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3,015,840

CONTINUOUS HINGE

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FIG. 1

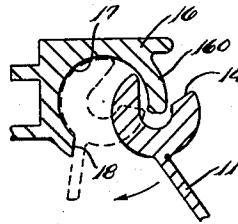
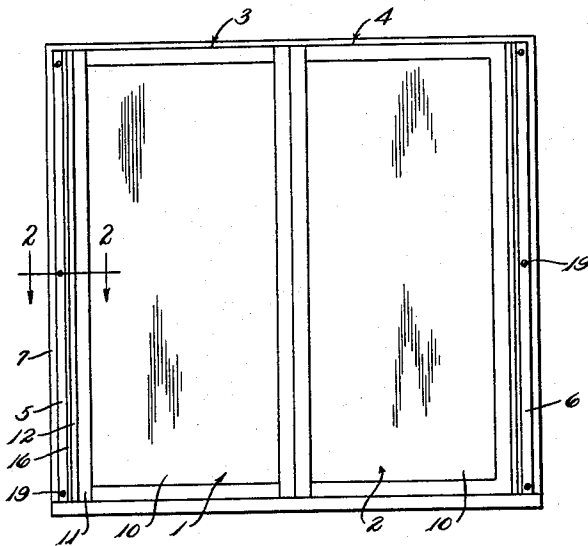
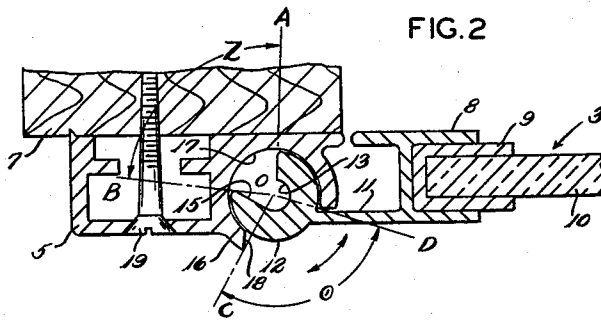


FIG. 3

FIG. 2



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3,015,840

CONTINUOUS HINGE

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Original application Apr. 5, 1957, Ser. No. 651,079, now Patent No. 2,866,997, dated Jan. 6, 1959. Divided and this application Sept. 22, 1958. Ser. No. 762,582

2 Claims. (Cl. 16-172)

This invention relates to continuous or elongate hinge constructions, especially to hinge constructions formed integrally with stiles or other portions of doors, casement window sash rails, and the like, and Z-bars, or other frame means therefor.

Heretofore, when storm or supplementary doors, or other doors, windows or awnings are to be pivotally positioned, it is the normal practice to provide pairs of hinges, or equivalent items by which the door, sash or the like can be pivotally secured to a supporting frame or other means.

The general object of the present invention is to provide a novel and improved construction wherein an elongate hinge means is formed integrally with a portion of the door, casement window sash or the equivalent, and the frame means therefor, and wherein the construction is characterized by the neat and secure positioning of one member in pivotal engagement with a fixed frame member.

Another object of the invention is to provide elongate hinge means integral with a formed metal section of doors, casement windows or the like and wherein the hinge means extend the length of the pivoted side of the door, window sash, or the like.

Another object of the invention is to provide hinge means wherein the hinge pintle member is formed integrally with a part of the frame or sash of the door or window and wherein the hinge socket is formed integrally with a portion of the frame, or supplementary member provided for positioning the pivoted member.

Yet another object of the invention is to provide an attractive, inexpensive, neat hinge member that provides limited smooth pivotal action between a door, or similar member and the anchor unit provided therefor.

Still another object of the invention is to provide hinge means wherein a hinge pintle can be threaded into engagement with a hinge socket and have substantially 90° arcuate movement with relation therewithout without the hinge pintle being removable from or falling out of engagement with the hinge socket.

A further object is to extrude metal members for use in window sash frames, door frames, and securing means therefor wherein inter-engaging means are provided on the securing means and frames for pivotal action therebetween.

The foregoing and other objects and advantages of the invention will be made more apparent as the specification proceeds.

In order to understand the present invention completely, reference now should be had to the accompanying drawings, wherein:

FIG. 1 is an elevation of a casement window and hinge means assembly embodying the principles of the invention;

FIG. 2 is an enlarged fragmentary horizontal section taken on line 2-2 of FIG. 1; and

FIG. 3 is a view showing the structure of FIG. 2 indicating how the pintle means thereof can be threaded into and out of engagement with the pintle socket provided in this hinge construction.

When referring to corresponding parts shown in the drawings and referred to in the specification, correspond-

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ing numerals are used to facilitate comparison therebetween.

The present invention, broadly speaking, relates to a window construction wherein a sash rail having a hinge pintle with an arcuate peripheral surface extending therefrom is provided, the hinge pintle is connected to the remainder of the sash rail by an integral connector flange that extends intermediate the margins of the arcuate peripheral surface, and a supplementary frame member is provided and has a hinge pintle socket with an arcuate surface provided at one margin thereof. This hinge pintle socket has a slot extending the length thereof for receiving the hinge pintle in such socket with the connector flange extending from the slot for a limited pivotal action between the sash rail and supplementary frame when the hinge pintle and socket are engaged with each other.

Reference now is made particularly to the details of the construction shown in the accompanying drawings, and a pair of casement windows 1 and 2 are shown. The casement windows 1 and 2 include casement sashes indicated as a whole by the numerals 3 and 4, and with the casement sashes being pivotally secured in position by engaging with frame means. Such frames include supplementary rails or members 5 and 6 that are secured to members such as window jambs 7, outlining the window opening in which the casement window sashes 3 and 4 are positioned.

FIG. 2 illustrates some of the important detailed features of the improved window and hinge construction of the invention, and it is seen that a window sash rail 8 is provided at the one vertical margin of the sash 3. The sash rail 8 has a substantially U-shaped opening therein for receiving a conventional sash-engaging channel 9 therein. Such channel 9 is made from flexible or resilient material and positions a window pane 10 in the sash rail 8. The pane 10 is permanently secured in the sash 3 by the remainder of the components of the sash.

As a novel feature of the present invention, the sash rail 8 also has an integral connector flange 11 extending therefrom in a direction oppositely to the channel receiving portion thereof and usually with such connector flange extending from a marginal portion of the sash rail. The connector flange 11 has a male hinge section, or hinge pintle 12 provided at the end thereof. This hinge pintle 12 extends the length of the sash rail 8 and is of uniform cross section throughout. FIG. 2 of the drawings best shows that a center hole or bore 13 is provided in the hinge pintle and that the hinge pintle has a peripheral or circumferential length of about 270°. It also will be seen that the arcuate peripheral portion of the hinge pintle 12 extends in opposite directions from the connector flange 11. One wall of this hinge pintle 12 extends substantially radially thereof as indicated at 14. The other wall of this peripheral portion of the pintle is indicated at 15 and extends substantially tangentially from the center bore 13.

FIG. 2 of the drawings best shows that each of the supplementary rails 5 and 6 of the frame means provided for the casement windows 1 and 2 has integrally formed hinged pintle sockets, or female hinge members 16 formed integrally therewith. Usually both the supplementary rails 5 and 6, sash rails 8 and other portions of the frame means for the casement windows are formed as extruded metal sections. Thus specialized shapes as shown herein can be readily provided and will form integral hinge sections with the means normally required for positioning the casement windows in a conventional window opening. The hinge pintle sockets have an arcuate surface indicated at 17 therein of at least about 250° of circumferential length and normally the radius of such

hinge pintle socket 16 is but slightly larger than the radius of the arcuate portion of the hinge pintle 12 so that the hinge pintle will be snugly received in the hinge pintle socket 16 for limited arcuate movement, as described hereinafter in more detail. The hinge pintle socket 16 thus has an axially directed slot 18 extending the length thereof and with the connector flange 11 being received in an extending from such slot 18.

The tangentially extending wall 15 of the hinge pintle 12 provides more or less of a protruding finger on the hinge pintle 12 and it thus can be threaded into engagement with the hinge pintle socket 16, as indicated in FIG. 3 of the drawings. By properly positioning the hinge pintle and casement sash 3 in association with the supplementary rail 5, as indicated, and then moving the sash 3 through an arc, the hinge pintle 12 can be moved into full engagement with the hinge pintle socket 16. Then any limited arcuate movement of the sash 3 with relation to the supplementary rail 5, while retaining the hinge pintle in its socket, will securely engage the sash with the supplementary rail for pivotal action with relation thereto.

FIG. 2 of the drawings illustrates how the casement sash 3 can extend from the supplementary rail 5 in direct alignment therewith when the casement sash 3 would be in its closed position. However, whenever it is desired to open the casement sash, such arcuate movement of the sash is permitted in the supplementary rail so that the casement window can be opened. Usually this casement sash 3 is provided as a storm window or auxiliary window in association with another pivotally positioned casement window, or the like in an ordinary house or building construction. Thus, a connector member, such as shown in Patent No. 2,231,573 can be used for securing the casement sash 3 to the associated primary window for movement therewith. Pressure set up on the casement sash 3 by the connector member would be sufficient to retain the hinge members in engagement at all relative positions thereof. In nearly all casement window constructions and the like, the casement window can only be opened a limited degree and usually such opening movement of the window would be of an arc of approximately 60 to 80°. Hence, it would not be possible for the casement sash 3 to be swung through a sufficiently long arc as to move the casement sash 3 to a position with the hinge pintle being adapted to be moved out of engagement from the hinge pintle socket 16, as shown in the structures in the drawings. The sash 3 must be moved through an opening arc of over 90° to remove it from the supplementary rail 5. However, at any time when it would be desired to disengage the casement sash 3 from the supplementary rail 5, the connector member, or any other means used for controlling the pivotal movement of the sash 3, could be disengaged therefrom or be otherwise released so as to permit the casement sash 3 to be pulled from engagement with the supplementary rail 5 and be removed for convenient cleaning action, or other repair or service action thereon.

FIG. 3 of the drawings best illustrates that the connector flange 11 will normally abut against one edge of the slot 18 provided in the hinge pintle socket when the hinge pintle is in its disengaging position with relation to the hinge pintle socket and this provides good index means for both engaging and disengaging the casement sash with relation to the supplementary rail.

Usually the corners or edges of the hinge pintle 12 formed by the walls 14 and 15 thereof are slightly rounded, or relieved to facilitate swinging the hinge pintle into engagement with the hinge pintle socket but yet to have maximum arcuate surfaces provided on both the hinge pintle and hinge pintle socket.

FIG. 2 of the drawings shows that the angle $\odot$ between the lines OD and OC determined by the circumferential length of the slot 18, is approximately 105 to 110° so that the arcuate surface provided on the hinge pintle

socket will be of at least 250° but may vary slightly therefrom. The angle Z defined by the lines OA and OB, which are the peripheral limits of the hinge pintle peripheral surface, indicate that such angle would be in the vicinity of 88° and thus such peripheral surface would normally have an overall extent of between about 265 to 275°, approximately.

It will be realized that the supplementary rails 5 can be secured to the associated frame means by any desired member, such as screws 19.

In all embodiments of the invention, the casement sash 3 or equivalent member, can be supported as desired on the supplementary rail 5, or equivalent member to facilitate support of the weight of the casement sash on the supplementary rail. Thus, some suitable low friction support button, or other conventional member can be provided at the lower end of the supplementary rail 5 to aid in support of the casement sash 3 for pivotal action.

It will be seen that, in general, normally the peripheral length of the hinge pintle 12 will be approximately 20 to 25° longer than the peripheral length of the hinge pintle socket in which it is received. The hinge pintle normally has an arcuate length as long as possible, such as about 270°. It is possible to engage these members because of the protruding finger portion provided on the hinge pintle together with the center bore provided therein and the relatively thin protruding edge portion 160 formed on the hinge pintle socket. All of such means facilitate the convenient threading engagement action of the hinge pintle 12 with relation to the hinge pintle socket 16.

It should be realized that the hinge means of the invention can be used for positioning any type of a casement, or awning window pivotally on the frame means therefor, or it could be used for securing an awning member in place, if desired. Thus the rail means of the awning or window sash normally would have the hinge pintles provided thereon, and the frame, or jamb means provided for anchoring the window in place would have the hinge pintle or socket provided thereon. The invention contemplates that the relationship of the hinge pintle and socket means could be reversed and be placed on the opposite members from those as described herein.

From the foregoing, it will be seen that elongate hinge means have been provided integrally with casement sash frame members and the positioning frame means therefor. These hinge members can be provided at low cost when the sash rails, or equivalent structures are initially formed. Installation of the casement sashes and associated means is also facilitated inasmuch as no separate hinge means are provided, and no holes need to be provided to secure hinge means to the various members. The window means unite by an attractive, substantially concealed hinge joint, so that an improved, desirable type of pivotal positioning means has been provided for the casement sashes by the invention. Thus it is believed that the objects of the invention have been achieved.

This application is a division of our prior application Serial No. 651,079 filed April 5, 1957, now Patent No. 2,866,997.

While a complete embodiment of the invention has been disclosed herein, it will be appreciated that modification of this particular embodiment of the invention may be resorted to without departing from the scope of the invention, as defined in the appended claims.

What is claimed is:

1. In a casement window, or the like, a sash rail having a hinge pintle extending therefrom and having an arcuate peripheral surface of between about 265° to about 275°, said hinge pintle being connected to the remainder of the sash rail by an integral connector flange extending from intermediate the margins of said arcuate peripheral surface, and a supplementary frame member having a hinge pintle socket with an arcuate surface

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therein provided at one margin thereof, said pintle socket having a slot of about 110° in arcuate width extending the length thereof for receiving said hinge pintle and said connector flange for pivotal action between said sash rail and supplementary frame member, said hinge pintle having a center bore therein and having one wall extending radially of said center bore and one wall extending substantially tangentially of said center bore to provide a finger-like portion in said hinge pintle to facilitate threading said hinge pintle into engagement with said hinge pintle socket for arcuate action therein, said hinge pintle having an arcuate length between said radially extending wall and the remote edge of said connector flange about equal to but less than the arcuate length of said slot to permit a generally radial withdrawal of said hinge pintle from said pintle socket when said remote edge of said connector flange is swung over against a margin of said pintle socket.

2. In a hinge construction, one hinge member having a hinge pintle with a smooth arcuate peripheral surface connected to the remainder of the hinge member by a flat integral connector, and a second hinge member having a hinge pintle socket of uniform radius provided therein in a portion thereof and with a slot formed in and extending the length of such socket which socket has an arcuate length of about 250° for snugly receiving said hinge pintle in said hinge pintle socket with said connec-

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tor extending through said slot for pivotal action between said members, said hinge pintle having a circumferential length of about 270° and a center bore therein connecting to the periphery of the hinge pintle by one substantially radially extending wall and by one wall substantially tangent to such center bore, said connector extending from said hinge pintle intermediate the margins thereof and being parallel to a tangent to a portion of said pintle, said pintle having an arcuate length of about equal to but less than 110° from said radially extending wall to the farther edge of said connector whereby the tangentially extending wall portion of said hinge pintle is able to be threaded into partial engagement with said hinge socket and pivoted into full engagement of said pintle with said socket, said hinge pintle having an arcuate length from said tangentially extending wall to the adjacent edge of said connector of slightly less than 180°.

References Cited in the file of this patent

UNITED STATES PATENTS

2,658,233	Kimmel	Nov. 10, 1953
2,852,802	Seby	Sept. 23, 1958

FOREIGN PATENTS

309,368	Switzerland	Nov. 1, 1955
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