United States Patent

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[54] ACCESS DOOR ASSEMBLY

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[52] **U.S. Cl.**.....**52/211,** 49/381, 52/122, 52/221, 52/303, 52/484

[51] **Int. Cl.**.....**E06b 1/60**

[58] **Field of Search** 49/381, 504; 52/484, 486, 204, 52/211, 303, 220, 221.19, 122

[56] **References Cited**

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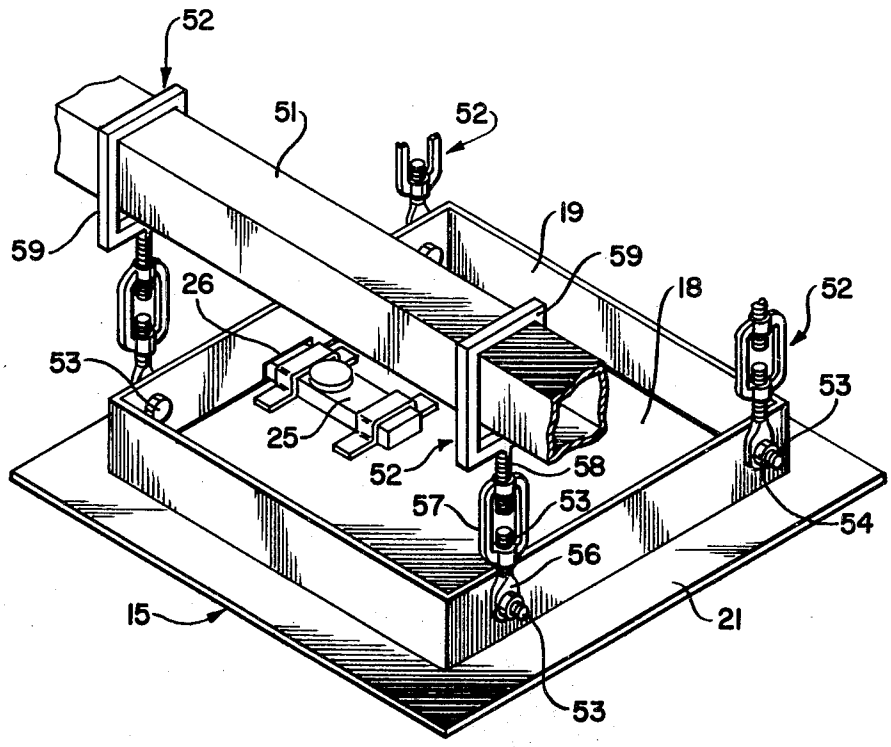
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Primary Examiner—Price C. Faw, Jr.
Attorney—Polachek & Saulsbury

[57] **ABSTRACT**

An access door assembly comprising a frame with an inwardly extending flange, a removable access door and clamping devices that are adjustable and so adapted that they can be adjusted to attach the access door assembly to bar members already randomly provided within the ceiling or wall structure at variable distances from the opening whereby a flush and tight clamping engagement will be made of the access door assembly against the exterior surfaces of the ceiling or wall within the opening of which the access door is being secured. The clamp devices are fixed at the corners of the door assembly and removed somewhat from the access door opening area and so that there is little interference therefrom.

8 Claims, 10 Drawing Figures



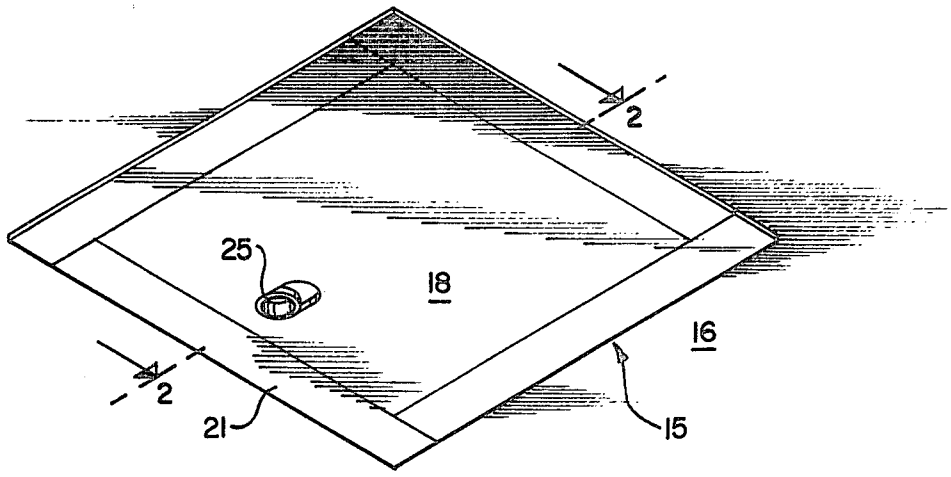


Fig. 1.

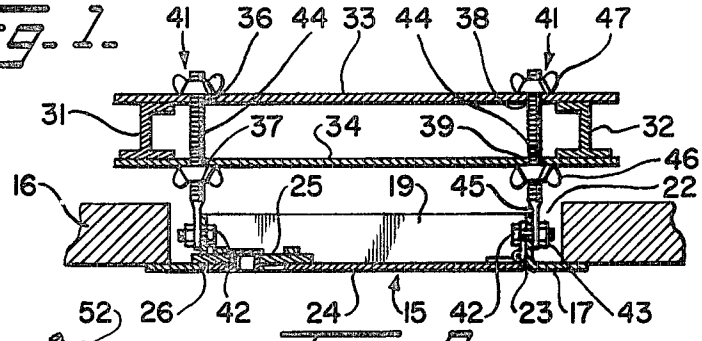


Fig. 2.

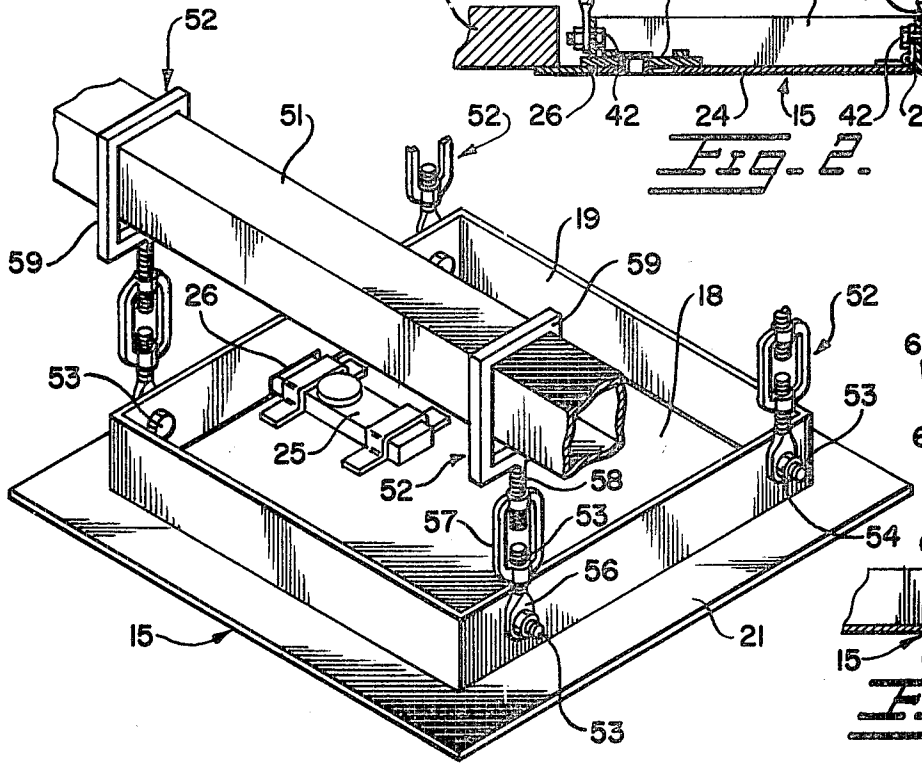


Fig. 3.

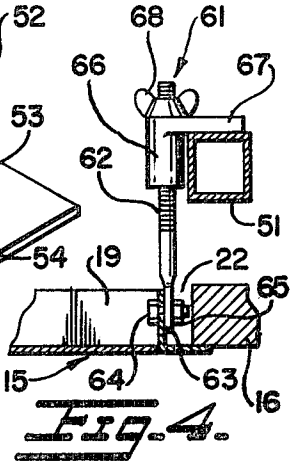


Fig. 4.

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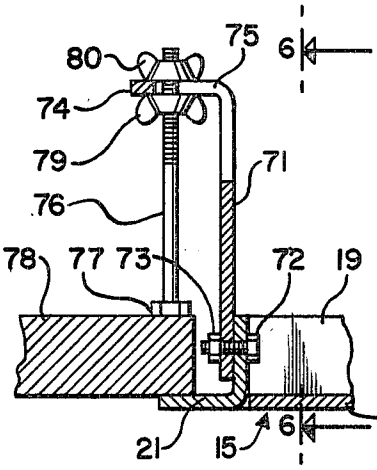


Fig. 5.

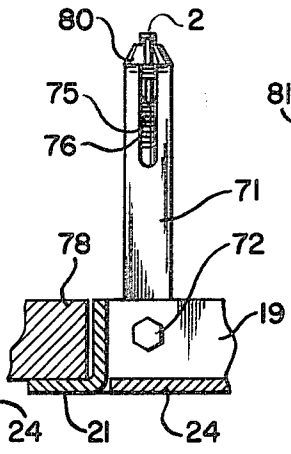


Fig. 6.

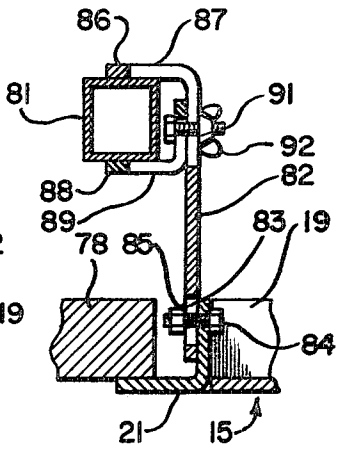


Fig. 7.

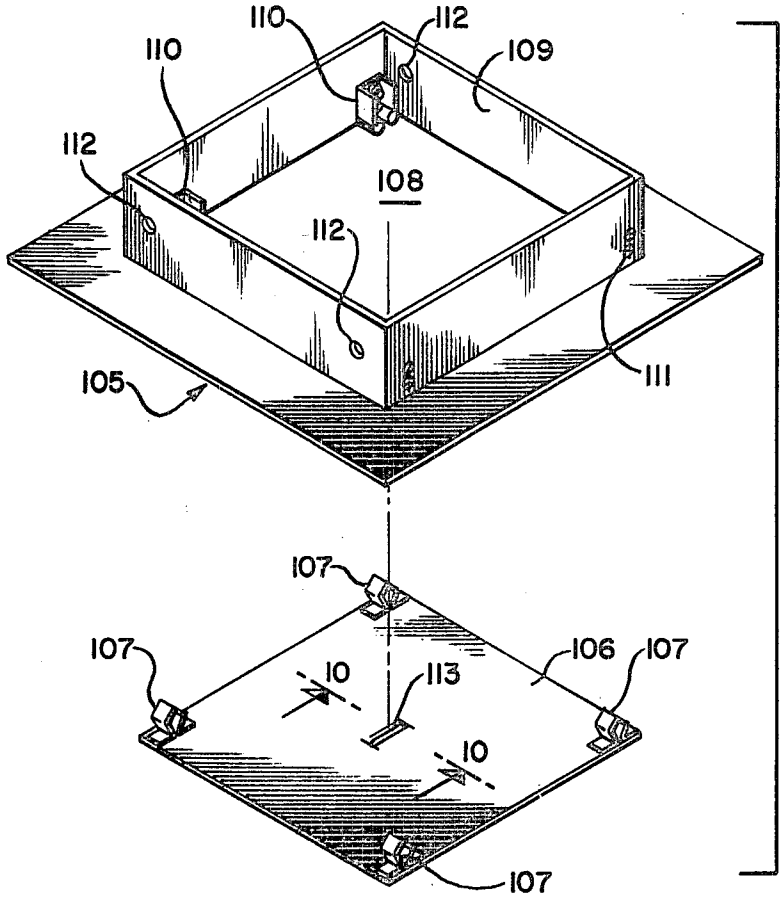


Fig. 9.

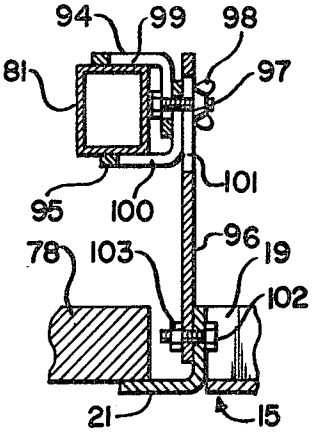


Fig. 8.

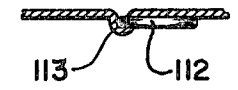


Fig. 10.

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ACCESS DOOR ASSEMBLY

This invention relates to an access door assembly and more particularly to clamping devices for the securing of the access door assembly upon a ceiling or wall structure.

It is the principal object of the present invention to provide clamping devices for access door assemblies which can be adjusted and adapted to secure an access door assembly to parts already fixedly provided in the ceiling or wall opening and in a tight-fitting manner flush against the exterior wall surface.

It is another object of the invention to provide an access door assembly which can be secured within a ceiling or wall structure which does not require replacing of parts or the drilling or tooling of parts already within the ceiling or wall structure in order to make the securement of the access door assembly within the wall or ceiling opening.

Other objects of the invention are to provide clamping devices for an access door assembly, having the above objects in mind, which is of simple construction, made of minimum number of parts, easy to attach to the access doorframe, can be adjustable on the access doorframe angularly, securable by thumb nut members, efficient and effective in use.

For better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawings, in which:

FIG. 1 is a front perspective view of an access door assembly mounted in a ceiling and its front flange lying flush against the exterior surface of the ceiling.

FIG. 2 is a transverse sectional view of the access door assembly and of the Z-bars of an acoustic ceiling serving as a support to which the clamp devices that hold the access door assembly are attached.

FIG. 3 is an enlarged inside perspective view of the access door and of hanger parts and clamp device according to another form of the invention that includes a turn buckle and enlarged square eye member extended over a support bar.

FIG. 4 is a fragmentary vertical sectional view of a modified form of clamp that can be used with a square fixed support bar in the ceiling or wall structure.

FIG. 5 is a fragmentary sectional view of a ceiling structure in which a further form of clamp device is used for the attachment of the access door directly to the interior of a wall structure.

FIG. 6 is a vertical view of the access door assembly of FIG. 5 as viewed on line 6—6 thereof and looking in full inner face view on the L-shaped clamp member. L-shaped

FIG. 7 is a fragmentary vertical sectional view of the access door assembly and of a clamp similar to that shown in FIGS. 5 and 6 in which by the addition of a further part, the L-shaped member is adapted for engagement to a square-shaped beam member.

FIG. 8 is a fragmentary sectional view of a still further clamp device for securing the access door to a square beam in which the connecting clamp part is not of L-shaped but straight and with which two angle members are used for engagement of the connecting clamp member with the square beam.

FIG. 9 is an inner perspective and collective view of a modified access door assembly to which the clamp devices may be attached and being modified from the door assembly FIG. 3 in that a closure plate is snap fastened to the access frame to cover the opening thereof.

FIG. 10 is a fragmentary sectional view of a pull ring member attached to the center of the cover plate and by which the cover plate can be lifted from the access doorframe.

Referring now to FIGS. 1 and 2, 15 generally represents an access door adapted to be secured into an acoustic ceiling structure 16 and which comprises a frame 17 of square shape with an opening 18, an inwardly extending wall 19 from which there extends laterally a flange portion 21 for engagement with the exterior surface of the acoustic ceiling structure 16 when the access door assembly is mounted within a ceiling opening 22. The frame 17 at one side thereof has hinges 23 to which an access door 24 is hingedly connected within the

frame opening and which has a slide latch 25 that can be slid into a slot 26 at one side of the opening 18 opposite to the hinges 23 to effect a latch engagement with the inwardly extending flange 19. When the latch 25 is released the door can be opened and access had to the interior of the ceiling.

Within an acoustic ceiling structure there is found fixedly spaced Z-bars 31 to the Z-bar 32. In a part of the ceiling structure which may be utilized for the purpose of making the attachment of this access door assembly 15 to the ceiling and aligned with the opening 22 thereof. As to the form of the invention and of the clamping device used for effecting this attachment where these Z-bars 31 and 32 are available, the attachment may be made by extending rigid bar strips 33 and 34 above and below the Z-bars 31 and 32 which are provided with aligned holes 36, 37 in the respective bars 33 and 34 adjacent the Z-bar 31 and holes 38, 39 in the respective bars adjacent to the Z-bar 32. In order to adequately support the access door assembly 15 two sets of these bar strips 33 and 34 are provided above the opening 22 in the ceiling structure 16 and at opposite ends of the opening 22, spaced apart, so that upon opening the access door 24 to have access to plumbing or electric conduits without interference from these bar strips at the opposite sides of the opening 22.

To the access door assembly of FIGS. 1 and 2, four clamp devices 41 are pivotally secured respectively adjacent the four corners of the inwardly extending flange 19 by fastening bolts 42 and nuts 43. There is fixed by the bolt 42 to the flange 19, a threaded shaft 44 by its flattened end 45 and this threaded shaft will extend through aligned holes 36, 37 or 38, 39 of the bar strips 33, 34 and are made secure to these bar strips 33, 34 by a thumb nut 46 that is tightened against the lower bar strip 34 and a thumb nut 47 that is tightened against the upper bar strip 33.

It should be apparent that with these clamping devices 41 assembled by the bolts 42 upon the flange 19 of the access assembly and the thumb nuts 46 and 47 tightened that the access door assembly will have been secured adjustably and evenly to members such as the Z-bars 31 and 32 that are found within am acoustic ceiling opening and in such a manner that the door opening of the access door assembly makes easy access without interference from the clamping devices to the plumbing and electric conduits disposed within the ceiling. The securement of the access door has been made without especially preparing the ceiling structure for the securement of the access door thereto. This is the purpose of all forms of the clamping devices constructed according to this invention being described.

In FIG. 3, there is shown a slightly different construction wherein instead of having spaced bar strips for attachment to Z-bars a hollow square bar member 51 is placed in the ceiling opening and rested on the upper edges of the Z-bars 31, 32 as the bar strip 33 is rested thereon as shown in FIG. 2. This hollow square bar 51 and there will be one bar at each end of the opening and adapted for the securement of turnbuckle clamp assemblies 52 disposed at each corner of the access door frame and pivotally secured to the inwardly extending flange 19 by a bolt 53 and a nut 54 in the same manner as the clamp devices 41 have been secured.

Each of the clamp devices 52 comprises a threaded member 55 which is flattened at one end 56 having a hole therein through which the bolt 53 extends. A turnbuckle 57 is threaded upon the member 55 and is also threaded upon a depending threaded shaft 58 of a large square eye 59 through which the square bar 51 that will rest upon the Z-bars 31, 32, is attached. Upon tightening the turnbuckle 57 the access door frame will be fixed tightly against the under exterior surface of the ceiling structure 16 to hold thereby in a properly clamped manner, the access door assembly 15 within the ceiling 16. Four such turnbuckle devices 52 are provided as shown in FIG. 3, one device 52 being at each corner of the frame, to thereby secure the access door assembly 15 within the opening 22 of the ceiling 16.

In FIG. 4, there is shown a further form of the invention, in which the square bar 51 or a Z-bar such as bar 31 or 32 in FIG. 2 may a part of the ceiling structure and rigid therein and wherein the access door assembly will be attached within the ceiling opening 22 more directly and without bar strips or square bar 51 extending across the opening and to render the opening more free for access to plumbing or electric conduit parts within the ceiling structure. Such a clamp device is indicated generally at 61 and comprises a threaded shaft 62 that is flattened at 63 for securement to the flange 19 by a bolt 64 and a nut 65. Slidable upon the shaft 62 is a sleeve 66 having a laterally extending arm 67 that is rested over the square bar member 51 so that the access door 15 can be brought tight against the ceiling structure 16 by a thumb nut 68 that is tightened upon the threaded shaft 62. With four of these devices 61 disposed at the four corners of the flange 19, the access door assembly 15, without any alteration of the ceiling structure, is thus easily and quickly attached to the ceiling frame member 51.

In FIG. 6, there is shown a still further form of the invention in which the connection of the access door assembly 15 is effected with an L-shaped member 71 that is connected by a bolt 72 and nut 73 to inwardly extending flange 19 of the frame 21 and adjacent the corner of the frame and which has a laterally extending leg 74 that has a slot 75 continuing from the depending leg 71 through which a threaded bolt or shank 76 is extended and which has a head 77 that abuts an inner face of a wall 78. The bracket 77 extends inwardly from the wall 78 and the bolt 76 extends through the slot 75 and is measured from the inner face of wall 78 by the adjusting of thumb nuts 79 and 80 tightened upon the threaded bolt 76 and against the top and undersides of the laterally extending leg 74 of the member 71. Thus with this construction, the assembly is fastened directly to the wall body 78.

In FIG. 7, there is a slight variation of the assembly of FIGS. 5 and 6, in that the clamp device is secured to a square section bar 81 found within the wall 78 and to which an attachment may be made for the securement of the access door assembly. An L-shaped member 82 similar to the member 71 but provided at its lower end with an elongated slot 83 through which a bolt 84 is extended with a nut 85 for the securement of the member 82 to the flange 19 of the access door assembly 15. In this manner, the L-shaped member 82 is inwardly adjustable to adapt the member for the connection of the same with the square bar 81 lying within the wall 78. The L-shaped member 82 has a laterally extending legs 86 and a slot 87 that extends therealong and downwardly into the lower leg of the member 82. A small angle-shaped member 88 having a slot 89 is brought tightly against the opposite side of the bar 81 and with the leg 86 extended across the one side of two-part clamp connection is effected upon the bar 81 by a clamping bolt 91 being extended through the slots 89 and 87 of the members 88 and 82 and made secure by a thumb clamp nut 92. An adequate connection is thus made with the fixed bar 81 within the wall 78 for the securement of the access door assembly and in such a manner that its horizontal or laterally extending flange 21 is held tightly against the outer face of the wall 78.

In FIG. 8, there is shown a still further modified form of a clamp somewhat similar to the clamp shown in FIG. 7 but utilizing two angle-shaped members 94 and 95 engaging respectively with opposite sides of the fixed bar 81 lying within the wall 78 and made secure to a straight clamp part link 96 by a clamp bolt 97 and clamp nut 98, the bolt 97 extending through slots 99 and 100 in the opposing angle-shaped members 94 and 95 and through an elongated slot 101 in the member 96. The lower end of the connecting clamp part 96 is secured to flange 19 of the access door assembly 15 in the same manner that other members are secured as described above by a bolt 102 and a nut 103, there being one device at each corner of the frame assembly as with the other above-described clamping devices.

In FIGS. 1 and 3, there is shown an access door assembly 15 in which the door 18 is hingedly connected to one side of the frame and a door latch 25 used for holding the door closed by extending the latch through a slot 26 in the flange 19 of the assembly. In FIGS. 9 and 10, there is shown a different form of access door assembly as indicated generally at 105, that is generally of the same shape as is frame assembly 15 but which instead of having a door that is hinged at one side and latched at the other side, a closure plate 106 is used that has wedge spring members 107 at each of the corners of the closure plate 106. This closure plate 106 will close an opening 108 formed by an inwardly extending flange 109 that has wedge spring-receiving devices 110 in each corner adapted to receive respectively the wedge spring members 107 on the closure plate 106, the receiving devices 110 being secured to the inwardly extending flange 109 by screws 111.

The flange 109 has holes 112 through which the bolts for the clamp connecting devices above described can be extended for making secure the access door assembly within an opening within the wall or in a ceiling. Two such members as are provided in the interior of the wall or ceiling. A pull ring 112 is pivotally connected to a boss 113 in the center of the closure plate 106 by which the plate 106 can be pulled from the access frame when it is desired to gain access to the interior of the ceiling or wall.

It should now be apparent that there has been provided clamping devices for use with the access doors by which an access door can be made secure in a ceiling or upon a wall by these clamping devices which are so designed that they can be attached to bar members or abutments lying within the ceiling or wall in such a manner that when the access door is opened there is a clear opening and without there being any interference of the clamping devices to gain access to pipes or electric conduits within the ceiling or wall.

What is claimed is:

1. In an access door assembly adapted to be applied within a ceiling or wall opening comprising a door frame having a laterally extending flange and an inwardly extending flange, said frame being generally of square shape and said inwardly extending flange providing access opening, closure means releasably secured to the frame within the opening provided thereby, and clamping devices pivotally secured to the inwardly extending flange of the frame adjacent to the respective corners thereof and said clamping devices having adjustable members adapted to engage with and be secured to fixed members lying within the ceiling structure or wall, and said clamping devices being adjustable longitudinally to clamp and pull the access door into the opening within the ceiling or wall with its frame flange engaging with the outer surface of the ceiling and wall in clamped relationship therewith.

2. In an access door assembly as defined in claim 1, and each of said clamping devices comprising a threaded member having threads extended therealong and a flattened end portion, means for pivotally securing the threaded member by its flattened end portion to the flange of the frame, thumb nuts threadable along the threaded member, bar strips having holes receiving the threaded members of two of the clamping devices and adapted to engage opposite sides of bar members lying within the ceiling or wall structure and said thumb nuts being adjustable upon the threaded member and engaging respectively with the opposite sides of the bar strips to hold the bar strips in clamping relationship with the bars lying within the ceiling.

3. In an access door assembly as defined in claim 1, and each of said clamping devices comprising a threaded member having a flattened portion, bolt and nut means for securing the flattened portions to the frame flange, a turnbuckle threadingly engaging said threaded member, a further threaded member secured to the opposite ends of the turnbuckle and having an enlarged eye frame, an attaching bar extending through the enlarged eye member of opposing clamping devices on opposite sides of the frame assembly and adapted to bear against bar members lying within the ceiling or wall structure to which the access door assembly is being attached, said turnbuckles being adjustable to effect the clamp-

ing engagement of the access door frame with the ceiling or wall exterior.

4. In an access door assembly as defined in claim 1, and each of said clamping devices comprising a threaded member having a flattened end and bolt and nut means for pivotally connecting the flattened end of the threaded member to the inwardly extending flange of the frame assembly, a sleeve member adjustable upon the threaded shank and having a laterally extending bar engaging an arm adapted to lie against one surface of a bar member within the ceiling or wall and a thumb nut adjustable upon the threaded member to fix the sleeve and its arm against the bar member.

5. In an access door assembly as defined in claim 1, and each of the clamping devices comprising an L-shaped member, bolt and nut means for pivotally securing one leg of the L-shaped member to the inwardly extending flange, said L-shaped member having a short laterally extending leg and an elongated slot extending therein, a bolt having a head engageable with the interior of a wall and extending through the elongated slot of the laterally extending arm of the L-shaped member and opposing clamp nuts upon the bolt and engaging the opposite faces of the laterally extending arm to hold the bolt in place in engagement with interior surface within the wall.

6. In an access door assembly as defined in claim 5, and said L-shaped member having an elongated slot and said bolt means for securing the L-shaped member to the flange extending through the elongated slot to adjustably retain the L-shaped member upon the flange, and the slot of the laterally extending arm of the L-shaped member continuing downwardly into the long leg of the L-shaped member, and angle-shaped clamp member opposing the laterally extending leg of the L-shaped member and having a slot extending throughout the corner thereof and clamp bolt means securing said angle-shaped member to the long leg of the L-shaped member to fix the parts to a bar within the wall.

7. An access door assembly as defined in claim 1, and each of said clamping devices comprising a connecting member, bolt and nut means for pivotally securing the connecting member to the inwardly extending flange of the access frame, the outer ends of said connecting member having an elongated slot, two angle-shaped members having elongated slots adapted to engage the opposite sides of a bar member within the wall or ceiling structure and clamping means extending through the slots of said members for securing the angle-shaped and connecting members together and in engagement with the bar within the wall structure.

8. In an access door assembly as defined in claim 1, and said closure means comprising a closure plate, wedge-shaped spring devices connected to the opposite corners of the plate and extending inwardly from the inner face thereof, and said inwardly extending flange of the frame member having wedge spring-receiving devices for effecting the fastening of the closure plate over the opening of the access frame and pull means connected to the closure plate to facilitate the removal of the closure plate from the access door frame.

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