No. 675,888. Patented June 11, 1901.

J. G. GRACEY & A. GFELLER.

ELEVATOR SAFETY APPLIANCE.

(No Model.) (Application filed Oct. 1, 1900.)

Fig. 1.

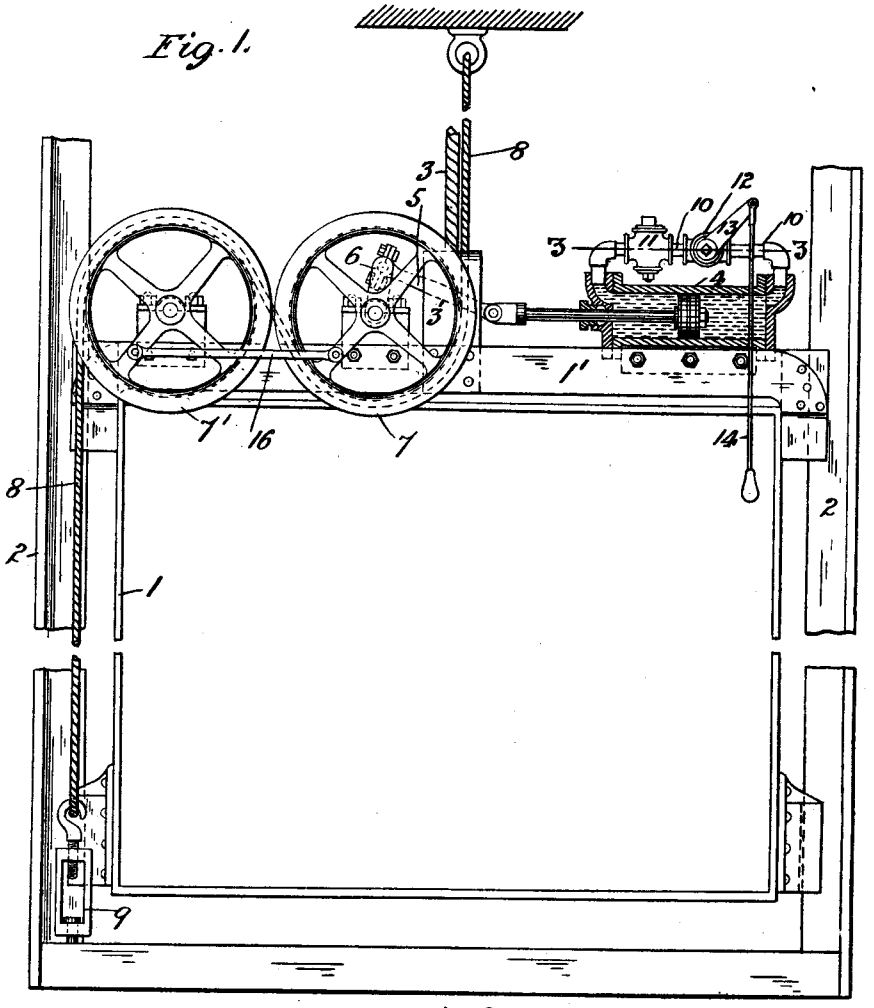


Fig. 2.

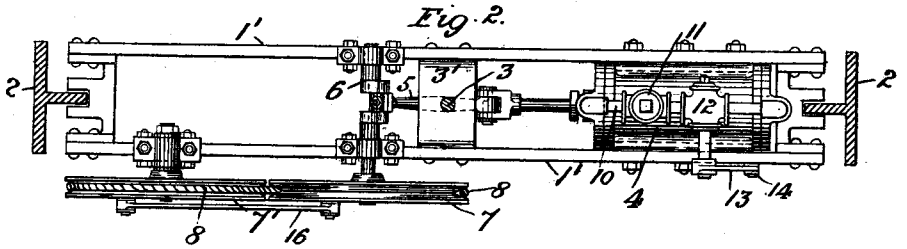
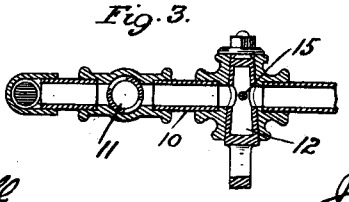


Fig. 3.



WITNESSES
Edward W Turrell
G L Bisby

INVENTORS,
James G. Gracey and
Alfred Gfeller
by Emil Starce atty

THE MORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES G. GRACEY AND ALFRED GFELLER, OF ST. LOUIS, MISSOURI, ASSIGNORS TO THE POSITIVE ELEVATOR SAFETY COMPANY, OF SAME PLACE.

ELEVATOR SAFETY APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 675,888, dated June 11, 1901.

Application filed October 1, 1900. Serial No. 31,690. (No model.)

To all whom it may concern:

Be it known that we, JAMES G. GRACEY and ALFRED GFELLER, citizens of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Elevator Safety Appliances, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

Our invention has relation to improvements in elevator safety appliances; and it consists in the novel arrangement and combination of parts more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a combined side elevation and section of our device mounted on top of the cage. Fig. 2 is a top plan with the guide-beams in section; and Fig. 3 is an enlarged sectional detail on line 3 3 of Fig. 1, taken through the regulating and emergency valves, respectively, said section showing the regulating-valve partly open and the emergency-valve open fully.

The present invention is an improvement on the construction shown and described in United States Letters Patent granted to James G. Gracey under date of September 5, 1899, and numbered 632,347, and like it has for its object to provide a passenger or freight elevator with a device which will not only regulate the speed of travel of the cage in either direction, but which can be manipulated by hand (or automatically) so as to cause the cage to come to a dead stop should occasion therefor arise. The present device substitutes a liquid-pump for the air-pump in the patent referred to and substitutes, further, a much simpler means for actuating such pump during the travel of the cage.

In detail the invention may be described as follows:

Referring to the drawings, 1 represents the cage, and 2 the guide-beams or tongues of the shaft along which the cage travels. The pulling and supporting cable is represented by 3, the lower end of the latter being secured to a U-shaped strap or yoke 3', secured between the upper transverse roof-bars 1' of the cage. Carried at one end and on top of the roof-bars 1' is an oil-cylinder 4, the piston of which is connected by a connecting-rod 5 to the crank-arm of a crank-shaft 6, mounted across the bars 1', one end of the crank-shaft having secured thereto a sheave 7, provided with a V-shaped peripheral groove, over which passes a stationary cable 8, the latter passing also over a portion of the V-shaped peripheral groove of a sheave 7', mounted adjacent to the sheave 7. The lower end of the cable 8 is secured to a turnbuckle 9 at the bottom of the shaft, by means of which the said cable is kept taut at all times, the upper end of the cable being secured at the top of the shaft. The opposite ends of the cylinder 4 are brought into communication with one another by a pipe connection 10, so that as the piston of the cylinder reciprocates it drives the oil confined in the cylinder first in one direction and then the other, the resistance offered to the movement of the piston being controlled by a regulating valve or cock 11 in the pipe 10. As is obvious, reciprocation is imparted to the piston during the travel of the cage in either direction, the sheaves 7 7' having rotation imparted thereto by the cable 8 as they move along the same. These in turn impart rotation to the crank-shaft which actuates the pump. The valve 11 is originally set to a position where it will not offer any material resistance to the flow of the oil under the normal speed of travel of the cage in either direction, and should the supporting-cable 3 break this same resistance thus offered to the flow of the oil in front of the piston would allow the pump to be operated at a predetermined rate of speed, so that the cage would descend only very little faster than under ordinary circumstances. Of course in case of the snapping of the supporting-cable 3 the cable 8 would become not only the driving-cable for the pump, but also the supporting-cable for the cage, the support being insured by the tendency of the cable to grip the walls of the V-shaped grooves of the sheaves. To bring the cage to a stop in emergency cases, we provide the pipe 10 with an additional valve 12, similar to valve 11, normally set to be fully open. The spindle of said valve is provided with a lever 13, by which it can at a moment's notice be oscil-

lated to a closed position by the operator drawing down on the rod 14, attached to the free end of the lever and depending a short distance into the cage. In thus closing the valve 12 the piston of the pump comes to a dead stop. To obviate any sudden jar under the circumstances, the wall of the valve 12 is provided with a relief-port 15, which enables the oil to flow through the valve in a measure, and thus exert a cushioning effect on the parts thus brought to a sudden stop. The valves 11 12 are of the ordinary faucet type, as seen in sections in Fig. 3, the valve 11 being set to a position which will allow for a predetermined rate of flow of the oil past it, and hence for a predetermined rate of travel of the cage, (whether the cable 3 breaks or not.) The valve 11 is here denominated the "regulating-valve," and 12 the "emergency-valve," the latter being always fully opened except when closed to bring the cage to a dead stop.

The present attachment of course finds application on inclined railways, as is obvious, and is not necessarily confined to passenger and freight elevators. The manner of mounting the several parts forms no part of the present invention, as that comes within the skill of the ordinary mechanic. We do not, of course, wish to be limited to the character or composition of the liquid confined within the oil pump or cylinder 4; neither do we wish to limit ourselves to the numbers of sheaves over which the cable 8 passes, for a single sheave or drum might be used or even three or more sheaves, so that the friction between them and the cable is sufficient to prevent the latter from slipping.

In the present instance where we employ two sheaves we couple them together by a connecting-rod 16 to insure them starting and stopping simultaneously and prevent any tendency on the part of the cable to slip.

Having described our invention, what we claim is—

1. In an elevator safety appliance, a suitable cage, a pump mounted thereon, a reciprocating piston therefor, a pipe connection establishing communication between the opposite ends of the pump-cylinder, a regulating cock or valve and an emergency-valve in said pipe connection, and means for reciprocating the piston upon the travel of the cage in either direction, substantially as set forth.

2. In an elevator safety appliance, a suitable cage, a pump mounted thereon, a reciprocating piston for said pump, a pipe establishing communication between the opposite sides of the piston, a regulating cock or valve and an emergency-valve in said pipe, a series of sheaves mounted on the cage, a stationary cable passing over the peripheries of the sheaves, and having its opposite ends secured at the top and bottom of the shaft respectively, and means under the control of the operator for closing the emergency-valve in case of accident, the stationary cable serving to impart rotation to the sheaves, and suitable connections between the sheaves and pump for operating the piston of the latter upon the travel of the cage in either direction, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

JAMES G. GRACEY.
ALFRED GFELLER.

Witnesses:
EMIL STAREK,
G. L. BELFRY.