

[54] WALL OR FLOOR SAFE

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109/56, 57, 58, 64; 220/24.5; 217/78, 79,
108; 138/89; 285/8, 338, 346; 166/195, 196,
134, 123, 124, 125

[56] References Cited

UNITED STATES PATENTS

2,262,117	11/1941	Roe	166/134 X
3,450,204	6/1969	Brown et al.	166/124
2,209,067	7/1940	Belknap	109/59
3,087,641	4/1963	Millard	220/24.5
968,536	8/1910	Brucklacher	109/50
2,685,380	8/1954	Moeller	220/24.5 X
3,017,053	1/1962	Mitchell	220/24.5

3,051,200	8/1962	Bevington	220/24.5 X
3,295,712	1/1967	Peterson	220/24.5

FOREIGN PATENTS OR APPLICATIONS

6,166	3/1901	Great Britain	109/58
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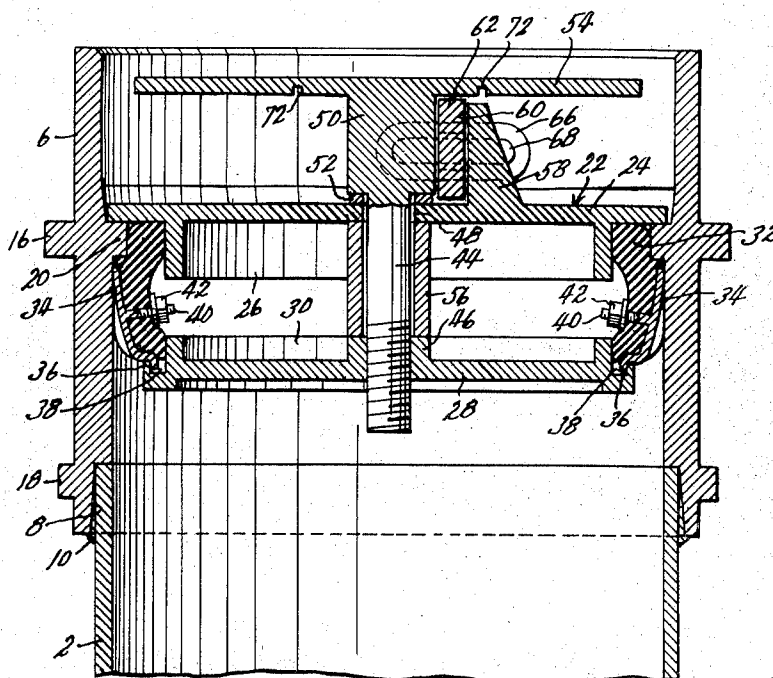
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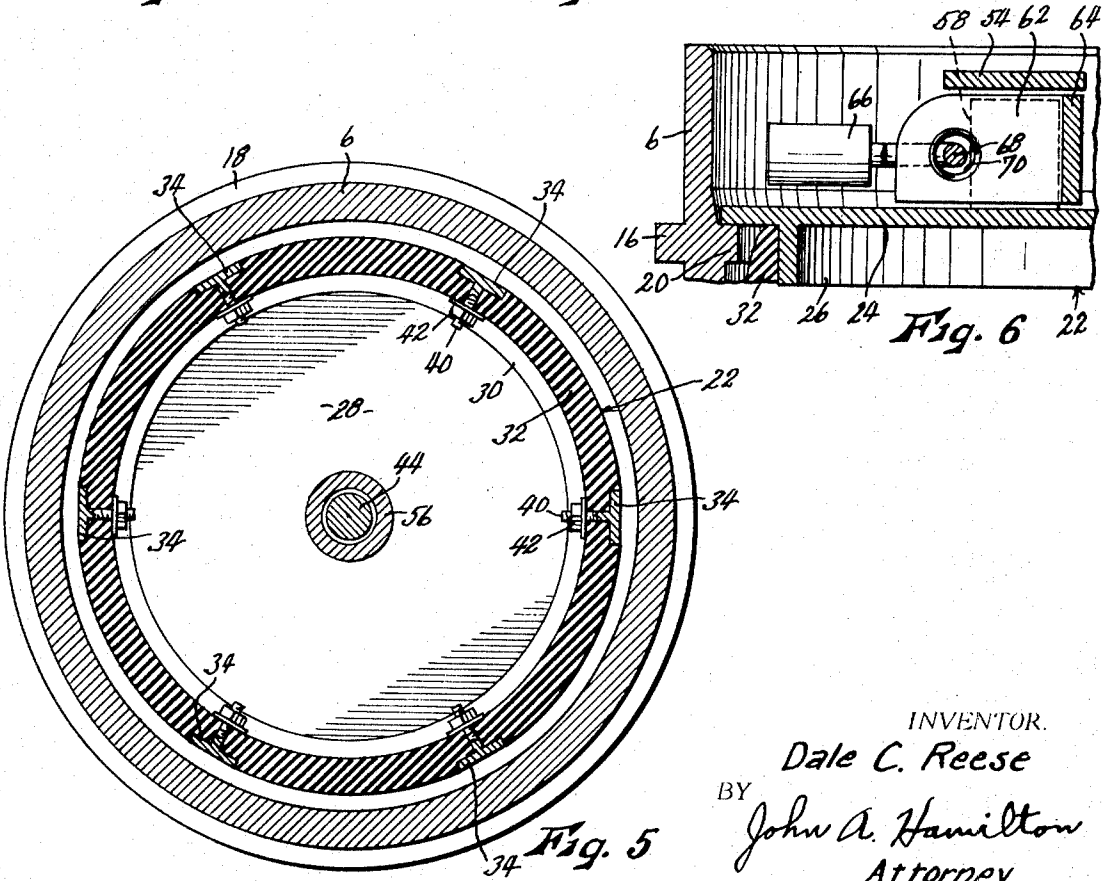
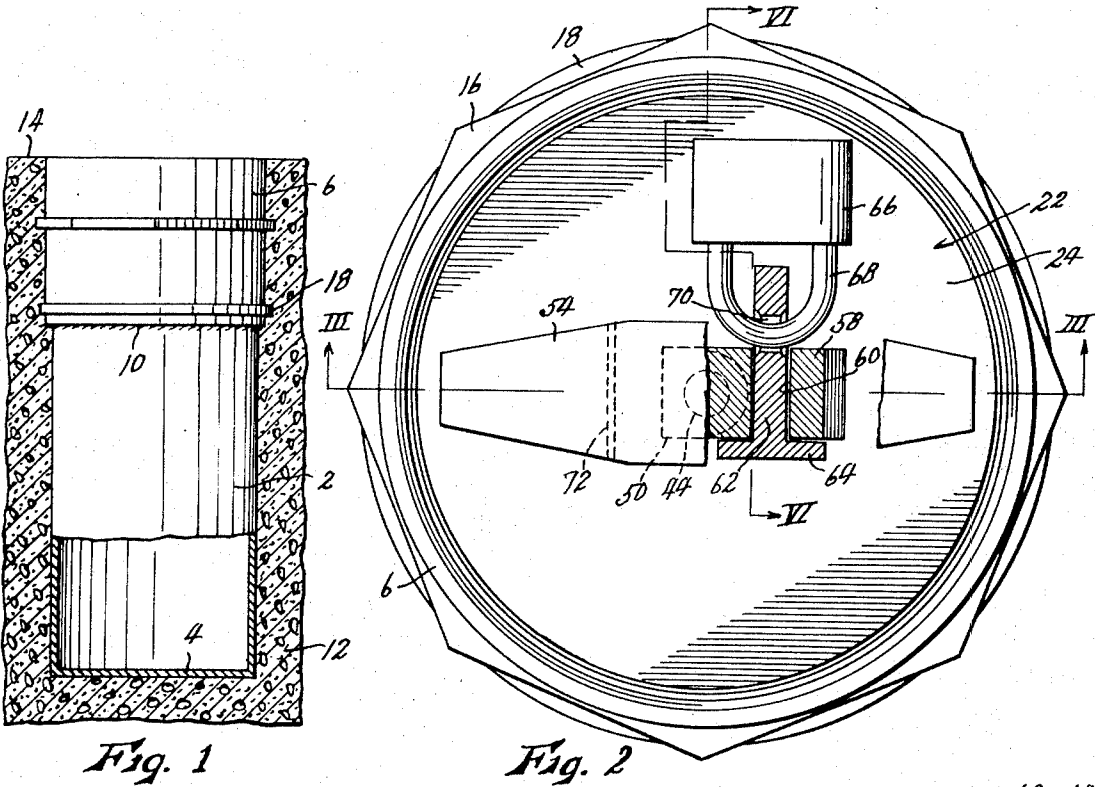
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[57] ABSTRACT

A safe adapted to be embedded in a concrete wall or floor consisting of a hollow body with a cylindrical mouth having an internal flange, and a door consisting of a pair of axially spaced apart circular plates adapted to be disposed coaxially in said mouth, an expandable cylindrical collar of rubber or the like disposed coaxially between said plates, a screw operable to draw said plates closer together whereby said collar is expanded tightly against the inner surface of said mouth and against said flange, rigid locking members carried by said door and movable into operative position by expansion of said collar, and a lock device for securing said screw against rotation.

1 Claim, 6 Drawing Figures





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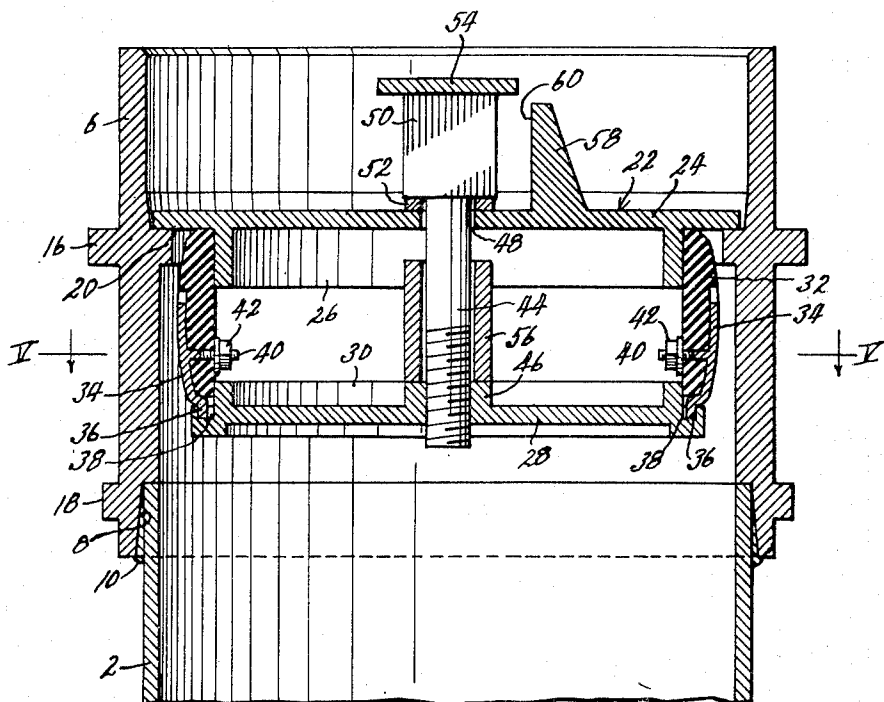


Fig. 4

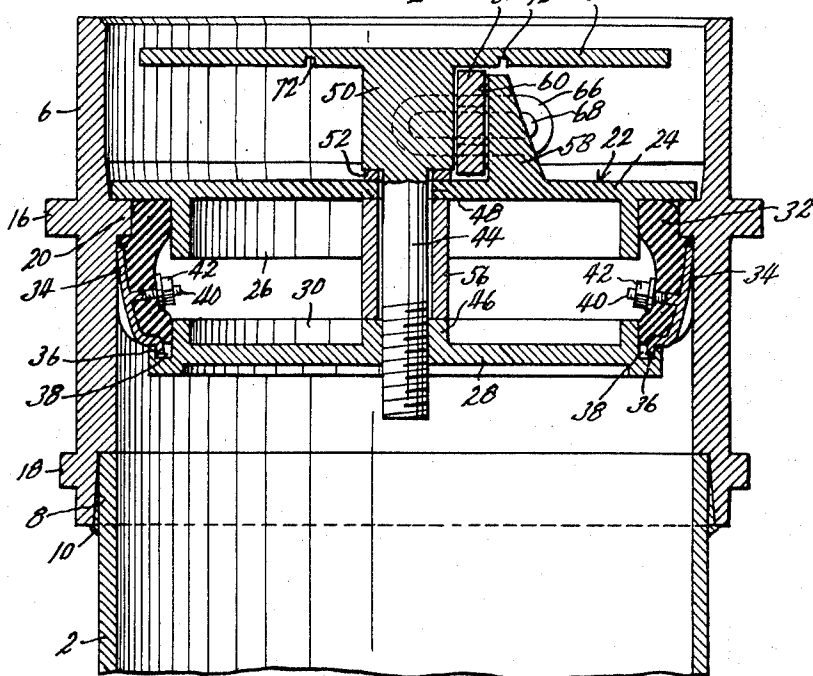


Fig. 3

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WALL OR FLOOR SAFE

This invention relates to new and useful improvements in safes, and has particular reference to a safe especially adapted to be embedded in walls or floors. However, since the principal features of the invention reside in the structure of the closure door and related elements, it will be clear that the invention has general applicability wherever an extremely tight, secure, waterproof and fireproof door may be necessary or desirable.

The principal objects of the present invention are the provision of a safe adapted to be embedded in a wall or floor which while extremely simplified and inexpensive as compared to ordinary safes, is nevertheless highly safe and secure, and which is both waterproof and fireproof to a very high degree.

More specifically, an object of the invention is the provision of a safe including a hollow body adapted to be embedded in concrete or the like and having a cylindrical barrel forming the access mouth to said body, and a closure door including an expansible rubber collar operable by a screw mechanism to be expanded into tight engagement with the inner wall of said barrel, whereby to secure said door frictionally against removal, and to form a water-tight seal.

Another object is the provision of a safe of the character described having novel locking means for preventing unauthorized operation of the screw means for expanding the collar.

A further object is the provision of a safe of the character described wherein the closure door, in addition to the frictional securing action provided by the expansible rubber collar, is also provided with positive, rigid mechanical locking members operable to be moved to and from their operative positions by the expansion and retraction of said rubber collar.

With these objects in view, as well as other objects which will appear in the course of the specification, reference will be had to the accompanying drawing, wherein:

FIG. 1 is a side elevational view of a safe embodying the present invention, embedded in a concrete floor and partially broken away,

FIG. 2 is an enlarged top plan view of the safe only, with parts broken away, showing the closure door in its locked position,

FIG. 3 is a sectional view taken on line III—III of FIG. 2,

FIG. 4 is a view similar to FIG. 3, but showing the closure door unlocked and ready for removal,

FIG. 5 is a sectional view taken on line V—V of FIG. 4, and

FIG. 6 is a fragmentary sectional view taken on line VI—VI of FIG. 2.

Like reference numerals apply to similar parts throughout the several views. As shown, the safe body 2 is of cylindrical form, being closed at its lower end as indicated at 4 and open at its upper end, and is preferably of steel or the like. Affixed to the upper end of the body member is a cylindrical barrel 6, also of steel, open at both ends, which forms an access mouth opening into the body member. As shown, said barrel is of about the same diameter as the body member, being provided at its lower end with an internal peripheral socket 8 into which the safe body is inserted and welded as indicated at 10. Obviously, safe body 2, while cylindrical as shown, may be of any desired size or con-

figuration, so long as it has a neck or the like to which barrel 6 may be affixed. In this manner, a single barrel 6, which carries the closure door to be described and all parts related thereto, may be used on nearly any safe body.

The safe is adapted to be embedded in a concrete floor 12 as indicated in FIG. 1, with the upper end of barrel 6 flush with the surface 14 of said floor. Barrel 6 is provided with a plurality of integral external flanges 16 and 18 which firmly anchor the safe in the concrete to resist bodily removal of the safe from the floor. At least one of said flanges (flange 16 as shown) is of polygonal peripheral contour to resist loosening of the safe in the concrete by rotation thereof about its axis.

The interior surface of barrel 6 is generally cylindrical, except that it is provided in spaced relation below the upper end thereof, with an integral, internal peripheral flange 20 which serves as a support for the closure door of the safe, said door being indicated generally by the numeral 22. Said door includes an upper circular plate 24 having a diameter smaller than the inner diameter of the barrel above flange 22, whereby to be freely insertable into said barrel, but larger than the interior diameter of flange 20, whereby its peripheral edge portion rests on the upper surface of said flange. Plate 24 is provided with an integral depending cylindrical skirt 26 concentric therewith but of smaller diameter than the interior diameter of flange 20. The door also includes a lower circular plate 28 in spaced relation below upper plate 24, plate 28 being of a smaller diameter than the inner diameter of flange 20 so as to pass freely therethrough. Plate 28 is provided with an integral upstanding cylindrical skirt 30 of the same diameter as skirt 26.

Interposed between plates 24 and 28 is a generally cylindrical collar 32 made of tough, resilient rubber or other similar material, the normal configuration of which is best shown in FIGS. 4 and 5. It is normally internally cylindrical, and fits snugly about the outer peripheries of the skirts 26 and 30 of the plates, respectively at its upper and lower ends, and its external surface is normally outwardly bowed between its upper and lower ends. The maximum normal outer diameter of the collar is slightly less than the inner diameter of flange 20 (see FIG. 4) in order that it may pass through said flange.

Embedded in recesses provided therefor in the external surface of collar 32, at regularly spaced intervals about the periphery thereof, are a series (six as shown) of lock bars 34 formed of steel or the like. Each of said lock bars extends generally vertically, conforming in contour to the normal external contour of the collar. The lower end 36 of each lock bar is contained loosely in an upwardly opening socket 38 formed therefor in lower plate 28, and each bar terminates at its upper end in spaced relation below barrel flange 20. Each lock bar is secured to the collar by a bolt stud 40 affixed thereto and extending inwardly through said collar, and a nut 42 threaded on said stud at the inner surface of said collar.

Upper plate 24 and lower plate 28 are connected by a vertical central screw 44 threaded into a central boss 46 formed on lower plate 28, and extending upwardly and rotatably through a hole 48 formed therefor in upper plate 24. Above said upper plate, said screw is provided with an axial extension 50 which is enlarged as compared to the screw, and of square cross-sectional

contour. An anti-friction washer 52 is interposed between extension 50 and plate 24. Extension 50 is provided at its upper end with a T-handle 54 rigidly affixed thereto. A tubular sleeve 56, of a length to be described, is fitted loosely about screw 44 between plates 24 and 28.

To prevent unauthorized operation of screw 44, upper plate 24 is provided with an upstanding integral lug 58 having a face 60 confronting and parallel to screw extension 50. Said lug is spaced sufficiently far from the screw to permit free rotation of the screw. However, if the screw is turned so that any face of square extension 50 thereof is parallel to face 60 of lug 58, a flat lock slide 62 may be inserted horizontally therebetween. Said slide fits snugly between these faces, and is restrained against vertical movement by plate 24 therebeneath and handle 54 thereabove. Screw 44 cannot be turned as long as the lock slide is in position. The insertion of the slide is limited by a T-head 64 formed integrally therewith at one end thereof, and its removal is prevented by a padlock 66 the hasp 68 of which may be inserted through a hole 70 formed in the end portion of the slide opposite from its T-head. Screw extension 50, lug 58, lock slide 62, handle 54, and the padlock parts may be formed of extremely hard, tough alloys, or coated with extremely hard materials such as stellite, to resist cutting, sawing, or other destruction thereof to gain unlawful entry to the safe. Also, for a similar purpose to be described, handle 54 may be weakened by a pair of grooves 72 formed in the lower surface thereof, respectively at opposite sides of screw extension 50.

In operation, it will be seen that with screw 44 turned to cause separation of plates 24 and 28 to the extent necessary to allow collar 32 to assume its normal shape, the operator may, by grasping handle 54, lower the door into position as shown in FIG. 4, lower plate 28 and collar 32 passing freely through flange 20 of barrel 6, and upper plate 24 coming to rest on the top of said flange. Handle 54 is then turned to operate screw 44 to raise plate 28 relative to plate 24. This compresses collar 32 axially, forcing it to bulge radially outwardly into extremely tight frictional engagement with both internal flange 20 of the barrel, and also with the internal wall of the barrel below said flange, as shown in FIG. 3. The motion of plates 24 and 28 toward each other is limited by sleeve 56, which is of such length as to abut firmly against plate 24 and boss 46 of plate 28 when the collar has been radially expanded to the proper degree. It is difficult for the average person to judge or "feel" by the turning of handle 54 when the collar has been expanded to the proper degree, and over-compression of the collar by turning said handle too many turns can result in permanent damage to the collar. After the screw rotation is arrested by sleeve 56, lock slide 62 and padlock 66 are applied as previously described, and the screw is thereby locked against unauthorized turning to loosen the collar.

Actually, collar 32 would in most circumstances provide an effectively secure affixation of the door in place, even in the absence of lock bars 34, and even if the interior wall of barrel 6 were smoothly cylindrical and flange 20 were absent. Packing devices including rubber expansion rings similar to collar 32 are already commonly used for supporting loads of many tons in smooth oil well casings, and perform quite effectively in this application. It is quite unlikely that an ordinary

burglar would possess the tools necessary to pull door 22 out of barrel 6 even if said barrel were smooth. Even if the burglar had such a tool as a powerful lifting jack, the only elements of the door to which such a jack could be applied are the end portions of handle 54, and these will break off due to the weakening action of grooves 72, under less lifting force than would be required to cause collar 32 to slip out of the barrel, leaving no parts to which the lifting jack could be effectively attached. Moreover, if the handle does break at grooves 72, the remaining remnant of the handle always overhangs the top surface of lock slide 62, so that the latter cannot be lifted out of place.

The holding power of the door is increased in the present device over that supplied by the friction of collar 32 alone, by at least two additional features, that is, first, the use of internal flange 20 in the barrel, and second, the combination of said flange with lock bars 37. Collar 32 of course expands outwardly under flange 20, as shown in FIG. 3, so that to pull the door free it would be necessary to overcome not only the friction applied to the barrel by the collar, but also the positive obstruction offered by the flange. In other words, the pulling force would necessarily be great enough to cause said flange to shear off the peripheral edge portion of the collar. This additional shearing load is very large with the tough rubbers which would ordinarily be used in the collar, and the holding power of the door is therefore greatly increased by use of flange 20. Also, as the collar is expanded as described, it pivots the upper ends of lock bars 34 radially outwardly to engage the interior wall of barrel 6 just below flange 20, as shown in FIG. 3. The vertical length of the lock bars is so selected that their upper ends are still disposed below flange 20 when plate 28 is elevated to expand the collar. In this position, said lock bars act as positive, rigid struts between plate 28, and flange 20, positively resisting upward removal of the door to the full limit of their strength. The holding power supplied by the lock bars is in addition to, and functionally independent of, the frictional holding power supplied by the collar, although the collar is relied on to move said lock bars to their operative positions.

The waterproof characteristics of the safe are provided by the sealing action of collar 32 against barrel 6 and its internal flange 20. Some leakage might possibly occur between the collar and the portion of the barrel below the flange, due to the presence of lock bars 34 therebetween, but the collar has continuous, unbroken contact with flange 20, so that the water seal formed thereby is complete. Anti-friction washer 52 seals the central hole 48 of plate 24.

The fireproof characteristics of the safe are derived principally from the facts that it is completely embedded in concrete, which has both good heat insulating properties and is also highly resistant to damage by ordinary fire temperatures, and that while embedded in concrete to the extreme upper end of barrel 6, door 22 is recessed well below the concrete surface. It is quite unlikely that an ordinary fire will damage either the contents of the safe, or collar 32, which is the only element of the safe itself which could be destroyed by ordinary fires. In this connection, it should be noted that even if, under unusual circumstances, collar 32 should in fact be burned, melted or otherwise destroyed by heat, lock bars 34 will remain in their outwardly tilted operative positions by gravity, whereby to maintain an

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effective locking action against unauthorized removal of the door. This is true even if the safe is installed with its axis horizontal, as in a wall since even then at least some of the lock bars will be retained in their operating positions by gravity. In this case and even with the safe vertical as illustrated, plates 24 and 28 may be referred to as the outer and inner plates of the door, rather than the upper and lower plates. Even after such fire damage, authorized removal of the door is still possible despite the fact that lock bars 34 cannot be retracted to their inoperative positions by loosening screw 44 to allow collar 32 to resume its normal shape, as in ordinary operation. This emergency removal of the door can be accomplished by first removing padlock 66 and lock slide 62, turning screw 44 to disengage it completely from plate 28, lifting plate 24 free, and finally reaching through flange 20 to free and remove plate 28. This removal procedure can also be used whenever for any reason, such as the unlikely permanent deformation of collar 32 or bending of lock bars 34, the door cannot be removed in the usual manner.

While I have shown and described a specific embodiment of my invention, it will be readily apparent that many minor changes of structure and operation could be made without departing from the spirit of the invention.

What I claim as new and desire to protect by Letters Patent is:

1. A safe comprising:
 - a. a hollow body member,
 - b. a generally cylindrical open-ended barrel affixed to and providing access to said body member,
 - c. a closure door insertable into and fixable in said barrel to lock said safe, said closure door comprising:
 1. rigid, circular inner and outer plates coaxial with

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- each other in axially spaced apart relation and insertable into said barrel coaxially therewith,
2. a generally cylindrical collar of resiliently compressible material carried coaxially between said plates and having a normal external diameter sufficiently small to enter said barrel,
3. operating means carried by said plates and operable to draw said plates closer together whereby said collar is axially compressed and radially expanded into tight frictional engagement with the interior wall of said barrel,
4. locking means operable to secure said operating means against unauthorized actuation,
- d. an internal peripheral flange fixed in said barrel, the diameter of said inner plate and the normal diameter of said collar being sufficiently small to pass through said flange,
- e. means limiting the insertion of said door into said barrel whereby said collar extends inwardly from said flange and said inner plate is spaced inwardly from said flange, and
- f. a plurality of locking bars attached to said collar at angularly spaced intervals about the periphery thereof, each of said locking bars constituting a rigid strut normally embedded in the external surface of said collar and extending generally parallel to the axis of the door, the inner end of each bar being engaged in a socket formed therefor in the outer face of said inner plate to permit radial pivotal movement of said bar, and the outer end of each of said bars terminating in spaced relation from the inner face of said flange, whereby as said collar is radially expanded, the outer ends of said bars are moved radially outwardly into opposed relation to the inner face of said flange.

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