

April 30, 1957

K. SCHOEN ET AL

2,790,198

DOOR AND WINDOW HINGE

Filed March 17, 1953

FIG.2.

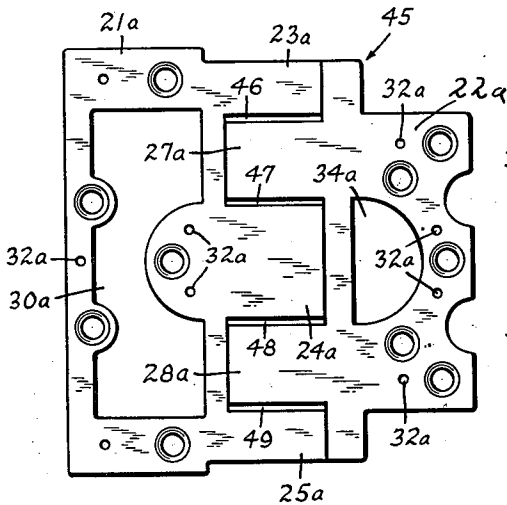


FIG.1.

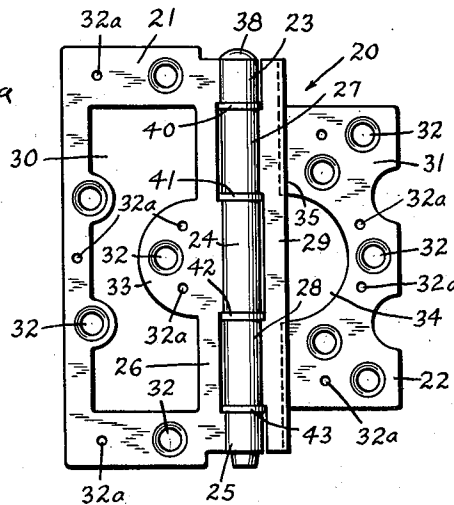


FIG.5.

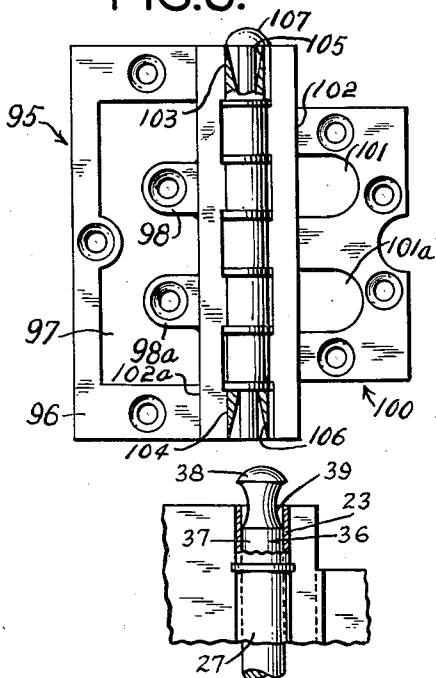


FIG.6.

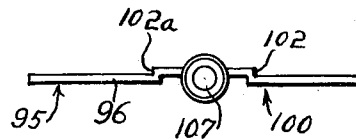


FIG.3.

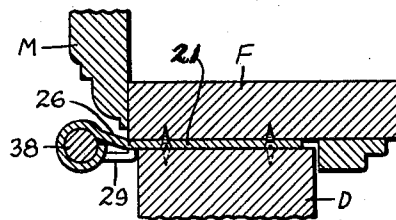


FIG.4.

INVENTORS.
KURT SCHOEN
ALFRED O. BELASCHK
BY

Charles H. Brown, Doyle, Fries & Lewis
THEIR ATTORNEYS.

1

2,790,198

DOOR AND WINDOW HINGE

Kurt Schoen, New Hyde Park, and Alfred O. Belaschk,
Elmhurst, N. Y.

Application March 17, 1953, Serial No. 342,916

2 Claims. (Cl. 16—128)

This invention relates to improvements in leaf-type hinges for supporting doors, windows and the like, and it relates more particularly to an improved type of hinge which does not require mortises to be formed in the door or window and supporting frame, and which is easily aligned therewith.

It has been proposed heretofore to provide hinges in which one leaf of the hinge can be received in an opening in the other leaf of the hinge so as to provide a single thickness of metal when the hinge is closed. Because such a hinge has only approximately one-half the thickness of the conventional leaf-type hinge, it is not necessary to form mortises in the door and supporting frame to enable a satisfactory fit to be had between the door and its frame. The prior non-mortise type of hinges have certain disadvantages. Inasmuch as they are formed of relatively thin metal to keep their over-all thickness at a minimum and one of the leaves is cut-away to provide a space for reception of the other leaf, such hinges are not very strong or resistant to deformation. Moreover, most of these hinges, because of their skeletonized or cut-away leaf formations have only three or four barrels or bearings to receive the hinge pin and for that reason their load carrying capacities are not very great. Attempts have been made in the past to overcome these deficiencies of the prior non-mortise type hinge by providing a separate bearing tab which fits into an opening in the smaller leaf of the hinge. However, this tab is usually relatively small and can only receive a single screw so that it has a tendency to wobble and bind and thereby reduces the ease of movement of the hinge as a whole.

The present invention involves an improvement over the prior types of non-mortise hinges by constructing them in such a way that the hinge may have five or more bearings for reception of the hinge pin and is provided with a stiffening member which stiffens the bearings of each leaf, thereby preventing misalignment and distortion of the hinge and greatly increasing its load carrying capacity. Due to the presence of the stiffening member in the hinge, it is necessary to offset a part of one or both of the interfitting leaves so as to keep the hinge of minimum thickness when it is closed. However, the offsets in the hinge provide an effective aligning means for assuring proper alignment of the hinge with the door and frame and for providing proper clearance to allow the door to be opened fully without interference with the door frame molding.

The invention further includes a novel type of bearing construction enabling the use of separate spacing elements or bushings to be used therein which take the greater proportion of the wear caused by opening and closing of the hinges and enable the hinge to be readily restored to its original, substantially unworn condition by replacement of the spacing elements or bushings.

The invention further includes novel types of hinge pins which greatly facilitate the lubrication of the hinge

2

by providing convenient lubrication grooves and recesses and which distribute the lubricant throughout the entire extent of the hinge in a convenient and easy way.

For a better understanding of the present invention reference may be had to the accompanying drawings, in which:

Fig. 1 is a plan view of a typical hinge embodying the present invention;

Fig. 2 is a plan view of a blank from which the hinge leaves and bearings are stamped;

Fig. 3 is a view in section through the hinge disclosed in Fig. 1, illustrating its use in connection with a door and supporting frame;

Fig. 4 is a fragmentary and partially sectional view of a portion of the hinge showing one form of hinge pin used therein in a raised position for oiling the hinge;

Fig. 5 is a plan view of another form of hinge embodying the present invention, and

Fig. 6 is an end view of the hinge shown in Fig. 5.

Referring now to Fig. 1, a hinge 20 is disclosed as including a pair of hinge leaves 21 and 22. The hinge leaf 21 includes a series of three tubular bearings 23, 24 and 25 thereon, which are spaced apart lengthwise of the continuous edge or strip 26 forming the inner edge of the leaf 21. The leaf 22 has two hinge bearings 27 and 28 which project outwardly from the continuous inner edge 29 of the leaf 22. The continuous edge portion 29 is of substantially the same length as the edge portion 26 of the leaf 21 so that, as shown in Fig. 3, the edge 29 overlies the edge 26 when the hinge is closed and forms a double thickness of metal at this point.

The leaf 21 is provided with an opening 30 which is substantially complementary to the body portion 31 of the leaf 22 so that the body portion 31 can fit entirely within the opening 30 when the leaf is closed, as best shown in Fig. 3. Each of the leaves may be provided with a plurality of holes 32 for receiving screws to secure the leaves to the frame and door or the like and a series of smaller holes 32a to receive nails for temporarily securing the hinge to the door and door frame. The leaf 21 may have a semicircular tab 33 at the mid-portion of the strip 26 provided with a screw hole 32 and this tab is receivable in a semi-circular cut-out or aperture 34 formed in the leaf 22, when the leaves are folded together.

The body portion 31 of the leaf 22 is offset from the edge portion 29 by about the thickness of the metal in the leaf 21 and thereby provides a shoulder 35 which may be used to align the hinge as a whole with the edge of the door D as shown in Fig. 3. A similar offset or shoulder (not shown) can be formed in the leaf 21 to form a shoulder to align the hinge with the door frame F. It will be apparent from consideration of Fig. 3 that the hinge, when folded, provides a single thickness of material between the door D and its supporting frame F so that mortises are not required for reception of the hinge leaves. The spacing of the shoulder 35 from the hinge axis preferably is such that the door D can be swung 180° without interference with the frame moulding.

The hinge leaves 21 and 22 are held together by means of a hinge pin 36, shown in Fig. 4, which may be of any conventional type but preferably is a member consisting of a generally cylindrical body portion 37 having an enlarged head 38 at one end and a groove or undercut 39 below the head. The body 37 of the hinge pin passes through the several bearings 23, 27, 24, 28 and 25 and is positioned with its head 38 against the upper end of the bearing 23. When the hinge pin is pushed up a short distance, the groove 39 is exposed and forms with the bearing 23 a well into which lubricant can be introduced readily for flow down along the hinge pin to lubricate the hinge bearings.

Hinges of the type described above can be produced from blanks of sheet metal, such as the blank 45 disclosed in Fig. 2. In referring to the blank 42, parts of the blank 45 corresponding to parts of the finished hinge will be identified by the same number with the suffix *a*. Thus, the blank 45 has at one end the leaf portion 21*a*, and the bearing portions 23*a*, 24*a* and 25*a*, which are narrow strips on opposite sides of the flat strips 27*a* and 28*a* corresponding to the bearing portions 27 and 28.

It will be seen starting with an initially substantially square blank of metal, a single stamping operation will separate the hinge leaf 21*a* and its bearing portions from the hinge leaf 22*a* and its bearing portions and provide gaps 46, 47, 48 and 49 between them for reception of the spacers 40, 41, 42 and 43 or 44. After the hinge leaves have been separated, the bearing strips may be coiled to form the completed bearings. The screw-receiving holes can, of course, be formed either before or after the hinge leaf portions 21*a* and 22*a* are separated and the offset in the hinge leaf 22 formed by a subsequent stamping operation.

It will be understood that the hinge 20 can be formed of metal of suitable gauge or thickness for the purpose required and that thick or quite thin sheet metal may be used in the manufacture of the hinge. Moreover, in extremely heavy duty hinges or in ornamental type hinges, it is possible to provide more than a total of five bearings in the hinge, for example, six or more bearings may be provided if desired.

Figs. 5 and 6 disclose a modified type of hinge which is similar to the hinge shown in Figs. 1 and 2 except for changes in the shapes of the leaves and in the construction of the upper and lower bearings. The hinge has one of its leaves 96 formed with a rectangular cut-out 97 with two projecting tabs 98 and 98*a* at its inner edge. The leaf 100 fits within the cut-outs of the leaf 96 when the hinge 95 is closed and has internal cut-outs or openings 101 and 101*a* to receive the tabs 98 and 98*a*, respectively. The attaching portions of the leaves 96 and 100 are offset from the plane of the hinge bushings to form aligning shoulders 102 and 102*a*.

The upper bearing 103 and, if desired, the lower bearing 104 of the hinge 95 are provided with conical bores 105 and 106 to admit lubricant when the hinge pin 107 is raised.

From the preceding description of typical hinges and blanks from which such hinges can be formed, it will be understood our new hinges have load carrying capacities not normally found in conventional non-mortise hinges and, moreover, are long-wearing and easily renewable. It will be understood that the style or design of the hinges in so far as contour and general appearance and the like, may be modified substantially. Accordingly, the forms of hinges disclosed herein should be considered as illustrative of the invention and not as limiting the scope of the following claims.

We claim:

1. A leaf hinge comprising a pair of leaves, one leaf having two aligned bearings along one edge thereof and adjacent to the ends thereof a centrally located bearing, and the other leaf having at least two spaced-apart, aligned bearings along one edge thereof to be positioned between the centrally located and end bearings of the other leaf, a hinge pin extending through said bearings and connecting said leaves for hinging movement, each of said leaves having a continuous strip adjacent to and connecting the bearings thereon and outwardly extending portions to receive fastening means, one of said leaves having an opening therein, the other leaf having a complementally shaped portion fitting and entering said opening when said leaves are closed, said other leaf also having an opening therein opposite to the centrally located bearing and said one of said leaves having a leaf portion thereon extending outwardly from the strip thereof into the opening therein and fitting in the opening of said other leaf, said openings and leaf portions being arranged symmetrically in said leaves, and screw receiving holes in each of said leaf portions.

2. A leaf hinge comprising a pair of hinge leaves, each leaf being generally rectangular and having a continuous inner edge and a plurality of bearings integral with and projecting from said continuous inner edge, a hinge pin extending through and connecting said bearings in alignment for hinging movement of said leaves, one of said leaves having a generally rectangular opening therein, the other leaf outwardly of its continuous inner edge being shaped substantially complementary to said opening for engagement therein when said leaves are closed, said other leaf having at least one opening therein outwardly of its continuous edge at the middle of said other leaf, said one leaf having a projection extending from its continuous edge into the opening therein for engagement in the opening in said other leaf, and screw receiving holes in the said leaves and projection, said openings and said projection being arranged symmetrically in said leaves.

References Cited in the file of this patent

UNITED STATES PATENTS

45	365,552	Taylor	June 28, 1887
	692,633	Daniels	Feb. 4, 1902
	1,097,741	Voight	May 26, 1914
	1,785,362	Regan	Dec. 16, 1930
	1,800,311	McKinney	Apr. 14, 1931
50	1,868,126	Wilson	July 19, 1932
	2,214,348	Roth	Sept. 10, 1940

FOREIGN PATENTS

	26,890	Switzerland	Jan. 22, 1903
55	820,864	Germany	Nov. 12, 1951