S. W. FISH & LE ROY LAYTON.

SAFE OR VAULT DOOR HOLDING OR LOCKING MEANS.

APPLICATION FILED DEC. 2, 1909.

997,793.

Patented July 11, 1911.

3 SHEETS—SHEET 1.

FIG. 2.

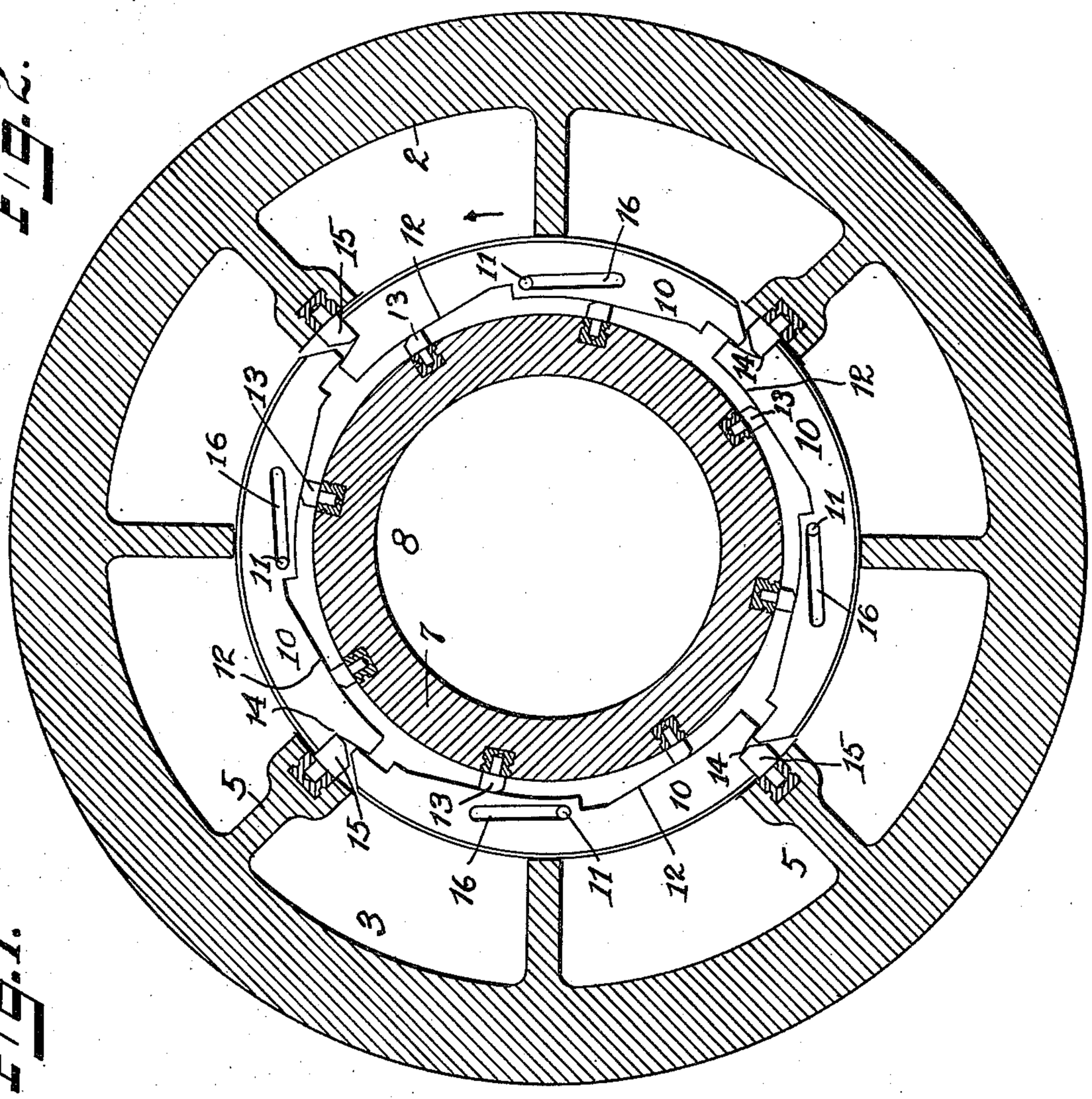


FIG. 1.

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3 SHEETS—SHEET 2.

FIG. 4.

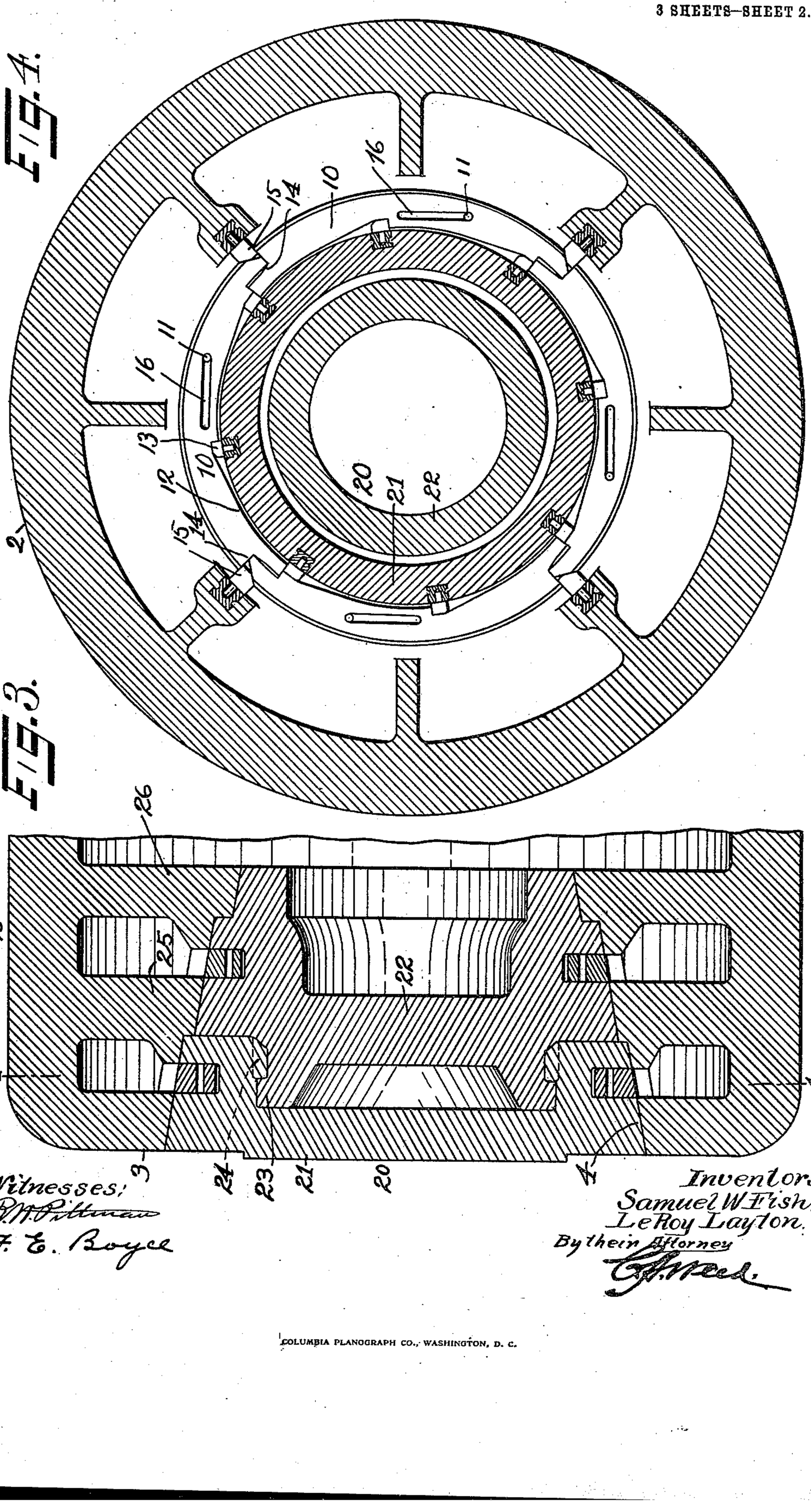


FIG. 3.

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3 SHEETS—SHEET 3.

Fig. 5.

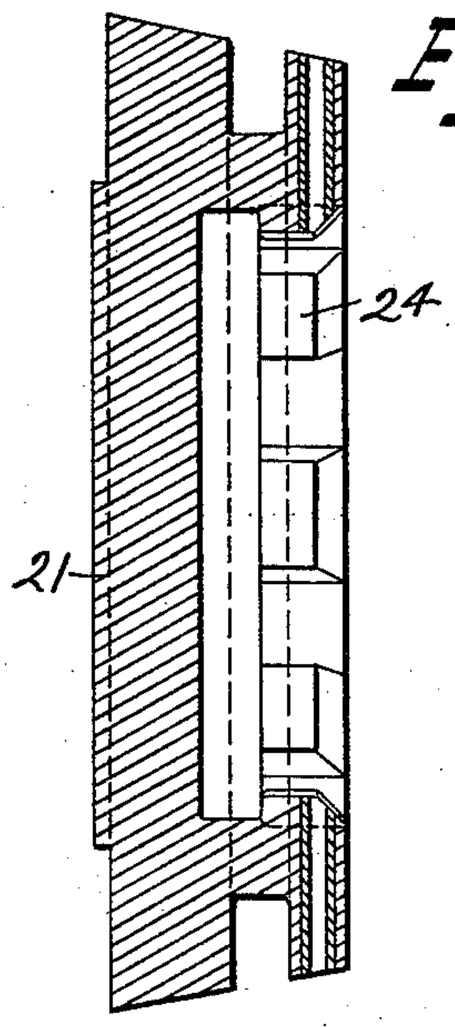



Fig. 6.

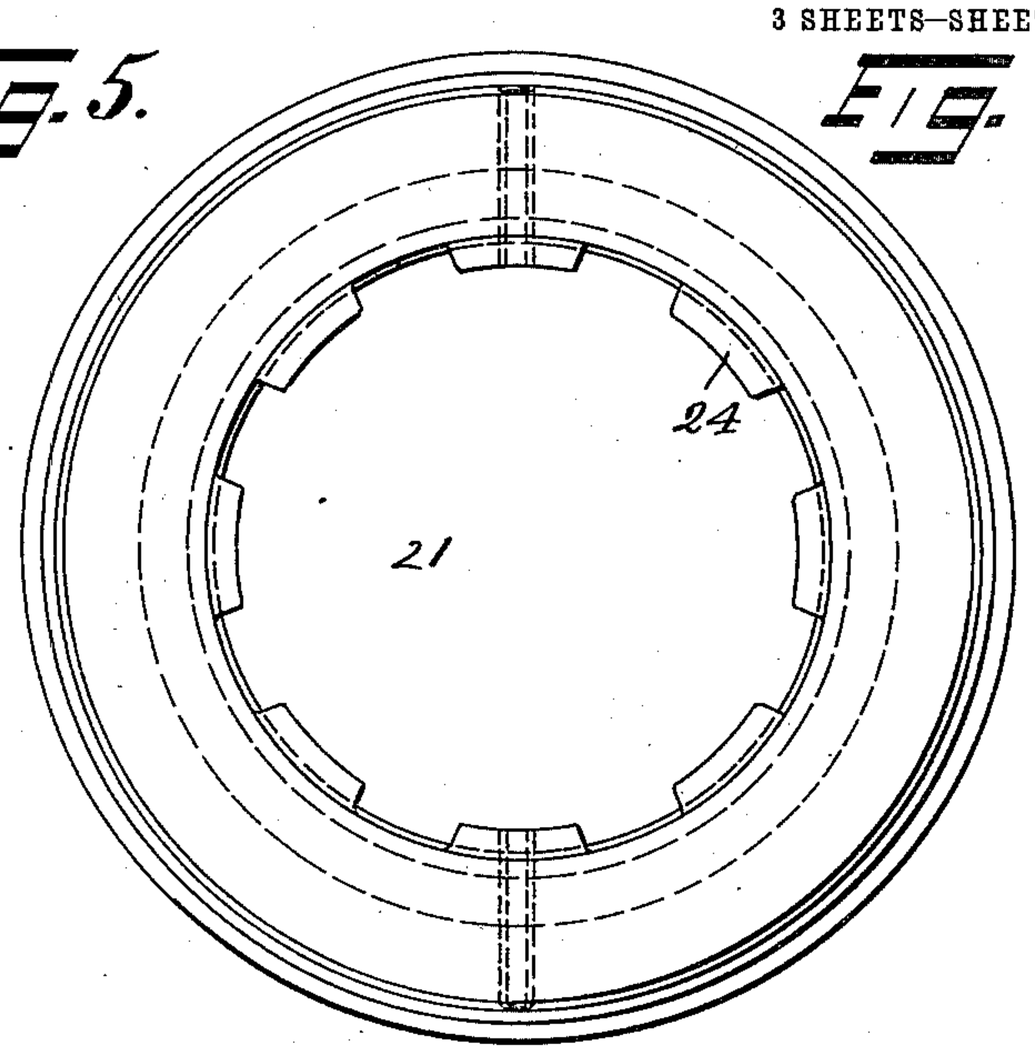



Fig. 7.

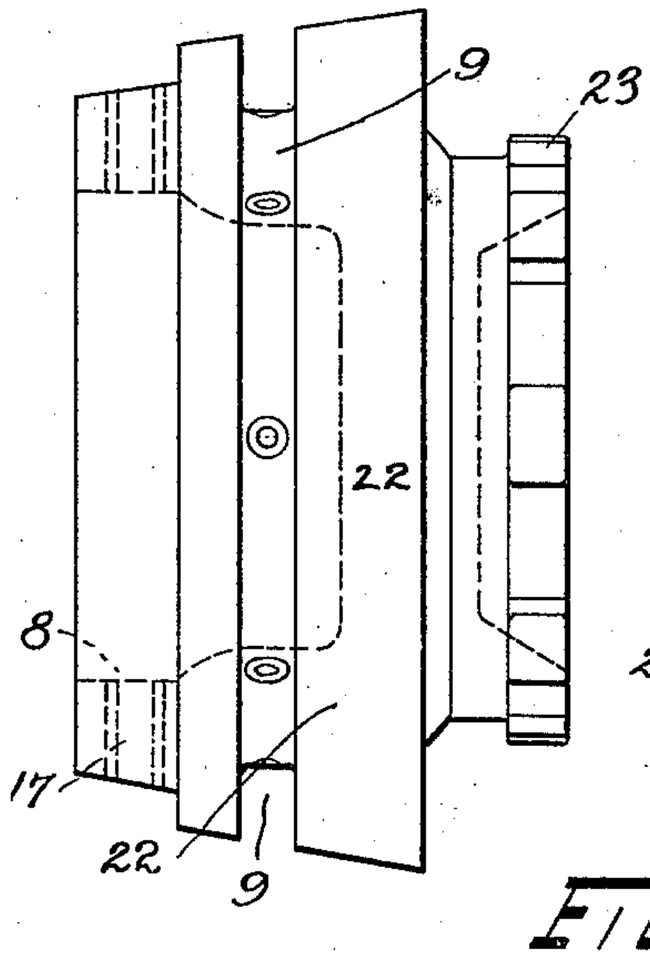



Fig. 8.

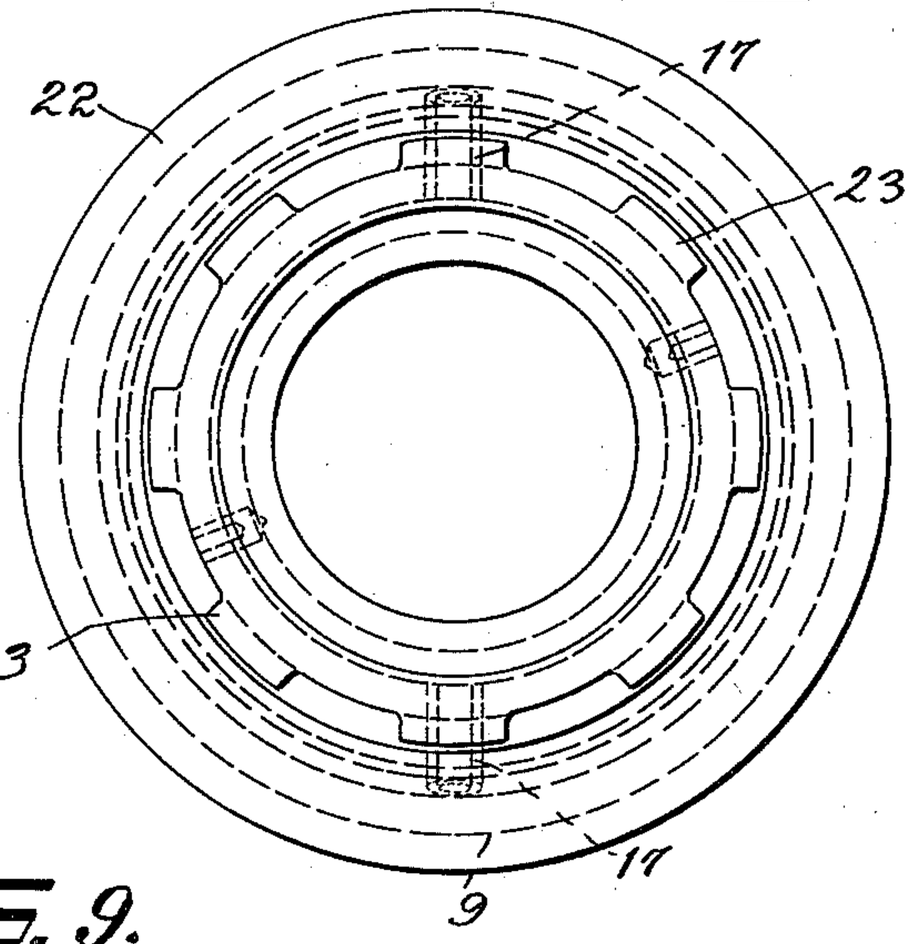
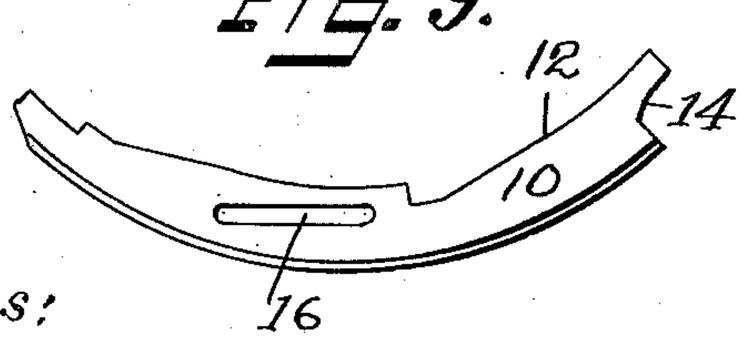



Fig. 9.

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# UNITED STATES PATENT OFFICE.

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## SAFE OR VAULT DOOR HOLDING OR LOCKING MEANS.

997,793. Specification of Letters Patent. Patented July 11, 1911.

Application filed December 2, 1909. Serial No. 530,944.

*To all whom it may concern:*

Be it known that we, SAMUEL W. FISH and LE ROY LAYTON, citizens of the United States, residing at Plainfield, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Safe or Vault Door Holding or Locking Means, of which the following is a specification.

The present improvement relates to safes or vaults, and more particularly to door holding or securing mechanism therefor, the object of the invention being to provide, in connection with a rotary door, an improved means for holding the door in the safe body.

In the drawings accompanying and forming part of this specification, Figure 1 is a cross-sectional view of a portion of the body and of the door; Fig. 2 is a sectional view taken in line 2—2, Fig. 1; Fig. 3 is a cross-sectional view of a body and door, the former adapted for the reception of a compound door; Fig. 4 is a cross-sectional view taken in line 4—4, Fig. 3; Fig. 5 is a cross-sectional view of the front or outer door; Fig. 6 is a rear view thereof; Fig. 7 is a side elevation of the rear or inner door; Fig. 8 is a rear view thereof; and Fig. 9 is a detail view of one of the holding segments.

Similar characters of reference indicate corresponding parts throughout the figures of the drawings.

A feature of the present improvement is the provision of improved holding mechanism in the form of segmental members adapted to be protracted or retracted on the rotary movement of the door, thereby to hold the door in its seat, and which improved holding mechanism is adapted for either a single or a compound door and is operated on the rotary movement of the door without the use of spindles or other means for protracting or retracting the holding segments. In other words, the rotary movement of the door automatically locks or unlocks such door.

The safe body 2 may be of any desired or suitable form. In the present instance it is shown provided with a front 3 having a jamb 4, part of which jamb is made up of projecting members or ribs 5 integral with the body, the jamb being shown as a tapered one for the reception of a similarly formed door 6 which may be mounted in any suitable manner on a hinge for rotary movement. This door comprises a body 7 having a rearwardly extending flange 8 provided with an annular recess 9 for the reception of the segmental holding members. Located within this recess is a plurality of locking segments or bolts 10, each pivotally supported by a pin or pivot 11. Each of these members 10 is provided with an inclined under surface 12 in engagement with a projection 13 rigidly supported in the bottom of the annular recess 9 of the door, such projections 13, therefore, being movable with the door. For preventing the movement of the locking segments with the door on the rotation thereof, the opposed ends of each pair of segments are recessed or rabbeted, as at 14, and in engagement with each pair of juxtaposed ends is a projection or stop 15 rigidly carried by one of the ribs 5 of the body. In practice, when the door and body are made of unmachineable metal, as for instance manganese steel, the projections 13 and stops 15 are suitably embedded or supported in soft metal inserts located in recesses of the door flange and jamb ribs of the door and body respectively. The pivots 11 upon which the segments oscillate are located in inclined slots 16 for the purpose hereinafter specified. In practice the projections 15 and the adjacent end of one of the segmental locking members are beveled or inclined. For securing the door in its seat against rotary movement some suitable form of bolting mechanism may be provided, alined bolt openings 17 being shown in the door flange and body jamb for this purpose.

In the form shown in Figs. 3 and 4 the door 20 is in the form of a compound door comprising an outer or front door 21 and an inner or rear door 22 secured together by coacting lugs 23 and 24, some suitable means, as keys, being provided for preventing the rotation of one door independently of the other. For holding the door in its seat, each of these doors 21 and 22 is provided with a similar securing means to that hereinbefore described. The body in this instance is provided with two sets of jamb-forming ribs 25 and 26.

In the form shown in Figs. 1 and 2 it will be observed that the locking segments are projected into position between the jamb-

forming ribs 5 and the rear wall of the body front 3 so as to contact with the latter, this also being the case with the locking segments carried by the outer door 21 of the construction shown in Figs. 3 and 4, while the locking segments carried by the rear door are projected into position between the jamb-forming ribs 26 and the jamb-forming ribs 25 so as to contact with the rear face of the said ribs 25. Thus it will be observed that in both forms shown a relatively long jamb surface is provided without the provision of the usual flange heretofore present in safes of this general character, such jamb being made up of one or more sets of ribs in the rear of the body front 3. It will also be observed that each of the doors is provided with a chamber, while that shown in Figs. 3 and 4 is provided with a pair of chambers, so that in both forms of body and door shown the metal is substantially uniform at all points, thereby to facilitate the heat treatment where the structure is made of unmachineable metal.

In operation, when the door is firmly seated in its jamb the rotation thereof in the direction of the arrow, Fig. 2, operates, through the medium of the projections 13, to protract the segments outwardly on their fulcrums, these being the pivotal pins 11, into position to engage in the recesses of the jamb and so hold the door in position, the return rotary movement of the door being then prevented by the bolt mechanism hereinbefore referred to. When it is desired to unlock the door, and after the bolts have been retracted which prevent the rotary movement thereof, the door is rotated in a reverse direction, thereupon carrying the projections 13 with it. At the same time the pivotal pins 11, moving with the door, slide in the inclined slots 16 from the position shown in Fig. 2 to the position shown in Fig. 4 and so withdraw or retract the locking segments, the movement of the segments with the rotary movement of the door being prevented by the stops 15 in a manner which will be readily understood.

By this improved locking means it will be observed that the locking segments extending entirely around the door thus project beyond the joint of the door and cover it entirely around the door and so prevent the passage of nitro-glycerin into the safe body, this being one of the advantages of a segmental holding means of the character set forth. By this improvement we are able to provide a segmental holding means which is automatically protracted and retracted by the rotary movement of the door without the necessity of providing special means in the form of a spindle or otherwise for operating these holding segments, and since the bolts for preventing the rotary movement of the door may be automatically protracted and retracted by a suitable automatic, it follows that by the provision of this improved holding means we are able to provide a rotary door having locking segments without the necessity of providing any means projecting through the door, in the form of a spindle or otherwise, for operating such segments. The under surface of each of the segments is recessed to form an abutment or stop face against which the projections 13 engage when the door has been rotated to its unlocked position. It will be observed that each segment is engaged by a pair of projections 13, one adjacent to its forward end and one adjacent to its rear end, thereby to insure the proper protraction of the segments on the rotation of the door, these projections being slightly beveled.

We claim as our invention:

1. In a safe or vault, the combination of a body and a rotary door, and swinging bolts for holding the door in the body and shiftable on and by the rotation of the door within the body.

2. In a safe or vault, the combination of a body and a rotary door, and shiftable and oscillatory bolts carried by the door for holding the door in the body and shiftable on the rotation of the door within the body.

3. In a safe or vault, the combination of a body and a rotary door, and swinging bolts carried by the door for holding the door in the body and shiftable on and by the rotation of the door within the body.

4. In a safe or vault, the combination of a body and a rotary door, a plurality of oscillatory bolts carried by one of said members and adapted to be protracted to engage the other, and means for protracting and retracting said bolts on the rotation of the door.

5. In a safe or vault, the combination of a body and a rotary door, a plurality of oscillatory bolts carried by the door, and means for protracting and retracting said bolts on the rotation of the door.

6. In a safe or vault, the combination of a body and a rotary door, a plurality of swinging bolts carried by the door, means carried by the body for preventing the rotary movement of the bolts, and means carried by the door for shifting said bolts on the rotary movement of said door.

7. In a safe or vault, the combination of a body and a rotary door, a plurality of holding segments carried by the door, means carried by the body for preventing the rotary movement of the segments, and means carried by the door for shifting said segments on the rotary movement of said door, said means comprising a plurality of projections for engaging said segments to protract them.

8. In a safe or vault, the combination of a body and a rotary door, a plurality of

holding segments carried by the door, means carried by the body for preventing the rotary movement of the segments, and means carried by the door for shifting said segments on the rotary movement of said door, said means comprising a pin and slot connection, one part carried by the door and the other by the segments and effective to retract the segments on the rotary movement of the door.

9. In a safe or vault, the combination of a body and a rotary door, a plurality of holding segments carried by the door, means carried by the body for preventing the rotary movement of the segments, and means carried by the door for shifting said segments on the rotary movement of said door, said means comprising a plurality of projections carried by the door and effective to engage the segments to protract the same on the rotary movement of the door, and a plurality of pins carried by the door and working in slots carried by the segments for retracting the segments on the rotary movement of the door.

10. In a safe or vault, the combination of a body and a rotary door, a plurality of holding segments carried by the door, means carried by the door for shifting said segments on the rotary movement of said door, and means for preventing the rotary movement of the segments with the door.

11. In a safe or vault, the combination of a body and a rotary door, a plurality of holding segments carried by the door, means carried by the door for shifting said segments on the rotary movement of said door, said means comprising a plurality of projections for engaging said segments to protract them, and means for preventing the rotary movement of the segments with the door.

12. In a safe or vault, the combination of a body and a rotary door, a plurality of holding segments carried by the door, means carried by the door for shifting said segments on the rotary movement of said door, said means comprising a pin and slot connection, one part carried by the door and the other by the segments and effective to retract the segments on the rotary movement of the door, and means for preventing the rotary movement of the segments with the door .

13. In a safe or vault, the combination of a body and a rotary door, a plurality of holding segments carried by the door, means carried by the door for shifting said segments on the rotary movement of said door, said means comprising a plurality of projections carried by the door and effective to engage the segments to protract the same on the rotary movement of the door, a plurality of pins carried by the door and working in slots carried by the segments for retracting the segments on the rotary movement of the door, and means for preventing the rotary movement of the segments with the door.

14. In a safe or vault, the combination of a body and a rotary door, a plurality of holding segments carried by the door, means carried by the door for shifting said segments on the rotary movement of said door, said means comprising a plurality of projections carried by the door and effective to engage the segments to protract the same on the rotary movement of the door, a plurality of pins carried by the door and working in slots carried by the segments for retracting the segments on the rotary movement of the door, and projections carried by the body and coöperating with the segments for preventing rotary movement thereof with the door.

15. In a safe or vault, the combination of a body and a rotary door, a plurality of slotted segments carried by the door, pins carried by the door and working in said slots, projections carried by the door and engaging the undersides of said segments for protracting them on the rotary movement of the door, one segment overlapping another, and projections carried by the body for preventing rotary movement of the segments with the door.

16. A rotary safe or vault door having an annular recess, projections located in the bottom of said recess, slotted segments located in said recess, pins carried by the door and working in the slots of the segments, and means in engagement with each pair of segments for preventing rotary movement thereof with the door, said segments being protracted and retracted on the rotation of the door.

17. A rotary safe or vault door having holding mechanism comprising a plurality of swinging bolts, and means carried by the door for retracting and protracting the bolts on the rotary movement of the door.

18. A rotary safe or vault door having holding mechanism comprising a plurality of pivotally supported swinging bolts, and means carried by the door for protracting and retracting the bolts on the rotary movement of the door.

19. A rotary safe or vault door having holding mechanism comprising a plurality of swinging bolts, and means carried by the door for retracting and protracting the bolts on the rotary movement of the door, the protracting means comprising a plurality of projections adapted to engage coöperating faces of the bolts.

20. A rotary safe or vault door having holding mechanism comprising a plurality of swinging bolts, and means carried by the door for retracting and protracting the bolts on the rotary movement of the door,

the retracting means comprising a plurality of pins working in inclined slots of the bolts.

21. A rotary safe or vault door having holding mechanism comprising a plurality of swinging segments, and means carried by the door for retracting and protracting the segments on the rotary movement of the door, the protracting means comprising a plurality of projections carried by the door and coöperating with inclined faces of the segments and the retracting means comprising a plurality of pins carried by the door and working in slots carried by the segments.

22. In a safe or vault, the combination of a body and a compound rotary door made up of a pair of interlocked doors each having holding means, each of said holding means being protracted and retracted toward and from the axis of the door on the rotary movement of the door.

23. In a safe or vault, the combination of a body and a compound rotary door made up of a pair of interlocked doors each having holding means, each of said holding means being protracted and retracted on the rotary movement of the door and comprising a plurality of shiftable segments.

24. In a safe or vault, the combination of a body and a compound rotary door made up of a pair of interlocked doors each having holding means, each of said holding means being protracted and retracted on the rotary movement of the door and comprising a plurality of pivotally supported swinging segments.

25. A safe or vault comprising a body and a compound rotary door made up of a pair of interlocked doors supported for movement as a single structure, and duplicate holding means protracted and retracted toward and from the axis of the door on the rotary movement of the door.

26. A safe or vault comprising a body member and a compound rotary door member made up of a pair of interlocked doors supported for movement as a single structure, and duplicate holding means protracted and retracted on the rotary movement of the door, each holding means comprising a plurality of swinging segments carried by one of said members.

27. A safe or vault comprising a body and a compound rotary door made up of a pair of interlocked doors supported for movement as a single structure, duplicate holding means carried by the rotary door and protracted and retracted on the rotary movement of the door, each holding means comprising a plurality of swinging segments, and means carried by the body for preventing rotary movement of the segments with the door.

28. A safe or vault comprising a body and a rotary door, said door having duplicate holding means, each comprising a plurality of segments protracted and retracted on the rotary movement of the door.

29. A safe or vault comprising a body and a rotary door, duplicate holding means carried by the door, each comprising a plurality of segments protracted and retracted on the rotary movement of the door, the protracting means comprising a plurality of projections carried by the door and engaging cooperating faces of the segments.

30. A safe or vault comprising a body and a rotary door, duplicate holding means carried by the door, each comprising a plurality of segments protracted and retracted on the rotary movement of the door, the retracting means comprising pins carried by the door and working in slots carried by the segments.

31. A safe or vault comprising a body and a rotary door, duplicate holding means carried by the door, each comprising a plurality of segments protracted and retracted on the rotary movement of the door, the protracting means comprising a plurality of projections carried by the door and engaging cooperating faces of the segments and the retracting means comprising pins carried by the door and working in slots carried by the segments.

32. A safe or vault comprising a body and a rotary door, segmental holding means comprising a plurality of bolts having their ends in juxtaposition and adapted to be projected into position to entirely close the joint of the door and means for automatically protracting such bolts during the rotary movement of the door.

33. A safe or vault comprising a body and a rotary door, segmental holding means comprising a plurality of segments having their ends in juxtaposition and adapted to be projected into position to entirely close the joint of the door, and means for automatically protracting and retracting the segments on the rotary movement of the door.

34. A safe or vault comprising a body and a rotary door, segmental holding means comprising a plurality of segments having their ends in juxtaposition and adapted to be projected into position to entirely close the joint of the door, and means for protracting and retracting the segments on the rotary movement of the door, said means comprising a plurality of projections carried by the door and a plurality of pins carried by the door and working in inclined slots of the segments, and means for preventing the rotary movement of the segments with the door and comprising a plurality of stops carried by the body.

35. A safe or vault body having a jamb and in the rear thereof inwardly extending ribs and having in front of said ribs recesses for the reception of door holding means, a rotary door, and holding members adapted

to be protracted and retracted on the rotary movement of the door.

36. In a safe or vault, the combination of a body and a rotary door, a plurality of holding members carried by the door, means carried by the body for preventing the rotation of the members with the door, and means carried by the door for protracting and retracting said holding members on the rotation of the door, said protracting means comprising projections adapted to engage the holding members and force them outwardly.

37. In a safe or vault, the combination of a body and a rotary door, a plurality of holding members carried by the door, means carried by the body for preventing the rotation of the members with the door, and means carried by the door for protracting and retracting said holding members on the rotation of the door, said retracting means comprising pin and slot connections, the pins being carried by the door and the slots by the holding members.

38. In a safe or vault, the combination of a body and a rotary door, a plurality of holding members carried by the door, means carried by the body for preventing the rotation of the members with the door, and means carried by the door for protracting and retracting said holding members on the rotation of the door, said protracting means comprising projections adapted to engage the holding members and force them outwardly and said retracting means comprising pin and slot connections, the pins being carried by the door and the slots by the holding members.

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