

No. 847,265.

PATENTED MAR. 12, 1907.

F. J. SUPER.
SAFE.

APPLICATION FILED JULY 14, 1904.

3 SHEETS—SHEET 1.

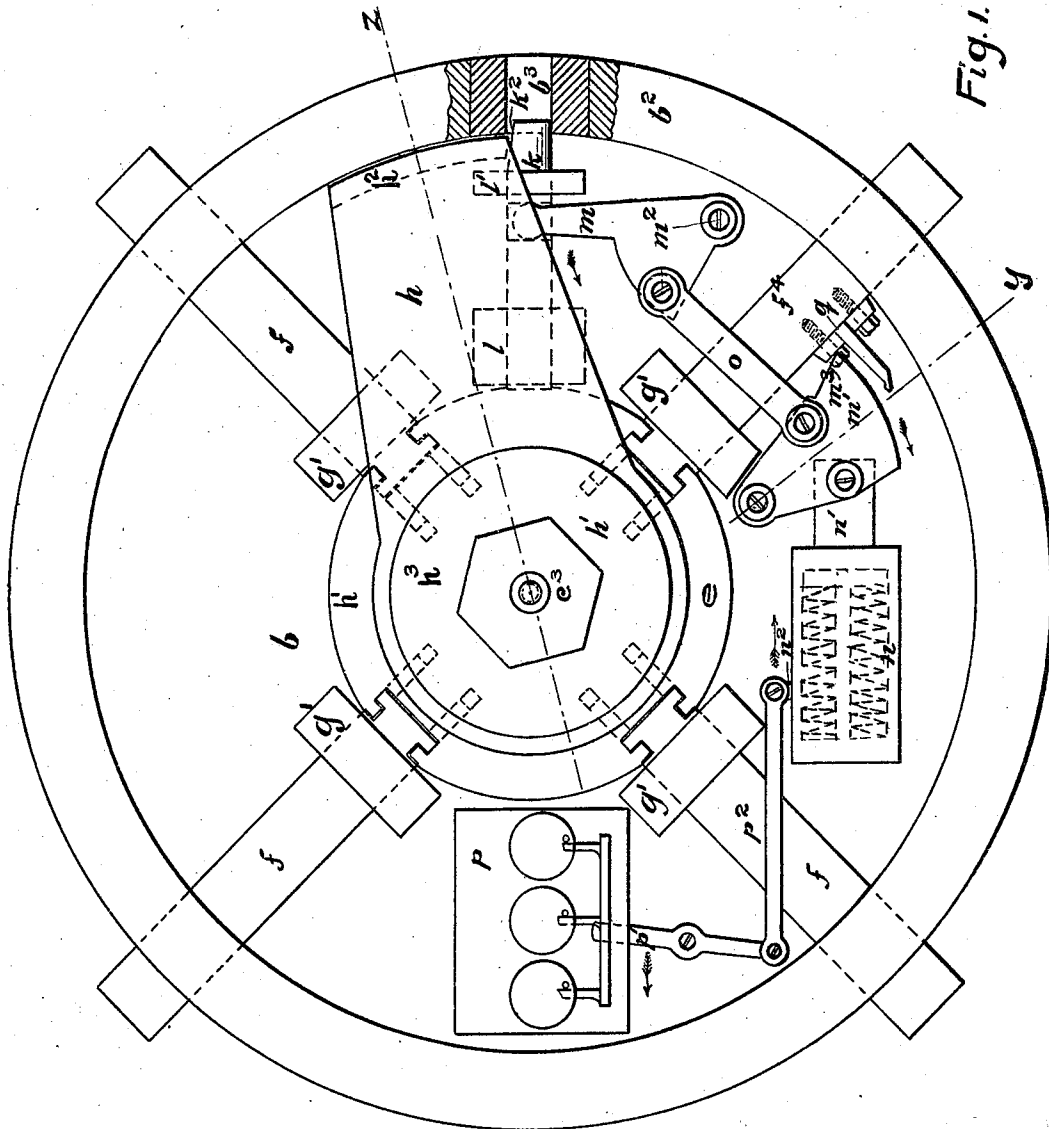


Fig. 1.

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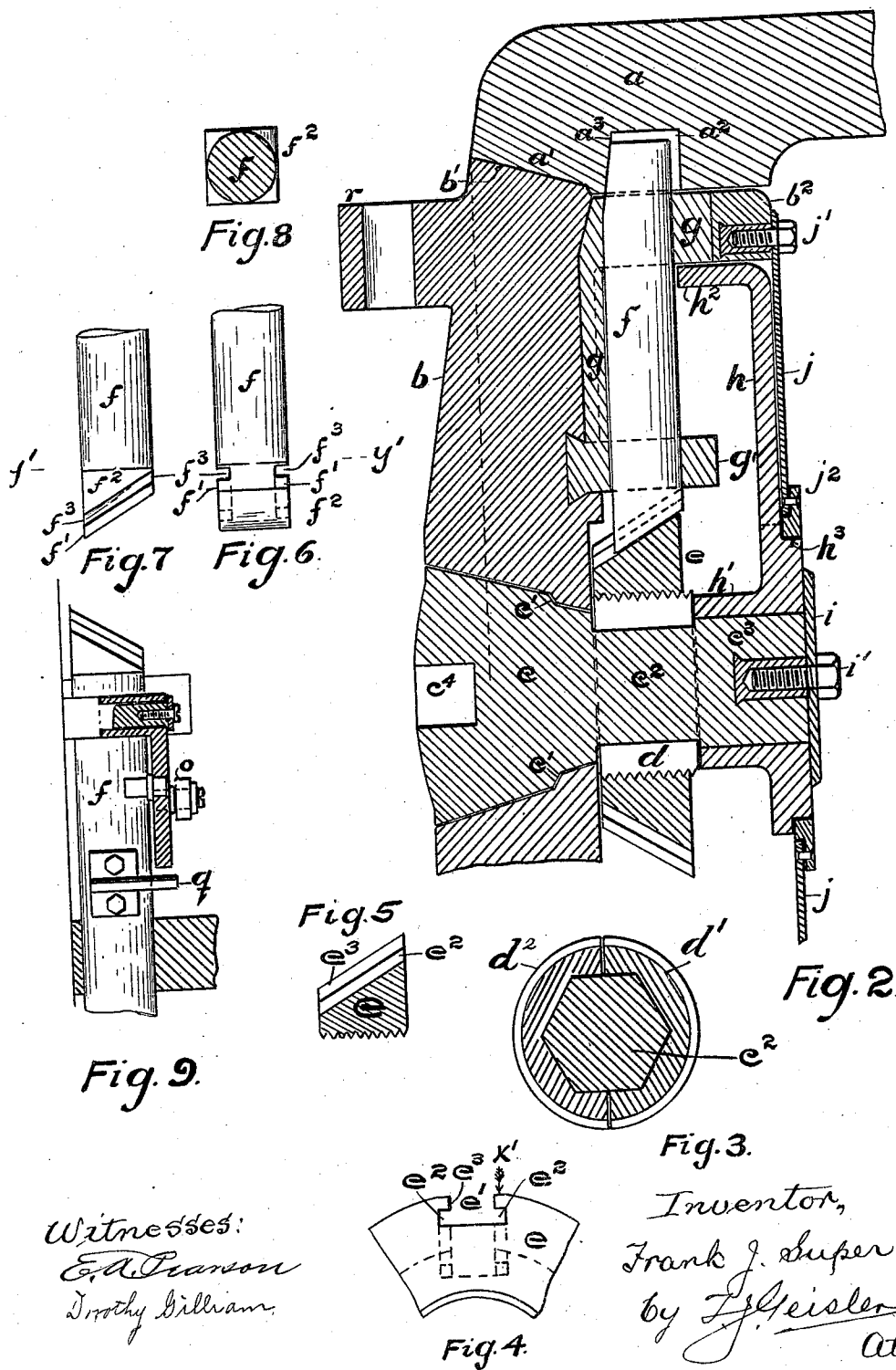
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

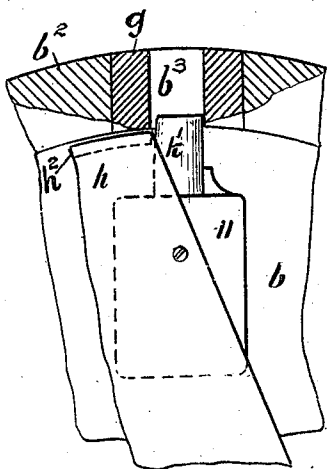


Fig. 11.

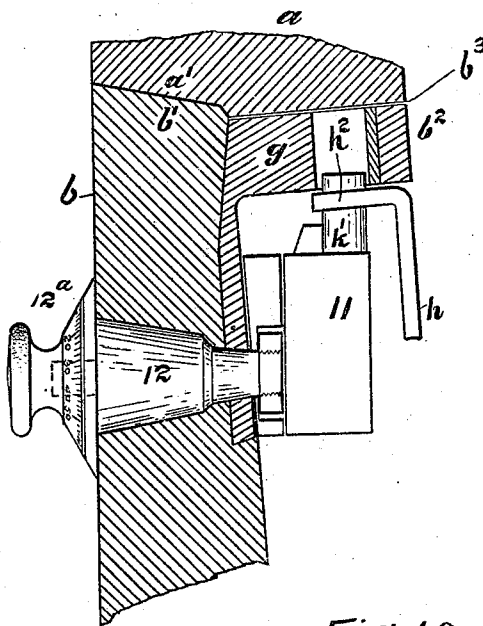


Fig. 10.

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UNITED STATES PATENT OFFICE.

FRANK J. SUPER, OF MOUNT TABOR, OREGON.

SAFE.

No. 847,265.

Specification of Letters Patent.

Patented March 12, 1907.

Application filed July 14, 1904. Serial No. 216,560.

To all whom it may concern:

Be it known that I, FRANK J. SUPER, a citizen of the United States, and a resident of Mount Tabor, in the county of Multnomah and State of Oregon, have invented a new and useful Improvement in Safes, of which the following is a specification, reference being had to the accompanying drawings as constituting a part thereof.

My invention relates to the locking mechanism of the doors of safes and vaults; and it has for its object to project the door-bolts into the door-jamb of the safe-body by means operated independently of the bolt-locking mechanism.

Furthermore, as the means for projecting the door-bolts have necessarily to be operated from the exterior of the safe-door, my invention also has for its object to construct and adapt my door-bolt-projecting mechanism in such wise that when it has been operated to project the bolts and the projecting mechanism has itself been locked by my locking mechanism all parts of my door-bolt-operating mechanism will be rigidly and tightly wedged in place on its bearings, so as to preclude the leaving of a crevice between its abutting parts accessible from the exterior of the safe through which liquid explosive can be introduced into the interior of the safe for burglarious purposes.

Furthermore, it is one of the most important features of my invention that the door-bolt-projecting mechanism and also the locking mechanism of my safe is so contrived that the effect of blows applied to the outside of the door for the purpose of loosening the same and its bolt-operating mechanism instead of accomplishing such result shall, to the contrary, draw the door and its bolting mechanism the more securely to its bearings.

I accomplish my object by the construction and means hereinafter described.

In the drawings, Figure 1 is an elevation of my door looking from the rear, the rear plate j and collar j^2 being removed to allow an inspection of the door-bolting and the locking mechanism. Fig. 2 is a partial vertical transverse central section of my door and a part of the door-jamb of the body of the safe. Fig. 3 is a transverse section of the shank c^2 of the spindle c and the two-part threaded collar d on such shank. Fig. 4 is a partial rear elevation of the nut e . Fig. 5 is a cross-section

of said nut on a line pointed by the arrow x' . Figs. 6 and 7 are respectively partial front and side elevations of one of said bolts. Fig. 8 is a cross-section of one of said bolts on a line $y'y'$ of Figs. 6 and 7. Fig. 9 is a section on line y of Fig. 1. Fig. 10 is a partial cross-section of the door, showing the bolt k replaced by a bolt operated by a combination locking mechanism; and Fig. 11 is a partial interior view of the door, also showing the combination locking mechanism shown in preceding figure.

The letters and numerals designate the parts referred to throughout the description.

The body of my safe, or the jamb of the door if my invention is to be applied to a vault, will be made in an integral casting of that quality of steel known as "unmachineable." It will be observed from Fig. 2 that the rim of the door and the faces of the door-jamb are made with a suitable taper, the abutting faces a' b' being ground to each other. The door-jamb a is further made with four bolt-recesses a^2 , the outer wall-surface a^3 of each of which recesses is tapered, so as to adapt the same to properly cooperate with the ends of the bolts, which have correspondingly-tapered surfaces, when such bolts are projected by the bolt-projecting mechanism provided for that purpose. The door b is made also in an integral casting of un-machineable metal. The door is provided in its center with a tapering cavity in which to rotatably hold a spindle c , also made of unmachineable metal and having a corresponding taper, (see Fig. 2,) the bearing-faces of said cavity in the door and the rim of the spindle c being ground to each other. The said parts are further made with a step or shoulder c' to hold the spindle properly in place and to better ward off or resist blows which may be applied to the exterior of the spindle for the purpose of forcing the same inward.

The central part c^2 of the spindle is made hexagonal in cross-section, and the inner end thereof c^3 is also hexagonal, but of larger cross-section. Said center part c^2 is designed to receive a collar d , made of two parts d' d^2 , as shown in Fig. 3, and provided with an exterior thread. On the collar d is a nut e . The nut e when rotated operates to project and retract the four bolts f . The rim of said nut is beveled and provided with

four recesses e' , shown in the partial rear elevation of the same in Fig. 4, and the cross-section thereof, Fig. 5, taken on a line x' of Fig 4.

5 The main portions or outer ends of the bolts f , as seen in Fig. 8, are cylindrical, while the inner ends of the bolts are made square and beveled at the base to conform to the bevel of the rim of the nut e . The opposite
10 walls of the recesses e' are made with inclined or oblique grooves e^2 , leaving projecting ribs e^3 , and the two lateral faces of the inner ends of the bolts f are also made with inclined
15 grooves f^3 and projecting ribs f' , by which construction the inner ends of the bolts f are adapted to be slidably seated in the recesses e' of the nut. Of course more than four bolts may be employed in the combination
20 of my locking mechanism; but the disposition of the bolts and the means for operating the same would be substantially as shown and described. The bolts f are slidably held in apertures therefor made in the rim b^2 and
25 lugs g' , the door being cast with cores g , of machineable metal, of which the lugs g' are an integral part. The outer ends of the bolts f are tapered to correspond and cooperate with the tapering wall portions a^3 of the recesses a^2 in the door-jamb.

30 On the hexagonal enlarged portion c^3 of the spindle c is affixed the hub or eye h' , provided with a hexagonal opening of an arm h , having an inwardly-projecting lip-like portion h^2 at its extremity. The arm h is held in
35 place by means of a plate i , secured to the portion c^3 of the spindle by means of a screw-bolt i' , the spindle portion c^3 being cast with a core of machineable metal, so as to provide for the tapping of the same to receive the
40 screw i' .

The back of the door is covered by a circular plate j , which is fixed in place by means of screws j' . In order to accommodate the
45 screws j' , the bolt-flange b^2 of the door is cast with cores of machineable metal, so that the same may be tapped to receive said bolts. The eye of the plate j is made with a brass collar j^2 for the purpose of providing a bearing for the exterior shoulder h^3 , being a boss
50 on the eye or hub of the arm h . The spindle c is made with an exterior rectangular recess c^4 , adapted to receive the crank by which to rotate the spindle and project and retract again the bolts f .

55 The operation of locking my safe is as follows: Supposing the safe-door to be set in the door-jamb, but unlocked, upon the rotation of the spindle c to the right by a crank inserted in recess c^4 the nut e is drawn outwardly—that is to say, toward the exterior
60 of the door. The effect of such movement of the nut e is to project the bolts f radially, driving the outer ends of the same into the recesses a^2 of the door-jamb. The rotation
65 of the spindle c is continued as far as it will

go—that is to say, until the nut e has projected the locking-bolts to such extent that they cannot be driven into their recesses any further. During the projection of the bolts
70 f their outer beveled ends climb the inclined wall portions a^3 of the recesses a^2 , and by this means the door-rim is forcibly and tightly drawn against its bearings in the door-jamb. The door of my safe fits perfectly tight in the
75 jamb of the safe-body by reason the ground contacting faces $a' b'$. In the section Fig. 2 one of the bolts f is shown projected into its recess a^3 by the rotation of the spindle in the act of locking the safe, and it will be observed that the wedge-like locking ends of the re-
80 spective bolts f may enter still further their recesses in the rim of the door-opening of the safe-body. Thus is provided against the door when closed becoming loose in its bearings or seat in the safe-body by reason of
85 wear of the bolts, and the same means insure that the door when closed cannot be loosened by ramming or other violent attack either on the door or the spindle. Upon the bolts f
90 having been projected, as mentioned, the arm h , rotating with the spindle c , will have assumed the position in which it is shown in Fig. 1—that is, it will be so arranged that it may be locked by the projection of the bolt k
95 against any movement in the unlocking direction. The bolt k is projected by the locking mechanism into a recess b^3 therefor made in the bolt-flange b^2 of the door. The flange b^2 is an integral part of the door, but cast with cores of machineable metal in which to
100 make the recesses for the bolts f and k . The bolt k is seated in the lugs $l l'$, which are integral castings of machineable metal, on the interior face of the door. As shown in the drawings, the bolt k is projected by devices
105 operated by an automatic lock n , the arrangement being as follows: The bolt k is made with a transverse slot, in which enters the projecting member of the crank-arm m , which is pivoted at m^2 . The crank-arm m is
110 connected with a second pivoted crank-arm m' by means of a connecting-rod o . The crank-arm m' is pivotally connected with the bolt n' of the automatic lock n . To the door-bolt f^4 is affixed a projecting finger q ,
115 and the crank-arm m' is made with an edge m^3 , which when the bolt n' of the lock n is retracted will be arranged parallel to the face of the bolt f^4 . When the door is open and the bolts f are in their retracted position and
120 the lock n has been wound up, the edge m^3 bears against the end of the finger q ; but after closing the door and rotating the spindle c to project the bolts f the finger q would be moved out of its engagement with the crank-
125 arm m' and the latter be free to be operated by the spring of the bolt n' , and the movement of the arm m' would have the effect of projecting the bolt k into its aperture b^3 ,
locking the arm h in place.

p indicates a time locking mechanism provided with the usual pivoted lever p' and connecting-rod p^2 , connected with the arm n^2 of the automatic-lock mechanism. The time-lock must be wound up, so as to be set, in the first place, as usual, after which the automatic mechanism may be wound up. After locking the door of the safe as described it cannot again be opened until the expiration of the time to which the time-lock p has been adjusted. The hour set having arrived, the time-lock, through the medium of the lever p' and rod p^2 , will operate the arm n^2 of the automatic lock, causing the latter to operate and retract the bolt n' , and therewith to move the crank-arm m' and its connections, so as to retract the bolt k , after which the spindle c may be rotated to the left for the purpose of retracting the door-bolts f and opening the door.

It will be observed from Fig. 1 that the bolt k has a long beveled surface k^2 , and that the lug or bearing l' for said bolt is so positioned as to allow for some further projection of the latter. When the bolt k is projected to the extent shown in Fig. 1, the arm h has been rotated to the position it assumes after the bolts f have been projected to lock the safe, and the bolt-actuating spindle c cannot be rotated any farther by the leverage which can be applied to such spindle in the act of locking the safe, as above described. It is the particular function of the bolt k to securely lock the arm h and therewith the spindle c against reverse rotation after the safe has been locked. Now it is apparent that if after locking the safe the door-spindle were forced around a trifle more the arm h would also be moved a trifle forwardly and then, unless such movement of the latter were taken up by wedging the arm in the advanced position to which it has been moved, more or less looseness would result in the locking mechanism, which may cause sufficient looseness in the bearing of the door against its casing as to admit the introduction of liquid explosive in a burglarious assault on my safe. With my mechanism such effect is, however, rendered impossible, for any forced forward movement of the arm h would cause the spring-controlled bolt k to be projected a trifle more, and thus would wedge the arm h just as tightly as before.

As shown in Figs. 10 and 11, the bolt k , by which the arm h is locked or wedged in place, and the means above described for projecting said bolt k , may be replaced by a combination locking mechanism of the well-known type—for example, a lock 11, provided with a bolt k' , a spindle 12, a dial 12^a. As well known, in locks of the construction referred to, a spring is provided arranged and adapted to bear against the bolt k' after the same has been projected, so as to hold said bolt in place, and when using a lock of the type last de-

scribed I make use of said spring member for the purpose of obtaining a continual pressure on the bolt k' to take up any lost motion or looseness of the arm due to any attempted forced rotation of the spindle c after the safe has been locked, as above more fully described.

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

1. In a safe or vault door locking mechanism, the combination of a rotatable spindle, radial sliding door-bolts, means connecting said spindle with said bolts and by which the latter are projected and retracted by rotating said spindle, a radial arm, fixedly mounted on said spindle and revolving therewith, and means for locking said arm against reverse rotation, after the door-bolts have been projected to lock the safe.

2. In a safe or vault door locking mechanism, the combination of a rotatable spindle, radial sliding door-bolts, means connecting said spindle with said bolts, and by which the latter are projected and retracted by rotating said spindle, a radial arm fixedly mounted on said spindle and revolving therewith, and means for locking said arm against reverse rotation, after the door-bolts have been projected to lock the safe, which arm-locking means are adapted to automatically follow any forward movement of the arm, caused by a forced rotation of the spindle after the safe has been locked, so as to lock said arm, and the door-bolt-actuating mechanism in the position to which the same may so be advanced.

3. In a safe or vault door locking mechanism the combination of a rotatable spindle, radial sliding door-bolts, means connecting said spindle with said bolts, and by which the latter are projected and retracted by rotating said spindle, a radial arm fixedly mounted on said spindle and revolving therewith, a spring-controlled bolt, positioned to be projected in front of said arm, to lock the same against reverse rotation after the door-bolts have been projected to lock the safe, and means to project and retract said arm-locking bolt, the extremity of the latter being made with an inclined bearing-face so as to adapt said arm-locking bolt to follow any forward movement of said arm, caused by a forced rotation of the spindle after the safe has been locked, and to lock said arm and the door-bolt-actuating mechanism in the position to which they may so be advanced.

4. In a safe or vault, the combination of a door-casing having a jamb and a door having a rim made with inclined abutting faces, and said door-casing having recesses made with inclined bearing-faces in which to receive the door-bolts, a centrally-positioned rotatable spindle, radial sliding door-bolts, the extremities of which are made with inclined

bearing-faces, means connecting said spindle with said bolts, and by which the latter are projected and retracted by rotating said spindle, a radial arm fixedly mounted on said spindle and revolving therewith, and means for locking said arm against reverse rotation, after the door-bolts have been projected to lock the safe, which arm-locking means are adapted to automatically follow any forward movement of the arm, caused by a forced rotation of the spindle after the safe has been locked, so as to lock said arm and the door-bolt-actuating mechanism in the position to which the same may so be advanced.

5. In a safe or vault, the combination of a door-casing having a jamb and a door having a rim made with inclined abutting faces, and said door-casing having recesses made with inclined bearing-faces in which to receive the door-bolts, a rotatable spindle, radial sliding door-bolts, the extremities of which are made with inclined bearing-faces, means connecting said spindle with said bolts, and by which the latter are projected and retracted by rotating said spindle, a radial arm fixedly mounted on said spindle and revolving therewith, a spring-controlled bolt, positioned to be projected in front of said arm, to lock the same against reverse rotation after the door-bolts have been projected to lock the safe, and means to project and retract said arm-locking bolt, the extremity of the latter being made with an inclined bearing-face so as to adapt said arm-locking bolt to follow any forward movement of said arm, caused by a forced rotation of the spindle after the safe has been locked, and to lock said arm and the door-bolt-actuating mechanism in the position to which they may so be advanced.

6. In a safe or vault door mechanism, the combination of a rotatable spindle, a threaded collar on the spindle, a nut longitudinally movable on said threaded collar and made with a beveled periphery, radial sliding door-bolts made with beveled inner ends, which are operatively connected with the periphery of said nut, so that said door-bolts may be projected and retracted by rotating said spindle, a radial arm fixedly mounted on said spindle and revolving therewith, and means for locking said arm against reverse rotation after the locking-bolts have been projected to lock the safe, which arm-locking means are adapted to automatically follow any forward movement of the arm, caused by a forced rotation of the spindle after the safe has been locked, so as to lock said arm and the door-bolt-actuating mechanism in the position to which the same may so be advanced.

7. In a safe or vault, the combination of a door-casing having a jamb and a door having a rim made with inclined abutting faces, and said door-casing have recesses made with inclined bearing faces in which to receive the door-bolts; a rotatable spindle, a threaded

collar on the spindle, a nut longitudinally movable on said collar and made with a beveled periphery, radial sliding door-bolts, the extremities of which are made with inclined bearing-faces and the inner end of which are beveled and operatively connected with the periphery of said nut, so that said door-bolts may be projected and retracted by rotating said spindle, a radial arm fixedly mounted on said spindle and revolving therewith, a spring-controlled bolt positioned to be projected in front of said arm, to lock the same against reverse rotation, after the door-bolts have been projected to lock the safe, and means to project and retract said arm-locking bolt, the extremity of the latter being made with an inclined bearing-face, so as to adapt said arm-locking bolt to follow any forward movement of said arm, caused by a forced rotation of the spindle after the same has been locked and to lock said arm and the door-bolt-actuating mechanism in the position to which they may so be advanced.

8. In a safe or vault door mechanism, the combination of a rotatable spindle, a threaded collar on the spindle, a nut longitudinally movable on said threaded collar, and made with a beveled periphery and recesses *e'*, radial sliding bolts made with beveled inner ends, adapted to be operatively inserted in said recesses of the nut *e*, so that said door-bolts may be projected and retracted by rotating said spindle, a radial arm fixedly mounted on said spindle and revolving therewith, a spring-controlled bolt positioned to be projected in front of said arm, to lock the same against reverse rotation, after the door-bolts have been projected to lock the safe, and means to project and retract said arm-locking bolt, the extremity of the latter being made with an inclined bearing-face, so as to adapt said arm-locking bolt to follow any forward movement of said arm, caused by a forced rotation of the spindle after the same has been locked and to lock said arm and the door-bolt-actuating mechanism in the position to which they may so be advanced.

9. In a safe or vault door locking mechanism, the combination of a movable spindle, radial sliding door-bolts, means connecting said spindle with said bolts and by which the latter are projected and retracted by movement of said spindle, and means for locking the bolts including an element carried by and movable with the spindle and a device to prevent movement of said element after the bolts have been projected to locking position by the spindle.

10. In a safe or vault door locking mechanism, the combination of a rotatable spindle, a reciprocal member having its periphery beveled, means between the spindle and the member to move said member when the spindle is rotated, radial sliding door-bolts operatively connected with and adapted to

be moved by the beveled periphery of the member, so that said door-bolts may be projected and retracted by rotating the spindle, means for locking the bolts including a member carried by and movable with the spindle and a device for preventing movement of the latter member after the bolts are moved to locked position.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

FRANK J. SUPER.

Witnesses:

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DOROTHY GILLIAM.