

(No Model.)

A. C. BEARDSWORTH.
SAFETY DEVICE FOR ELEVATOR GATES.

No. 520,103.

Patented May 22, 1894.

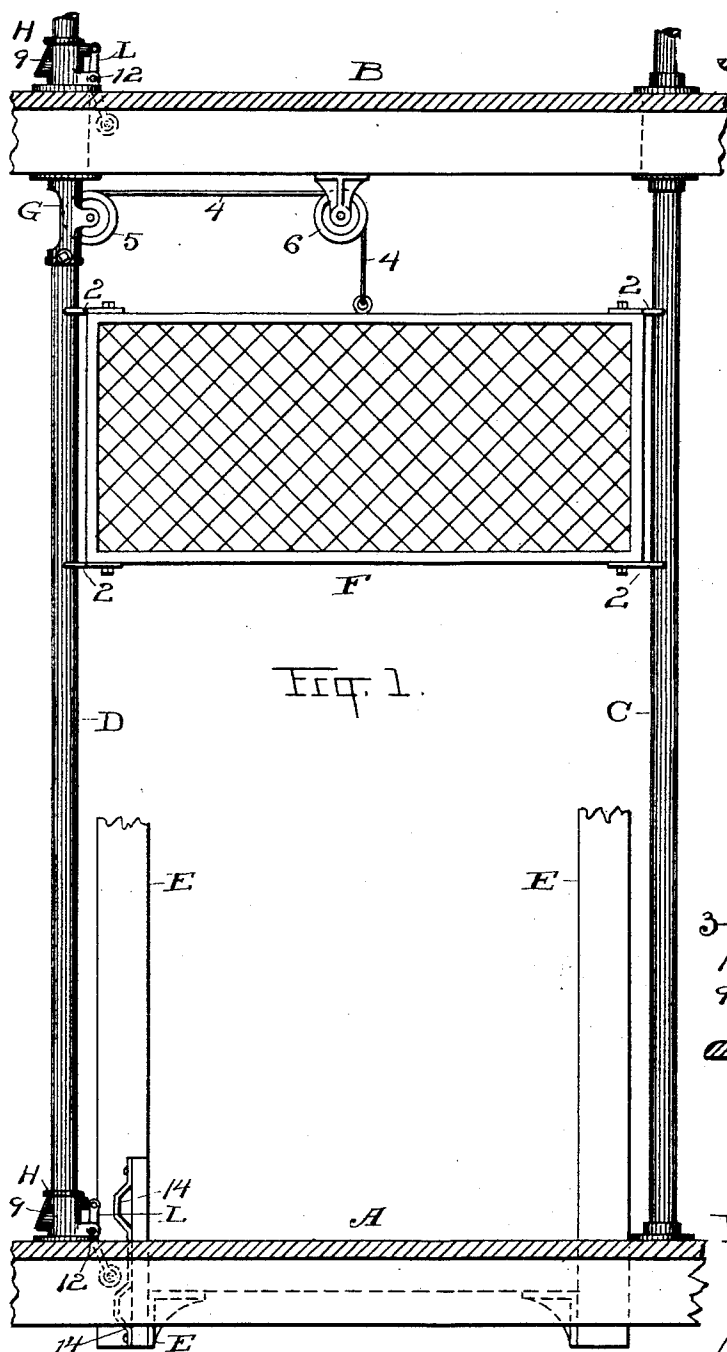


Fig. 1.

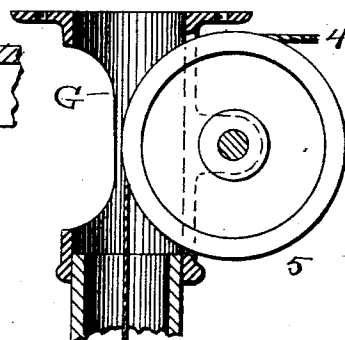


Fig. 2.

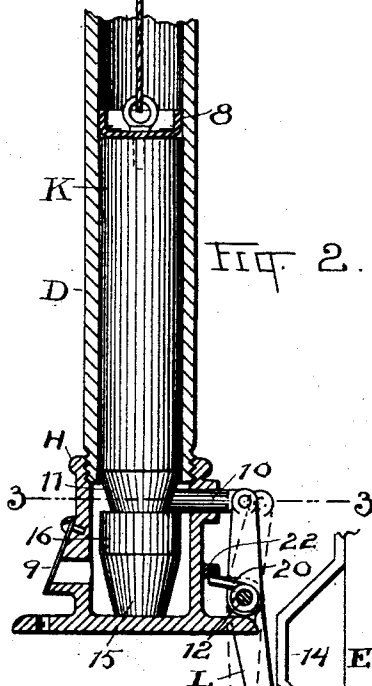
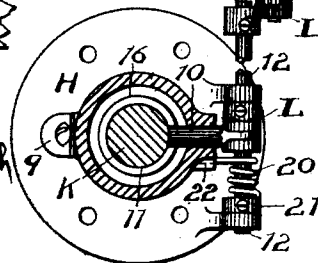


Fig. 3.

ATTEST.
R. B. Moser
G. L. Schaffer

INVENTOR.
Albert C. Beardsworth
BY H. T. Fisher,
ATTORNEY.



UNITED STATES PATENT OFFICE.

ALBERT C. BEARDSWORTH, OF CLEVELAND, OHIO.

SAFETY DEVICE FOR ELEVATOR-GATES.

SPECIFICATION forming part of Letters Patent No. 520,103, dated May 22, 1894.

Application filed February 17, 1894. Serial No. 500,467. (No model.)

To all whom it may concern:

Be it known that I, ALBERT C. BEARDSWORTH, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Safety Devices for Elevator-Gates; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to safety devices for elevator gates, and the invention consists in the construction, combination and arrangement of parts substantially as shown and described and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a front elevation of a door for entering the elevator, and showing sections of two landings between which the door is arranged and a gate in the door-way suspended as it appears when the gate is open. Fig. 2 is an enlarged vertical central sectional elevation of the tube and locking mechanism at the left in Fig. 1. Fig. 3 is a cross section on line 3, 3, Fig. 2.

The idea of the invention illustrated in the drawings is to provide means for automatically closing the gate when the elevator moves in either direction from a landing, and to do this without any effort on the part of the elevator-man or attention by him to any part of the closing mechanism. It does not, however, involve mechanism for raising the gate except that the gate is counterweighted so as to more nearly balance the weight of the gate itself, and thereby rendering opening of the gate by hand a practically easy matter.

Referring to Fig. 1, we have two landings A and B, and between them two posts, C and D, forming the sides of the door to the elevator.

E represents what may be considered a part of the elevator or carriage frame, the platform thereof in the view shown being on a level with the floor A because the gate F is in raised position.

Any well-known form of elevator carriage or platform, such, for example, as is used in freight elevators may be used, and I do not consider the invention as limited to any spe-

cial construction of elevator, because I may use my improved mechanism with any and all styles of elevators, whether for freight or passengers, provided they use or may desire to use a vertically sliding gate. As here shown, the gate has suitable brackets—2—at its ends which are adapted to engage partly around and to slide upon the standards or posts C and D, and any suitable means for effecting this sliding connection may be employed. In some instances it may be desirable to use anti-friction wheels with a concave periphery to engage the said standards instead of mere brackets as here shown.

Referring now especially to the standard or post D, we see in Fig. 2, in which a section of the post is broken out toward its top to make room for this figure on the sheet, that the said post is tubular and is set at its ends into or upon the hubs or joints G and H. These hubs or joints each are shown here as having flanges at their ends through which they are bolted to the floors or beams above and below, and to which the said tube D is attached at its ends. This tube is constructed of a size sufficient to accommodate a plunger K connected at its upper end by a rope or cable—4—over a sheave—5—supported in bearings in the upper joint G of the said tube and extending thence over another sheave—6—to the other elevator gate F, thereby serving as a counterbalance for the said gate. However, while it serves this purpose it still is necessarily lighter than the gate itself, so that when the two are united over the sheaves—5—and—6—by the rope or cord—4—, and there is no obstruction or hindrance to the gravity of the heavier part, the gate will descend and raise the counterweight. Now, since I rely upon this greater weight of the gate, as compared with the counterweight, to close the gate when the gate is released, I find it also desirable that the closing should be gradual and practically noiseless and yet with sufficient promptness and certainty to avoid an open door-way when the elevator platform has left the landing. To this end I provide suitable packing—8—in connection with the counterweight so as to make the tube practically air tight so far as this packing is concerned, thereby avoiding any passage of air from above the counterweight to

the space below. In the base joint or hub H there is an opening with a common flip valve —9— and this is the only air opening to the said base. The said tube or pipe D may, therefore, be said to be substantially air tight as against the admission of air in the said base H when the counterweight K rises therein, and it is tight enough to suit all practical purposes; but I also find that there is a slight admission of air by strong suction about the valve —9—, and possibly about the locking pin —10—, so that the moment the counterweight is released and the superior weight of the gate F begins to assert itself the said counterweight will rise at the desired rate or speed and a sufficient amount of air will be drawn in to permit the gradual and desired closing of the gate. I thus utilize the partial vacuum created by the rise of the counterweight and the counterweight itself to counterbalance the gate and thereby get the cushioned and easy closing of the gate, which is so desirable.

Now, in order that the release of the gate may be automatic and certain when the elevator leaves a landing, and that it may be certainly locked in raised position while it remains at a landing, I have formed a neck or depression —11— about the lower end of the counterweight which forms a shoulder thereon, and introduce a locking pin —10— through the base joint H to engage said shoulder. To effect this result I employ a lever L pivoted at —12— and having the locking pin —10— pivotally attached to its shorter arm, while the projections —14— on the elevator platform are adapted to engage the wheel or roller in the longer or lower end of the said lever.

It will be noticed that the projections —14— have an open space between them, and the lever or arm —L— is so constructed and arranged that the pin —10— will be held normally inward in about the position seen in Fig. 2, and in position to engage the neck of the counterweight whenever said weight is lowered. Hence, whenever the gate is raised and the counterweight sinks to the position shown in Fig. 2, the tapered or inclined side —15— of its head —16— will bear the said pin or bolt —10— back until it reaches the neck thereof, and then the bolt will automatically engage the shoulder of the neck and hold the weight down and the gate raised. This is supposed to occur when the platform stops at a landing and the gate is opened by hand. But any landing can be passed and the gate will always remain closed until it is purposely opened. As each landing is passed projections —14— will press against lever L, but this will not affect a gate unless it be open. When a landing is made and a door opened the roller —17— on lever L will be between the two projections —14— on the elevator, and the idea of this space is to provide room for the lever to rest in while the pin —10— is in locking position on

the counterweight. Then when the elevator moves in either direction the projection —14— above or below wheel —17— bears against the same and presses the long arm of lever L backward, releasing the counterweight by withdrawing the bolt —10— and thus letting the gate assert its superior weight and go downward to closing position.

Obviously the mechanism for operating bolt —10— may be more or less changed and yet serve the same purpose, and the formation of the counterweight for making engagement with the said bolt may also be modified and remain within the spirit of the invention. Among other things a stirrup or loop or the like might be attached thereto instead of head —16— for the bolt to engage. The cord or cable may be of any suitable flexible material, such as rope, wire, chain, or its equivalent.

The valve —9— is for outlet purposes, but may be modified so as to serve for outlet of air and a very limited inlet. Or it may be exclusively for outlet and made perfectly tight against inlet of air, so that what little air the counterweight needs in rising may enter through a perforation specially provided for that purpose, or in some other way. However, in any case the air inlet must be slow enough not to interfere with the desired back pull on the plunger by reason of a lack of air beneath it to prevent sudden and jarring closing of the gate.

The tube D and the end parts G and H might be made in a single piece, but I prefer separate pieces because this enables me to use ordinary tubing of a suitable kind for this purpose, and I can cut the tube to any desired length according to the space between floors. As here shown, tube D is threaded into base hub H, while it is simply set into top hub or joint G. The parts G and H may be first placed in position and then the tube D can be slipped into hub G and then into hub H and turned into engagement therewith, or, if preferred, simply set into it on a projection or the like to keep it from dropping too low.

The lever L pivoted on rod —12— is kept normally in position as seen in Fig. 2, by spring —20— wound about rod or shaft —12— and having one end fixed in collar —21— on the said shaft and the other end engaging lug —22— on the base H. The collar —21— has a set screw for holding it in any position of rotation on the pin to tighten the spring.

Having thus described my invention, what I claim is—

1. In elevator mechanism, the base for the counter-weight tube having a valved air outlet passage and a locking bolt extending into the base through a close fitting hole therein, in combination with the counter-weight tube seated in said base, a counter-weight in said tube having a shouldered head on its bottom engaged by said bolt, a pivoted arm to operate said bolt, an elevator gate, and flexible

connections therefrom to said counter-weight, said counter-weight having packing to render it air tight in said tube, substantially as set forth.

- 5 2. The construction described for carrying and operating the counterweight, consisting in the base hub provided with a valved air passage and an opening for a locking bolt, the upper hub constructed to be bolted into

place and the tube formed separately from said hubs and removably connected therewith, substantially as set forth.

Witness my hand to the foregoing specification.

ALBERT C. BEARDSWORTH.

Witnesses:

H. T. FISHER,

GEORGIA SCHAEFFER.