No. 764,762. PATENTED JULY 12, 1904.

A. PERRI.

SAFETY DEVICE FOR ELEVATORS.

APPLICATION FILED JAN. 16, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

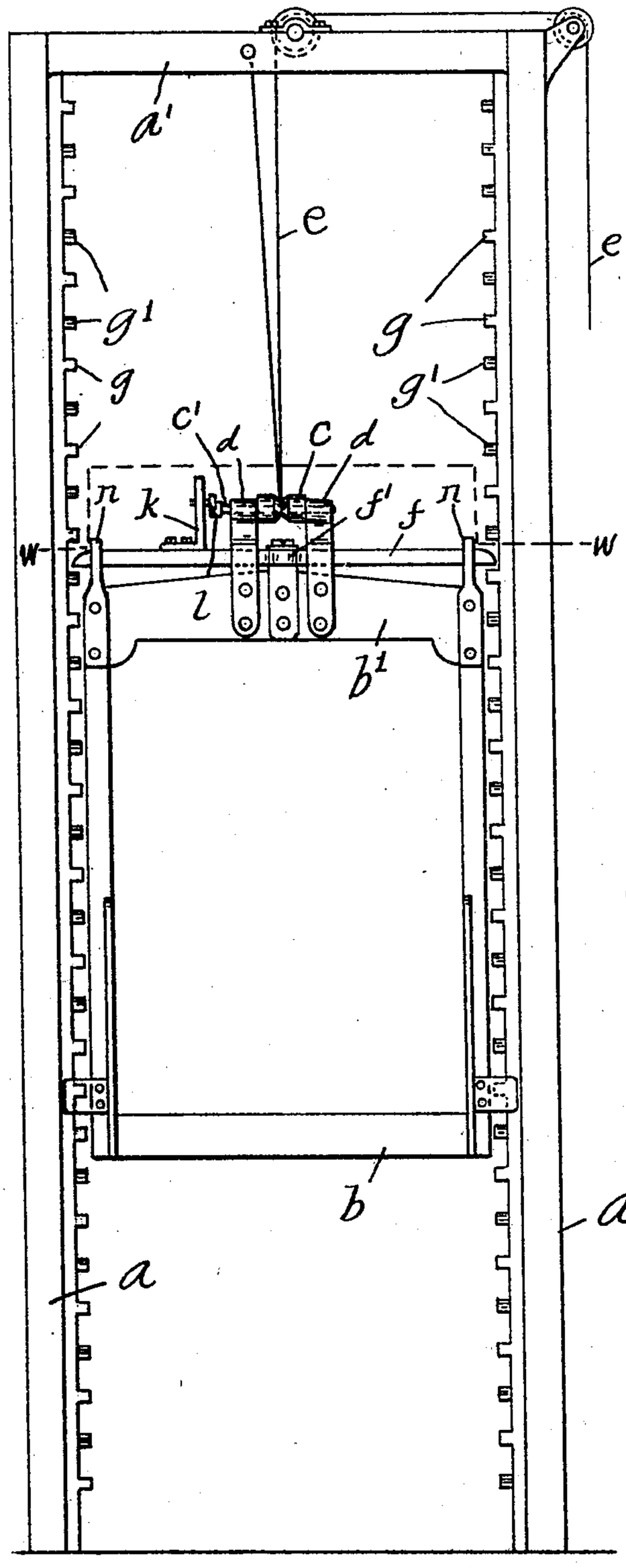

Fig. 1.

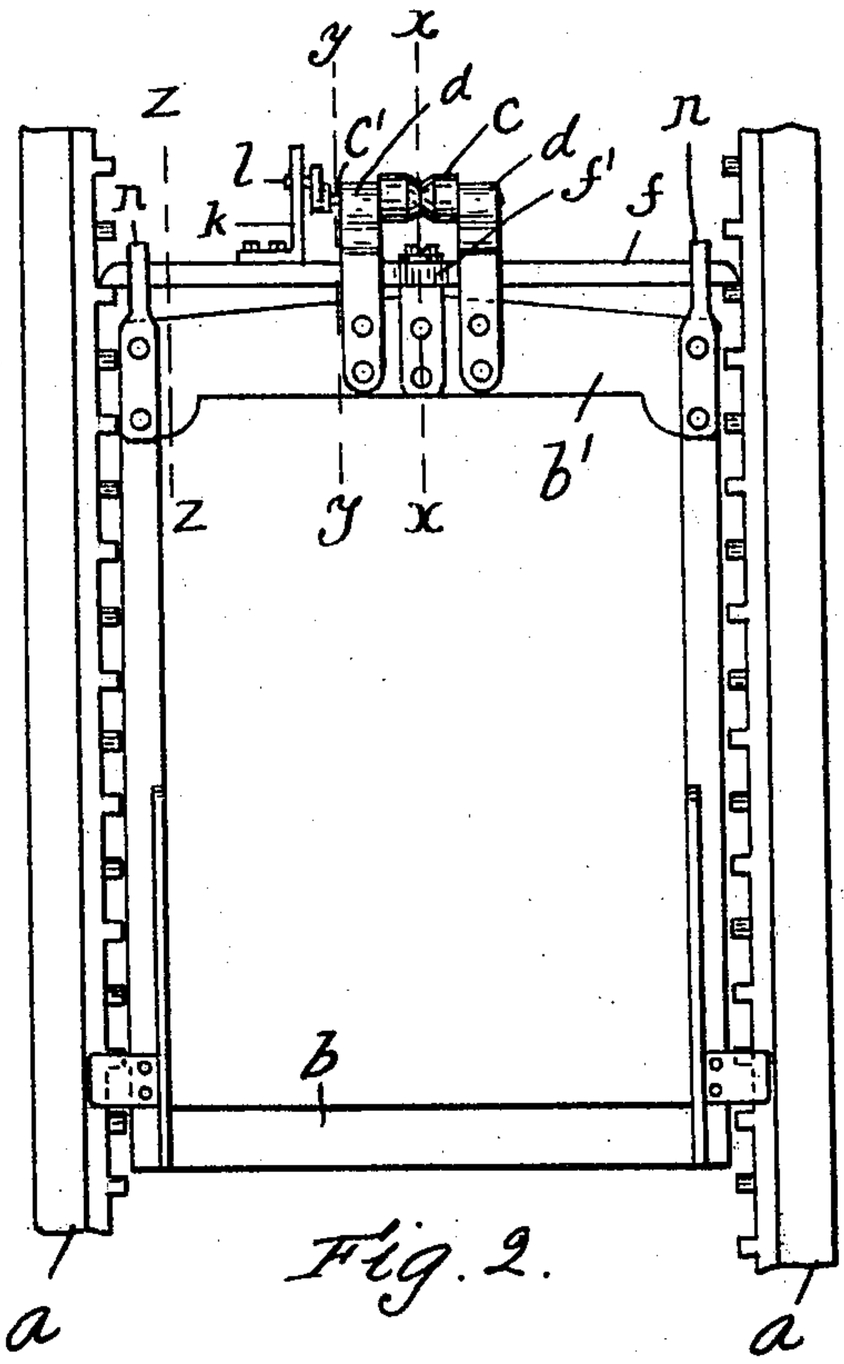

Fig. 2.

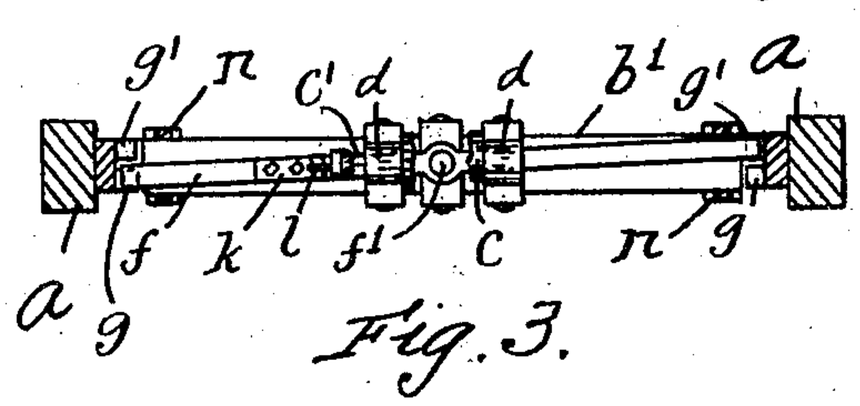

Fig. 3.

Witnesses:
H. B. Davis
Maud M. Piper.

Inventor:
Ruggero Perri,
by Wright Brown Quinby & Otis
Attys.

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A. PERRI.

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APPLICATION FILED JAN. 16, 1904.

NO MODEL. 2 SHEETS--SHEET 2.

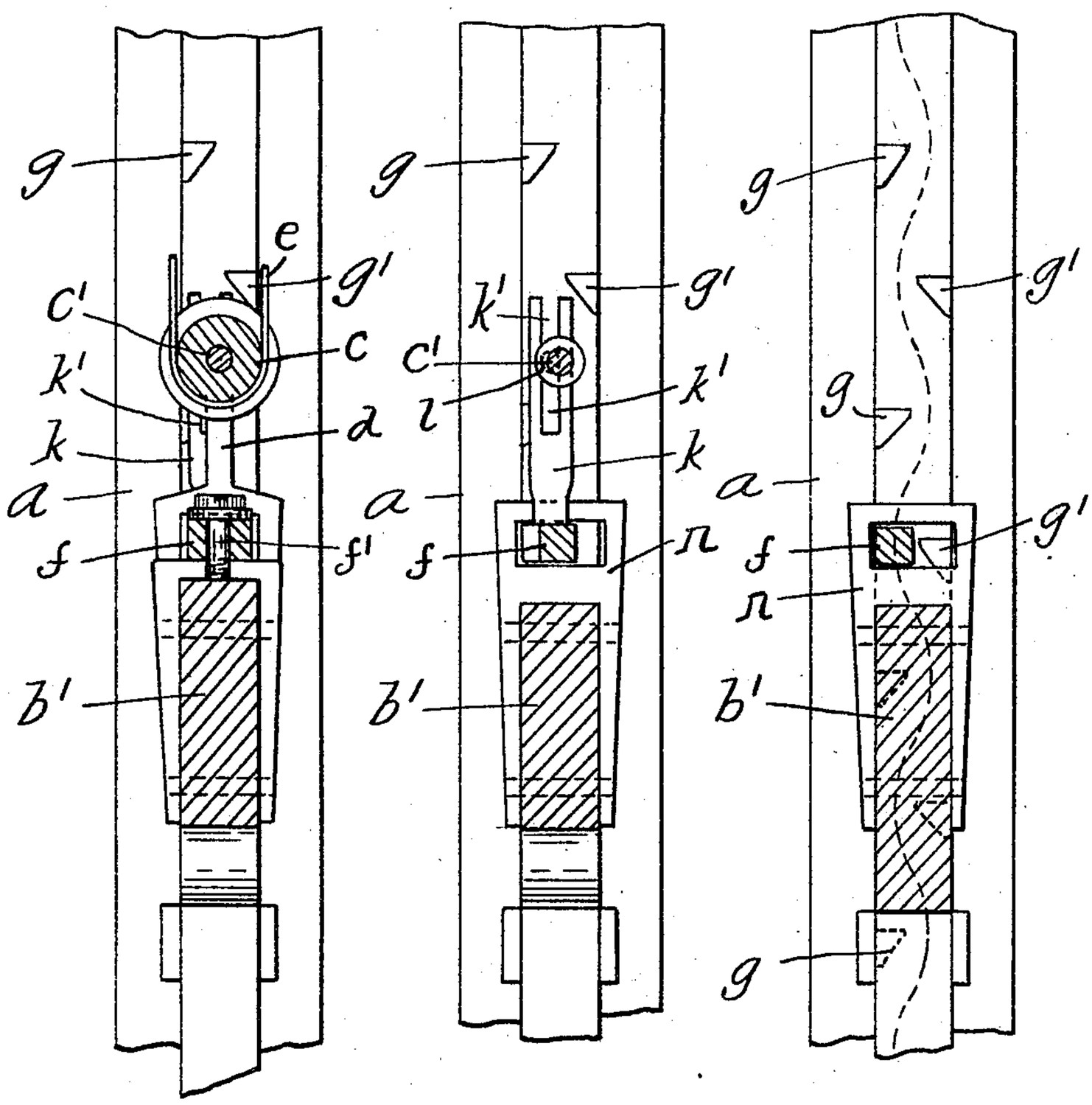

Fig. 4.

Fig. 5.

Fig. 6.

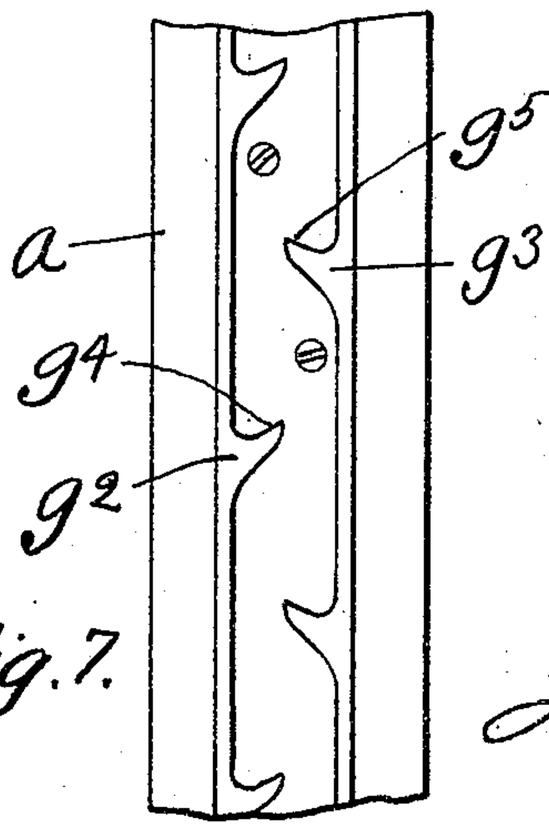

Fig. 7.

Witnesses:
H. B. Davis.
Maud M. Piper.

Inventor:
Angelo Perri
by Noyes & Kenway
Attys.

No. 764,762. Patented July 12, 1904.

UNITED STATES PATENT OFFICE.

ANGELO PERRI, OF HAVERHILL, MASSACHUSETTS.

SAFETY DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 764,762, dated July 12, 1904.

Application filed January 16, 1904. Serial No. 189,266. (No model.)

To all whom it may concern:

Be it known that I, ANGELO PERRI, of Haverhill, county of Essex, State of Massachusetts, have invented an Improvement in Safety Devices for Elevators, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to safety devices for elevators, and more particularly to safety devices for that class of elevators in which the car is lifted by a cable and in connection with which one or more racks or series of projections are provided in the elevator-well with which devices carried by the car engage when the cable breaks and the car begins to fall.

The object of my invention is to provide a device of the above-named character which will operate immediately, if the cable breaks, to prevent the car from falling and which is provided with means which are always in position to engage the holding-racks, so that the downward movement will be arrested almost as soon as the car begins to fall.

For an understanding of the means with which I accomplish these objects reference is made to the accompanying drawings, in which—

Figure 1 is a side elevation of an elevator car and well provided with my invention. Fig. 2 is a similar view showing the parts in a different position. Fig. 3 is a plan view on line *w w* of Fig. 1, some of the parts being broken away. Figs. 4, 5, and 6 are respectively sectional views on the lines *x x*, *y y*, and *z z* of Fig. 2. Fig. 7 illustrates a modified form of rack.

a a indicate the vertical guides for the car in an elevator-well, and *b* the car having the usual upper cross-beam *b'*. A sheave *c* is secured to a shaft *c'*, which is journaled in bearings *d*, secured to the cross-beam *b'* at the upper side thereof, and a cable *e* is connected at one end to a cross-support *a'* at the upper end of the run of the elevator and passes down beneath said sheave and upwardly over suitable pulleys to a windlass. (Not shown.)

A holding-bar *f* is pivoted at *f'* in the middle thereof and at the middle of the beam *b'*, the ends of said bar *f* extending beyond the sides of the car and beneath supports *n*, as shown in Figs. 1, 2, and 3, said supports being secured to the car and arranged to be engaged by the bar when its ends are sprung upward.

An arm is secured to the upper side of the bar *f* between its pivot and one of its ends, said arm being provided with a vertical slot *k'*, in which a crank-pin *l*, secured on the end of a shaft *c'* of the sheave *c*, is located.

A vertically-arranged rack is rigidly secured to each side of the elevator-well, each rack having two vertical rows or series of projections or teeth *g g'*, closely adjacent each other, the teeth of one row being opposite the middle of the spaces between the teeth of the other row and all of said teeth being equidistant.

With the above-described construction when the sheave *c* is rotated, the crank-pin *l* in the end of its shaft will cause the bar *f* to be oscillated, the amplitude of the oscillation of the bar being such that its ends will move from a point which is directly over or in position to engage the teeth *g* of one series until it is directly over or in position to engage the teeth *g'* of the other series. It will be apparent that as the car is raised or lowered and the cable *e* passes about the sheave *c* the latter will be rotated, causing the bar *f* to oscillate. These oscillations must be so timed that either one of the ends of the bar *f* will be exactly over one of the teeth *g* when it is directly opposite one of the teeth *g'*, or vice versa, so that as the car is raised and lowered the ends of the bar will move in a serpentine path between the lugs *g g'*, as indicated by the central dotted line in Fig. 6, the bar making a complete oscillation for each revolution of the sheave and the car at the same time moving a distance equal the distance between two teeth of a series. While it is necessary to set the shaft in a particular position when starting, after it has once been set it will not need to be readjusted, as there will be no slip of the cable upon the sheave as the car is raised or lowered. However, if the cable should break it would at once loosen its grip upon the sheave and fail to rotate the same in time as the car starts to fall, with the result that the ends of the bar would not be moved out of the way of the teeth or

projections of the rack, but would engage the next tooth below to prevent further downward movement of the car. (See Fig. 2.) The entire weight of the car will thus be supported by the holding-bar, the supports *n*, secured to the car, engaging the bar as close to its ends as is practicable.

With the above-described construction, the downward movement of the car will be arrested as soon as there is any disarrangement of the hoisting apparatus, the ends of the bar always being in position to engage one of the teeth of each rack should an accident occur.

In Fig. 7 I illustrate a modified form of rack in which the rack is made in two sections, one series or row of teeth, g^2, being secured to one section and the other series, g^3, being secured to the other. These teeth g^2 g^3 are provided with projecting portions g^4 g^5, which extend upward obliquely toward the path of movement of the end of the bar *f*, so that if the bar should be caught on the end of a tooth it will slide to the base thereof before the full weight of the car is placed thereon.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with an elevator-car, a stationary rack having two vertically-arranged rows of teeth side by side, the teeth of one row being opposite the spaces between the teeth of the other row, a holding-bar connected to said car and having one end constantly in position to engage one of said teeth, and means, operated by the lifting means of the car, for moving said bar out of position to engage one tooth and into position to engage the next as the car moves, and while it is supported by said lifting means, substantially as described.

2. In combination with an elevator-car, a sheave mounted thereon, a lifting-cable passing about said sheave, a stationary rack having two vertically-arranged rows of teeth side by side, the teeth of one row being opposite the spaces between the teeth of the other row, a holding-bar connected to said car and having one end constantly in position to engage one or more of said teeth, and connections between said sheave and bar timed to move the latter out of position to engage one tooth and into position to engage another tooth during the normal operation of the car, substantially as described.

3. In combination with an elevator-car, a sheave mounted thereon, a lifting-cable passing about said sheave, a stationary rack having two vertically-arranged rows of teeth side by side, the teeth of one row being opposite the spaces between the teeth of the other row, a holding-bar pivotally connected to said car and having one end constantly in position to engage one or more of said teeth, connections between said sheave and bar for causing oscillation of the latter upon rotation of the former, and timed to move the end of said bar out of position to engage one tooth and into position to engage the next during the normal operation of the car, substantially as described.

4. In combination with an elevator-car, a sheave mounted thereon, a lifting-cable passing about said sheave, a pair of racks secured in the elevator-well at opposite sides of the car, each having two vertically-arranged rows of teeth, side by side, the teeth of one row being opposite the spaces between the teeth of the other row, a holding-bar connected to and centrally pivoted on said car, the ends of said bar each being constantly in position to engage one or more of said teeth, and means driven by said sheave for oscillating said lever in time to move its ends out of position to engage one row of teeth on each rack and into position to engage another row of teeth on each rack, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ANGELO PERRI.

Witnesses:
L. H. HARRIMAN,
H. B. DAVIS.