May 8, 1956 J. P. McMILLAN 2,744,284

ADJUSTABLE DOOR HINGE

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Fig. 1.

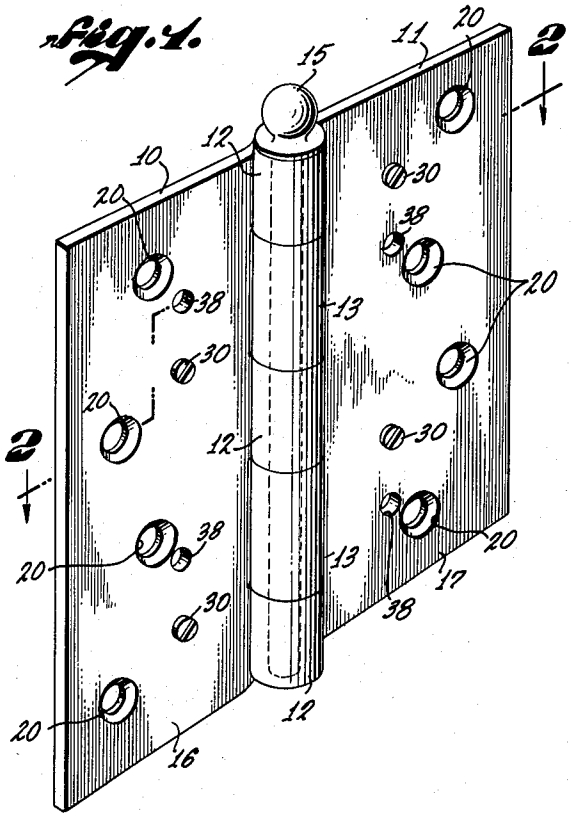


Fig. 3.

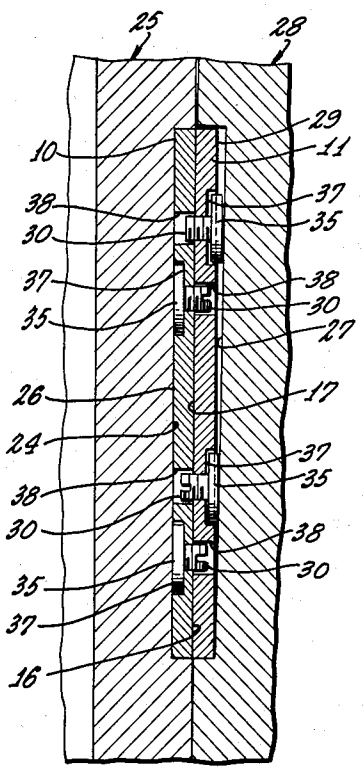
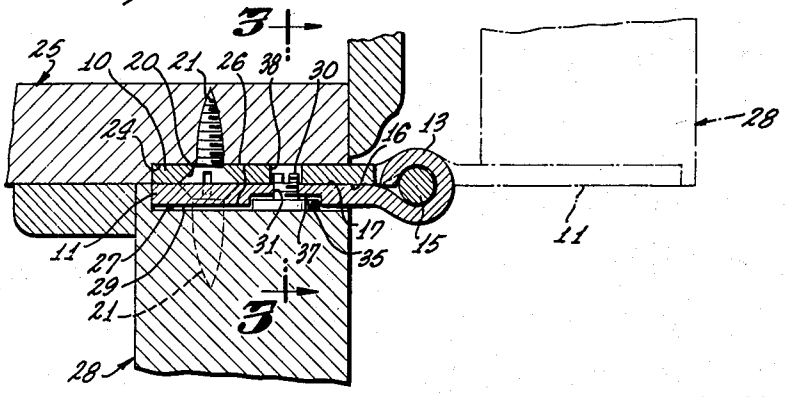


Fig. 2.



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ADJUSTABLE DOOR HINGE

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3 Claims. (Cl. 16—131)

This invention relates to hinges for swinging closures, with special reference to adjustable hinges, and is specifically directed to an adjustable hinge for mounting a door in building construction. The purpose of hinges of this general type is to permit adjustment of a door relative to a door jamb after the door is mounted on the jamb.

It is well known that need for such adjustment of the door on its hinges may arise from sagging, warping, swelling and shrinking on the part of either the door structure or the jamb structure and in such instances the need may occur a long time after the door is mounted on its hinges. More important, however, is the need for adjustability at the time of hanging the door to compensate for small variations among door hinges and for inaccuracies in the cutting of mortise seats in doors and jambs. Even with the exercise of great care and skill, doors often fail to hang right the first time they are mounted on their hinge.

The usual remedial procedure followed at the time of hanging a door is the insertion of shims behind the hinges but such a measure to correct the misalignment of a door is expensive because doors are hung by skilled craftsmen at high hourly rates. It can be appreciated, therefore, that substantial savings in the cost of installing doors can be obtained by using hinges that can be quickly and simply adjusted to vary the position of the door relative to the door jamb on which it is mounted.

Although adjustable hinges have been suggested heretofore in the art, none have found wide acceptance and, notwithstanding the well recognized need for adjustability, such hinges are rarely used in conventional building construction today. The one disadvantage that usually prevents wide adoption of adjustable hinges is that the hinge requires departure from the standard procedure for hanging a door. In some instances the adjustable hinge requires a mortise seat of unusual dimension and configuration. In other instances special base plates or the like are used for the hinges and often special instructions are required to make craftsmen familiar with an adjustable hinge and its mode of installation.

The present invention avoids these disadvantages by providing what is, in effect, a standard butt hinge, the hinge being standard or conventional not only in dimensions and configuration, but also in the disposition of the usual countersunk holes to receive wood screws for installing the hinge. Thus a workman needs no special instructions to install the hinge. He proceeds to attach the leaves of the butt hinge in the usual manner to the usual mortise seats in the door and in the corresponding door jamb. Moreover, the present adjustable hinge is a self-contained hinge structure with no separate plates or other parts to be lost or misplaced in the handling and transporting of the hinge.

Broadly described, the new hinge comprises the usual pair of pivotally inter-connected leaves, at least one of which leaves has an outer face to lie against a mounting surface such as a mortise seat when the hinge is installed for use. This leaf has the usual holes to receive wood screws for attachment to the mounting surface and has

at least one additional hole that is tapped to receive a screw. Adjustably mounted in the one or more threaded holes is what may be termed a spacer screw for adjustment towards the mounting surface. The outer end of the spacer screw is enlarged to provide a relatively extensive area for pressure contact against the mounting surface, thus minimizing any tendency of the spacer screw to penetrate or deform the mounting surface. Preferably the leaf is provided with two such spacer screws to permit the leaf to be tilted relative to the mounting surface as well as to permit the leaf to be spaced outward from the mounting surface.

The leaf carrying the spacer screws is attached to the mounting surface by wood screws in the usual manner, after which a desired adjustment may be accomplished by loosening the wood screws then advancing the spacer screws toward the support surface, each to the degree desired, and finally tightening the wood screws to cooperate with the spacer screws to hold the hinge leaf in the desired new alignment.

In the preferred practice of the invention the spacer screws in the one hinge leaf have relatively small shanks and the other leaf of the butt hinge has recesses or apertures to clear the inner ends of the spacer screws when the two leaves are folded together. While only one of the two leaves may be provided with such spacer screws, a feature of the preferred practice of the invention is the use of spacer screws in both leaves of the butt hinge, each hinge being recessed or apertured to clear the inner ends of the spacer screws carried by the other leaf.

A further special feature of the preferred embodiment of the invention is the provision of recesses around the outer end of each threaded hole to provide a seat into which the enlarged end of the corresponding spacer screw may be retracted to make the outer end face of the spacer screw substantially flush with the outer face of the hinge leaf. By providing such recesses or seats and by employing spacer screws that are not longer than the combined thickness of the two leaves when the two leaves are folded together, I provide a butt hinge of standard dimensions and configuration in which the retracted spacer screws lie entirely within the standard dimensions and configuration.

The invention may be more fully appreciated from the following detailed description considered with the accompanying drawings.

In the drawings, which are to be regarded as merely illustrative,

Figure 1 is a perspective view of the presently preferred embodiment of the invention as a butt hinge for mounting a door on a door jamb.

Figure 2 is a sectional view of the hinge in folded position as mounted on a door and door jamb, the section being taken as indicated by the broken line 2—2 of Figure 1; and

Figure 3 is a vertical section taken as indicated by the line 3—3 of Figure 2.

The butt hinge shown in the drawing is of the usual construction comprising two leaves **10** and **11**. In the usual manner, leaves **10** and **11** are formed with interfitting cylindrical knuckles **12** and **13**, respectively, which enclose the usual pintle **15** by which the two leaves are pivotally interconnected. In the normal use of the hinge the inner faces **16** and **17** of the two leaves **10** and **11** fold against each other at the closed position of a door, the outer faces of the two leaves being secured against the mounting surfaces of the door and door jamb respectively.

The leaves **10** and **11** are provided with standard screw holes **20** to receive wood screws **21**, the screw holes being countersunk on the inner faces of the two leaves. Thus Figure 2 shows leaf **10** in a mortise seat **24** in a door

jamb 25 with the outer face 26 of the leaf lying adjacent the bottom surface of the mortise seat, the hinge leaf being secured to the door jamb by wood screws 21 extending through screw holes 20. In like manner the second leaf 11 is mounted by similar wood screws in a mortise seat 27 in a door 28, with the outer face 29 of the leaf facing the bottom surface of the mortise seat. Thus the inner surfaces of two mortise seats 24 and 27 provide the mounting surfaces for the butt hinge. It will be noted that the screw holes 20 of each leaf are staggered, two of these screw holes being offset from the other two screw holes. If only three screw holes are provided instead of four, one of the three will be offset in this manner relative to the other two.

In accord with the teachings of the invention, each of the two leaves 10 and 11 is provided with the pair of spacer-screws 30, each spacer-screw being mounted in a tapped or threaded hole 31 for adjustment towards a corresponding support surface of a mortise seat. Preferably each spacer screw 30 is formed with a circular enlargement 35 at its outer end and is formed with a diametrical kerf at its inner end to receive a screw-driver for rotational adjustment of the spacer screw.

As heretofore indicated, preferably each of the two leaves 10 and 11 is recessed on its outer face around each of the threaded holes 31 to provide a seat 37 into which the enlargement 35 of the spacer screw may be withdrawn. It is contemplated that the seat 37 will be of substantially the same depth as the enlargement 35 of the spacer screw so that the outer face of the enlargement may be retracted to a position substantially flush with the outer face of the hinge leaf.

Since the inner end of a spacer screw 30 protrudes from the inner face of the leaf in which the spacer screw is mounted, especially when the spacer screw is in its retracted position, the other leaf is suitably recessed or apertured to provide clearance in this region. Thus each of the two leaves 10 and 11 is provided with two small apertures 38 to clear the inner ends of the spacer screws 30 mounted in the other of the two leaves when the two leaves are folded together as shown in Figures 2 and 3. It will be further noted in the present embodiment that the overall length of the spacer screws 30 is less than the total thickness of the butt hinge in the folded position of the butt hinge so that the spacer screws in their fully retracted positions lie entirely within the configuration of the folded hinge.

The manner in which the described adjustable butt hinge is used may be readily understood from the foregoing description. It is contemplated that the spacer screws 30 will be normally in fully retracted positions with the enlargements 35 of the spacer screws withdrawn into the corresponding seats 37 to avoid interference with the normal procedure of attaching the hinge leaves to the supporting surfaces in the mortise seats in the door and door jamb. It is apparent that for the purpose of installation the adjustable hinge may be regarded by the craftsman as a conventional hinge and will be mounted on the door and door jamb respectively in exactly the same manner as a conventional hinge.

After the door is mounted with the various wood screws 21 tight to hold the hinge leaves firmly against the support surfaces, any change that may be desired in the "hang" or alignment of the door relative to the door jamb may be acomplished simply by loosening the wood screws and adjusting the spacer screws. For example proper alignment of the door may require that hinge leaf 11 be inclined away from the mounting surface in the mortise seat 27 as shown in Figures 2 and 3. The desired inclination is accomplished by loosening the wood screws 21 that anchor the leaf 11 in the mortise seat 27 and then rotating the two spacer screws 30 for adjustment of the end enlargements 35 towards the mortise seat. In this instance, the upper spacer screw 30 is advanced towards the support surface somewhat more than the lower spacer screw 30 in accord with the desired inclination of the hinge leaf relative to the mortise seat. After the two spacer screws 30 are adjusted to the positions indicated in Figure 3, the wood screws 21 are again tightened to cooperate with the spacer screws in holding the hinge leaf 11 rigidly at the desired inclined position.

The tightening of the wood screws 21 causes the spacer screws 30 to exert considerable pressure against the support surface but the end enlargements 35 of the spacer screws provides such expansive areas for contact with the support surfaces that the spacer screws do not penetrate or mar the support surfaces. It will be noted that with respect to vertical alignment the alignment of the spacer screws 30 is relatively close to the alignment of two of the nearest screw holes 20 and that the horizontal distance between the two screws 30 and the nearest vertical row of screw holes 20 is less than the horizontal distance between the two rows of screw holes. Thus the relatively wide horizontal spacing between the two rows of holes 20 provides a stable base for anchorage of the leaf to offset any tendency for the spacer screws 30 to create a turning moment to tend to twist the leaf out of the desired alignment. In this regard it may be further noted that the end enlargements 35 of the spacer screws extend laterally very close to the vertical alignment of the nearest row of wood screws 21 as may be seen in Figure 2.

Obviously other types of hinges may be constructed for adjustment in the same way and my description in specific detail of the presently preferred embodiment of the invention will suggest to those skilled in the art various changes, substitutions and other departures from my disclosure that properly lie within the scope and spirit of the appended claims.

I claim:

1. A hinge for swinging closures comprising: two pivotally interconnected leaves, at least one of said leaves having an outer face to lie against a mounting surface when the hinge is installed for use, said leaf having holes to receive screws for attachment of the leaf to said surface and also having at least one threaded hole; and a spacer screw in said threaded hole for adjustment of the outer end of the screw into pressure contact with said mounting surface, said screw having an enlargement at said outer end to provide a plane surface to minimize deformation of the mounting surface, said screw being adapted at its inner end for tool-actuated rotational adjustment, said one leaf having a recess on its outer face around said threaded hole to receive said enlargement at a retracted position of said spacer screw.

2. An adjustable hinge as set forth in claim 1 in which the other of said leaves has a recess to clear the inner end of the retracted spacer screw when the two leaves are folded together.

3. An adjustable hinge as set forth in claim 2 in which said recess around said threaded hole is deep enough to receive substantially the full depth of said enlargement and the overall length of said spacer screw is not greater than the combined thickness dimension of said leaves in their folded positions.

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