(No Model.)

# W. P. KIDDER.

## SAFETY DEVICE FOR ELEVATORS.

No. 525,421. Patented Sept. 4, 1894.

Fig. 1.

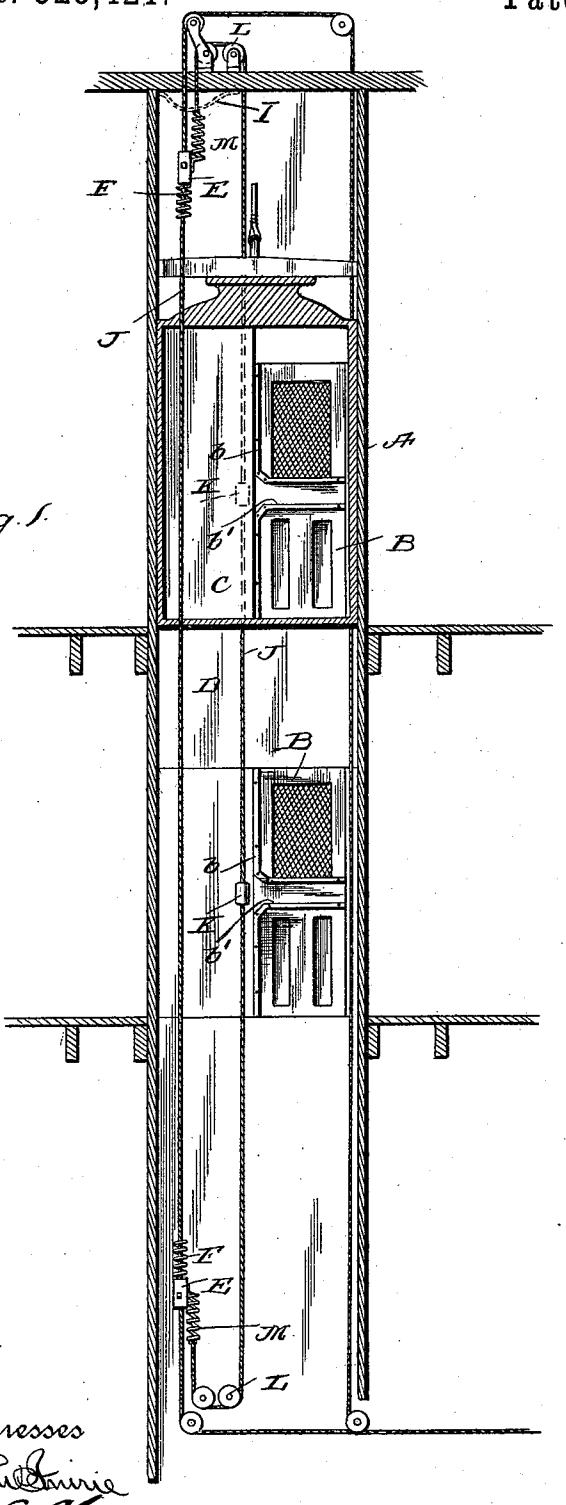
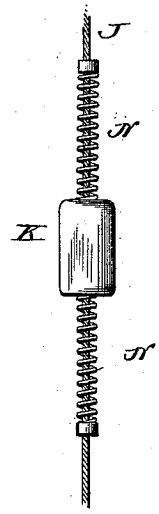



Fig. 2.




Witnesses
John E. Sinnie
W. E. Clendaniel.

Inventor
Wellington P. Kidder
By T. J. W. Roberton
Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

WELLINGTON P. KIDDER, OF BOSTON, MASSACHUSETTS.

## SAFETY DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 525,421, dated September 4, 1894.

Application filed August 22, 1893. Renewed August 8, 1894. Serial No. 519,774. (No model.)

*To all whom it may concern:*

Be it known that I, WELLINGTON P. KIDDER, a citizen of the United States of America, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Safety Devices for Elevators, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention is designed more particularly as an improvement on the safety devices shown in my Patent No. 495,094 and my application, Serial No. 473,780, filed May 11, 1893, but it may be applied in part to other elevators.

In most all power elevators, it is found to be important to provide stops on the rope near the top and bottom thereof, which are engaged by the elevator in case the operator fails to stop the car at its extreme upward or downward motion; which is very necessary, as otherwise the motion of the car would continue and the car rise so high or descend so low as to do great damage. The use of these stops causes the car, when it reaches a certain point in its motion in either direction, to move the rope and thus stop the car, but it often happens with some elevators that the momentum of the car moves the rope too far—so far in fact as to open the valve and start the car in the opposite direction, so that the car might thus travel up and down continuously until the power was stopped or the rope properly adjusted by hand. Besides this difficulty there is another one which will occur where my safety stops are used. If the car moves the rope too far to stop, it would carry my safety stop entirely past the opening between the horizontal bars on the door, and if any one just at the moment when the stop was thus passing, tried to open the door, my stop might be caught by the bars on the door and thus damage would result. To overcome these difficulties is the object of my improvement, and to this end the invention consists in the construction, arrangement and combination of parts hereinafter more particularly described and then definitely claimed at the end hereof.

In the accompanying drawings—Figure 1 is a side view of an elevator arranged according to my invention with parts represented broken away or removed the better to show other parts thereof. Fig. 2 is a modification on a larger scale.

Referring now to the details of the drawings by letter, A represents the well of an elevator, B one of the doors thereof, C the car and D the operating or controlling rope thereof (which I shall hereinafter generally call the controller), all of which may be of any approved construction, excepting the door which, preferably, should be provided with vertical and horizontal bars or stops marked *b* and *b'* respectively.

Rigidly mounted on the controller D are blocks E, one being near the top and the other near the bottom of the well. Beneath the upper block is shown a spiral spring F, wound open, and above the lower one is a similar spring. The upper spring should be mounted so as not to fall down, which may be done by attaching it to the block E in any convenient way. These springs may be attached to the top and bottom of the car and travel with it if preferred, but I consider it best to connect them to the blocks E E. These springs must be so stiff as not to be compressed in the ordinary action of the elevator, so that the car when it comes in contact with one of the springs, will move the block E and controller the same as if the spring were not there.

Ordinarily the springs will not yield, but if the momentum of the car should be so great as to be sufficient to carry the car too far, then, in case the controller is arrested from any cause so that the block E could not go any higher, then if the momentum of the car continues, the spring will be compressed and no injury would result therefrom. In some cases, I may attach a spring (shown in dotted lines at I) to the under side of the beam, in which case the block E would come in contact with the spring if carried too far up by the momentum of the car and thus said spring I would act as a buffer. This spring I may be used either with or without the spring F.

To overcome the other difficulty referred to, I propose to make a yielding connection between the controller and my rope-stops. One of the best ways of carrying out this feature of my invention is that shown in the drawings, but I do not wish to limit myself to this, as it may be done in various ways.

Referring again to the drawings: J repre-

sents a supplementary rope carrying the safety stop K, which is preferably fast thereon and co-operates with the bars *b* and *b'*, as in my application No. 473,780. This rope passes around suitable pulleys L and its opposite ends are preferably attached to closely wound springs M whose other ends are attached to the stops E, or to any convenient portions of the controller. Should the car now carry the block above its proper height, and an attempt be made to open the well door at the time that the safety rope-stop K is passing the opening between the bar-stops, so that the stop would be partly entered into the opening, the spring connection M, between the safety rope-stop K and the block E, would yield and thus no damage result. As a further precaution, I cut off the corners at the junction of the horizontal and vertical bars diagonally or slantingly as shown, so that should the door not be closed far enough to be latched, the stop pushing against such diagonal corner would push the door fully "home," and thus the latch would catch fast.

Instead of the spring connection between the rope J and the stop K, I may sometimes loosely mount the safety-stop on the rope J between springs N, as shown in Fig. 2. In this case if there should be any improper motion given to the rope J at a time when the stop K was between the horizontal door stops, the springs would yield and thus damage would be prevented.

Of course the springs M or N should be sufficiently strong as not to be operated by hand, or otherwise they might be used in such a manner as to entirely defeat the object of my safety stop.

In some cases instead of using springs, I may attach the stop K by a frictional connection, so that should there be any extra strain it would slide on the rope J, but this would not be so good as the other arrangements described, inasmuch as after sliding on the rope the stop would require to be adjusted to its proper position.

In addition to the advantages above set forth, the supplementary rope J above described has the further advantage that it forms a very convenient way of attaching my safety device to elevators already in use, for it frequently happens that the ordinary controller or rope is not in a position to conveniently receive the safety stops, and cannot well be changed in such a manner as to hold the stops in the proper position to act on the door.

I have used the beam supporting the pulleys and controller in the arrangement first described above, as a stop to prevent the block E from rising too high, but of course any other fixed part of the frame may be used as a stop for said block. Instead of the block, a pin passing through the rope at right angles and properly secured may be used. Other forms of stops may perhaps be used with as good advantage, but I prefer a block, and when I mention a "block" in the following claims, I mean to include any known device that will serve the same function, the word "block" being used here to more clearly distinguish it from stops co-acting with the doors. These spring connections may also be used with any other form of controller as well as with the rope controller shown.

In some cases, the springs or bumpers F may sufficiently protect my safety stop and door mechanism from injury, in which case the springs M or their equivalents may not be required.

In the drawings I have shown my safety rope-stop K acting upon the door through the medium of horizontal and vertical bars *b'* and *b*, but do not limit myself to this arrangement.

In the following claims, when I refer to "co-acting" or "engaging" with the door, I wish to be understood as meaning any arrangement of the parts in which the doors and stop co-act together, whether the door and stop are in immediate conjunction or co-act through intermediate mechanism.

What I claim as new is—

1. In an elevator and in combination with the controller and car thereof, of a block on the controller acted on by the car, and a spring co-acting therewith, substantially as described.

2. In an elevator and in combination with the controller and car thereof, a door, and a stop to engage with the door yieldingly connected with the controller, substantially as described.

3. In an elevator and in combination with the controlling rope, a door and the car thereof, a supplementary stop-carrier connected with the controlling rope and having stops co-acting with the door, substantially as described.

4. In an elevator and in combination with the controller, a door, and the car thereof, a supplementary stop-carrier connected with the controller, and a spring connection between the controller and the stop carrier, substantially as described.

5. In an elevator and in combination with the controlling rope, a door, and the car thereof, a supplementary stop-carrier, a block on the controlling rope, and a spring connection between the block and supplementary rope-carrier, substantially as described.

6. In an elevator and in combination with the controller and the car thereof, a stop connected with the controller, and a door having a stop engaging with the controller stop and having its corners cut slantingly, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 21st day of August, 1893.

WELLINGTON P. KIDDER.

Witnesses:
P. B. RISMAN,
M. P. EVANS.