

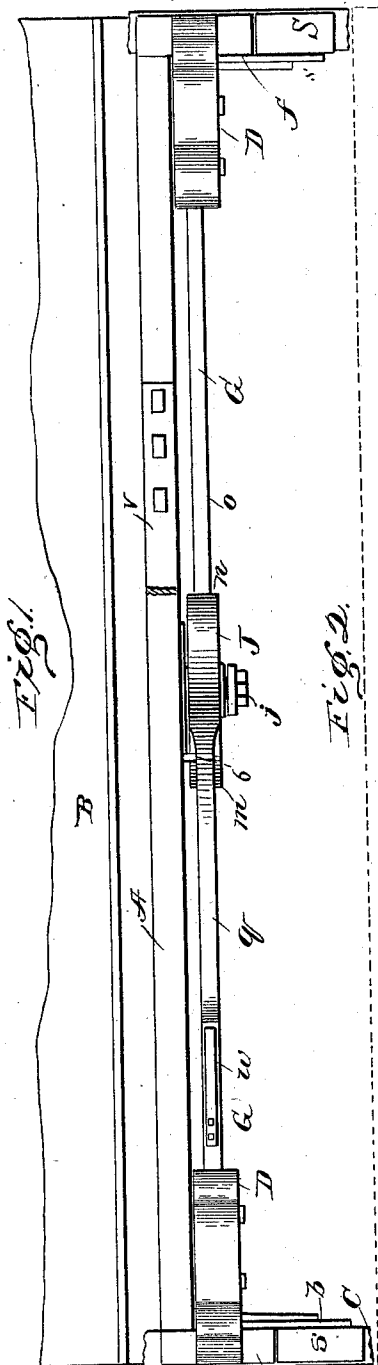
(No Model.)

2 Sheets—Sheet 1.

E. COLLINS.
SAFETY ELEVATOR BRAKE.

No. 559,569.

Patented May 5, 1896.



Witnesses:

J. M. Fowler Jr.
Wm P. Churchill.

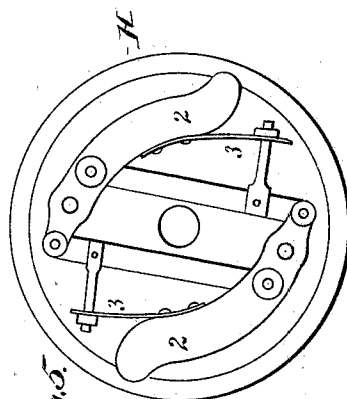
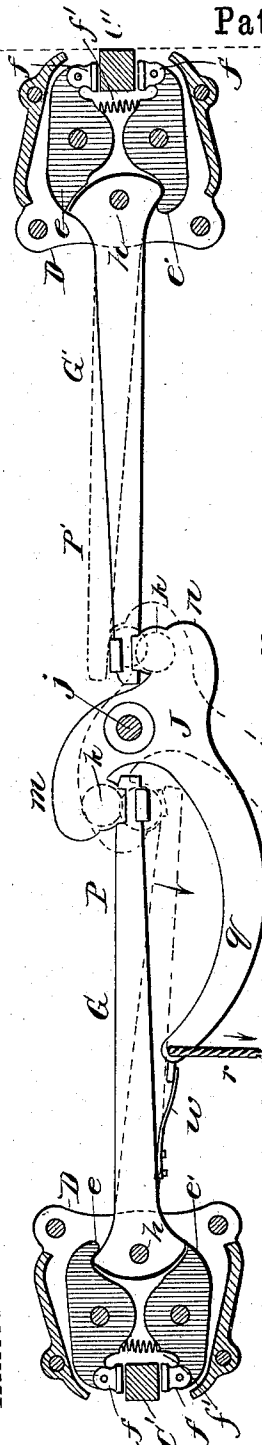


Fig. 3.

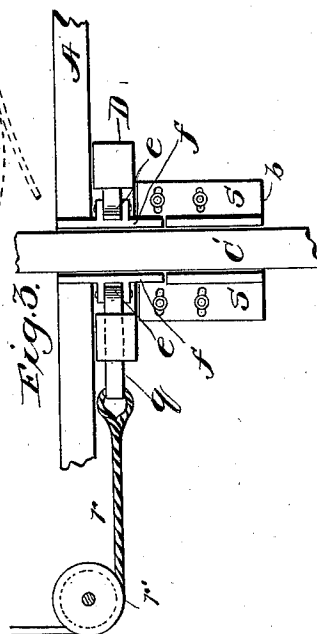


Fig. 4.

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Edw. Collins,
by N. L. Frothingham,
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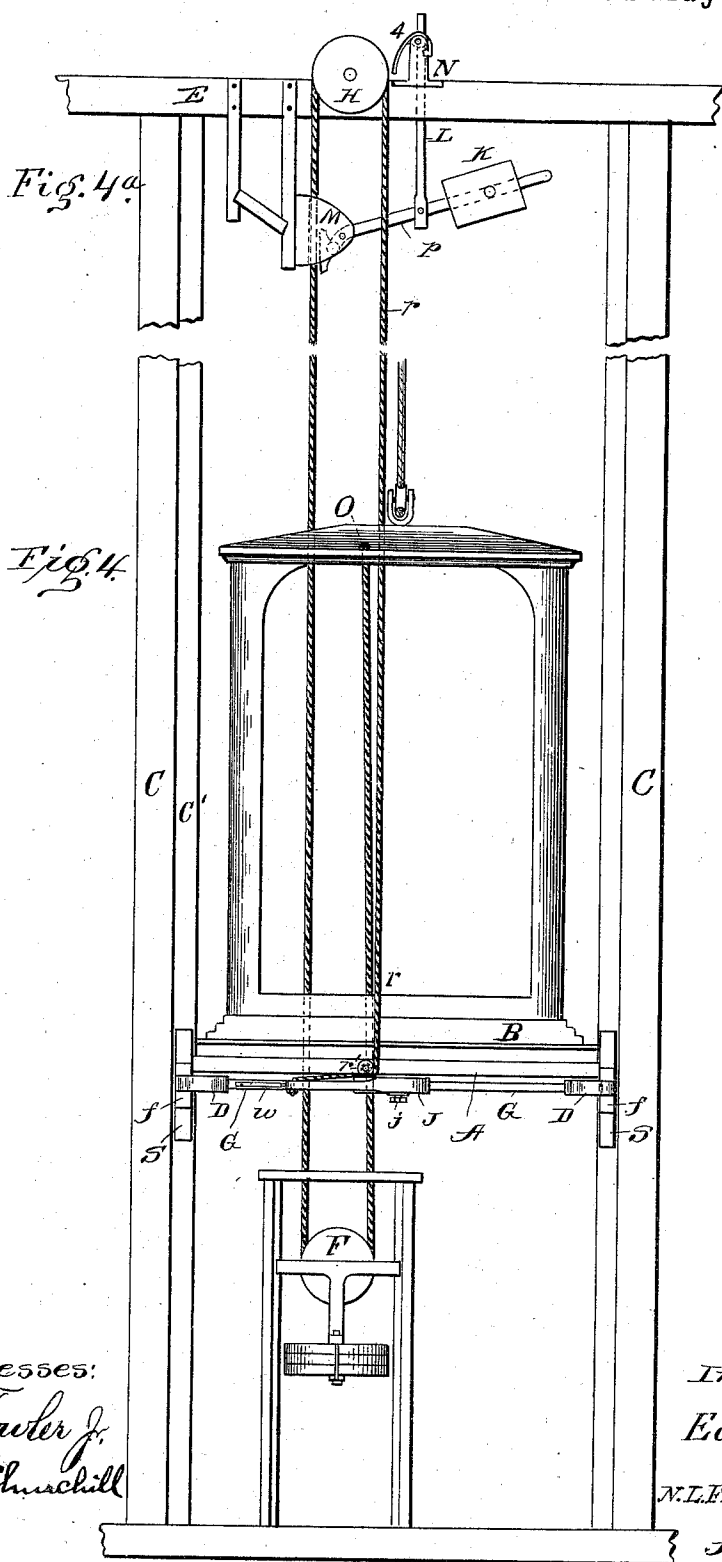
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UNITED STATES PATENT OFFICE.

EDWARD COLLINS, OF NEW YORK, N. Y.

SAFETY ELEVATOR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 559,569, dated May 5, 1896.

Application filed October 16, 1895. Serial No. 565,920. (No model.)

To all whom it may concern:

Be it known that I, EDWARD COLLINS, a citizen of the United States, and a resident of New York city, county and State of New York, have invented a new and useful Improvement in Safety Elevator-Brakes, of which the following is a specification.

My invention relates to improvements in safety-brakes for elevator-cars; and it consists in a novel combination of brake mechanism and compound levers for operating the same on occasion and clamping the brake-shoes powerfully to the guide-rails on which the car traverses, in conjunction with a rope, cord, or chain ordinarily moving with the car, but controlled by a governor and trip and clamp mechanism, which only operates when an accident occurs to greatly accelerate the motion of the car. The said governor and stationary trip and clamp mechanism I have illustrated and described for the sake of perspicuity; but my claims to invention are herein confined to the brake mechanism borne on the traversing car.

In the accompanying drawings, forming a part of this specification, I have shown, in Figure 1, a side view of my improvement. Fig. 2 is a plan view, partly in section; and Fig. 3 is an end view. Fig. 4 is a front view of the elevator-car with the vertical guide-posts and guide rails or runners, showing my device secured beneath the car to the bottom timbers thereof, also the running-rope by which the safety device is operated. Fig. 4^a is a view of a governor, trip, and clamping device by which the safety mechanism may be brought into action. Fig. 5 is a detail view of a convenient form of governor which may be employed for the purpose.

Referring to Figs. 1, 2, and 3, which illustrate my specific improvement, B represents a portion of the elevator-car, to the bottom timber A of which the operating parts of my safety-brake attachment are securely bolted on the under side thereof. D D are hollow head-blocks firmly secured to the timber A, one at each end. (Shown in section.) *e e'* illustrate members of the compound clamping-levers pivoted within the head-blocks. G G' are the long lever members of the compound clamping-levers, also pivoted within the head-blocks. *ff* are the brake-shoes car-

ried by the clamping-plates *e e'* and pivoted thereto. These brake-shoes engage with the vertical guide-runners and compress the same between their faces when the safety device is called into operation. The faces may be grooved or roughened to promote adhesion, if desired. By the pivotal connection between the brake-shoes and the clamping members or short levers the former are enabled to adjust themselves in position to the vertical surface of the guide-runners, so as to secure contact of the entire surface. *f'* denotes a spring the purpose of which is to keep the outer ends of the clamping-plates *e e'* away from each other when the lever J is in its normal position. J is another lever, firmly secured by a pivot-bolt to the timber A at *j*. Its office is to act upon and operate the long arms of the levers G G' when itself operated upon by the rope *r*, which connects its long arm *g* with the governor and trip and clamp mechanism. This action is conveyed through the medium of the short lever-arms *m n*, which may be provided with antifriction-rollers *k k*, as shown, for the purpose of reducing friction. S S are two guide-plates provided with slots, as shown in Fig. 3, through which suitable securing-bolts pass into webs *s*, formed on each head-block. This enables them to be adjusted. *vw* are springs employed to prevent the lever J from being accidentally operated by the check-rope and to retain the levers in their normal position. *6* denotes a pin or bolt which drops down after the lever J is drawn out, as shown in dotted lines, Fig. 2. The object of this construction is to prevent the lever J from returning to its normal condition if by any chance the rope *r* should break after the operating-lever J has been drawn out, as shown in said dotted lines.

Referring to Figs. 4 and 5, which are introduced merely for purposes of illustration, to show an operative device, B is a front view of the elevator-car, showing my device attached to its bottom timbers. C C are the vertical guide-posts, and C' C' the guide-runners on which the brake-shoes simultaneously operate when in action. *r* is the running-rope, made fast to the car at one end, as at O, Fig. 4, passing downward over the tension-sheave F and upward over the governor-pulley, and thence over pulley *r'* to the long arm *g* of lever

J, as shown in Fig. 2. The rope *r* is thus seen to travel with the car under ordinary circumstances, and has no special function until arrested, in case of accident, by the operation of the clamp M. E is the upper framework of the building, supporting the governor H and pulley attached, over which the rope *r* traverses. N is a standard carrying a rocking trip 4, which may be of any convenient form, its office being to sustain the rod L, supporting the lever-arm P and weight K until tripped by the action of the governor H. The operation of this portion of the mechanism, to which I lay no claim in this application, is as follows: Upon the breaking of the main cable, which supports the elevator in its travels, the rope *r*, which travels with the elevator-car, accelerates the motion of the governor, which is so arranged that its accelerated movement springs the trip 4, which in turn lets drop the rod L and with it the lever-arm P and weight K. This operates the clamp M, arresting the movement of the rope *r*, and thereby causing a sudden pull with a force proportioned to the weight and momentum of the car upon the lever J, to which it is attached. This is communicated through the compound-lever system to the brake-shoes *ff*, to produce the desired effect. The governor may be arranged to produce the trip in any well-known manner to cause the desired result. As I have shown it for purposes of illustration merely, the weighted arms 2 2 (shown in Fig. 5) are forcibly thrown outward against the tension of the springs 3 3 by the centrifugal force due to the increased velocity, and in their expansion come into contact with the lever-arm of the trip 4; but this may be varied *ad infinitum* to suit the pleasure of the designer.

The specific operation of my device will now be described. When the travel of the rope *r* is suddenly arrested by the action of the governor and trip mechanism, as aforesaid, a strong pull is communicated to lever-arm *q* of the lever J, to which the said rope *r*, passing over pulley *r'*, is attached, and this instantly moves the said lever-arm outward against the tension of the spring *v*. Motion is thereby transmitted through the chain of compound levers to the brake-shoes *ff*, which are simultaneously constricted toward each other, embracing the guide-runners in their jaws, and thus arresting the downward movement of the car.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a safety-brake for elevators, in combination with a running-rope *r*, controlled by a governor, trip, and clamping mechanism, a compound-lever system comprising lever J having long arm *q* and short arms as *m*, *n*, levers G G', clamping-levers *e e'* and

pivoted brake-shoes *ff*, acting upon the guide-runners C' C' to clamp the same when operated by unusual stress upon the rope *r*, substantially as specified.

2. In a safety-brake for elevators, the head-blocks D D, the clamping-levers *e e'*, pivoted within the said head-blocks, brake-shoes *ff*, pivoted to the said clamping-levers, one on each side of the guide-runners, lever J, having arms *m*, *n* and *q*, levers G G', pivoted within the head-blocks, having short arms acting in opposite directions on the arms of the clamping-levers *e e'*, long arms P P, acted on in opposite directions by the short arms *m n* of the lever J, and rope *r*, substantially as specified.

3. In a safety-brake for elevators, a pair of clamping-levers as *e e'*, pivoted in head-blocks D D, carrying brake-shoes as *ff*, pivoted thereto, which engage with the guide-runner, and compound levers acting upon the said clamping-levers to compress the brake-shoes through the medium of a rope, cord or chain *r*, when an unusual strain occurs upon the latter through the accelerated motion of the car downward, substantially as specified.

4. In a safety-brake for elevators, the combination of head-block D, adjustable guide-plates S, held to webs *s*, clamping-levers *e e'*, carrying pivoted brake-shoes *ff*, lever G acting upon the said clamping-levers simultaneously to compress the brake-shoes, and pivoted lever J, having short arm *m* acting on the long arm of lever G, and long arm *q* acted upon by the rope or chain *r*, when strain occurs in the said rope or chain, all substantially as specified.

5. In a safety-brake for elevators, the combination of the head-block D, guide-plates S, clamping-levers *e e'*, brake-shoes *ff*, lever G acting upon the said clamping-levers simultaneously to operate the brake-shoes, lever J, having arm *m* acting upon long-arm lever G, and arm *q* acted upon by the rope or chain *r*, when strain occurs in the said rope or chain, substantially as specified.

6. In a safety-brake for elevators, the clamping-levers *e e'*, pivoted in head-block D, carrying pivoted brake-shoes *ff*, which engage with the guide-runner, in combination with double-acting lever G, operating simultaneously in opposite directions on the clamping-levers; lever J, and rope *r*, substantially as specified.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 23d day of September, 1895.

EDWARD COLLINS.

Witnesses:

I. N. ROGERS,
T. J. VAIL.