(No Model.)

C. W. FOWLER & A. M. COYLE.

AUTOMATIC SAFETY DEVICE FOR ELEVATORS.

No. 467,591. Patented Jan. 26, 1892.

FIG. I.

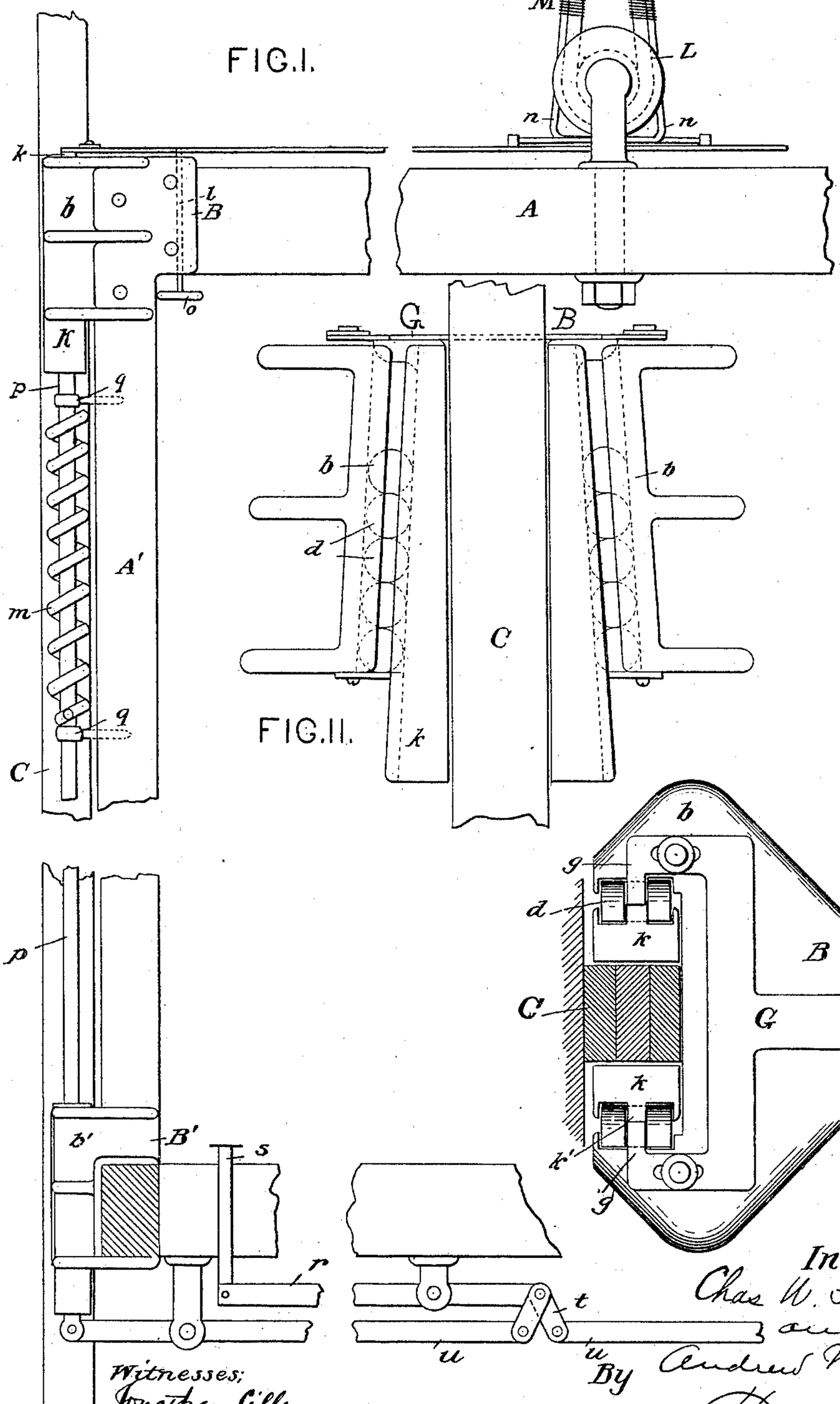

FIG. II.

FIG. III.

Witnesses;
Jonathan Culley
H. W. Gore

Inventors:
Chas W. Fowler
and
Andrew M. Coyle,
Peck & Mauro,
thier Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES W. FOWLER AND ANDREW M. COYLE, OF BALTIMORE, MARYLAND, ASSIGNORS TO THE STANDARD SCREW ELEVATOR COMPANY, OF SAME PLACE.

AUTOMATIC SAFETY DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 467,591, dated January 26, 1892.

Application filed August 24, 1891. Serial No. 403,507. (No model.)

To all whom it may concern:

Be it known that we, CHARLES W. FOWLER and ANDREW M. COYLE, citizens of the United States, and residents of Baltimore, in the State of Maryland, have invented a new and useful Improvement in Automatic Safety Devices for Elevators, which improvement is fully set forth in the following specification.

This invention has reference to the construction of safety mechanism for elevators—that is to say, of mechanism which acts automatically upon the accidental parting of the hoisting-cable to clutch the car against the uprights or sides of the well, and thus insure the safety of the passengers.

In certain respects the invention is an improvement upon the devices described in application of Charles W. Fowler and John Gustafson, filed May 9, 1891, Serial No. 392,220. In common with said devices the present invention includes actuating-springs for the arresting devices, normally held under uniform tension (or compression) by a latch, which latch is adapted to be withdrawn when the hoisting-rope breaks. The apparatus also is so arranged that after the brakes or arresting devices have been sprung they become absolutely independent of the hoisting-cable, so that it is immaterial at what point the latter may break. We do not therefore claim, broadly, these features of construction and operation, and the invention, moreover, includes several features not disclosed in said prior application.

The general objects of said invention are to secure greater simplicity in construction and increased certainty and efficiency in operation. These objects, as well as the means whereby they are secured, may be most conveniently explained in connection with the accompanying drawings, in which—

Figure I is a side elevation illustrating the improved safety mechanism. Fig. II is a partial elevation at right angles to Fig. I, and Fig. III is a partial plan view.

A represents part of the central cross-beam on top of the car, and A′ one of the side frames of the car.

B is a metal casting bolted on the end of beam A and provided with jaws *b*, which embrace the upright or rail C, which runs the full length of the elevator-shaft. A similar casting B′, with jaws *b*′, may be placed at the bottom of the car.

Between the rails C and jaws *b* lie the wedges *k*, normally out of contact with the rail C. They are carried by rods *p*, which can slide in eyebolts *q*, screwed into the side frame of the car. A spring *m* (which may be either a tension or a compression spring) surrounds rod *p* and tends to force it, and consequently the wedges also, upwardly. The wedges have at their upper ends a projection *k*′, extending horizontally from about the middle of the wedges, and these projections lie directly under the catches *g* of a sliding plate or latch G. Consequently, when the parts are in the position shown in the drawings, the wedges cannot be raised by their springs far enough to make contact with the rail C and check the movements of the car. When, however, the latches G are moved in either direction, so as to release the wedges *k* from catches or stops *g*, the springs *m* will at once throw the wedges into action, forcing them in contact with the rail C. The springs *m* have only to bring these surfaces in contact, the weight and momentum of the car being relied upon to clamp the wedges against the rail C with a grip proportionate to the energy of the descending car. To insure certainty in this action, it is necessary that the friction of the vertical faces of the wedges *k* against the rail C should greatly exceed that of the inclined edges against the jaws *b*. To this end a number of anti-friction rollers *d* are placed in the interior of the casting B, between the jaws and wedges *k*. It will be obvious that with this construction the wedge *k* cannot slip on the rail, for as the car descends the jaws *b*, rolling over the rollers *d*, will force the wedges against the rail. Conversely, when it is desired to release the car from the clutch mechanism, there is no difficulty arising from the jamming of the wedge. Power being applied to lift the cable, the jaws *b* move easily over the rollers and the car is released.

The mechanism for automatically withdrawing the latch G may be of various kinds. A simple form is shown in Fig. I. L represents a sheave, under which the double hoisting-rope M is looped. Cords or straps *n*, hav-

ing a certain amount of slack, are attached at one end to the rope M and at the other to the sliding plate or latch G, which extends across the car, these cords crossing each other under the pulley L. It will be seen that the unequal stretching of the rope M will have no effect on the latch, but should said rope break on either one side or the other the opposite side tightens, and, through its connecting-cord *n*, withdraws the latch G, and thus releases the clutch mechanism on both sides of the car.

It is found desirable to provide a ready means for ascertaining whether the safety mechanism is in order, so that it can be tested from time to time without detaching the cable and without any danger to the persons conducting the test. To this end the sliding plate or latch G is provided with a rack *h*, with which gears a pinion *i* on a shaft *l*, extending into the car and provided with a wheel *o* for turning by hand. By this simple means the latch G may at any time be thrown out of engagement with the wedges and the car, being at the time descending, will be suddenly arrested if the mechanism be in operative condition. Obviously other equivalent means for operating the latch for the purposes of a test may be substituted for those described.

Fig. I shows means for resetting the brake mechanism after it has been thrown into operation, said means comprising a lever *r*, connected at one end to the operating-rod *s* and at the other by links *t* with the horizontal levers *u*, whose outer ends are pivoted to the rods *p*. To reset the safety-clutch mechanism, the operator presses with his foot on the end of rod *s*. His weight, operating through the compound levers described, pulls down the rods *p* and the wedges, and as soon as the projections *k'* of the latter are below the catches or stops *g* of the latch-plate he resets the latter by turning wheel *o* in the proper direction.

The drawings show the mechanism on one side only of the car, for it will be understood that the other side has identically the same equipment. It will further be understood that modifications may be made in the forms and details shown without departing from the spirit of the invention.

We claim as our invention—

1. The combination of the wedges and their operating-springs normally held under tension, means for releasing said springs when the hoisting-rope breaks, and anti-friction rollers between the inclined sides of the wedges and the car, substantially as described.

2. The combination of the wedges and their springs, the latch normally keeping the wedges inoperative, connections between the hoisting-rope and the latch for withdrawing the latter in case of breakage of said rope, and anti-friction rollers between the inclined sides of wedges and the car, substantially as described.

3. The combination, with the arresting devices, such as wedges and their springs, of a latch-plate normally holding said devices out of action, a double hoisting-rope passing around a pulley attached to the car, and cords crossed under the pulley and connecting said latch-plate with the two members, respectively, of said hoisting-rope, substantially as described.

4. The combination, with the arresting devices, such as wedges, and the latch adapted to release said devices upon the breakage of the hoisting-rope, of manually-operated means for withdrawing and replacing said latch, substantially as described.

5. The combination, with the arresting devices adapted to clutch a stationary part of the elevator-shaft and arrest the falling car, of a system of manually-operated levers, as set forth, for releasing and resetting said arresting devices, substantially as described.

6. The combination of arresting devices, springs for throwing said devices into action, a controlling-latch holding said devices out of action against the force of said springs, hand-operated mechanism for withdrawing said latch for the purpose of testing the arresting devices, and mechanism under the control of the operator in the car for resetting said devices, so that the latch can be returned to its normal position, substantially as described.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

CHARLES W. FOWLER.
ANDREW M. COYLE.

Witnesses:
PHILIP MAURO,
NELSON HISS.