United States Patent

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[54] **ADJUSTABLE MOUNTING FOR DOORS**
7 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **16/129,** 16/131
[51] **Int. Cl.** **E05d 7/04**
[50] **Field of Search** 16/129, 130, 131

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ABSTRACT: A device adapted to be mounted in a metal buck or wooden jamb of a door so that conventional hinges may be used to hang the door while the device permits connecting the position by the hinge so that the door may be adjusted and aligned, not only during the initial hanging of the door, but at a later point of time to compensate for settling of the building or other problems. The device includes a mounting bracket which is adapted to mate with a hinge leaf and which is adjustable about a vertical pivotal axis as well as being adjustable within the plane of the door opening parallel to said vertical pivotal axis.

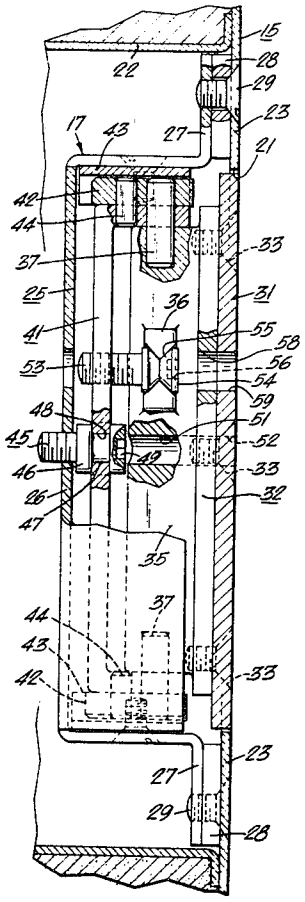


FIG. 2.

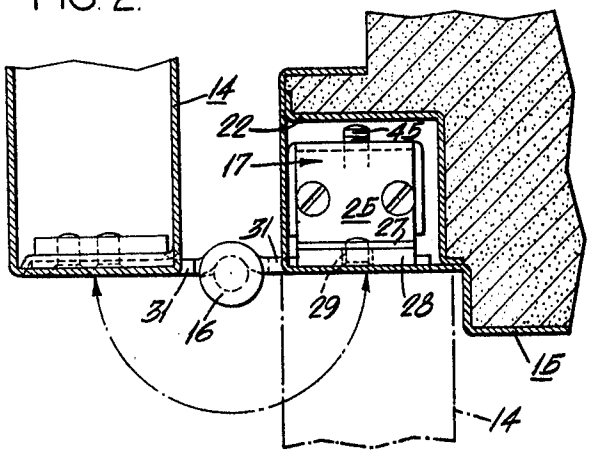


FIG. 1.

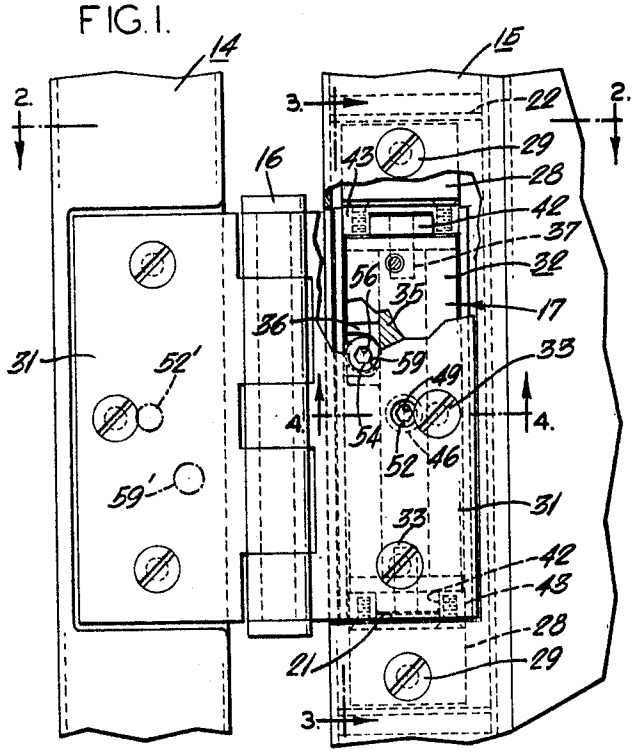


FIG. 3.

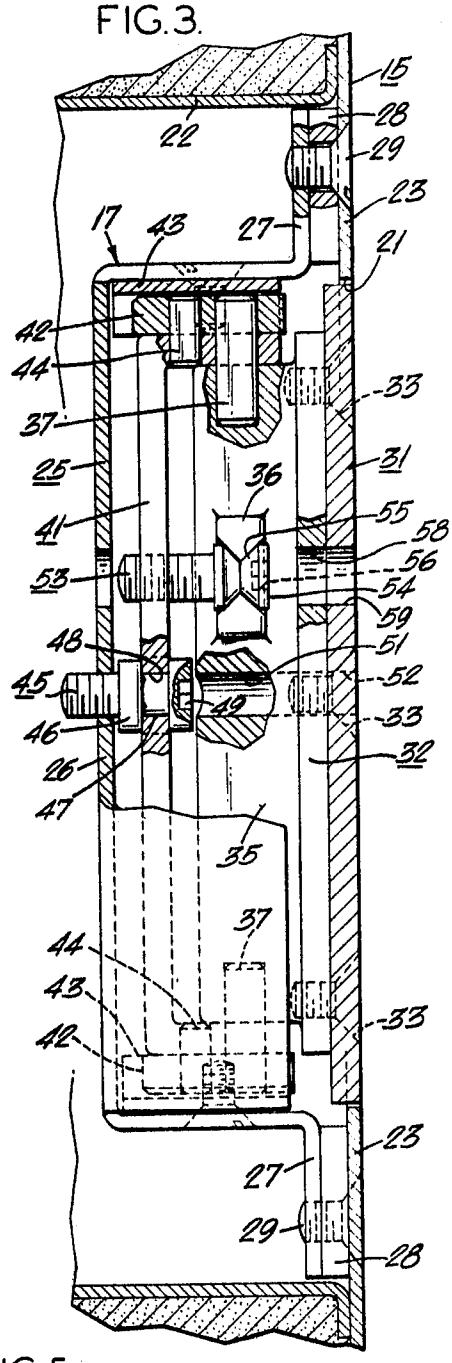


FIG. 4.

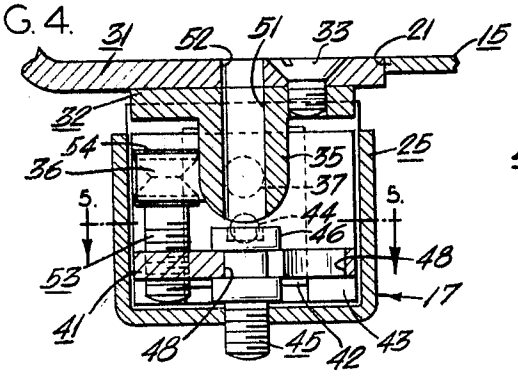
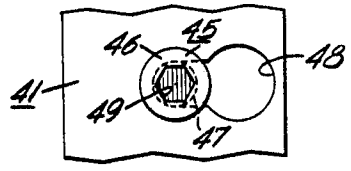


FIG. 5.



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ADJUSTABLE MOUNTING FOR DOORS

The present invention relates to hardware for hanging metal and wood doors on metal bucks and wood jambs by the use of conventional hinges of the type used in commercial buildings, private homes, etc. In particular, the present invention provides an adjusting device which is an accessory which may be installed in conjunction with conventional hinges to allow movement of the door without resetting the hinges and permit adjustment horizontally, or angularly-vertically, or both, so as to overcome the normal problems encountered in hanging doors and in rehanging doors which do not close properly due to settling of the house structure.

When using metal doors and bucks in structures, the standard practice is to make the buck with a hinge backup plate inset into the buck, and to install the buck during the rough construction of the building. Consequently, the metal bucks are subject to damage during the early stages of construction of the building. Such damage may be caused by the weather, or by the normal abuse which may cause bending of the buck or the backup plate or may cause the buck to be forced out of square and plumb. In addition, the buck and the plates which are provided therein frequently become encrusted with plaster, concrete, mortar or the like which must be removed before the door is hung and frequently the plate is damaged when it is cleaned of this material

Prior to the present invention, the correction of these problems required the use of abrasive grinding, padding out of hinges, bending or spreading the metal bucks and doors by hammering or by the use of prying bars. When hanging wooden doors on metal bucks, such problems may be overcome by shaving the door or using shims in the hinges, but in any event, there is a substantial loss of time in obtaining a proper fit. When hanging wooden doors in wooden jambs, the problems are not as severe, but it still requires a skilled mechanic to obtain a proper fit of the door in the jamb. Furthermore, in wooden building construction, there is a greater likelihood of maladjustments arising after completion of the construction and the present invention is designed to permit adjustment of the door after completion of the construction to remedy problems which arise thereafter.

With the foregoing in mind, the present invention provides the simple and economic appliance which may be mounted on the door jamb, or metal buck and to which conventional hinges may be secured so that after installation of the door, the device may be adjusted without dismounting the door.

Another object of the present invention is to provide a device which is of durable construction which is not easily damaged and yet which is fully effective in operation and use.

In particular, the present invention provides an adjustment device which permits both pivotal movement of the hinge about a vertical axis and parallel movement of the hinge within the plane of the door opening, these adjustments being effected by a single set screw for each adjustment.

All of the objects of the invention are more fully set forth hereinafter with reference to the accompanying drawing wherein:

FIG. 1 is a fragmentary view in elevation showing a metal door mounted on a metal buck by the use of a hinge and adjusting device made in accordance with the present invention;

FIG. 2 is a sectional view taken on the line 2–2 of FIG. 1;

FIGS. 3 and 4 are enlarged sectional views taken on the lines 3–3 and 4–4 of FIG. 1 respectively; and

FIG. 5 is a fragmentary face view as seen from the line 5–5 of FIG. 4.

Referring now to the drawing, FIG. 1 illustrates a standard metal door 14 hingedly mounted on a metal buck 15 by the use of a standard hinge 16 and an adjusting device 17. The buck 15 is a standard buck which has been modified by providing a mounting for the device in the area of the cutout 21 where the hinge backup plates are normally positioned. Behind the cutout 21, the standard void box 22 surrounds the cutout 21. As shown in FIG. 3, the void box 22 is larger than the cutout 21 so as to provide a marginal area of the buck 15 as indicated at 23 overlying the space enclosed by the void box 22. The present invention eliminates the need for providing hinge backup plates in the buck, thereby effecting a substantial saving.

In accordance with the invention, the adjusting mechanism 17 is mounted on the mounting area 23 within the space formed by the void box 22. The adjusting mechanism comprises a housing member 25 having a bottom wall 26 and a pair of ears 27 which are mounted on the marginal portions 23 of the buck by spacer elements 28 and fasteners 29. The spacer elements 28 are preferably welded to the back of the areas 23 and are dimensioned in thickness to correspond to the thickness of the standard hinge plate 31 of the hinge 16 which is used to hang the door 14. In this way, the face of the hinge leaf 31 is mounted flush with the face of the buck 15 when the adjusting mechanism 17 is adjusted to its inward limit position. Furthermore, the spacer permits the use of a standard flatheaded fastener which is countersunk in the marginal portions 23.

The hinge is mounted on the adjusting mechanism 17 by means of a mounting bracket 32 which has a flat face portion facing outwardly to engage flush against the hinge leaf 31. The bracket 32 is provided with tapped apertures to accommodate the standard hinge fasteners 33 as shown. A body extension 35 is provided on the back of the face portion of the bracket 32 to project into the interior of the housing 25, and a lug means 36 projects from the side of the body 35, for purpose more fully set forth hereinafter. At the top and bottom, the body 35 is provided with trunnions 37 which mount the bracket for pivotal movement about a vertical axis. The trunnions are pivoted in a yoke 41 having slide blocks 42 secured thereto at its upper and lower ends. The slide blocks 42 are slidable horizontally in guides 43 mounted in the housing 25 as shown in FIGS. 1 and 3. The slide blocks 42 are preferably of suitable material such as brass or nylon so as to be readily slidable in the guides 43 without binding. In the present instance, the slide blocks 42 are secured to the yoke 41 by the trunnions 37, which project through the top and bottom end walls of the yoke and into the slide blocks, and fastening pins 44 which are fixed into the slide blocks and yoke behind the trunnions 37. Thus, the yoke is readily slidable within the plane of the door opening.

To effect sliding adjustment of the yoke and consequently in-and-out adjustment of the hinge leaf 31, a threaded adjusting member is provided at 45 (see FIGS. 3 and 4). The adjusting member 45 comprises a setscrew having a threaded shank which is engaged in a threaded aperture in the bottom wall 26 of the housing and having an enlarged head 46 with a circumferential groove 47 therearound which engages in a keyhole slot 48 in the bottom of the yoke 41. The enlarged head of the adjusting device 45 is able to pass through the enlarged portion of the keyhole slot 48 and may then engage snugly in the elongated part of the slot. A receiver 49 is provided in the top of the head 46 to receive an adjusting tool, in the present instance, the receiver 49 comprises a socket for receiving an Allen wrench or similar adjusting device. To afford access to the adjusting member 45, the mounting bracket 32 is provided with a through bore 51, and a registering aperture 52 is provided in the hinge leaf 31. In this way, access to the socket 49 is provided to enable adjustment of the yoke 41 inwardly and outwardly within the plane of the door opening.

As is well understood by a skilled mechanic, the ability to adjust the hinge leaves 31 of the hinges which hang the door inwardly and outwardly within the plane of the door opening permits angular adjustment of the door to accommodate to the door opening, permitting the latch side of the door to be elevated and lowered and also permitting horizontal adjustment of the door latch relative to the keeper.

In order to effect adjustments of the door to fit properly within the plane of the door opening, means is provided to adjust the hinge leaves by tilting them about a vertical axis paral-

lel to the axis of the pin of the hinge 16. In the present instance, this is accomplished by pivoting the bracket 32 on the trunnions 37. An adjusting member 53 is provided to effect this pivotal adjustment, in the present instance, a setscrew. The setscrew 53 comprises a threaded shank portion having an enlarged head 54 with an angular groove extending about its periphery as shown in FIG. 3. The shank is threaded into the yoke member and the groove receives the lugs 36 of the body extension 35 of the bracket 32. The lug means 36 are provided with an internal angular rib to engage in the groove 55 so that threaded adjustment of the screw 53 in the bottom of the yoke 41 effects pivotal movement of the bracket 32 on the trunnions 37 (see FIG. 4). In order to adjust the screw 53, the head 54 is provided with a tool receiver 56, in the present instance a hex socket, which is adapted to receive the standard Allen wrench or similar adjusting device. To afford access to the socket 56 of the adjusting screw 53, the bracket 32 is provided with a through aperture 58 and the hinge leaf is provided with a similar aperture 59 registering with the bracket aperture 58 (see FIG. 3).

Since the apertures 52 and 59 are exposed when the door is opened while still hung on the jamb or buck, adjustment of the hinge to provide a proper fit may be accomplished without dismounting the door. This is of extreme advantage not only during the initail hanging of the door, but is advantageous so that the hinges may be adjusted after construction is completed by the housewife or by a relatively unskilled maintenance person.

It is contemplated that the adjusting device would be installed in the jamb or buck during the initial construction of the building. However, it may be found desirable to install an adjusting device in accordance with the present invention in previously hung door assemblies. Where the jamb is accessible, a recess may be cut out to receive the device of the present invention, which may be mounted in a manner somewhat similar to that described above. Where the jamb is not accessible, the adjusting device may be inset into the door rather than into the jamb or buck. Devices of the present invention may also be installed in both the door and the jamb or buck. It is noted that the device can be mounted in the door by simply reversing the device The broken lines 52' and 59' to the left in FIG. 1 indicate openings which may be made in the hinge leaf to afford access to the adjusting devices when such devices are mounted in the door rather than the jamb or buck. When mounted in the door, the devices effectively operate to permit proper fitting of the door in the jamb or buck initially, and are fully effective to permit repeated adjustments of the door to compensate for problems which may arise after the hanging of the door is completed.

It should be noted that the adjusting device of the present invention permits the use of standard hinges which need only to be drilled at specified points to afford access to the adjusting members. In the illustrated embodiment of the device, the backup plate is dimensioned and drilled and tapped to accommodate a 3½-inch hinge, but the plate may be modified to accommodate any other standard hinge. Furthermore, the hinge leaves are firmly mounted on the door and in the jamb against a solid backup plate or surface so that there is not any substantial opportunity for dirt, vermin or other foreign matter to become lodged therein to prevent proper functioning of the device. The savings in time which are possible as a result of the present invention will more than pay for the slight additional cost of the device.

All of the objects of the invention may be accomplished by the preferred embodiment illustrated herein, although it is obvious that additional changes and modifications may be made as desired to accommodate the invention to particular end uses.

I claim:

1. For mounting a hinge having a hinge pin interconnecting a pair of hinge leaves, a mounting bracket having a face portion and a body portion extending rearwardly from said face portion, said face portion including means for mounting one of the hinge leaves of said hinge flush thereagainst, a yoke member, trunnions mounting said bracket on said yoke member for pivotal movement about an axis substantially parallel to the hinge pin of said hinge, an adjusting member engaging between said bracket and said yoke to determine the pivotal position of said bracket on said yoke member, a housing mounting said yoke for sliding movement in a direction perpendicular to said trunnions including slide and guide assemblies at opposite ends of said yoke, and an adjusting member engaging between said yoke and said housing to determine the sliding position of said yoke.

2. A device according to claim 1 wherein each of said adjusting members comprises a member having a threaded shaft and an enlarged head with a groove extending therearound, said shaft being threaded into one of the engaged elements and said groove receiving the other of said elements.

3. A device according to claim 1 including a tool receiver in each of said adjusting members and registering apertures in said bracket and the mounted hinge leaf, said apertures being aligned with said receiver so that a tool may be engaged in said receivers to adjust the members following mounting of said leaf on said bracket.

4. A device according to claim 1 wherein said slide and guide assemblies include a slide block mounted on said yoke and a guide on said housing.

5. A device according to claim 1 wherein said mounting means includes spacer elements having a thickness corresponding to the thickness of said hinge leaf.

6. A device according to claim 1 wherein said bracket front face is substantially coextensive with said hinge leaf intermediate the hinge leaf mounting means.

7. A device according to claim 6 wherein said hinge leaf mounting means includes tapped apertures in registry with fastener apertures in said hinge leaf, so that said device is operable to mount the hinge leaf with conventional fasteners.