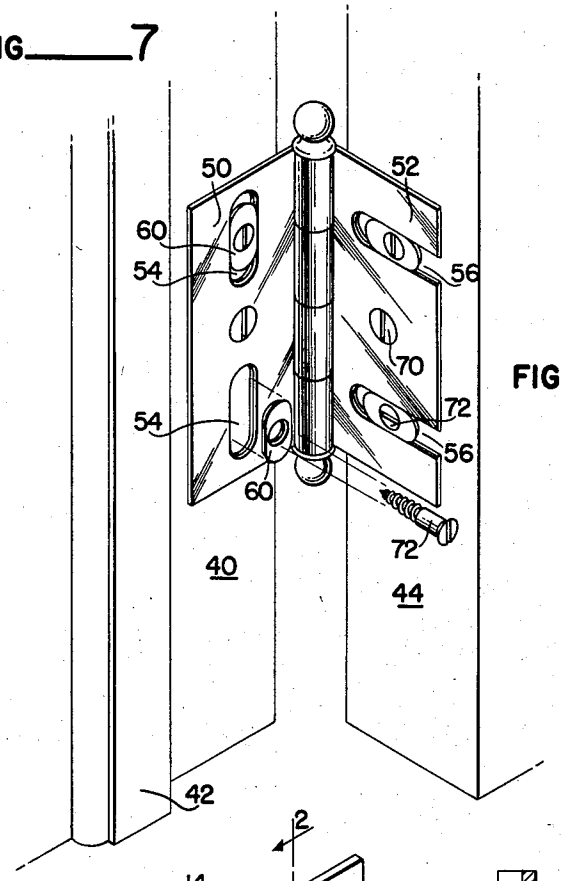
May 12, 1959 J. J. HALLIDAY 2,885,722

HINGES FOR HANGING DOORS

Filed Dec. 26, 1956

FIG. 7



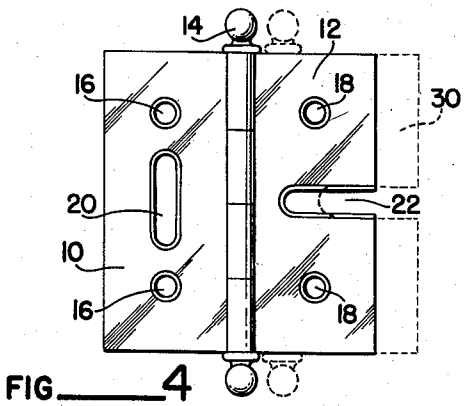


FIG. 4

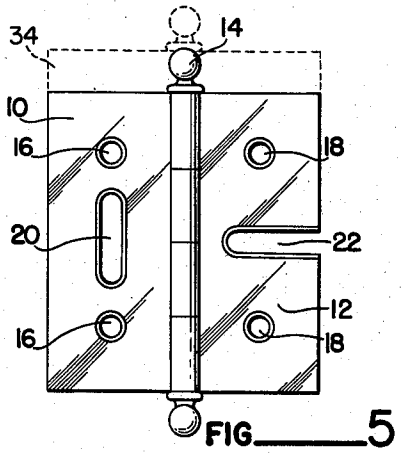


FIG. 5

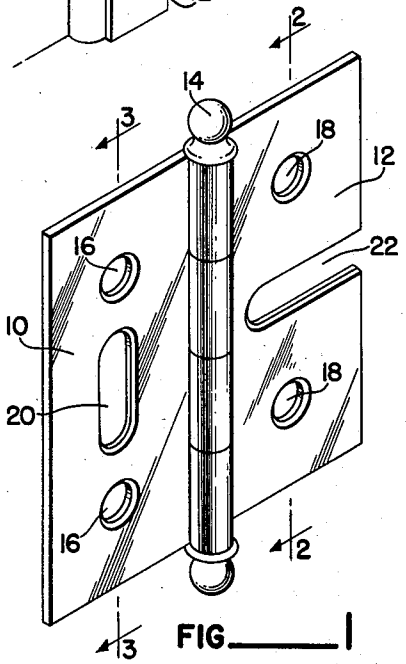


FIG. 1

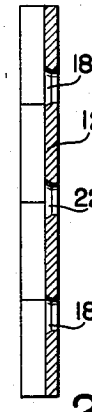


FIG. 2

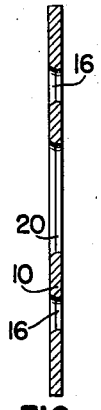


FIG. 3

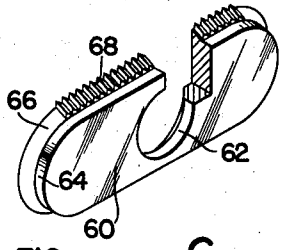


FIG. 6

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HINGES FOR HANGING DOORS

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Application December 26, 1956, Serial No. 630,669

4 Claims. (Cl. 16—130)

This invention relates to an improved form of hinge particularly adapted for the hanging or adjusting of doors. Each leaf of the hinge is provided with one or more round screwholes and has, additionally, slots in each leaf, which in the two leaves, forming a hinge, are disposed at right angles to each other. Special means are provided for securely holding the hinge in an adjusted position.

In the hanging of hinged doors considerable difficulty is experienced in getting the screws accurately positioned so that the hinges, and consequently the doors, will be properly positioned so as to give the desired clearances at top, bottom and sides. Then, after the doors have been hung for some time, and particularly in new construction, there is settling or shrinking of the materials of construction to the extent that the doors may no longer swing free, as they did when initially installed. Under such conditions the doors normally are re-hung which consumes considerable time. In the past, many patents have been secured, aiming to improve the structure of the hinges and to obviate some of the difficulties experienced both in the initial hanging and in the adjustment of the doors after the settling period.

A careful perusal of a large number of these former attempts does not disclose what to me is a preferred solution of this problem. Consequently, I have created my present hinge and the means for securing it in place.

A principal object of my present invention, therefore, is to provide a hinge that will make the accurate hanging of a door easily accomplished and in the minimum length of time.

A further object of my invention is to provide two forms of fastening each leaf of a pair of hinges, to the end that, in hanging a door, the hinges can be tentatively located and then adjusted before the final screws which will principally carry the burden of supporting the door are put in place.

A further object of my invention is to provide a hinge and securing means therefor, to the end that a hinge can be moved vertically or horizontally so as to effect either initial positioning or adjustment of the position, and then without the necessity of filling the former screwholes and driving screws in new holes, certain of the screws can be loosened and the adjustment made and then the entire assembly tightened for permanent use.

Further objects, advantages and capabilities will be apparent from the description and disclosure in the drawings, or may be comprehended or are inherent in the device.

In the drawings:

Figure 1 illustrates a preferred form of hinge to serve my purposes, in which one vertical slot is provided in one leaf of the hinge and a horizontal slot in the other leaf. These slots are in addition to a plurality of screw holes.

Figures 2 and 3 are vertical sectional views taken through similarly numbered lines of Figure 1.

Figure 4 is a view illustrating in dashed lines the practical limits of the transverse movement of the hinge.

Figure 5 is a view showing in dashed lines the practical limits of the vertical movement of the hinge.

Figure 6 is a perspective view, partly in section, illustrating a form of a toothed, elongated washer adapted for locking engagement with the slots of my hinge.

Figure 7 illustrates a modified form of my hinge as the same might occur in use.

Referring more particularly to the disclosure in the drawings, the numerals **10** and **12** designate the two leaves of a conventional door hinge. These two leaves have interlocking hinge lugs which accommodate the hinge pin **14**. This general type of hinge is normally referred to as a butt hinge and is the preferred type for hanging doors.

Referring to Figures 1 through 5, each leaf of a hinge is provided with two conventional countersunk screw holes **16** and **18**, respectively. Disposed between screws **16**, in leaf **10**, is a slot **20** disposed longitudinally of the leaf or parallel to the hinge pin **14**. This slot is beveled similarly to the countersunk opening **16** so that the same size flathead screws may be used. In leaf **12** I provide the transverse slot **22**. Slot **22** is preferably carried out to the margin of the hinge leaf so that it becomes an open slot and may in this manner be fitted over a screw which is partially driven home. This arrangement assists in the hanging of doors, particularly where the doors may be heavy. As in the case of slot **20**, slot **22** is also beveled so that the same size screws that are accommodated in openings **16** and **18** may be employed and engaged at any place along the length of the slot. The beveling and countersinking of the various openings is probably best illustrated in Figures 2 and 3.

Referring to Figure 4 of the drawings, the overall adjustment of a hinge horizontally or transversely is indicated as the distance between the solid lines of the outer edge of leaf **12** and the dashed line position **30**. In accordance with the expected need, the initial position of the screw to be engaged in slot **22** may be suitably positioned. Normally it is best to have the screw positioned so as to strike a mean position between the two extremes indicated.

In Figure 5 the vertical adjustment range is indicated and is the amount normally between the solid lines at the top of the hinge members and the dashed lines indicated at **34**. This represents the approximate range of a screw engaged in slot **20**. The general proportions illustrated throughout the drawings have proved to be quite satisfactory and to give an adequate range for the purposes of this invention.

Referring to Figure 7, a hinge made after the teachings of this present invention is illustrated in its normal relationship to the door frame **40** and its stop **42** and the door **44**. No recessing for hinges has been shown; this is a matter of choice and expediency determined by the type of construction and the hinge types used. The hinge shown in Figure 7 employs a modified form of hinge leaves as **50** and **52**, wherein only one round screw hole is employed, disposed in the center of the leaf, and then two vertically extending slots **54** are employed in one leaf as **50**. On the opposite side of the hinge in leaf **52** are illustrated two transverse or horizontal slots **56**, this arrangement being in effect a variant form of the type shown in Figure 1. The slots **54** and **56** are beveled after the showing of slots **20** and **22**, so that screws may be engaged at any point throughout the length of the slots.

There are occasions, particularly where heavy doors are being handled, where the frictional engagement of the screws particularly in the vertical slots **20** and **54** engaging as they do only on lines of contact on each side of the screw, is just not sufficient to accept the weight

of a heavy door. Slots 20 and 54 have curved ends and connecting tangent portions. Under conditions of this order it has been found desirable to provide a special washer of elongated form, as illustrated probably best in Figure 6 of the drawings and shown in use in Figure 7. The periphery of these washers having curved ends which are joined by straight or tangent portions. These washers 60 are provided with a countersunk screw hole 62 and the elongated margin of the washer, which is formed beveled substantially the same as required to make a complete fit within slots as 20 and 22, thus having the straight wall guide bearing portion 64 and the beveled portion 66. The tangent portion of the periphery of this beveled portion 66 is provided with a plurality of outstanding teeth as 68. These teeth are preferably of the cross-sectional form of a V screw thread and will bite into the beveled surface of the tangent portion of a slot as 20 or 22 or 54 and hold the hinge in the position determined by the screw passing through opening 62 of the washer. Best results will be obtained where washers 60 are of stock considerably harder than the stock from which the hinges themselves are made. It will be apparent, of course, that the screws passing through opening 62 of washer 60 will of necessity be smaller in head diameter at least than the screws used in the other openings and as illustrated at 70 in Figure 7, in comparison with the screws 72.

Method of use

In using my hinge for the hanging or resetting of a door of medium or light weight, the form shown in Figures 1 through 5 is normally preferred. The slots 20 and 22 are used during the first portion of the hanging, with a screw in each—one screw in the door frame and the other screw in the edge of the door, with the hinge in as near the mean position with regard to the adjustable features and at a position substantially that of the final secured position of the hinge. The screws are driven part way home in each of slots 20 and 22 in at least two hinges. By trial adjustment is made both vertically and horizontally positioning of the door and then the screws are driven home. They should be sufficient to permit repeated trials of the door and permit momentary loosening either the horizontal or vertical slot screw so final and exact adjustment of the door can be made. When the door is in its final adjustable position the screws using the round screw holes are driven home. This same operation is performed with any other aligned hinges supporting the door, normally two hinges being used on a light door and three on a medium or heavy door, with the extreme of four being used where a divided or so-called "Dutch door" is employed. Where all the hinges supporting the one door have been adjusted, then starting holes are made for screws in each of the holes 16 and 18, and these are usually made by some tapered centering type of punch, to the end that the screws themselves will be accurately centered so that, as they are driven home, they will not tend to change the position of the hinge. When all screws are driven home, they are found to normally be adequate to carry the door load, considering that the hinges are mutually supporting each other, and at this time a final tightening is given the screws in slots 20 and 22.

Where heavy doors are being hung or where adjustments are being made in doors previously hung, that may have gotten out of adjustment through shrinkage of materials or settling of the house, the form of hinge shown in Figure 7, preferably using the elongated washer shown in Figure 6, should be used. It will be realized, it is believed, that, with the toothed washers 60 in the four slots as 54 and 56, adequate bearing is given to the screws so that they can actively support the door, and in the initial setting of the door of course one hinge normally is required to hold the weight and thus do away with the necessity of employing wedges and the like under the door.

The double-slotted type of hinge shown in Figure 7 lends itself best apparently to the adjustment of heavy doors when settling or the like has changed the normal clearances around the door. In these cases it is first necessary to remove screws 70, one being in each of the leaves 50 and 52. Then by inspection of the door an estimate is made as to how much adjustment will be required of the hinge, and this can be effected by loosening normally one at a time screws 72 so that the washers, if they are used, can be pried up out of their locking engagement with the margins of the slots and thus permit the adjustment of the door and the re-positioning of the washers. On medium weight doors, where it may not be necessary to employ washers 60, then the screws 72 without the washers are loosened and of course then admit of a very quick and easy movement of the hinge with respect to the screws, which are still almost fully engaged in their original screw holes. When the door has been repositioned screws 72 are driven home, and this will hold the hinges in place so that a driven-in, glue coated, wooden peg in the screw holes of screws 70 will provide an adequate bite for the screws 70 when re-driven; and, due to the fact that the hinges themselves are held in place, they form a guide for the screws 70 which of course cannot move the hinge out of its adjusted position when they are driven home, even though they might run off their starting line, due to the difference in the density of the plug and the wood of either the door or the door framing.

It is believed that it will be clearly apparent from the above description and the disclosure in the drawings that the invention comprehends a novel construction of hinges for hanging doors.

Having thus disclosed the invention, I claim:

1. A door hinge to effect the positioning and adjustment of a door, comprising: two coacting hinge leaves; a vertical pivot pin operatively joining said hinge leaves; one of said leaves having a screw sized circular opening and a plurality of slots disposed parallel to the hinge pin; the second hinge leaf having a screw sized opening and a plurality of slots disposed transversely of said hinge pin; said screw sized openings being countersunk to accept flathead screws and said slots being beveled so that a cross-section of their margin will be similar to a cross section through the body sized screw opening; and elongated washers, formed of material harder than the material of the hinges, adapted to seat within said slots and having a centrally disposed body sized screw opening adapted for a flathead screw, said elongated washers having curved ends and tangent portions joining said curved ends; said washers having a wall at right angles to the plane of the washers extending part way up the wall of said washer and then joining a beveled portion which completes the periphery of said washer and teeth formed in the beveled side portions of the periphery of said washers adapted to engage the beveled side portions of the walls of said slots with the teeth coming to a bearing in the beveled walls of said slots.

2. A door hinge to effect the positioning and adjustment of a door, comprising: two coacting hinge leaves; a vertical pivot pin operatively joining said hinge leaves; one of said leaves having a screw sized circular opening and a slot disposed parallel to the hinge pin; the second hinge leaf having a screw sized opening and a slot disposed transversely of said hinge pin; said screw sized openings having a straight bearing wall in part and being countersunk in part to accept flathead screws and said slots having curved ends and tangent portions joining said curved ends and beveled so that a cross-section of their margin will be similar to a cross-section through the body sized screw opening; and elongated washers, formed of material harder than the material of the hinges and having curved ends and tangent portions joining said ends, adapted to seat within said slots and having a centrally disposed body sized screw opening counterbored for a flathead screw

and teeth formed in the tangent portions of said washers adapted to engage the tangent portions of the walls of said slots with the teeth coming to a bearing in the beveled wall portions of said slots.

3. The subject matter of claim 2 in which the screw receiving slots have a bearing wall portion disposed at right angles to the plane of the hinge leaf in which they are formed; a bevelled wall portion starting at the line of the bearing wall portion and flaring outwardly to conform to the conical portion of a flathead screw and flathead screws of reduced head diameter adapted to engage said wall portions.

4. The subject matter of claim 2 in which said slots have a bearing wall portion and a flared wall portion extending around the wall of the slots; elongated washers

adapted to be adjustably seated in said slots; said washers having a bearing wall portion and a flared wall portion extending around the perimeter of the washer and which are adapted to engage the bearing wall and flared wall portions of said slots.

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