Jan. 17, 1967 G. L. NYBORG 3,298,210

ELEVATOR SHAFT DOOR SAFETY MECHANISM

Filed Dec. 29, 1964

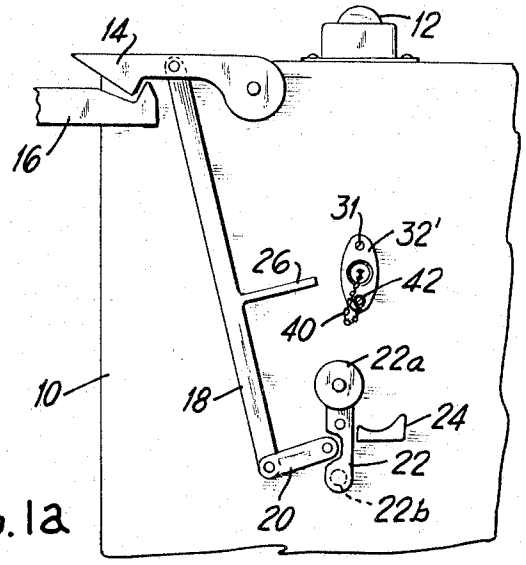
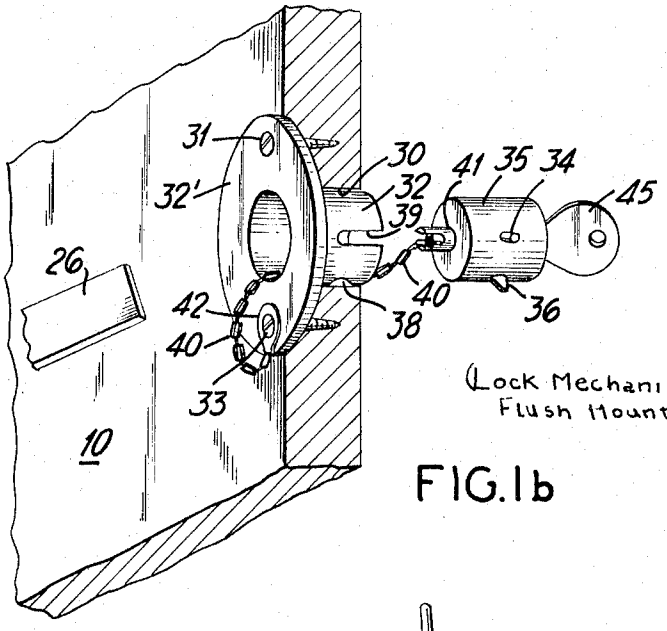


FIG. 1a



(Lock Mechanism Flush Mounted)

FIG. 1b

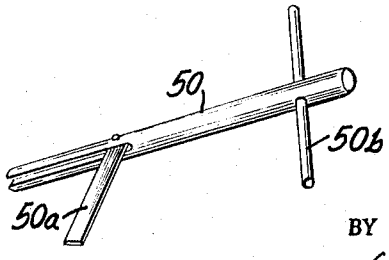


FIG. 2

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3,298,210

Patented Jan. 17, 1967

3,298,210

ELEVATOR SHAFT DOOR SAFETY MECHANISM

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Filed Dec. 29, 1964, Ser. No. 421,904
4 Claims. (Cl. 70—91)

This invention relates generally to elevator shaft doors and in particular to a safety apparatus appended to the door to preclude its unauthorized opening.

In most elevator systems, operator controlled or self-service, it is often desirable, if not necessary, to include some means for opening the shaft door from the outside. Toward this end there is generally provided an aperture in the shaft door located in front of the door opening linkage. Authorized personnel may then be provided with a latch lever which passes through the aperture, engages the linkage and upon rotation releases the door.

Such an arrangement, however, has several drawbacks, some of which arise as a direct result of regulatory statutes. For example, in several large cities, New York city being one, door opening apertures may be located only on lobby and basement shaft doors. This minimizes surreptitious entry to the shaftway and also minimizes the possibility of the shaft door being open or unlatched at hazardous heights. However, should an elevator stall at a floor above ground-level, access must be gained by bringing a companion elevator level, and then opening associated elevator car hatches on corresponding sides of each car. Neither the distance between the cars nor the possibility of beams being located adjacent the hatches lends itself to a safe or easy escape route for passengers. Further, in single car-shaft systems the foregoing is precluded and trapped passengers must await the restoration of service.

Accordingly, it is the object of this invention to provide a shaft door safety mechanism with safeguards adequate to permit its installation on each floor.

It is a further object of this invention to provide a mechanism which will defeat any attempt to bypass or temporarily suspend its use.

The above mentioned and other features and objects of this invention and the manner of attaining them will become more apparent and the invention itself will best be understood by reference to the following description of an embodiment of the invention taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a plan view of a portion of an elevator shaft door incorporating the invention;

FIG. 1*b* is a perspective sectional detail of the lock assembly in accordance with the invention; and

FIG. 2 shows a latch lever employed in conjunction with the embodiment of FIGS. 1*a* and 1*b*.

Turning now to the invention and in particular to FIG. 1*a*, there may be seen a portion of the shaft door **10**. At the upper end of the door one of several rollers **12** is shown; the rollers riding associated tracks (not shown) in the conventional manner. The shaft door is restrained from opening to the right by the engagement of the angularly displaceable latch **14** with the mating catch **16**; the latter of which is rigidly attached to the door frame or the rails. The latch **14** is operated by a linkage which includes toggle arms **18** and **20** and the lever **22**. When the elevator car reaches the shaft door, the roller **22***a* (which is rotatably mounted on the lever **22**) is embraced by a mating car-door runway (not shown). Upon opening, the car-door runway urges the roller **22***a* to its rest stop **24**, the other end of lever **22** moving upward to the left. By means of a second roller

22*b*, the toggle assembly is cammed upwards, thus angularly displacing the latch **14** and releasing the door.

Mounted perpendicularly upon, and forming a part of, the latch linkage is an arm **26**, the purpose of which will be explained. Suffice to say at this juncture that by moving the arm **26** upwards, the door will release in a manner similar to that described. A locking arrangement, which for clarity will be described with reference to the detail of FIG. 1*b*, is disposed adjacent and to the right of arm **26**.

Disposed within an aperture **30** in the shaft door **10** is a flanged tube **32**, secured to the door by means of screws **31** and **33** passing through the tube flange **32'**. A cylindrical lock **35** is dimensioned to slidably enter the tube, the lock bolt **36** engaging the tube aperture **38**. To aid in its insertion, the forward end of the bolt is chamfered so that it will easily retrograde upon striking the forward tube edge. The proper lock attitude for this engagement is assured by means of the cooperating tube-keyway **39** and lock-pin **34**. A chain **40** connects the inside of the door with the end of the lock and limits its axial displacement. For this purpose there is provided an axial lock appendage **41** and washer **42**, each adapted to retain the respective chain end.

When it is desired to open the door from the outside, the key **45** is inserted in the lock **35** and the cylinder removed. Because of the chain, which is sufficient in length to allow the cylinder to clear the tube end, the lock now hangs below the hole (for reasons to be explained) and the latch lever **50** (FIG. 2) may be inserted through the tube in a closed position. Upon clearing the tube, the arm **50***a* drops out (in the position shown) to engage the linkage arm **26**. The latch lever is now rotated, torque being applied via the cross bar **50***b*, to release the door. Upon removal of the latch lever, the door will not open completely, because there is insufficient clearance between the hanging lock cylinder **35** and the door frame. Consequently, either the door must remain in a position where it is still biased to close or the lock must be reinserted, assuring its replacement will not be forgotten and subsequent surreptitious entry is thereby precluded.

While I have described above the principles of my invention in connection with specific apparatus, it is to be clearly understood that this description is made only by way of example and not as a limitation to the scope of my invention as set forth in the objects thereof and in the accompanying claims.

I claim:

1. An elevator shaft door safety apparatus comprising in combination an elevator shaft door, a side of said door facing a shaft; a door latching linkage and latch disposed on the shaft side of said door for the opening and closing thereof; a member, comprising a tube, secured through a door aperture adjacent a portion of said linkage which permits release of said latch, said member including bolt retaining means; a cylindrical lock removably insertable in said tubular member; and a bolt operable by the mechanism of said lock and disposed thereon to engage said bolt retaining means when the lock face is substantially flush to the outside of the shaft door whereby disengagement of said bolt from said bolt retaining means permits said lock to be removed from said tubular member, thereby allowing access through said tubular member to said portion of said latching linkage in order to release said latch.

2. The elevator shaft door safety apparatus claimed in claim 1 further comprising relatively strong flexible means coupling the end of said cylindrical lock to the inside of said door, said means having a length sufficient

to allow said cylindrical lock to clear said tube and allow access therethrough to said latching linkage.

3. The safety lock arrangement claimed in claim 1 in which said bolt is disposed for radial retrograde on said cylindrical lock, and in which said bolt retaining means is an aperture in said tube, the forward edge of said bolt being chamfered for ease of insertion in said tube.

4. The safety lock arrangement claimed in claim 3 in which said tube includes a keyway, and said lock includes a cooperating radially extending pin, said keyway opening on the outside of said door whereby the placement of said pin in said keyway will insure the proper attitude of said bolt with respect to said tube aperture.

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