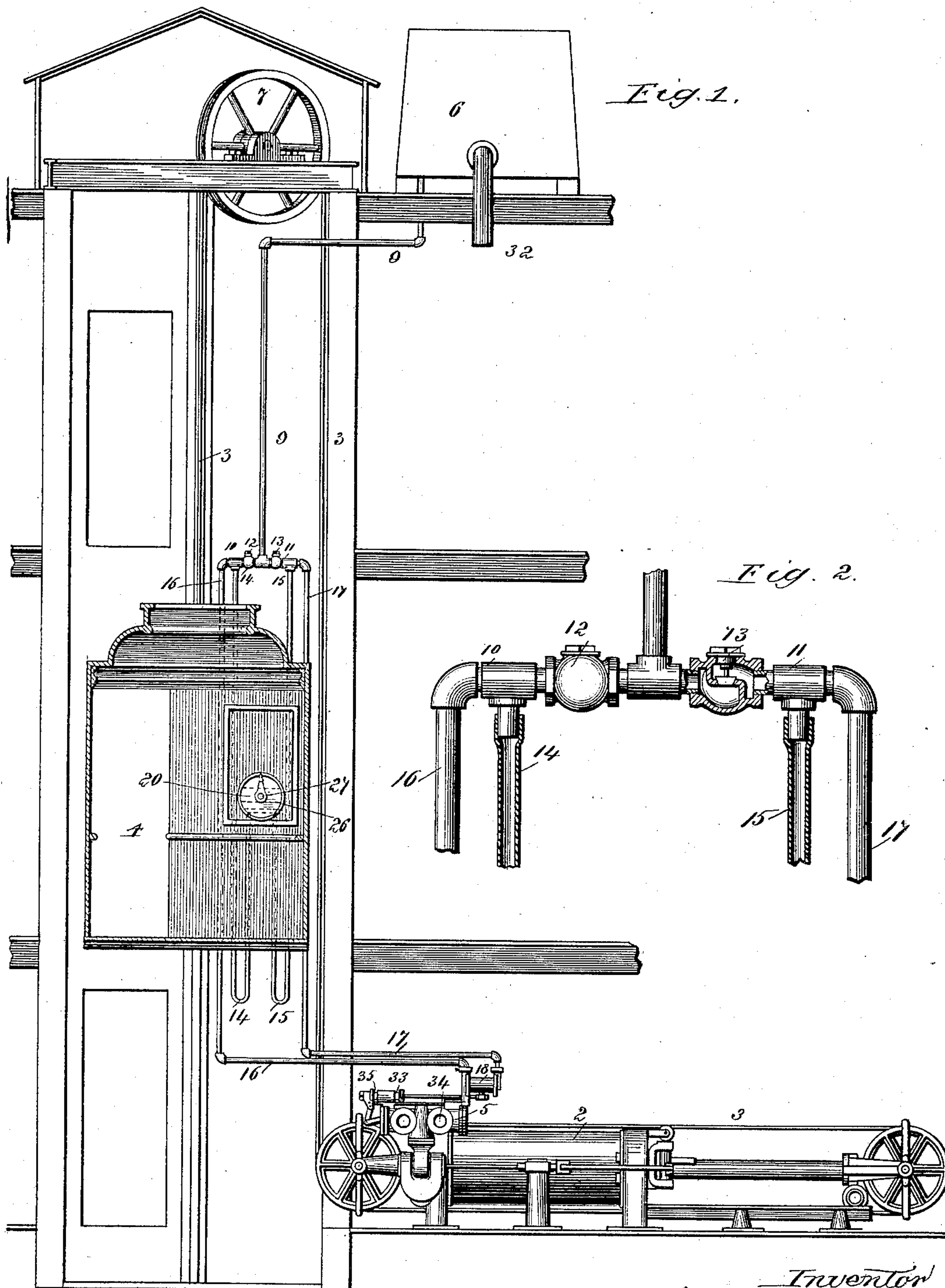


2 Sheets—Sheet 1.

No. 468,520

Patented Feb. 9, 1892.



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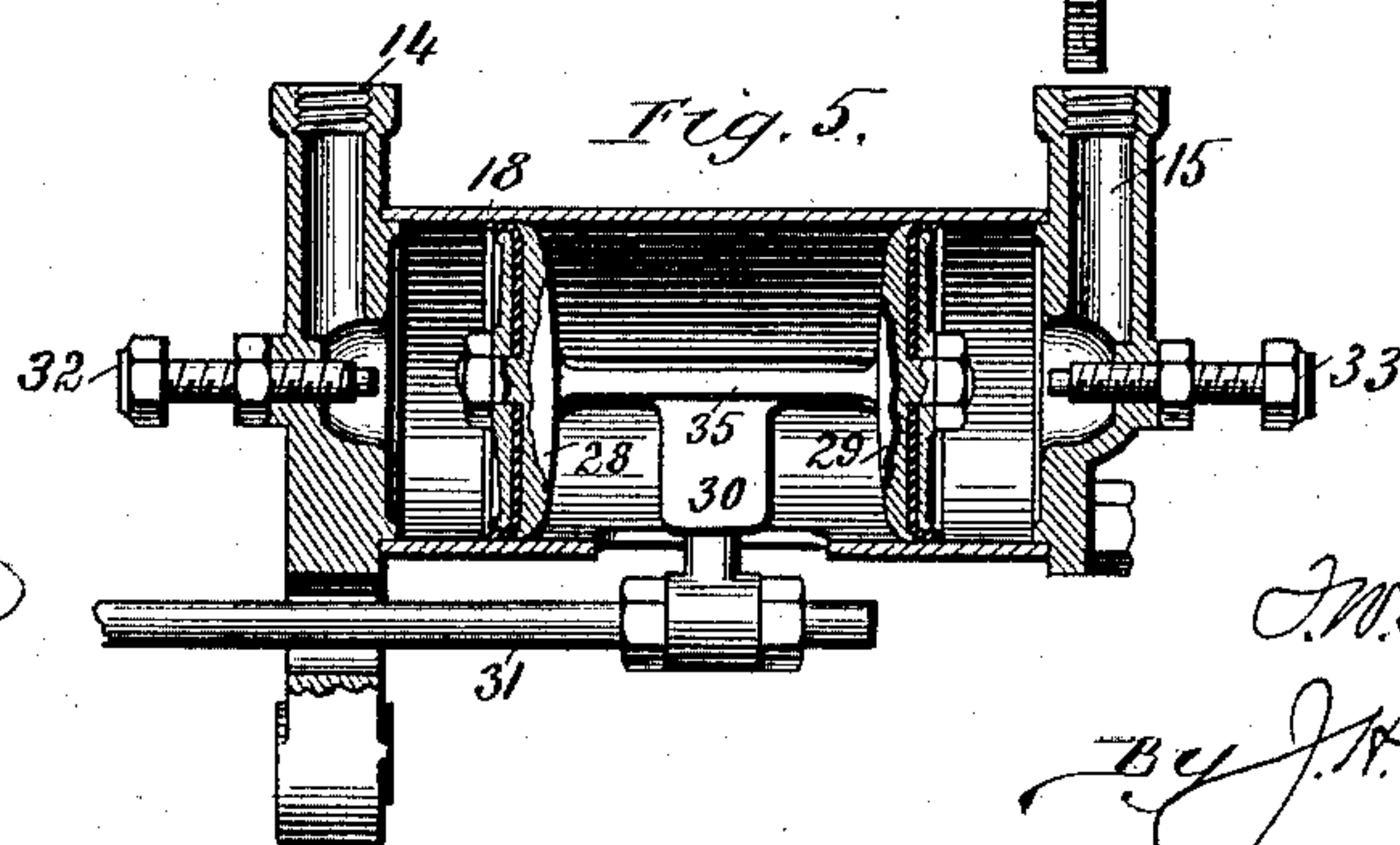
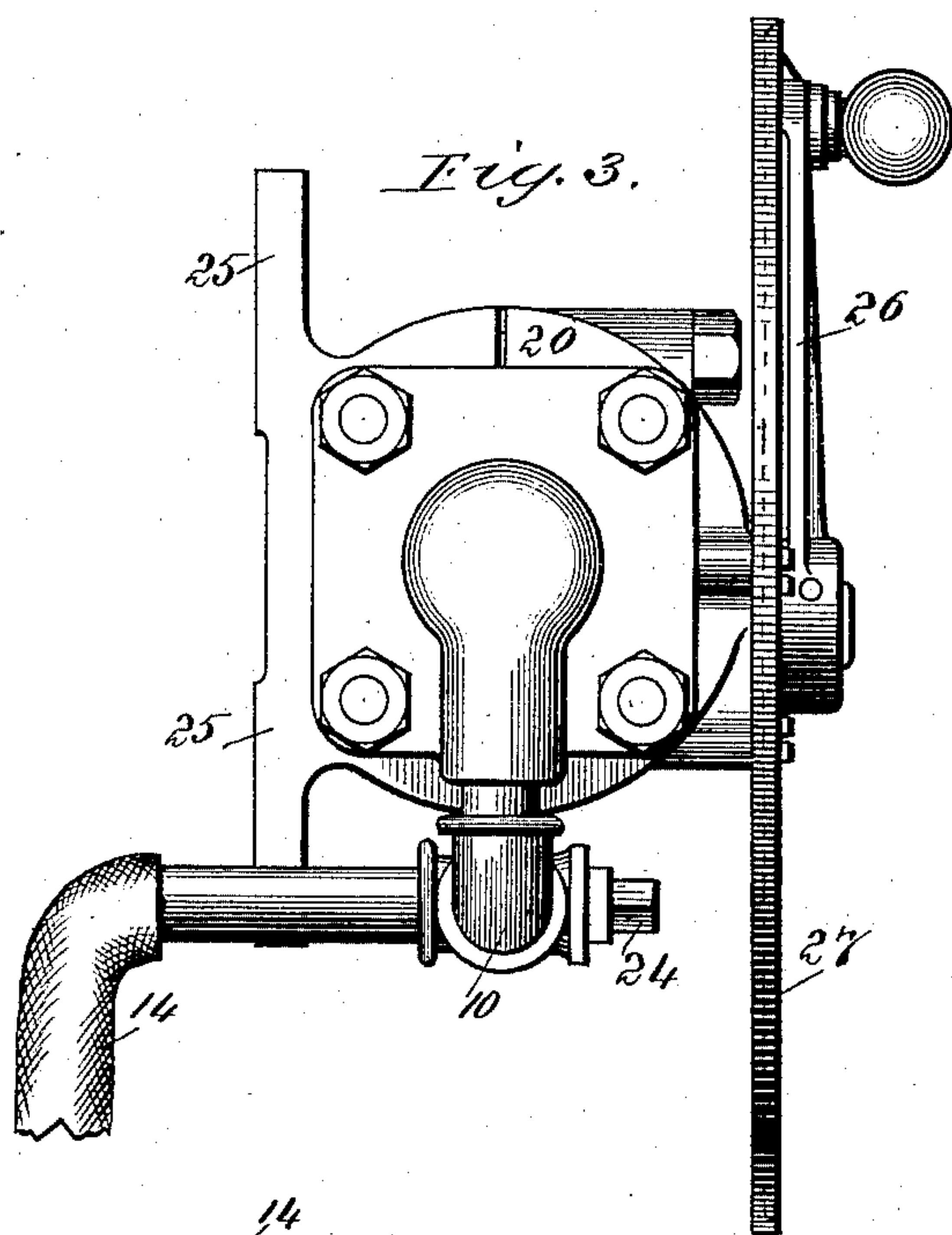
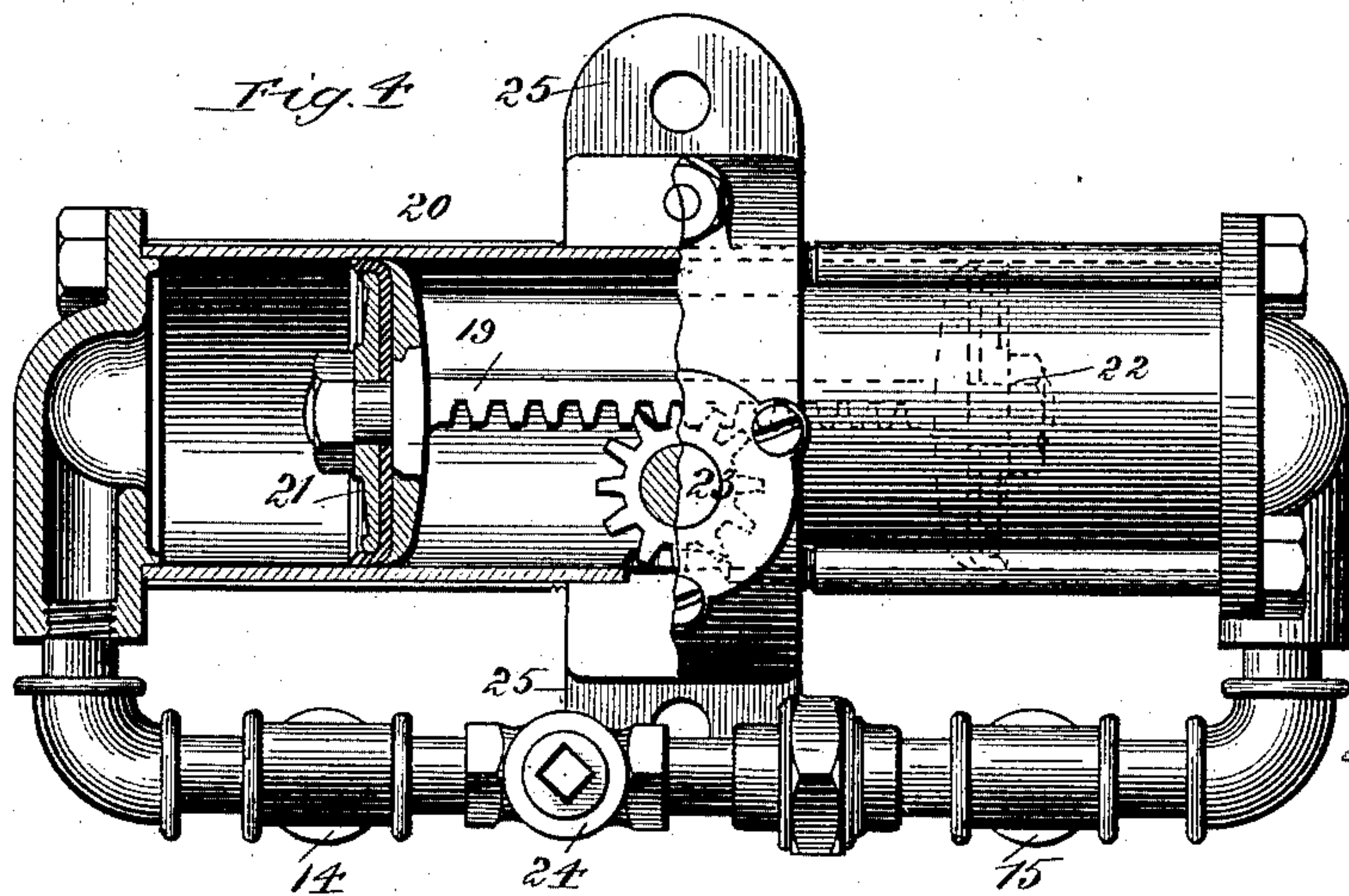
(No Model.)

2 Sheets—Sheet 2.

T. W. HEERMANS.  
ELEVATOR CONTROL GEAR.

No. 468,520.

Patented Feb. 9, 1892.



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# UNITED STATES PATENT OFFICE.

THADDEUS W. HEERMANS, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NATIONAL COMPANY, OF ILLINOIS.

## ELEVATOR-CONTROL GEAR.

SPECIFICATION forming part of Letters Patent No. 468,520, dated February 9, 1892.

Application filed December 19, 1887. Serial No. 258,296. (No model.)

*To all whom it may concern:*

Be it known that I, THADDEUS W. HEERMANS, of Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Elevator-Control Gears, of which the following is a specification.

My invention has for its object the provision of an apparatus for operating the control-valve of an elevator from the elevator-car which shall be capable of gaging the extent as well as controlling the direction of the movement of the control-valve.

My invention is specially applicable to hydraulic elevators, because in its use water or other incompressible fluid is necessary; but it may also be used for steam-elevators.

My invention is shown as applied to a hydraulic elevator controlled by a "pilot-valve" like that shown in United States Letters Patent No. 314,720 to George H. Reynolds, though it is of course applicable to any other sort of valve-gear.

My invention consists in the parts and combinations hereinafter described and claimed. In the accompanying drawings, Figure 1 is a side view, partly in elevation and partly in section, of a hydraulic engine, an elevator-car, and so many of their connections as are needed to illustrate my invention. Fig. 2 is a partial section of the branches 10 and 11 of pipe 9, Fig. 1. Fig. 3 is an end view of the operating parts in the car; and Fig. 4 is a side view of the same, partly in section, the front plate 27 and handle 26 being removed. Fig. 5 is a section of the cylinder operating the control-valve.

2, Fig. 1, is the elevator-engine, from which the cables 3 pass to the car 4 over sheave 7 in the top of the shaft. A tank 6 supplies water to the engine through the pipe 32 and inlet-port 34 of valve 5. In order not to conceal the controlling apparatus, the pipe 32 is broken away, and the exhaust-pipe, which in practice is attached to the exhaust-port 33, is not shown. From the tank 6 a pipe 9 extends to about the middle of the elevator-shaft, its lower end terminating in two branches 10 and 11. Check-valves 12 and 13 allow water to flow into said branches 10 and 11, but not from them. The pipe 9 and valves 12 and 13 serve to keep the branches and the

pipes and cylinders connected thereto always filled with water, but are not essential to the operation of the device for the reason that any other device for filling the operating cylinders and tubes would be effective; but I prefer the device shown as being simple and requiring no attention. From branch 10 a pipe 16 extends to one end of the control-cylinder 18 and a flexible pipe 14 to one end of the cylinder 20 on the car, said cylinder 20 being shown in Figs. 3 and 4. From the other branch 11 pipes 17 and 15 extend to the other ends of cylinders 18 and 20, respectively. The piston of cylinder 20 (*vide* Fig. 4) consists of two disks 21 and 22, connected by a bar 19, upon which rack-teeth are cut, a pinion 23 meshing therein. The pinion 23 is revolved by the handle 26. The disk 27 covers the cylinder 20 and connections and may have marked upon its face the words "Up," "Down," and "Stop" to indicate the position in which to place the handle 26. The piston in cylinder 18 (*vide* Fig. 5) is constructed in a similar manner, having disks 28 and 29 connected to bar 35, and the bar 35 carries a lug 30, which projects through the side of the cylinder 18 and is attached to a rod 31, which moves the control or pilot valve. Set-screws 32 and 33, projecting through the ends of the cylinder 18, serve to adjust the limits of the movement of disks 28 and 29. By reference to Fig. 4 it will be seen that not only are pipes 14 and 15 connected to their respective ends of the cylinder 20, but that they are connected to each other through the plug-cock 24. Said cock is usually closed, and its use will appear when the operation of the apparatus is described.

The operation is as follows: We will suppose that the piston of cylinder 20 is moved to the left (*vide* Fig. 4) by the revolution of the handle 26 and pinion 23. The water in the left-hand end of cylinder 18 is forced out and down through pipes 14 and 16 to the left-hand end of cylinder 18, thereby forcing its piston to the right and moving the control-valve. The water in the right end of cylinder 18 is at the same time forced into the corresponding end of cylinder 20. A movement of the handle 26 in the opposite direction is



in like manner followed by a movement of the control-valve in the opposite direction. It is desirable to have the position of the control-valve always correspond to certain fixed positions of the handle 26, and the plug-cock 24 is provided for adjusting and maintaining these relations. Thus if through unequal leakage or other cause the control-valve is not in its central position when the handle 26 is at its "Stop" or central position the error may be rectified by opening the plug-cock 24, setting the control-valve at the point desired, and bringing the handle 26 to its corresponding position, the last-named adjustment not causing the control-valve to move, because the water is not forced through the pipes 14 and 15, but simply passes from one end to the other of cylinder 20. The cock 24 is then closed and the device again ready for use.

In the use of the term "cylinder and piston" in the subjoined claims I include and refer to any of the well-known means for communicating pressure to and for receiving pressure from a column of fluid—such, for instance, as a flexible diaphragm.

I claim—

1. In an elevator, the combination of a stationary valve through which the movement

of the car is controlled, two expansible chambers having a common moving part connected with said valve to move the same in opposite directions, two expansible chambers upon the car, having a common moving part and means for operating it, and flexible pipes connecting the said chambers upon the car with the stationary chambers, substantially as described.

2. The combination, with the control-valve of an elevator, of a cylinder and piston operating the said control-valve, a cylinder and piston carried upon the car, and pipes connecting said cylinders, said pipes being filled with an incompressible fluid, substantially as described.

3. In an apparatus for operating the control-valve of an elevator, the combination of a cylinder carried by the elevator-car, a piston therein operated by a pinion meshing in the rack-bar joining the two disks of said piston, a piston and cylinder connected to said control-valve, and pipes connecting said cylinders and filled with an incompressible fluid, substantially as described.

THADDEUS W. HEERMANS.

Witnesses:

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