No. 722,894. PATENTED MAR. 17, 1903.

F. D. POTTER.

SAFETY CLUTCH FOR ELEVATORS.

APPLICATION FILED NOV. 13, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

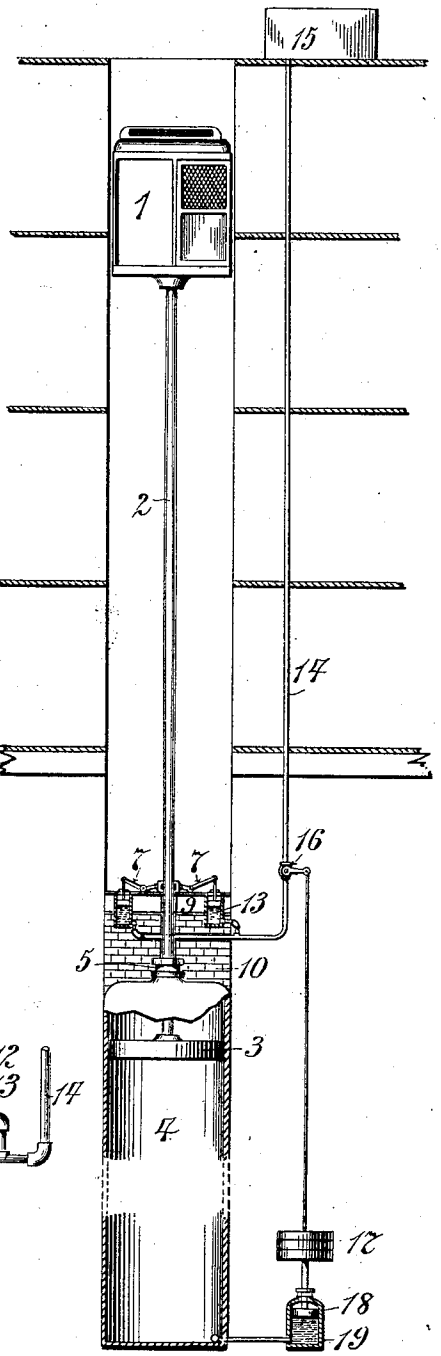
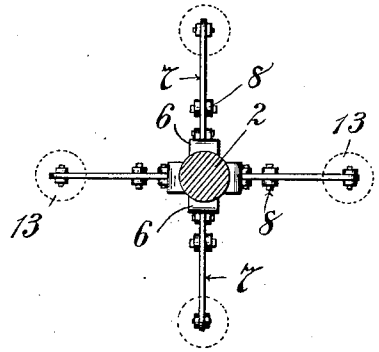


Fig. 3.



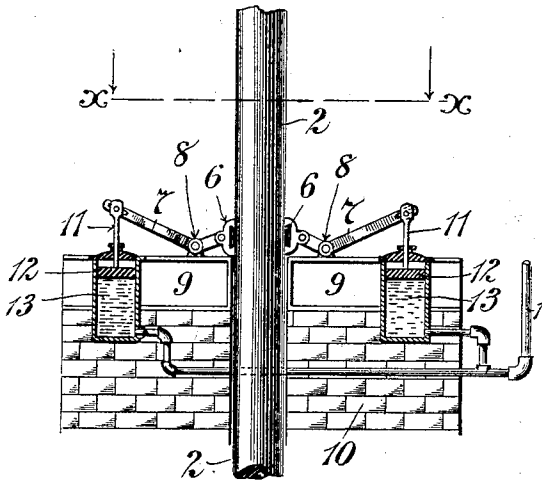


Fig. 2.

Witnesses
Edward C. Rowland.
Marie M. Hovey

Frederic D. Potter Inventor
By his Attorney H. Mallack

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

No. 722,894. PATENTED MAR. 17, 1903.

F. D. POTTER.

SAFETY CLUTCH FOR ELEVATORS.

APPLICATION FILED NOV. 13, 1902.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 4.

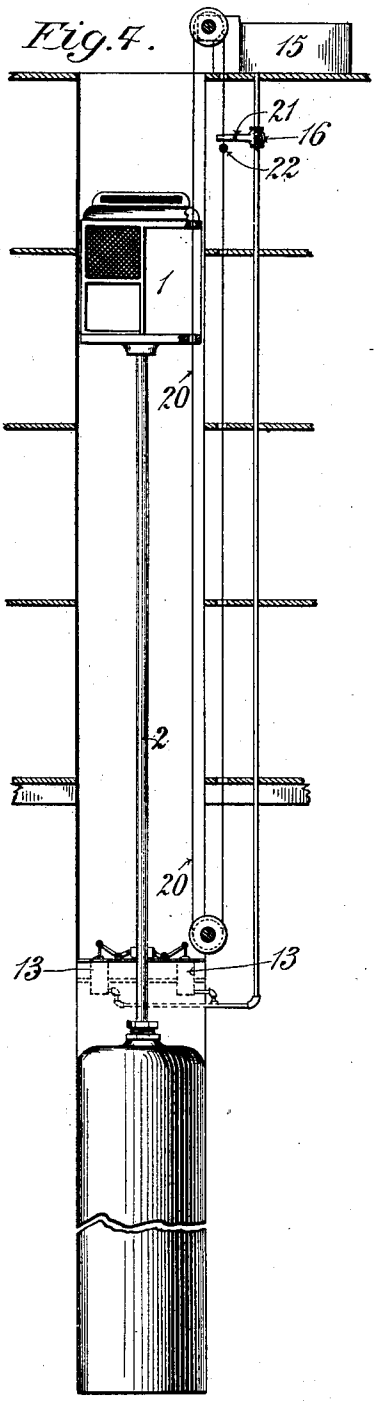
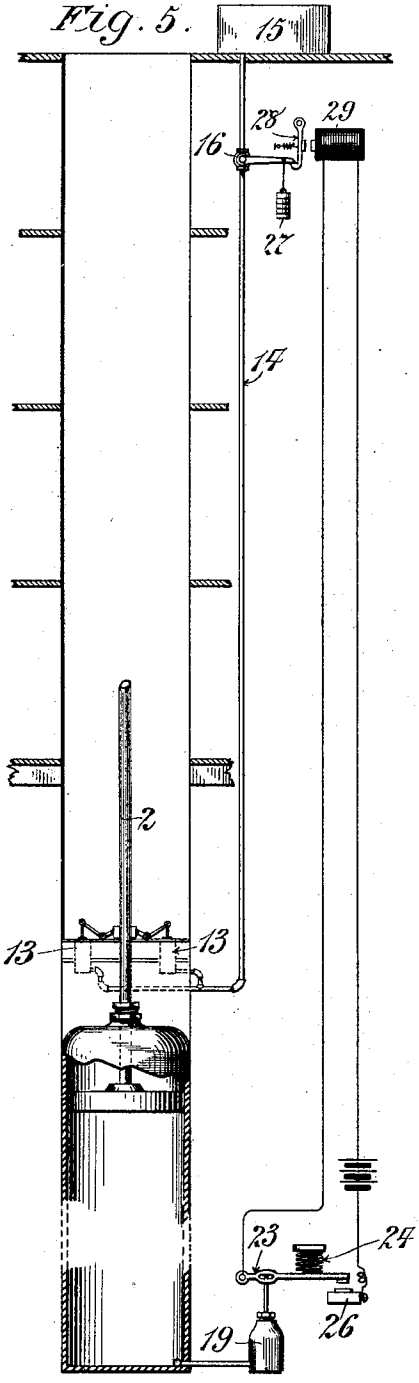


Fig. 5.



Witnesses
Edward G. Rowland,
Marie M. Hovey

Frederic D. Potter Inventor
By his Attorney H. Mackaye

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

UNITED STATES PATENT OFFICE.

FREDERIC D. POTTER, OF LINDEN, NEW JERSEY, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO OTIS ELEVATOR COMPANY, OF EAST ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SAFETY-CLUTCH FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 722,894, dated March 17, 1903.

Application filed November 13, 1902. Serial No. 131,277. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC D. POTTER, a citizen of the United States, residing in Linden, in the county of Union and State of New Jersey, have invented a certain new and useful Improvement in Safety-Clutches for Elevators, of which the following is a specification.

This invention has especial relation to what are known as "plunger-elevators," wherein a hydraulic cylinder is placed beneath the car and the piston acts through a vertical piston rod or shafting directly upon the car which is carried by said rod. In elevators of this class for use in high buildings it has been hitherto found inexpedient to apply the ordinary safety-clutches which grip the guides of the car, since the enormous weight of the plunger and shafting would tear out the lining of the elevator-shaft.

I have invented means applicable directly to the plunger-rod at its base in a location wherein the support provided can be of the strongest, and have invented means whereby the clutch can be applied either automatically on failure of the supporting-column of water or can be applied by hand from the car.

My invention is illustrated in a preferred form in the accompanying drawings, wherein—

Figure 1 is a side view of a plunger-elevator system provided with my invention. Fig. 2 is a side view, on a larger scale, of a portion of the apparatus wherein the clutches are applied. Fig. 3 is a sectional horizontal view on the plane *x x* of Fig. 1. Fig. 4 shows a modification adapted to hand operation, and Fig. 5 is a partial side view showing a modified automatic device for applying the brake or clutch.

In the drawings the car is shown at 1, supported by the plunger rod or shafting 2, at the lower end of which is located the usual plunger or piston 3 within the cylinder 4, shown of indefinite length, but which should be as long as the travel of the car with necessary clearance. The rod 2 passes through the usual stuffing-box 5, and just above this or, indeed, at any point below the lowest point of travel of the car I place the clutching apparatus. (Shown in detail in Figs. 2 and 3.)

Distributed symmetrically around the periphery of the plunger-rod 2 are placed a number of brake-shoes 6, (four in the drawings, although any number may be used,) and these shoes are placed, as shown, at the power ends of leverage systems, at the other ends of which systems are placed the motive means for applying the clutch. In the drawings I have shown each brake-shoe connected to the shorter arm of a bell-crank lever 7, pivoted, as at 8, upon a strong foundation, such as the I-beam 9, supported by brick walls 10. The longer arm of each bell-crank lever is controlled by a piston-rod 11, whose piston 12 works within a suitable hydraulic or pneumatic cylinder 13. In Fig. 2 this cylinder is shown filled and the brake consequently applied.

A pipe 14, leading from a water-tank placed at a suitable elevation, as at 15, supplies the fluid for actuating the brake-shoes, and the brakes are applied by opening a valve 16, which may be located at any desired point along the pipe 14. In Fig. 1 the valve 16 is shown adapted for operation by automatic means. Here the weight (or its equivalent) 17 tends constantly to open the valve 16, but is normally prevented by the piston 18 within the cylinder 19, which is supplied with fluid under pressure from the lower part of the main cylinder 4, as shown. When the pressure fails within 4 for any reason and there is danger of the piston 3 and car 1 falling, pressure also fails in the cylinder 19 and the weight 17 opens the valve 16, which, admitting fluid to the cylinders 13, causes the plunger-rod 2 to be gripped and held from falling.

In Fig. 4 is shown means for operating the clutches by hand, if desired. This involves a hand-rope 20, extending along the path of the car in a well-known manner, said rope passing the handle 21 of the valve 16 and being provided with a stop 22, which engages a handle 21 in a well-known manner when the portion of the rope 20 which remains within the car 1 is pulled downward. This will open the valve 16 and apply the clutches.

In Fig. 5 is shown another form of automatic device for applying the clutches. Here the cylinder 19 contains water from cylinder 4, which acts through its piston to uphold the pivoted bar 23 against a spring 24 or equivalent device, and so hold open the circuit of battery 25 at the switch 26. The weight 27 tends to open the valve 16 to apply the clutches, but is prevented by the catch 28. Upon closing circuit at 26 by failure of pressure in 19 the magnet 29 acts to withdraw the catch 28 and release the valve 16.

Although in the above description and in the drawings a separate piston and piston-rod have been shown and described, my present invention is intended for application to what is termed the "plunger-elevator," wherein the car is carried upon the piston itself, said piston taking the form of an elongated hollow cylinder carrying the car. In my claims, therefore, I use the word "plunger" to signify the combination of piston and piston-rod, whether in the form illustrated herein or where these elements form but one device, as above indicated. It is to be further understood that in some aspects my invention is applicable to any hydraulic elevator system, whether the car is pushed directly by the plunger or through intermediate mechanism.

A variety of changes might be made in the apparatus above described without departing from my invention, and I am not to be understood as limiting myself to the details herein specifically shown and described.

What I claim is—

1. In an elevator, a cylinder, a plunger and a car actuated by said plunger; in combination with a stationary clutch for holding the plunger fixed and means for bringing said clutching means into play, substantially as described.

2. In an elevator, a cylinder, a plunger and a car mounted on said plunger; in combination with a stationary clutch at a point below the lowest position of travel of the car adapted to grip and support the plunger and automatic means for bringing said clutching means into play, substantially as described.

3. In an elevator, a cylinder, a plunger and a car mounted on said plunger; in combination with a fixed brake-shoe adapted to bear on said plunger to support the same, a fixed leverage system connected to said shoe to press it against the plunger and means acting upon said leverage system for its operation, substantially as described.

4. In an elevator, a hydraulic safety-brake, hydraulic means for applying the same, a pressure-supply pipe and a valve thereon; in combination with a hydraulic cylinder for operating the elevator, a cylinder connected to said operating-cylinder, means tending to open said valve and means controlled by a piston in said last-named cylinder for permitting the valve-opening means to act.

5. In an elevator, a hydraulic safety-brake, hydraulic means for applying the same, a pressure-supply pipe and a valve thereon; in combination with a hydraulic cylinder for operating the elevator, a cylinder connected thereto and containing a plunger and means opposed by the normal operation of said cylinder and plunger last named for operating said valve to apply the brake.

FREDERIC D. POTTER.

Witnesses:
JOHN MCKAY,
HAROLD S. MACKAYE.