

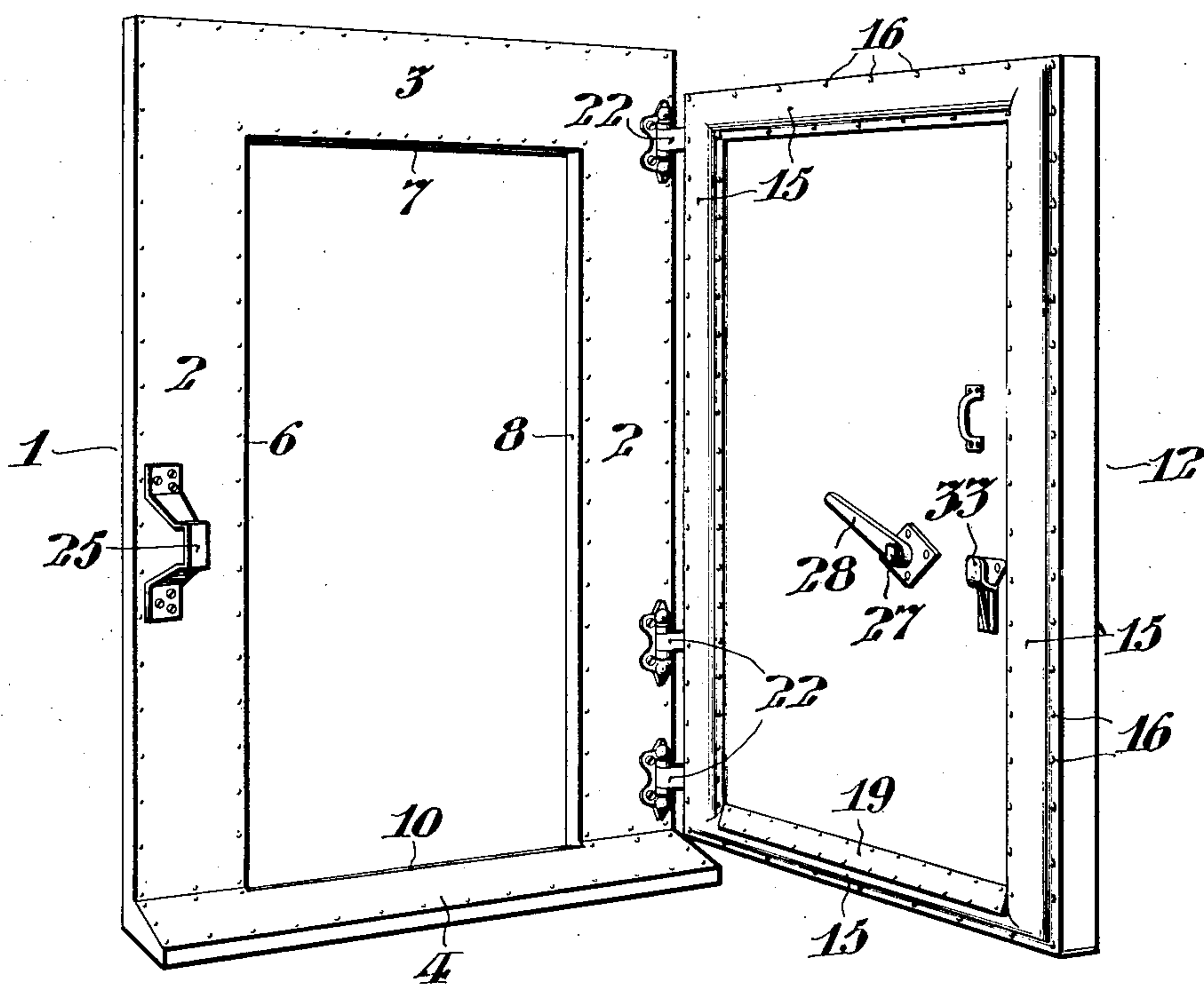
S. P. STEVENSON.  
DOOR AND DOORWAY FOR REFRIGERATING APARTMENTS AND SIMILAR STRUCTURES.  
APPLICATION FILED MAR. 9, 1905.

962,174.

Patented June 21, 1910.

3 SHEETS—SHEET 1.

FIG. 1.



WITNESSES:

*Clifton C. Hollowell*  
*John C. Berghner*

INVENTOR:

*SAMUEL PRICE STEVENSON*  
*by Paige, Paul & Haly*  
*Atty.*

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3 SHEETS—SHEET 2.

FIG. II.

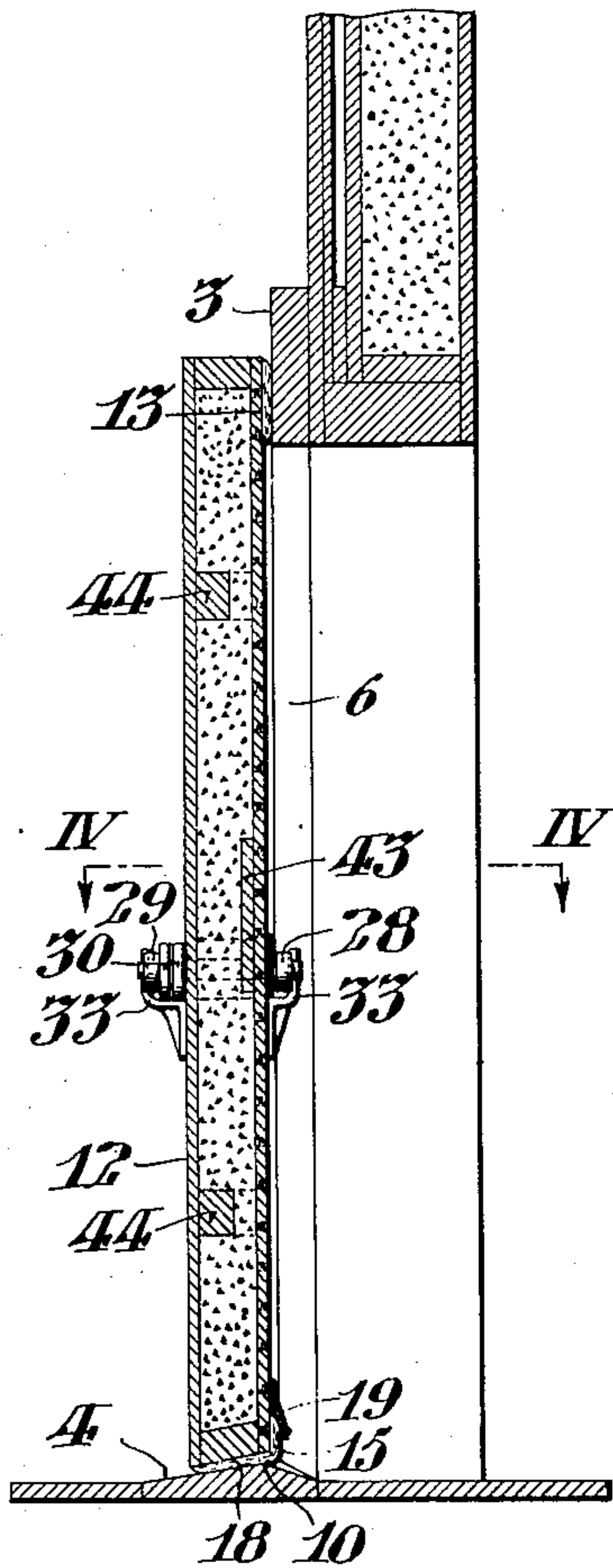


FIG. III.

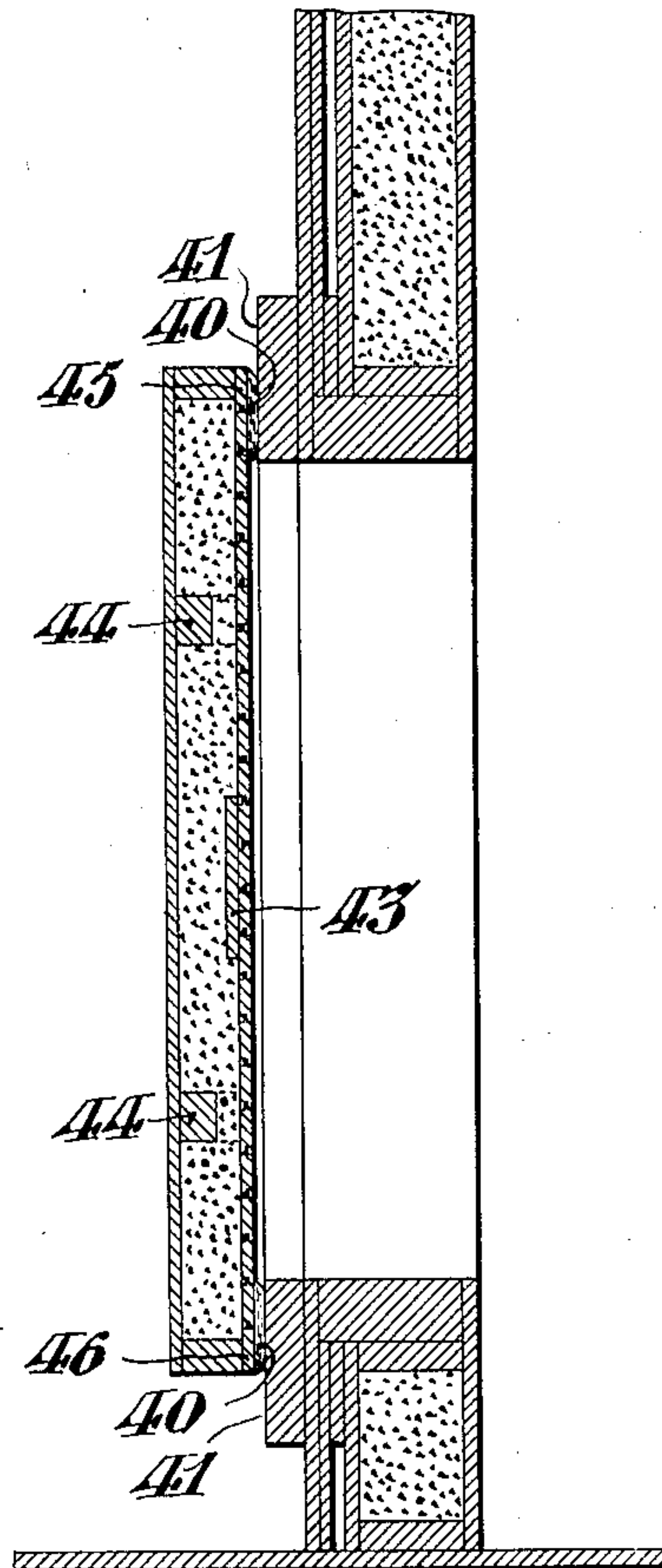


FIG. IV.

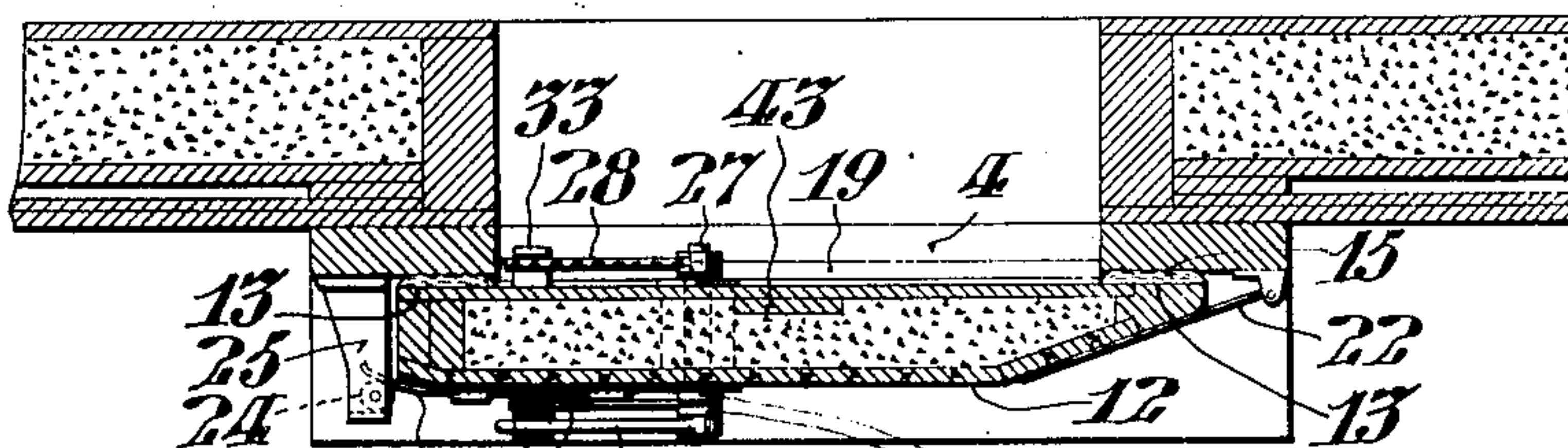
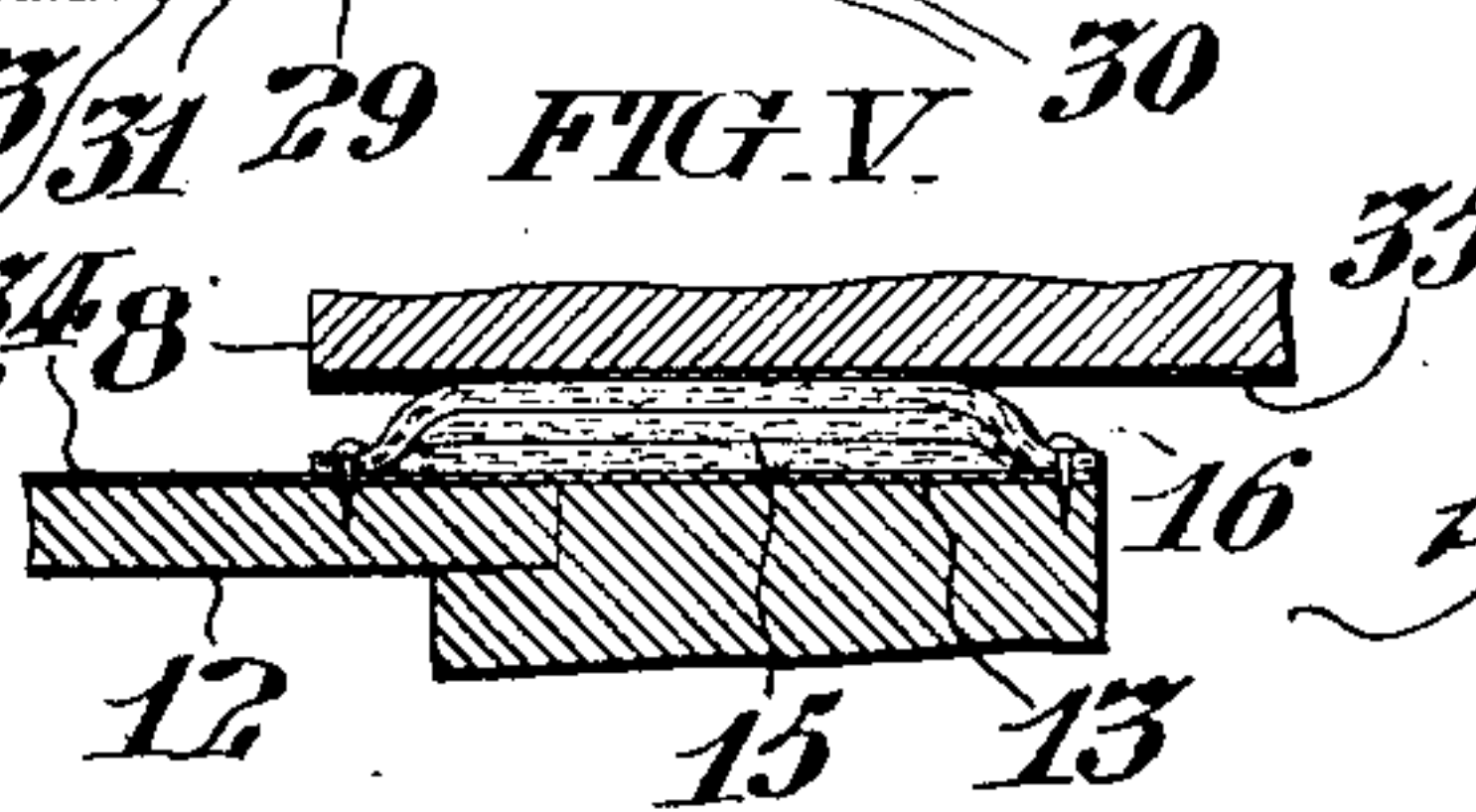


FIG. V.



WITNESSES:  
*Clifton C. Halliwell*  
*John C. Burgher*

INVENTOR:  
SAMUEL PRICE STEVENSON,  
*By Paige, Paul & Haley*  
*Atty.*

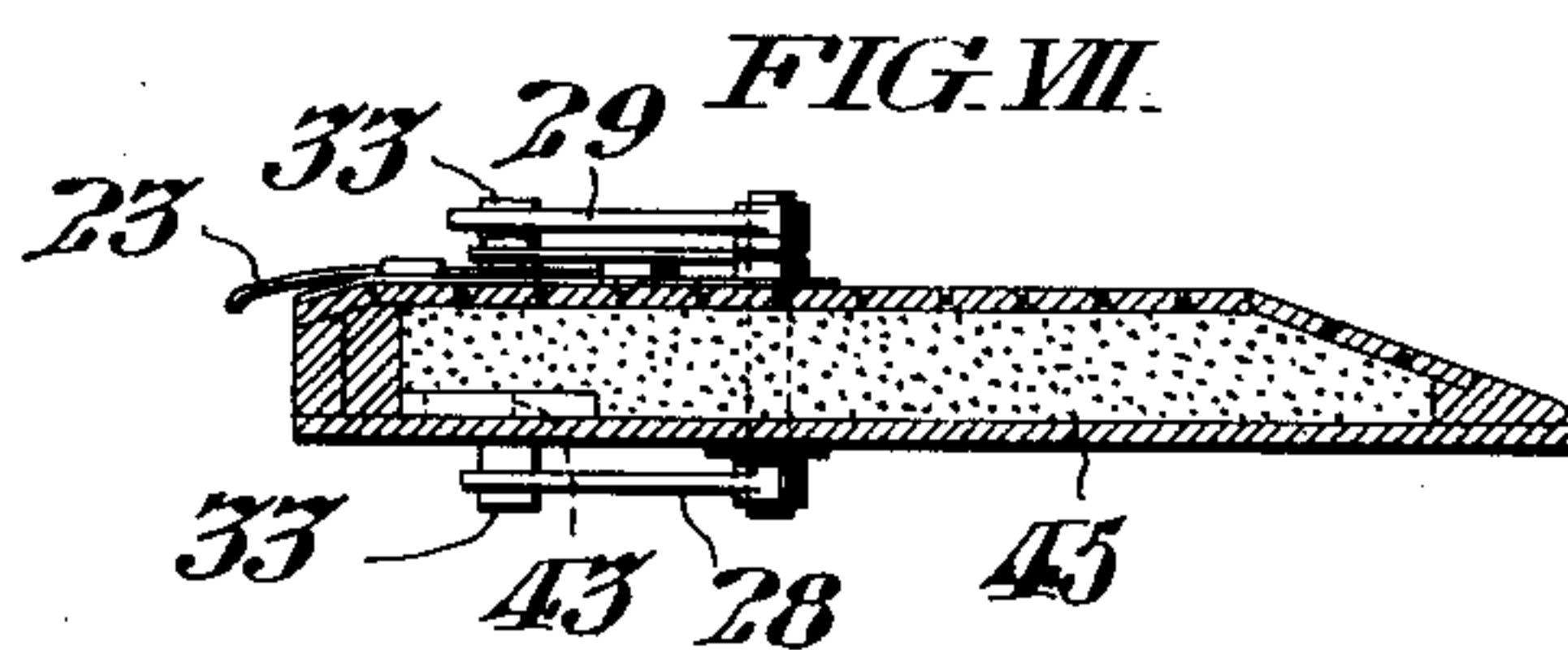
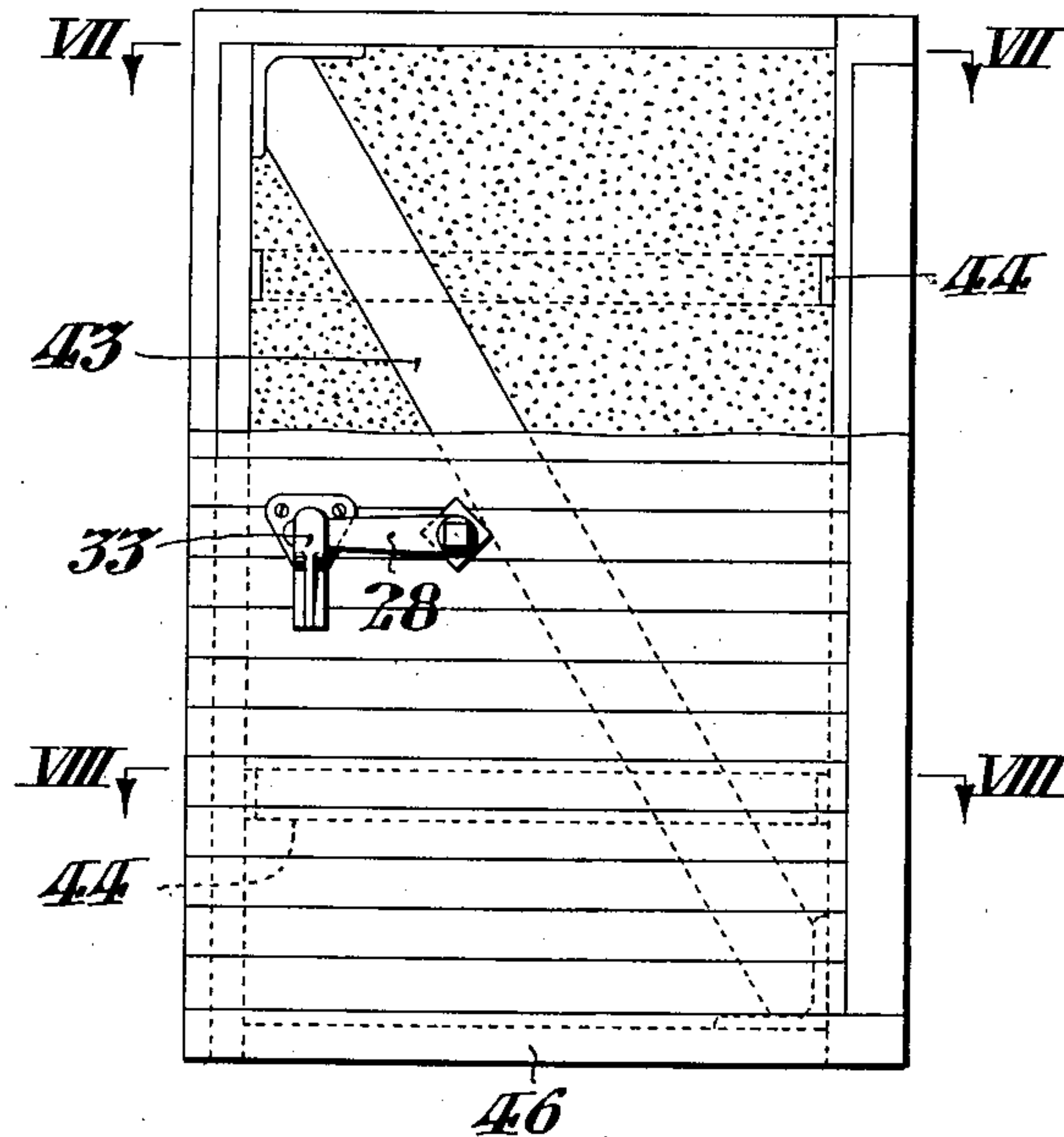
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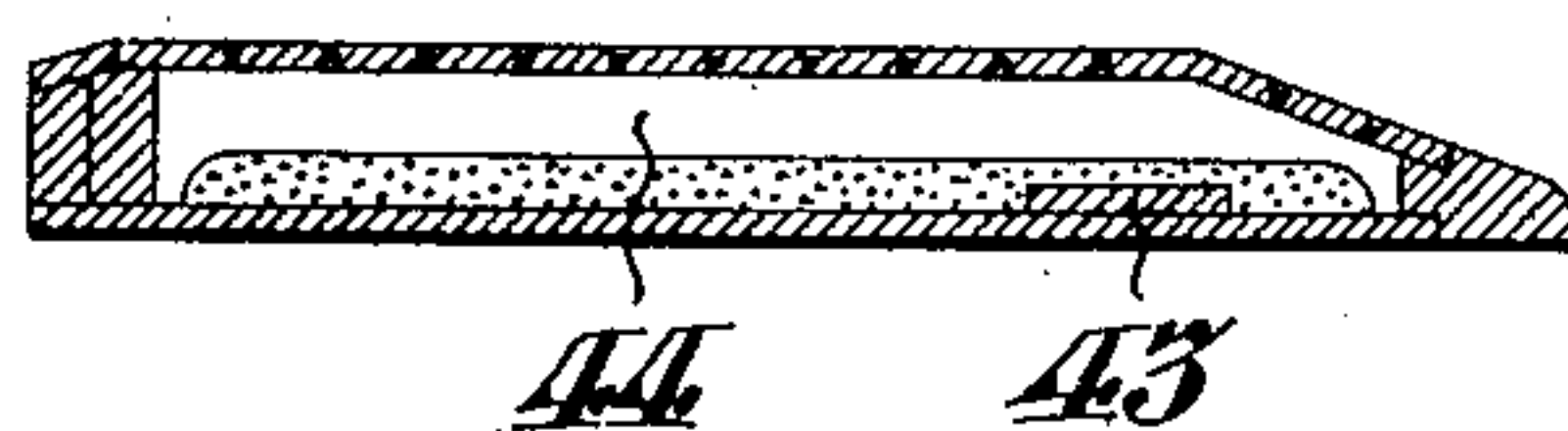
Patented June 21, 1910.

3 SHEETS—SHEET 3.

*FIG. VI.*



*FIG. VIII.*



WITNESSES:

*Clifton C. Halliwell*  
*John C. Bugner.*

INVENTOR:

*SAMUEL PRICE STEVENSON,*  
*by Briggs, Paul & Tracy,*  
*Attys.*



# UNITED STATES PATENT OFFICE.

SAMUEL PRICE STEVENSON, OF CHESTER, PENNSYLVANIA.

DOOR AND DOORWAY FOR REFRIGERATING-APARTMENTS AND SIMILAR STRUCTURES.

962,174.

Specification of Letters Patent. Patented June 21, 1910.

Application filed March 9, 1905. Serial No. 249,232.

*To all whom it may concern:*

Be it known that I, SAMUEL PRICE STEVENSON, of the city of Chester, in the State of Pennsylvania, have invented certain new and useful Improvements in Doors and Doorways for Refrigerating-Apartments and Similar Structures, whereof the following is a specification, reference being had to the accompanying drawings.

My invention relates particularly to doors and door ways which are exposed upon one side to a temperature below the freezing point of water and upon the other to a warmer atmosphere. Under these conditions the moisture condensing from the warmer atmosphere tends to cause swelling of the wood work, which may distort the door and its frame, producing a defective fit, and causing difficulty of operation. Moreover, under such conditions ice and frost may accumulate upon the surfaces to such an extent as to greatly interfere with the opening and closing of the door, the latter sometimes being rendered immovable by anything short of destructive force.

The purpose of the present invention is to provide a door and door frame peculiarly adapted for use under the general conditions above referred to, which shall afford the maximum degree of insulation against the penetration of heat, while at the same time insuring freedom of operation, without alteration or adjustment after being primarily fitted.

Among the prominent objects to which my invention is addressed are the following:—the avoidance of weak points in the insulation itself; the prevention of injurious effects of moisture; the minimizing of the accumulation of ice and frost, and the facilitation of the removal of that which may deposit; the prevention of distortion of the parts by strain and the ready operation of the door under all conditions.

The general character of the structure comprises a door-way having its contacting margin or face in a common plane at the top and sides and a relatively thick door having an interior cavity adapted to be filled with nonconducting material; said door closing flat against the face of the door-way, as distinguished from being inset, and having a relatively wide overlapping margin that is to say, preferably about equal to the total thickness of the door itself, so that, when the door is closed, the joint

between the opposing faces shall afford insulation not substantially less in extent than is afforded transversely through the body of the door itself. The contacting surface, of the door, is preferably provided with a wide pad of compressible material, such as felt, secured about its margins in a common plane so as to lie flat against the opposing surfaces of the door frame, which pad also affords a convenient receptacle for the retention of grease, one feature of my invention comprising the maintenance of greased contacting surfaces of such character as to greatly retard the deposit of ice and frost thereon, and render them easily separable even in the presence of ice.

Other convenient adjuncts of my invention consist in the following features. The provision of a sheet of metal facing upon the exterior surface of the door including its overlapping margins and upon the interior face of the door-frame; the employment of a drip flange arranged to overhang the marginal pad at the bottom of the door; and the use of a threshold beneath the door and sloping in both directions from a ridge which is overhung by the face of the contacting material at the lower portion of the door, so as to insure that moisture dripping from the bottom of the door shall be diverted and shed away from the padded joint.

It will be noted hereafter that the various novel features, which go to make up the complete embodiment thus generally described, are independently claimed and obviously may be individually utilized.

In the drawings, Figure I, is a perspective view of a door and door-way with frame, conveniently embodying my improvements and showing the face of the frame which is presented to the relatively colder inner atmosphere and the face of the door which is presented to the relatively warmer outer atmosphere and receives the deposit of moisture from said atmosphere. Fig. II, is a vertical sectional view of the door and frame shown in Fig. I; showing its connection with the walls of an inclosure. Fig. III, is a vertical sectional view similar to Fig. II, but showing a modified form of door and frame, the latter being without a threshold. Fig. IV, is a plan sectional view taken on the line IV, IV, in Fig. II. Fig. V, is a fragmentary sectional



view showing the detailed construction and arrangement of one of the marginal pads carried by the door. Fig. VI, is a view in elevation, (partly broken away) of the inner face of the door showing the general nature of the door structure, the particular form being that shown in Fig. III. Fig. VII, is a transverse section on the line VII, VII, in Fig. VI. Fig. VIII, is a transverse section on the line VIII, VIII, in Fig. VI.

Referring to Fig. I, the door frame 1, comprises the vertical jambs 2, lintel 3, and threshold 4. The margins 6, 7, and 8, of the frame lie in a common plane, and the threshold comprises portions which incline downwardly upon opposite sides of the plane of contact between the door and frame, the ridge 10, of said threshold being overhung by the contacting face at the lower portion of the door. The door 12, has margins 13, in a common plane, parallel with the plane of the door frame when the door is closed, and provided with pads 15, of compressible material preferably resilient, which, as indicated in Fig. V, are conveniently formed of a plurality of strips of felt secured to the door by tacks 16. The door is hollow and of considerable transverse thickness the cavity being preferably filled with nonconducting material such as cork packing. It will be observed that the margins of the door at the top and sides overlap the opening in the frame to an extent which is not substantially less than the transverse thickness of the door itself, so that assuming a close joint be made along the plane of contact, the effective thickness of insulation at this region about equals, or may even exceed, the transverse depth of insulation in the door itself.

Preferably the door is arranged to open inwardly into the cold apartment, so that the actual contacting faces are not directly in the region of the outer or warmer air when the door is open. Structurally, the door consists of a rectangular frame-work, the back and front being formed preferably of tongued and grooved boards, as indicated, which boards run transversely upon the front, or contacting side, and vertically upon the back. The transverse boards 45, and 46, at the top and bottom run entirely across the face, while the intermediate ones may terminate in a rabbet on the vertical marginal timber. A single diagonal brace 43, extends across within the hollow portion of the door, and horizontal stay pieces 44, are provided, said pieces being recessed or cut away so as to only come in contact with the outer face at very limited points of abutment, thus minimizing the conduction of heat through said pieces. By extending the top and bottom boards across the entire width, the door is properly braced against twisting. It will be noticed that the inte-

rior cavity of the hollow door extends considerably beyond the limits of the opening in the door-frame, so that the contact between the portions which are solid throughout is as limited as is consistent with strength.

The outer face of the door, which is exposed to the warmer and moist exterior atmosphere is covered by a thin sheet of metal 34, (see Fig. V), the strips of packing being applied upon the exterior of this sheet. In a door of this character used in connection with a refrigerating apparatus, the injurious deposit of moisture occurs of course upon that face which is exposed to the outer atmosphere; hence the metallic coating prevents the absorption of moisture by the wood of the door, and the consequent diminution of its insulating power, and also in this instance prevents the absorption by the wood-work, of the lighter elements of the grease employed in connection with the packing strips, and the consequent hardening thereof. It also facilitates the removal of any ice which may accumulate, without risk of abrasion of the door and frame. At the bottom of the door the packing is provided with an extension 18, which bears upon the threshold 4, when the door is in closed position. A drip flange 19, of metal is arranged across the bottom of the door and overhangs said pad, so as to shed any dripping moisture beyond the pad. The ridge 10, of the threshold is so located as to be overhung by that portion of the pad which is upon the inner face of the door and thus any moisture which reaches the threshold gravitates away from the pad and avoids the soaking thereof. The contacting face of the door frame may be similarly provided with a covering of sheet metal as indicated at 35, in Fig. V.

The pads or contacting faces surrounding the margin of the door are saturated or liberally supplied with a grease of such character as to be as permanent as possible, that is to say, it should neither run by reason of accidental exposure to the warm air, nor become brittle through the effects of the cold. When a greasy coating of this character is maintained at the region of contact, the formation of ice and frost there is largely prevented, and, moreover, should any congelation take place, it is usually soft and mushy so that it can readily be removed. The film of grease around the doorway thus facilitates the liberation of the door from the door frame.

It is of course desirable that when in the closed position the door shall be firmly pressed home, but at the same time any scraping or irregular pinching of the pads, which might distort them, should be avoided. I mount the door upon elongated hinges 22, which are preferably somewhat elastic, and fasten it when closed by a resilient latch 23,



which slides beneath the roller 24, in the bracket 25, mounted upon the frame. It is to be understood that said latch 23, may be reciprocated to and from its closed position shown in Fig. IV, by any convenient means; for instance, as shown in said figure, the rock shaft 27, extends through the door and is provided upon the opposite sides of the latter with the lever handles 28, and 29, by which said shaft may be rocked. Adjacent to the handle 29, said shaft is provided with the crank 30, connected by the link 31, with said latch 23, so that the latter is reciprocated in accordance with the oscillatory motion of said shaft 27. Brackets 33, are provided upon the opposite sides of the door to support the handles 28, and 29, when the latch is in closed position. I do not, however, in this application claim the specific features of construction of this latch, but reserve the same for a separate application.

The elongated hinges 22, are preferably applied to a beveled surface upon the non-contacting face, or back, of the door, so as to permit the mounting of the axes, upon which they swing, in close proximity to the plane of contact between the frame and the pads on the door. By this means the scraping and irregular pinching of the packing pads is minimized and their life is prolonged. This method of attaching and mounting the hinges has the advantage of avoiding an excessive extension of the knuckle end of the hinge, and permits the strap of the hinge to be secured to the door by screws or fastenings which do not extend through the latter, since there is little or no strain upon said fastenings, even when the door is closed with pressure.

Although under most circumstances it may be preferable to provide the door-way with a threshold having inclined portions as above described, and as shown in Fig. II, yet it is to be understood that the general features constituting my invention may be employed in a door, such as is shown in Fig. III, where no threshold, in the ordinary sense of the term, is employed, the casing of the door-way extending across the bottom in a manner similar to that at the sides. In this instance, the pad 40, upon the contact margin of the door, may extend completely around, so as to bear against the surface 41, of the door-frame which is similarly arranged at all four sides.

It is proper to note that the structural features, comprising the frame and door which embody my invention, may be constructed and supplied as a whole, constituting an article of manufacture and sale which can be applied to any suitable apartment, and which, when thus fitted in position, will maintain itself practically permanent, without necessity for readjustment. Obviously, however, the door may be applied to a door-

way or opening in a wall with plane margins, irrespective of the use of the frame itself.

I do not desire to limit my claim to the precise details of construction and arrangement herein set forth, since various modifications may be made therein without departing from the essential features of the invention, and, moreover, since many of the features are susceptible of independent use in structures which do not embody the totality of novel improvements, specified as preferable.

I claim:—

1. The combination, with a door-way having its contacting margin wholly in a common plane at the top and sides; of a door having an internal cavity, whose area is greater than the area of the door-way opening, said door having a contacting margin at its top and sides, wholly in a common plane, adapted to overlap and abut against the margin of the door-way; a non-conducting filling arranged within said cavity; and hinges adapted to support the door in such relation to the door-way that the internal cavity of the door shall overlap the edge of the door-way opening.

2. The combination, with a door-way having its contacting margin wholly in a plane surface at the top and sides; of a door having its contacting face at its top and sides wholly in a common plane adapted to overlap the face of said plane margin; and a coating of grease maintained between the contacting surfaces of the door and the door-way margin for retarding the deposit of ice and frost and facilitating the liberation of the door from the door frame, substantially as set forth.

3. The combination with a door-way having its contacting margin wholly in a plane surface at the top and sides; of a door having its contacting face at its top and sides wholly in a common plane adapted to overlap the face of said plane margin; a pad of compressible material mounted upon said face of the door, and a coating of grease upon said pad for retarding the deposit of ice and frost and facilitating the liberation of the door from the door frame, substantially as set forth.

4. The combination, with a refrigerator apartment; of a door-way having its contacting margin wholly in a common plane at the top and sides, said contacting margin being upon that face of the door-way which is within the apartment; a door having an internal cavity whose area is greater than the area of the door-way opening, said door having a contacting face at its top and sides wholly in a common plane adapted to overlap and abut against the margin of the door-way; hinges arranged upon that face of the door-way which is within the apartment,



whereby the door is adapted to open inwardly within said apartment; and a sheet metal covering on the surface of the door which is adjacent to the door-way opening.

5 5. The combination, with a refrigerator apartment; of a door-way having its contacting margin wholly in a common plane at its top and sides, said contacting margin being upon that face of the door-way which  
10 is within the apartment; a door having its contacting face at its top and sides wholly in a common plane adapted to overlap and abut against the margin of the door-way; a pad of compressible material mounted  
15 upon the contacting face of the door; a sheet metal covering on the surface of the door which is adjacent to the door-way opening; and a sill having portions sloping inwardly in opposite directions from a ridge  
20 located within the door-way and overhung by the outer face of the door at the lower extremity thereof.

6. The combination, with a door-way having its contacting margin wholly in a common plane at the top and sides; of a door  
25 having its contacting face wholly in a common plane adapted to overlap such plane margin; widely extended pads arranged upon the overlapping margin of the door

and extended hinges applied upon a beveled surface at the rear face of the door and having their axes of rotation close to the plane of contact between the pads and the door-way margin; whereby the said pads may be closed and compressed against the door frame without injurious scraping or pinching, substantially as set forth. 30 35

7. The combination, with a door frame having its contacting margin wholly in a plane surface at the top and sides; of a door  
40 having its contacting face wholly in a common plane adapted to overlap said plane margin, and having a beveled surface along one edge of its back; widely extended pads arranged upon the overlapping margin of  
45 the door; and hinges with elongated straps applied to said beveled surface, said hinges having their axes close to the plane of contact between the door and door frame, substantially as set forth. 50

In testimony whereof I have hereunto signed my name at Philadelphia, Pennsylvania, this sixth day of March, 1905.

SAMUEL PRICE STEVENSON.

Witnesses:

JAMES H. BELL,  
E. L. FULLERTON.