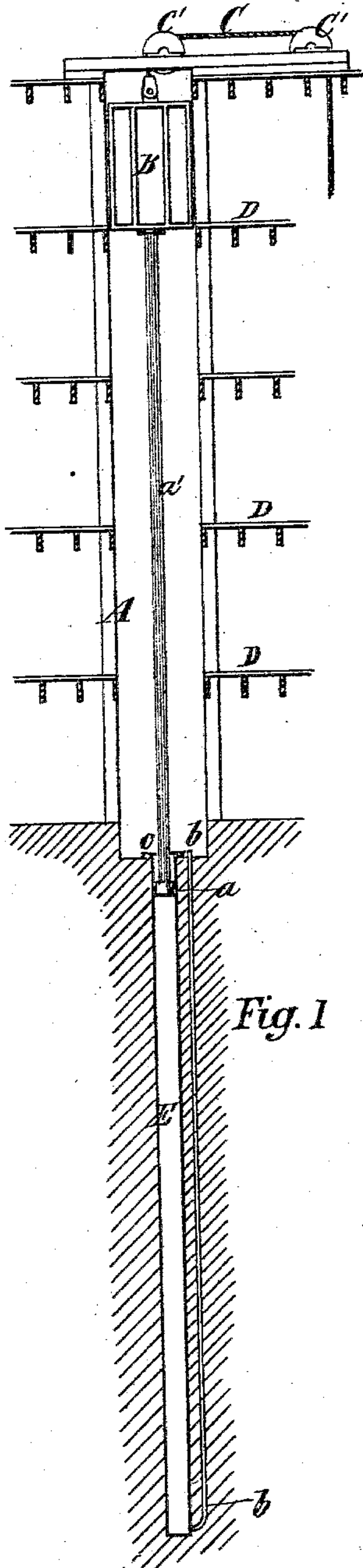
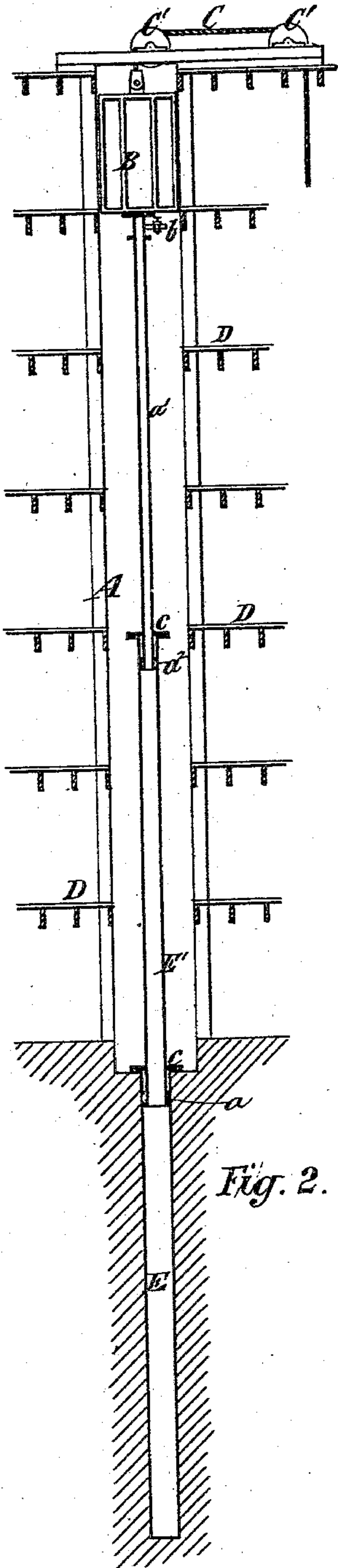
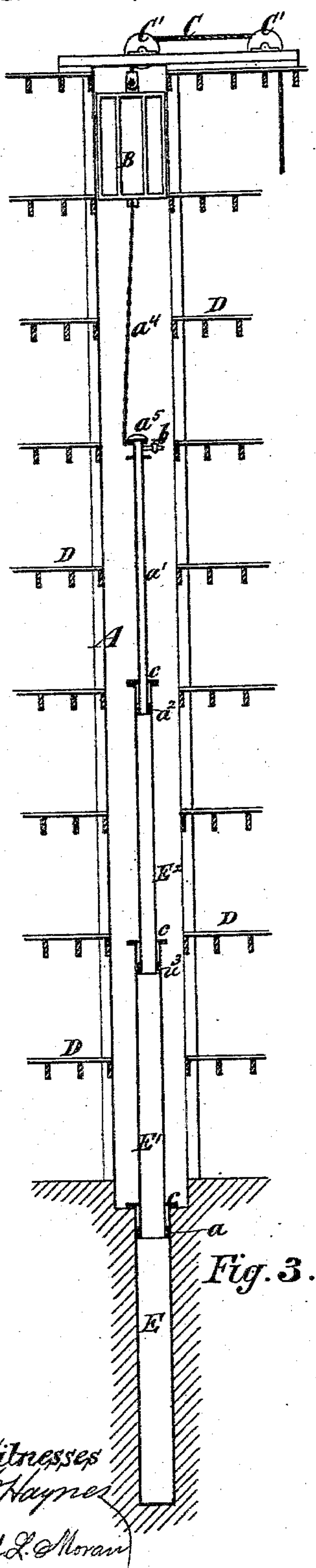


(No Model.)

R. A. CHESEBROUGH.  
SAFETY APPLIANCE FOR ELEVATORS.

No. 286,684.

Patented Oct. 16, 1883.



Witnesses  
J. Haynes  
Ed. L. Moran

Inventor  
R. A. Chesbrough  
by his Attorneys  
Brown & Brown



# UNITED STATES PATENT OFFICE.

ROBERT A. CHESEBROUGH, OF NEW YORK, N. Y.

## SAFETY APPLIANCE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 286,684, dated October 16, 1883.

Application filed August 10, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT A. CHESEBROUGH, of the city and county of New York, in the State of New York, have invented a  
5 new and useful Improvement in Safety Appliances for Elevators, of which the following is a specification.

My invention relates to the class of appliances for elevators which are designed to check  
10 or retard the fall of the elevator car, cab, or platform when the hoisting-rope breaks, and thus prevent injury to the occupant or occupants of said car, cab, or platform. The stop-pawls, dogs, or clamps with which the car or  
15 cab is frequently provided, and which are designed to engage with racks or posts in the elevator-shaft, are commonly thrown into action by a spring or springs, and are not always reliable, and in any case, if they act  
20 properly, they check and stop the car or cab suddenly, and are thus subjected to enormous strain and shock.

The object of my invention is to provide a safety appliance which shall be more certain  
25 in its action, which shall not be liable to get out of order or become inoperative, and which will retard the fall of the car or cab to such an extent as to remove all danger to the occupants, and yet so gradually as to prevent any  
30 considerable shock or strain upon the said appliance.

To this end the invention consists in the combination, with an elevator-shaft and a car, cab, or platform working therein, of a cylinder or tube and a plunger contained therein,  
35 one fixed at the bottom of the shaft and the other attached to the car, cab, or platform in such manner that the rise and fall of the car, cab, or platform will cause a reciprocating  
40 movement between said cylinder or tube and plunger without the plunger leaving the cylinder, and a vent aperture or passage through which air or other elastic fluid may enter or leave the cylinder. This vent aperture or  
45 passage I make of such size or so regulate its size that the air or other elastic fluid can flow to or from the cylinder in sufficient volume to enable the car, cab, or platform to be raised and lowered without any increased resistance,  
50 but of such small size that when the car, cab, or platform falls the piston or plunger will

tend to expel the air or elastic fluid from the cylinder or tube much faster than it can escape through the vent, and thus a cushion of compressed air or elastic fluid will be formed  
55 in the cylinder to gradually retard the fall of the car, cab, or platform, and thus prevent injury to the occupants thereof. For buildings of moderate height, or in places where the ground can be easily bored to receive a  
60 cylinder or tube, a single long cylinder or tube at the bottom of the shaft and a single plunger attached to the car, cab, or platform will suffice; but for higher buildings a telescopic system of tubes and plungers may be  
65 used; and in the very highest buildings the tube or plunger having the greatest extension may be connected with the car, cab, or platform by a chain or rope, so as to allow the  
70 said car to move some distance above it, and may have a buffer at its upper end against which the car, cab, or platform will strike as it commences to fall.

My safety appliance may be used alone or in addition to the usual safety appliances above  
75 described.

In the accompanying drawings, Figure 1 is a sectional elevation of an elevator having my appliance in its simplest form, the building not being very high. Fig. 2 is a similar section  
80 of an elevator in a higher building, and Fig. 3 is a similar section of an elevator in a still higher building.

Similar letters of reference designate corresponding parts in all the figures.  
85

In all the figures, A designates the elevator-shaft, and B designates the cab, car, or platform, which is capable of being raised and lowered therein. To the car or cab B is attached the  
90 hoisting-rope C, which passes over sheaves or wheels C', and thence to the mechanism whereby the car or cab is raised and lowered.

I will first describe the construction shown in Fig. 1, which represents a low building having only four floors, D.  
95

In the bottom of the shaft A is a tube or cylinder, E, which is sunk in the ground, and in which is fitted a piston or plunger, a, and its rod a'. The said rod is attached to the bottom of the car or cab B, and as the latter is raised  
100 and lowered the piston or plunger is reciprocated in the tube or cylinder E without ever



leaving the cylinder. From the lower end of the tube or cylinder E a pipe, *b*, leads upward to the shaft. This pipe forms a vent-passage, and as the piston or plunger *a* is reciprocated in the tube or cylinder, air will be drawn into the cylinder and forced out of the cylinder through the pipe or passage *b*. The pipe or passage *b* is large enough to allow air to be drawn into the cylinder or forced out therefrom with sufficient rapidity to allow of the piston or plunger *a* moving freely up and down in the normal operation of the car or cab B; but if the hoisting-rope C should break, or if from any other cause the car or cab should fall, the piston or plunger will compress the air in the cylinder, owing to the small vent-pipe *b*, and thus an air-cushion will be formed which will gradually retard the fall and prevent injury to the occupants. The cylinder E is closed at the top by a head, *c*, which should have a stuffing-box through which the rod or tube *a'* works, and both the stuffing-box and piston or plunger may be provided with any suitable packing. (Not here shown.) The rod *a'* may be solid or consist of a tube.

In Fig. 2 I have represented six floors, D, and because of the height of the shaft and consequent length of cylinder or tube that would be required it would be impracticable, or at least difficult, to employ a single cylinder or tube and plunger, as shown in Fig. 1. I fix a cylinder, E, in the bottom of the shaft A, and the piston or plunger *a* of this cylinder is attached to a second cylinder, E', within which works a second piston or plunger, *a*<sup>2</sup>, attached to the lower end of a rod or tube, *a'*. The upper ends of the cylinders E E' are provided with heads *c*, and in this case the air-vent *b* is at the top of the rod or tube *a'*, and is provided with a cock or valve for regulating the passage of air. This valve is adjusted so that it will permit the inflow and outflow of air to and from the cylinders with proper rapidity, so long as the car or cab moves at a normal speed; but in case the car or cab falls, the air, not having a sufficiently free escape through the vent *b*, will be compressed in the cylinders, and will retard the movement of the pistons or plungers *a* *a*<sup>2</sup> sufficiently to break the fall and prevent accidents.

In Fig. 3 I have represented eight floors, D, and two cylinders, E' E<sup>2</sup>, in addition to the fixed cylinder E. The cylinder E' carries a piston or plunger, *a*, fitting the cylinder E; the cylinder E<sup>2</sup> carries a piston or plunger, *a*<sup>3</sup>, fitting the cylinder E', and the rod or tube *a'* carries a piston or plunger, *a*<sup>2</sup>. The rod or tube *a'* in this case is not connected directly with the car or cab B, but is connected therewith by a chain, rod, or similar connection, *a*<sup>4</sup>, so as to permit the car or cab to continue its upward movement after the telescopic system of cylinders has been extended to its full height. At the upper end of the rod or tube *a'* is a yielding buffer, *a*<sup>5</sup>, to lessen the shock when the car or cab strikes it, and at the up-

per end of said rod or tube is a vent, *b*, controlled by a valve. So long as the car or cab moves at normal speed, the air to and from the cylinders will pass through the vent *b* with sufficient freedom to prevent any material resistance being offered; but in case the car or cab falls the air will be compressed in the cylinders, and the fall of the car or cab will be retarded.

The valve and vent *b* may advantageously be near the car or cab, as shown in Fig. 2, for then a governor may be carried by the car or cab, and if the speed of the latter increases beyond the desired point the vent-valve *b* will be more or less closed, and so the air prevented from escaping from the cylinders.

In order to place the lower tube or cylinder in place, a hole may be bored or drilled therefor, as is done in sinking a well.

In lieu of air, any other elastic fluid might be employed.

I am aware that it is not new to raise an elevator car or cab by means of a hydraulic cylinder and a plunger working therein by water-pressure, and I am also aware that a telescopic system of cylinders has been employed and worked by water-pressure for a like purpose. Heretofore, however, the elevator car or cab has been operated by such cylinders and plungers, while in my appliance I operate the plunger or plungers from the car or cab, and they have no function whatever until the hoisting-rope breaks.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with an elevator-shaft and a car or platform working therein, of a cylinder and plunger, one fixed at the bottom of the shaft and the other attached to the car or platform, in such manner that the rise and fall of the car or platform will cause a reciprocating movement between said cylinder and plunger without the plunger leaving the cylinder, and a vent aperture or passage through which air or other elastic fluid may enter and leave the cylinder, the whole being independent of the mechanism for raising and lowering the car or platform, and forming a safety appliance which always extends from the bottom of the car or platform to the bottom of the shaft, for retarding the fall of the car, substantially as and for the purposes described.

2. The combination, with an elevator-shaft and a car or platform working therein, of a telescopic system of tubes or cylinders and plungers between the bottom of said shaft and the car or platform, and provided with a vent aperture or passage through which air or other elastic fluid may enter and leave the system, the whole being independent of the mechanism for raising and lowering the car or platform, and forming a safety appliance to retard the fall of the car, substantially as described.

3. The combination, with an elevator-shaft



and a car or platform working therein, of a telescopic system of tubes or cylinders, and plungers having vent aperture or passage through which air or other elastic fluid may  
5 enter and leave the system, and attached to the car or platform by a chain or other connection, so as to permit the upward movement of the car or platform beyond the system, the whole being independent of the mechanism for raising and lowering the car or platform, 10 and forming a safety appliance to retard the fall of the car or platform, substantially as described.

ROBT. A. CHESEBROUGH.

Witnesses:

CHANDLER HALL,  
GEO. WADMAN.