June 20, 1967 T. M. BEJARANO 3,325,942

ADJUSTABLE CENTER HUNG DOOR PIVOT

Filed July 23, 1965

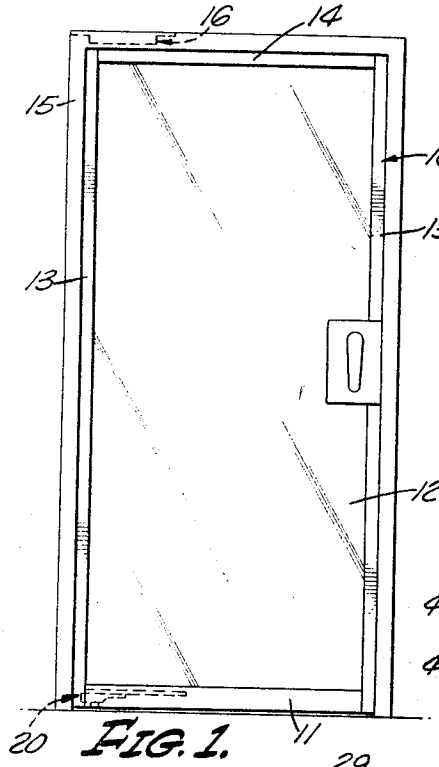
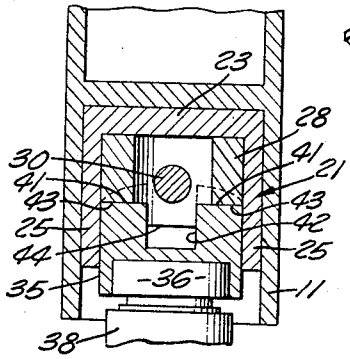


FIG. 1.

FIG. 4.



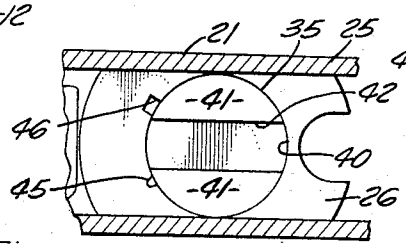


FIG. 5.

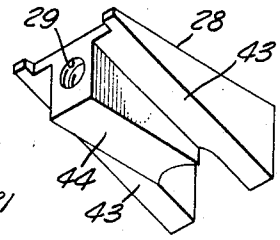


FIG. 6.

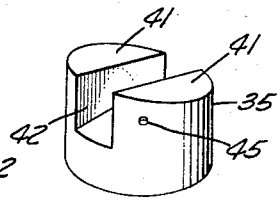


FIG. 7.

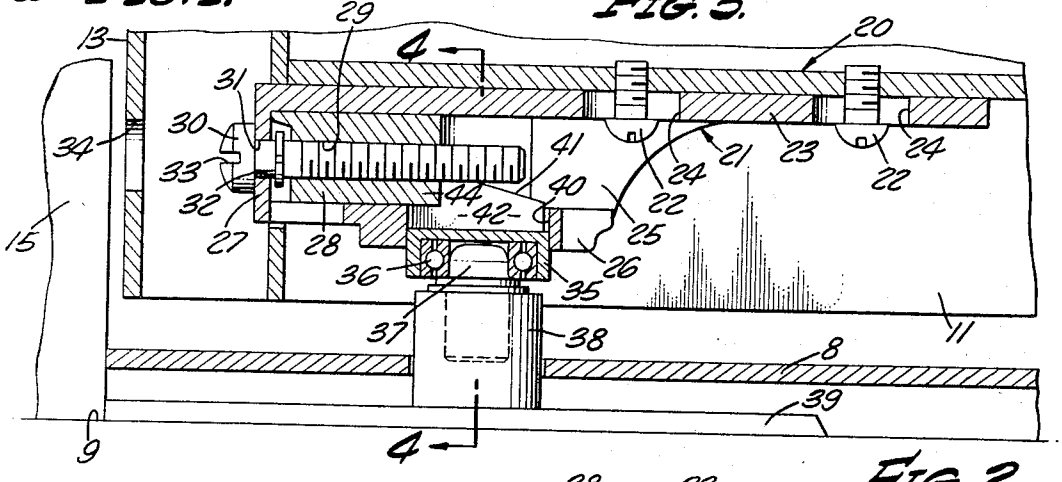


FIG. 2.

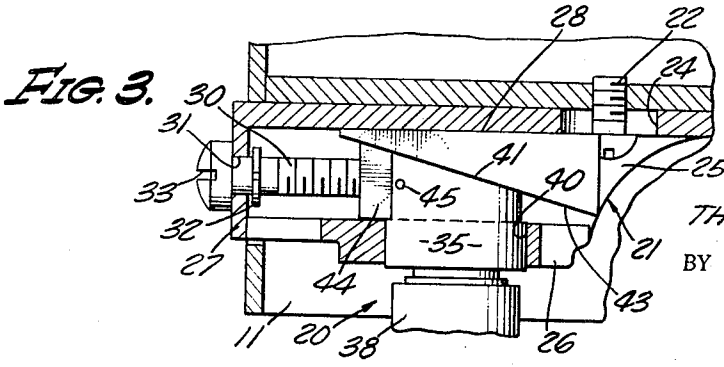


FIG. 3.

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ADJUSTABLE CENTER HUNG DOOR PIVOT

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This invention relates to a pivot for center hung doors and in particular is directed to an adjustable pivot arrangement for precisely adjusting the proper heighth of the door solely through an access opening in the edge of the door.

For both asthetic and practical purposes it is often desirable to mount a door on a pivotal axis passing through the door rather than on the inside or outside of the door. This pivotal axis is positioned as close to the butt edge of the door as practical and the arrangement is commonly known as a center hung door. The pivotal mounting of the door basically comprises separate pivot shifts at the top and bottom of the door mounted either in the door or in the doorway and vertically aligned. However since these pivots are virtually concealed between the door and the doorway, diffiiculty is encountered in both installing the door and adjusting its proper heighth. One common arrangement for accomplishing the necessary adjustability is in providing a threaded pivot shaft which may be rotated by inserting a thin flat wrench in the space between the door and the doorway to either extend or retract the pivot but often this results in permitting access to this adjustment from the exterior of the door which is objectionable from a security standpoint. Other difficulties are encountered in retaining the adjustment in the desired position.

It is a principal object of this invention to provide a novel form of adjustable center hung door pivot wherein elevating wedge shaped components are adjustably movable laterally of the door to cause raising and lowering of the door relative to the doorway.

Another object of this invention is to provide an extremely compact assembly of components adapted to be mounted in a relatively thin door wherein a laterally adjustable element is accessible only through the door edge and serves to accomplish vertical adjustment of the door.

A further object of this invention is to provide a novel form of bottom pivot for a center hung door wherein the pivot engaging bearing housing has an inclined surface for mating with an inclined surface on a laterally movable element which element is supported within the door and laterally movable by manipulation through the edge of the door to cause vertical movement of the door relative to the pivot.

Other and more detailed objects and advantages of this invention will appear from the following description and the accompanying drawings, wherein:

FIGURE 1 is an elevation view illustrating a center hung door.

FIGURE 2 is a fragmentary longitudinal section through the center of the door at the bottom pivot and showing the pivot assembly of this invention.

FIGURE 3 is a fragmentary view similar to FIGURE 2 and illustrating the movable components adjusted to a different position thereby lowering the door from the position shown in FIGURE 2.

FIGURE 4 is a fragmentary sectional elevation taken substantially on the line 4—4 in FIGURE 2.

FIGURE 5 is a fragmentary plan view of certain components of the assembly showing the means for preventing inadvertent disassembly.

FIGURE 6 is a perspective view of the movable adjusting element of the assembly.

FIGURE 7 is a perspective view of the pivot engaging element of the assembly.

Referring now in greater detail to FIGURE 1 of the drawings, the door 10 may be of any desired type but the device of this invention is most advantageously employed with a door of the type illustrated having a hollow metal channel 11 at the base of the door. The door may have a glass panel 12 with edge rails 13 and a top rail 14 forming the frame for the glass panel. The doorway or jam 15 is provided with a conventional downwardly projecting pivot assembly 16 pivotally supporting the upper rail 14 of the door. The bottom pivot assembly, generally designated 20, of this invention is mounted in the bottom channel 11 and pivotally supports the bottom of the door 10 on a vertical axis in line with the upper pivotal support thereby comprising a "center hung" arrangement for the door. The pivotal axis formed by the pivots 16 and 20 is spaced a short distance from the butt edge of the door and passes vertically through the door.

The bottom pivot assembly 20 of this invention includes a housing 21 adapted to be mounted in the bottom channel 11 by means of screws 22 which are accessible from the bottom of the door with the door removed from the doorway. Preferably the base plate 23 of the housing 21 is provided with slots 24 for receiving the screws 22 to permit adjusting the position of the housing along the channel 11 which, as will appear more fully hereinafter, serves to adjust the spacing between the butt edge rail 13 of the door and the door jam 15. The housing 21 is provided with vertical sidewalls 25 extending downwardly from the base plate 23 to support a horizontal boss portion 26. The housing 21 is provided with an end wall 27 toward the butt edge of the door thereby enclosing the generally tubular housing.

A slide bar 28, best illustrated in FIGURE 6, is positioned within housing 21 in sliding engagement with the base plate 23, sidewalls 25 and boss 26 of the housing. The slide bar 28 is adapted to move horizontally in the direction of the width of the door 10. The slide bar 28 is provided with a threaded central bore 29 which is threadedly engaged by the adjustment screw 30. Adjustment screw 30 passes through a hole 31 in the end wall 27 of the housing with the head of the screw on one side of the end wall and a snap ring retainer 32 fitted in a groove in the screw on the other side of the end wall. A screwdriver slot 33 in the head of the screw 30 is accessible through an opening 34 in the edge of the door and therefore adjustment screw is unaccessible when the door is in the closed position. Adjustment of the screw 30 cause the slide bar 28 to be moved within the housing 21 in the direction of the door width and the two extreme lateral positions of adjustment of the slide bar may be observed in FIGURES 2 and 3. The captive retainer arrangement formed by the screw head and retainer ring 32 on either side of end wall 27 serves to permit the screw 30 to force the slide bar 28 in either direction in the housing by appropriate turning of the screw.

The bearing support or housing 35 best illustrated in FIGURE 7, is generally cylindrical with a vertical axis and has a downwardly facing cup portion for receiving a bearing 36. The bearing 36 engages the pivot pin 37 which is mounted in a pedestal 38 extending upwardly from a floor plate 39. The floor plate 39 is permanently fixed to the floor 9 and a threshold cover plate 8 may cover the floor plate 39 and expose only a portion of the upwardly extending pedestal 38. The outer cylindrical surface of the bearing housing 35 is slidably fitted within and extends through the cylindrical bore 40 in the boss portion 26 of the housing 21. The upper end of bearing housing 35 is provided with a pair of spaced and coplanar inclined surfaces 41 separated by a key way 42. Similarly

the slide bar **28** is provided with a pair of spaced and coplaner inclined surfaces **43** for mating with the inclined surfaces **41** of the bearing housing. The surfaces **43** are separated by a key portion **44** for slidably engaging the key way **42** in the bearing housing to prevent relative rotation between the slide bar and bearing housing. By this arrangement it may be seen that the weight of the door **10** is supported by the channel **11** through the base plate **23** of housing **21**, through the slide bar **28**, through the bearing housing **35** by reason of the interengagement of the inclined surfaces **41** and **43**, through the bearing **36**, and through the pivot pin **37** to the pedestal **38** and floor plate **39**. Throughout the positions of adjustment of slide bar **28** the key portion **44** is spaced from the base of key way **42** as is illustrated in FIGURE 2. It may be seen that by adjustably moving the slide bar **28** by manipulation of screw **30**, the bearing housing **35** is raised and lowered relative to the housing **21** which in turn raises and lowers the door **10** whereby the vertical position of the door is readily adjustable. This facilitates the installation and proper adjustment of the door and yet the vertical position of the door can only be changed by access through the butt edge of the door when the door is open.

In order to prevent disassembly and loss of the bearing housing **35** from the pivot assembly **20**, the outer surface of the bearing housing is provided with a protuberance **45** near the upper end and above the boss portion **26** of the housing **21**. A slot **46** is provided in the cylindrical bore **40** in the boss portion **26** for accommodating the protuberance **45** when inserting the bearing housing **35** into the housing **21**. The slot **46** is angularly offset from the position of the protuberance **45** in the final assembly which is accomplished by rotating the bearing housing **35** to the proper position before installing the slide bar **28**. The interengagement between key **44** and key way **42** thereafter prevents rotation of bearing housing **35** thereby preventing the protuberance **45** from becoming aligned with the slot **46** and, therefore, the protuberance **45** engages the boss portion **26** to prevent separation of the bearing assembly **35** from the complete pivot assembly **20**.

Having fully described my invention it is to be understood that I do not wish to be limited to the details herein set forth or to the details illustrated in the drawings but my invention is of the full scope of the appended claims.

I claim:

1. In a center hung door pivot for use in a doorway with a door having a hollow lower portion, the combination of; a pivot pin for mounting at the base of the doorway, a housing for mounting within the hollow portion of the door opposite the mounting of said pivot pin, a slide bar supported in said housing and movable horizontally in the direction of the width of the door, a screw element interconnecting said slide bar and said housing and operable from the door edge for adjustably moving said slide bar in said direction, said slide bar having an inclined surface extending generally at an angle to the horizontal, a bearing means rotatably engaging said pivot pin and having an inclined surface for mating with said inclined surface on said slide bar for causing relative vertical movement between said pivot pin and housing upon operation of said screw element to adjust the vertical position of the door, and interengaging means on said bearing means and said slide bar for preventing relative rotation therebetween.

2. In a center hung door pivot, the combination of; a bottom pivot pin for mounting in the doorway threshold and protruding upwardly, a housing for mounting within the hollow portion of the bottom of the door opposite the mounting of said pivot pin, said housing having a horizontally extending tubular shape, a slide bar supported within said tubular housing and slidable in the horizontal direction of the width of the door, a screw element extending horizontally and interconnecting said slide bar and said housing, said screw element having means for rotating the screw element operable only from the door edge for adjustably moving said slide bar in said direction, said slide bar having a downwardly facing inclined surface extending at an angle to the horizontal in said direction, a bearing means rotatably engaging said pivot pin and having an upwardly facing inclined surface for mating with said slide bar inclined surface for causing relative vertical movement between said pivot pin and housing upon operation of said screw element to cause horizontal movement of said slide bar and in turn adjust the vertical position of the door, interengaging means on said bearing means and said slide bar for preventing relative rotation therebetween, and said bearing means slidably mounted in said housing for vertical movement relative to said housing.

3. The combination of claim **2** wherein said bearing means and housing are provided with cooperating means for preventing their disassembly.

4. The center hung door pivot of claim **1** wherein said screw element comprises a single screw having the threaded portion threadedly received in said slide bar and a head portion loosely journaled in a portion of said housing including means for limiting the axial movement of said screw relative to said housing.

5. The center hung door pivot of claim **1** wherein the said interengaging means on said bearing means and said slide bar are comprised of a central key way in said bearing means facing upwardly and a mating key portion on said slide bar projecting downwardly, said key way and key extending horizontally in the direction of the width of the door.

6. The center hung door pivot of claim **5** wherein said key and key way bisect the said inclined surfaces on said slide bar and bearing means, respectively, with portions of said inclined surfaces on either lateral side of said key and key way.

7. The center hung door pivot of claim **4** wherein said slide bar is provided with a central key portion extending downwardly from said inclined surfaces for threadedly receiving said screw, and said bearing means includes a key way for receiving said key portion on said slide bar.

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