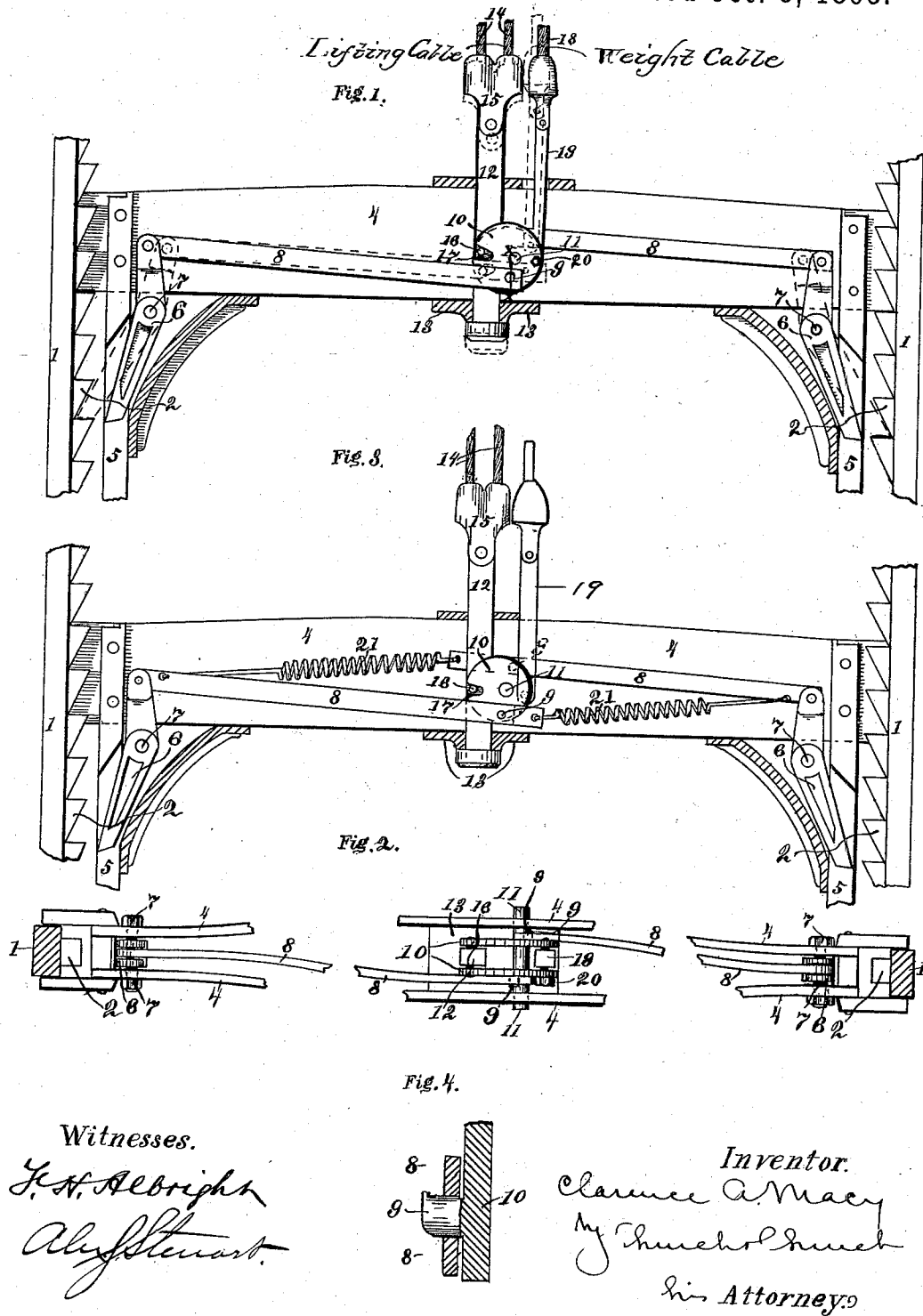


(No Model.)

C. A. MACY.
SAFETY DEVICE FOR ELEVATORS.

No. 547,493.

Patented Oct. 8, 1895.



UNITED STATES PATENT OFFICE.

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SAFETY DEVICE FOR ELEVATORS.

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To all whom it may concern:

Be it known that I, CLARENCE A. MACY, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Safety Devices for Elevators; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

My present invention has for its object to improve the construction and operation of that class of safety devices for elevators in which the descent of the car is automatically arrested when from any cause the lifting-cables are broken; and it consists in certain improvements in construction and combinations of parts, all as will be hereinafter fully described, and the novel features pointed out in the claims at the end of this specification.

In the drawings, Figure 1 is a side elevation of a portion of the lifting-head of a freight-elevator car, one of the side plates being removed; Fig. 2, a plan view of the same. Fig. 3 is a view similar to Fig. 1, showing a form of the invention in which a double safety device is employed; Fig. 4, a vertical sectional view on the line *xx* of Fig. 1.

Similar reference-numerals in the several figures indicate similar parts.

1 1 indicate the ordinary guides or ways on which the elevator-car travels, and 2 the rack-bar with which the safety catches or dogs on the car are adapted to co-operate. The cross or draw head of the car may be of the ordinary or any suitable construction, and is composed, preferably, of the two side beams 4 4, connected at suitable intervals by bolts and frames, and to which the suspending rods or standards 5 of the cars are attached, as shown. Arranged at the end of the cross-head and between the side plates thereof are the dogs or catches 6, pivoted at 7 and arranged relative to the rack-bars 2 so that when the lower ends are moved outward they will engage said racks and prevent the descent of the car. One of these catches is arranged on each side of the car, and at their upper ends are connected the outer ends of links 8, the inner ends of which are connected to pins 9, formed

upon disks 10, arranged at or near the center of the heads, and both mounted and adapted to turn upon a bolt or pin 11. The pins for the two links are arranged upon opposite sides of the pivot bolt or pin, so that when the disks (which are connected) are turned in one direction said links will be moved toward the center of the cross-head and the dogs will be thrown out and engage the racks, and when turned in the other direction the catches will be retracted to their normal position.

12 indicates the lifting or king bolt having the head at its lower end engaging the cross-piece 13 on the head, while its upper end is connected to the lifting-cables 14, in the present instance by means of a suitable clevis 15, and connected to said king-bolt is a bolt or pin 16, the opposite ends of which project outward and engage slots 17, formed in the two disks 10, the construction being such that when the bolt moves downward by reason of the breaking of the cables or otherwise the disks will be permitted to rotate in a direction to cause the outward movement of the engaging-catches; but normally when the car is suspended upon said cables the pin 16 will hold the dogs positively out of engagement.

In freight-elevators which are adapted to carry a greater weight than, say, fifteen hundred pounds it is usual to employ means for operating the safety devices outside of the car, such as counterweights, which may serve to counterbalance the car, or a weight which serves simply to operate the safety devices, but does not counterweight the car, in both instances said weight being connected to a cable one end of which travels with the car, and in the drawings I have indicated such a cable by 18, connected to a link 19, the lower end of which is pivoted to the disks 10 by a bolt 20, extending between and serving to connect them, said connected disks forming what I shall term a "rotary" member. This bolt, it will be noticed, is somewhat nearer the pivot of the disks than the pin on the king-bolt, so that there is always a slight leverage in favor of the latter, the object of this being to prevent the operation of the safety-catches when the car is suddenly arrested by the stop-

page of the motor actuating the lifting-cable. From the above it will be understood that under normal circumstances the safety-dogs will be held retracted, as shown in Fig. 1; but if the lifting-cables should break the king-bolt will be dropped, and the weight-cable, pulling upon the link 19, will rotate the disks and move the links inward and the catches outward into engagement with the racks.

In the use of elevators not designed to carry very heavy weights it is not essential that a weight-operating cable be employed in addition to the lifting-cable; but in order that my safety device may be used in such a construction I employ tension-springs 21, one end of each of said springs being connected to one of the links operating one of the dogs, while the other end is connected, preferably, to the link operating the other dog, as shown particularly in Fig. 3, or, if desired, to the upper end of the dog itself. From this construction it will be seen that the springs are kept normally under tension and the dogs retracted by the king-bolt, which is engaged with the disks, as before, but that if the lifting-cable breaks and the king-bolt drops the springs will serve to throw out the dogs, causing them to engage the racks and arrest the car. Although two springs are shown it will be understood that one could be employed.

I have shown in Fig. 3 both the weight-cable and the spring device for operating the safety-catches, and they may be used together, if desired, the spring device serving to operate the catches if the weight should be caught in its ways or should fail otherwise to properly operate them, and this would enable me to use a lighter counterweight; but in practice I prefer to employ the spring device alone for elevators carrying comparatively-light loads, and the weight device, as in Fig. 1, for elevators carrying heavy loads. The disks, it will be noted, are in effect levers connected and have no particular function as disks except strength, so that their peripheries between the points of connection of the links, pins, and levers could be cut away, if desired; but I prefer the arrangement shown, as the disks may be made of cast-steel, it being desirable to dispense with forged parts in this class of devices on the ground of economy. The pins 9 on the disks are preferably cast integral with them, and their ends are turned over, as in Fig. 4, to prevent the removal of the ends of the links, (though facilitating their application,) the outer ends being prevented from turning off by the yokes at the upper ends of the catches, which embrace them, as shown.

By employing two disks, connected as shown, and which constitute what I shall term a "rotary" member, I am enabled to mount the lifting or king bolt in the middle of the car, and as the parts are balanced I avoid any possibility of their cramping, and by employing the disks and links the dogs are operated by the longitudinal movement of the links 8,

thereby enabling me to employ a comparatively narrow cross-head for the car.

I claim as my invention—

1. The combination with the racks arranged in an elevator-well, an elevator-car, the dogs or catches pivoted thereon and the links connected to them, of the rotary member to opposite sides of the center of which the links are connected, the lifting cable engaging said member to rotate it in a direction to cause the links to pull the dogs into engagement with the racks, and operating devices engaging the member to rotate it in the other direction, but connected at a shorter distance from the center of motion than the connection with the lifting cable, substantially as described.

2. The combination with the racks arranged in an elevator-well, an elevator-car, the two connected disks thereon, the links connected thereto, and the pivoted dogs connected to the links and adapted to engage the racks, of the lifting-cable, the king-bolt to which it is connected engaging the disks, and preventing their movement in one direction and also engaging the car, and operating devices for rotating the disks when the lifting cable breaks, substantially as described.

3. The combination with the racks arranged in an elevator-well, an elevator-car, the connected rotary disks thereon, the dogs or catches, the links connected to them and to the disks on opposite sides of the center, of the lifting cable, the bolt to which it is connected engaging the car and arranged between the disks and engaging them, the weight cable connected to the disks and tending to operate them to throw out the catches, substantially as described.

4. The combination with the racks arranged in the elevator-well, an elevator-car, the pivot-pin or bolt, the two disks thereon, each having the slot and the crank-pins on opposite sides of the center, the dogs or catches, and the links connected to them and to the crank-pins, of the king-bolt engaging the car having the cross-bolt engaging the slots in the disk, and the weight-cable connected to the disks for turning them, substantially as described.

5. The combination with the racks arranged in an elevator-well, an elevator-car, the rotary member thereon, the king-bolt engaging the car and the rotary member, of the dogs or catches, the links connected thereto and to the rotary member on opposite sides of the center, and a spring connecting the links for positively moving them in opposite directions to cause the engagement of the catches with the racks, substantially as described.

6. The combination with an elevator-car, the pivoted catches or dogs arranged at the outer sides thereof, a rotary member at the middle of the car, and links connected to the catches and to the rotary member, of the king-bolt engaging the car and the rotary member, the lifting cable connected to the king-bolt, the weight-cable connected directly to the ro-

tary member on the side of the center opposite the king-bolt, substantially as described.

7. The combination with the car, the stationary pivot-bolt thereon, the two disks, each
5 having the slots, the pins with curved ends, and the bolt connecting them on one side of the pivot, of the pivoted catches, the links pivoted to them and engaging the pins on the disks, the king-bolt having the cross-pin, and
10 engaging the car, the lifting-cable, and the weight-cable connected to the bolt connecting the disks, substantially as described.

8. The combination with the racks arranged in an elevator-well, an elevator-car, the dogs

or catches, the rotary member, and the links 15 connected to the catches, and to the rotary member on opposite sides of the center of rotation, the lifting cable connected to one side of the member, the weight cable connected to the opposite side, and the springs operating upon the dogs to cause their projection, substantially as described and for the purpose specified. 20

CLARENCE A. MACY.

Witnesses:

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G. A. RODA.