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L. BUCHENBERGER ET AL.
 DEVICE FOR MOUNTING AIR CONDITIONING
 UNIT IN A CASEMENT WINDOW
 Filed Oct. 29, 1954

2,862,435

FIG. 3

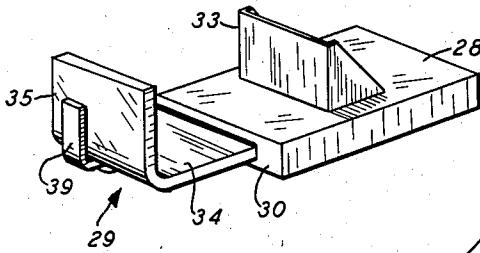


FIG. 1

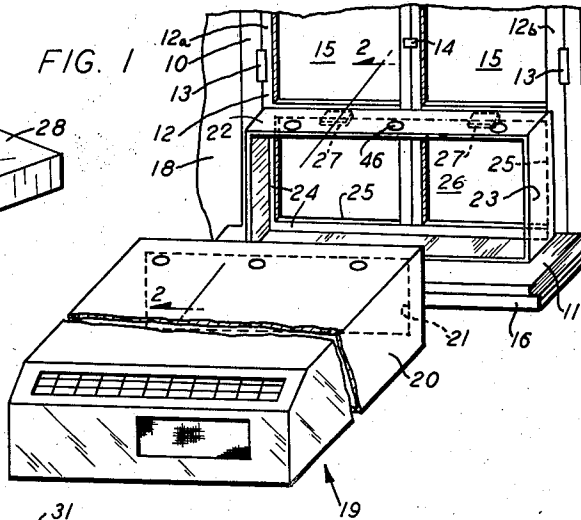


FIG. 4

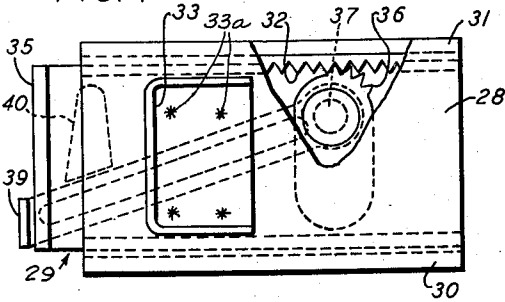


FIG. 6

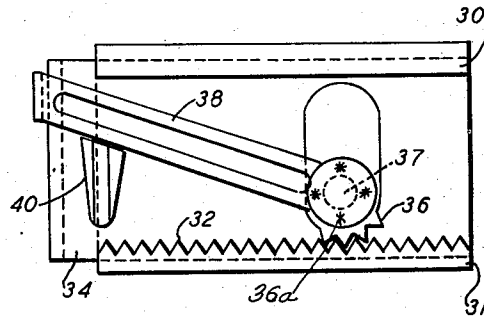


FIG. 5

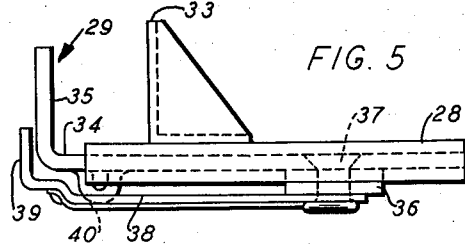
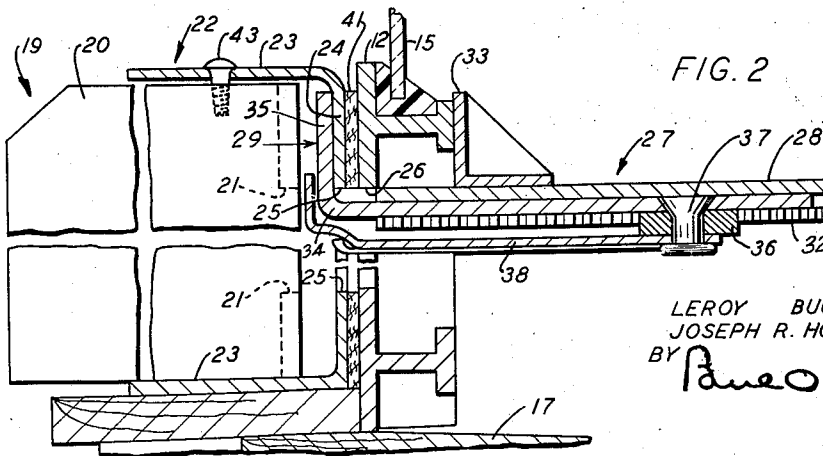


FIG. 2



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DEVICE FOR MOUNTING AIR CONDITIONING UNIT IN A CASEMENT WINDOW

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Application October 29, 1954, Serial No. 465,625

3 Claims. (Cl. 98—94)

This invention relates to air conditioning apparatus but more specifically it is concerned with a mounting structure for supporting a window-mounted type of air conditioning unit in a casement style window.

It is a principal object of the present invention to provide an improved and simplified arrangement for supporting a window-type air conditioning unit in a casement type of window.

Another object is to provide an inexpensive, rugged and readily removable means for supporting an air conditioner in a casement window.

A further object is to provide an adapter frame and an adjustable clamp device that cooperates therewith to provide casement window support means for an air conditioning unit.

A still further object is to provide an adapter frame which is positionable on a stool of a casement-type window structure and which is cooperative with the sash of said window for supporting an air conditioning unit therein.

A yet still further object is to provide a means for supporting an air conditioning unit in a casement-type window which is readily installable and removable without deforming or marring any of the window structure.

Another important object is to provide an adjustable clamping device which may be locked in a plurality of positions and which is adapted for securing an air conditioning unit adapter frame to a window sash frame.

A further important object is to provide a mounting structure for an air conditioning unit which permits a window-type unit to be mounted so that no part of the unit extends outside of or beyond the window sash frame.

Further objects and advantages of the invention will be apparent from the full description, reference being had to the accompanying drawings wherein a preferred form of the present invention is clearly shown.

Fig. 1 is a perspective view showing a casement window structure into which the proposed air conditioner adapter frame and clamp assembly have been mounted.

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1 but shown with the air conditioner unit in place.

Fig. 3 is a perspective view of the proposed clamping device.

Fig. 4 is a top plan view of the clamping device shown in Fig. 3.

Fig. 5 is a side elevational view of the clamping device of Fig. 3.

Fig. 6 is a bottom view of the clamping device and shows clearly the gear rack along one edge portion thereof.

Referring now to the drawings, it will be noted that the preferred embodiment selected for illustrating an application of the present invention shows a window structure which includes a frame 10, a stool 11, and a casement type of sash 12 pivotally mounted on hinges 13 and operable by means of a handle and latching device 14 and glazed throughout with conventional window glass

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15. The sash 12, as illustrated, is the well known casement type generally provided with a left-hand opening portion 12a and a right-hand opening portion 12b which meet at the center of the sash. The window structure generally includes also a trim member 16 located beneath the stool 11, and a sill 17 which extends outwardly from a wall 18 of the space to be air conditioned.

The air conditioning unit, which is shown generally by the reference numeral 19, may be enclosed by a single casing or housing 20, and, preferably, is the type that is provided with a rear wall opening 21 therein for air flow communication with the outside atmosphere. Such unit, additionally, is usually provided with a baffle (not shown) substantially in the center of said rear wall opening so that air from the outside may enter through one portion of said rear wall opening and exit through another portion thereof after having passed over the condenser and associated equipment in conventional fashion. Since air conditioning units of this general type are so well known, and since many such units are available on the commercial markets, it is believed further descriptive detailing of the construction of the unit is unnecessary to a proper understanding of the proposed invention.

In accordance with the specific teachings of the present invention there is provided a bonnet or canopy-like adapter frame member 22 which is shaped and dimensioned to snugly receive the end portion of the unit's casing 20 which generally encases the condenser portion of the cooling apparatus therewithin. The adapter frame as proposed herein may be formed with a peripherally extending flat outer rim member 23 fashioned to resemble a rectangle and having an inwardly directed continuously extending flange member 24, the marginal edge of which delimits an opening 25 formed thereby. Said opening 25, preferably, corresponds and registers generally with the overall area of the combined openings 26, resulting from the removal of a pane of glass from each of the adjoining sash frame portions 12a and 12b of the sash 12, and also with the opening 21 in the rear wall of the unit's casing 20. It will be appreciated, of course, that the opening 25 generally should be dimensioned so as to provide a suitable sized attaching and reinforcing flange 24 without at the same time making it too large as to be unduly restricting or otherwise interfering with the flow of air from and to the outside atmosphere.

An adjustable clamping device for fixedly and securely holding the adapter frame 22 against the sash frame 12, and in a registering position with respect to the adjoining openings 26 in said sash, is indicated generally by the reference numeral 27. The clamp, as illustrated, includes a stationary keeper or jaw-like body portion 28 and an adjustable jaw-like member 29 adapted for slidable positioning therewithin. The body portion 28 as fashioned resembles a C-shape in cross-section with a relatively flat upper surface and having opposed inwardly turned depending flange members 30, 31 that are spaced and dimensioned to provide a channel-like groove or track into which the movable jaw-like member 29 is snugly but not tightly slidable. Along the edge of the inwardly turned flange member 31 and facing the flange 30 there is provided a toothed gear rack 32. Secured to and projecting upwardly from the upper surface of the stationary member or body 28 there is an abutment or stop 33 which, preferably, is spaced inwardly from a forward edge thereof to provide a jaw-like member resembling the fixed jaw of a vise. It will be understood, of course, that such stop or jaw member may be fashioned integral with the body 28 or it may be separately formed and fixedly secured thereto by suitable conventional means, such as spot welding 33a.

The slide member 29, which may be said to resemble

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the movable jaw of a vise, is fashioned in the shape of a deformed L with a long horizontal arm 34 and a somewhat shorter arm 35 extending vertically therefrom and having the arm 34 dimensioned to slide easily in the track or channel of the non-slidable body portion 28. A pinion sector gear 36 is rotatably mounted on a stud or pin 37 which, in turn, is affixed to or anchored in the slidable member 29 in any suitable or conventional manner and is disposed proximate the free end of the long arm 34 thereof. Affixed to the pinion gear 36 by spot welding 36a or other conventional means and adapted for rotation therewith is an actuating lever or handle-like arm 38 which may be fashioned with a turned-up end portion 39 to facilitate manual rotative operation thereof.

The pinion gear 36, as shown in Figures 4 and 6, is fashioned as an elliptically-shaped member in which gear teeth have been provided only in a limited portion of the periphery thereof in order to be able to affect disengagement of the pinion gear and the rack and thus permit the sliding member 29 to slide freely within the fixed body member 28 at times when adjustment is required. Since the rotational displacement of the actuating arm or lever 38 is limited or restricted, when the clamp is in place in a window structure, by contact with the adapter frame 22, plus the additional fact that the pinion gear must be disengaged at times from said gear rack to permit free sliding of one member within the other, it will be appreciated that only a limited portion of the pinion gear need be provided with teeth for engaging said toothed rack.

A ramp-like ridge or rib is provided to function as a stop or a locking abutment 40 for the lever arm 38 and for thus maintaining said pinion gear and rack locked in any one of a multitude of different positions. While the lever 38 is being rotated counterclockwise, to the position of Fig. 4, the resiliency of said arm permits it to yield and ride the ramp to the end whereupon the resiliency thereof causes the arm to drop behind the vertical face of said stop and to prevent movement of the rack and pinion gear in the reverse direction. These gears, in effect, are thus locked in position.

In utilizing the present invention the adapter frame 22 is positioned over the openings 26, formed when a glazed window pane is removed from each of the two adjoining sash frame portions 12a and 12b of a casement window structure, and a strip-like sealing gasket 41, of suitable resilient material such as sponge rubber or the like, is interposed between adjoining surfaces of said adapter frame and said sash frame portions to minimize leakage of air to and from the outside atmosphere and deaden noise transmission therethrough. With the frame thus located, the clamping device 27 is then adjusted so that the jaw-like portions thereof are spaced to grip the adapter frame and sash frame. By turning the lever 38 and gear 36 clockwise, as viewed in Figure 4, the meshing teeth on said gear and said rack are disengaged and the member 29 becomes freely slidable with the member 28. Now the abutment or stop 33, on the stationary or keeper portion 28 thereof, may be pressed tightly against the exterior surface of the window sash 12, while the vertical arm 35, of the slide member 29, is slidably adjusted to press tightly against the inner surface of the flange portion 24 of said adapter frame. When thus firmly positioned the actuating lever or arm 38, which has heretofore been in its open position, is then rotated counterclockwise, to the position of Figure 4, so as to cause the pinion gear 36 to rotate and thereby bring the teeth of the pinion gear 36 into meshing engagement with the teeth of the rack 32. As the teeth of pinion gear 36 engage the toothed rack 32 the gear will tend to ride along the rack because the stop 33 is fixedly positioned while the member 29 is slidable therewithin. When this happens the jaw-like arm 35 and the jaw-like stop 33 are pressed or squeezed closer

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together in a vise-like or gripping action thus forcing the adapted frame 22, sealing gasket 41 and sash frame 12 into a tightly clamped relationship. When the handle or lever arm 38 starts to rotate counterclockwise from its open or teeth disengaged position it contacts the ramp-like portion of the stop or locking member 40, and the resiliency of such arm permits it to yield axially as it rides up this ramp. Upon reaching the top thereof it then drops in behind the end of the stop and thereafter engages the vertical surface of said stop to retain said pinion gear and rack meshed in a locked position. In order to release this locked relationship the lever arm 38 must manually be forced over the stop 40 and back down the ramp as it is rotated clockwise, to the position of Figure 4.

With the clamping device 27 locked in position the adapter frame 22 is fixedly secured and is ready to receive the air conditioning unit 19 and its enclosing casing 20 therewithin. Openings 46 in the adapter frame 22 may be provided for accommodating suitable securing means, such as the screws 43, which, in turn, may be threadably received in the casing 20 for maintaining or holding said unit fixedly positioned within said adapter frame. Although two clamping devices, one for each of the sash portions 12a and 12b, and three securing screws have been shown as being employed in the illustrated embodiment it will be appreciated that deviations from this number may be made and still be within the concepts of the present invention.

From the foregoing it should now be apparent that a novel and improved mounting means has been shown and described for use in mounting an air conditioning unit in a casement window structure. It will be appreciated also that the proposed device is simple and inexpensive to fabricate and that it may be used without deforming or otherwise marring the window structure and yet permit the unit to be mounted entirely within the space being cooled. It should be understood, of course, that changes may be made in the construction shown herein without departing from the spirit of the invention or the scope thereof as defined in the appended claims.

What is claimed is:

1. A mounting structure for supporting an air conditioning unit having an opening in one wall thereof in a window frame structure having a sash portion from which panes of glass have been removed to provide openings for air communication between the unit's wall opening and the outside atmosphere, comprising: an adapter frame having a inwardly directed continuously extending flange whose marginal edge delimits an opening that substantially coincides and registers with the overall area of the openings in the window sash when said adapter is positioned in close association therewith; a sealing gasket interposed between proximate surfaces of said adapter frame and the window sash; a channeled member having an abutment projecting from an upper surface thereof adapted for positioning against an outer surface of the window sash; said channeled member having a gear rack fashioned along one side if the channel thereof; an angle member slidably positionable within said channeled member and adapted for positioning against an inner surface of said adapter frame flange; a gear member rotatively affixed to said angle member and disposed so as to engage the gear rack of said channeled member, and effective for urging said channeled member and said angle member toward each other upon rotation of the gear in one direction and away from each other upon rotation of the gear in the other direction; and removable means for maintaining an air conditioning unit fixedly positioned within said adapter frame.

2. A clamping device for fixedly positioning an air conditioning unit adapter frame mounting in a window frame structure, comprising: a channeled member having

an abutment thereon adapted for positioning against the outer surface of a window sash frame; said channeled member having gear teeth formed on one side of the channel thereof; an angularly-shaped member slidably positionable within said channeled member and adapted for positioning against the inner surface of an adapter frame disposed in close proximity to a window sash frame; a toothed gear member rotatively secured to said angularly-shaped member and disposed so that when rotated in one direction the teeth thereon engage the gear teeth of said channeled member and urge said angularly-shaped and channeled members toward one another, and away from one another when rotated in another direction; an actuating lever affixed to said toothed gear member; and stop means on said angularly-shaped member and disposed so as to engage said actuating lever in a locking relation for fixedly positioning said channeled member with respect to said angularly-shaped member.

3. A tightening and securing clamp for holding an air conditioning unit against the frame of a window opening comprising, a member provided with a body having a fixed jaw for engaging one side of the window frame and having a movable jaw for engaging the other side of the movable frame, a rack and pinion connection carried by said body for actuating said jaws relative to each other and for drawing the air conditioning

unit against the window opening frame, said pinion comprising a partial gear having its teeth ending at a portion of the pinion which permits free sliding movement between said jaws to make a rough adjustment between the jaws, and an actuating member for said pinion adapted thereafter to bring the teeth of the pinion into engagement with the rack and to move the pinion far enough to move the air conditioning unit tightly against the window frame, said actuating member being adapted to engage a stop shoulder in the holding position, said stop shoulder being carried by said body, and comprising a beveled member resiliently engaged by the actuating member during the tightening action, and engaged by said actuating member at said stop shoulder in the holding position.

References Cited in the file of this patent

UNITED STATES PATENTS

63,468	Card	Apr. 2, 1867
529,765	Weyhe	Nov. 27, 1894
854,091	Hilberg	May 21, 1907
1,760,346	Correa	May 27, 1930
2,294,664	Hubbard	Sept. 1, 1942
2,322,904	Williams	June 29, 1943
2,448,671	Hord	Sept. 7, 1948
2,667,765	Harris et al.	Feb. 2, 1954
2,717,508	Loveley et al.	Sept. 13, 1955