May 16, 1961 G. VALLARELLI ET AL 2,984,299

PRE-FABRICATED WINDOW OR DOOR FRAME

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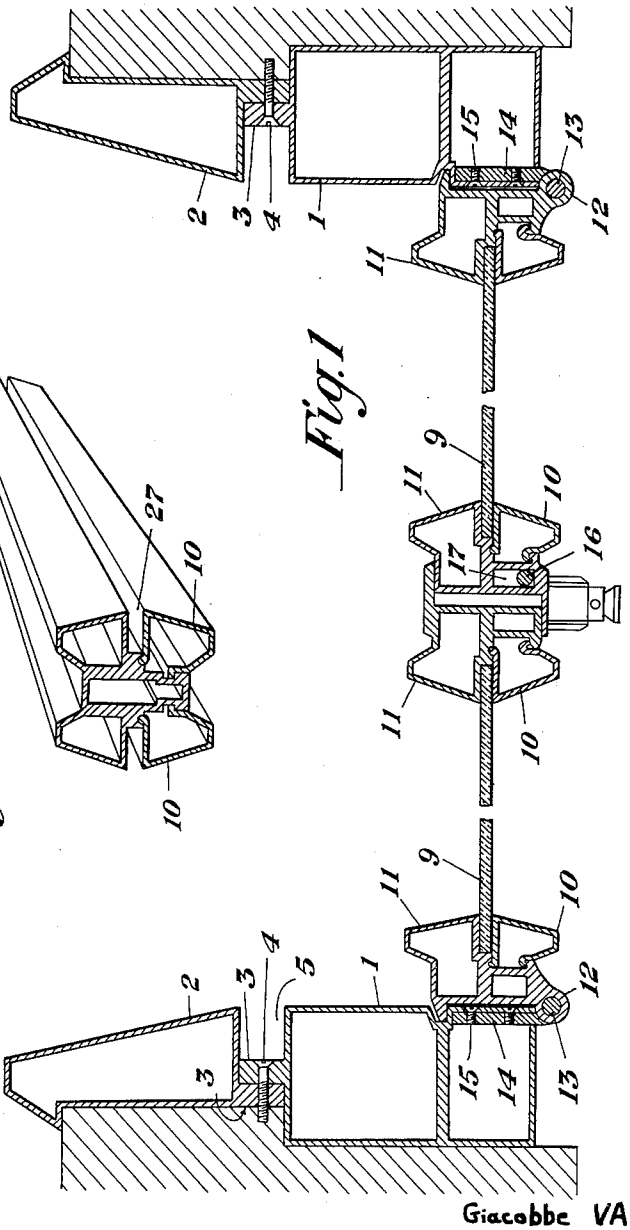

Fig. 1

Fig. 5

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PRE-FABRICATED WINDOW OR DOOR FRAME

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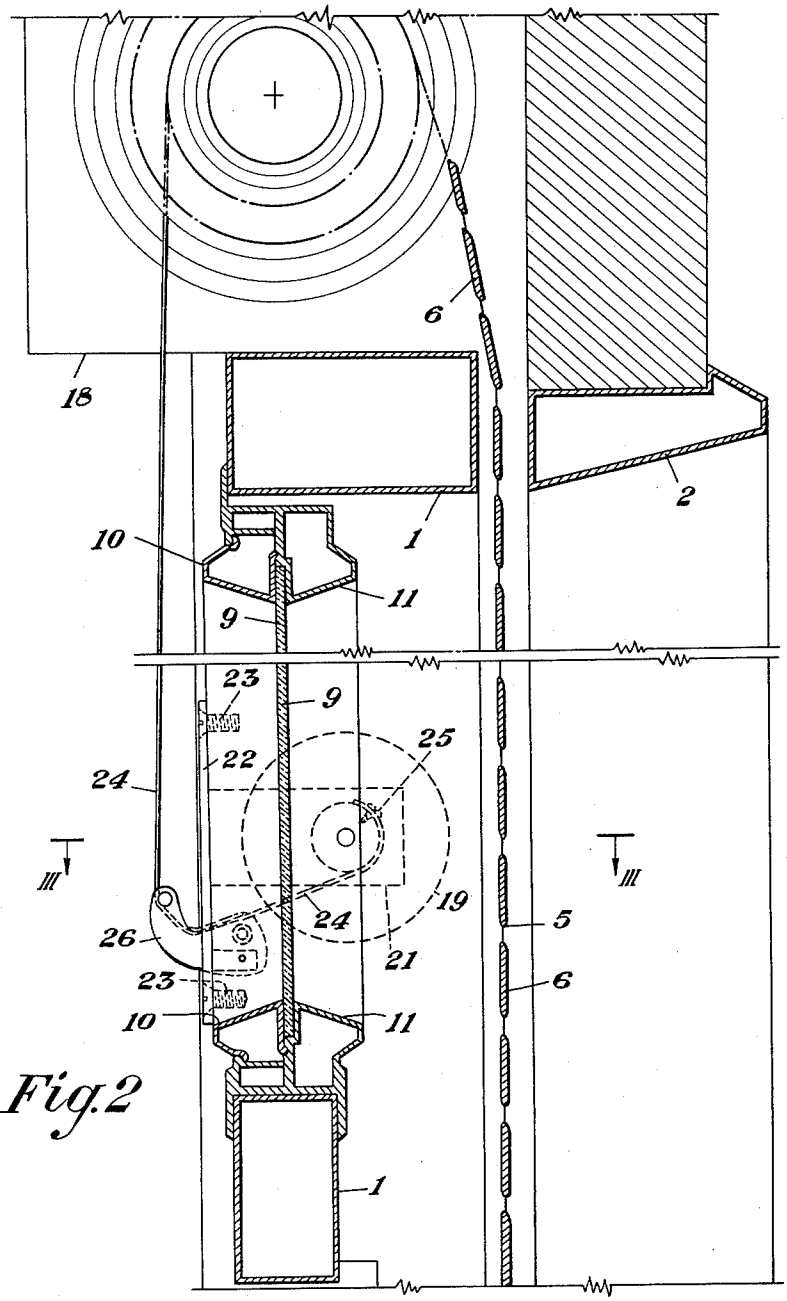

Fig. 2

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PRE-FABRICATED WINDOW OR DOOR FRAME

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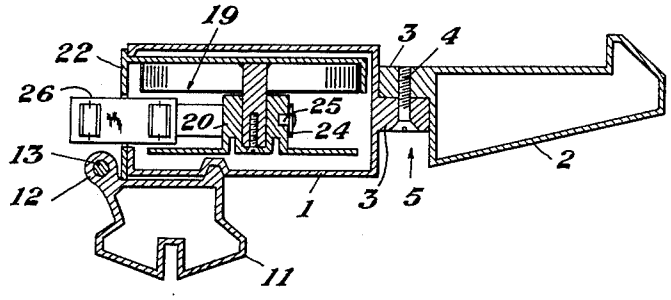
Fig. 3



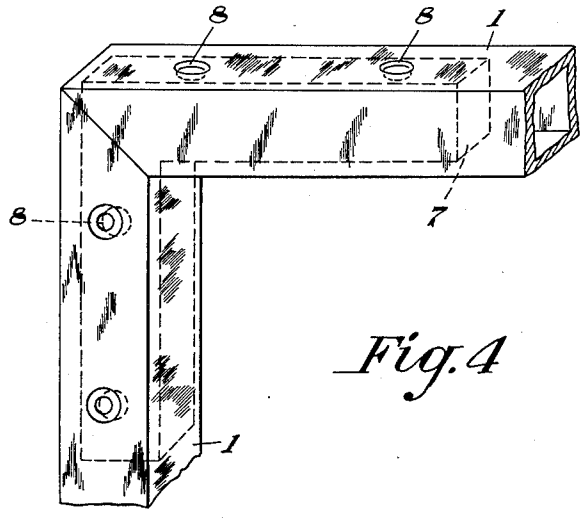


Fig. 4

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PRE-FABRICATED WINDOW OR DOOR FRAME

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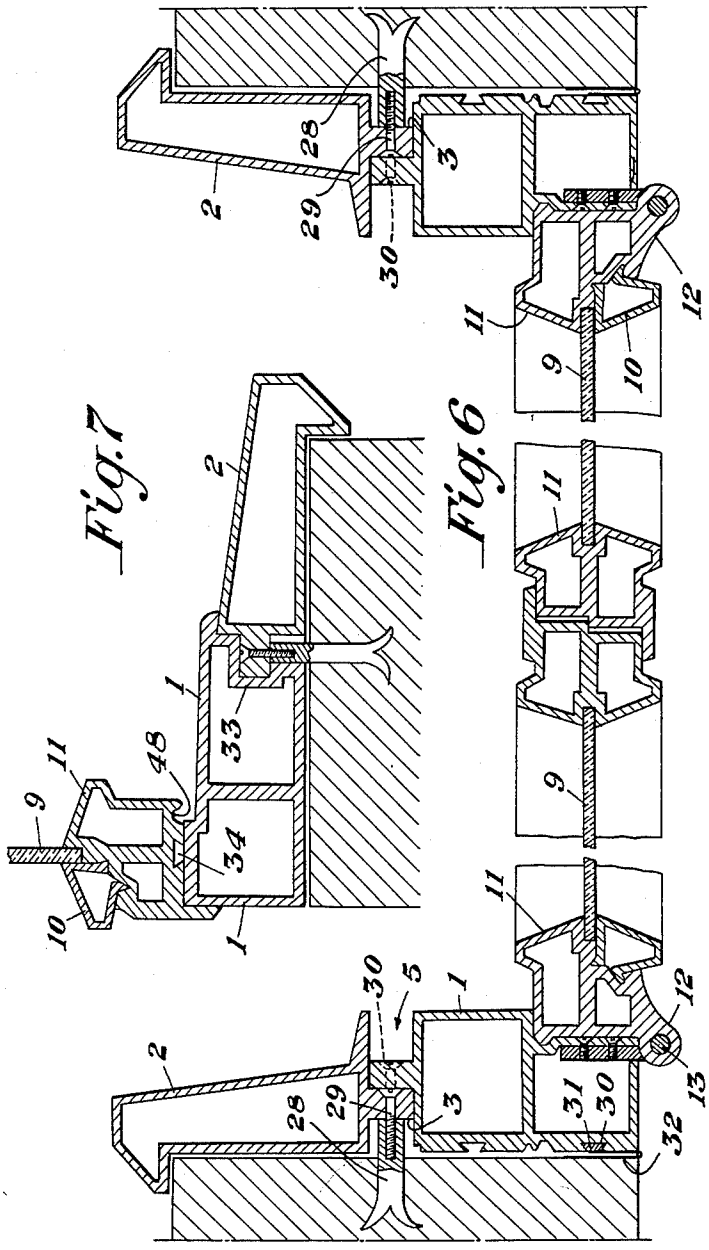

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May 16, 1961 G. VALLARELLI ET AL 2,984,299

PRE-FABRICATED WINDOW OR DOOR FRAME

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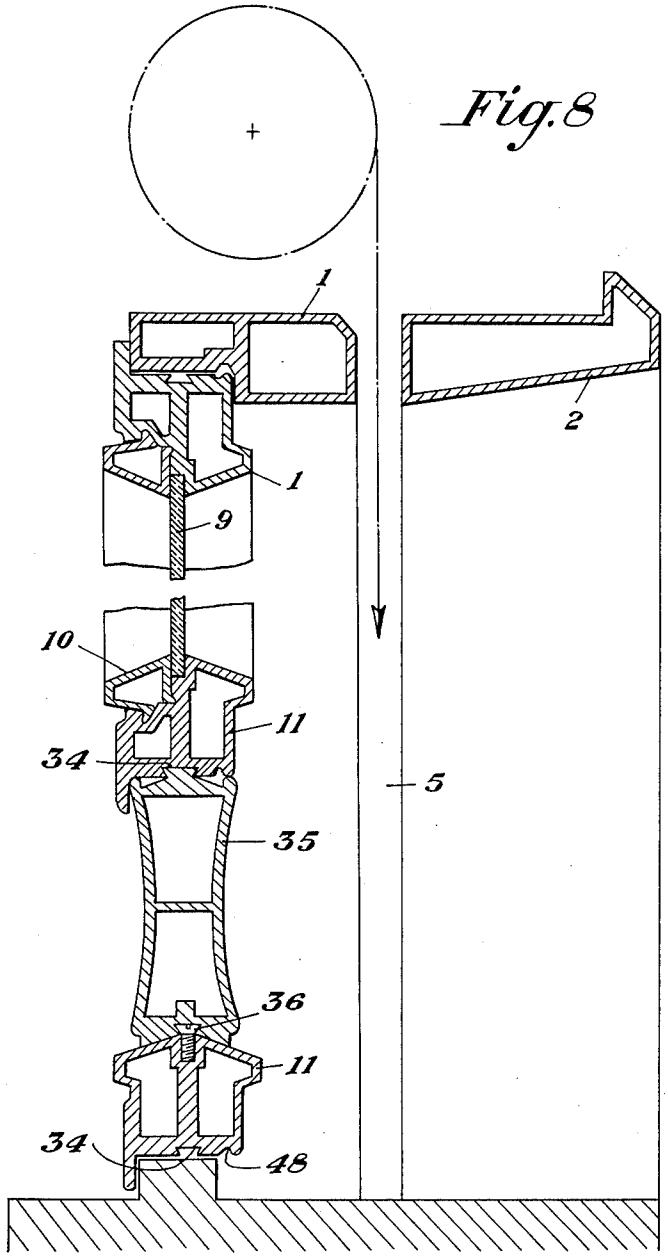
Fig. 8



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PRE-FABRICATED WINDOW OR DOOR FRAME

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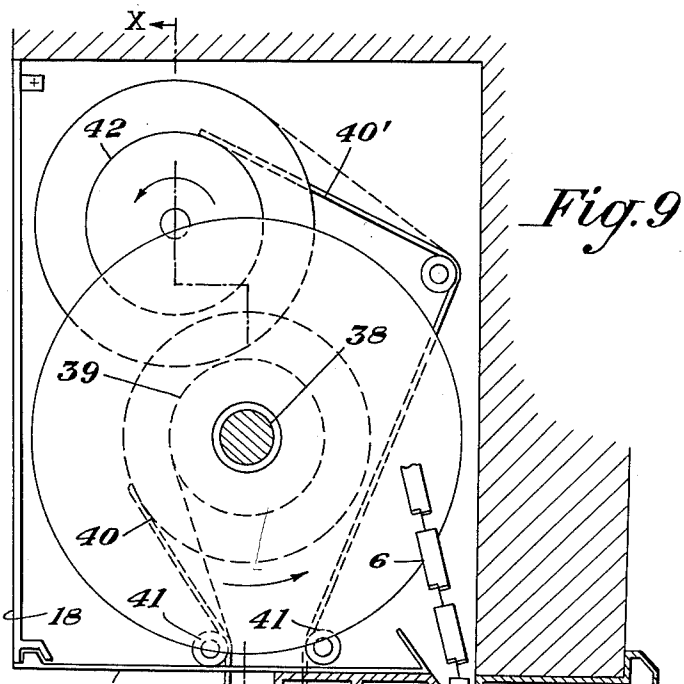

Fig. 9

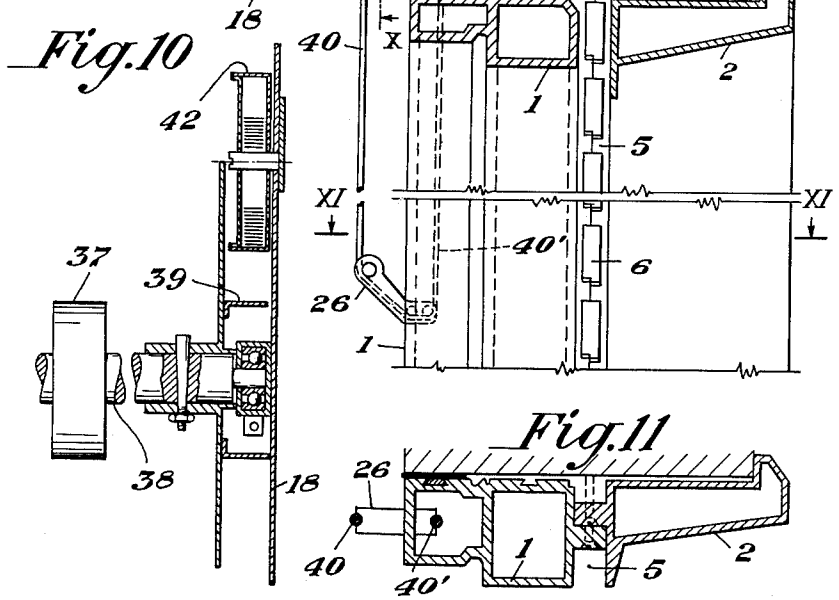

Fig. 10

Fig. 11

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United States Patent Office 2,984,299 Patented May 16, 1961

2,984,299

PRE-FABRICATED WINDOW OR DOOR FRAME

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Filed June 3, 1958, Ser. No. 739,526

Claims priority, application Italy June 12, 1957

11 Claims. (Cl. 160—26)

The present invention relates to a prefabricated frame, made of plastic material, suitable for forming a window or door frame, comprising the posts, the stationary and movable casements, and the roller blind, with the control members associated therewith, the several parts being united in a single unit.

The present industrial tendency in this art is to replace the wood which, as is known, was heretofore the sole material used to this purpose, by other materials which, avoiding the several drawbacks of the wood, will ensure the attainment of advantages which from the operative standpoint are of utmost importance such as for instance, strength, good weather-resistance, durability, indeformability under the effect of the weather, reduced weight, low cost of both installation and maintenance, and adaptability.

While it appeared that by resorting to the metal materials, such as iron and light alloys, the problem was provided with a satisfactory solution, it has since been found that some of these drawbacks are still present. It has therefore been proposed to adopt plastic materials which offer the advantage of affording all the advantages offered by the other materials, while avoiding their greater defects.

This industrial tendency was embodied in a type of window or door frame obtained by a molding technique; however this technique has both technical and economical drawbacks which, although not pertinent to this discussion, did not permit the problem to be considered totally solved.

According to this invention, a window frame is provided where all of the elements (main frame, posts, movable and stationary casements and other elements, such as bases, glass-clamps etc.) are extruded structural shapes made of plastic material, said shapes being connected at their corners by right angled members. Thus, window and door frames made of plastic material and having various dimensions, can be formed by cutting to the desired length a few types of extruded shapes. When using the molding technique it was necessary to substitute the whole mold to obtain different sizes, thus making the cost excessive.

The frame is comprised of two framing elements which are associated by inserting them into the window opening, from the outside and from the inside, respectively; the inner framing comprises the stationary jambs, the stationary and movable casements, as well as the casing with the roller blind and the associated control members, while the outer framing comprises the window sill with the associated abutment or outer slab. The guide for the roller blind is provided in the connection means for the outer and inner elements, while the hinges are formed by a member having a hole into which a pin is inserted which acts as a pivot for the casement.

This invention will be hereinafter described with reference to the attached drawings showing, only by way of example, one preferred embodiment of this invention.

In the drawings:

Fig. 1 is a sectional view taken in a horizontal plane of a frame according to this invention;

Fig. 2 is a sectional view taken in a vertical plane;

Fig. 3 is a sectional view taken in the plane III—III of Fig. 2;

Fig. 4 is a perspective view on an enlarged scale showing the connection of the extruded shapes at the corners of the frames;

Fig. 5 is a perspective view of an extruded shape of the frame according to this invention;

Fig. 6 is a sectional view, taken in a horizontal plane, of a frame similar to that of Fig. 1, but slightly modified;

Fig. 7 is a fragmentary sectional view of the frame of Fig. 6 taken in a vertical plane;

Fig. 8 is a sectional view taken in a vertical plane of the frame of Fig. 6;

Fig. 9 is a sectional view taken in a vertical plane of the casing containing the roller blind;

Fig. 10 is a sectional view taken in the plane X—X of Fig. 9, and

Fig. 11 is a sectional view taken along the line XI—XI of Fig. 9.

With reference to Figs. 1 and 2, the main frame **5** is comprised of the two different extruded framings **1** and **2** provided with the thick flanges **3** into which are inserted the screws **4** which directly fasten the unit to the masonry work. Thus a broad frame is obtained which avoids any need of pre-arranging stone posts, and the like, which are replaced by the plastic main frame.

The flanges **3** are so arranged that when they overlap in operative position, a channel-like passage **5** is provided between the opposed walls of framings **1** and **2** which forms the guide for the roller blind **6**.

The extruded shapes forming the side jambs, a sill and top girder of the frames are connected to one another as diagrammatically shown in Fig. 4. The extruded shape or member, for instance, the member **1** forming the inner stationary frame is cut at its exact length, then is cut at 45° and a rigid right angled member **7** made either of metal or of a suitable plastic material, is inserted into and fastened to the shaped member by means of screws or by a binding agent. Alternatively the notches **8** may be provided in the right angled member **7** and in register with said notches the shaped member is hot or cold deformed in order to firmly fasten the parts.

The glass **9** (Figs. 1 and 2) is arranged either by inserting same into the suitable channel guide, if existing, or by fastening said glass by resilient fastening members **10** having a resilient channel-shaped cross section the edges of which are resiliently engaged in recesses in casement forms **11** after the glass has been laid into the frame **11**.

The hinges are preferably made by an extension **12**, provided on the casement frame **11** having a cylindrical hole therein into which a metallic pin **13** is fitted, said pin being carried by the stem **14**, made either of metal or of suitably shaped plastic material, forming the stationary part of the hinges, said stem being fitted into spaced slots along the length of the frame **1** and fastened by the screws **15**.

The fastening devices for the windows can be key locks or vertical latches, or also rods **16** sliding in the hollow interior **17** of the posts.

The casing **18** containing the support members for the roller blind **6**, is an integral part of the window or door frame, i.e. said casing is mounted together with the inner frame **1**, while the control members are positioned within the stationary frame **1**, as shown in Fig. 3. The spring urged drum **19** and the winding pulley **20** thereon, are rotatably mounted on a stirrup **21** fastened to the plate **22** which is mounted on the frame **1** by means of the

screws 23. The control tape 24 is anchored to the pulley 20 by the screw 25 and the pawl 26 is rotatably mounted on the plate 22.

Fig. 5 shows a shaped member apt for forming a stationary post provided with the recesses 27 for the glass which is half in place by the fastening members 10 as already described.

Figs. 6 through 11 show a second embodiment of this invention and in said figures the above described elements are denoted by the same numeral references.

In this embodiment the outer frame 2 is directly applied to the masonry work, for instance by the dowels 28 engaged by the screws 29. The flange 3 of the frame 2 is then fastened to the corresponding flange of the stationary inner frame 1 by a series of screws 30 which are obviously staggered with respect to the screws 29. The outer surface of the frame 1 is provided with the recesses 30 into which a member 31 is inserted, said member 31 being provided with the resilient packing 32 protecting the joint.

The horizontal sill of the frame 2 (Fig. 7) is connected to the corresponding horizontal sill of the stationary frame 1 by engagement of the projecting flange 33. The horizontal sill of the movable casement 11 is provided with a longitudinal dovetail shaped groove 14 as well as with a recess 48 forming a drip gutter or for permitting a sealing packing to be inserted.

The joint 34 (Fig. 8) provides means for the mounting of a plinth element 35 which is connected at its lower portion to a second sill member, by the insertion of the heads of the screws 36 projecting from said shaped element, into the corresponding groove provided in the plinth element 35.

As aforesaid, the connection of the several shaped members to form the frame of the stationary part, of the side jambs and of the movable casements, is obtained by the insertion of a right angled member into the corners of the shaped members where they converge at said corners. Said right angled members or male elements, which may be made either of metal or of plastic material having a suitable strength, fit exactly into the shaped elements, and the parts are fastened by screws or by glueing or, should the right angled elements be provided with notches, the anchorage is obtained by a punching action which by distorting the outer surface of the shaped member, forces the latter to enter the notch and to remain therein, securing the involved parts.

Where the right angled members are made of plastic materials, the joint may also be obtained by welding, according to the known techniques for these materials.

The operating unit for the roller blinds (Figs. 9, 10 and 11) is provided with a casing 18 inside which is rotatably mounted the winding roller 37 for the roller blind 6. On the shaft 38 of the winding roller 37 is mounted a drum 39 to which is fastened one end of the control rope 40. This rope passes through a blocking device 26, of conventional form mounted on the main side jamb of framing 1, within which is received the upwardly extending run 40' which after having passed around the guide rollers 41 is fastened to the drum 42 which also is contained within the casing 18 and thereby supported.

The drum 42 contains a spiral spring which urges said drum in the direction of the arrow of Fig. 9. With such an operating unit, when the rope 40 is pulled down or is slackened, the roller blind 6 is raised or lowered respectively.

As stated in connection with the frame of Figs. 1 to 5, the casing containing the roller blind is arranged in the upper part of the unit and forms an integral part thereof, and is mounted together with this unit so as to form a single body. The casing is made of plastic material, preferably of the rolled type.

If projecting roller blinds are to be used, the guide channel arranged on both sides of the frame, instead of being made of plastic material and produced by the special

configuration of the shaped members forming the side jambs, is replaced by the usual metal channel, hingedly arranged according to known methods in the building art.

It is thought that the invention and its advantages will be understood from the foregoing description and it is apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing its material advantages, the forms hereinbefore described and illustrated in the drawings being merely preferred embodiments thereof.

We claim:

1. A prefabricated window frame assembly for a window opening in a wall of building material, comprising an outer framing and an inner framing, the outer framing having a rectangular shape and comprising two spaced side jambs, a sill connected across the bottom ends and a top girder across the top ends of said side jambs, the inner framing having a rectangular shape and comprising two spaced side jambs, a sill connected across the bottom ends and a casing across the top ends of the side jambs of the inner framing, each of the said framings being empty hollow elements of extruded rigid plastic material, the hollow elements forming the jambs of the said inner and outer framing each having a flange thereon extending longitudinally thereof, said flanges extending toward and overlapping each other, means in said flanges connecting them to each other and adapted to secure the inner and outer framing to the building material around the said window opening, the opposed walls of said elements forming the jambs of the inner and outer framing having the flanges thereon being spaced from each other to form a longitudinal channel adjacent to the said flanges, a roller blind in the said casing and extendable into and being guided by the said channel, supporting means in the said casing on which said roller blind is mounted, operating means for said roller blind contained in one of said hollow inner framing jamb members, and a sash associated with said inner framing and comprising two movable casements, one pivoted on each of the jambs of the said inner casing, said casements closing the space within the inner framing of said window frame assembly.

2. A window frame assembly as claimed in claim 1 in which said means for connecting said flanges comprises a plurality of screws connecting the flanges of the said inner and outer frame to each other, said screws being sufficiently long to engage in the building material defining the said window opening.

3. A window frame assembly as claimed in claim 1, in which said means for connecting said flanges comprises a first plurality of screws in the flange of said outer framing for fastening the flange of the said outer framing to the building material around the said window opening, and a second plurality of screws in said flange on said inner framing connecting the flange of the said inner framing to the flange of the said outer framing.

4. A window frame assembly as claimed in claim 1 wherein the outer framing and inner framing further comprise corner connecting members at each of the corners where two hollow elements join each other, said connecting members being extruded right angled plastic members having a cross section corresponding to the cross section of the inside of the said hollow elements forming the said framings, said right angle member extending into the hollow interiors of two hollow elements abutting at right angles to each other at the corners of said framings, said right angle members being welded to the said hollow elements.

5. A window frame assembly as claimed in claim 1, in which the outer peripheral walls of the hollow elements forming the jambs of the inner framing each have a groove therein and an elastic packing in the grooves for engagement with the building material defining the window opening.

6. A window frame as claimed in claim 1 wherein

each of the movable casements is formed with two vertical and two horizontal frame portions connected to each other to form a rectangle, each of the said horizontal and vertical frame portions being hollow and being of extruded rigid plastic material.

7. A window frame assembly as claimed in claim 6 in which each of the said vertical and horizontal frame portions has a longitudinally extending abutment thereon for receiving a plate of glass and further has two longitudinally extending recesses one of which is adjacent to the said abutment, and fastening members having a resilient channel-shaped cross section and having longitudinal edges resiliently engageable in the said recesses for keeping the glass pressed against the said abutment for the glass.

8. A window frame assembly as claimed in claim 6 in which the lower horizontal frame portion of each of the said movable casements has a longitudinal dovetail groove therein facing the inner framing and receiving a plinth element, and a second lower frame portion on the bottom edge of each plinth element and having a downwardly and outwardly opening groove therein for receiving a sealing packing.

9. A window frame assembly as claimed in claim 1 in which each of the said movable casements has hinges thereon comprising extensions on said casements spaced along the length thereof each having a cylindrical hole therein, and in which the hollow elements forming the jambs of said inner framing each have slots therein spaced from each other along the length of said jambs distances equal to the distances between said extensions, and a stem having a metallic pin thereon extending into each of said cylindrical holes, said stems extending into the said slots, and screws fastening said stems to the inner face of the said hollow element forming the jamb of the inner framing.

10. A window frame assembly as claimed in claim 1 in in which the operating means for the roller blind contained in a jamb of the said inner framing comprises a plate fixed to the jamb, a stirrup carried by the said plate, a spring urged drum rotatably mounted on the said stirrup, a winding pulley mounted on the said stirrup adjacent and fastened to the said spring urged drum, a strap fastened at one end to the periphery of the said winding pulley, a blocking device for the said strap rotatably mounted on the said plate.

11. A window frame assembly as claimed in claim 1, the operating means for the roller blind contained in the said casing comprise a shaft rotatably mounted on the two end walls of the casing, a winding roller for the roller blind mounted on the said shaft and rotatable therewith, a first drum mounted on and fixed to the said shaft and spaced from said winding roller and in tangential alignment with the said winding roller, a second drum containing a spring urging the second drum to rotate in a predetermined direction, said second drum being located in superposed position with respect to and spaced from the said first drum, a blocking device rotatably mounted on one jamb of the said inner framing, a controlling strap for the roller blind and having one end fixed to the periphery of the said first drum, said strap coming out of the said casing downwardly, abutting the said blocking device and going up again inside the jamb of the said inner framing and into the said casing with the other end fixed to the periphery of the said second drum, and guide rollers located inside said casing in predetermined positions guiding said strap along the path thereof.

References Cited in the file of this patent

UNITED STATES PATENTS

1,781,401	Lane	Nov. 11, 1930
2,119,685	Peremi et al.	June 7, 1938
2,562,105	Lang	July 24, 1951
2,614,665	Floyd	Oct. 21, 1952
2,709,489	Keebler	May 31, 1955
2,743,795	Taubman	May 1, 1956
2,753,603	Strawther	July 10, 1956
2,893,070	Gauthier	July 7, 1959