April 27, 1943. R. A. MILLER ET AL 2,317,931

FITTING FOR DOORS

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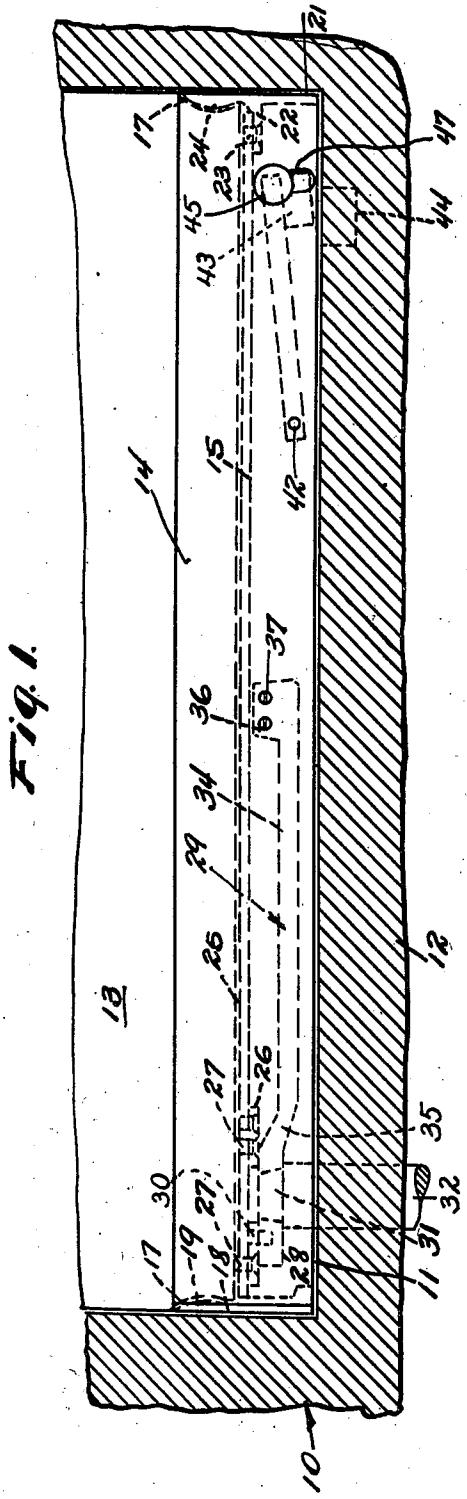


Fig. 1.

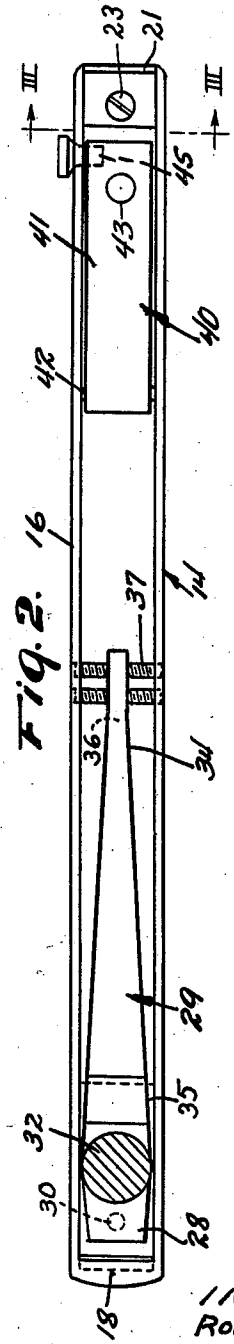


Fig. 2.

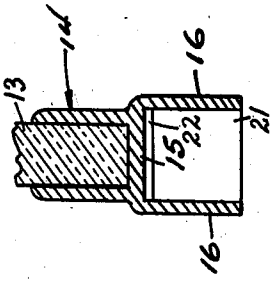


Fig. 3.

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Fig. 4.

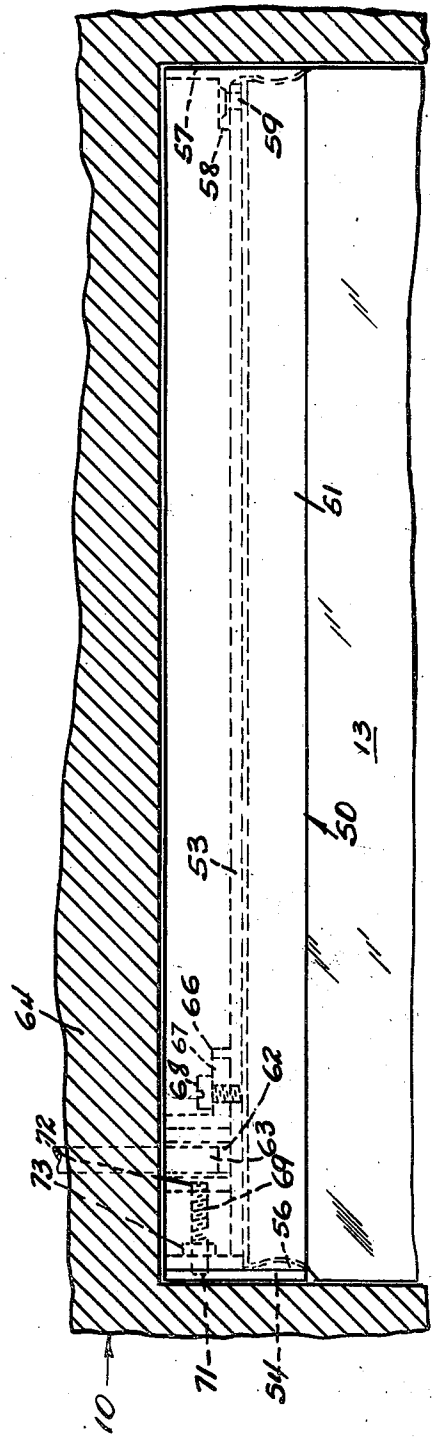
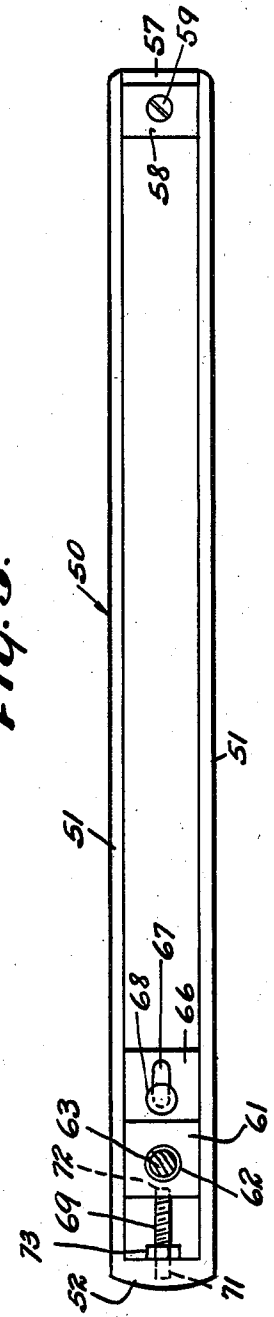


Fig. 5.



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Fig. 6.

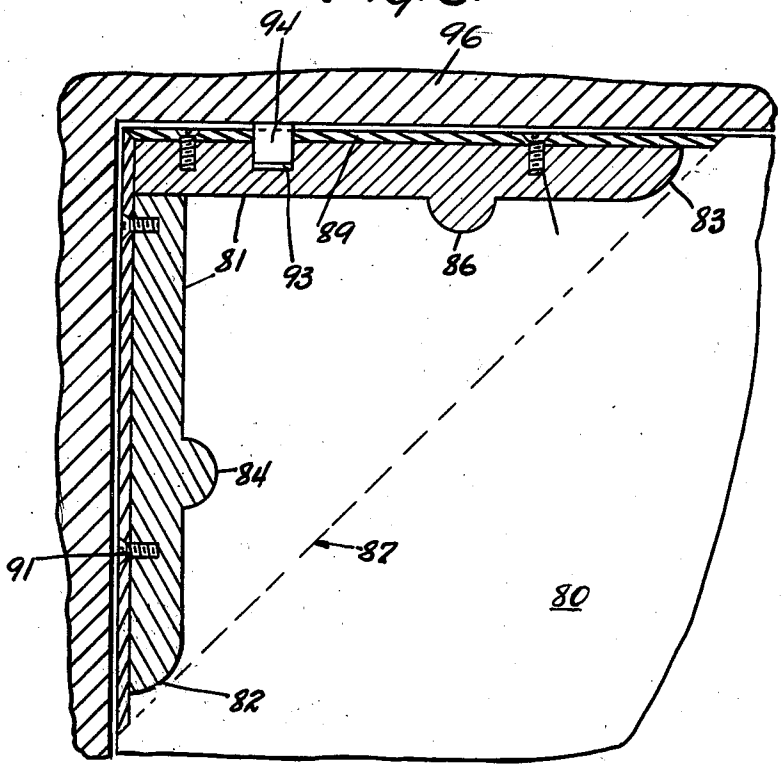
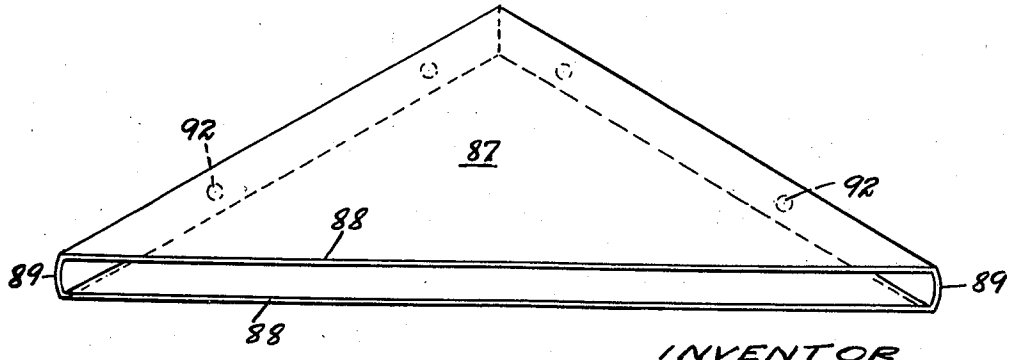


Fig. 7.



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UNITED STATES PATENT OFFICE

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FITTING FOR DOORS

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Application May 8, 1940, Serial No. 333,986

5 Claims. (Cl. 20—16)

The present invention relates to hardware mountings for doors and it has particular relation to mountings suitable for use in combination with monolithic doors comprising single massive panels of tempered glass or similar hard and brittle material.

One object of the invention is to provide a mounting of the foregoing type which is simple, rugged and secure and can be fastened to a door panel with a minimum of cutting or alteration of the panel to which it is applied.

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

The technique of tempering or heat-treating massive sheets or panels of glass for purposes of increasing the strength thereof has recently been brought to a high degree of perfection. Panels so treated possess a strength approximating that of cast iron, but retain the transparency and beauty characteristic of glass. It has been proposed to employ panels of such material for various purposes including that of providing closure elements or doors for the openings in buildings. However, difficulty has been encountered in connection with such structures, because of the peculiarities of the material.

Tempered glass panels, in addition to being characterized by great hardness, resilience and strength, are under internal strain, which upon rupture of the compression surface of a panel may result in complete shattering of the entire panel into relatively small, diced, but harmless fragments. This renders the plates safe, but it necessitates that any cutting operations to be performed upon the panels must be effected before they are tempered. Furthermore, care must be observed in the shaping and location of any openings or notches which are to be formed in the panel. For example, small holes of a diameter less than the thickness of the glass are not permissible because it is found practically impossible to temper a panel containing such holes. Holes and notches or corners in notches in the glass must also be carefully rounded and the radii of curvature must be comparatively large or the panels will be unstable and subject to shattering, even without preliminary rupture of the surface.

In accordance with the provisions of the present invention the foregoing difficulty is overcome by provision of an end element for a door panel providing a socket completely enclosing the end of the panel and being provided with elements adapted to engage small depressions formed in opposite edges of the panel in such manner as positively to lock the elements in position.

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

In the drawings Figure 1 is a fragmentary elevational view showing the lower portion of a door embodying the principles of the invention, together with a portion of the adjacent building wall.

Figure 2 is a plan view looking upwardly at the hinge mounting disclosed in Figure 1.

Figure 3 is a cross-sectional view taken substantially upon the line III—III of Figure 2.

Figure 4 is a fragmentary elevational view of the top mounting for the door disclosed in Figure 1.

Figure 5 is a plan view of the mounting disclosed in Figure 4.

Figure 6 is a sectional view of a modified form of the invention; and

Figure 7 is a perspective view of one of the parts shown in Figure 6.

In the construction as disclosed in Figure 1, a building wall 10 of conventional design is formed with an opening 11, the lower margin of which is defined by a floor structure 12. A door 13 comprising a monolithic panel of tempered glass is disposed as closure element in this opening, and preferably is free of supporting or reinforcing structure intermediate of the lower and upper ends thereof. Preferably such panels are of a thickness of about ¼ to about 1½ inches. However, panels of somewhat greater or lesser thickness are permissible. Obviously a panel of this type is relatively heavy.

A mounting for hinging the door in place in the opening includes a shoe-like end element 14 of bronze, aluminum, stainless steel or the like designed to fit over the lower edge of the door and provides a suitable socket for the latter. It is to be observed that the shoe includes a web 15, (shown in Fig. 3) which may be cast or otherwise formed integrally with the side wall portions 16 of the member. If desired, the portions of the sides below the web may be somewhat more widely spaced than the portions above, in order to provide a more roomy housing for the reception of the hinge structure for the door panel.

It is to be noted that the panel 13 adjacent to its lower corners is formed with slight, arcuate indentations or notches 17 in the vertical edges thereof. One end portion 18 of the end element

is provided with a boss 19, of arcuate section, fitting into one of the depressions, and the opposite end portion 21 of the element includes an inwardly-projecting tongue 22, which is bored to receive a screw 23, securing it to the adjacent portion of the web 15. The end element 21 is also provided with a boss 24 projecting into the depression or recesses 17 in the adjacent vertical edge of the door panel.

In mounting the end element upon the door the member 21 is first removed after which the shoe 14 is slipped into position with the boss 19 disposed in one of the recesses 17. The end element 21 is next disposed in position and is secured to the web 15 by means of the screw 23. Bosses 19 and 24 in notches 17 positively lock the shoe from displacement by a vertical force. In order to insure a tight fit between the end element and the adjacent portions of the door a packing 25 of cement, artificial resin, rubber or the like may be disposed in the socket for the panel. Still another form of packing may comprise an easily fusible metal, or an alloy, such as rose metal, which may be poured in molten state into the space between the glass and the socket without damaging the glass. If rose metal is employed it tends to expand upon cooling and thus insures that the end element will at all times securely grip the panel.

A construction providing a pintle socket for the door includes a plate 26 which may be secured to the web 15 by means of bolts or screws 27. The rear extremity 28 of a hinge arm 29 engages the lower face of the plate and is pivotally secured thereto by a pintle 30 extending upwardly into the plate. The extremity is, also, provided with a suitable socket for the reception of the upper extremity 31 of a pintle 32 having a shoulder 33 upon which portion 28 rests. The pintles 32 may be an element of suitable closure mechanism (not shown) disposed in or beneath floor 12.

The forward extremity 34 of the arm is connected by offset portion 35 to portion 28. It is, also, provided with a projecting lug 36 which, as shown in Figure 2, is engaged by set screws 37, threaded through the sides 16 of the end member 14. It will be apparent that by proper adjustment of the screws, it is possible slightly to rotate the arm about pivot 30 in housing 14 in such manner as to permit of adjustment of the door about the axis of rotation, thus insuring that it will come to rest in proper plane in its opening.

The opposite end of the construction may be provided with a floor latch mechanism 40, which includes a lever 41 journaled at its rear extremity up on a pin 42, extending transversely of the sides 16. The lever adjacent to its forward end may be provided with a pin 43 adapted to project, when the lever is lowered, into a socket 44 in the floor of the building. The forward or free extremity of the lever may further be provided with a transverse pin 45 adapted to work in a slot 47, thus admitting of raising or lowering of the end of the arm to lift the stud 43 from the socket 44 when it is desired to unlock or lock the door.

A hinge mounting for the upper extremity of the door includes a socket-like structure 50 quite similar in design to the structure 14 already described and including side walls 51 and an end wall 52 integral with or rigidly secured to the side walls. A web 53, corresponding to the web 15 already described, interconnects the side walls intermediate of their upper and lower edges and divides the element 50 into upper and lower compartments, the latter of which is designed to receive the upper edge of the panel 13.

Notches or recesses 54, corresponding to the recesses 17, are also provided in the vertical edges of the upper extremity of the panel and one of these receives a boss 56 projecting inwardly from the inner face of the end wall 52. The opposite end wall (57 of the construction) is formed as a separate and detachable unit having an inwardly-projecting arm or bracket 58, that, like the arm 23, is secured in position upon the web connecting the side walls of the structure by means of a screw 59.

The pintle bearing for the upper extremity of the panel includes a detachable socket element 61 having a depression 62 providing a bearing for a conventional door pintle 63 which may project downwardly from the lintel portion 64 of the door opening. Element 61 includes a bracket 66 which rests upon the upper face of the web 53 and has a slot 67 formed therein for the reception of a screw 68, securing it in position upon the web. Socket element 61 is further secured in position by means of an adjustment screw 69, the rear extremity 71 of which projects into a socket in the end wall 52. The opposite extremity of the screw is received in a socket in the rear face of the element 61, that may be adjusted by means of nut 73 threaded thereupon in such manner as to admit of adjusting the position of the socket element, in order to align it with the lower pintle 31.

It will be apparent that the space between the upper extremity of the door panel and the adjacent walls of the socket of the mounting 50 may be filled with cement, rose metal or other packing material in the same manner as the socket of shoe 14.

It will be apparent that the construction herein disclosed is very simple and yet it provides means positively securing hinge mountings to the extremities of a glass door panel without the necessity of substantially modifying the panel structure itself. The simplicity of the construction is in complete harmony with the appearance with the rest of the panel.

In the form of the invention shown in Figures 6 and 7, the holding means for a hinge is attached solely to a single corner, for example, one of the upper corners of a door panel 80 of tempered glass. In this construction, the panel has portions 81 of both a vertical and a horizontal edge adjacent to the end cut away to receive bars 82 and 83, which may be of iron or the like, and may be separate units or may be integrally united to provide a unit of L-shape. These bars are provided intermediate of their length with bosses 84, 86 of approximately semicircular sectional outline, which notches of course extend from face to face of the glass and are disposed as key elements in the notches.

The bars 82 and 83 are maintained in position by a shoe 87 of approximately triangular outline and involving spaced side plates 88 engaging the side of the glass and webs 89 integral with or otherwise connected to two contiguous edges of each of the plates. This shoe fits over the bars 82 and 83 after the latter have been disposed in position in the cut away portions of the door panel and is secured to the bars by screws 91 extending through openings 92 of webs 89. The spaces between the various portions of the fitting and the contiguous portions of the panel may be filled with a packing of rose metal flowed in while it is molten.

It will be noted that a relatively large opening **93** is formed in web **89** and receives a pintle **94** extending downward from lintel **96**.

It is to be noted that when the construction is assembled the bosses **84**, **86** act as keys, positively preventing displacement of the fitting by forces exerted in any direction in the plane of the door. Therefore, the effect is much the same as obtained by uses of the bosses **19**, **24** of Figure 1 or **56** of Figure 3.

Although only a preferred form of the construction has been described, it will be apparent 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 fitting for a door panel comprising a shoe to be fitted at one end of a door panel, the shoe having side plates for engaging the sides of the panel and webs interconnecting the plates and a plurality of key elements secured within the shoe and being disposed to engage notches formed in two distinct edges of the panel, whereby the key portions positively prevent displacement of shoe in any direction in the plane of the door, said fitting being formed to receive a hinge pintle.

2. A door construction comprising a door panel and a hinge fitting for the panel, the panel having a plurality of notches formed in two edges at one end thereof, the hinge fitting comprising a shoe engaging both of said edges and having key elements secured therein and engaging the notches to secure the shoe from displacement from the panel.

3. A hinge mounting for a door panel including an end element comprising a bar having a socket formed therein, which socket is adapted to slide over an extremity of a door panel and includes side walls engaging opposite faces of the panel, and a web portion interconnecting the side walls and enclosing the contiguous edge portion of the panel, said element further being provided with means adapted to project into and engage recesses formed in opposite vertical edges of said panel, said element being provided with a connection for a pintle extending approximately at right angles to it.

4. In combination with a door panel comprising a single massive panel of hard and brittle material, which panel has arcuate recesses formed in the vertical edges thereof adjacent to one end, a bar-like shoe adapted to slide over said end and including side walls engaging opposite faces of the panel and a web interconnecting the side walls and enclosing the contiguous edge portion of the panel, and end walls having boss portions formed therein and being adapted to project into the arcuate recesses, said shoe further being provided with a connection for a pintle extending approximately at right angles to the shoe upon which pintle the dor is adapted to hinge.

5. In combination a door comprising a panel having notches formed in two vertical edges thereof adjacent to one end, a bar-like shoe formed with a socket adapted to fit over the end of the panel and including side walls engaging opposite faces of the panel and a web interconnecting the side walls and enclosing the contiguous edge portion of the panel, the shoe having an end wall with a boss portion thereupon adapted to fit into one of the notches, the opposite end of the shoe being provided with a second boss portion, the latter being adapted to fit into the remaining notch and being provided with means releasably securing it to the shoe to permit it to be moved into and secured in the latter notch after the shoe has been disposed upon the end of the panel.

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