

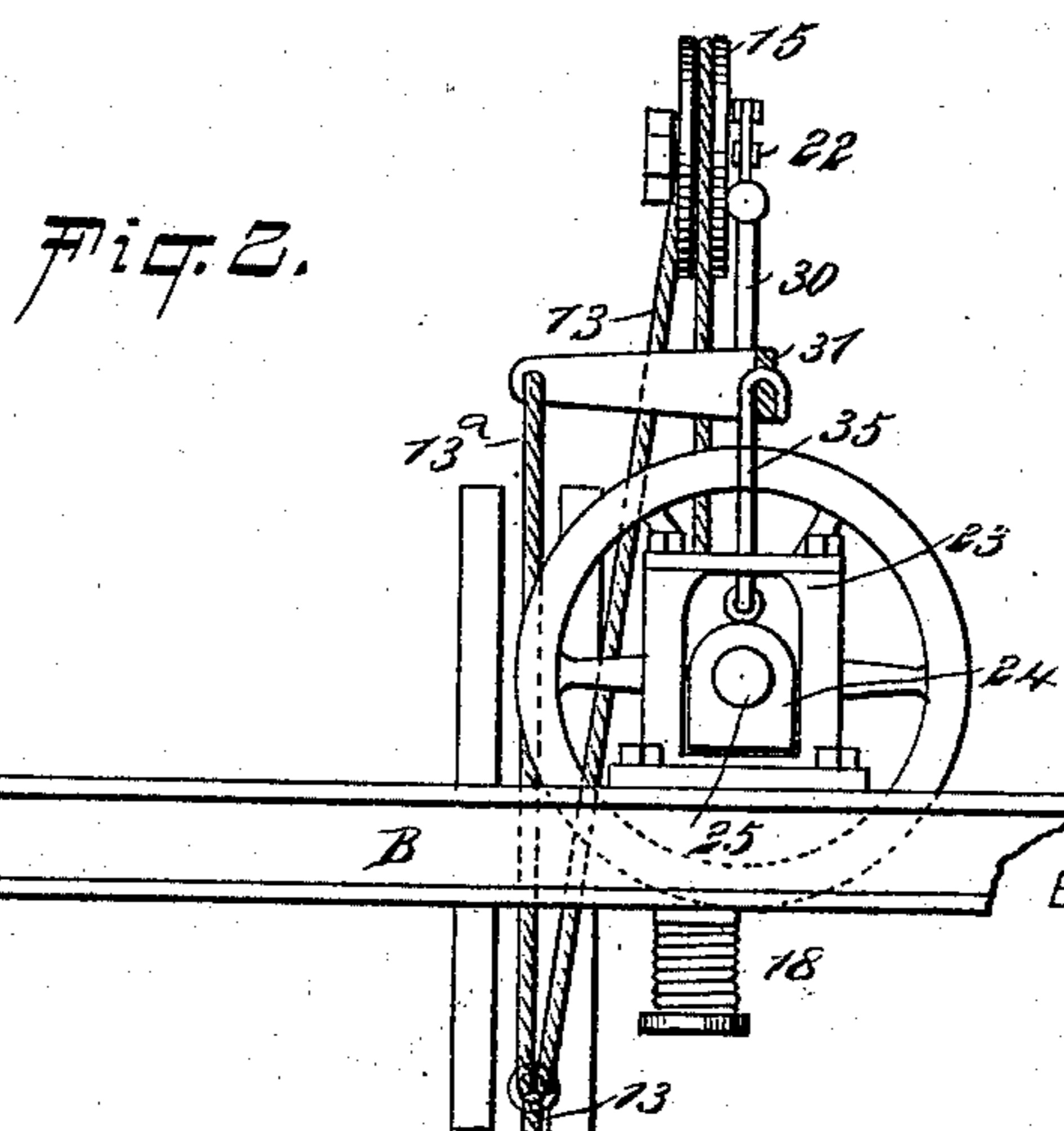
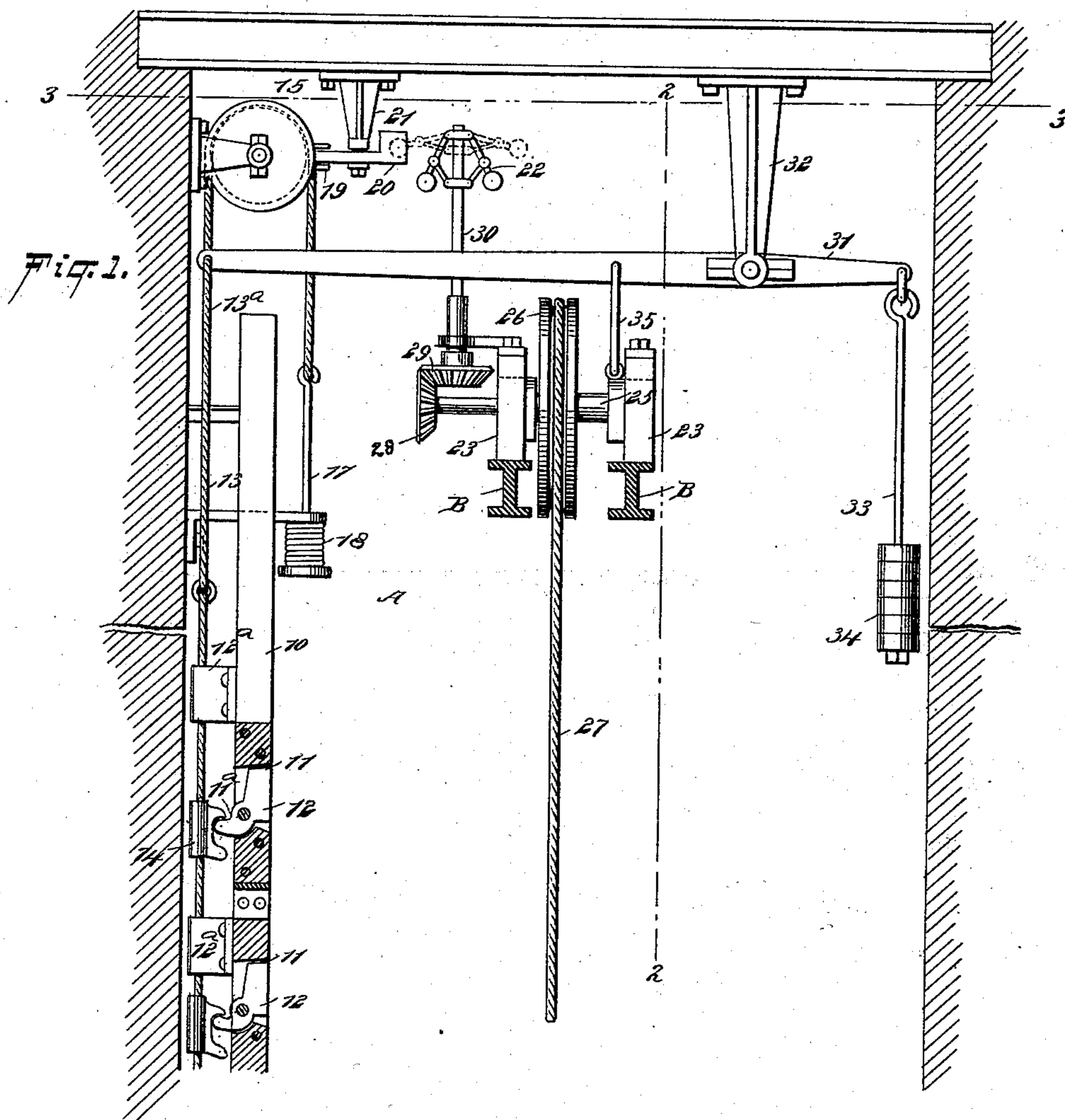
(No Model.)

3 Sheets—Sheet 1.

C. B. LABATT.
ELEVATOR SAFETY ATTACHMENT.

No. 547,270.

Patented Oct. 1, 1895.



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Fig. 3.

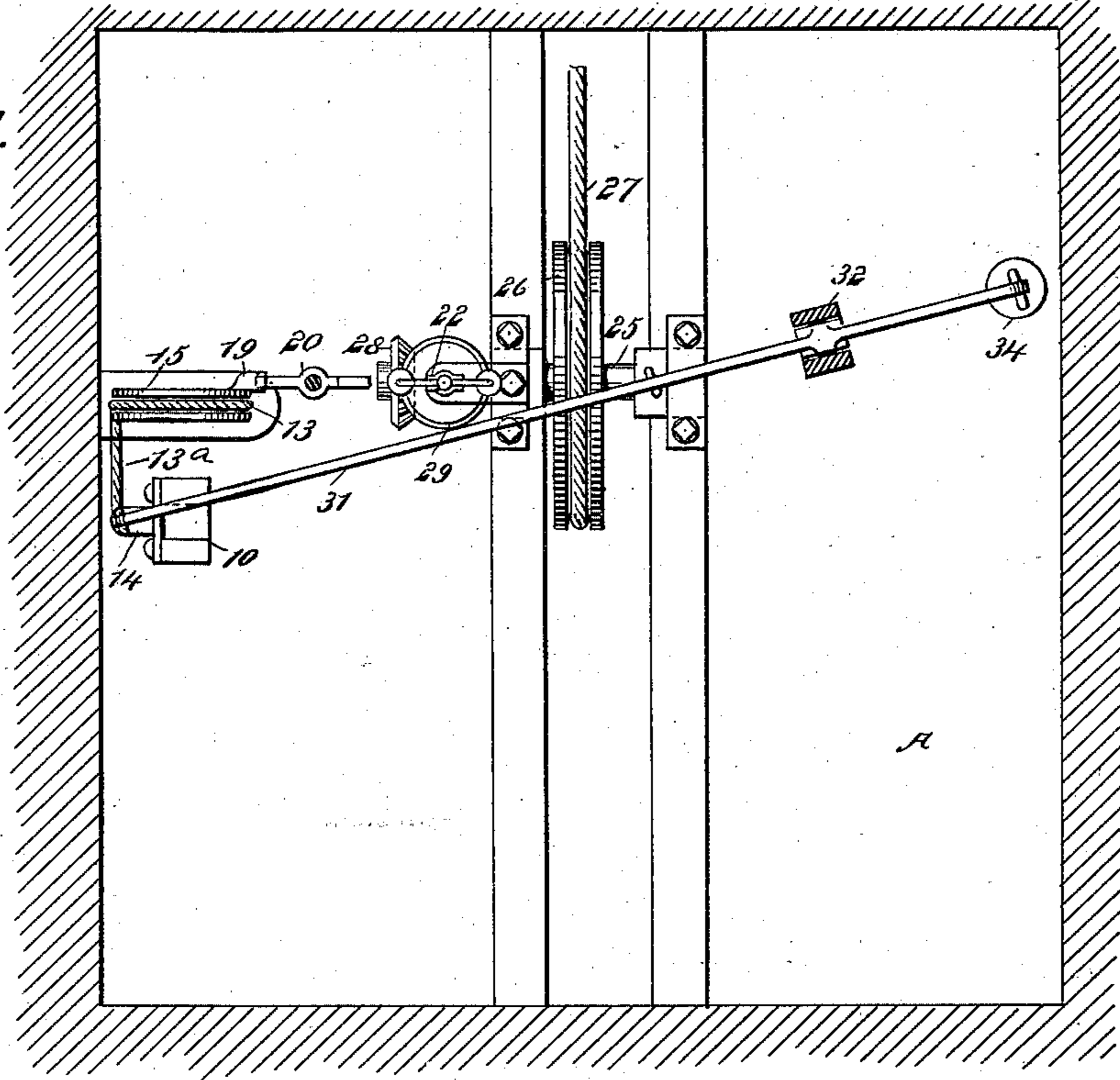


Fig. 4.

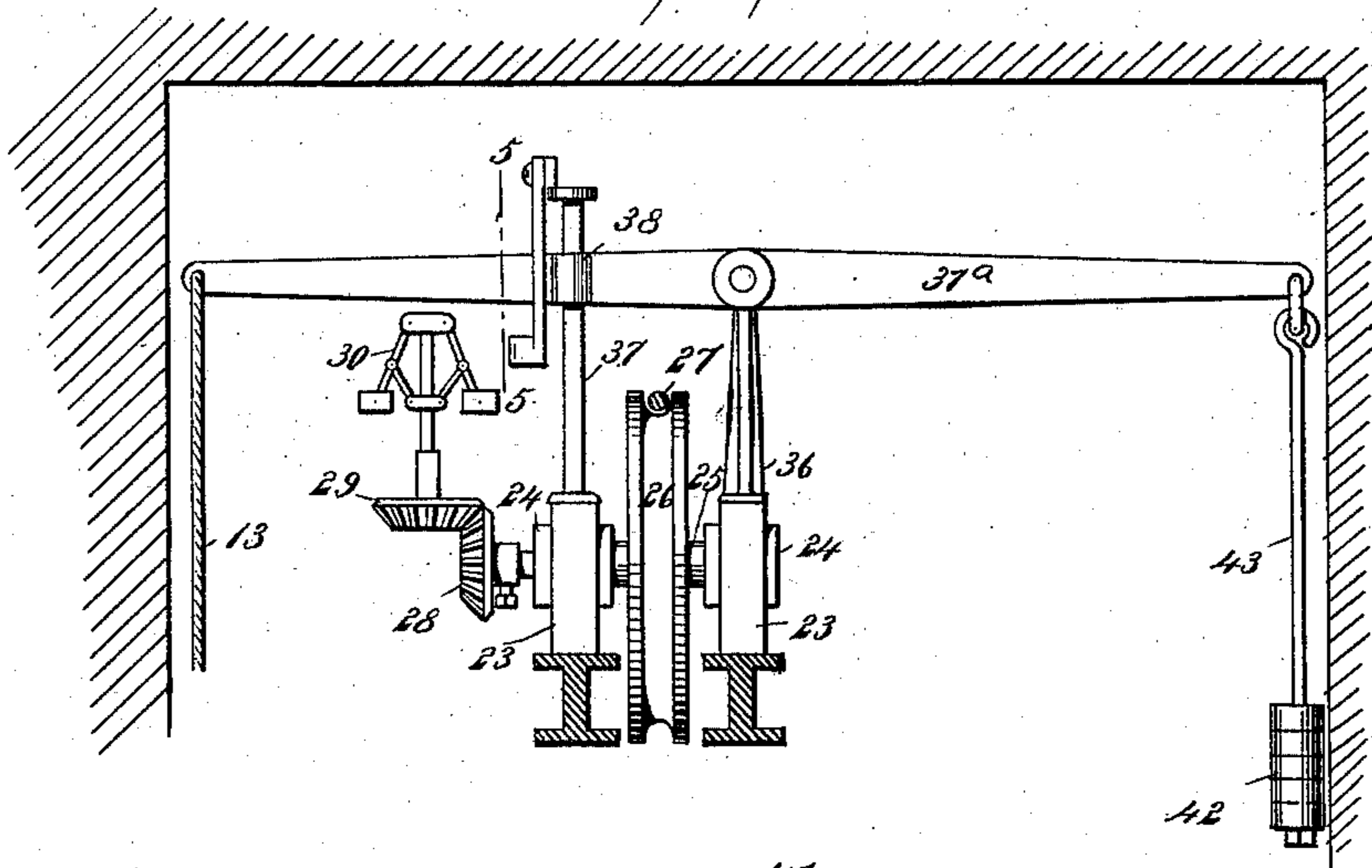
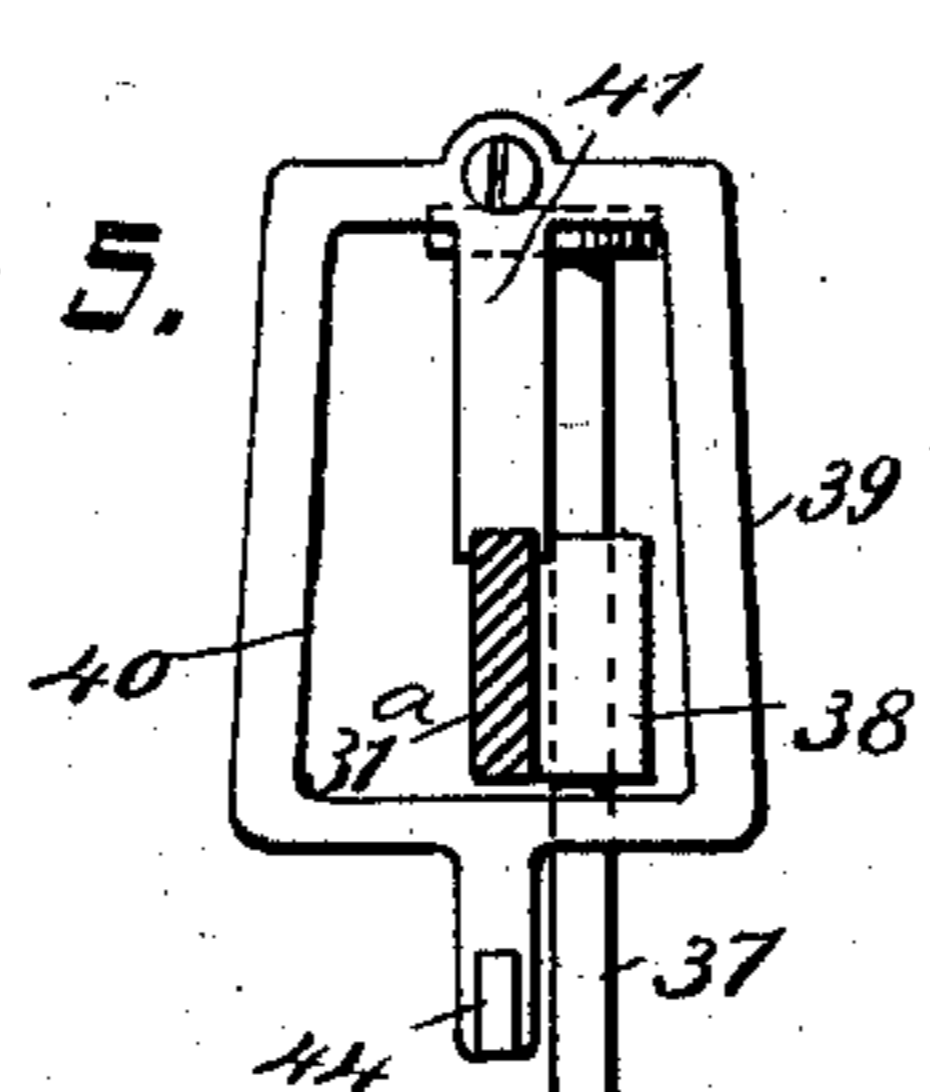


Fig. 5.



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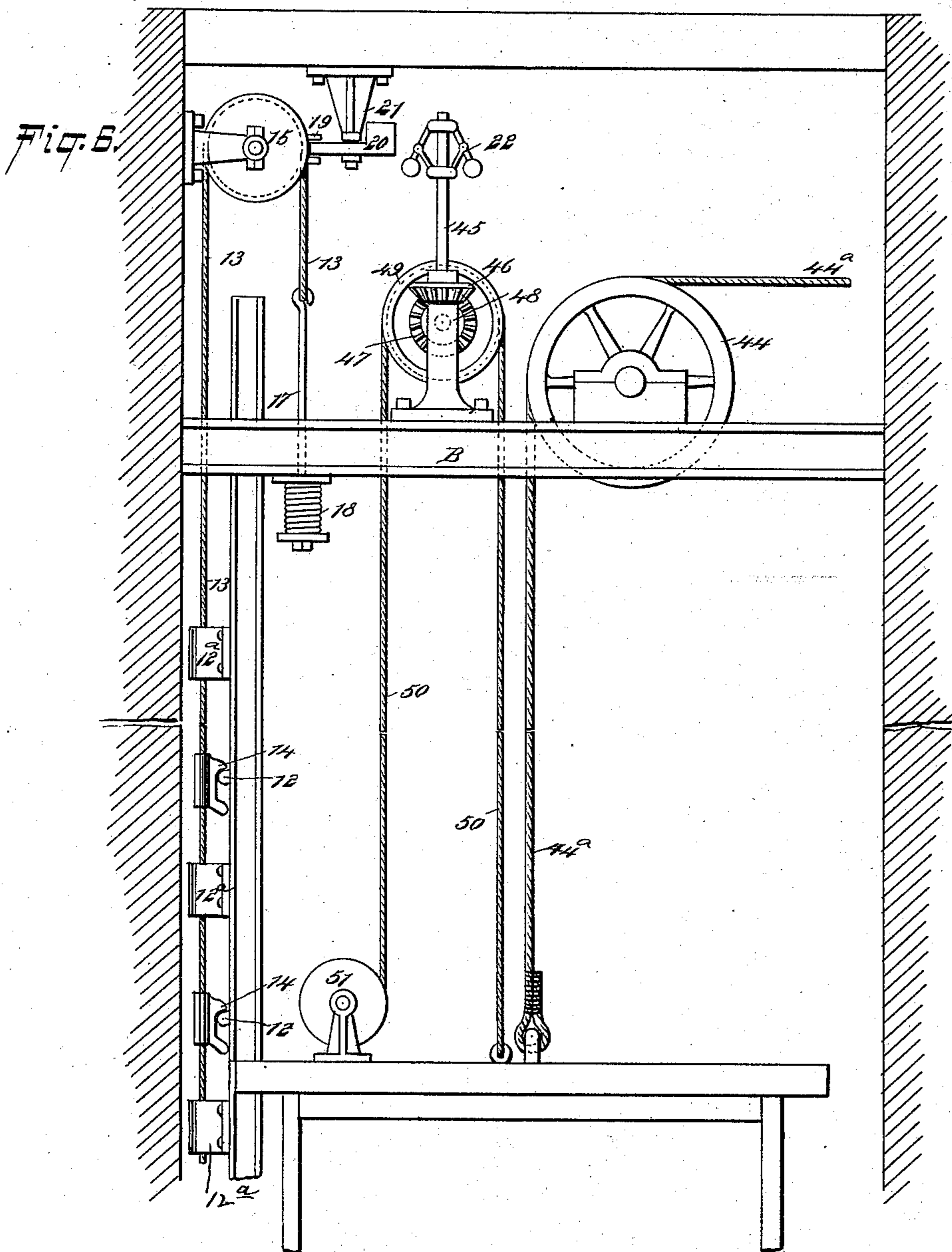
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UNITED STATES PATENT OFFICE.

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ELEVATOR SAFETY ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 547,270, dated October 1, 1895.

Application filed April 17, 1895. Serial No. 546,032. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. LABATT, a subject of the Queen of Great Britain, residing at New York city, in the county and State of New York, have invented a new and Improved Elevator Safety Attachment, of which the following is a full, clear, and exact description.

My invention relates to a safety attachment for elevators, and it has for its object to provide a means simple, economic, and durable whereby in the event the hoist-rope of the elevator-cage should break or part or in the event that the speed of the cage should be much more than a predetermined rate safety-catches will be automatically brought into the path of the cage to instantly stop the travel thereof and hold the cage stationary.

Another object of this invention is to provide a device for accomplishing the above-named objects capable of being expeditiously and conveniently applied to any elevator-shaft and any elevator-cage, the mechanism being brought automatically into action either directly through the movement of the cage itself or by controlling devices connected with the bearings of the drum supporting the cage.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

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

Figure 1 is a vertical section through a portion of the elevator-shaft, illustrating the means for bringing the safety device into requisition either through increase of speed on the part of the cage or by reason of a breakage or fracture in the supporting-cable. Fig. 2 is a vertical section taken substantially on the line 2 2 of Fig. 1. Fig. 3 is a horizontal section taken practically on the line 3 3 of Fig. 1. Fig. 4 is a partial vertical section through an elevator-shaft, illustrating a modification in the trip device brought into action by increase of speed on the part of the car or cage. Fig. 5 is a section taken substantially on the line 5 5 of Fig. 4; and Fig. 6 is a partial vertical section through an elevator-shaft,

illustrating a slight modification in the safety-catch controlling mechanism, wherein said mechanism is controlled directly from the cage or car.

The present invention is designed in a measure as an improvement upon that for which Letters Patent were granted to me August 15, 1893, No. 503,486, wherein the safety-catch operated only upon the breakage of the hoisting-rope.

Preferably at one side of the elevator-shaft A a vertical bar or beam 10 is supported, and said bar or beam is provided with recesses 11 at frequent intervals therein, while in each recess a safety-catch 12 is fulcrumed, the catch being practically in the form of a latch comprising a body portion, which is normally held entirely within the recess it is intended to occupy, and a shank 11^a, ordinarily somewhat of hook-like construction, which extends out beyond the outer face of the recess, as is best shown in Fig. 1, and when the hook or shank portion of the catch is liberated or is forced upward the body portion will be carried outward and downward from the recess in which the latch is placed into the path of the descending cage or car, so as to support the latter and prevent it from traveling farther downward. The latch-beam 10 is further provided with series of eyes 12^a upon its inner face, and through these eyes a trip-rope 13 is made to loosely pass, and this rope carries at proper intervals in its length a series of trip-blocks 14, which are recessed upon their inner faces, and a trip-block is located opposite the shank portion of each of the catches 12, as shown, also, in Fig. 1, the said shanks of the catches entering the recesses in the blocks, and normally these blocks maintain the catches wholly out of the path of the car or cage.

The trip-rope 13 is shown in Figs. 1, 2, and 3 as being carried upward over a pulley 15, located at the upper portion of the shaft, and is then connected with one end of a rod 17, controlled by a spring 18, a weight, or its equivalent, the spring serving to normally exert downward tension on the upper end of the trip-rope, and thereby cause the trip-blocks to be elevated to throw the catches 12 in the path of the cage or car; but the spring 18 is prevented normally from so acting by forming lugs 19 upon the periphery of the

pulley to receive between them one end of a lever 20, fulcrumed in a suitable hanger 21, which may be secured to a support at the top portion of the elevator-shaft, and when the speed of the car shall have increased beyond a predetermined degree the lever 20 is adapted to be engaged by the arms of a governor 22, the latter being of any well-known type, and in this event the said lever is disengaged from the said pulley, and the spring or weight 18 acting will bring the trip-blocks to a position to throw inward the safety-catches and stop the car.

It will be seen that the lever 20, while specifically such, operates, broadly, in the capacity of a stop.

Upon suitable supports B, located in the upper portion of the elevator-shaft, pillars 23 are supported, and in each of the said pillars a box 24 is arranged and has vertical sliding movement. These boxes are made to journal a shaft 25, and on the said shaft the drum-wheel 26, carrying the hoisting or supporting rope 27 of the elevator car or cage, is securely fastened, and preferably at one end of this shaft a miter-gear 28 is secured, which meshes with a similar gear 29, secured on the shaft 30, operating the governor.

A lever 31 is fulcrumed usually between its center and one of its ends upon a hanger 32, extending downward from the top of the shaft, and at the shorter end of this lever a rod 33 is located, carrying a predetermined amount of weight 34, while the opposite or longer end of the lever may be and preferably is connected with the trip-rope 13 by means of a branch 13^a, as is best shown in Fig. 2, and one of the boxes 24, in which the drum-shaft 25 is journaled, is connected with the aforesaid lever 31 by means of a link 35 or its equivalent. Thus it will be observed that should the speed of the car or cage be unduly accelerated the governor-arms will be made to expand, as shown in dotted lines in Fig. 1, and the trip-lever 20, connected with the pulley 15, will release said pulley, and, as heretofore stated, the safety-latches or cages will act to stop the car.

In the event that the hoisting or elevating rope 27 should break, the weight 34 will be sufficient to draw down the short end of the longer lever 31, the drum-shaft rising in its bearings as the lever swings, and as the free end of the lever is carried in an upward direction it will simply slack that portion of the trip cable or rope passing over the pulley 15, but will act upon the balance of the cable to draw upward the trip-blocks in a position to throw the safety-catches out into the path of the car. Thus it is evident that no matter whether the hoisting-cable should break or whether the speed of the car should be unduly increased the catches will serve to stop the car until any accident that may have occurred to the mechanism may be repaired.

In Fig. 4 I have illustrated a modification in that portion of the mechanism whereby the

trip-cable 13 is brought into action by the acceleration of speed on the part of the car. In this event the lever 31^a is fulcrumed upon a standard 36, located on one of the pillars or pedestals 23, in which the boxes of the drum-shaft are placed. The governor is driven in the manner heretofore described, and upon the opposite pedestal 23 a post 37 is arranged and passed through a vertical opening in the end of the pedestal, whereby it may be fixed to the box 24 thereof. The two boxes 24 and their shaft 25 are capable of vertical movement in the pedestal 23, and when the rope 27 is intact they are forced to the limit of their downward movement by the weight of the car. The upper end of the rod 37 is passed through an enlarged opening 38, formed in the lever 31^a.

As shown in Fig. 5, a lock-lever 39 is fulcrumed upon the upper end of the post, and this lock-lever is adapted to rock on its fulcrum and has an opening 40 made in it through which one end of the lever 31^a passes, the opening being of sufficient size to permit of considerable side movement on the part thereof. Under this construction a tongue 41 is projected downward from the lever, and the tongue normally rests upon the top of the lever 31^a, holding the same in a horizontal position and against the influence of weights 42, carried by a rod 43, connected with one end of the lever. At the opposite end of the lever the trip-rope 13 is secured, to which the trip-blocks 14 are attached, and upon the lower end of the lock-lever 39 an arm 44 or its equivalent is placed, which, when the speed of the car is beyond a predetermined degree or point, the governor-arms, in expanding, will engage, and therefore rock the lever 39 to one side or to the other to such an extent as to release the actuating-lever 31^a, permitting its weights 42, or a spring which may be substituted for the weights, to draw down the end of the lever with which the weight is connected, thereby elevating the opposite end and causing the safety-latches to drop in the path of the car. When, however, the rope 27 breaks, the weight of the car being no longer applied to the shaft 25, the same, together with its box 24, will be lifted by its weights 42, acting through the medium of the lever 31^a and rod or standard 37, it being understood that these two parts are connected by the engagement of the lever 31^a and arm 41 of the lever 39. As the lever 31^a swings upward it raises the rope 13 and operates the catch devices 12, as will be understood. Thus it will be seen that the lever 31^a may be operated in two ways—by causing the arms 41 to be disengaged therewith and by removing the weight of the car from the shaft 25—in both of which cases the weights 42 will lift the lever and positively operate the catches 12.

In the construction shown in Fig. 6 the movement is imparted to the governor directly from the car or cage. In this event the hoisting-drum 44 may be mounted in the usual

manner, and a hoisting-cable 44^a is attached to the car or cage as ordinarily. The governor-shaft 45 is provided with a bevel-gear 46, driven from a like gear 47, secured on a shaft 48, independent of the drum-shaft, and the shaft 48 carries a pulley 49, over which a cable 50 is passed. One end of this cable is secured to the elevator cage or car usually adjacent to the hoisting-cable 44^a, while the other end of the cable 50 is attached to a spring-controlled drum 51, of any approved construction, or the equivalent of said drum, the latter being secured to the car or cage. This drum may be provided with a spring, which will be wound up as the cable 50 unreels from the drum, which will be on the downward movement of the cage or car. Therefore on the upward movement of the said cage or car the spring of the drum 51 will cause the cable 50 to be wound thereon, and as long as the speed of the car or cage is within predetermined bounds the governor will not act upon the trip mechanism, which is a duplicate of that shown in Fig. 1 and correspondingly designated; but when the speed of the car or cage is unduly increased the governor-arms will release the pulley 15 of the trip mechanism and permit a spring 18 or a corresponding weight to draw upward the trip-rope and throw inward the latches.

It is obvious that the sheave 44 may be replaced by the wheel 26, boxes 24, lever 31, and the attending mechanism, and, indeed, in practice this will be desirable, since it may not be well to rely solely on the devices shown in Fig. 6 for acting upon the breaking of the hoisting-rope. In this event the said parts will be arranged and will operate precisely as in Figs. 1, 2, and 3, and will be supplemental to the parts illustrated in Fig. 6.

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

1. The combination of an elevator car, a safety catch, a rope connected to said catch mounted at the side of the shaft, and off the

car, means tending to move said rope to throw the catch into operative position, means for holding the rope against movement, and a governor controlling the said means, substantially as described.

2. The combination of an elevator car, a safety catch, a rope connected thereto, means for drawing on the rope, a drum over which the rope is wound, a stop for the drum, and a governor controlling the stop, substantially as described.

3. The combination of an elevator car, a safety catch, a rope connected to the catch, a drum over which the said rope is wound, a spring connected to the rope, a lever capable of holding the drum, a governor controlling the lever, a second lever connected to the rope of the catch, and a shaft carrying the elevator sheave and vertically movable, the said shaft having a connection with the second lever, substantially as described.

4. The combination of an elevator car, a safety catch, a rope connected to the catch, a drum over which the rope is wound, a spring connected to the rope, a lever capable of holding the drum, and a centrifugal governor controlling the lever and controlled by the movements of the elevator car, substantially as described.

5. The combination, with an elevator car, of a safety catch formed with a projecting shank, a trip lock having a recess receiving the shank of the safety catch, a rope connected to the trip block, and means for drawing on the rope, substantially as described.

6. The combination with an elevator car, of a recessed beam, a safety catch pivoted in the recess thereof and having a laterally projecting shank, a trip block having an indentation or recess receiving the shank, a rope connected to the trip block, and means for drawing on the rope, substantially as described.

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