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UNITED STATES PATENT OFFICE.

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AUTOMATIC SAFETY-GATES FOR FREIGHT-ELEVATORS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE W. UNDERWOOD, a citizen of the United States, residing at Council Bluffs, in the county of Pottawattamie, State of Iowa, have invented certain new and useful Improvements in Automatic Safety-Gates for Freight-Elevators, of which the following is a specification.

10 My invention relates to improvements in new and useful devices whereby the safety gates of an elevator are operated by the passage of the elevator car, and my object is to provide novel devices of this character
15 which are simple in construction and operable, and not liable to get out of order.

Other objects of the invention will hereinafter appear and in order that said invention may be fully understood, reference
20 will now be made to the accompanying drawing, in which:

Figure 1 is a vertical section of an elevator shaft, the elevator car and the gates. Fig. 2 is a broken front elevation of the
25 parts shown in Fig. 1, with the gates removed. Fig. 3 is a broken detail front elevation of a sprocket-chain employed in carrying out the invention, and Fig. 4 is a broken detail side elevation of a propelling
30 chain forming part of the invention.

The same letters of reference are used to indicate identical parts in all the figures.

A designates a freight elevator car; B one of the guide-posts for the car; D two floors
35 of a building, and *a-a* the safety gates to guard the hatchways of the respective floors, but one pair of gates being shown for the lower floor in the present instance.

Two cables *b-b* are attached at one end
40 to their respective gates *a-a* and at their other end to an eye-bolt T, secured to a counterweight K, which assists the elevator car A to raise the gates *a-a* and thus relieve the several parts of the device of the
45 major portion of the weight of said gates and the friction incident to raising the same. Cables *b-b* in their passage from the gates *a-a* to the counterweight K run over guide-sheaves *c-c* and S-S, the former
50 being supported from the upper floor D, while the latter are loosely-mounted upon a shaft L, mounted in a pair of brackets *m* projecting from the adjacent guide posts B. Shaft L is provided with a loosely-mounted
55 sprocket-wheel *f*, arranged between the brackets *m*, over which an endless, propel-

ling sprocket-chain E runs, said propelling sprocket-chain running beneath a sprocket-wheel F. Sprocket-wheel F is keyed upon a shaft G mounted in a tightener P—R, secured to the guide-post B to take up slack
60 in the propelling-chain E and a sprocket-chain *i*, hereinafter referred to. The sprocket-chain *i* has a link J provided with a laterally-projecting stud upon which the
65 counterweight K is mounted. Propelling chain E is provided with forwardly projecting lugs *d*¹ and *d*² spaced a short distance apart to receive the outturned terminal of an arm C, projecting from the upper portion
70 of one side of the elevator car A for the purpose of actuating the propelling chain E, as will hereinafter appear.

H designates a large sprocket-wheel keyed upon shaft G beside the small sprocket-wheel F and operably-connected through the
75 intermediacy of sprocket-chain *i* to another large sprocket-wheel *h*, loosely-mounted upon a stub-shaft O, projecting laterally from a bracket N, secured to guide-post B,
80 intermediate the brackets *m* and the tightener P—R which are located near the upper and lower floors, respectively.

Operation: As the elevator car A travels from the lower floor D to the upper floor D,
85 arm C engages lug *d*¹ and carries the same upward until it, through the intermediacy of the propelling chain E, moves counterweight K to the right from its position at the dead-center extending vertically through the axis
90 of the sprocket-wheel H. As the counterweight K moves outward to the right from said dead-center, it is drawn upward by the descending gates *a-a*, which are heavier
95 than said counterweight and draw the same upward to the dotted position shown on Fig. 1. As the counterweight K is drawn upward, it, through the intermediacy of the
100 intervening mechanism actuates the propelling chain E until the lugs *d*¹ and *d*² are carried upward to the dotted position shown on Fig. 1, at which time the gates *a-a* reach closed position. As the gates move downward to closed position they are retarded by
105 lug *d*², which is drawn up into engagement with arm C, thus it will be understood that the gates cannot descend more rapidly than the elevator car ascends. When the elevator
car descends from the upper floor D to the lower floor D, arm C engages lug *d*², and
110 carries the same downward, so that it, through the intermediacy of the interven-

ing mechanism, will draw the gates *a— a* upward to open position.

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

1. In combination with an elevator gate and an elevator car, a counterweight to assist in raising said gate to open position, a suitably-guided cable attached at its ends to the gate and said counterweight, a chain carrying the counterweight, a propelling chain geared to the first-mentioned chain to actuate the same, two lugs spaced a short distance apart on said propelling chain, and an arm on the elevator car adapted to engage one of said lugs and move the propelling chain in one direction to open the elevator gate and engage the other lug to move the propelling chain in a reverse direction to close the gate, substantially as described.

2. In combination with a pair of elevator gates and an elevator car, a counterweight to assist in raising said gates to open posi-

tion, suitably-guided cables attached at their ends to the gates and said counterweight, an endless sprocket-chain carrying said counterweight, a pair of sprocket-wheels around which said sprocket-chain extends, an endless propelling sprocket-chain, a pair of sprocket-wheels around which said propelling chain extends, a journaled shaft upon which one of the sprocket-wheels for each chain is keyed so that the propelling chain may actuate the first-mentioned chain, a pair of lugs spaced a short distance apart and projecting from one side of the propelling sprocket-chain, and an arm carried by the elevator car and adapted to engage one of said lugs to move the propelling-chain in one direction and engage the other lug to move said propelling chain in a reverse direction to open and close the elevator gates, substantially as shown and described.

GEORGE W. UNDERWOOD.

Witnesses:

I. F. DUNHARY,

H. S. GATES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."