Dec. 1, 1942. R. A. MILLER ET AL 2,303,886

ADJUSTABLE HINGE FOR DOORS

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Fig. 1.

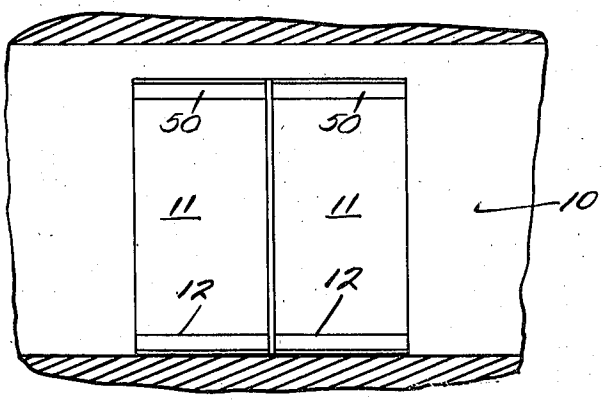


Fig. 2.

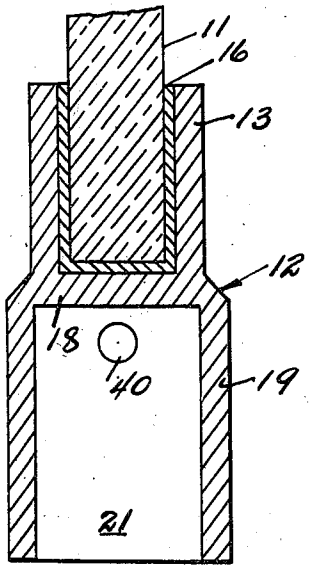


Fig. 4.

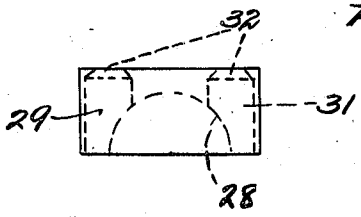


Fig. 5.



Fig. 6.

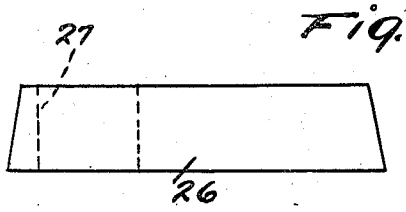
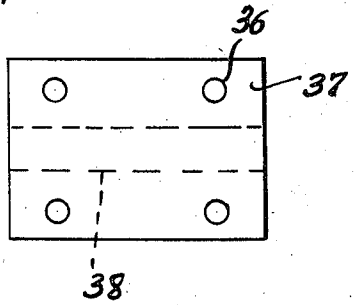


Fig. 7.



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Fig. 3.

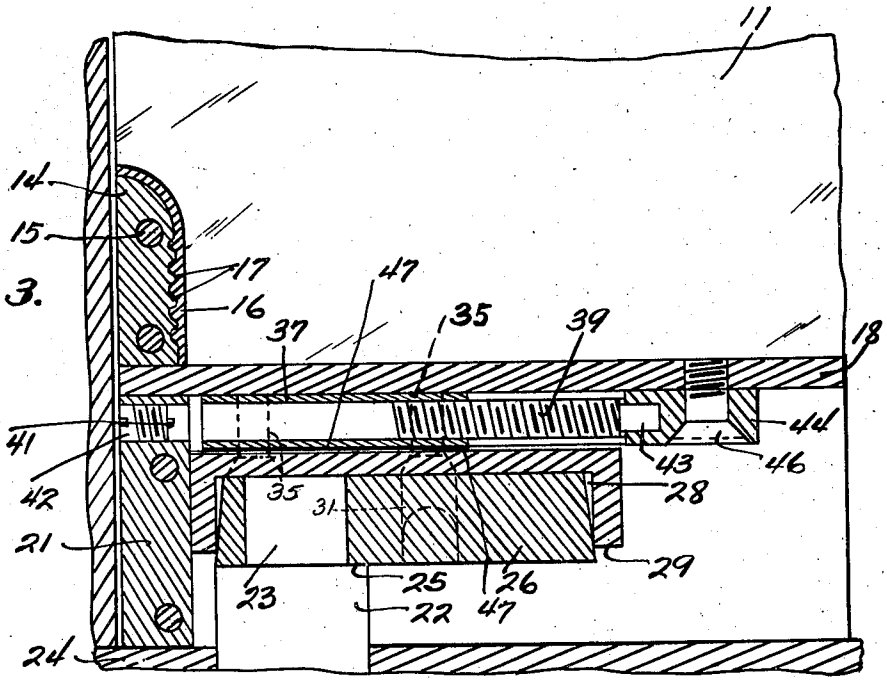
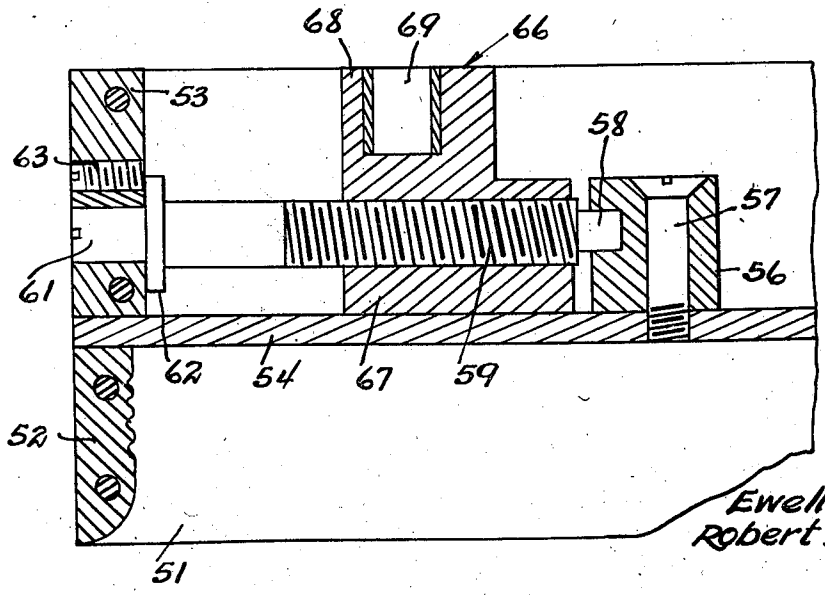


Fig. 8.



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UNITED STATES PATENT OFFICE

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ADJUSTABLE HINGE FOR DOORS

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Application July 12, 1941, Serial No. 402,206

3 Claims. (Cl. 16—129)

The present invention relates to hinge structures, such as are employed on double acting or swinging doors, and it has particular relation to hinge structures adapted for use upon doors comprising massive panels of tempered glass.

One object of the invention is to provide a hinge structure which is simple and inexpensive to construct, but which admits of adjustment of a door either vertically or transversely to suit conditions of operation.

A second object is to provide an adjustable hinge structure which admits of ready and convenient movement of the door into and out of position upon its pintles in the door frame.

These and other objects of the invention will be apparent from consideration of the following specification and claims.

It has heretofore been proposed to construct doors for buildings of single monolithic panels of glass, which preferably are tempered by heating the finished panel to or almost to the softening point and then suddenly chilling the surface. The panels so treated are of great mechanical strength, high resilience and if broken they disintegrate into small diced or cube-like fragments which are relatively harmless to objects and persons which might be struck thereby. Hinges for such doors most usually comprise fittings in the form of shoes or channels adapted to slip over an end or a portion of an end of the panel. These fittings are provided with socket elements adapted to receive pintles projecting respectively from the floor or sill and the lintel of the opening in which the doors are hinged. The fittings commonly are permanently mounted in position and the space between the fitting and the edges of the glass is poured full of Rose's metal, which has the facility of expanding when cooled, thus firmly bonding the fitting in place. Since the doors are prefabricated and since the openings in which they are disposed frequently are not perfect as to size and shape, it is desirable that the hinge structures be susceptible of adjustment to vary the position of the door both vertically and horizontally in the opening. Double doors, the free edges of which are adapted to be juxtaposed particularly require adjustment transversely in order to bring the edges as closely together as possible without actual contact.

It will be apparent that the door panels and hinge structures are highly rigid in character and are comparatively massive and heavy. Therefore, provision of a structure admitting of simple and convenient movement of the panel into position whereby the hinge fittings will receive the door pintles presents problems.

The present invention contemplates the provision of a hinge structure adapted for mounting upon a door panel, such as a panel of tempered glass, which hinge structure includes a pintle mounting carried by an adjustment screw which may be operated to move the door panel horizontally into substantially any position within limits which might be desired.

As a further object the invention comprises a pintle receiving or socket element, the vertical position of which may be adjustable by means of shims to alter the elevation of the door panel to meet any reasonable conditions.

As a third feature the invention contemplates the provision of a socket element, which is adapted to fit over a hinge pin and which further fits rotatably in a horizontally disposed socket in the hinge structure in such manner as to permit the bottom of a door panel to rest upon it during installation or removal of the door and to permit the panel to be swung vertically about it as a fulcrum into and out of position in the door opening.

For a better understanding of the invention reference may now be had to the accompanying drawings in which like numerals refer to like parts throughout.

In the drawings Figure 1 is a fragmentary view partially in elevation and partially in section, showing a pair of door panels embodying the invention and being disposed in an opening in a building wall.

Figure 2 is a sectional view through a combination mounting and housing element suitable for use in connection with the hinge structure of the invention.

Figure 3 is a sectional view through the housing and hinge structure.

Figures 4 and 5 are detailed elevational views of elements of the construction.

Figure 6 is an elevational view of the element disclosed in Fig. 5, taken at right angles to the plane of the latter view.

Figure 7 is a detailed view of an additional element of the construction.

Figure 8 is a sectional view of a modified form of the invention.

In the practice of the invention as shown in Figure 1 a building wall 10 of any convenient size and construction is provided with an opening in which are disposed swinging panels 11 preferably of tempered glass. The ends of these panels are provided with bar-like shoes 12, which

are adapted to fit thereover and are shown in greater detail in Fig. 2. Each shoe includes upper side wall portions 13 and end wall portions 14, held by pins 15, and which together provide a socket fitting over the end of the door panel. The space between the panel and the socket may be conveniently filled with Rose's metal indicated at 16 and being adapted to engage the glass panel in order to hold the fitting firmly in place. As shown in Fig. 3 the inner faces of the end portions 4 may be provided with serrulations 17 adapted to receive the metal and thus to provide keys which enhance the bond between the shoe and the metal. The shoe further includes an intermediate web portion 18 constituting the bottom of the socket and dependent side skirt 19 and a relatively thick end skirt 21, which together provide a housing for the adjustable pintle socket to be described.

The pintle 22, for example the bottom pintle of the door, is shown in Fig. 3 and includes an upper portion 23 preferably of square or other non-circular transverse section. It is journaled in the floor 24 and may be provided at its lower extremity with door check mechanism (not shown) of conventional design. The junction between the portion 23 and the main body of the pintle constitutes a shoulder 25 upon which a socket member 26 for the portion 23 is adapted to rest. Since portion 23 is non-circular in transverse section, it follows that mutual rotation between members 26 and the pintle 22 is prevented. The socket member 26, as shown in Fig. 5, is semi-circular in section and may be tapered as indicated in the drawings to frusto-conical vertical section. The member is disposed in a horizontal semicircular bearing 28 (shown in Figs. 3 and 4), formed in an elongated bearing bar or block 29, which is, also, bored as indicated at 31 to receive mounting screws. The upper portions of the bores are frusto-conical as indicated at 32 in Fig. 4, to receive the heads of mounting screws 35, shown in dotted line in Fig. 3. The screws are threaded into holes 36, in a block-like nut 37 shown in section in Fig. 3 and in detail in Fig. 7, to provide in effect a block consisting of upper and lower sections.

In order to effect transverse adjustment of the nut 37, the latter is slidably disposed upon web 18 and is bored and tapped as indicated at 38 to receive a horizontal adjustment screw 39 having suitable threads formed thereon. At one end the screw is journaled in an opening 40 (see Fig. 2) in the end wall portion 21 of the housing and may be provided with slot 41, to receive a screw-driver. Set screw 42, may, also, be threaded into the opening 40 and provides locking means to prevent accidental rotation of the adjustment screw by reason of vibration of the construction. The opposite extremity of the screw is provided with a bearing portion 43, which is journaled in a suitable block 44 connected to the web portion 18 by means of one or more screws 46.

For purposes of obtaining vertical adjustment of the door, shims 47 may be disposed between the socket element 29 and the contiguous face of the nut 37, so that by increasing or decreasing the thickness of or the number of shims substantially any desired adjustment of the height of the door may be obtained. The shims also constitute means permitting the bearing block 29 to be raised or lowered to compensate for any differences from standard in height of pintle 22.

The construction as thus described is adapted for use in connection with either the top or bottom extremity of the door panel. Assuming that it is employed upon the bottom extremity, it will be apparent that when the shoe-like fitting 12 is in position upon the panel and it is desired to mount the panel in a door opening, the block 29 is first secured in position by means of screws 35 threaded into nut 37. The socket member 26 is mounted upon pintle 22, after which the bearing in the block and the member are brought into register with the door disposed in inclined position. With the socket member 26 in its bearing, it is easy to swing the door into vertical alignment to register with the upper hinge pintle. Usually the latter is vertically adjustable so that it may be retracted to permit the upper edge of the door panel to move into position and subsequently it can be lowered to engage its socket.

In Fig. 8 of the drawings is illustrated a modified construction which is well adapted for use in connection with the upper hinge of the door. This construction includes a shoe 50, which may be substantially identical with the shoe 12 already described. This shoe includes side walls 51, end walls 52 and 53 and a web 54 corresponding to the web 18 already described. A block 56 is secured to the web by means of a screw 57 threaded into the web 54 and being provided with a socket for the extremity 58 of an adjustment screw 59. The opposite extremity 61 of this screw rotates in a bearing in an end wall portion 53. It may also be provided with a shoulder portion 62 bearing against the inner face of the end wall portion 53. The latter portion may further be bored and tapped to receive a set-screw 63, which is adapted to engage the shoulder to prevent any accidental rotation of the screw 59. The socket element 66 for the upper door pintle includes a base portion 67, which is bored and tapped to receive screw 59. It is also provided with an upper portion 68 which has a socket 69 to receive the downwardly-projecting pintle on which the door is adapted to revolve.

The constructions as thus shown and described are simple and very compact. They also admit of ready adjustment of the door panels to meet varying conditions. These adjustments can readily be made by the mechanics during the process of installing the doors.

The forms of the invention herein shown and described are to be considered merely as exemplary. It will be apparent to those skilled in the art that numerous modifications may be made therein without departure from the spirit of the invention or the scope of the appended claims.

What we claim is:

1. A hinge construction for a door panel comprising a shoe adapted to fit over an end portion of said panel, the shoe being provided with a housing portion having side walls and an end wall interconnecting the side walls, a block slidably disposed in the housing portion and being bored and tapped, an adjustment screw threaded into the block and having a bearing in said end wall, the block being formed with a horizontal, semi-cylindrical bearing and a socket member of semi-cylindrical section fitting into the latter bearing, the socket member having a socket receiving a pintle for the panel, said socket member being rotatable in the second mentioned bearing, to permit the door panel to be tilted about an axis perpendicular to the pintle.

2. A hinge structure for a door, which structure comprises a shoe providing a housing having side walls and an end wall interconnecting them, a block divided into upper and lower sections dis-

posed in the housing, shims disposed between the sections and determining the height of the panel in its opening and screw means interconnecting the sections to secure them together, the upper section being horizontally bored and threaded to receive an adjustment screw, said screw being journaled in the end wall and being rotatable to adjust the position of the block horizontally, the lower section being provided with a socket member adapted to receive a hinge pintle.

3. A hinge construction for a door panel comprising a shoe adapted to fit over an end portion of said panel, the shoe being provided with a housing portion having side walls and an end wall interconnecting the side walls, a block slidably disposed in the housing portion and being bored and tapped, an adjustment screw threaded into the block and having a bearing in said end wall, the block being formed with a horizontal, semi-cylindrical bearing, a socket member fitting into the bearing and being provided with a socket receiving a pintle for the panel, said socket member being rotatable in the bearing to permit the door panel to be tilted about an axis perpendicular to the pintle, the block being divided into upper and lower sections, shims for adjusting the height of the door panel disposed between the sections and screw means interconnecting the sections to secure them together.

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