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Description

[0001] The present invention relates to a joint structure as defined in the preamble of claim 1.

[0002] Traditionally, the corners of log walls are constructed using crib joints, by making mutually corresponding cut-outs or notches in the opposite log surfaces to be placed one over the other, so that intersecting logs can be stacked tightly on top of each other. A crib joint is massive in respect of both weight and appearance.

[0003] There are several problems or drawbacks associated with a crib corner. The log portions extending beyond the corner constitute a significant increase in log material consumption. Thermal insulation of the corner is difficult because gaps tend to be formed between the criss-cross logs as they gradually twist, contract, swell and move in different ways. Another problem is that building a good and tight crib structure is a difficult and slow job and that a crib joint can join only two walls together.

[0004] A further drawback in a crib structure can be found in the fact that the entire log building must be erected by mounting one tier of logs at a time, which means that erecting the log framework is a slow and difficult business.

[0005] In an attempt to eliminate these problems, Norwegian patent 37752 presents a log structure in which the corner consists of a post to which the logs are joined by their ends with dovetail joints.

[0006] However, this solution is not a workable one. If the joints are made tight and neat in appearance, the structure is almost impossible to erect. Again, if the joints are made loose enough to permit erection, they are not tight and sufficiently rigid and they also look untidy.

[0007] The object of the present invention is to eliminate the drawbacks described above. A specific object of the invention is to present a new type of joint structure for the making of log walls so that the joints between the logs will be sturdy, flexible, warm, tight and easy and simple to build and also easy to take apart when necessary. A further object of the invention is to present a log joint structure that does not require any nails, screws, bars or any other separate joining devices made of metal or other materials.

[0008] As for the features characteristic of the invention, reference is made to the claims.

[0009] The joint structure of the invention comprises a vertical post and joint elements in the post and in the logs to be placed in it by their ends, said joint elements serving to join the logs to the post. The joint elements consist of dovetail joints, by means of which the logs are joined to the post and also locked in position. According to the invention, the post comprises as an essential part of it, either on both sides of the dovetail joint or on one side of it, a covering ledge, i.e. an integral and essential part of the post which extends over the entire length of

the post and overlaps the ends of the logs joined to the post, extending over the side face of the logs through some distance from the log end. This makes it possible to achieve at once a finished and tight joint between the log and the post, a joint that looks elegant without any mouldings whatsoever.

[0010] The dovetail joints used in the structure are preferably implemented by providing the log end with a tongue and the post with a groove. The structure can also be implemented in a converse manner, i.e. by providing the log end with a groove and the post with a tongue. It is also possible within the framework of the inventive idea to have a groove both in the log end and in the post, in which case, when the log and post are aligned with each other, a double-tongued batten shaped to fit the space formed by the grooves can be inserted into the grooves, so that the wedge-shaped batten interlocks the logs and the post.

[0011] The post preferably comprises at least two dovetail joint elements directed or opening in different directions, which elements may be at right angles, at a straight angle or in any arbitrary angle to each other. It is also possible to join several log walls extending in different directions to the same post.

[0012] In an embodiment of the invention, the post is provided with a groove and comprises a detachable edging strip incorporating a covering ledge and extending over the entire length of the post. This allows the groove to be completely opened on one side so that the logs can be lifted from the side into position over each other in the groove in the post, the edging strip being finally fixed back to the post to lock the logs in position. The edging strip can be secured using suitable screws, and even glue can be used if necessary.

[0013] In an embodiment of the invention, a post connecting two walls of a corner to each other at an angle of 90° consists of two identical profiles glued together by their mutual contact surfaces and forming an angle of 45° to the walls to be erected. Thus, these same dovetail joint profiles can be used to make a straight angle, i.e. to extend a wall in the same direction, by gluing the profiles together by their contact surfaces the other way round. In addition, in this embodiment preferably a narrow wedge-shaped element can be glued between the contact surfaces. In this way, by using a suitable wedge-shaped element, corners with walls at different angles can be built from the same basic profile, the angles being preferably 120° and 135°.

[0014] In an embodiment of the invention, the dovetail joint comprises a tightening element used to tighten the log longitudinally to the post. The tightening element may consist of wedges of a length substantially corresponding to the log height, which are forced into the space between the tongue and the groove when the wall is being erected, thus causing the oblique contact surfaces of the tongues and grooves to be pressed tightly against each other. It is also possible to make a slot in the bottom of the tongue or groove to allow the use of a

thicker and more robust wedge-shaped tightening element.

[0015] The tightening element may also consist of a shouldered tightening strip, in which case the post is provided with wedge-shaped shoulders corresponding to the shoulders on the strip. In this case, when the log wall is being erected, the shoulders on the strip and those on the post lie as closely together as possible, and finally an impact is applied to one end of the shouldered strip so that the strip is forced to move outward from the post by its shoulders, thereby pushing the logs tightly against the dovetail joints of the post.

[0016] The shoulder distance on the shouldered strip is preferably equal to the log height, so that each log will be pressed by a shoulder. Another possibility is that no shoulders are formed in the post but instead two shouldered strips in opposite orientation are used, with the shoulders placed oppositely. In this case, after the logs have been mounted in place, when one of the strips is held stationary and an impact is applied to the other one, the logs are tightened in position. In this embodiment, the logs can be loosened just as easily by applying an impact to the strip that was held stationary when tightening the logs.

[0017] The tightening element used in the joint structure of the invention may also consist of various eccentric elements which are placed between the tongues and the grooves and which can be turned from the outside of the post.

[0018] The joint structure of the invention has significant advantages as compared with prior art. The joint structure is a self-stiffening and self-locking structure, in other words, it requires no separate fixing elements. The joint structure can be easily tightened to make it completely tight if necessary. The joint surfaces in the joint structure are relatively long and always longer than the reserve between logs, so the leakage caused by the joint will be insignificant. Moreover, thanks to the covering ledges, the parts of the dovetail joint can be fabricated to sufficiently loose dimensions to allow easy erection as the flanks of the logs are tightened between the covering ledges. The structure permits free natural motion and setting of the logs relative to the vertical post. In addition, the structure allows very simple and fast erection and disassembly without its components being damaged in any way during these operations because no fixing devices are needed, so using the joint structure of the invention it is possible to build various partitions of neat and representative appearance, temporary interior structures and all sorts of temporary structures which later need to be restructured or disassembled altogether.

[0019] In the following, the invention is described in detail by referring to the attached drawings, in which

Fig. 1 presents a perspective view of a joint structure according to the invention,

Fig. 2 presents a sectioned view of a structure sub-

stantially consistent with the structure in Fig. 1, Fig. 3 presents an embodiment of the invention, Fig. 4 presents another embodiment of the invention,

Fig. 5 presents a third embodiment of the invention, Fig. 6 illustrates a tightening arrangement, Fig. 7 illustrates a post structure, Fig. 8 illustrates another tightening structure, and Fig. 9 illustrates a post structure according to the invention.

[0020] The joint structure presented in Fig. 1 and 2 comprises a post 2 connecting two log walls 1 at right angles to each other. The log ends are provided with vertical dovetail joint tongues 3 and the post is provided with corresponding grooves 4. Therefore, the tongues of the logs 1 can be slid in from the upper end of the post into the grooves so that the logs 1 are secured to the post 2. Due to the wedge-shaped structure of the dovetail joint, the logs need not be fastened in any other way but are securely attached to the post solely by the joint. An essential part of the post structure are the covering ledges 5, which extend through some distance from the log end onto the sides of the logs. Thus, the covering ledges cover the joint and any machining traces that may have been left at the log ends, so a completely finished joint is obtained immediately after the logs have been mounted.

[0021] In Fig. 2, the post 2 is composed of several parts glued together, so a more rigid and straight post is obtained. In addition, the surface parts that remain visible on the post can be made of higher quality wood with fewer knots while the inner parts are made of more knotty raw material.

[0022] Fig. 2 further shows a door frame 16 joined to the post 2. Attached to the frame is a separate batten 17 with a dovetail tongue of a shape corresponding to the groove 4 in the post 2. It is naturally also possible to fabricate a frame that in itself comprises a tongue.

[0023] The post profile in Fig. 2 additionally comprises a hole 20 going through the post. The hole has two functions. It can act as a guide when the two opposite profile parts are being joined and glued together. A suitable bar or pipe can be inserted into the hole, so the parts will be accurately aligned when joined and pressed together. In a finished post, the hole can contain a threaded bar allowing a bottom beam under the post and a top beam on top of it to be tightened to form a rigid framework. This will not necessarily produce any pressure on the logs joined to the posts, but the logs can still undergo natural motion and setting depending on the conditions.

[0024] Fig. 3 presents an embodiment of the invention in which two adjacent log walls extending in the same direction are joined to a post 2 with dovetail joint elements 6. In this case, one of the walls forms an exterior wall 7 and the other an interior wall 8, with an insulation space left between them. This space can be filled with suitable insulating material 9, such as e.g. cellulose

wool introduced by blasting, the wall as a whole will have a structure that allows breathing and thus corresponds to a solid log wall.

[0025] Fig. 4 presents an embodiment of the invention in which both the post 2 and the log 1 end are provided with a groove 4. In this case, the logs are joined to the post by means of a separate double-tongued batten 11 shaped to fit the shape of the two opposite grooves. In this embodiment, the double-tongued batten 11 is mounted in place in pieces of a length corresponding to the height of e.g. one log or three logs, and these pieces are forced into position after an appropriate number of logs have been mounted, because mounting a full-length batten 11 may be difficult.

[0026] In the embodiment presented in Fig. 5, the post 2 comprises a detachable edging strip 10 attached to the post with a screw 18. The edging strip forms part of the groove 4 of the post and also comprises a covering ledge that covers the side of the log end. In this case, the logs 1 can be stacked on top of each other and placed against the post 2 without having to slide them into the groove from the end of the post 2. When the logs are in place, the edging strip 10 is mounted and screwed fast, thus locking the logs in position in the post.

[0027] Normally, when a dovetail joint according to the invention is used, a sufficiently tight and rigid joint that stiffens the whole structure is obtained by just sliding the logs into the grooves of the posts and stacking the logs one over the other to form a complete wall. However, if necessary, the joint can be tightened e.g. by forcing a wedge 12 into the space between the post 2 and the end of each log 1 as illustrated by Fig. 6. The wedge presses the log 1 and the post 2 in opposite directions, thus causing the oblique surface 14 of the tongue to be pressed tightly against the corresponding oblique surface 15 of the groove (Fig. 7).

[0028] The tongues and grooves can be fabricated to loose-fit dimensions such that a wedge 12 of suitable size can be inserted between them. It is also possible, as illustrated by Fig. 7, to make a separate key slot 21 in the bottom of the groove for the tightening wedge. It is further possible to use in this slot a tightening element 13 as shown in Fig. 8, i.e. a shouldered tightening strip, in which case the bottom of the key slot is provided with corresponding shoulders in reverse orientation. It is further possible to use two tightening strips 13 placed in the key slot in converse orientations with the shoulders opposite to each other, the strips being tightened and wedged up after the logs have been mounted.

[0029] The key slot 21 can also be used as a sealing channel, in other words, a suitable sealing strip pressed against the log end is placed in the key slot. Further, it is possible to use a separate sealing channel or channels in addition to the key slot.

[0030] Fig. 9 shows a profile view of an embodiment of the invention in which the post is composed of two identical dovetail profiles 18. An individual profile 18 may be made up of one or more parts. The joint surfaces

of the profiles are at an angle of 45° to the walls to be joined to them, so the profiles will form a 90° corner if they are joined directly together. In the case illustrated by the figure, however, a key profile 19 designed to produce a desired angle between the walls joined to the post is glued between the dovetail profiles. In this way, by only using different key profiles, different angles between walls, e.g. 45, 60, 120, 135, 150 and 180°, are achieved with the same dovetail profiles 18.

[0031] The invention has been described above by giving examples and referring to the attached drawings, but different embodiments are possible within the framework of the invention as defined by the claims.

Claims

1. Joint structure for joining walls built from logs (1) placed one over the other, said joint structure comprising a post (2) and dovetail joints both in the post and in the ends of the logs to join them together, **characterized** in that the post (2) comprises as an integral and essential part of it, at least on one side of the dovetail joint structure, a covering ledge (5) overlapping the sides of the logs (1) over some distance from the log end.
2. Joint structure as defined in claim 1, **characterized** in that the tongue of the dovetail joint belongs to the end of the log (1) while the groove (4) belongs to the post (2).
3. Joint structure as defined in claim 2, **characterized** in that the post (2) comprises covering ledges (5) overlapping both sides of the log (1).
4. Joint structure as defined in any one of claims 1 - 3, **characterized** in that the post (2) comprises at least two dovetail joint elements for joining two walls oriented in different directions.
5. Joint structure as defined in any one of claims 1 - 4, **characterized** in that the post (2) comprises two adjacent and parallel dovetail joint elements (6) in order that the wall to be joined to the post can be built from an outer wall (7) and an inner wall (8) and a possible insulation (9) in the space between them.
6. Joint structure as defined in any one of claims 1 - 5, **characterized** in that the post (2) comprises a detachable groove edging strip (10) allowing the groove to be opened and closed again after the logs (1) have been mounted.
7. Joint structure as defined in claim 1, **characterized** in that the post consists of two identical dovetail profiles joined together and a possible key profile (19) placed between them to change the directions of

the dovetail joints.

8. Joint structure as defined in claim 1, **characterized** in that both the post (2) and the end of the log (1) are provided with a groove (4) and the post and the log are joined together by means of a double-tongued batten (11).
9. Joint structure as defined in any one of claims 1 - 8, **characterized** in that the dovetail joint comprises a tightening element (12, 13) designed to press the oblique surfaces (14) of the tongue against the oblique surfaces (15) of the groove.
10. Joint structure as defined in claim 9, **characterized** in that the tightening element is a wedge forced into the space between the tongue and the groove.

Patentansprüche

1. Verbandkonstruktion zum Zusammenschließen miteinander von aus aufeinanderliegenden Blöcken (1) aufgebauten Blockwänden, zu der eine Säule (2) sowie an der Säule und an den Enden der Blöcke vorgesehene Schwalbenschwanzverbände zum Zusammenschließen dieser miteinander gehören, dadurch gekennzeichnet, daß zu der Säule (2) als integraler und wesentlicher Teil zumindest auf der einen Seite des Schwalbenschwanzverbandes Deckleisten (5) gehören, die sich über die Flanken des Blocks (1) auf einen Abstand vom Ende des Blocks erstrecken.
2. Verbandkonstruktion gemäß Anspruch 1, dadurch gekennzeichnet, daß die Feder (3) des Schwalbenschwanzverbandes an das Ende des Blocks (1) und die Nut (4) an die Säule (2) gehört.
3. Verbandkonstruktion gemäß Anspruch 2, dadurch gekennzeichnet, daß zu der Säule (2) über beide Flanken des Blocks (1) sich erstreckende Deckleisten (5) gehören.
4. Verbandkonstruktion gemäß irgendeinem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß zu der Säule (2) mindestens zwei Schwalbenschwanzverbandglieder mit verschiedener Richtung zum Zusammenschließen von zwei Wänden mit verschiedener Richtung gehören.
5. Verbandkonstruktion gemäß irgendeinem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß zu der Säule (2) zwei nebeneinanderliegende und gleichgerichtete Schwalbenschwanzverbandglieder (6) zum Aufbauen der an der Säule anzuschließenden Wand getrennt aus einem Außenmantel (7) und einem Innenmantel (8) und eventuell aus einer

Dämmung (9) im Zwischenraum gehören.

6. Verbandkonstruktion gemäß irgendeinem der Ansprüche 1 bis 5, dadurch gekennzeichnet, daß zu der Säule (2) eine loslösbare Randleiste (10) der Nut zum Öffnen der Nut und zum abermaligen Schließen desselben nach erfolgtem Einsetzen der Blöcke (1) gehört.
7. Verbandkonstruktion gemäß Anspruch 1, dadurch gekennzeichnet, daß die Säule aus zwei miteinander verbundenen identischen Schwalbenschwanzprofilen (18) sowie aus einem eventuellen Keilprofil (19) zwischen denselben zum Verändern der Richtungen der Schwalbenschwanzverbände besteht.
8. Verbandkonstruktion gemäß Anspruch 1, dadurch gekennzeichnet, daß sowohl zu der Säule (2) als auch an das Ende des Blocks (1) eine Nut (4) gehört, wobei diese mittels einer Doppelspundleiste (11) miteinander verbunden werden.
9. Verbandkonstruktion gemäß irgendeinem der Ansprüche 1 bis 8, dadurch gekennzeichnet, daß zu dem Schwalbenschwanzverband ein Spannglied (12,13) zum Pressen der Schrägflächen (14) der Feder gegen die Schrägflächen (15) der Nut gehört.
10. Verbandkonstruktion gemäß Anspruch 9, dadurch gekennzeichnet, daß das Spannglied (12,13) ein zwischen der Feder und der Nut einzuschiebender Keil ist.

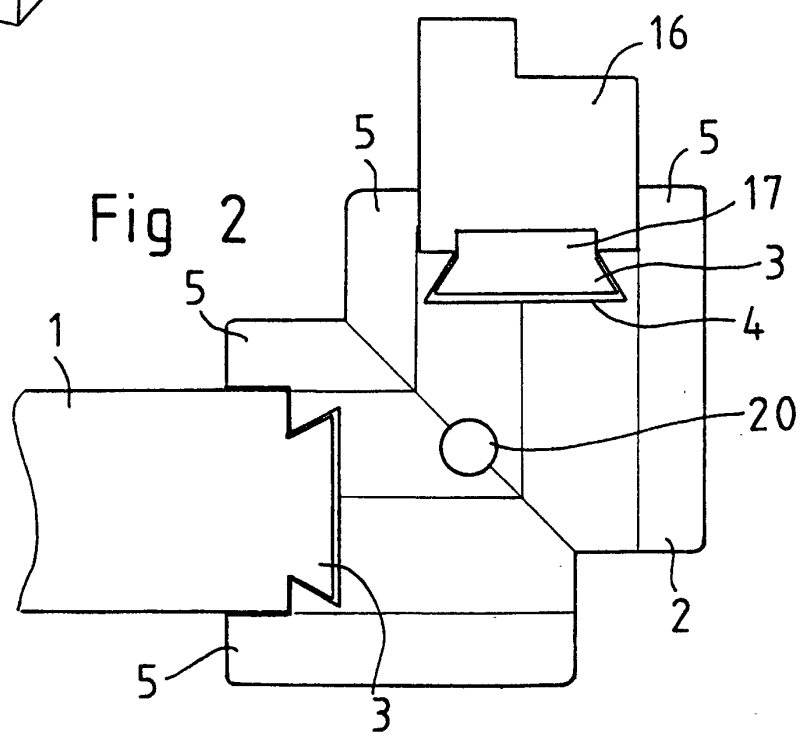
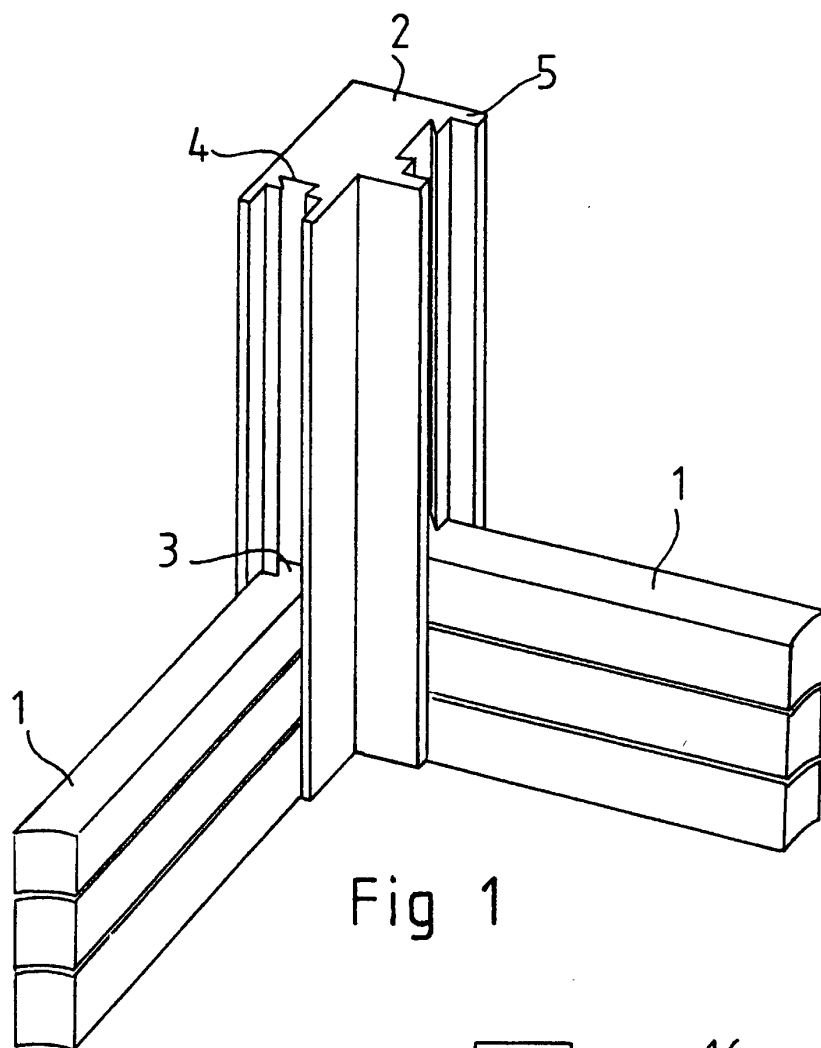
Revendications

1. Structure de joint pour joindre des murs construits à partir de rondins (1) placés les uns au-dessus des autres, ladite structure de joint comportant un poteau (2) et des assemblages en queue d'aronde, à la fois dans le poteau et dans les extrémités des rondins, afin de les joindre ensemble, caractérisée en ce que le poteau (2) comporte, en tant que partie intégrale et essentielle de celui-ci, au moins sur un côté de la structure d'assemblage en queue d'aronde, un rebord de couverture (5) chevauchant les côtés des rondins (1) sur une certaine distance à partir de l'extrémité du rondin.
2. Structure de joint selon la revendication 1, caractérisée en ce que la languette de l'assemblage en queue d'aronde fait partie de l'extrémité du rondin (1), tandis que la rainure (4) fait partie du poteau (2).
3. Structure de joint selon la revendication 2, caractérisée en ce que le poteau (2) comporte des rebords de couverture (5) chevauchant les deux côtés du rondin (1).

4. Structure de joint selon une quelconque des revendications 1 à 3, caractérisée en ce que le poteau (2) comporte au moins deux éléments d'assemblage en queue d'aronde pour joindre deux murs orientés selon des directions différentes. 5
5. Structure de joint selon une quelconque des revendications 1 à 4, caractérisée en ce que le poteau (2) comporte deux éléments d'assemblage en queue d'aronde adjacents et parallèles (6) afin que le mur destiné à être joint au poteau puisse être construit à partir d'un mur extérieur (7) et d'un mur intérieur (8) avec une isolation possible (9) dans l'espace entre ceux-ci. 10 15
6. Structure de joint selon une quelconque des revendications 1 à 5, caractérisée en ce que le poteau (2) comporte une bande de bordure détachable à gorge (10) permettant à la gorge d'être ouverte et fermée à nouveau, après que les rondins (1) aient été montés. 20
7. Structure de joint selon la revendication 1, caractérisée en ce que le poteau est constitué de deux profils identiques en queue d'aronde joints ensemble et d'un profil de clef possible (19), placé entre eux afin de changer les directions des assemblages en queue d'aronde. 25
8. Structure de joint selon la revendication 1, caractérisée en ce qu'à la fois le poteau (2) et l'extrémité du rondin (1) sont munis d'une gorge (4) et le poteau et le rondin sont joints ensemble au moyen d'une latte (11) à double languette. 30 35
9. Structure de joint selon une quelconque des revendications 1 à 8, caractérisée en ce que l'assemblage en queue d'aronde comporte un élément de serrage (12, 13) conçu pour pousser les surfaces obliques (14) de la languette contre les surfaces obliques (15) de la rainure. 40
10. Structure de joint selon la revendication 9, caractérisée en ce que l'élément de serrage est un coin forcé dans l'espace entre la languette et la rainure. 45

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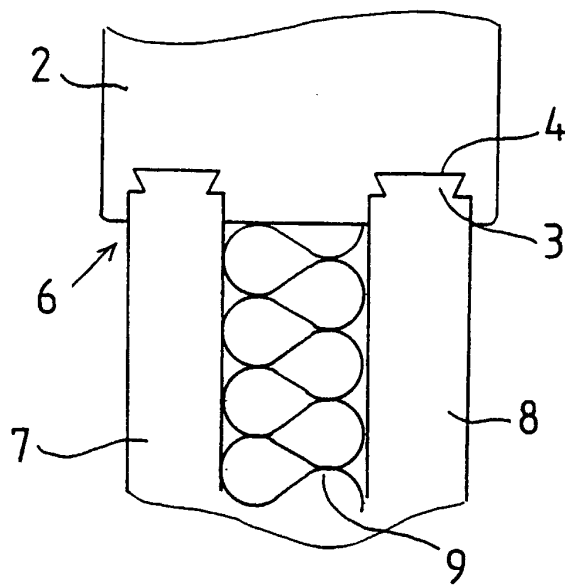


Fig 3

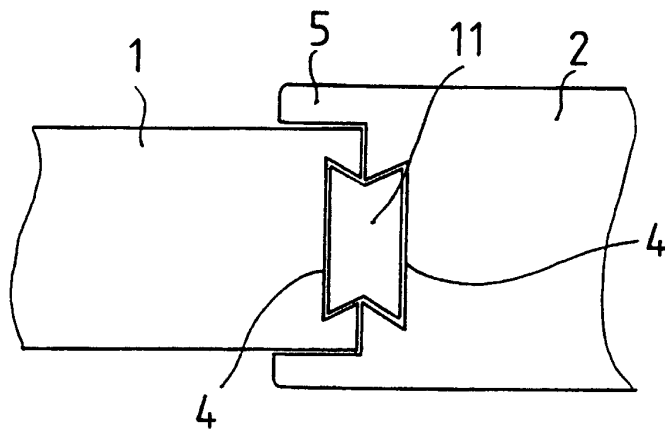


Fig 4

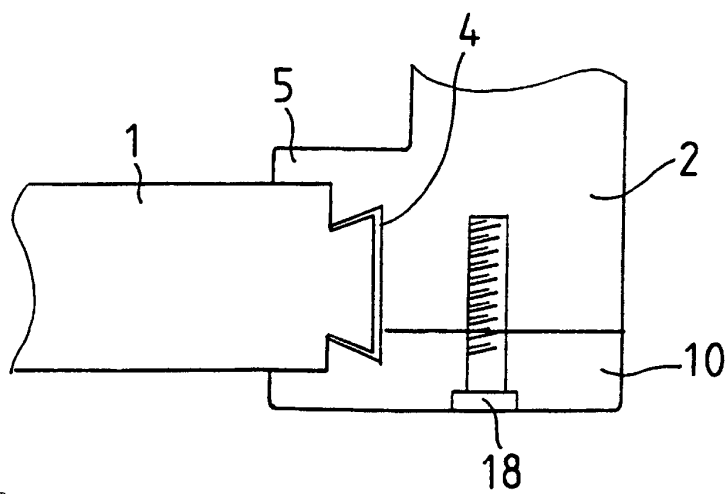


Fig 5

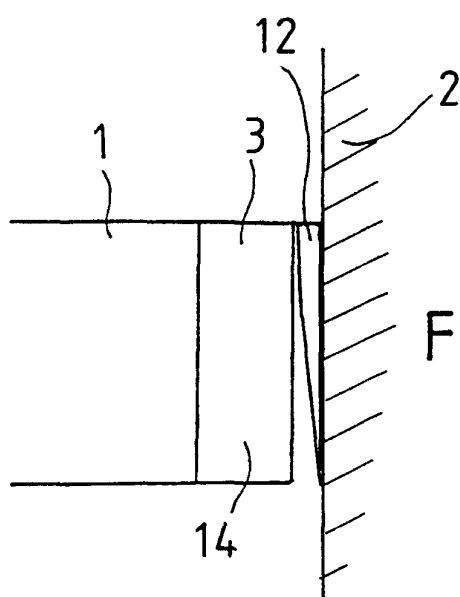


Fig 6

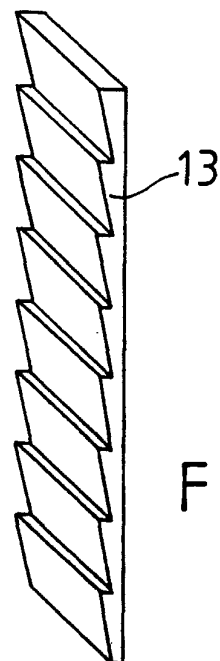


Fig 8

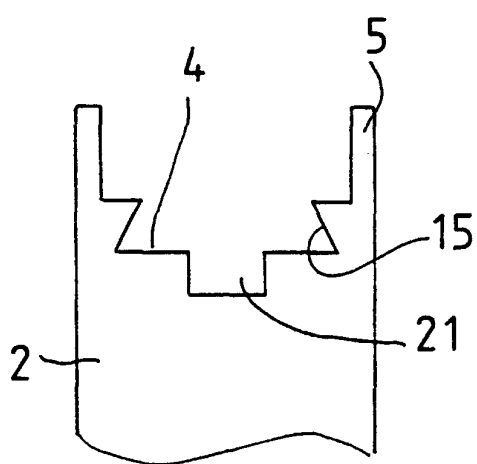


Fig 7

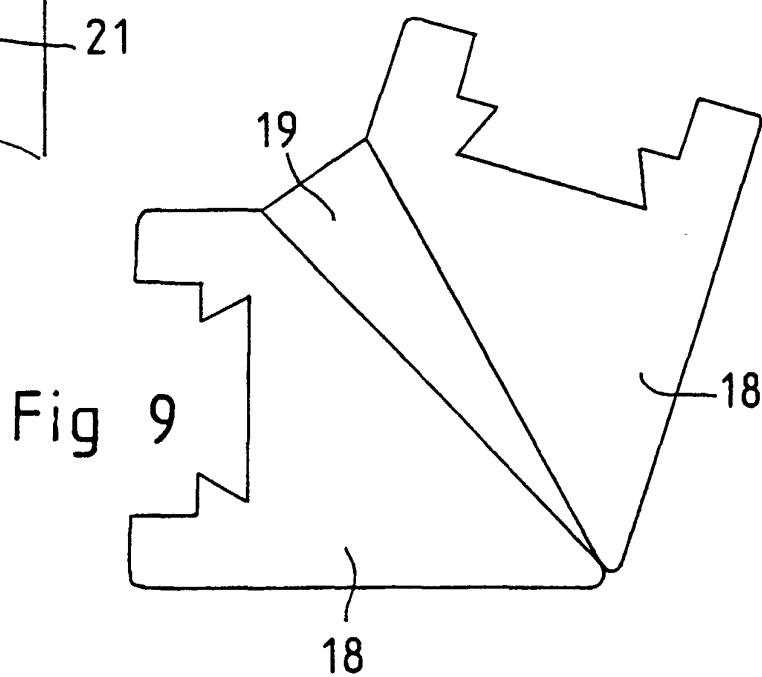


Fig 9