G. H. FORSYTH.

WINDOW CONSTRUCTION.

APPLICATION FILED DEC. 26, 1908.

1,086,319.

Patented Feb. 3, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

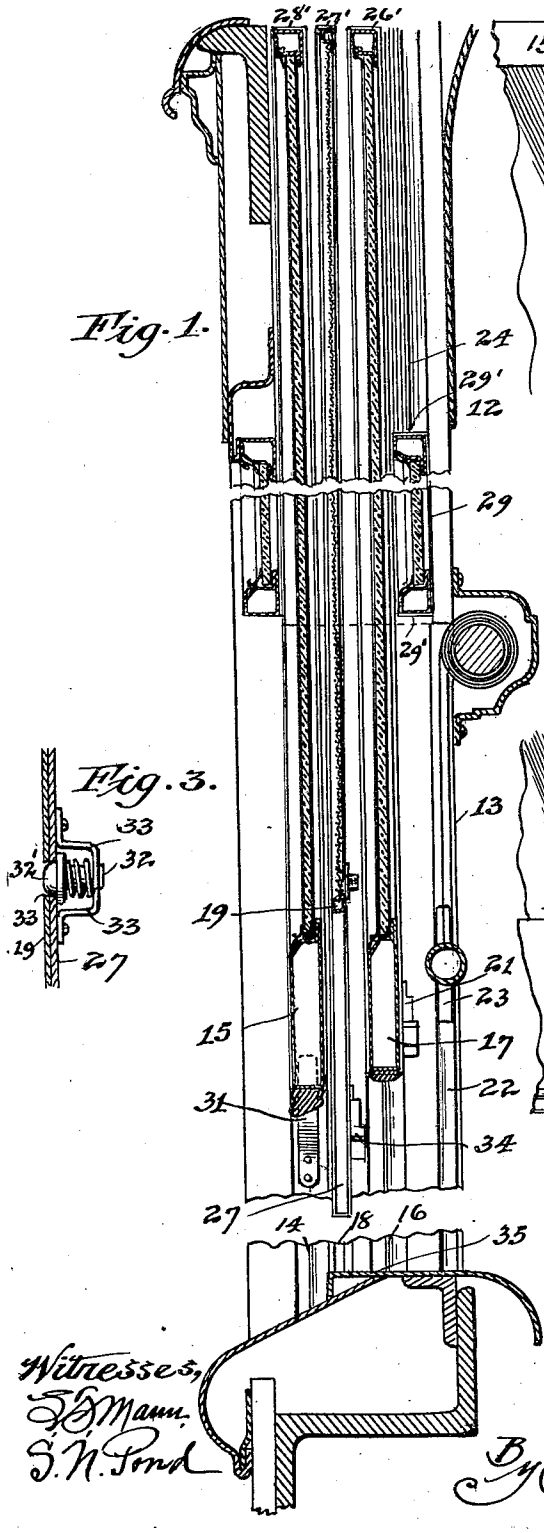


Fig. 2.

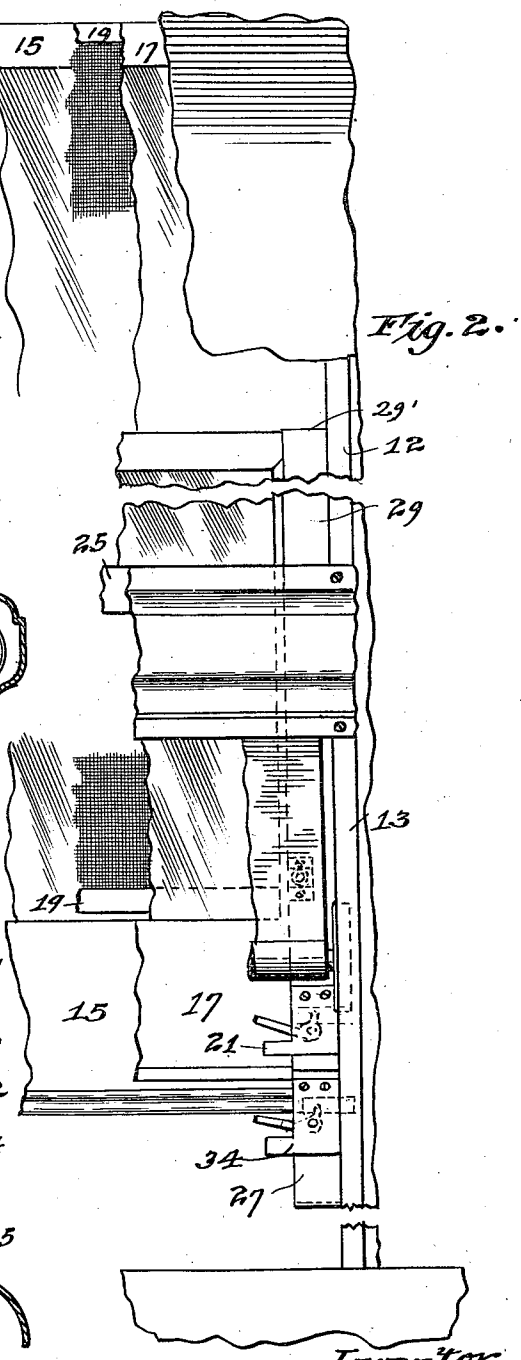


Fig. 3.

Witnesses,
S. H. Mann.
S. N. Pond.

Inventor,
George H. Forsyth
By Offield, Towle & Linthicum
Attys.

G. H. FORSYTH.

WINDOW CONSTRUCTION.

APPLICATION FILED DEC. 26, 1908.

1,086,319.

Patented Feb. 3, 1914.

2 SHEETS—SHEET 2.

Fig. 4.

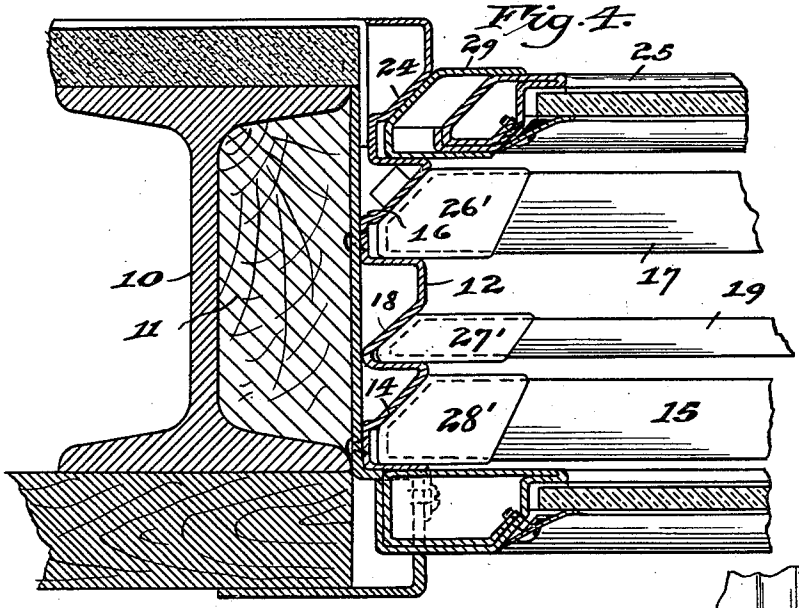
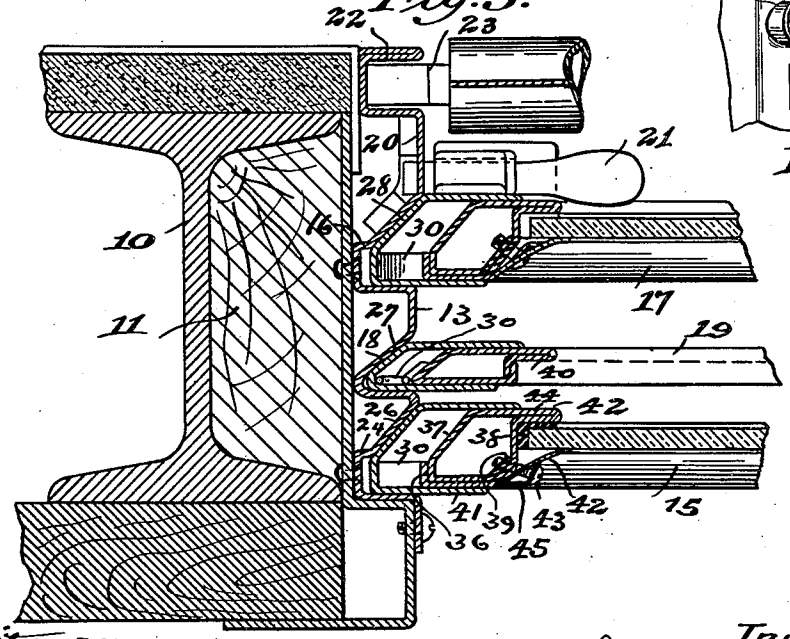


Fig. 5.



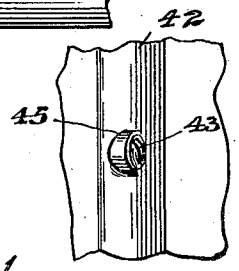


Fig. 6.

Witnesses,
F. E. Mann
S. N. Pond

Inventor,
George H. Forsyth
By Offield, Towler & Linthicum
Attys

UNITED STATES PATENT OFFICE.

GEORGE H. FORSYTH, OF CHICAGO, ILLINOIS.

WINDOW CONSTRUCTION.

1,086,319. Specification of Letters Patent. Patented Feb. 3, 1914.

Application filed December 26, 1908. Serial No. 469,281.

To all whom it may concern:

Be it known that I, GEORGE H. FORSYTH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Window Constructions, of which the following is a specification.

This invention relates to improvements in window constructions, having reference more particularly, although not exclusively, to windows.

One feature of the invention relates to a novel manner of mounting the sash member of the window screen, whereby the screen itself may be disposed of within a space between other sash members or in a pocket where it is inaccessible for direct manual manipulation, my invention in this regard including the provision of manually operable means for so disposing of the sash frame, as well as returning it to an accessible position, which means may constitute in part the mounting and support of the sash itself.

Another feature of the invention has to do with a novel construction of hollow sheet metal sash frame member, such as a bar or stile, whereby a maximum width of glass may be utilized in a sash frame member of minimum thickness, and whereby also the application of the glazing strip is facilitated.

Still another feature of the invention resides in a novel form and manner of applying a glazing strip so as to permit of a considerable variation in the thickness of the glass, as likewise to hold the latter flexibly or under spring pressure.

The invention will be readily understood when considered in connection with the accompanying drawings which illustrate one practical embodiment thereof, and in which—

Figure 1 is a vertical sectional view through a car window in a plane transverse to that of the window, showing the several sash members in coöperative relation to their respective guides. Fig. 2 is a side elevation, from the inner side of the car, of the parts shown in Fig. 1. Fig. 3 is a detail view, on an enlarged scale, of a spring lock yieldably connecting the screen sash frame to one of the coöperating shoes thereof. Figs. 4 and 5 are enlarged sectional views through the window posts and sash guides in the planes of the gothic and main sash members, respectively, said views more particularly illustrating the forms of the several sash frame guides and shoes coöperating therewith, as also showing that feature of the invention residing in a special formation of the sash frame members themselves. Fig. 6 is a detail fragmentary elevation of a portion of one of the sash members, more particularly illustrating the feature of the glazing strip.

Referring to the drawings, 10 designates the post of a window frame, herein shown as a metallic I-beam set upright between the roof and the floor of a car structure and equipped with a suitable filling and housing 11 of wood, felt, or other suitable material designed to occupy the space between adjacent window openings. Fitted to either side of the composite post structure thus formed is a longitudinally bent or corrugated sheath or covering, the outer surface whereof, by virtue of such longitudinal bends or corrugations, affords suitable guide channels or grooves for the several sash members employed in connection with the window. This corrugated metal member is preferably, and as herein shown, formed in two longitudinal sections, the upper whereof, designated as an entirety by 12, accommodates the usual upper or gothic sash members and is adapted also to receive the lower or main sash members, when in raised position; while the lower, designated by 13, is designed to accommodate the main glazed and screened sash members, as also a curtain, where used. This corrugated metal guide is, as stated, preferably made in two sections by reason of the fact that there is a partial variation in the guide-grooves between said sections; but it is possible to combine the upper and lower sections in a single continuous or integral structure, the upper and lower portions of which are differently bent to secure the variations in the forms of the guides, and hence the latter should be understood as within the invention. Both the upper and lower sections are provided in common with a guide-groove 14 for the accommodation of the outer main sash 15; a similar guide-groove 16 for the accommodation of the main sash 17; and a relatively narrow guide-groove 18 located between the guide-grooves 14 and 16 for the accommodation of an intermediate sash frame member 19. The lower guide 13 is

further provided, inwardly of the guide-groove 16, with a plain flat transverse wall 20 of sufficient width to coöperate with the plunger of a manually operable sash-lock 21, and inwardly thereof with a plain rectangular groove 22 adapted for coöperation with the head 23 of an ordinary curtain fixture. The upper section 12 of the corrugated guide is provided, inside of the guide-groove 16, with a vertical guide-groove 24, which accommodates the inner gothic sash 25, thus enabling the latter to be raised and lowered, if desired. It will be observed that the transverse walls of the several guide-grooves 14, 16, 18 and 24 are made wholly or partially oblique to the plane of the sash, the purpose of which is to automatically secure a snug fit of the coöperating sash shoes therein through the wedge action involved.

One advantage sought by the invention is to provide a construction which permits not only the easy raising and lowering of the sash frames, but also their ready removal, when necessary or desired. To this end the invention employs, in connection with the sash frames proper, devices which I term shoes that constitute intermediate coöperating members between the corrugated metal face of the window post, represented by the above-described sections 12 and 13, and the stiles of the sash members themselves. 26, 27 and 28 designate, respectively, the shoes which coöperate with the sash frames 15, 19 and 17; while 29 designates the shoes cooperating with the inner gothic sash 25. Each of these shoes is, as shown, a generally channel-shaped strip, the transverse wall of which is shaped to a substantially sliding fit on the bottom of its corresponding guide-groove or channel, the sides thereof embracing the side walls of the stile of the sash with which it coöperates. It will be observed that the sash stiles partake also of the oblique formation of the transverse walls of the guide-channels and shoes; and between the shoes and sash stiles are inserted suitable bow springs 30 which both effect an automatic adjustment of the sash members widthwise or in their own plane, and also permit the ready withdrawal of the sash members from the shoes by pressing the sash-member edgewise and compressing the spring on one side, which permits the opposite edge of the sash member to spring out of engagement with its shoe.

The shoes 26, 28 and 29 are adapted to slide with the several sash members engaged thereby, for which purpose they are suitably bent or lipped over the upper and lower edges of their respective sash members, as indicated at 26′, 28′ and 29′. The outer sash 15, when raised, is maintained in elevated position by an ordinary spring catch indicated at 31; the inner main sash member 17 is maintained in elevated position by the lock 21 which is applied to the side of the shoe 28; while the shoes 27 of the screen sash are made longer than the latter and are designed to have a sliding movement relatively to the latter in order to facilitate the manipulation of the screen sash at points where it is inaccessible for direct manual manipulation. To this end, the shoes 27 at their upper ends are lipped over the upper end of the screen sash frame, as shown at 27′, so that, when the screen sash is raised to a point at which its upper edge engages the upper ends of the shoes 27, the latter are positively raised with the screen sash. The screen sash 19 is also provided with a yieldable spring engagement with its shoes 27 through the provision of a spring-pressed plunger 32 slidably mounted in a supporting bracket 33 mounted on one side wall of the shoe 27, said plunger having a rounded head 32′ adapted for coöperation with an aperture 33 formed in and through the adjacent wall of the sash stile. The plunger engages the sash with sufficient force to cause the sash to be raised and lowered when the shoes are pushed up or drawn down; but the sash may be moved longitudinally of the shoes by the application of sufficient force to the sash to crowd the plunger out of holding engagement with the aperture. It will be observed that the shoes 27, when in their fully raised position, project at their lower ends slightly below the lower edges of the fully raised main sash members 15 and 17, said shoes carrying a lock 34 by which they may be secured to the guide. The screen sash, however, when in fully raised position, lies so far up between the main raised sash members 15 and 17 as to be inaccessible for direct manual manipulation, but when in such position the screen sash member is yieldingly locked to the shoes through the plungers 32, so that, when it is desired to draw the screen sash down, this may be done by retracting the locks 34, drawing the shoes down until their lower ends engage the sill 35, which movement brings the lower end of the screen sash frame below the lower edges of the main raised sash frames 15 and 17, whereupon, by seizing the lower edge of the screen sash frame and forcibly drawing it down, its locking engagement with the shoes through the plungers 32 is withdrawn, and the screen sash may be fully lowered. In raising the screen sash, the converse of these operations is employed, the screen sash being first raised until the plungers 32 click into the locking apertures 33; whereupon the screen sash is raised the balance of the distance by an upward lift of the shoes themselves.

It will be observed by reference to the enlarged cross-sectional views Figs. 4 and 5, that the vertical stiles of the several sash

frames are constituted by hollow sheet metal members formed from sheet metal strips bent and folded longitudinally. Referring to the stiles of the sash frames 15 and 17, which typically illustrate my improvements in this regard, it will be observed that each of these members has an outer edge wall made up of a relatively narrow transverse portion 36, and an oblique portion 37, an inner edge wall comprising a relatively narrow transverse portion 38, and an oblique portion 39, and parallel straight inner and outer side walls or faces 40 and 41. Continuous with the inner side wall 40 is a metal bead 42 constituting an abutment for the glazing, said bead being of minimum width formed by flattening together the folds of the metal constituting such bead. The marginal portions of the strip are overlapped to the extent of the several wall sections 36, 39 and 41, thus making such section of two ply or double thickness, which contributes largely to the strength of the member. The oblique section 39 constitutes a bearing or rest for the outer edge of a glazing strip, which is herein shown as an elastic metal strip 42 having a bearing at one edge on the oblique wall 39 and at its opposite edge on the glass. The screws 43 passed through the glazing strip and threaded into the two-ply wall 39 securely hold the strip in place and cause the latter to exert an elastic pressure upon the glass, the margin of which latter is preferably seated in a rubber or other relatively soft cushion 44. To facilitate the application of the fastening screws 43, the metal of the strip 42 is preferably offset, either outwardly, as shown in connection with the sash member 15 in Fig. 6, or inwardly, as shown in connection with the sash member 17 by a punch or die, as shown at 45, thus affording a support for the head of the screw which distributes the stresses throughout substantially the entire transverse extent of the strip and avoids local bending or breaking of the latter. The flexibility of the glazing strip 42, and its manner of support on the oblique wall 39 of the frame member permits said glazing strip to operate satisfactorily upon glass of considerably varying thickness, as also automatically to yield to any slight irregularities that may exist in the glass itself. By employing the described manner of mounting the glazing strip on a wall oblique to the plane of the glass, in combination with the narrow abutment bead or shoulder 42, I am enabled to secure the use of a maximum thickness of glass with a minimum thickness of frame, which latter constitutes an important advantage, especially in car window construction.

The application of the sash locks, such as 21 and 34, above described, to the shoes instead of to the sash frame members themselves, is of advantage in that the travel of the locking plunger is entirely independent of any variations in the width of the sash or the sash opening; and also in that the sash is capable of removal without disturbing the lock.

I claim:—

In a window construction, the combination of opposed guides, a pair of shoes slidably engaging within the guides, a sash of width less than the space between the shoes and disposed within the opposed shoes, a compressible spring interposed between each of the edges of the sash and its shoe, a lock connecting the shoes and guides, and a yielding spring catch connecting the sash and shoe, the shoe having a length less than the guide and greater than the sash whereby to permit of limited joint movement of the sash and shoe and further independent movement of the sash, substantially as described.

GEORGE H. FORSYTH.

Witnesses:
SAMUEL N. POND,
MATTIE B. BLISS.