March 17, 1931. A. H. FISHER 1,796,837

WINDOW CONSTRUCTION

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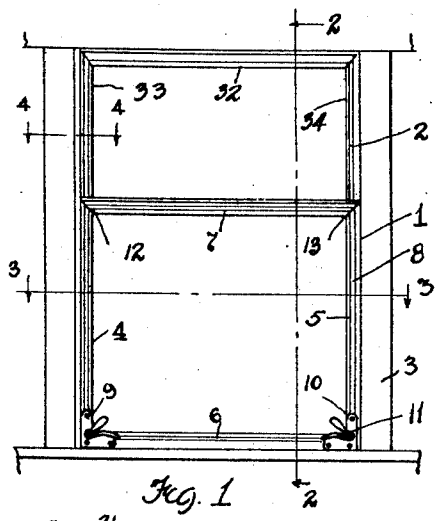


Fig. 1

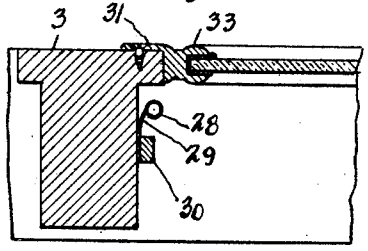
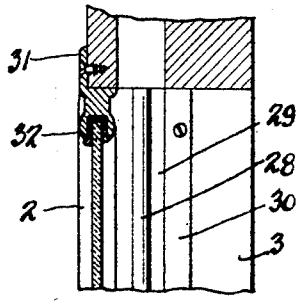


Fig. 4



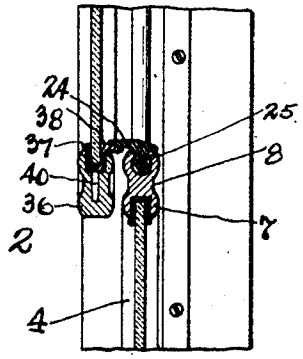
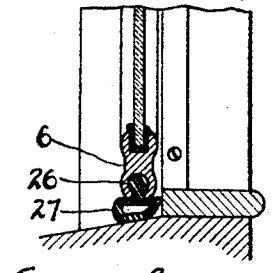


Fig. 2



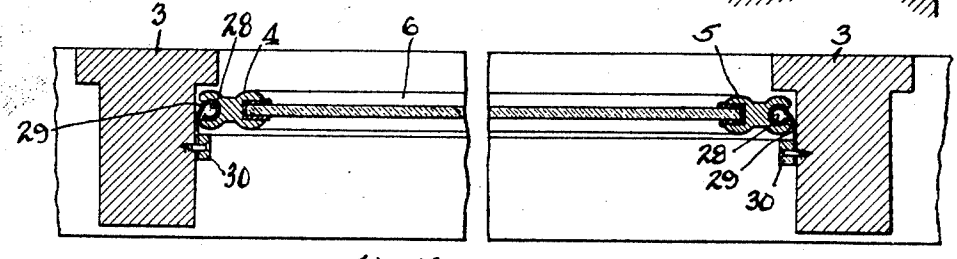


Fig. 3.

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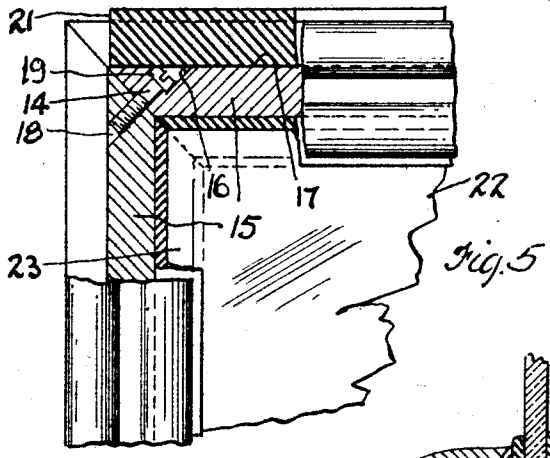


Fig. 5

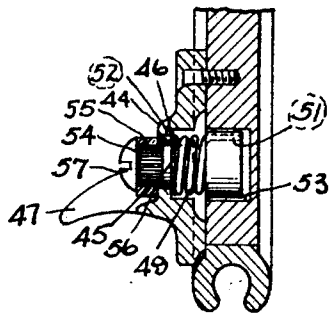


Fig. 8

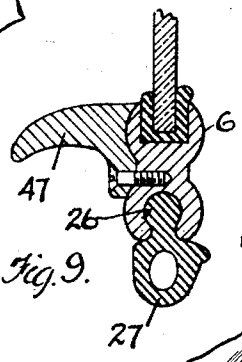


Fig. 9.

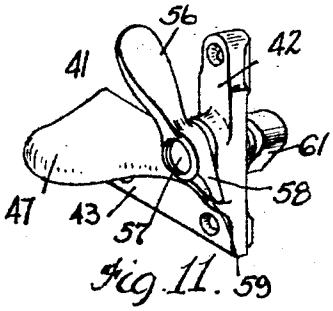


Fig. 11.

Fig. 6

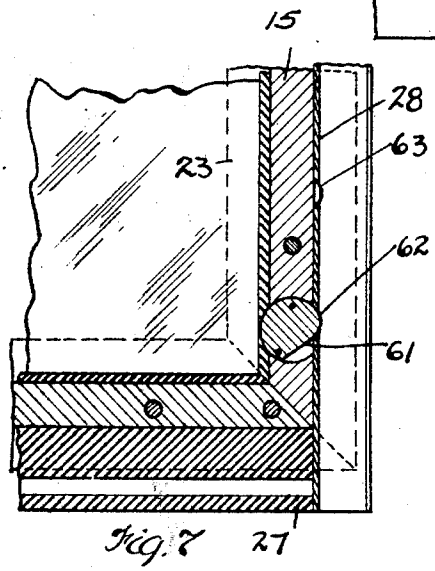


Fig. 7

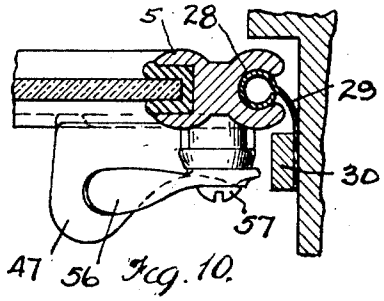


Fig. 10.

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UNITED STATES PATENT OFFICE

ALBERT H. FISHER, OF EAST CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF TO DELBERT M. STAFFORD

WINDOW CONSTRUCTION

Application filed March 14, 1928. Serial No. 261,435.

This invention, as indicated, relates to a window construction. More particularly it comprises a window construction having a sash formed of grooved metal strips with which appropriately formed guide members are adapted to co-operate. It also includes means provided on said guide members and sash to permit of the ready adjustment of said window to any desired elevation and the latching of the window at such point, the latching means being largely concealed within the sash and also being adapted to form a corner fastening or corner reinforcement of the sash. The invention also includes certain features of construction which particularly adapt the same for use upon automobile busses, street cars and the like.

The invention also includes a sash formed of extruded metal strips, preferably of aluminum or aluminum alloy, said strips being for most uses of identical cross-section for the side, top and bottom sash members, although where an auxiliary sash is employed, as in automobile busses or the like, strips of modified cross-section may be found desirable. The sash members thus formed are preferably provided with grooves or channelways on the outer and inner lateral surfaces which reduces the amount of metal required for the window construction to a minimum and at the same time causes the frame members to have a finished and artistic appearance, as well as adequate degree of strength for the purpose intended.

The invention also contemplates providing one removable sash member and in the preferred construction includes the provision of separable joints at two corners of the sash and welded joints at the opposite corners thereof, thus providing a rigid thoroughly braced structure and at the same time permitting free access to the glass, permitting its installation or removal at a minimum of effort and expense. The invention also includes the mitering of the frame members preferably at the upper corners of the window to permit the fastening thereof by securing members such as machine screws, or the like, set diagonally through the solid portions of the strips, a portion of the head of each screw projecting and being engaged by the rubber buffer strips inserted within the adjacent groove and being locked against disengagement from such frame members.

In addition to simplifying the corner construction of the window, the use of solid extruded metal sections of substantially H cross-section with the central portion of greater thickness than the remaining portions of the structure provides a rigid window frame which may be identical in cross-section for both the lateral and top and bottom members, and requiring a minimum quantity of material and at the same time providing for engagement of the lateral members with grooved guide members and of the top and bottom members with suitably shaped rubber closure strips. To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawing and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawing:—

Fig. 1 is a front elevation showing one form of a window construction embodying the principles of my invention; Fig. 2 is a vertical sectional view of the construction shown in Fig. 1, taken along the line 2—2, looking in the direction of the arrows; Fig. 3 is a horizontal sectional view of the construction shown in Fig. 1, taken along the line 3—3, looking in the direction of the arrows; Fig. 4 is an enlarged detail sectional view taken along the line 4—4 shown in Fig. 1, looking in the direction of the arrows; Fig. 5 is an enlarged detail view partially in section showing an upper corner construction; Fig. 6 is an enlarged detail view showing a lower corner construction; Fig. 7 is an enlarged sectional detail view showing a lower corner construction; Fig. 8 is an enlarged vertical sectional view taken along the line 8—8 shown in Fig. 6, looking in the direction of the arrows; Fig. 9 is an enlarged vertical sec-

tional view taken along the line 9—9 shown in Fig. 6, looking in the direction of the arrows; Fig. 10 is an enlarged detail view partially in section taken along the line 10—10 shown in Fig. 6, looking in the direction of the arrows; and Fig. 11 is a perspective view of the latching mechanism.

As is clearly shown in Fig. 1 of the drawing, the window construction comprises a lower sash 1 and an upper sash 2 positioned in a suitable opening in a framed structure 3. The lower sash is preferably formed of four strips of metal 4, 5, 6, 7, preferably of extruded aluminum, or suitable alloys thereof, each strip having a cross-section of H type with the transverse portion of greater thickness than the remaining elements and having a depression or groove 8, centrally of each inner and outer face to reduce the amount of metal in the structure without sacrificing its strength or detracting from its appearance.

Each of said strips preferably is mitred at a forty-five degree angle at the respective ends. The mitred sections when united are held in right angle relation to each other by suitable fastening means. The lower corners 9, 10, may be welded, or may be otherwise secured. A latching device 11 is preferably secured to each lower corner and will serve to reenforce the adjacent corner. The latching device alone might serve as the corner fastening but the corners are preferably welded and the latching device is applied thereover, serving to further brace and support the same. The upper corners 12, 13, are preferably supplied with removable securing means, which permits the ready removal of the top sash member 7. Each upper corner is preferably secured by means of a fastening member 14 inserted diagonally through such corners at the point where the solid portions 15 of the strips meet. An aperture 16 is formed through the solid portions of the adjacent strips, such aperture beginning at the base of the groove 17 in the top section, preferably adjacent each of the respective corners, and extending diagonally through the adjacent ends of the side strips. The bore to receive the fastening member may extend completely through each of the side strips, as shown in Fig. 5, or may terminate short thereof, but in either case must be finished to prevent interference with a smooth grooved surface at the outer edge of each of the side strips. The portion of the diagonal aperture within the side strips is internally screw-threaded to provide for the engagement of the fastening element. Such element preferably comprises a machine screw 18 having a large head 19 which projects slightly into the groove 17 for the rubber closure strip 21 at the top of the sash when the corners are securely united.

The construction, as has been indicated, involves the insertion of the glass 22 within the inner groove 23 of the window sash, with suitable cushioning material at the edges, such as is known to the trade as "glazing rubber", and the subsequent attachment of the removable section of the sash, preferably the top section, and thereafter the insertion within the outer groove of said section of the rubber closure strip, which prevents the release of the fastening members and also seals the lower window against the adjacent window frame when it is in raised or lowered position. The rubber closure strip at the top of the window comprises a flat section 24 to which is united a substantially cylindrical bead 25 secured at one side to said flat section and said bead is forced into secure engagement within the groove of the removable member of the window sash, which, as is shown, is of somewhat more than semi-circular extent in cross-section. This firm engagement of the bead of the rubber strip within the outer groove of the removable member provides a direct pressure upon the projecting edge of the diagonal fastening member and effectively prevents said fastening member becoming loosened through continued vibration of the parts.

A similar strip having a substantially cylindrical bead 26 is engaged within the groove at the lower edge of the sash to form a closure, but the buffer strip 27 at the base of the sash is made tubular (see Fig. 9) and becomes flattened (see Fig. 2) when in contact with the window frame. Thus in the lower sash all the members are of identical cross-section, the upper and lower outer grooves receiving the rubber closure strips and the outer lateral grooves being adapted to engage with the substantially cylindrical beads 28 on the resilient guide members 29 attached to each side of the window frame and preferably held by vertical securing strips 30 attached by suitable fastening elements. The guide grooves are reamed at the corners where the mitred edges overhang.

The upper sash may correspond in structure to the lower and be vertically slidable on guide members, but in constructions suitable for auto busses, street cars and the like, a stationary upper sash is more frequently used.

For an upper sash of this character the metal sections may be modified at their outer edges to provide an angle member 31 at the outer edge of the top and side members 32, 33, 34, and a rounded lower edge at the base 36 of the stationary sash. This edge may have a hollow center 40 to save metal, as is clearly shown in Fig. 2 of the drawing. The upper sash is preferably secured to the outside of the frame by means of screws or other fastening members engaged through suitable openings in the respective flanges.

The corners of the upper sash are secured in substantially the same way as in the lower

sash, one side, preferably the bottom member, being removable to permit the installation of the glass, which is preferably inserted in the inner groove of the sash member and cushioned with a liner of glazing rubber or similar material. The liner 37 inserted within the inner groove of the lower strip of the upper sash member is preferably provided with an extension flange 38 against which the extension flange 24 of the closure strip 25 is adapted to abut to form a weather-tight seal when the window is closed. Lock washers may be used on the diagonal fastening members when the rubber closure strip is not used in the bottom member of the upper sash.

The upper sash members are also preferably formed of extruded aluminum strips, the lateral faces of which are grooved or channeled similar to the sash members of the lower sash to provide for a minimum weight of material as well as an improved appearance without sacrificing any strength in the structure. It will be noted in each construction that the depressed portion of the sides of the sash members are joined with the flanges forming the inner and outer portions of said members upon a radius which meets the solid body portion of such members at points spaced from the base of such flanges to provide adequate strength at such points.

The lower corners of the main sash, as has been indicated, are preferably provided with latch members which form corner reinforcements as well as fastening means. As is clearly shown in Fig. 11 of the drawing, the latch comprises a base plate 41 having a vertical arm 42 adapted to rest in the groove of the adjacent vertical sash member and a horizontal arm 43 adapted to engage the curved portion of the inner sash adjacent the glass. The vertical arm carries a journal 44 for the latch bar 45 which is provided with an upstanding rib 46 forming a shoulder abutting the inner face of said journal. The horizontal arm is provided with a flange 47 forming a lifting member to raise the sash. The base plate is secured by suitable screws to the respective sash members. In line with the journal and the latch bar an aperture is formed in the adjacent vertical sash member to receive a cylindrical locking dog 48 formed integrally with the inner end of the latch bar.

A coiled spring 49 is adapted to be engaged about the central portion of the latch bar between the upstanding rib and the cylindrical locking dog. One end of the spring is adapted to be received in an aperture 51 on the inner face of the locking dog and the other end in an aperture 52 adjacent the journal in the vertical arm of the base plate. A recess 53 provided on the inner face of the vertical arm in alignment with the journal is adapted to form a housing for the spring. The outer end of the latch bar is provided with a tapered head 54 having a ribbed portion 55 over which is engaged a latch release arm 56 having an opening similarly ribbed to engage the same. A set screw 57 engaged in an aperture in the end of a latch bar serves to hold the latch bar, spring, and latch release arm in assembled relation. A lug 58 on the forward end of the release arm is adapted to engage a projecting lug 59 on the base plate to limit the inward throw of the locking dog. The locking dog is formed with a flat face 61 at one side which provides an arcuate portion 62 which is adapted to engage one of a series of locking apertures 63 formed in the respective vertical guide members of the lower sash.

It will be understood that the arcuate portions of the locking dog are forced outwardly by the coiled spring and engage the adjacent apertures of the lateral guide members to hold the lower sash to any desired position of adjustment. When it is desired to change the position of the lower sash, the release arm of the latches at the respective lower corners of the sash are depressed toward the lifting members and the flat faces of the cylindrical locking dogs are turned to vertical position, and in such position clear the adjacent guide members, leaving the lower sash free to be adjusted to any desired position.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. A window construction comprising a lower sash and an upper sash, each sash being formed of grooved members of extruded metal, a flanged rubber closure strip provided in a groove adjacent the lower portion of said upper sash, and a flanged rubber closure strip provided in a groove adjacent the upper portion of said lower sash cooperating directly with the closure strip of the upper sash and forming a rubber to rubber contact in the space intermediate the respective planes of said sashes.

2. A window sash having the top, bottom and side members joined at their adjacent corners, at least two of said corners being mitred, diagonal fastening elements engaged through said members adjacent said corners, a groove in one of said members and a locking member inserted in said groove to prevent disengagement of said diagonal members.

3. A window sash having the top, bottom and side members joined at their adjacent corners, at least two of said corners being mitred, diagonal fastening elements engaged through said members adjacent said corners, a groove in one of said members and a resili-

ent member secured in said groove to prevent disengagement of said diagonal members.

4. A sash member for windows formed of a solid strip of metal having two narrow and two wide longitudinal surfaces, one of said longitudinal surfaces being formed with a shallow channel along the portion of greatest thickness to reduce the amount of metal in said member and not affect the essential structural strength thereof.

5. A sash member for windows formed of a solid strip of metal having two narrow and two wide longitudinal surfaces, each of said wide longitudinal surfaces being formed with a shallow channel along the portion of greatest thickness to reduce the amount of metal in said member and not affect the essential structural strength thereof.

6. A sash member for windows formed of a solid strip of metal having two narrow and two wide longitudinal surfaces, one of said longitudinal surfaces being formed with a shallow channel along the portion of greatest thickness to reduce the amount of metal in said member, and being joined to the adjacent surface along a radius.

Signed by me this 25th day of February, 1928.

ALBERT H. FISHER.