

(No Model.)

2 Sheets—Sheet 1.

W. E. NICKERSON.
SAFETY DEVICE FOR ELEVATORS.

No. 405,371.

Patented June 18, 1889.

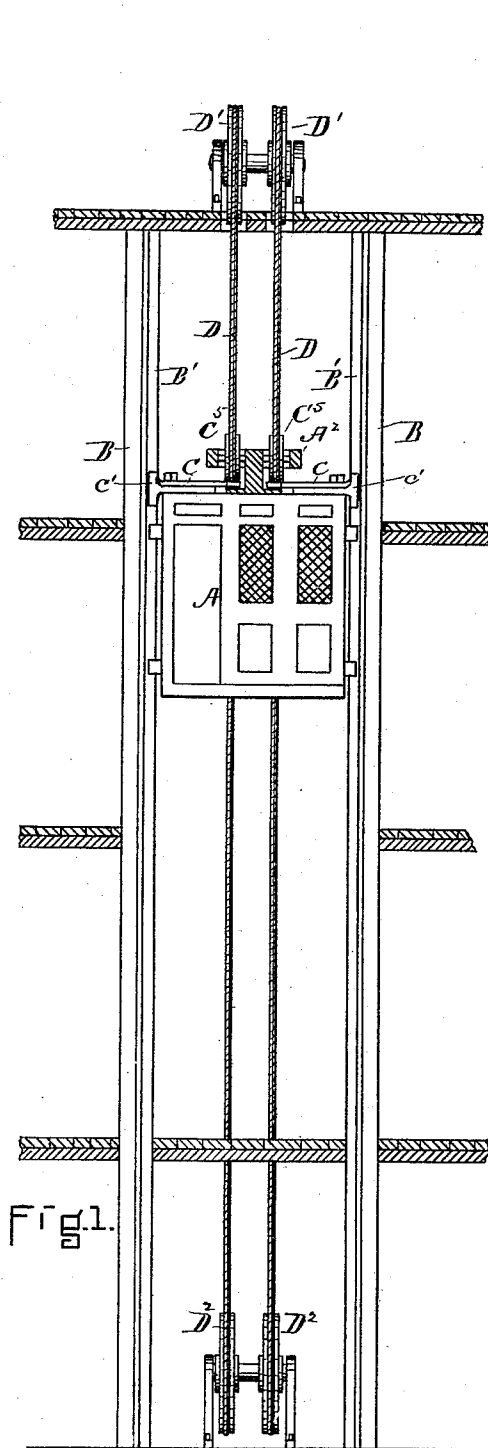


Fig. 1.

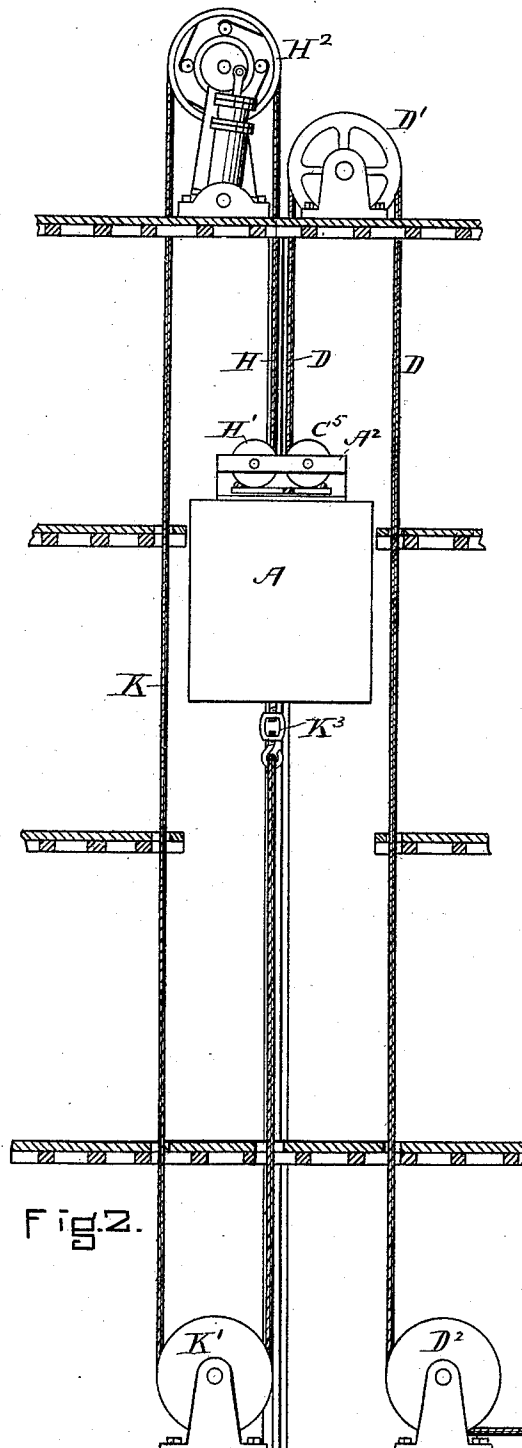


Fig. 2.

WITNESSES.

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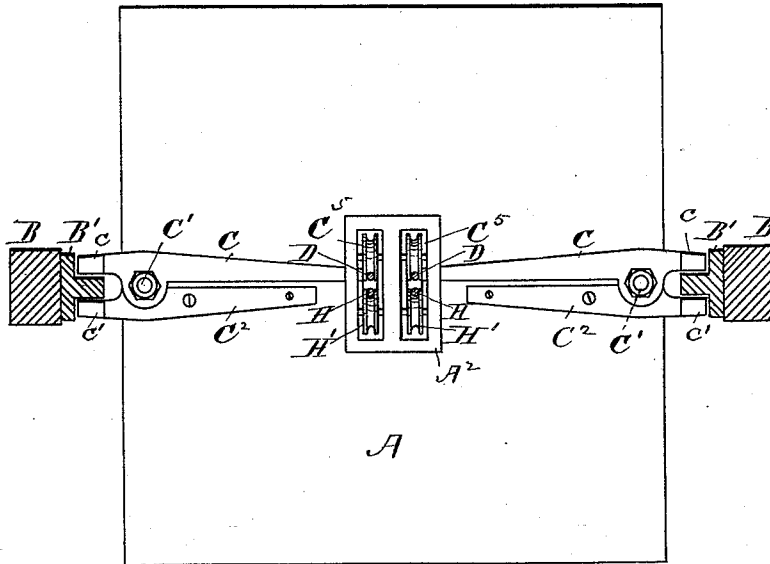


Fig. 3.

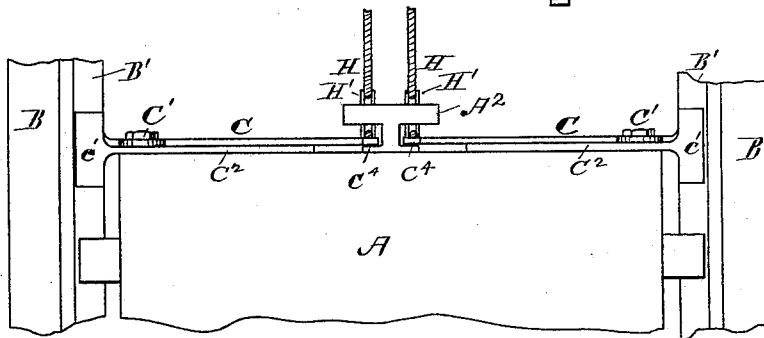
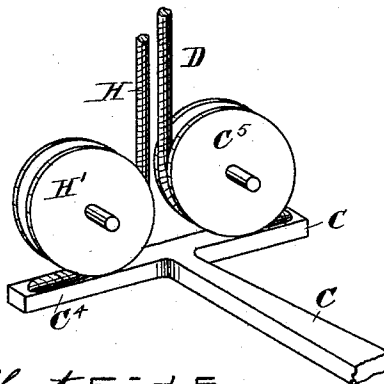


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM E. NICKERSON, OF CAMBRIDGE, MASSACHUSETTS.

SAFETY DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 405,371, dated June 18, 1889.

Application filed January 17, 1889. Serial No. 296,611. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. NICKERSON, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Elevator Appliances, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention consists in applying to elevators in which a speed-retarding device is used a gripping mechanism operated by and coacting with the retarding device to regulate the speed of the car whenever it shall become too great from any cause—such, for example, as the breaking of the hoisting apparatus—and to allow the car to descend slowly to the bottom. This I attain by the mechanism shown in the accompanying drawings, in which—

Figure 1 shows in front elevation an elevator-carriage, its guides, and the hoisting-ropes, together with their sheaves, the retarding-ropes and drum not being shown in this figure. Fig. 2 shows in side elevation an elevator-carriage, one of the retarding-ropes, and its drum, together with one of the hoisting-ropes and its sheaves. Fig. 3 is a plan showing the parts of my invention that relate to the gripping device. Fig. 4 is an elevation of the same. Fig. 5 is a detail of the same.

In the drawings I have shown such parts only as relate particularly to my invention, details not connected with my present device being omitted. The carriage of the elevator is represented by A, Figs. 1, 2, 3, and 4, and the guides and posts by B B' B B', Figs. 1, 3, and 4.

Attached to the top of the elevator-carriage A, I have a strong housing A², in which I have two sets of sheaves C³ C⁴ and H' H'. (See Fig. 3.) I also have attached to the top of the elevator-carriage two gripping devices C C² C C²—one for each of the guides B' B'. (See Fig. 4.) The gripping devices are constructed as follows: C², Fig. 4, is a fixed arm firmly bolted to the top of the elevator-carriage, as shown, and C is a pivoted arm attached by the pivotal bolt C'. The jaws c c' of the gripping device slide normally free on the guides B', but are arranged to firmly grip the guides when from any cause the carriage

is descending too fast, as will be explained. Each of the pivoted arms of the gripping device has lateral extensions C³ C⁴, (see Fig. 5,) that extend under the sheaves C³ H', respectively, and are connected as follows: C³ to the hoisting-rope D, (see Figs. 1 and 5,) and C⁴ to the retarding-rope H. The retarding-ropes H pass around and are attached to the speed-regulating drum H², Fig. 2, which, together with its connected devices, is fully described in Letters Patent granted to me February 15, 1887, No. 357,938. The counteracting-rope K passes under the sheave K', Fig. 2, and then to the bottom of the elevator-carriage A, to which it is fastened by the swivel-joint K³. The counteracting-rope K and its connected parts is fully described in Letters Patent granted to me December 18, 1888, No. 394,600. The hoisting-rope D passes over the sheave D' and under the sheave D² to the hoisting-machine.

From the above it will be understood that when the hoisting and retarding devices are all working in good order and the carriage is moving at or within its normal rate of speed, either up or down, the gripping device C C² will not operate to interfere in any manner with the movement of the elevator-carriage, for the reason that under normal conditions the strain on the hoisting-rope D is much greater than that on the retarding-rope, so that the gripping device will be held inoperative; but if the speed of the descending car increases much above the normal rate then the increased resistance of the retarding device, acting against the retention of the hoisting-rope, will overcome it and force the gripping device into action. Now we have both the gripping device and the retarder acting to check the speed of the car. This combined action will soon bring the speed of the car to a rate at which its weight is equivalent to said combined retarding action. This necessitates a uniform rate of descent, for if the car were to go faster then the increased resistance of the retarder, acting through the retarding-rope, would check it by the gripping device, and if it goes slower then the tension on the retarding-rope is diminished and the gripping device acts less strongly, allowing the rate of speed to increase until the weight of the car again balances the com-

bined retarding action. In brief, my mechanism constitutes a device by which safety is attained by a regulation of the speed of descent instead of by stopping the car.

5 One advantage of my combination is that the restraining action of the retarder is assisted by the gripping device, thus allowing the use of a retarder of comparatively small proportions.

10 I claim—

1. In an elevator, the combination of the carriage A, hoisting-rope D, retarding-rope H, and its retarder, adapted to resist more strongly as the speed of the descending car increases, with a grip device to which the
15 hoisting-rope D and retarding-rope H are both attached, but pulling in opposite directions, the hoisting-rope D tending to loosen the grip and the retarding-rope H tending to set
20 it, whereby an undue increase in the velocity

of the descending carriage will cause the increased resistance of the retarder through the rope H to overcome the tension of the hoisting-rope D and operate the grip, substantially as and for the purpose set forth. 25

2. In an elevator, the combination of the carriage A, guide B', the gripping device consisting of the fixed arm C² and pivoted gripping-arm C, having attached to it and being held inoperative by the hoisting-rope
30 D, with the retarding-rope H, also attached to the arm C, but pulling in the opposite direction from the rope D, and a retarder, all operating together substantially as and for the purpose set forth.

WILLIAM E. NICKERSON.

Witnesses:

FRANK G. PARKER,
MATTHEW M. BLUNT.