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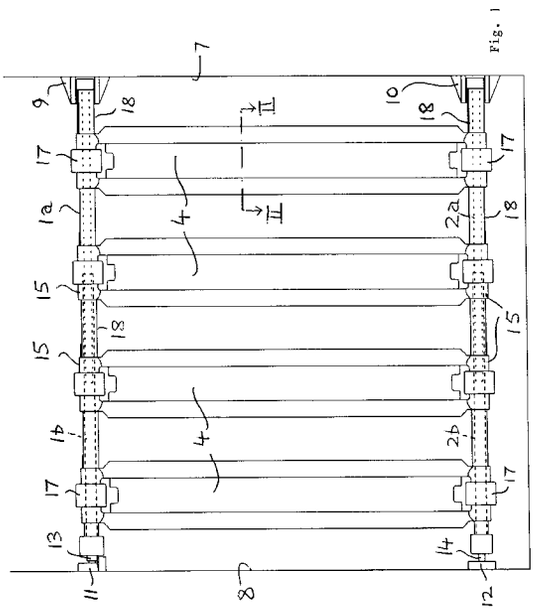
(54) Safety gates for children.

(57) A safety gate comprises at least three vertically extending barrier members 4 extending between upper and lower support tubes 1, 2 each of which is telescopic. Spacer sleeves 18 surround the upper or lower support tubes. The spacer sleeves 18 carry projecting serrated tongues 19 which can be clamped together against the upper or lower support tube by clamping rings 17, there being a clamping ring 17 at the upper and lower end of each barrier member 4. The spacer sleeves 18 and clamping rings 17 enable the horizontal spacing between adjacent pairs of barrier members 4 to be adjusted, to enable the effective width spanned by the safety gate to be varied.



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This invention relates to safety gates for children, which are devices for placing in openings such as doorways or at the top or bottom of stairs to bar children's access to certain areas, for safety purposes.

Known safety gates are adjustable to enable the effective width spanned by the safety gates to be varied, so that the gates can be fitted in openings of differing widths. In one known form of safety gate, a frame-like barrier carries horizontally projecting screw-threaded rods the extremities of which carry rubber pads for engagement with the sides of the opening into which the safety gate is to be fitted. By rotational adjustment of the rods, the safety gate can be removably clamped in position with the pads frictionally engaging the sides of the opening. This has the disadvantage that large horizontal gaps can be left between the sides of the opening and the frame-like barrier. Another known form of safety gate employs two panels which are interconnected for relative sliding movement which alters the extent of overlap of the panels so as to vary the effective width spanned. This form of safety gate avoids the problem of a potentially large horizontal gap but suffers from the disadvantage that the panels are large and bulky, resulting in a weighty and cumbersome safety gate. The invention aims to provide a safety gate which can span differing widths of opening but which avoids the problems of the known safety gates.

According to the invention a safety gate for children comprises a barrier including at least three generally vertically extending barrier members, connecting means which connect the barrier members together in series such that the horizontal spacing between adjacent barrier members is adjustable and clamping means for retaining the barrier members in adjusted positions with required horizontal spacings, to enable the effective width spanned by the safety gate to be varied. Hence, the horizontal spacings between each pair of adjacent barrier members and between the end barrier members and the sides of the opening can be chosen to suit the size of opening to be spanned by the safety gate.

The connecting means preferably comprise an upper generally horizontal support member and a lower generally horizontal support member, each of the barrier members extending between the upper and lower support members and being adjustable with respect to the upper and lower support members to vary said spacings.

The barrier is preferably pivotally movable between closed and open positions. This is conveniently achieved by the provision of hinges for pivotally mounting one side of the barrier in the opening and providing latching means for retaining the other side of the barrier. From a structural point of view, it is desirable to secure the barrier at the top and at the bottom. Hence, the latching means preferably comprise upper and lower keepers for attachment to the appropriate side of the opening, the keepers being cooperable with appropriately shaped latching members projecting from said other side of the barrier.

A lower keeper and cooperating latching member near the lower edge of the barrier present the difficulty of how conveniently to disengage the latching member from the lower keeper. To enable this to be done, the upper hinge is preferably such that the other side of the closed barrier can be lifted and rotated in its own plane by a small amount sufficient to disengage the lower latching member from the lower keeper. This is preferably achieved by the upper hinge having a hinge pin extending in an elongated slot formed in a hinge plate (or other member) carried by the barrier. Latching can either be the reverse of this (lift the barrier, centre it and lower it onto the keeper) or the latching member may be spring-loaded and automatically engageable with the lower keeper on closure of the barrier. It will be appreciated that the reverse arrangement is possible, ie the barrier carrying a hinge pin and the hinge plate attached to the opening having an elongated slot.

When the upper latching member moves into the keeper, these two components preferably engage automatically, for example as a result of the upper latching member being a spring loaded plunger retractable against longitudinal spring loading which biases the latching member to an extended operative position. Release of the upper latching member is preferably achieved by manual movement of a release member on the barrier. In a preferred embodiment, this release member is rotatably movable in order to rotate the latching member which is shaped, in relation to the shape of the upper keeper, such that rotation of the upper latching member, against rotational spring loading, moves the latching member towards its retracted disengaged position. The release member may be a rotatably movable knob, rotatable in either direction from a central position to which the knob is biased by the rotational spring loading.
abutment or stop which is selectively positionable in relation to the keeper to restrict opening of the barrier to one pivotal direction only.

Each of the upper and lower support members may be telescopic to achieve the required variation in length. The clamping means conveniently comprise an upper clamping member for clamping the upper end of each barrier in relation to the upper support member and a lower clamping member for clamping the lower end of each barrier member in relation to the lower support member. Adjustability and clamping may be achieved by providing, between each pair of barrier members and between the end barrier members and respective sides of the safety gate, a pair of spacer tubes respectively surrounding the upper and lower support members, each spacer tube carrying a projecting locking tongue, a corresponding clamping member on each barrier member being

manually rotatable to clamp the two tongues of adjacent spacers against the upper or lower support member.

A safety gate according to the invention, together with two alternative constructions, will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is an elevation of the safety gate shown in position spanning an opening,

Figure 2 is a sectional view, on an enlarged scale, on the line II-II of Figure 1,

Figure 3 is a sectional view, on an enlarged scale, showing the manner of clamping the upper end of a representative one of the barrier members of the safety gate of Figure 1,

Figure 4 is a sectional view on the line IV-IV of Figure 3, with the clamping means released,

Figure 5 is a view similar to that of Figure 4 but with the clamping means engaged,

Figure 6 is a sectional plan view, on an enlarged scale, showing an upper hinge of the safety gate,

Figure 7 is a perspective view of a lower keeper,

Figure 8 is a sectional view through the lower keeper and cooperating plunger,

Figure 9 is a perspective view showing an upper keeper and a stop prior to insertion of the stop in the keeper,

Figure 10 is a perspective view showing the upper keeper with the stop inserted,

Figure 11 is a perspective view illustrating the upper keeper, the upper latching member and adjacent structure of the barrier,

Figure 12 is a sectional view through the upper latching assembly of Figure 11,

Figure 13 is a sectional view on the line XIII-XIII of Figure 12,

Figure 14 is a plan view, partly sectioned, showing the upper latching member in engagement with the upper keeper,

Figure 15 is a side view, partly sectioned, of the structure of Figure 14,

Figure 16 is a view similar to that of Figure 14 but with a plunger partially withdrawn from the upper keeper,

Figure 17 is a side view, partly sectioned, of the structure of Figure 16,

Figure 18 is a front elevation of the first alternative construction,

Figure 19 is a fragmentary sectional view, on an enlarged scale, on the line XIX-XIX of Figure 18, and

Figure 20 illustrates the second alternative construction.

Referring to Figures 1 and 2, the safety gate comprises a horizontal upper support member 1 (consisting of a pair of relatively telescopic tubes 1a, 1b) and a horizontal lower support member 2 (consisting of a similar pair of relatively telescopic tubes 2a, 2b). The upper and lower support members 1 and 2 are spanned by four barrier members which are arranged in series along the members 1 and 2 and each of which is in the form of a vertically elongated panel 4. Each panel 4 has a cross-sectional shape illustrated in Figure 2, having tubular edge portions 5 interconnected by a web 6.

The structure of the upper and lower members 1 and 2 and the four panels 4 form a barrier which in Figure 1 is shown mounted in an opening defined by two side walls 7 and 8, such as the jambs of a doorway. The barrier is pivotally supported on the wall 7 by upper and lower hinges 9 and 10 defining a vertical pivot axis. The barrier is capable of being retained in the closed position illustrated by means of upper and lower keepers 11 and 12 which are attached to the wall 8 and which respectively cooperate with upper and lower latching members 13 and 14 carried by the barrier.

The barrier is adjustable in width to suit openings of different width. To achieve this, the upper and lower members 1 and 2 are telescopic (as previously described) and each panel 4 is horizontally adjustable (within limits) along the upper and lower members 1 and 2, clamping means being provided releasably to clamp the upper and lower ends of each panel 4 in the adjusted position. The manner of adjustment and clamping of the upper and lower end of each panel 4 is similar, and a representative form of this adjustment and clamping is illustrated in Figures 3 to 5 which show the upper end of a representative panel 4.

Referring to Figures 3 to 5, the representative panel 4 has tubular portions 15 which at their inner ends present a rotational bearing 16 for a clamping ring 17. Adjacent panels 4 are spaced by spacer sleeves 18 which surround the corresponding upper or lower support member 1 or 2 and the ends of which project into the corresponding tubular portions 15. Locking tongues 19 project from the sleeves 18, the locking tongues 19 having serrated profiles which are capable of being brought into clamping engagement by means of the clamping ring 17 acting through the intermediary of a clamping shoe 20. The ring 17 has an scrolled inner periphery 21 (Figures 4 and 5). In the clamped position shown in Figure 5, the inner periphery 21 of the ring 17 compresses the shoe 20 against the overlapping tongues 19 to clamp the latter together against the tube 1. This therefore clamps the corresponding panel 4 on the tube 1 or 2. In the released position shown in Figure 4, the tongues 19 are capable of relative longitudinal sliding movement for adjustment of the position of the panel 4 along the members 1 and 2.

The lower keeper 12 is shown in perspective view in Figure 7. The keeper 12 is in the form of a plate having angled sides between which is a central recess 22 flanked by spaced shoulders 23. The recess 22 re-

ceives a spring-loaded plunger 24 constituting the lower latching member 14. The recess 22 has an inclined ramp-like upper surface 25 cooperable with a chamfered upper edge 26 of the plunger 24 (Figure 8). The lower latching member 14 may alternatively be a peg rigidly attached to the barrier.

Figure 6 shows a detailed view of the upper hinge 9. A hinge plate 27 is attached to the wall 7 and carries a vertical hinge pin 28. The end tubular member 18 carried by the barrier has a horizontally elongated slot 30. Normally, the cantilevered weight of the barrier maintains the hinge pin 28 in the position shown in Figure 6. The elongation of the slot 30 enables the barrier to be lifted and pivoted in its own plane so as to disengage the plunger 24 from the keeper 12, the chamfered surfaces 25, 26 facilitating this disengaging movement.

The upper keeper 11 (Figures 9, 10 and 11) has a central recess 32 positioned between angled flanks 33 and above angled shoulders 34 all of which are shaped to guide the upper latching member 13 (constituted by a spring-loaded plunger 35, Figures 11 to 17) towards the fully engaged position in which the tip of the plunger 35 is received within the recess 32, to provide automatic engagement, when the barrier is moved towards its closed position. The barrier may, if desired, be biased (eg by a closure spring) towards its closed position.

The upper keeper 11 has two series of apertures piercing the respective flanks 33. Each series of apertures is intended to receive the projecting abutments of a stop 36 (Figures 9 and 10) which can be inserted in one or the other series of apertures to prevent opening of the barrier in one or other pivotal direction. Figure 10 shows the stop 36 positioned to prevent the plunger 35 moving away from the keeper 11 towards the left in Figure 10. It will be appreciated that the stop 36 is inserted through the apertures of the other flank 33 if it is desired to prevent the barrier opening in the opposite direction. The barrier may thus be fitted with the hinges on the chosen side and with the facility of preventing rotation to one or other side, and may subsequently be refitted in a new location with a hinge position and opening arrangement to suit the new location.

Figures 12 and 13 show the detailed construction of the upper latch 13. The plunger 35 is urged to its axially extended position illustrated in Figure 12 by a helical compression spring 37 acting between the inner end of the plunger 35 and a spring abutment formed at the end of a tubular extension 38 carried by the corresponding sleeve 18. The sleeve 18 terminates in a boss 39 on which is rotatably mounted a release knob 40. The release knob 40 is biased to a central rotational position by means of a spring 42 let into an annular groove in the boss 39 and acting on a lug 43 projecting into the groove from the knob 40. The plunger 35 is splined in the knob 40 by means of a keyway 44, so that the plunger 35 is capable of longitudinal sliding movement with respect to the knob 40 but is rotatable therewith.

Referring particularly to Figures 14 to 17, the plunger 35 is chamfered (at 45) on its side faces, and these chamfers match angled sides 46 of the recess 32. The upper surface of the plunger has a notch 47 shaped to be engageable with a hook 48 projecting downwardly from the upper edge of the recess 32.

Figure 14 is a plan view, partially sectioned, showing the plunger 35 engaged in the recess 32 of the upper keeper 11. Figure 15 is a corresponding side view and illustrates that the hook 48 is not normally engaged in the notch 47.

If the barrier is subjected to a lifting movement without disengagement of the plunger 35 from the keeper 11, the hook 48 engages the notch 47 to retain the barrier in the closed position. Disengagement of the plunger 35 from the keeper 11 is achieved by the user first grasping the knob 40 and rotating it against the influence of the bias provided by the spring 42, up to a maximum of 90° in either rotational direction. The chamfered shape of the end of the plunger 35, in relation to the shape of the recess 32, is such that this rotational movement of the plunger 35 causes the latter to be forced towards a partially disengaged position, against the influence of the longitudinal biasing spring 37 (Figures 16 and 17). When the barrier is rotated in its own plane to release the lower plunger 24 from the lower keeper, the upper edge of the recess 32 engages the uppermost chamfer 45 on the plunger 35 to cause further retraction of the plunger 35, until the plunger 35 in disengaged from the recess 32, enabling the barrier to be swung open. When the knob 40 is released the spring 42 returns the plunger 35 to its central rotational position, and the spring 37 returns the plunger 35 to its axially extended position. The plunger 35 is now ready to be automatically engaged with the keeper 11 when the barrier is moved towards its closed position. Similarly, the plunger 24 automatically engages in the lower keeper 12.

In the alternative construction of Figures 18 and 19, the barrier members are in the form of metal bars 50 which are arranged in series along (and extend between) upper and lower support members 51, 52 again in the form of relatively telescopic tubes. The upper and lower end of each bar is formed into the shape of a near circle so as to surround the upper or lower support member, as best shown in Figure 19. This enables the upper and lower end of each bar to be slid horizontally along the upper and lower support members for adjustment of the horizontal spacing between the bars, for adjustment of the effective width spanned by the safety gate. The upper and lower end of each bar is clamped onto the upper or lower support member by clamping means in the form of a nut and bolt 53.

The safety gate of Figures 18 and 19 has an up-

per hinge having a hinge plate with a horizontally elongated slot, enabling the safety gate to be lifted and pivoted in its own plane so as to disengage the lower latching member from the lower keeper, in a manner comparable to that previously described for the main embodiment. The upper latching member is associated with a spring-loaded tab which is pulled in the direction of the arrow to release the upper latching member from the upper keeper.

There are three main types of safety gate having pivotally mounted barriers, namely the "barn door" gate, the "centre-opening" gate and the "side-opening" gate. The safety gates shown in Figures 1 to 18 conform to the barn door type because they employ a barrier pivotally mounted on hinge pins attached to one side of the opening, the other side of which has a keeper or the like to receive a latching member on the barrier, for securing the barrier in a closed position, in a manner comparable with a barn door.

The centre-opening gate has a U-shaped frame one side limb of which carries hinges pivotally supporting the barrier and the other side limb of which has means for securing the barrier in a closed position. When the U-shaped frame is fitted in an opening, the intermediate limb extends across the base of the opening spanned by the barrier. The invention can be applied to this type of safety gate, provided that the intermediate limb is extendable and retractable (for example by being telescopic) to accommodate the adjustability in width of the barrier.

It will be appreciated that the centre-opening gate does not open in the centre but is so named to distinguish it from the side-opening gate which has an L-shaped frame the vertical limb of which carries hinges supporting the barrier and which is intended to be secured to one side of the opening, with the horizontal limb projecting across the base of the opening spanned by the safety gate. The invention is readily applicable to the side-opening type of safety gate.

Figure 20 shows an alternative way of achieving a repositionable stop for permitting the safety gate to open in one direction but not the other. A projecting lug 60 at the bottom of the pivotable barrier of a side- or centre-opening gate interacts with the lower limb or member 61 of the frame 62 of the safety gate; by unfastening the lug 60 and re-attaching it on the opposite face of the frame of the barrier, so the gate can be converted from one that opens - as shown - out of the plane of the paper (but not into the plane of the paper) to one that opens into the plane of the paper (but not out of the plane of the paper).

Claims

1. A safety gate for children comprising a barrier including at least three generally vertically extending barrier members, connecting means which connect the barrier members together in series such that the horizontal spacing between adjacent barrier members is adjustable and clamping means for retaining the barrier members in adjusted positions with required horizontal spacings, to enable the effective width spanned by the safety gate to be varied.

2. A safety gate according to claim 1, wherein the connecting means comprise an upper generally horizontal support member and a lower generally horizontal support member, each of the barrier members extending between the upper and lower support members and being adjustable with respect to the upper and lower support members to vary said spacings.

3. A safety gate according to claim 1 or 2, wherein the upper support member comprises an upper pair of relatively movable members and the lower support member comprises a lower pair of relatively movable members.

4. A safety gate according to claim 3, wherein the upper support member comprises an upper pair of relatively telescopic tubes and lower support member comprises a lower pair of relatively telescopic tubes.

5. A safety gate according to any of claims 2 to 4, wherein the clamping means comprise, for each barrier member, an upper clamping member for releasably clamping the upper end of the barrier member to the upper support member and a lower clamping member for releasably clamping the lower end of the barrier member to the lower support member.

6. A safety gate according to claim 5, wherein the connecting means comprise, between each pair of barrier members and between the end barrier members and respective sides of the safety gate, upper and lower spacer sleeves respectively surrounding the upper and lower support members, each spacer sleeve carrying a projecting locking tongue, the corresponding clamping member being manually movable to clamp the two tongues of adjacent spacer sleeves against the upper or lower support member.

7. A safety gate according to claim 6, wherein each clamping member is a rotatable clamping ring which forces a serrated clamping shoe against serrations of the overlapping pair of tongues, to effect clamping.

8. A safety gate according to any of the preceding claims, wherein the barrier is pivotally movable

between closed and open positions.

9. A safety gate according to claim 8 and comprising upper and lower hinges for pivotally mounting one side of the barrier in the opening, and latching means for retaining the other side of the barrier, the latching means comprising upper and lower keepers for attachment to the appropriate side of the opening and latching members projecting from the barrier for respective engagement with the keepers.

10. A safety gate according to claim 9, wherein the upper hinge is such that the other side of the closed barrier can be lifted and consequently rotated in its own plane, about a horizontal axis passing through the lower hinge, by a small amount sufficient to disengage the lower latching member from the lower keeper.

11. A safety gate according to claim 10, wherein the upper hinge has a hinge pin extending in a horizontally elongated slot formed in a hinge plate or other member carried by the barrier, or the upper hinge has a plate with a slot receiving a hinge pin carried by the barrier, in either case the elongation of the slot being sufficient to enable the lower latching member to be disengaged from the lower keeper.

12. A safety gate according to any of claims 9 to 11, wherein the upper latching member and the keeper are so shaped that the upper latching member automatically engages the upper keeper, when the barrier is moved to the closed position.

13. A safety gate according to claim 12, wherein the upper latching member is a plunger retractable against longitudinal spring loading which biases the plunger to an extended position, release of the upper latching member being effected by manual movement of a release member on the barrier.

14. A safety gate according to claim 13, wherein the release member is rotatably movable in order to rotate the plunger which is shaped, in relation to the shape of the upper keeper, such that rotation of the plunger, against rotational spring loading, moves the plunger towards its retracted disengaged position.

15. A safety gate according to claim 14 as appendant to claim 10, wherein rotational movement of the release member moves the plunger to a partially disengaged position and wherein the end of the plunger is chamfered such that rotation of the closed barrier in its own plane causes a chamfered edge of the plunger, in the partially disengaged position to engage the upper keeper to complete movement of the plunger to its retracted disengaged position.

16. A safety gate according to claim 14 or 15, wherein the release member is a rotatably movable knob, rotatable in either direction from a central position to which the knob is biased by said rotational spring loading, the plunger being mounted in the knob by a spline or keyway which allows longitudinal plunging movement of the plunger with respect to the knob but which prevents relative rotational movement between the plunger and the knob.

17. A safety gate according to any of claims 12 to 16, wherein the upper latching member automatically engages the upper keeper in either direction of pivotal closing movement of the barrier.

18. A safety gate according to any of claims 12 to 17, wherein the upper keeper is provided with a stop which is selectably positionable in the upper keeper so as to prevent the barrier opening in one or other pivotal direction.

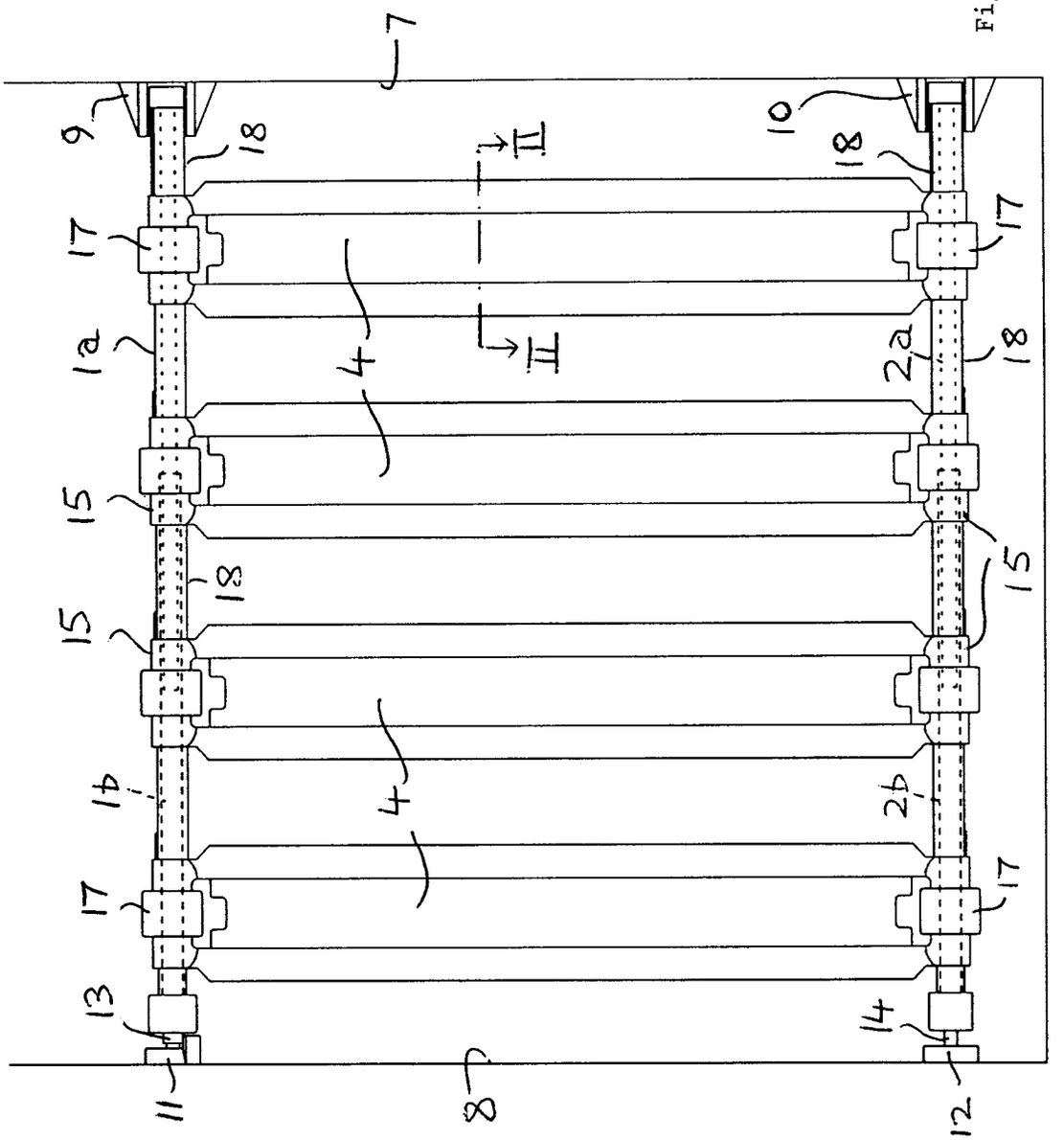

Fig. 1

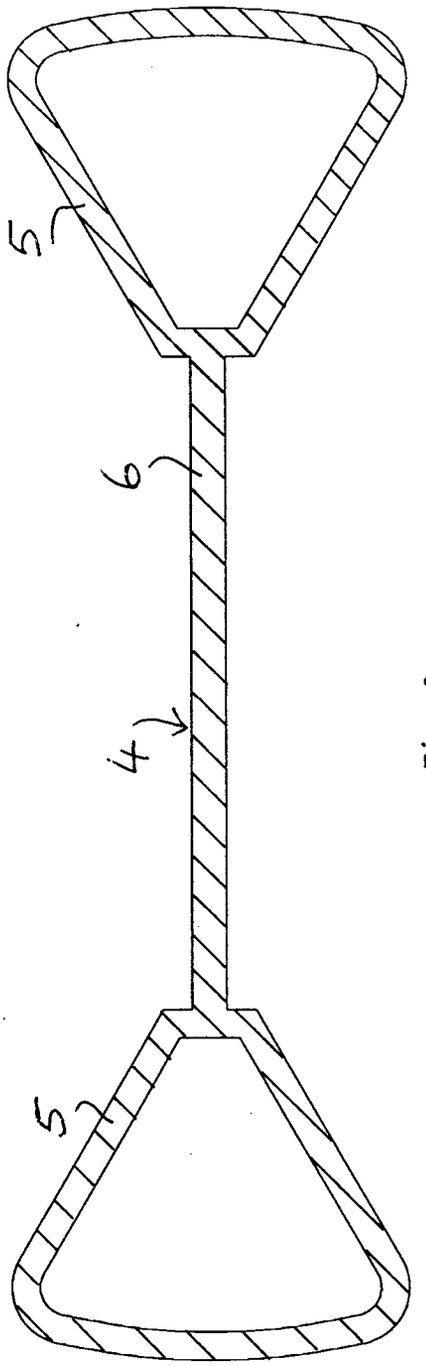

Fig. 2

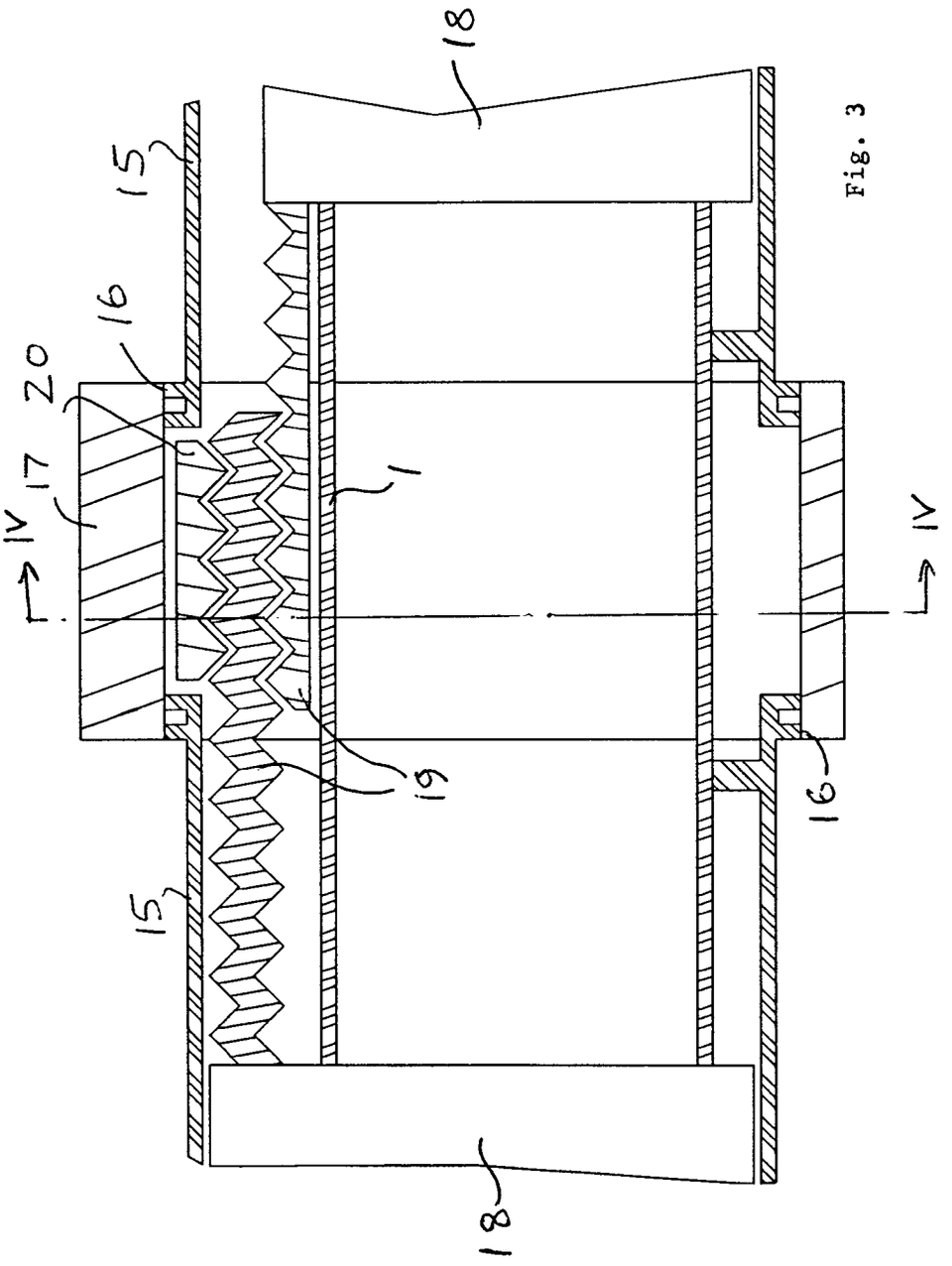

Fig. 3

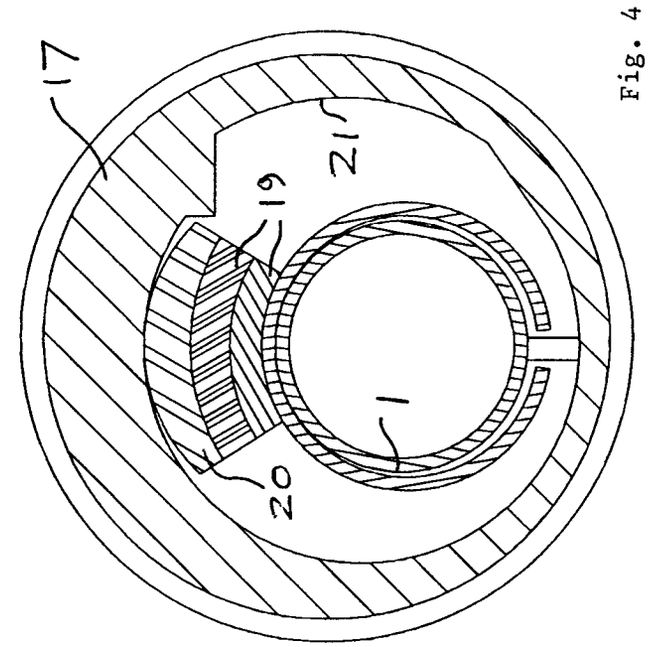

Fig. 4

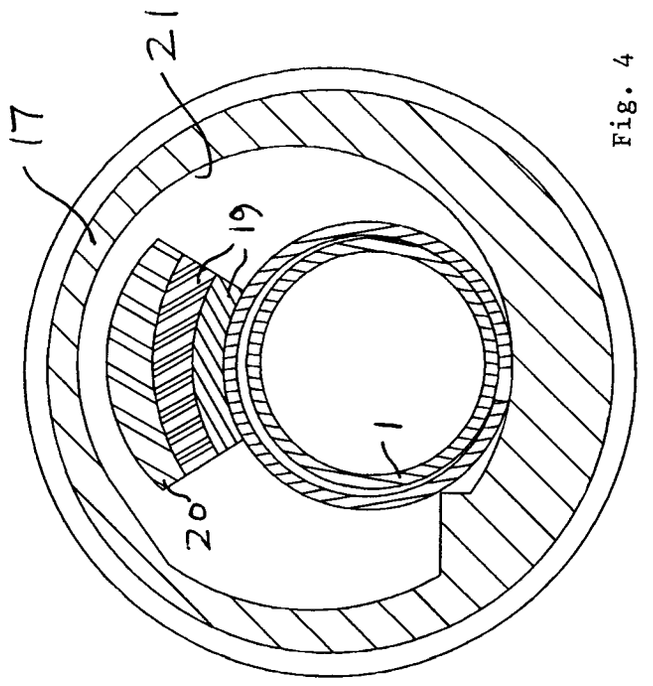

Fig. 4

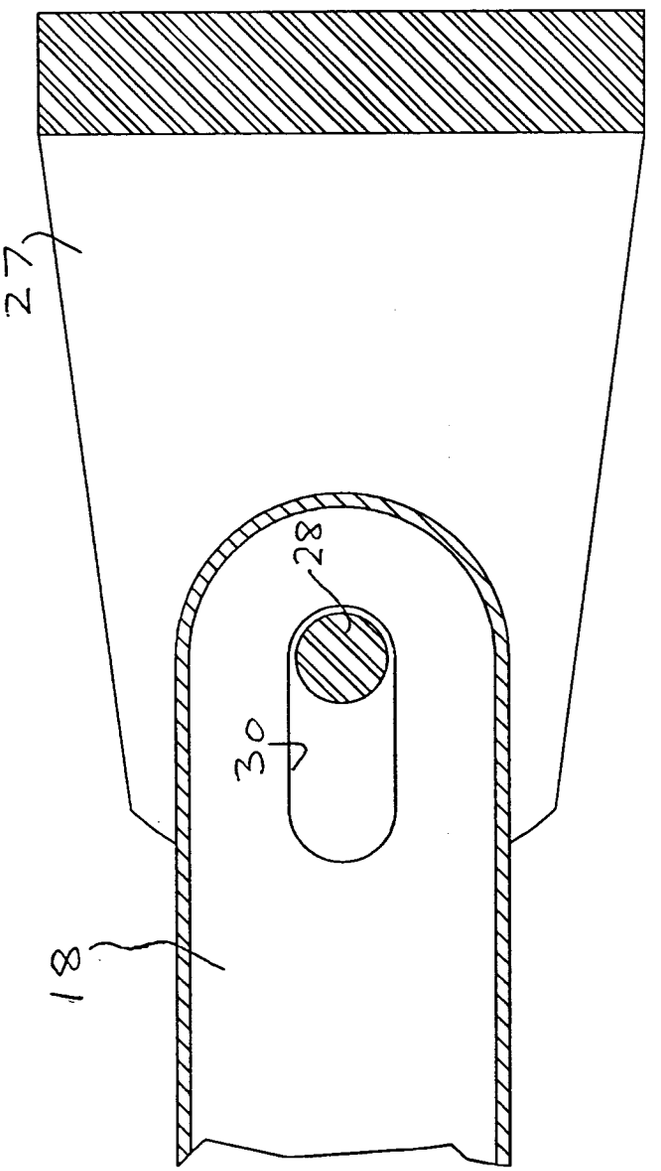

Fig. 6

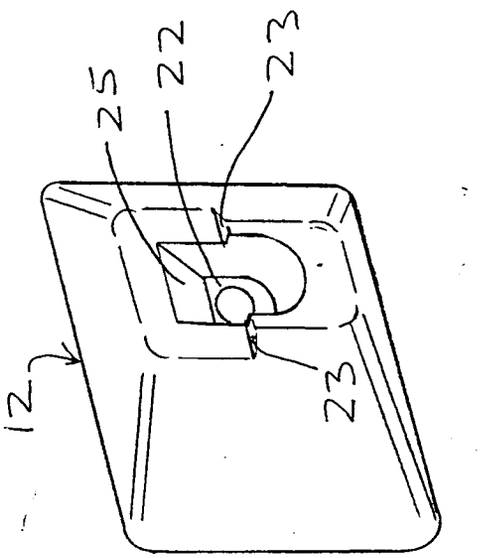

Fig. 7

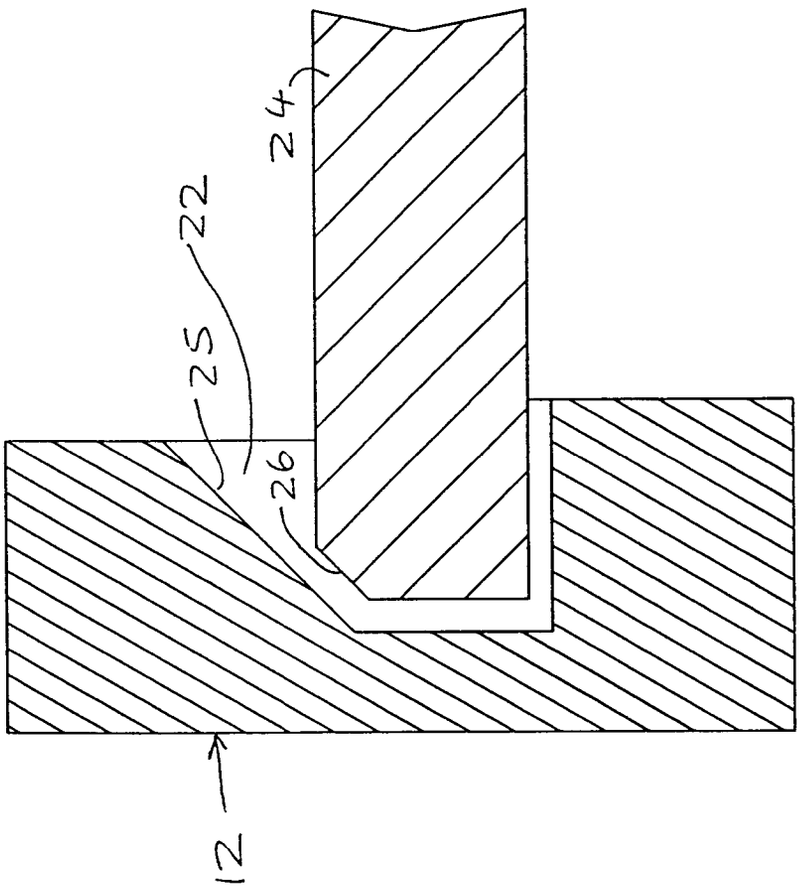

Fig. 8

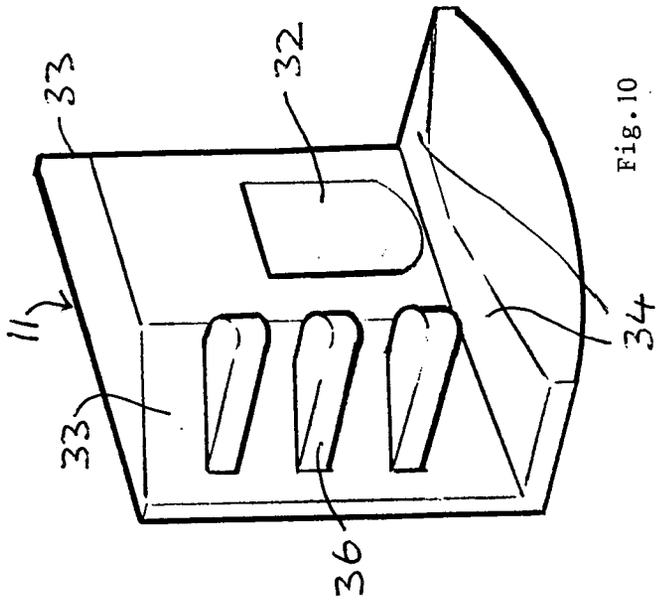

Fig.10

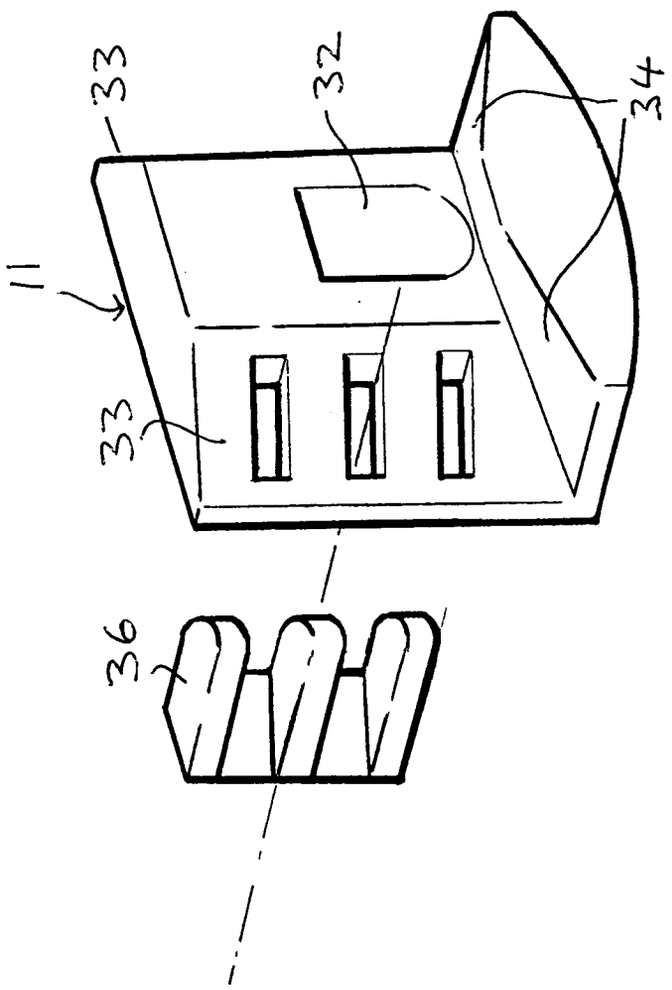

Fig. 9

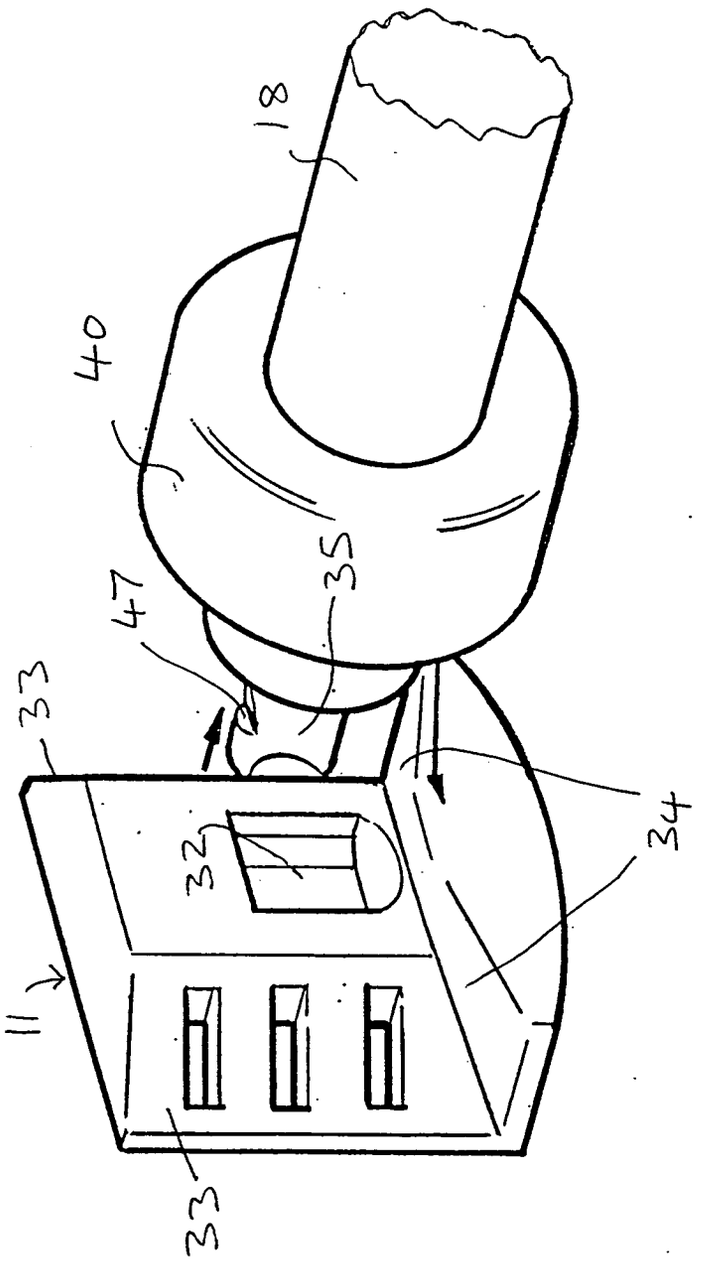

Fig. 11

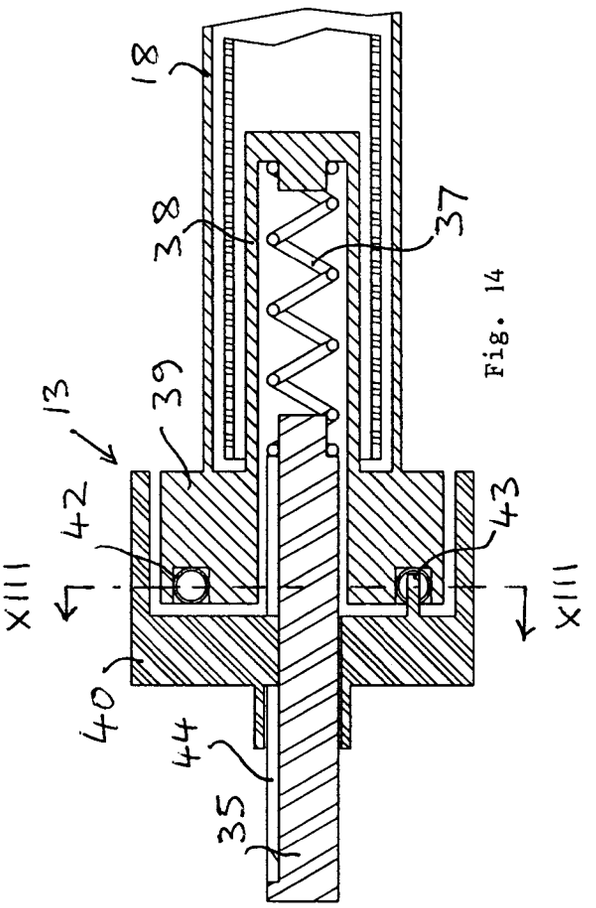

Fig. 14

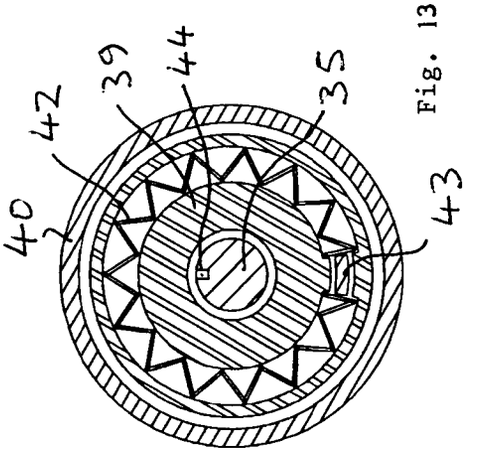

Fig. 13

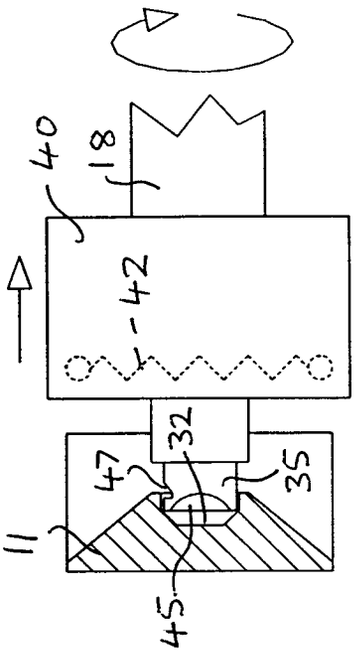

Fig. 16

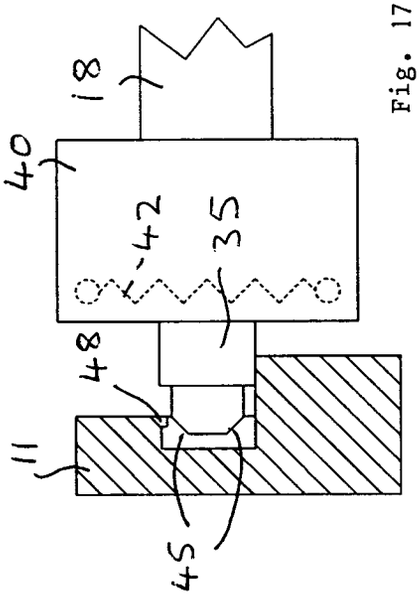

Fig. 17

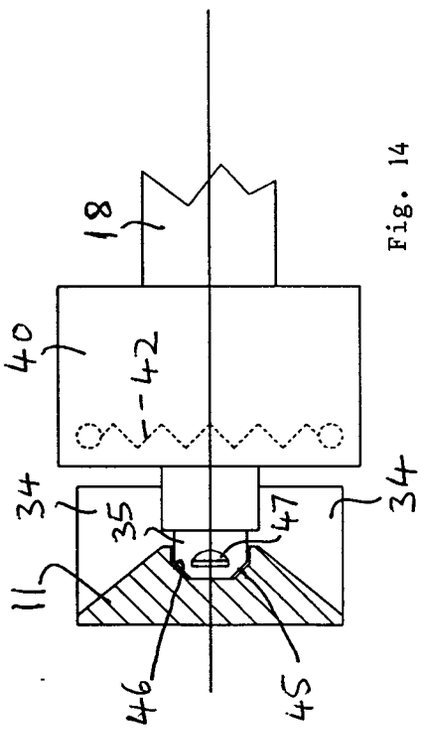

Fig. 14

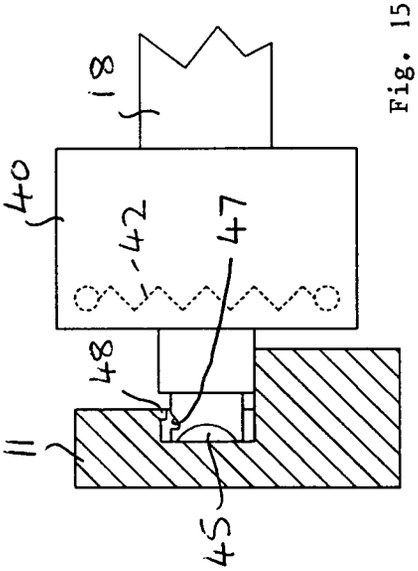

Fig. 15

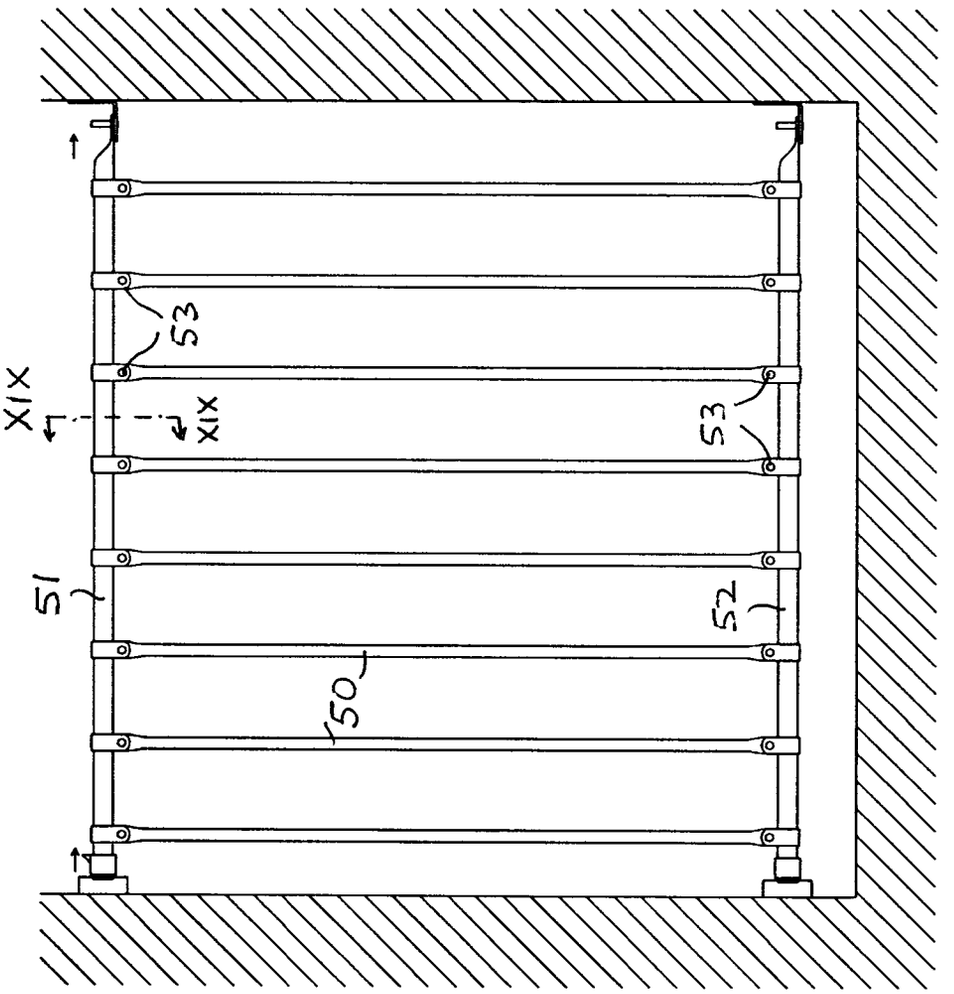

Fig. 18

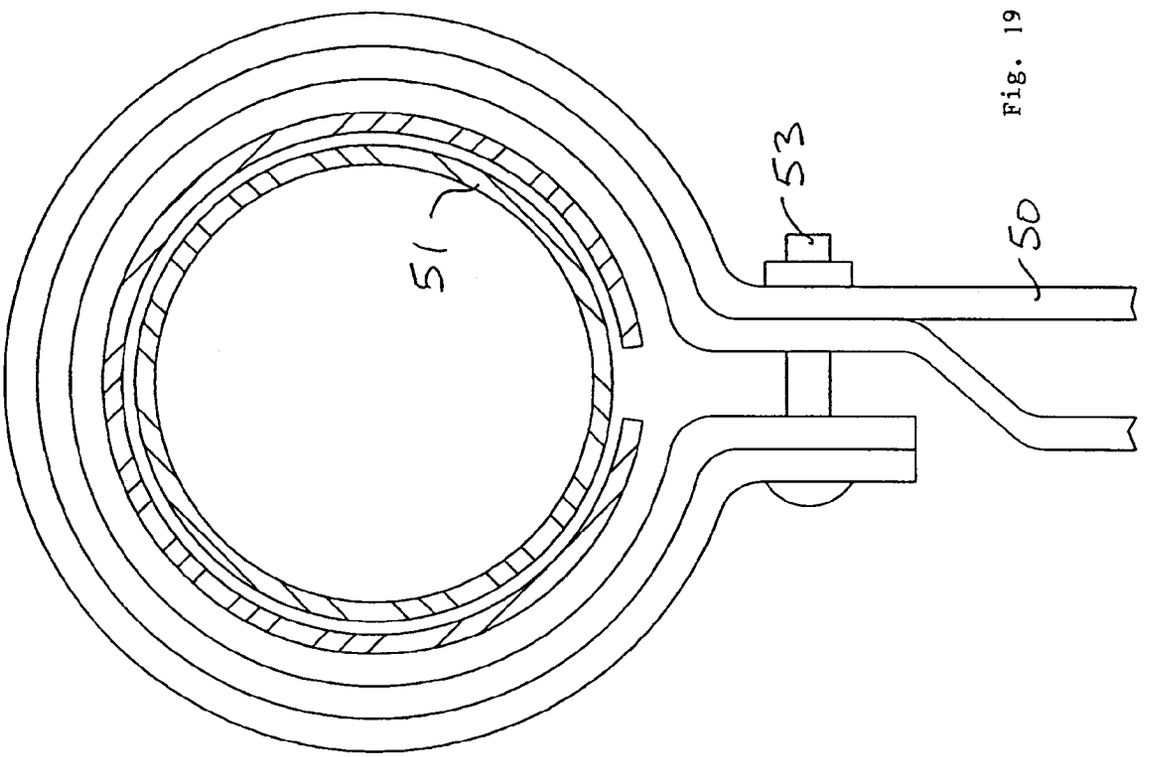

Fig. 19

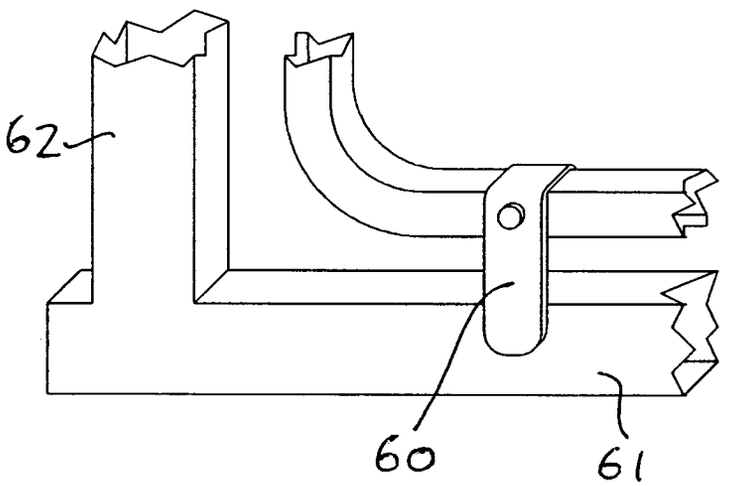

Fig. 20

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 93 30 4951

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.5)
Y	AU-B-536 676 (OWEN CLARK PERSHOUSE) * page 4, line 8 - page 5, line 30; figures *	1-5,8,9	E06B9/02
Y	GB-A-2 088 939 (KOK) * the whole document *	1-5,8,9	
A	DE-C-496 346 (SKARABIS) * the whole document *	6,7	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	07 OCTOBER 1993	KUKIDIS S.

CATEGORY OF CITED DOCUMENTS

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