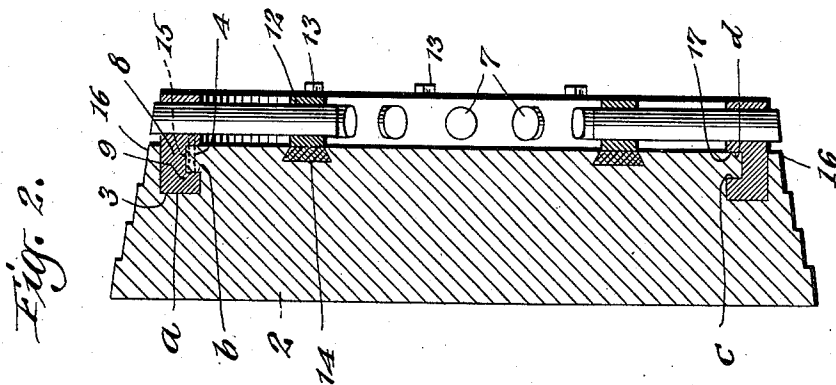
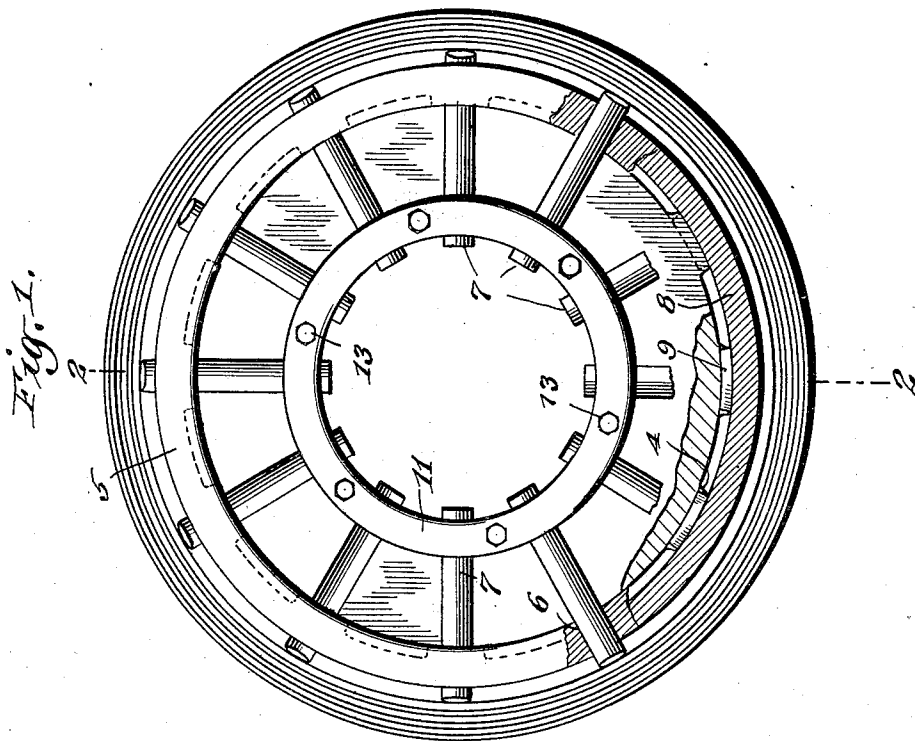


S. W. FISH.  
 SAFE OR VAULT DOOR.  
 APPLICATION FILED AUG. 26, 1910.

997,782.

Patented July 11, 1911.



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# UNITED STATES PATENT OFFICE.

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## SAFE OR VAULT DOOR.

997,782.

Specification of Letters Patent. Patented July 11, 1911.

Application filed August 26, 1910. Serial No. 578,993.

*To all whom it may concern:*

Be it known that I, SAMUEL W. FISH, a citizen of the United States, residing at Plainfield, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Safe or Vault Doors, of which the following is a specification.

This invention relates to safe and vault doors, but more particularly to vault doors, the object of the invention being to provide an improved bolt supporting frame adapted particularly for attachment to solid doors, while permitting each to be independently and completely separately formed before the attachment thereof together, the present structure illustrating another form of the improvement shown in my contemporaneously pending application Serial No. 561,183, filed May 13, 1910, and also in my contemporaneously pending application Serial No. 530,943, filed December 2, 1909.

A further object of the invention is the provision of an improved solid door and bolt supporting means which may be secured together without the necessity of providing a flange for carrying holding lugs for the bolt supporting means, and without the necessity of casting one part around the other or using a filling material for maintaining the parts in rigid connection.

In the drawings accompanying and forming part of this specification, Figure 1 is a rear view, partly in section, of this improved door; and Fig. 2 is a cross-sectional view taken in line 2—2, Fig. 1.

Similar characters of reference indicate corresponding parts in the figures of the drawings.

The door 2, which may be of any suitable construction, shown herein as a solid door, is provided on its rear side with a recess 3 having a series of lugs 4 projecting into the recess and toward the periphery of the door. This recess will be of annular formation when the door is a circular one as shown in the present instance, and it extends depthwise into the metal of the door, the inner and outer walls *a* and *b* of this recess being formed by portions of the metal integral with the body of the door, such recess extending from within the body of the door to and terminating at the inner side of such door.

The bolt frame is shown comprising a ring

5 when the door is of circular formation, 55 provided with a series of bolt openings 6 for supporting the outer ends of bolts 7, shown as sliding bolts. This ring is provided with a portion 8 fitting the recess hereinbefore described and carrying inwardly extending 60 lugs 9 adapted to cooperate with the lugs of the door for locking the ring in position. Thus the two members of the door, comprising the body proper and the bolt supporting frame, are interlocked rigidly together by lugs, one set carried by the door 65 and the other set by the bolt frame, this interlocking of the two members being effected within the periphery of the door.

For supporting the inner ends of the bolts, 70 suitable means may be provided, which in the present instance is shown as a ring 11 having bolt openings 12 therethrough for the reception of the inner ends of the bolts. This ring may be secured to the door in any 75 suitable manner, as by means of bolts 13 projecting into metal inserts 14 embedded in the door, this being permissible since there is no particular strain upon this part of the bolting mechanism. 80

In practice the bolt carrying frame may be assembled with the door by rotating one with relation to the other and then secured rigidly together against rotation by means of a suitable key 15 passing through the 85 bolt frame and into a recess provided for that purpose in the door. By this means of supporting the bolts the door may be made of an unmachineable metal, as for instance manganese steel, if desired, while the bolt 90 frame may be made of a different metal, whereby the machining of the bolt carrying member may be facilitated. By attaching the bolt carrying frame in the manner shown it will also be observed that the door 95 may be made solid throughout without the necessity of providing it with a rearwardly extending flange forming a chamber as heretofore, since the lugs are not carried by a flange but project outwardly or toward 100 the periphery of the door instead of inwardly therefrom. Thus, it is unnecessary to provide a flange for carrying such lugs. In other words, the lugs are formed within the body portion of the door itself and not 105 on a flange of that door, and thus obviating, as stated, the necessity of forming a chambered door in order to provide a flange for

carrying the lugs, and also permitting the bolt carrying frame or ring to be secured between opposing surfaces, *a* and *b*, of the body of the door, so that, without the use of any filling material of any kind, the bolt frame is secured rigidly in position between opposing surfaces integral with the door and effectively secured thereto by interlocking lugs. By this construction I am enabled to completely form the door and bolt frame entirely separate one from another and to properly machine the bolt frame independently of the door in readiness for the reception of its bolts and such other mechanism as it might be desirable to connect thereto, and to also completely form the door without the necessity of casting the door around portions of the bolt frame. In other words, each member, the door proper and its bolt supporting frame, may be separately and completely formed and all of the machine work thereon completed, if desired, prior to the connection of these two members together, and when attached in the manner set forth the connection will be a rigid one, such structure forming a unitary structure and to all intents and purposes an integral one, since in order to separate the bolt frame from the door it would be necessary to break off the lugs either of the bolt frame or of the door, which would be next to impossible to do. Furthermore, it will be observed that in the construction shown, any liquid explosive that might be inserted into the joint of the door would run into the body of the safe or vault, so that it could not come in contact with the holding lugs between the bolt carrying frame and the door, since the recess in the door opens at the inner side thereof and extends in the direction of the depth of the door, such recess being entirely covered by the outer peripheral layer of metal 16 forming a portion of the joint surface of the door.

From the foregoing it will be observed that the joint surface of the door, from the inner to the outer side of such door, is formed entirely of the metal from which the body of the door itself is formed, and that those portions of the bolt carrying ring which are effective to secure the ring to the door are located entirely within the metal of this door, without the necessity of casting one part around another and without the use of any molten metal or filling material of any kind, and that these two parts may be readily and effectively connected after each is completely formed.

In practice the bolt carrying frame has a part thereof, as at 17, forming a shoulder adapted to overlap the lugs and the recesses between such lugs when the frame is rigidly connected to the door, so that the lugs of the door are thus as it were located

between opposing surfaces *c* and *d* of the bolt carrying frame, while the lugs of the bolt carrying frame are in turn located between the opposing surfaces *a* and *b* of the door, without any joint between the two leading from the periphery of the door.

It will be understood, of course, that the door will be supported by some suitable form of hinge, which it is not deemed necessary to show herein, and that the holding bolts will be operated by some suitable mechanism adapted for that purpose, this likewise not being deemed necessary to show herein.

I claim as my invention:

1. A safe or vault door comprising a body, and a ring shaped frame carrying door holding means and means for interlocking it with similar means carried by the door on the rotation of one of said members, one of said members having a part fitting between parallelly located integral opposing walls extending depthwise of such member.

2. A safe or vault door comprising a body, and a bolt carrying ring shaped frame having bolt openings for the reception of bolts and interlocked with said door by lugs carried by said body and frame on the rotation of one of said members, means for preventing the rotation of one of said members relatively to the other, one of said members having a part fitting between parallelly located integral opposing walls extending depthwise of such member.

3. A safe or vault door comprising a body having a recess at the inner side thereof extending depthwise of such body, and a bolt receiving ring shaped member having with the body interlocking means secured together by rotating one relatively to the other, and having a part of the inner and outer walls thereof overlapped by the integral walls of said recess.

4. A safe or vault door comprising a body having an annular recess at the inner side thereof extending depthwise of such body, and a bolt carrying ring shaped member secured to said door by lugs carried by said body and member on the rotation of one of said members, said member having a part of its inner and outer walls overlapped by the integral opposing walls of said recess.

5. A safe or vault door comprising a solid body having a recess at the inner side thereof extending depthwise of such body and located entirely within the metal of the body, and a bolt carrying member secured to said door by lugs carried by engaging portions of said body and member on the rotation of one of said members, said member having a part thereof located between the integral opposing walls of the body recess whereby the inner and outer sides of such member are overlapped by the recess

walls of such body, and said door having a part thereof located between integral opposing portions of the bolt carrying member.

6. A safe or vault door comprising a solid body having a recess at the inner side thereof extending depthwise of the body and located entirely within the solid metal of the door, and a bolt carrying member having a portion thereof projecting within said recess with its inner and outer sides overlapped by the integral walls thereof and secured to said door by means brought into operative relation on the rotation of one relatively to the other.

7. A safe or vault door comprising a solid body having a recess at the inner side thereof extending depthwise of the body and located entirely within the solid metal of the door, a bolt carrying member having a portion thereof projecting within said recess with its inner and outer sides overlapped by the integral walls thereof and secured to said door by means brought into operative relation on the rotation of one relatively to the other, and means for preventing the independent rotation of said members.

8. A safe or vault door comprising a body having an annular recess at the inner side thereof extending depthwise of such body and located entirely within the solid metal of the body, and an annular frame having door holding means and having a part thereof projecting into said recess with integral portions of the body overlapping the outer and inner sides of the frame, said door and frame having means for interlocking such members together on the rotation of one of them.

9. A safe or vault door comprising a body having an annular recess at the inner side thereof extending depthwise of such body and located entirely within the solid metal of the body, an annular bolt carrying frame provided with bolt openings and having a part thereof projecting into said recess with integral portions of the body overlapping the outer and inner sides of the frame, said door and frame having lugs for interlocking such members together on the rotation of one of them, and means for preventing the independent rotation of such members.

10. A safe or vault door comprising a solid body having an annular recess at the inner side thereof extending depthwise of such body and located entirely within the solid metal of the body, an annular bolt carrying frame provided with bolt openings and having a part thereof projecting into said recess with integral portions of the body overlapping the outer and inner sides of the frame, said door and frame having lugs for interlocking such members together on the rotation of one of them, and means for preventing the independent rotation of

such members, the lugs of the body projecting toward the joint surface of the door.

11. A safe or vault door comprising a solid body having an annular recess at the inner side thereof extending depthwise of such body and located entirely within the solid metal of the body, an annular bolt carrying frame provided with bolt openings and having a part thereof projecting into said recess with integral portions of the body overlapping the outer and inner sides of the frame, said door and frame having means for interlocking such members together on the rotation of one of them, means for preventing the independent rotation of such members, the interlocking means of the body projecting toward the point surface of the door, and means carried by the door for guiding the inner ends of the bolts.

12. A safe or vault door comprising a solid body having an annular recess at the inner side thereof extending depthwise of such body and located entirely within the solid metal of the body, and an annular bolt carrying frame having a part thereof projecting into the annular recess of the body, said body having lugs projecting toward the joint surface of the door and said frame having lugs cooperating with said door-body lugs.

13. A safe or vault door comprising a solid body having an annular recess at the inner side thereof extending depthwise of such body and located entirely within the solid metal of the body, and an annular bolt carrying frame having a part thereof projecting into the annular recess of the body, said body having lugs projecting toward the joint surface of the door and said frame having lugs cooperating with said door-body lugs, that portion of the bolt carrying frame projecting into the body located between integral portions of the door whereby the inner and outer sides thereof are overlapped by the integral walls of such recess and the lugs of the door-body being located between integral portions of the bolt carrying frame.

14. A safe or vault door comprising a body having an annular recess at the inner side thereof extending depthwise of such body and located entirely within the solid metal of the body, a frame carrying door holding means having a part thereof projecting into the annular recess of the body, and interlocking means carried by the frame and body for securing the members together, that part of the interlocking means carried by the body being located at the inner side of the frame.

15. A safe or vault door comprising a body having an annular recess at the inner side thereof extending depthwise of such body and located entirely within the solid

metal of the body, a frame carrying door  
 holding means having a part thereof pro-  
 jecting into the annular recess of the body,  
 interlocking means carried by the frame and  
 5 body for securing the members together on  
 the rotation of one of them, that part of  
 the interlocking means carried by the body

being located at the inner side of the frame  
 and means for preventing the rotation of  
 said members independently.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,  
 Washington, D. C."

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