

No. 764,240.

PATENTED JULY 5, 1904.

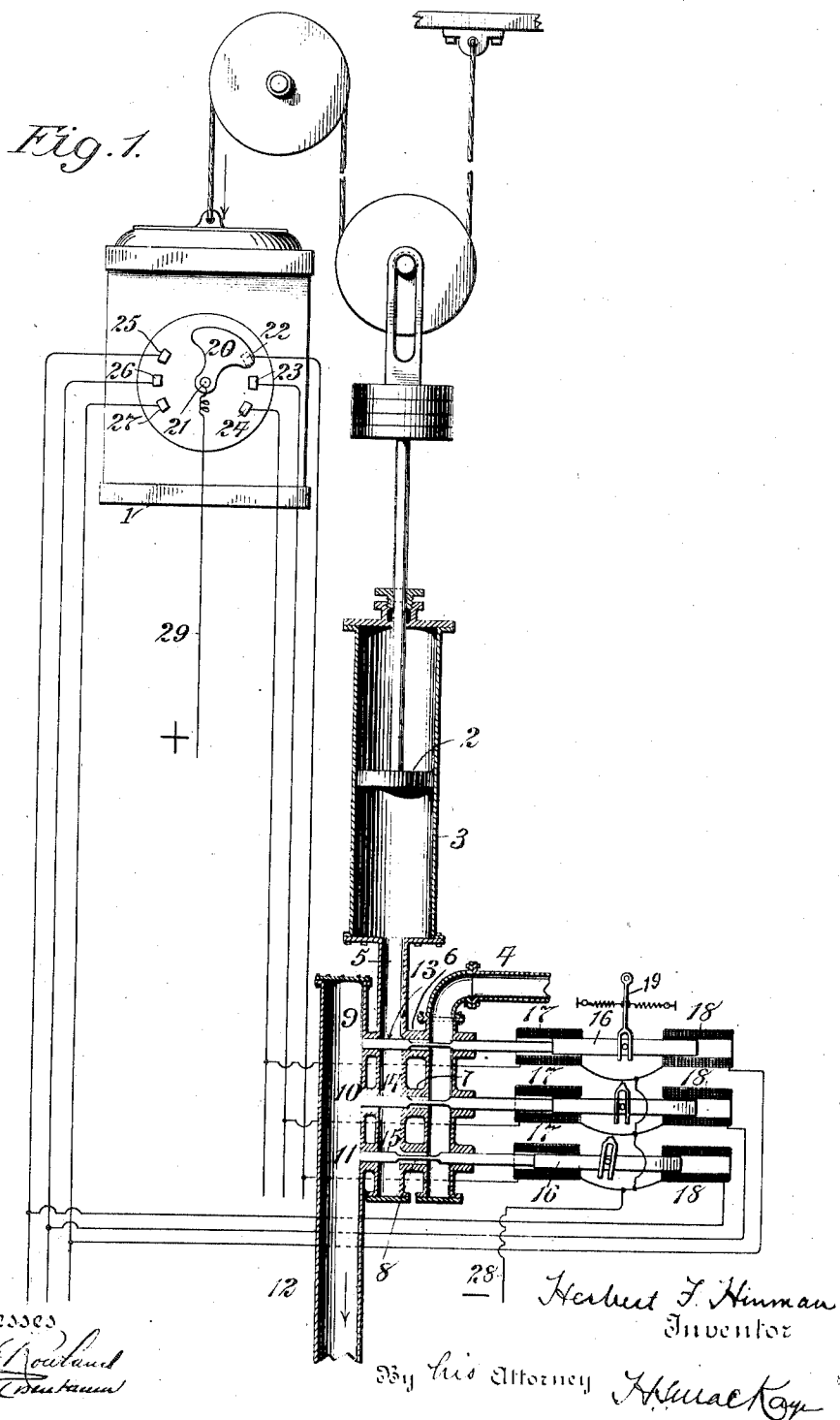
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ELECTROHYDRAULIC VALVE MECHANISM FOR ELEVATORS.

APPLICATION FILED APR. 26, 1902. RENEWED JUNE 3, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



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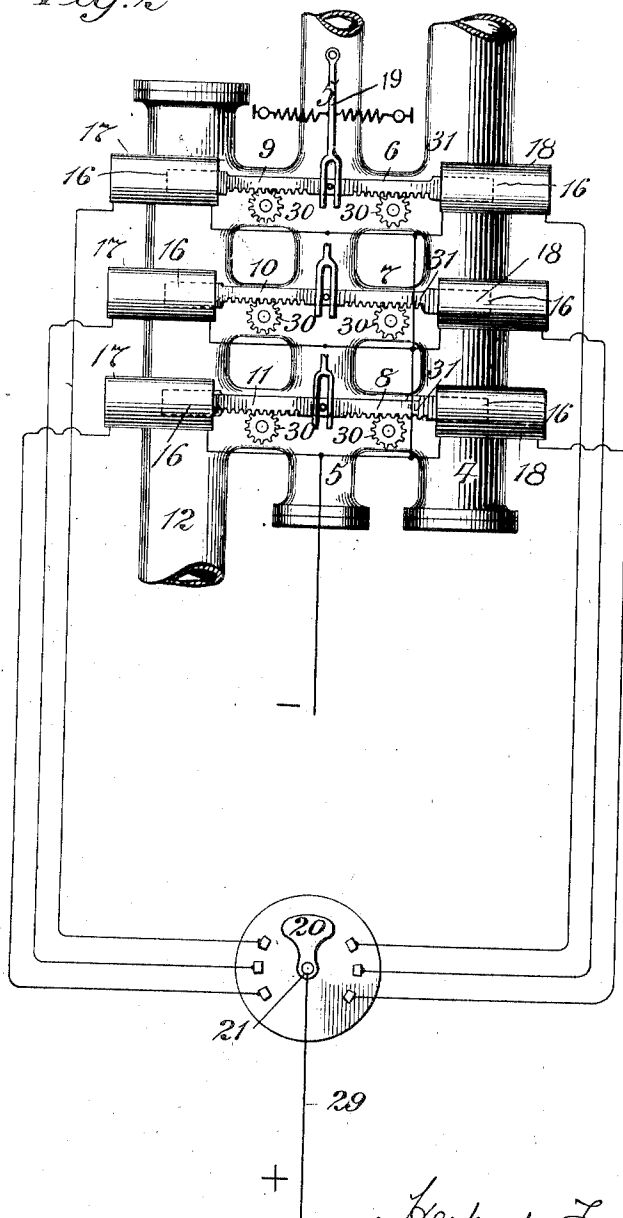
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2 SHEETS—SHEET 2.

Fig. 2



Witnesses
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UNITED STATES PATENT OFFICE.

HERBERT F. HINMAN, OF NEW YORK, N. Y.

ELECTROHYDRAULIC VALVE MECHANISM FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 764,240, dated July 5, 1904.

Application filed April 26, 1902. Renewed June 3, 1904. Serial No. 210,991. (No model.)

To all whom it may concern:

Be it known that I, HERBERT F. HINMAN, a citizen of the United States, residing in the city, county, and State of New York, have invented a certain new and useful Improvement in Electrohydraulic Valve Mechanism for Elevators, of which the following is a specification.

My present invention has relation to a simple and economical means easily applied to any hydraulic elevator whereby the apparatus may be controlled electrically from the car by means of light currents.

By the use of my improvement I do away with all cumbrous and expensive mechanical connections between the moving car and the stationary motive apparatus and at the same time avoid all necessity for bringing power-current into the car.

Certain embodiments of the principle of my invention are shown in the accompanying drawings, wherein—

Figure 1 is a general view of a hydraulic-elevator installation provided with my controlling means; and Fig. 2 is a diagrammatic view of an arrangement of valves different from that shown in Fig. 1, but also embodying my invention.

In Fig. 1 the car or cage is shown at 1 and the hydraulic piston and cylinder at 2 and 3, respectively. The transmitting pulleys and cables may be arranged in any well-known manner without affecting my invention, and those in the drawings are intended to represent any such transmitting means. The water under pressure is fed in primarily through the main feed-pipe 4, while the secondary feed-pipe 5 connects directly with the cylinder 3, as shown. The branch pipes 6, 7, and 8 connect the two feed-pipes, while another set of branch pipes 9, 10, and 11, respectively in alinement with 6, 7, and 8, connect the secondary feed-pipe 5 with the outlet 12. The plunger-valve 13 works in pipes 6 and 9 to control the flow of water therein. If this plunger be drawn to the right, it lets the water out of the cylinder 3 through pipes 5 and 9 to the outlet-pipe 12. If, on the contrary, the plunger 13 is pushed to the left, the out-

let is closed and the pipe 6 is opened, so as to admit water under pressure from 4 through 5 to the cylinder 3. The other two plunger-valves, 14 and 15, act similarly to admit water to or let it out of the cylinder.

In the drawings the plunger 15 is shown admitting pressure, and thus the piston 2 is supposed to be rising.

Each plunger 13 14 15 is provided with its own core 16, and each core 16 is controlled by two solenoids or equivalent electromagnetic means, (indicated, respectively, in the drawings by 17 and 18 in each case.)

It will be seen that each solenoid 17 acts upon the magnetic core 16 to admit water under pressure, while the solenoids 18 have the contrary effect of opening the exhaust-pipes. Each plunger and core is brought automatically to the central position, as shown for 13 and 14, by a spring 19 or equivalent means.

It is to be understood that while I have shown as an example three plungers and corresponding branch pipes my invention covers the use of any desired number of these elements for the purposes herein set forth.

In the car a switch is used of the type shown in the drawings. Here the rotary contact-segment 20 turns on the pivot 21 and may be brought over all the stationary terminals 22 23 24 one at a time, or when swung in the opposite direction 20 can be brought in the same manner over the terminals 25, 26, and 27.

One side of each of the solenoids 17 18 is connected with one side of the electric-supply circuit, as indicated in both figures at 28. The other main wire, 29, is connected to the sector 20.

The terminals 22, 23, and 24 are connected, respectively, to the free ends of the solenoids 17 successively, while terminals 25, 26, and 27 are connected to corresponding ends of solenoid-coils 18. By this arrangement one, two, or all of the plungers 13 14 15 can be operated simultaneously from the car in either direction at will, and thus by means of the switch shown or its equivalent the flow of water to or from the cylinder 3 can be controlled both as to direction and speed, thus producing corresponding changes of move-

ment in the car. When the sector is in the middle position, touching none of the terminals, the springs 19 maintain the plunger-valves in the middle or universally-closed position, thus stopping the car.

It will of course be understood that the solenoids shown are but one of several practicable types of electromagnetic means which may be used in the connection shown and that I do not limit myself to this particular type in my claims.

In Fig. 2 is shown a second embodiment of my invention, wherein the pipes 6 9 and 7 10 and 8 11 are controlled by rotary valves having pinions 30 on their exterior ends, which may be operated by racks 31, moved by cores and solenoids in a manner similar to that above described. It is to be understood that when the racks are in their middle positions, as shown, both valves are closed in each pair of pipes, while opposite movements from this mean position produce the same effects as movements of the plungers in Fig. 1.

A number of modifications suggested by mechanical skill can be made in the construction of my device without departing from the scope of my invention, and I am not to be understood as limiting myself to the details of what is herein shown and described.

What I claim is—

1. In an elevator apparatus, a hydraulic cylinder, a pressure-pipe and a second pipe leading directly to said cylinder; in combination with independent branch openings between said two pipes, a valve controlling each branch, an electromagnetic operating device

for each valve and a switch controlling one or all of said valves at will.

2. In an elevator apparatus, a hydraulic cylinder, a pressure-pipe, a second pipe leading directly to said cylinder and an exhaust-pipe; in combination with independent inlet-openings from the pressure-pipe to said second pipe, independent outlet-openings from said second pipe to said exhaust-pipe, and a separate electromagnetic means corresponding to each inlet-opening for simultaneously controlling said inlet-opening and its corresponding outlet-opening.

3. In an elevator apparatus, a hydraulic cylinder, a pressure-pipe, a second pipe leading directly to said cylinder and an exhaust-pipe; in combination with a number of inlet-openings from said pressure-pipe to said second pipe, similar exhaust-openings from said second pipe to said exhaust-pipe, each of said exhaust-openings being in line with a corresponding inlet-opening, a plunger-valve for each pair of openings in line so arranged as to close both when in the median position and open one or the other opening when moved one way or the other, and two electromagnetic devices for each plunger, one of said devices being adapted to move said plunger one way from the center and the second device being arranged to produce the contrary movement of the plunger.

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