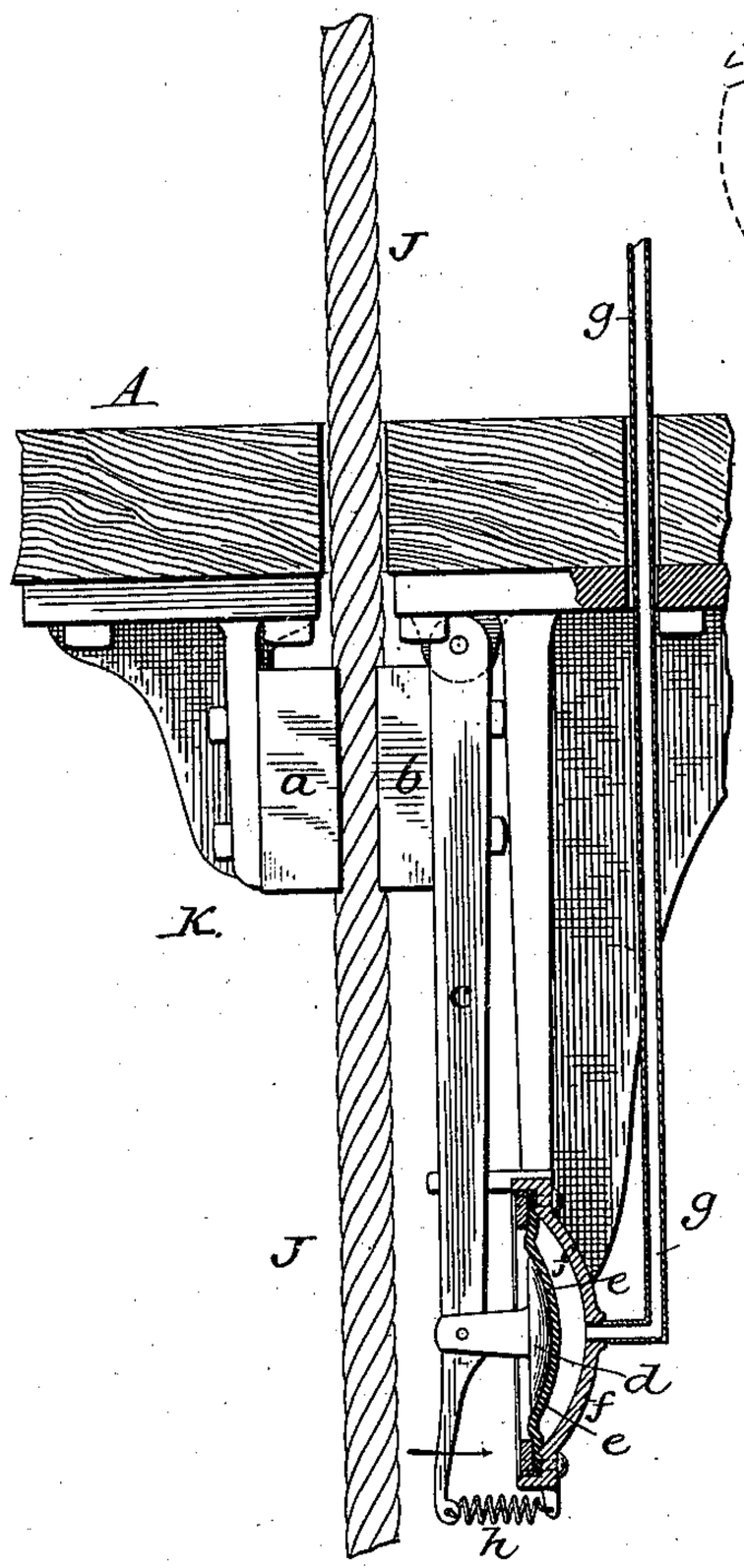


Fig. 3.

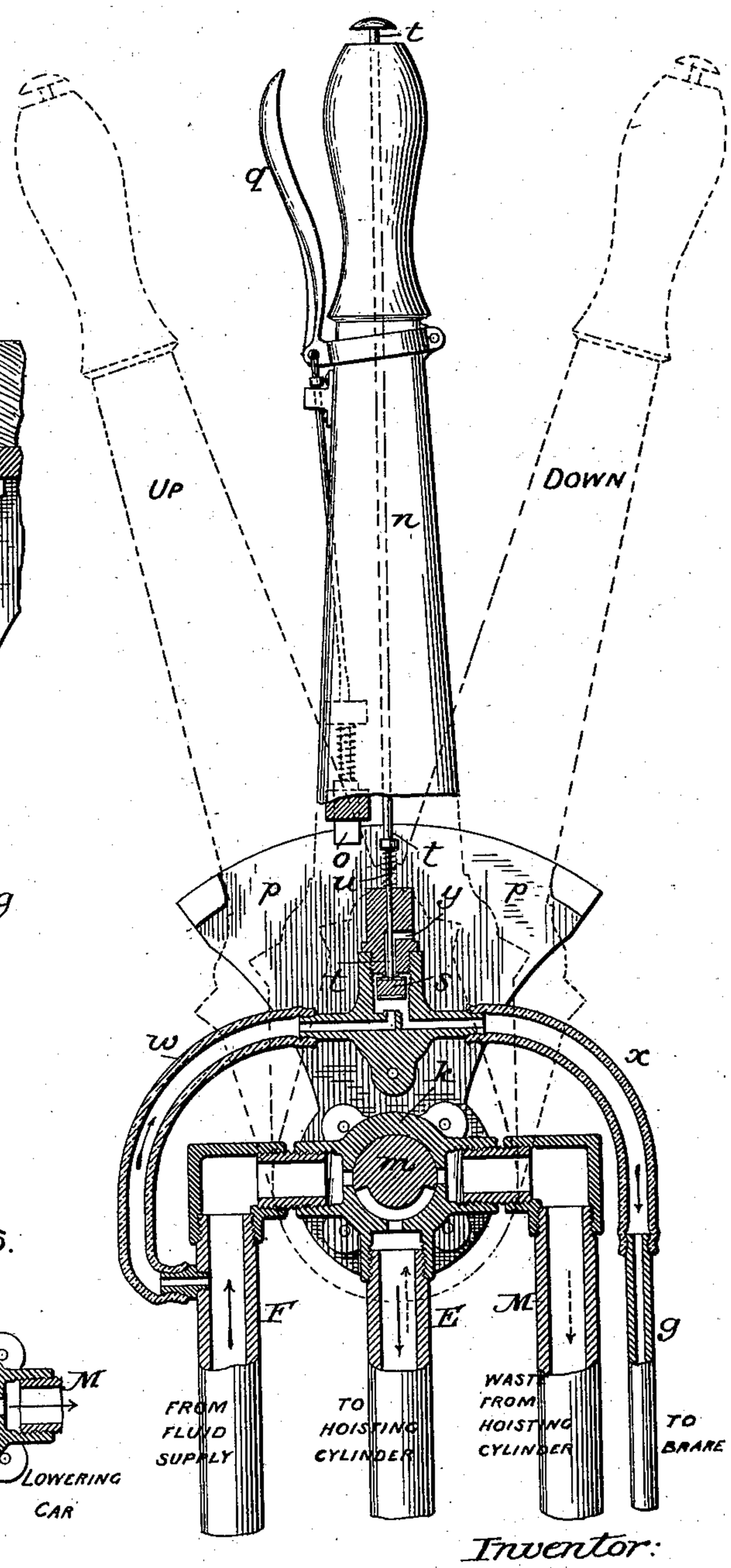


Fig. 4.

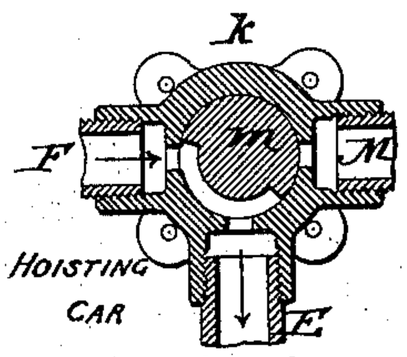
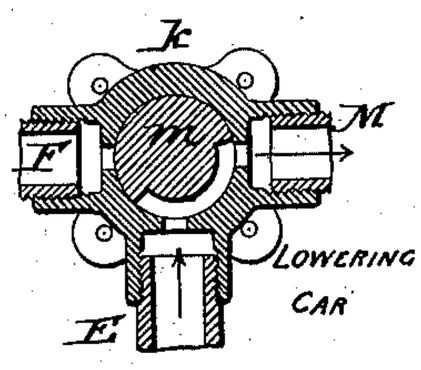


Fig. 5.



Attest:

Sidney P. Hollingsworth.

H. R. Kennedy.

Inventor:

W. S. Johnson.

By Alex T. Dodge

Atty.

UNITED STATES PATENT OFFICE.

WARREN SEYMOUR JOHNSON, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF ONE-HALF TO WILLIAM PLANKINTON, OF SAME PLACE.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 384,169, dated June 5, 1888.

Application filed January 22, 1887. Serial No. 225,150. (No model.)

To all whom it may concern:

Be it known that I, WARREN SEYMOUR JOHNSON, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain Improvements in Elevators, of which the following is a specification.

My invention has reference to that class of elevators in which the car is raised and lowered by fluid-pressure acting through a cylinder and piston or equivalent mechanisms, of which there are many known in the art, and its object is to combine with said hoisting mechanism and with a brake actuated by fluid-pressure to control the motion of the car, means under the control of the attendant on the car whereby he may at will control the flow of the fluid in such manner as to cause the ascent, descent, or stoppage of the car and the action or inaction of the brake.

To this end it consists in a new combination of the conductors with a valve, and in a valve of peculiar construction having devices to control the flow of the fluid to the hoisting mechanism and the brake independently, as hereinafter more fully explained.

My combination admits of the brake being applied and retained in operative position simultaneously with the stoppage in the flow of the car-actuating fluid, and is particularly advantageous when the elevator is operated by compressed air or other elastic fluid. Owing to the elasticity of the air the momentum of the car will cause it to rise or fall below the proper point. It is, therefore, important to have a brake which will act instantly and with a continuing effect to keep the car at the point required, and this end my invention is peculiarly adapted to accomplish.

Referring to the accompanying drawings, Figure 1 represents in elevation an elevator having my improvements embodied therein, the car and the hoisting-cylinder being represented in section. Fig. 2 is a vertical section through the base of the car and the brake mechanism. Fig. 3 is an elevation partially in section of the valve through which the motion of the car and the action of the brake are controlled. Figs. 4 and 5 are sectional views showing the main valve in different positions.

Referring to the drawings, A represents the car or cage of the elevator, which is raised and lowered by a rope, B, attached thereto and passed thence upward over suitable guide-pulleys and conected through intermediate devices of any suitable character with a piston, C, mounted in a stationary cylinder, D, provided at its upper end with a pipe, E, through which fluid under pressure is delivered alternately into and out of the cylinder for the purpose of controlling the piston.

The foregoing parts are of ordinary construction, well known in the art, and are not claimed as of my invention. The cylinder and the piston and the intermediate connections may be replaced by any other suitable mechanism adapted to be operated by fluid-pressure for raising and lowering the car. Various mechanisms of this character the equivalents of those shown in the drawings are now in general use, and are familiar to all persons skilled in the art.

F′ represents a stationary tank or reservoir, from which air, water, or other fluid under pressure is delivered through a stationary pipe, G, to a flexible pipe, H, which is extended and attached to the moving car, and then returned and connected to the pipe E of the cylinder.

I represents a valve or cup mounted on the car under the control of the attendant, and connected with the flexible pipe H in a manner hereinafter described in detail, so that when placed in one position it will permit the fluid to flow from the reservoir F′ through the intermediate pipes to the upper end of the cylinder, thereby depressing the piston and lifting the car, and that when turned in the opposite direction it will permit the fluid to escape from the cylinder, so that the piston may rise and the car descend by gravity. The details of this valve will be presently described.

J represents a stationary vertical rope or rod extending through the car from the top to the bottom of its shaft, and K represents a brake applied to the bottom of the car and adapted to grasp the cable at the will of the attendant for the purpose of holding the car at rest or limiting the speed of its descent. This brake, which is also operated by fluid-pressure, is preferably constructed in the manner shown

in Fig. 2, in which *a* represents a stationary block lying on one side of the cable, and *b* a second co-operating block attached to a lever, *c*, one end of which is pivoted to the car, while the opposite end is connected to a disk, *d*, bearing against a flexible diaphragm, *e*, forming one side or wall of a chamber, *f*, into which the fluid is delivered at proper times through a pipe, *g*. A spring, *h*, applied as shown, tends to draw the lever backward and, by separating the blocks *a b*, to render the brake inoperative. When, however, the fluid is admitted into the chamber, its movable wall is urged outward, and operating the lever causes the cable to be gripped between the friction-blocks, whereby the movement of the car is resisted. The pipe *g*, supplying the fluid to actuate the brake, is connected through the valve I with the pipe H, leading to the source of fluid-supply, as will be presently explained in detail, so that the valve serves to control both the brake mechanism and the hoisting mechanism.

As the brake mechanism may be modified in form, and as its details are of minor importance, provided only that it is actuated by the fluid under pressure, I shall hereinafter refer to the same for the sake of convenience simply as a brake actuated by fluid-pressure, this form being understood by those familiar with the art as designating brakes of this general class, which are already known in various forms in connection with different classes of machinery.

Referring now to the details of the valve by which the brake and hoisting devices are controlled, which, for convenience of reference and because of its embracing two independent valves, I will hereinafter designate as a "double valve," attention is directed particularly to Figs. 3, 4, and 5, in which *k* represents the body of the valve provided at different points in its circumference with throats connecting, respectively, with the fluid-supply pipe F, the fluid-delivery pipe E, leading to the hoisting-cylinder, and the fluid-discharge pipe M, through which the fluid from the hoisting-cylinder finally escapes. *m* represents a rotary plug passing through the body of the valve and provided in one side with a port or passage of the form shown, so that by turning the plug into different positions it will establish communication between the supply-pipe F and cylinder-pipe E, as shown in Fig. 4, to cause the elevation of the car or establish communication between the cylinder-pipe E and discharge-pipe M, as shown in Fig. 5, to permit the descent of the car or close the communication between the pipes, as shown in Fig. 3, so as to hold the car at rest. This main valve resembling in its construction and action the ordinary three-way valve familiar to every mechanic, a further description of its action is deemed unnecessary.

For the purpose of turning the plug to its different positions, I secure to its end a handle, *n*, provided with a locking-dog, *o*, adapted to engage notches in a stationary plate, *p*, whereby it may be held in different positions. This locking-dog, urged downward by a spring, is connected by a rod to a thumb-lever, *q*, applied to the upper end of the handle in a manner familiar to mechanics, so that the latch may be released by the hand which moves the hand-lever.

The foregoing parts control only the movement of the fluid by which the car is controlled.

For the purpose of controlling the fluid which actuates the brake, I attach to the handle or lever a secondary valve having a spindle or plug, *s*, attached to rod *t*, which is surrounded by a lifting-spring, *u*, and extended upward through the handle or lever of the main valve to its upper end, where it terminates in a head or enlargement adapted to be depressed by the thumb, so that the attendant grasping the handle to move the main valve may by means of his thumb operate the secondary valve, if so desired.

The throat or passage closed by the secondary valve communicates at one end by a flexible pipe, *w*, with the fluid-supply pipe F, and communicates at the opposite end by a second flexible pipe, *x*, with the pipe *g*, extending to the brake, so that whenever the secondary valve is in its normal condition the fluid under pressure will pass from the pipe F through the secondary valve and flexible connections to the brake, throwing the same into action. The secondary valve is, however, provided with a third port or vent, *y*, above the plug and in such position that when the plug is depressed to prevent the passage of the fluid to the brake a communication is established between this vent and the pipe *x*, whereby the fluid is permitted to retnrn from the brake-chamber and escape, allowing the spring *h* to throw the brake out of action.

It will be observed that I combine in the one valve a means for controlling the hoisting mechanism and for controlling the brake, that both may be controlled by one hand and at the same time, or either controlled independently of the other.

I am aware that a brake has been mounted on an elevator-car and actuated by the pressure of water carried in a tank on the car; also, that a fluid-pressure brake on the under side of a car has been actuated by fluid delivered through a flexible pipe and through a stationary controlling-valve located at a distance from the car and operated therefrom by a complicated combination of cords, levers, &c., and to such constructions I lay no claim, my invention being confined to an elevator in which the brake is carried on the car, actuated by fluid delivered through a flexible pipe from a distant source, and the fluid controlled directly by a valve in the car.

Having thus described my invention, what I claim is—

1. In combination with the elevator-car and the fluid-pressure brake mounted thereon and acting against a stationary surface, such as a rope, a three-way valve mounted on the car, subject to the control of the attendant, a pipe

leading from said valve to the brake, and a flexible pipe leading from the valve to a stationary reservoir or like source of fluid-pressure supply, whereby the valve is brought in close proximity to the brake and the instantaneous action of the fluid upon the brake permitted.

2. In an elevator, the combination of the movable car, the cylinder and piston, and suitable intermediate connections for raising and lowering the car, the fluid-pressure brake mounted on the car, a stationary reservoir or source of fluid-pressure supply, a flexible pipe communicating with said source of supply and extending to the car, the double valve mounted on the car under control of the attendant and connected with said flexible supply-pipe, a pipe leading from said valve to the brake, and a second and flexible pipe connected with the valve and communicating with the car-operating cylinder.

3. In an elevator, the three-way valve or cock with its actuating-handle, in combination with the independently-operative secondary valve and its actuating devices mounted on said handle, substantially as described, whereby the two valves may be operated independently or simultaneously by one hand.

4. The main valve with its three ports, three-way plug, and operating-handle, in combination with the secondary valve and its actuating spring and rod, all mounted on the handle, and the flexible pipes communicating with the secondary valve, substantially as shown.

In testimony whereof I hereunto set my hand, this 10th day of January, 1887, in the presence of two attesting witnesses.

WARREN SEYMOUR JOHNSON.

Witnesses:
ALFRED MORAWETZ,
ROBERT R. HOSKING.