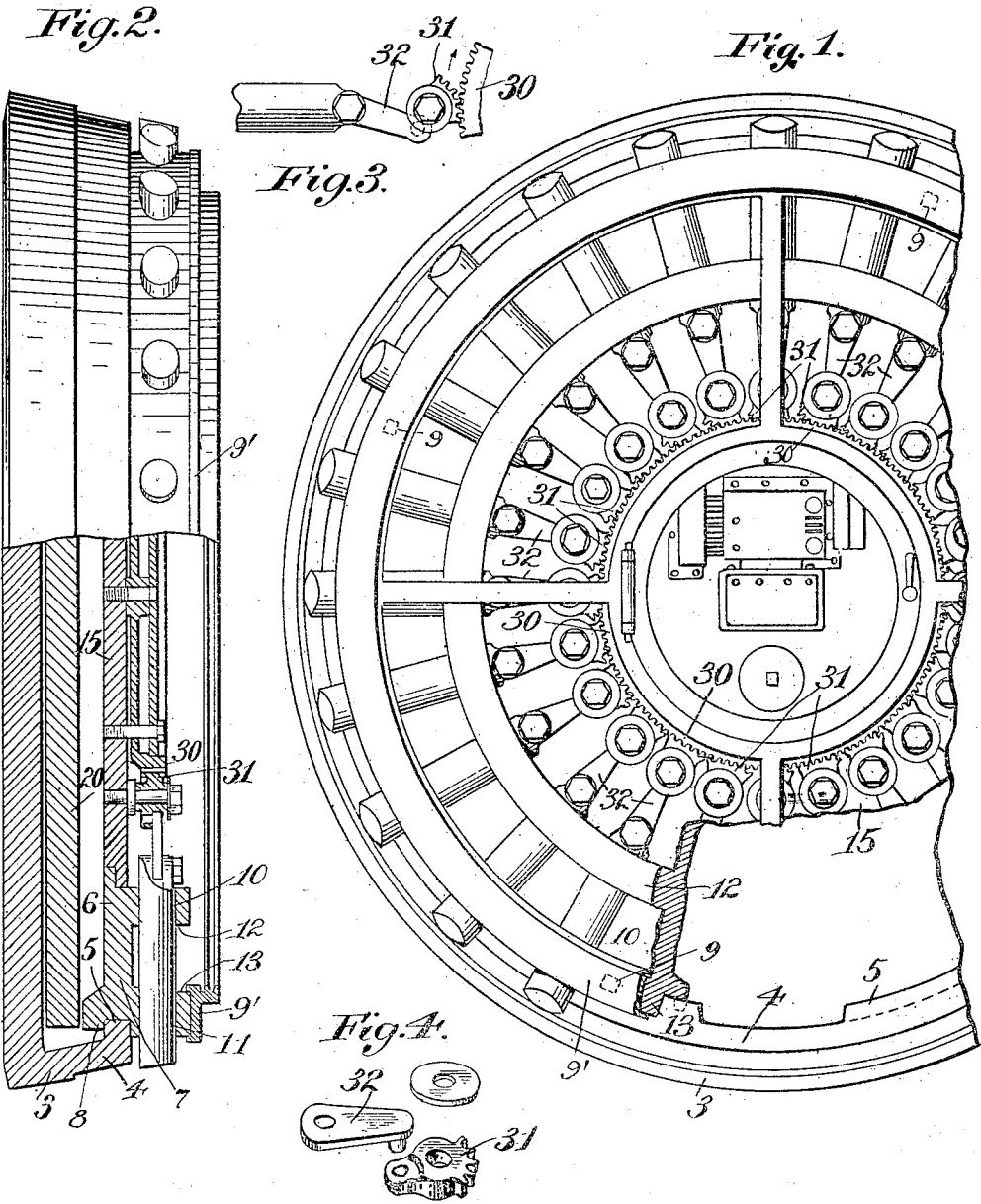


S. W. FISH.
 LOCKING DEVICE FOR SAFE AND VAULT DOORS.
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1,049,069.

Patented Dec. 31, 1912.



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LOCKING DEVICE FOR SAFE AND VAULT DOORS.

1,049,069.

Specification of Letters Patent.

Patented Dec. 31, 1912.

Original application filed December 2, 1909, Serial No. 530,943. Divided and this application filed June 17, 1911. Serial No. 633,649.

To all whom it may concern:

Be it known that I, SAMUEL W. FISH, a citizen 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 Locking Devices for Safe and Vault Doors, of which the following is a specification.

The present improvement relates to safe or vault doors, and more particularly to the bolting mechanism thereof, the object of the invention being to provide improved means for operating such bolting mechanism, the present application being a division of my contemporaneously pending application Serial No. 530,943, filed December 2, 1909, now Patent No. 997,778 dated July 11, 1911.

In the drawings accompanying and forming part of this specification, Figure 1 is a rear view of a part of a vault door having part of the bolting mechanism broken away; Fig. 2 is partly a side and partly a sectional view of this improved door and its bolting mechanism; Fig. 3 is a detail view illustrating a portion of one of the bolts and a portion of the means for protracting and retracting the same; and Fig. 4 is a detail view of the means for operating the bolts.

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

It is desirable in practice, especially in large vault doors, which usually weigh many tons, to so support the bolting mechanism that the supporting means therefor may be separate and independent of the door proper but so connected therewith that to all intents and purposes the door and its bolting mechanism are a unitary structure, and this is especially desirable where the door is made of unmachineable metal, since in such cases, when the door is itself provided with bolt openings the casting must not only be unusually heavy and massive, but the heat treatment thereof is difficult. In the present improvement, in order to do away with these disadvantages, the door is made up of a pair of members, an outer or body member and an inner or bolt supporting member, the latter of which may be made of some suitable steel less difficult to machine, whereby the outer member may be readily made of unmachineable metal and heat treated while

the inner member, as stated, may be made of a different steel and of a steel which can be readily machined. The foregoing, however, constitutes broadly the subject-matter of my contemporaneously pending application hereinbefore referred to. The present improvement, however, particularly relates to the locking devices for the safe or vault doors.

The door 2 in the form shown comprises an outer member 3 having preferably a rearwardly extending flange 4 provided around the same with suitable lugs 5. The inner or bolt carrying member 6 may comprise an annular ring 7 having lugs 8 adapted to cooperate with the lugs 5 of the outer member 3 and so be interlocked therewith, suitable keys 9 being provided for preventing the separation of the two members of the door when once they are interlocked, the detachment of these keys being prevented by an annular ring or plate 9' secured to the inner member of the door. The annular member 7 is provided with suitable bolt openings 10 and 11 carried by projections 12 and 13 for the reception of the bolts. Secured to this annular member 7 for supporting the bolt operating means and the time lock and other mechanism usually used in vault doors, is a disk 15.

By reason of this construction it will be observed that the bolt supporting member 7 may be made of a different metal from that of which the main portion of the door is made, and of a metal which can be readily machined, the two members being interlocked by a rotary motion of one relatively to the other through the medium of the lugs, and when so interlocked keyed or otherwise held together. In practice the vault doors may be provided with a protecting plate 20 between the body door and the inner bolt supporting member 7.

For operating the bolts suitable gearing is provided, this being automatically operated or otherwise, as found most desirable in practice. This gearing in the present instance comprises a ring gear 30 meshing with a series of segmental gears or segments 31, one connected with each bolt, and for this purpose each segment 31 is pivotally connected by an arm or crank 32 with its bolt, whereby, on rotating the ring gear, the

segments will be operated to either withdraw or protract the bolts, each segment and its connected crank arm thus forming a toggle joint, so that when the bolts are protracted the pivotal connections of the crank arm of each bolt are in alinement, and therefore in a dead-center position, so that it is impossible to force in or retract the bolts except by rotating the operating gear 30.

10 By reason of the present improvement I am able not only to provide an improved operating means for the bolts, but also an improved means for supporting and securing the bolts to the door, thus obviating the necessity of having the bolt supporting portion of the door and the door proper made as a single massive casting, and also obviating the necessity of making the entire structure of one metal.

20 From the foregoing it will be observed that the door comprises a main door member and an inner member which constitutes both a door and a body-locking member, since it has on its front side means for interlocking it with the main door and on its rear side means for locking or securing the main door to the safe or vault body, and therefore it will be herein designated as a door and body locking member, since it constitutes the means for securing the main door to the body of the safe or vault

I claim as my invention:

1. A locking device for safe or vault doors comprising a plurality of sliding bolts, an arm for each bolt, a pivot bolt connecting each arm with its bolt, a segmental gear pivotally connected to each of said arms, a rotatable gear in mesh with said segmental gears, and means for rotating said gear to protract and retract the bolts.

2. A locking device for safe or vault doors comprising a plurality of sliding bolts, a crank arm for each bolt, a pivot bolt connecting each arm with its bolt, a segmental gear pivotally connected to each of said crank arms, and means for operating said segmental gears to protract and retract the bolts.

3. A locking device for safe or vault doors comprising a plurality of sliding bolts, a crank arm for each bolt, a pivot bolt connecting each arm with its bolt, a segmental gear pivotally connected to each of said crank arms, and means for operating said segmental gears to protract and retract the bolts and comprising a rotatable ring gear.

Signed at New York, N. Y., this 15th day of June 1911.

SAMUEL W. FISH.

Witnesses:

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