No. 771,704. PATENTED OCT. 4, 1904.

# W. BRINTON.

## SAFE OR VAULT.

APPLICATION FILED FEB. 23, 1904.

NO MODEL. 4 SHEETS—SHEET 1.

Fig. 1.

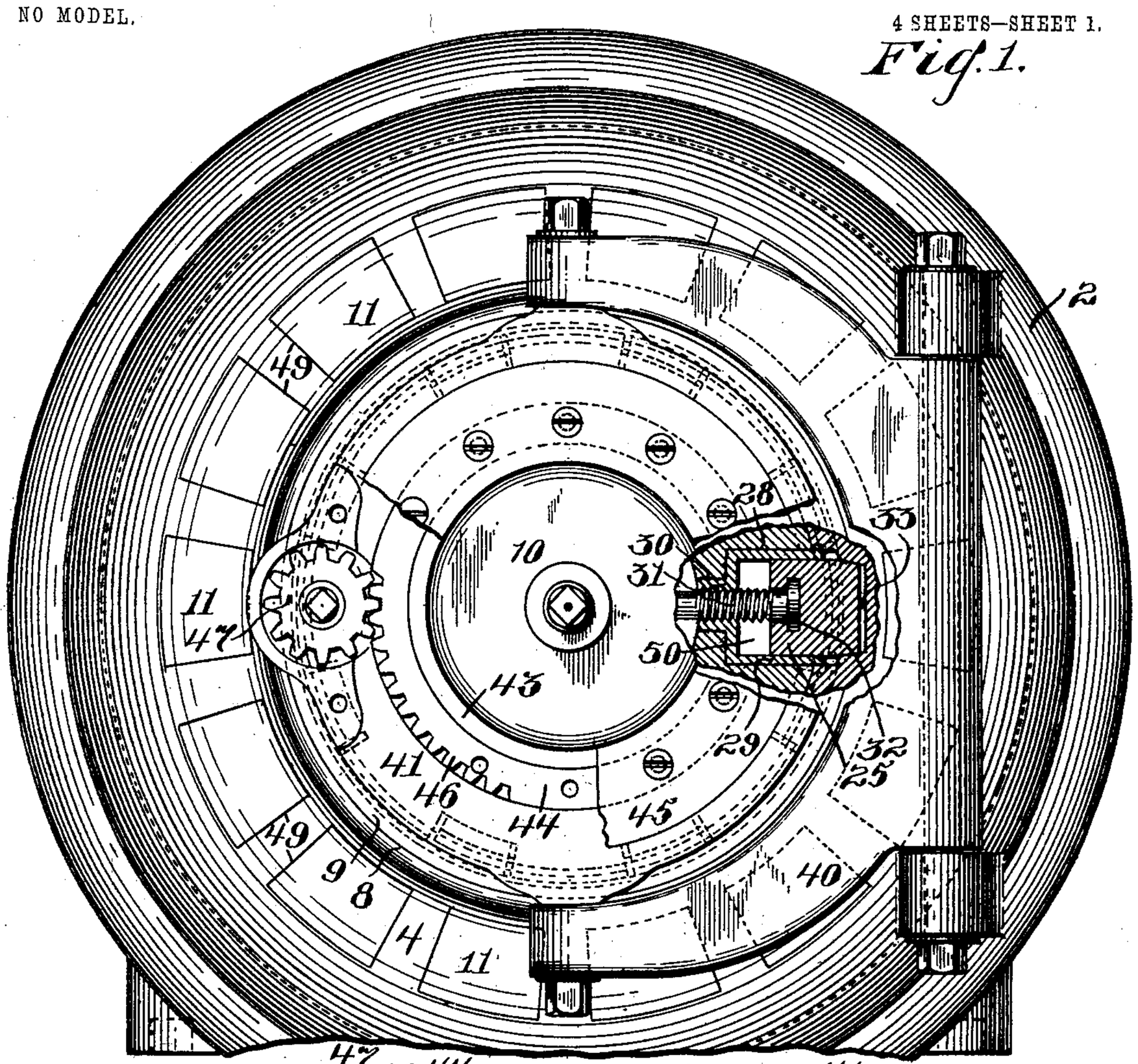
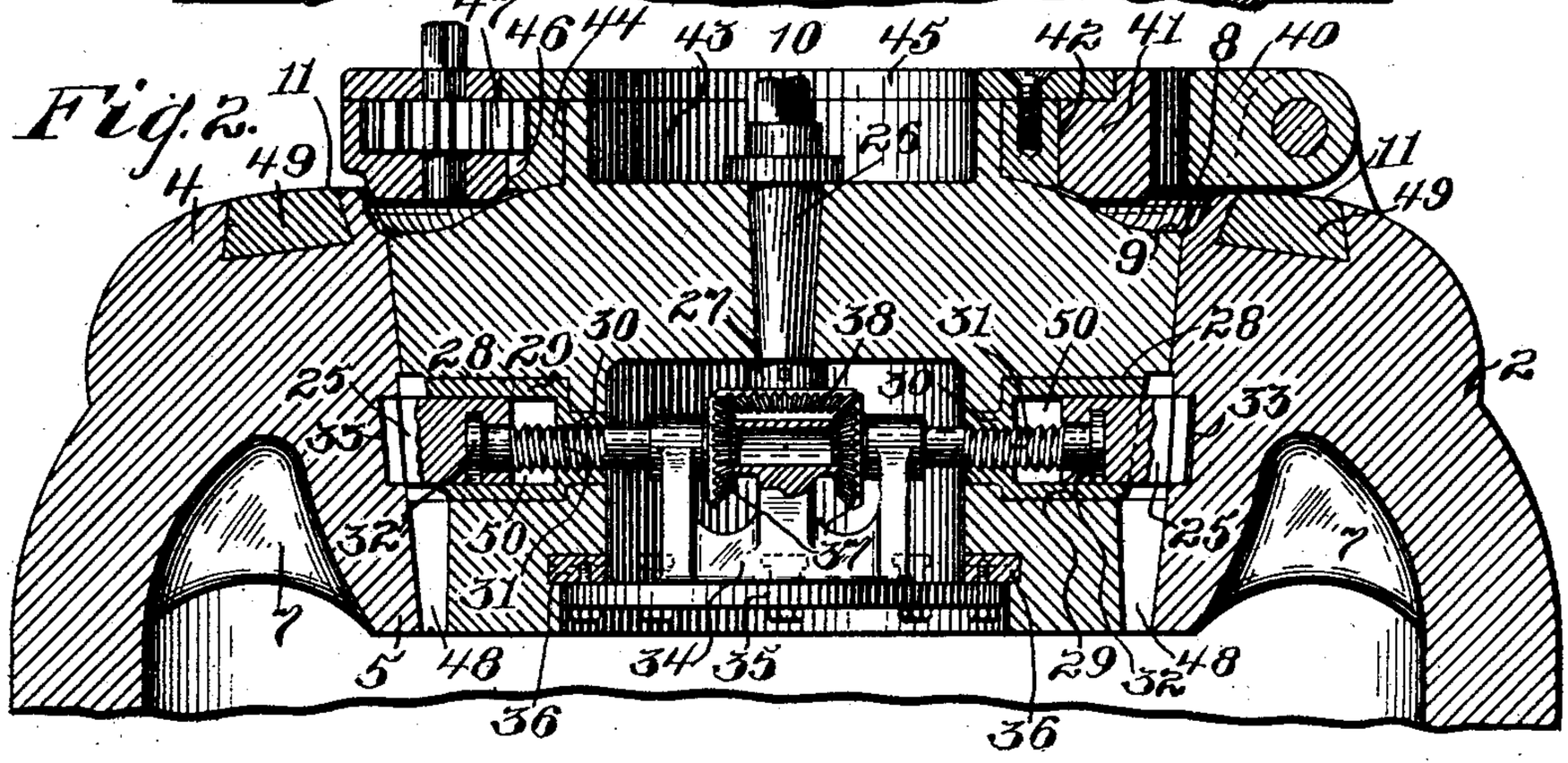



Fig. 2.




Witnesses:
Robert Adt
C. C. Fuss

Inventor:
Walter Brinton.
By his attorney,
F. A. Richards.

No. 771,704. PATENTED OCT. 4, 1904.

W. BRINTON.

SAFE OR VAULT.

APPLICATION FILED FEB. 23, 1904.

NO MODEL. 4 SHEETS—SHEET 2.

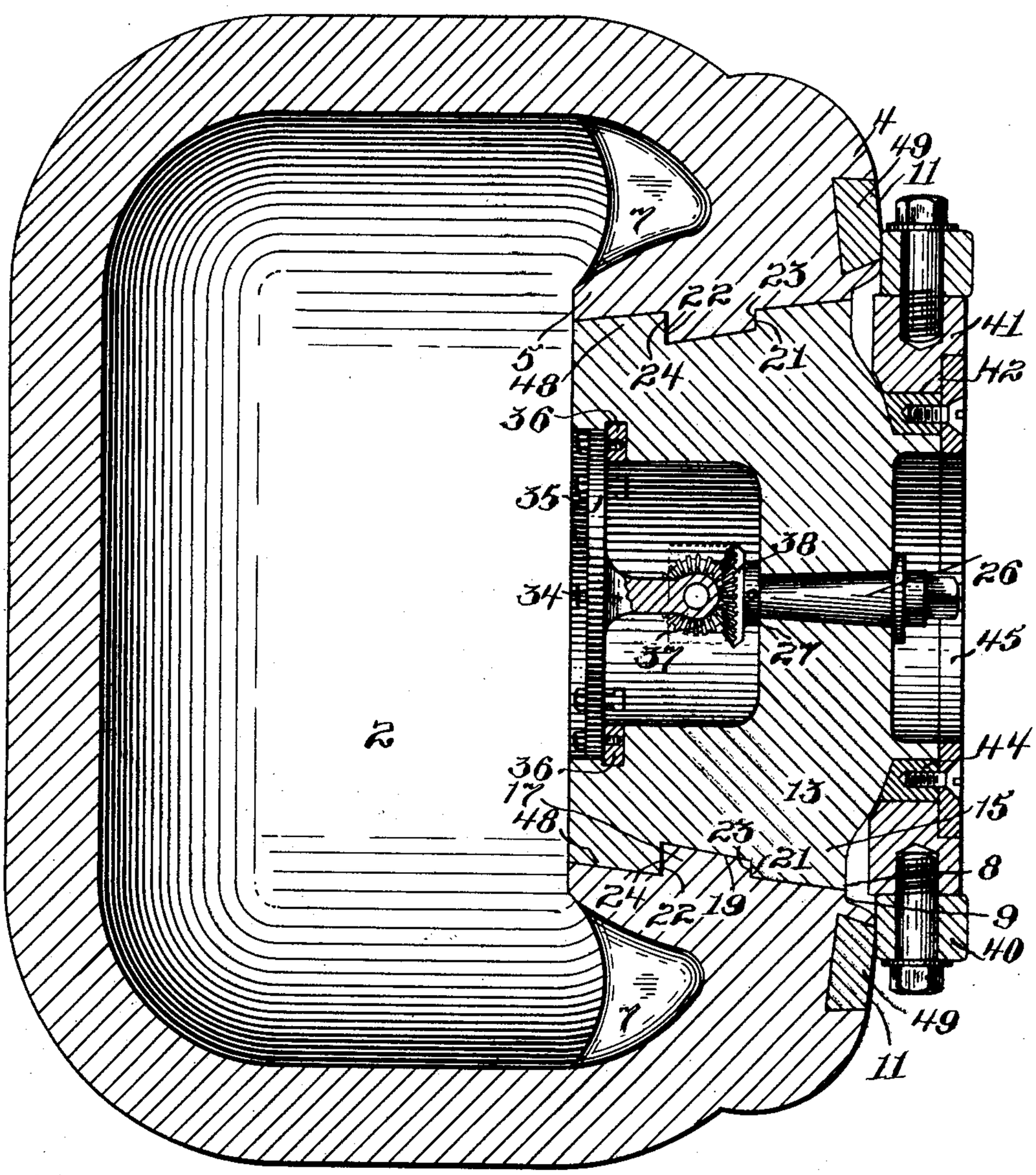



Fig. 3.

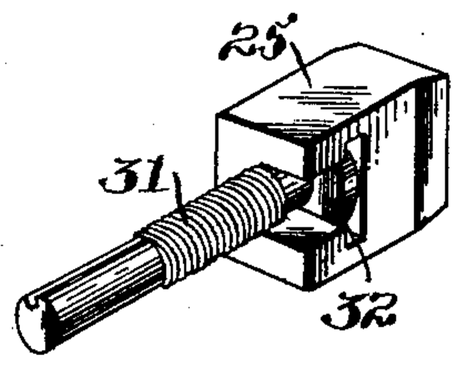



Fig. 8.

Witnesses:
Robert Adt
G. F. Fuss.

Inventor:
Walter Brinton,
By his attorney,
F. A. Richards.

No. 771,704. PATENTED OCT. 4, 1904.

W. BRINTON.

SAFE OR VAULT.

APPLICATION FILED FEB. 23, 1904.

NO MODEL. 4 SHEETS—SHEET 3.

Fig. 4.

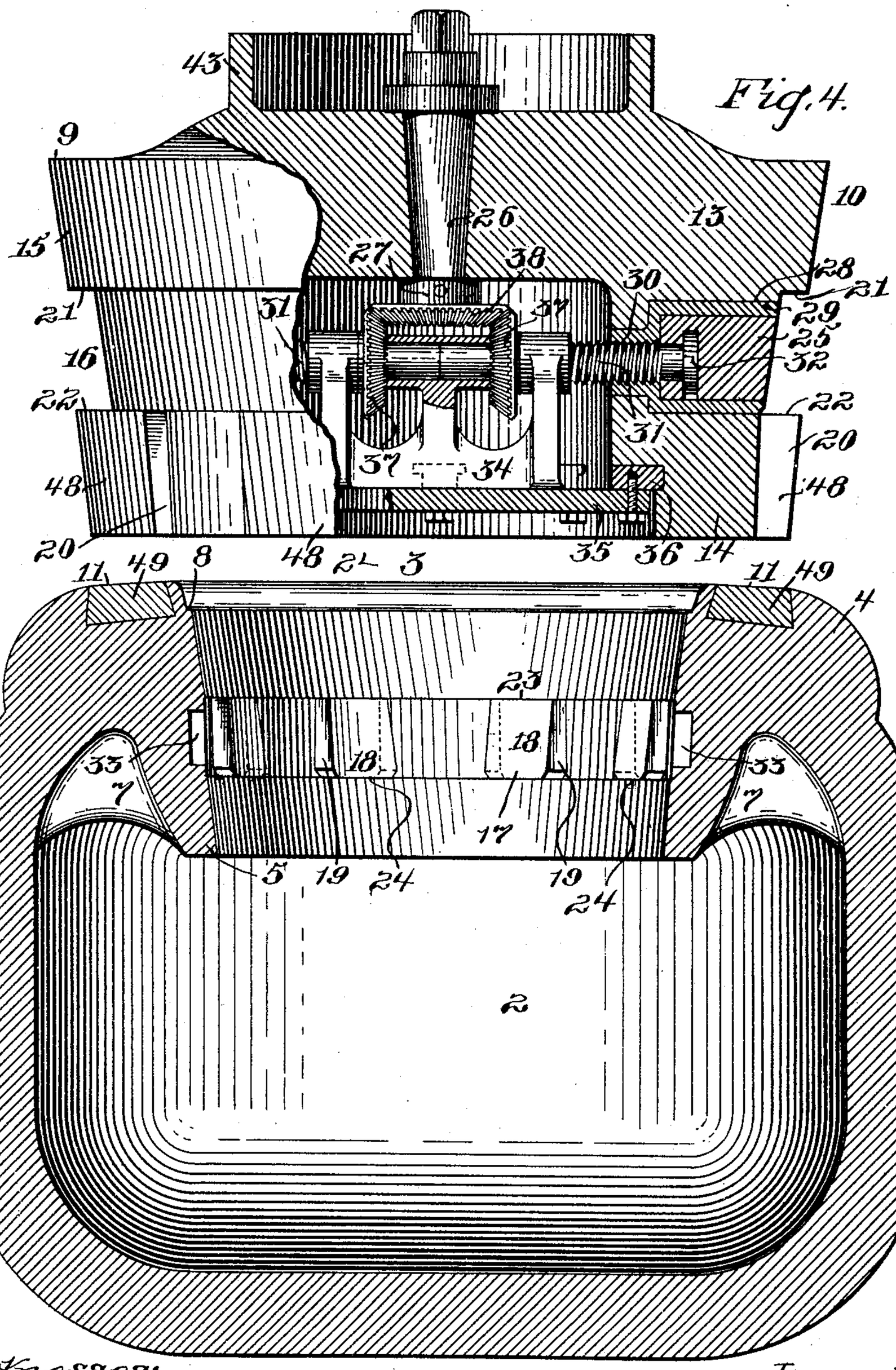



Fig. 5.

Witnesses:
Robert Adt
C. C. Fuss.

Inventor:
Walter Brinton.
By his attorney,
F. A. Richards.

No. 771,704. PATENTED OCT. 4, 1904.

# W. BRINTON.

## SAFE OR VAULT.

APPLICATION FILED FEB. 23, 1904.

NO MODEL. 4 SHEETS—SHEET 4.

*Fig. 6.*

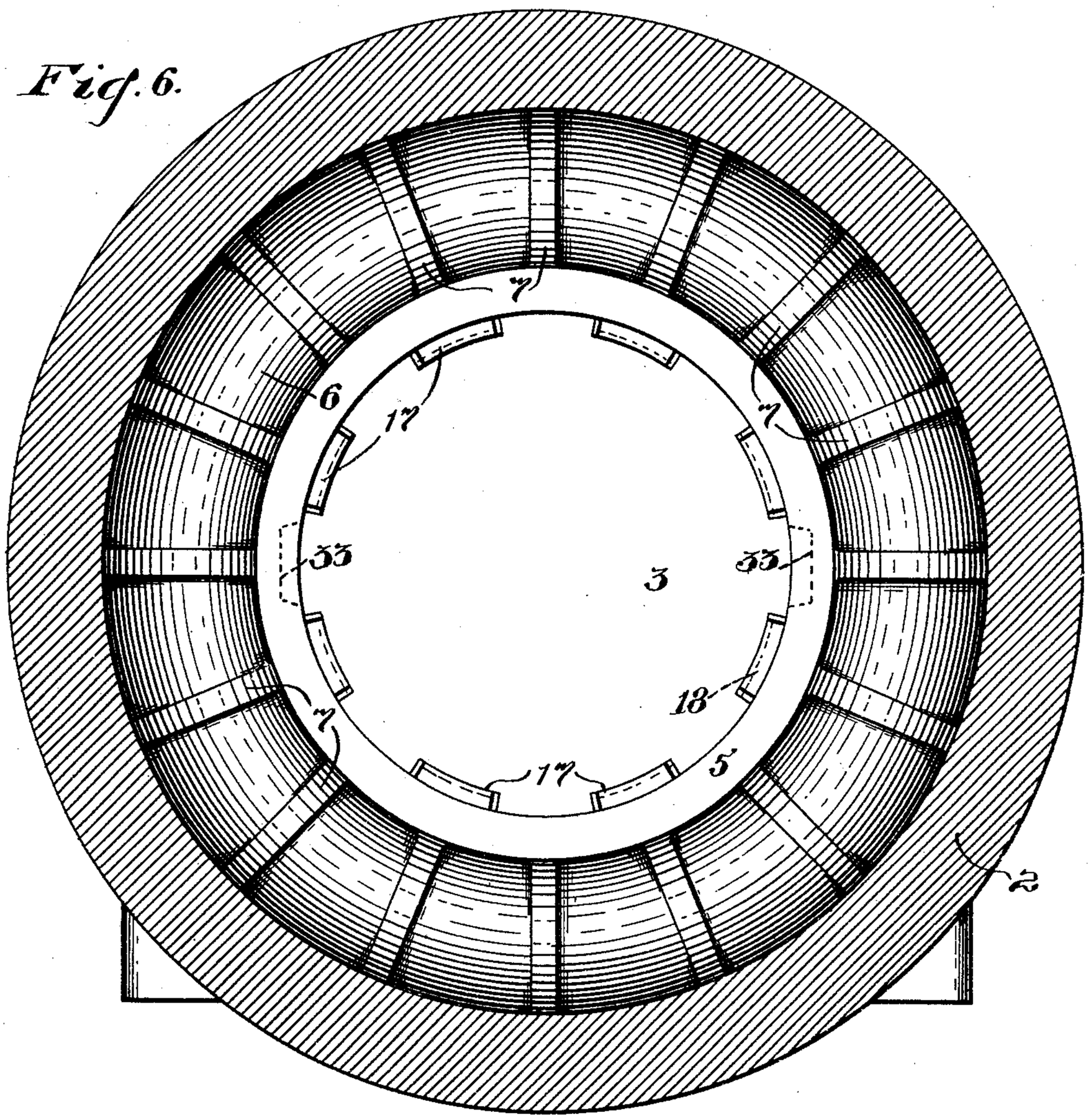
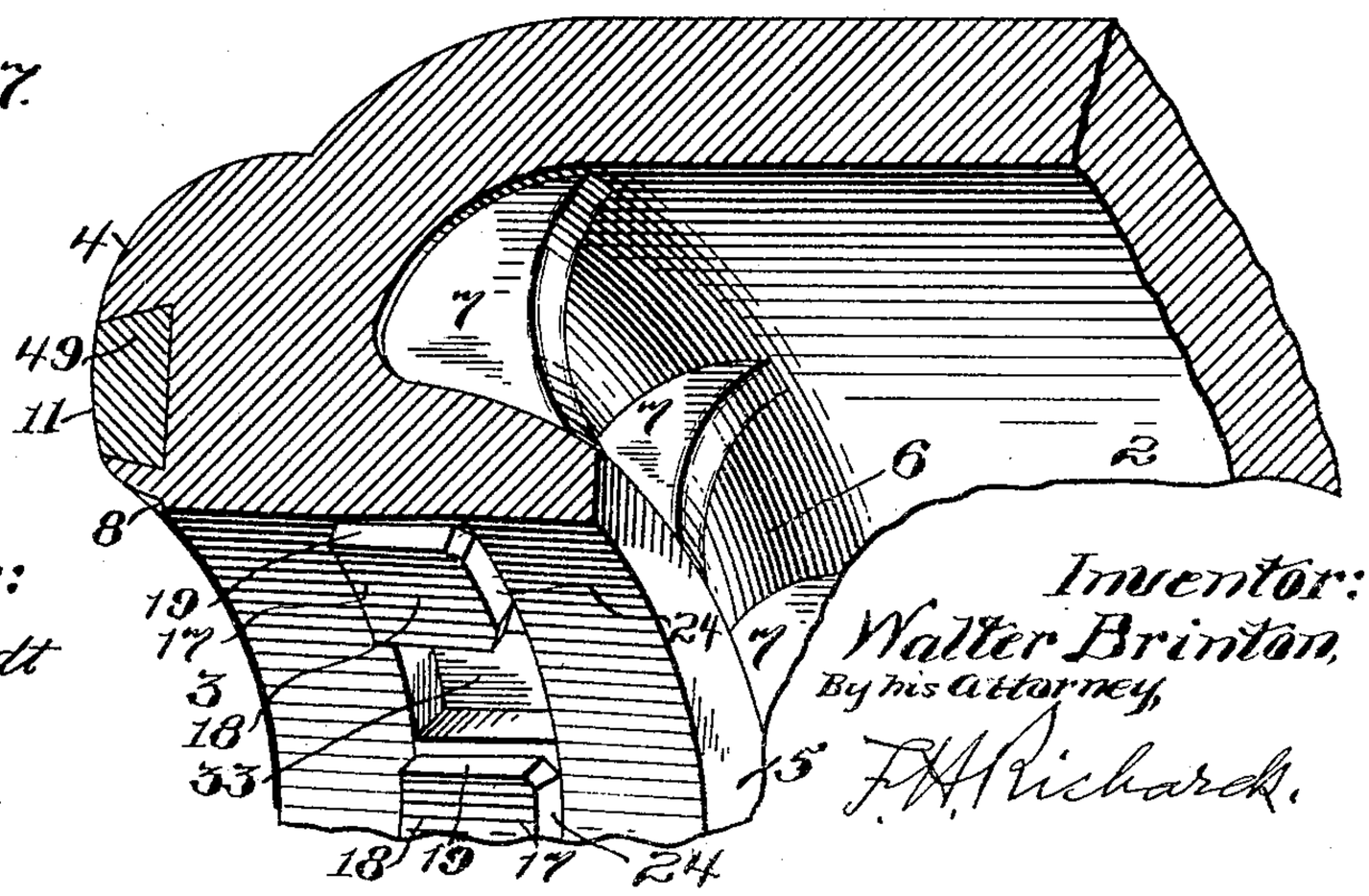



*Fig. 7.*




*Witnesses:*
*Robert Adt*
*C. C. Fuss.*

*Inventor:*
*Walter Brinton,*
*By his attorney,*
*F. A. Richards.*

No. 771,704. Patented October 4, 1904.

# UNITED STATES PATENT OFFICE.

WALTER BRINTON, OF HIGHBRIDGE, NEW JERSEY.

## SAFE OR VAULT.

SPECIFICATION forming part of Letters Patent No. 771,704, dated October 4, 1904.

Application filed February 23, 1904. Serial No. 194,655. (No model.)

*To all whom it may concern:*

Be it known that I, WALTER BRINTON, a citizen of the United States, residing in Highbridge, in the county of Hunterdon and State of New Jersey, have invented certain new and useful Improvements in Safes or Vaults, of which the following is a specification.

This invention relates to safes or vaults, more particularly to that class thereof known as "burglar-proof" safes or vaults, an object of the invention being to provide an improved burglar-proof structure comprising an integral body and an integral door, forming what is usually known as an "integral" or "two-piece" safe or vault.

A further object of the invention is the provision of an integral burglar-proof safe or vault formed of unmachineable or unworkable metal—such, for instance, as manganese steel—so that it cannot be readily cut or drilled with ordinary tools, with certain improved features by means of which those parts thereof which ordinarily might be weaker than the unmachineable integral walls of such safe are reinforced, in consequence of which such parts will equally, if not to a greater extent than the integral walls of such structure, resist burglarious operations and prevent entrance to such safe or vault.

A further object of the invention is the provision of an improved integral burglar-proof structure so organized and constructed that those parts thereof which would ordinarily be weak are materially reinforced, but in such manner that the castings are maintained substantially uniform throughout, thereby to permit the production of superior castings and so that when the structure is formed of unmachineable or non-workable metal—such, for instance, as manganese steel, which is preferable—and it is desired to heat-treat the same in order to increase its resisting qualities this may be readily done without impairing or injuring such casting.

A further object of the invention is the provision of an integral burglar-proof safe or vault body with an improved reinforced front, affording increased protection to the joint of the door.

A further object of the invention is the provision of an integral safe or vault body with a reinforced elongated jamb-surface.

A further object of the invention is the provision of an integral safe or vault with improved means for securing the door in its locked or closed position.

A further object of the invention is the provision of an improved rotary-door-locking integral burglar-proof safe or vault simple in its construction and operation and effective to prevent the forcing out of the door under burglarious or mob attacks.

A further object of the invention is the provision of an integral safe or vault embodying a rotary door with coöperating locking means formed integral with the door and body and so organized that such coöperating locking means can be readily machined or worked to obtain superior effectiveness when the structure is formed of non-workable or unmachineable metal—such, for instance, as manganese steel.

In the drawings accompanying and forming part of this specification Figure 1 is a front elevation of this improved safe or vault with a part of the door, body, and hinge shown in section. Fig. 2 is a cross-sectional view thereof. Fig. 3 is a vertical sectional view thereof. Fig. 4 is an enlarged partly cross-sectional view of the door. Fig. 5 is a horizontal cross-sectional view of the body. Fig. 6 is a vertical sectional view of the safe-body looking toward the front. Fig. 7 is a detail enlarged view of a portion of the front of the body, and Fig. 8 is a detail view of one of the locking bolts or members.

Similar characters of reference indicate like parts throughout the different figures of the drawings.

As a preface to a further description of this improved safe or vault it is to be understood that certain of the improved features herein referred to could be used with safes or vaults formed of other material than manganese steel and with manganese steel whether the same be heat-treated or not; but as manganese steel has been found to give the best results in burglar-proof structures and superior results when the castings formed thereof are heat-treated, and thereby toughened, the pres-

ent improvements are particularly well adapted for such a structure. The superior effectiveness of a heat-treated manganese-steel safe, owing to the inherent quality of such heat-treated metal, will, it is believed, be very materially increased by the reinforcing qualities and effectiveness of the several improvements herein shown and described; but, as stated, it is to be understood that certain of the improvements about to be described are of considerable value independently of the character of the material of which the structure is formed, although, as stated, they are particularly designed and adapted for use with unmachineable-metal integral safes or vaults heat-treated or otherwise, but preferably heat-treated.

This improved safe or vault comprises in the preferred form thereof herein shown and described an integral safe or vault body 2, shown, preferably, of arched formation throughout—that is, having resemblance to an oblate spheroid—provided with a circular doorway 3, having located around the same a forwardly-extending reinforcing bead or projection of metal 4 integral with such body. The body also has an interiorly-located inwardly or rearwardly projecting flange 5 of considerable length or depth, forming between it and the walls of the body a recess 6, whereby substantial uniformity of the metal around the jamb is preserved and which flange is shown connected with the walls of the body by a series of ribs 7, forming braces shown integral with the flange and body-wall. These braces are provided to stiffen and give greater rigidity to the jamb and to the inwardly-projecting flange partly forming the same, which flange is, as stated, of great depth or length, the length of the jamb-surface being by means of the present organization very materially prolonged, so that a jamb or joint surface around the door of very great depth is provided. It is well known to those familiar with burglar-proof structures that the greater the depth of the jamb the greater is the resistance of the safe to burglarious attacks, since great depth of jamb necessarily increases the surface over which the shocks of an explosion must be distributed, so that the effectiveness of such an explosion is materially decreased. By providing the ribs cast integral with the body and flange such jamb-surface may be materially increased in depth without the formation of a large mass of metal at this point, so that not only may a superior casting be furnished free of internal strains and cracks, but when it is desired to heat-treat the casting this may be successfully done, it being well known that a uniform casting, particularly when formed of manganese steel, can be more readily and effectively heat-treated. In fact, when formed of manganese steel it cannot be properly heat-treated at all unless it is substantially uniform. This uniformity is, as stated, a desirable feature, even though the casting should not be heat-treated, for a much better casting may be obtained by preserving a substantial uniformity of metal at all points, since this obviates the setting up of internal strains within the casting during the casting operation. The provision of the braces or ribs therefore not only enables the furnishing of a casting having substantial uniformity around the doorway, but enables the provision of a materially elongated or prolonged jamb-surface integral with the casting, a very desirable object.

In the present instance the bead 4 is so formed that there is a depressed part or "grinding" surface 8 contiguous to the joint and which is flush, or substantially so, with the contiguous outer surface 9 of the door 10, such surface 8 and 9 being ground so that one does not project beyond the other to any considerable extent when the door is firmly seated in its jamb, and which feature forms a part of the subject-matter of a contemporaneously-pending application, Serial No. 175,161, filed September 30, 1903, of myself and Walter Gaston. This same formation is obtainable and desirable even when the door-bead is dispensed with by projecting the safe or vault front beyond the door—that is, so forming such front that a projecting wall is provided beyond the annular surface terminating the joint, as shown in and more particularly forming part of the subject-matter of my contemporaneously-pending application, Serial No. 212,924, filed June 17, 1904. This bead is shown reinforced. In the present instance the bead has located in it at equal distances apart around the same and adjacent to the door-joint a series of members 49. These members are interlocked with the bead during the casting of the body, so that to all intents and purposes they are integral therewith. They may project beyond the surface of the bead or body of the casting and then ground off flush, or substantially so, with the surface of such casting, as in the present case, such inserts projecting more or less, as occasion may require, or if for any reason it is desirable to leave them appreciably project beyond the surface of the casting this could be done, as shown in the said application hereinbefore referred to. They are shown of wedged or dovetailed construction fitting into corresponding pockets or recesses in the beads, and thus held against displacement. These members are formed of hard metal, preferably of chrome-steel, and are located in position to receive the blows of a sledge or other tool intended to be used on the bead adjacent to the door-joint and resist such blows with superior effectiveness, owing to the hard resisting qualitiy of the metal of which the members are formed. The bead is thus provided with a reinforcement formed of a series of hard-metal inserts, and in the organization

shown they have their outer surfaces exposed and preferably substantially flush with the metal of the body contiguous thereto, the inner or bottom faces thereof being, when these parts are located in a bead or a surface which projects beyond the joint or surface of the door contiguous thereto, preferably substantially flush or in line with the termination of the joint at the outer end thereof. This organization is particularly well adapted when the safe-body is formed of manganese steel, which is very tough, but which under some conditions may permit the peening of the metal adjacent to the joint, owing to the yielding quality of such metal. By the provision of these hard-metal members, however, even the possibility of peening the metal at the joint is prevented, since this chrome-steel or analogous metal has no tendency whatever to yield, but owing to its hardness will break the sledge or tool used on it. The provision of the bead, however, owing to its yielding characteristics, insures a metal-to-metal fit of the jamb and door-joint surfaces and the preservation of a tight joint at all times, for the reasons set forth at length in the patent granted to Henry D. Hibbard November 27, 1900, No. 662,429—that is to say, should an explosive charge be placed on the joint the result would be to force the metal of the door inwardly at this joint, and consequently outwardly at its edge or joint surface, in a somewhat similar manner to which a piece of putty is caused to spread at its edge by the insertion of the thumb into the body thereof adjacent thereto, and as this action of the door-metal takes place the metal of the bead adjacent thereto is likewise forced radially or laterally to conform to the bulging portion of the door edge or joint surface, it yielding with the metal of the door, and thus preserving a metal-to-metal contact and a tight joint under such explosive charge, manganese steel having this peculiar yielding quality, it yielding, owing to its toughness, rather than cracking. In some forms of safes, however, it might be practicable to use these hard-metal reinforcing members around the doorway even though the bead was dispensed with, especially when the form of the safe around the doorway would permit a peening action of the metal. They are, however, of superior efficiency in connection with such bead or with a safe or vault front which projects beyond a depressed portion or grinding surface terminating the joint. Should the structure be a large vault and have several joints, then these inserts could be located along each of such joints in the same way they are located around the jamb. These inserted members, which are shown with their outer faces 11 exposed and substantially flush with the bead, are, as stated, of wedge-shape formation, the larger area of each being at the bottom. Owing to this peculiar arrangement, should the blows of the sledge or other tool be directed on the manganese steel adjacent to these members instead of directly on the members such blows will, nevertheless, be received by the members and not transmitted to the manganese steel to any considerable extent at the bottoms of such members, for the reason that as the members are of larger areas at their bottoms or inner portions—in other words, spread out—the efficiency of any blow directed on the manganese steel or bead adjacent to such inserts would be received from such manganese-steel portion directly onto the enlarged or spread-out inner surfaces of the members, so that the effectiveness of the blows to secure a peening action of the manganese steel would be materially interfered with.

I believe I am the first to provide a means formed of a metal composition different from the metal composition of which such body is formed in the form of a plurality of inserts located in the front of a safe or vault body adjacent to the joint or jamb-surface thereof during the casting of such body for the purpose of resisting the action of sledges or analogous tools to prevent the peening of the metal around such joint, and therefore whether this means be in the form of a series or a less number of sections located side by side entirely around the jamb it is believed to be within the scope of my invention. When this means is so disposed that its outer face is exposed to form a striking-surface and directly receive the blows of a sledge or other tool, this means could be in some structures in the form of a ring, since it is not for the purpose of acting as a steel band to hold the metal under compression to primarily prevent the use of wedges, as in the present form of safe. The door being circular, it is ground to a matching fit, and therefore it is not practicable to insert a wedge unless the metal is first peened to permit this, and by the provision of this improved reinforcing means this peening is prevented, since the means is so located that the surface of the metal at the joint cannot be forced to yield under the action of a sledge or other means. The embedding of a ring in the body of the safe a considerable distance below the surface merely to act as a compression-band to prevent wedging would leave a certain portion of the metal outside or in front of the band, which under the action of a sledge could be peened, and if once peened to afford even a slight opening it could be further wedged open notwithstanding such band, sufficiently at least to permit the insertion of a small quantity of nitroglycerin, a few charges of which, if one was insufficient, would offset such band very quickly, and especially could this be readily done if the joint were a square joint, so that the parts could not be ground to a matching fit. In the present case the use of a ring for the mere purpose of increasing the tensile strength would not be of any advantage or have any

value, since every square inch of a casting of manganese steel is equal to the strength that would be present in a safe formed of other metals, even with the rings in place, so that in the manganese-steel casting there is without the rings the same high measure of strength; but by adding the inserts a barrier is formed against compression by hammer or other blows. Furthermore, the use of a ring, even when so located as to be effective to prevent the peening of the metal adjacent to the jamb, is not as advantageous and does not give the superior results which are present from the use of separate inserts or sections in that the expansion and contraction of the ring during the period of casting would be likely to set up strains in the casting, owing to the arch of the ring, while in the case of separate inserts there is no tendency whatever to cause such strains. Moreover, by using the series of inserts the possibility of attack in any form is more difficult, since each insert is independent of the other and firmly incased and held by the unmachineable or manganese steel, while in the case of a ring it would only be possible to have the casting incase the inside and outside diameters or surfaces of the ring, which would not give the same security against attacks as separate or independent inserts would. From the foregoing it will be seen that these hard-steel inserts located in the front of the body during the casting thereof are so designed that when the body is in process of casting the fluid manganese steel completely envelops the inserts, which are larger inwardly than outwardly, and therefore the exposed part, which is merely on the surface, is of less area than the base or inner surface of the inserts. The inserts are therefore firmly fixed or held in position, making it impossible to loosen or remove them from their position except by the destruction of the manganese steel, with which they are entirely enveloped, and these inserts are of such composition as will be proof against and withstand enormous compression, thereby insuring the joint against any possible peening effect by stretching of the metal at the door-jamb by sledging or otherwise and will thus wholly prevent the admission of fluid explosives. These inserts also have several functions to perform in assisting to make the safe-body casting a success from the casting standpoint, thereby insuring a superior safe-body casting to the castings heretofore made for this purpose, not only in their value from the point of hardness which they present on the surface of the jamb, but they give very great assistance toward making the main body of the safe-casting solid and perfect, because of their tendency to solidify the molten metal by cooling or absorbing the heat at the point in the casting where the greatest amount of heat accumulates and is retained during the pouring of the casting and also during the cooling of the same to the proper degree of heat preparatory to the toughening or treating process.

The door 10, which, like the body, is of integral formation, preferably comprises a body 13 and an inwardly or rearwardly extending flange 14, whereby the uniformity of the metal in the door is likewise maintained, insuring a better casting even though such casting be not heat-treated and insuring a better heat treatment of the casting when the door is heat-treated and by which organization an elongated or prolonged joint-surface is obtained without the necessity of forming the door of a great mass of metal throughout. It is to be understood, however, that the improved features herein so far set forth or to be set forth are of practical value independently of the particular form of door. The door, which in the presence instance is a rotary one and, like the jamb, is of conical formation, is provided with a series of projections or lugs 48, located around the same and integral therewith, forming between them and an annular portion 15 of the door an annular recess 16 for the reception of a similar set of lugs or projections 17, integral with the body around the jamb-surfaces thereof and corresponding with the projections or lugs 48 of the door, the projections or lugs on the jamb being located in the present instance substantially midway of the depth of the jamb and provided with beveled or tapered inner corners 18 to insure the proper seating of the door in the jamb. The side faces 19 of the jamb lugs or projections are straight, as likewise are the side faces 20 of the lugs or projections formed on the door, so as not to interfere with the passage of the door-lugs into position to be rotated back of the lugs on the jamb. The outer and inner surfaces 21 and 22 or front and back surfaces of the projections on the door and the same surfaces 23 and 24 on the jamb are ground to a matching fit. This is not necessary with the side surfaces of the projections, in consequence of which it is practicable from a commercial standpoint to form these projections integral with the body and door when the same are formed of unmachineable or unworkable metal—such, for instance, as manganese steel. By this organization it will be seen that the lugs on the jamb and door are not located one in front of the other in the form of tapered lugs or threads, as is usual in rotary-door safes, but that all of the lugs are located side by side entirely around the jamb and door, respectively, and are of the same depth and having plane meeting faces instead of inclined or tapered ones, as heretofore. The lugs in the present instance extend depthwise of the jamb and door instead of circumferentially thereof. The inner face 22 of each lug on the door has a positive bearing on the inner face 24 of its corresponding lug formed on the jamb, such meeting faces

being straight, as just stated, the drawing of the door tightly to its seat being obtained by the beveled or tapered corners of the jamb-lugs. By this organization the grinding of the door to its seat is not interfered with, as is the case where the locking means comprises threads or tapered lugs, so that the grinding of the door by partially rotating the same to a matching fit with the jamb-surface is permitted. These lugs or locking-surfaces, any desired number of which may be used, are located in sets, each set comprising a lug carried by the door and a lug carried by the body, designated herein as a "door-lug" or "locking-surface" and a "body-lug" or "locking-surface," one of each set being shown provided with a beveled or tapered edge or corner, which in some forms could be on the door-lugs instead of on the body-lugs, as shown herein, or on both. By forming them on both a quarter of an inch bevel on each will give a half-inch space to start the grinding operation. By forming the lugs with straight or plane meeting or engaging faces parallel to the plane of the door instead of with tapered or inclinedly-located meeting surfaces there is no tendency of the door to work itself back, as is the case with a door which is drawn to its seat by tapered surfaces or screw-threads formed either by the location of the lugs or threads in a plane inclined to the plane of the door or by lugs having inclined or tapered surfaces—that is to say, when the door is drawn to its seat by the use of tapered surfaces or threads or lugs located inclinedly to the plane of the door the wedging action which is imparted to the door to bring it to its seat firmly in the jamb is such that under vibration the tendency of the door-lugs is to slip back on the inclined or tapered body-lugs, and so form a space at the joint around the door for the insertion of nitroglycerin.

It is believed that it is a recognized fact that an integral rotary door locked to its seat by integral lugs is one of the strongest doors that could be made; but heretofore, owing to the backlash which is always present in a door of this kind, permitting the joint to be opened, it has not been found practicable to make an integral safe of this kind that could not be opened within a burglarious time, and this has been largely due to the fact that the lugs or threads used to lock the door in place not only were not integral with the door and body, but had tapered meeting faces throughout their engaging portions, so that when the door was locked to its seat the strain was such that its tendency was to rotate back, this being prevented only by the locking-bolts or other means which were used to prevent the rotation of the door and which when automatically controlled did not fit with such precision as would prevent a slight backlash. Even though this backlash was but slight it would be sufficient to start the door out of its jamb, owing to the tapered or inclinedly-located locking-surfaces, and as the door has a tapered jamb-surface the space formed around the door would be in proportion to this taper. The greater the taper the greater the opening of the joint. In my safe, however, when the door is firmly seated and rotated to its final position there is no tendency of the door to rotate backward, or to its initial position, since the meeting surfaces of the door and body lugs are plane or straight faces. In this improved safe the beveled corners of the body-lugs on their engagement with the plane faces of the door-lugs during the first part of the rotary movement of the door pull it inwardly and firmly into its seat until there is a metal-to-metal tight joint around the jamb, and then on the further rotation of the door the plane surfaces of the door-lugs and body-lugs engage throughout their entire area, so that there is no longer any appreciable tendency of the door to rotate backward, and consequently there is no backlash. Even if the door were rotated a short distance the grinding-surfaces around the door and jamb would still be flush with each other. In fact, the door could be rotated the entire area of the plane surfaces of the lugs and yet the door would not be thrown out or project beyond the grinding-surface on the body, whereas when the lugs have tapered surfaces or are in the nature of threads or located inclinedly to the plane of such door when the door is rotated backward even a small amount it is thrown out in proportion beyond the jamb, as hereinbefore stated, and owing to the tapered formation of the door and jamb opening up the joint. From the foregoing it will be seen that even if the door of this improved safe is rotated backward the joint would not be opened up until the plane faces of the door-lugs passed away from the plane faces of the body-lugs, so that the door would have to be rotated the full area of the plane surfaces of the lugs, which would of course necessitate that the heads of the bolts used to prevent rotation of the door be entirely broken off, before any space at the joint could be obtained. Thus it will be seen that each lug that has a beveled face performs two functions, one a drawing-in function during the first part of the rotary movement of the door and so long as such beveled face is in engagement with the plane face of the door-lug, and then a holding or true-locking function during the time the plane faces of the lugs are in engagement as distinguished from a continued drawing-in action, which is present when the lugs have tapered surfaces throughout their entire area or are in the form of threads or located inclinedly to the plane of the door. When the lugs are formed with beveled or inclined corners, as set forth herein, they not only assist in the seating of the door, so that it may be more easily seated, but such construction also assists in properly

locating the door to facilitate its withdrawal after the plane meeting faces are disengaged. To prevent the door from being rotated and withdrawn after the same is properly seated, radially-acting bolts 25 are provided, which in the form shown are thrown outwardly by gearing controlled by a tapered spindle 26, projecting through the door. This spindle is provided with a collar 27 or other means secured on the tapered end thereof at the inner side of the body of the door to prevent its being withdrawn, the tapered formation thereof preventing it being forced inwardly from the outside. In the form shown the flange of the door is provided with bolt-openings 28, soft-metal inserts 29 being cast therein, such inserts having threaded portions 30 coöperating with threaded shanks 31 of the bolts, the bolt-heads 32 being connected with the shanks by a slotted connection, (see Fig. 8,) so that the shanks may turn relatively to the bolt-heads to thereby withdraw or move the bolts radially in the angular openings 50 formed in the inserts. These bolts project into bolt openings or recesses 33, located in the jamb, and, if desired, the bolts and recesses could be of tapered formation at certain parts thereof to assist in a tighter wedging of the door within its jamb. In the present instance the inner ends of the bolt-shanks 31 are shown supported by a bracket 34, secured to the back plate 35, which back plate is secured to the door by means of soft-metal inserts 36, located within the door-flange and into which the bolts carried by the back plate extend. The inner ends of the threaded bolt-shanks 31 are provided with beveled gears 37, meshing with a beveled gear 38 on the inner end of the spindle 26, so that on the turning of such spindle the bolts will be thrown outwardly or withdrawn, as the the case may be, the manipulation of such spindle and of the bolts being controlled by combination-lock mechanism. (Not shown.) It will be obvious that other means of throwing or withdrawing the bolts may be provided—that is to say, this may be done automatically, as by means of the usual automatic time-lock, thus doing away entirely with the use of even a single spindle through the door—and that a different mode of operating the same by means of the spindle could be used, if desired, and without the necessity of supporting it in the back plate. To support the door for movement into and from its seat and for rotary movement to permit it to be locked and unlocked within its seat, the hinge 40, which may be of the usual crane formation having the usual adjusting means, pivotally carries a ring 41, having an annular recess 42 at its front. The door is shown provided with a forwardly-extending flange 43, which may or may not be integral, onto which is shrunk in the present instance a ring 44, which fits within the ring 41, carried by the crane-hinge. To the ring 44 a plate 45 is bolted or screwed, such plate fitting the annular recess 42 of the ring 41. The play of the door in the crane-hinge ring 41 is prevented rearwardly by the plate 45 and forwardly by the door itself. For rotating the door within the ring 41 the ring 44 is provided with a toothed segment 46, in mesh with a pinion 47, mounted on a spindle carried by the crane-hinge 41 and which spindle is in position to be engaged by a crank, and in rotating the pinion the door will be rotated to carry its locking lugs or projections back of the locking lugs or projections on the jamb.

Having thus described my invention, I claim—

1. A safe or vault body having reinforcing means located in the front thereof around the joint or jamb surface and formed separate from the safe-body but rigid with the metal thereof and in position to break the force of sledges or analogous tools, thereby to prevent the peening of the metal adjacent to such joint.

2. A safe or vault body having resisting means formed of a metal composition different from the metal composition of which the body or front of the safe or vault is composed, located in the front thereof around and adjacent to the joint or jamb surface and in position to receive and break the force of sledges or analogous tools thereby to prevent the peening of the metal at such joint.

3. An integral safe or vault body having a plurality of separated rigid devices located approximately side by side entirely around and adjoining its circular jamb-surface during the casting of the metal and in position and effective to break the force of sledges or analogous tools thereby to prevent the peening of the metal adjacent to such jamb.

4. A safe or vault body having protecting members embedded in its front around its doorway with the outer surfaces thereof exposed.

5. A safe or vault body having protecting wedge-shaped members located in its front around its doorway with the outer surfaces thereof exposed.

6. A safe or vault body formed of one quality of metal having protecting members formed of another quality of metal embedded therein each with its outer surface substantially flush with the contiguous outer surface of the body.

7. A safe or vault body formed of manganese steel having a circular doorway having protecting-segments formed of another steel embedded and locked therein around its doorway, each with its outer surface exposed.

8. A safe or vault body having wedge-shaped reinforcing members embedded their full depth in its front around the jamb with the outer surfaces thereof exposed.

9. A safe or vault body formed of tough, unmachineable metal having hard, unyield-

ing members located in its front around its doorway with the outer surface of each exposed, and substantially flush with the contiguous outer surface of such body.

10. An integral safe or vault body formed of tough metal having a circular jamb, having hard-metal segments embedded their full depth in its front around such jamb with the outer surface of each exposed and substantially flush with the contiguous outer surface of the body.

11. A safe or vault body having a plurality of protecting members interlocked with its front around its doorway, the outer surface of each being substantially flush with the contiguous outer surface of such body.

12. A safe or vault body having a circular series of interrupted chrome or analogous steel inserts located in its body approximately side by side around its doorway.

13. A safe or vault body having hard-metal means located therein adjacent to the joint-surface with its outer surface exposed.

14. A manganese-steel safe or vault body having chrome or analogous steel means located in the front thereof adjacent to the door jamb or joint, with its outer surface in position to prevent the peening of the metal adjacent to such joint.

15. A safe or vault body having an exteriorly-located bead around its jamb-surface and means located in said bead and effective to prevent the peening of the metal adjacent to such jamb-surface.

16. A safe or vault body having an exteriorly-located circular bead around its joint-surface and a plurality of separated protecting means located therein approximately side by side and entirely around said bead during the casting of such body, and in position to receive the blows of a sledge or analogous tool to prevent the peening of the metal adjacent to such jamb or joint surface.

17. A safe or vault body having an exteriorly-located bead around its jamb-surface and wedge-shaped means locked in said bead and in position and effective to resist the action of sledges or analogous tools and prevent the peening of the metal adjacent thereto.

18. A safe or vault body having an exteriorly-located bead around its jamb-surface, and a series of protecting-inserts located therein and in position and effective to receive the force of the blows of a sledge or analogous tool to prevent the peening of the metal adjacent thereto.

19. A safe or vault body having an exteriorly-located bead located around its jamb or joint surface, said bead having reinforcing means located therein with its bottom surface substantially flush or in line with the outer termination of the joint.

20. An integral safe or vault body having an exteriorly-located circular bead located around its jamb or joint surface and provided with a series of hard-metal inserts located therein, each with its outer surface exposed.

21. A manganese-steel safe or vault body having an exteriorly-located integral circular bead around its jamb or joint surface provided with a series of inserts of chrome or analogous hard steel located in such bead, each with its bottom surface substantially flush or in line with the outer termination of the joint and with its outer surface exposed to afford a striking-surface around such joint.

22. An integral safe or vault body of manganese steel provided with an exteriorly-located integral, circular bead around its jamb or joint surface, having a series of radiating hard-metal segments formed of chrome or analogous steel locked in such bead each with its outer surface exposed and substantially flush with the contiguous outer surface of such bead.

23. A safe or vault body having its front so formed that a wall projecting beyond the outer terminus of the joint-surface is provided and a series of hard-steel inserts located approximately side by side in such front adjacent to such wall and alternating with parts of the body thereby forming an interrupted series of protecting members.

24. An integral heat-treated unmachineable-metal safe or vault body having a circular doorway and provided around its doorway with metal inserts of chrome or analogous steel located therein during the casting of such body, such inserts being independent of each other and alternating with portions of the body and forming a reinforcing-surface around such doorway.

25. An integral heat-treated manganese-steel safe or vault body having a circular doorway and provided with a series of chrome or analogous hard-steel inserts wedged therein during the casting of such body with the outer surfaces thereof in position to receive the force of a sledge or analogous tool thereby to prevent the peening of the metal adjacent to the jamb-surface.

26. An integral heat-treated manganese-steel safe or vault body having a circular doorway and an exterior-located integral bead around such doorway, provided with a series of protecting-inserts located in said bead during the casting of such body, the outer surfaces of which are exposed.

27. An integral heat-treated manganese-steel safe or vault body having a circular doorway and an exteriorly-located integral bead around such doorway provided with a series of wedge-shaped chrome or analogous hard-steel inserts located in such bead during the casting of such body, the outer face of each of which is exposed and substantially flush with the contiguous outer surface of the bead.

28. A safe or vault body having an integral jamb formed by an inwardly-extending braced flange.

29. A safe or vault body having an elongated jamb formed by an integral inwardly-extending integrally-braced flange.

30. An integral safe or vault body having an inwardly-extending integral flange connected with the body by a series of braces or ribs.

31. An integral safe or vault body having an integral inwardly-extending flange connected with the safe or vault body by a series of integral ribs.

32. An integral safe or vault body having located around its doorway an inwardly-extending integral ribbed, circular flange.

33. A safe or vault body having its joint-surface protected by providing such body adjacent to such joint with a resisting exposed surface of a different quality from that of which the body is formed.

34. A safe or vault body having its joint-surface protected by an annular bead located around such joint, and reinforcing such bead by providing it with a resisting-surface of a different quality from that of which the bead as a whole is formed.

35. An integral safe or vault body, having a circular reinforced doorway comprising an inwardly-extending integral circular flange reinforced by a series of ribs integral with the flange and body and a forwardly-extending integral circular bead reinforced by one or more hard-metal inserts.

36. An integral safe or vault casting substantially uniform throughout, and provided with a circular doorway, having its jamb-surface prolonged by an integral inwardly-extending annular flange forming a recess between it and the body and connected with such body by a series of integral ribs.

37. An unmachineable-metal safe or vault body, having a circular reinforced doorway comprising an inwardly-extending integral flange connected to the body by a plurality of integral braces, the front of said body adjacent to and around said doorway having located therein during the casting of such body a series of radially-disposed metal inserts effective to resist the action of a sledge or analogous tool to prevent the peening of the metal adjacent to the doorway.

38. A safe or vault comprising a body and a door each having integral locking-lugs so constructed that the door may be ground to its seat and to first draw the door firmly to its seat and then hold the door therein free from any tendency to shift backward.

39. An integral safe or vault comprising a body having a conically-formed jamb and a similarly-formed door, said body having integral locking surfaces or lugs having plane meeting faces and beveled meeting corners, and said door having similarly-formed integral lugs, the organization being such that the door may be ground to its seat, and may be drawn firmly to its seat, and then held therein free from any tendency to rotate back to its initial position.

40. A safe or vault body having its circular jamb provided with one or more door-locking lugs having a locking-face and a beveled corner or corners.

41. A safe or vault body provided with a plurality of door-locking surfaces having beveled corners and each having a straight or plane locking-face.

42. A safe or vault body having a circular jamb provided with a plurality of integral, door-locking lugs having beveled surfaces and each having a straight or plane locking-face terminating in said beveled surfaces.

43. A safe or vault body having a circular jamb provided thereon with a series of integral door-locking lugs having their longer axes transverse to the plane of the door, having beveled corners and each having a straight or plane locking-face.

44. An integral safe or vault comprising an integral body and an integral door the body having a plurality of integral locking-surfaces having beveled corners and the door having a plurality of integral surfaces coöperating therewith.

45. A safe or vault comprising an integral body having a plurality of integral locking surfaces or lugs, each having a straight or plane locking-face, and a beveled meeting corner, and each having its longer axis transverse to the plane of the door, and an integral door having a plurality of coöperating similarly-formed integral locking surfaces or lugs.

46. A safe or vault comprising a body having a plurality of integral locking-surfaces each having a plane locking-face and a beveled corner and a door having a plurality of coöperating integral locking-surfaces each likewise having a straight or plane meeting face.

47. A safe or vault comprising a body having its circular jamb provided with a plurality of integral lugs or projections having beveled inner corners, and an integral door having a plurality of coöperating integral lugs or projections, the meeting surfaces of said door and body-lugs having staight or plane faces, and means for maintaining the door against rotary movement, comprising one or more bolts entering the jamb of said body.

48. The combination with a safe or vault body, of a door supported thereon for rotary movement and having a forwardly-extending flange, a rim shrunk onto said flange, a hinge having a ring pivoted thereto and encircling the shrunk-on ring of the door, a plate secured to the shrunk-on ring of the door for maintaining said door in position with relation to the hinge-ring, said shrunk-on ring having a toothed segment and a pinion in engagement therewith for rotating the door.

49. The combination with a safe or vault body, of a door provided with a forwardly-

extending flange, a ring shrunk thereon, a hinge secured to said body, a ring carried thereby and encircling the shrunk-on ring, said shrunk-on ring having a toothed segment, and means for rotating said door.

50. The combination of an integral safe or vault body having a circular doorway, of an integral circular door therefor, said body and door having a series of coöperating integral lugs having straight or plane meeting faces for holding said door against withdrawal, the integral lugs of the body having beveled corners, and means for locking said door against rotary movement.

51. A safe or vault comprising a body and a rotary door having a plurality of sets of cooperating locking lugs or surfaces integral respectively with the body and door and so organized that during the first part of its rotary movement the door will be drawn firmly to its seat and then during a further rotary movement locked against any tendency to rotate back to its initial position.

52. A safe or vault comprising a body and an integral rotary door having a plurality of sets of integral locking surfaces or lugs having plane or straight meeting surfaces, one or more lugs having a beveled or tapered surface or surfaces so that during the engagement of such beveled surface or surfaces with a surface or surfaces of coöperating lug or lugs, the door will be drawn firmly to its seat, and during the engagement of the opposing plane surfaces of the lugs will be held in its seat without any tendency to rotate back to its initial position.

53. A safe or vault comprising a body and a rotary door having coöperating integral locking surfaces or lugs having plane meeting surfaces located in a plane parallel to the plane of the door throughout an appreciable part of their area, said structure having means for first drawing the door firmly to its seat to permit the said plane meeting surfaces to contact with each other and hold the door in its seat.

54. A safe or vault comprising a body and an integral rotary door, having a plurality of sets of coöperating integral lugs or locking-surfaces having plane or straight meeting faces located in a plane parallel to the plane of the door, one lug of each set having a beveled or tapered surface by means of which the door during the first part of its rotary movement is drawn firmly to its seat and into position to have, on the further rotation of the door, the opposing plane surfaces of the body and door lugs engage each other to hold the door against withdrawal.

55. A safe or vault having a joint and a wall projecting beyond such joint and protecting-inserts adjacently located in such structure and adjacent to such wall.

56. A safe or vault comprising a body and a door, the outer contiguous surfaces of the body and door being substantially flush with each other, said body having a wall extending beyond such meeting surfaces, and protecting means located in the body front and adjacent to such wall and formed of a metal composition different from the metal composition of which the body is formed.

57. A safe or vault comprising a body and a door, the outer contiguous surfaces of the body and door being substantially flush with each other, said body having a wall extending beyond such meeting surfaces, and protecting means located in the body front and adjacent to such wall and formed of a metal composition different from the metal composition of which the body is formed, the inner surfaces of such protecting means being substantially in alinement with the meeting surfaces of said door and body.

58. A safe or vault comprising a body and a door, said body and door having surfaces substantially flush with each other, and said body having a part around such surfaces projecting beyond the same, and inserts formed of a metal composition different from the metal composition of which the body is formed located adjacently in such projecting part and around such surfaces.

59. A safe or vault body having its front formed to provide a wall extending beyond its joint-surface, and protecting means located in such front and formed of a metal composition different from that of which the body is formed.

60. A safe or vault body having a projecting front portion extending beyond its jamb, and a surface located within such projecting front portion and diverging from the jamb-surface at the outer end thereof, and protecting means located in such projecting front portion and formed of a metal composition different from that of which the body is formed, and comprising a series of inserts adjacently located with their inner or bottom surfaces in substantial alinement with such diverging surface.

61. A safe or vault comprising a body and a rotary door each provided with integral locking lugs or surfaces having relatively great length depthwise of the door, the meeting or locking faces of which lugs are plane surfaces so that there is no appreciable tendency of the door to creep back in its jamb after it is rotated to its locked position.

62. A safe or vault comprising an unmachineable-metal body having a conically-formed jamb provided with integral locking-lugs located substantially midward of the door-jamb and having relatively great length depthwise of the jamb and having plane locking-faces at their inner ends, and an integral, conically-formed, rotary, unmachineable-metal door fitting said jamb and having an annular step adapted to engage said body-lugs at their outer ends and limit the inward

movement of the door, and also having integral lugs likewise having relatively great length depthwise of the door and provided opposite said annular step with plane faces to coöperate with the plane faces of the body-lugs to lock the door against withdrawal, such engaging faces preventing any appreciable tendency of the door to creep back in its jamb after it is rotated to its locked position.

63. A safe or vault comprising an integral, unmachineable-metal body having a conically-formed jamb, and an integral, unmachinable-metal, rotary, conically-formed door fitting said jamb, said body having locking-lugs of relatively great length depthwise of such jamb and located substantially midward of its jamb, and said door having an annular shoulder adapted to engage the outer ends of said locking-lugs to limit inward movement of the door, and also having integral lugs opposite said shoulder formed to engage the inner ends of the body-lugs.

64. A safe or vault comprising an unmachineable-metal body and an integral, rotary, unmachineable-metal door, each having integral locking-lugs of relatively great length depthwise of the door, the meeting or locking faces of which are plane surfaces, said structure having means for firmly seating the door to permit the plane locking-surfaces on the door to engage the similarly-formed locking-surfaces of the body.

WALTER BRINTON.

Witnesses:
JACOB STRUBLE,
A. F. MURRAY.