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(54) **Reticular structure made up of sectional elements for interior decoration and lighting.**

(57) Straight and curved reticular modular elements have three longitudinal structure shapes (1A, 1B, 1C) disposed according to a triangular configuration in the transverse section and reticular connections (3) only on two of the three interspaces between said shapes, and slightly projecting ends for sleeves (5) connecting the abutting ends of the shapes of adjacent elements, with clamping means; a crosspiece (9) with sleeves (5) can be engaged between the ends of the shapes (1A, 1C) on the side lacking in reticular connections.

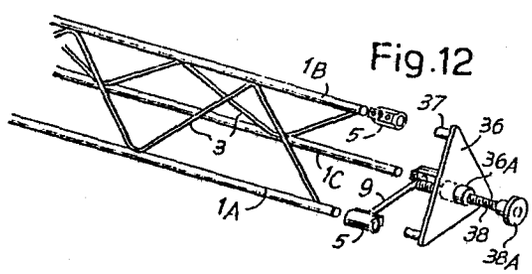

Fig.12

EP 0 238 457 A2

DESCRIPTION

The invention refers to a reticular structure made up of sectional elements for supporting lighting means for interior decoration and other. Substantially, it comprises straight reticular modular elements, with three longitudinal structural shapes disposed according to a triangular configuration in the transverse section and reticular connections only on two of the three interspaces between said shapes in order to allow the piling-up of more elements one inside the other and said shapes having slightly projecting ends; sleeves are provided for connecting abutting ends of shapes of adjacent elements, whith clamping means, as well as a crosspiece equipped with said sleeves for its engagement with the ends of the shapes on the side lacking in reticular connections. Auxiliary components are applicable at the ends of said shapes being supplied with appendixes corresponding to said ends for the connection through said sleeves.

Angular modular elements are as well provided with three arcuate curved shapes, having ends suitable to correspond to those of the straight elements, and with reticular connections provided as well on only two of the interspaces between said three shapes.

The shapes are advantageously of circular cross-

section, and the sleeves are cylindrical and have three threaded holes for blocking screws and for the connection with said crosspiece.

The invention will be better understood by following the description and the attached drawing, which shows a practical non limitative exemplification of the same invention. In the drawing:

Figs. 1 and 2 show a side view and a sectional view on line II-II of Fig. 1, illustrating a straight reticular element;

Fig. 3 shows more elements on stacked arrangement;

Figs. 4 and 5 show perspective views of two angular elements;

Fig. 6 shows a terminal component;

Figs. 7, 8 and 9 show a sleeve according to two views, and a crosspiece with sleeves;

Figs. 10 and 11 show a cantilever construction projecting from a mounting wall;

Figs. 12 and 13 show a resting and wall contrasting terminal;

Figs. 14, 15 and 16 show two end plates, Fig. 15 being a view and a sectional view on line XV-XV of Fig. 14;

Figs. 17 and 18 and, respectively, 19 to 22 show two types of base components according to the indicated

views and sectional views;

Figs. 23 to 25 show suspension members;

Figs. 26 to 33 show members for assembling reticular elements and for mounting tubular lamps or other;

Figs. 34 and 35 show a ceiling light application;

Figs. 36 to 39 show embodiments for torch lihgts.

According to what is illustrated in the attached drawing, one of the basic components of the structure is represented by reticular modular elements of 600, 900 and 1200 mm in length, for example, which are characteristically formed with a triangular development of their section, wherein, in correspondence of the angles, three longitudinal shapes 1A, 1B, 1C are provided having circular cross-sections like metal rods which are connected between them along two of the mutual spacings through reticular connections 3 developed like inclined wind-bracings; in particular, these reticular connections are developed between the two shapes 1A, 1B and between the two shapes 1B, 1C, whereas they are not present in the spacing between 1A and 1C. As a first consequence, the reticular modular elements may be piled up as shown in particular in Fig. 3 thus greatly reducing the overall dimensions. The ends of the shapes 1A, 1B, 1C are at least slightly projecting in respect to the reticular connections, in

such a way that, on said ends, sleeves 5 may be fitted (see also Figs. 7 to 9) which are of use for the connection of adjacent reticular elements, and of other components, with the straight reticular elements. The connecting sleeves 5 may be practically developed with a longitudinal through hole 5A intended to receive the ends of the shapes 1A, 1B, 1C and of equivalent ones; on a projecting portion 5B of the sleeve 5 transverse threaded through holes, indicated by 7A, 7B (external) and by 7C (internal), are formed. Into the holes 7A, 7B, pressure clamping dowels or screws may be screwed for blocking the sleeves to the ends of the rod-like shapes 1A, 1B, 1C and to other appendixes provided in other components to be described later. In the central hole 7C of two sleeves a tension rod 9 may be fixedly engaged connecting the two end sleeves 5, so that the corresponding holes 5A of these two sleeves can result exactly spaced apart at the same distance as the shapes 1A, 1B, 1C, provided that the longitudinal reticular elements have an equilateral triangular development and, in such a way that the distance between the holes 5A of the two sleeves engaged by the tension rod 9 corresponds to the distance between the two shapes 1A, 1C of the straight reticular modular elements. The screws indicated by 10 and able to be engaged with the

holes 7A, 7B and possibly 7C, may be point-like developed in order to be tightly fitted into the ends of shapes 1A, 1B, 1C and into the appendixes provided in other components of the structure. The unit depending on the tension rod 9 represents a crosspiece that may be applied to the ends of the shapes 1A, 1C in order to complete, at the ends of the straight reticular elements, the triangular section and to allow the coupling with other components of the structure, by utilizing, in correspondence of the ends of the shape 1B, an isolated sleeve 5. Thus it is possible to directly connect reticular elements of triangular section one after the other, whether they are straight or of particular shape and development like the ones indicated below.

Figs. 4 and 5 show two angular elements, also developed with three shapes similar to those 1A, 1B, 1C, but being bent or curved so as to actually form angular elements; these shapes are indicated by 11A, 11B and 11C and, respectively, by 111A, 111B and 111C, the shape 111C being, in this case, limited to a short angle to which a sleeve 5, which is connected to a tension rod 9, may be engaged. The use of the crosspieces made up of the tension rods 9 with the sleeves 5 engaged at their ends, is if use both for the

connection with adjacent elements and for the mutual stiffening between shapes like those indicated by 1A, 1C, respectively 11A, 11C, respectively 111A and 111C.

By means of the straight and arcuate reticular elements as above described, it is possible to realize both vertical and horizontal structures, of both lintel and portal type, and of wathever type may be desired, the triangular arrangement in the horizontal parts being possibly developed with the vertex indifferently downwards or upwards directed, according to requirements.

Fig. 6 shows a terminal element 13 to be applied to the above described reticular elements, which is developed with an arcuate shape 15A able to receive at its ends two sleeves 5 which may be or may be not connected through a tension rod 9; in the middle of the arcuate stretch of the shape 15A a shape 15B is engaged, symmetrically disposed relative to the shape 15A and so bent as to form an end element being triangularly disposed in respect to the ends of the arcuate shape 15A, for the connection with the reticular elements described above. The terminal 13 can be utilized both as a vertical upper terminal and as a horizontal terminal, as well as a terminal for elements

to be cantilever mounted.

As far as this last application is concerned, as shown in particular in Figs. 10 and 11, provision is made for completing a straight reticular element, indicated by 21, by means of two terminals 13A and 13B, the latter being of a special type with a bridge 13C so developed as to make up a transverse articulation to be engaged with an articulating support fixed to a plate 23 to be mounted on a wall. This plate 23 is provided in particular, as a support and articulation means for the bridge 13C, of a pair of discoid members 25 that may be tightened by a screw 26 going through axial holes of said discoid members, the latter being provided with impressions of semi-circular and straight cross-section and disposed like two chords corresponding to each other so as to form a seat for the articulation bridge 13C. As a consequence of such disposition, the support formed by the two discoid members 25 is able to be oriented both about the axis of the screw 26 and about the axis of the impressions which are orthogonal to a plane passing through the axis of the screw26· accordingly, the bracket 21 is realized in order to constitute a punctiform articulation. The bracket 21 is also supported by a cable 30 which is entrained over a pulley 32 provided

at the upper end of the plate 23, the cable being anchored at a suitable fastening means 34, for example, through a bitt.

Figs. 12 and 13 show an end component made up of a triangular plate 36 with three appendixes 37 being fully similar to the ends of the shapes 1A, 1B, 1C or 11A, 11B, 11C or 111A, 111B, 111C, to be received inside the sleeves 5 and fastened by the screws 10 of the same sleeves 5. The triangular plate 36 has a hub 36A with a threaded through hole for a screw pin 38 provided at its outer end, that is, opposite to the appendixes 37, with an expansion 38A which serves for leaning against a wall. A plate terminal 36, as indicated above, is intended to form a support and a stop for a reticular structure formed by horizontally located straight reticular elements, in order to block such structure against axial movements which may occur inside the residual space relative to opposite walls, between which this linear structure may be developed.

Figs. 14, 15 and 16 show two plates 40 and 42 respectively, the first 40 having slots 40A that provide for the hooking of suspension means of a structure to a ceiling or other; the plate 42, mostly metallic, may be provided with holes for wall mounting. Both the end plates 40 and 42 of triangular

development have appendixes 44 which, like those indicated by 37, serve for their fastening at the ends of the shapes like those indicated by 1A, 1B, 1C or equivalent, by utilizing the sleeves 5 possibly together with a crosspiece 9.

Figs. 17 and 18 show a base 48 that may be made of drawn sheet having circular development (according to the drawing) and appendixes 49 capable of being engaged in the sleeves 5 for connecting the base 48 to a reticular structure formed by the above mentioned elements. The appendixes 49 may be fastened by welding, respectively by screw-clamping means to allow an easier and less bulky packing.

Another type of base for reticular structures as above described, is illustrated in Figs. 19 to 22. This base is made up of a central laminar member 50, that may have circular shape, and of three short bars 52 which can be engaged radially thereto as they are provided with slit seats for housing the edge of said laminar member; said short bars 52 have holes 56 which, upon the assembly of the three bars on the laminar member 50, are able to reach a mutual position corresponding to that of the structural shapes disposed along the corners, with a triangular positioning in the section of the above described reticular elements;

accordingly, a reticular structure may be fitted on this base to support it, the short bars being kept, in turn, by the shapes having their ends housed into the holes 56 and possibly screw-blocked therein and by the misalignment that said short bars form with the central laminar member 50.

A horizontal reticular structure as above described may be suspended through the intervention of the terminal plates like those 40 respectively through the engagement to the shapes 1A or 1B or 1C or others, by means of spring-clip members 60 (see Figs. 23 and 24) that are supported by filiform elements 62 which can be engaged on hooks of the ceiling respectively on shapes like that indicated by 64 which can be engaged with brackets 66 previously fastened to the ceiling.

Between two structural shapes like those 1A, 1B, 1C ceiling lights , tubular lamps or other, may be fitted. For example, according to Figs. 34 and 35, a ceiling light 66 can be engaged with two shapes like those indicated by 1A and 1C, through blocks 68 U-developed and apt to be hooked to the shapes 1A, 1C owing to an elasticity obtainable both with the ceiling light and, with the unconnected shapes just like those indicated by 1A, 1C.

For the application of tubular lamps or other, box-

like elements may be also provided like those indicated by 70 in Figs. 26 to 33, being supplied with appendixes 72 similar to those already described for other components, for their engagement at the ends of the shapes through the aid of sleeves 5. A lid 74 may be applied to the box element 70 to close it and so as to exhibit appendixes 76 similar to those indicated by 72 and to those previously described, for the continuation of the structure, again connectable with sleeves 5. Inside the box thus made up, respectively at an intermediate position of its bottom suitably provided with slots 78A, 78B, 78C as shown in Figs. 30 to 32, the placing may be arranged of tubular lamps - like those indicated by 80 and carried by terminals 82 at least partially applied in the box 70 - or of the PL type.

The boxes 70 may be interposed between straight reticular elements being horizontally disposed or even vertically disposed like posts or torch holders. In particular in Fig. 36 there are shown utilizations of boxes 70 between two vertical reticular elements 84 and 86 applied between adjacent boxes and the one indicated by 86 on a base like that indicated by 48 or other equivalent; the two boxes 70 illustrated therein may actually house a lamp 80 vertically disposed. In such

disposition, a lamp 80 may be shielded by laminar and semi-transparent shields 88 acting like diffusers, which may be developed either on three sides or even only on two sides like a dihedral as shown in the drawing, the shields 88 being able to engage the shapes like those indicated by 1A, 1B and 1B, 1C so as to permit a directional light projection in one direction, and a diffusion of the light through the diffusing shields in other directions.

A structure similar to the one above described and relative to a torch holder may be utilized with a reticular element 90 (see Figs. 38 and 39), which is made to terminate with ball or similar supports, indicated by 92, for a cup 94 holding a suitable upwardly directed projector also capable of being oriented because it can be made to rest on three terminals 92 of rubber or other material providing a minimum friction sufficient to allow for the desired positioning of the component 94.

The above described reticular elements may be utilized to form the most varied combinations to meet the user's requirements, both for decorative effects and for supporting lighting means and for any other use. It is possible to realize, for example, a U structure that can be cantilever mounted, respectively

a square structure to be suspended, for example, in the middle of the ceiling. Any other structure may be possibly conceived stemming from a ceiling, from a wall, or leaning on a floor or combined to make up a floor-, wall- and ceiling-connection.

CLAIMS

1. A reticular structure made up of sectional elements for supporting lighting means for interior decoration or other, characterized in that it comprises: straight reticular modular elements, with three longitudinal structural shapes (1A,1B,1C) arranged according to a triangular configuration in the transverse section, and reticular connections (3) only on two of the three interspaces between said shapes in order to consent to a piling-up of more elements one inside the other and said shapes having slightly projecting ends; sleeves (5) for connecting abutting ends of the shapes (1A,1B,1C) belonging to adjacent elements, by clamping means (10); a crosspiece (9) with sleeves (5), for engaging the ends of the shapes (1A,1C) placed on the side lacking in reticular connections; and auxiliary components (13;36;40;42;48;70), applicable to the ends of said shapes and supplied with appendixes (37;44;49;72) corresponding to said ends for the connection through said sleeves.

2. Structure according to claim 1, characterized in that it comprises angular modular elements with three arcuate curved shapes (11A,11B,11C; 111A,111B,111C) having ends capable of corresponding to those of the

straight elements, and having reticular connections being again on only two interspaces between said three shapes.

3. Structure according to claim 1 or 2, characterized in that the shapes (1A,1B,1C; 11A,11B,11C; 111A,111B,111C) are of circular cross-section, the sleeves (5) are cylindrical and have three threaded holes (7A,7B,7C), for blocking screws (10) and for the connection with said crosspiece (9).

4. Structure according to the preceding claims, characterized in that it comprises a terminal component (13;13A;13B) having ends corresponding to those of the other elements.

5. Structure according to the preceding claims, characterized in that it comprises end components (36,40,42,70) - mostly having a triangular development - with appendixes (37) for the connection to the ends of the shapes of the modular elements, for various functions.

6. Structure according to claim 5, characterized in that an end component (36) has a screw adjustable stop (38,38A) to contrast with a wall.

7. Structure according to claim 5, characterized in that an end component (40) has holes (40A) for suspension means.

8. Structure according to claim 5, characterized in that an end component (42) has holes for the wall mounting by means of screws or other.

9. Structure according to claim 5, characterized in that an end component (70) has a box configuration, with shaped slots (78A,B,C) , to receive at least partially a terminal for attachment of tubular lamps.

10. Structure according to the preceding claims, characterized in that it comprises a cup-like base component (48) with appendixes (49) for its connection to modular elements by said sleeves (5).

11. Structure according to claims 1 to 9, characterized in that it comprises a base component with a central laminar member (50) and three short bars (52), which are radially engaged to said laminar member and are provided with seats (56) for the ends of said modular elements.

12. Structure according to the preceding claims, in particular to claim 4, characterized in that it comprises, in a terminal componet (13B), an articulation bridge (13C), angularly movable about a first axis in a support (25) which is, in turn, angularly movable about a further axis orthogonal to said first axis,on a wall-mountable plate (23), said plate also comprising entraining driving means (32) and

anchoring means (34) for a sustaining cable (30).

Fig.1

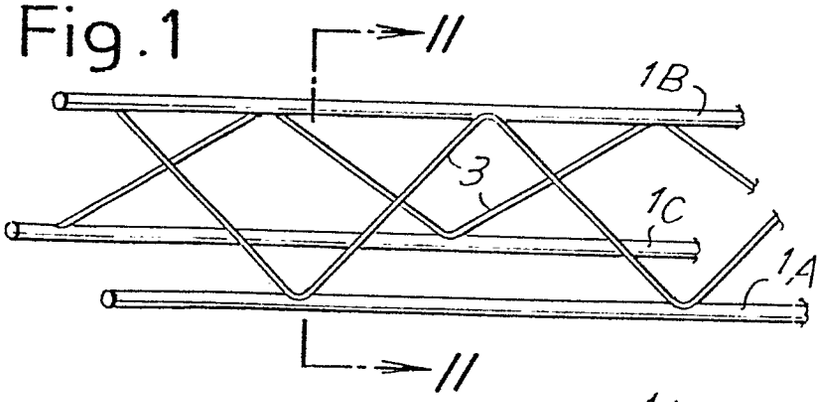

Fig.2

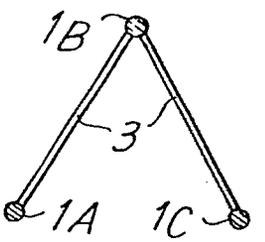

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Fig.3

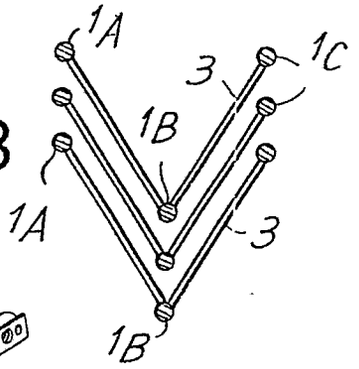

Fig.4

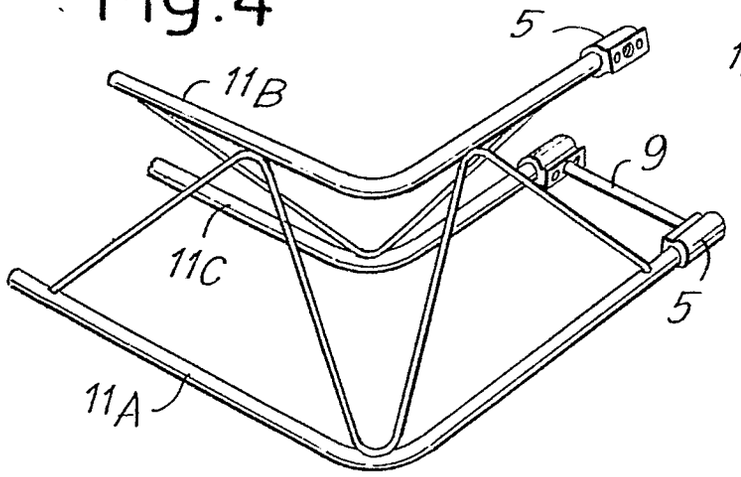

Fig.5

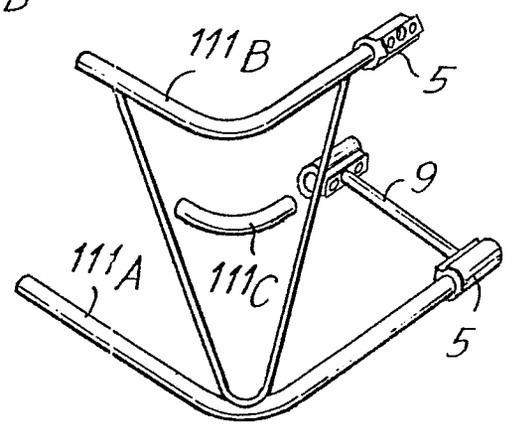

Fig.6

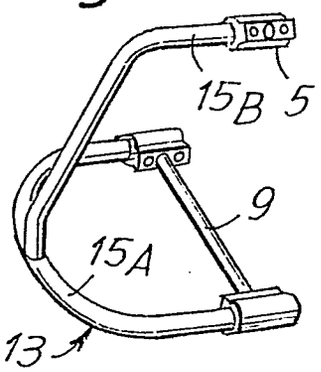

Fig.7

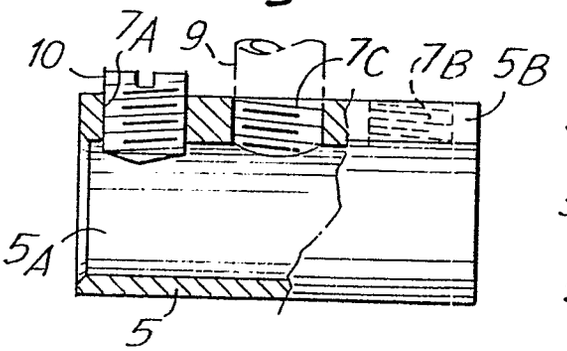

Fig.8

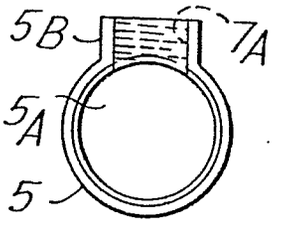

Fig.9

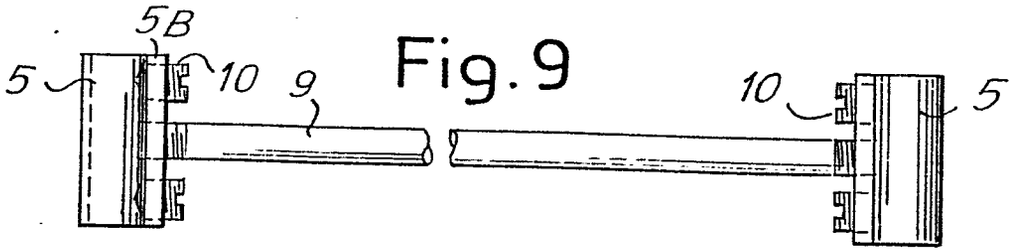

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Fig.11

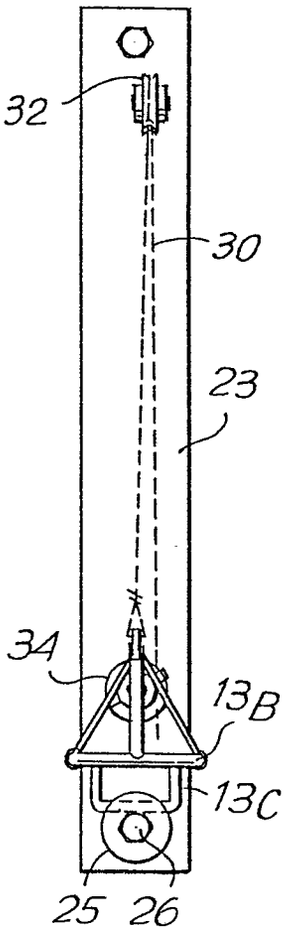

Fig.10

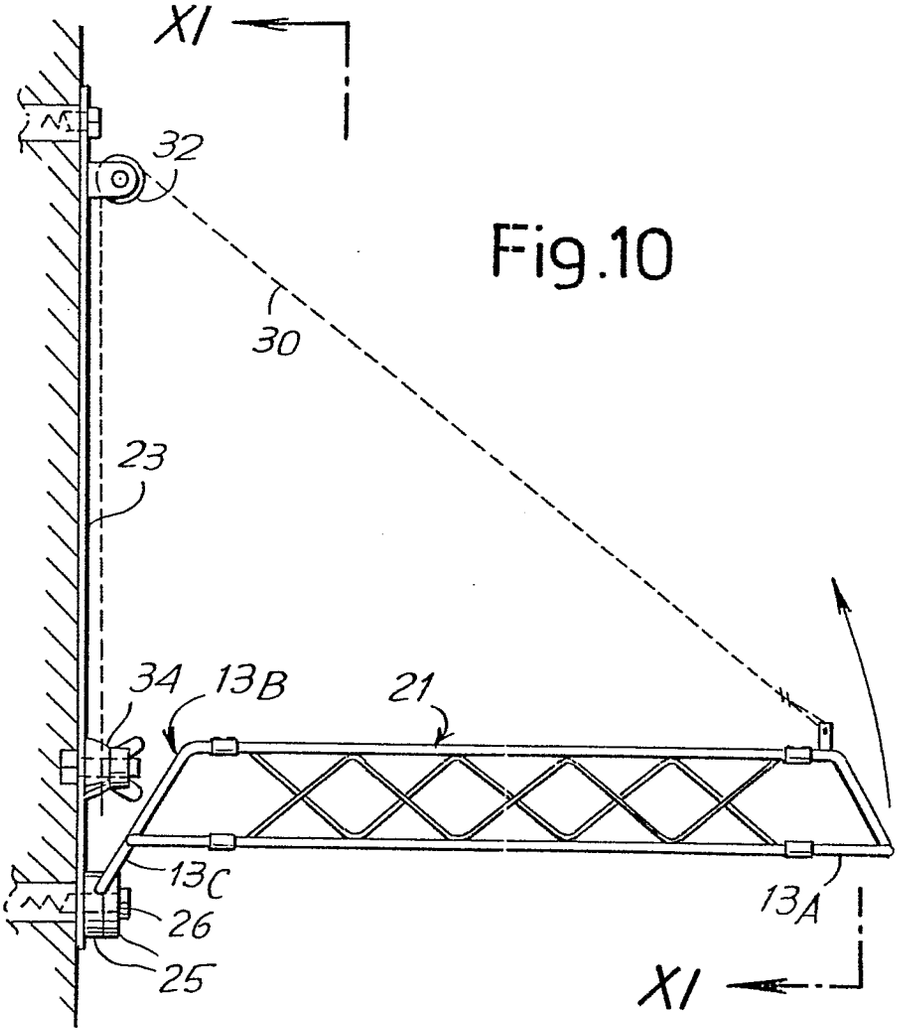

Fig.12

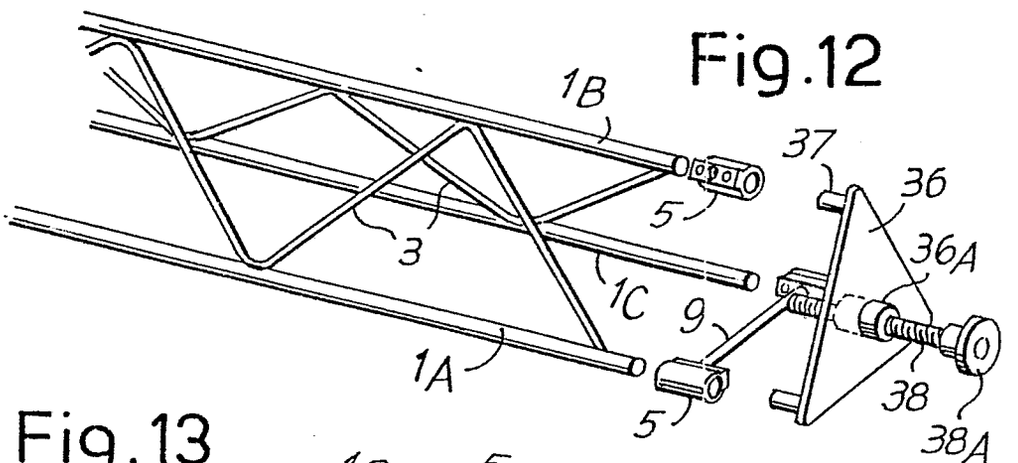

Fig.13

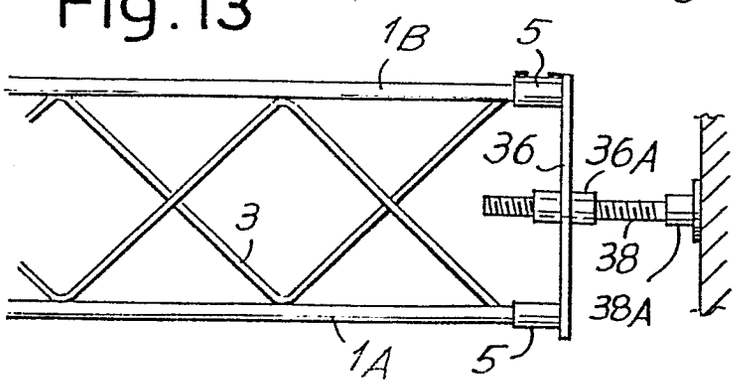

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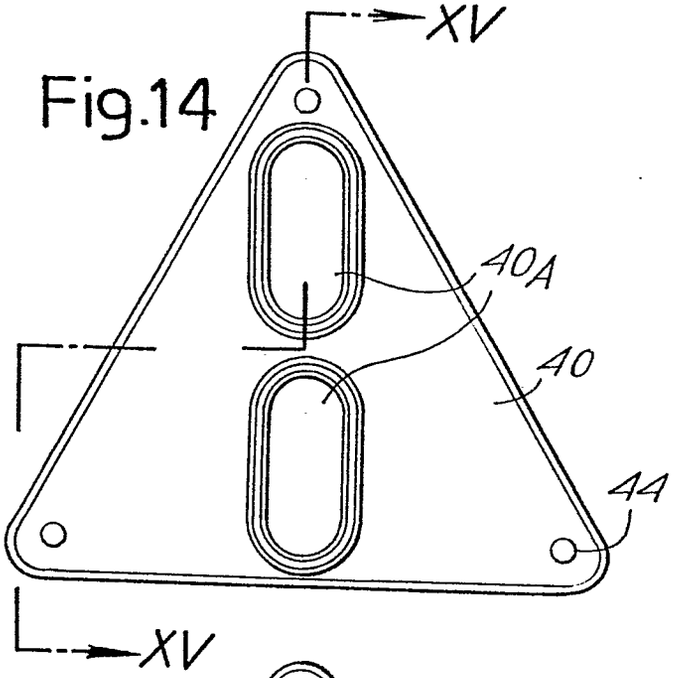
Fig.14



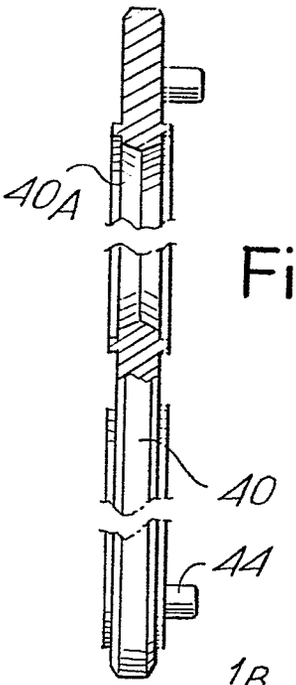


Fig.15

Fig.16

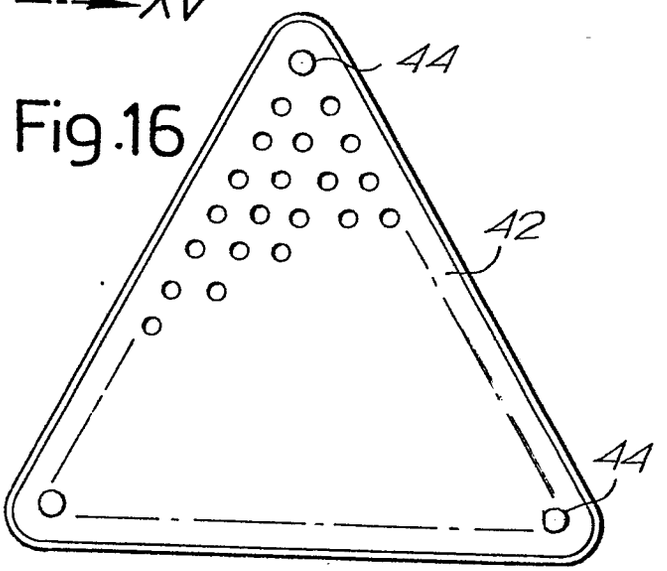


Fig.19

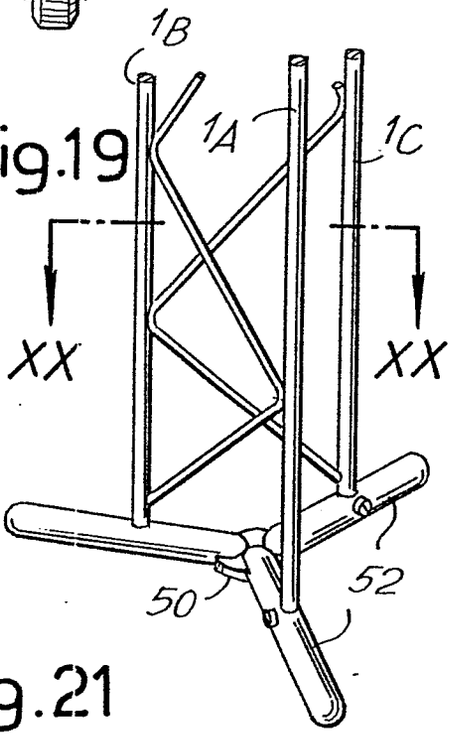


Fig.18

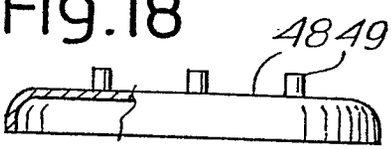


Fig.21

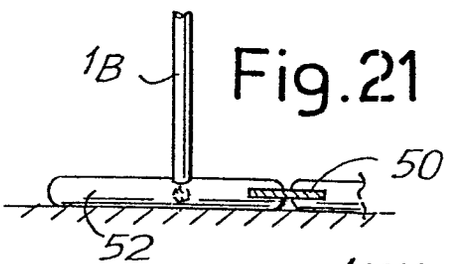


Fig.17

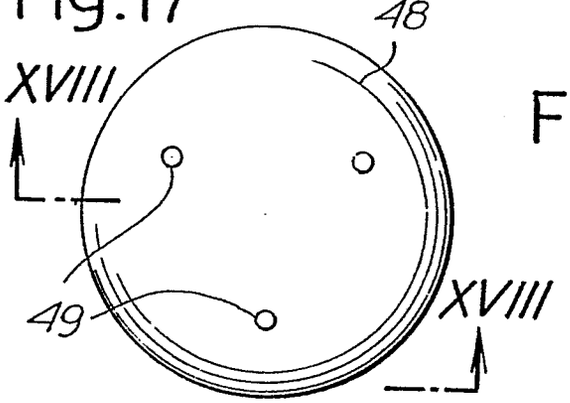


Fig.22

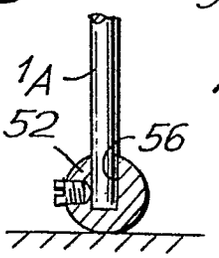


Fig.20

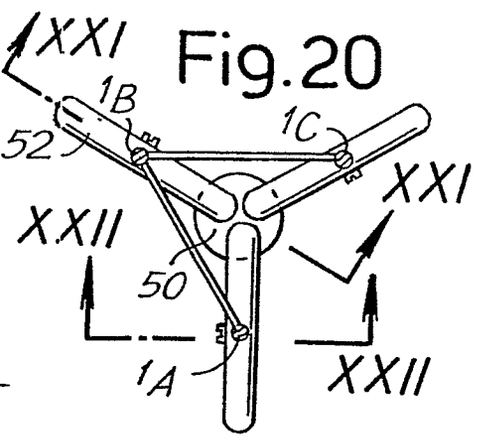


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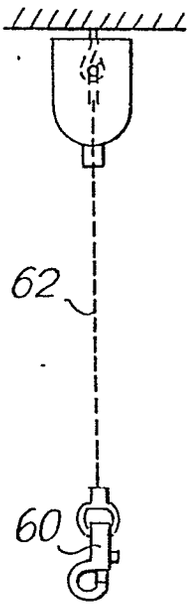
Fig.23



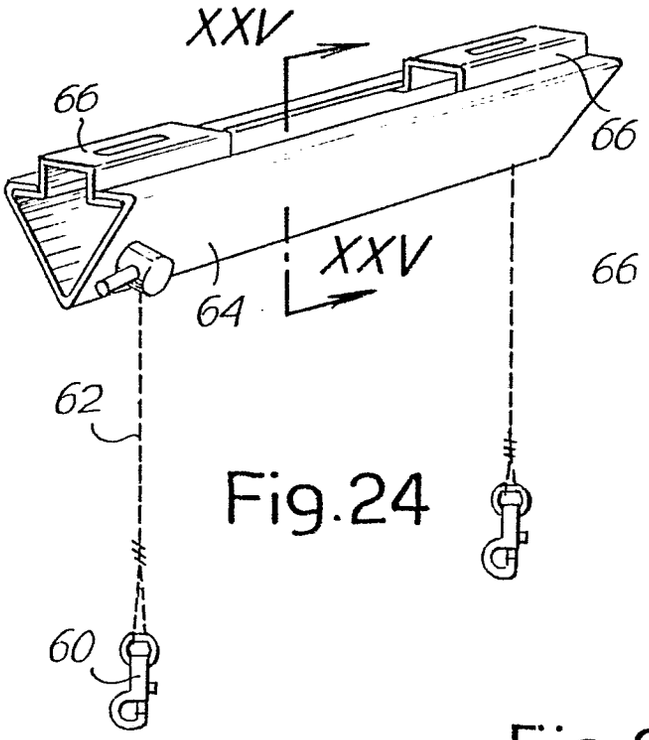


Fig.24

Fig.25

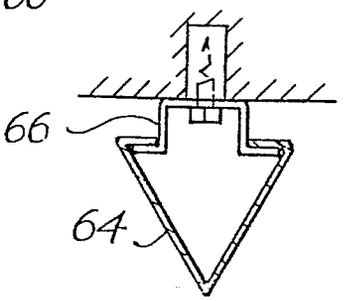
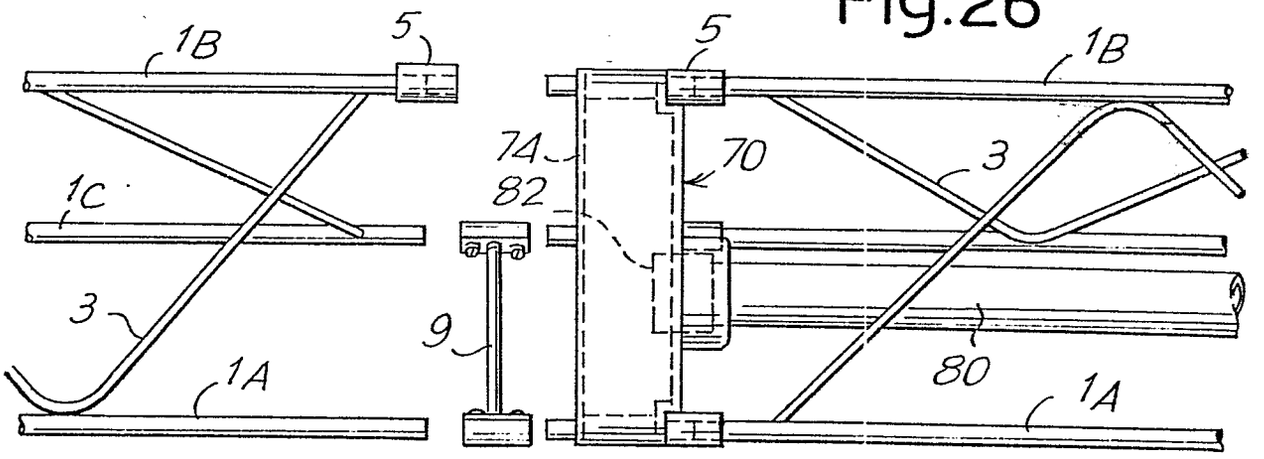


Fig.26



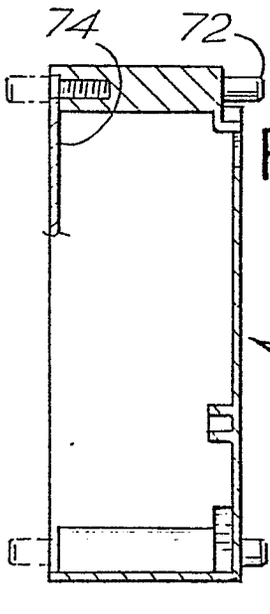


Fig.28

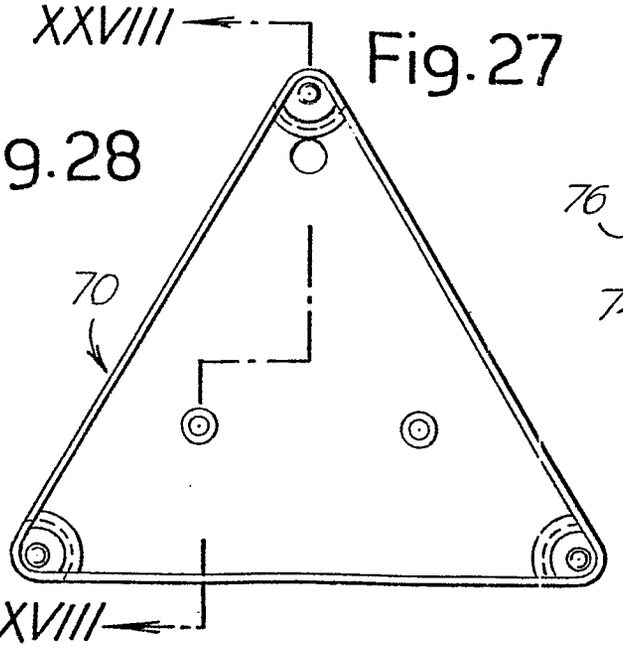


Fig.27

Fig.29

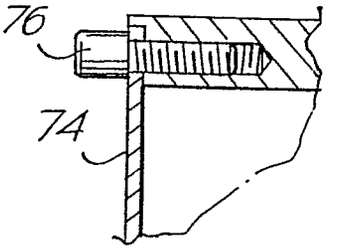


Fig.30

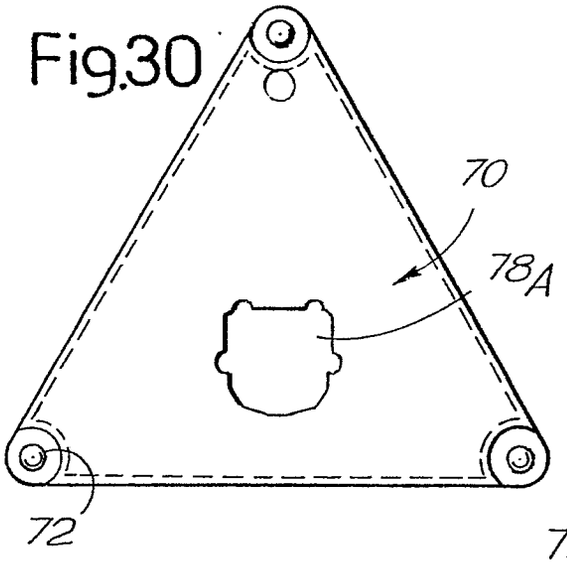


Fig.31

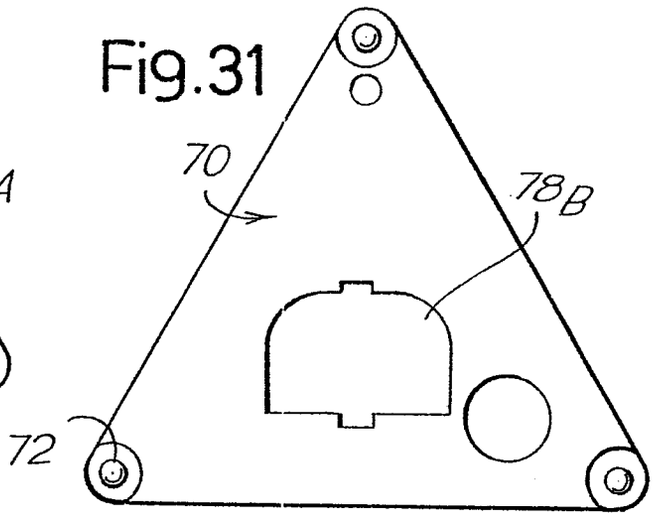


Fig.32

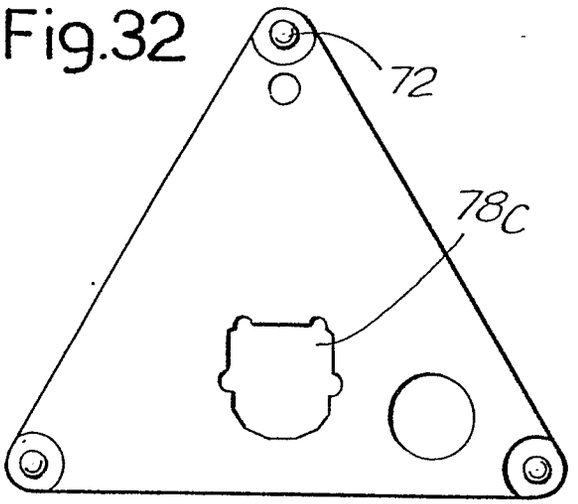


Fig.33

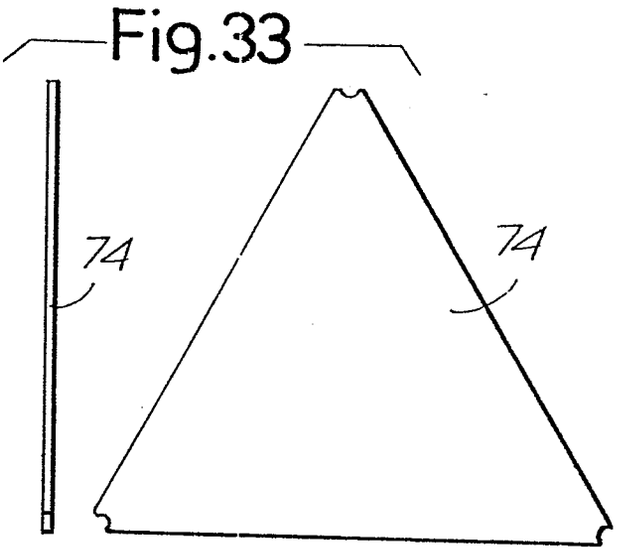


Fig.34

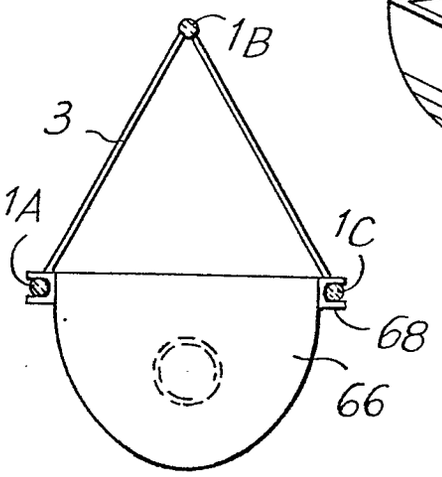
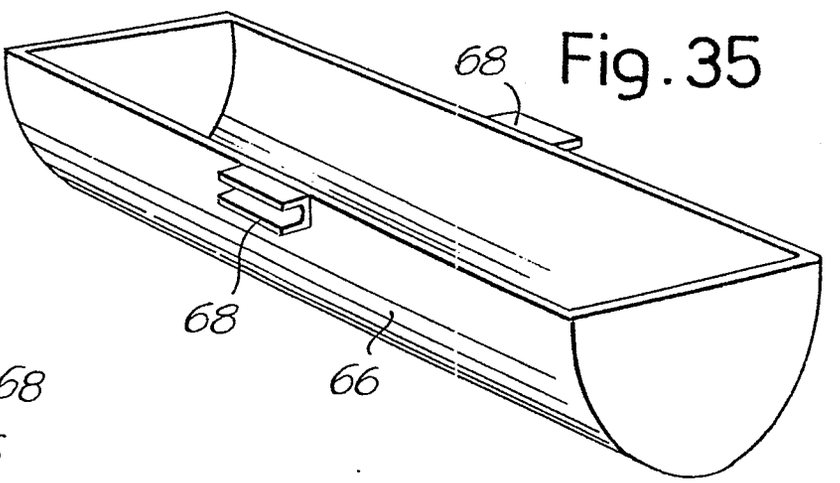


Fig.35



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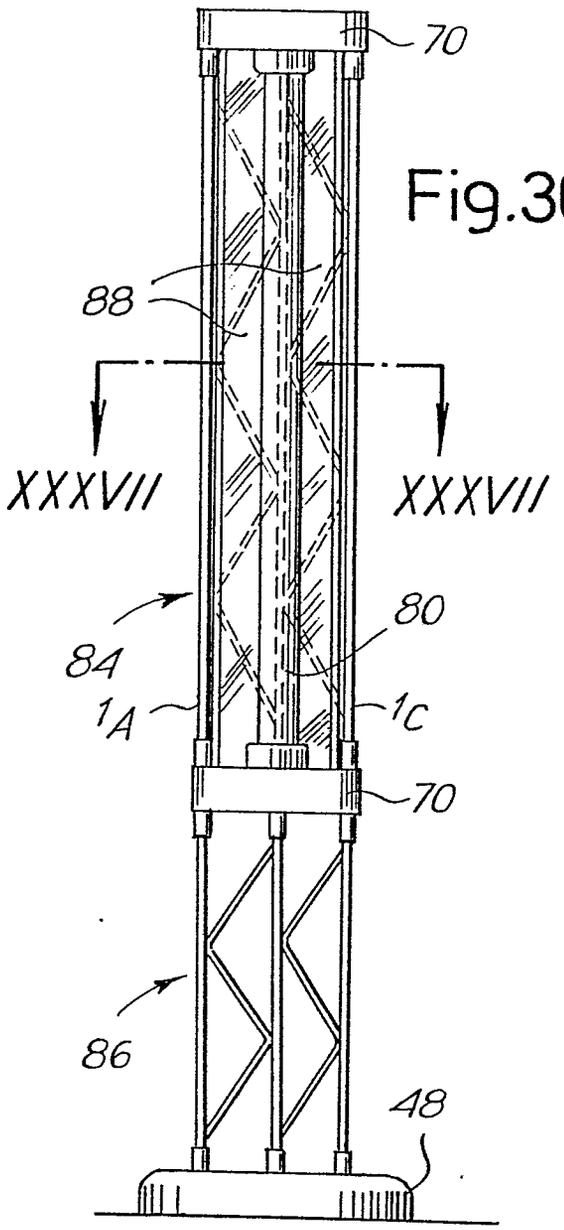

Fig.36

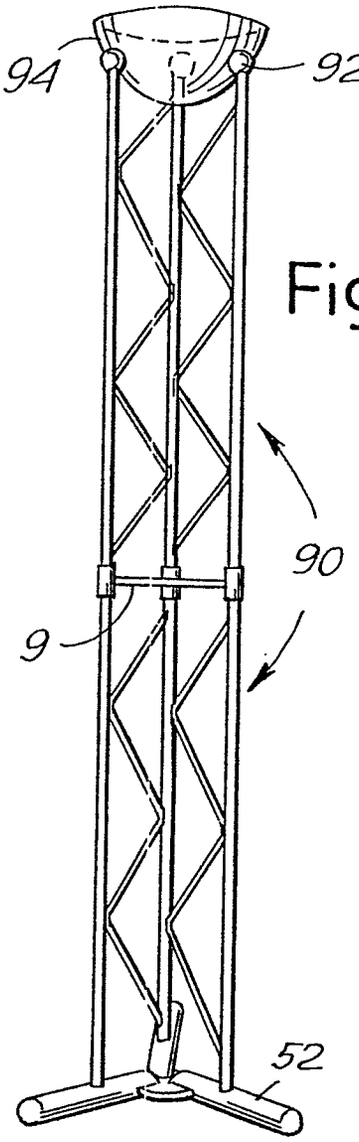

Fig.38

Fig.37

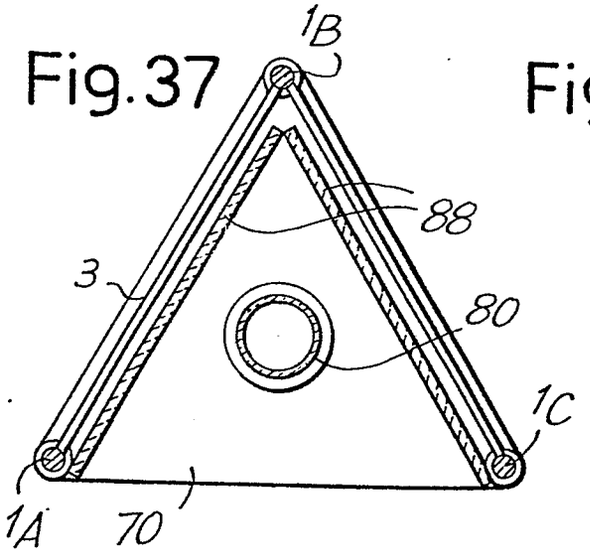

Fig.39