Aug. 7, 1956 E. D. TONEY 2,757,421

METAL SASH CONSTRUCTION

Filed March 25, 1952

2 Sheets-Sheet 1

FIG. 1

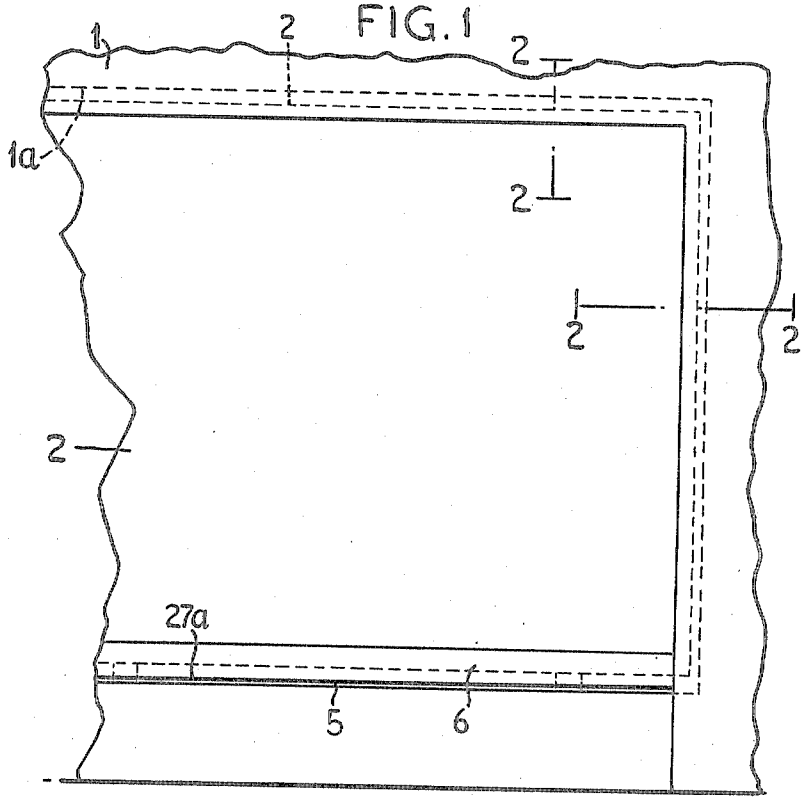
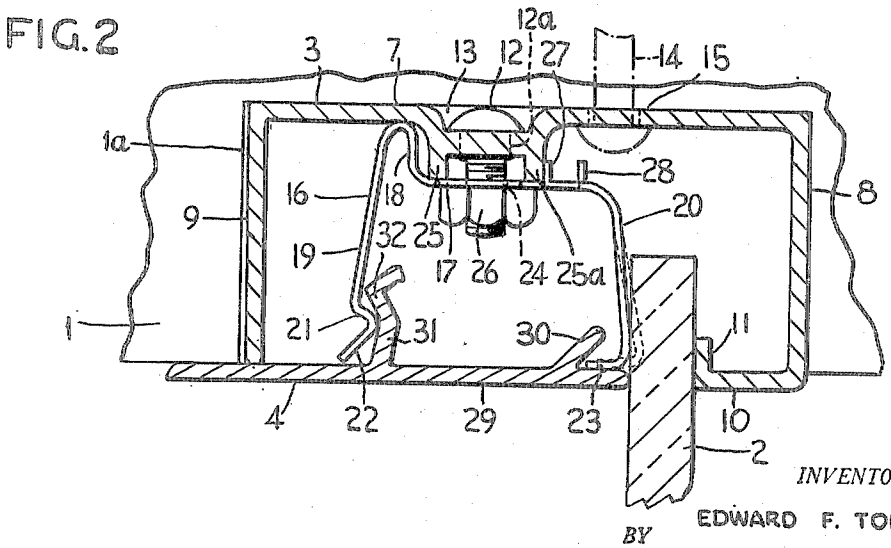


FIG. 2



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FIG 3

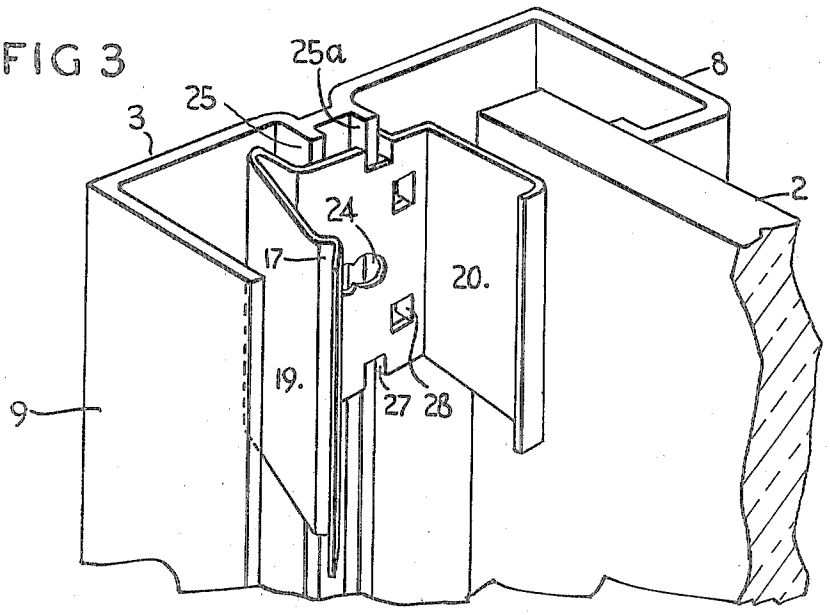
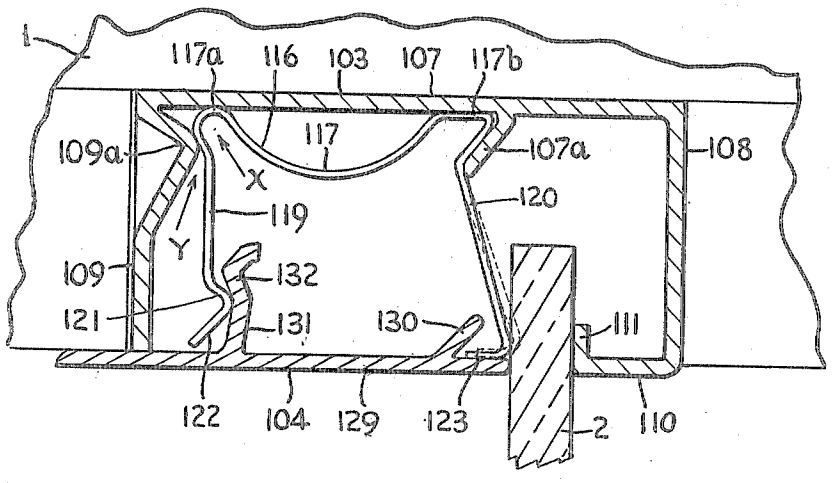


FIG. 4



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2,757,421

METAL SASH CONSTRUCTION

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Application March 25, 1952, Serial No. 278,722

12 Claims. (Cl. 20—56.4)

This invention relates to recessed type sash for mounting a pane of glass in commercial and residential windows.

One object of the invention is to provide a metal sash which may be recessed into the sidewalls and ceiling of window openings whereby large panes of glass may be readily and accurately mounted or demounted.

Another object of the invention is to provide a substantially weather tight sash having sufficient resiliency to prevent destructive pressures being imposed upon the glass as a result of temperature changes, displacement or sag in the building structure, and sudden variations in wind pressure upon either side of the glass.

A further object of the invention is to provide an improved form of recessed metal sash in which the face or closure member is resiliently held in place without the possibility of setting up stress concentrations on the glass pane through commercial tolerances in the size of the sash or pane of glass.

A still further object of the invention is to provide a single metal recessed type sash which will permit the mounting of a plurality of thicknesses of glass therein.

Recessed type sash for mounting panes of glass are old. Many examples of this type of sash have been found in residential as well as in large glass openings for commercial establishments. In a broad sense all sash, particularly metal sash, are in part recessed into the wall and ceiling structure of the window opening. One early form of metal sash of this type is shown in Murnane Patent 1,008,984 of November 14th, 1911 and Toney Patent 1,994,464 of March 19, 1935. Later improvements in metal sash in which the channel or gutter member may be mounted substantially wholly within the plane of the wall or ceiling and the face or closure member inserted parallel with the glass are shown in Reuter Patent 1,589,560 of June 22, 1926, Peterson Patent 2,185,735 of June 2, 1940 and Ketchum Patent 2,463,284 of March 1, 1949.

All of the foregoing types of metal sash have one or more common construction characteristics which make them unsuitable when adapted to a metal sash in which the gutter member is substantially wholly recessed within the plane of the wall and ceiling window openings. The Murnane, Peterson and Ketchum type of sash are excellent in regard to adjustability for different thicknesses of glass, but in order to secure the glass in position they grip the glass adjacent its margins between relatively heavy and rigid metal sections of the sash. Furthermore, these types of sash tend to create unequal stress concentration at each adjustable member due to the inability of the ordinary workman to apply the same tension on each adjusting member screw throughout the length of each face member.

All of the foregoing disadvantages are avoided in the hereinafter described invention in which Fig. 1 shows a portion of a store front with the sash and glass in position; Fig. 2 shows in enlarged detail a typical section on the lines 2—2 through the glass and sash of Fig. 1; Fig. 3 shows in perspective one form of the resilient and adjustable face clip of the invention; Fig. 4 shows in assembled relation the gutter member, face member and resilient face clip of a modified form of the invention. Both Figs. 2 and 4 show in dotted lines the compensating feature of the resilient face clip therein to compensate for commercial variations in both the metal sash and glass thickness.

Referring now to Figs. 1 and 2 of the drawings reference character 1 indicates a building structure having a window opening therein closed by the glass 2. Within the building structure at each side of and above the window opening is a suitably shaped channel opening 1*a* to receive the recessed sash comprised of a gutter member 3 and face member 4. The gutter member is recessed substantially flush with the plane of the adjacent building wall and ceiling. At the bottom of the window the use of a recessed sash is possible but a sash having a fully exposed face plate is preferred for ease of mounting and replacing the glass 2. Hence the sash 5 at the base of the window is preferably one in which the face member 6 is inserted in a direction normal to the glass as in my Patent 1,994,464 hereinbefore referred to.

One form of the sash structure of the invention is best shown in Figs. 2 and 3 of the drawings wherein the gutter member 3 comprises a bottom wall 7 terminating in side walls 8 and 9 extending towards the window opening. The side wall 8, inwardly of the glass, terminates in a flange 10 directed towards the glass and preferably provided with an inwardly turned flange 11. This flange 11 serves as a support against which the glass is placed when mounting the glass within the sash. The opposite gutter member side wall 9, outwardly of the glass, preferably terminates within the plane of the adjacent wall or ceiling. Mounted in the bottom wall 7 of the gutter member are suitable face member clip mounting means such as the bolts 12. The bolts 12 may be secured to the gutter bottom wall 7 in any desired manner, preferably by recessing the bottom wall 7, as at 13, so that the bolt head lies within the plane of the outer face of the wall 7. The gutter member 3 is mounted in the wall or ceiling within the channel shaped opening 1*a* thereof by any suitable means such as the screws 14 in the apertures 15 of gutter bottom wall 7.

The face member clips 16 are generally of U-shape and are disposed in longitudinally spaced relation within the gutter member 3. These clips are preferably of resilient material for a purpose hereinafter disclosed. Each clip 16 includes a web 17 terminating at one end in a depending portion 18 to which is joined the outwardly directed arm 19. The opposite end of web 17 terminates in an outwardly directed arm 20. Arm 19 adjacent its free end has an offset comprised of the portions 21 and 22 which preferably lie wholly within gutter 3. The arm 20 has its free end 23 deflected towards the arm 19. These clips are secured within the gutter 3 by the bolts 12 which pass through aperture 24 in the web 17 of each clip. This web 17 bears against the longitudinally extending and spaced gutter bottom wall extensions 25 and 25*a* to provide a bearing for the nut 26 of the bolt 12. As best illustrated in Fig. 3 of the drawings, aperture 24 in web 17 is elongated so that clip 16 may be shifted laterally. The lateral tongues 27 and 28 struck from the web 17 selectively engage the gutter bottom wall extension 25*a* to position the clip 16 upon bolt 12 and accommodate different thickness of glass 2. The most popular glass thicknesses being ¼ and ⅜ inch.

The face member 4 of the sash of Fig. 2 comprises a web 29 extending outwardly from glass 2 for closing the opening of the gutter member 3. The web has two inwardly extending portions 30 and 31 which co-operate

with face lug **16** to resiliently retain the face member in position. The web **29** of the face member preferably overlaps the adjacent wall or ceiling surface **1**. Adjacent the glass **2** and integrally formed upon the inner face of web **29** is an inwardly extending flange **30** which is preferably directed towards the glass so as to form an acute angle with the inner face of the web **29**. Adjacent the arm **9** of the gutter member and integral with the inner face of web **29** is an inwardly extending flange **31** having an offset portion **32** directed towards gutter arm **9** for engagement with the offset portion **21** of face clip arm **19**. Upon reference to Fig. 2 it will be apparent that the face member web **29**, when the sash is assembled, rests upon face clip portion **23** and upon the adjacent wall or ceiling surface **1**.

A modified form of sash is illustrated in Fig. 4, wherein gutter member **103** comprises a bottom wall **107** having outwardly extending arms **108** and **109**. Arm **108** terminates in a flange **110** directed towards glass **2** and a reentrant flange **111** for normally engaging the glass. Arm **109** of the gutter member has, intermediate its ends, an inwardly offset portion **109***a* for engagement with face clip **116**. Intermediate the arms **108** and **109** of the gutter member and upon the inner face of bottom wall **107** is an inwardly projecting lug **107***a* which also engages the face clip **116**.

The face member **104** of Fig. 4, is substantially the same as the face member **4** of Fig. 2 and includes web **129** with the inwardly extending portions **130, 131** and **132**. The face clip **116** of Fig. 4 is a modified form of the face clip **16** of Fig. 2. Here the face clip **116** includes similar arm **120** with its portion **123** and similar arm **119** with its portions **121, 122**. The arcuate web **117** of the modified face clip has suitably formed portions **117***a* and **117***b* which engage with the gutter member portions **109***a* and **107***a* to retain the clip in position within the gutter member. This face clip **116** is also made of resilient material and the arcuate shape of web **117** readily permits deflection thereof so that the clip may be snapped into place between gutter member portion **109***a* and **107***a*.

The resilient face clip **16** of Fig. 2 and **116** of Fig. 4 normally have the arms **20** and **120** spread a greater distance relative to the opposite arms **19** and **119** respectively as indicated by dotted lines. The purpose of this is to normally cause a slight deflection of these arms **20** and **120** when engaged with the glass **2** so that the clip snugly but resiliently retains the glass against the adjacent flange **11** and **111** respectively of the gutter member.

The manner in which the sash of Figs. 2 and 3 are mounted within the building structure and assembled with the glass will now be described. At the ceiling and wall or walls of the window opening a suitable substantially channel shaped opening is formed in the adjacent building structure for the full size of the window opening. Within these channel shaped openings are mounted the gutter members **3** and are secured in position by any suitable means such as the screws **14**. At the bottom of the window opening is mounted an L-shaped gutter member of the general type described and claimed in my patents, No. 2,475,682 of 1949 and No. 1,994,464 of 1935.

The glass **2** is then picked up in the usual manner as by canvas straps or suction cups and while the top edge is inclined inwardly, one side edge is diagonally moved into the gutter members of a wall and ceiling of the window opening. By this time the bottom edge of the glass is slightly above the bottom wall of the bottom gutter member such as **27** of my Patent 2,475,682 and indicated as **27A** at the bottom of Fig. 1 of the present drawings. The glass, at one side edge, has now moved sufficiently far into the gutter member **3** of one wall of the window opening so that the opposite side edge of the glass may be rotated inwardly and aligned with the flange **11** of the adjacent opposite wall channel **3**. The glass then is moved inwardly against the flanges **11** of both side walls of the gutter members **3** and adjusted to project a substantially equal amount within each of the gutter members **3**. The glass is now raised upward and setting blocks are inserted to provide vertical support for the glass. It is to be understood that the glass is cut sufficiently larger than the "sight" opening of the window opening so that the adjacent edge of the glass within each gutter member **3** projects inwardly of the gutter member beyond the flange **11** as illustrated in Fig. 2 of the drawing.

The glazing operation has now progressed to the point where the face clips are to be mounted. The face clip of Fig. 3 is shown substantially double size and its actual dimension is about 1 inch long. The gutter member **3** has openings **12***a* punched in the bottom wall **7** on about 8 inch centers and the bolts **12** inserted therein. These bolts are usually provided with a knurled shoulder portion which locks the bolt in place in the offset portion **13** of the gutter wall **7** so as to secure the bolts against displacement during handling of the sash and rotation during turning of the nuts **26**. Face clips **16** are now mounted on the bolts **12**. If the glass is ¼ inch thick the aperture **24** of the clip is inserted over the bolt to bring tongue **27** into engagement with wall projection **25***a* and in so doing the arm **20** is deflected inwardly to obtain a positive resilient contact with glass **2** thereby ensuring resiliently retaining the glass against sash flange **11**. Should the glass be ⅜ inch thick the face clip **16** is mounted on bolt **12** so as to bring tongue **28** in contact with adjacent projection **25***a*. Since tongues **27** and **28** are spaced ⅛ inch apart the clip arm **20** will have the same bearing upon the ⅜ inch thick glass **2** as previously described for the ¼ inch glass. These are the two popular glass thicknesses and if a greater glass thickness is used special clip **16** must be provided. With the clips **16** thus in place, nuts **26** are applied and tightened to bring the web **17** of the clip into equal bearing against projections **25** and **25***a*. In so doing, the web extension **18** of the clip bears against the inner face of gutter member wall **7** to provide a bearing and pivoting point for resilient arm **19** of the clip. After the face clips are applied at the ceiling and side wall or walls the glass is resiliently secured in place and the face members may now be applied.

Face members **4** for each gutter member are snapped into position by tilting the web **29** of the member to insert extension **30** past flange **23** of the face clip and moving the web **29** towards the gutter member to deflect arm **19** as web extension **32** engages and slides along extension **22** of clip arm **19**. As the face member comes to rest upon the gutter member arm **9** or adjacent wall **1**, the extension **32** of the face member has moved beyond offset **22** of clip arm **19** and the arm **19** snaps inwardly beneath the portion **32** resiliently locking the face member in position. In this latter position the face member web **29** is resiliently urged against the glass to provide a weather seal at this point. It will be apparent upon reference to Fig. 2 that sufficient clearance is provided between the edge of flange **23** of the face clip and extension **30** of the face member to permit the face member to engage the glass. Likewise with the face member in position as described, it is supported upon flange **23** of the face clip and upon the wall surface **1**. The face clip preferably overlaps the adjacent wall surface a sufficient distance to completely close the channel opening in the wall previously described as being formed to receive gutter member **3**.

Referring now to Fig. 4 of the drawings, wherein is shown a modification of the sash of Fig. 2, the gutter member **103** is substantially the same as gutter member **3** except for changes necessary to accommodate the face clip **116**. This latter face clip is approximately the same length and width as face clip **16** and is spaced longitudinally of gutter member **103** in the same manner, approximately 8 inches on centers. Face clip **116** is preferably made of resilient material such as spring steel, phosphor bronze or aluminum alloy. The arcuate web **117** of

the clip is connected with the spaced arms **119** and **120** by substantially arcuate portions as shown. The portion **117***b* is so formed as to engage the web **107** of gutter member **103** and fit within the angle formed between web **107** and the inwardly offset portion **107***a* of the gutter member. When portion **117***b* of the face clip is positioned between lug **107***a* and web **107** of the gutter member face clip portion **117***a* may be snapped into position by deflecting web **117** and arm **119** of the clip. By deflecting arm **119** sufficient tension is built up therein to assist in retaining the free end portions **121** and **122** in contact with the face member.

To set the clip **116** in place I prefer to press upon the clip portion **117***a* with a screw driver or other convenient tool in the direction of arrow X. To remove the clip, I prefer to insert the screw driver behind the clip in the direction of arrow Y and twist. Face clip arm **120** is preferably formed so as to normally extend towards the glass **2** as indicated by dotted lines so that after the glass is in position within sash **103** and the clip is mounted, as described, the deflected arm **120** bears against the glass with a slight tension to ensure a full bearing between clip and glass regardless of the usual commercial tolerances in dimensions of the sash **103** and thickness of glass **102**.

As previously stated it is preferable, when using recessed sash at the side and ceiling portions of the window opening, to use a conventional exposed sash at the bottom of the window opening. When this is done, the large pane of glass can be readily manipulated in order to mount the top and side edge within the recessed sash.

Throughout this specification and drawings preferred forms of detail construction have been illustrated. Many acceptable modifications in all of the various portions of the sash will suggest themselves to those skilled in the art while still retaining the invention disclosed herein. It is to be understood that I do not limit myself to the details of construction disclosed except as is made necessary by the scope of the appended claims.

I claim:

1. A metal sash for a store front window comprising a substantially U-shaped gutter member for receiving a sheet of glass, a wall flange on the gutter member providing horizontal support for the glass sheet, a face clip mounted wholly within the gutter member and having one resilient arm extending outwardly away from the base of the gutter member and yieldably retaining the glass sheet against the gutter wall flange, a second resilient arm on the face clip in spaced relation to the first clip arm and extending outwardly away from said base, said first arm being between said wall flange and said second arm, and a face member having flanges resiliently and releasably engaged by said clip arms to cover the space between the glass sheet and opposite gutter side wall to complete the sash, and means for mounting the face clip within the gutter member in such a manner that the first resilient arm yieldably engages the glass regardless of the presence of the face member.

2. A metal sash for store front windows comprising a gutter member having a base wall and spaced side walls for receiving a sheet of glass, a flange on one of the side walls providing bearing support for the glass in a direction normal to one face thereof, a face clip having a base portion engaging the gutter member base wall and connected thereto between the side walls thereof, spaced resilient arms on the face clip extending outwardly from the base of the gutter member, one of said arms serving to retain a sheet of glass in yieldable engagement with the gutter side wall flange, and a face member for closing the space between the glass and opposite gutter member side wall, the face member having suitably shaped portions for moving between the gutter member side walls and co-operating with the face clip resilient arms to retain the face member in position, the gutter member base wall being provided with spaced converging portions

between which the face clip base portion is snapped to position the face clip.

3. A metal sash as in claim 1, in which the second resilient face clip arm normally holds the face member in yielding engagement with the glass.

4. A metal sash as in claim 1, in which the first face clip arm provides a bearing for the face member.

5. A metal sash as in claim 2, in which the face member has an exposed face in substantially the plane of the outer face of the gutter member side wall flange.

6. A metal sash construction for store front windows and adapted to be recessed within the plane of the wall or ceiling of the window opening so as to be substantially flush with the wall or ceiling surface, comprising a channel shaped recess in each wall and ceiling of the window opening, a gutter member having a base secured to the base of the recess, a side wall on the gutter base disposed adjacent one side of the recess, a flange on the gutter side wall and disposed over the gutter base in substantially the plane of the adjacent ceiling or side wall surface to provide a bearing for a glass sheet extending past the flange into the recess, a substantially channel shaped face clip disposed within the gutter member and having its base connected with the gutter member base, a resilient arm on the face clip which is deflected by the glass when the face clip is inserted into the gutter member, a second resilient arm on the face clip disposed in spaced relation to the first named clip resilient arm, said first clip arm being between the second clip arm and said gutter wall flange, a face member having a web portion closing the opening in the gutter member between the glass and the opposite side of the recess, and means on the face member web portion extending inwardly of the recess for engagement with the first face clip arm and means on the face member web portion extending inwardly in engagement with the second clip arm to resiliently urge the face member against the glass sheet.

7. A metal sash construction as in claim 6 in which the face member web portion has a continuous outer surface in substantially the plane of the gutter member side wall flange.

8. A metal sash construction as in claim 6, in which the face clip is adjustably connected to the gutter member base for accommodating two or more thicknesses of glass.

9. In a recessed sash construction of the character described the combination of, a gutter member having a flange for positioning the glass sheet within the recess, a resilient clip mounted within the gutter member having a first arm extending outwardly away from the gutter base and for resiliently retaining by itself the glass sheet in position against the gutter flange and a second arm extending outwardly away from the gutter base, said first arm being between said second arm and said flange, and a face member resiliently held in assembled position with the gutter member by the arms of the clip independently of the engagement between the clip and the glass.

10. A recessed sash as described in claim 9, in which the face member overlaps one side of the recess and is resiliently urged by said second arm against the glass adjacent the opposite side of the recess.

11. The recessed sash as described in claim 10, in which the clip is adjustably mounted within the gutter member to accommodate at least two different thicknesses of glass.

12. In a sash assembly of the character described, a gutter member having a base and spaced arms extending from one face of the base, a flange on the first of said arms for positioning the glass sheet within the gutter member, a face member clip mounted upon the gutter member base and having a first arm and a second arm extending outwardly therefrom a spaced relation and spaced from the arms of the gutter member, the first clip arm being between the second clip arm and the flanged gutter member arm and resiliently retaining the glass sheet in position, and a face member extending between the unflanged gut-

ter member arm and the glass, said first clip arm having a lip extended toward the second gutter member arm, the second clip arm having a portion extending toward the first clip arm, said portion being closer to the gutter base than said lip, and said face member having a first flange and a second flange, the first flange of the face member having an offset portion for engaging said portion of the second clip arm and said second flange of the face member engaging the first clip arm.

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