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S. CUNNINGHAM.
SAFETY APPLIANCE FOR ELEVATORS.

APPLICATION FILED SEPT. 20, 1905.

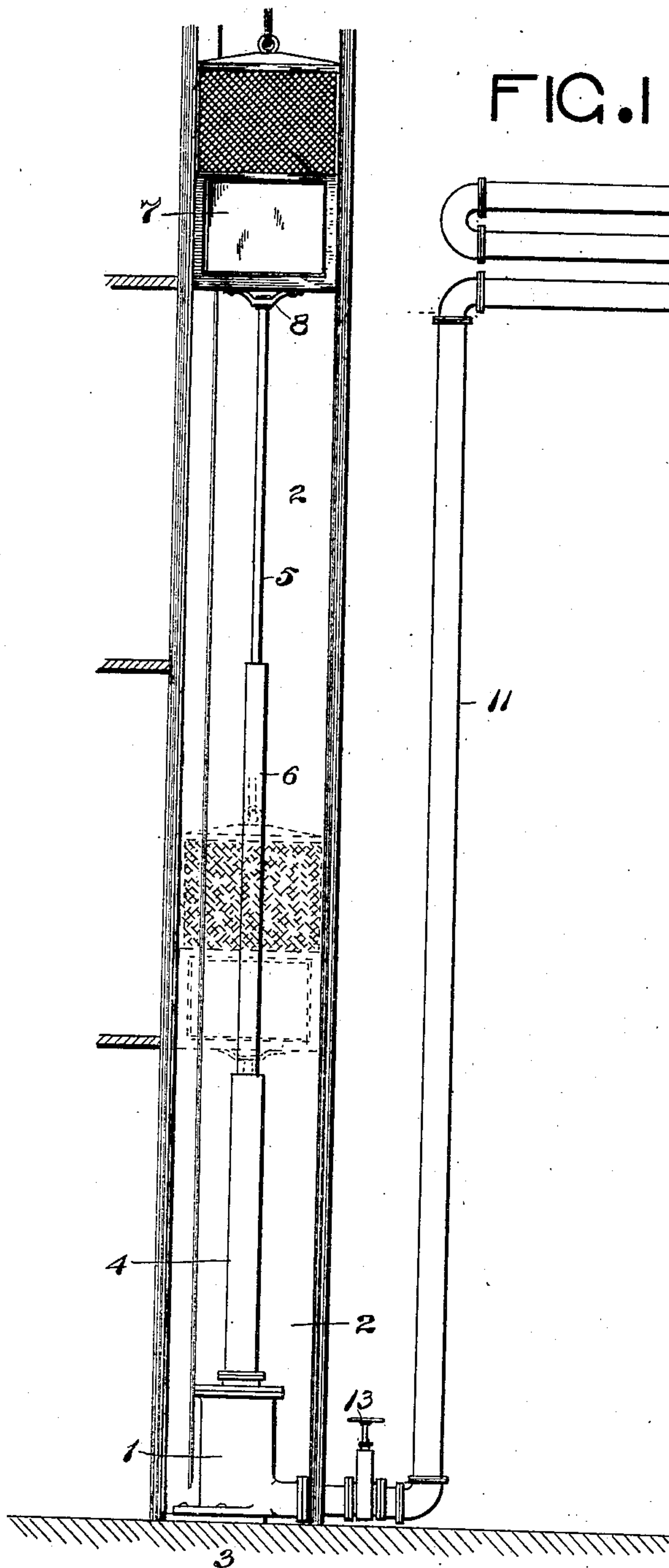
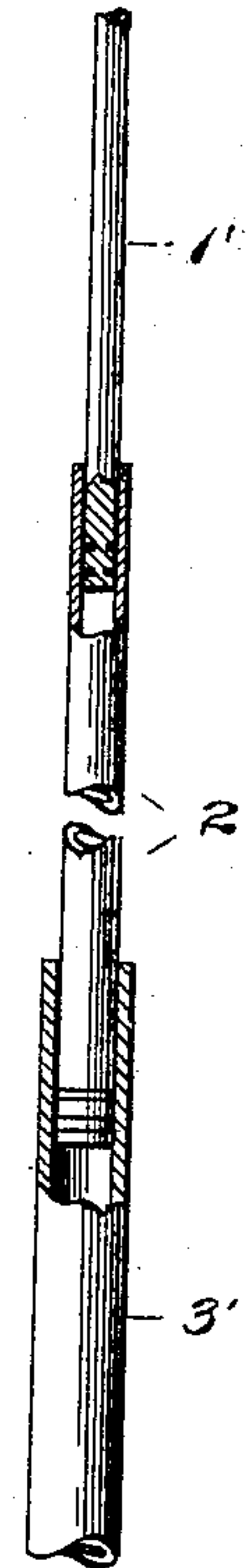
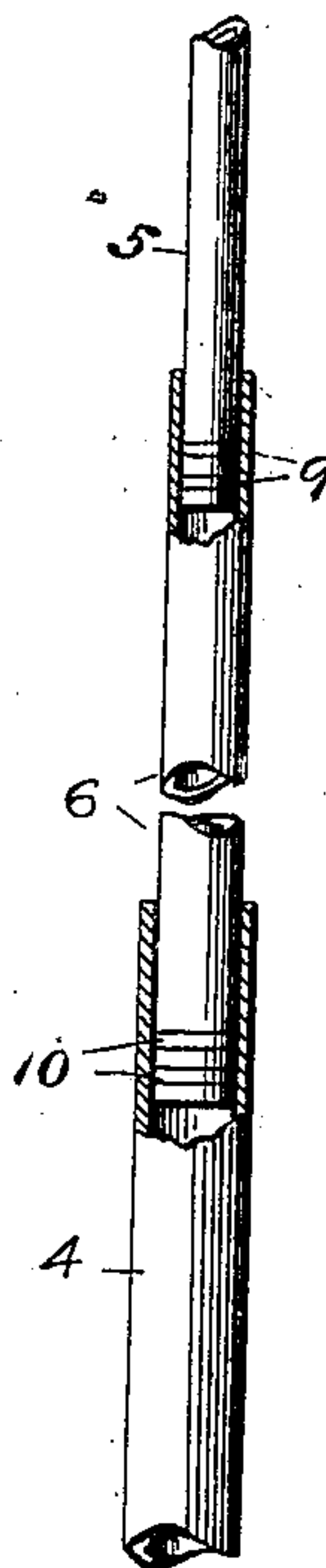


FIG. I

12

FIG. II

FIG. III



Witnesses:

J. H. Lord
A. E. Harrison

Inventor,
Stewart Cunningham
By
Richard D. Harrison
his Attorney.

UNITED STATES PATENT OFFICE.

STEWART CUNNINGHAM, OF TURTLE CREEK, PENNSYLVANIA.

SAFETY APPLIANCE FOR ELEVATORS.

No. 835,665.

Specification of Letters Patent.

Patented Nov. 13, 1906.

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To all whom it may concern:

Be it known that I, STEWART CUNNINGHAM, a citizen of the United States, residing at Turtle Creek, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Safety Appliances for Elevators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to that class of elevator appliances which are adapted to check or retard the fall of the elevator car, cab, or platform when the hoist-rope or other lifting appliance breaks or becomes uncontrollable, and thus prevent injury to the passengers and operator in or on the car, cab, or platform.

The object of my invention is to provide a safety appliance which shall be more certain in its action than the ordinary appliances heretofore employed for that purpose, which is not liable to become out of order or inoperative at any time, and which is so arranged and operated as to cause the car, cab, or platform to descend at approximately normal speed should the hoist-rope break or other appliance for operating the car, cab, or platform become so inoperative as to cause the car to descend, by which means all danger of injury to the passengers or operator, or, for that matter, to the car, cab, or platform, is entirely eliminated.

The device is entirely independent of the hoisting appliance and its attending devices and is applicable to any and all forms of elevators.

To this end the invention consists in interposing between the conveyance and bottom of the elevator-shaft a collapsible follower-piston of hollow form into which fluid is admitted as the conveyance ascends and discharged therefrom as the conveyance descends, the operation thereof being automatic with the movements of the said conveyance, the movements of said fluid in either direction being controllable in accordance with the desired speed of the conveyance, all of which will hereinafter be more fully set forth.

In the accompanying drawings, Figure I is a vertical side elevation of an elevator-shaft with the conveyance operating therein, in which view the application of my invention is shown. Fig. II is an enlarged view of a portion of the hollow telescoping or collapsible piston forming a part of the appliance, and Fig. III is a like view of a modified form of said piston.

In this instance I have, as an illustration and for the purpose of simplifying the explanation of the application of my invention thereto, selected and shown a three-floor elevator-shaft, in which case the numeral 1 designates a chamber secured within the bottom of the elevator-shaft 2 upon a suitable foundation 3, to which chamber is secured a vertically-disposed pipe 4, which communicates therewith. The collapsible or telescopic piston in this case consists of the two tubular sections 5 and 6. The first-mentioned section operates within the said second section and is connected to the conveyance 7 by a spider 8 or in other suitable manner, and the said second section operates in a like manner within the said fixed pipe 4, both of said piston-sections being provided with suitable packing-rings 9 and 10. Connected to the said chamber at the bottom of the elevator-shaft is a stand-pipe 11, which is disposed vertically from a point on a line level with the base of the conveyance when the latter is at its extreme elevation, after which said pipe is preferably arranged in a back-and-forth manner, as shown, to form a length slightly in excess of that part which is disposed vertically, the extremity of which is closed by a head and is disposed in a vertical position and provided with a regulating-cock 12, which is fitted into a vent-opening in the said head, said vertical portion being also provided with a valve 13 where it connects with the said chamber.

Fluid, such as water, is placed and maintained within the stand-pipe. the quantity of which is to be such as will fill the hollow piston, chamber, and stand-pipe to a point in the latter on a line with the base of the conveyance when said conveyance is at its extreme elevation, the said cock being opened and maintained at an area of opening determined upon for admission and expulsion of air from the pipe.

Relative to the operation thereof it is to be assumed that the conveyance is at one of the

upper floors, and should the same fall from any cause whatever the fluid in the piston, as the car descends and piston collapses, would be displaced back into the stand-pipe and the
 5 air driven out of the cock 12 at a rate corresponding to the pressure of the conveyance upon the fluid and area exposed to the escape of the air through the cock—that is to say, that, that air as displaced by the water in the
 10 stand-pipe would escape, under pressure of said water, out of the cock in accordance with what the opening through the cock has been adjusted to and to the pressure exerted upon the water and air, thereby causing the
 15 conveyance to descend gradually little in excess of that at which it would descend under normal conditions.

Ordinarily the conveyance will operate at all times, as heretofore set forth, in the case
 20 of accident in descending, and in ascending the water flows back again through the cock into the pipe. Therefore the device is in constant use, regardless of accident, and yet performs its function should accident occur
 25 at any time.

The object of the valve 13 in the line is that if occasion should demand it the water may be shut off in the stand-pipe—for instance, in case of repair. Again, said valve
 30 may be employed as a means to regulate the flow of water to and from the stand-pipe and chamber.

As will be understood from the foregoing description, the appliance in no way assists
 35 in the operation of the elevator-conveyance, as the same is entirely independent from the means employed to operate the same and is intended to perform the function set forth.

At Fig. III, I have shown a modified form
 40 of collapsible piston wherein the section 1' is made of solid form and the sections 2' and 3' tubular in form, in which case were it employed water in the stand-pipe would then not require a greater elevation than would be
 45 about on a line with the top of the highest tubular section when the conveyance is ele-

vated to its extreme position instead of on about a level with the bottom of the conveyance, as in the case where all sections are tubular in form, as previously set forth. 50

It is to be understood that where the conveyance is to be employed for service with a greater number of floors than shown in the drawings the piston-sections would be increased in number correspondingly unless the
 55 lower fixed section or pipe be placed deep enough or the distance from the first to the ground floor be deep enough to permit the use of long sections.

Having thus fully described my invention, 60 what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with an elevator-shaft and the conveyance operating therein, of a cushion means, said means comprising tele- 65 scoping tubular sections vertically disposed, the upper section being suitably connected with the said conveyance, a vertically-disposed stand-pipe coextensive with the extended cushion means, a plurality of hori- 70 zontal parallel connected pipes communicatively connected with the upper end of the stand-pipe and provided with a terminal air-vent, said stand-pipe being communicatively connected at its lower end with the lowest 75 telescoping section, and a regulating means at said last-named point of connection.

2. The combination with an elevator-shaft and the conveyance operating therein, of a cushion means attached to the conveyance 80 and having suitable support, and a vertically-disposed stand-pipe communicating with and coextensive with the extended cushion means, and means whereby the flow of fluid may be controlled between the stand-pipe 85 and cushion means.

In testimony whereof I affix my signature in presence of two witnesses.

STEWART CUNNINGHAM.

Witnesses:

W. J. ELLIOTT,
 JOHN TRATT.