J. HAJEK.

SAFETY ELEVATOR DEVICE.

APPLICATION FILED FEB. 15, 1917.

1,275,673.

Patented Aug. 13, 1918.

2 SHEETS—SHEET 1.

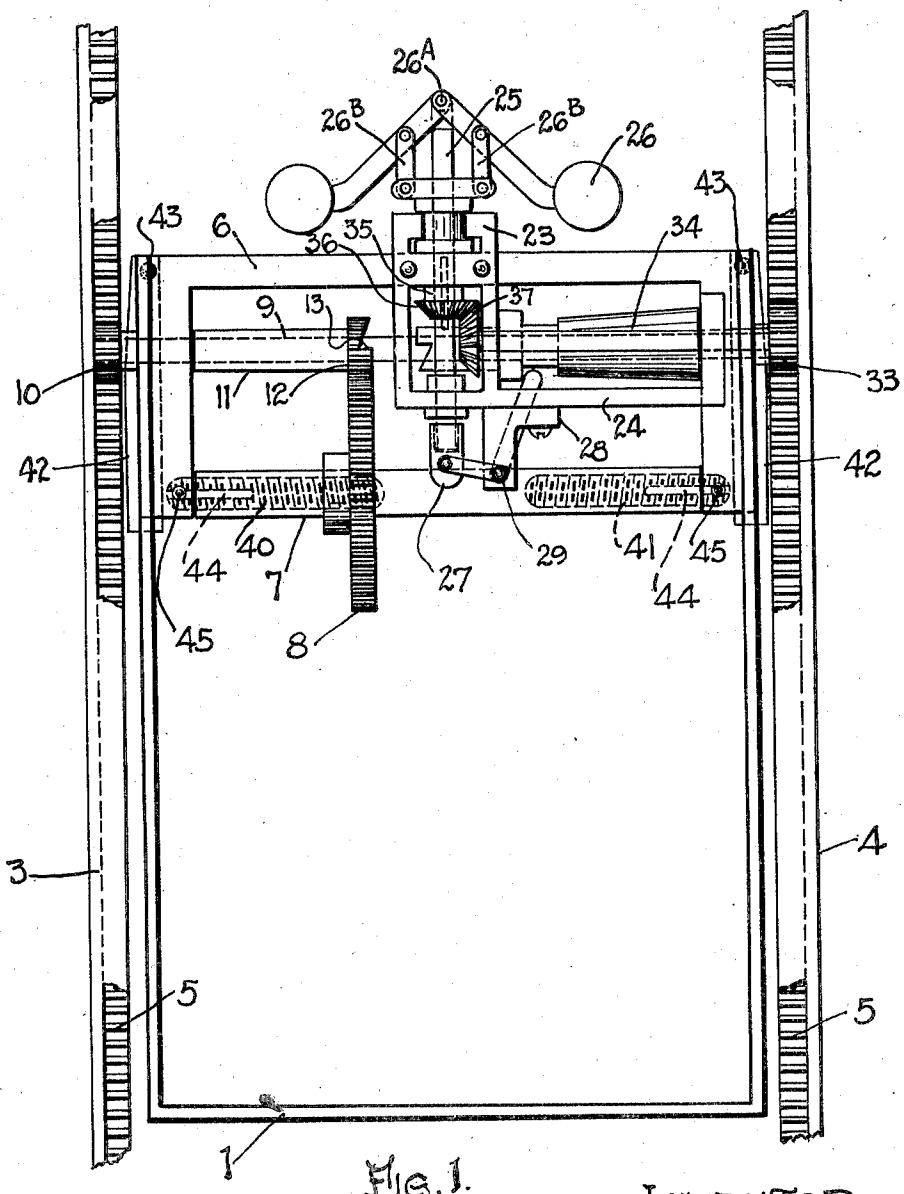


FIG. 1.

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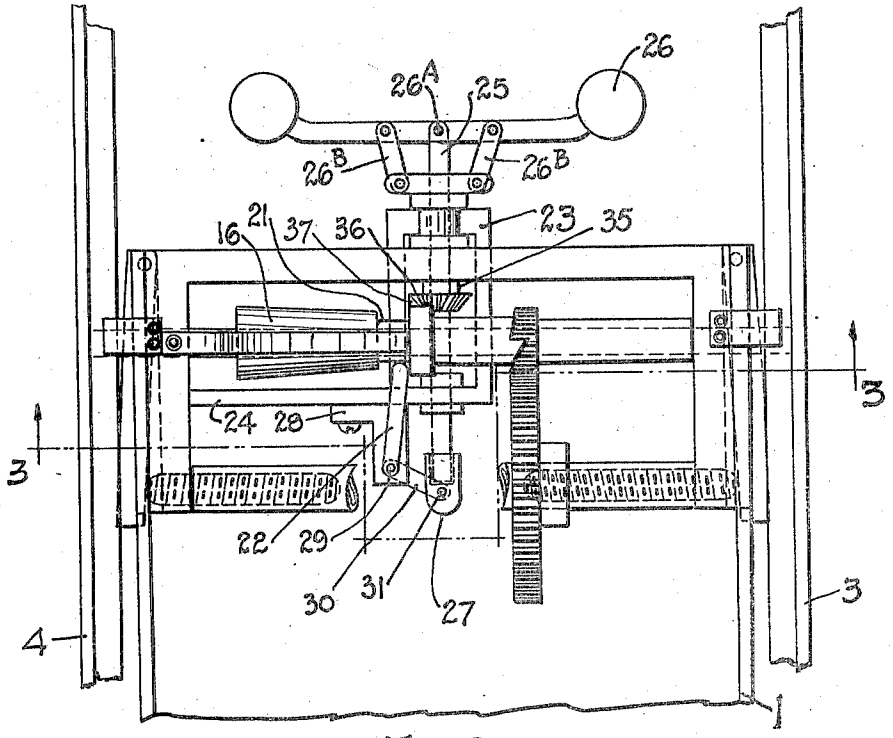


FIG. 2.

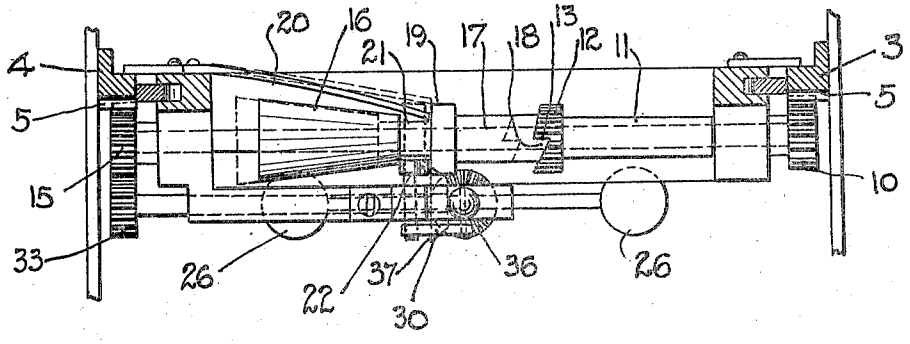


FIG. 3.

INVENTOR

Joseph Hajek

BY

Frank J. Schneider

Attorney.

# UNITED STATES PATENT OFFICE.

JOSEPH HAJEK, OF NORTH BRADDOCK, PENNSYLVANIA.

## SAFETY ELEVATOR DEVICE.

1,275,673. Specification of Letters Patent. Patented Aug. 13, 1918.

Continuation of application filed July 31, 1914, Serial No. 854,342. This application filed February 15, 1917. Serial No. 148,855.

*To all whom it may concern:*

Be it known that I, JOSEPH HAJEK, a subject of the Emperor of Austria, residing at 1803 Mordough street, in North Braddock, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Safety Elevator Devices, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention, which is a continuation of applicant's prior application No. 854,342 filed July 31, 1914, relates to a safety elevator device and has for its object to provide a device of such class as hereinafter set forth, for arresting the descent of an elevator car if the hoisting cable should break, or become slack.

Further objects of the invention are to provide a safety elevator device which is simple in its construction and arrangement, strong, durable, efficient in its use, readily set up with respect to the elevator car, and comparatively inexpensive.

With the foregoing and other objects in view the invention consists of a novel construction, combination and arrangement of parts, as hereinafter more specifically described and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications, can be resorted to which come within the scope of the claims hereunto appended

In the drawings wherein like reference characters indicate corresponding parts throughout the several views:—

Figure 1, is a front elevation, broken away, of a safety elevator device in accordance with this invention, the latter being in an inoperative position.

Fig. 2, is a rear elevation, broken away, of a safety elevator device in accordance with this invention, the device being in operative position.

Fig. 3 is a view taken on line 3—3 of Fig. 2.

Referring to the drawing in detail, 1 denotes an elevator car which is elevated and lowered through the medium of a hoisting cable, not shown, and 3 and 4 denote a pair of uprights arranged at opposite sides of the elevator shaft and each of which is of angular shape in cross section. The longitudinal leg of each of said uprights 3 and 4 has one face provided with teeth, as at 5.

Secured in the car 1, at the top thereof, is an inverted yoke-shaped support 6, in which is supported the internally threaded sleeve 7, provided with a large gear wheel 8, intermediate its ends.

Journaled in one side of the support 6, as well as projecting laterally from both sides of the car 1, is a shaft 9, provided with a pinion 10, which travels upon one of the said racks 5. Loosely mounted upon the shaft 9 is a clutching member which consists of a sleeve 11, provided with a pinion 12, the latter being cut away at one side to form a seat 13.

Journaled in the other side of the support 6, and projecting laterally from the car 1, at the other side thereof, is the other end of shaft 9, having a pinion 15 which travels in the other rack 5. Longitudinally shiftable upon the shaft 9 is a slidably clutching member consisting of a sleeve 16, having a clutch 17 provided with a protrusion 18, which is adapted to engage in the seat 13 and thereby rotate sleeve 11 and pinion 12, and under such condition impart motion to gear 8. The frusto-conical sleeve 16 is cut away at one side to provide a shoulder 19, and capable of bearing against the latter is a spring 20 which will positively prevent clutch 17 from sliding back to disengage from pinion 12. The sleeve 16 is cut away, as at 21, to form a recess and extending therein is an actuating lever 22, for shifting the sleeve 16 and to move the clutch 17 to engage the pinion 12.

Secured to the support 6, centrally thereof, is a bracket, which includes a vertically disposed body portion 23 and a laterally extending L-shaped arm 24, and extending through the body portion 23 is a vertically movable rotatable shaft 25, which carries a centrifugal governor 26 at its upper end, and is adapted for free rotation within a relatively large cavity in the collar 27 at its lower end. Depending from the body portion 23 and arm 24, is an angle-shaped member 28, which carries a pivot pin 29. The lever 22 at its lower end is rigidly fixed to one end of the pin 29 and the other end of the pin 29 has rigidly fixed thereto a link 30, the latter being pivotally connected to the collar 27, as at pin 31. The governor 26 is mounted upon the shaft 25, in such manner that, when the weighted ends of the governor arms are thrown outwardly and upwardly by centrifugal force, the shaft 25

will be lowered, having pivotal connection with said arms as at $26^A$. The pivoted supporting links $26^B$ will be moved outwardly about their lower pivots thereby causing the link 30 to shift and move the lever 22 through the medium of pin 29 to shift the slidable coupling member so that the clutch 17, will engage the pinion 12, to operate gear 8.

The shaft 25 is rotated through the medium of a pinion 33, which operatively engages the pinion 15. The pinion 33 is carried by shaft 34 journaled in the arm 24 and body portion 23. Fixed to the shaft 25 is a sleeve 35, which is splined to shaft 25 and which sleeve is provided with a bevel pinion 36, which meshes with a bevel gear 37 mounted on the inner end of the shaft 34. When the pinion 15 rides over the continuous rack 5 it is obvious that motion is imparted to the shaft 25, by the interconnections just referred to, and therefore the governor 26 is in constant operation. When the car moves at a normal rate, the weighted arms of the governor assume a position shown approximately by Fig. 1.

If, however, the cable should break, it will be obvious, that the car will suddenly increase in its downward speed but which speed will be almost instantly, yet gradually checked and the car finally arrested within the guides of the elevator shaft, due to the increased speed and raised position of the weighted governor arms which will lower shaft 25 and, thereby operate the clutch 17, as above explained, to engage pinion 12 and rotate gear 8 which is rigidly mounted on the internally threaded sleeve 7 and which gear will continue to rotate the sleeve 7, thereby gradually moving the threaded pins 40 and 41 outwardly through the slots within the yoke 6 to further engage the free or movable ends of the friction shoes 42 which are pivotally supported on pins 43 in the top of the yoke 6 and which shoes 42 will act as wedges between the guides to arrest the car. To cause the outward movement of the pins 40 and 41, the same are oppositely threaded and retained from axial motion by means of a slot 44 therein and fixed pin 45 within the yoke 6. There is no sudden strain upon any part of the mechanism, but all coöperate to gradually check and finally arrest the car.

I claim:

1. In an elevator traveling in a pair of vertical guides, an automatic brake comprising a frame mounted on said elevator, a governor adapted to revolve during the travel of said elevator, a pair of shoes pivotally mounted on said frame and registering with said guides, a rotatable threaded sleeve, a pair of oppositely threaded pins mounted within said rotatable sleeve, a gear rigidly mounted on said sleeve, a shaft having a pinion meshing with said gear, a clutch mounted on said shaft, and means operated by said governor at a predetermined high speed for operating said clutch to rotate said pinion and gear whereby said oppositely threaded pins will be moved outwardly by the screwing action of said sleeve, to wedge said shoes between said guides and elevator.

2. In an elevator traveling in a pair of vertical guides having racks mounted thereon, an automatic brake comprising a frame mounted on said elevator, a governor, a pair of shoes pivotally suspended from the top of said frame and opposite said guides, a rotatable threaded sleeve mounted in the lower part of said frame, a pair of oppositely threaded pins supporting said sleeve and extending into the lower part of said frame, a gear rigidly mounted on said sleeve, a shaft extending between said guides, pinions on the terminals of said shaft engaging said racks, a clutching member and co-acting pinion mounted on said shaft, said co-acting pinion meshing with said gear, and mechanism operated by said governor at a predetermined high downward speed of the elevator for operating said clutching member and co-acting pinion and meshing gear and thereby moving said oppositely threaded pins outwardly, by the screwing action of said sleeve, to wedge said shoes between said guides and frame.

In witness whereof, I have hereunto subscribed my name this 6th day of February, 1917.

JOSEPH HAJEK.