May 28, 1929. J. A. FELLOWS 1,715,191

VAULT DOOR

Filed Oct. 18, 1927 2 Sheets-Sheet 1

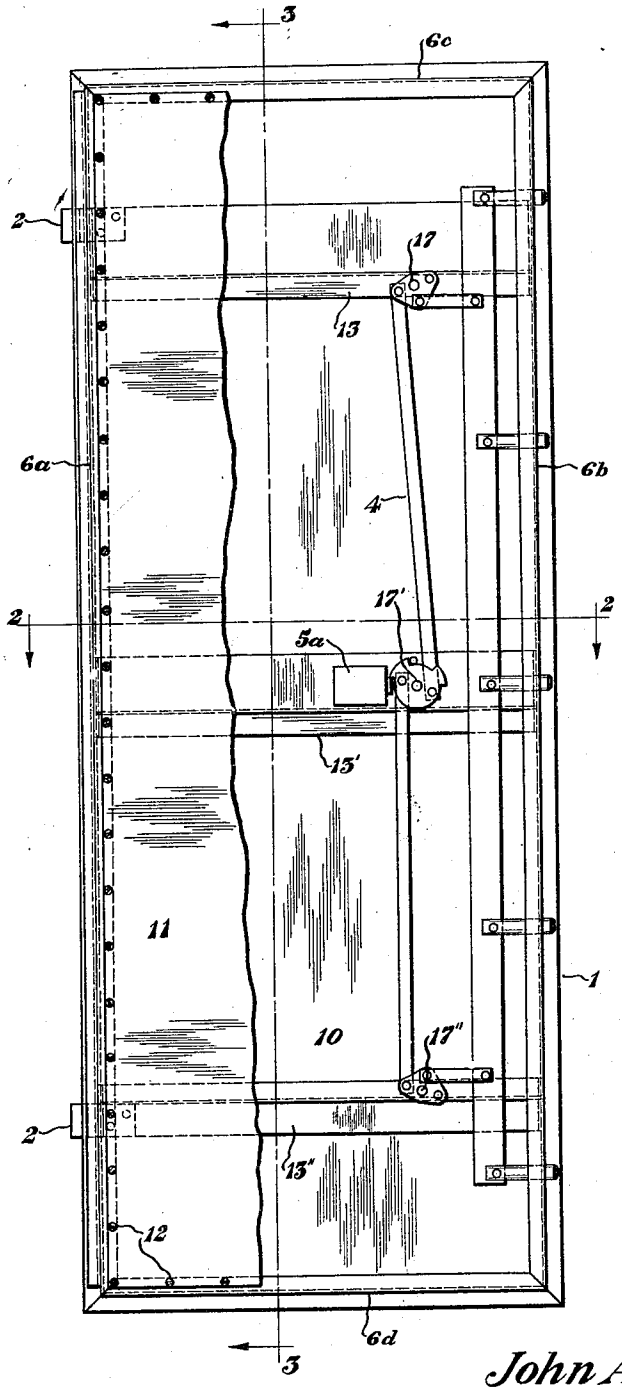


Fig. 1

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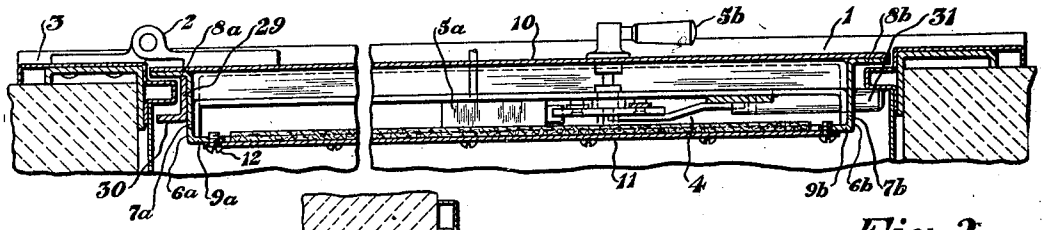


Fig. 2

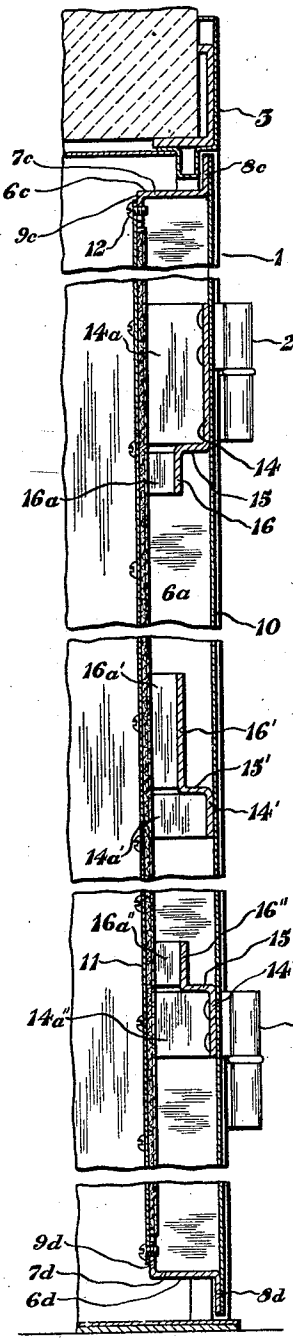


Fig. 3

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Patented May 28, 1929. 1,715,191

UNITED STATES PATENT OFFICE.

JOHN A. FELLOWS, OF CANTON, OHIO, ASSIGNOR TO DIEBOLD SAFE & LOCK COMPANY, OF CANTON, OHIO, A CORPORATION OF OHIO.

VAULT DOOR.

Application filed October 18, 1927. Serial No. 226,894.

The invention relates more particularly to fire and heat retarding doors for vaults for storing records and the like, the contents of which it may be desired to protect from fire and intense heat for a certain period of time.

The door of the present invention associated with an improved frame and vestibule therefor, cooperate with each other to form a vault closure set forth in a companion application for United States Letters Patent, filed October 18, 1927, Serial No. 226,895, and which may be designed for example to resist and prevent the passage into the vault interior of intense heat and flames for a period of one-half hour.

The door of the present invention is however novel in itself and may be used advantageously with other types of frames, in place of doors which have heretofore been constructed by the use of heavy plates for the doors, upon the backs of which the bolt-works have been mounted on structural angles, which plate doors have been found to warp relatively easily and quickly when subject to fire and intense heat.

Doors thus constructed of plates and angles, are moreover relatively heavy, and the material cost of the same is consequently relatively great.

Accordingly, the objects of the present improvements include the provision of a strong rigid fire and heat retarding vault door which shall require a relatively small weight of material for its construction, and which shall be adapted for easy and economical manufacture and assemblage.

These and ancillary objects are attained by a construction and arrangement hereinafter set forth in detail, and which may be stated in general terms as including an internally reinforced box door, preferably made of sheet metal or the like, the internal reinforcements preferably being in the form of formed sheet metal braces, which not only reinforce the hollow door, but also provide supporting means for the door bolt-work carried thereby in the hollow interior of the door.

The door, thus being of reinforced box beam construction, resists to a great degree, deflection induced by heat, flame, or the like.

Preferred embodiments of the invention are illustrated in the accompanying drawings forming part hereof, in which

Figure 1 is a rear view of the improved door detached from a frame, portions of the back member thereof being broken away to illustrate the interior construction of the door;

Fig. 2, a horizontal sectional view thereof as on line 2—2, Fig. 1, the door being hung on a suitable frame; and

Fig. 3, a vertical sectional view thereof as on line 3—3, Fig. 1, the door being hung on the frame illustrated in Fig. 2.

Similar numerals refer to similar parts throughout the drawings.

The improved hollow box door indicated generally at 1 is hung by suitable hinges 2 on a frame indicated generally at 3, and the door is provided with bolt-work indicated generally at 4, carried in the interior of the box door, and which may be controlled by a combination lock indicated generally at 5^a and operated by a suitable handle 5^b.

The improved hollow box door 1 includes side members 6^a and 6^b, a top member 6^c and a bottom member 6^d all preferably made of formed sheet or strip metal.

All of the door side, top and bottom members preferably have the same Z cross section, including, respectively, webs 7^a, 7^b, 7^c and 7^d, preferably spaced inwardly from the extreme outer edges of the door and extending perpendicular to the plane of the door front, outwardly extending front flanges 8^a, 8^b, 8^c and 8^d, and inwardly extending rear flanges 9^a, 9^b, 9^c and 9^d, the front and rear flanges being preferably parallel with each other and with the plane of the door front, and the ends of the top, bottom and side members being secured to each other as by welding.

The door front member 10 is preferably in the form of a steel sheet, secured at its outer borders as by spot welding to the outwardly extending front flanges 8^a, 8^b, 8^c and 8^d of the door side, top and bottom members.

The back member of the door is preferably formed by a steel sheet 11 removably secured as by screws 12 to the inwardly extending flanges 9^a, 9^b, 9^c and 9^d of the door side and top members.

The side, top, bottom, front and rear members of the door thus form a box, the interior of which encloses the bolt-work 4, which may be of any usual construction.

The hollow box door thus formed is preferably reinforced by horizontally extending Z braces 13, 13′, and 13″, which include respectively flanges 14, 14′, and 14″, the outer

faces of which abut the inner face of the door front member 10, and which are secured thereto preferably by spot welding.

Webs 15, 15′, and 15″ preferably perpendicular to the plane of the door front, extend respectively rearwardly from edges of the flanges 14, 14′, and 14″; and flanges 16, 16′, and 16″ extend respectively from the rear edges of the webs 15, 15′, and 15″, preferably parallel with the flanges 14, 14′, and 14″.

The flanges 16, 16′, and 16″ are preferably spaced intermediate the front member 10 and the rear member 11, and provide pivotal supports as at 17, 17′, and 17″ for the bolt-work 4.

For further strengthening and reinforcing the door, the ends of the Z brace flanges may be turned up at right angles thereto, as indicated at 14^a, $14^{a'}$, $14^{a''}$, 16^a, $16^{a'}$, and $16^{a''}$ and these turned up ends may abut and be secured to one or more of the door side member webs, as by spot welding.

One leg 29 of a sheet metal angle bar may be spot welded to the web 7^a of the door side member 6^a, whereby the other leg 30 of the angle extends laterally outward at the rear of the outwardly extending flange 8^a, thereby providing stops for fitting on both sides of a door jamb and preventing removal of the door by removal of the pins of the hinges 2; the bolts 31 of the bolt-work in extended and locked position, cooperating with the flange 8^b and a door jamb for the same purpose.

Vault doors constructed of sheet steel formed and arranged as aforesaid have been found, when subject to intense heat and flames, to resist warping, particularly in the directions to and from the vault interior; and when associated with suitable frames, have been found to satisfactorily resist the passage into vault interiors of intense heat and flames for the desired period of time.

Ordinary plate doors for the same purpose require much greater weight of material, and have been found incapable of resisting the same heat and flames without warping for the same period of time.

For still further increasing the resistance to heat and flames of the improved door 1, a sheet of asbestos 32 or other non-conductor of heat may be applied upon the inner surface of the door back member 11.

I claim:

1. A vault box door including side, top, and bottom members, each having a Z cross-section and including a web angular to the plane of the door front, a front flange extending outwardly from the web, and a rear flange extending inwardly from the web, a front member secured to the outwardly extending flanges, a back member secured to the inwardly extending flanges, and an internal brace secured to one of the members.

2. A vault box door including side, top, and bottom members, each having a Z cross-section and including a web angular to the plane of the door front, a front flange extending outwardly from the web, and a rear flange extending inwardly from the web, a front member secured to the outwardly extending flanges, a back member secured to the inwardly extending flanges, and an internal Z brace secured to one of the members.

3. A vault box door including a side, top, and bottom members, each having a Z cross-section and including a web angular to the plane of the door front, a front flange extending outwardly from the web, and a rear flange extending inwardly from the web, a front member secured to the outwardly extending flanges, a back member secured to the inwardly extending flanges, and an internal brace secured to the front member.

4. A vault box door including side, top, and bottom members, each having a Z cross-section and including a web angular to the plane of the door front, a front flange extending outwardly from the web, and a rear flange extending inwardly from the web, a front member secured to the outwardly extending flanges, a back member secured to the inwardly extending flanges, and an internal brace secured to the front and side members.

5. A vault box door including side, top, and bottom members, each having a Z cross-section and including a web angular to the plane of the door front, a front flange extending outwardly from the web, and a rear flange extending inwardly from the web, a front member secured to the outwardly extending flanges, a back member secured to the inwardly extending flanges, an internal brace secured to one of the members, and a bolt-work supported by the brace.

6. A vault box door including side, top, and bottom members, each having a Z cross-section and including a web angular to the plane of the door front, a front flange extending outwardly from the web, and a rear flange extending inwardly from the web, a front member secured to the outwardly extending flanges, a back member secured to the inwardly extending flanges, an internal brace secured to some of the members, and a bolt-work supported by the braces.

In testimony that I claim the above, I have hereunto subscribed my name.

JOHN A. FELLOWS.