No. 624,096. Patented May 2, 1899.

C. F. RITCHEL.

SAFETY APPARATUS FOR ELEVATOR CARS.

(Application filed June 17, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

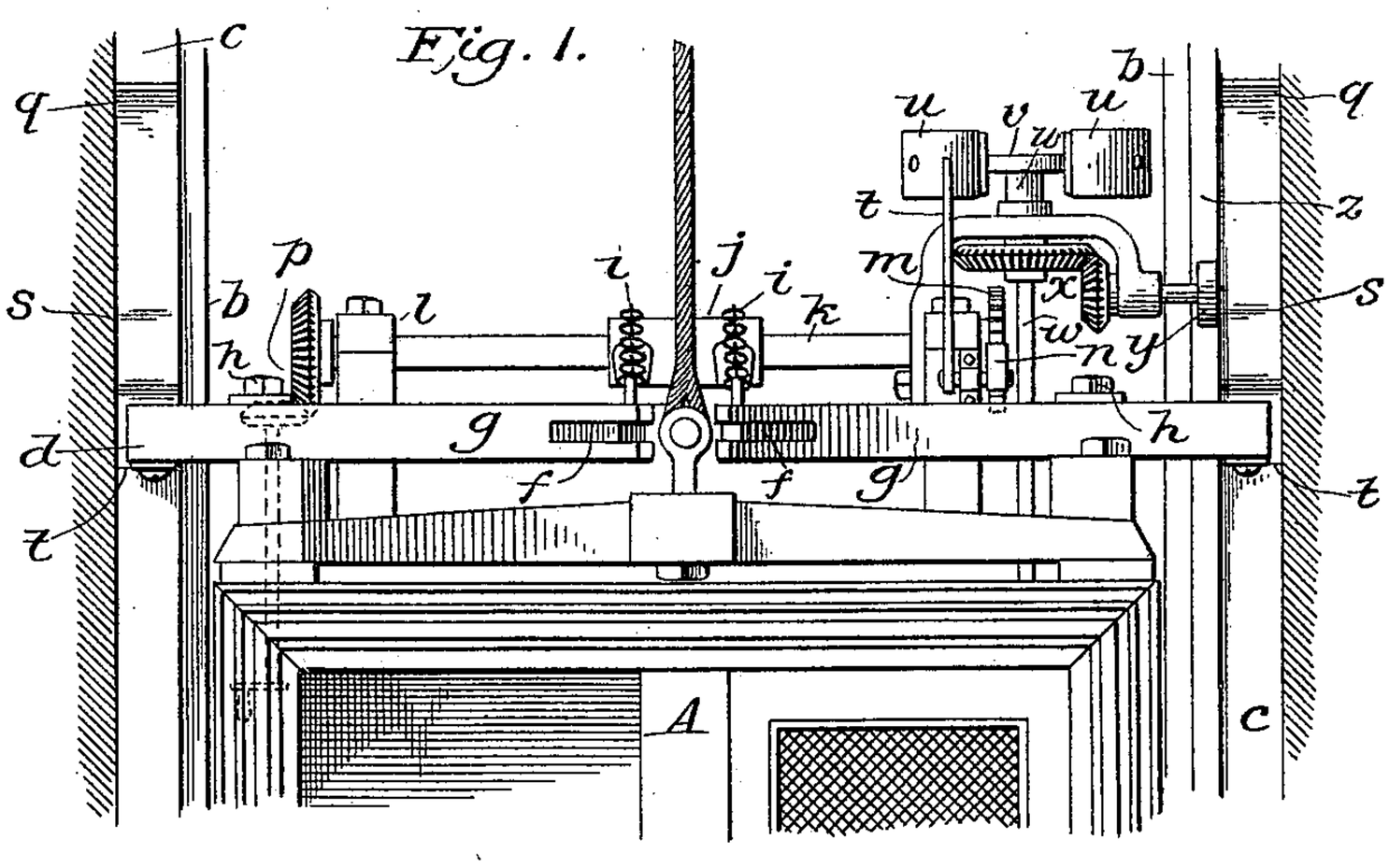
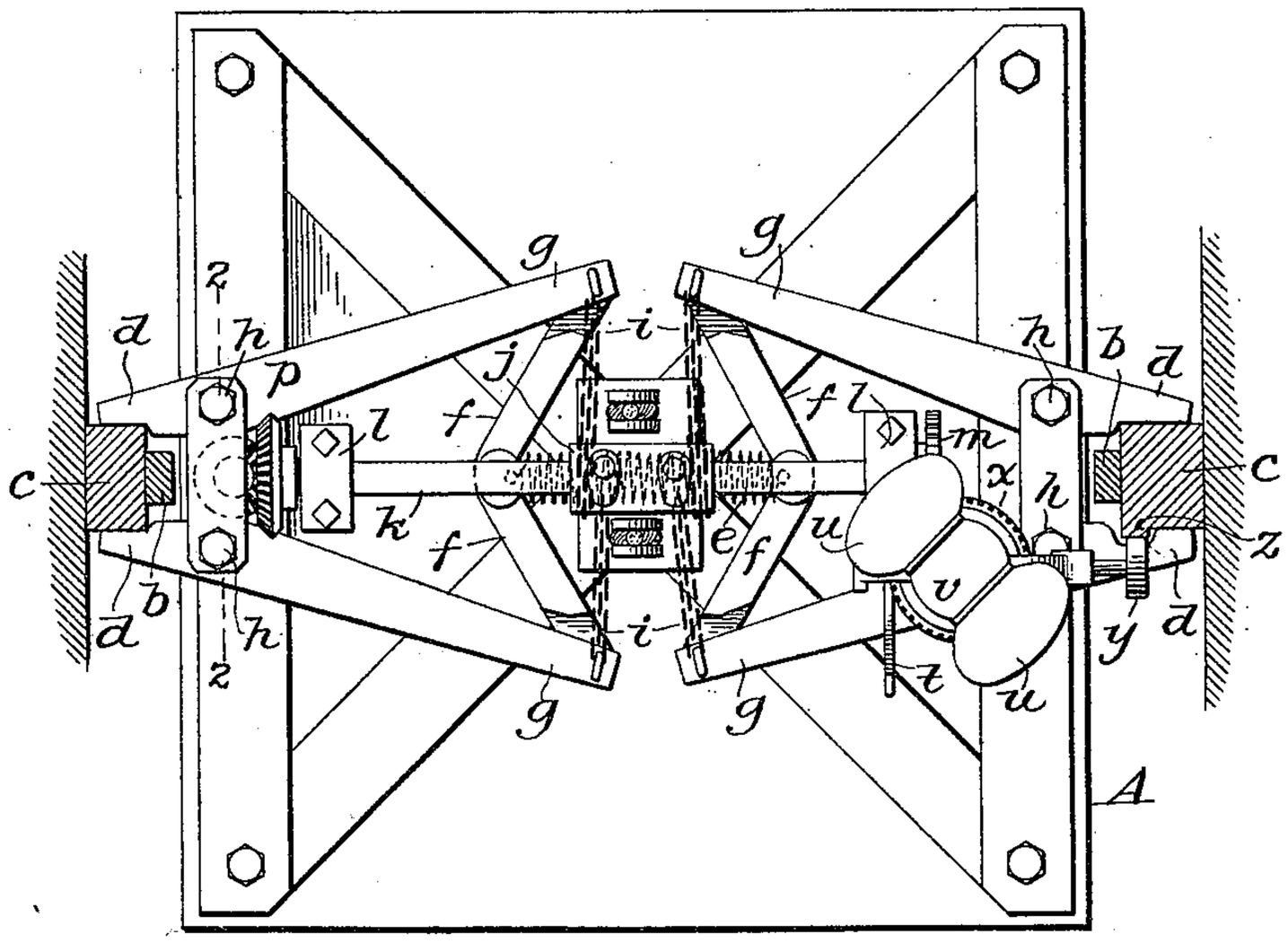


Fig. 2.



WITNESSES

James F. Duhamel

C. Sedgwick

INVENTOR

Chas F. Ritchel

BY

A. O. Thayer

ATTORNEY

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Fig. 3.

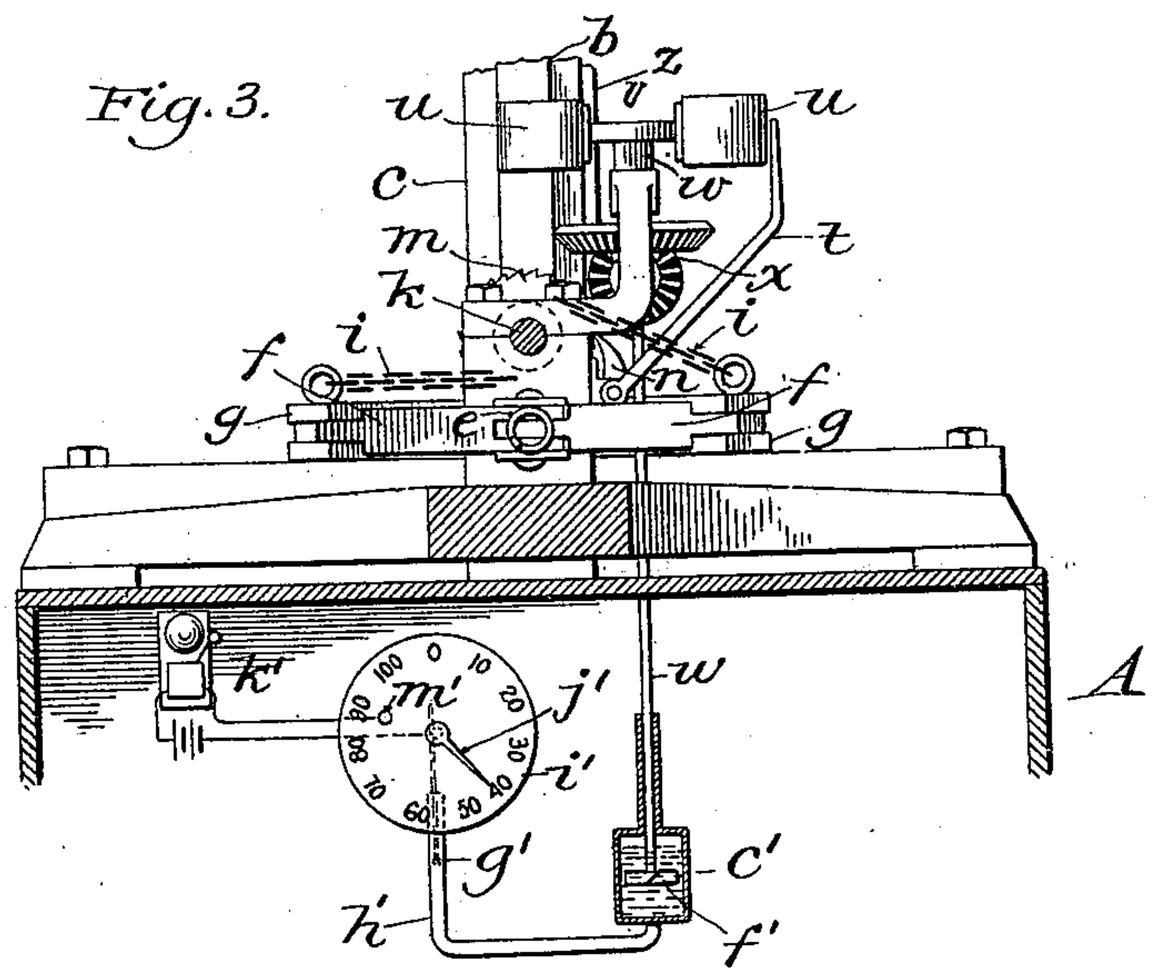


Fig. 4.

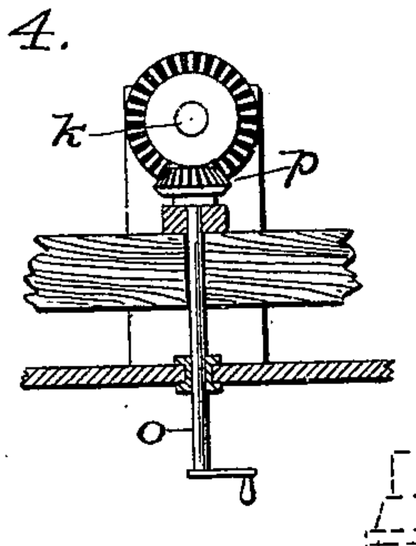


Fig. 5.

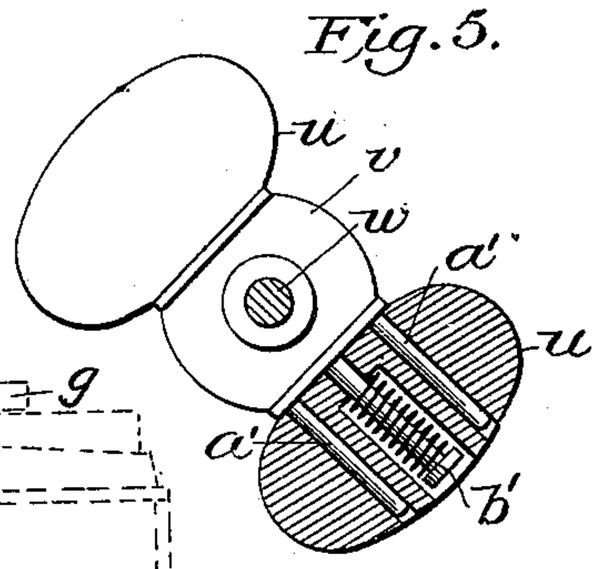
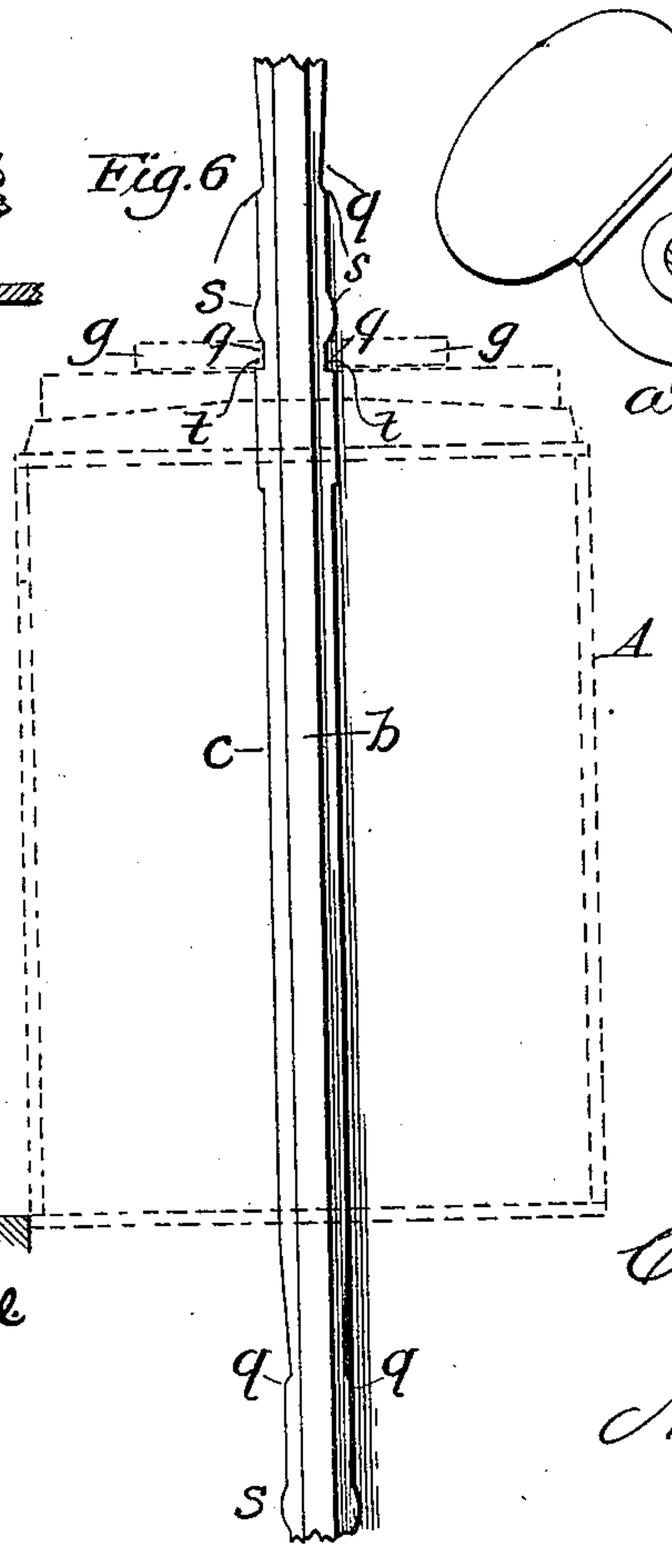


Fig. 6



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ATTORNEY

UNITED STATES PATENT OFFICE.

CHARLES F. RITCHEL, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR OF ONE-HALF TO JOHN P. PINKERMAN, OF SAME PLACE.

SAFETY APPARATUS FOR ELEVATOR-CARS.

SPECIFICATION forming part of Letters Patent No. 624,096, dated May 2, 1899.

Application filed June 17, 1898. Serial No. 683,772. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. RITCHEL, a citizen of the United States of America, and a resident of Bridgeport, county of Fairfield, State of Connecticut, have invented certain new and useful Improvements in Safety Apparatus for Elevator-Cars, of which the following is a specification.

My invention relates to improvements in the apparatus of friction gripping-jaws, such as are caused to grasp the sides of the vertical guideway-supporting posts when the car falls or descends more rapidly than it should to stop the car, as hereinafter described, reference being made to the accompanying drawings, in which—

Figure 1 is a side elevation of a car and its guideways and the supporting-posts therefor with safety apparatus contrived in accordance with my invention. Fig. 2 is a plan view of the car and a horizontal section of the guideways and posts. Fig. 3 is a transverse section of the top portion of the car. Fig. 4 is a detail in vertical section on line 2 2, Fig. 2. Fig. 5 is partly a plan view and partly a horizontal section of the balls of a centrifugal governor employed to release the gripping-jaws when it becomes necessary for them to act. Fig. 6 is an elevation of one of the posts, showing the contours of the sides to be gripped.

a represents the car; *b*, the guideways; *c*, the posts for supporting the guideways, and *d* the jaws for gripping the sides of the posts to arrest the fall of the car by friction, said jaws being caused to forcibly grip the sides of the posts by the powerful spring *e* and the toggle-links *f*, coupled to the extremities of the long arms *g* of the jaws and the jaws being pivoted at *h*, so as to afford powerful leverage to the spring and the toggle-links.

For detaching the jaws from their grip on the posts and securing them in a set position ready for action in an emergency the extremities of the long arms of the jaws are connected by chains *i* with a horizontal winding-drum *j* on a shaft *k*, having bearings at *l* on the top or bottom, if preferred, of the car, with a ratchet-wheel *m* and a pawl *n* to hold them, and a hand-crank *o* or other equivalent device is located within the car and geared with the shaft *k* by wheels *p*, suitable for turning it to set the jaws. As thus far described the apparatus is practically such as has been heretofore employed and is not claimed herein as my invention.

Instead of making the posts *c* with straight sides on which the jaws grip and depending wholly upon the friction of the jaws thereon to arrest the falling car I construct the sides in wave-lines, as indicated in Fig. 6, with one or more depressions *q* and bulges *s* and positive stop-shoulders *t* below the bulges and depressions at intervals along the posts in suitable relation with the floors for more effectually slowing the movements of the car prior to reaching the positive stops than plain surfaces would afford and effecting the full stops at the floors, as *t'*, Fig. 6.

For automatically tripping the ratchet holding mechanism and releasing the jaws when the car falls or descends more rapidly than it should do I have provided the upwardly-projecting lever-arm *t* on the axis of the pawl *n* with a pair of centrifugally-acting governor-balls *u* on horizontal arms *v* of a vertical shaft *w*, geared by bevel-wheels *x* with a trolley *y*, bearing on a rail-rib *z* of one of the posts for being rotated as the car runs up and down. The balls are mounted on fingers *a'* with a retracting-spring *b'*, so as to be thrust outward by centrifugal action when the speed is excessive into contact with the lever-arm *t*, and thus to detach the pawl and release the gripping-jaws. The trolley thus geared with a rail of a guideway-post avoids the necessity of a special rope for operating it, as in some prior constructions.

The retracting-spring *b'* has sufficient tension to prevent the balls from taking effect on the lever-arm *t* when the car runs at the proper rate of speed and the speed of the governor is normal.

I also represent, but do not claim in this application, a speed-indicator for the car, as follows: The shaft *w* is extended into the car and into an oil-pot *c'*, with a screw-propeller *f'* attached suitably for raising a column of oil against a piston *g'* in a vertical cylinder *h'* and geared with the axial pivot of a pointer *j'*, adapted to range around a dial *i'*, set up inside of the car for indicating

to the occupants of the car the rate of its speed for notice when the speed is unduly rapid, and there is an electric bell *k'* in circuit with the pointer *j'* and a stud-pin *m'*, through which the circuit is closed when the pointer comes in contact with the stud-pin to give an alarm when the speed of the car is excessive.

I claim—

1. In safety apparatus for elevator-cars, the combination of a guideway-post for the car having wave-like or depressed and bulged unyielding opposite sides, a pair of gripping-jaws on the car adapted for gripping said sides, said jaws having means to cause them to so grip the posts, also means to set and normally hold them free of the posts, and means to trip and release the jaws when the speed of the car is excessive, substantially as described.

2. In safety apparatus for elevator-cars, the combination of guideway-posts for the car having wave-like or depressed and bulged sides and positive stops below the bulges and depressions, of gripping-jaws on the car and adapted for gripping said sides, said jaws having means to cause them to so grip the posts, also means to set and normally hold them free of the posts, and means to set and release the jaws when the speed of the car is excessive, substantially as described.

3. In safety apparatus for elevator-cars, the combination of guideway-posts for the car having wave-like or depressed and bulged sides, gripping-jaws on the car adapted for gripping said sides, said jaws having means to cause them to so grip the posts, also means to set and normally hold them free of the posts, and means to trip and release the jaws when the speed of the car is excessive, said wave-like depressions and bulges grouped on the guideway-posts in the relation to the floor-landings for stopping the car thereat substantially as described.

Signed by me, at New York, N. Y., this 20th day of May, 1898.

CHARLES F. RITCHIEL.

Witnesses:
FRANK J. HUGHES,
CHARLES KELLER.