Feb. 23, 1926. 1,574,295

S. F. LAUCKS ET AL

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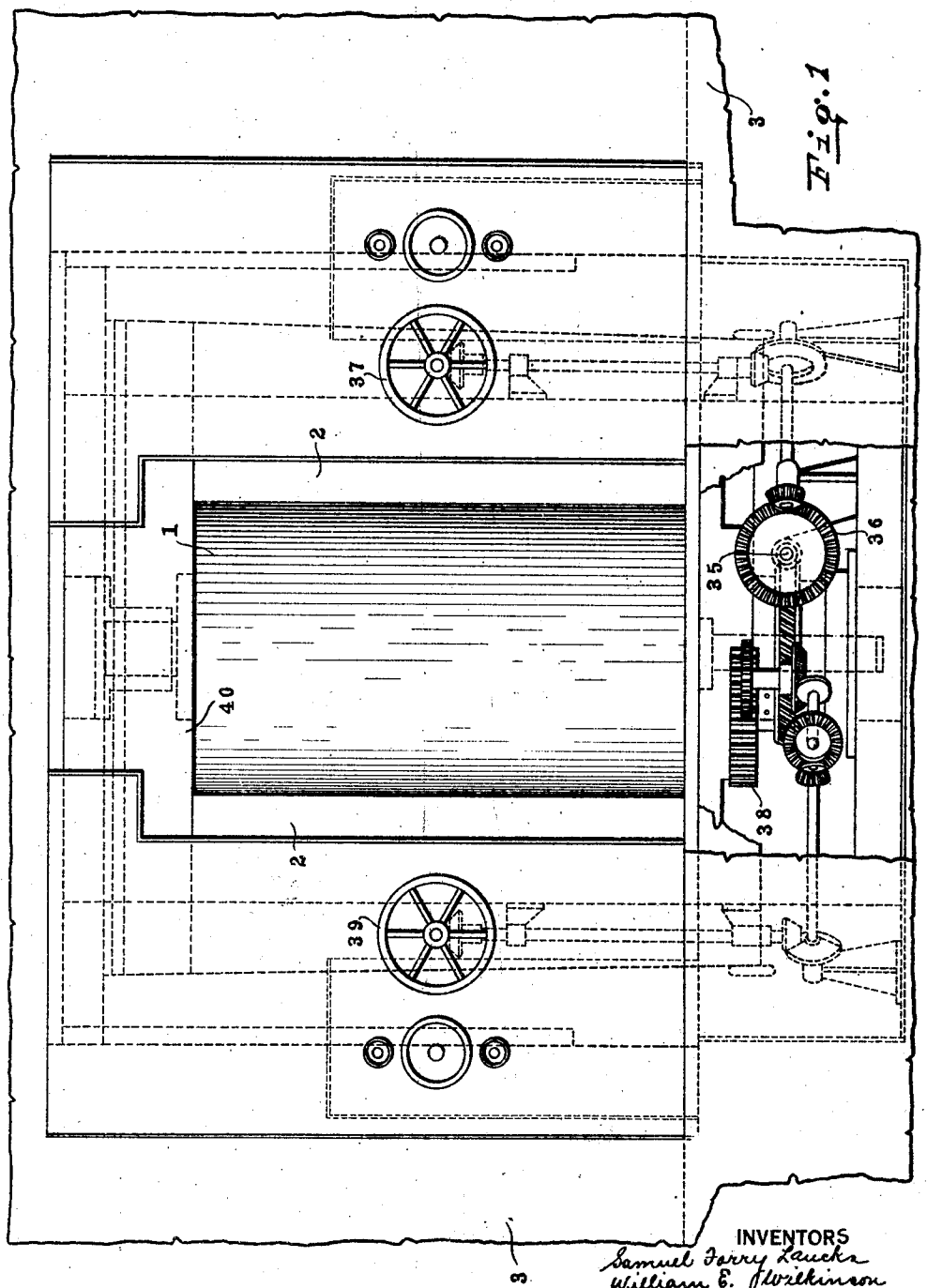

Fig. 1

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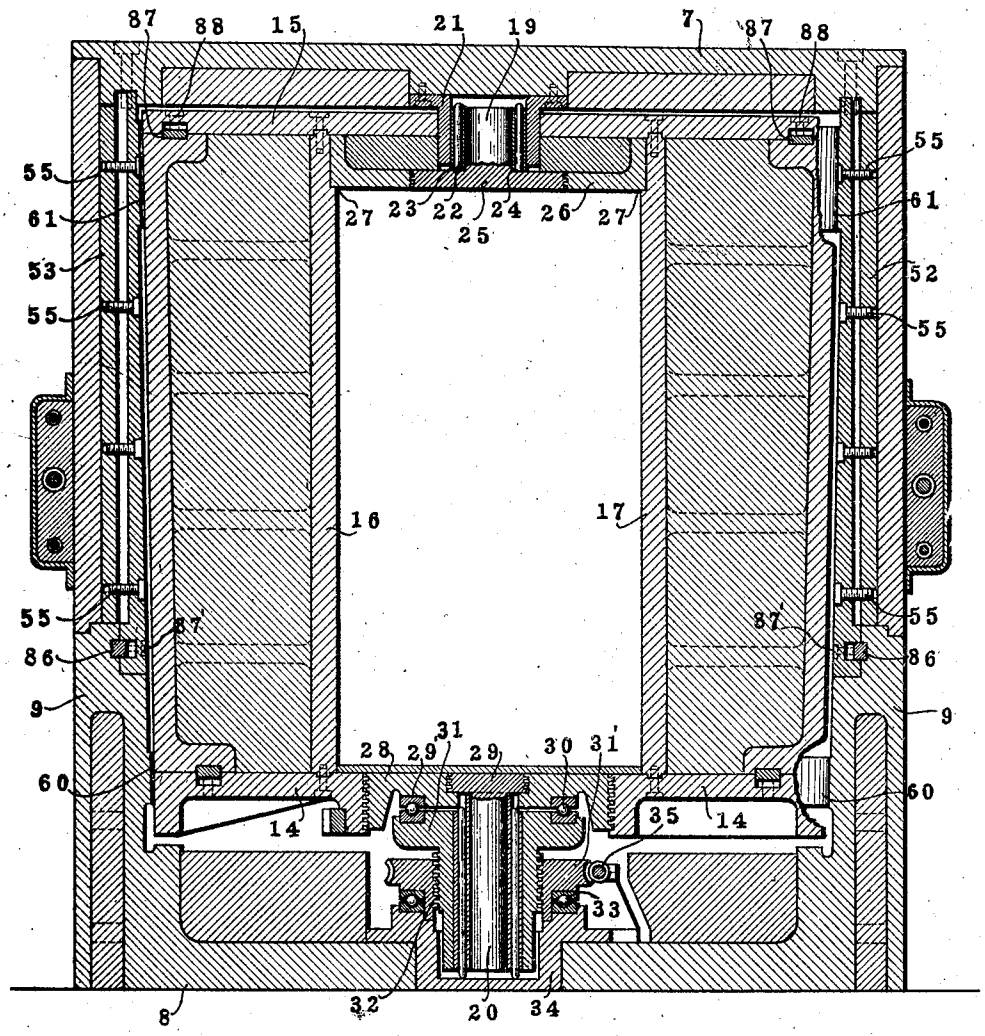

Fig. 2

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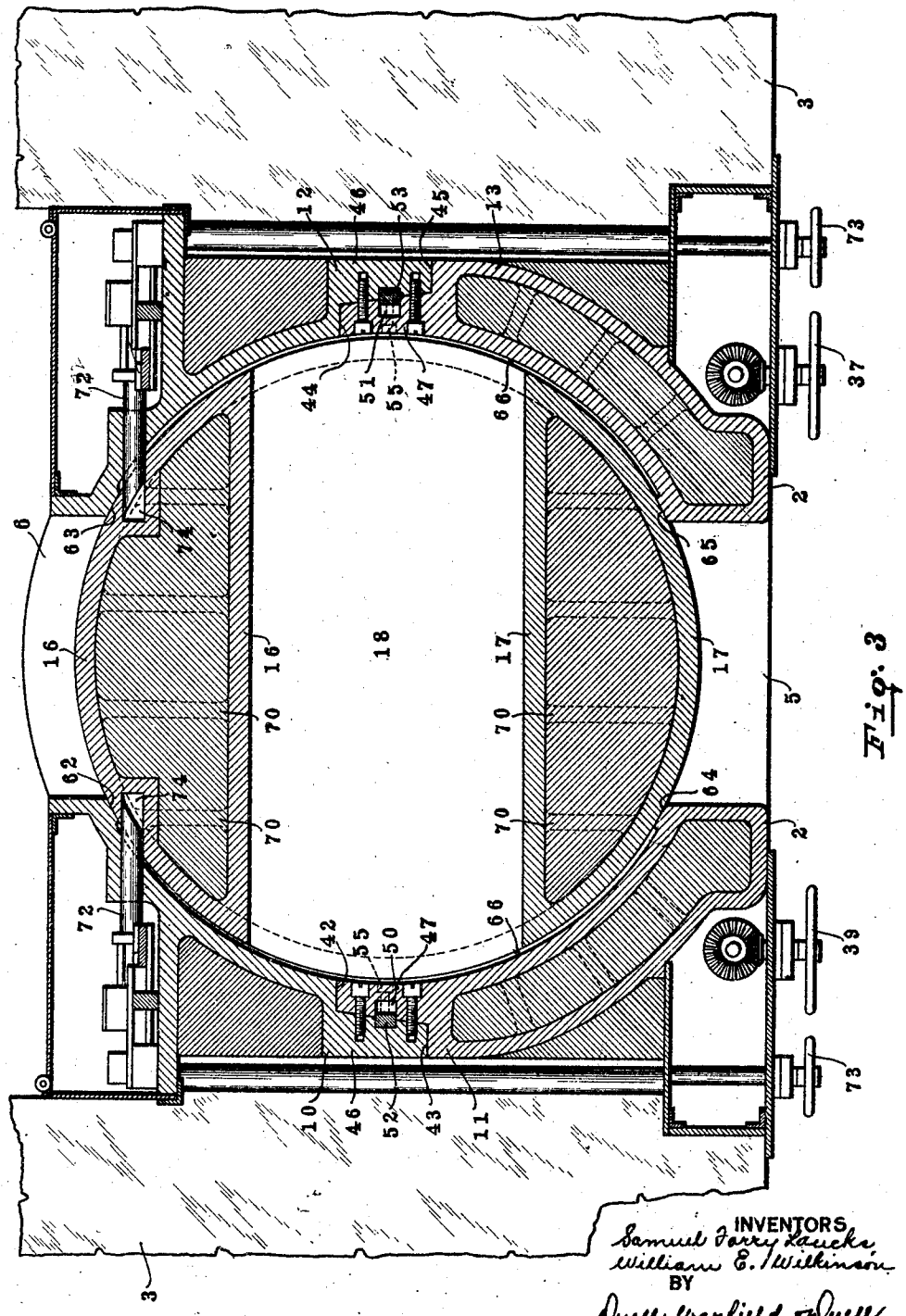

Fig. 3

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Fig. 4

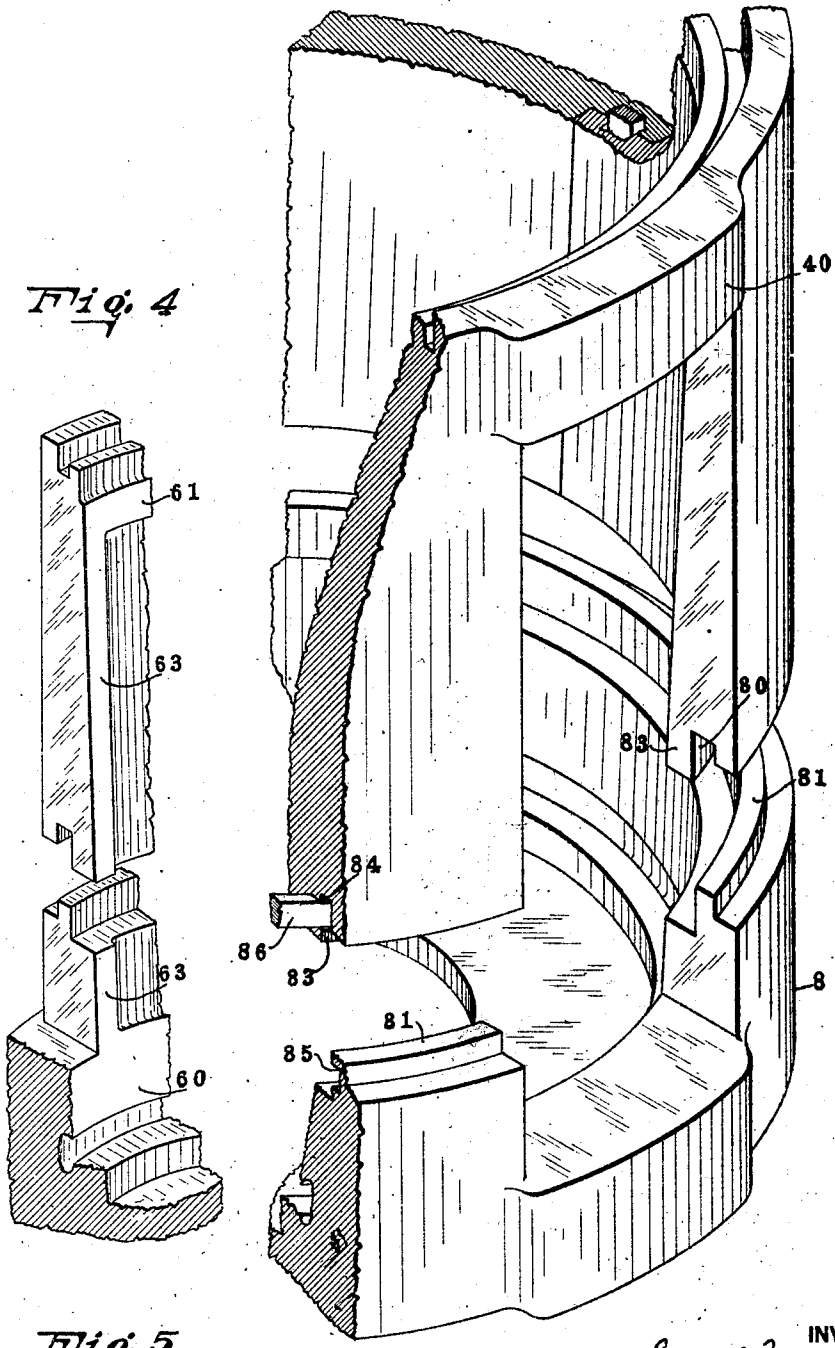

Fig. 5

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UNITED STATES PATENT OFFICE.

SAMUEL FORRY LAUCKS AND WILLIAM E. WILKINSON, OF YORK, PENNSYLVANIA, ASSIGNORS TO SAID LAUCKS.

SAFE.

Application filed May 11, 1922. Serial No. 560,013.

To all whom it may concern:

Be it known that we, SAMUEL FORRY LAUCKS and WILLIAM E. WILKINSON, citizens of the United States, residing at York, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Safes, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to vaults, safes and the like and with respect to its more specific features to closures for vaults or safes, especially closures for large structures and designed to be burglar-proof.

One of the objects of the invention is the provision of a simple and practical construction of closure adapted to securely seal the vault or safe against violent entry.

Another object is the provision of an efficient construction adapted effectively to resist penetration of the closure wall by a flame and to insulate the interior against fire.

Another object is the provision of a practical construction for large closures which shall be very strong and durable and adapted for convenient transportation and erection as well as efficient securing of the parts together, the joints in which construction shall be close-fitting so as to prevent the entry of explosive liquids and the like.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawing forming part of this specification and wherein similar reference characters refer to similar parts throughout the several views—

Figure 1 is a front elevation, partly broken away, showing a vault equipped in accordance with the present invention;

Fig. 2 is a vertical section of the revoluble door and its housing, the door being shown in open position;

Fig. 3 is a horizontal section through the door and housing with the door in closed position and locked;

Fig. 4 is a perspective view of a portion of the housing, with the parts separated to more clearly disclose the construction; and

Fig. 5 is a detail view.

The invention is particularly exemplified as embodied in a vault or safe, the walls of which, indicated at 3, may be of any well-known construction, being formed, for example, of well armored masonry, cement or metal. In order that access may be had to the interior of the vault, this wall is formed with an opening, the outer and inner ends of which are indicated at 5 and 6 respectively, and this opening is provided with a revoluble door 1, a particular form of which will be described below. The door is mounted in a housing or frame, which in the present instance comprises a top frame piece 7 which lies against the upper face of the masonry, and a base frame piece 8 which lies upon the masonry at the bottom of the opening. The members 7 and 8 are circular in plan, and the latter has a heavy flange extending upwardly from its circumference. A plurality of side frame pieces or bearing sections 10, 11, 12 and 13 are set upon and securely connected with the base frame piece 9 and extend along both sides of the opening upwardly to the top piece 7 to which they are securely attached.

The particular type of revoluble door illustrated includes a pair of spaced sections 16 and 17 which, as shown, consist of tubes or jackets of hard material, such as steel, filled with a heat-resistant material and reenforced by pins 70 which extend to the side walls thereof. The shape of these sections may be substantially that of sections of a cylinder from which the central portion has been cut away along the lines of two planes extending throughout the length of the cylinder. There is thus provided a door comprising two members which may be revolved on a single axis and which have formed therebetween a large air space or passageway 18 which serves when the door is in open position to connect the ends 5 and 6 of the opening through the wall 3 and which serves when the door is closed to increase the heat insulating properties of the door. In the construction shown, the axis of the door is vertically disposed, the sections 16 and 17 of the door are connected by means of a circular cap plate 15 and a circular base plate 14, and the door is provided with

an upper journal 19 and a lower journal 20 which operate to center the door.

The upper journal 19 is mounted in a journal bearing 21 depending from the inner face of the top frame piece 7. Between the journal 19 and the bearing 21 are hardened roller bearings 22 on each side of which are hardened wearing rings 23 and 24. In order conveniently and efficiently to secure the journal 19 to the door, the lower end 25 of the journal is enlarged and is threaded to an upper journal-carrying plate 26, which is seated against shoulders 27 on the walls of the tubular jackets of the door sections 16 and 17, and which is held in place by the cap plate 15. The lower journal 20 is mounted, in the same manner as the journal 19, in a member 31 which is adapted to operate as a lifting jack. The upper end of the journal 20 is enlarged as shown at 29 and is threaded to a lower journal carrying plate 28 which in turn is threaded into the base plate 14. The plate 28 is adapted to ride upon the lifting jack 31 by means of a ball bearing comprising balls 30 movable in grooves in cooperating hardened rings, one of which 29′ is mounted in the plate 28. The mechanism which is provided in the present instance for causing a rotation of the door is illustrated in Figs. 1 and 2, and comprises a toothed gear 38 which is adapted to rotate the base plate 14 through an arc of 90° and which is actuated from a hand wheel 39 through a suitable gear train, such as illustrated in Fig. 1. By means of this mechanism the door members 17 and 16 may be revolved between a position in which they are across the openings 5 and 6 so as to close these openings and to provide a closure for the opening through the wall 3, and a position in which they extend along the side frames of the housing so that the air space 18 will provide a passageway through which access may be had to the interior of a safe or vault. The interior faces of the housings are adapted to conform in general with the surfaces of the door sections so that these faces will provide bearing surfaces in which the door may be rotated. The housing itself may be formed in any well-known manner, as by being integrally cast. When, however, the size of the door and the housing is at all large, it is most desirable to form the housing of a number of connectable members which may be readily shipped and assembled, such as top and base pieces 7 and 8 and side frame pieces 10 and 11 on one side, and 12 and 13 on the other, which oppositely disposed side frame pieces may be joined by cross frame pieces or braces 40 which provide lintels for the doorway at the top of openings 5 and 6.

With a view to providing means for permanently assembling the housing and for releasably interlocking the side frame pieces 10 and 11, and the side frame pieces 12 and 13, these members are provided, in the present exemplification, with overlapping tongues 46 and 47, and with shoulders 42, 43, 44 and 45 formed on the end of the tongues and adapted to rest lightly against the body of the adjacent frame piece. In the normally contiguous faces of each tongue are recesses which are adapted to register with each other when the tongues are in assembled relation as indicated at Fig. 3. The registering recesses at one side of the door are indicated by the numeral 50 and the recesses at the other side of the door are indicated by the numeral 51. The recesses 50 and 51 respectively provide spaces for the reception of locking keys such as the keys 52 and 53 which are shown in Fig. 3 as intersecting the meeting faces of the tongues so as to resist longitudinal separation of the frame pieces. The recess in one of each pair of frame pieces is made, in the present instance, of sufficient depth so that the key may be moved into it and out of locking engagement with the adjacent frame piece during the assembling or disassembling of the door housing. Now with a view to moving the keys into and out of locking position and to holding them in either position there are provided key actuating devices which, in the present exemplification, consist of screws 55 carried by the side frame pieces 11 and 13 and having threaded connection, with the keys. These screws will, as a general rule, be provided with means to oppose the axial movement thereof. It is often desirable that access to the key actuating devices such as the screws 55 may be rendered difficult and to this end the keys 55 are, in the device shown in the drawings, positioned so that they will be inaccessible when the door is open; and, when the door is closed, will only be accessible from the air space 18 at the interior of the door. Thus after the assembly of the closure illustrated, it will be necessary, in order to unlock the side frame pieces one from the other, either to remove the door entirely from its housing or to first open the door and then to close the same with the operator standing in the passageway or air space 18.

In order that the side frame pieces may be securely connected to the base frame piece 8, the lower edges of the side pieces are, in the present instance, grooved as shown at 80 and the base 8 is provided with tongues 81 which are adapted to fit into these grooves. A mechanism similar to that by which the side pieces are interlocked is also provided to securely lock the side pieces to the base. This mechanism comprises a key 86 which is adapted to be movably set in recesses 85 and 84 formed respectively in the tongue 81 and in a shoulder 83 on one

side of the groove 80. Screws 87' are employed to move and hold the key in locking position in a manner similar to that in which the screw 55 operates upon the key 52. A similar locking mechanism may, of course, be employed to lock together various other portions of the door or its housing, as for instance to lock the top frame piece 7 to the side pieces or to lock the cap plate 15 or the base plate 14 to the door sections 16 and 17. In the drawings such a mechanism, employed to lock the cap plate to the door sections, is illustrated at 87 and 88 in Fig. 2. In mechanisms of this type the keys may be continuous or in sections as may best meet the requirements of a particular case.

In order that the door may be securely locked in its closed position so as to prevent any unauthorized person from rotating the door to its open position and thus obtaining access to the safe, the outer surface of the door is, in the exemplification under consideration, tapered downwardly so that, instead of the door sections 16 and 17 being sections of a cylinder, they are sections of an imaginary cone whose apex would be found at a considerable distance beneath the door, and a portion, at least, of the inner faces of the housing correspond to the shape of a second imaginary cone of a similar nature but with its apex in a still lower plane. Thus by lowering the door slightly certain of the surfaces thereof will engage certain of the inner faces of the housing so that the weight of the door will be effective to lock the same in place. Any suitable mechanism may be provided for raising and lowering the door, a particular type of such mechanism being illustrated in Figs. 1 and 2, and comprising the lifting jack 31. This jack is provided with threads 32 which cooperate with the threads of a nut 31' supported by means of ball bearings 33 upon a frame piece 34, which in turn is mounted on the base plate 8. The nut 31' is provided with worm teeth and is adapted to be rotated by means of a worm 35 which is provided with a bevel gear 36 operated from a hand wheel 37 by a suitable train of connections as illustrated in Fig. 1.

Now with a view to the provision of tightly sealed joints between the door and its housing when the door is in its lowered position, the bearing faces of the housing, in the present instance, are provided with sealing and guiding ribs at the margins of the openings 5 and 6 These ribs, which are indicated at 62, 63, 64 and 65, are carefully machined so as to correspond exactly in surface coutour to the surfaces of the door sections 16 and 17 so that, as the door is lowered it will fit exactly against these surfaces and will be thrust tightly against the surfaces of the ribs 64 and 65 at the outer opening 5. Thus the penetration of a flame or heated air through the joints thus formed, as well as the penetration of explosive liquids, will be effectually opposed. It should be noted that as the door is lowered the ribs 62 and 63 act as guiding ribs to thrust the door into sealing relation with the ribs 64 and 65. To this end there are also provided guiding rings 60 on the base piece 8 and guiding rings 61 on the side frame pieces. The various sealing and guiding ribs are all inter-connected and present surfaces which correspond to the surfaces of the second imaginary cone above referred to, and it is against these surfaces alone that the door is adapted to seat when lowered. It will be readily apparent that the provision of these carefully machined guiding and sealing ribs obviates the necessity of accurately machining the full outer surfaces of the door or the full inner surfaces of the side frame pieces and nevertheless provides a joint which is efficiently sealed when the door is lowered even though the journals 19 and 20 have a slight lateral movement, or have become worn.

As was pointed out above, the tubular jackets of the door sections contain a material adapted to offer a great resistance to heat or to a flame. In constructions in which the flame proof and heat resistant properties of the door are of particular importance, it is desirable to form the door sections in the manner illustrated, with the layer of heat resistant material much thicker than the steel walls of the tubular jacket which surrounds it. Any type of heat resistant material may be used, such as a mixture of heat resistant cement, although a material having a high degree of heat conductively, as for instance gray iron or a copper iron alloy, which may be cast in the jackets, is preferably employed. In order to strengthen and rigidify the door sections and to reenforce the outer steel walls thereof, anchoring members connecting these walls may be employed. In the present instance these connecting members consist of the cross pins 70 cast integrally with the tubular jacket and disposed at various points therein so as to be embodied in the heat resistant material. When an attempt is made to penetrate a door section of this type by means of a blow torch, the heat will be carried off too rapidly to enable the torch to be effectively used in sufficiently melting the mass of material quickly to form an opening of the necessary size.

It will be evident that the construction just described in connection with the door sections may be employed in connection with other wall members designed for use in vaults and similar constructions; for example, the side frame pieces 11 and 13 in the present exemplification are shown as formed in this manner.

In order to prevent the door from being readily moved out of its lower position in which it bears against sealing ribs 64 and 65 to effectively seal the opening 5, and to prevent its rotation, it is desirable to provide means for securely locking the door in such position. In the present instance such means consist of locking bolts 72 mounted adjacent the interior of the vault upon the side frame pieces 10 and 12 and adapted to extend into recesses 74 in the door member 16 when the door is in its closed and lowered position. These bolts are preferably disposed on opposite sides of the opening in the manner shown and may be of any number which meets the requirements of a particular case. Suitable mechanism, which in the present instance includes hand wheels 73 carried by the front face of the vault, may be provided in order to operate the bolts 72, and as a general rule the bolt actuating mechanism will be provided with a time controlling device of any usual type which will render it impossible to actuate the bolts except at predetermined times. It will be remarked that the bolts 72 act to lock the door both against axial movement and against rotation.

It is believed that the operating of the door will be readily apparent from the above description. After the timing mechanism has operated the bolts 72 will be withdrawn from the recesses 74, whereupon the hand wheel 37 will be turned to operate the lifting jack 31 so as to raise the door to such a position that the rotation thereof is possible. The hand wheel 39 will then be turned to rotate the door so as to cause the passageway 18 to register with the opening through the housing so that access to the interior of the vault through the passageway 18 is possible. The door may be closed and the vault sealed and locked by the operations above described performed in reverse order.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which as a matter of language might be said to fall therebetween.

Having described our invention, what we claim as new and desire to secure by Letters Patent is:

1 A closure for vaults, safes and the like including, in combination, a wall having an opening, a door for closing said opening mounted for rotation on its axis and for bodily axial movement, marginal bearing and sealing ribs adjacent said opening, and co-operating upright and transversely extending guiding ribs interposed between said wall and said door and being inclined to the axis of said door, said guiding ribs being opposed to said sealing ribs so as to guide the door upon axial movement thereof to effect through said sealing ribs tight joints at the margins of said closure.

2. A closure for vaults, safes and the like including in combination, a wall having spaced openings therein, a door for closing said openings having an axially inclined surface and being mounted for rotation between said openings on its axis and for bodily axial movement, marginal bearing and sealing ribs adjacent said openings and being inclined to the axis of said door to correspond with the inclination of the door surface, said ribs being opposed to each other so as to guide the door upon axial movement thereof to effect tight sealing joints for both of said openings.

3. A closure for vaults, safes and the like, including, in combination, a supporting cage having a passage-way therethrough and including vertically spaced coaxial bearing rings and circumferentially spaced longitudinally extending bearing ribs, the inner faces of said rings and said ribs being surfaces of an imaginary cone with downwardly pointing apex, and a revoluble coaxial door in said cage tapering downwardly, and movable axially, said bearing ribs occupying opposed positions in said cage so as to guide said door into sealing position upon axial movement thereof.

4. A closure for vaults, safes and the like including, in combination, a wall having an opening and a door-bearing in said opening, said door-bearing including two notched bearing sections with overlapping tongues adapted to resist separation of the sections transversely of said tongues and a key for resisting separation of said sections longitudinally of said tongues, one of said sections having a recess into which said key may move and lie out of interlocking engagement with the other section, and means carried by one of said sections adapted to move said key into interlocking relation to said sections.

5. A protective wall member for vaults, safes and the like including integrally cast steel tubular jacket and anchoring pins, said jacket filled with cast metal of a high degree of heat conductivity in which said pins are embedded.

6. A closure for vaults, safes and the like including, in combination, a wall having an opening, a revoluble door adapted to bear against said wall at the side margins of

said opening at each end of said opening, said door including two walls spaced apart transversely of the axis of rotation to form an air space therebetween, said latter walls including a layer of steel backed by a layer of material of a high degree of heat conductivity adapted to bridge said opening.

7. A closure for vaults, safes and the like including, in combination, a wall having an opening, a rotatable door adapted to bear against said wall at the side margins of said opening at each end of said opening, said door including two walls spaced apart transversely of the axis of rotation to form an air space therebetween, said latter walls including a layer of steel backed by a layer of material of a high degree of heat conductivity adapted to bridge said opening, said air space extending through said door and adapted to register with the opening in said wall.

8. A door for safes, vaults and the like, composed of sections and including, in combination, a base plate, a cap plate and two members of composite tubular construction between and fastened to said plates and spaced apart to provide a passage-way through the door.

9. A door for safes, vaults and the like, composed of sections and including, in combination, a base plate, a cap plate and two tubes of composite construction between said plates, fastened to each and spaced apart to provide an aperture through the door, and a journal carrying plate threaded into said base plate.

10. A door for safes, vaults and the like, composed of sections and including, in combination, a base plate, a cap plate and two tubes between said plates, fastened to each and spaced apart to provide an aperture through the door, a journal carrying plate threaded into said base plate, and a journal threaded into said journal carrying plate, said journal carrying plate having a hardened bearing ring.

11. A door for safes, vaults and the like composed of sections and including, in combination, a base plate, a cap plate and two tubes between said plates fastened to each and spaced apart to provide an aperture through the door, and a journal carrying plate fitted between said tubes and held in place by said cap plate.

12. A door for safes, vaults and the like, composed of sections and including, in combination, a base plate, a cap plate and two tubes between said plates fastened to each and spaced apart to provide an aperture through the door, said tubes having anchoring cross pieces.

13. A door for safes, vaults and the like, composed of sections and including, in combination, a base plate, a cap plate and two tubes between said plates fastened to each and spaced apart to provide an aperture through the door, said tubes being filled with material of high heat conductivity.

14. A door for safes, vaults and the like, composed of sections and including, in combination, a base plate, a cap plate and two tubes between said plates fastened to each and spaced apart to provide an aperture through the door, a journal carrying plate threaded into said base plate, and a journal threaded into said journal carrying plate, said journal carrying plate having a hardened bearing ring, and a journal carrying plate fitted between said tubes and held in place by said cap plate.

15. A door for safes, vaults and the like, composed of sections and including, in combination, a base plate, a cap plate and two tubes between said plates fastened to each and spaced apart to provide an aperture through the door, a journal carrying plate threaded into said base plate, a journal threaded into said journal carrying plate, said pournal carrying plate having a hardened bearing ring, and a journal carrying plate fitted between said tubes and held in place by said cap plate, said tubes having anchoring cross pieces.

16. A door for safes, vaults and the like, composed of sections and including, in combination, a base plate, a cap plate and two tubes between said plates fastened to each and spaced apart to provide an aperture through the door, a journal carrying plate threaded into said base plate, a journal threaded into said journal carrying plate, said journal carrying plate having a hardened bearing ring, and a journal carrying plate fitted between said tubes and held in place by said cap plate, said tubes having anchoring cross pieces, said tubes being filled with material of high heat conductivity.

17. A closure for vaults, safes and the like including, in combination, a wall having an opening, and a revoluble door adapted to bear against said wall at the side margins of said opening at each end of said opening, the side walls of said opening between the bearing margins having clearance from said door when the door bears against said margins, the bearing surfaces of said door and said side margins inclining toward the axis of rotation of said door and being circular in transverse section, said door being mounted for axial movement, said wall, at the end margins of said opening, having circular bearings adapted to contact with counterpart bearing surfaces in said door simultaneously with the contacting between the door and wall at the side margins of said opening, and one or more bolts at each side of and at the same end of said opening for locking said door against both axial and rotative movement.

18. A closure for vaults, safes and the like,

including, in combination, a wall having an opening and a door-bearing in said opening, said door-bearing including two notched bearing sections with overlapping tongues adapted to resist separation of the sections transversely of said tongues and a key for resisting separation of said sections longitudinally of said tongues, and one or more door locking bolts extending through one of said bearing sections.

19. A closure for vaults, safes and the like including, in combination, a revoluble plug door, and a housing for said door including side frame pieces having releasable interlocking joints therebetween, said housing surrounding and being adapted to support said door, a base frame piece connected to and supporting said side frame pieces, and a top frame piece connected to and supported by said side frame pieces, the connections between said housing and said base and top frame pieces including releasable interlocking joints.

20. A closure for vaults, safes and the like including, in combination, a revoluble-plug door, and a housing for said door including side frame pieces connected together surrounding and adapted to support said door, a base frame piece connected to and supporting said side frame pieces, a top frame piece connected to and supported by said side frame pieces, the connection between said side frame pieces including shoulders and overlapping contiguous tongues on the respective frame pieces having registrable recesses, and keys movable in said recesses into and out of position to lock said tongues against relative longitudinal movement.

21. A closure for vaults, safes and the like including, in combination, a revoluble-plug door, and a housing for said door including side frame pieces connected together, surrounding and adapted to support said door, a base frame piece connected to and supporting said side frame pieces, a top frame piece connected to and supported by said side frame pieces, the connection between said side frame pieces including shoulders and overlapping contiguous tongues on the respective frame pieces having registrable recesses, keys movable in said recesses into and out of position to lock said tongues against relative longitudinal movement, and key actuating devices accessible from the interior of said housing.

22. A closure for vaults, safes and the like including, in combination, a revoluble-plug door, and a housing for said door including side frame pieces connected together, surrounding and adapted to support said door, a base frame piece connected to and supporting said side frame pieces, a top frame piece connected to and supported by said side frame pieces, the connection between said side frame pieces including shoulders and overlapping contiguous tongues on the respective frame pieces having registrable recesses, keys movable in said recesses into and out of position to lock said tongues against relative longitudinal movement, and key actuating devices accessible from the interior of said housing, said door having an aperture adapted, when the door is closed, to register with said devices.

23. A closure for vaults, safes and the like including, in combination, a revoluble-plug door, and a housing for said door including, side frame pieces connected together, surrounding and adapted to support said door, a base frame piece connected to and supporting said side frame pieces, a top frame piece connected to and supported by said side frame pieces, the connection between said side frame pieces including shoulders and overlapping contiguous tongues on the respective frame pieces having registrable recesses, keys movable in said recesses into and out of position to lock said tongues against relative longitudinal movement, key actuating devices accessible from the interior of said housing, said door having an aperture adapted, when the door is closed, to register with said devices, and locking bolts for said door, operable, some in one side frame piece and some in another side frame piece.

24. A closure for vaults, safes and the like including, in combination, a revoluble-plug door, and a housing for said door including side frame pieces connected together, surrounding and adapted to support said door, a base frame piece having tongue and groove connection with and supporting said side frame pieces, and a top frame piece connected to and supported by said side frame pieces.

25. A closure for vaults, safes and the like including, in combination, a vertically movable plug-door revoluble on a vertical axis and a supporting housing therefor having an opening therethrough, said housing including side frame pieces having shoulders and overlapping contiguous tongues with registering recesses, keys movable in said recesses into and out of position to lock said tongues against relative longitudinal movement, the door supporting surfaces of said housing including vertically spaced coaxial bearing rings and circumferentially spaced vertically extending bearing ribs at the margins of said opening, the bearing faces of said ribs and rings being surfaces of an imaginary cone with downwardly pointing apex, said door including two jackets spaced apart transversely of its axis of rotation to form an air space therebetween, said jackets filled with material of a high degree of heat conductivity, the outer surfaces of said jackets adapted to bear against said ribs

when the door is in lowered position, door locking bolts, at each side of and at the same end of said opening, guided in said side frame pieces, a base plate and a cap plate removably keyed to said jackets, a base frame piece removably keyed to said side frame pieces, and a removable top plate, and means carried by said base frame piece and said top plate for centering said door.

26. A closure for vaults and the like including, in combination, a door, a housing for said door, said housing including a metallic base frame piece having an upstanding peripheral flange, and metallic side frame pieces interlocking with said peripheral flange and with each other.

27. A closure for vaults and the like including, in combination, a door, a housing for said door, said housing including a metallic base frame piece having an upstanding peripheral flange, metallic side frame pieces interlocking with said peripheral flange and with each other, and a top frame piece interlocking with said side frame pieces.

28. A closure for vaults and the like including, in combination, a door, a housing for said door, said housing including a metallic base frame piece having an upstanding peripheral flange, metallic side frame pieces interlocking with said peripheral flange and with each other, and a top frame piece interlocking with said side frame pieces, said base frame piece and said side frame pieces having openings therein cooperating when assembled to provide a passage-way, and the interlock of said side frame pieces being spaced from the opening therein.

29. In a door for a safe or similar receptacle, a revoluble member comprising an outer wall, an inner plate, heat-resistant material held between said wall and said plate, and braces extending through said material to connect said wall and said plate.

30. A closure for vaults, safes and the like, comprising a wall presenting an opening, and a door mounted in said wall for revolution to close said opening, said door comprising an outer arcuate wall, an inner plate, heat-resistant material between said wall and said plate, and reenforcing members extending through said material and connecting said wall and said plate.

31. A closure for receptacles, including, in combination, a door, and a doorway formed of a plurality of frame pieces and means releasably to lock one of said frame pieces, to another of said frame pieces, said means being inaccessible when said door is open and being accessible only from within said doorway when the door is closed.

32. A closure for receptacles, including, in combination, a revoluble door, a housing therefor comprising frame pieces having overlapping tongues, and a key movable into and out of position to lock said tongues against longitudinal movement, said key being accessible only from the interior of the housing.

33. A safe, including a door comprising a pair of door members spaced apart to provide a passageway therebetween, means for rotatably mounting said door including a pair of journals and journal-carrying plates, said journal-carrying plates being connected to said spaced members to permit the removal of said journals and said plates into said passageway.

34. A safe, including a pair of door members spaced apart to provide a passageway therebetween, a pair of end plates for connecting said door members, said end plates and said spaced members being formed with registering recesses, and means for releasably connecting said plates and said members comprising a key adapted to seat in the recess of one of said elements and extensible into the recess in the other of said elements to bridge the joint therebetween, and means for adjusting the position of said key.

35. A safe, including a closure comprising a rotatable door embracing a pair of door members spaced apart to provide a passageway therebetween when the door is open, a housing for said door comprising a plurality of frame pieces, means releasably to lock one of said frame pieces to another of said frame pieces, and means to release said locking means, said latter means being so positioned as to be inaccessible when said door is open and to be accessible only from said passageway when the door is closed.

36. A safe, including a door having a recess therein, a plurality of frame pieces forming a doorway for said door, and means releasably to lock one of said frame pieces to another of said frame pieces, said means being inaccessible when the door is open and being accessible only from said recess when the door is closed.

In testimony whereof we affix our signatures.

SAMUEL FORRY LAUCKS.
WILLIAM E. WILKINSON.