

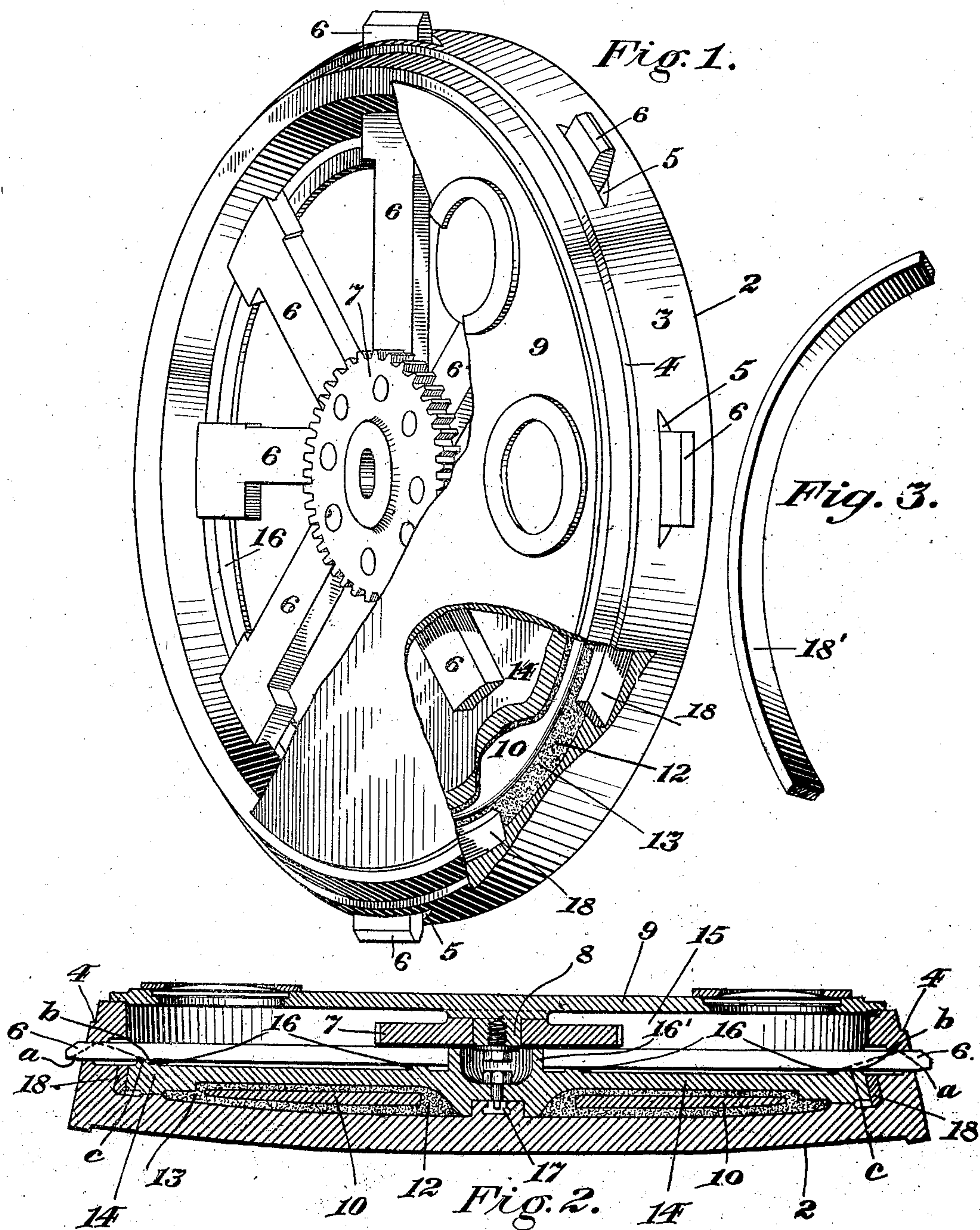
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H. D. HIBBARD.
SAFE OR VAULT DOOR.

(Application filed Mar. 6, 1902.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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SAFE OR VAULT DOOR.

SPECIFICATION forming part of Letters Patent No. 713,879, dated November 18, 1902.

Application filed March 6, 1902. Serial No. 96,872. (No model.)

To all whom it may concern;

Be it known that I, HENRY DEMING HIBBARD, a citizen of the United States, residing in 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 constructed to resist electrical attacks, the object of the invention being to provide an improved door so constructed that the reaching of the boltwork by electrical apparatus will be rendered so difficult that its accomplishment will be a practicable impossibility.

A further object of the invention is to provide an improved organization in which the means for resisting electrical attacks is to a certain extent maintained in position by the bolts carried by the door.

In the drawings accompanying and forming a part of this specification, Figure 1 is a perspective view, partly in section, of the rear side of a door. Fig. 2 is a transverse sectional view of such door, and Fig. 3 is a perspective view of one of the wedges.

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

This improved door in the form thereof herein shown and described may be similar, if preferred, to any of those heretofore patented by me, in which case it would comprise a body portion 2, having a rearwardly-extending integral flange 3, provided with the usual offset or step 4, and bolt-openings 5 for the bolts 6, which are shown as radially located, the door being of circular formation. Any suitable means may be used for throwing the bolts into and out of their protracted positions—such, for instance, as gearing, one member of which, as 7, is located on a stud 8, supported by a back plate 9, secured to the flange of the door, and to which gear member the bolts are pivoted at their inner ends for swinging movement as they are longitudinally projected or withdrawn.

In practice the body of the door and its flange will be made or cast of unmachineable metal—such, for instance, as manganese

steel, which, as is well known, it is not possible to drill or cut. Consequently it has not been found practicable to drill or cut into the door for the purpose of reaching the boltwork by any of the usual means known to the burglar. It has been suggested, however, that by means of an electric arc an opening might be drilled through the doors heretofore patented by me and by means of this opening the boltwork manipulated or nitroglycerin inserted and the boltwork blown off or the door blown out. The use of nitroglycerin, however, would not be practicable, as there would be no way to prevent its running away, so that it could not be fired, this having proved to be the case when nitroglycerin was inserted through the opening after the combination-lock spindle was removed. Furthermore, even if it could be fired the organization is such that the back plate and the bolt-operating mechanism only would be blown inwardly, it being impossible to blow the bolts out of position or the door outwardly thereby unless such an amount be used as would wreck not only the safe, but its contents and the building in which it was placed. So far as I am aware this electrical attack has not yet been successfully tried in a burglarious manner and in my opinion could not be successful except under the most favorable and exceptional circumstances, owing to difficulties which the burglar would find impossible to overcome. The object of the present invention, therefore, is to provide means which will render such attacks impracticable even under the most favorable and exceptional circumstances and to make such attacks impossible within the time which the burglar usually has to devote to the operation of opening the safe or vault, and for this purpose I have provided means which will prevent the use of the electric arc for the purpose of drilling a hole through the door sufficiently to permit the boltwork to be reached even should, under the most favorable and exceptional circumstances, the door be drilled in this manner. This means in the present instance comprises a member or plate 10, usually corresponding in shape and material to that of the door, and therefore shown

as of circular formation embedded in suitable non-conducting material 12—such, for instance, as cement and sand disposed in a chamber 13 in the rear of the door—and which material and plate are held in position by suitable means—such, for instance, as a plate 14, (designated herein as the “chamber-forming plate,” since it forms with the door-body 2 a chamber 13.) Should the burglar be successful in drilling by means of an electric arc through the body of the door, the non-conducting material will interrupt the use of the arc, and if further attempt is made to reach the bolts by the ordinary tools the manganese-steel plate 10, embedded within the non-conducting material, would prevent this. Consequently the difficulties which would have to be overcome in any attempt to reach the boltwork would require so much time and labor that even under the most favorable and exceptional circumstances a burglar would find it impossible to accomplish his object. In the present instance this plate 14 carries the bearing-surfaces 16 for the bolts. These have heretofore been placed on the body 2 of the door and have, owing to the material of which the door was composed, necessitated considerable work in grinding such surfaces in order that the bolts may work smoothly and properly. By locating these surfaces on this plate 14, which may be of ordinary steel, they can be formed with less time and labor than heretofore. This plate 14 also carries a centrally-located boss 16', with which the inner ends of the bolts engage when in their protracted positions, so that the possibility of withdrawing the bolts except by swinging them radially is prevented. This plate 14 may be maintained in position in various ways; but in the present instance it is bolted at the center thereof to the body of the door, which for this purpose is provided with a boss having a soft-metal insert 17 cast therein for the reception of the bolt. For securing the plate in position at its periphery a wedge is provided in the form of a ring 18. This ring is shown comprised of a plurality of sections 18'.

The plate 10 is cast or formed with a centrally-located opening, so that the centrally-located projection of the chamber-forming plate 14 may pass therethrough and be bolted to the door. By this organization it will be seen that not only is the chamber-forming plate 14 maintained in position by the bolt at the center and the wedges at its periphery, but the locking-bolts resting on such plate throughout their entire length also tend to hold the plate in position when they are in their protracted positions, since the strain thereof will be received by this plate—that is to say, the load being at the points *a* and the fulcrum at the points *b* the power will be applied at the points *c* to the plate 14, whereby it is pressed toward the body of the door. Moreover, it will be seen that this organization provides a multiplied door, be-

tween which plates and the back plate the bolts are located, thus affording additional security to such bolts and their operating mechanism. It will also be seen that should a burglar working under extremely favorable and exceptional circumstances be successful in drilling by means of the arc through the body of the safe-door his further progress would be intercepted and practically prevented by the non-conducting material, since this will prevent the formation of the arc, and consequently the further drilling by this means through the door. Before he could proceed further it would be necessary to remove a considerable portion of the non-conducting material, after which he would still have to penetrate the manganese-steel plate, and the possibility of using an electric arc through such plate while the non-conducting material is surrounding the same is not believed to be practicable.

It will be seen that in the present structure the plate 10 is independent of the door-body and its flange—that is to say, suspended free of connection therewith at all points, except through the medium of the insulating material—and is therefore in what may be designated a “floating” condition.

I claim as my invention—

1. A safe or vault door comprising a body having an integral flange; a plate located interiorly of said flange, said members constructed to form between them a chamber; means for maintaining said members assembled; and a plate suspended in said chamber and embedded in non-conducting material.
2. A safe or vault member comprising an outer member and an inner member constructed to form between them a chamber; means for maintaining said members assembled; and a single, unmachineable plate of relatively large area, suspended in said chamber and embedded in non-conducting material.
3. A safe or vault member comprising an outer member and an inner member constructed to form between them a chamber; means for maintaining said members assembled; and a single member corresponding in shape to that of said safe or vault member and of relatively large area, suspended in said chamber and embedded in non-conducting material.
4. A safe or vault member comprising an outer member and an inner member, one of said members having a surface relative to which the other member is wedged in position, said members constructed to form a chamber between them; and a plate located in said chamber and embedded in non-conducting material.
5. A safe or vault member comprising an outer member and an inner member bolted to each other centrally thereof, and constructed to form an intermediate chamber, and a plate suspended in said chamber and embedded in non-conducting material.

6. A safe or vault member comprising an outer member and an inner member bolted together centrally thereof and constructed to form an intermediate chamber and an annular plate located in said chamber and embedded in non-conducting material.

7. A safe or vault member comprising an outer member and an inner member, said outer member having a surface relative to which the inner member is wedged, said members constructed to form an intermediate chamber, and means located in said chamber and embedded in non-conducting material for resisting attacks.

8. A safe or vault member comprising a body having a rearwardly-extending flange; an inner member conforming to the shape of said body and maintained in position by a wedge or wedges, said members constructed to form a chamber, and means located in said chamber and embedded in non-conducting material for resisting attacks.

9. A safe or vault member comprising a body having a rearwardly-extending flange; a plate wedged in position relatively to said body and bolted centrally thereof to such body, said members constructed to form a closed annular chamber, and an annular plate located in said chamber and embedded in non-conducting material for resisting attacks.

10. A safe or vault door comprising a body having a rearwardly-extending flange; a back plate secured to said flange; bolt mechanism carried by the door; a plate located between the bolt mechanism and the door-body, such members constructed to form a chamber, and means located in said chamber and embedded in non-conducting material for resisting attacks.

11. A safe or vault door comprising a body having a rearwardly-extending flange; a back plate supported by said flange; bolt mechanism operative by means supported on said back plate; a plate located between said bolt mechanism and the body of the door and wedged in position at its periphery and bolted centrally thereof to the door, such members constructed to form a chamber; and a plate located in such chamber and embedded in non-conducting material for resisting attacks.

12. A safe or vault door comprising a body having a rearwardly-extending flange; bolt mechanism for the door, and a plate located interiorly of such flange between such bolt mechanism and the body of the door and receiving the strain of the bolts when such bolts are in their bolting positions, such members constructed to form a chamber; and means located in said chamber for resisting attacks.

13. A safe or vault door comprising a body having a rearwardly-extending integral flange having bolt-openings; bolt mechanism for the door; and a plate located between such bolt mechanism and the body of the door and receiving the strain of the bolts when such bolts

are in their bolting positions, such members constructed to form a chamber; and a manganese-steel plate suspended in said chamber and embedded in non-conducting material for resisting attacks.

14. A safe or vault door comprising a body having a rearwardly-extending flange having bolt-openings; bolt mechanism for the door; a plate located between the bolt mechanism and door and receiving the strain of said bolts when in their protracted positions, such members constructed to form a chamber; means for wedging said plate in position; and means located in said chamber for resisting attacks.

15. A safe or vault door comprising a body having a rearwardly-extending flange having bolt-openings; bolt mechanism for the door; a plate located between the bolt mechanism and the door and receiving the strain of said bolts when in their protracted positions, said members constructed to form a chamber; means comprising sectional wedges for wedging said plate in position at its periphery, and means located in said chamber for resisting attacks.

16. A safe or vault door comprising a body having a rearwardly-extending flange having bolt-openings; bolt mechanism for the door; a plate located between said bolt mechanism and the door-body and maintained in position at its periphery by sectional wedges, and bolted centrally to the door, and receiving the strain of the bolts when in their protracted positions and constructed to form with the door-body a chamber; and a plate located in said chamber and embedded in non-conducting material for resisting attacks.

17. A safe or vault door comprising a body having a rearwardly-extending flange provided with bolt-openings; bolt mechanism for the door; and a plate located between said bolts and the door and maintained in position at its periphery by sectional wedges and bolted centrally thereof to the door and having a boss for the engagement of the inner ends of the bolts when in their protracted position and receiving the strain of such bolts when in such protracted positions and constructed to form with the door-body an intermediate chamber for the reception of a plate embedded in non-conducting material.

18. A safe or vault door formed of manganese steel and comprising a body having a rearwardly-extending integral flange; bolt mechanism for the door; a plate located between said bolt mechanism and said body, said members constructed to form a chamber; and a single manganese-steel plate located in said chamber of an area approximating that of said first plate and embedded in non-conducting material and effective to resist attacks.

19. A safe or vault member comprising an outer member and an inner member rigidly secured in position relatively to each other and constructed to form a chamber; sectional

wedges for securing said members in position; and means in said chamber for preventing electrical attacks.

20. A circular safe or vault door comprising
5 a body having a rearwardly-extending flange, a plate wedged interiorly of said flange, such members constructed to form a chamber; a ring-shaped wedge formed of sections for securing said plate in position, and means in
10 said chamber for preventing electrical attacks.

21. A safe or vault member comprising an outer member and an inner member secured to each other centrally thereof and constructed to form an intermediate chamber, and a
15 plate suspended in said chamber and embedded in non-conducting material.

22. A safe or vault member comprising an

outer member and an inner member in engagement with each other centrally thereof
20 and constructed to form an intermediate chamber and a plate suspended in said chamber and embedded in non-conducting material.

23. A safe or vault door comprising a body
25 having a rearwardly-extending flange, a plate located interiorly of said flange and constructed to form with said body a chamber, means for maintaining said members assembled; and means located in said chamber for resist-
30 ing attacks.

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