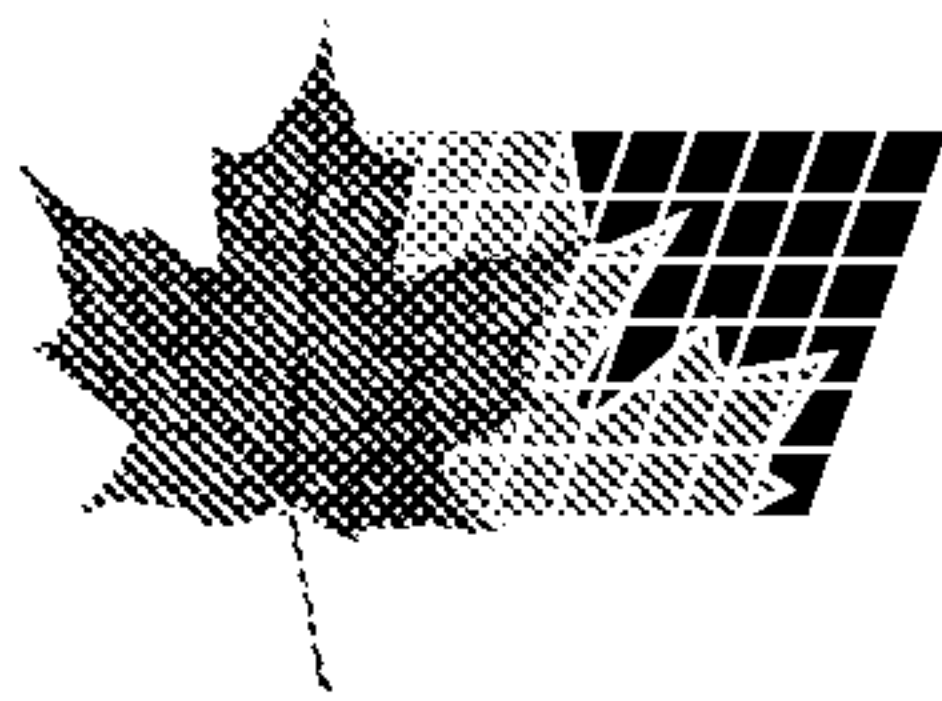




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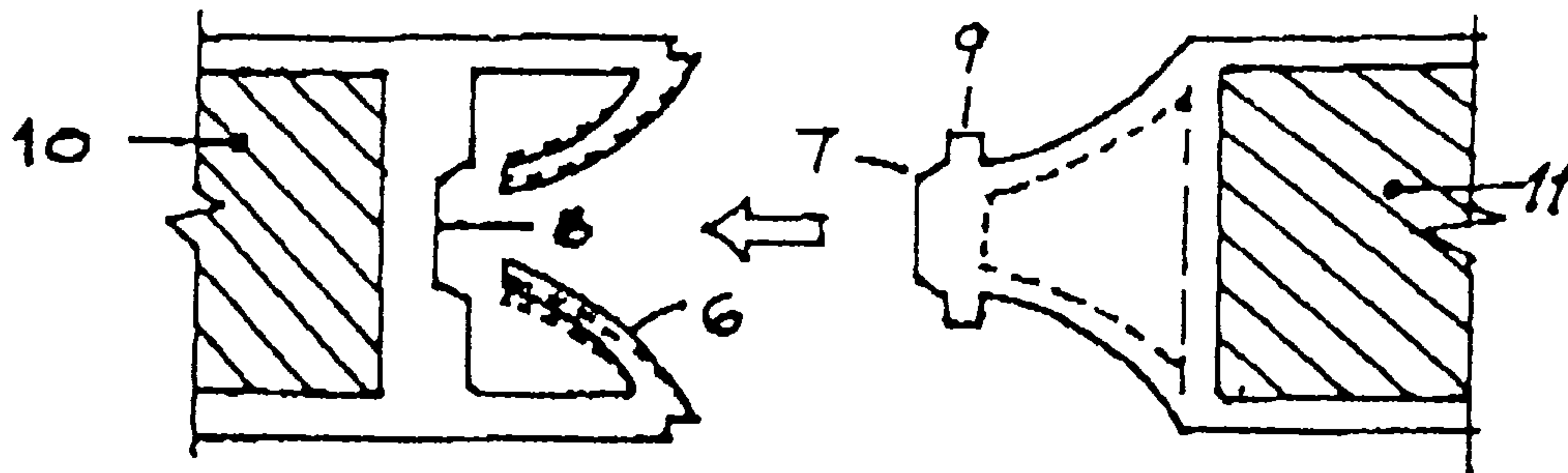
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(54) **DISPOSITIF DE FIXATION POUR RETENIR DES OBJETS OU
ASSEMBLER DES OBJETS DEUX A DEUX**

(54) **CLAMP MEANS FOR HOLDING OBJECTS OR JOINING
OBJECTS TOGETHER**



(57) Dispositif de serrage profilé en forme de U dans lequel un ou deux éléments profilés intérieurs (1, 6) sous forme de ressorts de préhension s'appuient élastiquement contre un objet et l'assujettissent. Lorsque l'objet a une forme mâle (7, 9) adaptée à la forme femelle dudit dispositif de serrage, l'ensemble peut servir à solidariser deux objets (10, 11) l'un à l'autre. De préférence, le dispositif de serrage est constitué d'un matériau homogène, et un effet de serrage et/ou une jointure sont obtenus sans recours à des outils ou à des pièces de petites dimensions.

(57) The invention comprises a profile-shaped clamp means based upon a U-shape, where one or two inside profile elements (1, 6); shaped as gripping springs, press resiliently against an object which is thereby retained. When the object is constituted by a male shape (7, 9) adapted to the female shape of said clamp, the total clamp means can be utilized for locking two objects (10, 11) to each other. The clamp means is preferably constructed as a profile in a homogeneous material, and a clamp effect and/or a joint is obtained without use of tools or small parts.

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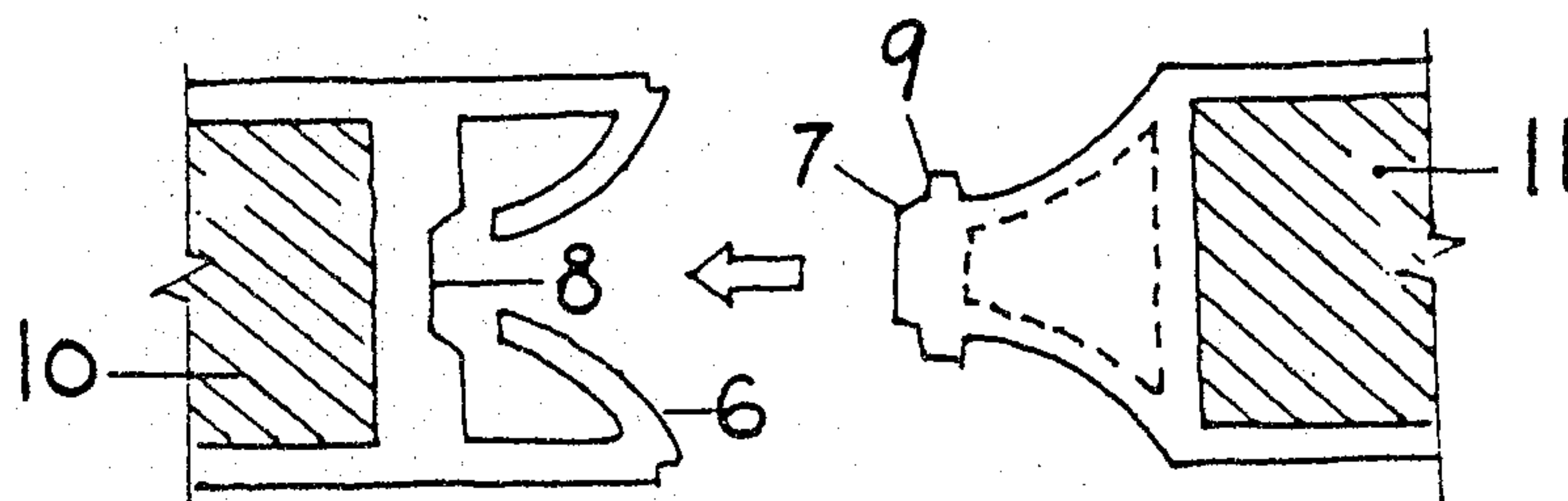
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(57) Abstract

The invention comprises a profile-shaped clamp means based upon a U-shape, where one or two inside profile elements (1, 6), shaped as gripping springs, press resiliently against an object which is thereby retained. When the object is constituted by a male shape (7, 9) adapted to the female shape of said clamp, the total clamp means can be utilized for locking two objects (10, 11) to each other. The clamp means is preferably constructed as a profile in a homogeneous material, and a clamp effect and/or a joint is obtained without use of tools or small parts.

CLAMP MEANS FOR HOLDING OBJECTS OR JOINING OBJECTS TOGETHER

The present invention generally concerns a clamp means, which in one aspect of the invention comprises one single part and is adapted to hold objects fixedly, and in a second aspect of the invention comprises two parts and is adapted to join together two objects. Said clamp means preferably has a profiled shape, i.e. it is more or less elongated in shape.

Several related clamp means are previously known, and the most common in this respect are clamps with elastic U or inverse o shapes which surround parts of an object which is pushed into the clamp. Ordinary two-part buttons of the snap-fastener type, often used in garments, exhibit a principle which is related to the two-part clamp means of the present invention for joining together two objects.

However, such a snap-fastener operates only in accordance with an elastic principle, and is released by pulling the male part of the button right out again by use of sufficient power, in order to overcome the elasticity in a "retainer spring part" in the female part of the snap-fastener.

However, there exists an obvious need of a clamp means of a substantially stronger type than the above mentioned types, which clamp means may provide the advantage that two objects can be joined together instantaneously to create a very strong unity, and possibly including the opportunity of a release mechanism which can be realized in a simple manner.

The same clamp principle may also be utilized in a single-part clamp means for holding or retaining an object, and a very good retaining effect can be achieved.

The purpose of the first aspect mentioned above, namely the strong joining together of two objects, is achieved by providing a preferably profile-shaped clamp means for fast and simple ("snap") joining together of two objects, each object being provided with respectively a male part and a female part of said clamp means, and said female part comprising in cross-section a substantially U-shaped cavity with a bottom and two upright walls, and a springy, barb-like profile element attached along or alongside the upper edge of one or both of

the female part walls for providing a retaining effect for said male part when inserting this part into the female part cavity, said profile element extending down into said cavity and being adapted to yield sideways elastically when said male part is inserted into the cavity and engages a profile element surface, and thereafter to be relaxed and return quickly to a less strained position when the tip of said male part has passed by said profile element, the tip of said male part having such dimensions that the tip is retained by the profile element due to a barb effect and against the cavity bottom due to an engagement effect, a further clamping effect also being obtained due to a pinch effect between the profile elements or between the single profile element and the opposite wall, and the particular characteristics of the clamp means is that said profile element is convexly curved when viewed in the insertion direction, that the lower edge of said profile element is located substantially closer to the cavity bottom than to the upper edge of the wall, and that the male part section behind said tip, has a surface with a substantially complementary cross-section shape in relation to said profile element surface when said profile element is in its less strained position, in order to obtain a firm and rigid engagement.

In one embodiment of the present invention, the surface of that male part section which lies behind said tip, is complementary to said profile element surface for some distance along the profile direction.

In certain embodiments, clamp means is relatively elongate in the direction given by said upper edge of a limiting wall of said cavity.

In a central embodiment of the clamp means, the female part has two oppositely arranged profile elements, placed symmetrically and for a symmetrical effect in relation to a central plane spanned by an axis which is parallel to the longitudinal direction of the clamp means along said upper edge, and by the insertion direction for the male part into the cavity, said male part also being correspondingly symmetrically shaped behind its tip for a double complementary engagement

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effect against the two profile elements when in their less strained positions.

In a very favourable embodiment of the clamp means, the tip of the male part has a tapered forward section which fits complementarily into a correspondingly shaped recess in the cavity bottom, for further support effect.

In most embodiments of the clamp means in accordance with the present invention, it is important that it can be released in a simple manner, and one embodiment of the clamp means is that it is typically long in the direction given by said upper edge and comprises one or several sections without profile elements in the female part thereof, and with corresponding sections in offset positions in the male part without tip dimensions for providing the barb effect, in such a manner that the male part can be released from the female part by a relative displacement along the longitudinal direction, until said sections are in such a position that no locking/holding effect is present.

An alternative embodiment in order to provide a simple release, is that the female part is designed typically long in the direction given by said upper edge, and with at least one section without profile elements, and that the male part has an extent in the same said direction which is somewhat less than the extent of said at least one section without profile elements, so that said male part can be released from the female part by means of a relative displacement along the longitudinal direction, until the male part is located in said section and no locking/holding effect is present.

In another embodiment of the most generally stated clamp means specified above, the female part has two oppositely arranged profile elements, placed symmetrically and for symmetrical effect in relation to a central plane spanned by an axis which is parallel to the longitudinal direction of the clamp means along said upper edge, and by the insertion direction for the male part into the cavity, however the male part is in this case shaped rotation symmetrically about an axis in the insertion direction, and has a surface in the area behind the tip, the cross-section shape of which is complementary

to the cross-section shape of the two profile elements when in their less strained positions and in contact with said male part, for achieving a double complementary engagement effect along the curves of contact.

A particular embodiment of the clamp means, particularly adapted for clamping a paper collection, where one object is constituted by the female part and the other object comprises the paper collection and constitutes the male part, is characterized in that the male part also comprises a special front and/or a special backside sheet, and that at least one of said sheets is provided with an outward thickening along the edge to be inserted into the female part, said thickening constituting the tip.

Regarding the aspect of clamping objects, the desired purpose is achieved in accordance with the invention by providing a profile-shaped clamp means for clamping and retaining objects, said clamp means having a main part with a cross-section shape substantially like a U with a bottom and to upright walls, one or both of said walls having attached thereto along or alongside the upper edge a cross-sectionwise barb-like, springy profile element, said profile element extending down into the inner cavity of said U and being adapted to yield elastically sideways when the object to be retained is pushed into said inner cavity between the springy profile elements or between one wall and the profile element, whereby said object is retained at least due to a pinch effect, possibly also due to a barb effect from the profile element of elements, and the clamp means is particularly characterized in that the profile element is convexly curved when viewed in the insertion direction and that the lower edge of the profile element is located substantially closer to the cavity bottom than to the wall upper edge, said profile elements and clamp means bottom, possibly said profile element, the opposite wall and the bottom, cooperate to provide a good clamping/retaining of the object.

In the most desired embodiment of this one-part clamp means, it is constructed as one single piece.

In a particular embodiment of the one-part clamp means, particularly adapted to clamp a paper collection, and using only one profile element, the clamp means is particularly characterized in that the wall without a profile element has a rigid or flexible elongation section in a direction out from the bottom, and the wall with a profile element has a flexible and possibly transparent elongation section in the same direction, adapted to constitute respectively a base layer and a cover sheet for the paper collection when the paper collection is pinched between the profile element and the opposite wall.

Thus, as a principle common to both aspects, one may state that the technique mentioned above is based upon a general shape of a U-profile with one or two profile elements or springs directed inwardly for retaining an object, either a general object to be fixed or a male part to be fixed in the U-profile which thus constitutes a female part. Thus, when using the last mentioned principle, a male and a female profile are utilized for connecting two objects. Either the female profile and the male profile may be separately fastened to respective objects, or the profiles may be comprised as parts of or may constitute the two objects to be fastened together.

With the one-part clamp means it is achieved that tools of different shapes and sizes easily can be pushed into a retaining position and released again using only one hand. The object can be removed again quite simply by displacing it along the clamp means until it exits and is free at an end. Possibly the one-part clamp can be equipped with sections without locking edges, i.e. springs or profile elements pointing inwardly, at which sections the object may then be pulled out of the clamp means. Paper sheets can be retained and filed in a practically bound state, without any need of punching holes, stapling etc., and at the same time they can be released easily.

Regarding the two-part clamp means, this clamp means leads to a simple joining together of two objects by pushing these objects towards each other. The two objects are also separated in an equally simple manner, if this is a desirable embodiment, by mutual displacement along the joining profiles. These may

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then possibly be equipped with sections without locking edges, where the objects may be pulled apart from each other.

The invention may be summarized as a clamp means for joining together two objects in a fast and simple snap-on
5 manner, comprising a male part and a female part provided respectively for each object, said female part having a cavity and comprising at least one springy, barb-like profile element attached along the upper edge of the female part, and in such a manner that for providing a retaining effect for the male part
10 when the male part is inserted into the female part cavity, said profile element extending down into said cavity and being adapted to yield elastically sideways when the male part is inserted in the cavity and engages a profile element surface, and thereafter to be relaxed and return quickly to a less
15 strained position when the tip of the male part has passed by the profile element, said male part tip having such dimensions that said tip is retained by the profile element due to a barb effect and against the cavity bottom due to an engagement effect, a further clamping effect also being obtained due to a
20 pinch effect between the profile elements or between the single profile element and the opposite wall, said profile element being convexly curved when viewed in the insertion direction, the lower edge of said profile element being located substantially closer to the cavity bottom than to the upper
25 edge of the wall, a male part section behind said male part tip having a surface with a substantially complementary cross section shape in relation to said profile element surface when the profile element is in its less strained position, in order to obtain a firm and rigid engagement.

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In the following, the invention will be described more closely by means of examples, and with reference to the enclosed drawing figures, where

Fig. 1 shows the clamp means in an embodiment as a
5 joining means for two objects,

Figs. 2A to D show the clamp means for retaining papers, in embodiments in accordance with both aspects of the invention,

Figs. 3A and B show a snap-fastener embodiment of the
10 invention,

Figs. 4A to C show a more advanced and releasable embodiment of a female part in accordance with the invention, and

Fig. 5 shows a detail embodiment of central elements
15 of the invention.

Fig. 1 shows a cross section through profile-shaped objects 10 and 11 which are provided with respectively a female part and a male part of a profile-shaped clamp means. The female part of the clamp means is in this embodiment example constructed integrally with the object 10, the female part bottom being provided with a recess 8 and being of a symmetrically shaped type with two profile elements or springs 6 with a convexly curved shape when viewed from the outside, and this female part is adapted to receive a male part with substantially complementary shape. This male part is in a corresponding manner designed as a part of the object 11 which shall be locked to object 10. The locking operation is made in a very simple manner in this case, by moving the two objects 10 and 11 right toward each other, see the arrow, the elasticity of the profile elements 6 causing these profile elements to yield sidewise, allowing the tip 7, 9 of the male part to penetrate to the bottom of the female part. The two profile elements 6 slip back to a less strained position immediately when tip 9 has passed by, and a joining connection with a very large engagement surface is obtained. When the material dimensions have been machined with sufficient precision, this joint will be very strong, with good rigidity in all directions. Such a joint clamp means can provide both temporary and permanent connection of two objects, or of several similar objects according to a tongue and groove principle.

It is favourable if the tip 9 of the male part has dimensions which are precisely adapted, so that there is achieved simultaneous engagement against the bottom and complementary engagement of the profile elements against the curved male part surface.

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The female and the male parts of the clamp means must not necessarily be integrally constructed with the objects to be fastened together, but may equally well be screwed separately on to each respective object.

5 However, in its most general form, this clamp means is not necessarily equipped with two symmetrical profile elements, and nor must the male part surface be completely complementary designed in relation to the surfaces of the female part. The important and quite essential feature is that
10 the female part has at least one convexly curved profile element, attached along the outer edge of the female part, and in such a manner that it extends a substantial part of the way down into the female part cavity, that the profile element is elastic, and that the tip of the male part has dimensions
15 adapted to be clamped by the profile element by a barb effect and against the cavity bottom by an engagement effect. The male part is then retained in three simultaneous manners, namely by the possibly one spring (or profile element) pinching the male part against the opposite wall or possibly against the
20 opposite profile element, by said profile element operating as a barb and by said male part engaging the bottom of the female part.

Of course it is possible to utilize such a clamp means as the type shown in fig 1 to make a permanent joint.
25 One may then simply envisage the female and the male part being quite uniform along the total profile length, and that blocking plates are provided in both ends thereof, so that the two parts cannot be shifted along each other (i.e. perpendicular to the paper plane).

30 On the other hand, if such a longitudinal displacement is possible along the whole profile length, it

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will of course be possible to release the male part and the female part from each other in this manner. However, if one is dealing with typically long objects, it will be favourable to provide both male part and female part with sections without a tip 9 respectively profile elements 6. With such sections intercalated in suitable positions, male and female parts can be pulled apart after only a short longitudinal relative displacement. Possibly, when the

male part has a substantially shorter extent in the longitudinal direction than the female part, the female part can be provided with a section without profile elements, and this section will then be somewhat longer than the extent of the male part in a longitudinal direction, so that the male part can be released from the female part by means of a longitudinal shift movement until it is positioned in this opening.

10 In the clamp means shown in fig. 1, the male part at the right in the drawing may also have a rotation symmetrical shape, about an axis in the same direction as the arrow. Such an embodiment is of course not as strong as that embodiment which utilizes a longitudinal profile shape also regarding the male part, however also such a joint clamp means will exhibit a certain degree of rigidity against bending "out of the paper plane", even though the complementary engagement between the two parts in such a case actually only takes place along two curves of contact. However, such a means may have clear advantages within the art of building constructions.

20 Fig. 2 shows a clamp means for retaining papers, and different embodiments are shown in figs. 2A-2D. Typically such a clamp means will be constructed with a length (perpendicularly to the paper plane) about equal to an A4-sheet and with gripping springs or profile elements along the whole length of the clamp means or in sections of the total length. In the case shown, one object is constituted by a paper collection plus two special cover pages or front and backside sheets 4, but an embodiment using only one such cover sheet is of course also possible.

30 In fig. 2A there is shown a symmetrically shaped embodiment, with a female part comprising two profile elements or gripping springs, as well as a male part consisting of a sheet collection in the middle, a backside sheet 4 and a front sheet. Both backside sheet 4 and front sheet are equipped with outward thickenings 5 along the edge to be inserted in the female part, and this complete, thickened "point" of the sheet collection constitutes the male part tip which shall penetrate to the bottom of the female part and be retained in the previously mentioned manner.

In fig. 2B there is shown a version with only one gripping spring or profile element in the female part, and in this case the backside sheet 4 of the sheet collection has no thickened part. On the contrary, the front sheet has a thickening 5, and in the same manner as in fig. 2A the sheet collection comprising front and backside sheet 4 now constitutes a male part, the tip of which is adapted to penetrate to the bottom of the female part and to be retained in the previously stated manner. Also in these cases the backside sheet 4 can advantageously be rigid, while the front sheet optionally can be rigid or flexible, possibly consist of a transparent material. It is also in this case possible to choose between a permanent binding in the female part (if the paper sheets are first fixed to the cover sheets), or a possibility for simple removal of documents by having the ends of the elongate profile back, i.e. the female part, open, in such a manner that the sheet collection quite simply can be pushed out lengthwise. When the backside 4 has a rigid or semi-rigid character, there is obtained a file folder which can be arranged upright in similarity with board covers and books.

The embodiment of fig. 2C has all the features of the embodiment of fig. 2B. In addition, a further element is shown in fig. 2C and made clearer, viewed sideways, in fig. 2D. In order to give an even better clamping effect there is provided an inclined and through groove 22 in the cavity wall behind the profile element. In this groove there is a button 21 which can be shifted along the groove, and on the inside the button 21 has a rounded head or elevated part which engages the backside of the profile element. When shifting this button 21 in an inclined direction, the pressure toward the profile element can be increased for achieving improved clamping of the paper collection.

Figs. 3A and 3B show a snap-fastener embodiment of the present invention. Viewed from above, i.e. along the axis indicated in fig. 3A, the push-button has in this case a circular shape, i.e. the upper part of the male part is substantially circular. The male part can be pushed down into the female part in a quite similar manner as previously mentioned, and provides a

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very good hold between the two parts. However, in total this button embodiment is not profile-shaped, even if the operational section of the female part of the button actually is. This appears most clearly from fig. 3B, which displays the female part in a view from above. It

appears from fig. 3B that the cavity is closed in one end (up in the plane of the drawing) and open in the other end. Thus, with such a shape it is possible to shift the male part along the profile elements 6 and out of the female part in the open
5 end thereof (downward in fig. 3B). Such a snap-fastener is well suited for e.g. holding parts of garments together, since the release movement is made in the opposite direction of the natural pulling force in the garment parts.

In figs. 4A and 4B there is shown a more advanced
10 embodiment of a female part in accordance with the invention. As appears most clearly from fig. 4B, showing the female part in a view from above, i.e. one views down into the cavity, holes are provided on both sides on the top at the edges of the female part walls. A lever 12 is arranged behind each profile
15 element 6, and the profile elements as well as the female part walls are further refined. The lower edge of each profile element 6 is provided with a groove 14, and a protruding rim on a first arm of lever 12 thrusts down into this groove 14. Further, lever 12 has a support arm which reaches down to be
20 supported in a second groove 13 provided on the inside of the wall. The lever also has a second arm extending in the opposite direction in relation to the said first arm, and this second arm has an end part 23 projecting out through the hole in the upper edge of the female part.

25 As indicated with arrows in both figs. 4A and 4B, it is possible to push or squeeze the projecting end parts 23, to the effect that the lower edges of the profile elements move sideways and out. Thereby a male part which possibly has been entered in the female part, can be released by pulling directly
30 outwards. The arm dimensions are such that a favourable translation ratio is achieved, i.e. the moment arm to end part

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23 is longer than the moment arm to groove 14 from the pivot axis in the second groove 13.

A further variant of the same principle can be found in fig 4C. In this case, which as a starting point is the same as that shown in figs 4A and B, the elasticity of the system is provided by means of an articulation, shown at hinge 16, and alternative spring means 19 or 20 (those shown in the same fig. 4C on respective sides) mounted between the lower part of the profile element and the wall adjacent to the profile element.

10 The same release possibility as in the previous case is also shown here, but the springy mobility in the profile elements is in this case obtained by a spring action in spiral spring 19 or leaf spring 20, and the articulate motion of the lower section 18 of the profile element about hinge 6. This solution may be

15 of interest regarding embodiments of the clamp means with higher rigidity and/or larger dimensions.

CLAIMS:

1. A clamp means for joining together two objects in a fast and simple snap-on manner, comprising a male part and a female part provided respectively for each object, said female part having a cavity and comprising at least one springy, barb-like profile element attached along the upper edge of the female part, and in such a manner that for providing a retaining effect for the male part when the male part is inserted into the female part cavity, said profile element extending down into said cavity and being adapted to yield elastically sideways when the male part is inserted in the cavity and engages a profile element surface, and thereafter to be relaxed and return quickly to a less strained position when the tip of the male part has passed by the profile element, said male part tip having such dimensions that said tip is retained by the profile element due to a barb effect and against the cavity bottom due to an engagement effect, a further clamping effect also being obtained due to a pinch effect between the profile elements or between the single profile element and the opposite wall, said profile element being convexly curved when viewed in the insertion direction, the lower edge of said profile element being located substantially closer to the cavity bottom than to the upper edge of the wall, a male part section behind said male part tip having a surface with a substantially complementary cross section shape in relation to said profile element surface when the profile element is in its less strained position, in order to obtain a firm and rigid engagement.

2. The clamp means in accordance with claim 1, wherein said male part surface is complementary to said profile element surface for some distance along the profile direction.

3. The clamp means in accordance with claim 1 or 2,
5 wherein said clamp means is elongate in a profile direction given by said upper edge of a cavity limiting wall.

4. The clamp means in accordance with claims 1, 2 or 3, said female part comprising in cross section a substantially U-shaped cavity with a bottom and two upright walls, and two
10 oppositely arranged profile elements, wherein said profile elements are placed in a symmetrical manner and for symmetrical effect in relation to a central plane spanned by an axis which is parallel to the longitudinal direction of the clamp means along said upper edge, and by the insertion direction for the
15 male part into said cavity, and wherein said male part also being correspondingly symmetrically shaped behind its tip for a double complementary engagement effect against the two profile elements in their less strained positions.

5. The clamp means in accordance with any one of claims
20 1 to 4, wherein the male part tip has a tapered forward section which fits complementarily into a corresponding shaped recess in the cavity bottom, for further support effect.

6. The clamp means in accordance with claim 4 or claim 5, wherein it is constructed typically long in the direction
25 given by said upper edge and with one or several sections without profile elements in the female part, and with corresponding sections in off-set positions in the male part without tip dimensions for providing the barb effect, so that the male part can be released from the female part by a

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relative displacement along the longitudinal direction, until said sections are in such a position that no locking/holding effect is present.

7. The clamp means in accordance with claim 4 or claim 5, wherein said female part is constructed typically long in the direction given by said upper edge and with at least one section without profile elements, and that said male part has an extent in the same said direction which is somewhat less than the extent of said at least one section without profile elements, so that the male part can be released from the female part by a relative displacement along the longitudinal direction, until said male part is located in said section and no locking/holding effect is present.

8. The clamp means in accordance with claim 4 or 5, wherein the lower edge of each profile element has a longitudinally extending part which is curved rearwardly toward the adjacent wall and up, thereby providing a first groove, each respective wall having on the inside thereof arranged a longitudinally extending section which projects inwardly and up at a height between said edge groove and the upper edge of the wall, thereby providing a second groove, and a rigid lever is arranged behind each respective profile element, said lever comprising a first arm with a rim protruding down into said first groove, a support arm in an inclined relation to said first arm, said support arm having an end thereof in engagement with the second groove for providing a pivot axis for said lever, and a second arm in the opposite direction of said first arm, said second arm having an end part projecting out through a hole in the upper edge of the female part, said hole being provided for that purpose, said levers, on both sides of said

clamp means, being adapted, when both end parts are pushed or squeezed to bend said profile elements backwards and away from a possibly retained male part, such that said male part is able to be pulled right out of the female part again, the distance
5 from said pivot axis to the squeeze position of an end part being larger than the distance to the first groove, so that the necessary squeeze force is reduced due to a favourable moment arm ratio.

9. The clamp means in accordance with claim 8, wherein
10 both profile elements are articulated along the profile direction with hinges mounted on the backside thereof, the springy effect of the profile elements being provided by separate spring devices mounted between the backside of the respective profile element and the adjacent wall.

15 10. The clamp means in accordance with claim 5, constructed as a circular snap-fastener in two parts, the profile-shape of said female part being surrounded by a circularly shaped area integral with said profile-shape, and the outer section of the male part being correspondingly
20 circularly shaped when viewed in the insertion direction, wherein the cavity is closed in one longitudinal end and open in the other end, so that said male part can be released from the female part by displacing it out along the profile direction.

25 11. The clamp means in accordance with claim 1, said female part comprising in cross section a substantially U-shaped cavity with a bottom and two upright walls, and two oppositely arranged profile elements, wherein the profile elements are placed symmetrically and for symmetrical effect in
30 relation to a central plane spanned by an axis which is

parallel to the longitudinal direction of the clamp means along said upper edge, and by the insertion direction for the male part into the cavity, and wherein said male part is rotation symmetrically shaped about an axis in the insertion direction, 5 with a surface the cross sectional shape of which in the section behind said tip is complementary to the cross sectional shape of the two profile elements when in their less strained positions and in contact with the male part, for obtaining a double complementary engagement effect along the curves of 10 contact.

12. The clamp means in accordance with claim 1, particularly adapted for clamping a paper collection, where one object is constituted by said female part and the other object comprises said paper collection and constitutes said male part, 15 wherein said male part also comprises a special front and/or a special backside sheet, and that at least one of these sheets is provided with an outward thickening along the edge to be inserted in the female part, said thickening constituting said tip, said paper collection including front and/or backside 20 sheet taking a substantially complementary shape in relation to the profile element/elements due to the squeezing effect.

13. The clamp means in accordance with claim 12, of the type with only one profile element, further comprising an inclined slide groove in the cavity wall carrying said single 25 profile element, and a slide button arranged in said groove, said slide button having a rounded, elevated part on the section thereof which projects into said cavity, said elevated part contacting the backside of the profile element and providing further and successively increasing pressure against

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the paper collection due to successively stronger engagement against the backside of the profile element when said button is displaced along the slide groove.

FETHERSTONHAUGH & CO.

OTTAWA, CANADA

PATENT AGENTS

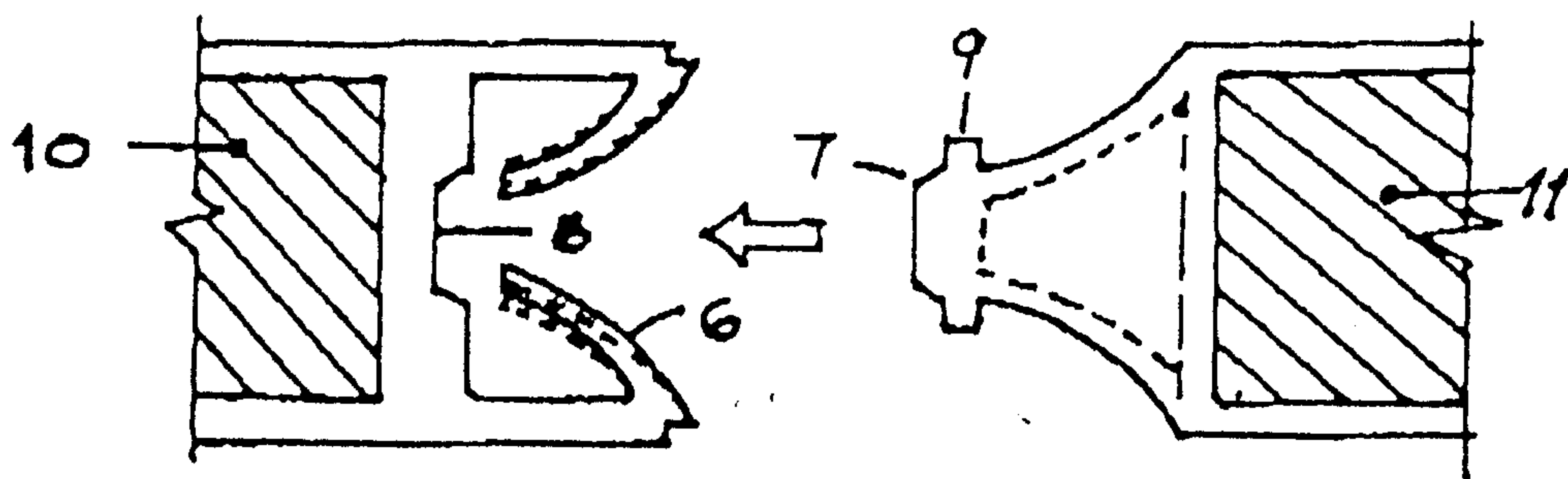


FIG 1



FIG 2A

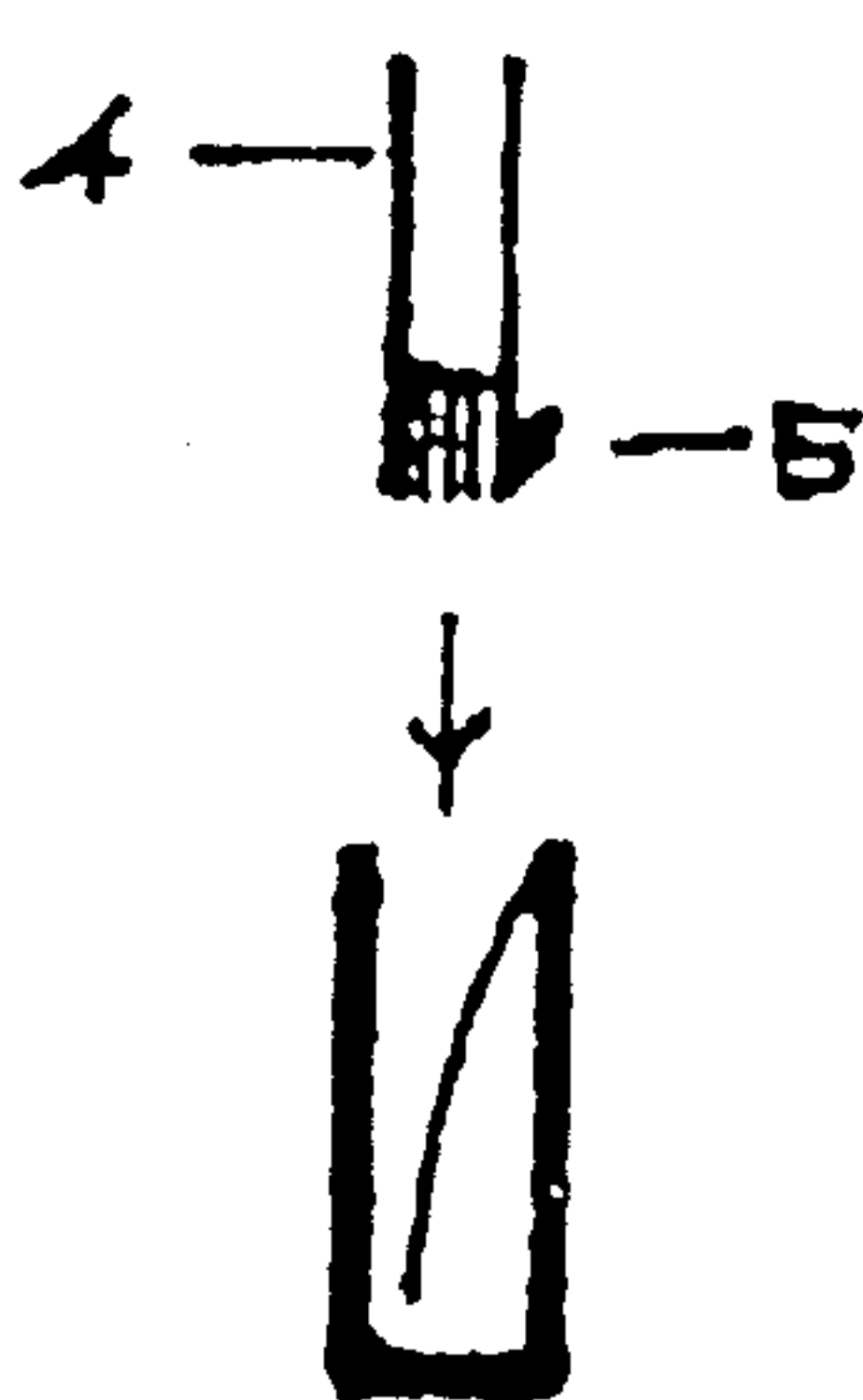


FIG 2B

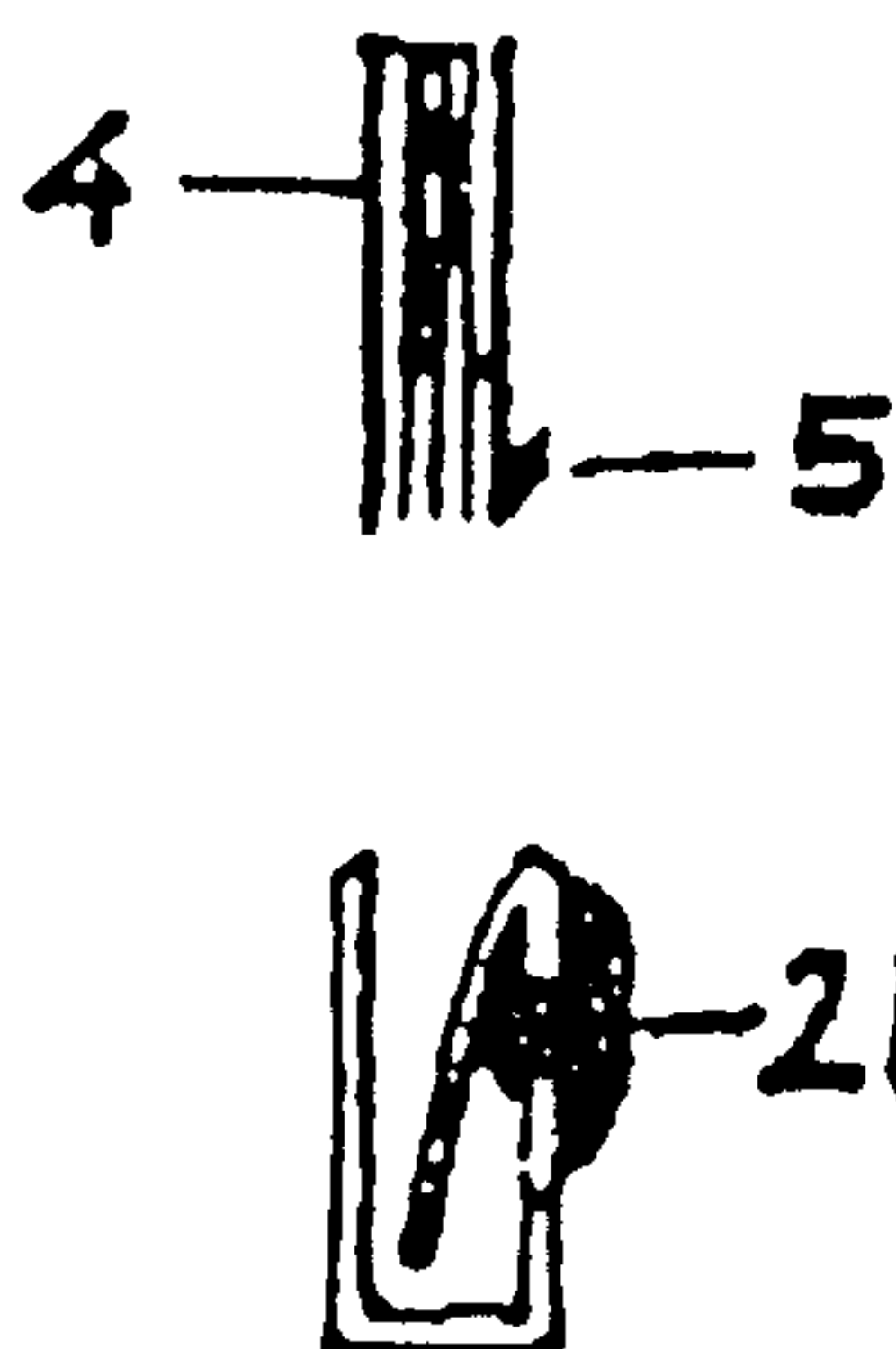


FIG 2C

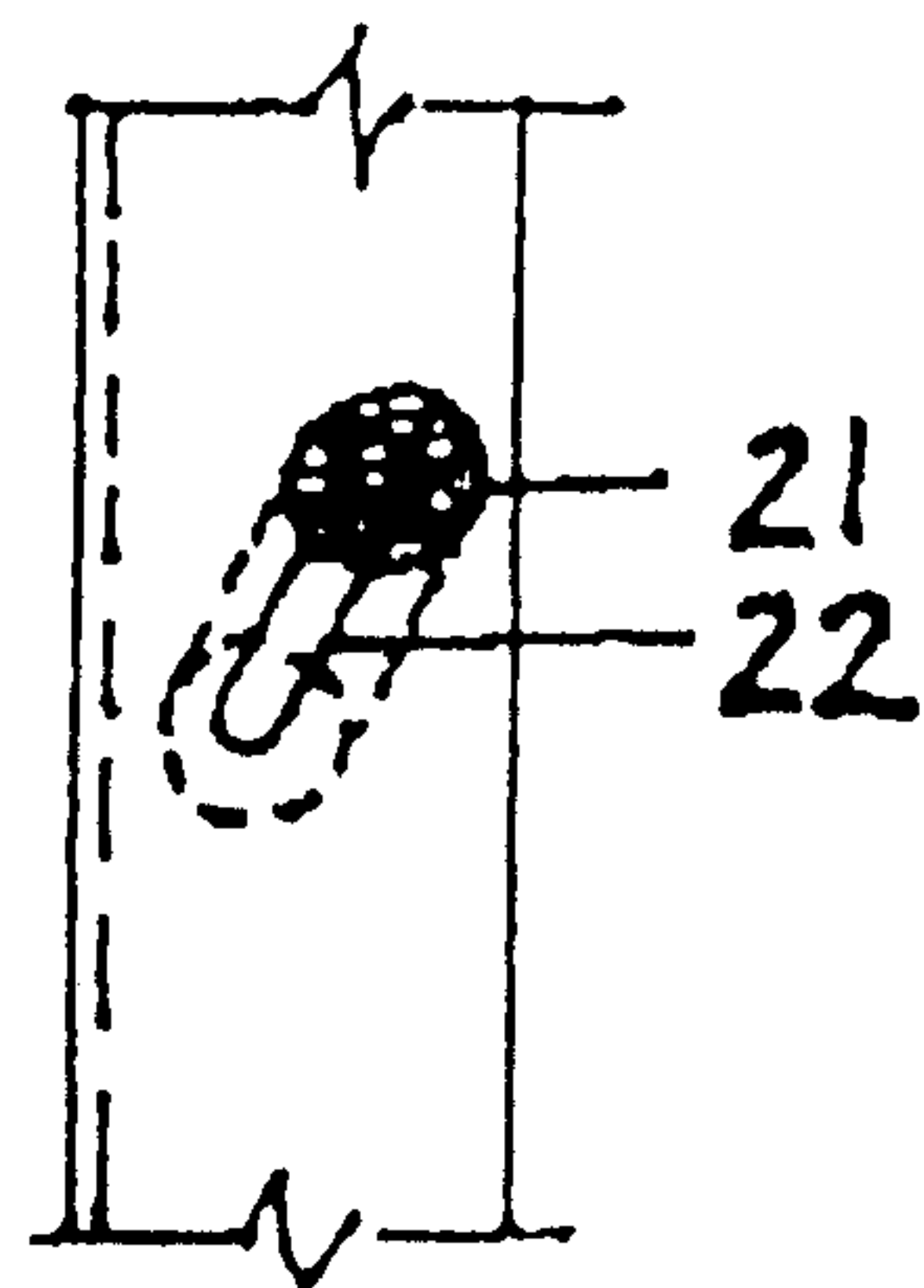


FIG 2D

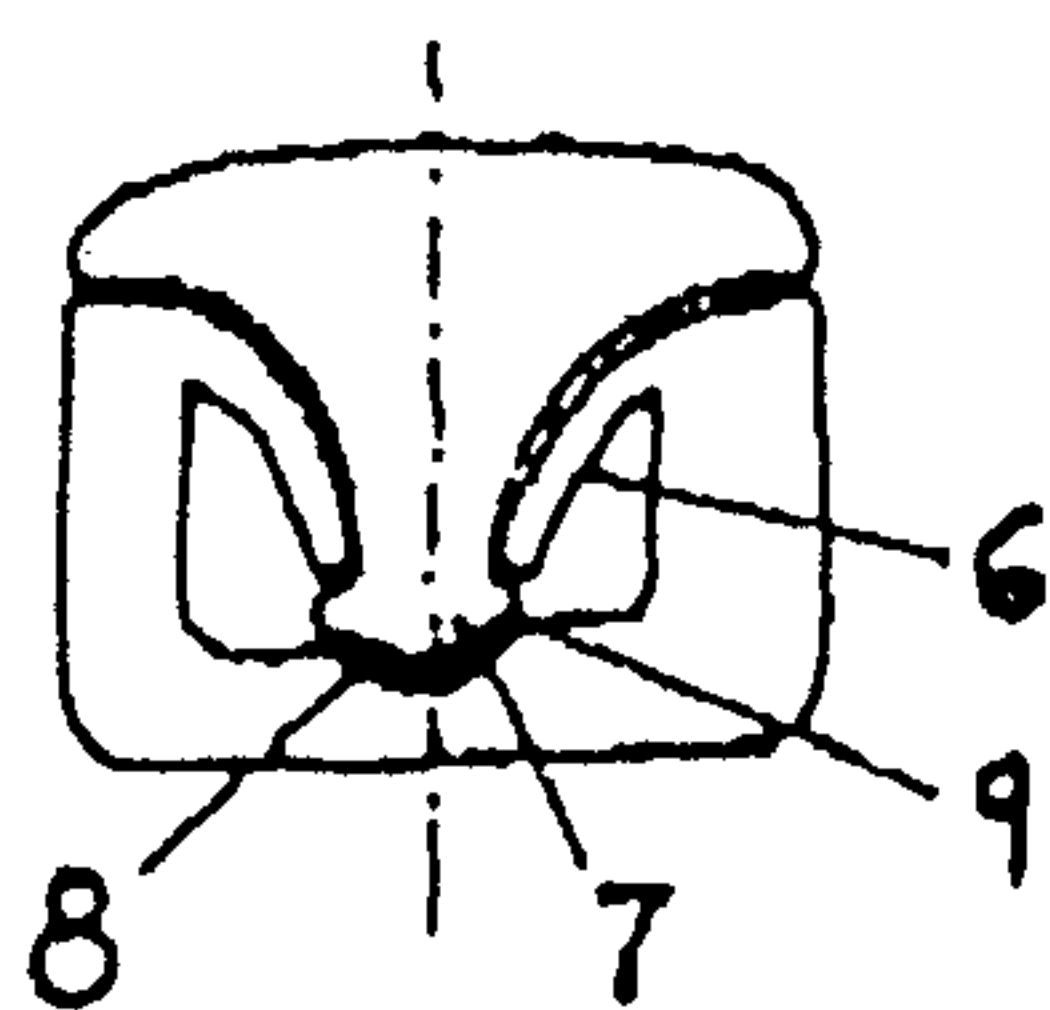


FIG 3A

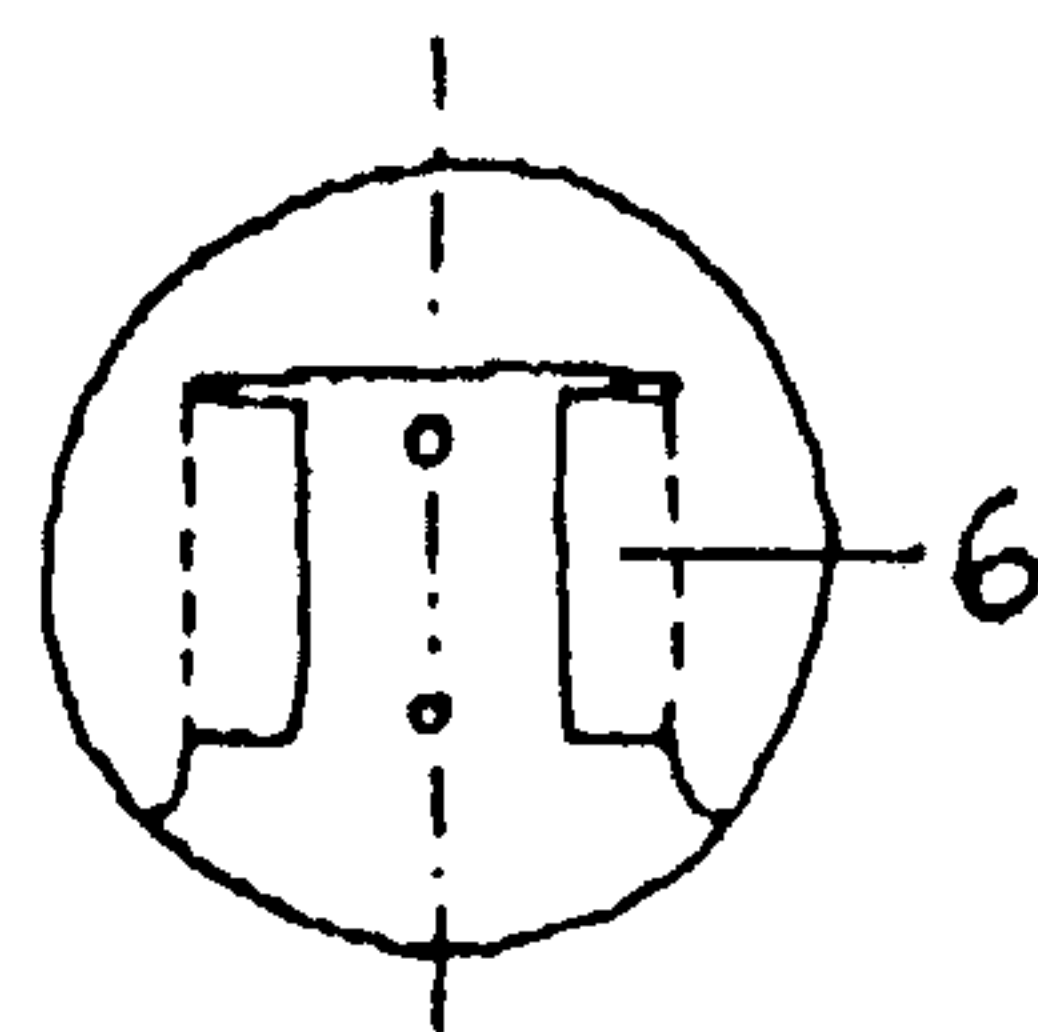


FIG 3B

FIG 4A

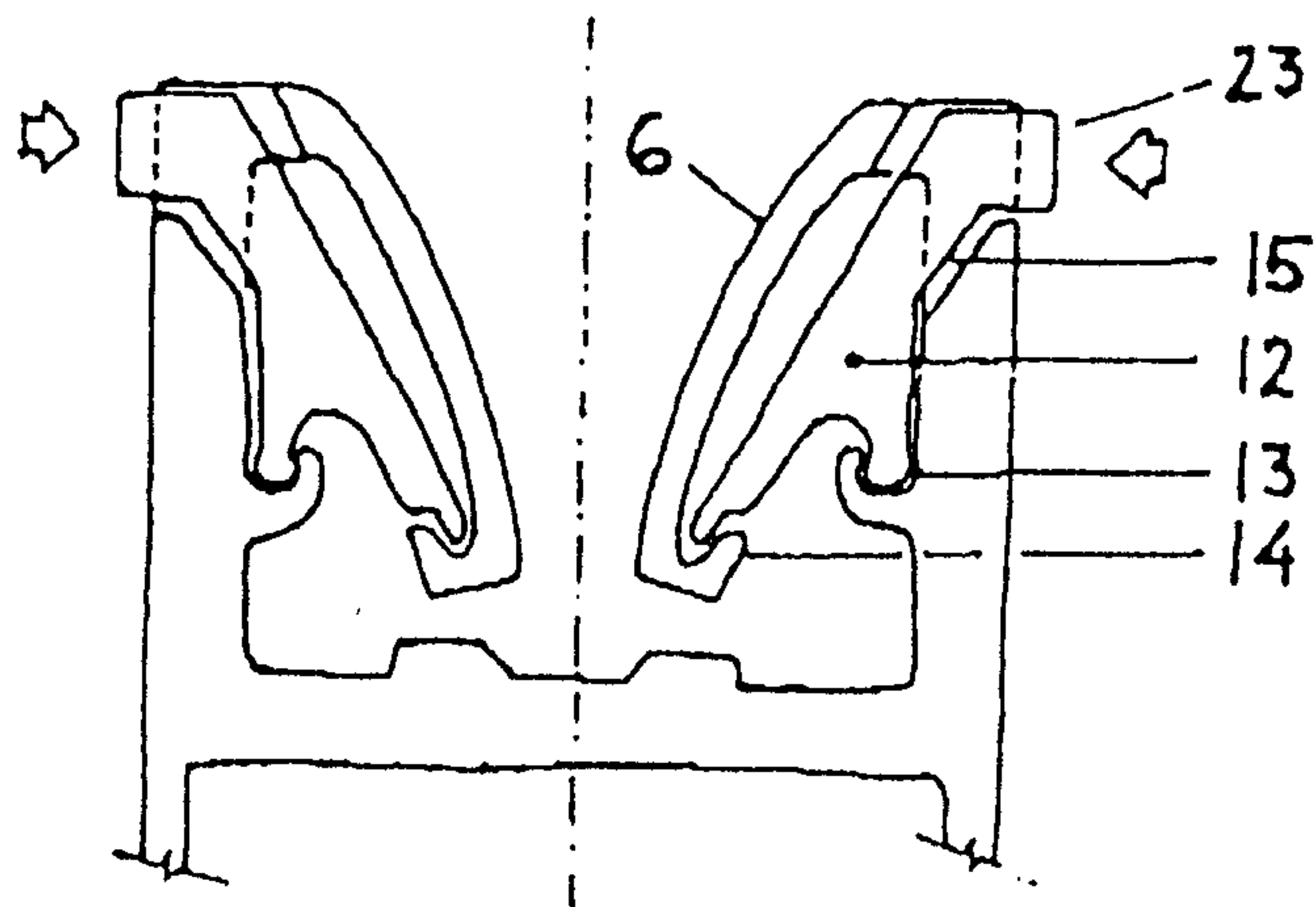


FIG 4B

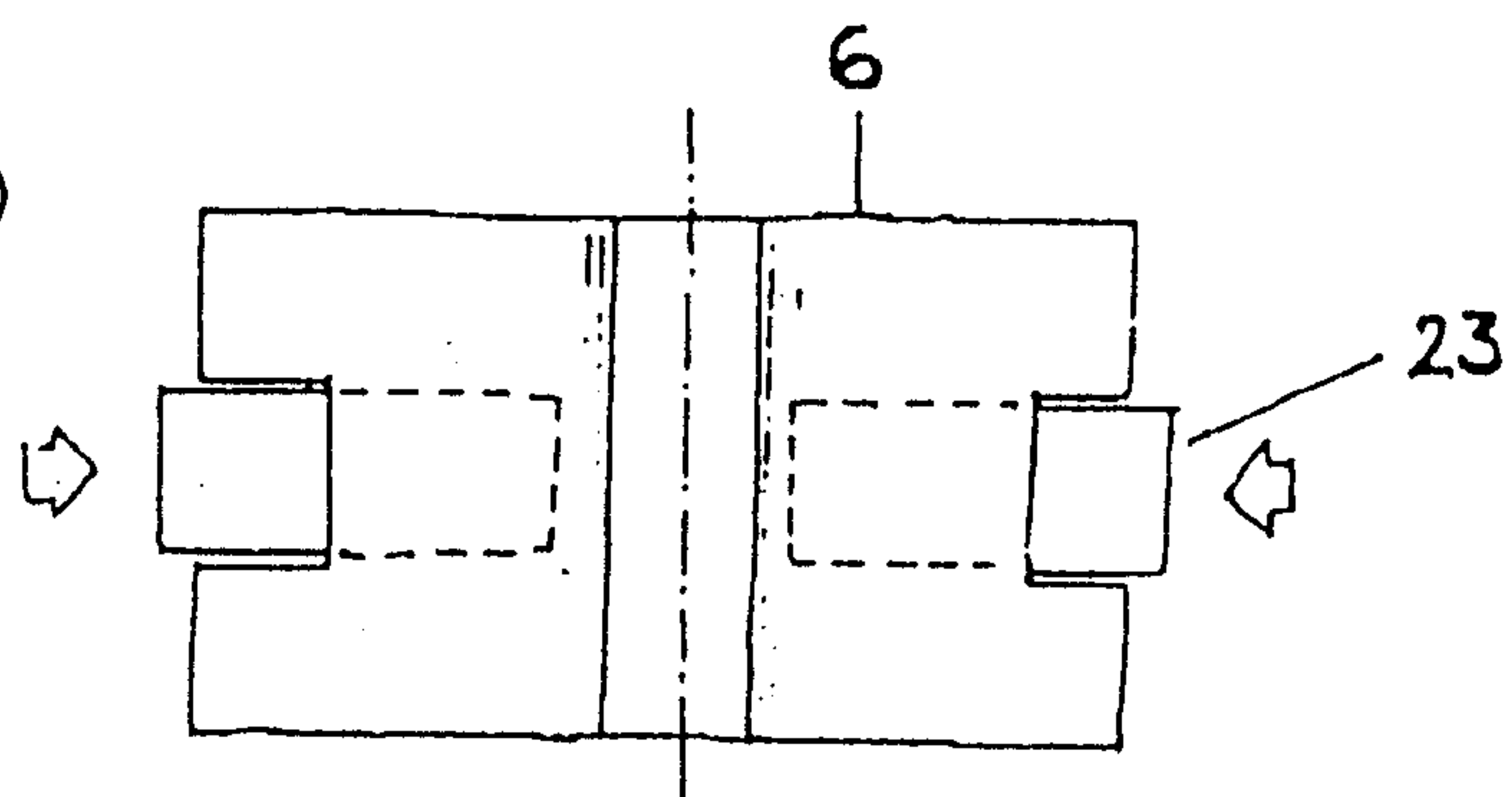
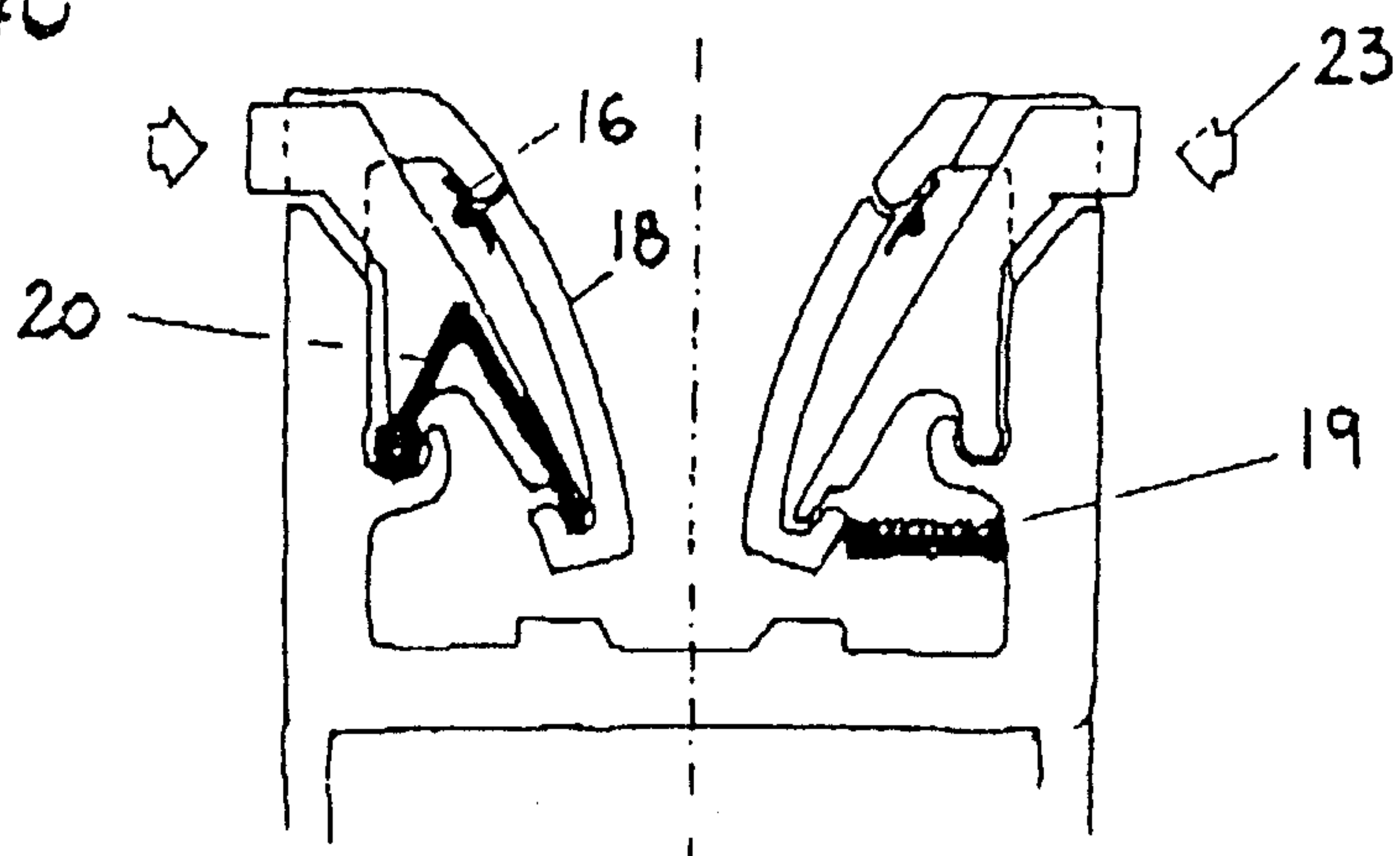
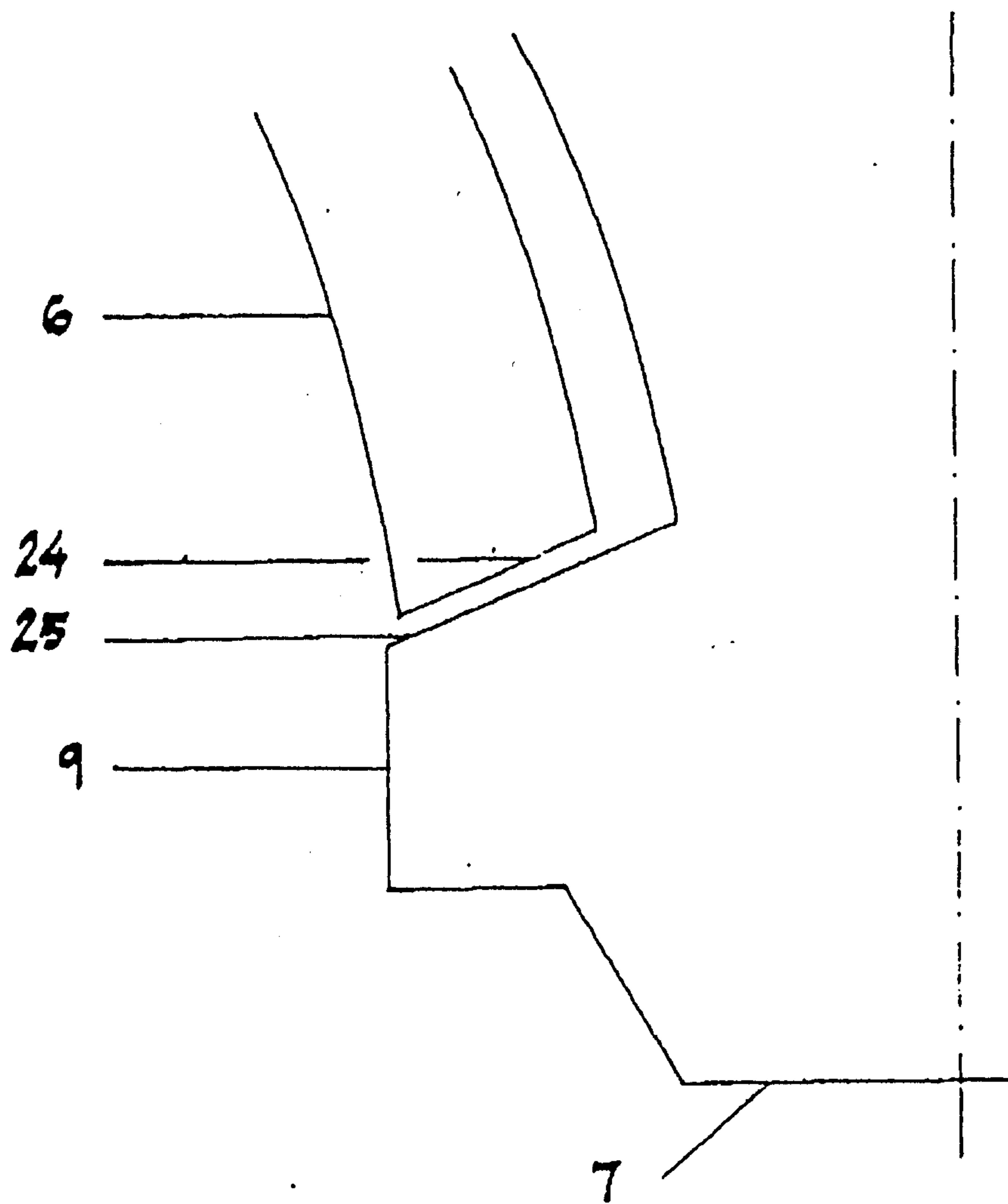


FIG 4C





F/G 5

