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HINGE MOUNTING FOR METALLIC DOOR FRAMES, WINDOW FRAMES AND THE LIKE

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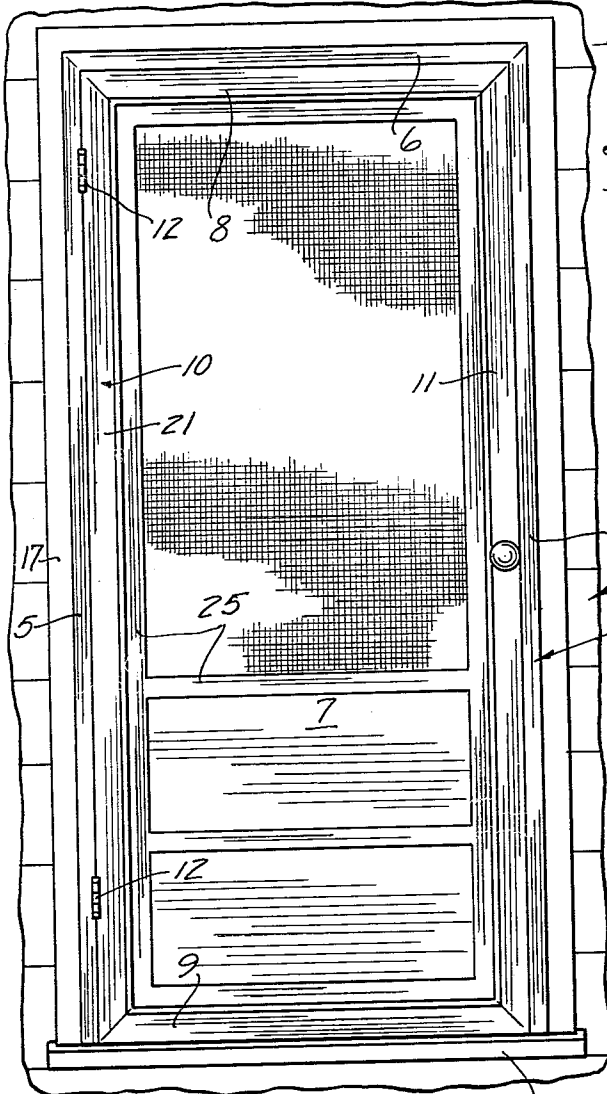


Fig. 1

Fig. 2

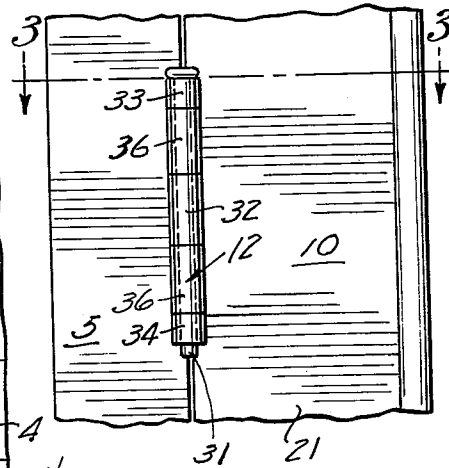


Fig. 3

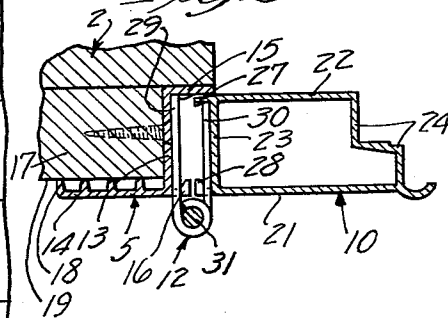
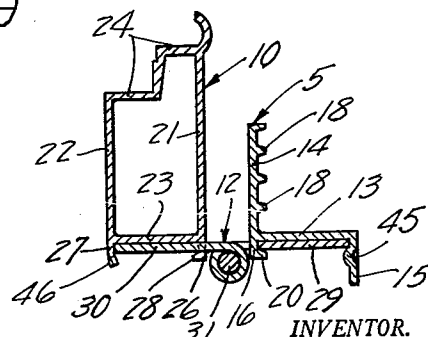


Fig. 5

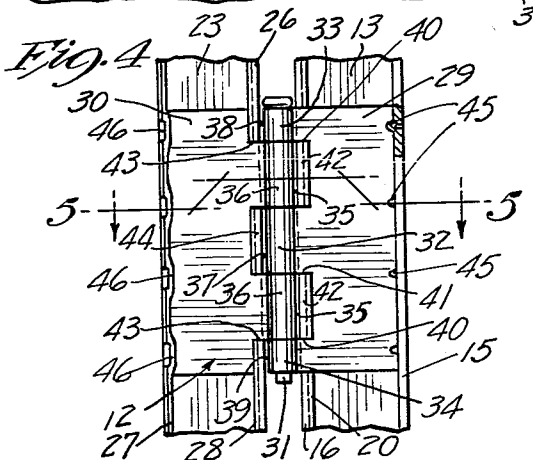


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HINGE MOUNTING FOR METALLIC DOOR FRAMES, WINDOW FRAMES AND THE LIKE

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3 Claims. (Cl. 189-46)

My invention relates generally to hinged closures and more particularly to novel hinge structure and means for anchoring the same to cooperating hinged elements.

More specifically, my invention comprises novel means for anchoring a hinge to a closure rail such as the rail element of a door and to the door frame element particularly when one or both of said elements are made from metal having relatively thin wall sections. Such elements are in common use and are generally made from formed sheet or hollow extruded metal such as steel or aluminum. One of the major problems connected with closures made from sheet or extruded material is that of anchoring hinges thereto in a satisfactory manner, particularly when the closure is made from soft material such as extruded aluminum having relatively thin walls. With such material, the use of conventional screws is unsatisfactory for the reason that the softness of the material and the relatively thin walls thereof do not provide sufficient threaded engagement with the anchoring screws to prevent their being pulled out during use. The primary object of my invention is, therefore, the provision of a hinge and anchoring means therefor to a closure rail as set forth which will not become loosened under prolonged use.

Another object of my invention is the provision of hinged structure and a hinge therefor as set forth which dispenses with the necessity of fastening devices such as screws and the like for anchoring the hinge to the hinged elements.

Still another object of my invention is the provision of hinged structure as set forth which can be manufactured at relatively low cost, which is efficient in operation, and which is rugged in construction and durable in use.

Another object of my invention is the provision of a novel method for anchoring a hinge to a cooperating member.

The above and still further highly important objects and advantages of my invention will become apparent from the following detailed specification, appended claims and attached drawings.

Referring to the drawings, which illustrate the invention, and in which like characters indicate like parts throughout the several views:

Fig. 1 is a fragmentary view in front elevation of a door frame and a door hingeably mounted thereon in accordance with my invention;

Fig. 2 is an enlarged fragmentary view in front elevation of a hinged portion;

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 2;

Fig. 4 is a fragmentary view in side elevation of the door and door frame of Figs. 1 to 3 inclusive in a door open position, some parts being broken away and some parts being shown in section; and

Fig. 5 is a horizontal section taken substantially on the line 5—5 of Fig. 4.

In the preferred embodiment of the invention illus-

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trated, the numeral 1 indicates the side wall of a building or like enclosure having therein a generally rectangular door frame 2 comprising a sill 3 at the bottom thereof, a pair of spaced jamb elements 4 and 5 and a horizontal connecting lintel element 6 at the upper end. A closure in the nature of a door 7 includes spaced parallel top and bottom horizontal rails 8 and 9 respectively and laterally spaced parallel vertical connecting rails 10 and 11 the former of which is hingedly connected to the frame member or jamb 5 by means of hinges 12. The door frame 2 as well as the framework of the door 7 including the top and bottom rails 8 and 9 and the side rails 10 and 11 are constructed of relatively thin wall metal, preferably aluminum made in the desired cross-sectional shape by extrusion or the like. Aluminum is utilized in doors of this type particularly for dwellings because of its light weight and resistance to deterioration. The door frame member or jamb 5 may be made in any one of the several structural shapes generally used for this purpose but preferably, and as shown, is formed to provide a relatively flat wall engaging body portion 13, a pair of parallel flanges 14 and 15 extending longitudinally of the wall engaging portion 13 and projecting laterally from opposite side edges thereof in opposite directions, see Figs. 3 and 5, and an anchoring flange 16 forming a continuation of the flange 14 and projecting outwardly from the adjacent side edge of the body 13 in the same direction as the flange 15. The jamb 5 may be secured to any one of several members which comprise the building structure but preferably and as shown are screwed or otherwise anchored to one side of a secondary door frame member or jamb 17. It will be noted, by reference to Figs. 3 and 5 that the flange 14 is provided with strengthening ribs 18 which engage the front wall surface 19 of the frame member 17. The flange 16 is provided with an intumed head portion 20, the purpose of which will hereinafter become apparent.

The side rail 10 of the door 7 like the rails 8, 9 and 11, and as above indicated, is preferably made from light weight metal such as aluminum and the like and is formed by extrusion to provide a cross-sectionally rectangular hollow member having front and rear walls 21 and 22 respectively, a hinge engaging wall 23 and an opposed inner wall element 24 which is adapted to support a door inner portion such as a storm or screen unit 25. The front and rear walls 22 project laterally outwardly beyond the hinge engaging wall 23 to provide respective anchoring elements in the nature of longitudinally extended flanges 26 and 27 respectively. The flange 26 is similar to the flange 16 of the jamb member 5 and is provided with an intumed head portion 28 similar to the head portion 20 of the flange 16.

The hinges 12, being identical, but one thereof will be described in detail. With particular reference to Figs. 2 to 5 inclusive it will be seen that the hinge 12 comprises a pair of wings 29 and 30 and a pintle 31. Preferably, the hinges 12 are of the "butt" type, the wings 29 and 30 thereof engaging the walls 13 and 23 respectively of the frame element 5 and the closure rail 10 respectively. The wing 29 is formed to provide a central pintle journal 32 and a pair of upper and lower pintle journals 33 and 34, and adjacent notches 35 which receive one each one of a pair of spaced pintle journals 36 formed integrally with the hinge wing 30. The pintle journals 36 are spaced to provide therebetween a notch 37 which receives the pintle journal 32 of the opposite wing 29, and upper and lower end notches 38 and 39 respectively which receive the upper and lower pintle journals 33 and 34 respectively of the hinge wing 29. As clearly shown in Figs. 3 to 5 inclusive, the flange 16 is cut away at spaced intervals to provide lateral openings 40 and 41 through which portions of the wing 29 adjacent the notches 35 project, and an-

choring elements 42 which extend through the notches 35 adjacent the pintle journals 36, the inwardly turned head portions 20 thereof overlying an adjacent exposed face of the wing 29. In like manner, the flange 26 of the rail 10 is cut away as indicated at 43 to permit the portions of the hinge wing 30 between the notches 37, 38 and 39 to extend therethrough and provide a central anchoring element 44, the inturned head portion 28 of which overlies the adjacent portion of the exposed face of the hinge 30. With particular reference to Fig. 4 it will be seen that the inturned head 28 of the flange 26 within the notches 38 and 39 also overlies the adjacent face on the associated hinge wing 30. The outer longitudinal edge portion of the hinge wing 29 is locked in place by a plurality of spaced anchoring elements 45 which overlie the exposed face of the hinge wing 29 adjacent the free edge thereof, and which are formed by peening spaced portions of the flange 15 inwardly. In like manner, the free edge of the hinge wing 30 is locked against movement outwardly from the adjacent hinge engaging wall 23 equipped by a plurality of longitudinally spaced anchoring elements 46 that are formed from the flange 27 by peening or the like. The inwardly extended portions of the hinge wings 29 and 30 which terminate in their respective pintle journals, due to their engagement with the anchoring elements 42 and 44, lock the hinges 12 against movements longitudinally with respect to the door and the door frame, whereas the inturned heads 20 and 28 and the inwardly peened anchoring portions or elements 45 and 46 positively lock the hinge wings 29 and 30 against laterally outward movement with respect to the door and door frame. Thus, a permanently tight coupling is assured between the door 7 and the hinges 12 as well as between the hinges 12 and the door frame member 5. From the above, the method of applying the hinge 12 to the closure rail 10 and the frame element 5 should be obvious. The heads 20 and 28 of the flanges 16 and 26 respectively, and inserted through their respective notches in the hinge wings 29 and 30 respectively, and the hinge wings slid into engagement with their respective wall 13 and 23 of the frame member 5 and door rail 10 respectively by swinging movement, the free edges of the hinge wings abutting their respective flanges 15 and 27 at the bases thereof. Thereafter, the flanges 15 and 27 are peened inwardly at spaced points and as indicated at 45 and 46 to permanently anchor the hinge wings in place.

While I have shown and described a hinge mounting structure particularly adapted for metal frames and metal doors, the arrangement can be easily modified to provide a wooden frame with a metal door as set forth or a wooden closure could be applied to a metal structure, merely by drilling holes in the hinge wing to be secured to the non-metallic structure and utilizing screws, rivets, bolts or the like as desired.

My invention has been fully tested and found to be highly satisfactory for the accomplishment of the ob-

jectives set forth; and while I have shown and described a commercial embodiment of my invention it will be understood that the same is capable of modification without departure from the spirit and scope of the invention as defined in the claims.

What I claim is:

1. In combination, a rail for a hinged closure and a hinge for pivotally anchoring the closure rail to a frame member; the hinge comprising a pair of wings and a pintle, the wings being formed to provide spaced pintle journals and adjacent notches; the journals of one wing being staggered with respect to the other and being disposed in the notches of the other, the notches of one wing extending beyond the journals received therein to define therewith anchoring element receiving apertures; and means for anchoring the last said hinge wing to the rail, said means comprising outstanding anchoring lugs on the rail extending through the said aperture of the associated hinge wing and having a head portion which is offset in the direction of the free edge of that wing and which overlies the exposed faces thereof, and other anchoring elements rigid with the rail and overlapping the exposed face of the associated wing adjacent the free edge thereof, said other anchoring elements engaging the free edge portion of the associated wing to anchor said free edge portion against movement in one direction away from the rail independently of said anchoring lugs.

2. In combination, a rail for a hinged closure and a hinge for pivotally anchoring the closure rail to a frame member; the hinge comprising a pair of wings and a pintle, the wings being formed to provide spaced pintle journals and adjacent notches, the journals of one wing being staggered with respect to the other and being disposed in the notches of the other, the notches of one wing extending transversely beyond the journals received therein to define therewith anchoring element receiving apertures; and means for anchoring the last said wing hinge to the rail, said means comprising a pair of laterally spaced parallel longitudinally extending flanges, one of said flanges having cutaway portions receiving the portions of the last said hinge wing between the notches thereof, said one of the flanges between the cutaway portions providing anchoring elements extending outwardly through the notches, said flanges having opposed head portions overlapping and engaging the exposed face of the associated wing hinge adjacent said notches and the free edge thereof.

3. The structure defined in claim 2 in which said flanges comprise extensions of opposite sides of said rail.

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