Dec. 29, 1925. 1,567,707

C. G. CARLSON

SAFE

Filed August 19, 1920 3 Sheets-Sheet 1

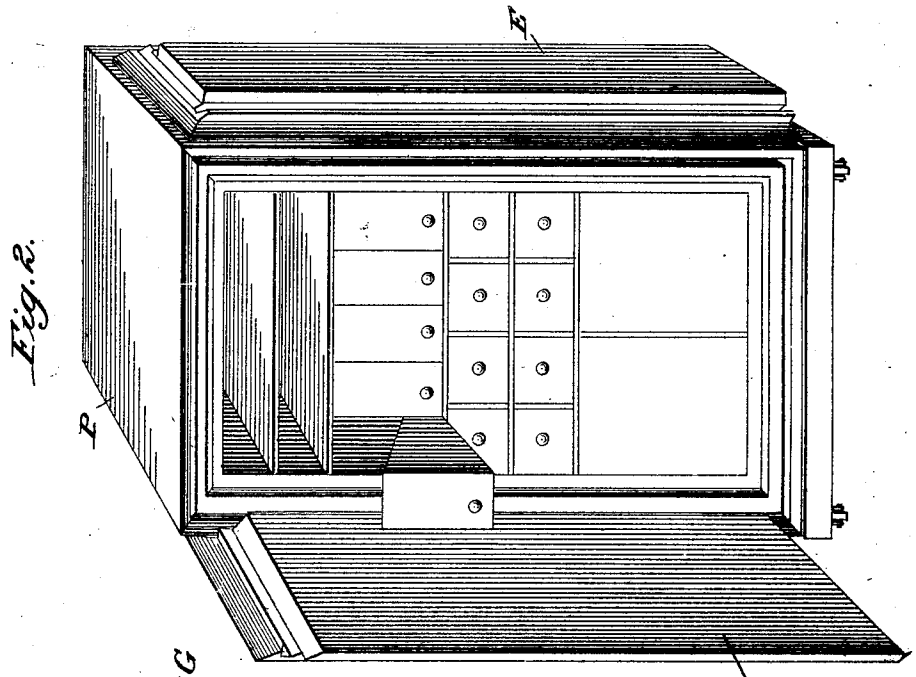

Fig. 2.

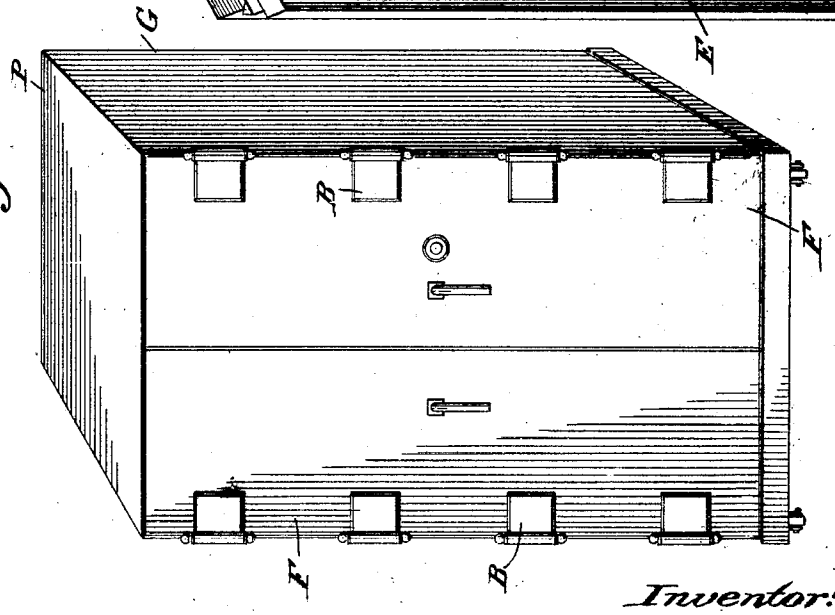

Fig. 1.

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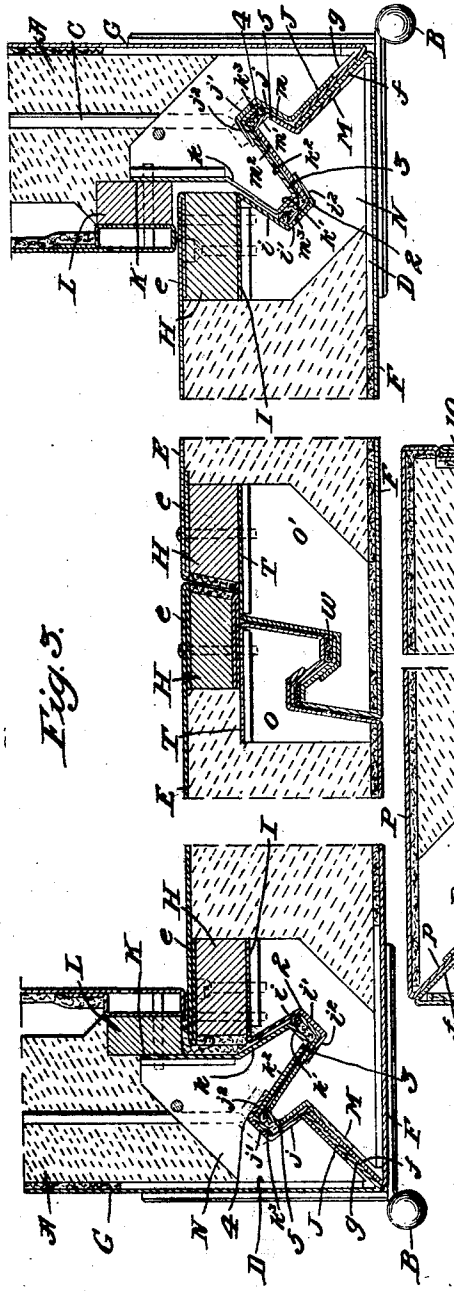

Fig. 3.

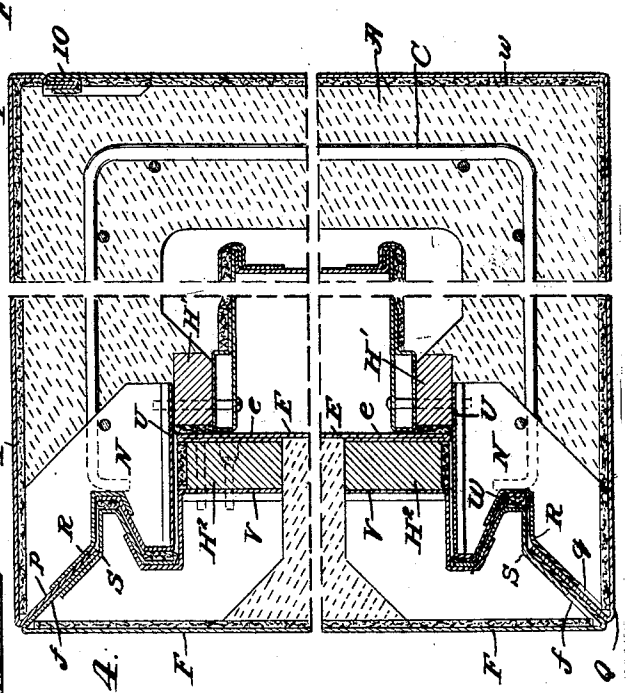

Fig. 4.

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Fig. 5.

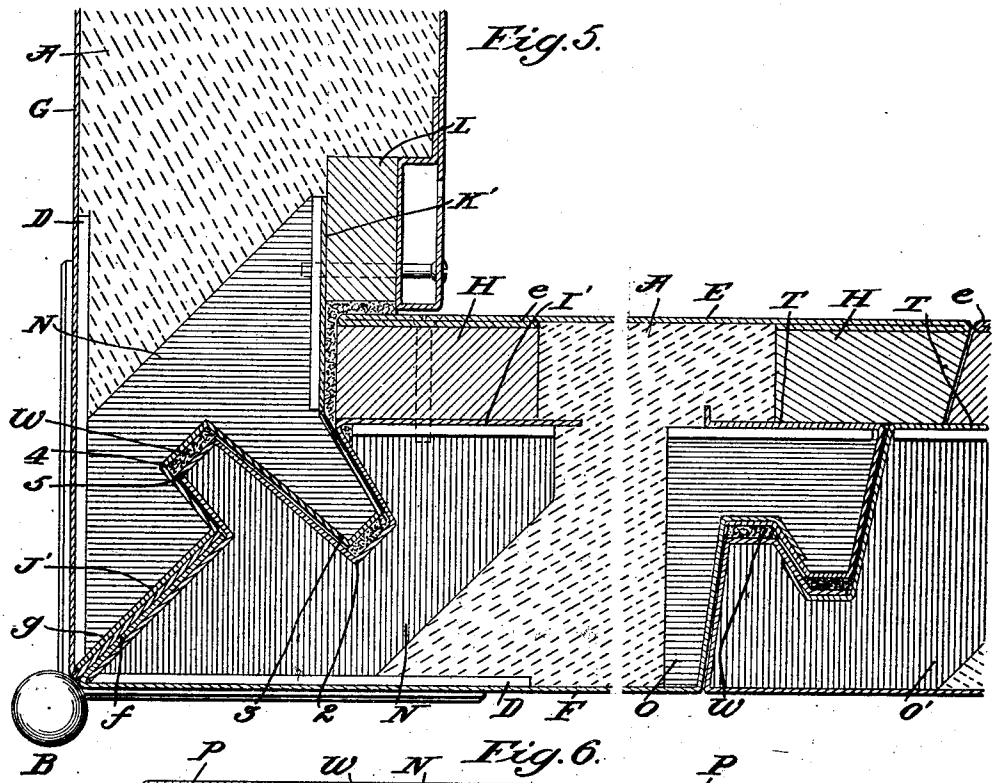
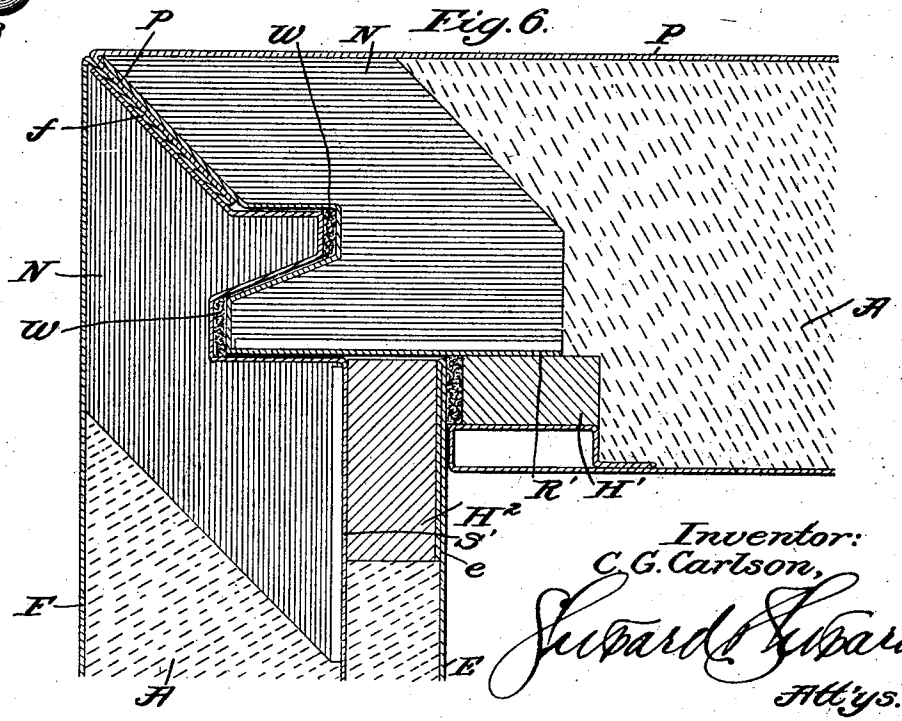


Fig. 6.



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Patented Dec. 29, 1925. 1,567,707

UNITED STATES PATENT OFFICE.

CLIFFORD G. CARLSON, OF JAMESTOWN, NEW YORK, ASSIGNOR TO ART METAL CONSTRUCTION COMPANY, OF JAMESTOWN, NEW YORK, A CORPORATION OF MASSACHUSETTS.

SAFE.

Application filed August 19, 1920. Serial No. 404,528.

To all whom it may concern:

Be it known that I, CLIFFORD G. CARLSON, a citizen of the United States, residing at Jamestown, in the county of Chautauqua and State of New York, have invented new and useful Improvements in Safes, of which the following is a specification.

The invention relates to safes for the storage of valuable papers, documents, records and sundry articles of value required to be preserved against accident by fire, loss by theft or damage in the event of the collapse of a building or other cause resulting in the safe falling from a height and the opening of its joints by reason of the shock incident to the impact of the safe when arrested in its fall.

The invention also provides a safe which prevents obstructing of the interior space by the door when open so that drawers, file holders and the like adjacent the side walls may be moved in and out of the safe freely without any interference therewith by the door; and which admits of the door folding close against the outer side of the safe so as to be wholly out of the way when in open position.

The invention furthermore aims to provide interlocking joints between the door and the walls of the safe whereby the door acts to tie together the walls of the safe at the open side thereof and prevents the widening or spreading of the joints or the relative movement of the door and walls, other than the pivotal movement of the door on its hinges for opening and closing the door, said joints also being of zig-zag or tortuous formation to obstruct the passage of heat, smoke and moisture.

Another object of the invention is to construct the hollow metal walls forming the body and door of the safe so as to effectively prevent the conduction of heat from the outer to the inner metal plates or parts of the walls.

The drawings hereto attached illustrate a preferred embodiment of the invention. However, it is to be understood that in adapting the same to meet different conditions, various changes in the form, proportion and minor details of construction may be resorted to without departing from the nature of the invention as claimed hereinafter.

Referring to the drawings;

Figure 1 is a perspective view of a safe embodying the invention.

Figure 2 is a view similar to Figure 1 with one of the doors in line with the side to which it is hinged and the other door folded against the outer side of the wall to which it is hinged, said view also illustrating one of the file holders adjacent a side of the safe partly drawn outward.

Figure 3 is a plan section of the front portion of the safe showing the parts on a larger scale and having portions of the doors omitted.

Figure 4 is a vertical section of the safe showing the parts on substantially the same scale as Figure 3 and having portions broken away.

Figure 5 is a sectional detail showing the preferred structure of the doors at their meeting and hinge edges.

Figure 6 is a view similar to Figure 5 showing the structure of the doors at their top and bottom edges.

Corresponding and like parts are referred to in the following description and illustrated in the several views of the drawings by like reference characters.

The body of the safe and the closure of the opening thereof comprise hollow walls, the space between the walls being supplied with insulating material to resist the action of heat and prevent ready access to the interior of the safe by unauthorized methods. The closure of the safe is hinged so as to swing and may comprise one or more doors according to the size and design of the safe. In the present illustration the closure comprises double doors which are hinged so as to swing against the outer sides of the safe, as indicated at the right in Figure 2, or to occupy a position in the plane of the sides so as not to obstruct the interior space of the safe, as shown at the left in Figure 2, whereby file holders or like receptacles adjacent the inner side walls of the safe may be moved in and out freely without interference on the part of the doors. As shown most clearly in Figures 1 and 3 the doors are hinged to the outer vertical corners of the side walls whereby to admit of the doors folding against the outer side of the safe so as to be entirely out of the way when the safe is open to admit of ready access to its

interior. The enclosing walls and closure of the safe comprise spaced inner and outer metal plates between which an insulating filling is located, said filling being indicated by the letter A. A reenforcement C is embedded in the filling A and may consist of rods, bars or wire fabric. The plates comprising the walls and closure of the safe may be of any gauge and material best adapted for the purpose intended. The closure may be hinged in any suitable way but the hinge joint B is preferably disposed at the corners of the safe, as indicated most clearly in Figure 3, to admit of the closure folding against the outer side of the safe, as indicated most clearly at the right in Figure 2. The manner of hinging the closure also provides for the door clearing the inner wall when said door is swung into open position about the plane of the side of the safe to which the door is hinged thereby admitting of unobstructed access to the interior of the safe whereby file holders and like receptacles adjacent the side walls may have free and unobstructed movement in their withdrawal and replacement.

In the preferable construction the leaves of the hinge connections are secured to the closure and sides of the safe by being electrically welded thereto. As shown most clearly in Figures 3 and 5 the outer plates of the closure and walls of the safe are reenforced opposite the hinge elements, said reenforcements consisting of plates D which are secured to the inner sides of the outer plates of the closure and walls of the safe.

The joint between each of the doors and the side wall to which the door is hinged is of miter formation, as shown, or of other formation permitting a location of the hinges so that the door can swing rearwardly around against the side of the safe as explained. Grooves 2 and 4 are formed in the faces of the joints and these grooves are adapted to receive complementary tongues or projections 3 and 5 on the opposing faces of the joints. These matching or interengaging tongues and grooves are of such relative formation and disposition as to resist or prevent relative movement of the parts bordering upon the joints either in the direction of the plane of the closed door or perpendicularly to said plane while at the same time admitting of free pivotal movements of the doors on their hinges to effect opening and closing of the doors. The tongues and grooves are preferably disposed upon opposite sides of the joints as shown clearly in Figures 3 and 5. To insure the free pivotal movement of the closure, the tongues and grooves are preferably of flared or tapered formation and are disposed substantially at right angles to the planes of the joints. The complementary tongues and grooves have broad, parallel, opposed side faces adapted to engage face to face throughout an extended surface area. This formation and disposition of the interlocking parts resists the opening of the joints by forces acting in either of the directions before mentioned and also produces zig-zag or tortuous joints which will offer the maximum resistance to the passage of heat, smoke and moisture. Any expansion of the walls or door of the safe from heat, or any force tending to pull the door and wall apart and widen the joints between them, other than the pivotal movement of the door on its hinge will act to forcibly press one or more of the opposed faces of the complementary tongues and grooves firmly into contact and thus maintain a tight joint between the door and the wall to which it is hinged. On account of this formation of the interlocking joints, the hinges do not have to be relied upon to resist abnormal strains on the parts, and comparatively light hinges located at the corner of the safe can be used.

Each of the doors comprises an inner plate E and an outer plate F. The edge portions of the inner plates E are folded, as indicated at *e*, whereby to reenforce said plates. Edge portions of the outer plates F adjacent the hinge edges of the doors are bent inward as indicated at *f*, preferably at an angle of about 45° to the plates F. The outer plates G of the side walls of the safe have their edge portions *g* adjacent the hinge joints bent inwardly at an angle so as to make a close joint with the bent edge portions *f* of the plates F. Strips H of wood or other suitable heat insulating material are secured to the folded edge portions *e* of the plates E. Metal edge strips or walls I are secured to the inner sides of the wooden strips H and have edge portions bent as indicated at *i*, *i'*, i^2. The parts *i*, i^2 are oppositely inclined and form side walls of the pockets 2. The parts *i'* connect the parts *i*, i^2. Metal strips J are secured to the bent edge portion *g* and have edge portions bent as indicated at *j*, *j'* and j^2. The bent portions *j*, j^2 constitute side walls of the pockets 4 and are connected by the part *j'*. Metal strips K are attached to the inner sides of strips L of wood or other suitable heat insulating material and have edge portions bent to provide the parts *k*, *k'*, k^2 and k^3. The insulating strips L are disposed at the edges of the side walls of the safe between the inner plates thereof and the metal strips K. The bent portions *k*, k^2 of the strips K form opposite walls of the projections 3. Metal strips M are attached to the bent edges *f* of the plates F and have portions bent as indicated at *m*, *m'*, m^2 and m^3. The strips J and M are welded or secured in any other suitable manner to the bent edges *g* and *f* of the respective plates G and F. The strips I and M are similarly secured together and

form the edge wall of the door, while the strips J and K are likewise secured together and form the edge of the side wall of the safe. Horizontal plates N are located adjacent the miter-joints and are disposed between the inner and outer plates of the side walls and doors of the safe and are formed with projecting portions to enter the parts comprising the pockets and projections. The plates or parts N constitute reenforcements to stay and strengthen the parts bordering upon the miter-joints. It is to be understood that any number of the stay or reenforcing plates N may be provided and located at desired intervals in the length of the joints so as to provide a substantial structure.

As shown most clearly in Figures 3 and 5 of the drawings, the meeting edges of the doors are formed in substantially the same manner as the hinged edges and have interfitting tongues and grooves or pockets and projections of such formation as to admit of the doors opening freely but to lock the doors together against separation in the direction of the plane of the doors. Since the doors are thus interlocked with each other and each door is interlocked with the wall to which it is hinged, the doors serve to tie together the opposite side walls of the safe and prevent the spreading apart of the walls which might otherwise occur from expansion from heat or other force acting in a direction to separate the walls. Where only one door is used this, as explained, will have a similar interlocked connection at its free edge with the adjacent wall of the safe and the single door will act in the same manner to tie together the opposite walls of the safe. The edge portions of the doors bordering upon the joint are reenforced by plates O, O′ which are similar in formation to the stay and reenforcing plates N. It is observed that the safe stay and reenforcing plates N, O and O′ have their edge portions flanged to provide for reception of the fastening means whereby said stay plates are attached to the parts to which they are connected.

The several joints formed between the top and bottom walls of the safe and the adjacent edges of the doors are similar or substantially like the joints between the meeting edges of the doors and have matching pockets and projections which prevent the opening of the joints in the direction of the plane of the doors. As shown, the top plate P of the safe has its edge portion p bent at an angle of about 45°. The bottom plate Q of the safe has its edge portion q bent at substantially the same angle as the edge portion p of the top plate P. The edge portions of the front plates F of the doors are bent at substantially the same angle as the edge portions p and q so as to lie adjacent thereto. Metal edge strips R are secured to the bent edge portions p and q of the respective top and bottom plates of the safe. These strips correspond with the strips J applied to the bent edge portions q of the side plates G and their edge portions are bent in a similar manner. Metal strips S are secured to the bent edge portions f of the top and bottom edges of the front plates of the doors and correspond to the metal strips M and are bent in substantially a similar manner. Plates or strips U are attached to wooden or heat insulating strips H′ applied to the forward edge portions of the inner top and bottom plates of the safe. The plates or metal strips U correspond approximately to the plates or strips K and are bent in substantially a like manner. Plates or strips V are secured to wooden or heat insulating strips H^2 applied to the top and bottom edge portions of the doors and these plates correspond to the plates I and are bent in approximately a like manner. It is observed that vertical stays or reenforcing plates N are disposed at the top and bottom edges of the doors and at the forward edges at the top and bottom of the safe as indicated most clearly in Figures 4 and 6.

Metal strips or plates T are attached to wooden strips at the meeting edges of the doors and their edge portions are bent to coact with bent edge portions of the front plates F of the doors so as to form the matching or interlocking joint.

A packing w is interposed between the bottom of each of the pockets and the top of the companion projections at the several edges of the doors so as to secure and maintain a close joint to exclude the passage of smoke and moisture. This packing may be of felt, asbestos or other suitable material. If desired, packing w, in sheet form, is interposed between the insulating filling A and the inner faces of the metal plates to protect the latter from dampness during the placing of the filling and its setting and drying.

The plates comprising the body of the safe may be joined in any manner so as to provide a substantial and firm connection. As indicated at 10 the meeting edges of the plates are secured by means of a lock joint. These joints may be subsequently electrically welded to make them absolutely secure. The insulating filling A and the reenforcements N, O and O′ embedded therein may be placed in position in any convenient way. It is observed that the stay or reenforcing plates N, O and O′ besides being embedded in the filling material are secured to the body structure in any convenient and substantial way.

It is not essential that the edges of the doors and the edges of the sides of the safe

bordering upon the door openings comprise a plurality of strips, as indicated in Figures 3 and 4. These edges may be formed in various other ways, for instance, as indicated in Figures 5 and 6, which will reduce the number of parts and the consequent cost of construction.

As shown in Figure 5 the hinge edge of the door embodies a single strip, or molding I' which has an edge portion secured to the wooden strip H and its opposite edge portion fast to the bent edge *f*, the intermediate portion being bent to provide the pocket 2 and the projection 5. A strip, or molding K' has one edge secured to the wooden strip L and its opposite edge attached to the bent edge *g*, the intermediate portion forming the projection 3 and the pocket 4 which coact with the pocket 2 and projection 5. The top and bottom joints between the doors and the body of the safe are formed substantially as indicated in Figure 6, a single strip or molding R' being attached at its edges to the respective parts *p* and H' and the strip or molding S' being attached at its edges to the respective parts *f* and H^2. It will be noted that the several insulating strips H, L, etc., of wood or kindred insulating material are interposed between the inner plates and the edge plates of the doors and the several walls of the safe and prevent the conduction of heat from the outer to the inner metal plates or walls of the several parts of the safe. The insulating strips therefore materially assist in preventing a destructive temperature within the safe in the event of a fire in the room or building containing the safe. The wooden strips are fastened to the metal strips or moldings before the insulating material is placed in position and after the material has set and become dry the inner plates are positioned and made secure.

A safe constructed in accordance with the present invention will resist the action of heat and the penetration of smoke and moisture and is not liable to have its joints opened in the event of the safe falling from a relatively great height so that the contents of the safe are preserved under all conditions incident to fire, theft or falling of the safe from any cause.

What is claimed is:

1. A joint for the hinged parts of safe structures embodying flared grooves and complementary tapered tongues extending lengthwise of and crossing the joint at an angle of substantially 45° to the plane of each of said hinged parts, said tongues and grooves having parallel flat opposed faces arranged to contact face to face and prevent relative rectilinear movement of said hinged parts in any direction perpendicular to the hinge axis while permitting free pivotal movement of said parts about said hinge axis.

2. In a safe structure embodying hollow walls formed by spaced plates, a joint formed between adjacent parts by having edge portions of the plates bent to form a miter joint having matching pockets and projections which are relatively flared and disposed transversely of the general direction of the joint, and reenforcing plates disposed within the edge portions bordering upon the joint.

3. In a safe structure embodying hollow walls comprised between spaced plates, a miter joint formed between adjacent parts by having edge portions of the plates bent to provide matching pockets and projections of flared form extending transversely at opposite sides of the general direction of the joint reenforcing plates disposed within the edge portions bordering upon the joint and at substantially right angles to the plates and a filling within the walls and having the reenforcing plates embedded therein.

4. In a safe structure embodying hollow walls formed between spaced plates, strips of wood or analogous material disposed in the meeting edge portions of the parts bordering upon a joint, metal plates or strips attached to the wooden strips and having edge portions bent to provide enclosing walls of matching pockets and projections, edge portions of the other plates being bent to form and complete the walls of the pockets and projections, reenforcements disposed within the edge portions of the parts bordering upon the joint and a filling material in the walls and having the reenforcements embedded therein.

5. A safe having a hinged door, said door and the wall of the safe to which the door is hinged being formed with interfitting flaring tongues and grooves having complementary broad parallel flat faces arranged to engage face to face and disposed at angles of substantially 45° to the plane of the door so that they prevent movement of said door relatively to said wall both in the direction of the plane of the door and also perpendicularly to said plane.

6. A safe having a hinged door, said door and the body of the safe to which the door is hinged being formed with interfitting tongue and groove joints having complementary broad flat parallel faces arranged to engage face to face and disposed at angles of substantially 45° to the plane of the door so that they prevent any movement of said door relatively to said body except only the pivotal movement of the door on its hinge.

7. A safe having a hinged door, said door and the wall of the safe to which the door is hinged being formed to provide an interfitting tapered tongue and groove joint between said door and wall, said tongue and groove having at one side of the tongue opposed broad flat faces arranged to contact

and prevent relative movement of the door and wall in one direction and having at the opposite side of the tongue opposed broad flat faces arranged to contact and prevent relative movement of the door and wall in a direction perpendicular to said first mentioned direction.

8. A wall structure for safes comprising an outer metal wall, an inner metal wall spaced therefrom, a metal edge wall extending from the rim of one of said first mentioned walls toward said other wall, a heat insulating strip interposed between and secured to said edge wall and the rim of the adjacent wall and insulating the one from the other to prevent conduction of heat from said outer wall to said inner wall, and an insulating filling between said inner and outer walls, said edge wall and insulating strip connecting and tying together the rims of said outer and inner walls and confining said insulating filling.

9. A safe body comprising an outer metal shell, an inner metal shell spaced therefrom, metal edge walls extending from the rim of said outer shell toward said inner shell, heat insulating strips interposed between and secured to said edge walls and said rim of the inner shell and insulating the one from the other to prevent conduction of heat from said outer wall to said inner wall, and an insulating filling between said walls, said edge walls and insulating strips connecting and tying together the rims of said outer and inner shells and confining said insulating filling.

10. A safe having body and closure members, each comprising outer and inner metal walls separated by an insulating filling, an edge wall extending from the periphery of one of said walls of each member toward the rim of the other wall of said member, and a heat insulating strip interposed between and attached to said edge wall and rim of each member, whereby the outer and inner walls of each member are mechanically connected at their edges and said insulating filling is enclosed, but the conduction of heat from one to the other of said walls is prevented, the inner walls of said members being disposed so that they overlap and are adapted to contact with each other when the safe is closed to protect said insulating strips from contact and wear.

CLIFFORD G. CARLSON.