July 26, 1938. C. J. BATES, JR., ET AL 2,124,758

BOLT ACTUATING MECHANISM

Filed Feb. 20, 1936

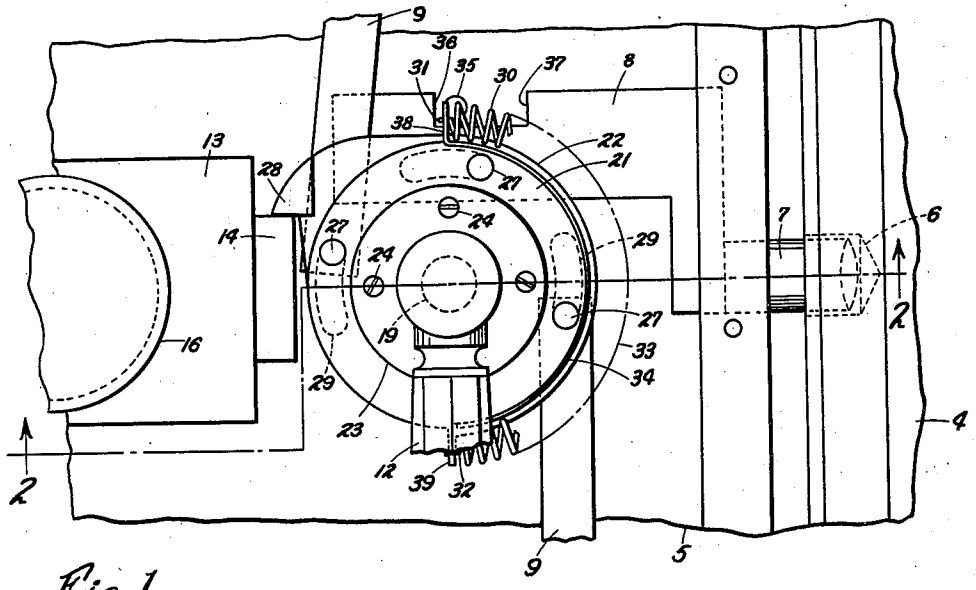


Fig. 1.

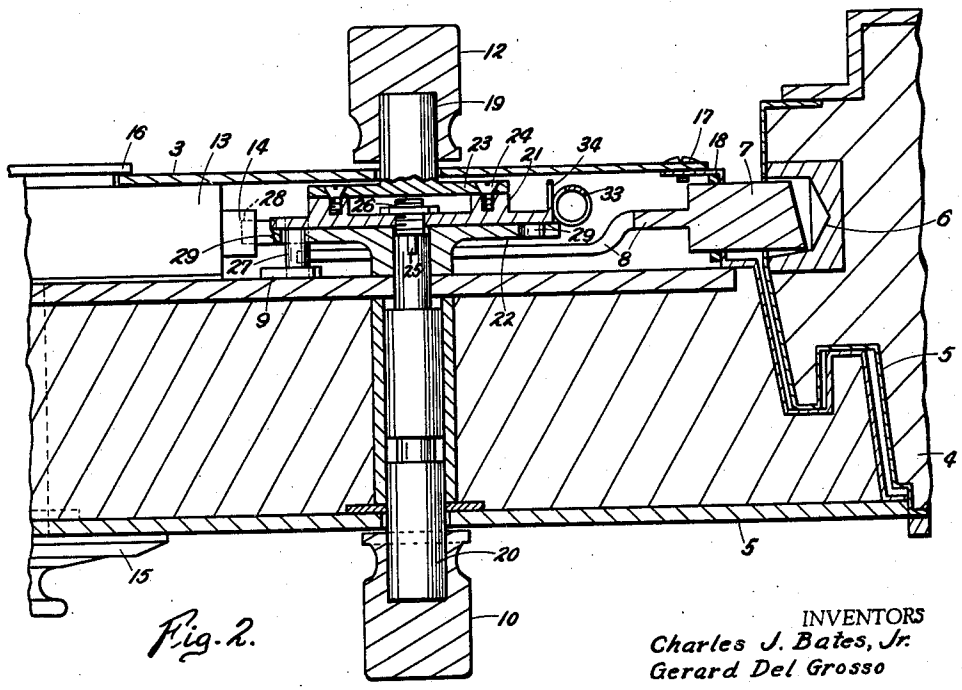


Fig. 2.

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Patented July 26, 1938

2,124,758

UNITED STATES PATENT OFFICE

2,124,758

BOLT ACTUATING MECHANISM

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Application February 20, 1936, Serial No. 64,910

10 Claims. (Cl. 70—114)

The present invention relates to a bolt actuating mechanism for the doors of large storage vaults.

An object of the invention is to provide a vault door with simple and effective means whereby a person trapped within the vault may easily free himself therefrom even though the interior of the vault be unlighted.

Another object of the invention is to provide means for the purpose stated, which are burglar proof and fool proof, though simple and inexpensive of manufacture.

The foregoing and other objects are attained by the means described herein and disclosed in the accompanying drawing, in which:

Fig. 1 is a fragmental elevational view of the interior of a vault door, the cover plate 3 of Fig. 2 being removed.

Fig. 2 is a fragmental cross sectional view taken on line 2—2 of Fig. 1.

The bolt actuating mechanism of the present invention is designed in such a manner that, after closing the door and throwing the combination lock into locked position, the outside handle of the door cannot be operated to throw the bolts to the retracted position. The inside handle, however, by reason of the connecting means illustrated in the accompanying drawing, can always be moved for withdrawing the bolts. Such withdrawing of the bolts from the interior of the vault is desirable in the event that a person be locked within the vault. In accordance with the present invention, the inside handle can be actuated to withdraw the bolts whether the door be in the normal locked position or not. A particular advantage of the construction about to be described, is that the person inside the vault need not grope in the dark for any auxiliary latches or the like before being enabled to operate the inside handle. This elimination of auxiliary latches is very desirable, because a person locked within a vault ordinarily is so excited as to become confused and unable to locate such auxiliary means. The present invention provides also for an exact duplication within the vault of the handle means on the exterior thereof, both handle means occupying identical positions inside and outside of the vault, so that the trapped person who is ordinarily familiar with the handle outside the door, will readily and unhesitatingly locate and actuate the inside handle even though the interior of the vault be unlighted. It is to be noted that the simple and convenient procedure just recited is all that is required to free the trapped person, it being unnecessary for him to fumble and feel for any auxiliary latches to condition the inner hand piece for actuation to withdraw the door bolts.

In the drawing, the character 4 indictes the wall of a vault, and 5 indicates generally the vault door. As is usual, the opening closed by the door includes a tortuous sealing means 5 for reasons well understood in the art. The wall of the vault includes one or more socket members 6 for receiving corresponding bolts 7 carried by the vault door. The bolt 7 illustrated in the drawing, includes an extension 8 which is operatively connected to the bolt actuating means associated with the inside and outside handles above referred to, and similar bolts, not shown, may likewise be connected to the actuating means through the additional extensions or links 9. Any desired number of members such as 8 and 9 may be provided, according to specification.

In the accompanying drawing, the characters 10 and 12 indicate, respectively, the outside and inside handles or levers for the bolt actuating means. The elements 10 and 12 will hereafter be referred to as the outside and inside hand piece, respectively, so that the term will include hand wheels as well as hand levers, both of which are in common usage upon the doors of vaults.

The character 13 indicates the casing of a lock, the lock bolt 14 of which may be controlled either by means of a key or a combination dial 15 as indicated on Fig. 2. The lock need not be further described, except to state that it may carry an overhanging flange 16 beneath which the cover plate 3 may be engaged while held in position by means of the screw or other fastening means 17 which engages the inside wall part 18 of the vault door.

Associated with the shafts 19 and 20 of the inner and outer hand pieces, are the bolt actuating members 21 and 22, these members being preferably in the form of plates or discs disposed in flatwise abutment. By means of a connection including the smaller plate 23 and screws 24, the bolt actuating member 21 is fixed relative to the inside hand piece 12 so as to rotate therewith. Likewise, the second bolt actuating member 22 is keyed as at 25 to the shaft 20 of outside hand piece 10, so as to rotate with the latter. A threaded arrangement at the location 26 may be provided to maintain the members 21 and 22 in close but sliding relationship.

The bolt actuating member 21 carries a series of crank pins or studs 27 to which the bolt extensions 9 and 8 are pivoted. As will be readily understood, rotation of the bolt actuating member 21 by means of the shaft 19 and hand piece

12, will extend or retract the various door bolts such as 7, through the medium of the members 8 and 9. Viewing Fig. 1, the uppermost stud 27 is fixed to the part 8 of bolt 7, so as to constitute a means of reciprocating said bolt. Thus, the inside hand piece 12 may be moved at will to extend or retract the door bolts. On the other hand, the bolt actuating member 22 may not be rotated by means of the outside hand piece 10, except when the lock bolt 14 is retracted. The lock bolt 14, when extended, dogs the bolt actuating member 22 through a lug or extension 28 of member 22, so that the assembly constituting the member 22, shaft 20 and hand piece 10 can not be rotated counterclockwise (viewing Fig. 1), except upon withdrawal of the lock bolt 14 by means of the combination dial 15.

In order that the door bolts may be operated by means of the inside hand piece 12 when the outside hand piece is locked against rotation at the location 14, the alternative bolt actuating member 22 is provided with a series of elongated arcuate slots 29 through which the studs 27 extend. The lost-motion connection thereby provided permits rotation of the studs 27, together with member 21 while the member 22 is locked against rotation by means of the lock bolt 14. In order that the studs be maintained at one end of their respective arcuate slots 29, a suitable spring arrangement is provided which tends always to yieldingly rotate the bolt actuating members 21 and 22 in opposite directions. One form of resilient means is illustrated, this being a spiral spring 30 having one end 31 fixed to the bolt actuating member 21, and the other end 32 fixed to the alternative bolt actuating member 22. The intermediate portion 33 of the spring may be arcuately disposed to rest upon a curved track part or flange 34 formed preferably along the periphery of member 21.

The character 35 indicates a stop lug carried by a stationary part of the door, said lug being adapted to limit the extent of advancing and retracting movement of the bolt part 8, by abutting one or the other of the edges 36 and 37 of a notch formed in the part 8. By limiting the movement of one of the bolts 7, the movement of all the other bolts and of the hand pieces 10 and 12, is likewise limited.

It is noteworthy that the axes of rotation of the hand pieces 10 and 12 are axially aligned, and extended in a common direction from the common axis of rotation, so that a person familiar with operation of the outside hand piece will necessarily be familiar with the operation of the inside hand piece, thereby enabling him to readily and unhesitatingly locate and actuate the inside handle in the event that he becomes trapped within the vault, even though the vault be unlighted. For the same reason, the hand pieces preferably are made identical in form and size.

The characters 38 and 39 indicate, respectively, spring attaching lugs on the bolt actuating members 21 and 22.

From the foregoing, it should be evident that the spring connection renders the alternative door bolt actuating members operable for normally bolting the door from the outside, and locking the bolts against unauthorized retraction, while at the same time the inside hand piece may be manipulated regardless of a locked or unlocked condition of the outside hand piece, to retract the door bolts when necessary.

It is to be understood that various modifications and changes in the structural details of the device may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What is claimed is:

1. Apparatus for locking a door having inside and outside faces, and an extendible and retractable bolt carried by the door, comprising a pair of alternative bolt actuating members and a hand piece associated with each of said members, one hand piece being accessible from the outside of the door and the other being accessible from the inside thereof to move said bolt actuating members, a lost-motion connecting means for said bolt actuating members whereby one may be moved independently of the other, and a lock bolt mounted in protected position interiorly of the door to engage that bolt actuating member which is associated with the outside hand piece, while the lost motion connection permits bolt movement by means of the inside hand piece in the engaged position of the lock bolt with the actuating member of the outside hand piece.

2. Apparatus for locking a door having inside and outside faces, and an extendible and retractable bolt carried by the door, comprising a pair of alternative bolt actuating members mounted upon the door for relative rotation, a hand piece outside the door for rotating one of the bolt actuating members and a second hand piece inside the door for rotating the other bolt actuating member, a stud on the latter bolt actuating member pivotally supporting the bolt, the other actuating member having an elongated slot receiving said stud and thereby providing a lost-motion connection between the bolt actuating members, yielding means tending always to keep the stud located at one end of the slot, and a lock for precluding rotation of one only of said bolt actuating members.

3. Apparatus for locking a door having inside and outside faces, and an extendible and retractable bolt carried by the door, comprising a pair of alternative bolt actuating members mounted upon the door for relative rotation, a hand piece outside the door for rotating one of the bolt actuating members and a second hand piece inside the door for rotating the other bolt actuating member, a stud on the latter bolt actuating member pivotally supporting the bolt, the other actuating member having an elongated slot receiving said stud and thereby providing a lost-motion connection between the bolt actuating members, yielding means tending always to keep the stud located at one end of the slot, and means controllable from the outside of the door in all positions of the door, for definitely locking against rotation only that bolt actuating member which is associated with the outside hand piece.

4. Apparatus for locking a door having inside and outside faces, and an extendible and retractable bolt carried by the door, comprising a pair of alternative bolt actuating members mounted upon the door for relative rotation, a hand piece outside the door for rotating one of the bolt actuating members and a second hand piece inside the door for rotating the other bolt actuating member, a stud on the latter bolt actuating member pivotally supporting the bolt, the other actuating member having an elongated slot receiving said stud and thereby providing a lost-motion connection between the bolt actuating members, yielding means tending always to keep the stud located at one end of the slot, and means controllable from the outside of the door in all positions of the door, for definitely locking

against rotation only that bolt actuating member which is associated with the outside hand piece, the hand pieces being similar in form and in location relative to the door, whereby to require, of a person located at the inner side of the door, the same character of effort to unbolt the door as is required to normally unbolt the door from the outside.

5. Apparatus for locking a door having inside and outside faces and an extendible and retractable bolt carried by the door, a pair of alternative bolt actuating members each comprising a hand piece, one hand piece being accessible from the outside of the door and the other being accessible from the inside thereof to move said bolt actuating members, a lost-motion connecting means for said actuating members whereby one may be moved independently of the other, and means for locking at the inside of the door that bolt actuating member which is associated with the outside hand piece while the lost-motion connection permits bolt movement by means of the inside hand piece while the outside hand piece remains locked, and yielding means adapted to normally take up the lost motion between the bolt actuating members.

6. Apparatus for locking a door having inside and outside faces, and an extendible and retractable bolt carried by the door comprising a pair of alternative bolt actuating members and a hand piece associated with each of said members, one hand piece being accessible from the outside of the door and the other being accessible from the inside thereof to move said bolt actuating members, a lost motion connecting means for said bolt actuating members whereby one may be moved independently of the other, and a lock bolt mounted in protected position interiorly of the door to engage that bolt actuating member which is associated with the outside hand piece, while the lost-motion connection permits bolt movement by means of the inside hand piece in the engaged position of the lock bolt with the bolt actuating member of the outside hand piece, and spring means normally acting upon a bolt actuating member to yieldingly maintain the hand piece thereof in a predetermined relationship to the other hand piece.

7. Apparatus for locking a door having inside and outside faces and an extendible and retractable bolt carried by the door, comprising a pair of alternative bolt actuating discs disposed in flatwise abutment, and mounted interiorly of the door for relative rotation, a hand piece outside the door for rotating one of the bolt actuating discs and a second hand piece inside the door for rotating the other bolt actuating disc relatively, said bolt actuating discs being loosely coupled in close proximity to one another at the inside face of the door, and including means to move the bolt upon actuation of either of the hand pieces independently, a lock including a lock bolt at the inside face of the door to engage the interiorly disposed bolt actuating disc which is associated with the outside hand piece, the loose coupling permitting extension and retraction of the door bolt by the inside hand piece at all times irrespective of the engaged condition of the lock bolt, and means accessible at the outside face of the door for engaging and disengaging the lock bolt with respect to the bolt actuating disc of the outside hand piece.

8. Apparatus for locking a door having apertured inside and outside faces and an extendible and retractable bolt supported for sliding movement adjacent to the inside face of the door, a substantially flat encased lock fixed in flatwise position relative to the inside face of the door, a bolt for the lock, and an apertured substantially flat cover plate mounted over the lock and the door bolt in spaced substantial parallelism with the inside face of the door, a rotatable door bolt throwing shaft extending inwardly through the apertured faces of the door to a location between the door and the cover plate, a handle fixed on the outer end of the shaft and a disc on the inner end thereof, an abutment on the disc for engagement with the bolt of the lock when said bolt is extended, a second disc concentric with and parallel to the first disc, and likewise disposed between the cover plate and the inside face of the door, a bolt throwing shaft with one end fixed to said second disc and extending through the aperture of the cover plate, an interior handle on the opposite end of the last mentioned shaft, and cooperative means near the peripheries of the discs for connecting the door bolt directly to the second mentioned disc, and indirectly to the first disc with sufficient play to enable throwing of the door bolt by rotating said second disc while the first disc remains stationary.

9. Apparatus for locking a door having inside and outside faces and having an opening through said door, comprising a shaft rotatably received in said opening and extending through the door, means on the outer end of the shaft for manually turning the shaft in said opening, a slotted disc mounted on the inner end of the shaft for rotary movement with the shaft, said slots in the disc being elongated, arcuate and concentric relative to said shaft, a second disc disposed adjacent the first disc and having an opening therein, the shaft extending loosely through the opening in the second disc, means at the inner end of the shaft for retaining the second disc against separation from the shaft, studs carried by the second mentioned disc and extending, one each, into a slot in the first mentioned disc whereby the discs may have limited independent movement about the axis of the shaft, means on the second mentioned disc, aligned with the shaft, for manually actuating the second mentioned disc about its axis, a lock bolt operable from the outside face of the door and mounted in protected position interiorly of the door for movement to and from engagement with the slotted disc for controlling operation of said disc by said external manually operable means, door bolting means connected to said studs, and a coiled spring disposed circumferentially of said discs and having its opposite ends attached to one each of the discs, said spring being conditioned to yieldingly retain the second disc in position for disposing the door bolting means in door bolting position.

10. Apparatus for locking a door having inside and outside faces and having an opening through said door, comprising a shaft rotatably received in said opening and extending through the door, means on the outer end of the shaft for manually turning the shaft in said opening, a slotted disc mounted on the inner end of the shaft for rotary movement with the shaft, said slot in the disc being elongated, arcuate and concentric relative to said shaft, a second disc disposed adjacent the first disc and having an opening therein, the shaft extending loosely through the opening in the second disc, means at the inner end of the shaft for retaining the second

disc against separation from the shaft, a stud carried by the second mentioned disc and extending into the slot in the first mentioned disc whereby the discs may have limited independent movement about the axis of the shaft, means on the second mentioned disc, aligned with the shaft for manually actuating the second mentioned disc about its axis, a lock bolt operable from the outside face of the door and mounted in protected position interiorly of the door for movement to and from engagement with the slotted disc for controlling operation of said disc by said external manually operable means, door bolting means connected to said stud, and a coiled spring disposed circumferentially of said discs and having its opposite ends attached to one each of the discs, said spring being conditioned to yieldingly retain the second disc in position for disposing the door bolting means in door bolting position.

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