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INSULATED DOOR AND THE LIKE

Filed Aug. 17, 1929

2 Sheets-Sheet 1

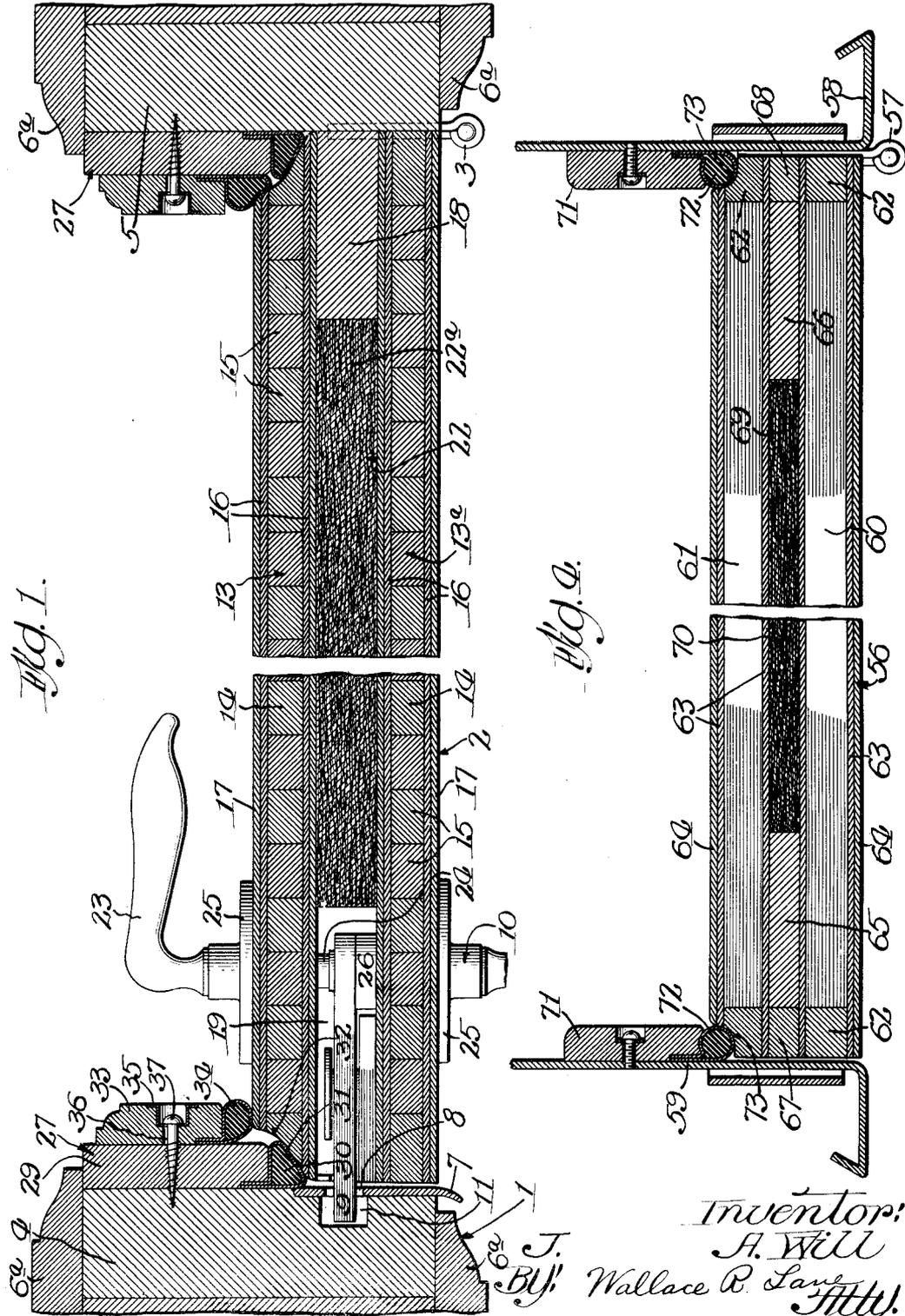


Fig. 1.

Fig. 4.

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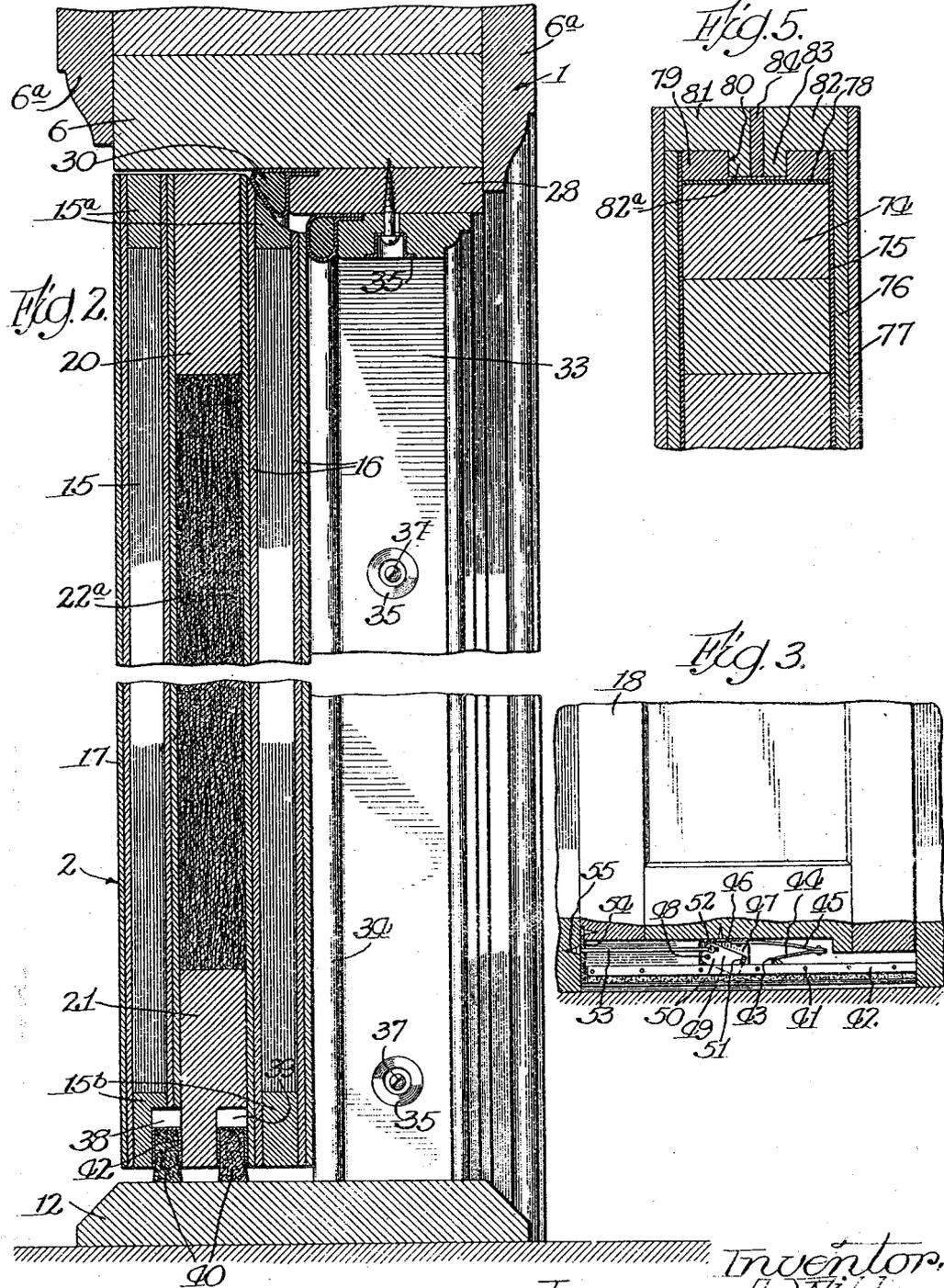
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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INSULATED DOOR AND THE LIKE

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The present invention relates to insulated structures, and more particularly to insulated door constructions or the like.

Among the objects of the invention is to provide a novel insulated door construction or the like having closure units in spaced relation with an insulating medium therebetween, such that vibration or the like set up in the closure units will be absorbed within the insulating medium and diffused to such an extent that the passage of sound from unit to unit is negligible or nil.

Another object of the invention is to provide a novel insulated door construction or the like comprising spaced closure units to provide an insulating space therebetween, whereby vibrations set up within the closure units are diffused and absorbed by the medium within the space, the closure units being connected together for providing sufficient mass which, together with the spaces therebetween, provide resisting media for the passage of sound or the like.

It is a further object of the invention to provide a novel insulated closure member such as a door or the like, the closure member comprising spaced closure units to provide an insulating space therebetween, the units being so connected together as to form a unitary closure member which is hinged to a suitable framing or studding to permit ingress and egress through the opening closed by the closure member.

The invention comprehends the idea of providing a novel insulated door or the like having spaced closure units provided with spacing or separating means for providing a closed space between the units for holding and retaining an insulating material to further assist in absorbing and diffusing vibrations occurring in the closure units and members.

It is a further object of the invention to provide a novel door construction or the like in which the insulated closure member is adapted to contact resilient means provided in the frame surrounding the closure member, the contacting of the member and such means sealing and closing the opening between the member and frame.

The invention further comprehends the provision, with the resilient means about the frame, of means associated with the door and at the bottom thereof for sealing the opening at the base of the closure member and between the same and the threshold at the base of the frame.

Another feature of the invention is to provide means for adjustably connecting these resilient contacting means to the frame of the door construction such that as the means becomes less resilient due to use and the like, a greater surface of contact may be provided by suitable adjustment.

A further object of the invention is to provide a novel composite insulated door or closure member having spaced closure units of novel construction and marginal separating members adapted to form the stile and rail members of the door, as likewise to provide a closed space between the units for insulating purposes, the space containing a suitable insulating material to effect a further barrier for the transmission of vibrations occurring in the closure units.

A still further object of the invention is to provide a novel compositely constructed door or the like having a closure unit or units, these units having a core provided with an insulating material thereover, such as asbestos and the like, as likewise a surface covering or veneer, the closure units being spaced or otherwise, as may be desired.

Other objects, capabilities, advantages and features are comprehended by the invention as will later appear, and as are inherently possessed thereby.

Referring to the drawings:

Fig. 1 is a horizontal cross sectional view through an embodiment selected to illustrate the invention.

Fig. 2 is a vertical cross-sectional view taken through the embodiment shown in Fig. 1 of the drawings.

Fig. 3 is a view in front elevation with parts cut away to show in detail the means provided to effect a sealing of the opening between the bottom of the door and threshold.

Fig. 4 is a horizontal cross sectional view

of another embodiment illustrative of the present invention.

Fig. 5 is a horizontal cross sectional view showing in part an alternative construction of an enclosure member embodying the inventive idea of the present application.

Referring now more in detail to the drawings, the invention is shown as embodied in a door construction provided with a frame 1 having properly fitted therein a closure member 2 suitably hinged to the frame by hinge elements or butts 3 of any suitable construction.

The frame 1 comprises vertical jamb members 4 and 5 having a lintel piece 6 suitably connected to the top thereof, these jamb members and lintel piece having connected to their edges by any suitable means, such as nails, screws or the like, molding strips or edge strips 6^a of any desired design or configuration in accordance with the surroundings.

The jamb 5 has connected thereto at suitable intervals, the butt or hinge elements 3 for properly hanging the closure member 2, while the jamb member 4 is provided with a keeper 7, having an opening 8, adapted to receive a bolt 9 of a lock 10, the latch 9 protruding through the opening 8 and into a recessed portion 11 in the jamb. A threshold 12 is provided and extends between the lower ends of the jambs 4 and 5, and is suitably fitted or connected thereto, the base of the threshold resting upon a flooring or the like.

The closure member 2 comprises closure units 13 and 13^a of like construction, each of these units having a central core portion 14 made up of a plurality of longitudinal strips 15 of any suitable material, their edges being suitably planed or finished, and the adjacent strips being connected together by any suitable material, such as glue or the like. Horizontal cross members 15^a and 15^b are provided at the top and bottom respectively of the longitudinal core members, these members running across the ends of the longitudinal members 15 and being flush with the top and bottom of the closure unit when finished. Over each face of this central core is laid cross banding or strips 16, this cross banding being connected to the core or central portion 15 by any suitable means, such as by nails, brads, glue or the like, the grain thereof running crosswise or perpendicular to the grain of the longitudinal members 15.

The cross-banding or strips 16 is then covered or surfaced with a suitable surface finish, such as veneer 17 or the like, the veneer being connected to the cross-bands or strip and core by any suitable means such as nails, brads, glue or the like.

The composite closure units 13 and 13^a are spaced apart by vertical marginal or stile members 18 and 19 and rail or horizontal members 20 and 21, the ends of these members being suitably connected together to form a

frame to which the closure units are connected to form a closed space 22 between the units and frame. This closed space 22 in itself, is very effective in preventing the transmission of vibrations from one side of the closure member to the other, but to further provide means for absorbing and diffusing the travel of such vibrations from one side to the other, an insulating material 22^a, such as pressed flax, felt, or any other suitable sound absorbing material is provided in this space.

The lock 10 may be of any suitable construction and is shown, in the embodiment selected to illustrate the invention, as comprising handles 23 on each side of the door, these handles being connected to a rod or shaft 24 passing through suitable apertures in the closure member 2 and being journaled in bearing plates 25 connected to the face of the member 2 by any suitable means. This rod or shaft 24 has an eccentric mounted thereon over which fits the apertured end of the latch 9 for the operation thereof. Any suitable mechanism (not shown) may be provided for keeping the latch 9 in its normal extended position.

In the construction of an insulated closure member, it is very important, in order that the structure may be effective in preventing passage of sound, fire or the like, that the openings occurring between the closure member and the frame thereabout be sealed and closed. In the present invention, suitable means have been provided to effectually seal and close such openings which comprises vertical stops 27 of like construction connected to the jambs 4 and 5 by any suitable means. A similar horizontal stop member 28 is suitably connected to these vertical stops at the tops thereof and is connected to the lintel member 6. These stop means 27 and 28 comprise an inner member 29 adjacent to the jamb or lintel members and is provided at its inner edge adjacent the closure member 2 with a resilient strip of insulating material such as rubber, flax, or other like materials, the insulating material in the present embodiment being shown as having a central resilient portion 30 surrounded by an outer covering 31, the ends of the covering being extended and being intermediate the surfaces of the inner member 29 and jambs for holding the resilient strip in position. The edge of the closure unit 13 is provided with a cut-out portion as clearly shown at 32 to provide a suitable surface against which the resilient strip contacts to provide a sealing means around the closure member. The stop 27 is further provided with an outer member or strip 33 having at its edge adjacent the closure unit 13, a resilient insulating strip 34, similar to the previously described insulating strip and similarly held in position. This outer member 33 is provided with inserts or eyelets 35 at intervals

therealong, these inserts having a slotted opening adapted to fit over a slotted aperture 36 in the member. This member 33 is adjustable on the screw 37 and when in a desired position may be so held by tightening the head of the screw on the bottom shoulder of the insert 35.

By means of such adjustment the resilient strip 34 may be made to contact the closure unit 13^a over a greater or less surface as desired, or when the resilient strip becomes worn, it may be necessary to adjust by way of the screw 37 in order to sufficiently contact the surfaces of the closure unit 13^a to assist in preventing the transmission of sound, fire, etc. through the openings between the closure members and the frame thereabout.

In the bottom portion of the insulated closure member, is provided slotted openings 38 and 39 in one of the cross members 15^b and in the rail member 21, respectively. Suitable mechanism is installed therein for extending the strips of felt 40 or other like material enclosed therein to contact the upper surface of the threshold 12 and for sealing and closing the opening between the bottom of the door and threshold when the enclosure member is in a closed position. The felt strip is suitably connected by rivets 41 or the like to a metallic channel strip 42 guided by the walls of the slotted openings. The channel 42 is provided with a lug or projection 43 engaging an aperture at the end of a flat spring 44, the other end of this spring being connected to a similar flat spring 45 which is connected to the central portion of a channel member 46 having downwardly extending side legs 47, these legs having suitable apertures to receive trunnions 48 projecting from the side legs 49 of a channel member 50 pivotally connected with the sides of the channel member 46 having a portion 51 extending between the side legs and adapted to bear on the top of the channel member 42. A member 52 is journalled in the side walls or legs of the channel member 50 and adapted to carry a rod 53 extending and protruding through an aperture in a plate 54 flush with the face of the stile member 18, the end of the rod adapted to contact the head of a screw 55 or the like in the jamb 5.

The springs 44 and 45 normally hold the rib or channel 42 carrying the felt or other insulating material within the slotted openings 38 or 39 when the door is in an opened position, however, the rod 53 is adjustable in the member 52, such that when its other end contacts the head of the screw 55, when the door is closed or is being closed, the pressure exerted on the rod thereby being transferred by way of the rod 53 and the pivoted member 50 to cause a downward movement of the rib or channel member 42 and felt 40 for sealing the

opening between the bottom of the closure member and threshold.

The embodiment shown in Fig. 4 of the drawings to disclose the present invention is shown as comprising a closure element 56 hingedly connected by suitable hinge elements 57 to a metallic jamb member 58, the latch mechanism at the other edge of the closure member being in engagement with a similar jamb 59, these jamb members forming together with a metal lintel member the frame about the closure member.

The closure member is somewhat similar to the closure member hereinbefore described, with the exception that the cores 60 and 61 are made up of horizontal members suitably connected together and having vertical stile members 62 at the ends thereof. Cross-bands or strips 63 are connected by such means as nails, brads, glue or the like, to the face of these cores. The exterior surfaces of the core members are provided with a surface covering or veneer 64. Separating members 65 and 66 as well as rail members (not shown) at the top and bottom of the closure member, are provided and are of a similar construction as hereinbefore described with the exception that stile members 67 and 68 are provided at the outer edges thereof, and interposed between the stile members 62.

An insulating space 69 similar to the insulating space referred to before, is provided between the closure unit and frame, and in which is placed an insulating material 70, such as pressed flax, felt or other similar materials. Stop members 71 having resilient insulating strip 72 associated therewith and adapted to contact the cut-out portion 73 in the closure units 61 are provided and are adjustably connected (as hereinbefore described) to the jambs 58 and 59 and the lintel member (not shown) of the closure frame. Similar means as hereinbefore described may be provided to seal the openings between the bottom of the closure member and a threshold provided at the bottom of the member.

The closure member disclosed in Fig. 5 and embodying the present invention is shown as comprising a central core portion 74 of a plurality of longitudinal members suitably connected together. The surfaces of the core are provided with a layer of asbestos 75, the asbestos being covered by cross banding or strips 76 over the face of which is a surface finish or veneer 77. A strip of asbestos 78 is provided for the edge of the core portion over which is positioned a member 79 having a longitudinal central cut-out portion or slot 80. The edge or stile members about the closure member comprise members 81 and 82 of like construction having inwardly extending leg portions 82^a and 83 extending into the slotted opening 80 of the member 79. A longitudinal key strip 84 is provided between the members 81 and 82 and is adapted to hold

these edge members in position about the margin or border of the closure member. Similar means as previously described, may be provided to seal the opening about the closure unit and frame, as likewise to close the opening occurring between the bottom of the closure member and threshold.

In the construction as shown in Fig. 5 of the drawings the layer of asbestos or asbestos sheathing between the central core portion and the outer surface of veneer not only serves to render the door soundproof but also fireproof. This construction likewise readily lends itself for use where it is desired to provide a door having the natural wood finish as also having fire resisting qualities. In the present construction, no metal is necessary to produce a fireproof door and has the advantage over such a construction inasmuch as asbestos is not only fire resisting but furthermore absorbs and diffuses sound vibrations which otherwise would be transmitted in a metallic door.

While I have herein described and upon the drawings shown illustrative embodiments of the invention, it is to be understood that the latter is not limited thereto, but may comprehend other constructions, details, arrangements of parts, and features without departing from the spirit thereof.

Having thus disclosed the invention, I claim:

1. A composite insulated door construction comprising spaced closure units each comprising a central core composed of a plurality of elements joined together, veneer sheets on opposite sides of said core, marginal spacing means between said units and enclosing a space therein and between said units, and insulating material in said space.

2. A composite insulated door construction comprising spaced closure units each comprising a central core composed of a plurality of elements joined together, cross bandings joined to the opposite sides of said core, veneer sheets on said cross bandings, marginal spacing means between said units and enclosing a space therein and between said units, and insulating material in said space.

3. A composite insulated door construction comprising spaced closure units each comprising a central core composed of a plurality of elements joined together, cross bandings joined to the opposite sides of said core, veneer sheets on said cross bandings, marginal spacing means between said units and enclosing a space therein and between said units, insulating material in said space, stops located proximate to the marginal portions of one of said units, and resilient sealing means carried by said stops and contacted by said marginal portions of said unit.

In witness whereof, I hereunto subscribe my name to this specification.