

[54] **HINGE STRUCTURE**

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[51] **Int. Cl.²** **E05D 11/00**

[58] **Field of Search** 16/130, 134, 137, 173,
16/176, 169, 140, DIG. 36, 180, 182, 183

[56] **References Cited**

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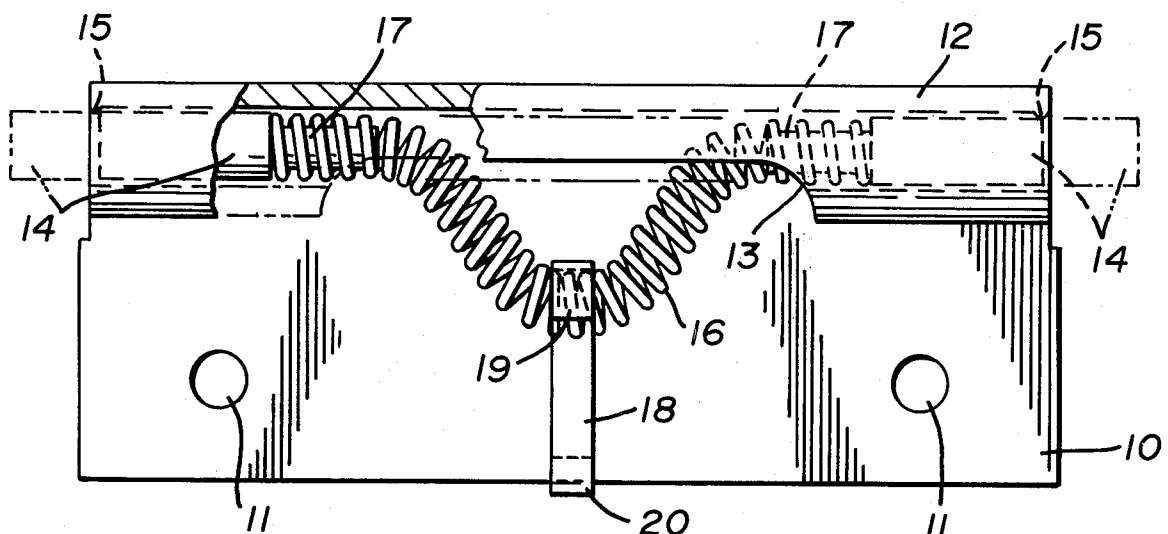
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Primary Examiner—George H. Krizmanich
Attorney, Agent, or Firm—Webster B. Harpman

[57] **ABSTRACT**

A hinge structure which can be used on a storm door or window combines a mounting frame for the door or window and a hinge leaf attachable to the door or window and having a knuckle portion registrable in a cut away section of the frame which is of a configuration forming a registering knuckle in which pintles positioned in the knuckles of the hinge leaf can be engaged. A spring positioned between the pintles is held in inactive position by a clip engaged on the hinge leaf so as to maintain the pintles in location within the knuckles of the hinge leaf until such time as the door or window is engaged in the frame and the clip released to permit the spring to move the pintles into the hinged configuration of the frame so as to hingedly affix the door or window thereto.

7 Claims, 5 Drawing Figures



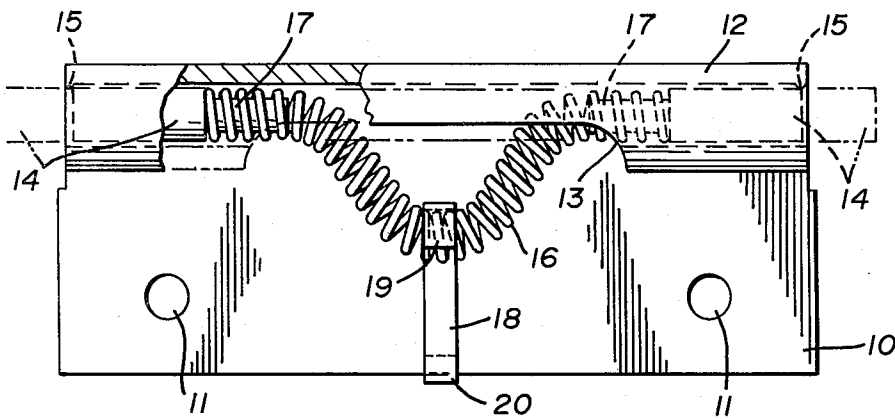


FIG. 1

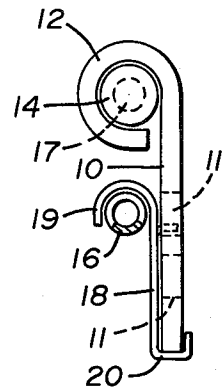


FIG. 2

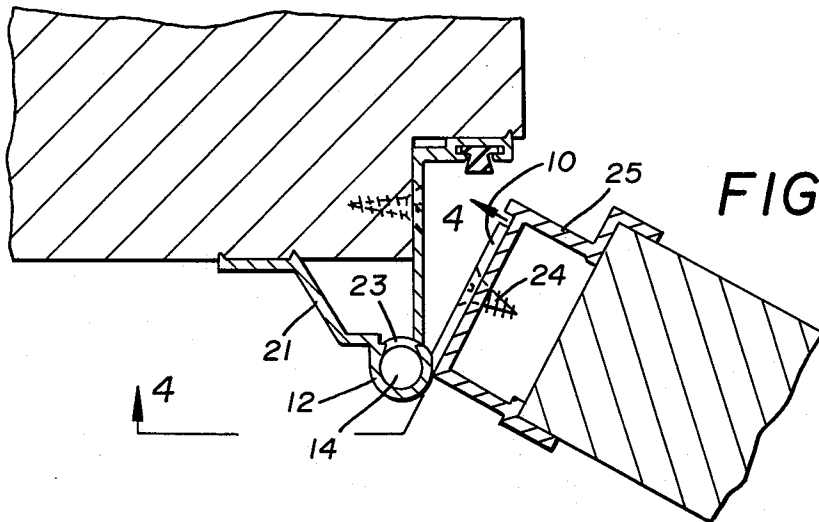


FIG. 3

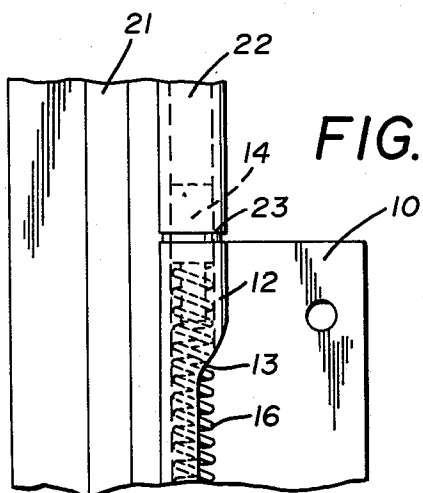


FIG. 4

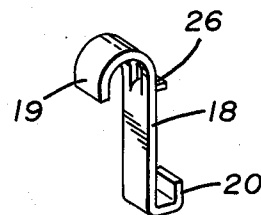


FIG. 5

HINGE STRUCTURE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to hinge structures as used for example with door and window frames and doors and windows hingedly mounted therein and wherein the frames and doors and window are generally aluminum extrusions.

2. Description of the Prior Art

Prior structures of this type have employed door frames with hinge forming components and hinge leaves registrable therewith and positioning pintles in operative relation therein, as for example in U.S. Pat. No. 2,903,735. Still other arrangements of spring urged pintles in hinge constructions may be seen in U.S. Pat. Nos. 3,375,546 and 3,673,636.

This invention is a substantial improvement over the prior art structures as for example that set forth in U.S. Pat. No. 2,903,735 in that the hinge leaf, the pintles and the spring which will eventually hold them in operative relation between the hinge leaf and the matching configuration in the door or window frame are pre-assembled and held in inoperative position until the door or window is actually installed in the frame at the point of use.

SUMMARY OF THE INVENTION

A hinge structure comprises a hinge leaf having pintle receiving knuckles thereon in spaced relation and a spring positioned between the pintles and means on the hinge leaf temporarily holding the spring in inoperative position with respect to said pintles together with a frame having pintle receiving configurations registrable with the knuckles of the hinge leaf so that release of the temporary spring holding means permits the spring to assume its normal position and move the pintles into hinged relation between the hinge leaf and the pintle receiving configurations of the frame.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a hinge leaf with parts broken away and parts in cross section and illustrating pintles disposed in the knuckle portion thereof and spring means engaging said pintles and held in inoperative relation thereto;

FIG. 2 is an end elevation of the hinge leaf seen in FIG. 1;

FIG. 3 is a horizontal cross section through a construction including a door frame and a door and illustrating the hinge leaf of FIG. 1 in operative position in a cut out section of the door frame;

FIG. 4 is an enlarged detailed elevation on line 4—4 of FIG. 3, and

FIG. 5 is a perspective detail of the hinge holding clips seen in FIGS. 1 and 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In its simplest form the hinge structure disclosed herein consists of a hinge leaf 10 apertured at 11 so that it can be attached to a door or window frame or the like and having one longitudinal edge thereof formed in a continuous cross sectionally circular knuckle 12 with a portion of the knuckle between the ends thereof being cut away as at 13 to form an elongated access opening therein. A pair of pintles 14 are slidably positioned in

the opposite end portions of the knuckle 12 and are temporarily retained within the knuckle 12 by small dimples 15 formed in the walls of the knuckle 12 adjacent the ends thereof, the dimples 15 being so formed as to permit the pintles 14 to slide outwardly past the same by the application of pressure thereto.

The pintles 14 are positioned in the opposite ends of the knuckles 12 by the engagement of the opposite ends of a coil spring on inward extensions 17 of the pintles 14, the extensions 17 being of relatively smaller diameter than the pintles 14. The pintles 14 may be positioned through the cut away openings 13.

In FIGS. 1 and 2 of the drawings, the coil spring 16 is illustrated as having been bowed outwardly of its normal straight line position in the knuckle 12 and temporarily held in the bowed position by a clip 18 having a hooked end 19 engaged over the spring 16 and having an oppositely disposed hooked end 20 on its opposite end engaged over the longitudinal edge of the hinge leaf 10 opposite the knuckle 12.

By referring now to FIG. 3 of the drawings, the complete hinge structure of the invention may be seen to include the hinge leaf 10 heretofore described and a mounting frame 21 which includes a continuous longitudinally extending cross sectionally circular pintle receiving configuration two or more areas of the pintle receiving configuration 22 are cut away as at 23, the length of the cut away areas being slightly greater than the length of the knuckle 12 of the hinge leaf 10 heretofore described so that the knuckle 12 may be positioned in the cut away area as best seen in FIG. 4 of the drawings.

By referring to FIG. 4 of the drawings, it will be seen that when the knuckle 12 of the hinge leaf 10 is so positioned, the pintles 14 may be moved outwardly of the ends of the knuckle 12 and into the pintle receiving configuration 22 of the mounting frame 21, and that they are normally so urged and held by the coil spring 16 when the same is permitted to assume its normal position as seen in FIG. 4 of the drawings having been freed from its temporary holding clip 18. Bushings may be positioned between the pintle receiving configuration 22 and the ends of the knuckle 12 if desired as will occur to those skilled in the art and secondary dimples may be formed in the pintle receiving configuration 22 to prevent the pintles 14 from moving axially thereof beyond their desired location therein.

It will thus be seen that the hinge structure disclosed herein provides for the preassembly of the hinge leaf to include the pintles 14 and the actuating spring 16 therefor and the temporary positioning of the spring 16 by the clip 18 which with the small dimples 15 in the knuckle 12 insures a complete and useable hinge leaf assembly which may be attached as by fasteners 24 to a door or window frame 25 as seen in FIG. 3 of the drawings.

The clip 18 is preferably provided with a tongue 26 as may be seen in FIG. 5 of the drawings and which will register with one of the apertures 11 in the hinge leaf 10 as seen in FIG. 2 of the drawings and which will insure against the accidental dislocation of the clip 18 during handling.

Those skilled in the art will observe that when a door and door frame or a window and window frame are installed on a building the frame such as the mounting frame 21 disclosed herein, is cut to fit the opening and installed thereon by fasteners all as known in the art.

Each hinge leaf 10 to be used may then be positioned in the respective cut away portion of the pintle receiving configuration 22 of the mounting frame, the clip 18 removed to permit the pintles 14 to move out of the ends of the knuckle 12 and into the pintle receiving configuration 22. The door or window may then be attached to the hinge leaf 10. If desired the procedure may be reversed with the hinge leaf attached to the door or window at the proper location thereon and then positioned in registry in the opening in the pintle receiving configuration 22 of the mounting frame and the clip 18 removed to permit the pintles 14 to move into the pintle receiving configurations.

The above described structure provides a relatively easy and fast assembly of doors and windows in mounting frames at their point of use and is versatile in that it can be used on windows and doors of various sizes and shapes.

Although but one embodiment of the present invention has been illustrated and described it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention.

Having thus described my invention what I claim is:

1. A hinge structure for mounting a door in a doorway comprising an elongated mounting frame secured in said doorway, an elongated arcuate knuckle on said mounting frame, a plurality of cut out sections in said knuckle, a hinge leaf for each of said cut out sections, each hinge leaf being secured to the edge of a door, an elongated arcuate secondary knuckle on said hinge leaf of substantially the same cross sectional configuration as said first mentioned knuckle, a cut away section in said secondary knuckle inwardly of the ends thereof, a pair of pintles movable longitudinally within said secondary knuckle on either side of said cut away section

thereof, a spring positioned between said pintles normally urging said pintles outwardly of the ends of said secondary knuckle and means on said hinge leaf temporarily engaging and holding said pintles and spring against movement in said secondary knuckle so as to temporarily prevent said spring from moving said pintles outwardly of said secondary knuckle and into engagement with said first mentioned knuckle.

2. The structure set forth in claim 1 wherein said means temporarily engaging and holding said pintles and spring consists of resilient means in the opposite ends of said secondary knuckle.

3. The structure set forth in claim 1 and wherein said means temporarily engaging and holding said pintles and spring consists of a device holding said spring outwardly of said cut away section in said secondary knuckle.

4. The structure set forth in claim 1 and wherein said means temporarily engaging and holding said pintles and spring consists of a clip having configurations on its ends engaging said spring and hinge leaf so as to temporarily hold said spring outwardly of said cut away section in said secondary knuckle.

5. The structure set forth in claim 1 and wherein said pintles have extensions on their innermost opposite ends with respect to said secondary knuckle in which they are positioned, said extensions being of relatively smaller diameter than the remainder of said pintles and wherein the ends of said spring are engaged on said extensions.

6. The structure set forth in claim 5 wherein the spring is a coil spring.

7. The structure set forth in claim 1 and wherein an opening in a wall forms said doorway and a closure for said doorway comprises said door.

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