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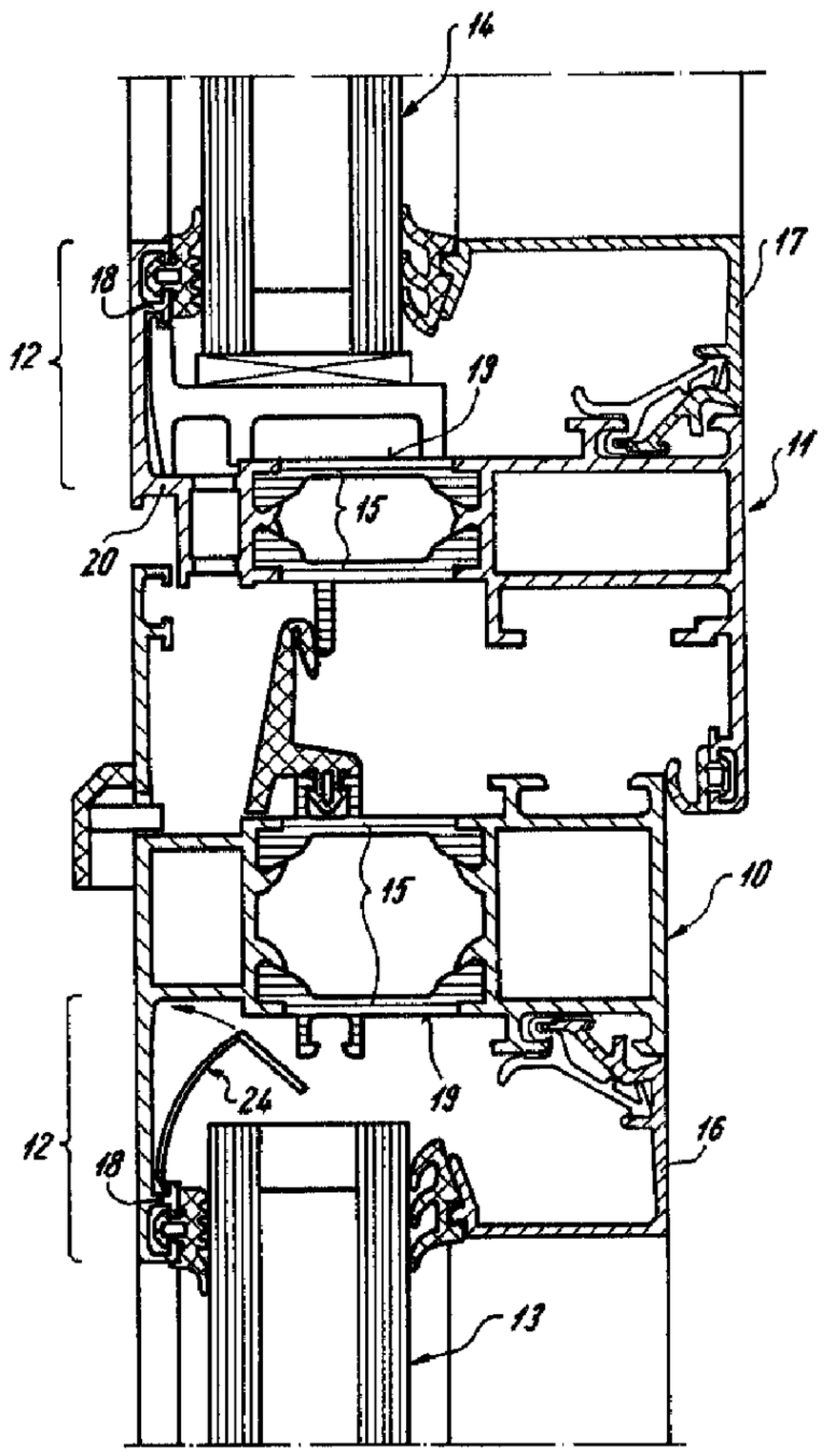

(57) Abrégé/Abstract:
A butt connection in the form of a corner or T-connection is so configured that the stiffeners that are used to align the butt joint

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(57) Abrégé(suite)/Abstract(continued):
can be installed in the particular corner or butt area after connection has been effected by means of the profile connectors. Furthermore, the use of a sealant to seal the area of the butt joint after installation is also made possible. The stiffener (24) of the butt connection according to the present invention is an elastically deformable sheet metal or plastic part which rests under tension on the inside profile webs (18, 20, 21) that define the particular stop (12). The stiffener (24) can be inserted into the inside or outside corner subsequently. To this end, it is not necessary that the grooves be under-cut. Providing that the stiffener (24) is provided with bores (28, 29), a sealing compound can be injected into the butt area subsequently by using a cartridge. The butt connection according to the present invention can be used, in particular, for windows and doors produced from aluminum compound profiles.

ABSTRACT

A butt connection in the form of a corner or T-connection is so configured that the stiffeners that are used to align the butt joint can be installed in the particular corner or butt area after connection has been effected by means of the profile connectors. Furthermore, the use of a sealant to seal the area of the butt joint after installation is also made possible. The stiffener (24) of the butt connection according to the present invention is an elastically deformable sheet metal or plastic part which rests under tension on the inside profile webs (18, 20, 21) that define the particular stop (12). The stiffener (24) can be inserted into the inside or outside corner subsequently. To this end, it is not necessary that the grooves be under-cut. Providing that the stiffener (24) is provided with bores (28, 29), a sealing compound can be injected into the butt area subsequently by using a cartridge. The butt connection according to the present invention can be used, in particular, for windows and doors produced from aluminum compound profiles.

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A BUTT CONNECTION

The present invention relates to a butt connection in the form of a corner or T-connection in which hollow profile sections that are set at an angle to each other and which incorporate an outer web that forms a stop are connected by means of an inserted profile connector so as to form a butt joint, and which a shaped stiffener that covers the butt joint on the inside is fixed in the corner area.

A butt connection of this kind, in the form of a T-connection, is described in DE 79 35 701 U1. In this T-connection, clamping elements are secured in the areas of the long edges of the profiles and these extend beyond the butt joint and are secured in undercut grooves. Each clamping element consists of a plate-shaped section with a moulded-on hook and a foot section. The connection is effected by means of a screw. The foot section has cut-outs on two diametrically opposing corners and these form lugs that fit behind the edge webs of grooves. This forms a positive fit between the clamping elements and the undercut groove. When the screw is tightened, this pushes against the bottom of the groove and can even dig into this. In practice, this is a disadvantage in that these parts can then be used only if there are two undercut grooves to accommodate the clamp elements in the edge areas of each stop. A further disadvantage is that assembly is made more difficult for it is necessary to slide the second hollow profile section on the arm of the profile connector and onto the clamping elements. Assembly is also made more difficult because the hollow profile sections are relatively long. In this connection, it must be borne in mind that the hollow profile sections are designed with close tolerances so that the arms of the profile connectors and the clamping elements

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that form the stiffeners must fit closely into the hollow profile sections.

In addition, it is also known from practice that stiffening corner pieces can be used in place of the clamping elements, although these, too, must be inserted into the first hollow profile section prior to the connection of the hollow profile sections being made. The problems described above occur here as well. In addition, in none of these versions is it possible to provide for additional sealing in the area of the butt joint by using a sealing agent.

The stiffeners in the form of clamping elements or stiffening corner pieces are necessary in order to align the stops that have been pressed on, so that the outer surfaces of the profile are aligned with each other in the area of the butt joint.

It is the task of the present invention to so configure a butt connection of the type described in the introduction hereto that the stiffeners can be installed later, i.e., after the connection by means of the profile connectors in each corner or butt area. In addition, should it be necessary, it should also be possible to provide additional sealing in the area of the butt joint by means of a sealant.

This task has been solved in that the stiffener is elastically deformable and rests under tension on the inside profile web that defines each particular stop.

Accordingly, in one aspect there is provided a butt joint comprising: a first hollow profile member having an interior surface, and exterior surface and a projecting first stop, said first stop comprising a first web and a

groove-bounding web; a second hollow profile member being connected to said first hollow profile member to form an inside corner, said second profile member having a interior surface, an exterior surface and a projecting second stop, said second stop comprising a first web and a groove-bounding web; and a reinforcement part being disposed adjacent to said inside corner, said reinforcement part being elastically deformable and being supported by said first stop and said second stop such that said reinforcement part is disposed solely on the interior surface of the first hollow profile member and the interior surface of the second hollow profile member.

In a second aspect, there is provided a butt joint comprising: a first hollow profile member having an interior surface, an exterior surface and a projecting first stop, said first stop comprising a first web and a groove-bounding web; a second hollow profile member being connected to said first hollow profile member to form an outside corner, said second profile member having an interior surface, an exterior surface and a projecting second stop, said second stop comprising a first web and a groove-bounding web; and a reinforcement part being disposed adjacent to said outside corner, said reinforcement part being elastically deformable and being supported by said first stop and said second stop, such that said reinforcement part is disposed solely on the exterior surface of the first hollow profile member and the exterior surface of the second hollow profile member.

Because the stiffener that aligns the steps is elastically deformable, the butt connection that is produced from the two hollow profile sections can first be assembled and then the stiffener can be inserted into the particular

corner subsequently. To this end, it is not necessary that the grooves be undercut in order to secure the stiffeners. It is adequate if

the stops have projecting webs on the inside, for a tight fit is ensured by the stiffeners that are under tension. In addition, the elastic deformability of the stiffener will even out any tolerances because the part can be formed to a greater or lesser extent and thus adapt. In addition, the locking screw, which can possibly damage the eloxal coating, is eliminated. Given an appropriate design of the stiffener it is also possible to seal the area of the butt joints with a sealing compound.

The shape of the stiffener will depend on the type of butt connection and will also depend on the profile. Most expediently, however, it is of sheet spring steel. It can also be of plastic providing this is elastically deformable to a suitable degree.

The present invention will be described in greater detail below on the basis of preferred embodiments shown in the drawings appended hereto. These drawings show the following:

Figure 1: a window in cross-section, with a stiffener;
Figure 2: a butt connection formed as an inside corner, with the stiffener not yet installed;
Figure 3: a view corresponding to figure 2, but with the stiffener in its final position;
Figure 4: an exploded view of a butt connection in the form of a T-connection;
Figure 5: a view corresponding to figure 4, showing the end position of the T-connection, but with a second T-connection that is formed by an additional horizontal hollow profile section, showing the possibility for sealing the butt joints;
Figure 6: the assembly of the stiffeners in a view that is perpendicular to the vertical element;
Figure 7: the stiffener for a butt connection as in figures 1 to 3;

Figure 8: a side view of the stiffener;
Figures 9 to 11: various views of stiffeners for an outside corner (not shown herein).

Figure 1 is a horizontal section through a window that comprises a blind frame 10 and a casement frame 11. For clarity, only one rail of the frame is shown. The blind frame 10 is configured as a ladder profile. On the outside, the profile of the blind frame 10 and of the casement frame 11 each incorporate an outer web which constitutes the stop for panes of insulating glass 13, 14 that are installed in the blind frame 10 and in the casement frame 11. The profiles are compound profiles, the insulating webs of which bear the reference number 15. The panes of insulating glass 13, 14 are secured in the blind frame and the casement frame 10, 11, by inside glass retainer rails 16, 17 that are opposite the stops 12. As is shown very clearly in figure 1, on the inside, the areas of the stops 12 that face away from each other each have a receiver groove for a gasket that is in contact with the outer pane of glass. The groove defining webs 18 that face each other and which face the insulating webs 15 are of T-shaped cross-section. These groove defining webs 18 are associated with the so-called fold of the profile. The profile fold height is defined by the outer surface of the two outside insulating webs 15, and this bears the reference number 19. The webs 20, 21 that define the stops 12 in the area of the profile fold height, which are moulded on on the inside and which are perpendicular to the stops 12, are offset relative to the outer surfaces of the insulating webs 15 that define the profile height 19 such that they are each offset towards the other web. The offset is approximately equal to the thickness of the profile walls. This means that moisture collection surfaces are formed on the sides of the webs 20, 21 that face away from each other.

The butt connections that are shown in figures 2 and 3 are corner connections in the form of inside corners. The hollow profile

sections 22, 23, which are mitre cut, are connected to each other in the usual way by corner connectors (not shown herein). The figures show that the two stops 12 of the hollow profile sections 22, 23 form a butt joint that has to be aligned. This is done by means of a stiffener 24, which will be described in greater detail, which is of an angular shape that corresponds to the corner and which has angled tabs at both face ends; these fit behind the T-shaped groove defining webs 18. The opposing angled tabs lie on the webs 20, 21 respectively and the free edges rest on the edge of arms that run parallel to and at a distance from the stops 12 and which are offset relative to the webs 20, 21. This means that it is possible to press the appropriately shaped stiffener 24 into the inner corner, by using a screw driver, for example, as is shown in figure 2. The stiffener 24 is so designed that in its final position, which is shown in figure 3, it is under tension so that it does not fall out of the corner. This means that it is locked in place positively and it also means that not only is the butt joint formed from the stops 12 covered over but also that the outer surfaces of the stops 12 are aligned so as to be flush with each other. The abutting surfaces of the stops for an outer corner are aligned in the same way providing the stiffener is designed in an appropriate manner.

Figure 4 shows the connection of a horizontal frame profile 25 with a vertical ladder profile 26 by means of a T-connector 27. The frame profile 25 and the ladder profile 26 are each provided with two stops 12 which are once again defined by the groove defining webs 18 and 21. Two stiffeners 24 are required for this T-connection and these cover the butt joints formed by the stops 12, as is shown clearly in figure 5. Each stiffener 24 is so formed that the webs 18 are enclosed. This stiffener 24 is angled on the side that faces the two webs 21 so that the opposing edge fits under the T-shaped groove defining web 18 and the angled tab lies on the web 21. Once again, the stiffener 24 is so designed that it is under tension when it is pressed into

its final position as is shown in figure 5. Figure 5 also shows that the identical stiffener 24 is used in order to cover the butt joints in a T-connection when a profile of identical cross-section is installed in a horizontal position on the vertical ladder profile 26. A connection is once again made by an appropriate connector. In addition, both figures show that a sealing agent that is used to caulk the joints can be injected through the bores 28, 29. This is done by using a cartridge, as is indicated in the drawing. Figure 6 shows the insertion of the stiffener 24 for connecting the horizontal frame profile 25 to the vertical ladder profile 26. Each stiffener 24 is inserted with the angled tabs behind the webs of the groove defining webs 18 that face each other. Using a suitable tool, the stiffener 24 is then pressed between the groove defining webs 18 and the two webs 21 such that the surfaces of the stiffener 24 that are opposite the T-shaped groove defining webs 18 lie on the surfaces of the web 21 that face away from each other. Each stiffener is so designed that it is then under tension.

Each stiffener 24 can be made of spring steel sheet of a robust material. However, they can also be made from a suitable elastic plastic. Figure 7 shows an angular stiffener 24 for an inside corner as is shown in figures 1 to 3. The stiffener 24 consists of an angular base body 30. On one side of the base body there are two spring tabs 31, 32 and these form an obtuse angle with the surfaces of the angular base body 30. In the case of the inside corner shown in figures 2 and 3, these spring tabs 31, 32 fit behind the inner webs of the groove defining webs 18. The angled spring tabs 31, 32 even out dimensional differences between the width of the groove and the thickness of the sheet metal used in the stiffener 24 by spring tension. On the opposite side, the base body 30 has two additional spring tabs 33, 34, although these are bent to the other side and, when installed, they rest on the surfaces of the drain fold that face away from each other. The angle that is subtended between the

outer surfaces of the angular base body 30 and the spring tabs 33 and 34 is greater than 90°. The two parts of the angular base body 30 are at an angle to each other that is just over 90°. Because of this, pre-tensioning is achieved after assembly. The angle that is subtended between the surfaces of the angular base body 30 and the spring tabs 33, 34 is similarly greater than 90°. Figures 2 and 3 show how the stiffener 24 is pressed into the inside corner.

Figure 8 is a side view of a stiffener 24 for an inside corner. As can be seen from the drawing, the base body 30 is pre-tensioned in the form of an arc. This pre-tensioning leads to the fact that the spring tabs 31, 32 are inserted at the groove defining web 18 and the stiffener 24 is inserted into the inside corner by shortening the length. There, the spring tabs 33, 34 that have been pre-tensioned snap into the groove that is defined by the webs 21 and align the stops 12 so that they are flush with each other. In addition, the butt joint that is formed by the stops 12 is covered over on the inside.

Figures 9 to 11 show a stiffener 24 for an outside corner. Essentially, this stiffener 24 corresponds to the stiffener 24 that is shown in figures 7 and 8. The spring tabs that fit behind the webs of the groove defining webs 18 are numbered 35, 36. The spring tabs that each define a drain fold and fit behind the webs are numbered 37 and 38. The base body is once again angular and is numbered 39. These figures show that first the spring tabs 35, 36 are inserted behind the webs of the groove defining webs 18 and that then the stiffener is pressed into the outside corner, using a suitable tool. When this is done, the spring tabs 37, 38 once again fit into the bottom of the groove of the drain fold that is defined by the webs.

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CLAIMS:

1. A butt joint comprising: a first hollow profile member having an interior surface, and exterior surface and a projecting first stop, said first stop comprising a first web and a groove-bounding web; a second hollow profile member being connected to said first hollow profile member to form an inside corner, said second profile member having an interior surface, an exterior surface and a projecting second stop, said second stop comprising a first web and a groove-bounding web; and a reinforcement part being disposed adjacent to said inside corner, said reinforcement part being elastically deformable and being supported by said first stop and said second stop such that said reinforcement part is disposed solely on the interior surface of the first hollow profile member and the interior surface of the second hollow profile member.

2. The butt joint of claim 1, wherein said reinforcement part is thinner than said webs of said hollow profile members, and wherein said reinforcement parts are elastically deformable.

3. The butt joint of claim 1, wherein said reinforcement parts have an angled base body, such that the enclosed angle is slightly greater than 90 degrees.

4. The butt joint of claim 3, wherein said reinforcement parts have angled spring tabs at one face end, and spring tabs at the other face end, such that an angle between the surfaces of the angled base body and the angled spring tabs is obtuse, and an angle between the surfaces of the angled base body and the spring tabs is obtuse, said spring

tabs gripping behind said groove-bounding web behind said first web.

5. The butt joint of claim 4, wherein said webs, are displaced relative to an insulating web, said insulating web determines the depth of a profile fold, said displacement being in the direction toward the other web, such that said displacement corresponds to the thickness of the webs of the hollow profile members.

6. The butt joint of claim 1, wherein said second hollow profile member is connected to said first hollow profile member, in the form a T-joint, said reinforcement parts have a base body having an angled cross section, such that a middle area of said base body has a constriction which grips over the webs and which forms a groove for receiving a seal.

7. The butt joint of any one of claims 1 to 6, wherein said reinforcement part has at least one hole for injecting a sealing compound into a joint area between said first hollow profile member and said second hollow profile member.

8. A butt joint comprising: a first hollow profile member having an interior surface, an exterior surface and a projecting first stop, said first stop comprising a first web and a groove-bounding web;
a second hollow profile member being connected to said first hollow profile member to form an outside corner, said second profile member having an interior surface, an exterior surface and a projecting second stop, said second stop comprising a first web and a groove-bounding web; and
a reinforcement part being disposed adjacent to said outside corner, said reinforcement part being elastically deformable and being supported by said first stop and said second stop,

such that said reinforcement part is disposed solely on the exterior surface of the first hollow profile member and the exterior surface of the second hollow profile member.

9. The butt joint of claim 8, wherein said reinforcement part is thinner than said webs of said hollow profile members, and wherein said reinforcement parts are elastically deformable.

10. The butt joint of claim 8, wherein said reinforcement parts have an angled base body, such that the enclosed angle is slightly greater than 90 degrees.

11. The butt joint of claim 10, wherein said reinforcement parts have angled spring tabs at one face end, and spring tabs at the other face end, such that an angle between the surfaces of the angled base body and the angled spring tabs is an obtuse angle and an angle between the surfaces of the angled base body and the spring tabs is obtuse, said spring tabs gripping behind said groove-bounding web behind said first web.

12. The butt joint of claim 11, wherein said webs, are displaced relative to an insulating web, said insulating web determines the depth of a profile fold, said displacement being in the direction toward the other web, such that said displacement corresponds to the thickness of the webs of the hollow profile members.

13. The butt joint of any one of claims 8 to 12, wherein said reinforcement part has at least one hole for injecting a sealing compound into a joint area between said first hollow profile member and said second hollow profile member.

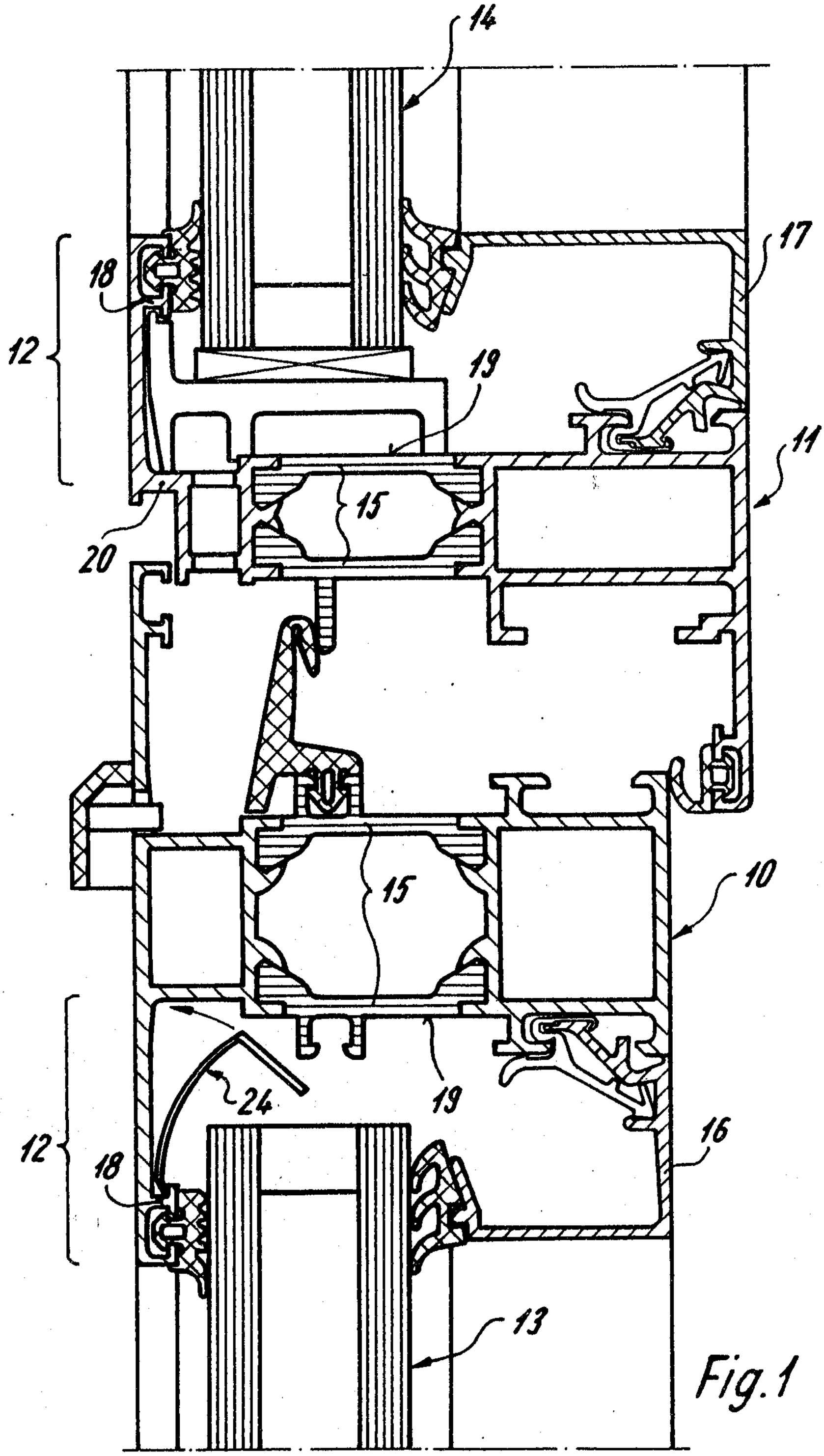

Fig.1

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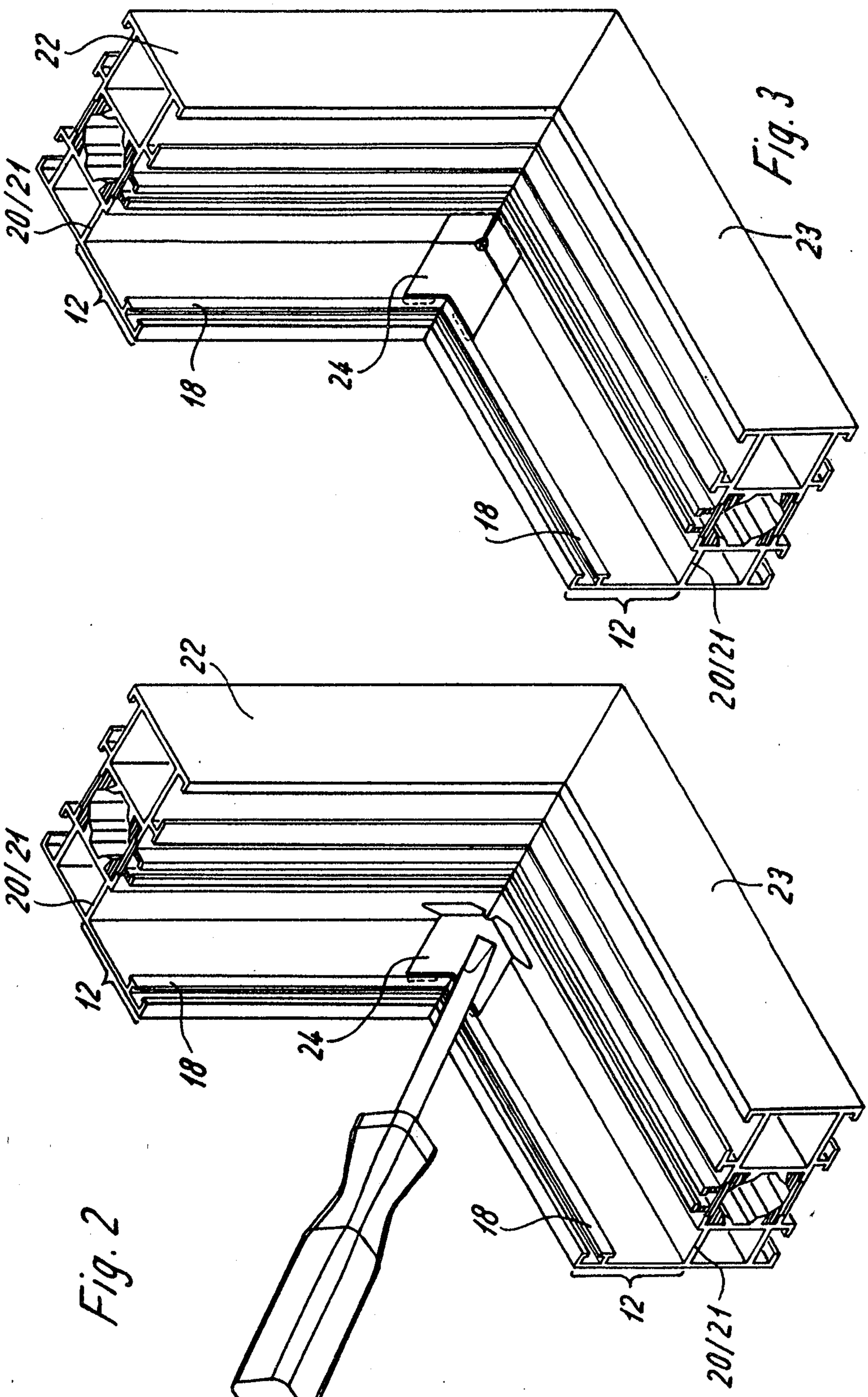

Fig. 2

Fig. 3

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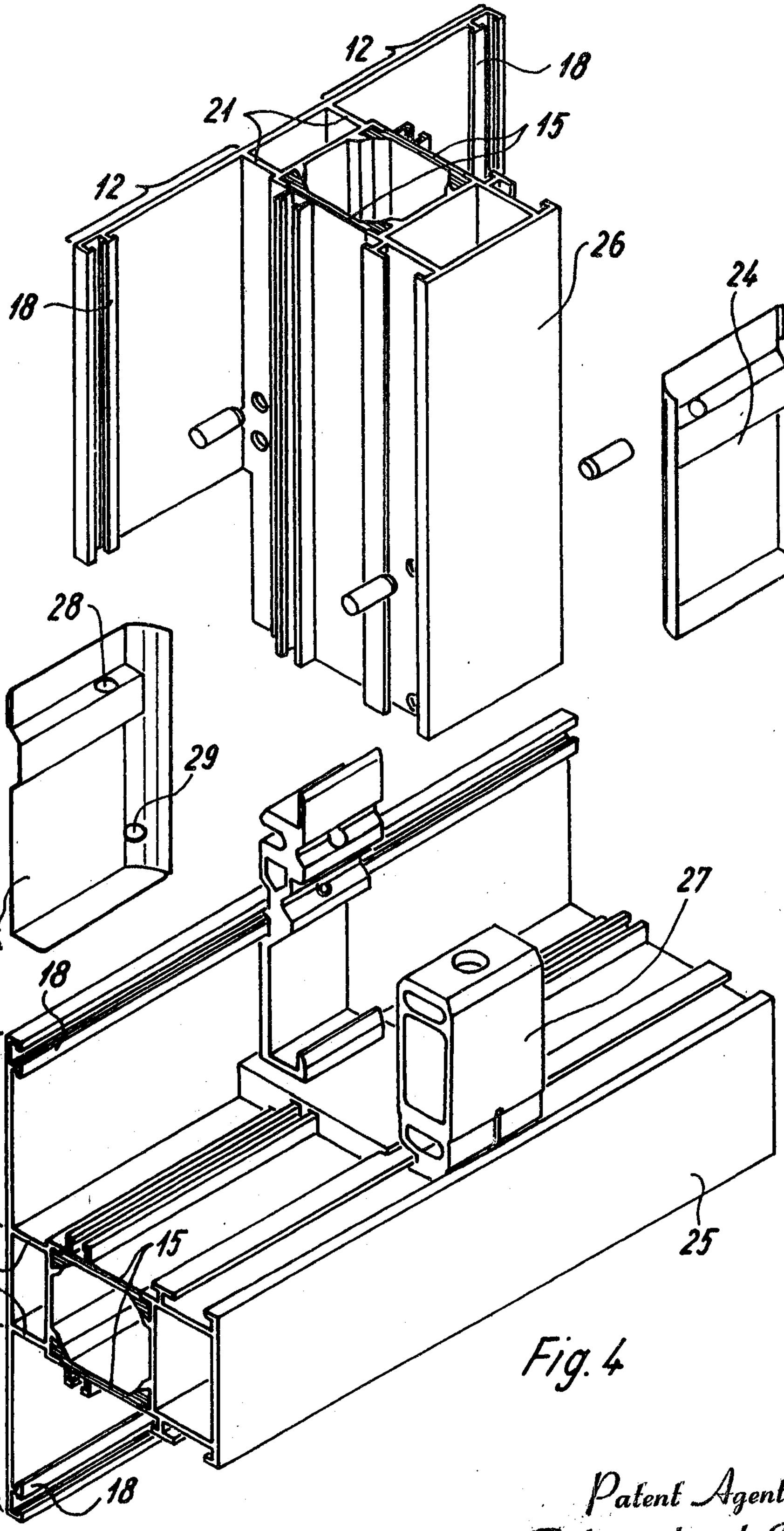

Fig. 4

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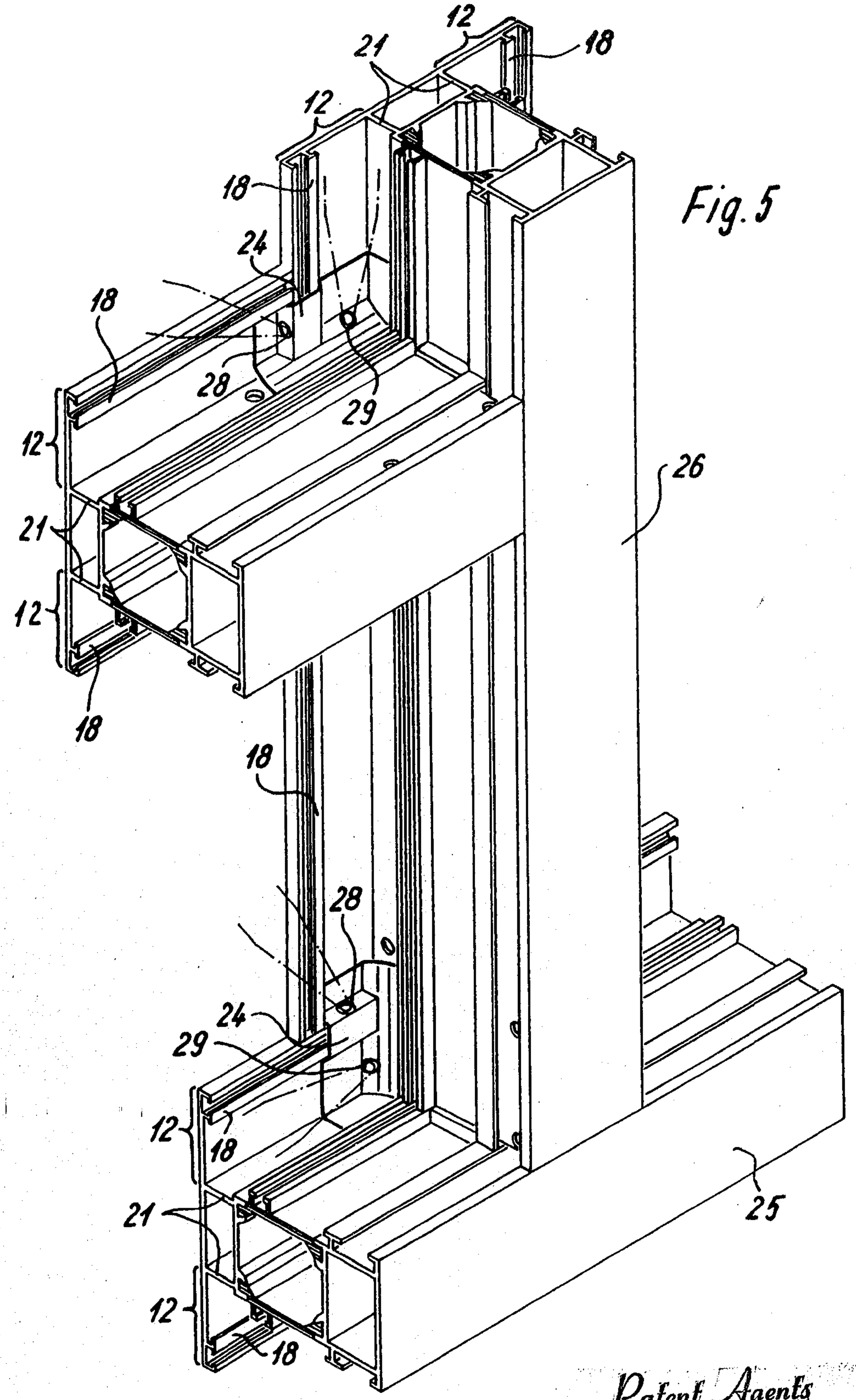

Fig. 5

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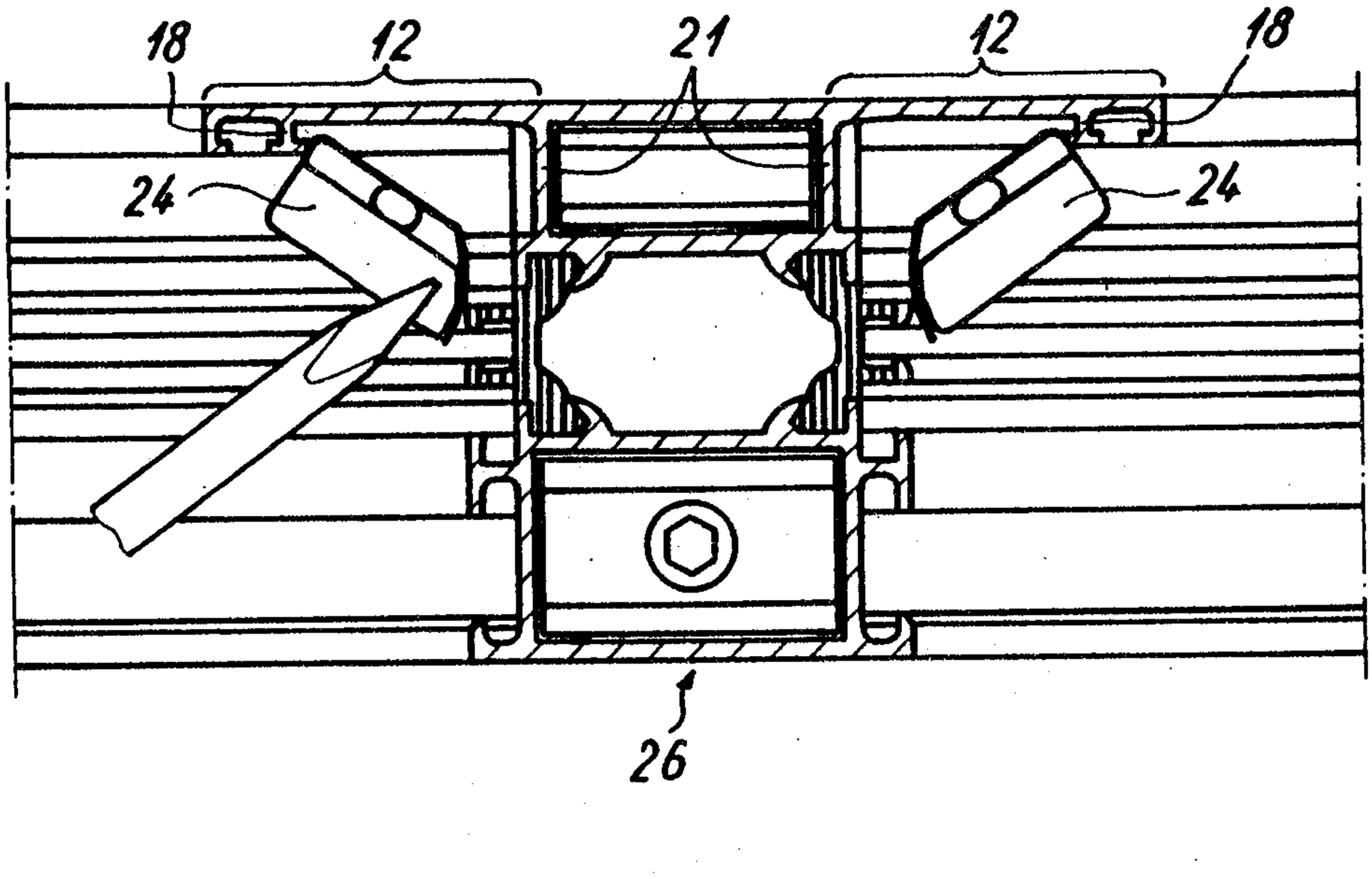

Fig. 6

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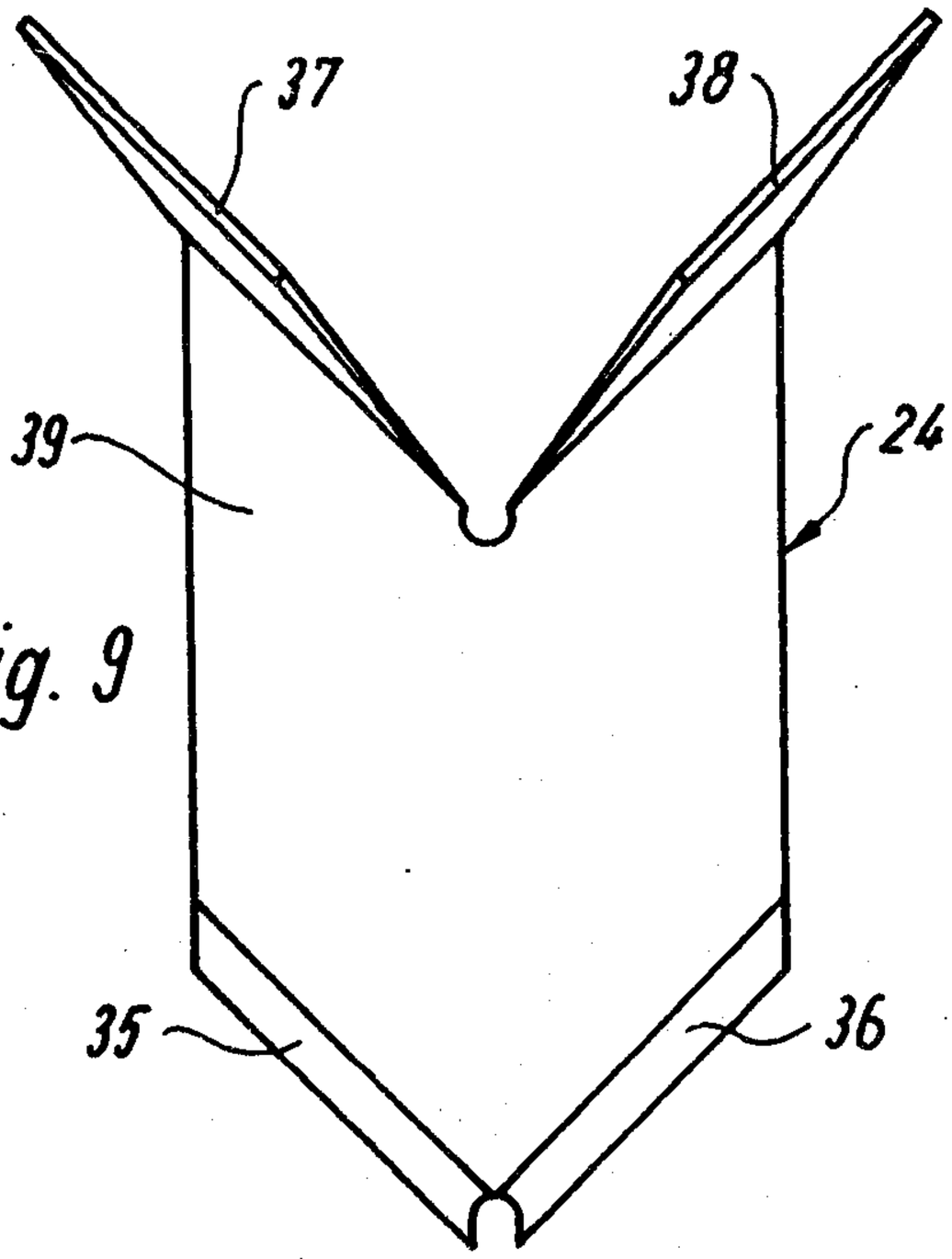

Fig. 9

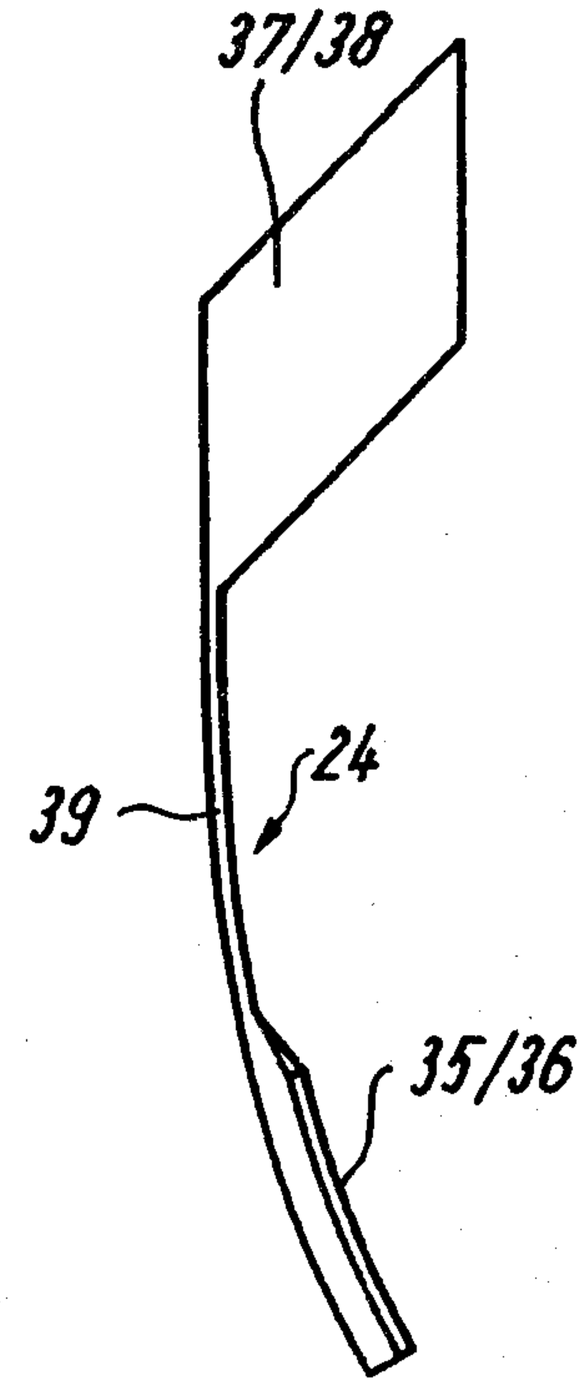

Fig. 11

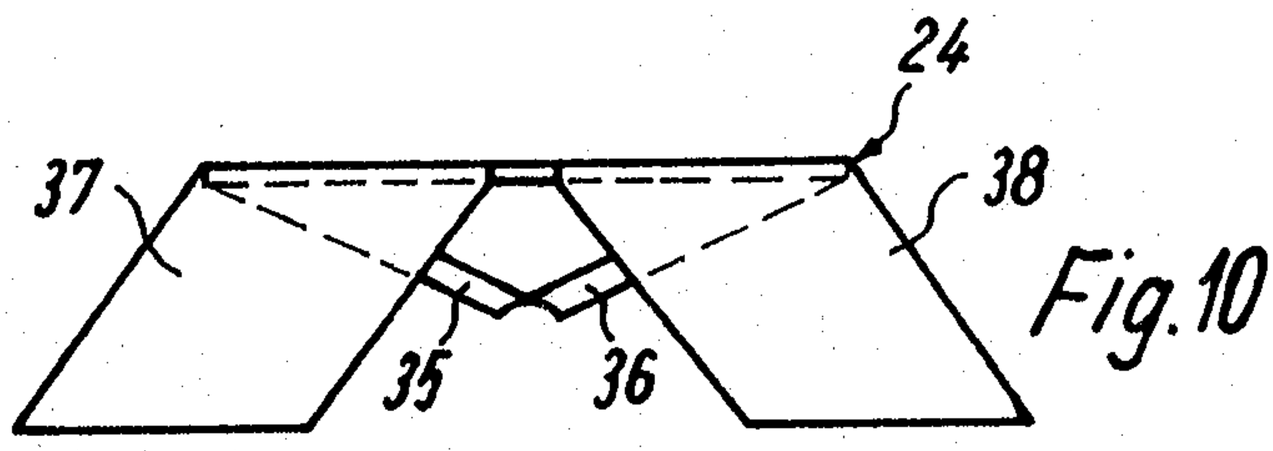

Fig. 10

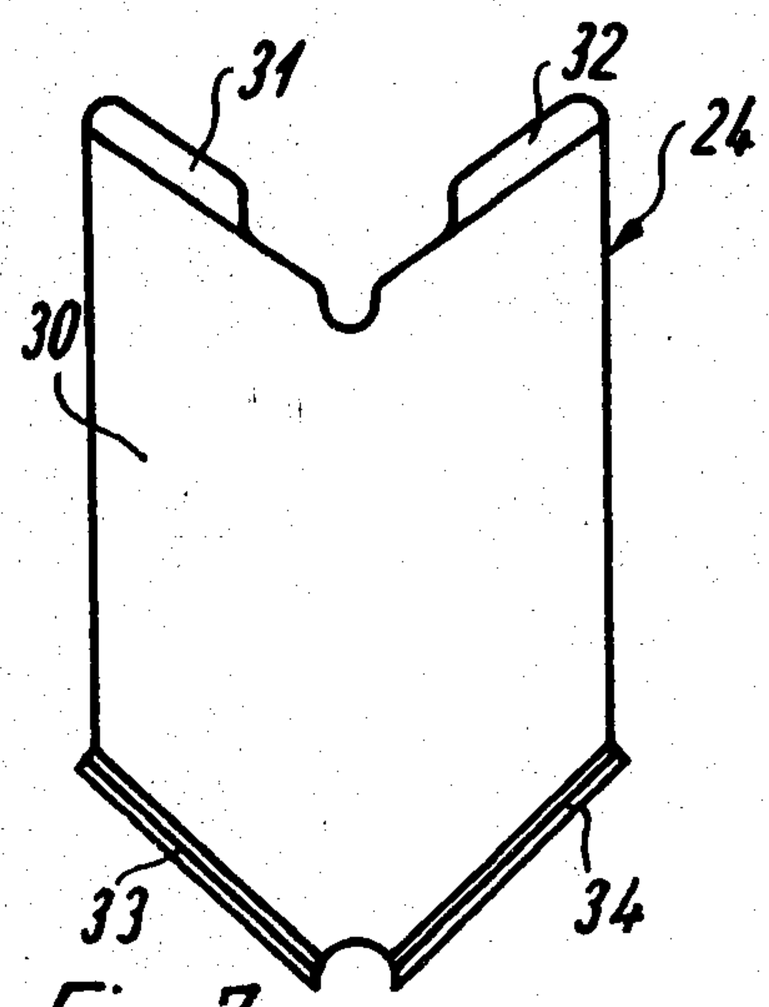

Fig. 7

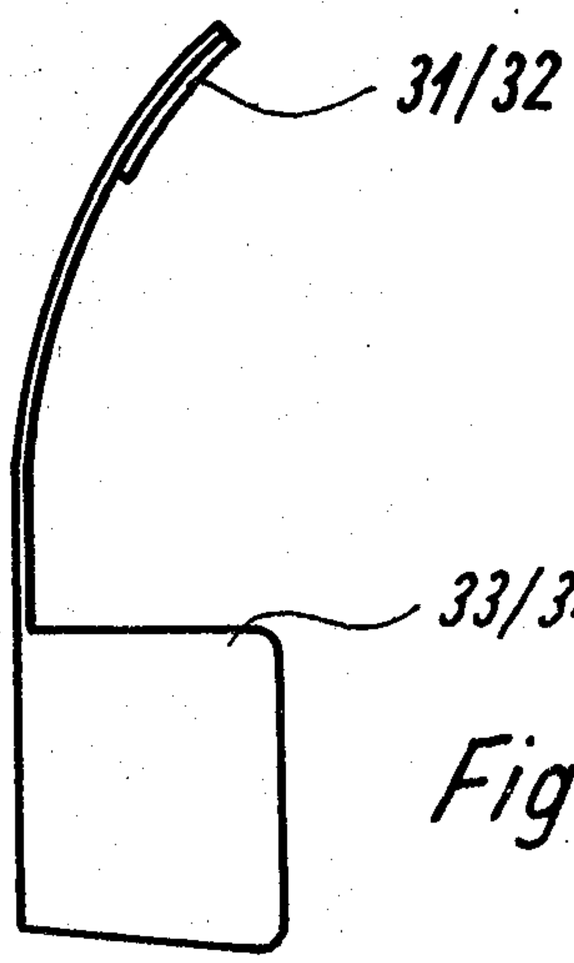

Fig. 8

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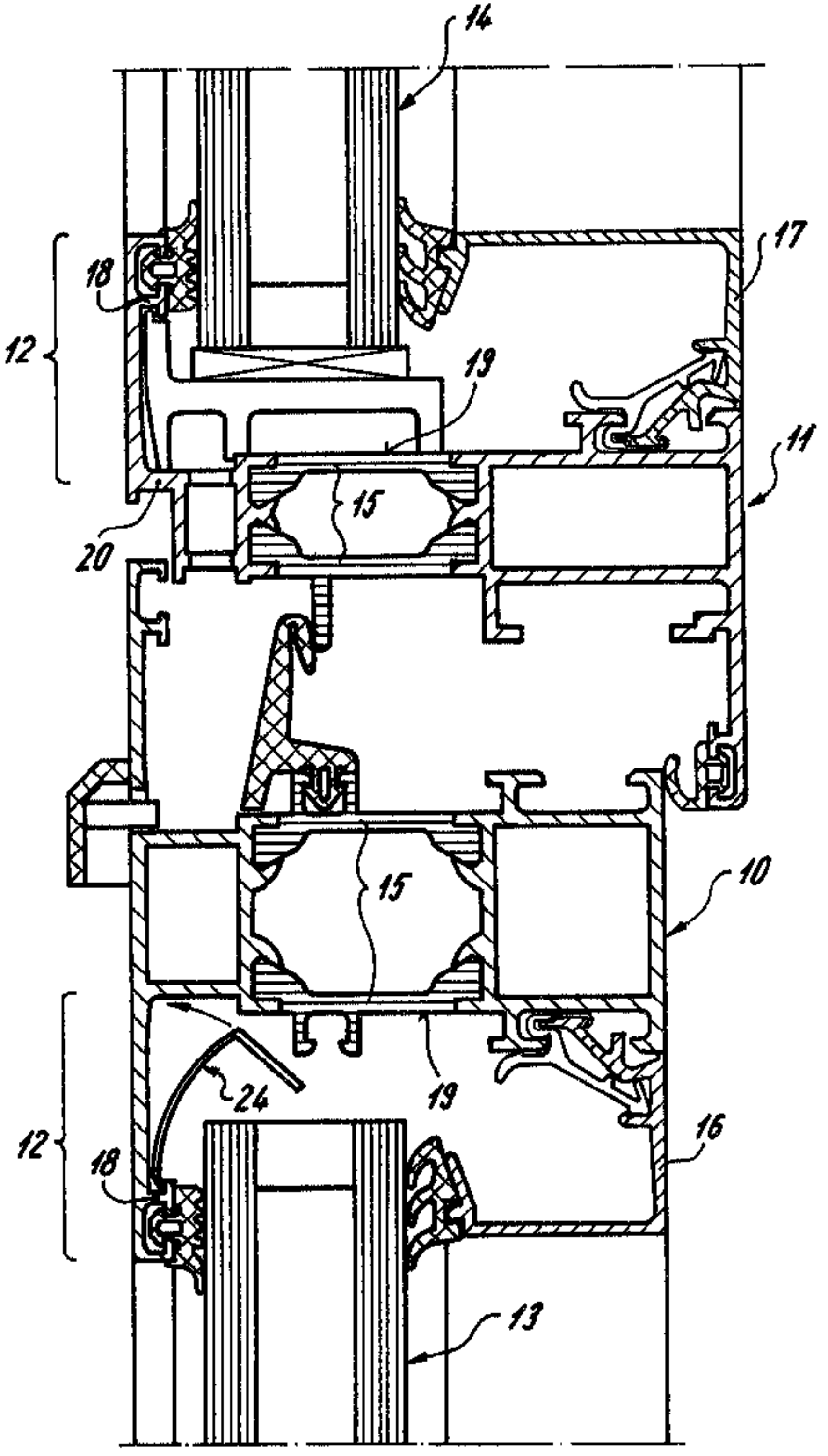
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