Feb. 11, 1969 L. W. HEYL ETAL 3,426,707

SECURITY FILE

Filed Sept. 9, 1966 Sheet 1 of 5

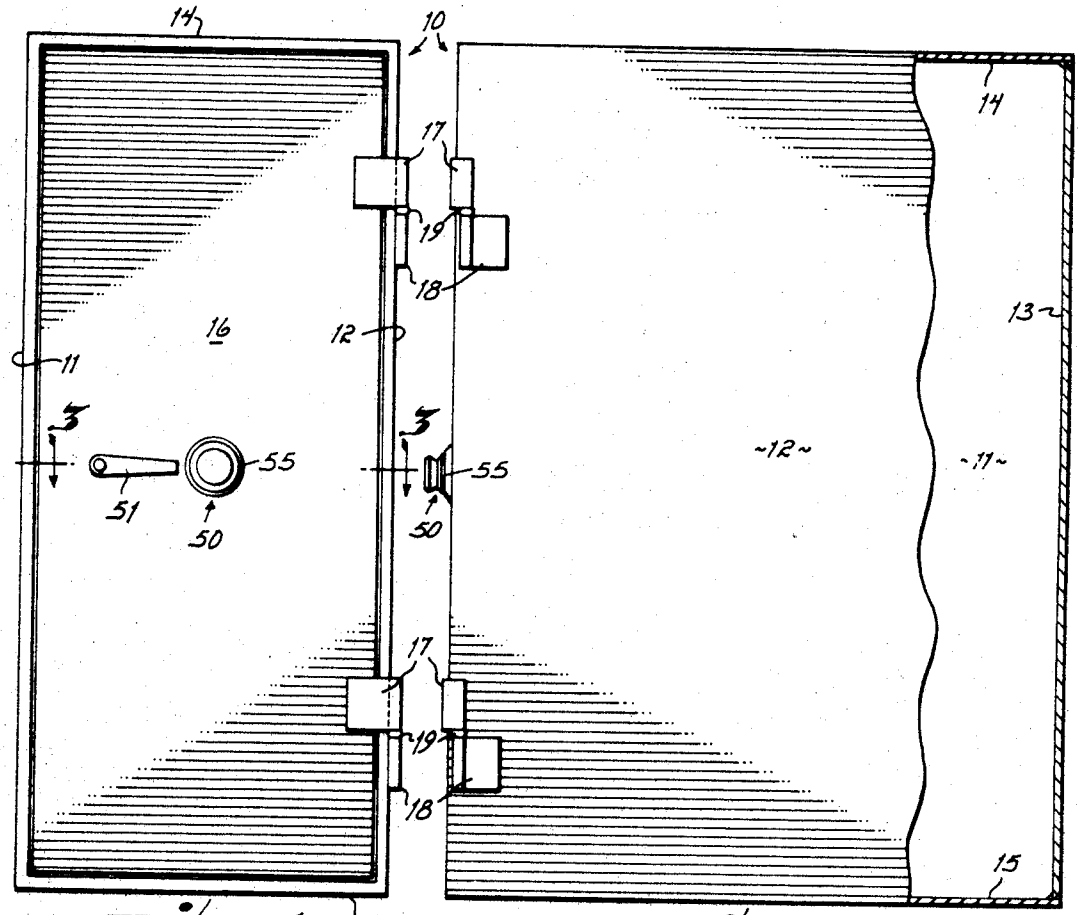


Fig. 1

Fig. 2

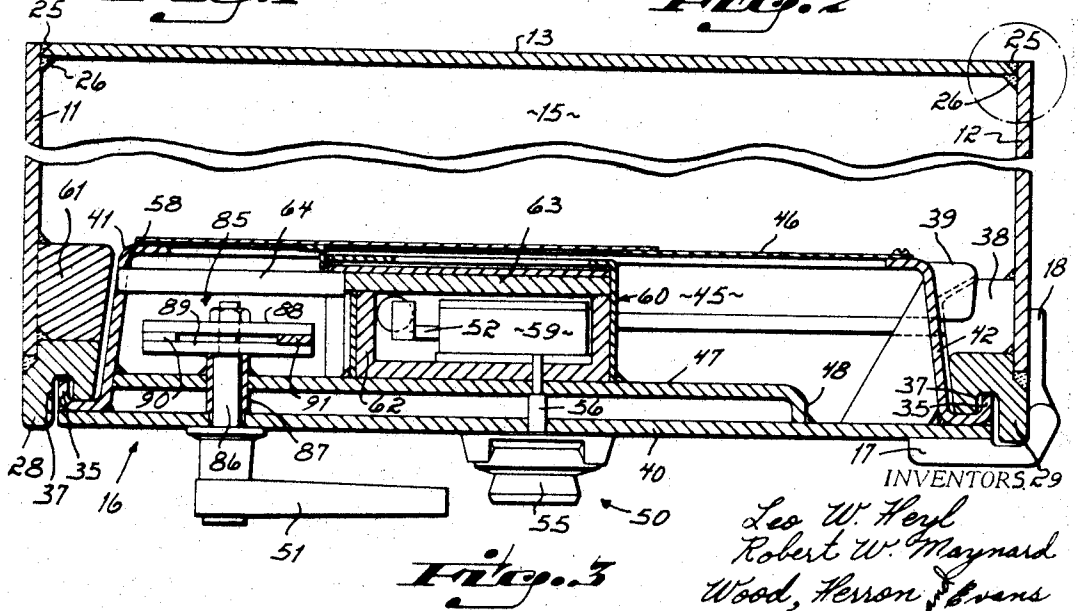


Fig. 3

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SECURITY FILE

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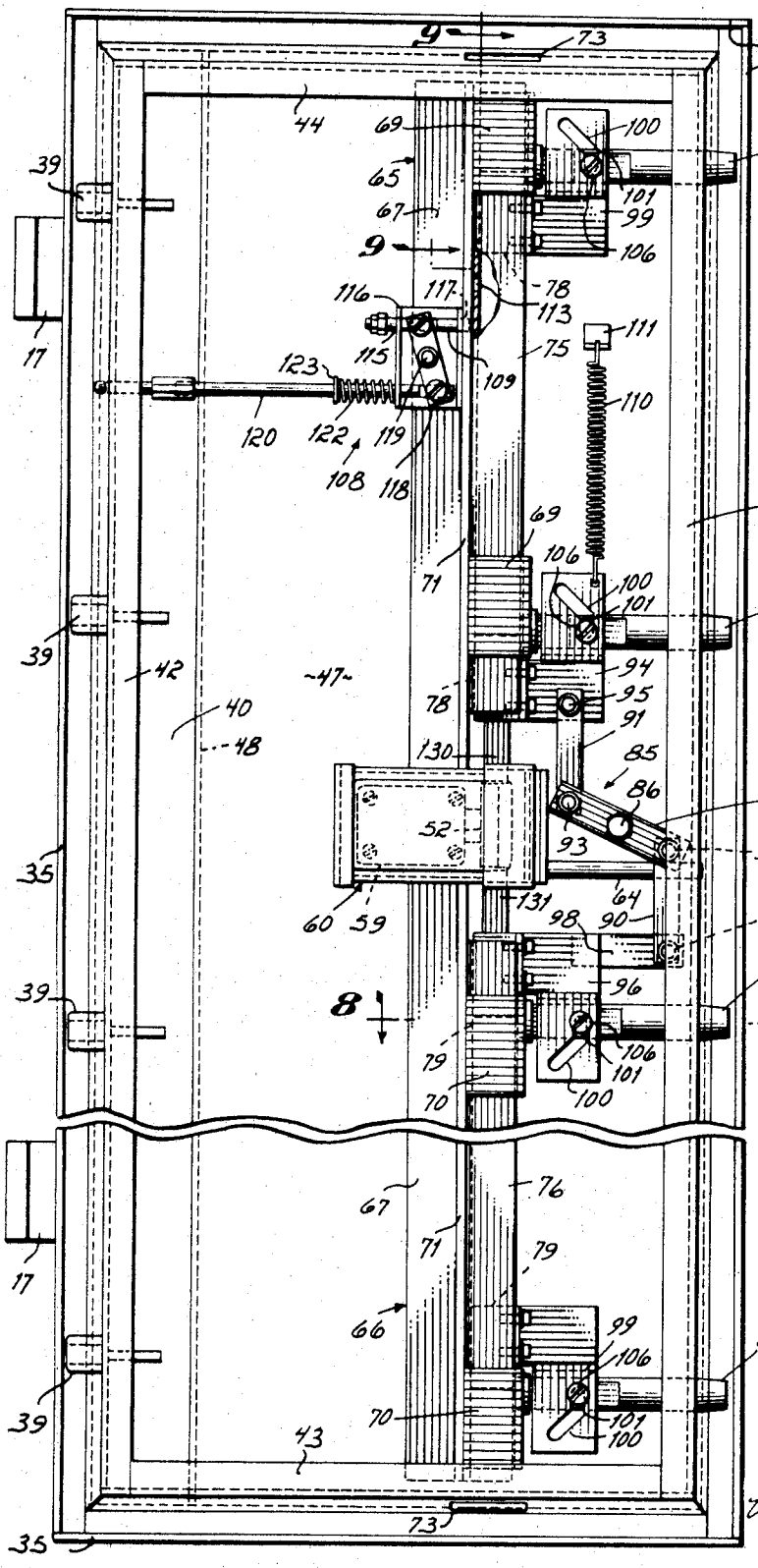


Fig. 4

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SECURITY FILE

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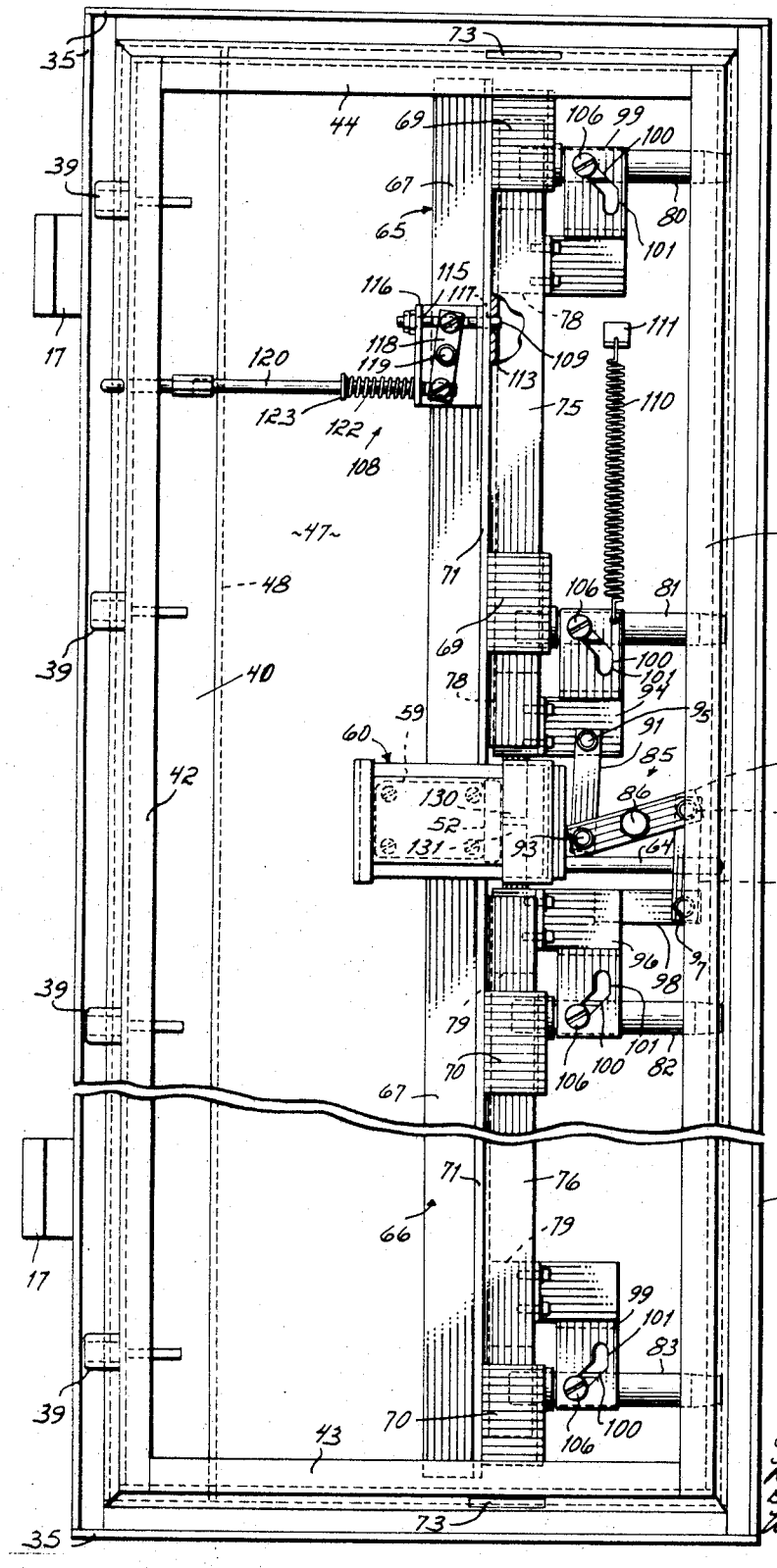


Fig. 5

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Sheet 4 of 5

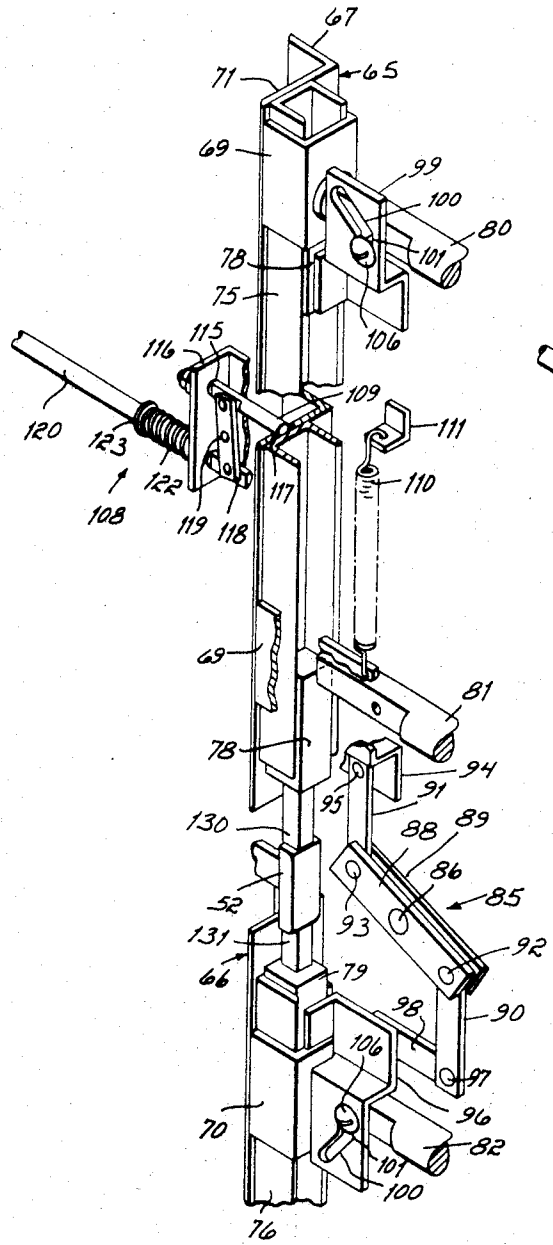


Fig. 6

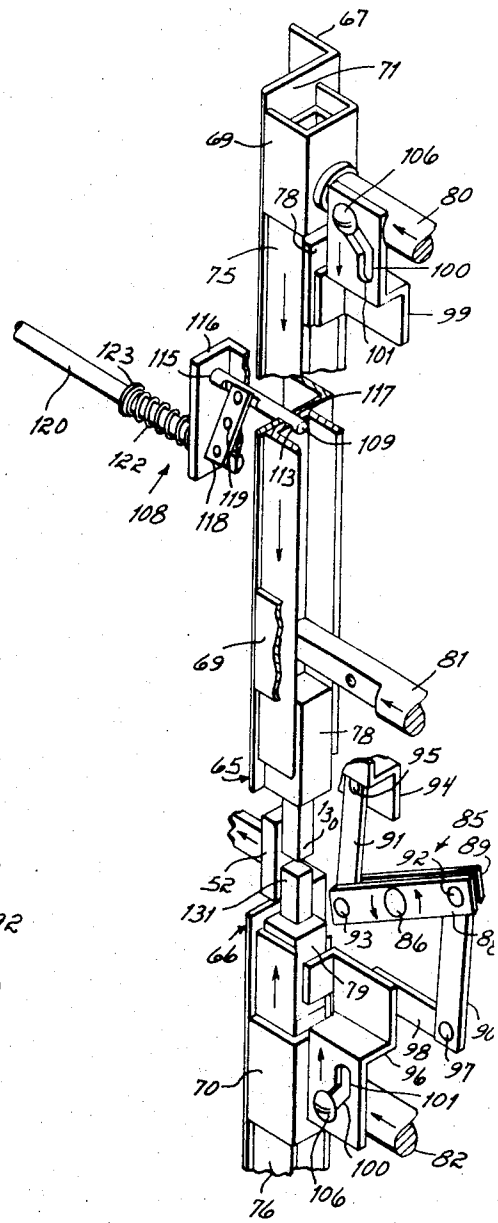


Fig. 7

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Sheet 5 of 5

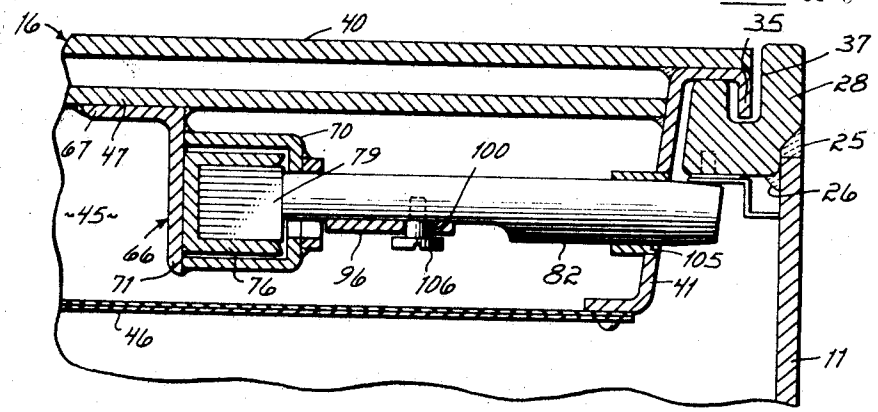


Fig. 8

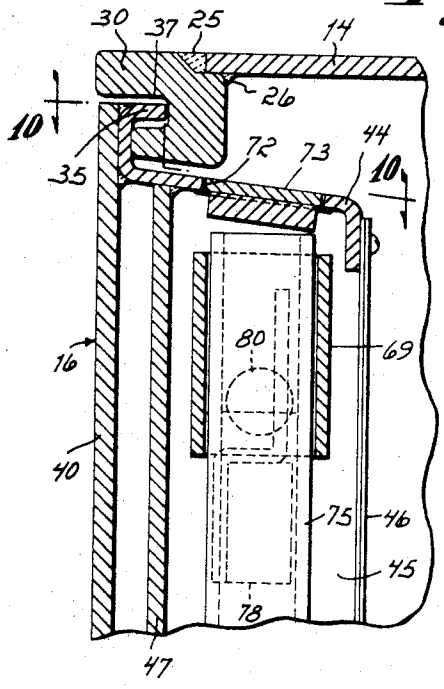


Fig. 9

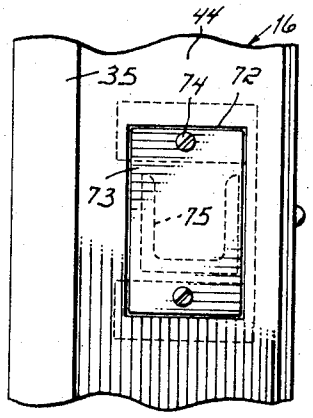


Fig. 10

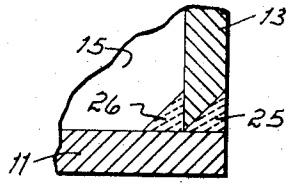


Fig. 11

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SECURITY FILE

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Filed Sept. 9, 1966, Ser. No. 578,277
U.S. Cl. 109—59 8 Claims
Int. Cl. E05g 1/04; E05b 65/52, 63/00

ABSTRACT OF THE DISCLOSURE

A security file for resisting both forced and surreptitious entry. To secure the door of the file, a locking mechanism is attached thereto which comprises a pair of vertically movable lock bars, laterally movable door bolts, and a lock bolt movable between the lock bars when they are extended and the door is locked to prevent the lock bars from being moved together upon a forced entry. To unlock the door, the lock bolt is moved out of longitudinal alignment with the lock bars so that they are free to be moved together into endwise juxtaposition.

This invention relates to a safe and, more particularly, to a file cabinet type of record safe.

Safes are classified by the U.S. Government in accordance with the degree of security which they afford. Class 5 safes, the class with which this invention is primarily concerned, are expected to withstand a thirty minute surreptitious entry attempt and a ten minute forced entry attempt. This invention is primarily concerned with resistance to forced entry attack.

It has been a primary objective of this invention to provide a record safe cabinet which successfully resists forceful attack methods for a period of time in excess of the duration specified for a class 5 security file.

Another objective of the invention has been to provide a security file cabinet structure which is inexpensive to manufacture and has improved strength characteristics.

One aspect of this invention is predicated upon the discovery that a welded safe cabinet having a combination fillet and butt welded corner structure has greater strength, and thus resistance to forceful attack, than a conventional butt welded gusset reinforced corner. Prior to this invention, it has been the practice in the manufacture of safes to butt weld the exterior plates of the safe and to reinforce the corner with gussets welded or otherwise secured in the interior of the corner. We have found that greater strength is derived from butt welding the exterior of the safe corner and fillet welding the interior of the corner. An incidental benefit derived from this latter construction is the lack of a protrusion in the form of a gusset into the interior of the safe which necessarily restricts interior space and mars the interior appearance.

Another aspect of this invention concerns the boltwork for locking the door of the safe. This boltwork comprises a series of movable parts, all of which are so interrelated that a forced entry into the safe requires one of the parts to be compromised by overcoming the compressive strength of that part. In other words, boltwork is so interconnected that all parts are placed in compression during an attempt to forcefully compromise the locked safe. This construction thus takes advantage of the maximum strength characteristic of the component parts of the boltwork in contrast to other systems which rely upon the tension, shear, or bending strength of the boltwork to resist forced entry.

Briefly, the inventive boltwork of this invention comprises a pair of vertically movable bars operable when separated by actuation of a door handle to move the door bolts into locked position, and when moved into endwise juxtaposition, to cause the bolts to be moved into unlocked condition. A bolt of a combination lock is movable between the separated vertical bars so as to secure them against movement into endwise juxtaposition except after proper manipulation of the lock. In order to prevent the door bolts from being forced inwardly from the extended or locked position, the vertical bars carry blocking elements which are movable between a fixed or stationary part of the door and the extended bolts.

The primary advantage of this boltwork is that it precludes the door bolts from being pounded or forced into the locked door by placing blocking elements between the extended bolts and a stationary part of the door. Additionally, forceful entry cannot be gained by forcing the vertical bars inwardly because of the placement of the bolt of the combination lock between the extended bars. Thus, forced entry of the safe by compromising the boltwork requires that one of these boltwork elements be compressed or attacked in compression.

These and other objects and advantages of this invention will be more readily apparent from the following description of the drawings in which:

FIGURE 1 is a front elevational view of a security file incorporating the invention of this application,

FIGURE 2 is a side elevational view of the safe of FIGURE 1,

FIGURE 3 is a cross-sectional view taken along the line 3—3 of FIGURE 1,

FIGURE 4 is a rear elevational view of the door with the back plate removed and illustrating the door in the locked condition,

FIGURE 5 is a view identical to FIGURE 4 but with the door in the unlocked condition,

FIGURE 6 is a perspective view of the boltwork of the door in a locked condition,

FIGURE 7 is a view similar to FIGURE 6 but with the boltwork in an unlocked condition,

FIGURE 8 is a cross-sectional view taken along line 8—8 of FIGURE 4,

FIGURE 9 is a cross-sectional view taken along line 9—9 of FIGURE 4,

FIGURE 10 is a cross-sectional view taken along line 10—10 of FIGURE 9,

FIGURE 11 is an enlarged cross-sectional view of the encircled portion of FIGURE 3.

Referring first to FIGURES 1 and 2, it will be seen that the security file of this invention comprises a cabinet or enclosure **10** made from welded plates which define side walls **11**, **12**, a rear wall **13**, a top wall **14**, and a bottom wall **15**. A door **16** is pivotally supported from the side plate **12** by a pair of hinges **17** which comprise hinge plates **18** welded to the door **16** and side plate **12**, respectively, and interconnected by hinge pins **19**.

As may be seen most clearly in FIGURES 2, 3, and 11, the side plates **12**, rear plate **13**, top plate **14**, and bottom plate **15** are secured together by weldments to form the complete cabinet enclosure. Each of these weldments comprises a pair of continuous welds, a butt weld **25** along

the exterior edge of each corner joint and a fillet weld **26** along the inside of each of the corner joints. Each weldment, including both the butt and fillet weld extends for the full length of each side of each plate. It has been found that a combination butt and fillet weld which extends for the full length of the seam or side edge produces a corner assembly which is much stronger and resistant to forced entry than prior art assemblies which typically comprise a butt welded edge reinforced by a gusset plate inside the corner.

Referring to FIGURES 3, 8, and 9, it will be seen that the door jamb of the cabinet is defined by steel door jamb bars **28**, **29**, and **30** which extend around the periphery of the door opening of the cabinet. (The door jamb bar for the bottom of the door is not shown in the drawings.) A recess or groove **37** in the front of each bar **28**, **29**, **30**, and the bottom bar accommodates an interfitting or interlocking front edge **35** of the door **16** when the door is closed.

The door jamb bar **29** on the hinged side of the door has a series of blocks **38** (FIGURE 3) attached to the rear side thereof which define recesses for the accommodation of dead bolts **39** attached to the hinged side of the door. The dead bolts **39** prevent unauthorized opening of the door by simply removing the hinges and pulling the door forward.

As may be seen most clearly in FIGURES 3, 4, 8 and 9, the door **16** comprises a front plate **40** upon the rear of which are mounted a pair of generally Z-shaped side channels **41**, **42**, bottom channel **43**, and top channel **44**. These channels **41**, **42**, **43**, and **44**, together with the front plate **40**, define a lock mechanism housing or chamber **45**, the rear of which is enclosed by a removable rear door panel **46**.

A mounting plate **47** is attached to the rear of the front door plate **40** in spaced relation thereto. One vertical edge **48** of this mounting plate **47** is bent forwardly and welded to the rear side of the front plate **40** while the opposite vertical edge is welded to the side channel **41**.

Opening and closing of the door **16** is controlled by a combination lock **50** and a door handle **51**. A shaft **56** of the lock extends through the front plate **40** and mounting plate **47** to connect the dial **55** of the lock **50** to the combination lock mechanism **59**. The lock mechanism **59** is mounted on the rear of the mounting plate **47** within a sheet metal enclosure **60** which has a liner **62** made from conventional drill resistant material. This liner **62** includes a removable cover **63** which is laterally slidable in the direction of the hinged side of the door to open the enclosure and render the lock mechanism **59** accessible for purposes of changing the lock combination. To prevent the cover **63** from ever being opened when the door is closed and locked, as for example after drilling a hole in the rear wall **13** of the file, a blocking pin **64** extends between the edge of the cover and an abutment block **61** welded to the side wall **11** of the file behind the door jamb bar **28**. This pin **64** extends through and is slidable within an aperture **58** in the side channel **41** of the door to allow the cover **63** of the enclosure to be opened when the door is standing open.

The boltwork, which is pictured in perspective in the locked condition in FIGURE 6 and unlocked condition in FIGURE 7, is mounted interiorly of the door chamber **45** upon a pair of L-shaped channels **65**, **66**. One leg **67** of each of these channels **65**, **66** is welded to the rear of the door mounting plate **47**. Each of these channels **65**, **66** supports a pair of U-shaped guide channels **69** and **70**, the open ends of which are welded to the rearwardly extending leg **71** of the channels **65**, **66** to form a rectangular guideway for reception of a pair of vertically movable bars **75**, **76**. The bars **75**, **76** comprise U-shaped channels within which are welded spaced blocking elements **78** and **79**. These blocking elements **78**, **79** function to preclude forced inward or unlocking movement of the door bolts **80**, **81**, **82**, and **83** when the door is locked, as is explained more fully hereinafter.

In order to permit assembly of the vertically movable bars **75**, **76** within the guideways defined by the guide channels **69** and **70**, both the bottom and top channels **43** and **44** of the door are provided with apertures **71** through which the bars **75**, **76** are insertable into the interior **45** of the door. The apertures **70** are closed by caps **73** secured to the door channels **43**, **44** by screws **74** (see FIGURE 10).

Vertical movement of the bars **75**, **76** is controlled from the door handle **51** by a linkage system indicated generally by the numeral **85**. This linkage system comprises a handle shaft **86** which extends inwardly from the door handle **51** through a bushing **87** mounted within and extending through the front plate **40** and the door mounting plate **47**. The inner end of this shaft **86** is nonrotatably secured to a pair of spaced, generally horizontal, linkage elements **88**, **89** between which a pair of vertical linkage elements **90**, **91** are pivotally secured by pivot shafts **92**, **93** respectively. As may be seen most clearly in FIGURES 6 and 7, rotational movement of the handle shaft **86** and thus of the connected linkage elements **88**, **89** effects vertical movement of the linkage elements **90**, **91**.

The upper end of the vertical linkage element **91** is pivotally secured to a cam plate **94** by a pivot pin **95** and similarly, the lower end of the vertical linkage element **90** is pivotally secured to a cam plate **96** by a pivot pin **97** and horizontal link **98**. The link **98** is welded to the cam plate **96** and forms a horizontal extension thereof. Thus the vertical link **90** is effectively pivotally secured to the cam plate **96**.

The cam plates **94**, **96** are welded to the vertically movable bars **75**, **76** respectively such that vertical movement of the cam plates **94**, **96** as a consequence of rotational movement of the handle **51** effects vertical movement of the bars **75**, **76**.

A second pair of cam plates **99—99** are welded to the bars **75** and **76** near the top and bottom.

All of the cam plates **94**, **96** and **99—99** are provided with a cam slot **100** which is angulated at approximately 45° relative to a horizontal plane through the slot. The slots **100** in the upper pair of cam plates **94** and **99** have a vertical extension **101** at the lower end and similarly, the slots **100** in the lower pair of cam plates **96**, **99** have a vertical extension **101** at the upper end. These cam slots **100** control horizontal movement of the door bolts **80**, **81**, **82**, and **83** as in explained hereinafter.

The outer end of each of the bolts **80**, **81**, **82**, and **83** is slidable within a guide bushing **105** mounted within the side channel **41** of the door (see FIGURE 8). At the inner ends, the bolts **80**, **81**, **82**, and **83** are supported from the cam plates **94**, **96**, and **99—99** by guide pins in the form of screws **106** which extend through the cam slots **100** of the cam plates **94**, **96**, and **99—99**. Because the cam slots are angulated, vertical movement of the cam plates as a result of vertical movement of the bars **75**, **76**, causes the pins **106** and the attached bolts **80**, **81**, **82**, and **83** to be moved horizontally.

As may be seen most clearly in FIGURES 4, 5, and 6, a tension spring **110** is secured between the cam plate **94** and a support bracket **111** attached to the rear mounting plate **47**. This tension spring **110** carries the weight of the boltwork and bias the door bolts **80**, **81**, **82**, and **83** into the locked or extended position.

In order to hold the door bolts in the withdrawn or unlocked condition when and so long as the door is open, an interlock indicated generally at **108**, is mounted interiorly of the door lock chamber **45**. This interlock comprises a detent pin **109** movable into and through a hole **113** in the vertically movable bar **75** to hold this bar **75** in its lower or door open position. When the pin **109** is withdrawn from the aperture **113**, the spring **110** is operative to pull the bar upwardly and force the bolts **80**, **81**, **82**, and **83** of the door out to a locked position.

The detent pin **109** is supported for sliding movement in an aperture **115** of a bracket **116** which is welded to the vertical mounting channel **65** and in an aperture **117** of the channel **65**. Sliding movement of the detent pin **109** is controlled by a vertical link **118** mounted for pivotal movement on a pivot pin **119**. The upper end of the link **118** is pivotally secured to the detent pin **109** while the lower end is pivotally secured to an interlock control rod **120**. One end of this rod is slidable within an aperture in the mounting bracket **116** while the opposite end is slidable within and extends through an aperture in the vertical door channel **42**. A compression spring **122** is mounted over the control rod **120** and extends between a collar **123** attached to the control rod and the bracket **116** so as to bias the rod **120** to the left as viewed in FIGURES 4 and 5 to a position in which the rod extends beyond the vertical channel **42** into engagement with the block **30**.

When the door is closed, control rod **120** is located in the position illustrated in FIGURE 4 in which the end of the rod **120** is engaged with the abutment block **30**. In this position of the control rod, the detent pin **109** is out of engagement with the aperture **113** in the vertically movable bar **75**. When the door is unlocked, the vertical bar **75** is moved downwardly so that the aperture **113** is aligned with the detent pin **109**. Subsequently, when the door is opened, the detent pin enters the aperture **113** as a consequence of the spring **122** moving the interlock control rod to the left as viewed in FIGURE 4. So long as the door remains open, the control rod **120** remains extended beyond the hinged edge of the door and the detent pin **109** remains in the aperture **113** of the vertically movable bar **75**. Thus the pin **109** holds the bar **75** down against the bias of the spring **110** and retains the door bolts withdrawn into the door. When the door is subsequently closed, the end of the bar **120** at the hinged side of the door engages the abutment block **30**, causing the control rod **120** to be moved to the right as viewed in FIGURE 4 against the bias of the spring **122**. This effects leftward movement of the detent pin **109** so that it is withdrawn from the aperture **113** at which time the spring **110** moves the bar **75** upwardly and the door bolts out to the locked position.

When the door is locked, the channels **75, 76** move apart and the abutment blocks **78, 79** mounted within the channels **75** and **76** enter behind the door bolts **80, 81, 82,** and **83** so as to form a solid abutment between the bolts and the stationary channel **65** of the door. With the bars **75, 76** separated, the dial **55** of the combination lock may be manipulated to move the lock bolt **52** into longitudinal alignment with the lower end **130** of the bar **75** and the upper end **131** of the bar **76**. In this position of the lock bolt **52**, it precludes the bars **75, 76** from being moved together into the unlocked position.

If a successful forced entry of the safe is to be accomplished by attacking the boltwork of the file, it is necessary to overcome the compressive resistance of either the bolts **80, 81, 82,** and **83**, the blocking elements **78, 79**, the vertical bars **75, 76** or the bolt **52**. As is commonly known, the compressive strength of solid metal parts, such as those used in this boltwork, is far superior to the shear, tensile, or bending strength. Thus, placement of all of the movable parts of the boltwork in compression during any forceful entry attempt markedly increases the resistance to such an entry.

While only a single preferred embodiment of the security file of this invention has been disclosed and described herein, those skilled in the art to which this invention pertains will readily appreciate numerous changes and modifications which may be made without departing from the spirit of our invention. Therefore, we do not intend to be limited except by the scope of the appended claims.

Having described our invention, we claim:

1. A security file comprising:

a file cabinet having a pivotally mounted door,

locking mechanism mounted upon said door, said locking mechanism comprising:

a pair of vertically movable lock bars mounted upon the inside of the door,

at least two laterally movable door bolts mounted upon said door and operatively connected to said lock bars, said door bolts being movable upon vertical movement of said lock bars between a locking position in which they extend beyond the swinging edge of said door and an unlocked position in which they are withdrawn into said door,

a door handle mounted upon said door and operatively connected to said lock bars, said handle being movable in one direction to move said bars apart and thus effect locking movement of the door bolts and movable in an opposite direction to move said bars together into endwise juxtaposition to effect unlocking movement of said door bolts, and

a door lock mounted upon said door and having a lock bolt movable between a locked position in which said lock bolt extends between said vertically movable bars and an unlocked position in which said lock bolt is out of longitudinal alignment with said bars so that said bars may be moved by said handle into endwise juxtaposition.

2. The security file of claim **1** wherein said vertically movable bars include a solid blocking element movable between each of said door bolts and a stationary part of the door.

3. The security file of claim **1** wherein each of said door bolts is operatively connected to one of said lock bars by a cam plate and cam follower.

4. The security file of claim **3** wherein each of said cam plates is attached to one of said lock bars and each of said cam followers is attached to one of said door bolts.

5. The security file of claim **1** wherein said door bolts are biased into the locked position by a spring element.

6. The security file of claim **5** further comprising an interlock mechanism operable to hold the door bolts in an unlocked position so long as the door is open and operable to release said door bolts for movement into the locked position when said door is closed.

7. The security file of claim **6** wherein said interlock mechanism comprises a detent pin movable into engagement with a recess in one of said lock bars, a pivotally mounted linkage element connected at one end to said detent pin, and a control rod connected to the opposite end of said linkage element and engageable with a stationary part of the file cabinet during the closing of the door to withdraw the detent pin from said recess.

8. A security file for resisting forced entry techniques, said file comprising:

top, bottom, rear and side plates welded together to form a cabinet enclosure, said enclosure having a weldment located along each joint between said plates operative to hold the plates in assembled relation,

each of said weldments comprising a continuous butt weld which extends for the full length of the joint between said plates and is located on and exposed to the exterior of the cabinet, and a continuous fillet weld which extends for the full length of the joint between said plates and is located on the inside of the cabinet,

a door pivotally mounted upon said enclosure and at least partially defining a front wall,

a locking mechanism mounted upon said door and operable to hold said door closed and locked relative to said enclosure, said locking mechanism comprising:

a pair of vertically movable lock bars mounted upon the inside of the door,

at least two laterally movable door bolts mounted upon said door and operatively connected to said

lock bars, said door bolts being movable upon vertical movement of said lock bars between a locking position in which they extend beyond the swinging edge of said door and an unlocked position in which they are withdrawn into said door,

a door handle mounted upon said door and operatively connected to said lock bars, said handle being operable to move said bars apart and thus effect locking movement of the lock bolts and movable together into endwise juxtaposition to effect unlocking movement of said door bolts, and

a door lock mounted upon said door and having a lock bolt movable between a locked position in

which said lock bolt extends between said vertically movable bars and an unlocked position in which said lock bolt is out of longitudinal alignment with said bars so that said bars may be moved by said handle into endwise juxtaposition.

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