Feb. 21, 1939. P. BESCHERER 2,148,008

DOOR STRUCTURE

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Fig. 1

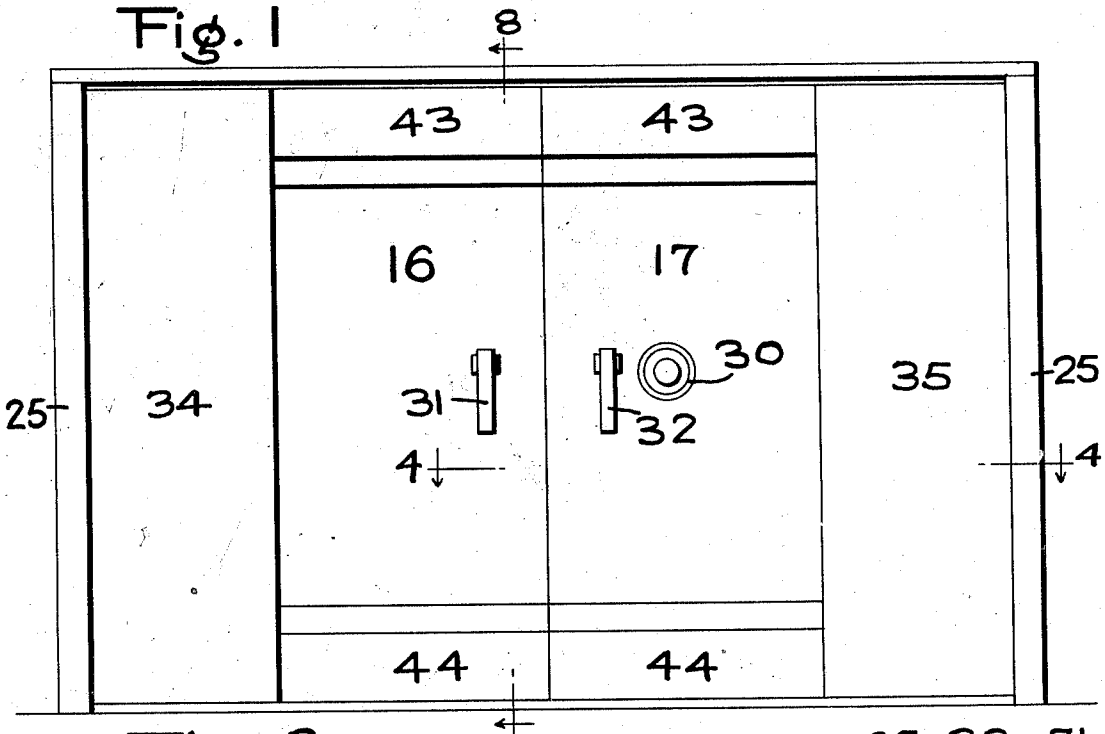
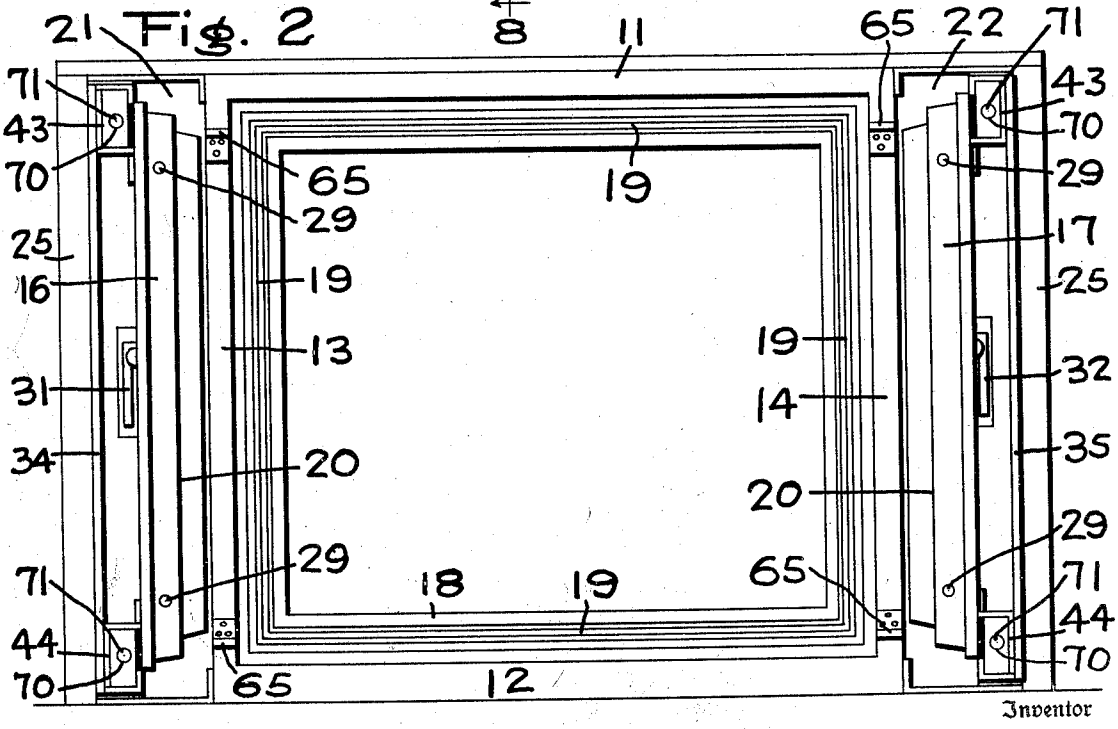


Fig. 2



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DOOR STRUCTURE

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Fig. 3

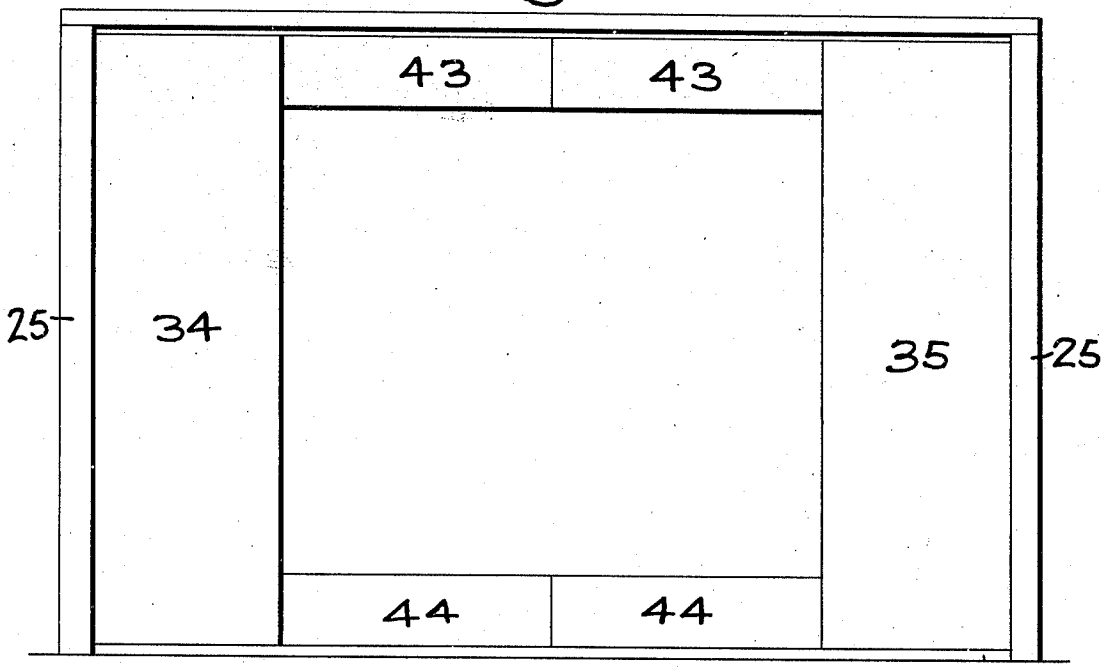
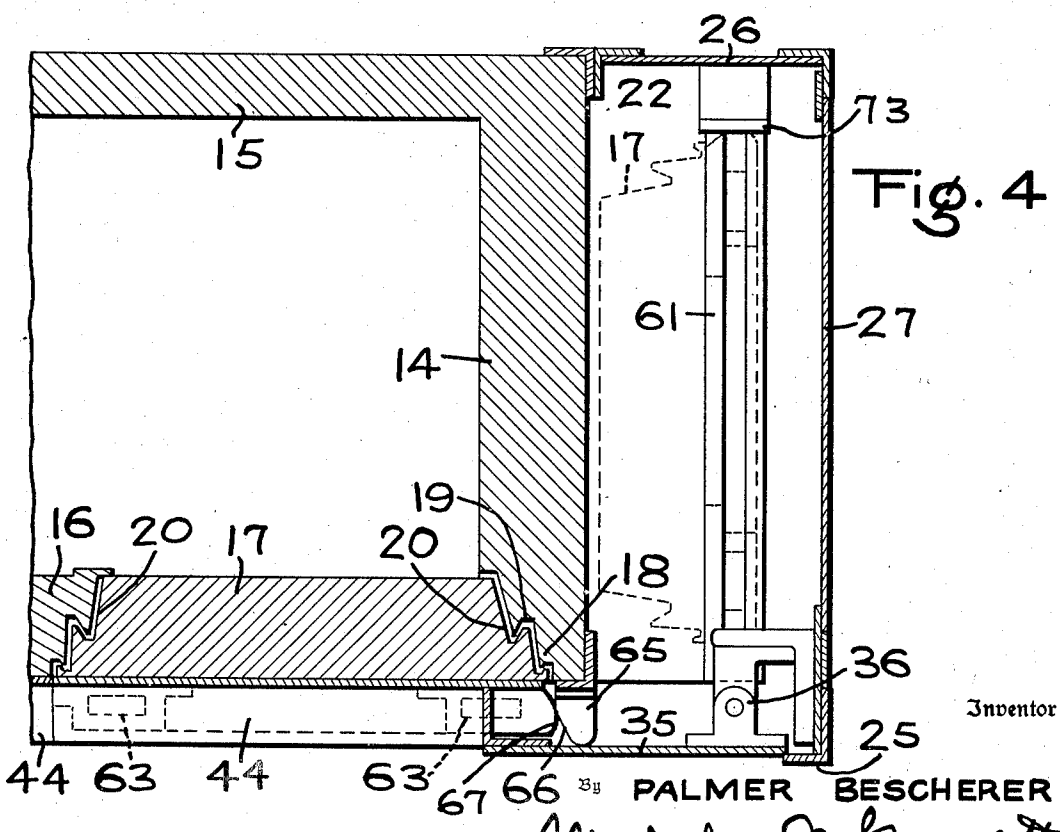


Fig. 4



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DOOR STRUCTURE

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Fig. 5

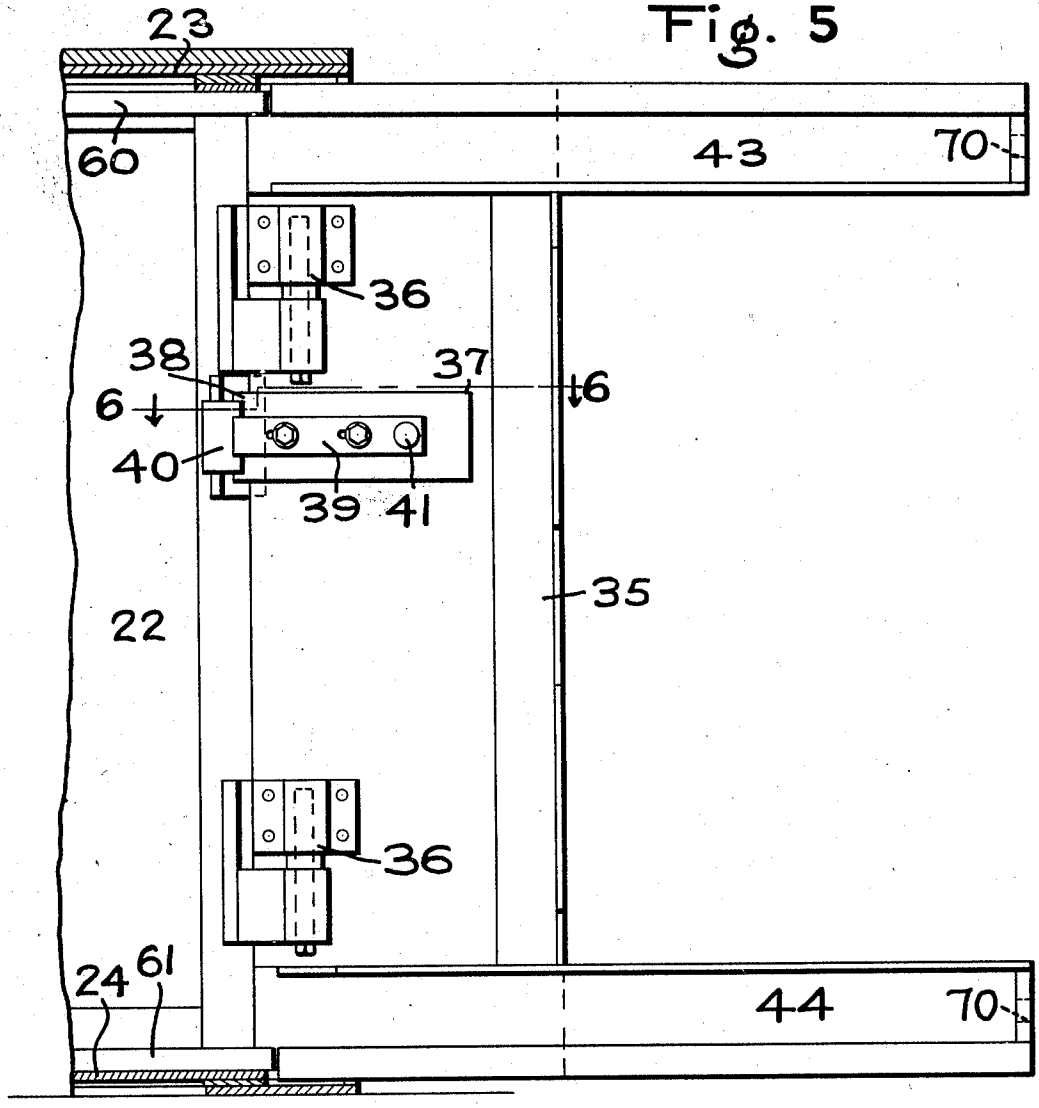
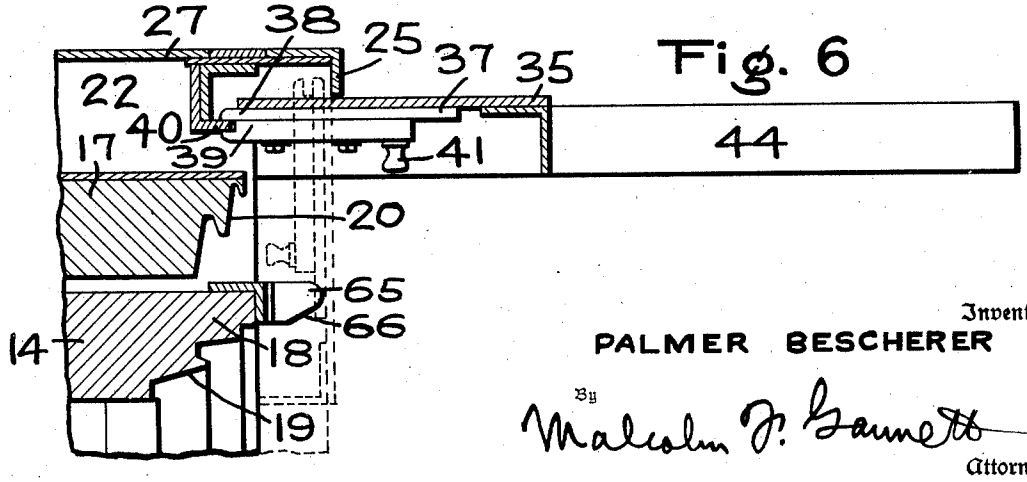


Fig. 6



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DOOR STRUCTURE

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Fig. 7

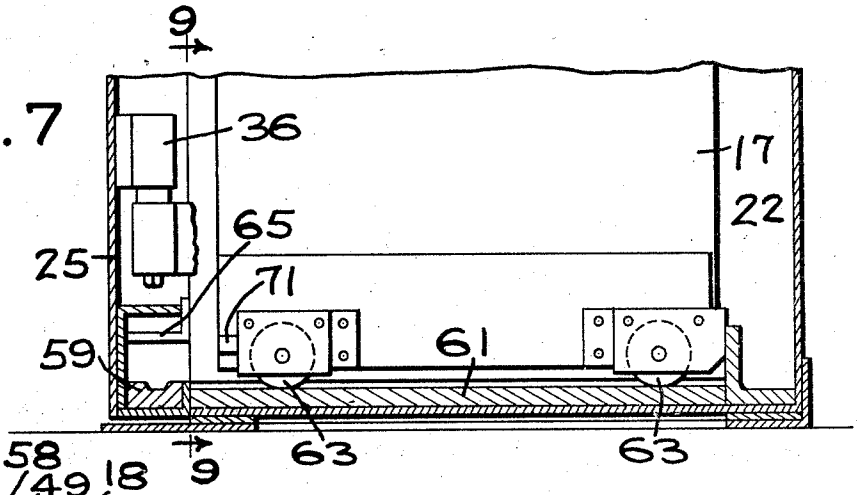


Fig. 8

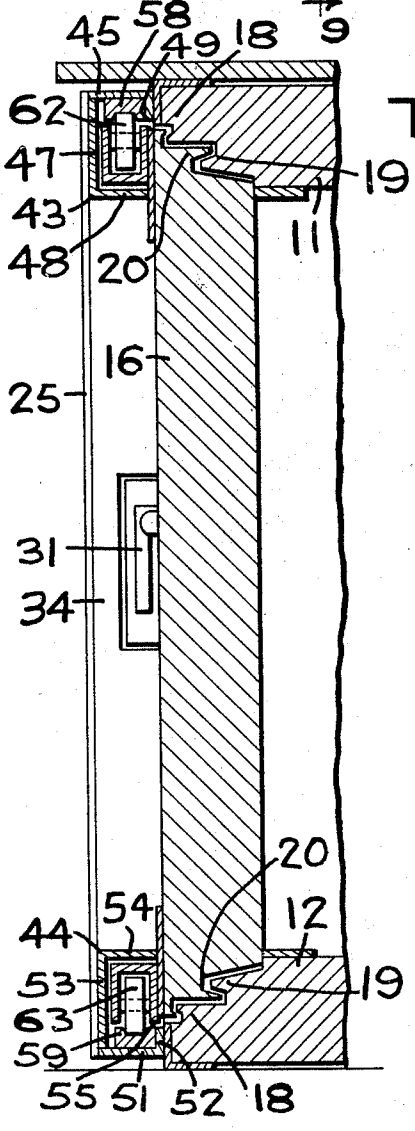
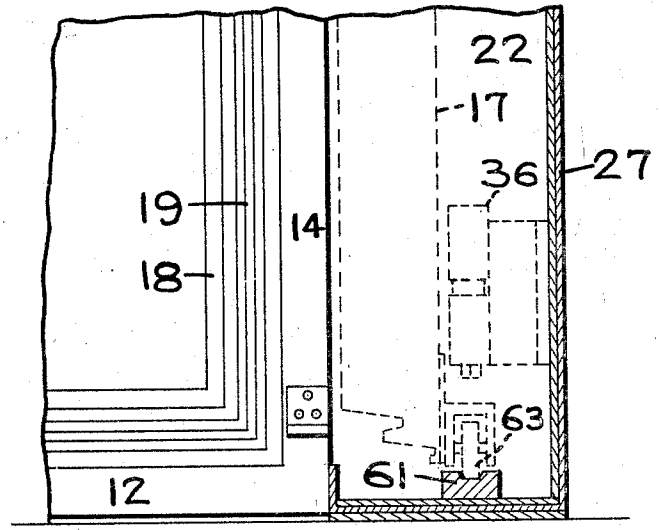


Fig. 9



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UNITED STATES PATENT OFFICE

2,148,008

DOOR STRUCTURE

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Application October 12, 1937, Serial No. 168,563

3 Claims. (Cl. 109—70)

This invention relates to a door construction adapted for use in installations where doors are turned about a vertical axis.

An object of the invention is to provide an improved door construction in which the closure elements are capable of being moved from closed to open position and vice versa by mechanism so designed and associated with the closure elements that swinging movements of the closure elements through desired angles can be easily effected without the use of fixed hinges or similar pivotal elements fastened to the closure elements.

Another object of the invention is to provide an improved door construction in which the closure elements of the door are operatively associated with swinging carriers in such a manner that the closure elements will be concealed from view when in open position and disassociated entirely from the carriers, the latter being adapted to be positioned in front of the door opening and constitute a frame therefor.

With the foregoing and other objects and advantages in view, the invention consists in the construction and arrangement of the several parts which will be hereinafter more fully described and claimed.

In the accompanying drawings:

Figure 1 is a front elevation of a safe constructed according to the present invention, the parts being in closed position;

Fig. 2 is a front elevation of the safe showing the closure elements in their respective pockets at the ends of the safe and the carriers for the closure elements in open position;

Fig. 3 is a front elevation of the safe with all parts of the door structure in open position;

Fig. 4 is a horizontal section taken on the line 4—4 of Fig. 1 and indicating by dotted lines the position of one of the closure elements when the parts are in the position shown in Fig. 3;

Fig. 5 is a detail vertical section of one of the ends of the safe with the carrier shown in the position illustrated in Fig. 2;

Fig. 6 is a detail horizontal section taken on the line 6—6 of Fig. 5 showing the locking mechanism for the carrier;

Fig. 7 is a detail vertical section of one end portion of the safe showing one of the closure elements therein;

Fig. 8 is a vertical section taken on the line 8—8 of Fig. 1; and

Fig. 9 is a detail vertical section of a portion of one end of the safe, taken on the line 9—9 of Fig. 7, the closure element and hinge structure being shown by dotted lines.

Since among its various uses the invention is applicable to safes and vaults, in the instant case, the invention has been shown applied to a safe of well-known construction and comprising a top 11, a bottom 12, end walls 13 and 14, a rear wall 15, and a front door frame 18.

For closing the front of the safe, one or more closure elements may be utilized, two closure elements 16 and 17 being shown.

The door frame 18 and the closure elements 16 and 17 may be, respectively, formed with interfitting tongue and grooved portions 19 and 20, so that when the safe is closed there is no direct passageway for heat or flames to the interior of the safe between the closure elements and the door frame 18.

The tonguing and grooving of the frame 18 and the closure elements 16 and 17, may be of any usual arrangement, and the closure elements may be provided with any usual bolt-work, indicated generally by 29, and controlled in a usual manner by a lock which may be a combination lock 30, as shown in Fig. 1. Also the closure elements 16 and 17 are provided with handles 31 and 32, respectively.

In accordance with the present invention, adjacent the end walls 13 and 14, the safe is formed with chambers or pockets 21 and 22, respectively, into which are adapted to be positioned the closure members 16 and 17, respectively, when the safe is open.

Each chamber or pocket has a top 23, a bottom 24, a front wall 25, a rear wall 26, and an outer side or end wall 27. The end walls 13 and 14 of the safe constitute the inner side or end walls of the chambers or pockets 21 and 22, respectively, as shown in Fig. 2.

Since the walls of said chambers or pockets serve merely as means for enclosing the closure elements 16 and 17, such walls can be constructed from light plate and structural steel members, which are suitably united together and attached to the main body of the safe in any desired manner, such as by welding.

Operatively associated with the closure elements 16 and 17 are carriers 34 and 35, respectively. These carriers are adapted to support the closure elements in the manner to be hereinafter more fully described.

Each carrier comprises a vertically disposed main body portion which is pivotally connected to the outer front corner portion of the chambers or pockets 21 and 22, by hinges 36, disposed respectively near the top and bottom of each car-

rier, as shown best in Fig. 5. The construction of the hinges 36 is such that the carriers are capable of being swung outwardly from a position alongside of the front of the safe to a position approximately at right angles thereto, as shown in Fig. 6, and vice versa.

In order to retain each carrier in the outer position, a suitable locking mechanism is utilized, such locking mechanism comprising, in the instant case, a manually operable latch 37 mounted on the carrier and having a fixed portion 38 and a notched retractable portion 39 which are adapted to engage with a tongue 40 carried by the end wall 27, in the manner shown in Figs. 5 and 6. The retractable portion 39 of the latch carries an operating knob 41, so that the portion 39 can be moved out of engagement with the tongue 40 to thereby release the carrier and permti swinging movement thereof towards the front of the safe. When the fixed portion 38 of the latch engages the tongue 40 when the carrier is swung outwardly, the swinging movement of the carrier will be arrested, and at the same time, the retractable portion 39 of the latch will, due to the shape of its inner end, ride over the tongue and then snap into the position shown in Fig. 6, thereby preventing inward swinging movement of the carrier until the latch is first released.

Projecting from the upper and lower portions of each carrier are arms 43 and 44. These arms have such a length that when the carriers are positioned in front of the safe and in engagement with the front wall thereof, the extremities of the arms meet, as shown in Fig. 4.

Each carrier arm is of tubular construction and rectangular in cross section, as shown in Fig. 8.

The arms 43 are formed with an upper wall 45, an inner wall 46, an outer wall 47 and a bottom wall 48. The inner wall 46 extends only a short distance from the upper wall 45, so as to leave an open space or elongated slot 49 on the inside of the arms 43, for a purpose to be hereinafter described.

The arms 44 are formed with a bottom wall 51, an inner wall 52, an outer wall 53 and a top wall 54, the inner wall 52 only extending upwardly a short distance from the bottom 51, so as to provide an open space or elongated slot 55 on the inside of the arms 44.

As shown in Figs. 1, 3, 4 and 6, the main body of each carrier 34 and 35 comprises a sheet of plate steel, and this portion of the carrier has a width sufficient to extend from a point adjacent the inner edge of the front wall portion 25 of the safe to a point adjacent the inner surfaces of the end walls 13 and 14 of the safe, so that when the carriers are positioned against the front wall of the safe, the front edges of the door openings and the front of the chambers or pockets 21 and 22 will be closed, as shown in Fig. 3. Since the arms 43 and 44 constitute means for supporting the closure elements 16 and 17 when the latter are being transferred from one part of the safe to another, said arms extend inwardly of the inner surface of the main body portion of each carrier a suitable distance, as shown best in Fig. 5.

Mounted in the arms 43 and supported from the upper wall 45 thereof, is a grooved track 58.

The bottom wall 51 of the carrier arm 44 supports a grooved track 59.

The top and bottom of the chambers or pockets 21 and 22 also support grooved tracks 60 and 61, respectively, as shown in Figs. 5, 7 and 9.

The tracks 58, 59, 60 and 61 may be formed of suitable lengths of bar metal, the tracks 58 and 59 having a length substantially equivalent to the length of the arms 43 and 44 (see Fig. 5) so that when the carriers are positioned in the manner shown in Figs. 5 and 6, the inner ends of the tracks 58 and 59 will approximately abut the outer ends of the tracks 60 and 61, to thereby form a continuous track.

Carried by the upper portions of the closure elements 16 and 17 are spaced wheels 62 which are adapted to roll in the tracks 58 and 60, and carried by the lower portions of said closure elements are spaced wheels 63 which are adapted to roll in the tracks 59 and 61 (see Figs. 7 and 8).

Fixed to the front portion of the safe adjacent to the door frame 18, are heels 65, each having a cam surface 66 adapted to cooperate with the adjacent end portion 67 of the closure elements 16 and 17 when the closure elements are being moved towards closed position, so that the tongue and grooved portions 20 will be correctly positioned with respect to the tongue and grooved portions 19 to enable quick and easy interfitting movements of the closure elements in the door frame 18 (see Fig. 4).

As shown in Fig. 2 the ends of the carrier arms are formed with openings 70 which are adapted to receive pins 71 on the ends of the closure elements 16 and 17. This construction limits the outward movement of the closure elements in the carriers and when the pins 71 are disposed in the openings 70, lateral displacement of the closure elements with respect to the carriers will be prevented.

As shown in Fig. 7, the pins 71 do not project beyond the front edges of the closure elements, the extremities of the carrier arms being constructed in the manner shown in Fig. 2 to permit positioning the pins 71 in the openings 70 in such a manner that the front edges of the closure elements aline substantially with the outer ends of the carrier arms, (see Fig. 1).

At each end of the tracks 61 there is a stop 73 for the purpose of limiting the inward movement of the closure elements (see Figs. 4 and 7).

In operation, when the closure elements are in the closed position shown in Figs. 1 and 4, the carriers 34 and 35 will be in the position in which the chambers or pockets 21 and 22 are closed.

When it is desired to open the safe, after the locking mechanism 30 has been released, the door handles 31 and 32 are operated to release the bolt-work 29.

The closure elements and their respective carriers are next swung outwardly to the position shown in Figs. 2 and 6. In this position, latch 37 will lock its carrier in fixed position, in which the tracks of the carriers will aline with the tracks in the chambers or pockets 21 and 22.

Each closure element is then moved manually into its respective chamber or pocket, the inward movement of the closure elements being arrested when the inner ends thereof abut the stops 73.

After the closure elements have been thus disposed in the chambers or pockets, the latches 37 are operated to release the carriers 34 and 35, so that said carriers can be swung inwardly against the front of the safe, to the position shown in Fig. 3.

In this way, the closure elements can be quickly transferred from a position in front of the safe to a position alongside of the end walls of the safe, and the carriers which support the closure elements in their closed and swinging positions can

be positioned in front of the safe so as to frame the front thereof. In the latter position of the carriers the closure elements are entirely disassociated from the carriers.

When it is desired to close the front of the safe, the carriers are first swung outwardly to the position shown in Fig. 6. The closure elements are then pulled out of the chambers or pockets onto the carriers, and then the carriers, with the closure elements therein are swung inwardly against the front of the safe, the registering of said closure elements with the door frame being effected by the action of the end portions 67 moving along the cam surfaces 66 of the guide members or heels 65. When the closure elements have thus been positioned within the door frame 18, the handles 31 and 32 can be manipulated to set the bolt-work 28, and the combination lock 30 operated to lock the closure elements in position, as shown in Fig. 1.

Having thus described my invention, what I claim is:

1. A door structure comprising a walled structure having a door frame, a chamber at one end of the structure and separated therefrom by a wall, a carrier having pivotal connection with a wall of said chamber and movable outwardly from a position in front of said door frame to a position paralleling the outer end wall of said chamber, a closure element slidably mounted in said carrier and adapted to fit within said door frame when said carrier is positioned adjacent thereto, and means within said chamber for supporting said closure element when the closure element is slid from the carrier into said chamber, said carrier being movable to a position in front of the door frame when the closure element is disposed within said chamber.

2. A door structure comprising a walled structure having a front door frame, a chamber at one end of the structure and separated therefrom by an end wall, a carrier pivotally connected to the outer wall of said chamber and movable outwardly from a position in front of said door frame to a position paralleling the outer end wall of said chamber, a closure element adapted to fit within said door frame to close the front of said walled structure, upper and lower horizontally disposed tracks mounted in said carrier, wheels carried by said closure element for engaging said tracks whereby said closure element is slidable in said carrier, upper and lower horizontally disposed tracks mounted within said chamber in alinement with the carrier tracks when the carrier is positioned parallel to the outer end wall of said chamber, said closure element being transferable from said carrier to said chamber when the respective tracks are alined, and said carrier being movable back to position adjacent the door frame independently of said closure element.

3. A door structure comprising a walled structure having a front door frame, a chamber at one end of the structure and separated therefrom by a vertical wall, a carrier having pivotal connection with said structure and movable from a position in front of said door frame to a position paralleling the outer end wall of said chamber, said carrier having means for closing the front of said chamber when the carrier is disposed adjacent the front door frame, and a closure element for said door frame slidably mounted in said carrier and transferable from the carrier to said chamber, whereby said carrier can be disposed adjacent to the door frame independently of said closure element.

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