

G. M. MERCER.
DOOR FOR BANK SAFES.
APPLICATION FILED MAY 19, 1909.

963,236.

Patented July 5, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

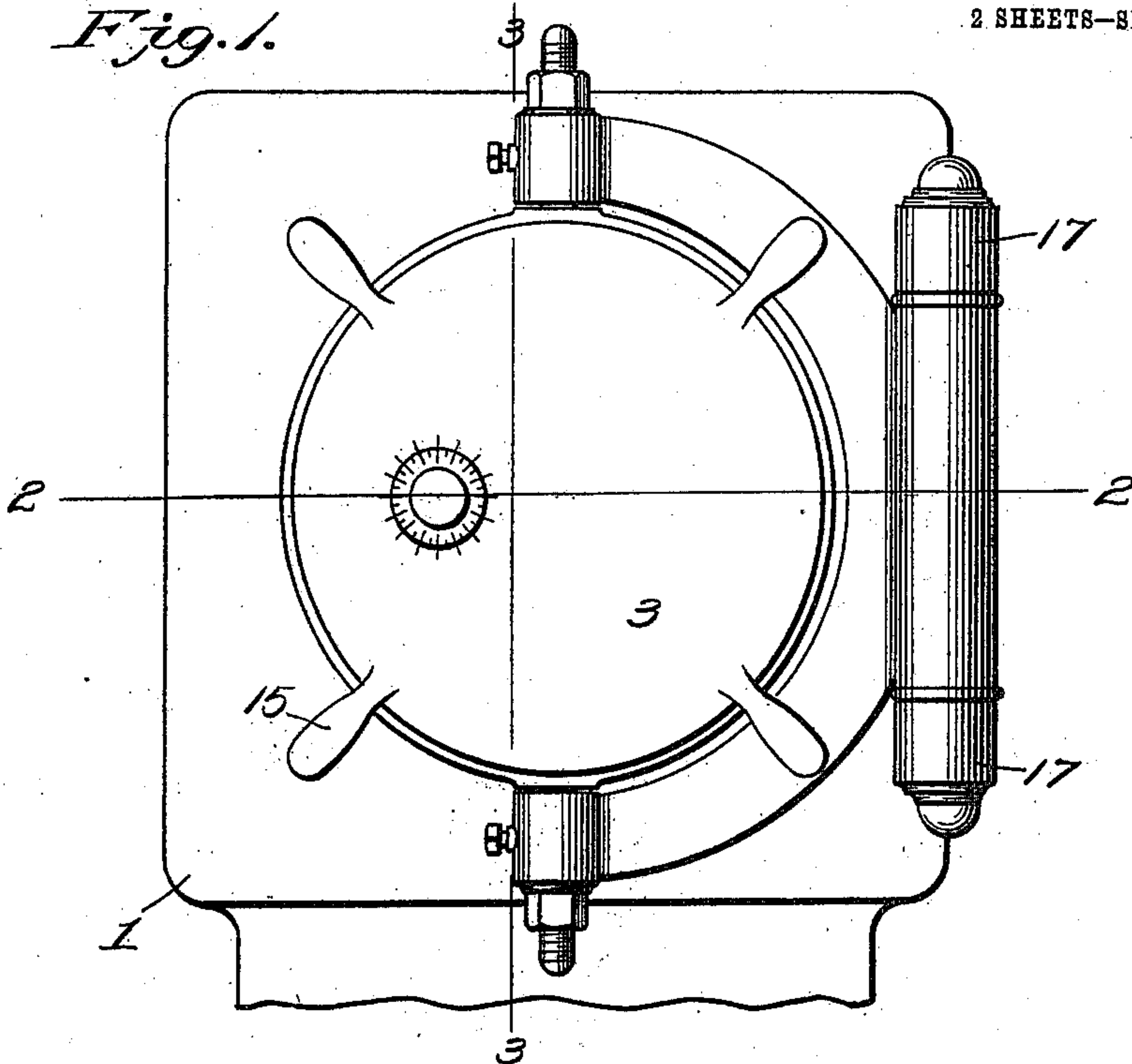
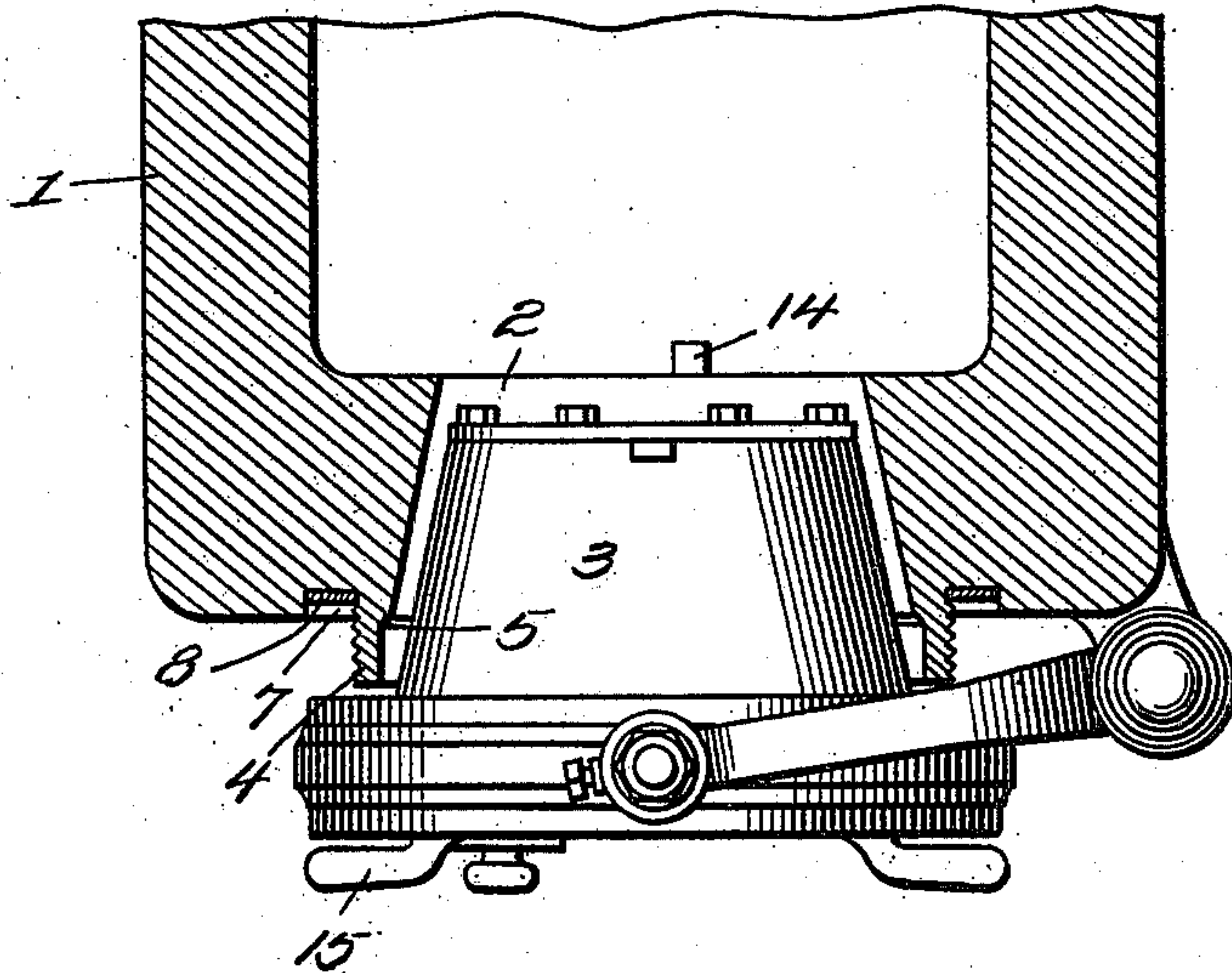


Fig. 2.



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V. B. Hillyard.

By *Victor J. Evans*

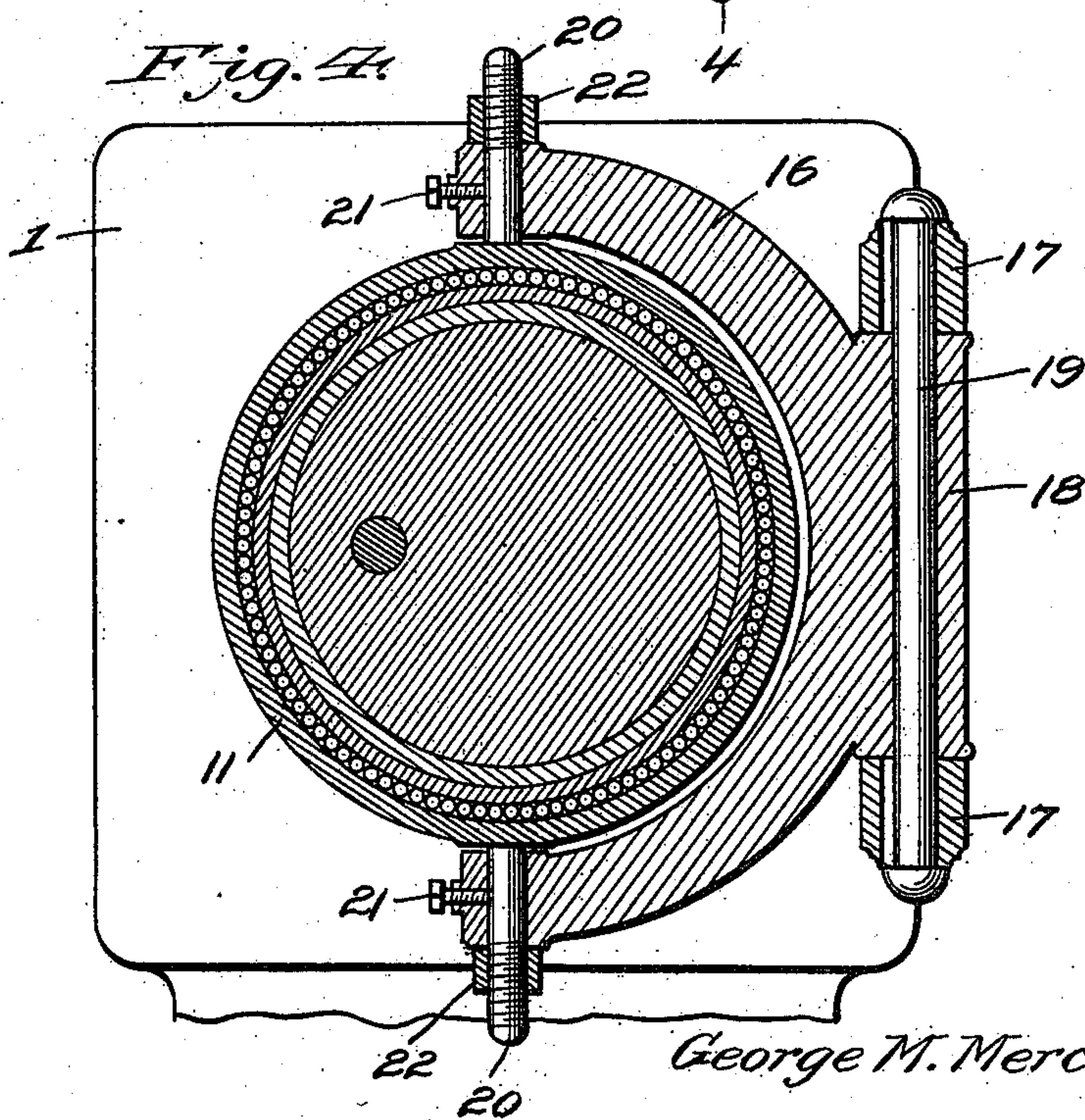
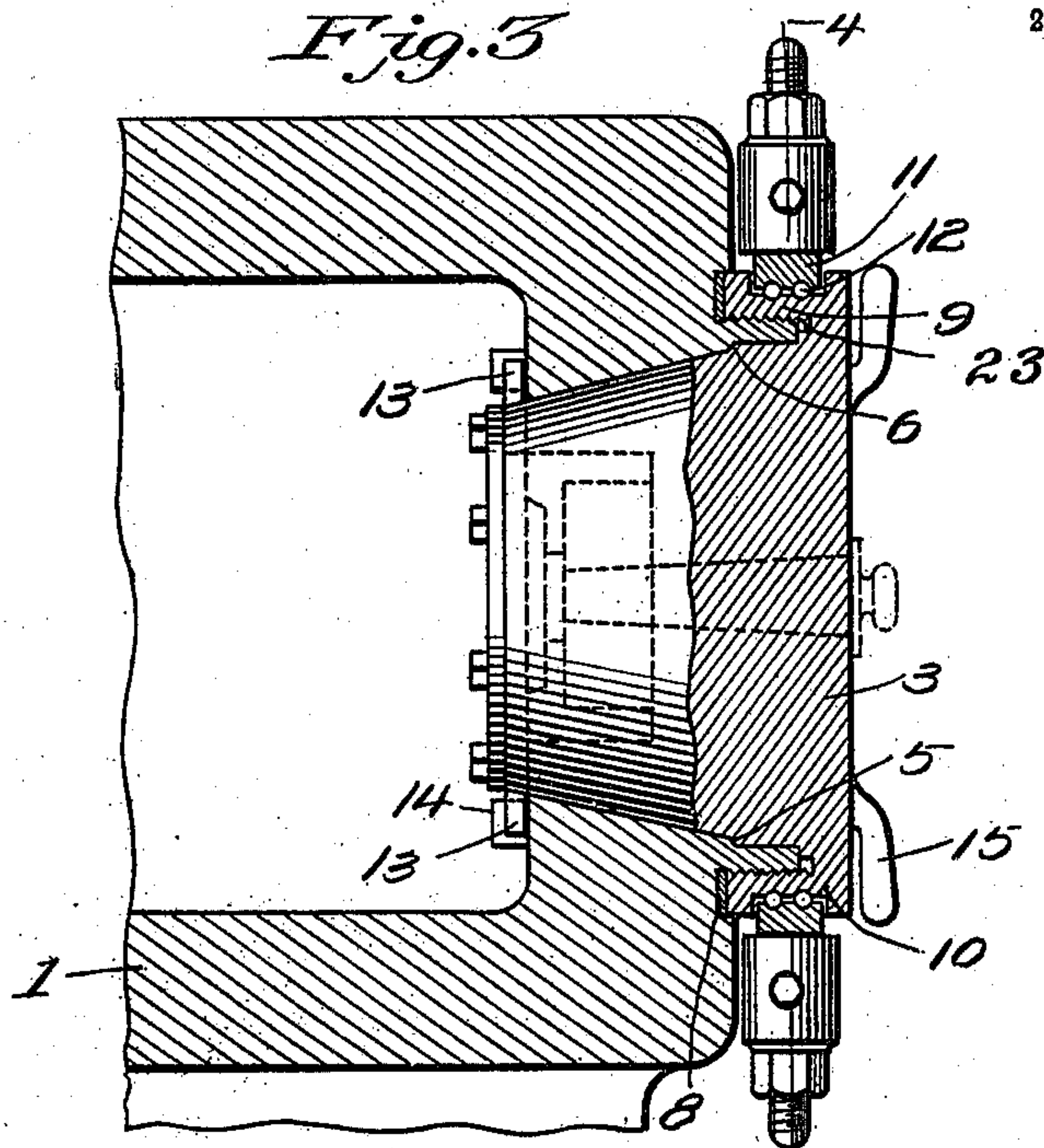
Attorney

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UNITED STATES PATENT OFFICE.

GEORGE M. MERCER, OF COLUMBUS, OHIO.

DOOR FOR BANK-SAFES.

963,236.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE M. MERCER, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented new and useful Improvements in Doors for Bank-Safes, of which the following is a specification.

The purpose of the present invention is to render safes, vaults and other structures for the storage of valuables secure against entrance by means of the usual door. Entrance to such structures for the storage and safety of valuables is usually effected by high explosives introduced into the space formed between the door and the body of the safe or other structure.

The purpose of the present invention is to device a closure for bank vaults, safes and other repositories of valuables so that it is practically impossible to introduce an explosive between the door and the part of the safe against which the door closes so as to produce any effect in the opening of the door.

In accordance with the present invention the door of the bank vault, safe or the like is retained in place by the combined action of the usual lock devices and a positive interlocking connection between the door and the safe or vault, said interlocking connection in the preferred form consisting of operating screw threads or equivalent means.

A further purpose of the invention is the provision of a safe or vault door which is mounted to be turned to effect coöperation of the interlocking means both when releasing the door or securing the same.

The invention consists of the novel features, details of construction and combinations of parts which hereinafter will be more particularly set forth, illustrated and finally claimed.

Referring to the drawings forming a part of the specification: Figure 1 is a front view of a portion of a safe or like structure provided with a door embodying the invention. Fig. 2 is a horizontal section of the safe on the line 2—2 of Fig. 1 showing the door and its mountings in full lines, the door being partly open. Fig. 3 is a vertical section on the line 3—3 of Fig. 1 looking to the right, a portion of the door only being in section. Fig. 4 is a section on the line 4—4 of Fig. 3 looking to the left.

Corresponding and like parts are referred

to in the following description and indicated in all the views of the drawings by the same reference characters.

The numeral 1 designates a safe, vault or other structure or repository such as commonly employed for the storage of moneys, papers and other valuables. Access is had to the interior of the safe or structure 1 by means of an opening 2 formed therein, said opening being closed by means of a door 3, the latter being of any substantial structure to resist forcible entrance. In elevation the door 3 is of circular form and in side view tapers toward its inner end so as to snugly fit within the door opening 2 which is of corresponding shape. An annular flange 4 surrounds the door opening 2 and projects outwardly from the front of the safe or structure. The flange 4 is exteriorly threaded and is provided near its inner end with a shoulder 5 against which a corresponding shoulder 6 near the front of the door abuts thereby limiting the closing of the door and providing a jog or offset in the joint formed between the walls of the door opening and door when the latter is closed. An annular groove 7 is provided in the face of the safe or structure 1 at the base of the annular flange 4 and receives a packing 8 whereby a tight joint between the door and safe is assured when the door is properly closed and secured.

The door 3 is provided near its front or outer end with a flange 9 which is adapted to encircle the flange 4, the flange 9 being internally screw threaded to match the screw threads upon the outer side of said flange 4. The inner end of the flange 9 is adapted to enter the annular groove 7 when the door is closed and secured. A groove 10 is formed in the outer side of the flange 9 and constitutes an annular seat to receive a ring 11, anti-friction devices 12 being interposed between the ring 11 and the inner wall of the seat 10 so as to reduce the friction between the door and ring 11 to the smallest amount possible whereby said door may be turned with comparative ease when tightening or loosening the same to effect engagement or disengagement of the interlocking means or screw threads formed between the companion flanges 4 and 9. It is to be understood that any interlocking means the substantial and full equivalent of the screw thread connections between the flanges 4

and 9 may be utilized in the practical embodiment of the invention. The ring 11 constitutes in effect a support for the door and forms an essential part of the mountings.

5 The anti-friction devices between the ring 11 and the flange 9 of the door may consist of balls or analogous elements commonly employed for reducing friction between relatively movable parts. The door 3 is of a

10 length from front to rear so as to project beyond the inner wall of the front of the safe or structure 1 when said door is closed. The lock means for securing the door comprises lock bolts 13 which are adapted to be pro-

15 jected beyond the sides of the door so as to engage with the safe as indicated most clearly in Fig. 3 and prevent both turning or outward movement of the door. The projecting ends of the lock bolts 13 may en-

20 gage projecting parts 14 or keepers of any style so as to secure the results herein mentioned. The lock-bolts 13 are adapted to cooperate with lock devices of any variety usually employed in connection with bank

25 safes, vaults and the like and which embody permutation devices, time, or electric mechanisms. The door 3 may be turned by any means so as to effect engagement or dis-

30 engagement of the ring locking means and for this purpose the door is shown provided with handles 15, the same being conveniently arranged to enable the force exerted to be advantageously applied in the rotat-

35 ing of the door when securing or loosening the same in the final or the initial turning of the door.

For supporting the door to admit of its swinging open or shut a carrier 16 is provided and mounted to swing being pivoted

40 or hinged to the safe. Lugs 17 are cast with or provided upon the safe or like part and the carrier 16 is formed with a projecting part 18 to fit between said lugs 17, both the lugs and projection 18 being apertured to receive a pin-

45 tle 19 by means of which the carrier 16 is hingedly connected to the safe so as to swing and admit of the door supported thereby opening or closing. The swinging door carrier 16 is approximately of semicircular

50 form to embrace one-half of the ring 11 and its ends terminate in sleeves which are apertured and receive pivot pins 20 adjustably mounted in said sleeves and retained in proper position by means of set screws

55 21 and set nuts 22, the latter being threaded upon the projecting ends of the pivot pins 20 which are threaded to match the threads of the set nuts. The inner ends of the pivot pins 20 are constructed to engage with the

60 ring 11 and properly support the same and the door without interfering with the free rotary and swinging movements of said door. The adjustable mounting of the pivot pins 20 in the swinging door carrier admit

65 of the adjustment of the door so as to fit

the door opening 2 with a nicety so as to obviate binding or friction which would render operation of the door difficult.

The flange 9 is spaced from the edge of the door a distance corresponding to the 70 thickness of the flange 4 to admit of the latter snugly fitting within the space. An annular groove 23 is formed in the wall at the inner end of the space between said flange 9 and the edge of the door and is 75 adapted to receive a packing or absorbent to prevent the possibility of any fluid being forced through the joint between the door and the door opening in an attempt to tam-

80 per with or blow the safe open by an explosive. It is to be understood that the door mountings are constructed in any manner to admit of the door having a limited movement so as to enter and leave the door opening without binding. In one construc-

85 tion the openings in the lugs 17 are elongated in a plane parallel with the front of the safe, thereby admitting of the pintle 19 having a limited play, so that the carrier 16 may move to accommodate the position of 90 the door.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily 95 apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the device which I now consider to be the best embodiment 100 thereof, I desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto. 105

Having thus described the invention, what is claimed is—

1. In combination with a safe provided with a circular door opening and having a flange extending outward beyond the front 110 of the safe in line with the door opening, and having an annular groove in the front of the safe at the base of the flange, a door for closing said door opening and having an annular flange spaced therefrom a dis-

115 tance corresponding to the thickness of the flange extending from the front of the safe and connected at its outer edge with the front of the door and having an annular

120 groove in the connecting wall, said flange adapted to enter the annular groove in the front of the safe at the base of the flange projecting outward therefrom, and inter-

125 locking means between the two flanges adapted to be engaged or disengaged by a rotary movement of the door.

2. In combination a safe provided with a circular door opening outwardly flared and having an annular flange in line with the door opening exteriorly threaded and 130

formed upon its inner wall with a shoulder
a short distance from the outer end of the
flange, a door of circular form and tapered
to correspond with the flare of the door
5 opening to snugly fit the same, and having
a shoulder near its outer end to abut against
the shoulder of the door opening, said door
having an annular flange connected with its
outer portion to encircle the annular flange
10 projecting outward from the safe and in-

teriorly threaded to make screw thread connection with said annular flange of the safe, and a swinging carrier for said door.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE M. MERCER.

Witnesses:

STANLEY E. GRAY,
CLARA G. MERCER.