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

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 therefrom, 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 along the entire 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 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.

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 drawing, wherein:

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

Fig. 2 is an enlarged fragmentary horizontal section taken on line 2—2 of Fig. 1.

When referring to corresponding parts shown in the drawing and referred to in the specification, corresponding 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 drawing, and a pair of casement windows 1 and 2 are shown.

The casement windows 1 and 2 include casement sash indicated as a whole by the numerals 3 and 4, and with the casement sash being pivotally secured 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 sash 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 portion, or 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 socket 12 provided at the inside position. This hinge pintle 12 extends along the entire length of the sash rail 8 and is of uniform cross section throughout.

Fig. 2 of the drawing 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 hinge 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 about 265° 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 and extending from such slot 18.

Fig. 2 of the drawing 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, dated February 11, 1941, can be used for securing the casement sash 3 to the associated primary window for movement therewith. Pressure setup 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°.

It will be realized that the supplementary rails 5 and 6 can be secured to the associated frame means by any desired member, such as screws 19.

The integral hinge pintle 12 provided on the rail 8 may have an overall arcuate surface of 360°, if desired. However, in order to reduce the amount of aluminum, or other metal used for making such hinge pintle, in excess 20 is provided therein and extending radially thereof. However, nearly a full cylindrical surface is provided on such hinge pintle so that it can only be engaged with a hinge pintle socket 16 only by telescoping the hinge pintle 12 into the hinge pintle socket 16 at an open end portion of such hinge pintle socket.

It will be realized that the slot 18 in the hinge pintle socket 16 will be of approximately 90° in extent so that the casement sash can have a pivotal movement in the positioning means therefor of approximately 90°. The slot 18 shown in the hinge pintle socket 16 has an arcuate length of approximately 95°. Closing movement of the pivotally supported closure of the invention is limited or controlled by contact of the inner face of sash rail 8 with a sill 30 of the window frame 7, as indicated in Fig. 2. 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 bearing (not shown) can be provided at the lower end of the supplementary rail 5 to aid in support of the casement sash 3 for pivotal action. Such support button would be carried in the hinge pintle socket and would be suitably secured against vertical movement. The lower end of the hinge pintle would have thrust bearing engagement with this support button, or bearing. The casement sash 30 normally contacts a shoulder or other portion of the window sill 30 which forms part of the frame 7.

The drawing clearly brings out that both the hinge pintle 12 and the hinge pintle socket 17 are of uniform radius throughout and the radius of the hinge pintle socket 17 is such as to conform to the radius of the pintle but be slightly larger than such radius so as to provide effective arcuate bearing engagement between the pintle and pintle socket. The drawing shows that the connector flange 11 is substantially flat and that it defines a plane which is parallel, but spaced radially inwardly of a tangent to the pintle 12 of the invention. 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 jambs 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.

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 hinge construction for mounting a closure on a supporting frame comprising one hinge member having a cylindrical hinge pintle, said hinge pintle having an integral flat flange extending therefrom in non-symmetrical relation thereto, said flange defining a plane intersecting a radius of the pintle and positioned parallel to a tangent to said radius, and a second hinge member having an arcuate surfaced hinge pintle socket of uniform radius throughout provided therein and with a non-symmetrical positioned slot extending the length of such hinge pintle socket and having an outer marginal portion spaced from said radius, said hinge pintle socket pivotally receiving said hinge pintle with said flange extending through said slot, the arcuate surface of said hinge pintle socket being in full bearing contact with all of said cylindrical hinge pintle received therein, said hinge pintle and said hinge pintle socket being constructed and arranged to have motion limiting contact therebetween by said outer marginal portion of said slot contacting said flange in one direction of movement of said closure, said first hinge member having a section connected to said flange for supporting said closure, said second hinge member having a section thereon by which said hinge member can be secured to said supporting frame, said section of said first hinge member connected to said flange contacting said frame to limit hinge action in the other direction of hinge movement.

2. A hinge construction as in claim 1 wherein the outer surfaces of said sections of said first and second hinge members are parallel to each other and to the surface of said supporting frame.

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