No. 693,142. Patented Feb. 11, 1902.

H. C. LOWRIE.

SAFE.

(Application filed Oct. 1, 1901.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

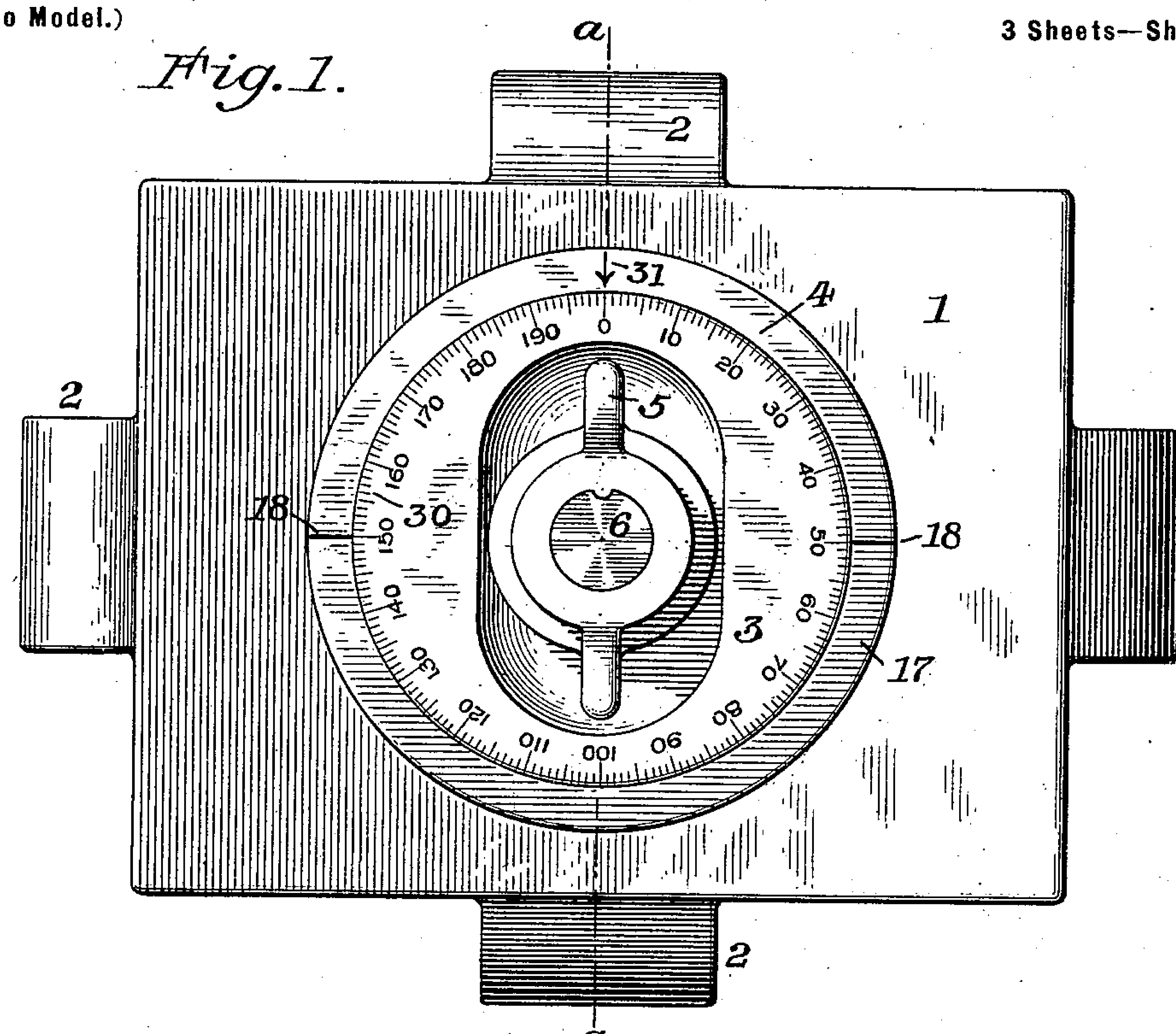
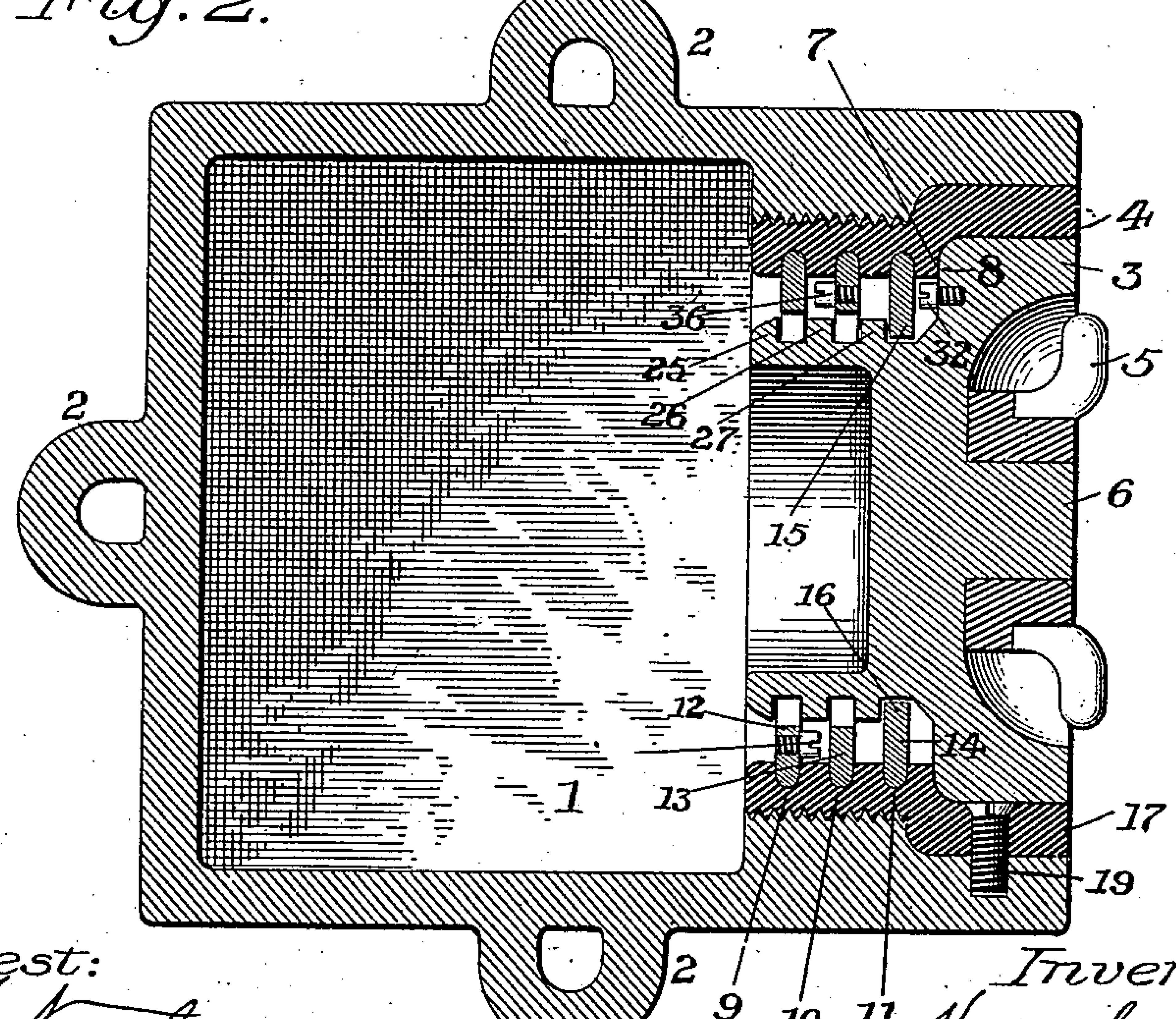


Fig. 2.



Attest:
C. W. Neale
M. A. Miles

Inventor:
Harvey C. Lowrie,
By Lowell Battle
Attorney.

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H. C. LOWRIE.

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(Application filed Oct. 1, 1901.)

(No Model.) 3 Sheets—Sheet 2.

Fig. 3.

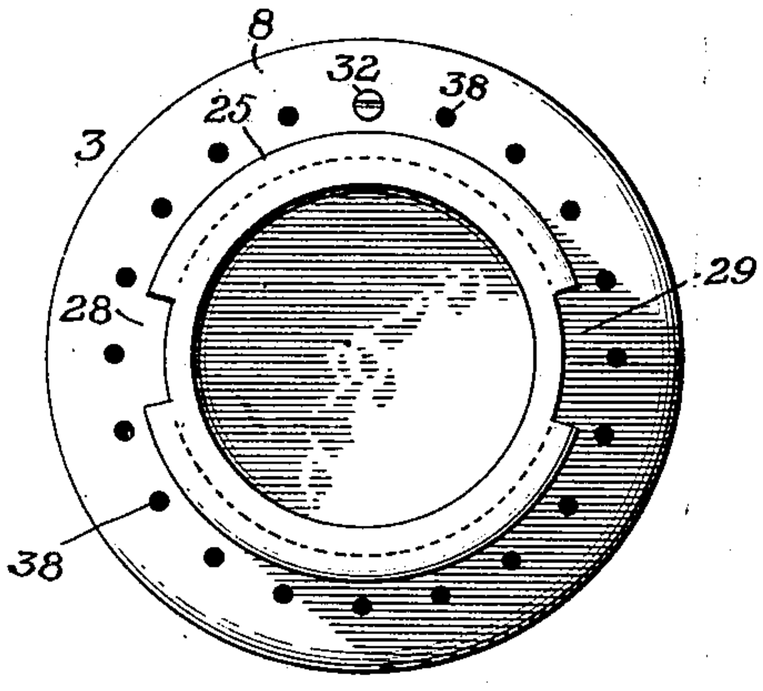


Fig. 4.

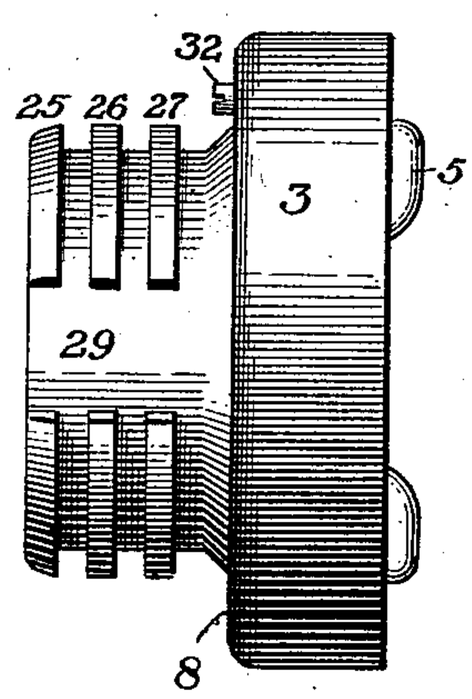


Fig. 5.

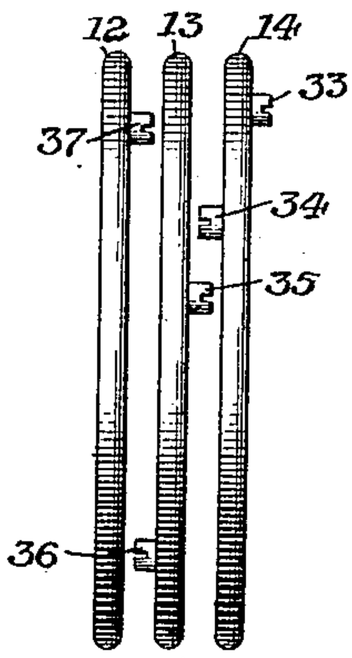


Fig. 6.

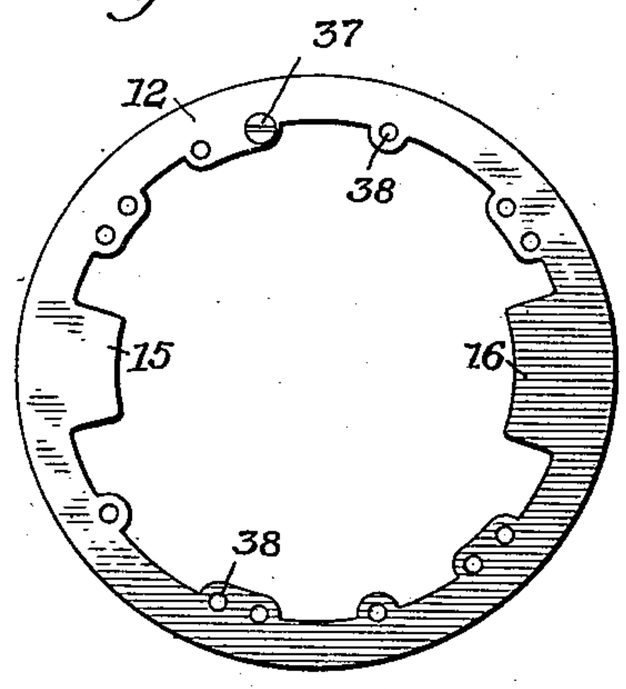
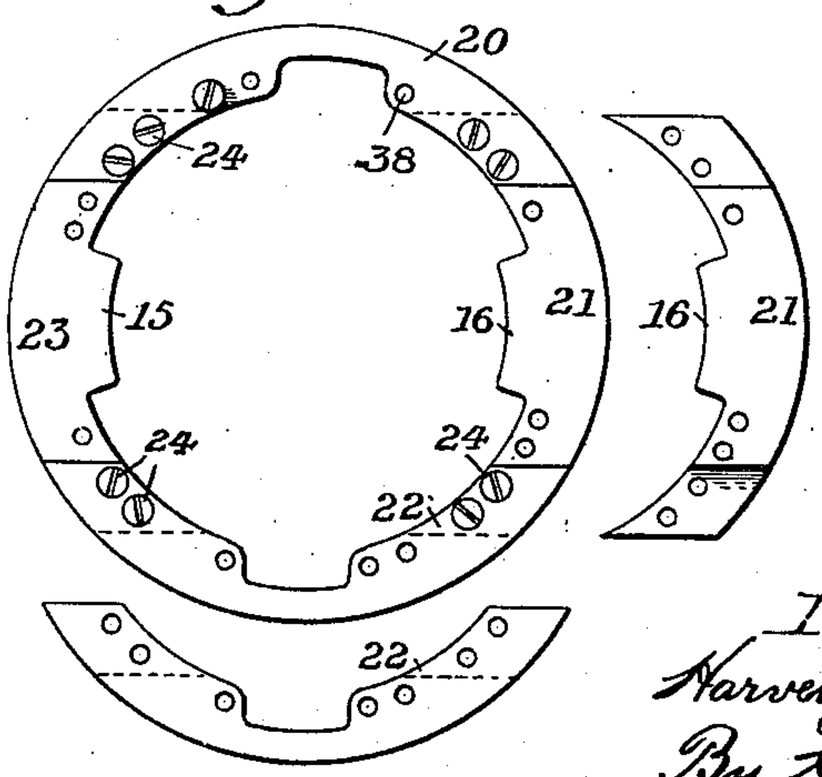


Fig. 7.



Attest:
M. A. Miley.

Inventor:
Harvey C. Lowrie,
By Howell Battle
attorney.

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H. C. LOWRIE.

SAFE.

(Application filed Oct. 1, 1901.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 8.

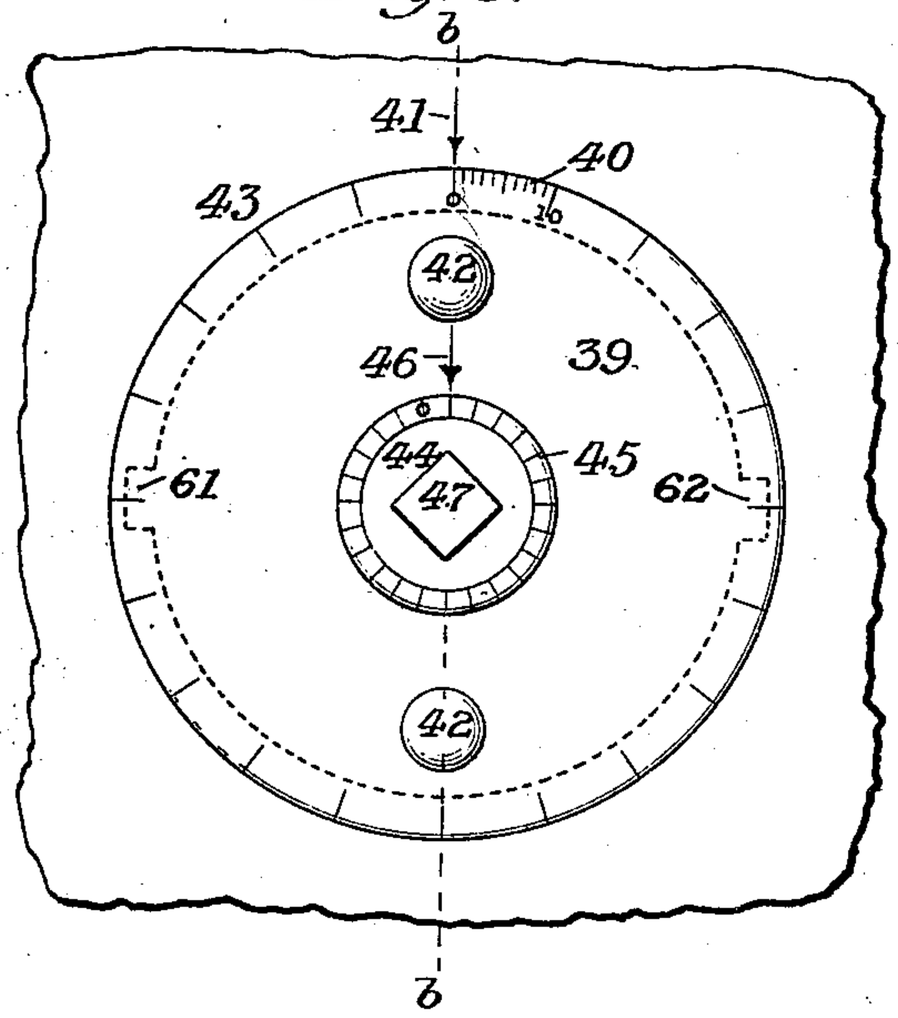


Fig. 9.

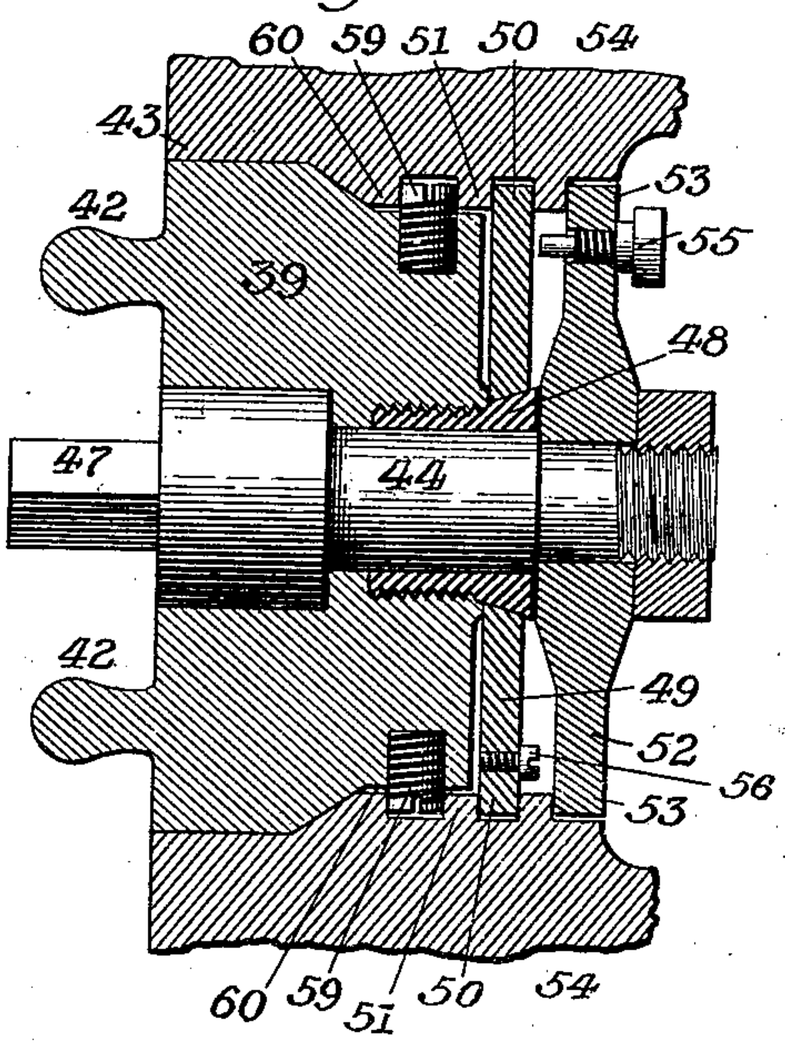


Fig. 10.

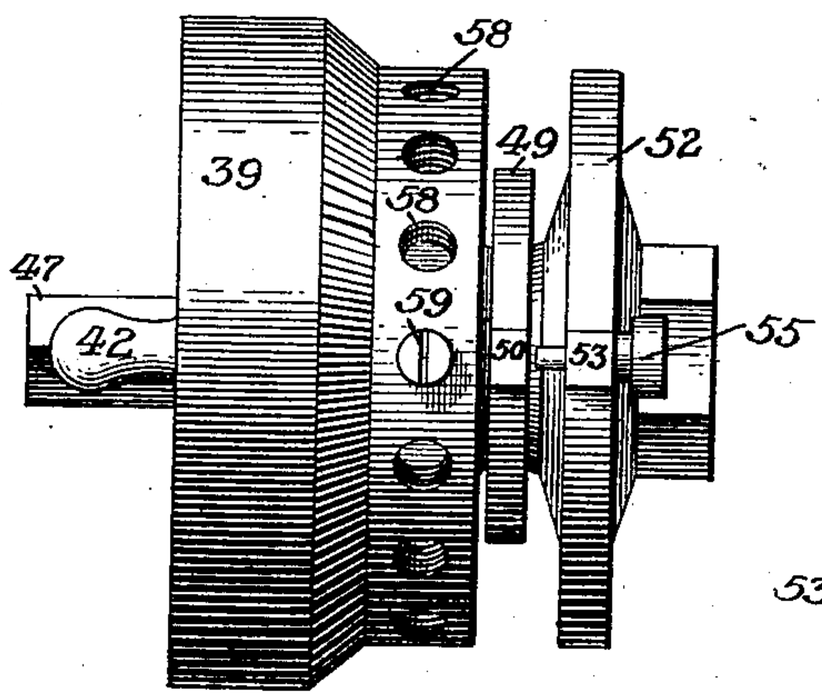


Fig. 11.

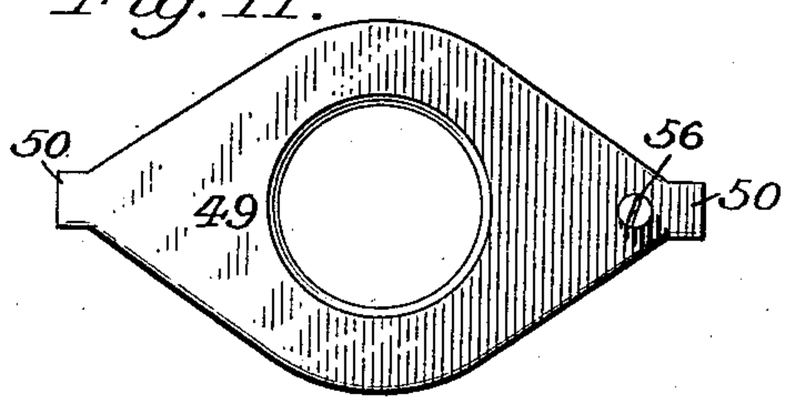
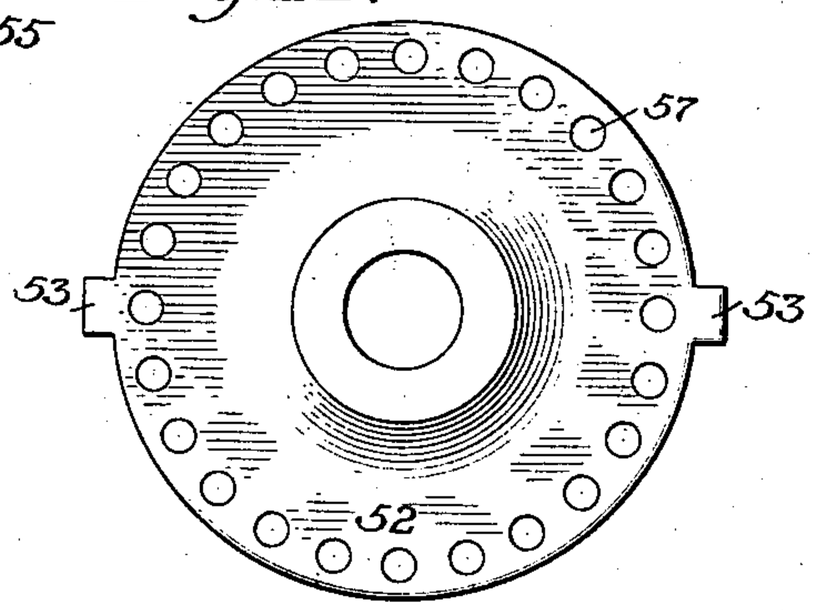


Fig. 12.



Attest:
Edward C. Mitchell
M. A. Miley.

Inventor:
Harvey C. Lowrie.
By Howell Battle.
Attorney.

UNITED STATES PATENT OFFICE.

HARVEY C. LOWRIE, OF DENVER, COLORADO.

SAFE.

SPECIFICATION forming part of Letters Patent No. 693,142, dated February 11, 1902.

Application filed October 1, 1901. Serial No. 77,246. (No model.)

To all whom it may concern:

Be it known that I, HARVEY C. LOWRIE, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented new and useful Improvements in Safes, of which the following is a specification.

My invention relates to safes or receptacles for the storage of money or other articles of value; and its main object is to provide a keyless safe which will afford reasonable security against theft of articles stored therein and which may be manufactured at such small cost as to come within the means of farmers, householders, and others who cannot afford the more expensive articles now on the market.

My said invention, broadly stated, consists in providing a safe-door or its casing with locking-lugs which are movable in such a manner as to be placed in or out of alinement with each other and in or out of engagement with projections which coöperate therewith for securing the door to its casing, said lugs being moved in a manner similar to the tumblers or wheels of a combination-lock of ordinary construction.

After a detail description of my invention the features deemed novel will be specified in the claims hereunto annexed.

Referring to the drawings, Figure 1 is a front view of a "wall-safe" embodying my invention. Fig. 2 is a central vertical section of the same on line *a a* of Fig. 1. Figs. 3 and 4 are rear and edge views of the door. Fig. 5 is an edge view of the rings which carry the locking-lugs. Fig. 6 is a front or face view of one of said rings. Fig. 7, in three views, illustrates a sectional ring adapted for use in connection with a door-casing of modified construction. Fig. 8 is a front view of a safe-door and its casing embodying the main features of my invention in a modified form. Fig. 9 is a vertical section of the same on line *b b* of Fig. 8. Fig. 10 is an edge view of the door; and Figs. 11 and 12 are detail views of the plates that carry the locking-lugs, which are movable independently of the door.

While I have illustrated my improvements in connection with a wall-safe, it is to be understood that the form of the safe or its intended use is immaterial to the invention.

The safe illustrated in Figs. 1 to 6, inclusive, consists of an iron or steel box 1, provided on its rear, two sides, top, and bottom with perforated lugs 2, through which tie-rods (not shown) are to be inserted for anchoring the safe to a wall into which it is to be built, as will be readily understood. The door 3 is circular in form and fits into a correspondingly-shaped door-casing 4 in the front wall of the safe and preferably with its outer surface flush with the outer surface of said wall, as clearly shown. The door 3 is rotated for operating the locking-lugs, to be hereinafter described, and it is therefore provided with a handle 5, which is preferably so mounted on a stud 6 as to be readily pulled off by an attempt to open the door while the latter is held by its locking-lugs. The door-casing 4 is provided with a shoulder 7, against which a shoulder 8 on the door abuts for forming a perfect closure, and at the rear of the shoulder 7 are annular grooves 9, 10, and 11, affording seats for rings 12, 13, and 14, which are movable in said grooves around the periphery of the rear portion of the door, and each ring carries locking-lugs 15 and 16, which coöperate with annular projections on the door to lock the latter to the casing, as will be explained. These rings 12, 13, and 14 are duplicates of each other and are preferably stamped from sheet-steel. They are inserted in the grooves 9, 10, and 11 in the door-casing by making the latter in the form of a bushing 17, which is split centrally, as at 18, so that the two halves of the bushing may be separated for the insertion of the rings and thereafter put together and screwed into the safe-opening, said bushing being further held to the safe by screws 19, as shown in Fig. 2. The grooves 9, 10, and 11 may, however, be formed directly in the safe-casting, in which case the rings must be made in sections—for instance, as illustrated in Fig. 7. The ring there shown is made in four sections 20, 21, 22, and 23, which are first assembled in its retaining-groove in the door-casing and then secured together by means of screws 24, as will be readily understood.

Surrounding the periphery of the door at

the rear of the shoulder 8 are three annular collars or projections 25, 26, and 27, with which the locking-lugs 15 and 16 on the rings 12, 13, and 14 engage, and said projections are cut away at opposite sides of the door to afford passage-ways 28 and 29 for the locking-lugs to permit the insertion and removal of the door after said lugs have been placed in proper alinement therewith. It is to be understood, however, that each ring 12, 13, and 14 may be provided with a single lug 15 or 16 without departure from my invention, in which case the annular projections 25, 26, and 27 are to be cut away to form a single passage-way 28 or 29.

It will be noted that the rings 12, 13, and 14 are placed quite close together and that the rotation of one ring will not interfere with another except when a pin on the moving ring collides with a similar pin on an adjacent ring. The moving ring will then move its neighbor and carry it around with it to any desired point.

The door 3 is provided with a dial 30, which, in connection with an index 31 on the door-casing, enables any one knowing the proper combination to so rotate the door as to bring all of the locking-lugs in alinement with the passage-ways 28 and 29. On the shoulder 8 of the door there is a pin 32, which when the door is rotated collides with a pin 33 on the ring 14. At the rear of said ring 14 is another pin 34 in line with a pin 35 on ring 13, and at the rear of ring 13 there is a pin 36 in line with a similar pin 37 on the ring 12. These pins are screw-threaded, and each ring, as well as the shoulder 8 on the door, is provided with numerous screw-threaded holes 38 to admit of moving the pins to various radial positions for the purpose of varying or changing the combination of the lock at pleasure, as will be readily understood. It will now be seen that if the door is turned a complete revolution (in either direction) pin 32 on the door will engage pin 33 on ring 14, and another revolution in the same direction will cause ring 14 to be moved so that its pin 34 will engage pin 35 on ring 13, which will be moved by a continued rotation of the door so that its pin 36 will engage pin 37 on ring 12. Ring 12 may then be carried to its proper position of adjustment for opening the door by continuing the rotation of the latter until the proper point is indicated by the dial 30 and index 31, before referred to, the stopping-point being of course known only to the proper person. The rotation of the door is now reversed two complete revolutions, so that by means of the pins before referred to ring 13 may be moved in a reverse direction to bring its locking-lugs 15 and 16 in alinement with the lugs on ring 12, which has remained undisturbed, the rotation of the door for this purpose being guided by the dial and index, as before. Now by again reversing the rotation of the door and stopping it at the proper point lugs 15 and 16 on ring 14 may be brought into alinement with those on rings 12 and 13, and by again reversing the direction of rotation of the door and stopping it at the proper point the ways 28 and 29 may be brought into alinement with the locking-lugs, so that the door may be readily removed from its casing. For closing and locking the safe it is only necessary to carefully insert the door in its casing and give it one or two complete turns, so that the locking-lugs will be moved out of alinement and in engagement with the coöperating projections on the door.

If in the construction just described the parts are properly made and fitted, it will be practically impossible to unlock the door by "feeling" for the position of the locking-lugs, and to open it by any system other than the true combination is rendered more difficult by having the lugs 15 and 16 on each ring of different size and the width of the passage-ways 28 and 29 varied to correspond therewith, as shown in Figs. 3 and 6; but it is to be understood that the lugs on each ring, regardless of their number, are for the purposes of this specification to be considered as one lug.

The door may be secured to the safe by means of a chain attached thereto by a swivel connection or by means of any of the well-known supporting-hinges that have been heretofore used in connection with rotatable doors.

As heretofore indicated, the locking-lugs may be attached to the door and the coöperating projections form a part of the door-casing without departure from the main features of my invention. A construction of this character is illustrated in Figs. 8 to 12, inclusive. The door 39, Figs. 8, 9, and 10, is provided with a dial 40 to be read in connection with an index 41 on the door-casing, as before described, and said door is provided with two knobs 42, by means of which it is rotated in its casing 43. Passing centrally through the door is a spindle 44, which also has a dial 45 around its outer edge to be read in connection with an index 46 on the door, and said spindle is rotated independently of the door by means of a projecting stem 47. At the rear of the door is a bushing 48, which affords a conical seat or bearing for a plate 49, which carries at diametrically opposite points locking-lugs 50, that engage with an annular projection 51 around the inner edge of the door-casing for locking the door, as shown in Fig. 9. Secured to the inner end of spindle 44 is a circular plate 52, having two locking-lugs 53 projecting from its edge at diametrically opposite points, which coöperate with an annular projection 54 on the door-casing in the same manner and for the same purpose as the lugs 50, already referred to. Plate 52 is provided with a pin 55, which when said plate is rotated by the spindle 44 engages a pin 56 on plate 49 and rotates the latter, as will be

understood. Plate 52 is also provided with a series of screw-threaded holes 57, provided for changing the radial location of pin 55 with respect to the lugs 53, and thus varying or changing the combination of the lock. Around the periphery of the door there is a series of radial screw-threaded holes 58 for the reception of two screw-threaded locking-lugs 59, placed at diametrically opposite points for engaging an annular projection 60 on the door-casing, the lock combination being changed with respect to these locking-lugs by shifting their radial position from one hole 58 to another, and thereby changing their position with respect to the dial on the face of the door. The annular projections 51, 54, and 60 are cut away to form passage-ways 61 and 62, (shown in dotted lines in Fig. 8,) said passage-ways permitting the removal of the door when all of the locking-lugs are brought into alinement therewith. Now, assuming the door to be locked, the operation for unlocking and opening is as follows: The door is first turned to the point where the locking-lugs 59 will be in alinement with the passage-ways 61 and 62. Spindle 44 is then given one complete turn to bring the pin 55 on plate 52 in contact with pin 56 on plate 49. The rotation of the spindle is then carried to a point where the lugs 50 will be in alinement with the lugs 59. The rotation of the spindle is then reversed until the locking-lugs 53 are in alinement with the others, the door being then free to be removed. The door is locked by revolving it in its casing and then revolving the spindle independently of the door, all of the locking-lugs being thereby moved out of alinement.

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

1. In a safe or strong box, the combination with a circular door and its casing, of locking-lugs movable around the peripheral line of said door, projections adapted to coöperate with said lugs for securing said door in its casing, and means for moving said lugs singly to their proper positions of adjustment for releasing them from engagement with said projections, substantially as described.

2. In a safe or strong box, the combination with a circular door and its casing, of locking-lugs movable around the peripheral line of said door and adapted to be moved into and out of alinement with each other, projections coöperating with said lugs for securing said door in its casing, and means for moving said lugs singly to their proper positions for releasing them from engagement with said projections, substantially as described.

3. In a safe or strong box, the combination with a circular door and its casing, of locking-lugs movable in planes parallel with each other around the peripheral line of said door and adapted to be moved into and out of alinement with each other, and projections adapted to coöperate with said lugs for securing said door in its casing, substantially as described.

4. In a safe or strong box, the combination of a circular door and its casing, of locking-lugs movable in parallel planes around the peripheral line of said door, projections adapted to coöperate with said lugs for securing said door in its casing, and means whereby said lugs may be moved into and out of alinement with each other and into and out of engagement with said projections, substantially as described.

5. In a safe or strong box, the combination with a circular door and its casing, of locking-lugs movable around the peripheral line of said door, one or more of said lugs being movable independently of the others, projections adapted to coöperate with said lugs for securing said door to its casing, and means whereby all of said lugs may be moved into or out of engagement with said projections by movements of said independently-movable lug or lugs, substantially as described.

6. In a safe or strong box, the combination of a circular-door casing, rings movable in said casing around the opening formed thereby, lugs on said rings projecting into said opening, a circular door provided with projections adapted to be engaged by said lugs, a pin or projection on said door and similar pins or projections on said rings, whereby the latter may be moved to any desired position by rotating said door, substantially as described.

7. In a safe or strong box, the combination of a circular-door casing, grooves in said casing, rings movable in said grooves having lugs projecting toward the center of said casing, a circular door having projections adapted to be engaged by said lugs, and means whereby said lugs may be moved into or out of alinement with each other by rotating said door, substantially as described.

8. In a safe or strong box, the combination of a circular-door casing, rings movable in said casing having lugs projecting toward the center thereof, a circular door having annular projections adapted to engage with said lugs, said projections being cut away to afford one or more passage-ways for said lugs, and means for moving said rings for placing said lugs into or out of alinement with each other by rotating said door, substantially as described.

9. In a safe or strong box, the combination with a circular door and its casing, of locking-lugs movable in parallel planes around the peripheral line of said door, projections adapted to be engaged by said lugs for securing said door to its casing, a pin or pins movable with each of said lugs, said pins being adapted to engage with a pin movable with the next adjacent lug, means for moving one of said lugs, and means for varying the

location of one or more of said pins with respect to the lug with which it moves, substantially as and for the purpose described.

10. In a safe or strong box, the combination of a circular door and its casing, of locking-lugs movable around the peripheral line of said door, projections adapted to engage with said lugs for securing said door in its casing, a dial on said door, a pin movable with said door, adapted to move said lugs, and means for changing the location of said pin with respect to said dial, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HARVEY C. LOWRIE.

Witnesses:
F. M. OGLEBAY,
JOHN G. STEINER.