No. 621,475. Patented Mar. 21, 1899.

J. J. McCORMICK.

ELEVATOR.

(Application filed Aug. 24, 1896.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

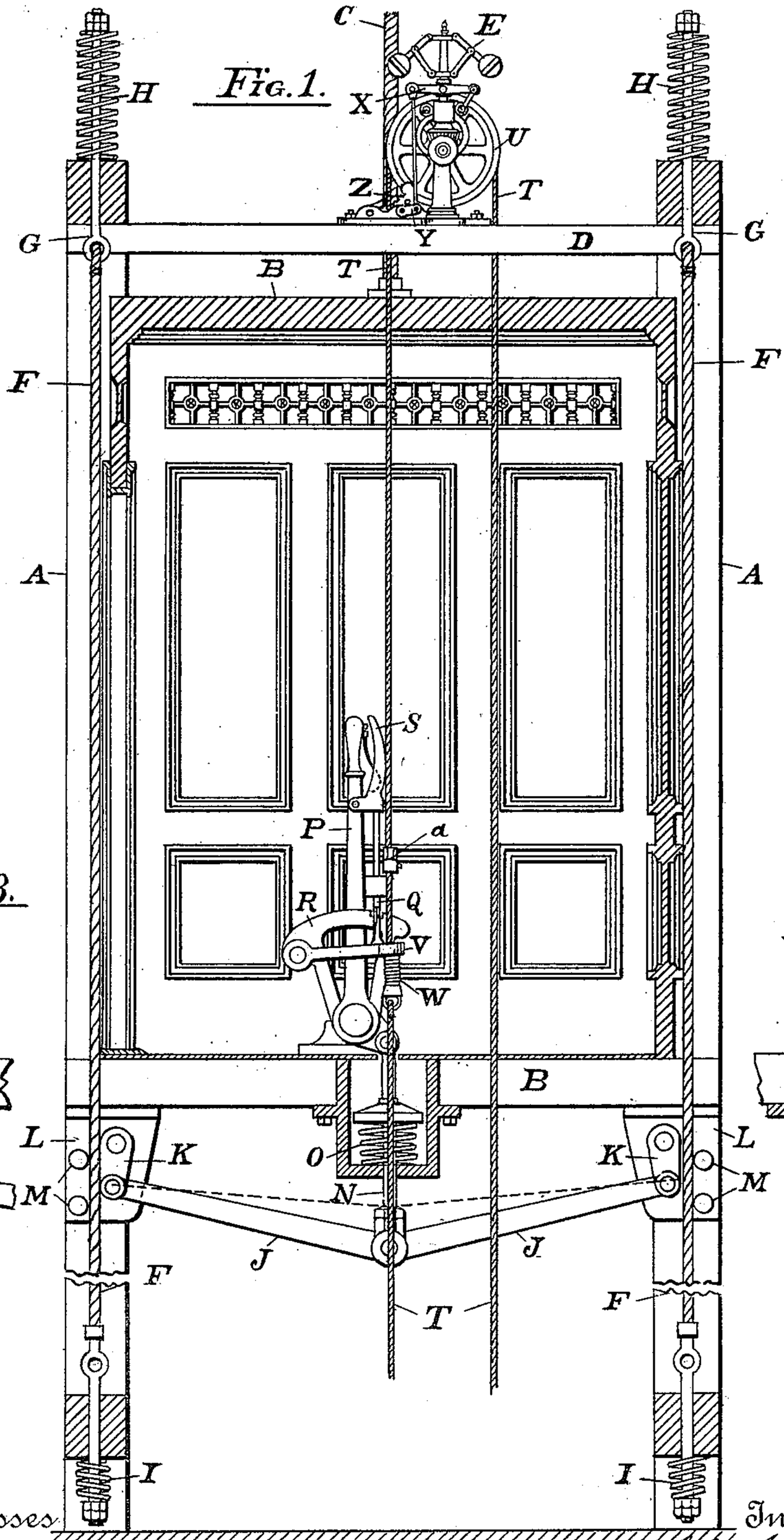

Fig. 2.

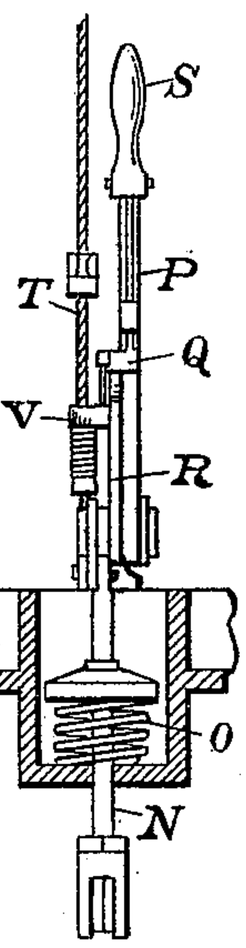

Fig. 3.

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Fig. 4.

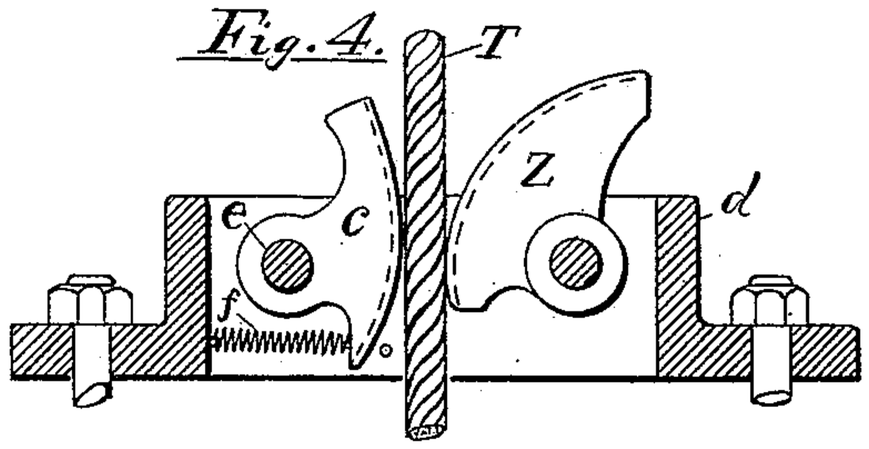
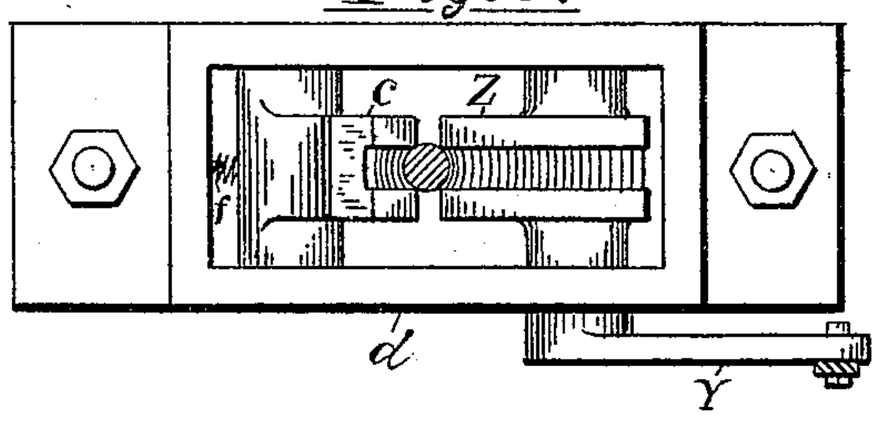


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN J. McCORMICK, OF SAN FRANCISCO, CALIFORNIA.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 621,475, dated March 21, 1899.

Application filed August 24, 1896. Serial No. 603,819. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. McCORMICK, a citizen of the United States, residing at San Francisco, county of San Francisco, and State of California, have invented certain new and useful Improvements in Elevators; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to elevators for buildings, and especially to means of security against accident by the cages falling and also from overrunning on the upward stroke or travel.

My improvements consist in providing independent grip-cables at each side of the cage, with both hand and automatic devices, or either of these, to grip the cables in case the cage-sustaining ropes break or fail.

To this end I provide devices and apparatus, as illustrated in the drawings herewith and set forth in the specification, especially in the claims at the end thereof.

Referring to the drawings, Figure 1 is an elevation, partly in section, illustrating the application of my invention to an elevator-cage. Fig. 2 is a detail in a plane at a right angle to Fig. 1 of the hand-lever and escapement mechanism to apply the gripping devices. Fig. 3 is another detail of Fig. 1, showing the gripping devices as they appear when applied or in action. Fig. 4 is an enlarged detail, partially in section, showing the grab-jaws operated by the centrifugal governor. Fig. 5 is a plan view of Fig. 4. Fig. 6 is an enlarged front view of the brake-disengaging mechanism in the cage. Fig. 7 is a plan view of the same details. Fig. 8 is an enlarged front view of the hand-lever and connected parts to operate the brake from the cage.

Similar letters of reference apply to like parts throughout.

It is well known that gripping-jaws and frictional devices applied on the guides or posts of an elevator often fail to stop a falling cage because of abrasive action that fills the teeth of the gripping-jaws with wood, also by want of elasticity in the arresting medium or mechanism, and for other causes. So, also, is well known the intensity of traction developed by gripping a wire cable or rope, illustrated by cable-railway propulsion and here applied as a resisting force against a falling cage.

Referring to the drawings, A are common elevator-posts, between which moves the cage B, suspended on a rope or ropes C, that extend to the usual winding-gearing.

D is a fixed cross-rail on the top, constituting a part of the framing and supporting a centrifugal apparatus E, the functions of which will be hereinafter described.

Extending from the top to the bottom of the wellway, preferably at two sides of the cage B, are two wire cables F F, fastened to the eyebolts G, as seen in Fig. 1. On the eyebolts G, at the top, are placed coil-springs H, that permit the cables F F to yield, and thus cushion or gradually stop the cage B in case of its falling. Also by preference springs I are placed at the bottom, where the tension of the cables F F is adjusted, so that the cage, if stopped by the gripping devices on its upward course, will be cushioned. I have illustrated coil-springs, as being most suitable; but it will be understood that any other kind of a spring, such as one of india-rubber, may be substituted.

At the bottom of the cage B are the gripping devices, consisting of the toggle-levers J J, cranks K K, and the pins M M, the latter and the cranks K K being mounted in the angular brackets L L, bolted to the bottom of the cage B. The toggle-levers J J are, when released, thrown upward suddenly by means of the link N and a strong spring O, causing the cranks K to impinge upon and nip the cables F F against pins M at each side, as shown in Fig. 2, thereby offering a strong but frictional and yielding resistance sufficient to stop the cage B if it fall or overrun.

To hold the toggle-levers down and keep the gripping mechanism out of contact, there is a lever P, to which the link N is attached. This lever has a latch Q, that engages in a notch *t* in the quadrant-bar R, disengaged by the press-handle S and also, if required, by the automatic centrifugal apparatus E in the following manner: This apparatus E is driven by a rope T, that passes around the pulley U

and a corresponding pulley at the bottom (not shown in the drawings) and is attached to the lever V, a coil-spring W being interposed to prevent shock. As the cage B moves upward or downward the rope T drives the centrifugal apparatus E at a regular rate in either direction when rising by the stop *a* and when descending by the spring W, which thus acts as a stop, the force on the latter not being enough to disengage the latch Q; but if the movement of the cage B is accelerated, as in falling, the centrifugal weights fly outward, raising the lever X, which is linked to the crank Y, that operates a turning jaw Z, that nips the rope T, pressing it against the jaw *c*, and by stopping the rope instantly draws up the lever R, releasing the latch Q from the sector-bar R, so the lever P will fly back and the toggle-levers J J rise by action of the spring O nipping the cables F F between the cranks K and the pins M, stopping the cage. The jaws Z and *c* are held in a frame *d*, the one, *c*, being pivoted on the pin *e* and provided with a spring *f*, that holds it up in proper position for acting when the jaw Z is thrown back, as seen in Fig. 4. Besides this automatic release of the lever P it can also be operated by the attendant in the cage, who, if the operating-lever is alongside of the brake-lever P and on the same axis, which is preferable, will have ample time to throw on the brake mechanism by gripping the clamp-handle S and releasing the latch Q. This method of stopping the cage on its ascent is important in case of overrunning—that is, if the operating-ropes or other parts of the controlling-gearing fails, as is often the case, and the cage goes above its intended range and comes in contact with the bar D or other overhead obstruction.

In case the suspending rope or ropes C are parted and the cage is arrested by the lever P and grip mechanism on the cables F F the operator can then by means of the lever P lower the cage gradually and safely to any point in its range downward.

Having thus described the nature and objects of my invention, I claim—

1. In an elevator, the cables or ropes F, swinging cranks K and toggle-levers J, in combination with the spring O to operate said toggle-levers in one direction, and the controlling-lever P to operate said toggle-levers in the opposite direction, substantially as described.

2. In an elevator, the cage and parallel brake-ropes F, the swinging cranks K and levers J connected thereto, a spring to operate the lever, and disengaging mechanism to release the spring, in combination with the rope T passing through or alongside the cage and operating such mechanism, substantially as described.

3. In an elevator, the toggle-levers J, swinging cranks K connected to said toggle-levers so as to be operated thereby, spring O to operate said toggle-levers in one direction, hand-lever P to operate said toggle-levers in the opposite direction, and trip-lever V to release the hand-lever, the rope T provided with stops W and adapted to operate the lever V, the quadrant R having a notch therein, and a latch Q connected with said hand-lever P and adapted to engage in said notch, substantially as described.

4. A safety device for elevators comprising cables, pins and suspended toggle-levers which have an endwise-swinging as well as a pivotal movement and clamp the cables directly between their outer ends and the pins.

5. A safety device for elevators comprising cables, pins M, M, cranks K, K, and toggle-levers J, J, pivotally connected with the cranks and which coöperate directly with the pins to impinge the cables.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

JOHN J. McCORMICK.

Witnesses:
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