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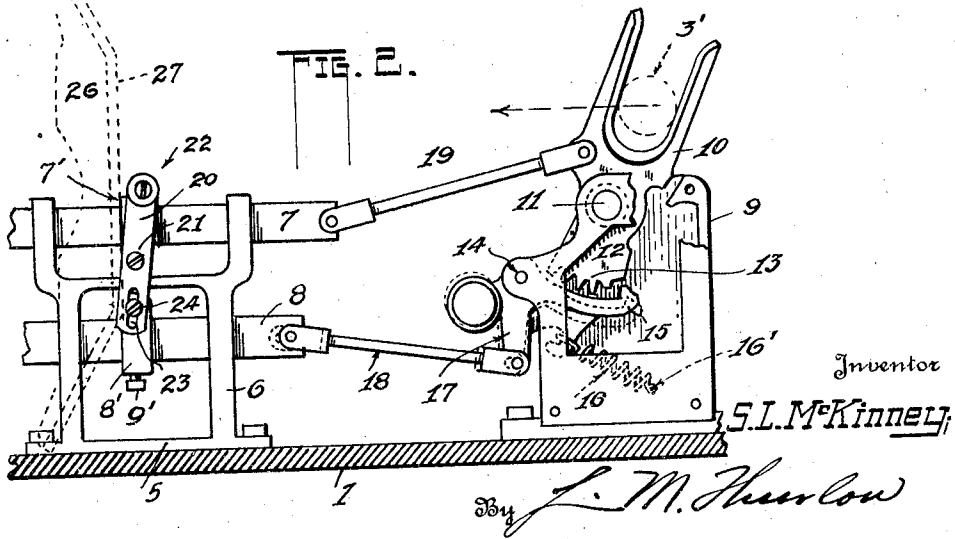
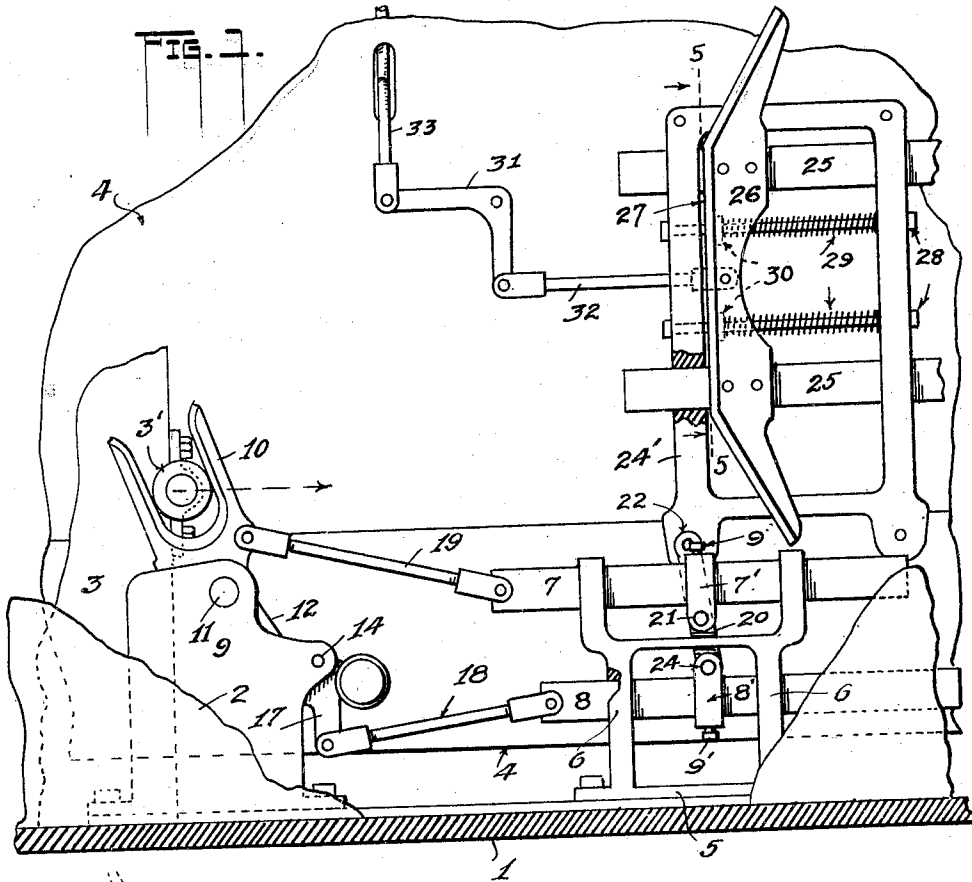
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1,732,193

SAFETY APPLIANCE FOR ELEVATORS.

Filed April 13, 1928

3 Sheets-Sheet 1



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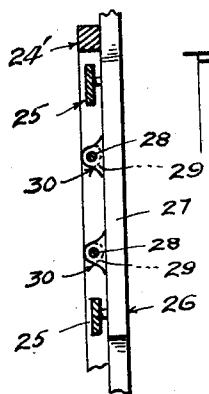
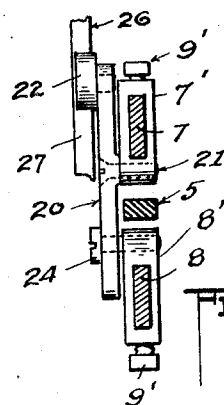
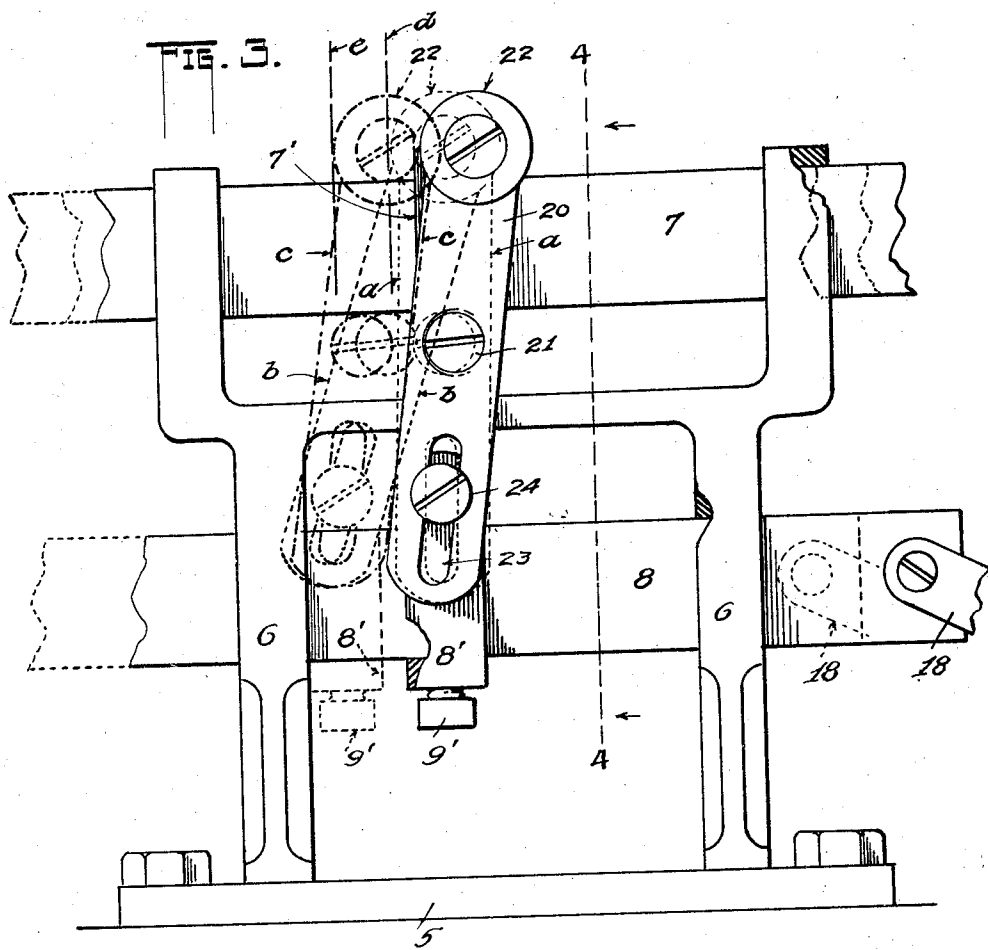
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SAFETY APPLIANCE FOR ELEVATORS

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3 Sheets-Sheet 2



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SAFETY APPLIANCE FOR ELEVATORS

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3 Sheets-Sheet 3

FIG. 6.

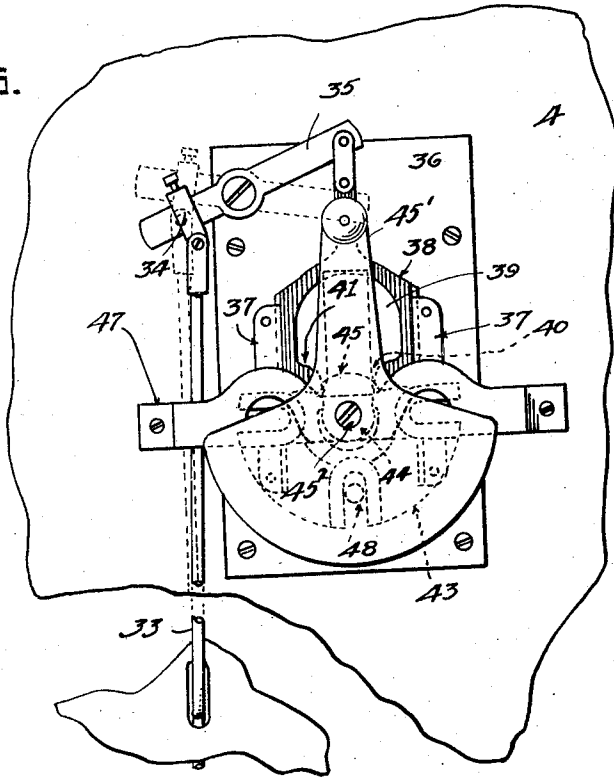
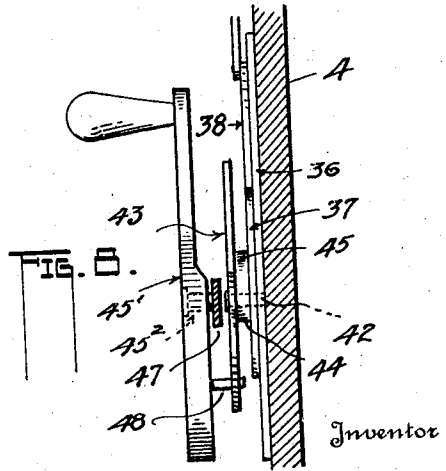
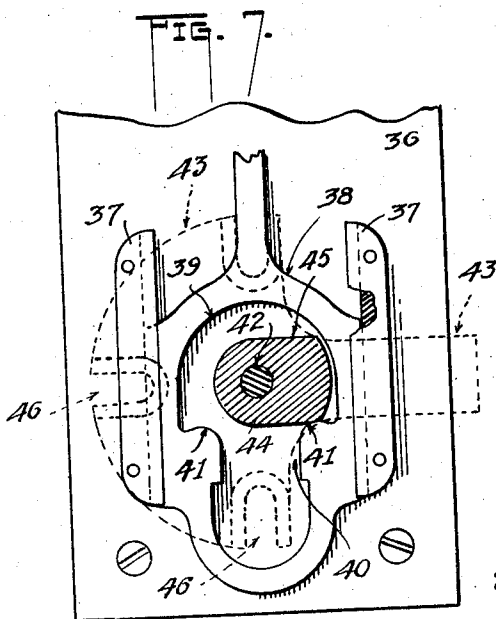


FIG. 7.



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SAFETY APPLIANCE FOR ELEVATORS

Application filed April 13, 1928. Serial No. 269,707.

This invention pertains to safety appliances for passenger elevators, being that type used for preventing opening the shaft door when the car is distant from the landing at such door, and likewise preventing operation of the power control in the car while the door is open at such landing.

An object of the invention is to simplify the structure of appliances of this class while making the same more efficient, and quiet in operation.

Another object is the provision of a novel form of arrangement by which when the car has made a landing the act of opening the shaft-door simultaneously securing the power-control lever in an inoperative position permitting the door to be opened.

Still another object is that of furnishing mechanism by which the act of opening the shaft door automatically and positively moves the power-control lever in the car to its neutral or "off" position.

In addition to these objects the invention consists in certain novel arrangement of parts to be described herein, and forming the subject of some of the appended claims.

In the appended drawings forming part hereof,

Figure 1 is a side elevation of mechanism mounted on the floor of a building adjacent the shaft door, and mechanism mounted upon the elevator-car, all as seen from outside said car.

Figure 2 is a side elevation of the floor-mounted mechanism shown in Figure 1 as seen from a position from within the elevator-shaft.

Figure 3 is a view similar to Figure 2 but showing parts of the same greatly enlarged, being in fact full size.

Figure 4 is a transverse section of the mechanism shown in Figure 3 on line 4—4 of that figure, but on a reduced scale.

Figure 5 is a transverse section of parts shown in Figure 1 on line 5—5 of that figure.

Figure 6 is a front elevation of a power-control lever mechanism as placed inside the elevator-car.

Figure 7 is a larger view of certain por-

tions appearing in Figure 6 with part thereof in section, and

Figure 8 is a transverse section of the wall of the car showing in side elevation the mechanism illustrated in Figure 6.

The floor of the building is designated at 1, the shaft enclosure at 2, the landing door at 3 and the elevator-car at 4, all as seen from outside the car. Secured on the floor 1, and in this instance to the right of the door-way, not shown, is a standard 6 of any convenient form but in this instance including two spaced portions 6 in which is slidable a pair of bars or members 7, 8. Spaced from the standard is a casing 9 also secured on the floor and having mounted therein a forked lever 10 on a pivot 11. This lever lies in substantially an upright position and has an extension 12 below its pivot provided with a series of teeth 13 which I shall refer to in the claims as an abutment. Pivotaly mounted in the casing 9 at 14 is a pawl or dog 15 to engage any one of the said teeth 13, there being a retractile spring 16 attached at one end to a part of the dog and secured at its other end on a pin 16', for example, the direction of pull of said spring being such as to move the dog toward said teeth 13. A depending arm 17 of the dog has attached thereto one end of a link 18 whose other end is connected with the bar 8. Likewise, a link 19 is connected at its ends to the forked lever 10 above its pivot and with the bar 7. Adjustably mounted on the bars 7 and 8 are blocks 7', 8' respectively, secured by set screws 9' for example. A lever-arm 20 is pivoted between its ends at 21 on the block 7' one end carrying a roller 22, Figure 4, its other end having a slot 23 through which extends a screw 24 secured in the block 8'. The blocks have substantially the positions shown relatively so that in practice the lever-arm 20 takes a slightly inclined position or about as illustrated.

As in other devices of this nature the door 3 carries a roller 3' which normally engages in the fork of the lever 10 but which passes out of the same when the door is thrown to its open position, moving back into said fork when the door is closed, which is the position of said door in Figure 1.

Affixed to the side of the car 4 is a frame 24' slidable in the members of which is a pair of spaced bars 25 having affixed thereto a shoe 26 provided with a striking face 27 having a path of movement paralleling the plane of the roller 22, Figure 4, and adapted to receive the latter against it. Carried by the frame 24' is a pair of rods 28 paralleling the bars 25, there being a compression spring 29 on each rod which lie between said frame and lugs or ears 30 on the shoe 26, see Figures 1 and 5. Pivotaly mounted on the wall of the car is a bell crank lever 31 one end of which is connected by a link 32 with the said shoe 26. Connected to the other end of the lever is a rod 33 having connection with an adjustable member 34 on a lever 35 pivoted on a base plate 36, for example, secured on the inner surface of the wall of the car 4. A pair of spaced guides 37 is secured to the said base plate 36 between which lies a slide 38 best shown in Figure 7 and with which the arm 35 is linked in suitable manner. This slide is in the form of an open link in that it has a semi-circular central opening 39 which communicates with a narrower opening 40 leaving shoulders 41. Fixed on the base plate 31 is a stud 42 on which rocks a plate 43, Figure 8, affixed to the back of which is a member 44 in the form of an arm 45 having greater measurement in one direction than the other, its narrower measurement permitting it to lie within the opening 40 between the shoulders 41 of the slide in the raised position of the latter as shown in broken lines in Figure 6. In the position shown in Figure 7, which is the lowest position of the slide, the member 44 is free to be rotated within the opening 39. Said Figure 7 shows the parts illustrated in Figure 6 except as to the power-control member 45', and the bar 47, the plate 43 beyond the member 45' shown in broken lines in said Figure 6 being also shown in broken lines in Figure 7 since severed from its member 44, and is illustrated in a different position from that in Figure 6, and necessarily so also is said member 44.

The plate 43 is designed to operate any suitable switch, not shown, controlling the power circuit, and said plate may have one or more slotted openings 46 any one of which may receive any type of operating part.

In the present instance I have shown a power-control lever 45', Figure 8, which is mounted on a stud 45² secured in a supporting bar 47 affixed to the wall of the car. Said control lever has a pin 48 to engage in one of the said slotted openings 46 as shown in Figure 6.

A movement of the power-control lever in either direction on the stud 45² will swing the plate 43, the member 44 of which will be swung from side to side within the opening 39, this being possible when the car is away from a landing, or even at a landing when the

door is closed at such landing, the springs 29 at the shoe 26 through the named parts 32, 31, 33 and 35 maintaining the slide 38 in the lowered position, or that shown in Figure 7. When, however, the car is at a landing the door when opened will shift the said shoe 26 toward the right, Figure 1, and thus the lever 35 will be drawn downward lifting the slide 38 to the position shown in said Figure 6.

In the type of device shown in Letters Patent No. 1,496,477 issued to me on the 3rd day of June 1924 two shoes similar to 26 herein were employed, one of which was required for releasing the forked-lever in order that the shaft-door might be opened. In the present instance the lever 20 herein described, by a peculiar action in connection with the bars 7 and 8, accomplishes the same result besides the entire freeing of said forked lever. That is to say, when the car stops at a landing the shoe 26, whose path of travel with said car at the time of approaching and stopping at the roller 22 of said lever-arm 20 is in spaced relation to such roller as shown in Figure 2. In the initial movement of the door toward the left in that figure the forked lever 10 can be moved sufficiently to carry the roller 22 against the shoe as an abutment, see dotted lines *a*, Figure 3, the lever 20 taking an upright position. To permit this movement there is sufficient clearance between the dog 15 and the tooth nearest it. The springs 29 of the shoe are comparatively stiff and can withstand some little pressure. Now, as the door is moved further, which is still possible due to said clearance at the dog 15, the shoe, in effect, becomes the fulcrum for the lever 20. Therefore, as the door moves the pivot of the lever at 21, since moving with the bar 7, carries the bar 8 toward the left causing the block 8', thereof to abut against the standard 6', the lever taking up the position denoted by the broken lines *b*. In this action the dog 15 has been swung on its pivot at 14 withdrawing it from the path of travel of the teeth 13 permitting the forked-lever 10 to continue its movement. Since the bar 8 can move no further, the screw 24 becomes the fulcrum of the lever-arm 20 and as the door continues movement the bar 7 is moved to carry the said lever-arm to the position *c*, forcing the shoe from its normal position *d* to the position *e*. In this latter action the lever 31, Figure 1, is operated to draw down the rod 33 and the lever 35, lifting the slide 38 and if, at this time, the operator has not fully thrown the control lever 45' to the "off" position the lifting of said slide will engage the arm 44 by means of one or the other of its shoulders 41 and positively finish the movement besides enclosing said arm preventing movement of the same so long as the door is open. Now, although it is not new to lock the power-control lever when the shaft-door is open it is believed to be new

to provide for the positive movement of said control lever to the "off" position by a door-opening movement.

As the door is closed the roller 3' reenters the forked lever 10, the parts mounted on the standard 6' regain their normal positions permitting the shoe 26 to take up its proper position due to the springs 29 freeing the control lever 45' in the drop of the slide 38. The series of teeth 13, as in my patent above referred to, provide for preventing the door being opened even when somewhat ajar since the dog can engage any one of such teeth.

I claim:

1. A safety appliance for elevators including a standard mounted in a fixed position, a pair of independently movable members mounted therein, a pivotally mounted forked lever operatively connected to one of the members and having an abutment, a dog pivotally mounted adjacent the forked lever and operatively connected to the other of the members, and a lever-arm pivotally carried by one of the members and operatively connected with the other of the said members.

2. A safety appliance for elevators including a standard mounted in a fixed position, a pair of independently movable members mounted in the standard, a pivotally mounted lever operatively connected to one of the members and having an abutment, a dog pivotally mounted adjacent the lever and operatively connected to the other of the members, and a lever-arm pivotally carried between its ends by one of the members and operatively connected with the other of the said members.

3. A safety appliance for elevators including a standard mounted in a fixed position, a pair of independently movable members mounted in the standard, a pivotally mounted lever operatively connected to one of the members and having an abutment, a dog pivotally mounted adjacent the lever and operatively connected to the other of the members, and a lever-arm pivotally carried between its ends by one of the members and operatively connected at one of its ends with the other of the said members.

4. A safety appliance for elevators including a standard mounted in a fixed position, a pair of independently movable members mounted in the standard, a pivotally mounted lever operatively connected to one of the members and having an abutment, a dog pivotally mounted adjacent the lever and operatively connected to the other of the members, a block on each member, one of them being adjustable, and a lever-arm pivotally mounted between its ends on one of the blocks and operatively engaging the other of the blocks.

5. A safety appliance for elevators including a standard mounted in a fixed position, a pair of independently movable mem-

bers mounted in the standard, a pivotally mounted lever operatively connected to one of the members and having an abutment, a dog pivotally mounted and arranged to lie normally in the path of movement of the abutment and operatively connected to the other of the members, a block adjustably mounted on each of the members, a lever-arm pivoted between its ends on one of the blocks and operatively engaging the other of the blocks.

6. A safety appliance for elevators including in its construction a standard, a pair of members carried by the standard adapted for independent movement therein, a lever-arm carried by and pivotally mounted with respect to one of the members and operatively engaging the other of the members.

7. A safety appliance for elevators including in its construction a standard, a pair of members carried by the standard adapted for movement therein independent of one another in substantially parallel planes, a lever-arm carried by and pivotally mounted between its ends with respect to one of the members and operatively engaging at one of its ends the other of the members.

8. A safety appliance for elevators including in its construction a standard, a pair of members carried by the standard adapted for movement independently of one another in substantially parallel planes, a lever-arm carried by and pivotally mounted between its ends on and with respect to one of the members and adapted for adjustment in the direction of movement of said member, and a lever-arm operatively engaging at one of its ends the other of the members in pivotal manner.

9. A safety appliance for elevators including in its construction a standard, a pair of members carried by the standard adapted for movement independently of one another in substantially parallel planes, a lever-arm carried by and pivotally mounted between its ends on and with respect to one of the members and adapted to be adjusted in the direction of movement of said member, a part affixed to the other of the members and adjustable thereon in the direction of movement thereof and having one end of the said lever-arm pivotally connected thereto.

10. A safety appliance for elevators including in its construction, and in combination with an abutment, a standard, a pair of members carried by the standard adapted for independent movement with respect thereto and with respect to one another, and a lever-arm carried by one of the members adapted to bear against the abutment in a movement imparted to it through said member, said lever-arm having operative engagement with the other of the members and adapted to impart movement to

the same in a continued movement of the said member carrying said lever.

11. A safety appliance for elevators including in its construction, and in combination with an abutment, a pair of members mounted in the standard adapted for movement independently of one another, and mechanism carried by and connecting the members adapted when moved against the abutment by one of the members to impart movement to the other of the members.

12. A safety appliance for elevators including in its construction a standard, a pair of members carried thereby adapted to have movement one with respect to the other and with respect to the standard, a lever-arm pivotally mounted between its ends substantially at right angles to the line of movement of the members, its pivot being carried by one of such members, and one end of said lever-arm having operative engagement with the other of said members.

13. A safety appliance for elevators including in its construction, and in combination with an abutment, a standard, a pair of members mounted in the standard movable with respect to one another, a pivotally mounted lever operatively connected to one of the members including an abutment, a dog lying normally in the path of movement of the abutment of the lever and operatively connected with the other member, and mechanism carried by and connecting the members adapted when moved against the first named abutment by a movement of the lever to impart movement to one of the members to itself impart movement to the other of the members to withdraw said dog from the path of movement of the said abutment of the lever.

14. In a safety appliance for elevators, the combination with an elevator-car, a movable shoe mounted on the car, a power-control lever in the car, and means operated by the shoe to lock said lever, of a standard mounted in a fixed position at the elevator shaft, a pair of independently movable members carried in the standard, a door, a forked lever mounted to be swung by the door, the same being connected to one of the members and including an abutment, a dog adapted to lie normally in the path of movement of the abutment and operatively connected to the other of the members, and mechanism mounted jointly on the pair of members arranged to engage the shoe in an initial movement of the forked lever adapted to withdraw the dog from said path of movement of the abutment.

15. In a safety appliance for elevator cars, the combination with a shiftable shoe carried by the car, mechanism in the car operated by the shoe, and a shaft door, of a standard mounted on the building floor, a pair of inde-

pendently shiftable members carried by the standard movable in the same direction as the shoe, a pivotally mounted lever engaging the door and operatively connected with one of the members and including an abutment, a dog pivotally mounted operatively connected to the other of the members adapted to engage the abutment, a lever-arm pivotally carried between its ends by the member to which the first named lever is connected adapted at one end to engage the shoe, its other end operatively engaging the member controlling the dog, the door in its opening movement initially carrying the said lever-arm against the shoe followed by the movement of the lever-arm to disengage the dog from the abutment of said first named lever.

16. In a safety appliance for elevator cars, in combination with a shaft-door, a shoe carried by the car, a lever mounted on the building floor having an abutment, and a dog engaging the abutment preventing movement of the lever, of a structure mounted on the building floor between the lever and said shoe wholly operated by said lever and engageable with the shoe in the opening movement of the door for disengaging the dog from said abutment.

17. In a safety appliance for elevators, the combination with an elevator-car, a shaft door, means operated by the door, and pivotally mounted power-control means in the car including a laterally extending arm, of mechanism in the car having a shoulder arranged to engage the said arm of said control means and operated by the first named means to positively throw the power-control means to the "off" position in the opening movement of said door.

18. In a safety appliance for elevators, the combination with an elevator-car, a shaft-door, means operated by the door in its opening movement, and a pivotally mounted swingable power-control means in the car including an arm at one side of the place of mounting thereof, of mechanism also in the car normally free of the control means and operated by the first named means when the door is opened, said mechanism having a shoulder adapted to travel past the pivot of the control means in spaced relation thereto and to engage said arm for throwing the said control means to the "off" position and for holding it in that position while the door is open.

19. In a safety appliance for elevators, the combination with a car, of a swingable power-control means therein including an arm adapted to move therewith, and mechanism also in the car adapted for movement relative to said arm adapted in one direction of such movement to engage and swing said arm to a given position.

20. In a safety appliance for elevators, the combination with a car, of a power-control

means therein including an arm adapted to swing therewith, and mechanism for movement relative to said arm adapted in one direction of its movement to engage and swing said arm to a given position and maintain it in that position.

21. In a safety appliance for elevators, the combination with a car, of a power-control means in said car including an arm adapted to swing therewith, and mechanism adapted for movement relative to the arm normally free of the same adapted in one direction of its movement to engage and swing said arm to a given position.

22. In a safety appliance for elevators, the combination with a car, of a power-control means in said car including an arm adapted to swing therewith, and mechanism adapted for movement relative to the arm normally free of the same adapted on one direction of its movement to engage and swing said arm to a given position and to maintain it in that position.

23. In a safety appliance for elevators, the combination with a car, of a power-control means in said car including an arm adapted to swing therewith, and adapted for movement relative to the arm, the same having an opening within which the arm is free to have rotative movement in one position of such mechanism, and also having a narrower communicating opening substantially the width of the arm within which the latter is adapted to lie in another position of the mechanism.

In testimony whereof I affix my signature.
SAMUEL L. MCKINNEY.

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