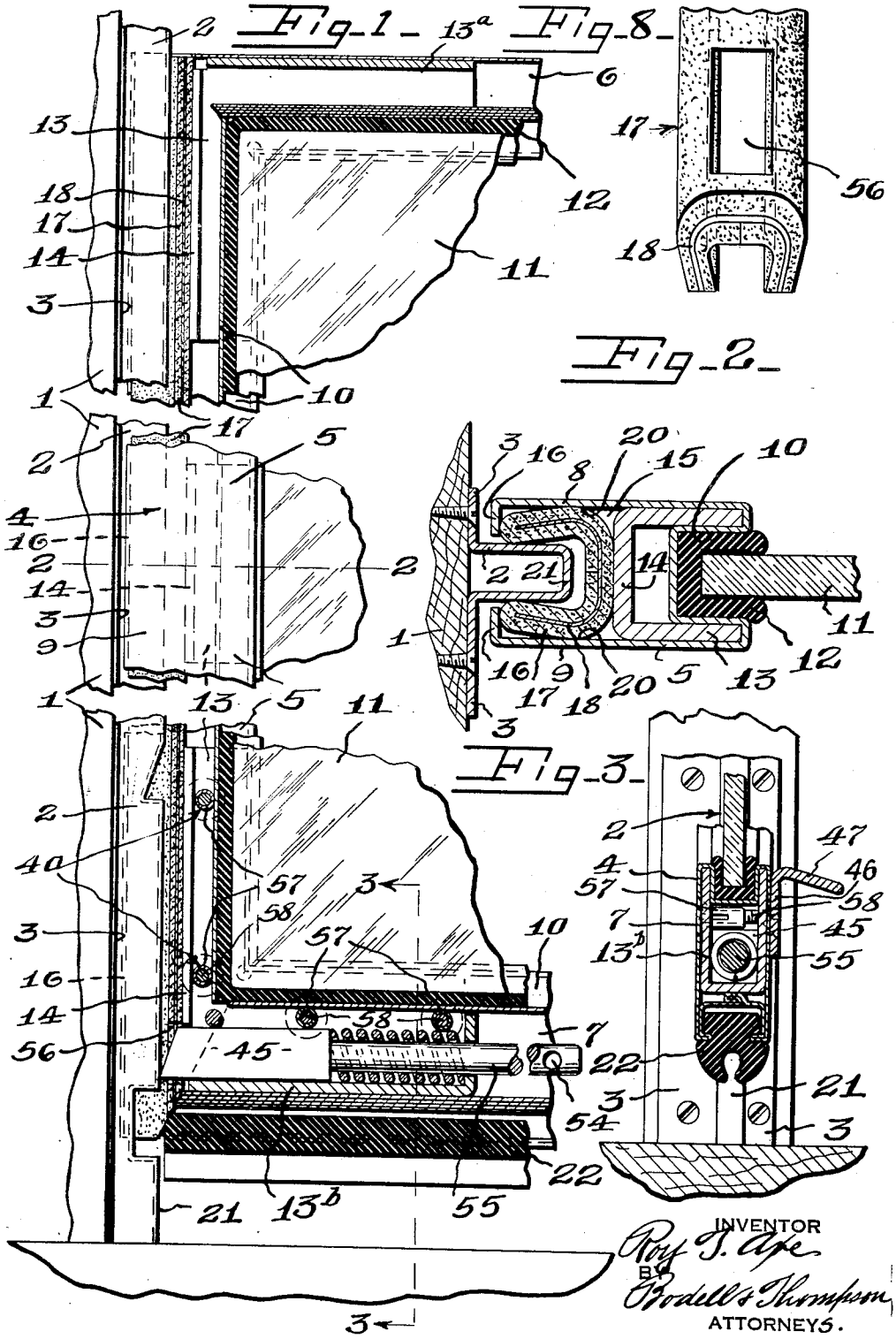
Aug. 8, 1933. R. T. AXE 1,922,009

WINDOW AND SASH CONSTRUCTION

Filed April 10, 1931 2 Sheets-Sheet 1



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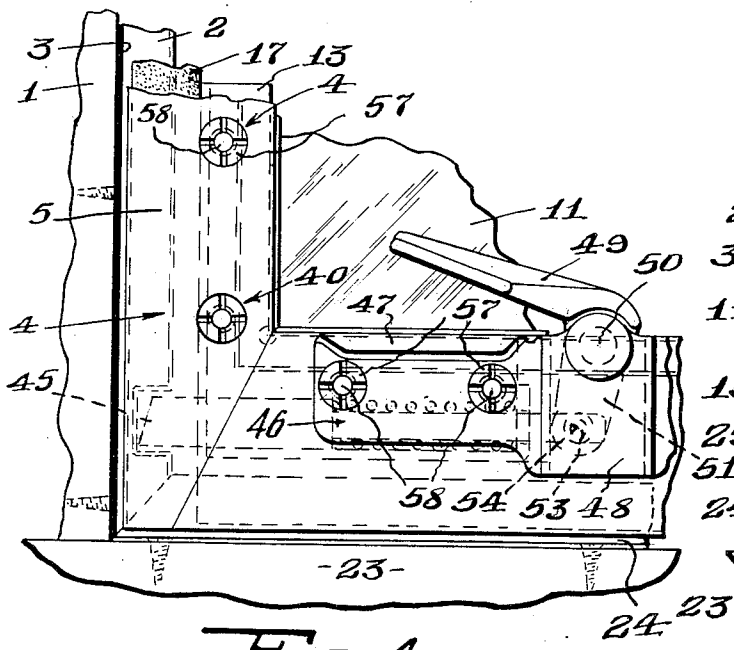

Fig-4-

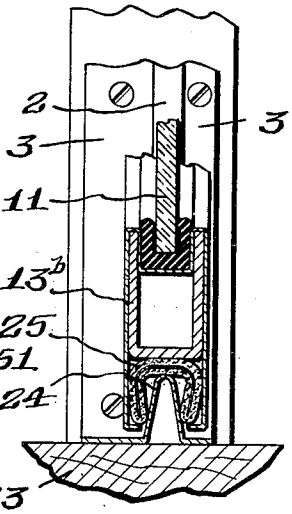

Fig-5-

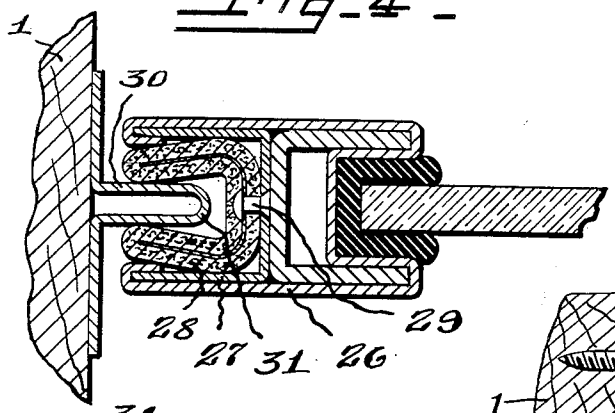

Fig-6-

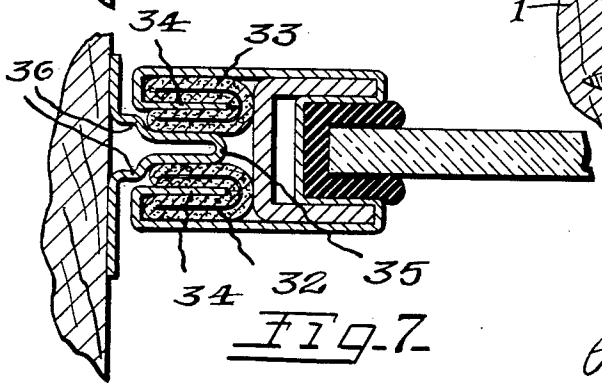

Fig-7-

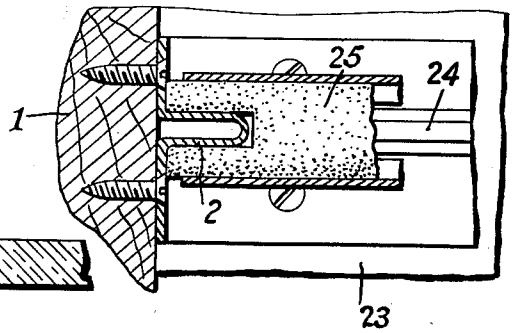

Fig-9-

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BY Bodell & Thompson

ATTORNEYS.

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UNITED STATES PATENT OFFICE

1,922,009

WINDOW AND SASH CONSTRUCTION

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Application April 10, 1931. Serial No. 529,081

7 Claims. (Cl. 189—72)

This invention relates to window frame and sash constructions, and particularly to a frame and sash construction for motor vehicles as busses and the like, and has for its object a particularly simple, efficient and compact weather stripping means formed in part of yielding, non-metallic, or fibrous material, as felt, which weather stripping means is housed entirely within the sash so as to be protected at all times against water and weather conditions tending to expand and contract and to cause deterioration thereof. Other objects appear throughout the specification.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings, in which like characters designate corresponding parts in all the views.

Figure 1 is an enlarged fragmentary vertical sectional view of a window frame and sash embodying this invention.

Figures 2 and 3 are respectively sectional views taken on lines 2—2, 3—3, Figure 1.

Figure 4 is a fragmentary elevation of a sash provided with this invention showing a modified form of weather stripping along the bottom rail from that shown in Figures 1 and 3.

Figure 5 is a sectional view taken vertically through the bottom rail of Figure 4.

Figures 6 and 7 are enlarged sectional views similar to Figure 2 of modified forms of this invention.

Figure 8 is an enlarged fragmentary elevation of the lower end portion of the fibrous insert.

Figure 9 is a detail view illustrating the joint between the inserts in the stiles of the sash and the insert in the bottom rail showing the formation of a channel in the insert in the bottom rail for the guide rib.

This invention comprises generally a sash having one or more of its members provided with a channel opening through the edge thereof for receiving a projecting rib or ribs on a window frame and an insert housed entirely within each channel of the sash and coacting with the adjacent rib, this insert being of fibrous material, as felt, or including a fibrous layer and means for tensioning the fiber to cause it to press against opposite sides of the rib, this means being preferably self-contained with the fibrous layer. The fibrous layer is usually felt, but it will be understood that the term "fibrous" is used in its generic sense as including any non-metallic yielding material in order to avoid a metal to metal contact.

Heretofore and particularly in motor cars, a sashless window pane movable vertically in guides in the window frame has been used, these guides containing a lining of fibrous material or left and when the window is opened, the linings are subject to water, dust and weather conditions, which cause them to swell or to dry or contract, or to deteriorate, and either to fit too tightly, causing binding, or too loosely, causing rattling.

By my invention, a window sash is used and the fibrous lining inserted or housed in channels formed in the sash members so that the lining or insert is housed at all times.

1 designates a window frame having a projecting rib 2 usually bent up of sheet metal with base flanges 3 overlying and secured to the frame, these ribs being located along the upright members of the frame and in some instances along the bottom member or sill. The most important function, however, of the ribs is to serve as guides along which the sash slides, when being raised or lowered. A secondary function is forming a tight joint along the bottom rail, when the window is closed.

4 designates generally the sash, this including the usual stiles as 5 and upper and lower bottom rails 6 and 7. Preferably the sash members are formed up of sheet metal to have front and rear opposing walls 8, 9 and a re-entrant groove 10 for receiving the margin of the glass pane 11, this margin usually seating in a marginal channel member 12 of rubber, seated in the re-entrant groove 10. The sash members 5 are provided at the corners and at intermediate points with metal re-inforcing inserts 13, which are U-shaped in general form with the arms of the U formation extending into the spaces on opposite sides of the re-entrant groove 10. The intermediate parts 14 of these inserts 13 form bottom sections of a channel 15, which opens through the edge of the sash member. Preferably, this channel is formed with a contracted entrance provided by inturned flanges 16 at the outer end of the walls 8, 9, these flanges providing internal shoulders for a purpose to be presently described.

17 designates the insert in the channel 15 coacting with opposite sides of the rib 2, this being principally composed of a layer or layers of fibrous material as felt and provided with a resilient backing of metal, which tends to press the fibrous layer or layers against opposite sides of the rib 2. As shown in the drawings, this insert 17 is provided with a U-shaped resilient strip 18 embedded

therein, and this is tensioned to press the opposite arms of the U formation against opposite sides of the rib 2.

In the form shown in Figures 1 and 2, the insert is sprung into the channel 15 with the ends of the arms of the U formation coacting with the shoulders 16 and the intermediate part of the U formation thrusting against the bottom of the channel 15, or against the intermediate parts of the metal inserts 13. The portions of the arms of the U formation where they approach the bottom engage the sides 8 and 9, as at 20.

The rib 2 is provided with an abutment surface 21 for holding the edge of the sash or the inturned flanges 16 off the frame or the base flanges 3 of the rib 2, that is out of running or sliding metal to metal contact with the frame or base flanges 3. This abutment surface 21 is preferably located at the end of the rib and coacts with the intermediate part of the U-shaped formation of the insert 17. Usually the bottom rail of the sash is provided with a rubber weather strip 22 as shown in Figure 3, and the bottom rail, when provided with the weather strip 22 is formed slightly different from the stiles 5.

The formation of the sash of sheet metal, per se forms no part of this invention.

As seen in Figures 4 and 5, the sill 23 is formed with a projecting rib 24 and the bottom rail formed with a channel and insert 25 similar to the insert 17, and also the rib 24 is tapered or wedge shaped instead of being rectangular, as shown in Figure 2, for the purpose of guiding the channel in the bottom rail onto the guide rib and spreading the insert 25.

In Figure 5, the end of the rib is shown as abutting against the intermediate part of the U formation of the insert 25.

In the form shown in Figure 6, the sheet metal sash frame member 26 is provided with a sheet metal channel shaped insert 27, and the weather strip insert 28 is mounted therein and secured to the insert 27 by suitable means as rivets 29. In this form shown in Figure 6, the entrance of the channel is not contracted and the edges of the insert are exposed at the entrance of the channel. Also, the edge of the rib 30 is formed rounding at 31 instead of square as at 21.

In Figure 7, the insert is composed of two sections 32, 33, these being arranged astride a flange 34 on the walls of the sash member, which flanges are opposed to and parallel to the front and the rear wall of the sash member. The rib 35 is shown as provided with shoulders 36 near the base thereof for thrusting against the edges of the weather strip sections to hold the sash members off the window frame or the base flanges of the rib and also to hold the sash from undue lateral movement. In any form of this invention a weather strip insert including fibrous material and a spring backing is housed entirely within the sash member and coacts with a window guide or rib to render the sash weather tight and antirattling and to hold the sash from undue lateral movement, and out of metal to metal contact with the frame.

The inserts 13 at the upper and lower ends of the stiles are arms of a corner iron insert, the other arms 13^a, 13^b of which extend into the top or bottom rail.

The weather strips or inserts 17 are insertable in and removable from the channels by an endwise sliding movement and are insertable and removable when one of the sash members, as the top rail, or the bottom rail, usually the bottom rail, is removed. In sashes of this type, one of the sash members, usually the bottom rail, is removable for the purpose of replacing a broken glass. The bottom rail is removable by first removing the fastening members or screws 40 which pass transversely through the stiles 5, and through the portions of the inserts 13 in the stiles, so that the bottom rail with the corner irons can be pulled outwardly and separated from the stiles. When so separated, the inserts 17 in the stiles 5 can be removed and replaced by an endwise movement.

Also, in the form shown in Figure 6, the channels 27, which carry the inserts 28, can be moved and replaced in a similar manner. If an insert is used in the bottom rail, it can be removed and replaced by an endwise movement when the bottom rail is separated. If an insert is used in the top rail, the top rail is removable the same as the bottom rail, in order to remove and replace the insert therein. As the inserts in the stiles move vertically with the sash along the guide rib 2, the insert 25, if used in the bottom rail, can not extend across the lower end of the strips or inserts in the stiles, nor the inserts in the stiles extend across the ends of the insert 25 in the bottom rail, unless the insert that extends across the end of the other is split or provided with a passage. If the inserts in the stiles extend across the ends of the insert in the bottom rail, said inserts in the stiles would be provided with a passage alined with the passage of the insert in the the bottom rail. Likewise, if the insert in the bottom rail extended across the lower end of the inserts in the stiles, said insert in the bottom rail would be split or provided with a passage for the guide or rib 2 as seen in Figure 9.

When a rubber buffer strip 22 is used in the bottom rail, it and the fibrous inserts 17 in the stiles are beveled at their ends to conform to the miter joint between the stiles and the bottom rail (Figure 1).

Sashes are usually provided with latches at the lower corners thereof, and these are carried by the bottom rail in order to be readily removable therewith.

45 designates a latch or bolt located internally of the sash and extending within the bottom rail.

46 designates a plate mounted on the outside of the inner wall of the bottom rail and formed with a lift flange 47, this plate being provided with an offset portion 48.

49 is an angle lever pivoted at 50 at its angle to the plate 46 and having one arm 51 located in the offset portion 48 and the other arm extending in juxtaposition to the lift flange to act as a finger piece or as a pinch handle. The arm 51 located in the offset portion has a pin 53 at its end extending through a slot in the wall of the bottom rail and the pin coacts with a passage 54 in the shank or rod part 55 of the bolt 45.

As before stated, the bolt slides in an enlarged portion 13^b of the corner iron located in the bottom rail and is spring pressed outwardly by a spring encircling a stem 55 of the bolt, the spring being located between the inner end of the bolt and the end wall of the part 13^b, which houses the bolt. The bolt extends through an opening 56 provided in the lower end portion of the insert 17 and coacts with notches in the ribs 2. The arm 13^b of the insert and the plate 46 are secured to the bottom rail by fastening members or screws similar to the screws 40. These fastening members are preferably composed of two sections, one being a sleeve screw 57 and the

other a stud screw 58 threading into the sleeve screw.

During the operation of the pinch handle lever 49, obviously, the bolt will be withdrawn and by removing the fastening members 40 and withdrawing the bolt 45 so that its end clears the opening in the weather strip insert 17, the bottom rail can be removed and also the weather strip insert 17 removed and replaced by an endwise movement.

What I claim is:

1. In a window construction, the combination of a window frame having inwardly projecting guide ribs, of a sash having each of its stiles formed with a lengthwise channel opening through its outer edge at the side edge of the sash, the channel receiving one of the ribs, an insert housed in the channel and engaging opposite sides of the rib, a latch including a member housed within the bottom rail member of the sash and movable transversely of the adjacent channel into and out of engagement with the adjacent rib, the adjacent insert being provided with an opening through which the latch member extends, the latch member being retractable out of said opening for permitting the removal and replacement of the insert, the bottom rail being removable carrying the latch mechanism therewith for permitting the removal and replacement of the inserts by an endwise movement of the inserts out of and into the channel.

2. In a window construction, the combination with a window frame having an inwardly projecting guide rib, of a sash having a member formed with a channel extending lengthwise thereof and opening through the edge of the sash member, the channel receiving the rib, and an insert housed in the channel and movable with the sash, the insert being of a yielding non-metallic material and engaging opposite side faces of the rib, said rib and the insert having engaging surfaces at an angle to the side faces of the rib and extending lengthwise thereof, and coacting to limit the widthwise shifting of the sash and hold the sash from running engagement with the frame at the base of said rib.

3. In a window construction, the combination with a window frame having an inwardly projecting guide rib, of a sash having a member formed with a channel extending lengthwise thereof and opening through the edge of the sash, the channel receiving the rib, the channel also having inwardly extending flanges at its open side extending toward opposite sides of the rib and forming a contracted entrance for the rib, and an insert housed in the channel and movable with the sash, the insert being of yielding non-metallic material and having portions engaging opposite sides of the rib having its edge portion located behind said inwardly extending flanges and shielded thereby, the portions of the insert behind the rib being of greater thickness than the width of the flanges, whereby said portions hold the edges of the flanges out of contact with the rib.

4. In a window construction, the combination with a window frame having an inwardly projecting guide rib, of a sash having a member formed with a channel extending lengthwise thereof and opening through the edge of the sash, the channel receiving the rib, the channel also having inwardly extending flanges at its open side forming a contracted entrance for the rib, and an insert housed in the channel and movable with the sash, the insert being of yielding non-metallic material and engaging opposite sides of the rib and having portions located behind said inwardly extending flanges and shielded at its edges thereby, said rib and the insert having engaging surfaces at an angle to the side faces of the rib and extending lengthwise thereof and coacting to limit the widthwise shifting of the sash and hold said flanges out of running engagement with the frame at the base of the rib.

5. In a window construction, the combination with a window frame having an inwardly projecting guide rib, of a sash having a member formed with a channel extending lengthwise thereof and opening through the edge of the sash member, the channel receiving the rib, and a U shaped insert housed in the channel and movable with the sash, the insert being of a yielding non-metallic material and having the branch portions of the U formation engaging opposite sides of the rib, and its intermediate portion located at the bottom of the channel, said rib having an engaging surface at its free edge at an angle to the side faces thereof and arranged to thrust against the portion of the insert at the bottom of the channel to limit the widthwise movement of the sash and hold the sash from running engagement with the frame at the base of said rib.

6. In a window construction, the combination with a window frame having an inwardly projecting guide rib, of a sash having a member formed with a channel extending lengthwise thereof and opening through the edge of the sash member, the channel receiving the rib, and an insert housed in the channel and movable with the sash, the insert being of a yielding non-metallic material having portions engaging opposite sides of the rib, said rib having shoulders on opposite sides thereof and located within the channel for thrusting against the edge faces of the insert and limiting the widthwise shifting of the sash and hold the sash from running engagement with the frame at the base of the rib.

7. In a window construction, the combination with a window frame having an inwardly projecting guide rib, of a sash having a member formed with a channel extending lengthwise thereof and opening through the edge of the sash member, the channel receiving the rib, and an insert housed in the channel and movable with the sash, the insert being of a yielding non-metallic material having portions engaging opposite sides of the rib, the sash also having inwardly extending flanges at the entrance of the channel forming a contracted entrance, and said flanges housing and protecting the edge surfaces of the insert, and the rib having shoulders on opposite sides thereof and located in the channel and coacting with other lengthwise edge surfaces of the insert to limit the widthwise shifting of the sash and hold the sash with said flanges out of running engagement with the frame at the base of the rib.

ROY T. AXE.