July 30, 1963 F. BANK 3,099,036

SWIVEL MOUNT FOR WINDOWS

Filed April 12, 1961

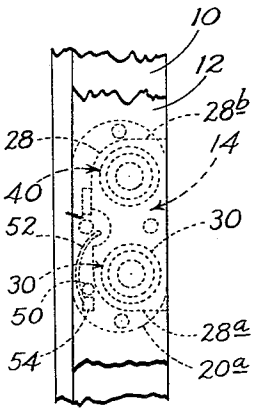


Fig. 1.

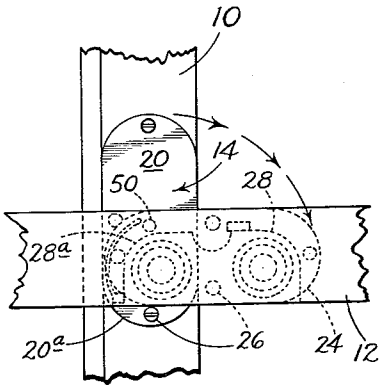


Fig. 2.

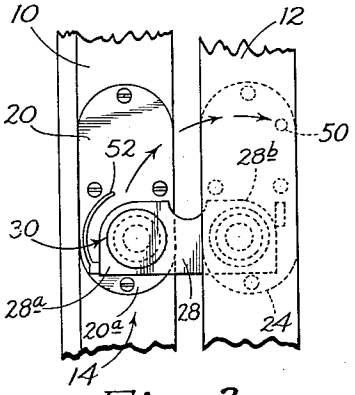


Fig. 3.

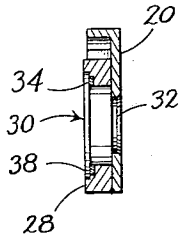


Fig. 5.

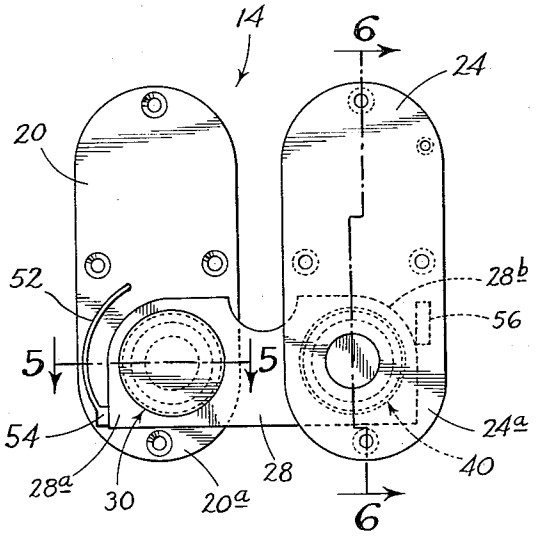


Fig. 4.

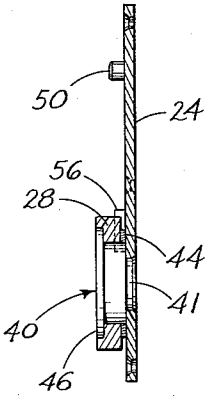


Fig. 6.

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United States Patent Office 3,099,036 Patented July 30, 1963

3,099,036

SWIVEL MOUNT FOR WINDOWS

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Filed Apr. 12, 1961, Ser. No. 102,529
2 Claims. (Cl. 16—163)

This invention relates to swivel or pivot mountings for windows, of the type that enable a window to be swung from a closed position about a 180° angle, to put the outside of the window in and the inside of the window out.

A general object of this invention is to provide an improved swivel mounting of this description, which is relatively compact, and features no unsightly protrusions projecting from the mounting when the mounting supports a window with the window closed.

More specifically it is an object of the invention to provide a swivel or pivot mounting for windows, which comprises an unfolding hinge, including one member which swings 90° when the window is swung half way about, and another member pivoted to this one that swings 90° on swinging of the window to a position 180° from its original, closed position. The hinge, with the window turned about, projects into a room thus to hold a window casement inwardly of the window frame, and with window closed the hinge folds up with nothing protruding from the window frame.

Another object of the invention is to provide a swivel mounting for windows, comprising an unfolding hinge of the type described that includes disconnectable guide means controlling pivotal movement of a plurality of pivoted members in the hinge whereby, during opening and swinging about of a window, various members in the hinge pivot in a predetermined sequence.

Yet another object of the invention is to provide a swivel mounting where spring-powered retarders are provided for braking free pivotal movement of hinge members in the swivel mounting, in all positions of the mounting.

A further object of the invention is to provide a mounting of the type described above which is easy to install and relatively simple in construction.

Yet another object is to provide a swivel mounting in the form of an unfolding hinge, which is relatively trouble free in operation, and where parts in the mounting in all positions of the mounting move in positively defined paths by reason of pivots and guide structure provided in the mounting.

These and other objects and advantages are attained by the invention, and the same is described below in conjunction with the accompanying drawings, wherein:

FIG. 1 illustrates portions of a window casement and window frame and an embodiment of the swivel mounting supporting the casement in the window frame, with the window in its closed position;

FIG. 2 is similar to FIG. 1 but shows the casement swung to a position 90° from the position in FIG. 1, and the swivel mechanism partially unfolded;

FIG. 3 is similar to FIGS. 1 and 2 but shows the casement swung to a position 180° from the position in FIG. 1, and the swivel mounting fully unfolded;

FIG. 4 is an enlarged illustration of the swivel mounting, showing it fully unfolded;

FIG. 5 is a section view, taken generally along the line 5—5 of FIG. 4; and

FIG. 6 is a section view, taken generally along the line 6—6 of FIG. 4.

Referring now to the drawings, in FIGS. 1, 2 and 3, **10** indicates portions of a standard window frame, and **12** portions of a hinged window sash, or casement, mounted in the usual manner within the confines of frame **10**. In FIG. 1 the window casement is in its ordinary, closed

position. The part of the casement to the left of the figure is the outside or exterior part of the casement, and at the right of the figure is the inside of the casement.

Mounting casement **12** within frame **10** is a swivel or pivot mounting **14**, which accommodates swinging of the casement from the closed position in FIG. 1, 90° to the open position in FIG. 2, and thence another 90° to the reversed position for the window illustrated in FIG. 3, where the normally outside of casement **12** is on the inside and the normally inside of the casement is on the outside.

Considering now more particularly the construction of pivot or swivel mounting **14** in the embodiment of the invention shown, the mounting comprises (with the window closed) an outer fitting or member **20**, in the form of an upright plate, which is secured to the inside of window frame **10**, and an inner fitting or member **24**, also in the form of an upright plate, which is secured to the outside of casement **12**. The outer and inner fittings are at the same elevation and have the same overall size and outline. Screws **26** are used in securing the fittings to the frame and casement. Between the inner and outer fittings is an elongated, upright, interconnecting link member or link **28**.

Link member **28** has an end **28***a* which overlaps the lower end **20***a* of the outer fitting in all positions of the member. End **28***a* is the lower end of the link, with the mounting in its folded positions as shown in FIG. 1. Interconnecting end **28***a* of the link and end **20***a* of the fitting, for relative pivotal movement of the member and link about an axis having a fixed position with respect to the member and link, is a pivot means **30**. In the form of the invention shown this comprises a bearing **32** joined to fitting **20** and journaled in link **28**.

When opening the window casement it is preferable that it remain stationary in various adjusted positions, and thus a spring-powered retarder is included inhibiting free pivotal movement between the link and outer fitting. The retarder is indicated at **34**, and takes the form of a spring washer which bears, on one side, on link **28**, and on the opposite side on a flange **38** of bearing **32**. The washer functions to press the link against fitting **20**, and the friction that results brakes the two members from swinging completely freely.

Link **28** has an end **28***b* that overlaps in all positions of the member an end **24***a* of the inner fitting. These two overlapping end portions are interconnected by a pivot means **40** spaced laterally on link **28** from pivot means **30**. The pivot axis of means **40** has a fixed position with respect to the link and fitting **24**. Pivot means **40** is similar to pivot means **30** already discussed. Thus, **41** indicates a bearing which is joined to the inner fitting and journaled in link **28**. A spring washer **44** (spring-powered retarder) is interposed between the inner fitting and link, and operates to press the link against a flange **46** of bearing **40**, with the resulting friction produced braking free pivotal movement. The pivot axis of pivot means **40** parallels the pivot axis of pivot means **30**.

With the window closed, the inner and outer fittings and link are all upright. As can be seen with reference to FIG. 2, first 90° movement of the window casement is accompanied with inward swinging of link 28 90°, about the pivot axis of pivot means **30**. With the link horizontal, as will be described, further movement of the link is prevented, and when the casement is swung further the casement and the inner fitting swing about the axis of pivot means **40**. When the window casement swings 90° from the position of FIG. 2, the casement is completely turned about.

Projecting outwardly of inner fitting **24** is a finger **50**. This finger, in the position of the parts shown in FIG. 1, occupies a position to one side of the pivot axis of

pivot means **30**. On swinging of the link and inner fitting between the positions of FIGS. 1 and 2, the finger moves in an arc extending about the pivot axis of pivot means **30**. Projecting inwardly from the outer fitting, and outside of the arc that the finger moves in, is an arcuate guide **52**. The guide confines the finger on the parts pivoting between the positions of FIGS. 1 and 2, prevent the inner fitting from swinging with respect to the link until the link is horizontal. The finger and guide constitute disconnectable guide means assuring proper sequence of movements in the parts.

There is also provided, at the base of arcuate guide **52**, a stop **54** projecting inwardly from outer fitting **20**. When finger **50** reaches the position shown in FIG. 1, further movement of the link and inner fitting in a counterclockwise direction in FIG. 1 is prevented, through the finger striking the stop. Thus, the top of the window casement cannot swing outwardly from an upright position. Link **28** also engages stop **54** when the link is in the horizontal position of FIG. 2, to prevent further movement of the link in a clockwise direction from this position.

Integral with the inner fitting and projecting outwardly therefrom is an abutment or stop **56**. In the position of the window casement shown in FIG. 3, the stop engages an edge of link **28** to prevent further rotation of the casement in a clockwise direction. In the position of the casement shown in FIG. 2, the stop engages another edge of link **28** (extending normally of the first-mentioned edge) to prevent further rotation of the casement relative to the link in a counterclockwise direction. The stop thus limits pivotal movement of the casement and inner fitting relative to the link to movement over about a 90° angle.

It will be seen, therefore, that an unfolding hinge has been provided which, when the window casement is closed, is completely folded and devoid of any projections that could catch clothing, or produce an unsightly effect. On initial 90° swinging of the window casement, the hinge provides for pivotal movement about an axis extending through the window frame, as is the case in the usual window swivel. After reaching the horizontal position shown in FIG. 2, the window casement now pivots about the pivot axis provided by pivot means **40**, which is now inwardly of the axis about which initial movement occurred, enabling the window casement on swinging properly to clear the window frame. In all positions, free pivotal movement is braked by the spring washers discussed.

I claim:

1. The combination of an outer window frame, a casement mounted therein, swivel means on either side of the casement mounting it in said frame and accommodating opening of the casement by swinging it about a horizontal axis through a 180° angle, said swivel means comprising, with the casement in a closed position, an upright outer plate secured to the outside of the window casement, an upright inner plate secured to the inside of the window frame at approximately the level of the outer plate, an upright link interposed between the inner and outer plates and substantially aligned therewith, first pivot means connecting the lower end of the link and the outer plate accomodating swinging of the upper end of the link in the direction of the inside of the window frame and through about a 90° angle to a horizontal position, stop means between the outer plate and link limiting swinging of the link beyond this horizontal position, second pivot means connecting the upper end of the link and the upper end of the inner plate accommodating swinging of the inner plate about the pivot axis for the second pivot means with the plate swinging in the same direction that the link is swingable about the pivot axis of the first pivot means, and stop means between the inner plate and the link limiting swinging of the inner plate relative to the link beyond a position where it is approximately at right angles to the link, said outer plate having an arcuate guide projecting toward the inner plate that curves about the pivot axis of the first pivot means, and said inner plate having a finger projecting toward the outer plate confined by the guide so as to prevent swinging of the inner plate relative to the link during movement of the link between its vertical and horizontal positions.

2. In a swivel structure for hinging the central portion of an edge of a window casement to the corresponding portion of an outer window frame to mount the casement for 180° rotation relative to the frame, an outer plate adapted to be secured to the inner edge of such an outer window frame, an inner plate adapted to be secured to the outer edge of such a window casement, a rigid strap-like link, means connecting one end of said link pivotally to said outer plate to mount said link on one side of said outer plate, means connecting the other end of said link pivotally to said inner plate to mount said inner plate on the side of said link opposite to the side of said link adjacent to said outer plate so that said link lies between said plates, first stop means limiting pivotal movement of said link and said outer plate through a first range of substantially 90°, second stop means limiting pivotal movement between said link and said inner plate through a second range of substantially 90°, and means for preventing pivotal movement between said link and said inner plate except when said link is in a position relative to said outer plate at one end of said first range, said link being of such a width and so connected to said plates and said plates being adapted to be so fastened to the window frame and casement that said link lies wholly with the projected area of the casement when the casement is in a closed position relative to the frame.

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