May 22, 1962 G. EMBERLAND 3,035,635

HINGES FOR WINDOWS AND DOORS

Filed Feb. 2, 1959

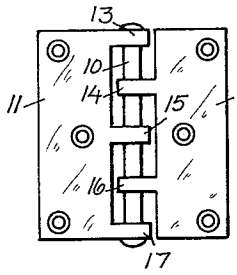


Fig. 1.

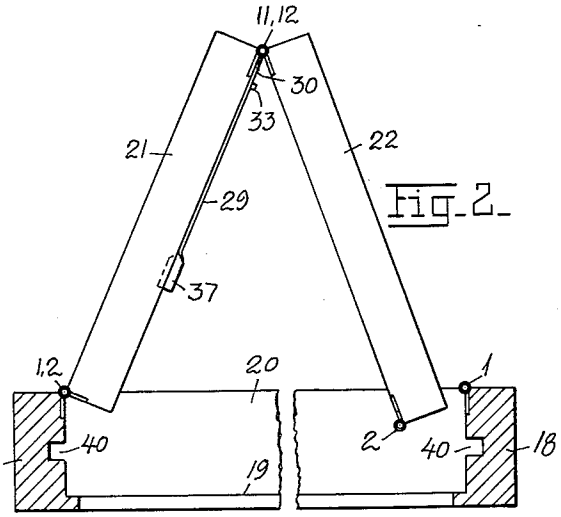
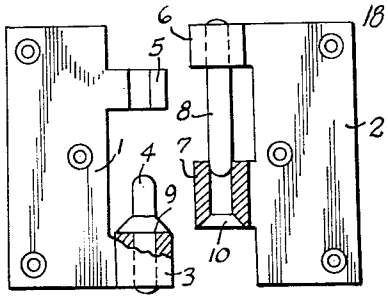


Fig. 2.

Fig. 4.



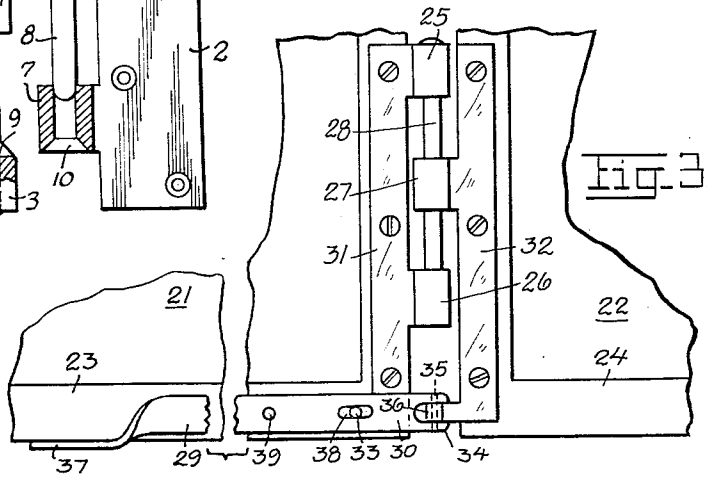


Fig. 3.

United States Patent Office 3,035,635 Patented May 22, 1962

3,035,635

HINGES FOR WINDOWS AND DOORS

Georg Emberland, Ytre Raelingen, Lillestrom, Norway

Filed Feb. 2, 1959, Ser. No. 790,582
Claims priority, application Norway Apr. 10, 1958
8 Claims. (Cl. 160—213)

This invention relates to window structures and hinges therefor.

It is an object of the invention to provide an improved sash structure and arrangement whereby the cleaning of the windows associated therewith is facilitated and access to the glass thereof is readily permitted.

It is a further object of the invention to provide an improved hinge structure especially adapted for use with the above noted window arrangement.

With respect to the window structure of the invention there is provided a pair of sashes hingeably connected and alternatively and selectively connectible to a sash frame whereby both of the sashes are individually supportable on the sash frame either separately or simultaneously.

The hinge contemplated by the invention involves the provision of first and second brackets. On one of these brackets are provided axially aligned sleeves which are spaced at a determinable distance. A pin is fixed in one of these sleeves and extends partially into the other of the sleeves to define w ith the latter a blind bore. A second pin is mounted laterally of the other of said brackets for engaging in the aforenoted blind bore. Furthermore, a hinge blade is provided on this latter bracket, the hinge blade having an open groove axially aligned with the second said pin and the open groove having a contour corresponding with that of the first said pin. This groove and the blade defining the same have an axial extent which is smaller than the distance between the first noted sleeves whereby to permit a displacement between said brackets.

Other objects and features of the invention will be pointed out in the following detailed description of preferred embodiments thereof as illustrated in the accompanying drawing in which:

FIG. 1 illustrates a hinge providing for permanent connection between two sashes as indicated above;

FIG. 2 illustrates a sash and sash frame arrangement provided in accordance with the invention;

FIG. 3 illustrates a detail for controlling the assembly of the sashes; and

FIG. 4 illustrates a hinge provided in accordance with a preferred embodiment of the invention for use in the window assembly thereof.

The hinge with members or brackets **11** and **12** shown in FIG. 1 is intended to be used on a sash to which member **11** is fixed and which may be lifted and lowered for a short distance with respect to another sash or a sash frame to which member or bracket **12** is attached.

Members **11** and **12** are connected by the hinge pin **10**, which is accommodated in corresponding sleeves **13, 14, 15, 16** and **17**, whereof sleeves **13, 15** and **17** are arranged on the member **11**, whereas sleeves **14, 16** are arranged on member **12**. Between the sleeves **13** and **14**, sleeves **14** and **15**, sleeves **15** and **16** and finally between sleeves **16** and **17** is permitted a free motion in the direction of the pin axis. These free motions are suitably all of the same magnitude.

In FIG. 2 are shown two sashes **21** and **22**. Also shown is a frame **18** which has abutments **19** for the inner sash **22** when the latter is swung about the special hinges **11, 12** into abutment with the sash **21** following which both of these sashes are swung to the left about the stop hinge **1, 2** into the frame opening **20**.

The sash **21** is attached pivotally to the left hand side of frame **18** by means of two stop hinges **1, 2**, whereof member **1** is on the frame and the other member **2** on the sash **21**. The second sash **22** in the same manner is attached pivotally to the frame **18** at the right by means of two stop hinges **1, 2** whereof member **1** is on the frame and member **2** on the sash.

In FIG. 2 only the sash **21** is shown as connected by its hinges to the frame. When the sash **22** is on its hinges on the frame **18**, it will be possible to clean the glasses of the sashes **21** and **22**. Then one sash, for instance sash **22**, is loosened from its hinges **1, 2** as permitted by the special hinges **11, 12** of the sash, the sliding of the sleeves **14** and **16** taking place along the pin **10** without the sash **21** being disconnected from its hinges **1, 2** (FIG. 4).

The sash **22** may be swung around the sash **21** and the glass of same may be cleaned on the opposite side. Then the sash **22** is replaced on its hinges **1, 2** at the right. Next, the sash **21** after having been coupled free from its pins **1, 2** is swung in a similar manner and its glass cleaned on the opposite side.

In order to facilitate the lifting of the sashes **21** and **22** up and down on their hinges **1, 2**, the mechanism shown in FIG. 3 may be used.

The lowermost portions **23** and **24**, most remote from the frame **18**, are hinged together at the bottom by the same type of hinge as that shown in FIG. 1.

The left hinge member is seen at **31** (FIG. 3) and the right hand member at **32**. Member **31** has side sleeves **25** and **26**, and member **32** has a side sleeve **27** for the hinge pin **28**. The same axial free motion is provided between members **31** and **32** as in the hinge shown in FIG. 1, viz. between elements **25** and **27**, and between elements **27** and **26**.

On one side of the frame portion **23**, however, preferably that which faces against the portion **24** of the sash **22**, a lever is arranged which may be swung up and down upon a pin **33** projecting out from the side of portion **23**. The exterior lever branch **30** is directed against the sash **22** and is connected pivotably with a small free motion by a fork **34** with a vertical pin **35**, which is accommodated in a small sleeve **36** projecting laterally from the hinge member **32**. The second lever branch **29** is directed inwards towards the frame **18** and has in its free end a handle **37**, which is on the underside of the portion **23** of the sash.

When both sashes **21, 22** are mounted on their hinges **1, 2** and the handle **37** is pressed down, the lever branch **30** will lift the sash **22** on its hinges **1, 2** and **11, 12**, so that this sash is disconnected from the frame **18** on the right and the glass may be cleaned on the exterior side.

However, if the handle **37**, which is arranged loosely upon the pin **33**, is moved with the lever branch **29** somewhat outwards to the right so that the handle is freed from the portion **23**, the handle **37** may be lifted, whereby the sash **21** is disconnected from its stop hinges **1, 2** on the left on the frame **18** and the glass may be cleaned on its exterior side. In this manner one avoids the risk that both sashes **21, 22** are simultaneously disconnected from their stop hinges **1, 2**.

The hole **38** in the lever **29, 30** for the pin **33** has the form of a horizontal slot **38** and the lever may be held fast in the middle position by being placed in engagement with a rest pin **39**.

The reference **40** in FIG. 2 denotes depressions on the inside of the frame **18**. These depressions serve to receive the hinge sleeves **6, 7** when the sashes are folded adjacent one another and pivoted about hinges **1** and **2** into the opening **20** of frame **18**.

FIG. 4 illustrates a hinge particularly suitable for use with the structure illustrated in FIG. 2 to provide for

detaching selectively the sashes **21** and **22** from the frame **18**.

In FIG. 4 are illustrated the brackets **1** and **2** which are made of a suitable material such as metal.

On the bracket **1** is provided a sleeve **3** having a central bore in which is accommodated a pin **4**, the pin having a spherical end surface to facilitate the insertion of the pin **4** in a sleeve as will be shown. Encircling the pin **4** is a conical elastic ring **9** the purpose of which will become hereinafter apparent.

Spaced axially from the sleeve **3** and mounted laterally on the bracket **1** is a hinge blade **5**. This hinge blade is provided with a groove axially aligned with the pin **4**, the groove being an open groove preferably occupying an extent of about 180°.

On the bracket **2** is mounted a sleeve **6** provided with a bore aligned with the bore provided in a sleeve **7** also mounted on the bracket **2**. A pin **8** is affixed in the sleeve **6** and extends in part into the bore of sleeve **7** to define a blind bore with said sleeve. The blind bore is provided with a conical mouth **10** which is adapted to accommodate the elastic ring **9** noted above.

The sleeves **6** and **7** are spaced by a distance which is greater than the width or axial extent of the hinge blade **5** on the bracket **1**. This permits a displacement between brackets **1** and **2** so as to facilitate an engagement of the pin **4** in the bore of the sleeve **7** in order to seat the ring **9** in the conical mouth **10**.

Preferably, when the brackets **1** and **2** are engaged with the ring **9** in the mouth **10** blade **5** is spaced from the sleeve **6**.

By use of the bracket illustrated in FIG. 4 a ready detachment and engagement of sashes **21** and **22** is permitted with respect to the frame **18** so that the structural and functional advantages noted above are achieved in accordance with the invention.

There will now be obvious to those skilled in the art many modifications and variations of the structures set forth above. These modifications and variations will not however depart from the scope of the invention if they come within the definition of the following claims.

What is claimed is:

1. A hinge comprising first and second brackets, axially aligned sleeves on one of said brackets, said sleeves being spaced by a determinable distance, a pin fixed in one of said sleeves and extending partially into the other of said sleeves to define with the latter a blind bore, a second pin mounted laterally of the other of said brackets for engaging in said blind bore, and a hinge blade having an open groove axially aligned with said second pin and selectively engageable with the first said pin, said open groove having a contour corresponding with the first said pin, said groove and blade having an axial extent which is smaller than said distance to permit displacement between said brackets.

2. A hinge as claimed in claim 1, wherein said blind bore is provided with a conical mouth, comprising a conical elastic ring encircling said second pin and adapted to be received in said mouth.

3. A hinge as claimed in claim 2 wherein, with said ring in said mouth, the said one sleeve on the said one bracket is spaced from said blade.

4. An outwardly opening window comprising a pair of sashes including glasses, hinge means permanently coupling together adjacent edges of said sashes, said hinge means defining a pivotal axis and enabling the sashes to be moved relative to one another axially along said pivotal axis, a hinge member attached to each of the sashes at their opposite edges, a sash frame, and corresponding hinge members on said frame detachably engageable with the first said hinge members, each of said sashes being releasable from said frame with said sash axially displaced along the pivotal axis.

5. A window as claimed in claim 4 wherein the hinge means comprises a bracket on each of said adjacent edges, said brackets including sleeve portions, in interdigitated relation, a pin engaging said sleeve portions, said sleeve portions being of narrow length axially to enable the brackets to be moved relative to each other in the axial direction.

6. A window as claimed in claim 5, comprising a pin on one sash, a horizontal double lever turntable on the latter said pin, said lever including an exterior branch pivotally connected with the other sash beneath their permanently connecting hinges whereby the exterior lever branch by a tilting of the lever upon its pin selectively lifts and lowers said other sash relatively to the first said sash.

7. A window as claimed in claim 6, wherein said lever comprises a branch directed towards the sash frame, and releasable means to stop the tilting of the lever.

8. A window as claimed in claim 7, wherein the releasable means is a pin attached to one of the sashes and penetrating through a hole provided in said lever.

References Cited in the file of this patent

UNITED STATES PATENTS

Re. 5,843	Hoadley	Apr. 24, 1874
969,926	Wightman	Sept. 13, 1910
1,775,681	Marino	Sept. 16, 1930
1,869,542	Chamberlain	Aug. 2, 1932
2,839,779	Haag	June 24, 1958

FOREIGN PATENTS

332,638	France	May 30, 1903
474,190	France	Nov. 7, 1914
193,855	Switzerland	Jan. 17, 1938