(No Model.) 2 Sheets—Sheet 1.

L. W. HEWETT, S. J. LEONARD & P. B. SHAW.

SAFETY DEVICE FOR ELEVATORS.

No. 305,689. Patented Sept. 23, 1884.

Fig. 1.

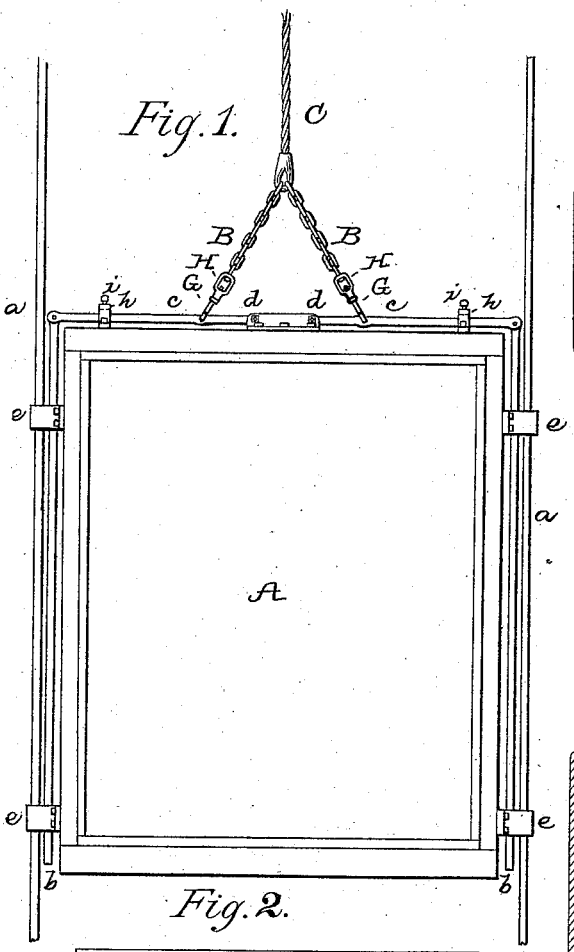

Fig. 2.

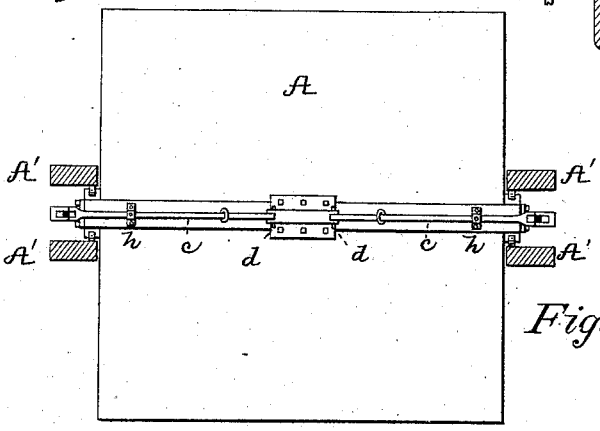

Fig. 3.

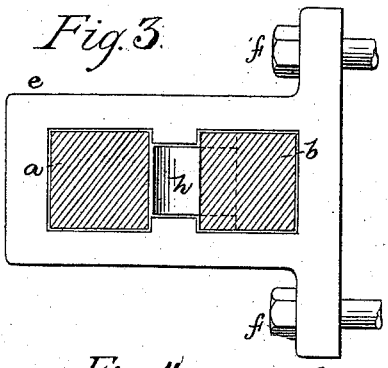

Fig. 4.

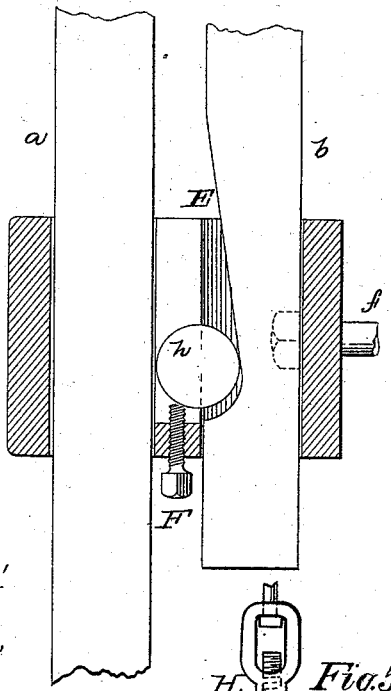

Fig. 6.

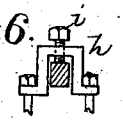

Fig. 5.

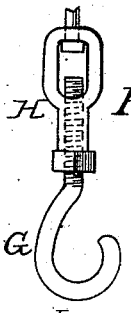

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Fig. 8.

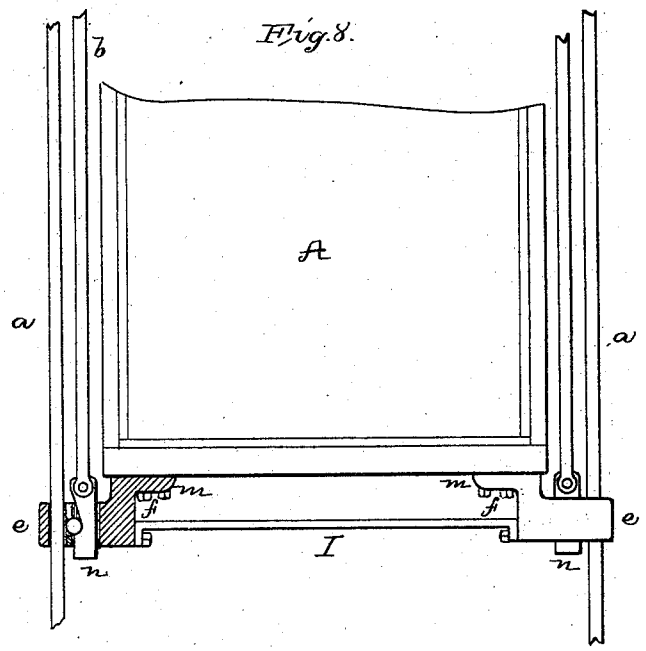


Fig. 9.

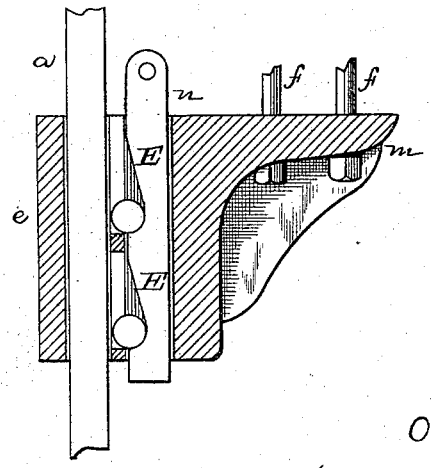
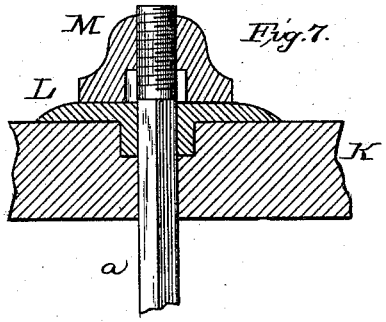


Fig. 7.



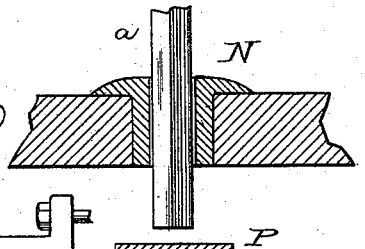
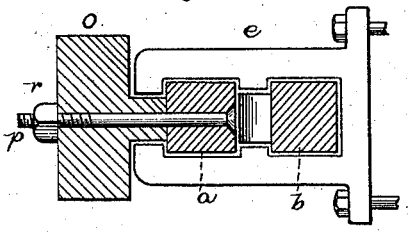


Fig. 10.



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UNITED STATES PATENT OFFICE.

LEWIS W. HEWETT, SUMNER J. LEONARD, AND PHILIP B. SHAW, OF WILLIAMSPORT, PENNSYLVANIA, ASSIGNORS TO THE NEW YORK AND NEW JERSEY CAR STARTER COMPANY, OF NEW YORK, N. Y.

SAFETY DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 305,689, dated September 23, 1884.

Application filed May 14, 1884. (No model.)

To all whom it may concern:

Be it known that we, LEWIS W. HEWETT, SUMNER J. LEONARD, and PHILIP B. SHAW, all of Williamsport, in the county of Lycoming and State of Pennsylvania, have invented a certain new and useful Improvement in Safety Devices for Elevators, of which the following is a specification.

The object of our invention is to provide means for stopping the descent of an elevator-car in case the hoist-rope or other portion of the hoisting apparatus shall give way, which means shall be quick and efficient in their action, being brought into action immediately when the strain is removed from the hoisting devices and checking the car before it can fall far enough to acquire additional velocity; and our invention consists in the novel devices employed by us in attaining the above-named object, as hereinafter fully set forth and claimed.

In the accompanying drawings, Figure 1 is a view in elevation of an elevator-car and the appliances connected therewith which embody our invention; Fig. 2, a top view of the same; Fig. 3, an enlarged top view of the safety device; Fig. 4, a view of the same, partly sectional and partly in elevation; Fig. 5, a view of the adjustable connection between the hoisting apparatus and one of the levers which actuate the safety device; Fig. 6, a view of an adjusting device for said lever; Fig. 7, a view of one of the rods which support the car when its descent is checked, the supports for the rod being in section; Fig. 8, a view of a car having the safety devices attached to its bottom, and Figs. 9 and 10 views of modified forms of the safety device.

Like letters refer to corresponding parts in all the figures.

A is the elevator-car which, as shown in Fig. 2, is guided by rollers traveling between guides A′ A′ at the sides of the shaft. It may, however, be guided in any other manner commonly in use. Rods *a a*, attached to the sides of the elevator-shaft, extend the whole length of said shaft. These rods, however, may be placed instead in diagonally-opposite corners, or four of them may be used, one in each corner. These rods are supported as will be presently explained. Rods *b b*, corresponding in number and position to the rods *a a*, are placed at the sides or corners of the elevator-car.

To the upper end of each rod *b* is attached a lever, *c*, which levers extend along the top of the car to the center, where they are pivoted at *d d*. These levers are both connected through chains B B with rope C. This may be the hoist-rope of the elevator, or it may be connected with the hoist-rope or other portion of the hoisting apparatus, so that when the weight of the car comes upon the hoisting apparatus rope C will raise the levers *c* and rods *b*.

Iron straps *e e* are secured to the car by bolts *f*. The rods *a* and *b* pass through the square portions of the apertures in the straps. In Figs. 1, 2, 3, and 4 these straps are shown as attached to the sides of the car.

At the part of each rod *b* which passes through a strap, *e*, upon the outer side of the rod, is an inclined depression, E, deepest at its curved lower end. This forms a tapering pocket within the strap *e*, between rods *a* and *b*, in which is placed a roller, *h*, of somewhat smaller diameter than the widest part of the pocket, so that when at its lowest position it will be out of contact with rod *a*. A set-screw, F, passes through the bottom of strap *e* and sets against the roller. Each lever *c* has an adjusting device consisting of a strap, *h*, placed over the lever and secured to the top of the car, and a set-screw, *i*, passing through the strap *h*, against the lever. Each chain B is connected with hook G, which is hooked to lever *c* by turnbuckle H, in which the screw-threaded end of the hook is adjustable.

The operation of these devices is as follows: When the weight of the car is on rope C, the levers *c c* and rods *b b* are raised and rollers *h* remain near the bottoms of their pockets and out of contact with rods *a a;* but if the hoist-rope breaks or the strain is in any other

way removed from rope C the levers *c* and rods *b* drop and rollers *h* are immediately wedged into the narrow part of the pocket between rods *a* and *b*, so as to immediately stop the movement of the car, locking it on both sides at the same instant, and the greater the weight and momentum of the car the more tightly will the rollers be wedged in. By means of the set-screws F the rollers are adjusted so as to be just out of contact, so that the slightest downward movement of the rods will cause them to act. By set-screws *i* the levers are all adjusted to work precisely together, so as to compensate for any slight differences in their mechanical construction, and also they are adjusted so that the rope C lifts them only the very smallest distance required to give a sufficient drop to the rods *b* to bring the rollers into action. By these two adjustments of the rollers *h* and of the levers *c*, the rollers are made to act almost instantaneously on the cessation of the strain, and all the rollers are caused to act exactly together. As the chains B may differ slightly owing to slight differences in the length of the links, &c., the hooks G are adjustable in the turnbuckles H to make them both act alike. In some cases the elevator-shaft may not be wide enough to admit the two rods and the projecting strap. In such case, to economize in room, we prefer to attach the straps to the bottom of the car, as shown in Fig. 8, where part *m* of the strap is bolted to the bottom of the car. Otherwise the straps are similar to those just described. The two straps on opposite sides may be braced by a cross-bar, I, if desired. In this construction we prefer, instead of having the depressions E in the faces of the rods *b*, to attach a piece, *n*, to the end of the rod in which such depressions are formed. If additional friction-rollers are necessary, they may be similarly placed at the top of the car, or two rollers may be placed in the same strap, as seen in Fig. 9. Rod *b* has two depressions, E E, in each of which is a roller, *h*, acting in the manner set forth above. In Fig. 10 the strap does not entirely inclose the rods, but rod *a* has a T-shaped strip, *o*, secured to it by bolts *p*, having countersunk heads, as shown, and nuts *r* on their screw-threaded ends, and the strap has jaws entering between the rod and this strip, as shown. The rod is thus made of greater strength.

In order that the rods *a* may be allowed to expand and contract, they are supported in the manner illustrated in Fig. 7. In this figure the middle portion of the rod is broken away, only its two extremities being shown. At its upper end the rod is secured rigidly, passing through a beam or other support, K, supported by the walls of the shaft and a plate or washer, L, and being held by a nut, M, screwed upon its end against plate L. At its lower end, however, the rod passes loosely through a sleeve, N, placed in an aperture in the support O, and is thus free to move through this sleeve as it expands and contracts. A bottom plate, P, may be provided, against which the end will bear at the greatest length of the rod.

Our invention may be readily applied to elevators already in use by simply placing the parts in position and connecting rope C with the hoisting apparatus, so that it will take part of the strain. In putting in a new elevator, however, the rope C would preferably be the hoist-rope of the car.

It is evident that balls or cam-plates or other similarly-operating devices may be substituted for the cylindrical rollers shown, and are the equivalents of such frictional rollers.

What we claim is—

1. The combination, with an elevator-car and its shaft, of one or more frictional devices between the car and the sides of the shaft, and direct connections between said frictional devices and the hoisting apparatus, whereby said frictional devices are lifted out of contact by the hoisting apparatus and dropped into contact when the strain on said apparatus ceases, substantially as set forth.

2. The combination, with an elevator-car and its shaft, of a movable rod attached to the car and connected with the hoisting apparatus, a stationary rod attached to the side of the shaft, and a roller in a tapering pocket between said rods, substantially as set forth.

3. The combination, with the elevator-car and shaft, of the strap attached to the car, the movable rod and stationary rod passing through said strap, and one or more rollers, each placed in a tapering pocket within the strap and between the rods, substantially as set forth.

4. The combination of the two or more stationary rods on different sides of the shaft, the two or more corresponding movable rods on the car, the levers connecting said movable rods with the hoisting apparatus, and the rollers or equivalent devices thrown into or out of action by the movement of said movable rods, substantially as set forth.

5. The combination, with an elevator-car, of frictional devices moved by the cessation of strain on the hoisting apparatus to lock the car against downward movement, and means for adjusting the extent of movement of said frictional devices, substantially as set forth.

6. The combination, with the levers connecting the movable rods with the hoisting apparatus, of devices for adjusting the extent of movement of said levers, substantially as set forth.

7. The combination, with the roller or equivalent friction device, for the purpose set forth, of a device for adjusting its position in the pocket which contains it, substantially as set forth.

8. The combination of the movable rods, the levers connecting them with the hoisting apparatus, the rollers or equivalent devices between said movable rods and the sides of the

shaft, devices for adjusting the extent of movement of said levers, and devices for adjusting the position of said rollers, substantially as set forth.

9. The combination, with the levers attached to the movable rods, of the chains connecting them separately with rope C, substantially as set forth.

10. The combination, with the two or more chains connecting the levers with the rope, of devices for separately adjusting the length of the chains, substantially as set forth.

11. The combination, with the stationary rods *a*, of the movable rods *b*, having depressions forming tapering pockets between the rods for the rollers or equivalent devices, substantially as set forth.

12. The combination, with the stationary rods extending through the elevator-shaft, of supporting devices therefor, permitting the expansion and contraction of such rods, substantially as set forth.

13. The rods extending through the shaft, supported rigidly at their upper ends and loosely to permit expansion and contraction at their lower ends, substantially as set forth.

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