

No. 755,189.

PATENTED MAR. 22, 1904.

S. B. TRAPP.

SAFETY APPARATUS FOR ELEVATORS.

APPLICATION FILED DEC. 1, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

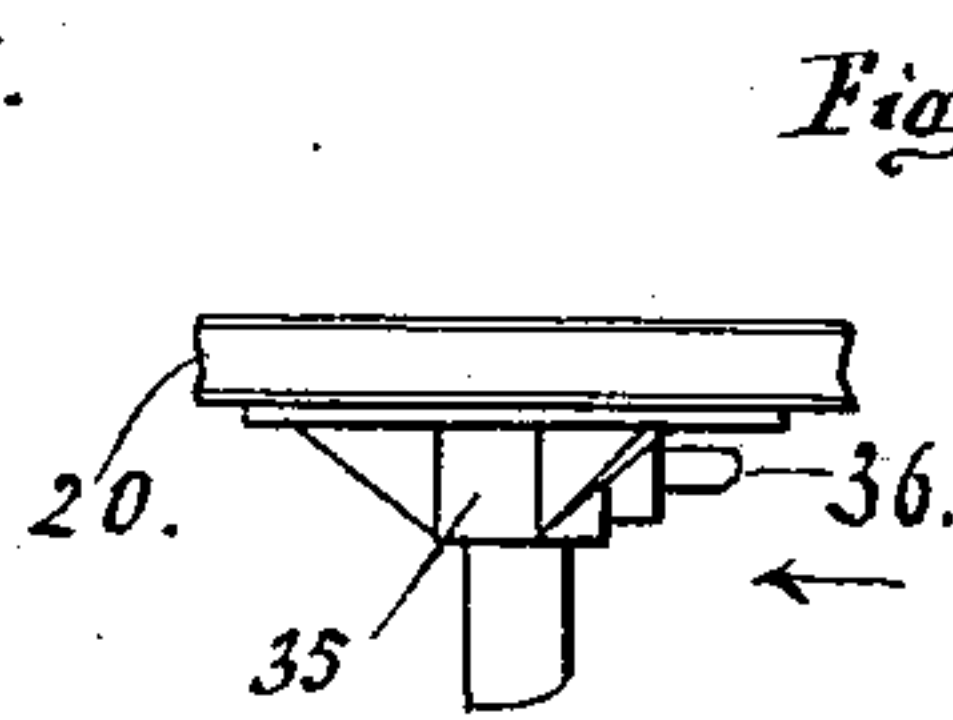
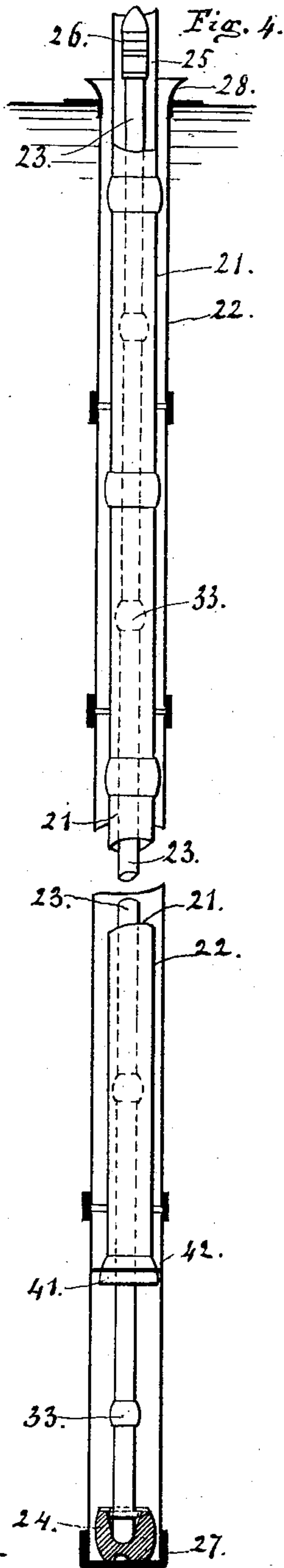
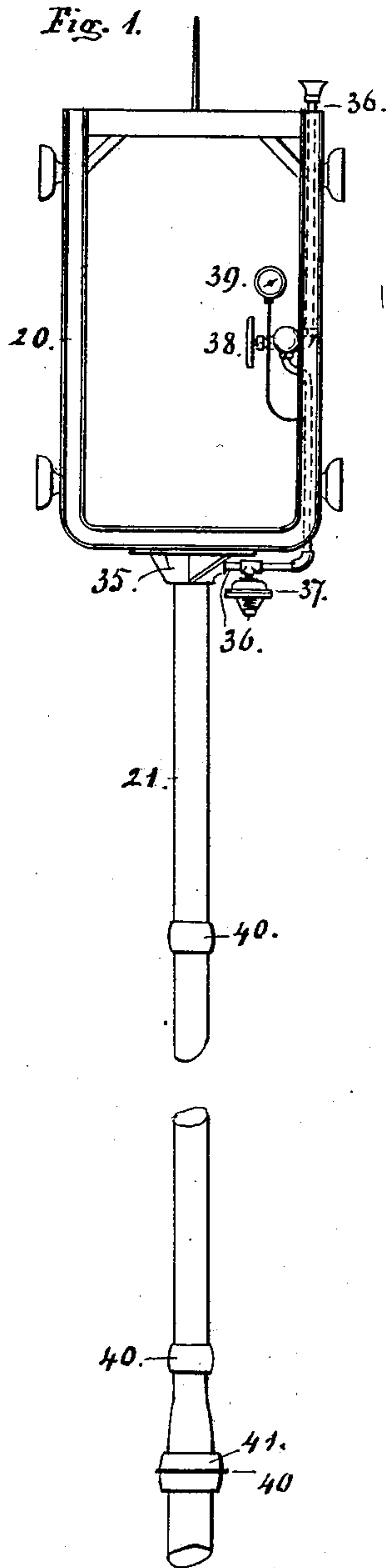
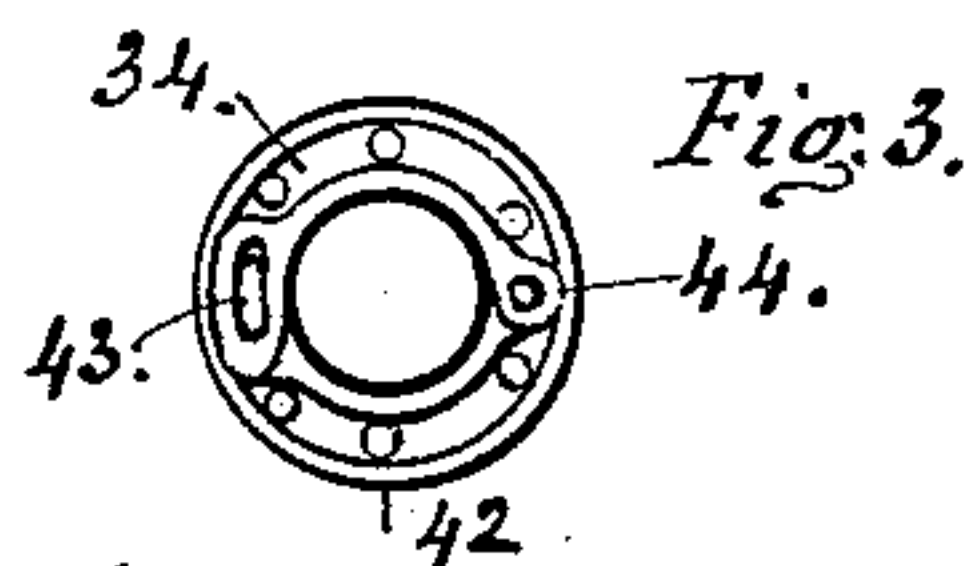
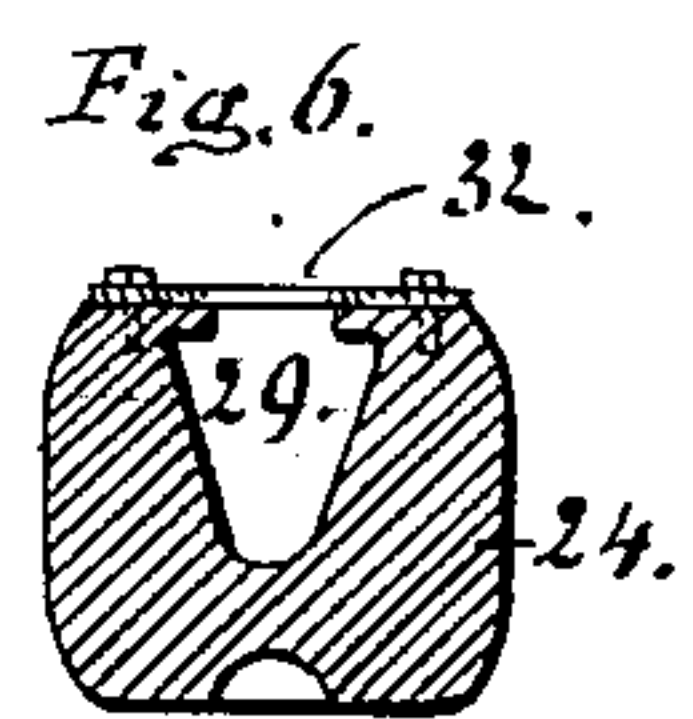
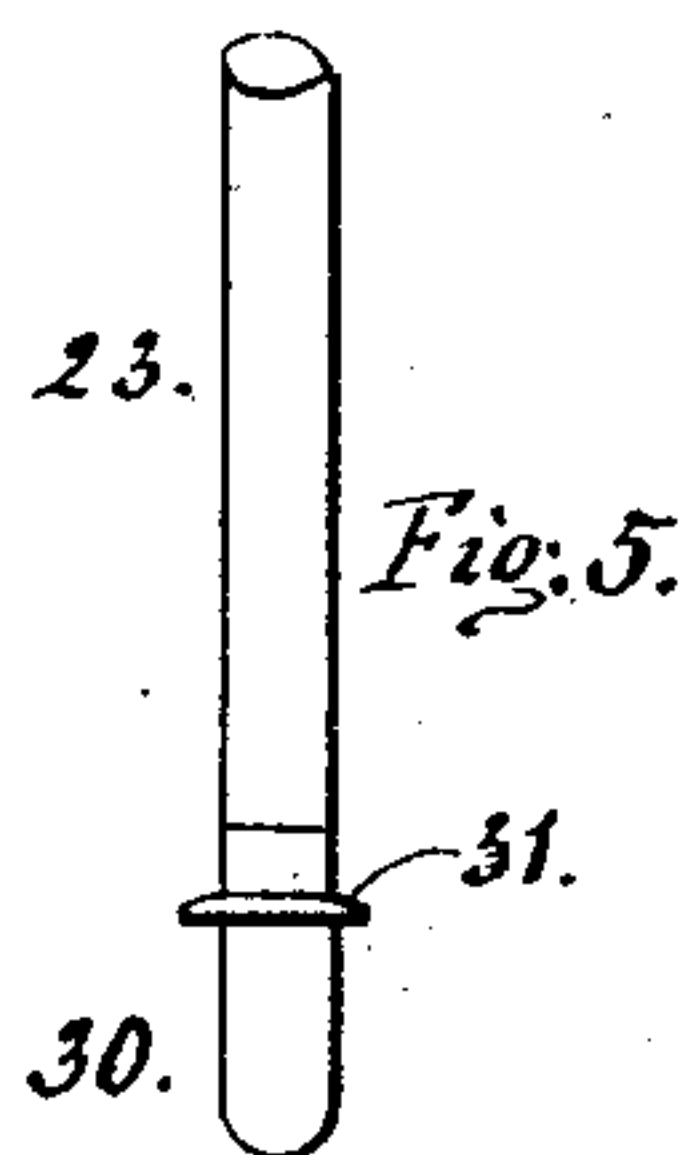
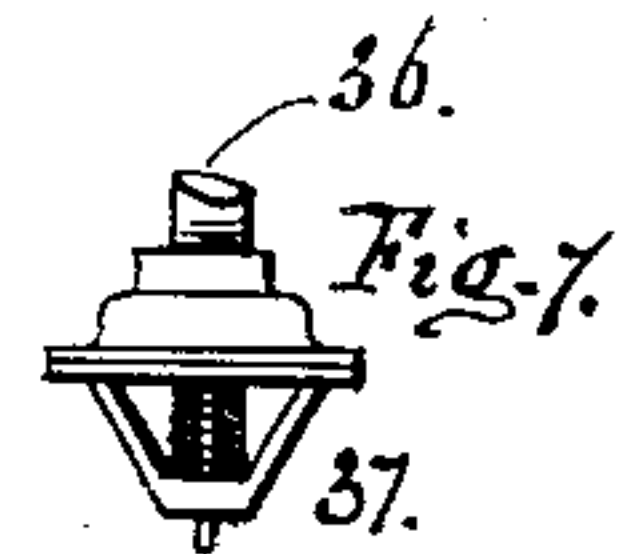
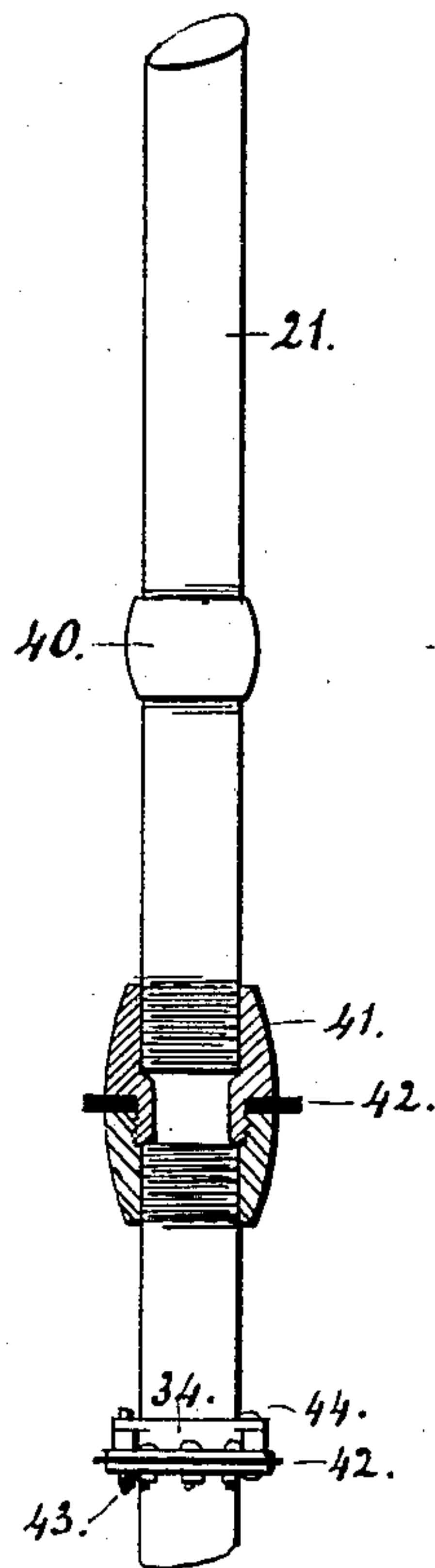


Fig. 2.



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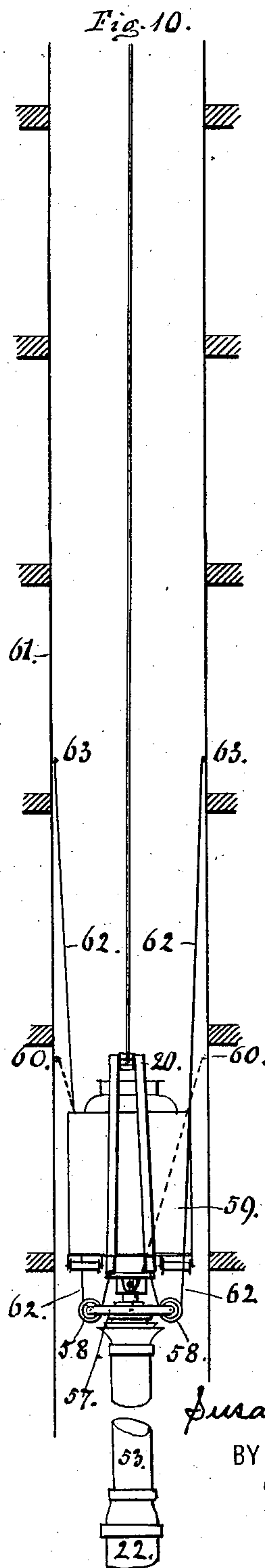
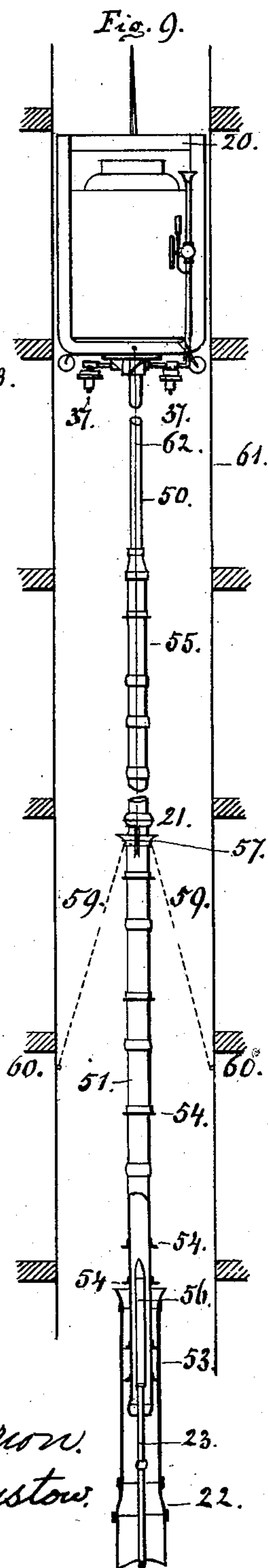
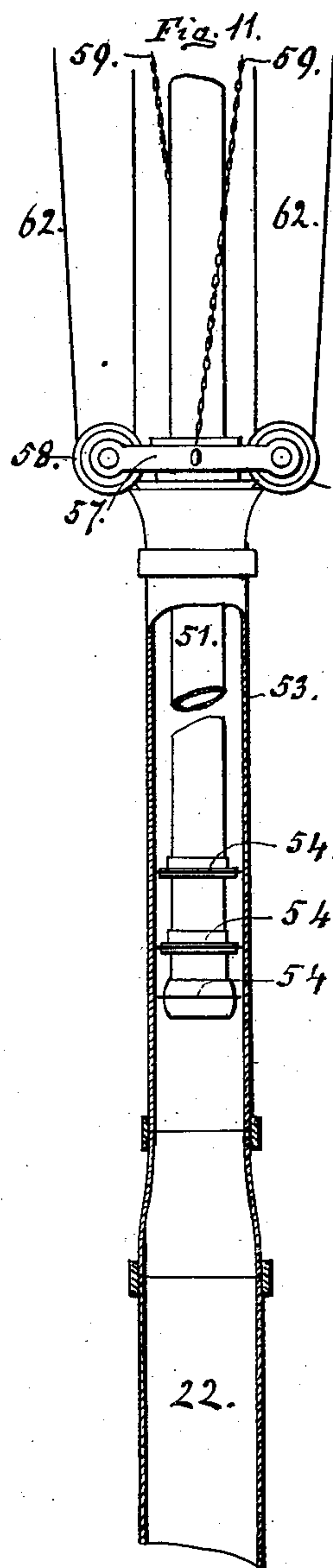
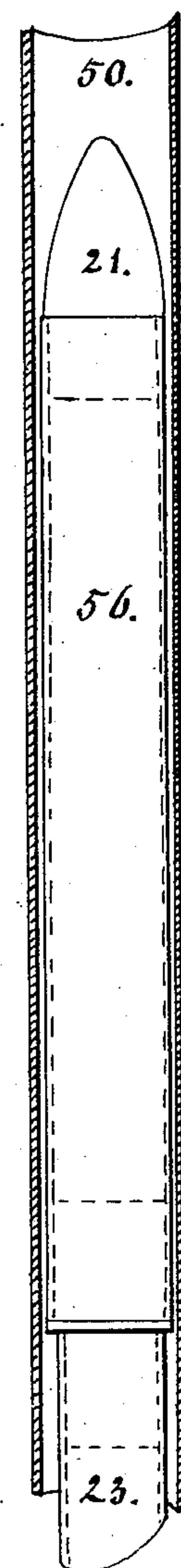


Fig. 12.



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# UNITED STATES PATENT OFFICE.

SUSANNA B. TRAPP, OF NEW YORK, N. Y.

## SAFETY APPARATUS FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 755,189, dated March 22, 1904.

Application filed December 1, 1903. Serial No. 183,846. (No model.)

*To all whom it may concern:*

Be it known that I, SUSANNA B. TRAPP, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Safety Apparatus for Elevators, of which the following is a specification.

The invention relates to improvements in safety appliances for elevators; and it consists in the novel features, combinations, and arrangements of parts hereinafter described, and particularly pointed out in the claims.

The invention comprises means for arresting the car in case of accident and in so cushioning the car upon the stoppage thereof as to relieve the car from breakage and its passengers from unnecessary shock or jar.

The invention comprises air-cushioning apparatus which will become operative for arresting the car in case the latter attains undue speed in its descent; and the said apparatus in general terms comprises an exterior stationary cylinder located below the elevator-shaft and preferably embedded in the ground, a stationary piston-rod centrally mounted within said cylinder, and a tubular or cylindrical piston-rod secured at its upper end to the framing which receives and supports the elevator-car, this cylindrical piston-rod being adapted to inclose the said stationary piston-rod and move between it and the inner walls of the said stationary cylinder, all of said parts—to wit, the exterior stationary cylinder, the interior stationary piston-rod, and the cylindrical piston-rod carried by the car-framing—being substantially coextensive in length with the length of the elevator-shaft and being provided with suitable structural features adapting them for successful operation.

The invention will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation, partly broken away, of the framing for an elevator-car with the cylindrical piston-rod secured to and suspended therefrom, Fig. 1 also illustrating the outlet-pipe from the upper end of the cylin-

drical piston-rod with the vacuum and regulating or blow-off valve therefor. Fig. 2 is an enlarged side elevation, partly broken away and partly in section, of the cylindrical piston-rod secured to the car-framing, this figure being presented for the purpose of more particularly illustrating the pistons carried by said rod for trapping and compressing the air within the exterior cylinder and the interior of the hollow cylindrical piston-rod. Fig. 3 is a detached top view of the adjustable piston shown upon the cylindrical piston-rod at the lower portion of Fig. 2. Fig. 4 is a central vertical section, partly broken away and partly in side elevation, of the three main parts comprising the air-cushioning apparatus—to wit, the stationary exterior cylinder seated within a vertical hole in the ground, the stationary piston-rod mounted therein and extending throughout the length of the same, and the cylindrical piston-rod carried by the car-framing and adapted to have a vertical movement upon the said stationary piston-rod and within the said stationary cylinder. Fig. 5 is a detached side elevation of the lower portion of the stationary piston-rod, this figure being presented to illustrate a cap applied upon the lower end of said rod for enabling the convenient seating and securing of said end within a recess in a base located within the lower end of the stationary cylinder. Fig. 6 is a central vertical section through the base for receiving the lower end of the stationary piston-rod. Fig. 7 is a detached elevation of the vacuum-valve for the outlet-pipe from the upper end of the cylindrical rod carried by the car-framing, this vacuum-valve in itself being a commercial article of well-known form and construction. Fig. 8 is a view showing the method of securing the upper end of the cylindrical piston-rod to the car-framing, this figure being taken in the direction of the arrow looking at the upper end of Fig. 2. Fig. 9 is a side elevation, partly broken away and partly in section, of an elevator equipped with my invention, the car being shown in its upper position and the cylindrical rod carried by the car-framing being shown as formed in two telescopic sections, so as to avoid excessive length in the stationary cylinder or tube



located below the elevator-shaft. Fig. 10 is a corresponding view of same, but showing the car as having descended to its lower position. Fig. 11 is an enlarged side elevation, partly broken away and partly in section, of the structure represented at the lower portion of Fig. 10; and Fig. 12 is an enlarged vertical section showing the cooperating upper portions of the stationary piston-rod and the cylinder movable with the car.

In the drawings, 20 designates the framing of usual construction adapted to receive an elevator-car; 21, the cylindrical piston-rod, secured at its upper end to said framing 20; 22, the stationary cylinder, preferably seated in a hole in the ground, as represented in Fig. 4, and 23 the stationary piston-rod, mounted upon a base-block 24 within the lower end of said cylinder 22, the said stationary piston-rod 23 extending throughout the length of the cylinder 22 and to receive the cylindrical piston-rod 21 and the upper end of said rod 23 being provided with a piston 25, adapted to the walls of the upper contracted portion of the cylindrical piston-rod 21 and having, if preferred, expansible rings 26 to be driven outwardly against the inner walls of said rod 21 when the air is compressed within the latter, these valve-rings 26 being of known form and operation and shown at 49 in Letters Patent of the United States No. 725,893, granted to Susanna B. Trapp on April 21, 1903, for safety appliances for elevators.

The exterior cylinder 22 is in the preferred construction simply a plain cylinder composed of sections coupled together and having a cap 27 on its lower end and an outwardly-flaring mouth 28 at its upper end, the flaring construction of the mouth 28 not being absolutely necessary, but being desirable in receiving and directing the piston-rod 21 and the pistons thereon during the descent of the elevator-car. The cylinder 22 will be of metal and may be substantially coextensive in length with the length of the elevator-shaft above it, the flaring mouth 23 for said cylinder 22 being at the base of the elevator-shaft.

The stationary piston-rod 23 will preferably be formed of sections secured together by couplings, and this rod 23 extends throughout the entire length of the cylinder 22, within which it is mounted. Within the lower end of the cylinder 22 is the metal base-block 24, containing an inverted conical recess 29 to receive the lower portion of the cap 30, Fig. 5, applied upon the lower end of the rod 23 in the manner represented in Fig. 4. The lower extremity of the cap 30 is rounded and engages the rounded surface at the lower end of the recess 29, and these rounded surfaces form, in effect, a pivotal or ball bearing, which enables the rod 23 to have a slight yielding movement upon its lower end whenever the same is necessary to prevent undue binding of the cylindrical piston-rod 21 against the said rod 23

during the movement of the elevator-car. The cap 30 is provided with a flange or shoulder 31, which passes within the upper portion of the base-block 24 and is locked therein by means of a ring-plate 32, loosely encircling the cap 30 above said flange 31 and fastened by screws to the upper surface of the base-block 24, the plate 32 not interfering with the slight pivotal movement permitted in the rod 23, but preventing said rod 23 from being pulled upwardly out of the cylinder 22 without carrying with it the said base-block 24. The rod 23 therefore consists of a series of sections coupled together by means of couplings 33 and is stationary within the cylinder 22, the lower end of the rod being seated in the base-block 24 and the upper end of the rod being provided with the piston 25. I do not, of course, limit the invention to the forming of the rod 23 in sections, since it may be formed in one continuous integral piece of material. The couplings 33 are, as illustrated in Fig. 4, of elliptical outline, the exterior surfaces of said couplings being convex and tapering from a horizontal center line through them toward their ends, whereby they are enabled to aid in guiding the cylindrical piston-rod 21 during the travel of the car. The piston 25 at the upper end of the rod 23 is adapted to the upper contracted portion of the rod 21, so that it may effect the compression of the air and cushion and stop the car in case the latter should attain an unsafe speed, as hereinafter explained; but said piston should not so tightly fit the walls of said contracted portion of the cylindrical rod 21 as to interfere with the proper travel of the car under normal or safe conditions.

The cylindrical piston-rod 21 has an upper portion, which is of one diameter, adapted to the piston 25 and a lower portion, which is of greater diameter than the said upper portion, as is represented in Figs. 1 and 2, and this cylindrical rod 21 is at its upper end secured within a casting 35, which is riveted or bolted to the framing 20 for the elevator-car, and the said casting 35, within which the upper end of the rod 21 is preferably secured, receives the lower end of a pipe 36, which leads to the upper end of the framing 20, as shown in Fig. 1, and is provided with an automatic vacuum-valve 37 and with a manually-operable regulating or blow-off valve 38, the latter being within reach of the attendant in the car and enabling the ready control of the passage through the pipe 36, closing or opening or restricting the passage through the latter, as may be required. The pipe 36, or the casing of the valve 38 connected therewith, will preferably be provided with a pressure-gage 39 of ordinary construction. The cylindrical rod 21 will ordinarily be formed of sections connected together by couplings 40, which will preferably, like the couplings 33, be formed with convex surfaces. The rod 21 will be



provided with one or more pistons, and whether these pistons are formed at couplings or are independently provided will depend upon circumstances and the wish of the manufacturer, and hence in Fig. 2 I illustrate a piston 41 as  
 5 formed of coupling parts holding between them a packing-ring 42, which projects outwardly beyond the adjoining surfaces of the coupling parts and is adapted to the stationary  
 10 cylinder 22. I will preferably provide a piston having a packing-ring 42 adjacent to the lower end of the upper contracted portion of the rod 21 and also adjacent to the lower end of the rod 21, the piston at the lower end  
 15 of the rod 21 in Fig. 4 being, like the piston 41 in Fig. 2, composed of parts holding between them a packing-ring 42, and I indicate the piston at the lower end of the rod 21 in Fig. 4 by the numeral 41. I deem it desirable  
 20 at times that one or more of the pistons 41 may be adjustably mounted upon the rod 21 for the more accurate regulation of the compression of the air, and in Figs. 2 and 3 I illustrate a piston 34 of this character, holding  
 25 a packing-ring 42 and composed of two hinged parts adapted to be clamped around the rod 21 and held by a wedge 43, the pintle for the hinged parts of the adjustable piston being indicated by the numeral 44.

30 The rod 21 is therefore both a cylinder and a piston-rod, and the said rod is of differential diameter and passes upon the stationary piston-rod 23, the purpose of the pistons thereon being during the descent of the car  
 35 to more or less press the air below them, trap the air within the cylinder 22, and cause the same to pass upwardly through the cylindrical rod 21 and into the pipe 36 leading therefrom. The pistons 41 34 do not tightly fit  
 40 the cylinder 22, and I designate them as "retarding-pistons."

In the employment of my invention the framing 20 for the car will carry the cylindrical piston-rod 21, and during the safe  
 45 travel of the car the features constituting my invention will practically be inoperative, performing no necessary function. In the event that the car should, due to accident or other cause, descend at an unsafe speed the piston  
 50 or pistons on the cylindrical rod 21 will, due to the rapid movement of the rod 21, trap the air below them within the cylinder 22 and partly compress and force said air into the lower end of said cylinder and thence upwardly  
 55 into the rod 21. Upon the car reaching such position that the upper contracted portion of the cylindrical rod 21 passes upon the piston 25, the exit for the air from the rod 21 being then substantially closed and  
 60 the air within said portion being already more or less compressed, the car will become arrested by the compressed air, the latter acting as a cushion. The rapid descent of the car will create more or less of a cushion  
 65 before the upper contracted portion of the

rod 21 reaches the piston 25; but upon said portion of the rod 21 reaching the piston 25 the latter will create a sufficient cushion to gradually but absolutely arrest the car. If  
 70 the car should be arrested by the air-cushion at a point removed from a floor or landing of a building, the attendant in the car by slightly opening the valve 38 and permitting an escape of air through the pipe 26 may effect the  
 75 lowering of the car to a proper place for the exit of the passengers. During the ascent of the car the vacuum-valve 37 will operate automatically to prevent the formation of a vacuum within the cylinder 22 and rod 21,  
 80 and during both the descent and ascent of the car the valve 38 is in convenient position to be manipulated by the attendant in the car or set to regulate the passage through the blow-off pipe 36.

There may be occasions when it may not  
 85 be desired or convenient to employ an external cylinder or tube 22 of the full length of the elevator-shaft, and in any such case I shall employ a shorter cylinder or tube 22 or one of the appropriate length and make the  
 90 cylindrical rod 21 in telescopic sections, so that it may when extended by the ascent of the car be of the length of said shaft below the car and that it may during the descent of the car collapse longitudinally into the space  
 95 permitted by the length of said cylinder 22, and in Figs. 9, 10, 11, and 12 I illustrate the invention as employing a telescopic cylindrical rod 21 and an appropriately short cylinder 22, the sections of the rod 21 being designated  
 100 by the numerals 50 51.

I do not regard the construction shown in Figs. 9, 10, 11, and 12 as a modification of the invention shown in Figs. 1 to 8, inclusive,  
 105 but the same invention, and for the purposes of this application either of the constructions shown may be regarded as the principal embodiment of the invention.

The stationary piston-rod 23 of Figs. 9 and 12 is the same as the piston-rod of Fig. 4, but  
 110 in Figs. 9 and 12 the piston on the upper end of said rod is of elongated form and does not have expansible rings. The cylinder 22 in Figs. 9, 10, and 11 is the same as the cylinder of Fig. 4, except that it is of the shorter  
 115 length and is shown as having a contracted upper end portion 53.

As to the rod 21 of Figs. 9, 10, 11, and 12, it may be said that the lower section 51 thereof corresponds with the lower portion of the  
 120 rod 21 of Figs. 1 and 2 and that the upper section 50 thereof corresponds with the upper contracted portion of the rod 21. (Shown in Figs. 1 and 2.) The section 51 is provided with pistons 54 to pump or force the air downwardly  
 125 into the exterior cylinder 22, whence it will pass upwardly within the cylindrical rod 21, as with the use of the construction shown in Fig. 4. The pistons 54 may be of the same construction as the pistons 41.  
 130



(Illustrated in Figs. 1 and 2.) The upper contracted section 50 of the cylindrical rod 21 is adapted to slide into the lower section 51 of said rod, and the said section 51 is adapted to slide into the exterior cylinder 22. The lower portion of the upper section 50 of the rod 21 is larger in diameter than the upper portion of said section, and the said lower portion of the section 50 will be provided with pistons 55, freely entering the section 51, so as to force air down into said section 51 during the movement of the section 50 into said section 51, and above these pistons 55 the section 50 is sufficiently contracted to form a reasonably snug fit, though not a tight fit, upon the piston 56 at the upper end of the rod 23, as shown in Fig. 12, so as to enable the piston 56, coöperating with the section 50, to form the safety air-cushion at the proper time. The piston 56 should not so tightly fit the section 50 of the rod 21 as to bind against the walls of the latter, because this would interfere with the upward travel of the elevator-car. There may be a leakage of air around the piston 56, but that would not be sufficient under the rapid descent of the car to prevent the formation of the safety air-cushion.

In view of the fact that the rod 21 (shown in Fig. 9) is in the form of telescopic sections some provision must be made for the control of these sections, and in the present instance I secure upon the upper end of the lower section 51 a cross-yoke 57, carrying pulley-wheels 58 at its ends, and I secure the cross-yoke 57 to chains or cables 59, whose upper ends are secured at the points 60 to the opposite walls of the elevator-shaft 61, these chains 59 being of such length that when the section 51 is in its proper lower position within the cylinder 22 they will extend downwardly to their full length and that when the section 51 is in its full upper position the said chains will, as shown in Fig. 9, extend upwardly to their full length and hold the section 51 against any further upward movement. The purpose of the chains 59 is to control or limit the movements of the section 51, and they perform no other function. The wheels 58, carried by the cross-yoke 57, coöperate with chains or cables 62, which are fastened at one end to the walls of the elevator-shaft at the points designated by the numerals 63, Fig. 10, and thence, assuming that the elevator-car is at the base of the shaft, the said cables 62 extend downwardly around the pulley-wheels 58 and thence upwardly to the car-framing, to which they are secured, a loop being thus formed in said cables 62 around the lower side of the wheels 58. The cables 62 serve to insure the upward movement of the lower section 51 of the cylindrical rod 21, and they also permit of the downward movement of said section 51.

In explaining the operation of the structure shown in Figs. 9 to 12, inclusive, it may be assumed that the elevator-car is in its lower

position, Fig. 10, and is about to make an ascent. Upon the car being started upwardly it will first, operating through the cables 62, withdraw the lower section 51 of the rod 21 upwardly to the full limit of its movement permitted by the chains 59 and at the same time withdraw the upper section 50 of the rod 21 from the lower section 51 of said rod, both of said sections 50 51 being extended throughout the length of the elevator-shaft in the manner shown in Fig. 9 when the car shall have reached its upward position, the cables 62 at such time extending from the car-framing downwardly around the pulleys 58 and outwardly to the securing-points 63, and the chains 59, extending upwardly, the latter limiting the upper movement of the section 51 and the cables 62 maintaining said section 51 in its upwardly-extended position. During the descent of the elevator-car the cables 62 will permit the gradual descent of the section 51 into the cylinder 22, and the upper section 50 will move downwardly into the section 51, until the entire apparatus is in the condition represented in Fig. 10. Should an accident happen whereby the car should attain an undue speed in its descent, the cylinder 22, containing air, will have additional quantities of air forced into it by the descending section 51, and the latter above the piston 56 will have additional quantities of air forced into it by the descending section 50, and the air in and forced within the cylinder 22 will be more or less compressed and rush upwardly around the piston-rod 23 into the cylindrical rod 21, and finally the contracted portion of the rod 21 will pass upon the piston 56, with the result that the air-cushion will be formed and the car will become arrested. The attendant in the car may then, if occasion should require, open the regulating-valve 38 for the purpose of permitting a portion or all of the compressed air to escape through the pipe 36.

In Fig. 9 I illustrate two of the automatic vacuum-valves 37 to prevent the formation of a vacuum within the cylinder 22 and rod 21 during the ascent of the car.

It will be understood from the foregoing description that the invention comprises the cylinder or tube 22 set below the elevator-shaft a piston stationary within said tube or cylinder, and a cylinder rod movable with the car-framing and adapted to enter the cylinder 22 and to pass upon said stationary piston, a portion of the said cylindrical rod being adapted to the diameter of said stationary piston so that the latter, coöperating with said rod, may form a safety air-cushion in the event that the car should descend at an unsafe speed. In instances where the circumstances permit the exterior cylinder 22 and the cylindrical rod 21 will each in one continuous length equal the length of the elevator-shaft below the car when the latter is at the top of the building, and in instances in which it may not be possible or



desirable to have the exterior cylinder 22 equal in length to the length of the elevator-shaft the said cylinder will be of such length as may be possible or appropriate, and the  
 5 cylindrical rod 21 instead of being in one continuous length will be made up of telescopic sections which when extended will equal the length of the elevator-shaft below the car when the latter is in its upper position and which  
 10 when collapsed will substantially equal the length of the cylinder 22 employed in connection with them. In both embodiments of my invention hereinbefore described the upper end of the cylindrical rod moving with  
 15 the car is provided with an exit or blow-off pipe containing a valve to be within reach of the attendant within the car.

It is obvious that many changes may be made in the details of form and construction  
 20 in respect of the several features constituting my invention, and I do not, therefore, limit the invention to the special details of construction hereinbefore described. I have shown and described the preferred embodiments of  
 25 my invention, but it is obvious that the details of these must vary in accordance with the conditions to be met in installing the apparatus.

Without therefore limiting my invention  
 30 to details of form or construction otherwise than indicated in the claims, what I claim as my invention, and desire to secure by Letters Patent, is—

1. A safety apparatus for elevators comprising the cylinder extending downwardly  
 35 below the elevator-shaft, a piston mounted therein, and a cylindrical rod to travel with the car and within said cylinder and adapted to said piston, whereby upon the descent of the  
 40 car at an unsafe speed an air-cushion will be formed for the car; substantially as set forth.

2. A safety apparatus for elevators comprising the cylinder extending downwardly  
 45 below the elevator-shaft, a piston mounted therein, and a cylindrical rod to travel with the car and within said cylinder and adapted to said piston, whereby upon the descent of the car at an unsafe speed an air-cushion will be  
 50 formed for the car, the upper portion of said cylindrical rod being provided with means for regulating said air-cushion; substantially as set forth.

3. A safety apparatus for elevators comprising the cylinder extending downwardly  
 55 below the elevator-shaft, a piston-rod mounted therein and having a piston upon its upper end, and a cylindrical rod to travel with the car and within said cylinder, and having a contracted portion adapted to said piston, where-  
 60 by, upon the descent of the car at an unsafe speed an air-cushion will be formed for the car; substantially as set forth.

4. A safety apparatus for elevators comprising the cylinder extending downwardly  
 65 below the elevator-shaft, a piston-rod mounted

therein and having a piston upon its upper end, and a cylindrical rod to travel with the car and within said cylinder, and having a contracted portion adapted to said piston, where-  
 70 by, upon the descent of the car at an unsafe speed, an air-cushion will be formed for the car, combined with means for regulating said air-cushion; substantially as set forth.

5. A safety apparatus for elevators comprising the cylinder extending downwardly  
 75 below the elevator-shaft, a piston supported from within said cylinder, and a cylindrical rod to travel with the car and within said cylinder and adapted to said piston, whereby, upon the descent of the car at an unsafe speed,  
 80 an air-cushion will be formed for the car, the said cylindrical rod being provided with a piston; substantially as set forth.

6. A safety apparatus for elevators comprising the cylinder extending downwardly  
 85 below the elevator-shaft, a piston supported from within said cylinder, and a cylindrical rod to travel with the car and within said cylinder and adapted to said piston, whereby, upon the descent of the car at an unsafe speed,  
 90 an air-cushion will be formed for the car, the said cylindrical rod being provided with a piston and with means for regulating the air-cushion; substantially as set forth.

7. A safety apparatus for elevators comprising the cylinder extending downwardly  
 95 below the elevator-shaft, a piston mounted from within the same, and the cylindrical rod to travel with the car and within said cylinder and having an upper contracted portion  
 100 adapted to said piston, whereby, upon the descent of the car at an unsafe speed, an air-cushion will be formed for the car, the said rod having a piston upon its lower portion and a piston adjacent to the lower part of its upper  
 105 contracted portion; substantially as set forth.

8. A safety apparatus for elevators comprising the cylinder extending downwardly  
 110 below the elevator-shaft, a piston mounted from within the same, and the cylindrical rod to travel with the car and within said cylinder and having an upper contracted portion adapted to said piston, whereby, upon the descent of the car at an unsafe speed, an air-cushion  
 115 will be formed for the car, the said rod having a piston upon its lower portion and a piston adjacent to the lower part of its upper contracted portion, and the said rod also being provided with means for regulating said  
 120 air-cushion; substantially as set forth.

9. A safety apparatus for elevators comprising the cylinder extending downwardly  
 125 below the elevator-shaft, a piston mounted from within the same, and a cylindrical rod to travel with the car and within said cylinder and adapted to said piston, whereby, upon the descent of the car at an unsafe speed, an air-cushion will be formed for the car, the said  
 130 cylindrical rod being provided with means for preventing the formation of a vacuum therein



during the ascent of the car and also with means for controlling the escape of air from said rod; substantially as set forth.

5 10. A safety apparatus for elevators comprising the cylinder extending downwardly below the elevator-shaft, a piston mounted from within the same, a cylindrical rod to travel with the car and within said cylinder and adapted to said piston, and a blow-off pipe  
10 from said rod, said pipe being provided with a controlling-valve; substantially as set forth.

11. A safety apparatus for elevators comprising the cylinder extending downwardly below the elevator-shaft, a piston-rod seated  
15 in the lower end of said cylinder and having a piston upon its upper end, and a cylindrical rod to travel with the car and within said cylinder and adapted to said piston; substantially as set forth.

20 12. A safety apparatus for elevators comprising the cylinder extending downwardly below the elevator-shaft, the base-block within the lower end of said cylinder, and having the rounded recess in its upper end, a piston-rod  
25 set within said cylinder and having its lower rounded end seated within said recess and at its upper end having a piston, and a cylindrical rod to travel with the car and within said cylinder and adapted to said piston; substantially as set forth.  
30

13. A safety apparatus for elevators comprising a cylinder extending downwardly below the elevator-shaft, a piston mounted from

within the same, and a cylindrical rod to travel with the car and within said cylinder and adapted to said piston, said rod carrying an  
35 external piston composed of two clamping parts and a flexible packing-ring; substantially as set forth.

14. A safety apparatus for elevators comprising a cylinder extending downwardly below the elevator-shaft, a piston mounted from within the same, and a cylindrical rod in telescopic sections to travel with the car and within  
40 said cylinder and adapted to said piston, said cylindrical rod when extended being of the length of the elevator-shaft below the car when the latter is in its upper position; substantially as set forth.

15. A safety apparatus for elevators comprising the cylinder extending downwardly below the elevator-shaft, a piston mounted from within the same, a cylindrical rod in telescopic sections to travel with the car and within  
50 said cylinder and adapted to said pistons, and means for effecting and controlling the movement of the lower one of said sections; substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 30th day of  
60 November, A. D. 1903.

SUSANNA B. TRAPP.

Witnesses:

CHAS. C. GILL,  
ARTHUR MARION.