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(54) Metallic blind formed by assemblable components.

(57) The aluminium extrudet sections and the mutual connecting means both fixed or mobile as per the invention, allow an easy assembling of a blind with tilting slats, inserting it in the span of a common standard aluminium frame for glass windows or glass doors or glass skylights, without the use of screws rivets and other common connecting means.

The perimetral section 1 of the blinds are all exactly alike and remain locked in the housing formed by the battens (15a) of the frame (15) of the glass door, without possibility of being removed, owing to the pressure exerted by the pins of the coupling boxes 3 when inserted in the holes 12b of the cog-wheel of the rack boxes 11, due to the matching of the battens 1d, against the battens 15a of the frame 15 itself forming the housing for the glass.

The connecting means, that is the coupling boxes and the rack boxes, are made of extruded plastic.

The system can, however, be built with any materials other than aluminium or plastics.

The system does not depend on the dimension of its components, however, in a particular execution suitable to the standard aluminium frames for glass doors or glass windows the dimensions of the sections and of the slats are

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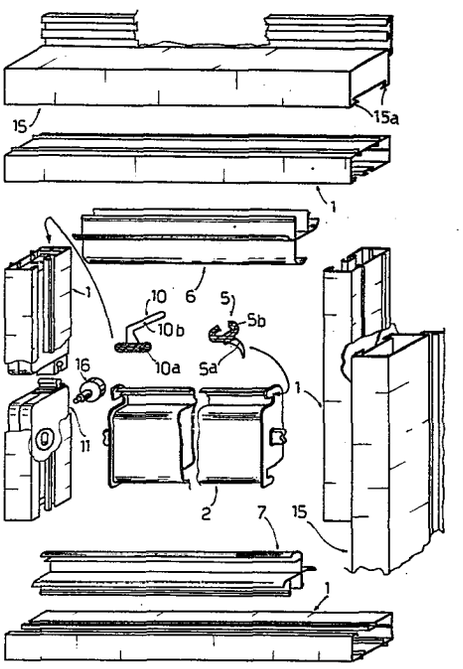

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arranged in such a way so that the only dimension requiring the cutting of the sections be that which regards the inner width of the frame 15.

The adjustability to the internal height of the frame 15 itself can be, in fact, obtained by applying the compensating section. The invention also provides for the application of slats in which the interruption of the thermic conduction is obtained.

Metallic blind formed by assemblable components.

The object of the invention is a metallic blind, in preference aluminium alloy blind to be mounted in the span of the metallic frame of a glass door or a glass window or a skylight, formed by an assortment of assemblable metallic extruded sections and connecting devices and having slats adjustable in a preferred and,if necessary,lockable position.

There are two groups of parts wich compose a metallic blind with slats adjustable in a preferred position.
A first group includes the metallic extruded sections and related accessories necessary to build both the metallic frame to be fixed in the opening of the masonery and the metallic frames forming the mobile wing of the blind, to be hinged to the aforesaid fixed frame or to be durably fixed to itself.
A second group of elements includes the slats and all those other parts wich are necessaries to form the blind and to adjuste and to lock the slats in the preferred position.

Actually to mount blinds of the aforesaid type in a mobile metallic frame, is necessary to unhang the frame itself and to insert in itself the blind using connecting means as screws, weldinds and so on.

These operations require persons skilled in the art, various equipements and waste of time; consequently, the cost of the metallic blind are high and their use is restricted.

An aim of the present invention is to supply a set of metallic extruded sections and connecting and assembling means of the aforesaid sections by wich it be possible to rapidly mount a blind furnished of slats to be locked in a preferred position and suitable to be inserted in the slots where are inserted the glasses of a wingframe of a glass window, or of a glass door, or skylight, without employing any further connecting means besides the ones as the before mentioned

An other aim of the present invention is to furnish a blind with tilting slats, to be mounted and inserted by the user itself, in the aluminium frame of a glass window or a glass door of the standard type.

A further aim of the present invention is to furnish both to the manufacturers concerned and the users a set of aluminium extruded sections and of connecting means and special devices wich allow the manufacturing of blinds of whatever dimensions, only by cutting the extruded sections in the proper lenght.

A furter aim of the present invention is to furnish an aluminium blind whose assembling technology is such as to be included as a main component of the design of the blind itself.

Still a further aim of the present invention is to furnish a device to connect in series with other equal devices, to rotate the slats of a blind from 0° to 180°, suitable to be applied to windows or door frames of any height and capable to block the slats in the closed position by adding suitable means.

A further important aim of the present invention is to furnish assemblable blinds with aluminium slats of the type in

which there is an interruption of the thermic conduction. Finally, a further aim of the present invention is to furnish a set of aluminium extruded sections and fittings made of plastic, of standard measures, to insert in the metallic frame of glass windows or glass doors or skylights of any size. The aforesaid aims and other more, may be obtained with the blind object of the invention, which is described in details below with reference to the drawings which illustrate only one specific embodiment, in which:

Fig. 1, is an exploded view of the blind in accordance with the invention;
Fig. 2, is an external view of the blind;
Fig. 3, is an external view of the blind with slats in the open position;
Fig. 4, is the cross section XX of Fig. 2;
Fig. 5, is the cross section YY of Fig. 2;
Fig. 6, is the cross section X'X' of Fig. 3;
Fig. 7, is the cross section Y'Y' of Fig. 3;
Fig. 8, is the perimetral extruded section;
Fig. 9, are the fixed upper and lower slats;
Fig.10, is the compensating extruded section;
Fig.11, are slats with coupling devices;
Fig.12, is an exploded view of the coupling device 3;
Fig.13, is the insertion of the rack devices;
Fig.14, is an exploded view of the rack device;
Fig.15, is an exploded view of the slat with interruptions of the thermic conduction.

The blind has been studied so as to be inserted in the normal frames of glass windows or glass doors made by extruded aluminium sections having, for example, thickness from 40 to 50 mm. and marketed as mass products under different names,

but it can be adapted also to frames of different thickness.
It is composed by the following parts;

1) a set of aluminium alloy and plastic rigid material extruded sections;
2) a set of extruded plastic material gaskets;
3) a set of fitting made of pressed plastic materials.

The first set is composed in detail by:

- the perimetral extruded sections 1 with a longitudinal opening 1e in whose interior 1a there are two longitudinal spacers 1b; the section is also furnished of one longitudinal slot 1c for the insertion of light and wind seal gasket 10 and, on the esternal surface, of two longitudinal spacers 1d.
- the slats 2 having one longitudinal hollow 2a and along one longitudinal edge forming slot 2b, the hollow 2a to contain, at both ends,the coupling devices 3 containing the pins 4 to engage in the hole 12b of the rack devices, the slot 2b to contain the gasket of extruded plastic material as light and wind seal in between slats.

The slats, in the preferred embodiment, have a pitch of 60 mm.

- The sections of the two fixed terminal slats, that is the superior 6 and inferior 7, to be spring inserted in the longitudinal hopening 1e of the respectively superior and inferior orizontal perimetral sections: the section 7 forms a 7a slot to insert gasket 5 for light and wind sealing.
- A slat of type with interruption of the thermic conduction, formed by two aluminium semi-slats 8a and 8b and an intermediate plastic section 8c, which have a pressure lock connection through insertion of the longitudinal fin 8b1 in the slot 8c1 of the plastic section and of the longitudinal fin 8a1 in the slot 8c2 of the same section 8c section 8b forms also a slot 8b2 in which the gasket section 5 is inserted.

In the preferred embodiment, these slats have a 60 mm. pitch.

- A compensating section 9, of 10 mm. thickess, to be inserted in the two superior and inferior orizontal sides of the window frame before applying the perimetral section 1, to allow, in the preferred embodiment, the recovery of the eventual centrimetres of the height of the frame which are not covered by the slats wich can only cover window frames having an hight multiple of 60 mm.

The second set of elements is formed by the gasket 10 made of the aforesaid extruded material, with rigid 10a base and flexible 10b fin to be inserted in the 1c slot of the perimetral section 1, to be mounted vertically.

Alternatively, to this gasket can be used a normal seal brush of commercial standard.

The coexstruded gasket section 5, is provided with a rigid 5b base and a flexible 5a fin to be also inserted in the longitudinal slot 8b2 of the slats having thermic interruptions.

The third set is formed by plastic auxiliary components obtained with a pressing process, that is by:

- Rack devices 11 to cause the rotation of slats 2 throug the pins 4, each made of two plates 11a perfectly identical and coupling each other through simmetrical spring joints. Each rack contains one sector 12 of a cog-wheel and a rack bar 13 placed respectively in their proper housing 11a1 and 11a2, the cog-wheel 12 made one with the mub 12a which itself, in its interior, is axially piercede in such a may as to form a hole 12b, frustum of cone shaped.

The rack is completed at one end by an head-shaped appendix 13a and at the other end by a slot 13b of the same shape of the said appendix, in such a way it be possible to connect in series several rack devices to form a single long rack.

Coupling devices 3 for each mobile slat, respectively symmetric so as to be inserted on both ends of the slat itself,

which are both also formed by two equal parts, 3a and 3b coupled by pegs 3b3 to insert in the holes 3a3 of the part 3, each device containing a tapered pin reactioned by a spring 14.

Spring 14 has the function to push the pin through the hole 3c1 outwards from the device, to insert it in the frustum of cone shaped hole 12b in the mub of the cog-wheel 12.

Each coupling device 3 is one with a stop-plate 3c which has the function to plug the end of the slat and, when the said slat is in a vertical, that is closed position, to compress the gasket 10 towards the vertical perimetral metallic section 1 which contains it.

The coupling devices which are inserted in the 2a hollow of the normal slats, may also be inserted in the 8c3 hollow of the intermediate plastic section of the slats 8 after removing the edge 3a1 of the plate 3a and 3b1 of the plate 3b.

The plates 3a and 3b are also provided with clefts 3a2 and 3b2 to make easier the support of spring 14.

Closing plugs respectively at the right and left end of the fixed terminal slats and blocking plugs applied to the ends of the vertical perimetral metallic section to block the rack boxes and avoid sliding of the rack when this is in use.

The assemblings of the elements composing the blind is achieved first by inserting the four perimetral sections which are all the same, after having cut them to measure with a cut orthogonal to the longitudinal axis, between slide battens 15a of section 15 which forms the frame of the glass-window or glass-door so that spacers 1d meet with the said battens 15a producing the fitting of perimetral sections 1 in the frame 15 itself.

For this purpose, first, the two orizontal superior and inferior elements should be mounted so as to fill the whole width of

the frame span and, successively, the two vertical elements in which have already been inserted the rack devices 11 mutually connected by inserting end 13a in the slot 13b of the contiguons bars and, at the ends, the bloking plugs of the same rack devices.

The vertical perimetral sections are fixed to the frame 15 without the use of fixing screws or rivets because of the pressure exerted by the spring pins 4 mounted in the coupling devices 3 inserted in the hollow 2a of each end of the directional slats 2 pressure that is exerted when the same pins have been inserted in the holes 12b inside the cog-wheel mub 12 mounted in each rack devices.

The orizontal perimetral sections remains, also, connected to the frame of the window frame without the use of fixing screws or rivets, because of the matching against the cross area of the said vertical sections ends.

The slats 2 are applied after having mounted the terminal superior and inferior fixed slats respectively 6 and 7 in the longitudinal opening 1e of the perimetral slat 1 and after having applied the blocking plugs to both ends.

The rack devices 11 allow to obtain any lenght of rack and, therefore, are adjustable to window frame that may have different heights: in the preferred embodiment, the rack bars 13 also have a lenght of 60mm.

The rack device can be operated through a knob 16 to be inserted in the threaded hole 13c of the rach bar, so as to rotate the cog-wheel 12 sector which forces the slat jointed to it throug the conical pins 4, to rotate around its own axis.

Because of the easy assembling of a set of rack devices, it is sufficient to operate one of the elements which compose the set itself, to action the corresponding cog-wheel of all

the other racks and therefore their respective slats.

The invention may differ from the described execution only because of the variation in the dimension of the elements which compose the blind and in the use of different materials.

Infact, nothing witholds from building the blind with materials other than aluminium or plastic, for example, stainless steel, if one wants to build burglar-proof blinds or blinds for any other applications.

In the favourite version, the dimensions of the sections are exactly rounded up to the centimetre; the dimensions of sections 1 are mm. 20x40, while those a,b,c, of the slats are respectively mm. 72, 58, 44.

The metallic slats 2 can be substituted by plates made of glass i.e. armoured glass slats 2/1,or slats mabe by other materials as, for example, wood or stratified plastic rolled sections.

In this embodiment, the coupling device of Fig. 11 is modified as in 3/1 so as to include one end of the slat 2/1.

The knob 16, in its turn, can be substituted by a device 17 as illustrated in Fig. 14, operated by means of a handle 17a, lockable in the preferred position through the small peg 17b, that operates the rack bar 17c to apply to the rack 13, by inserting the pin 17d of square cross-section in the hole 13c: so it is impossible to rotate the slat from outside.

In a further embodiment, the knob to rotate the slats, may be substituted by a lever to connect to the coupling device 3: in this whay it is avoided the cut 1f on the section 1, necessary to consent the slide of the pin of the knob 16 or of the pin 17d of the device 17.

Claims:

1. Metallic blind formed by assemblable components particularly suitable for insertion in the inside of the aluminium frames of a glass window or a glass door fixed or mobile, made by standard sections that is of commercial production, characterized by a perimetral section 1 valid for both vertical and orizontal sides, by a single section 2 to form the slats, by section 6 and 7 of fixed slats to be inserted respectively in the opening 1e of the superior and inferior sections 1, by a compensating section 9 to form the blind if the frame 15 has a height which is different from that of the perimetral frame of the blind, by means for the rotation of the slats consisting of a rack device formed by a set of rack boxes 11 to be inserted inside both perimetral vertical sections 1, each rack box being supplied with a cog-wheel sector where there is a frustum of cone hole 12b for the insertion of the tapered pin 4 of the coupling devices 3 to be mounted in each end of each slat 2, the abovesaid coupling pins 4 having also the function to block the perimetral vertical sections between the slide battens 15a of the glass frame 15 fixed or mobile, through a pressure that a spring 14 inserted in each coupling device 3, exertes on the corresponding pin 4, as well as longitudinal gaskets, end plugs to block the racks in the sections 1 and other secondary accessories.

2. Metallic blind as claimed in claim 1, characterized in that its assembling does not require the use of screws, rivets or other connecting means, but it is obtained only through reciprocal contrasts generating between its elements because of the pressure exerted by pins 4 on the vertical sections 1 when the blind is inserted in the inside of the frame of

glass window, glass door or sklight and for the insertion of the two battents 1d between the two battens 15a of the frames of the said glass window or glass door, so as to remain joined together.

3. Metallic blind as claimed in previous claims,characterized in that it can be built also with other materials different from aluminium and plastic, as for example steel.

4. Metallic blind as claimed in previous claims, characterized in that the directional slats can rotate in a range from 0° to 180°, choosing a cog-wheel sector of a variable angle between 0° and 180°.

5. Metallic blind as claimed in previous claims,characterized in that it can also use slats in wich there are one or more interruptions of the thermic conduction.

6. Assembling rack to be inserted inside the perimetral section device 1, each characterized by:

a) a box 11 formed by two plates 11a exactly alike;
b) a cog-wheel sector 12 complete of a coaxial hole for the insertion of a locking pin 4 of the coupling device 3;
c) a rack bar 13 for the rotating of the said cog-wheel,the same bar being complete at one end of an appendix 13a and at the other and of a slot 13b of the same shape, to allow a reciprocal connection of more rack-bars.

7. Coupling device 3 to be applied at both end of each blind slats 2, each characterized by a plate 3c of shape similar to the cross-section of the said slat, jointed to a plate 3a orthogonal to it complete of a rectangular cleft 3a2, to

which can be pressure coupled another plate 3b of the same shape, through small pegs 3b3, the devices containing a spring 14 and a pin 4 moved by the said spring for the coupling in the corresponding hole of the rack device 11.

8. A blinds slat in wich thermic conduction is interrupted, characterized in that it is formed by two half slat 8a and 8b each complete of fins 8a1 and 8b1 for insertion in the corresponding slots 8c2 and 8c1 of a plastic intermediate section 8c, the hollow 8c3 of the same intermediate plastic section capable of coupling at the two ends to the said coupling boxes 3 provided for the standard slat 2 after having removed the appendices 3a1 and 3b1 of the box 3 itself.

9. Metallic blind as claimed in claim 1, characterized in that the coupling device 3 may be of the type 3/1, illustrated in Fig. 11, in such a way as to include, one end of a slat of type 2/1, i.e. a plate of solid material as glass, plastic and so on.

10. Metallic blind as claimed in claim 2, characterized in that the sliding of the rack 13 may be executed through a knob 16 or a device 17 furnished of a handle lockable in a prefered position or by means of a lever to apply to the coupling devices 3 or 3/1.

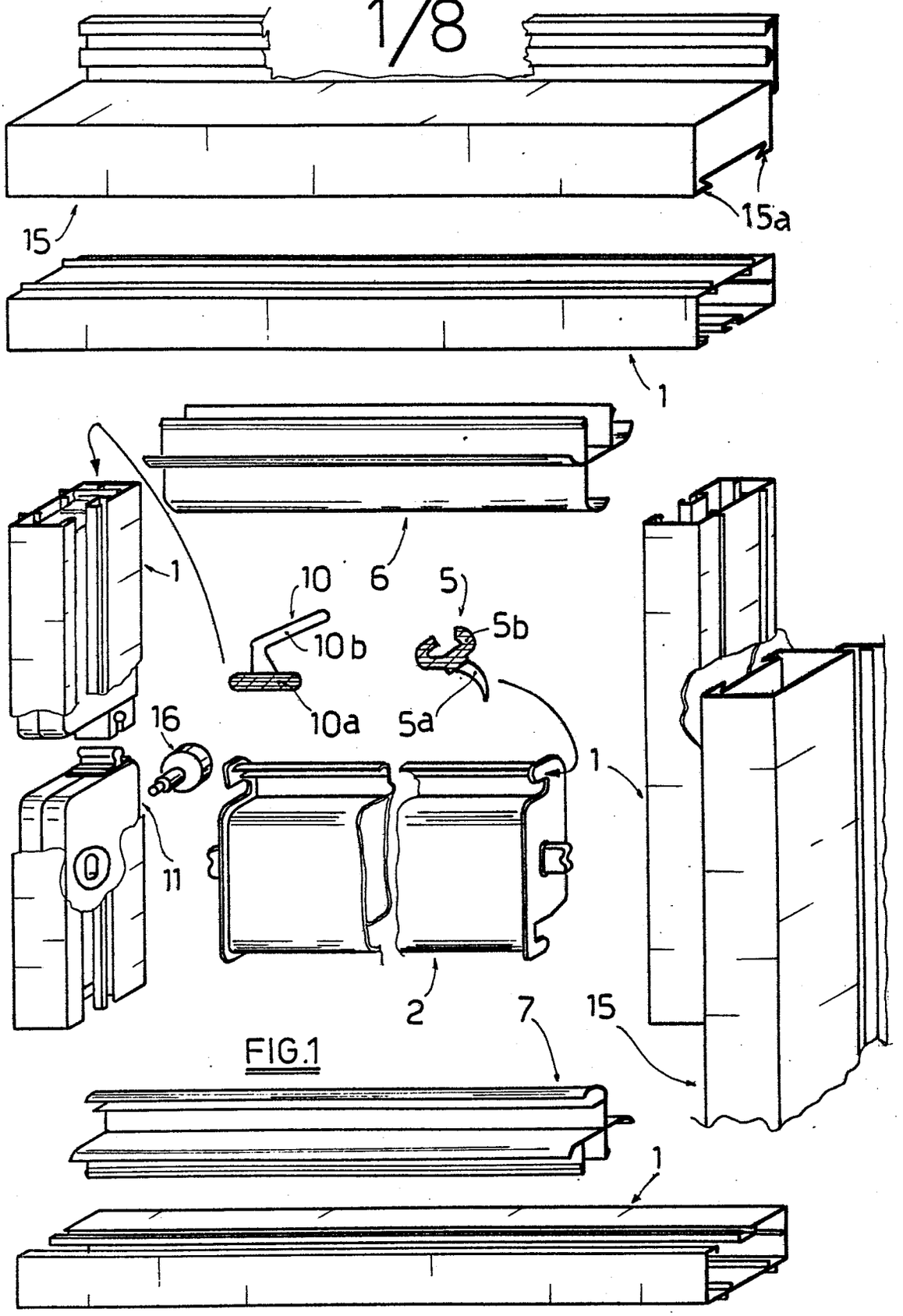


FIG.1

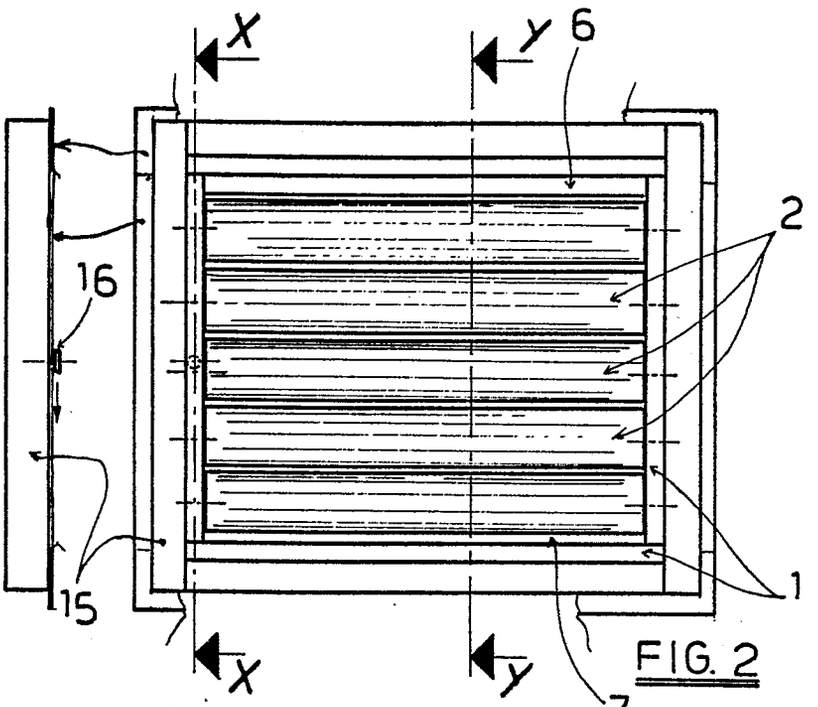


FIG. 2

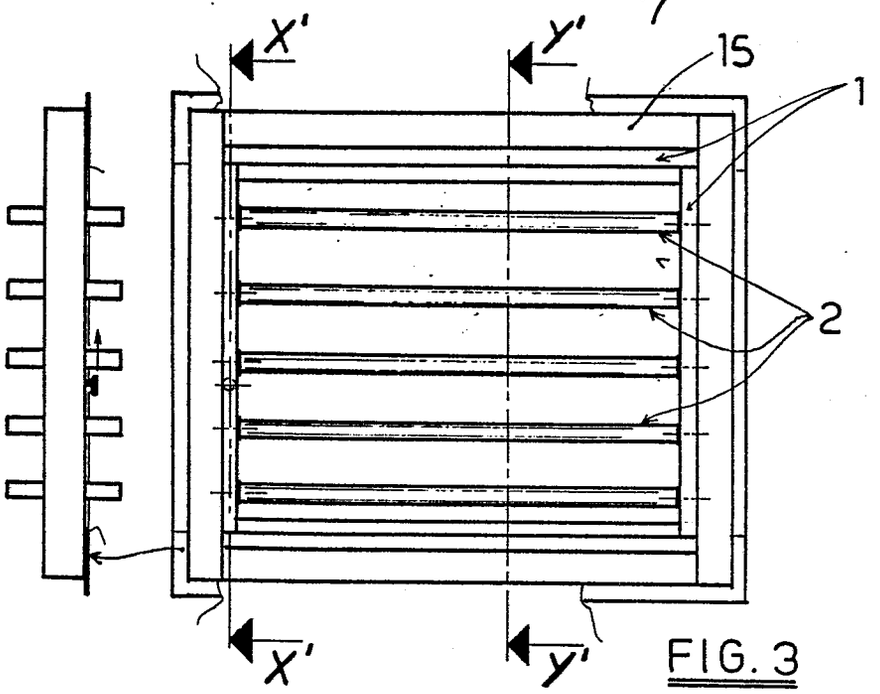
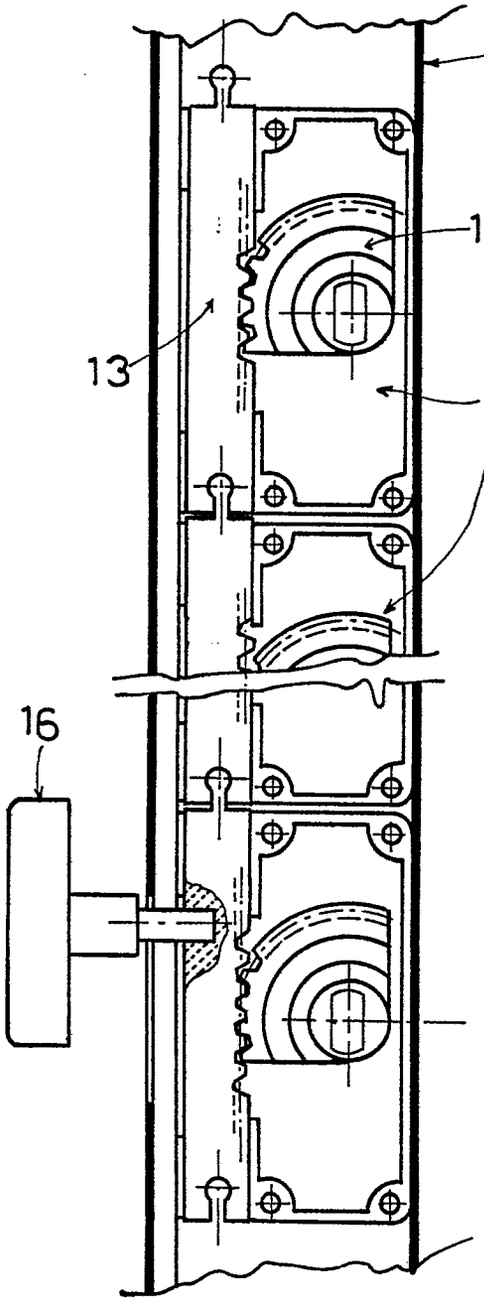
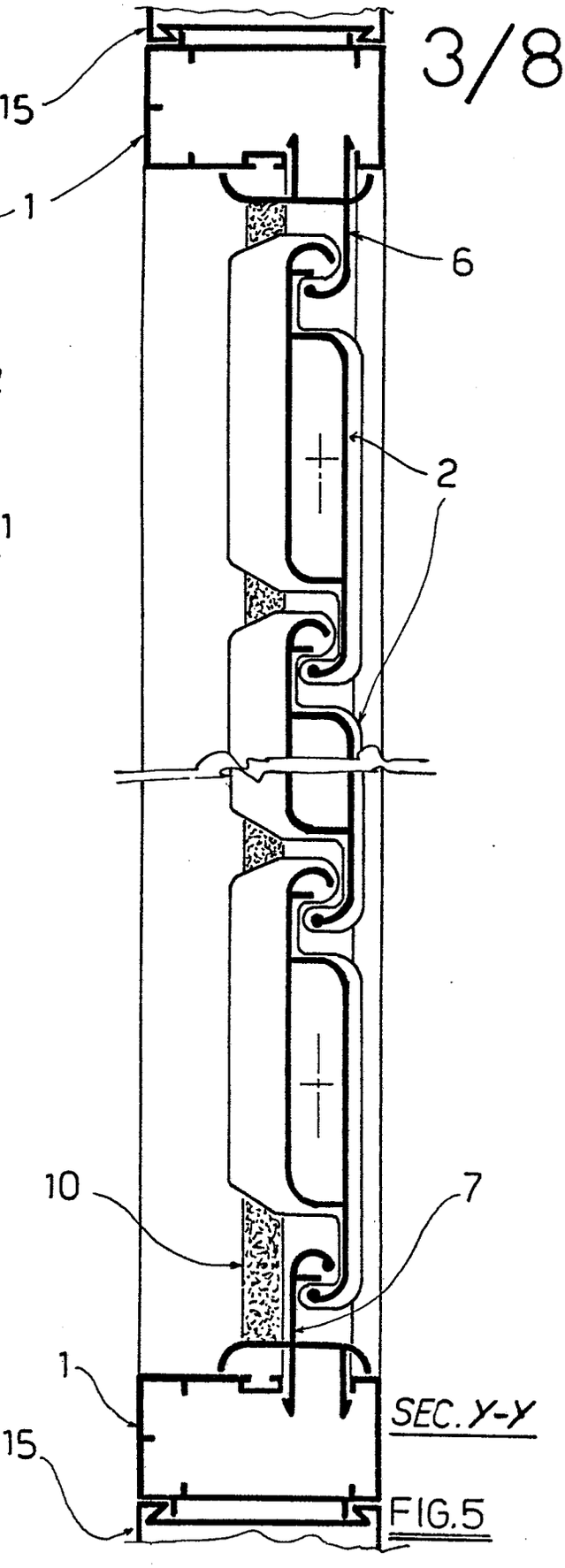


FIG. 3



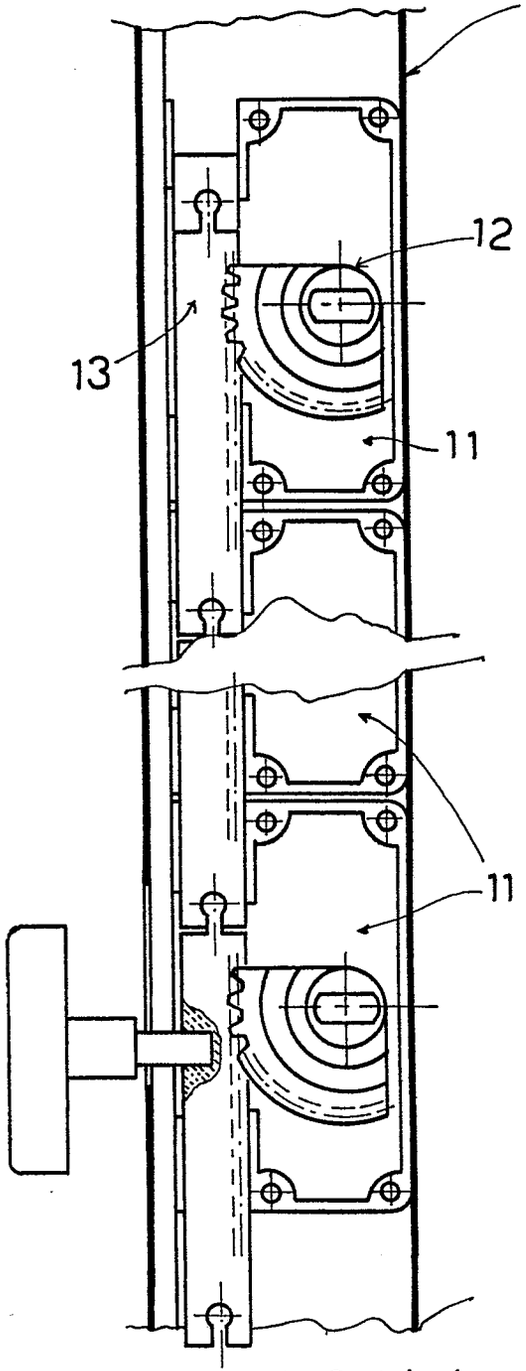
SEC. X-X

FIG. 4



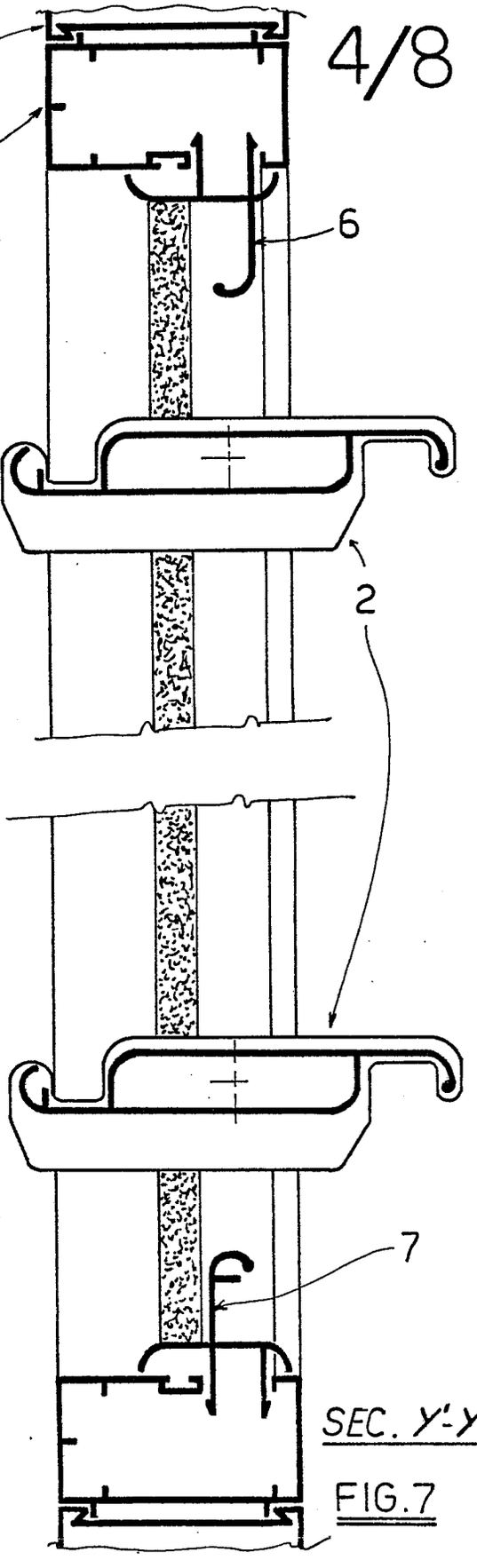
SEC. Y-Y

FIG. 5



SEC. X'-X'

FIG. 6



SEC. Y'-Y'

FIG. 7

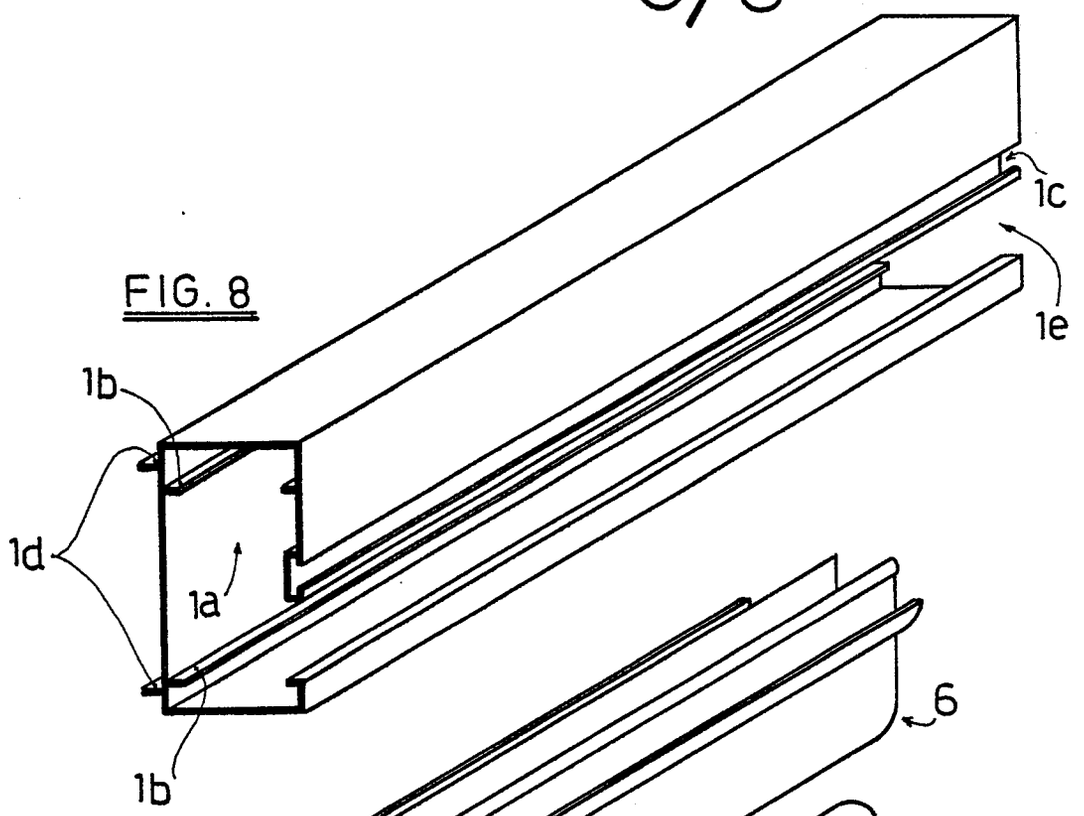


FIG. 8

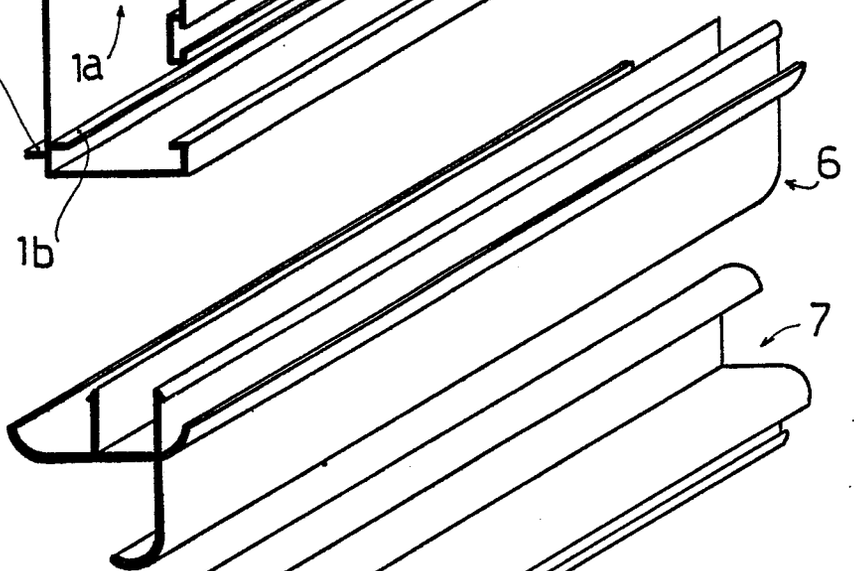


FIG. 9

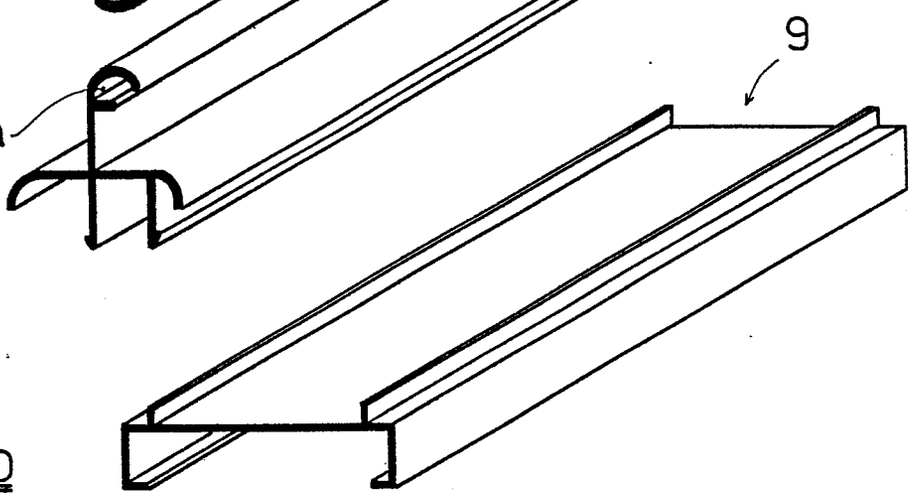


FIG. 10

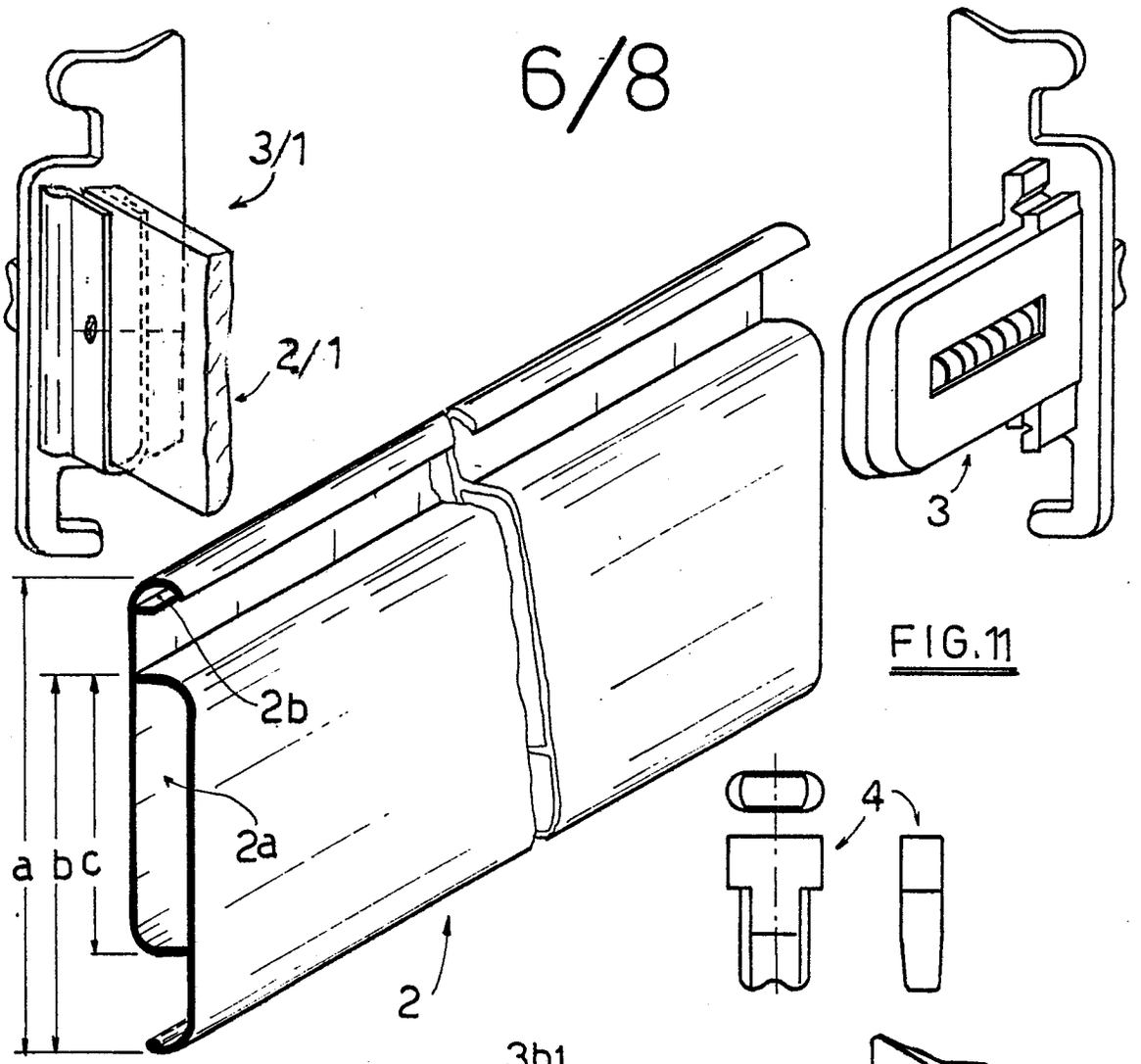

3/1
2/1
3
2b
2a
a b c
2
4

FIG. 11

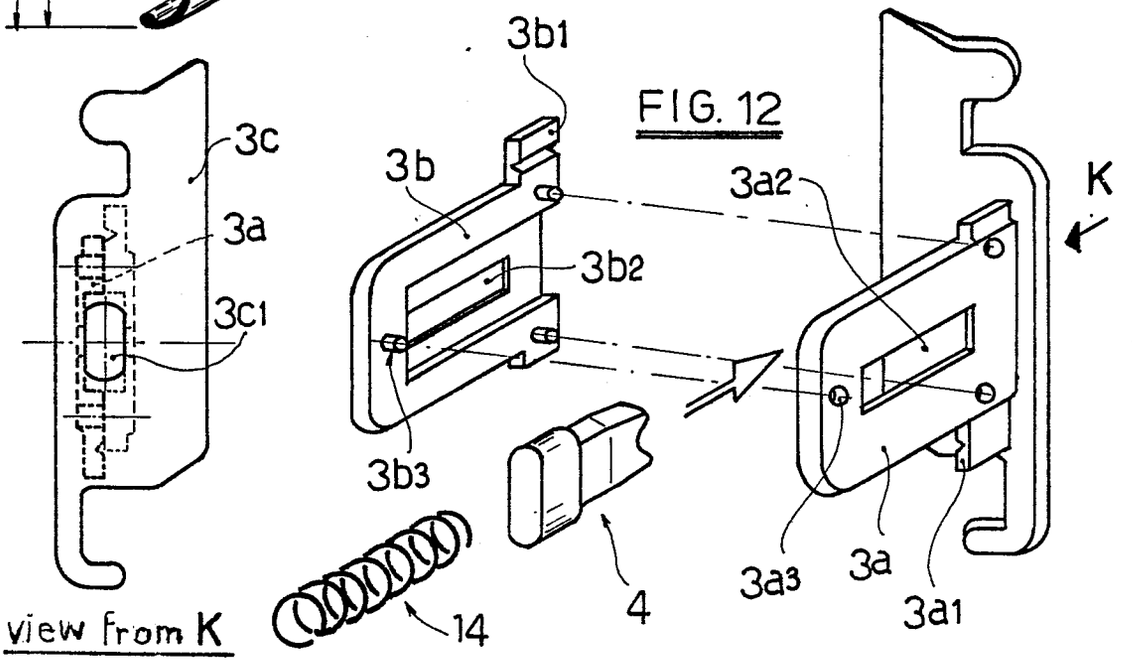
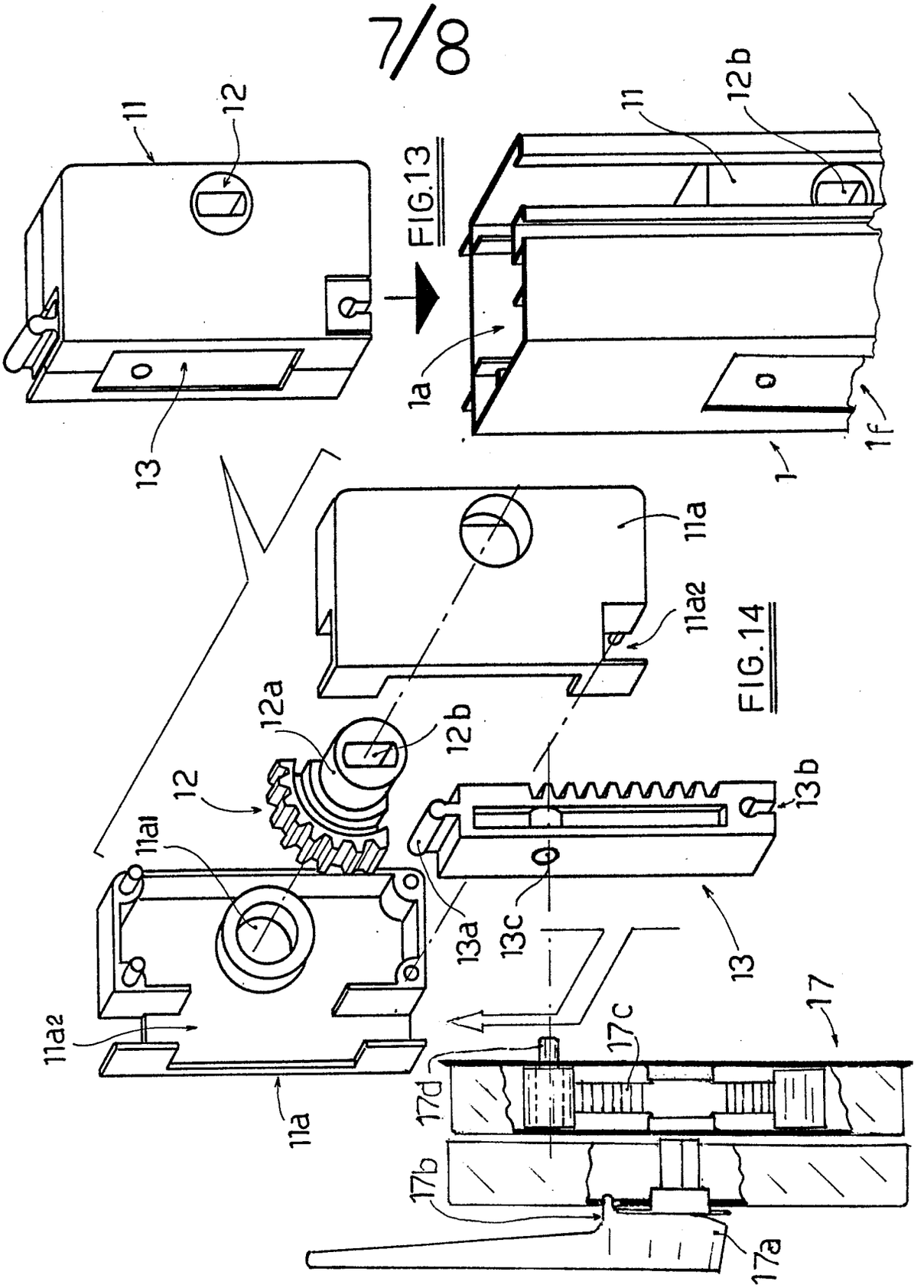

3c
3a
3c1
view from K
3b1
3b
3b2
3b3
14
4
3a2
K
3a3
3a
3a1

FIG. 12


11
12
13
FIG.13
1a
12b
1f
1
11a
11a2
FIG.14
12a
12b
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13b
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13c
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17
17c
17d
17b
17a
11a2
11a

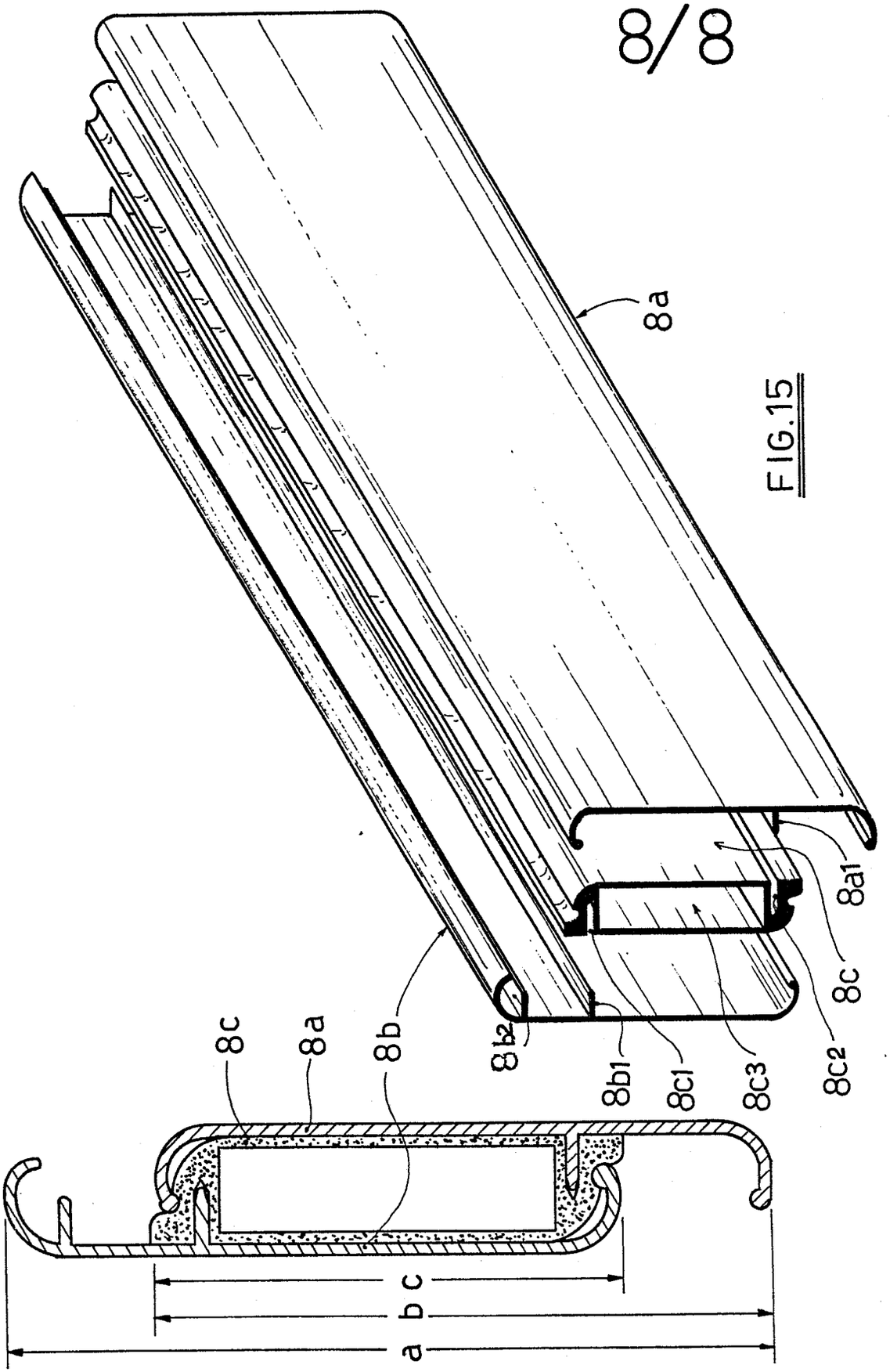

FIG.15

European Patent Office

EUROPEAN SEARCH REPORT

Application number

EP 83 83 0053

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
A	DE-A-2 659 741 (LAMELLENFENSTER) * Pages 8-13; figures 1-12 *	1,5,6, 8	E 06 B 7/086 E 06 B 9/28
A	US-A-2 311 122 (NIESNER)		
A	LU-A- 57 802 (MELANI RESINE)		

TECHNICAL FIELDS SEARCHED (Int. Cl. ³)

E 06 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	12-06-1984	VIJVERMAN W.C.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

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