A. J. BAUTZ.

SAFETY DEVICE FOR ELEVATORS.

APPLICATION FILED MAR. 28, 1908.

995,654.

Patented June 20, 1911.

2 SHEETS—SHEET 1.

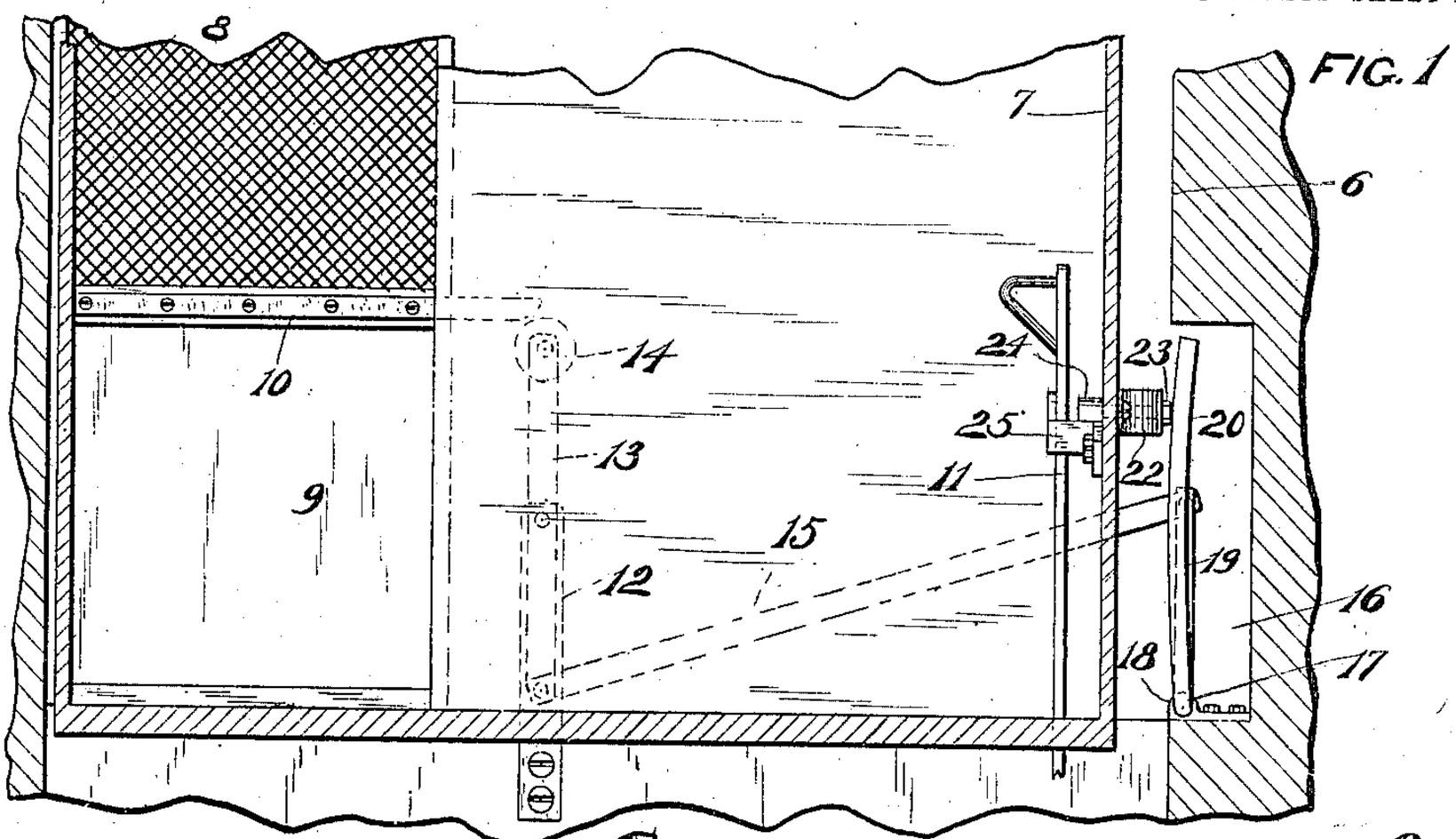

FIG. 1.

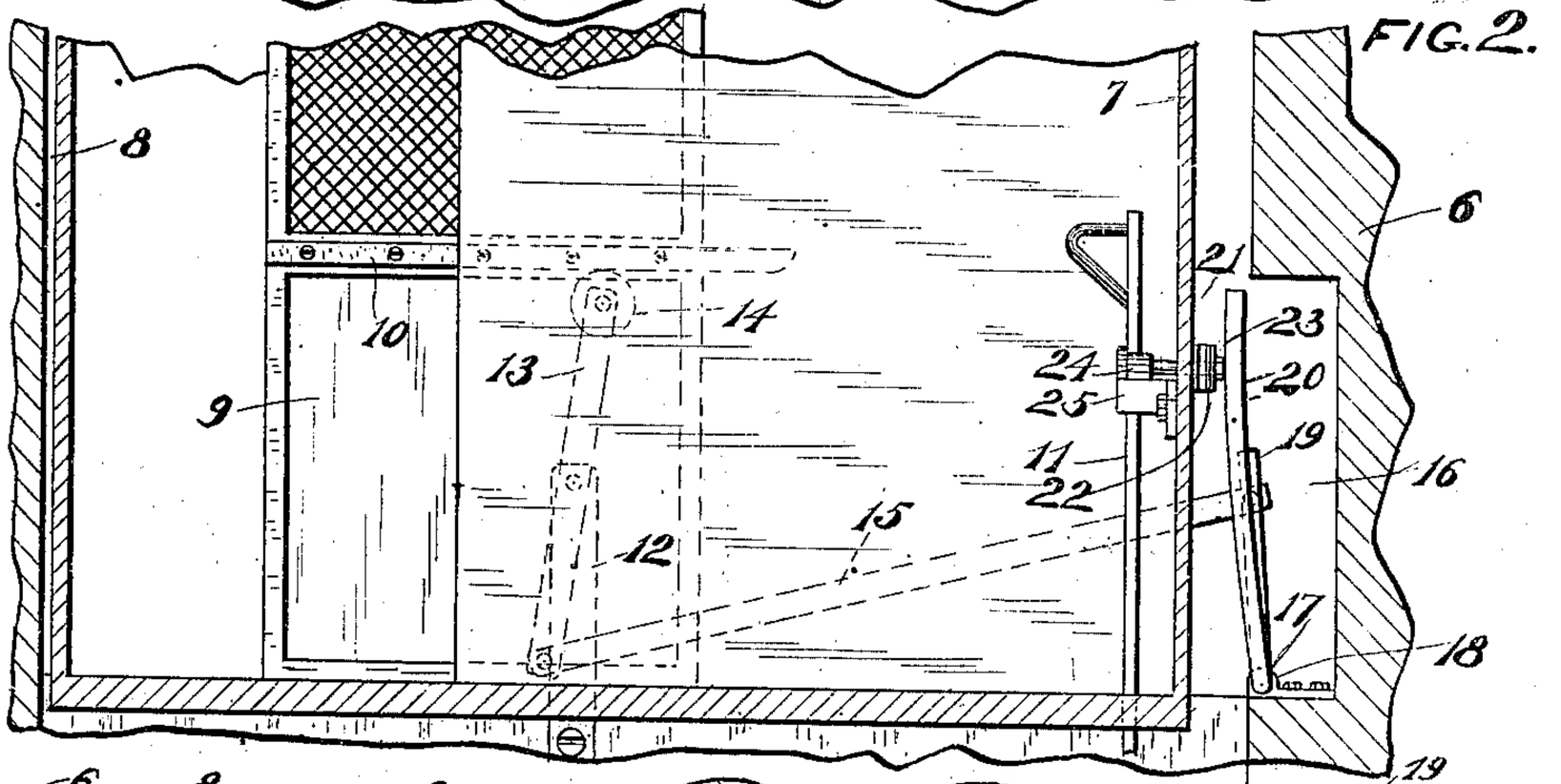

FIG. 2.

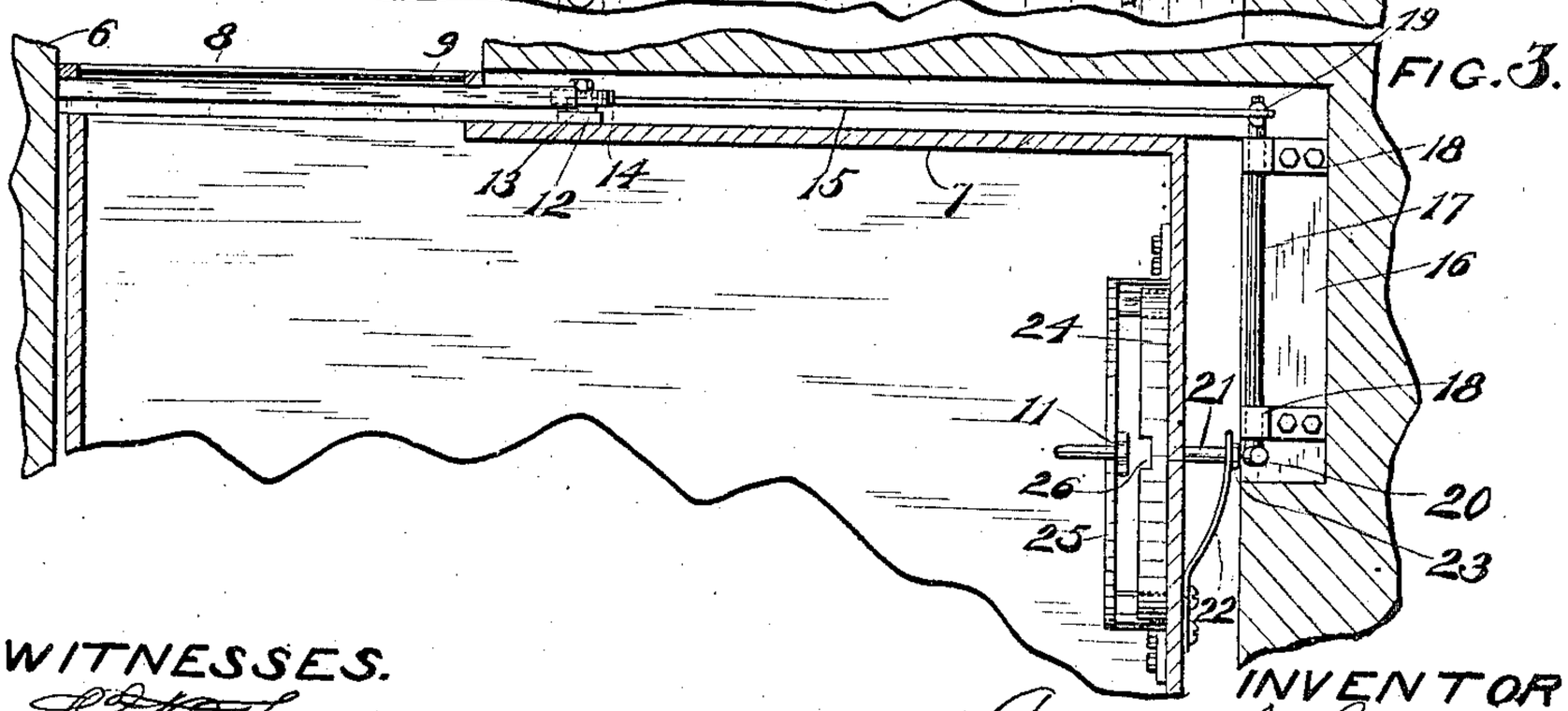

FIG. 3.

WITNESSES.

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2 SHEETS—SHEET 2.

FIG. 4.

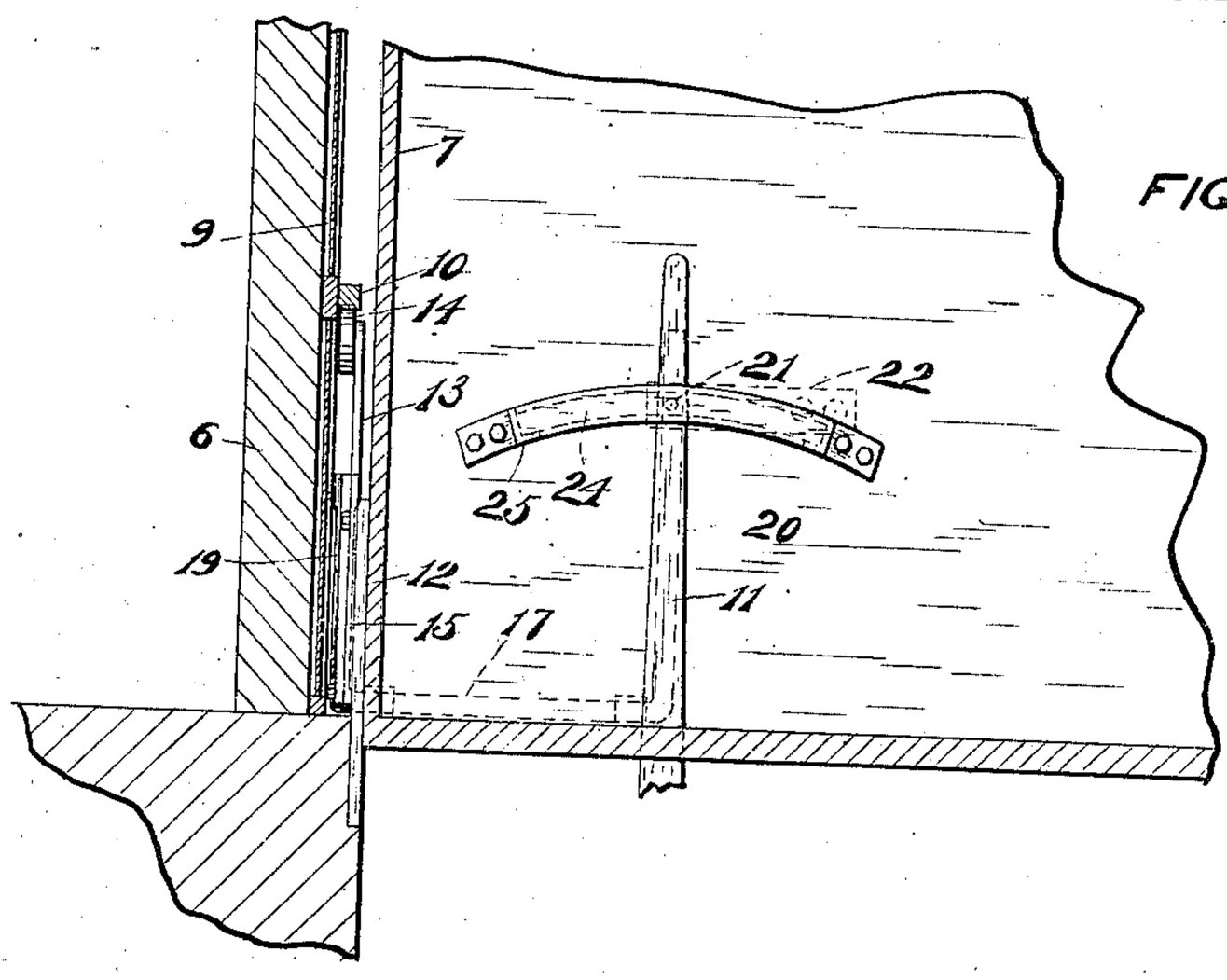
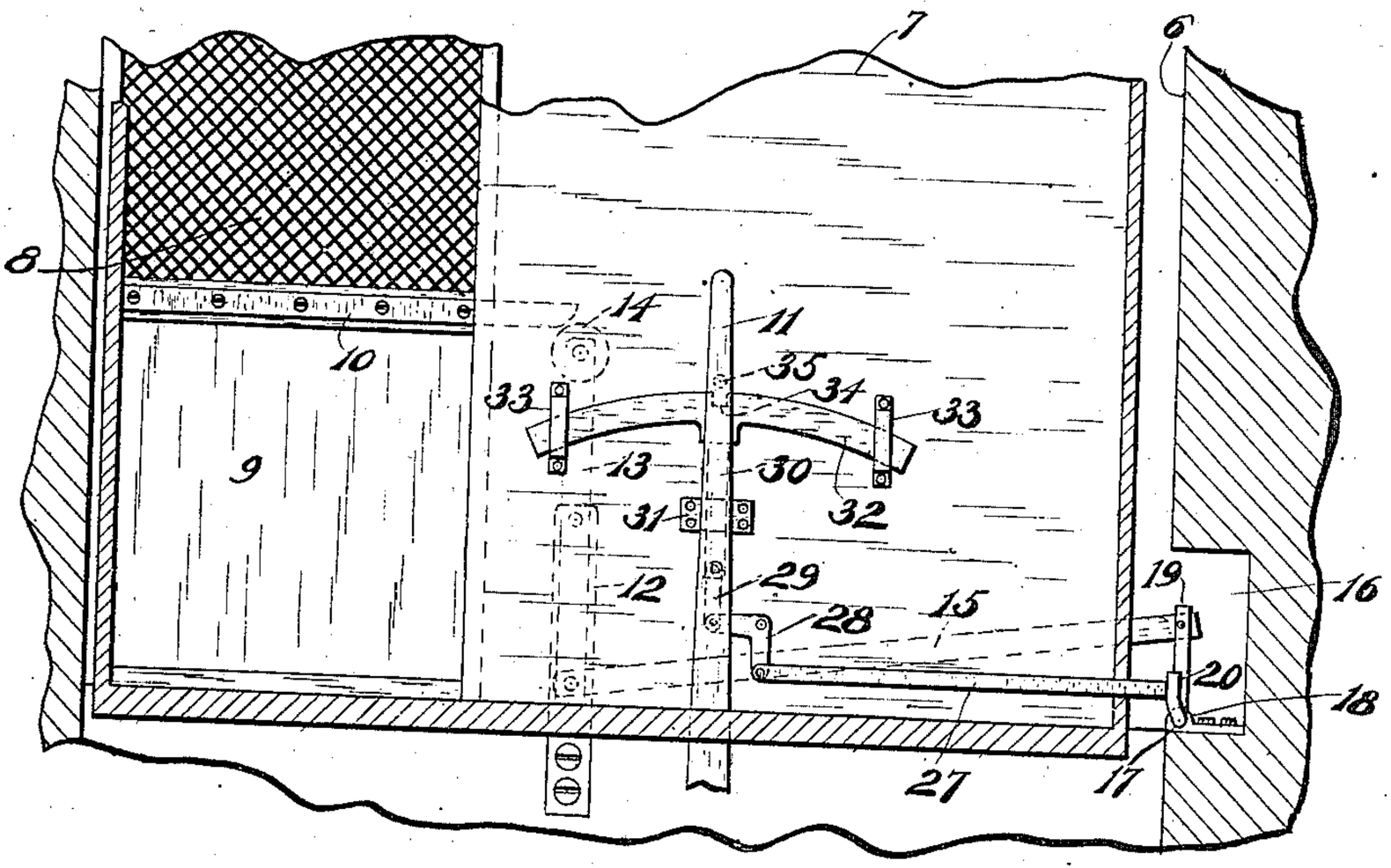


FIG. 5.



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SAFETY DEVICE FOR ELEVATORS.

995,654. Specification of Letters Patent. Patented June 20, 1911.

Application filed March 28, 1908. Serial No. 423,844.

To all whom it may concern:

Be it known that I, ANDREW J. BAUTZ, residing in Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Safety Devices for Elevators, 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 safety devices for elevators.

The object of the invention is to provide an improved construction and combination of parts, whereby the elevator cage is prevented from traveling up or down while the door leading to the elevator shaft is open, the travel of the cage only being permitted when the door is fully closed.

With the above primary object, and other incidental objects, in view, the invention consists of the devices and parts, or the equivalents thereof, as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a section through an elevator shaft or well and through the elevator cage, the door of the elevator shaft being shown as closed; Fig. 2 is a similar section to Fig. 1, but showing the door leading to the elevator shaft as partly open; Fig. 3 is a horizontal section through the mechanism shown in Fig. 1, taken on a plane above the mechanism for effecting the locking of the operating lever of the cage; Fig. 4 is a section through a fragment of the elevator shaft and the elevator cage, taken on a plane at right angles to the plane of Figs. 1 and 2; and Fig. 5 is a section through an elevator shaft and elevator cage, showing a modified form of the locking mechanism for the operating lever.

Referring to the drawings, the numeral 6 indicates an elevator shaft or well, 7 an elevator cage adapted to travel therein, 8 an opening in the elevator shaft located at a landing, and 9 a sliding door for controlling the opening, said door having rigidly secured thereto, and transversely thereof, a rail 10, which rail, preferably, has its inner end projecting laterally beyond the inner edge of the door.

Within the elevator cage is the usual operating lever 11. Attached to one of the sides of the elevator well, and extending upwardly a desired distance is a standard 12, and pivoted between its ends to this standard is a lever 13, said lever carrying at its upper end a roller 14. Over this roller the rail 10 is adapted to travel whenever the door is opened or closed. Pivotally connected to the lower end of the lever 13 is a link 15. Within a pocket or recess 16 formed in one of the end walls of the elevator shaft or well is a rock-shaft 17 mounted in suitable bearings 18, 18, said shaft provided at opposite ends with upwardly extending arms 19 and 20. To the arm 19 the outer end of the link 15 is pivotally jointed. The arm 20, when the rock-shaft is turned, is adapted to operate the mechanism for locking and unlocking the operating lever 11.

Referring now particularly to the construction illustrated in Figs. 1 to 4 of the drawings, the numeral 21 indicates a rod which passes freely through the side of the elevator cage which is parallel to the wall of the elevator shaft in which the pocket or recess 16 is located. The outer end of this rod passes through one end of an outwardly bowed flat spring 22, the opposite end of said spring being secured to the side of the elevator cage. A nut 23 is turned on to the outer extremity of the rod 21, and serves to prevent the spring from working off the outer end of said rod. The inner end of rod 21 which extends into the elevator cage is connected to a bar 24, said bar, when pressure is exerted against the outer end of rod 21, being adapted to be moved inwardly in a guide 25 secured to one of the side pieces of the elevator frame. The guide 25 also serves as a keeper for the operating lever 11. The inner edge of the bar 24 is provided centrally with a notch 26.

In explanation of the operation of the mechanism, it is to be stated that when the elevator cage reaches a landing, the operator slides the door 9 from the closed position illustrated in Fig. 1 toward the right and to an open position (Fig. 2 representing the door as being slid toward the right to a partly open position). As the door is thus moved, the free cammed end of rail 10 acts on the roller 14 at the upper end of lever 13, and causes said upper end of the lever to turn toward the right, thereby moving the link 15 toward the left. This movement of the link pulls the upwardly extending arm 19 toward the left, and consequently the rock-shaft 17 and its other arm 20 are turned in the same direction. The arm 20 in thus moving toward the left is caused to contact

with the outer end of the rod 21. This rod, together with the notched bar 24 at the inner end thereof, are thereby forced toward the operating lever 11. It will be understood that the operating lever 11 occupies an upright central position with relation to the guide or keeper 25, when the elevator cage reaches a landing and is stopped. The result is that when the bar 24 is moved toward the operating lever 11 as just explained, the notch 26 thereof is brought into engagement with said operating lever 11, and consequently the said lever is locked against movement so long as the door 9 is open. The elevator cage, therefore, cannot be caused to travel upwardly or downwardly so long as the door remains open. When it is desired to start the elevator cage, the door is pushed by the operator toward the left or toward a closing position. This releases the lever 13, and the spring 22 then reacts, and pulls the rod 21 and the connected notched bar 24 outwardly out of locking engagement with the operating lever 11. The outward movement of the rod 21 causes a turning of the arm 20, the rock-shaft 17 from which said arm projects, and also the other arm 19 of the rock-shaft, toward the right. This movement of the arm 19 toward the right exerts a pull on link 15 in the same direction, and consequently the medially pivoted lever 13 is turned in a direction to restore it to normal position. Thes lever 11, of course, is then free to be swung in either direction, in accordance with whether it is desired that the elevator cage should ascend or descend.

Figs. 1 to 4 show an arrangement applicable to an elevator cage in which the operating lever is located adjacent to the side of said cage which is at right angles to the side of the elevator shaft or well in which the door affording access to the elevator cage is located. In many forms of elevators, however, the operating lever is located on the same side as the door which affords access to the cage. I have therefore shown in Fig. 5 of the drawings a modified form of construction applicable to an elevator such as last referred to. In this modification, instead of the arm 20 of the rock-shaft 17 acting against a rod such as 21, it is adapted to act against a link 27. The inner end of this link is pivotally connected to the depending arm of a pivoted bell-crank lever 28. The other horizontal arm of this bell-crank lever is pivotally connected to a short link 29, and the upper end of this link in turn is pivotally connected to a rod 30 which is movable in a guide or keeper 31. The upper end of rod 30 is rigidly connected to a bar 32, said bar being movable vertically in guides 33. This bar 32 is provided centrally on its upper edge with a notch 34, which is adapted to coöperate with a pin or stud 35 extending from the operating lever 11. It will be understood that the bar 33 is located back of the lever, or in other words, between the lever and the wall of the elevator cage. In the operation of this modified form, when the door is pushed to the right toward an open position, the rail 10 acts on the roller 14 of lever 13, the same as in the principal form of construction, and through the lever 13 causes a pulling of the link 15 toward the left, and consequent inward turning of the rock-shaft 17 toward the elevator cage. This turning of the rock-shaft 17 causes the arm 20 thereof to act against the link 27 and thereby push said link toward the left of Fig. 5. This movement of the link causes a turning of the bell-crank lever in a direction to move the short link 29 and the rod 30 upwardly. As rod 30 has rigidly connected thereto the bar 32 said bar is moved upwardly with the rod, and the notch 34 of the bar is thereby brought into engagement with the pin 35 of the operating lever, which of course occurs when the elevator cage is brought to a landing and the operating lever thrown to a central position for stopping the cage at such landing. When it is desired to start the cage, the door is slid toward the left or toward a closed position. The weight of the rod 30 and the bar 32 to which said rod is attached, causes these parts to descend and consequently the notch 34 of the bar 32 is brought out of engagement with the pin 35, and thereby the lever 11 is released so as to render it capable of being operated. The descent of rod 30 and bar 32 also causes a return of the other parts to normal position.

What I claim as my invention:

1. In a safety device for elevators, the combination of an elevator shaft provided with an opening at the landing thereof, a door for controlling said opening, an elevator cage adapted to travel in the elevator shaft, cage controlling mechanism within the elevator cage, locking mechanism adapted, when the elevator cage reaches the landing and is stopped and the door is opened, to lock said controlling mechanism, a rock-shaft mounted in bearings located in one of the walls of the elevator shaft, said rock-shaft provided with two projecting arms, one of said arms being so positioned that when the rock-shaft is rocked in one direction it will act on the locking mechanism in a manner to cause the controlling mechanism to be engaged and locked thereby, and when said shaft is rocked in the opposite direction to permit of the controlling mechanism being unlocked, a link jointed to the other arm of the rock-shaft, and a medially pivoted lever to one end of which the other end of said link is connected, the opposite end of said medially pivoted lever being so positioned as to be acted upon by the door when the door is opened, to thereby, through the link, effect the turning of

the rock-shaft in the direction to cause the locking mechanism, when the elevator cage is at a landing, to engage and lock the controlling mechanism, and when the medially pivoted lever is released by the closing of the door, to permit the unlocking of the controlling mechanism, and a restoring of the rock-shaft, link and medially pivoted lever to normal positions.

2. In a safety device for elevators, the combination of an elevator shaft provided with an opening at the landing thereof, a sliding door for controlling said opening, a rail rigid with and extending across said door, an elevator cage adapted to travel in the elevator shaft, cage controlling mechanism within the elevator cage, locking mechanism adapted, when the elevator cage reaches the landing and is stopped and the door is opened, to lock said controlling mechanism, a rock-shaft mounted in bearings located in one of the walls of the elevator shaft, said rock-shaft provided with two projecting arms, one of said arms being so positioned that when the rock-shaft is rocked in one direction, it will act on the locking mechanism in a manner to cause the controlling mechanism to be locked, and when said shaft is rocked in the opposite direction to permit of the controlling mechanism being unlocked, a link jointed to the other arm of the rock-shaft, and a medially pivoted lever to one end of which the other end of said link is connected, the opposite end of said medially pivoted lever being so positioned as to be acted upon by the rail of the door, when the door is opened, to thereby through the link effect the turning of the rock-shaft in a direction to cause the locking mechanism, when the cage is at the landing, to engage and lock the controlling mechanism, and when the medially pivoted lever is released by the closing of the door, to permit the unlocking of the controlling mechanism, and a restoring of the rock-shaft, link and medially pivoted lever to normal positions.

3. In a safety device for elevators, the combination of an elevator shaft provided with an opening at the landing thereof, a sliding door for controlling said opening, a rail rigid with and extending across said door, an elevator cage adapted to travel in the elevator shaft, cage controlling mechanism within the elevator cage, locking mechanism adapted, when the elevator cage reaches the landing and is stopped and the door is opened, to lock said controlling mechanism, a rock-shaft mounted in bearings located in one of the walls of the elevator shaft, said rock-shaft provided with two projecting arms, one of said arms being so positioned that when the rock-shaft is rocked in one direction it will act on the locking mechanism in a manner to cause the controlling mechanism to be locked, and when said shaft is rocked in the opposite direction to permit of the controlling mechanism being unlocked, a link jointed to the other arm of the rock-shaft, a medially pivoted lever jointed at one end to one end of the link and a roller carried at the opposite end of the lever, said end of the lever which carries the roller being so positioned that the roller will be acted upon by the rail of the door when the door is opened, to thereby, through the link, effect a turning of the rock-shaft in a direction to cause the locking mechanism, when the cage is at the landing, to engage and lock the controlling mechanism, and when the medially pivoted lever is released by the closing of the door, to permit the unlocking of the controlling mechanism, and a restoring of the rock-shaft, link and medially pivoted lever to normal positions.

4. In a safety device for elevators, the combination of an elevator shaft provided with an opening at the landing thereof, a door for controlling said opening, an elevator cage adapted to travel in the elevator shaft, cage controlling mechanism within the elevator cage, a slidable rod, a locking bar rigidly secured to the slidable rod, a rock-shaft mounted in bearings located in the wall of the elevator shaft, said rock-shaft provided with projecting arms, a link having one end connected to one of the arms of the rock-shaft, and a medially pivoted lever having one end connected to the opposite end of the link, and its opposite end so positioned as to be operated upon by the door and turned in one direction when the door is opened, to thereby, through the link, effect the turning of the rock-shaft in a direction to cause the other arm of said rock-shaft to act upon and move the slidable rod and the locking bar, when the elevator cage is at a landing, in a direction to effect the engagement of the locking bar with the controlling mechanism, and when the medially pivoted lever is released by the closing of the door, to permit of the sliding of the slidable rod and bar in a direction to effect the disengagement of the locking bar from the controlling mechanism, and the restoring of the several parts to normal position.

5. In a safety device for elevators, the combination of an elevator shaft provided with an opening at the landing thereof, a door for controlling said opening, an elevator cage adapted to travel in the elevator shaft, a controlling lever extending into the elevator cage, a movable notched bar within the elevator cage, a rod rigid with said bar and extending through the side of the elevator cage, a rock-shaft mounted in bearings located in the wall of the elevator shaft, said rock-shaft provided with pro-

jecting arms, one of said arms being so positioned as, when the rock-shaft is turned in a direction toward the cage, to act on the outwardly extending rod and cause the same and its attached bar to move in a direction to bring the notch of the bar into locking engagement with the lever, a link having one end connected to the other arm of the rock-shaft, and a medially pivoted lever having one end connected to the opposite end of the link and its opposite end so positioned as to be operated upon by the door and turned in one direction, when the door is opened, and when the medially pivoted lever is released by the closing of the door to permit the unlocking of the controlling mechanism and a restoring of the rock-shaft, link and medially pivoted lever to normal positions.

6. In a safety device for elevators, the combination of an elevator shaft provided with an opening at the landing thereof, a door for controlling the opening, a rail rigid with and extending across the door, an elevator cage adapted to travel in the elevator shaft, a controlling lever extending into the elevator cage, a movable notched bar withing the elevator cage, a rod rigid with said bar and extending through the side of the cage, a spring engaging the rod and acting to normally hold said rod and its attached bar outwardly, a rock-shaft mounted in bearings located in the wall of the elevator shaft, said rock-shaft provided with projecting arms, one of said arms being so positioned as, when the rock-shaft is turned toward the elevator cage, to act on the outwardly extending rod and cause the same and its attached bar to move in a direction to bring the notch of the bar into locking engagement with the lever, a link having one end connected to the other arm of the rock-shaft, and a medially pivoted lever having one end connected to the opposite end of the link and its opposite end so positioned as to be operated upon by the rail of the door and turned in one direction when the door is opened to thereby, through the link, effect the turning of the rock-shaft in a direction to cause the locking mechanism, when the elevator cage is at a landing, to engage and lock the controlling mechanism, and when the medially pivoted lever is released by the closing of the door to permit of the movement of the rod and bar in a direction to effect the disengagement of the locking bar from the controlling mechanism, and a restoring of the several parts to normal positions.

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

ANDREW J. BAUTZ.

Witnesses:
A. L. MORSELL,
ANNA F. SCHMIDTBAUER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."