Aug. 19, 1924. 1,505,699

J. F. CLANCY ET AL

ELEVATOR CONTROL

Filed March 1, 1920

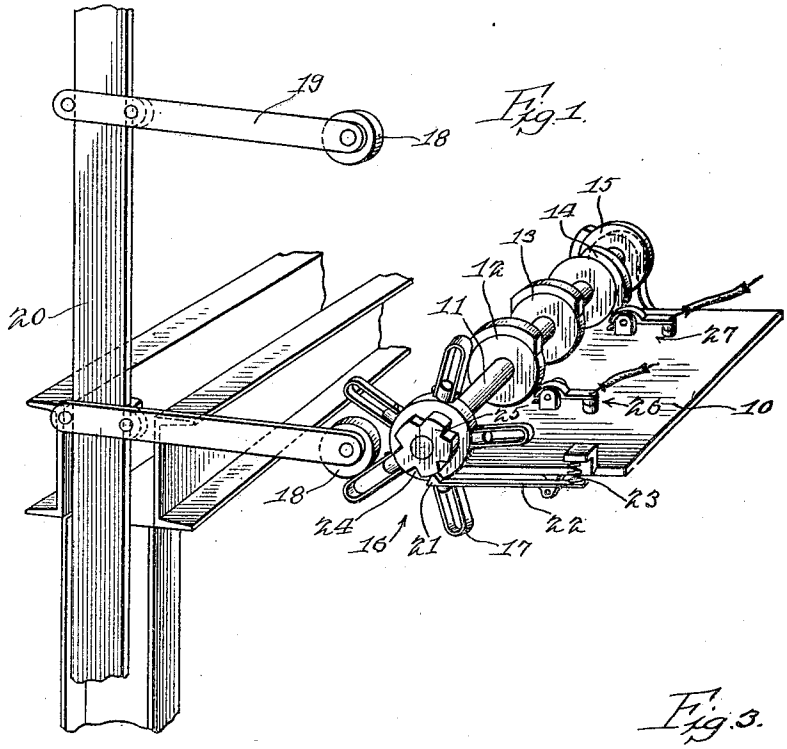


Fig. 1.

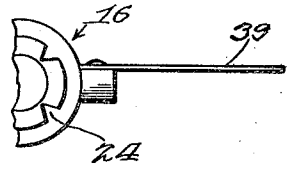


Fig. 3.

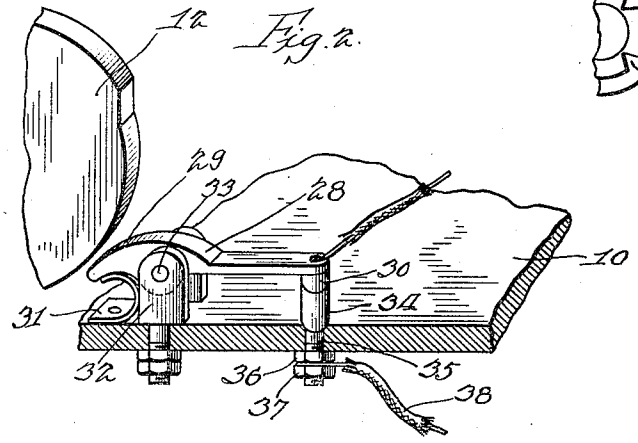


Fig. 2.

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UNITED STATES PATENT OFFICE.

JOHN F. CLANCY AND ADOLPH A. GAZDA, OF CHICAGO, ILLINOIS, ASSIGNORS TO KAESTNER & HECHT COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

ELEVATOR CONTROL.

Application filed March 1, 1920. Serial No. 362,492.

To all whom it may concern:

Be it known that we, JOHN F. CLANCY and ADOLPH A. GAZDA, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Elevator Controls, of which the following is a specification.

Our invention relates to controlling devices for elevators and more specifically to an improved unitary structure for automatically checking the speed and completely stopping an elevator whenever it reaches either end of the elevator shaft.

In elevators driven by means of frictional engagement between grooved wheels and the cables carrying the elevator, it is impossible to employ an automatic control device geared to the wheel or drum, on account of the gradual slipping and relative displacement between the drum and the cable.

One of the objects of our invention is to provide a control device independent of the drum and comprising relatively few parts and which may be so mounted with respect to the shaft and the elevator as to economize both in equipment and in wiring.

Another object is to provide such a device which will quickly and positively actuate appropriate controlling mechanism at any desired point or points in the motion of the car.

Further objects and advantages of our invention will become apparent as the description proceeds.

In the accompanying drawings, Figure 1 is a perspective view of a device according to our invention. Fig. 2 is an enlarged view of the cam and circuit breaker. Fig. 3 is a fragmentary view illustrating a modified form of radial contact arm.

In the embodiment of our invention selected for illustration all the mechanism to be carried by the car is preferably assembled on a base 10 which may be mounted on the car in any suitable or preferred manner, preferably on the roof of the same. The mechanism carried by the car comprises in this instance a rotatably mounted shaft 11 carrying a plurality of cam elements 12, 13, 14 and 15 and at one end a star wheel 16 having a plurality of radially projecting arms 17, in this instance five. Rubber rollers 18 are supported in stationary position by suitable means such as projecting arms 19 clamped or otherwise secured to a stationary guide rail 20 forming part of the structure of the elevator shaft. As the car, carrying the star wheel 16 moves past the stationary rollers they will make contact with one of the projecting arms 17 and rotate the shaft through a portion of a revolution. To prevent the "spinning" of the star wheel and shaft by contact with the stationary rollers, resilient means in the nature of a pawl 21 carried by a lever 22 pressed upon by a spring 23 is preferably provided to engage notches 24, one for each arm, in a boss 25 on the face of the star wheel 16. By this means the position of the shaft and cams is determined and firmly held after each contact with one of the stationary rollers. Associated with each cam element is an electric contact making device which we have illustrated in Fig. 1, 26 and 27. Referring to Fig. 2 it will be seen that the contact device comprises a simple pivoted arm 28 having a suitably shaped heel 29 to engage the advancing cam, and at its other end carrying an electric contact element 30. Resilient means in the nature of a leaf spring 31 may be employed to hold the contact arm 28 normally in closed position. A suitable standard 32 mounted on the base 10 supports the pintle 33 for the contact arm and a stationary electric contact 34 is carried on the upper end of a bolt 35 clamped to the base 10 by a nut 36. An additional nut 37 makes the bolt available as a binding post for an electric conductor 38.

To eliminate noise and rattling when the rollers contact with the arms 17 these arms are preferably formed of U-shaped loops of resilient metal. We have found that the combination of a resilient metal arm and a rubber roller eliminates to a large extent both noise and wear. In some cases we have found it advantageous to employ a simple strip 39 (see Fig. 3) of resilient metal which in certain instances will operate practically as well as the U-shaped pieces illustrated in Fig. 1.

The operation of the device is as follows:

As the elevator approaches the top of the shaft the star wheel 16 will move upward as shown in Fig. 1 past the rollers and upon making contact with the first roller 18, the

shaft will be rotated through one-fifth of a revolution. This motion will be sufficient to carry the cam 15 into contact with its rocker arm and open a circuit which will reduce the speed of the car. Upon further motion of the car the upper roller 18 will make contact with the next radial arm and rotate the shaft 11 far enough to carry the cam 13 into engagement with its contact arm which will open a control circuit arranged to completely stop the car. Similarly, when the elevator approaches the bottom of the shaft the star wheel and cams will be rotated in the opposite direction and contact devices 27 and 26 will be actuated by their respective cams to slow down and stop the car. The contact devices cooperating with cams 15 and 13 are on the opposite side of shaft 11 from devices 27 and 26, and in Fig. 1 are hidden by the shaft and cams.

We have illustrated only four cams which provide only one intermediate step in the slowing down and stopping of the car but it will be obvious that a greater number may be provided, three steps or four being desirable for high speed elevators.

It has been customary in the past to check the elevator at the end of the shaft by means of stationary contact devices mounted in the elevator shaft. The use of such devices necessitates a much larger amount of equipment than our device and is also very inconvenient in the arrangement of the wiring for the control circuits, as these must be carried to the controller on the car. Devices for operating the circuits by means of a controller mounted on the car have also been in use comprising long tapered cams carried by the shaft and adapted to actuate plungers or levers mounted on the car. These devices are difficult to adjust on account of the slight inclination of the cam surface and they open the contacts slowly which causes arcing.

It will be seen that we have provided a simple compact unitary device which eliminates the necessity for a great amount of wiring and is also quick and positive in its operation.

While we have described and illustrated in detail a specific embodiment of our invention, it should be clearly understood that the description is only for purposes of illustration and that many modifications and variations will naturally occur to those skilled in the art. We aim in the subjoined claims to cover all such legitimate variations and modifications.

We claim as our invention:

1. In a mechanism for controlling elevators, a rotary device carried by the elevator car having a plurality of radially projecting arms, a plurality of stationary rollers mounted at spaced intervals in the elevator shaft and adapted to engage said radial arms and rotate said device through definite increments at definite points in the travel of the car.

2. In a mechanism for controlling elevators, a plurality of electric circuits, making and breaking devices carried by the elevator car, rotary controlling means for said devices and stationary means mounted in the elevator shaft at spaced intervals, each stationary means being adapted to operatively engage said controlling means to quickly and positively open one of said circuit breaking devices at a definite point in the motion of the car.

3. In a control mechanism for elevators, a rotary device carried by the elevator car, a plurality of cams carried by said device, a plurality of contact elements adapted to be successively operated by said cams upon rotation of said device, and stationary means mounted in the elevator shaft adapted to engage and rotate said device.

4. In a device of the class described, a movable head, a plurality of U-shaped resilient members, said members being attached to said head to form radially projecting arms, and a series of spaced elements arranged to successively engage said arms and rotate said head through a limited portion of a revolution.

5. In a device of the class described, a head, a plurality of radially projecting arms carried by said head, and a plurality of pivoted rollers mounted in a spaced series adapted successively to engage said radially projecting arms and rotate said head in both directions selectively.

6. In a device of the class described, a plurality of rubber rollers mounted in a spaced series, a rotary head movable in relation to said rollers and a plurality of radially projecting arms projecting from said head, each arm formed of resilient sheet metal, and adapted to be engaged by said rollers to rotate said head.

7. In a device of the class described, a head and a plurality of radially projecting arms projecting from said head, each arm comprising a U-shaped member of resilient sheet metal mounted on said head with its bight outermost.

8. In a control mechanism for elevators, a rotary shaft carried by the elevator car, a switch operatively connected with said shaft, a projecting arm rigidly secured to said shaft, and stationary means mounted in the elevator well for engaging said arm to rotate said shaft, whereby said switch is actuated.

In testimony whereof we have hereunto set our hands.

JOHN F. CLANCY.
ADOLPH A. GAZDA.