Sept. 28, 1965 C. K. SITTERLY 3,208,564

WINDOW

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Fig. 1.

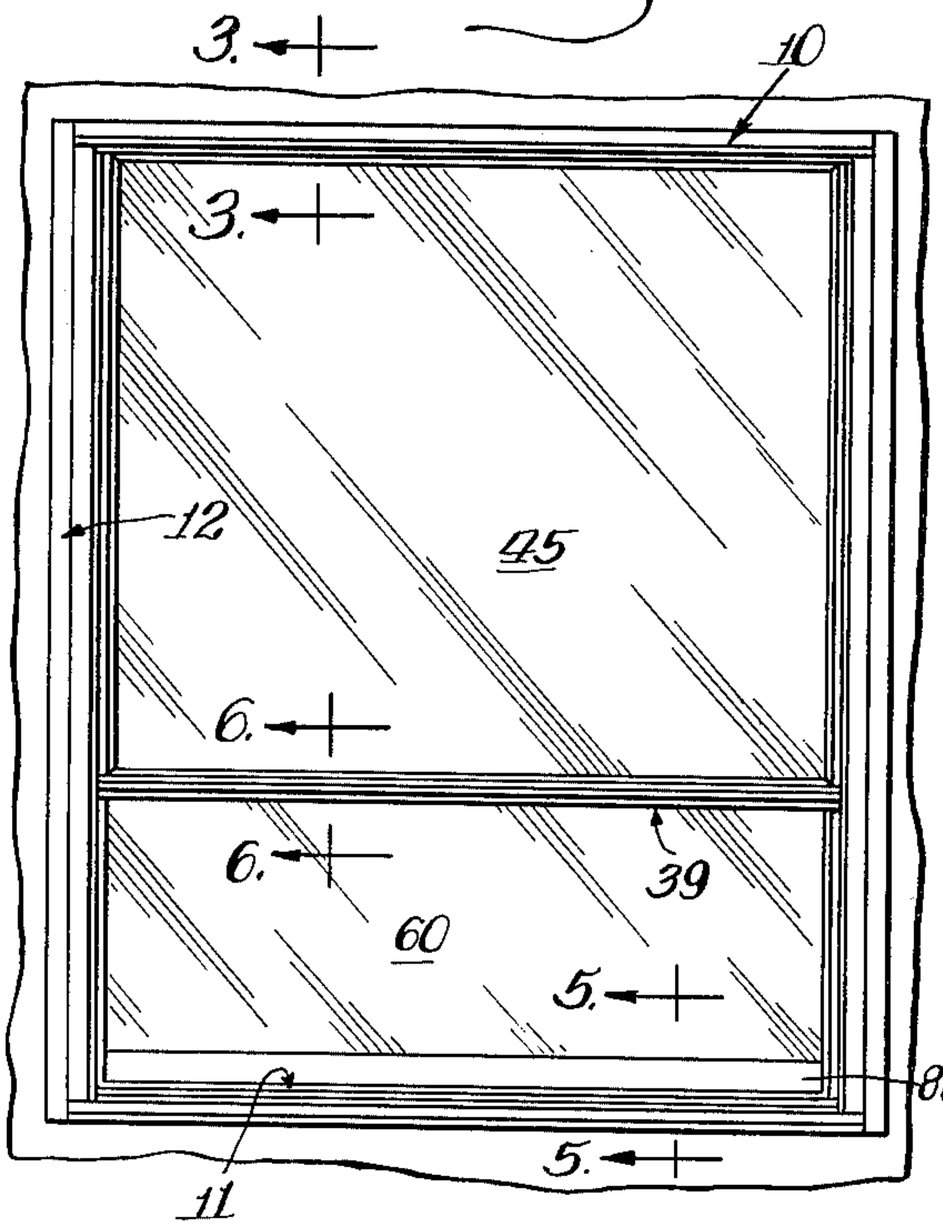


Fig. 2.

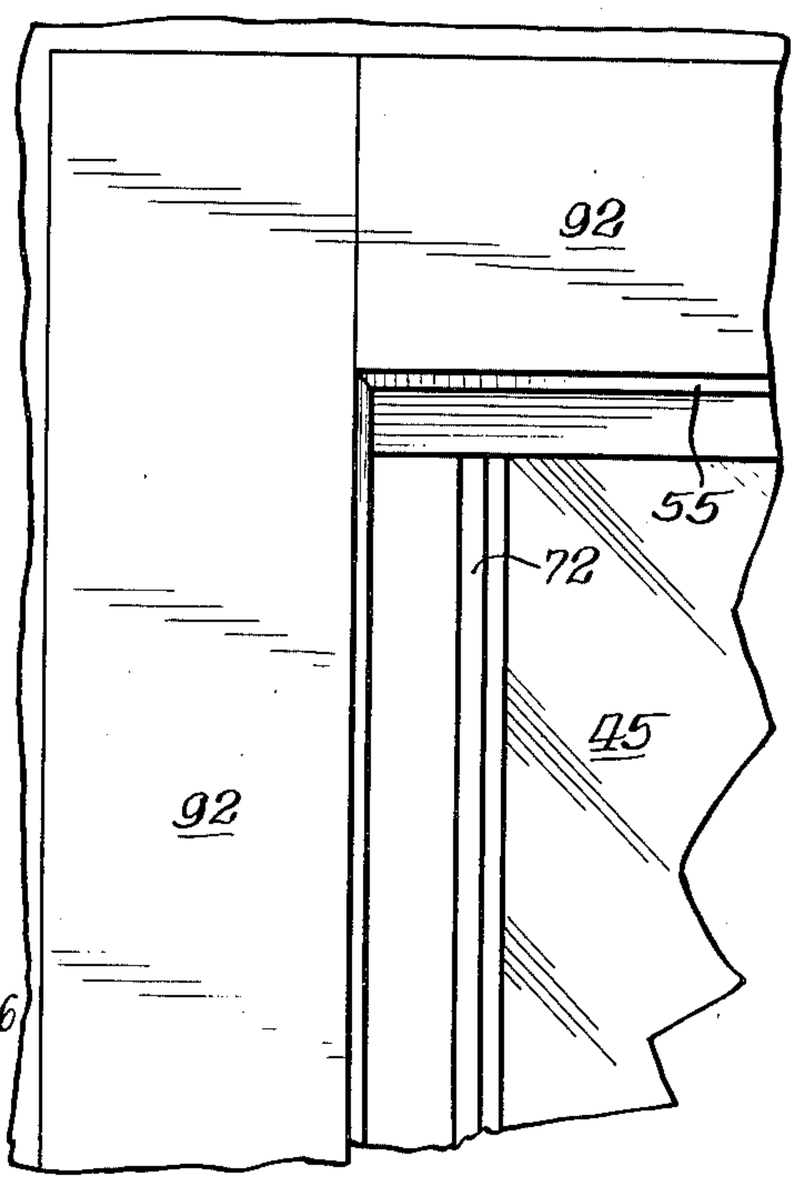
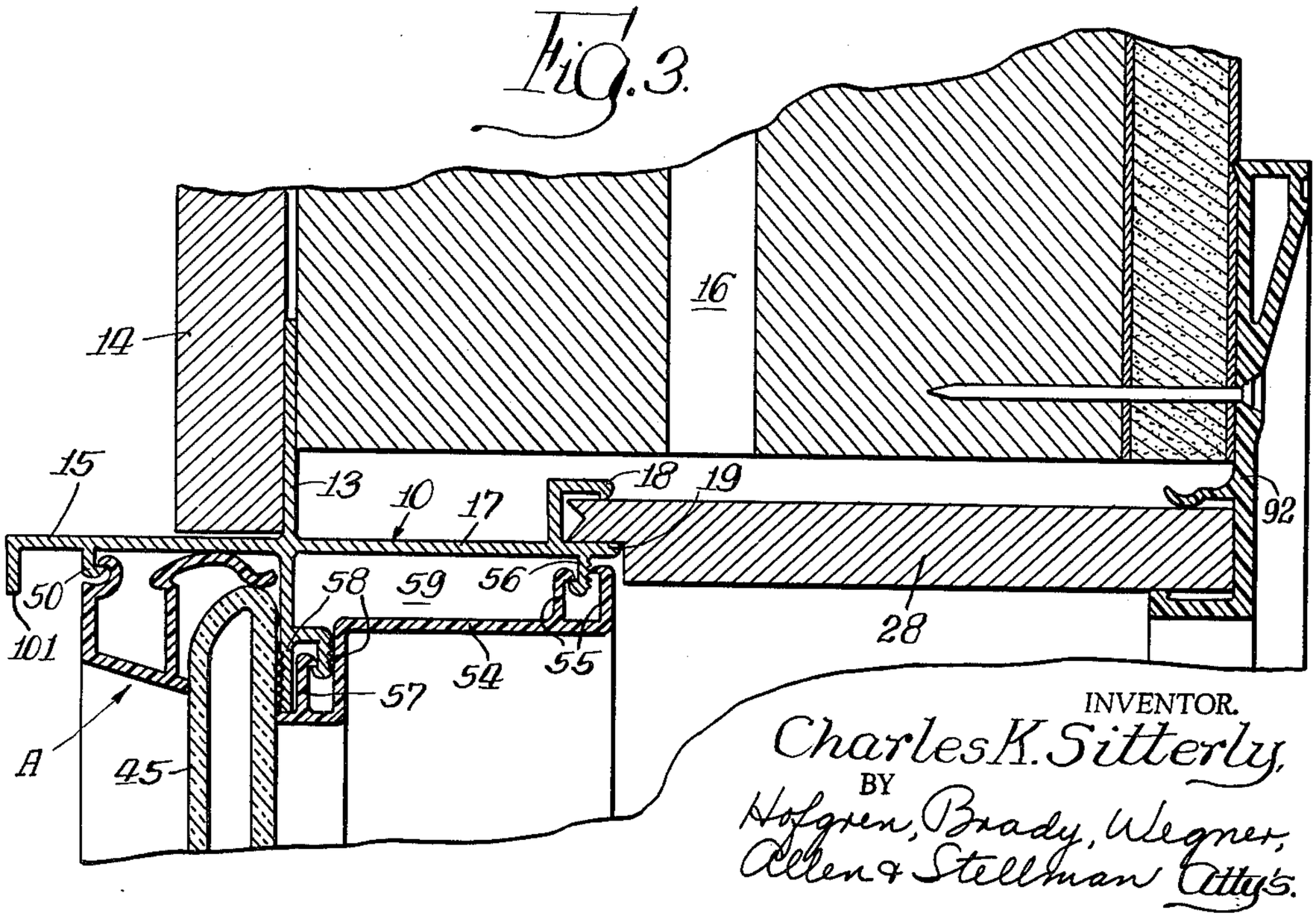


Fig. 3.



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Fig. 4.

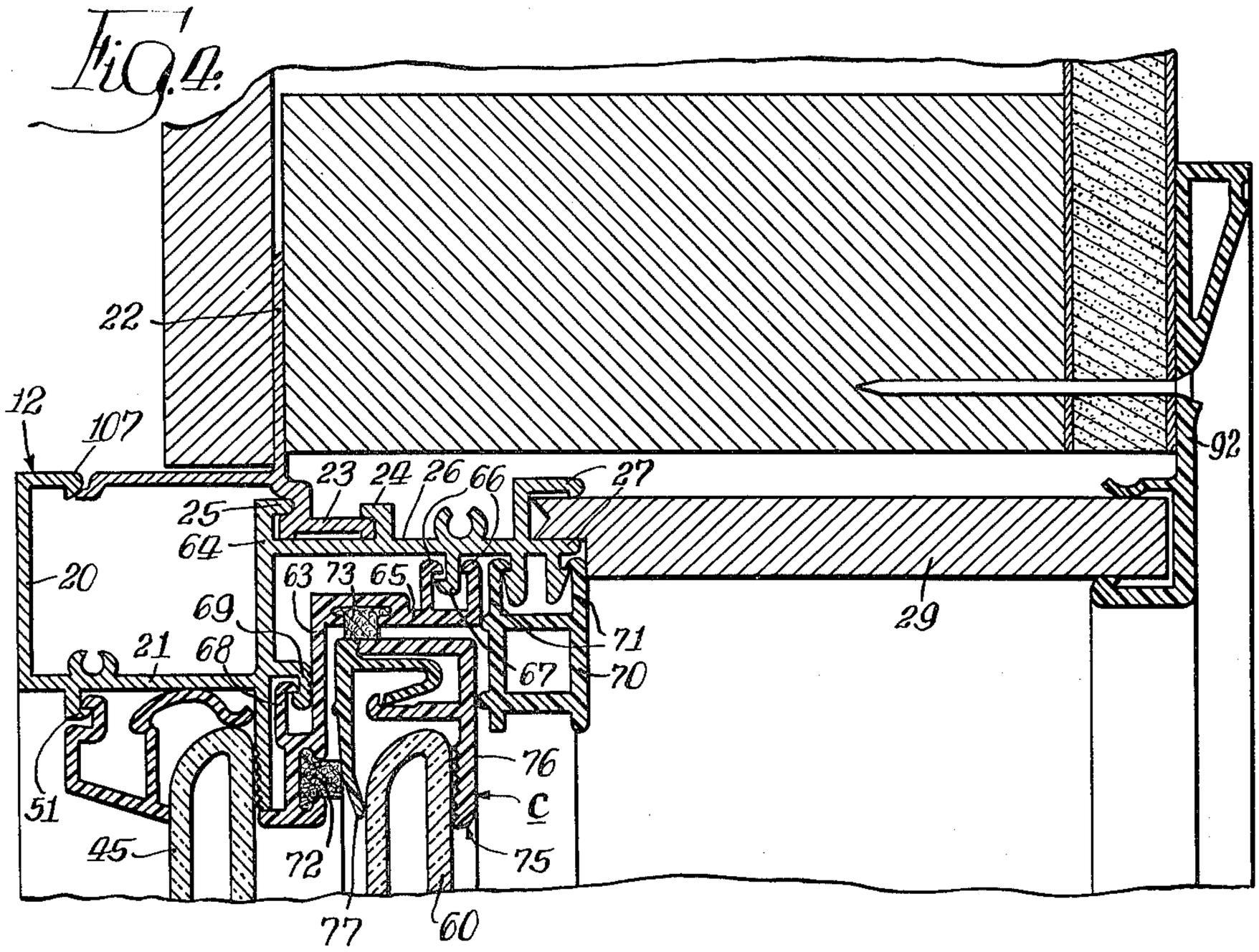
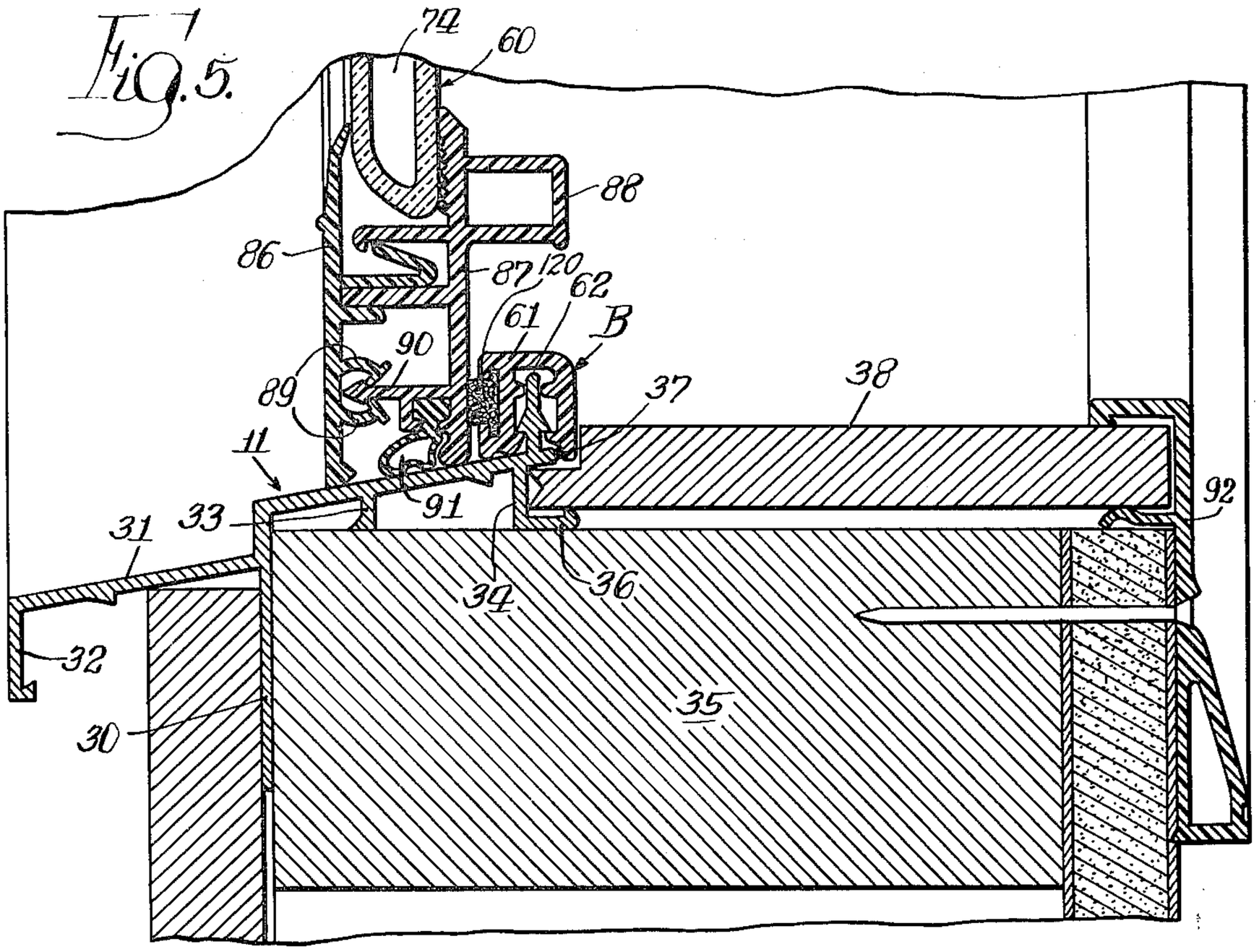


Fig. 5.



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Fig. 6.

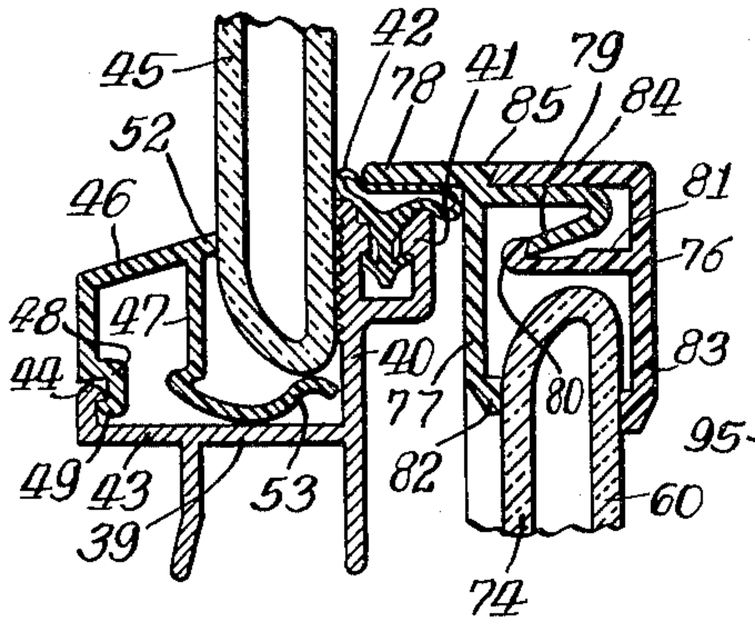


Fig. 7.

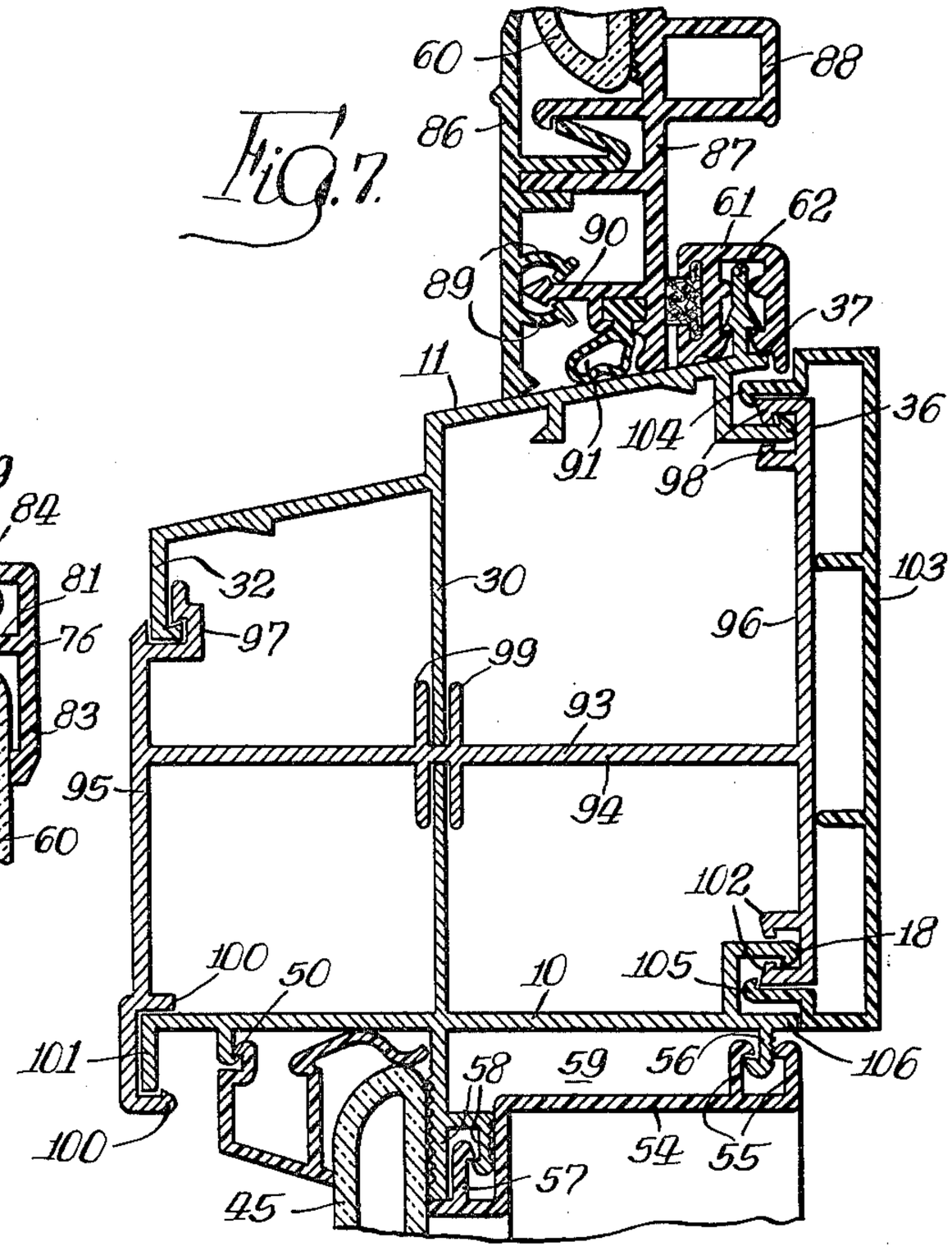
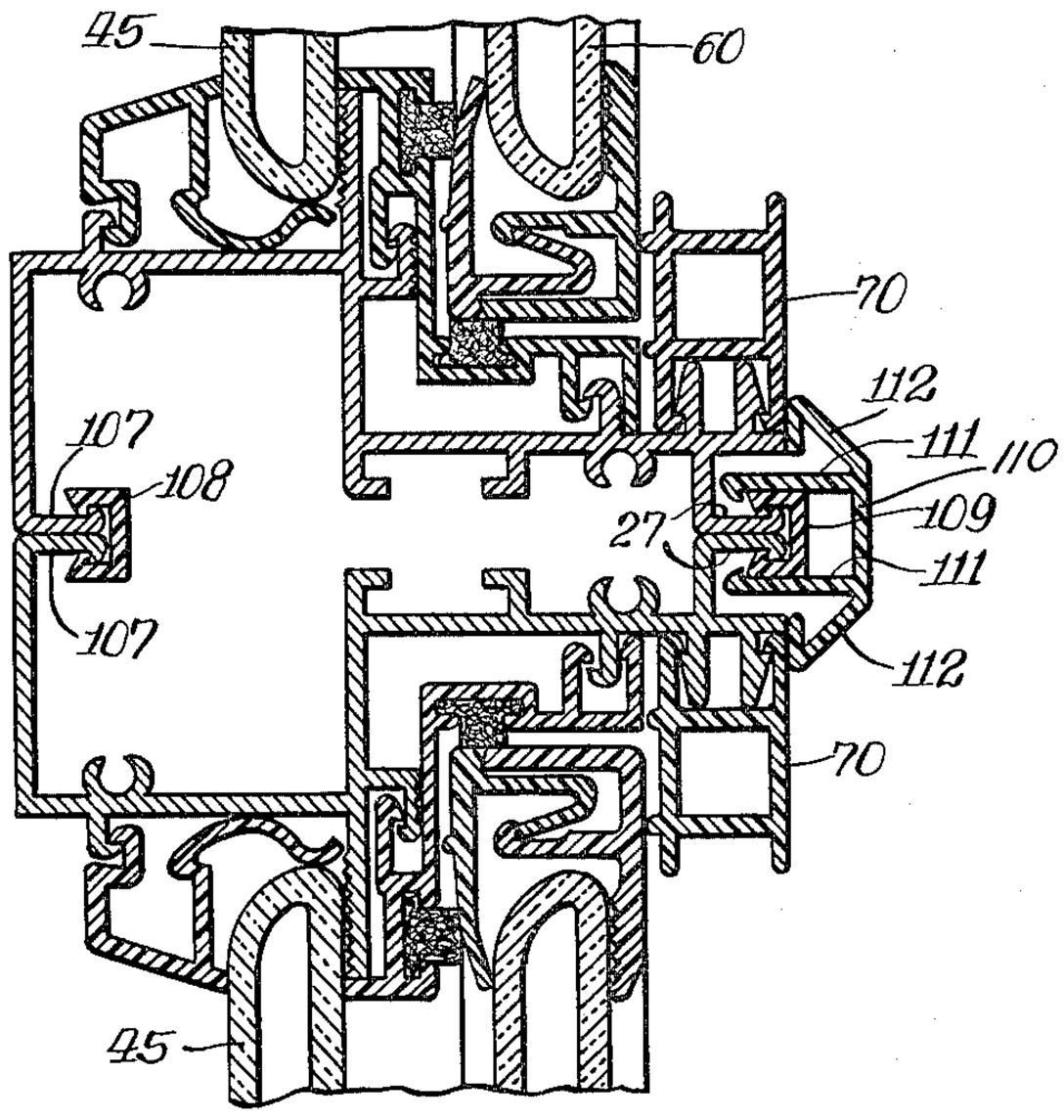


Fig. 8.



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3,208,564

WINDOW

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7 Claims. (Cl. 189—72)

This invention relates to a window, particularly a metal window of the type adapted to be located in buildings.

One of the principal disadvantages of metal windows is that during the winter the metal, of course, gets cold and condensate from room air moisture tends to form on the inside cold surfaces and damage wall covering, draperies, floor covering and the like. Furthermore, metal windows have a certain stark appearance because of the metal.

The window of this invention avoids these difficulties, as means are provided not only to substantially inhibit condensate formation on the inner surfaces but also to provide a better appearance in the window.

One of the features of this invention therefore is to provide an improved window construction having a better appearance and in which condensation of moisture during the cold winter months is either completely prevented or at least materially reduced.

Other features and advantages of the invention will be apparent from the following description of certain embodiments of the invention as shown in the accompanying drawings. Of the drawings:

FIGURE 1 is an elevational view of the exterior side of a window embodying the invention.

FIGURE 2 is an elevational view of the interior side of the window.

FIGURE 3 is a fragmentary sectional elevational view of the window and associated structure taken substantially along line 3—3 of FIGURE 1.

FIGURE 4 is a horizontal sectional elevational view through the window and associated structure with the sash partially raised in order that the section illustrates both the side construction of the sash and the side construction of the fixed glass.

FIGURE 5 is a vertical sectional view of the window and associated structure taken substantially along line 5—5 of FIGURE 1.

FIGURE 6 is a vertical sectional view taken substantially along line 6—6 of FIGURE 1.

FIGURE 7 is a vertical sectional view through another embodiment of the invention showing means for stacking two windows vertically.

FIGURE 8 is a horizontal sectional view through a third embodiment of the invention showing means for connecting two windows side-by-side.

In the embodiment shown in FIGURES 1–6, the window frame is made up of aluminum parts joined together to form a head rail 10, a sill rail 11 a pair of side jamb rails 12. Each of these rails is preferably of extruded aluminum construction and is provided with attaching means for attaching the frame to adjoining portions of the wall. Thus, as shown in FIGURE 3, the head rail has a vertical wind break 13 adapted to be located inwardly of an outside wall member 14 and an outwardly extending web 15 on the exterior of the wall 16.

The head rail 10 is also provided with an inwardly extending web 17 substantially coplanar with the outer web 15 provided on its inner end with a pair of parallel flanges 18 and 19 between which is positioned one edge of a wall surface member 28.

Each jamb rail 12, as shown in FIGURE 4, is constructed to have an outside box section 20 of generally rectangular horizontal cross section with this box section including an outwardly extending web 21 and a removable wind break. This removable wind break 22 has a foot flange 23 normally held between spaced brackets 24 and 25 having inturned edges adapted to retain the flange 23. As can be seen in FIGURE 4, the brackets 24 and 25 extend toward each other so that the foot flange 23 may be slid between them longitudinally to attach the wind break 22 in position. The brackets 24 and 25 are integral with an inwardly extending web 26 having on its inner end a pair of parallel flanges 27 adapted to receive one edge of a member 29 similar to the member 28.

The sill rail 11 is also provided with a wind break 30 similar to the wind breaks 13 and 22. The wind break 30 extends downwardly from the main portion 31 of the sill which is of outwardly and downwardly sloped stepped construction. The outer end of this sill is provided with a downward extending flange 32 while the inner end is provided with a pair of depending feet 33 and 34 adapted to rest on the subconstruction 35. The foot 34 is provided with a flange 36 spaced from the inner edge 37 of the rail in order to support one edge of a construction member 38 similar to the members 28 and 29.

As is shown in FIGURE 6, the window is provided with a transverse transom 39 also of aluminum with the transom including an inwardly, upwardly extending portion 40 provided with a forked construction 41 at the top to retain a sealing gasket 42. The transom 39 also has a horizontally outwardly extending portion 43 provided at its outer edge with an upwardly and inwardly extending hook 44.

The transom 39, side jamb webs 21 and head rail web 15 have a fixed window glass 45 located within the frame formed by these parts. In order to retain the fixed glass 45 in position, there is provided a plastics glazing strip 46. The glazing strip 46 is, of course, on the exterior side of the glass 45 and has a first portion 47 engaging the glass 45 and a second portion 48 engaging the above-described frame formed by the members 15, 21 and 39. This second portion 48 is provided with a hooked end 49 for engaging the hook 44 and similar hooks 50 and 51 on the members 15 and 21, respectively. The first portion 47 of the glazing strip 46 comprises two spaced parts 52 and 53, one of which 53 bears against an edge of the glass 45 and the other of which 52 bears against the side of the glass adjacent the edge. The parts 52 and 53 are distorted away from each other by the glass in order that firm holding pressure is applied to the glass. The two portions 47 and 48 of the strip are distorted toward each other when the glazing strip is in position in order that the resiliency of the plastics strip will apply holding pressure to the glass 45.

The various plastics parts of the window of this invention may of course be made from any weather resistant, solid, resilient plastics described and in a particular embodiment solid polyvinyl chloride is used.

In order to prevent or at least materially inhibit formation of condensate on the interior metal parts of the window in the winter from room air moisture, there are pro-

vided various cover members of low heat conductivity substantially entirely covering the interior side of the window. These cover members are joined to the metal members of the window at spaced areas of minor extent with the cover members being otherwise spaced from the metal members to provide heat insulating spaces therebetween. Such spaces maintain the cover members at a relatively warm temperature so that injurious condensate does not form even in the most severe winter weather.

As shown in FIGURE 3 the head rail **10** is provided with a plastics cover member **54** attached to the head rail at only the side edges of the cover member. In the embodiment shown the inner edge of the cover member **54** is provided with a pair of spaced parallel inwardly directed hooked flanges **55** with the hooks extending toward each other and adapted to engage the opposite sides of a headed metal flange **56**. The outer edge of the cover member **54** is provided with an inwardly directed hooked flange **57** adapted to be located between a pair of spaced parallel metal flanges **58**. The flange construction is such that the cover member **54** itself hides all of the flanges from view and the flanges not only fasten the cover member in place but also space the cover member to provide internal insulating space **59** between the head rail and the cover member.

Because of the insulating effect of the lower sash **60** it is only necessary to provide a relatively simple cover member **61**. This cover member is of channel construction and fits over a ribbed flange **62** on the inner end of the sill rail **11**.

The side jamb rails **12** are similarly provided with plastics cover members which not only insulate the inner portions of the metal window frame but also provide guideways for the vertically movable sash **60**. Thus, as shown in FIGURE 4, the cover member **63** is of right angle construction and arranged substantially parallel to the right angle construction of the web **26** and of the web **64** that forms the inner side of the box section **20**. The cover member **63** has one side **65** substantially parallel to the window frame web **26** and is provided with inwardly spaced substantially parallel brackets **66** with inwardly extending spurs engaging the opposite sides of a spurred flange **67** that is formed integrally with the web **26**. The opposite side of the cover member **63** is held by means of a web **68** provided with an inwardly directed spur cooperating with a spurred flange **69** that is integral with the side jamb **12**.

The inner end of the jamb is provided with its cover member **70** that is attached to the inner end of the jamb web **26** by means of a pair of parallel inwardly spurred cover member flanges **71** engaging similar flanges integral with the web **26** and located between the flanges **71**. The cover member **70** and cover member **63** cooperate to provide side guides for the sash **60**. Cover member **63** is provided with gaskets **72** and **73** preferably of felt to bear against the side and edge respectively of the sash to seal the sash and frame against penetration by outside weather elements.

The sash **60** includes window glass **74** which like the glass **45** is preferably of the thermal insulating type in which two spaced sheets of glass are joined together at the edges to form an insulating air space therebetween. The glass **74** is provided with a framing **75** enclosing the edges of the glass. This framing is also a plastics material as described above and is constructed of interlocking inner **76** and outer **77** parts that grip the edges of the glass therebetween. As is shown in FIGURE 6 the outer stile part **77** is provided with an inner end **82** that presses against the side of the glass **74**. This part **77** is also provided with an outwardly extending flange **78** that makes sealing contact with the gasket **42** on the transom **39** when the window **60** is closed. Extending inwardly of the flange **78** is a hook member **79** having a

lower end adapted to make locking engagement with a hook **80** on the outer edge of a flange **81** that extends outwardly from the inner stile part **76**. This inner stile part also has an inner end or flange **83** whose edge bears against the inner surface of the glass **74**. The hook member **79** on the outer stile part **77** is received between the flange **81** and an outer flange **84** also formed integrally with the outer stile part **77**. The outer end of this flange **84** bears against a step **85** on the inner stile part **76** so as to lock the two parts together. The flange ends **82** and **83** are distorted outwardly by their pressure against the sides of the glass **74** from their normal unstressed conditions so as to apply sealing pressure to the sides of the glass.

As can be seen in FIGURE 4, the sides of the framing **75** is substantially the same as the top, as shown in FIGURE 6, but with the omission of the flange **78**. Similarly, as shown in FIGURE 5, the bottom of the framing **75** is substantially the same as the top except for the extension of the inner and outer stile parts into parallel members **86** and **87** with the inner member **87** provided with an integral handle portion **88** and the outer member **86** provided with a pair of spaced inwardly directed arcuate flanges **89** adapted to receive the barbed inner end of a flange member **90** to lock the lower ends of the members **86** and **87** together. This flange member **90** also holds a gasket **91** for sealing against the top surface of the sill rail **11** when the sash **60** is closed. The cover member **61** on the sill rail **11** carries on its outer surface a gasket **120** also preferably of felt similar to the gaskets **72** and **73** and attached in a similar manner.

The inside of the wall **16** surrounding the window is framed by a plastics part **92** for both construction and decorative purposes.

As can be seen from the above description all interior metal parts on the room side of the window are covered by plastics cover members that not only provide a decorative appearance but are also spaced from the metal parts to provide an insulating space therebetween. The insulating effect of the cover members is not exactly understood but it is believed to be more than the mere provision of a dead air space. Observations have indicated that it may be that the cover members absorb heat from the room by radiation and convection and then project this heat by radiation into the air space between the metal and the plastics. This appears to set up a slightly warmer air bubble zone which has a positive internal pressure to prevent the passage or circulation of moisture laden room air. This explanation appears logical because it is noted that with the plastics cover member ice does not form in extremely cold weather on the metal parts that are covered by the cover members even when outside temperatures are many degrees below freezing. Similarly, ice and moisture do not form on the cover members themselves as the cover members are prevented from cooling below the dew point of the atmosphere.

As mentioned above, the cover members are preferably solid polyvinyl chloride. These members cover all metal parts of the frame which is preferably of aluminum that are exposed to the room. In addition, it is preferred that plastics glazing strips be used as described in order to present a pleasing appearance to the exterior.

FIGURE 7 illustrates how this window construction can be used to provide stacked units one on top of the other. In this embodiment a sill rail **11** is located above a head rail **10** and the two are connected together by means of a metal connecting member **93** preferably of extruded aluminum. This connecting member is provided with a horizontal base piece **94** having an outer vertical web **95** and an inner vertical web **96**. The upper end of the outer web **95** is provided with a locking groove section **97** receiving the lower end of the outer flange **32** to retain the outer end of the sill rail **11**. The upper end of the inner vertical web **96** is provided with inwardly spurred

upper and lower parallel flanges **98** for receiving the spurred flange **36**. This serves to retain securely the inner end of the sill **11**. The center of the sill is supported by providing upwardly extending parallel flanges **99** at an intermediate area with the connecting member **93** embracing the opposite sides of the bottom of the wind break **30**.

The bottom end of the outer vertical web **95** is provided with parallel inwardly extending flanges **100** the lowermost of which is inwardly spurred to retain in position the downwardly extending flange **101** on the outer end of the head rail **10**. The bottom of the inner vertical web **96** is provided with inwardly spurred flanges **102** similar to the opposite flanges **98** in order to receive the spurred flange **18** and thereby lock securely the inner end of the head rail **10**. This assembly is provided with its plastics cover member **103** that is locked in position at the top by means of an inwardly spurred outwardly extending flange **104** that is received between the upper spurred flange **98** and the inner end **37** of the sill. The lower end of the cover member **103** is provided with a similar outwardly extending spurred flange **105** that is held between the lower spurred flange **102** and the inner end **106** of the head rail **10**.

FIGURE 8 discloses an embodiment in which the adjacent side jambs of two adjacent windows may be attached together to form a side-by-side construction. In this embodiment the wind breaks **22** are removed to leave inwardly directed flanges **107**. When the two jambs are assembled in side-by-side relationship the two flanges are in contact with each other as shown in FIGURE 8. They are then locked together by means of an inwardly flanged channel member **108** of metal, preferably extruded aluminum. In this side-by-side relationship flanges **27** on the opposite sides of the jambs are similarly in contact with each other and locked together by a channel member **109** like the channel member **108**. Then to cover this inner side there is provided a cover member **110** of plastics material having inwardly directed spurred flanges **111** receiving and locked around the channel member **109**. The cover member **110** also has sloped side parts **112** extending toward and contacting the cover members **70**.

In the various figures used to illustrate the invention it will be noted that for clarity of illustration spaces have been left between certain of the parts. It should be understood, however, that this arrangement is used only for clarity of illustration and in actual practice the spaced parts will actually be in contact with each other.

Having described my invention as related to the embodiment shown in the accompanying drawings, it is my intention that the invention be not limited by any of the details of description, unless otherwise specified, but rather be construed broadly within its spirit and scope as set out in the accompanying claims.

I claim:

1. A window having an exterior side and an interior side, comprising: metal members joined together to form a frame having a head, side jambs, and a sill; a movable sash comprising a glass pane and a rigid plastics stile enclosing the edge of the pane and having side rails, a bottom rail and a top rail; and cover members of low heat conductivity covering the interior side of said frame, said sash moving within and in contact with said cover members to be guided thereby.

2. A window having an exterior side and an interior side, comprising: metal members joined together to form a frame having a head, side jambs and a sill; a movable sash comprising a glass pane and a rigid plastics stile enclosing the edge of the pane and having side rails, a bottom rail and a top rail; and cover members of low heat conductivity covering the interior side of said frame said sash moving within and in contact with said cover members to be guided thereby, certain of said cover members carrying gasket members against which said sash bears.

3. The window of claim **2** wherein means are provided for joining said cover members to said metal members at spaced areas of minor extent with the cover members being otherwise spaced from said metal members to provide heat insulating spaces.

4. A window having an exterior side and an interior side, comprising: metal members joined together to form a frame having a head, side jambs, a sill, and a transom; a movable sash comprising a glass pane and a plastics stile enclosing the edge of the pane and having side rails, a bottom rail and a top check rail carrying an outwardly extending ledge for making sealing engagement with said transom on closing of said sash, said stile including an outer part and an inner part each having a glass bearing portion and an interlocked portion for holding said parts in interlocked relationship; and cover members of low heat conductivity covering the interior side of said frame within which said sash moves, certain of said cover members carrying gasket members against which said sash bears.

5. A window having an exterior side for exposure to outside air and an interior side for exposure to inside air, comprising: metal members joined together to form a frame having a head, side jambs, and a sill; a connecting member joining the head of one frame to the sill of another frame to form a pair of stacked windows, said connecting member having interlocking connections to said head and sill; and a plastics cover strip covering substantially completely the interior sides of said head, sill and connecting member, said cover strip having interlocking connections to said head and said sill.

6. A window having an exterior side and an interior side, comprising: metal members joined together to form a frame having a head, side jambs, and a sill, said side jambs each having removable wind breaks on said exterior sides forming a part thereof; a first connecting member on said interior side joining the jamb of one frame to the jamb of another frame; a second connecting member joining the portions of the exterior sides of said jambs remaining after removal of the wind break on each of said jambs; and plastics cover strips covering the interior side of said jambs and said first connecting member.

7. A window having an exterior side and an interior side, comprising: metal members joined together to form a frame having a head, side jambs, a sill and a transom, said side jambs, head and transom having coplanar glass receiving surfaces on said exterior side; a glass pane having an edge and an outer side and retained against said head, side jamb and transom surfaces to cover the space therebetween; a flexible plastics glazing strip on the exterior side of said glass having a first portion engaging the glass and a second portion engaging said frame with the strip being stressed between said portions to hold the glass in said retained position, said first portion comprising two spaced parts one of which bears against said edge and the other of which bears against said outer side and both of which are thusly stressed to apply pressure against said pane and said second portion being provided with a catch engaging a cooperating catch on said frame to hold said glazing strip and thus said glass in position in the frame; a movable sash comprising a glass pane and a plastics stile enclosing the edge of the pane and having side rails, a bottom rail and a top check rail carrying an outwardly extending ledge for making sealing engagement with said transom on closing of said sash, said stile including an outer part and an inner part each having a glass bearing portion and an interlocked portion for holding said parts in interlocked relationship; plastics cover members of low heat conductivity covering the interior side of said frame within which said sash moves, certain of said cover members carrying gasket members against which said sash bears; and means for joining said cover members to said metal members at spaced areas of minor

extent with the cover members being otherwise spaced from said metal members to provide heat insulating spaces,

References Cited by the Examiner

UNITED STATES PATENTS

2,456,486	12/48	Berghoff	20—55
2,840,202	6/58	Hehr	189—75
2,701,041	2/55	Toth	189—78
2,711,232	6/55	Toth	189—75
2,795,306	6/57	Fey et al.	189—78
2,927,355	3/60	Rasmussen	189—75

2,996,845	8/61	Cipriani et al.	189—75
2,999,279	9/61	Lauer	20—56 X
3,071,215	1/63	Gall	189—34
3,080,023	3/63	Armstrong	189—64

FOREIGN PATENTS

771,181	3/57	Great Britain.
818,142	8/59	Great Britain.
551,636	11/56	Italy.

HARRISON R. MOSELEY, *Primary Examiner.*