

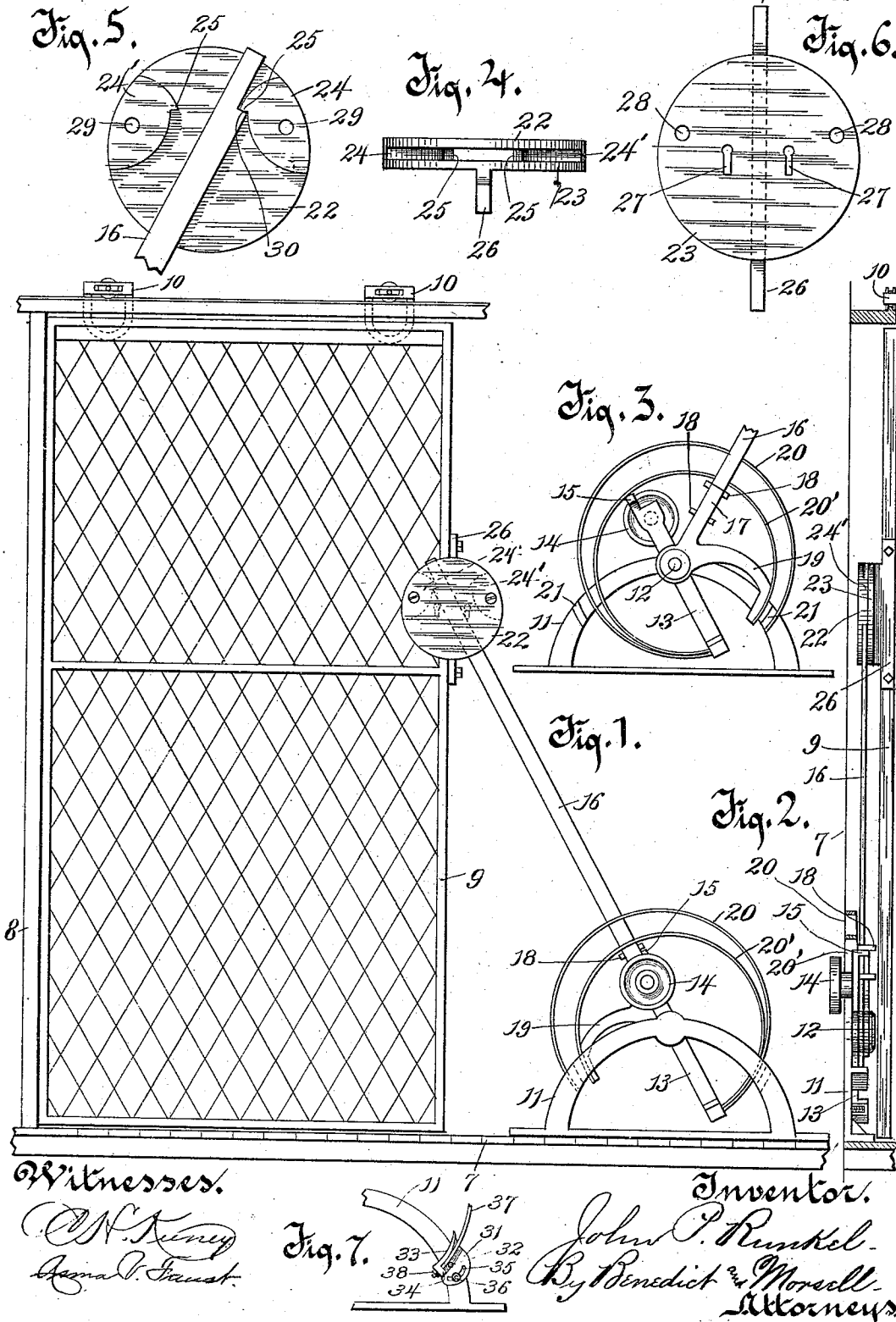
(No Model.)

J. P. RUNKEL.

DEVICE FOR OPENING OR CLOSING DOORS OF ELEVATOR WELLS.

No. 552,005.

Patented Dec. 24, 1895.



UNITED STATES PATENT OFFICE.

JOHN P. RUNKEL, OF MILWAUKEE, WISCONSIN.

DEVICE FOR OPENING OR CLOSING DOORS OF ELEVATOR-WELLS.

SPECIFICATION forming part of Letters Patent No. 552,005, dated December 24, 1895.

Application filed May 3, 1895. Serial No. 548,011. (No model.)

To all whom it may concern:

Be it known that I, JOHN P. RUNKEL, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Devices for Opening or Closing the Doors of Elevator-Wells, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention has relation to improvements in devices for opening and closing the doors of elevator wells.

It consists of certain improvements upon the device covered by my application for Letters Patent, filed December 26, 1894, Serial No. 532,904, the object being to provide a more simple construction of that part of the mechanism to which the operating-lever is secured, and by which the door is opened and closed, and held in a locked position when closed.

My invention also contemplates a further object, which will be hereinafter more fully described.

In the accompanying drawings, Figure 1 is an elevation of the inner side of an elevator-well door with my improvements applied thereto. Fig. 2 is an edge view of Fig. 1. Fig. 3 is an elevation of the opposite side to that shown in Fig. 1 of the door-operating mechanism, showing the safety-lever as having been moved, but the door-lever as yet unaffected by the spring connected thereto. Fig. 4 is an edge elevation of the lock-casing. Fig. 5 is an outer face view of one side of said lock-casing. Fig. 6 is an inner face view of the other section of said lock-casing, and Fig. 7 is an illustration of the preferred form of connection for the end of the spring 20.

Like numerals of reference denote like parts throughout the several views.

Referring to the drawings, the numeral 7 indicates a flooring; 8, the frame of an elevator-well door; 9, the door, which is suspended by the usual hangers 10 10 and is adapted to slide laterally in grooves or ways therefor.

Secured to each floor of the building in proximity to and to one side of the door of the elevator-well is a frame 11, preferably in the form of a segment of a circle. Pivoted centrally to the highest point of the circle, upon a stud 12, is a lever 13, having journaled

at its upper end, upon one side, an antifriction-roller 14. At one edge the upper extremity of the lever is provided with a lug 15 projecting forwardly at right angles thereto, as clearly shown in Fig. 3.

The numeral 16 indicates a door-operating lever. The lower end instead of being an integral part of this lever is preferably a casting 17, which is provided with edge lugs 18 projecting both ways beyond the casting. The lower end of the lever proper is passed between these lugs and is secured to the casting. The lower end of the casting turns upon the stud 12, and is located thereon in front of the lever 13. The casting has also projecting therefrom an integral arm 19. The ends of flat curved springs 20 20' are secured to the lower end of lever 13. The opposite end of the outer spring 20 is secured to a lug 21, while the opposite end of the inner spring 20' is secured to the end of arm 19.

The lock-casing consists of two sections 22 and 23, respectively. The inner section 22 is provided upon its outer side, at opposite points, with circular blocks 24 24', each of which is provided with a projecting shoulder 25. The outer section has secured to its outer face an arm 26, which is bolted to the edge of the door. This outer section is also provided with two keyholes 27 27', and with two bolt-holes 28 28', which bolt-holes when the sections are adjusted together are adapted to register with similar holes 29 29' in the other section, said registering holes adapted to receive the bolts for securing the two sections together.

The upper end of the door-operating lever 16 passes between the two sections of the casing and is provided upon its inner edge, near its upper end, with a shoulder 30, which is adapted to engage under the shoulder of block 24, as clearly shown in Fig. 1. This shoulder 30 is preferably provided, although it is obvious that instead thereof the upper end of the operating-lever could terminate where the shoulder is located, and said upper end engage the shoulder of block 24, and the same result obtained.

It will be understood that the parts just described are adapted to be used in connection with mechanism carried by the elevator for engaging the operating-lever and turning

it upon its pivot upon the ascent or descent of the elevator-cage, as fully described in my application for Letters Patent filed December 26, 1894, Serial No. 532,904.

5 In operation, if the parts are in the position shown in Fig. 1, and in descending it is desired that the cage should stop at the floor below and the door opened, the operator throws the mechanism carried by the elevator-cage
10 into action to engage the roller 14. As the cage continues to descend, the action of the mechanism carried thereby on said roller causes the lever 13 to be turned upon its pivot, thereby compressing the two springs 20 and
15 20'. If the door moves very freely and with but little friction in its ways, the door-lever 16 will be turned on its pivot at the same time the lever 13 is turned, but not so rapidly as said lever 13. When the lever 13 has
20 reached the limit of its movement, spring 20' begins to regain its normal expanded condition, and in doing so, inasmuch as one end is attached to arm 19, the door-operating lever 16 is brought to the full limit of its movement.
25 As the shoulder at the upper end of said lever is, when the door is closed and before the movement of the lever begins, in engagement with the shoulder 25 of block 24, it is evident that the moment said lever is actuated, inas-
30 much as the upper end thereof is moved in the arc of a circle, the shoulder 30 thereof is released from engagement with the shoulder 25 and the outer edge of the lever is brought into engagement with the edge of block 24',
35 thereby necessarily sliding the door laterally in its ways or grooves to an open position. After the passengers are let out at this floor and as soon as the elevator begins to travel again, the mechanism carried by the elevator-
40 cage is allowed to resume its normal inactive position. The outer spring 20 has now an opportunity to expand, and in doing so acts upon the lower end of lever 13 and returns the lever to its former position. Said lever 13 in thus
45 returning carries with it, by reason of the lug 15, the door-operating lever. The upper end of said lever is thereby thrown out of contact with the block 24', over toward the block 24, and into engagement with the projecting
50 shoulder 25 thereof, and with the continued movement of said operating-lever the door is forced laterally back to a closed position. When thus closed, as shown in Fig. 1, it is ob-
55 vious that it cannot be opened by force applied directly to the door, in view of the fact that the lever swings in the arc of a circle, and of course any force applied to the door for the purpose of sliding the same to an open position would only
60 have the effect of more closely wedging the same. Inasmuch as the upper end of the lever is confined between the two sections of the casing, it will also be seen that it is difficult for access to be obtained to the lever from the outside of the door.

65 It is not essential to successful operation that the block 24' be provided with a shoulder 25. I have shown such shoulder in connection

with block 24', however, in order to clearly illustrate the feature of the interchangeability of the parts, whereby they are made adaptable
70 no matter in what direction laterally the elevator-well doors are opened and closed. If, for instance, my invention is to be applied to a door opening in an opposite direction to that shown in Fig. 1, the lock-casing is applied to
75 said opposite edge of the door and the operating-lever reversed, so that the shoulder 30 thereof will engage the inner shoulder 25 of the block, in this new relation of the parts, of course the mechanism connected up to the op-
80 erating-lever is also reversed. I have shown the outer section 23 of the lock-casing as provided with two keyholes 27. This adapts a key to be inserted, and the lever thrown out of locked engagement with the locking-shoulder
85 of a block from the outside of the door at whichever edge of the door the lock-casing may be applied.

In my application for Letters Patent hereinbefore referred to a bar running transversely
90 of the door and connected at one end with the operating-lever and at the opposite end with a latch was absolutely necessary in order to secure the opening and closing of the door and the locking of the door in its closed position. It will be seen that by my improved construction these several parts are entirely dis-
95 pensed with, and the device thereby very much simplified. Said former application for patent also covered lever mechanism, as well
100 as mechanism carried by the cage for operating said lever mechanism. No claim, therefore, is made herein to these parts, excepting only in so far as the lever mechanism co-operates with the door-operating mechanism.
105

Fig. 7 of the drawings illustrates an improved form of connection for one end of the spring corresponding to the spring 20 in the other figures of the drawings. It consists of a
110 plate 31 pivoted to the frame 11 by means of a pivot-pin 32. It is provided at its upper edge with a projecting lug 33, concavo-convex in cross-section, said lug having at one end a depending portion 34. Near its lower end the plate is provided with a curved slot 35, which
115 is adapted to receive a set-screw 36. I also contemplate using round springs, such as 37, instead of the flat springs shown in the other figures of the drawings, and for each of the outer and inner spring portions two of these
120 round springs will be used, as better results are obtained therefrom than from a single spring. An end of each of the round springs of the outer spring portion is passed through the depending portion 34, and is threaded to
125 receive a locking-nut 38. The manner of attaching the end of the outer spring 20, as shown in Figs. 1 and 3—viz., to a lug 21—is objectionable, owing to the sharp corner presented by the lug 21, which, as will be appar-
130 ent, has a tendency to bend the spring and ultimately break the same. By the arrangement shown in Fig. 7, however, the spring bears directly against the convex under side

of the lug 33, and consequently all danger of bending and breaking is avoided. It is also to be noted that the construction shown in this figure of the drawings provides a simple means for taking up all slack in the spring, this being accomplished by loosening the set-screw, turning the plate on its pivot, and subsequently again tightening the screw to hold the plate in its adjusted position.

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

1. The combination, of two pivoted levers, a yielding connection between the levers, a sliding door, and an attachment to the door, so constructed as to be engaged by one of the levers, when the lever mechanism is acted upon, whereby the door is opened, and said attachment to be likewise engaged by the lever acting thereon, when the lever mechanism is actuated reversely, whereby the door is closed, and locking mechanism adapted to automatically hold the lever in locked engagement with the attachment, against being forced open by force applied directly to the door, substantially as described.

2. In a door operating device for elevator wells, the combination, of a sliding door, an attachment to the door, consisting of two sections, with blocks between the sections, the inner one of said blocks being shouldered at its inner edge, and a pivoted lever having its upper end passing between the two sections of the attachment and lying between the two blocks thereof, substantially as set forth.

3. In a door operating device for elevator wells, the combination, of a sliding door, a pivoted lever, and an attachment to the door so constructed as to be acted upon by the lever, when said lever is turned in one direction, whereby the door is opened, and to likewise be acted upon by the lever when said lever is turned in the opposite direction, whereby the door is closed, the attachment being provided with locking means to automatically hold the lever into locked engagement therewith against being opened by force applied directly to the door, and also provided with a key-hole arranged to permit a key inserted therein to act against the lever to throw the same out of locked position, substantially as set forth.

4. In a door operating device for elevator wells, the combination of a sliding door, a pivoted lever and an attachment to the door so constructed as to be acted upon by the lever, when said lever is turned in one direction, whereby the door is opened, and to likewise be acted upon by the lever, when said lever is turned in the opposite direction, whereby the door is closed, the attachment being provided with locking means to automatically hold the lever in locked engagement therewith against being opened by force applied directly to the door, and also provided with key-holes, one of said key-holes at whichever edge of the door the attachment is applied, adapting a key inserted therein to act against the lever to throw the same out of locked position, substantially as set forth.

5. In a door operating device for elevator wells, the combination, of a frame, formed or provided with a lug having a convex side, a lever pivoted to the frame, and a spring having one end secured to the lever, and its opposite end secured to the lug, and bearing against the convex side thereof, substantially as set forth.

6. In a door operating device for elevator wells, the combination, of a frame, a lever pivoted thereto, a plate also formed or provided with a lug having a convex side, a spring having one end secured to the lever, and its opposite end secured to the lug, and bearing against the convex side thereof, and means for holding the plate in adjusted position, substantially as set forth.

7. In a door operating device for elevator wells, the combination of a frame, a lever pivoted thereto, a plate also pivoted to the frame, and provided with a curved slot, and also formed or provided with a lug having its under side convex, said lug provided at one end with a depending portion, a spring having one end secured to the lever, and its opposite end bearing against the convex side of the lug, and secured to the depending portion of said lug, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN P. RUNKEL.

Witnesses:

C. T. BENEDICT,
ANNA V. FAUST.