

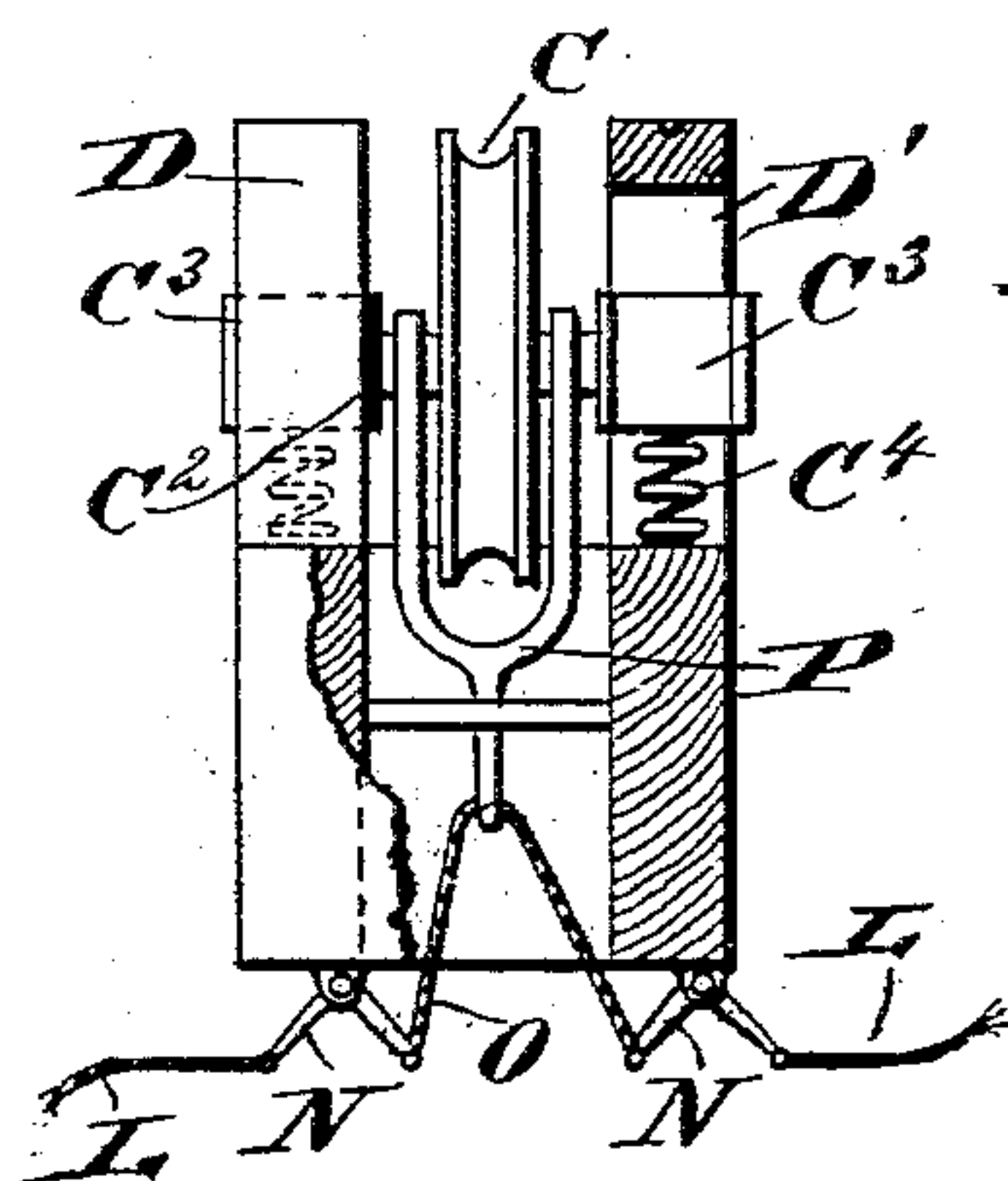
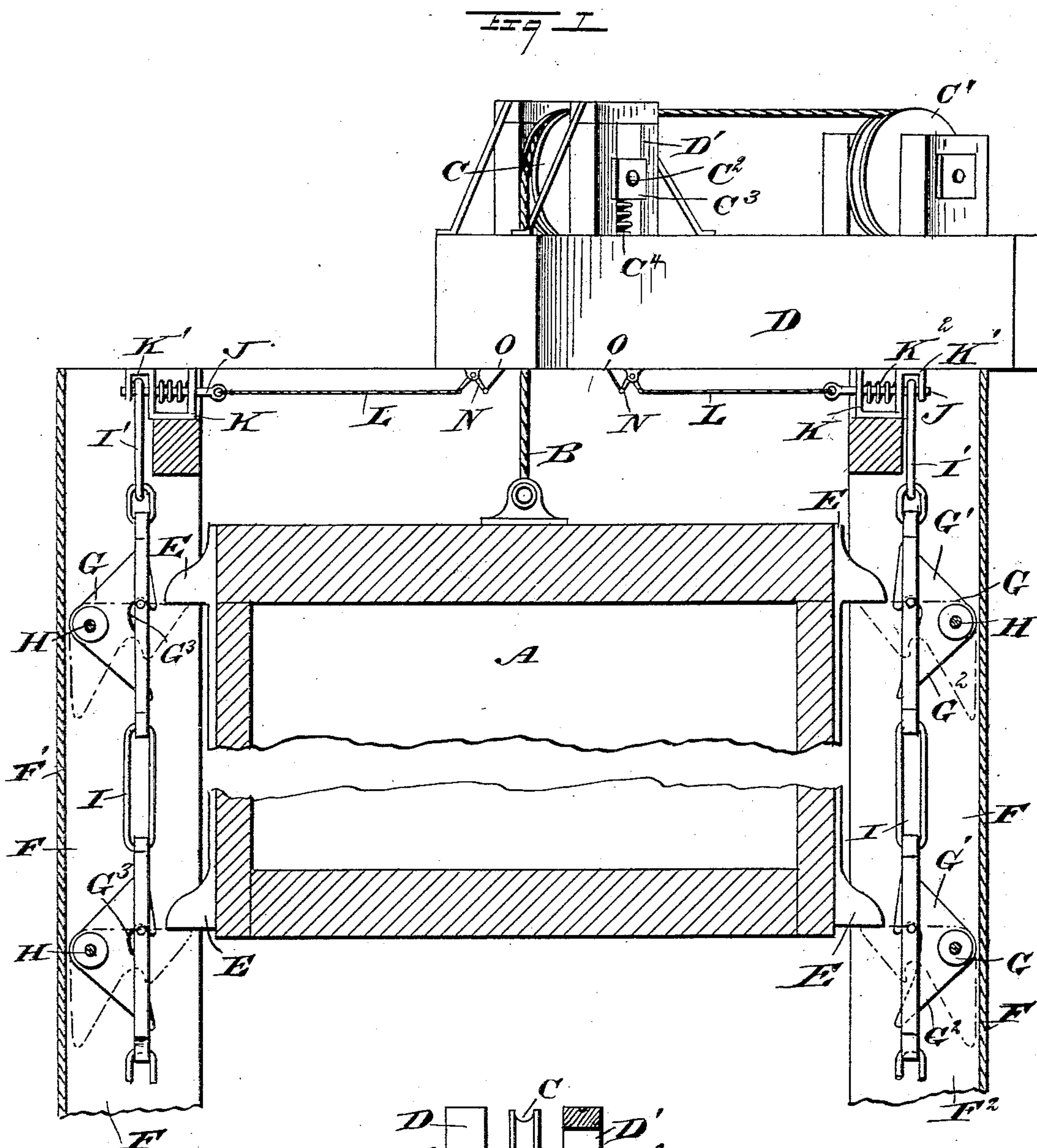
(No Model.)

2 Sheets—Sheet 1.

F. H. SHURTZ & H. G. SWAN.
SAFETY DEVICE FOR ELEVATORS.

No. 504,629.

Patented Sept. 5, 1893.



WITNESSES:

W. Walker
C. Sedgwick

INVENTORS

F. H. Shurtz
H. G. Swan
BY *Munn & Co*
ATTORNEYS.

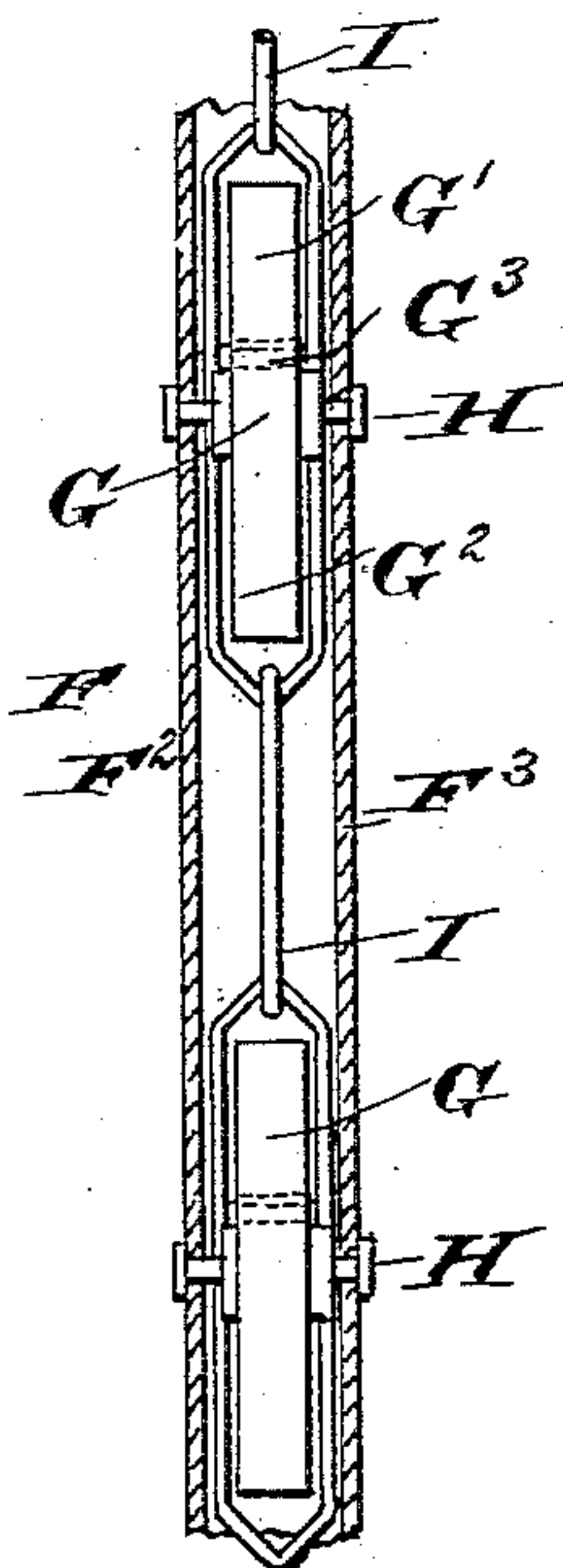
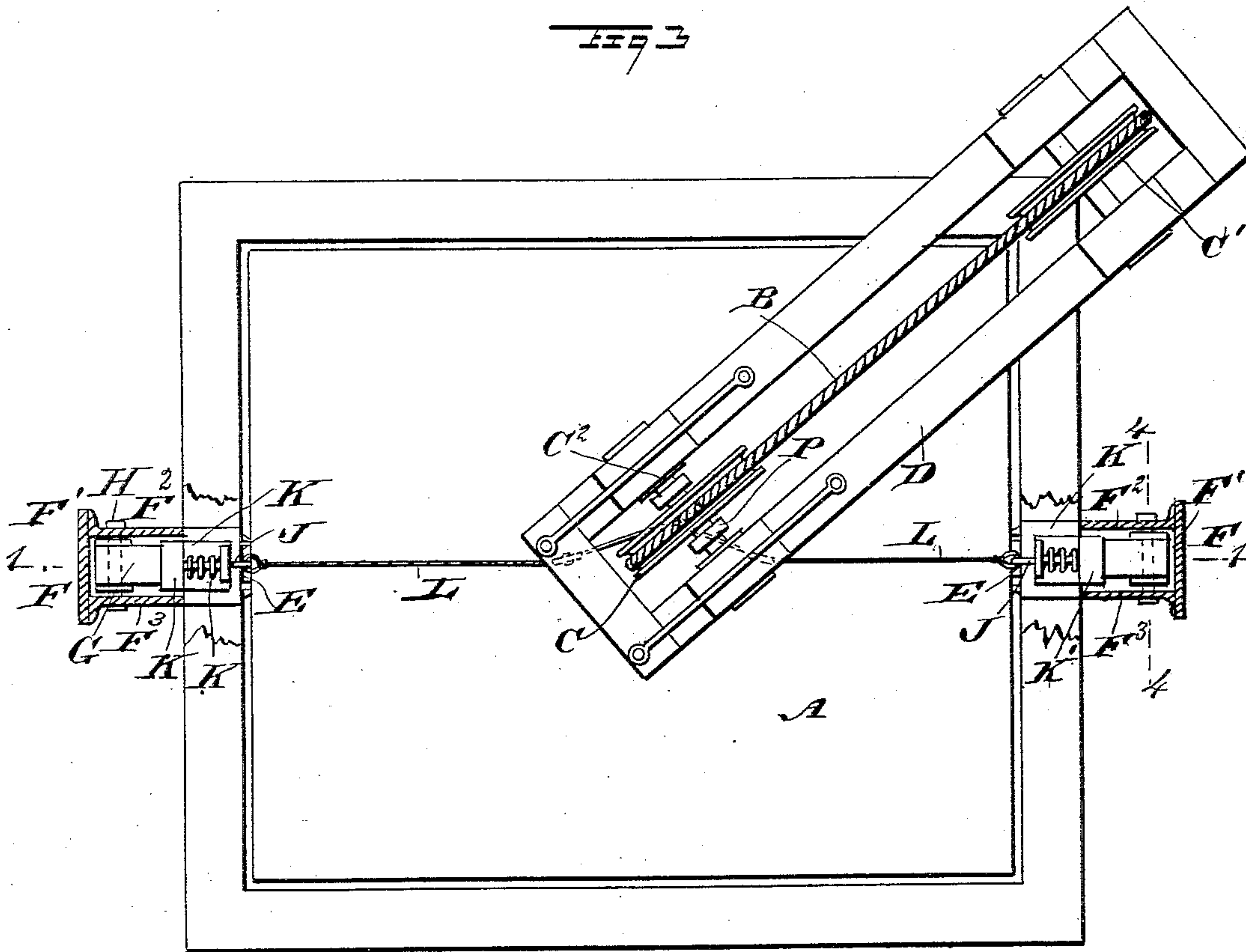
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UNITED STATES PATENT OFFICE.

FRANK HARRY SHURTZ AND HENRY GEORGE SWAN, OF SAN FRANCISCO,
CALIFORNIA.

SAFETY DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 504,629, dated September 5, 1893.

Application filed September 13, 1892. Serial No. 445,784. (No model.)

To all whom it may concern:

Be it known that we, FRANK HARRY SHURTZ and HENRY GEORGE SWAN, of San Francisco, in the county of San Francisco and State of California, have invented a new and Improved Safety Device for Elevators, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved safety device for elevators, which is simple and durable in construction, very effective and automatic in operation, and arranged in such a manner that in case of accident the cage is instantly locked in place, and is adapted to be readily unlocked as soon as the rope is again attached to the cage and the latter lifted.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement on the line 1—1 in Fig. 3. Fig. 2 is a transverse section of the cable pulley and adjacent parts. Fig. 3 is a plan view of the improvement with parts in section and parts broken out; and Fig. 4 is a transverse section of one of the guides and the blocks therein.

The elevator is provided with the usual cage A, hung on the cable or rope B, passing over the usual pulley C, journaled on the frame D, on the top of the elevator shaft, as is plainly shown in the drawings. The cable, after leaving the pulley C, passes over a second pulley C', and then to the hoisting device which imparts the necessary movement to the cable to cause the cage to ascend and descend in the elevator shaft in the usual manner.

On the opposite sides of the cage A and ranging from top to bottom are arranged lugs E, which extend into the guides F, arranged vertically in the elevator shaft and constructed of a metallic back plate F', on which are riveted angle irons F² and F³, forming a passage or guideway for the lugs E of the cage A. It will be understood that although but

two of said lugs are shown on each side of the cage, any desired and necessary number of the same may be employed.

In the guideway of each guide F are pivoted blocks G, preferably made L-shape, and having their pivots H, held in the side plates F² and F³ of the guides F. The arms G' and G² of each block G are arranged in such a manner that when the said blocks are in the position shown in Fig. 1, they are not touched by the lugs E on the ascent and descent of the cage A. When, however, a swinging motion is given to the blocks the same swing into the position shown in dotted lines in Fig. 1, so that the arm G² rests against the back plate F' of the guide F and the other arm G' extends horizontally and into the path of the lugs E. The blocks G are located one above the other throughout the entire height of each guide and each block has formed therein a notch G³ adapted to be entered by the cross bolts of the links of a chain I, extending in the guideways of the guides F and having its upper link I', supported on a bolt J, mounted to slide longitudinally in a suitable bearing K, the outer end of the bolt being additionally supported in a lug K', extending from the bearing K. The bolt J is held in an outermost position by a spring K² to prevent accidental shifting of the bolt and consequent displacement of the link.

The inner end of each bolt J is connected by a rope or chain L, with a bell crank lever N, fulcrumed on the under side of the frame D, the said bell crank lever being also connected with a rope or chain O, attached to a forked arm P, engaging the shaft C², of the pulley C, as is plainly illustrated in Fig. 2. The shaft C² is journaled in bearings C³, mounted to slide vertically in guideways D', arranged on the frame D, the said bearings being supported on springs C⁴.

When the elevator is in running order, the blocks G are in the position illustrated in the drawings, so as to be out of the path of the lugs E; now, in case the rope or cable B breaks, the pulley C is relieved of the weight of the cage A and the springs C⁴ will consequently move the bearings C³, the shaft C², and pulley C, upward, whereby the forked arm P is moved in a like direction and by the

ropes or chains O imparts a swinging motion to the bell crank levers N which in turn, pull on the ropes or chains L, so that the bolts J are caused to slide inward and disengage the links I' of the chains I in the two guides F. The chains I thus drop, and in doing so the cross bolts of the links of the chains pass out of the notches in the blocks G so that the arms G' of the latter swing into the position shown in dotted lines in Fig. 1 and above described. As the arms G' of the blocks G now extend into the path of the lugs E, a downward motion of the cage A will be prevented as the lugs will seat themselves on the two next blocks G on each side of the elevator cage A. The cable B, after being repaired and attached to the cage A, is caused to travel so as to lift the cage A to raise the lugs E above and out of the way of the respective blocks G, and the operator then pulls the chain I upward by hand so as to again engage the upper links I' with the bolts J, the latter being free to slide outward on the downward movement of the pulley C in its bearings. At the same time, the cross bolts of the links of the chains enter the notches in the blocks G, causing said blocks to swing out of the path of the lugs E in to the position shown in full lines in Fig. 1. It is understood that when the cage A is again lifted by the cable B, a pressure is exerted on the pulley C so that the shaft C² of the latter and its bearings C³ move downward and compress the springs C⁴, and at the same time a downward movement is given to the forked arm P to release the bolts J. The latter move out in their normal positions by the action of the springs K² held on the said bolts.

It will be seen that this device is very simple and durable in construction, and permits of a ready adjustment and resetting in case of accident, no mechanic being required for resetting the blocks nor is it necessary to stop the elevator for days in order to repair the damage usually done by clutches digging into the wooden guides of the elevator shaft.

By constructing the guides as shown and described, it is impossible for them to spread when the cage stops between the floors.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. A safety device for elevators, comprising a bolt adapted to be actuated from the cable pulley, a chain adapted to be supported on the said bolt, and a series of pivoted blocks connected with each other by the said chain, and adapted to swing into the path of the cage to stop the descent of the latter, substantially as shown and described.

2. A safety device for elevators, comprising a bolt adapted to be actuated from the cable pulley, a chain adapted to be supported on the said bolt, a series of pivoted blocks connected with each other by the said chain and adapted to swing into the path of the cage to stop the descent of the latter, and intermediate mechanism, substantially as described, for connecting the said bolt with the cable pulley, as set forth.

3. A safety device for elevators, comprising an arm hung on the shaft of the cable pulley, a bolt mounted to slide, an intermediate mechanism for connecting the said bolt with the said arm, a chain supported on the said bolt, and a series of pivoted blocks adapted to be engaged by the said chain, the said blocks being adapted to swing into the path of the elevator cage, to stop the descent of the latter whenever the said bolt is withdrawn and the chain released, substantially as shown and described.

4. In a safety device for elevators, the combination with a cage provided with lugs, a cable for supporting the cage, and a cable pulley journaled in spring-pressed bearings, of a series of blocks mounted to swing and located one above the other, a chain for connecting the blocks with each other, a bolt for supporting the said chain, and an intermediate mechanism for connecting the said bolt with the said cable pulley, to withdraw the said bolt whenever the pulley slides inward, substantially as shown and described.

5. In a safety device for elevators, the combination with a cage provided with lugs, and a guide arranged in the elevator shaft and into which the lugs on the cage project, of angular blocks pivoted in the guide, a chain with which the blocks are connected a support for the chain, and means for releasing the said support from the chain to allow the blocks to drop into the path of the lugs on the cage, substantially as described.

6. In a safety attachment for elevators the combination with a cage provided with lugs, and a guide arranged in the elevator shaft and into which the lugs on the cage project, of angular blocks pivoted in the guide, a chain with which the blocks engage, a spring pressed bolt for supporting the chain, and means for releasing the bolt from the chain to allow the blocks to drop into the path of the lugs of the cage, substantially as herein shown and described.

FRANK HARRY SHURTZ.
HENRY GEORGE SWAN.

Witnesses:

ALEX. L. LYNN,
L. PH. BOLANDER.