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PIVOT PIN ADJUSTING MEANS FOR CENTER-HUNG DOORS

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FIG. 1

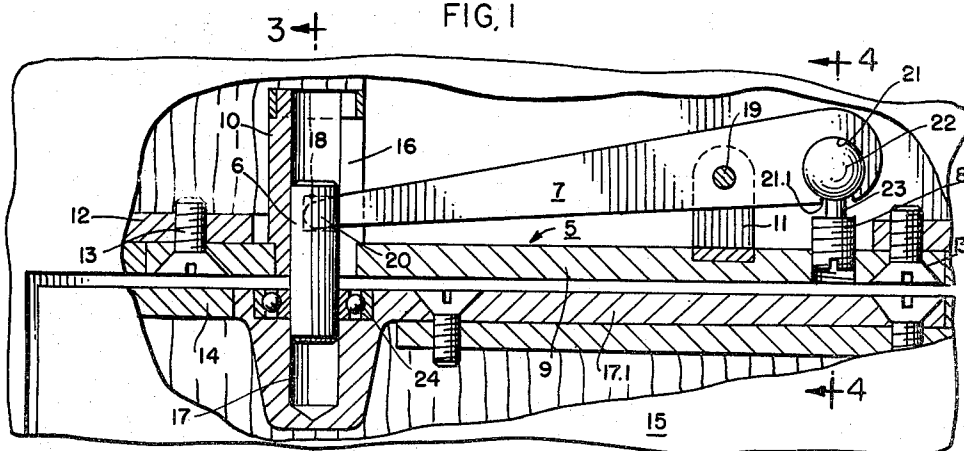


FIG. 2

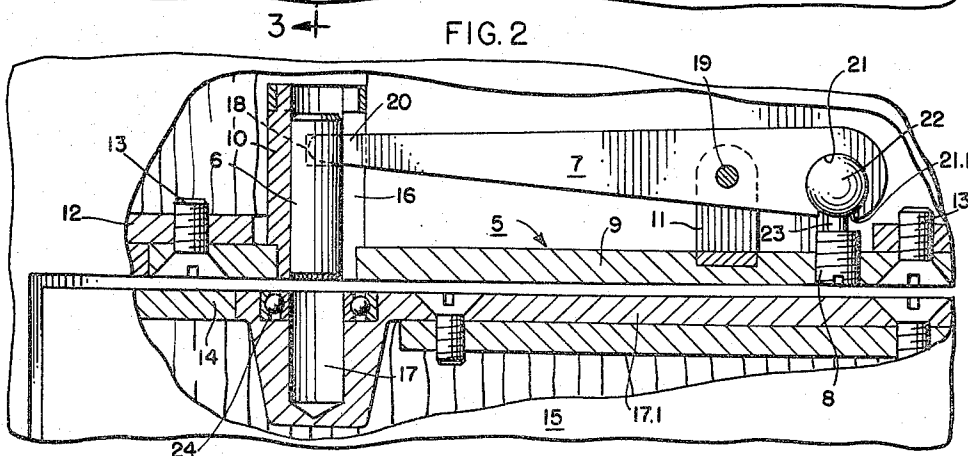


FIG. 3

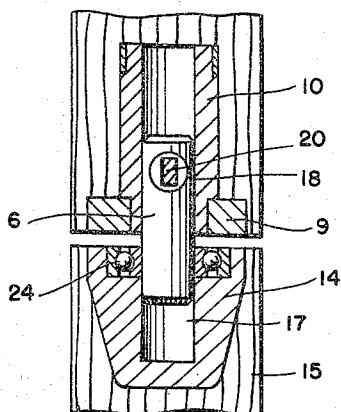
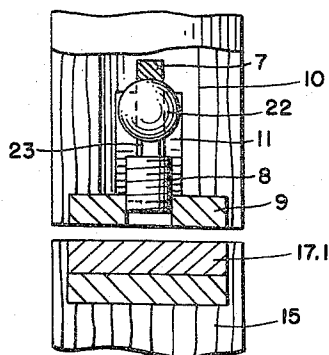


FIG. 4



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## PIVOT PIN ADJUSTING MEANS FOR CENTER-HUNG DOORS

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2 Claims. (Cl. 16-176)

This invention relates to pivot-pin adjusting devices for use with center-hung doors.

Of recent years metal-framed glass doors have become very much in vogue at the entrances and between sections of all kinds of buildings where there is a constant movement of people into and out of and through the building. In order to enhance the attractiveness of such doors pivot mountings and door-closing and check mechanisms have been devised to permit their location within the surrounding framework intermediate the planes of the door faces.

For example, doors are hinged for swinging on vertically-aligned pivot pins with the mounting for the lower pin located in the floor below the surface thereof and the mounting for the upper pivot pin located in the doorway lintel for shifting into and out of a socket located in the door frame intermediate the faces thereof and adjacent one vertical edge of the door. A door so mounted generally is designated as a "center-hung" door.

The bottom pivot pin is usually fixed in its mounting and extends up above the face of the floor. The top pivot pin is mounted for vertical adjustment in its mounting between a completely-retracted and predeterminedly-extended position. This permits setting of the door on the lower pivot pin and then positioning the door to align the socket in the top cross bar of the door frame with the pivot pin in the lintel so that the top pivot pin may be shifted into the door-frame socket and thereby lock the door in place for its normal swinging function.

When a door of this kind is to be removed for any reason, it becomes a very simple operation—merely the retraction of the upper pivot pin into its mounting; and various mechanisms have been developed and are in use for effecting this reciprocable adjustment of the upper pivot pin.

The main objects of this invention are to provide an improved form of pivot-pin adjusting device for effecting the axial shifting of the top pivot pin in its mounting; and to provide an improved pivot-pin adjusting device of this kind which is the acme of simplicity, producible at the very minimum of expenses, and faultless in its functioning.

In the embodiment of this improved pivot-pin adjusting mechanism shown in the accompanying drawings;

Figure 1 is a fragmentary, vertical, sectional elevation of contiguous portions of a door frame and the door-way lintel, showing a top pivot-pin and an improved adjusting mechanism constructed in accordance with this invention, the mechanism being shown positioned with the pivot pin set into the door-frame socket for normally locking the door in swinging position;

Fig. 2 is the same view except that the adjusting mechanism is shown positioned to retract the pivot pin to permit placement or removal of the door; and

Figs. 3 and 4 are transverse, sectional views taken on the planes of the lines 3—3 and 4—4, respectively, of Fig. 1.

The essential concept of this invention involves an

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axially-shiftable pivot pin the opposite reciprocation of which is effected by a lever actuated by a threaded element connected thereto by a ball-and-socket joint.

A pivot-pin adjusting device, embodying the foregoing concept, comprises a mounting 5 slidably supporting a pivot pin 6 the opposite axial movement of which is effected by a lever 7 actuated by a threaded element 8.

The mounting 5 is in the form of a plate 9 whereon is secured a pin sleeve 10 and a lever-fulcrum bracket 11. The plate is shaped and dimensioned to be set or mortised into the doorway lintel 12 and secured in place by screws 13 flush with the under face of the lintel which is opposed to the upper cross-bar 14 of a framed door 15.

The sleeve 10 is set in the plate adjacent one end wherein the pin 6 is slidably retained and reciprocated by the lever 7, as will be described presently. Along one side of the sleeve 10 is a longitudinal peripheral slot 16 through which one end of the lever 7 extends to engage the pin 6. The bracket 11, which is U-shape, is set in and secured to the plate 9 remote from the sleeve 11.

The pivot pin 6 is a short piece of rod dimensioned for free and easy movement in the sleeve 10 to be shifted into and out of a socket 17 formed at one end of a plate member 17.1 which is set into the upper door-frame cross-bar 14. As shown, the pin 6 is formed with a recess 18 for the reception of the small end of the lever 7.

The lever 7 is an elongated piece of metal preferably a simple flat plate stamping, tapered from one end to the other and of rectangular cross-section, fulcrumed adjacent the larger end, by a pin 19, to the bracket 11 and constitutes what is commonly referred to as a walking-beam. The lever fulcrum 19 thus disposes the lever 7 radially of the pin 6 so that the small end 20 extends into the pin recess 18 and so that the lever is swingable in the plane of the pin axis. The rear or larger end of the lever 7 is formed with a circular aperture 21 which opens laterally at the lower edge of the lever to provide a socket. As shown the axis of the aperture 21 is normal to the plane of the lever 7 and the opening 21.1 is of considerably less width than the diameter of the aperture.

The threaded adjusting element 8 is a common screw stud threaded into the plate 9 in axial alinement with the center of the lever socket 21 when the lever is in substantially horizontal position. At its upper end the screw stud 8 mounts an integral ball 22 which fits in the lever socket 21 to form a conventional ball-and-socket joint between the lever 7 and element 8. The ball 22 is connected to the stud 8, axially thereof, by a short neck 23 and the ball is loose enough in the socket 21 to permit limited movement of the lever about the pin 19 without binding between the ball and the socket walls.

The ball-and-socket connection of the lever 7 and screw element 8, being positioned closely adjacent the lever fulcrum outwardly thereof, makes possible a multiplied movement of the apposite end of the lever, and hence a relatively great axial movement of the pin 6, for a very small axial movement of the element 8.

The door 15, as previously noted, is a metal-framed glass panel in the top frame member 14 of which is located the plate member 17.1 carrying the pin socket 17. As shown, a ball bearing 23 is seated in the plate member 17.1 concentrically of the socket 17 to embrace the pin 6, when it is extended into the socket and thereby provides a nearly frictionless top support for the swinging door. The retractible pivot pin with the lever adjusting means therefor is also known as a "walking beam pivot" and several forms and arrangements thereof are known in the art. In almost all cases however the means for operating the lever to extend or retract the pivot pin is of a comparatively costly form for both

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manufacture and assembly and the adjustment action is stiff and, unhandy to manipulate. The present invention is intended to cure these difficulties and provide a walking-beam pivot that is smooth acting and easily operated, of extremely simple construction that is easily manufactured and assembled, and which can be made at a considerable saving in cost over any of the prior arrangements.

Although but one specific embodiment of this invention is herein shown and described, it will be understood that details of the construction shown may be altered or omitted without departing from the spirit of the invention as defined by the following claims.

I claim:

1. A door hinge pivot pin adjusting device comprising, a mounting, a door hinge pivot pin carried by said mounting, said pin being reciprocable along its own longitudinal axis, a lever pivoted on the said mounting, one end of the lever engaging the said hinge pin and adapted to reciprocate the hinge pin along its longitudinal axis upon movement of the lever, a portion of the lever being flat, said portion being a single flat plate, said portion having a circular aperture, an opening extending from the circular aperture to an edge of the said lever portion, a ball positioned within the said circular

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aperture, said ball having a diameter greater than the width of the said opening, the axis of the ball which is parallel to the said flat plate passing through the center of the plate so as to be parallel to and equidistant from the two outer surfaces of the said plate, an adjusting screw carried by the said mounting, said adjusting screw being connected to the said ball by a neck which extends through the said opening.

2. The device of claim 1 wherein the diameter of the said ball is greater than the thickness of the said flat lever portion and wherein the ball, neck and adjusting screw are integral.

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