

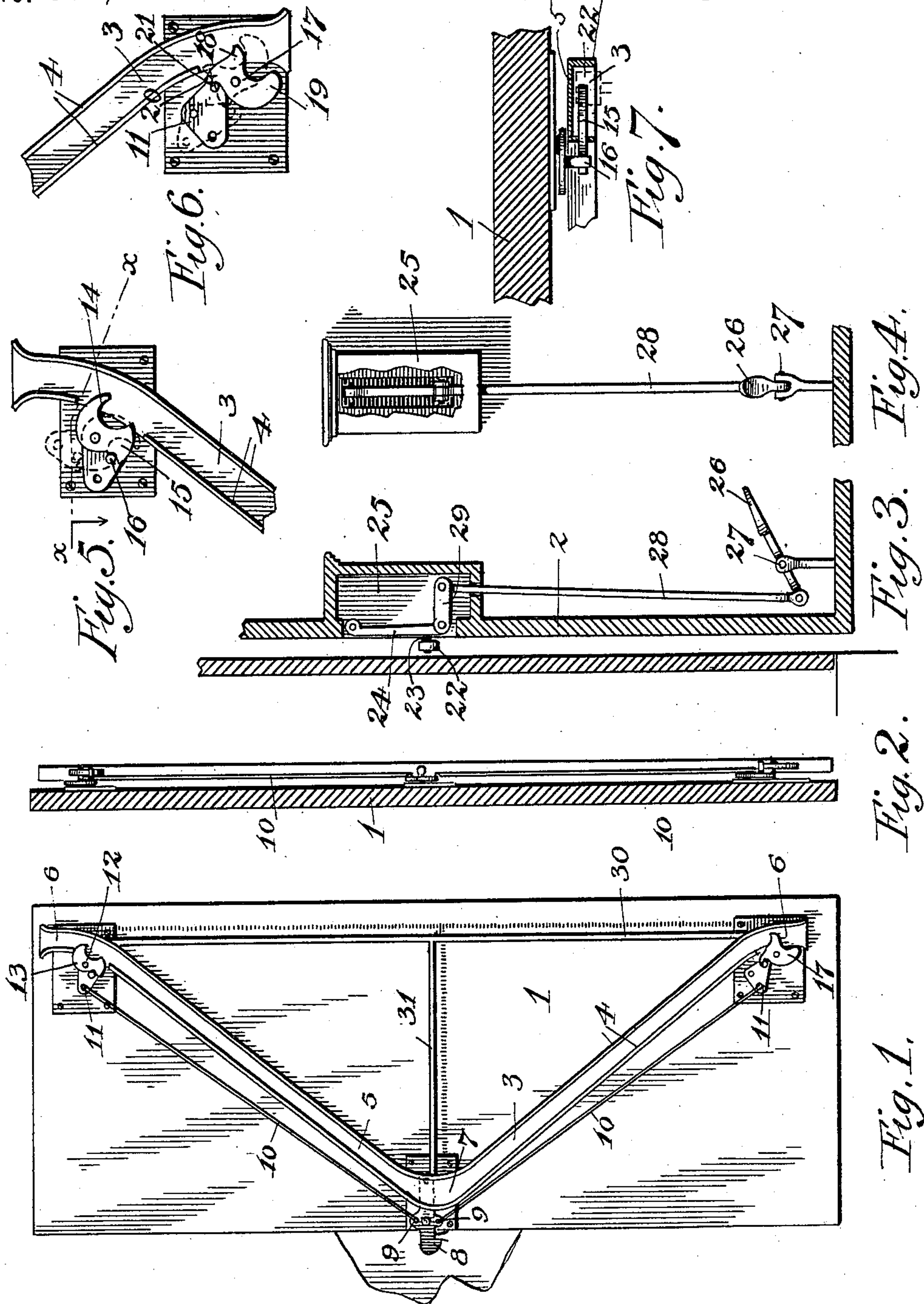
(No Model.)

C. L. BELL.

MEANS FOR OPENING OR CLOSING ELEVATOR DOORS.

No. 587,420.

Patented Aug. 3, 1897.



WITNESSES

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# UNITED STATES PATENT OFFICE.

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## MEANS FOR OPENING OR CLOSING ELEVATOR-DOORS.

SPECIFICATION forming part of Letters Patent No. 587,420, dated August 3, 1897.

Application filed November 28, 1896. Serial No. 613,767. (No model.)

*To all whom it may concern:*

Be it known that I, CHESTER L. BELL, a citizen of the United States, residing at El Paso, in the county of El Paso and State of Texas, have invented certain new and useful Improvements in Means for Opening or Closing Elevator-Doors; and I do hereby 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.

This invention relates to means for automatically opening and closing the doors of elevators, and has for its object to provide a simple and efficient means which may be applied to elevators already in operation whereby any particular door or series of doors may be opened and closed, the same being actuated by a device mounted upon the traveling car or cage.

To this end the invention consists in certain novel features and details of construction and arrangement of parts, as hereinafter fully described, illustrated in the drawings, and pointed out in the claims.

In the accompanying drawings, Figure 1 is an inside elevation of one of the doors of an elevator-shaft, showing the race in which the operating device of the car travels and also showing the door-latch, the trips, and operating connections. Fig. 2 is an edge view of the door. Fig. 3 is a cross-section taken through the front side of the car or cage and also showing the adjacent wall of the elevator-shaft. Fig. 4 is a detail elevation looking from the inside of the car or cage. Fig. 5 is an enlarged detail elevation showing the upper trip. Fig. 6 is a similar view showing the lower trip. Fig. 7 is a section through  $x x$  in Fig. 5.

Similar numerals of reference designate corresponding parts in the several figures of the drawings.

Referring to the drawings, 1 designates an ordinary sliding elevator-door, and 2 indicates the front wall of the car or cage. Secured to the inner surface of the door 1 is a race 3, which may be formed from sheet metal, and having substantially parallel flanges 4, which extend inward from the face of the door

to a central connecting portion 5, forming the base of the race. The upper and lower portions of the race are reversely inclined, and their extremities are deflected into substantially vertical planes, as indicated at 6. At the point where these reversely-inclined portions join the race is slightly widened or extended, as indicated at 7, in order to admit extra freedom of the operating device at this point and also admit of the introduction of the operating device into the race while the elevator is at a standstill for causing the elevator to close the door in either its upward or downward movement.

Adjacent to the central portion 7 of the race 3 is a latch 8, the same being pivotally mounted on the race at its inner end and provided at points intermediate its ends with eyes 9, from which connecting wires or rods 10 extend upward and downward to meet the upper and lower edges of the door where they connect with elbow-levers 11. Mounted on the same fulcrum 12 with the upper elbow-lever 11 is a trip 13, having a hooked portion 14, which is adapted to be engaged by the operating device in its upward movement, and a heel portion 15, which engages with a stud 16 on the elbow-lever, whereby in the downward movement of the operating device the trip is caused to rock the elbow-lever, and thereby, through the connection 10, rock the latch 8 out of engagement with its keeper on the door.

At the bottom of the door is arranged a second trip 17, which comprises a hook or catch 18, which normally projects across the race 3, and a weighted portion 19, which causes the trip to be maintained in the proper position with the lip or hook 18 extending across or partially across the race and in the path of the operating device on the car. The trip 17 also comprises a projection 20, which as the lip 18 is elevated strikes against a stud 21 on the lower elbow-lever 11, thereby pushing on the rod or connection 10 and moving the latch 8 out of engagement with its keeper.

The operating device preferably consists of a roller 22, mounted on a stud 23 on the lower end of a pendent link 24, swung in the central portion of the car at the front side, the



same being inclosed in a suitable boxing or casing 25, arranged upon the inner side of the car.

26 designates a foot-lever fulcrumed intermediate its ends at 27 and having attached to one end a rod 28, which extends upward through an opening in the casing 25, where it is connected to the pendent link 24 by means of one or more interposed pivotal links 29. By this construction as the foot-lever 26 is depressed the rod 28 is forced upward, and through the medium of the links 29 the roller 22 is turned inward and out of engagement with the door. By limiting the pressure upon the foot-lever 26 the weight of the rod 28 will cause it to gravitate to the position shown in full lines in Fig. 3, thereby forcing the roller or operating device outward into engagement with the door. If the operator wishes to open a certain door, just before the car reaches said door he removes his foot from the lever 26, thus allowing the roller 22 to be projected beyond the surface of the car, and if the elevator is moved upward it will cause the roller at the lower end to strike the lip or hook 18, rock the trip 17, and thereby vibrate the elbow-lever 11 and lift the latch 8. At the same time the roller operates against the upper wall of the race, and as the roller 22 moves upward the door is slid open. While the elevator is at a standstill the roller occupies a position at the junction of the reversely-inclined portions of the race. On the starting of the elevator upward again the roller operates upon the upper wall of the race, thus effecting a closing of the door. Upon striking the upper trip 13 it simply rocks said trip out of the way and passes on without affecting the upper elbow-lever 11.

In the downward movement of the elevator the roller 22 strikes against the projecting lip or hook 14 of the upper trip, causing the said trip to vibrate the upper elbow-lever 11, thereby operating the rod or connection 10 and lifting the latch 8. In the further downward movement of the elevator the roller operates upon the lower flange or wall of the race, thereby opening the door; but upon reaching the lower end of the race it simply rocks the lower trip out of the way and passes to the lower end of the race. If the operator wishes to pass the door without opening it, he presses upon the foot-lever 26, and thus withdraws the roller 22, so that it cannot act upon the door. As soon as the roller passes the upper or lower end of the race the operator may remove his foot from the said lever, thus allowing the said roller 22 to move outward, when it will rest upon and travel in contact with a vertical rod 30, extending between the end portions of the race. The rod 30 is braced relatively to the race 3 by means of a cross bar or rod 31. Should the operator reach a landing without having arranged the operating device to open the door, while still hold-

ing his foot upon the lever 26 he may unlatch the door by hand and slide the door back, when, by removing his foot from the lever 26, the roller 22 will enter the widened portion 7 of the race, and in the further upward or downward movement of the car said roller will engage within the race and close the door in a manner that will be readily understood.

It will be observed that no delicate parts such as are liable to get out of order are employed in the above-described mechanism. The trips are arranged to maintain themselves in proper working position by means of gravity. By means of the construction described it will be seen that the opening and closing of the several doors of the elevator-shaft are not only facilitated, but insured. This adds greatly to the safety of the elevator and prevents persons from walking through the open doors of the shaft and being precipitated to the bottom.

It will be understood that the several parts of the device herein described are susceptible of changes in form, proportion, and minor details of construction, which may accordingly be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. The combination with a sliding elevator-door, of a race secured to the inner surface thereof and having reversely-inclined portions, a latch pivotally mounted on the door, trips pivotally mounted at the upper and lower ends of said race, elbow-levers adapted to contact with and be operated by said trips, connections between said elbow-levers and the latch, and an operating device carried by the car, substantially as described.

2. The combination with a sliding elevator-door, of a race secured thereto and provided with reversely-inclined end portions, an operating device carried by the car or cage, a latch on the door, gravity-trips pivotally mounted at or near the opposite ends of said race and provided with lips which normally project partially across said race, and connections between said trips and latch, substantially as described.

3. The combination with a sliding elevator-door, of a race on the inner side thereof and comprising reversely-inclined portions, an operating device on the car or cage adapted to traverse said race, a latch on the door, gravity-trips projecting partially across and pivotally mounted at the opposite ends of said race, elbow-levers arranged in the path of said trips and adapted to be vibrated by direct contact therewith, and connections between said elbow-levers and latch, substantially as described.

4. The combination with a sliding elevator-door, of a race attached to the inner side there-

of, a rod extending vertically between the  
end portions of said race, and a vibratory op-  
erating device on the car movable toward and  
away from the door and adapted to traverse  
5 said race and also adapted to be shifted so as  
to rest and slide upon said rod, substantially  
as described.

In testimony whereof I have signed this  
specification in the presence of two subscrib-  
ing witnesses.

CHESTER L. BELL.

Witnesses:

REXFORD M. SMITH,  
ARTHUR BROWNING.