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(71) Applicant: GS Scaffalature Engineering S.p.A.
35015 Galliera Veneta (Padova) (IT)

(72) Inventors:
- Grigolo, Giuseppe
35015 Galliera Veneta (Prov. of Padova) (IT)
- Scapin, Flavio
35015 Galliera Veneta (Prov. of Padova) (IT)

(74) Representative: Modiano, Guido, Dr.-Ing. et al
Modiano & Associati S.r.l.
Via Meravigli, 16
20123 Milano (IT)

(54) Variable-capacity composite upright, particularly for metal shelvings

(57) The present invention relates to a variable-capacity composite upright, particularly for metal shelvings, comprising a longitudinally extended body obtained by cutting and bending metal plate, which is fixed to a ground resting plate at the end that is lowest on assembly. The body is associable with supporting stringers for the shelves. The composite upright also comprises reinforcement means constituted by at least one longitudinally extended reinforcement element which is obtained by cutting and bending metal plate and is substantially shaped complementarily to part of the surface of the body, with which it is associated through first anchoring means having an upward insertion direction and self-locking when loaded. The reinforcement element rests effectively on the ground together with the body, cooperating therewith to support the load.

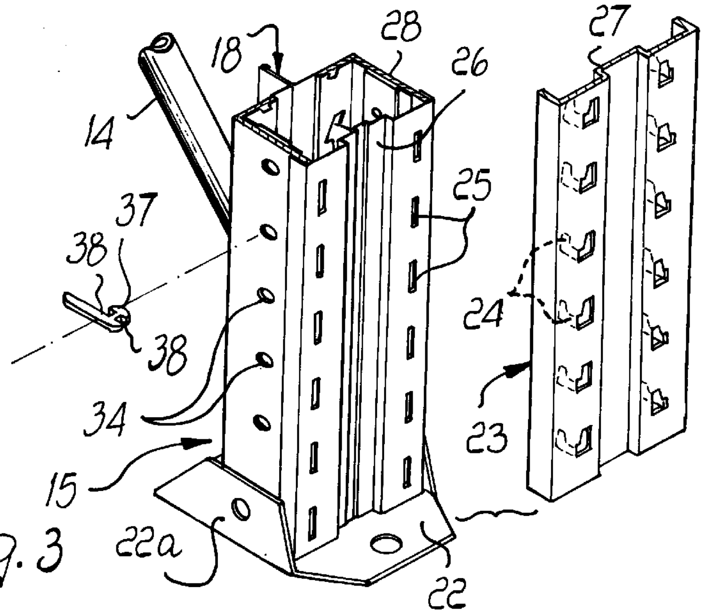

FIG. 3

Description

The present invention relates to a variable-capacity composite upright, particularly but not exclusively useful for metal shelvings.

It is known that in the industrial and commercial field, as well as in the private field, there is currently an extensive use of metal shelvings the structure whereof is substantially constituted by uprights which in turn support the shelves.

These shelvings are often provided with braces to provide a stable structure even under considerable loads.

Metal shelvings are particularly appreciated because of their overall light weight and their easy assembly in structures which are highly adaptable to the context in which they are applied.

However, currently used metal shelvings are often required to support loads which exceed the safety load or in any case the load that can be supported by said shelvings, for example because of the increased volumes of goods handled by a company or by a business concern, or because of the need to increase in-store product capacity.

It is therefore necessary to provide reinforcements which help to support the excess load.

These reinforcements are substantially constituted by longitudinally arranged elements or by plates which are normally associated with the uprights.

The reinforcement elements are currently associated with the uprights substantially by welding or bolting or riveting.

This method of applying the reinforcement elements is very complicated, troublesome and expensive.

In addition to the actual execution time, it in fact requires specialized personnel, often independent of the company, business concern, or private individual.

A principal aim of the present invention is to provide a variable-capacity composite upright which solves the drawbacks of conventional uprights used in the production of metal shelvings, particularly allowing to associate reinforcement means and elements without requiring the execution or use of welds, bolted couplings, or riveted couplings.

Accordingly, an object of the present invention is to provide a composite upright which, once reinforced, has a competitive stability with respect to conventional uprights and in which the applied reinforcement means act effectively by resting on the ground, helping to support the overall load.

Another object of the present invention is to provide a composite upright having production and assembly costs which are competitive with respect to conventional uprights, also in relation to the reduced number of elements that compose it.

Another object of the present invention is to provide a composite upright, for which the application of the reinforcement means does not require the intervention of specialized personnel and can be easily performed even by a private user without particular technical knowledge.

Another object of the present invention is to provide a composite upright which can be produced with conventional technologies, can be easily inserted in models of shelvings which are already being produced, and is adapted to protect the stringers against impacts.

This aim, these objects, and others which will become apparent hereinafter are achieved by a variable-capacity composite upright, particularly for metal shelvings, comprising a longitudinally extended body obtained by cutting and bending metal plate, said body being fixed to a ground resting plate at the end that is lowest on assembly and being associable with supporting stringers for the shelves, said upright being characterized in that it comprises reinforcement means constituted by at least one longitudinally extended reinforcement element which is obtained by cutting and bending metal plate and is substantially shaped complementarily to part of the surface of said body, with which it is associated through first anchoring means having an upward insertion direction and which self-lock when loaded, said reinforcement element resting effectively on the ground together with said body, cooperating therewith to support the load.

Further characteristics and advantages of the present invention will become apparent from the description of an embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

- figure 1 is a view of a shelving in which an upright is used, according to the invention;
- figure 2 is a perspective view of part of a variable-capacity composite upright, according to the invention;
- figure 3 is another partially exploded perspective view of the upright of figure 2;
- figure 4 is a sectional orthographic projection view of the upright of figure 2;
- figure 5 is another sectional orthographic projection view of the upright of figure 2.

With particular reference to figures 1 to 5, a variable-capacity composite upright, particularly for metal shelvings, is generally designated by the reference numeral 10.

The upright 10, in this case, is inserted in a shelving which is generally designated by the reference numeral 11 and also includes stringers 12 which support shelves 13.

The shelving 11 also comprises rod-like brace elements 14 which are associated, as described hereinafter, with the uprights and are arranged along diagonal directions.

The composite upright 10 comprises a longitudinally extended body 15 which is obtained by cutting and bending metal plate.

In this case, the body 15 is box-shaped and has a substantially rectangular transverse cross-section.

Moreover, during manufacture, the cross-section of the body 15 is closed, in this case by seaming and riveting, by means of rivets 16, the free edges 17 which together form a coupling flap 18 for the rod-like elements 14.

More specifically, the ends of the rod-like elements 14 are connected to the corresponding coupling flap 18 by bolts 19 which can be inserted in holes 20 formed in said flap.

The body 15 is fixed, at its end which is lowest on assembly, by means of bolts 15a, to internal wings 21 which extend at right angles from a resting plate 22, which is shaped so as to also form two outer wings 22a arranged opposite to each other and folded upwards.

The upright 10 comprises reinforcement means which are constituted, in this case, by a longitudinally extended reinforcement element 23 obtained by cutting and bending from metal plate and substantially shaped complementarily to the part of the surface of the body 15 which upon assembly is directed towards the outside of the shelving 11.

More specifically, the reinforcement element 23 is associated, by means of first anchoring means described hereinafter which have an upward insertion direction and self-lock when loaded, with the above-mentioned surface part, resting effectively on the ground together with the body 15 and cooperating therewith to support the load.

In this embodiment, the first anchoring means comprise two sets of first flaps 24, each whereof is arranged longitudinally in lateral portions of the reinforcement element 23.

Each one of the first flaps 24 is L-shaped with a free end which is directed upwards upon assembly and can be inserted in a corresponding through hole 15 formed in the body 15, so as to provide a self-locking anchoring, when loaded.

The surface portion of the body 15 with which it is possible to associate the reinforcement element 23 is shaped so as to form at least one longitudinally extended cavity 26, which is adapted to facilitate centering upon assembly and guiding when loaded for a complementarily-shaped portion 27, in this case a median portion, of said reinforcement element 23, which also constitutes a reinforcement ridge against any flexural stresses.

The reinforcement element 23 can also be anchored to the resting plate 21 by means of bolts which are not shown in the figures.

In this case it is possible to associate with the body 15, at the surfaces adjacent to the one whereon the reinforcement element 23 is associable, a plurality of stringers 12 by means of corresponding brackets to which they are welded, each bracket being designated by the reference numeral 28.

Each bracket 28 is obtained, in this case, by cutting and bending metal plate and has a substantially L-shaped cross-section which is complementary to the surface portion of the body 15 with which it is associable.

Moreover, each one of the brackets 28 is associated with the corresponding surface portion of the body 15 through second snap-together anchoring means having a downward insertion direction, self-locking when loaded, and described hereinafter.

In this case, each one of the brackets 28 has two sets of second flaps 29, each flap being L-shaped with the free end directed downwards upon assembly.

More specifically, a first set of flaps 29 is formed by blanking and bending in a wing 30 of the corresponding bracket 28 and the second flaps 29 that constitute it are adapted to enter corresponding through holes 31 formed directly in said body.

A second set of second flaps 29 is formed by simple blanking at the edge that lies opposite to the wing 30 and each one of the second flaps 29 that form it is adapted to enter a corresponding through hole 32 which is also formed in the body 15.

Each one of the brackets 28 can also be stably fixed to the body 15, in this case, by means of one or more safety elements 33 which fit in through holes 34 and 35 formed respectively in a wing 36 of the corresponding bracket 28 and in the body 15.

Each one of the elements 33 has an end 37, to be inserted within the holes 34 and 35 upon assembly, which runs substantially at right angles with respect to the rest and proximate whereto two notches 38 are provided which are adapted to facilitate the plastic deformation of the corresponding element 33 by means of a rotation about the axis of said end 37 performed by the assembly worker in order to fix the corresponding bracket 28 to the body 15.

The particular configuration of the body 15 and the particular coupling thereto of the brackets 28 prevent the stringers 12 from protruding with respect thereto, thus remaining protected against impacts.

In this case, when the reinforcement elements 23 are assembled, they protrude also downwards from the corresponding body 15, thus ensuring effective ground support when they are actually rested on the ground and loaded.

In practice it has been observed that the present invention achieves the intended aim and objects.

In particular it should be noted that the reinforcement elements which can be associated with the upright, according to the invention, are extremely quick and easy to apply and do not require particular expertise or technical knowledge.

Their assembly to the body of the upright occurs in fact by simple snap-together action, with an upward insertion direction which also ensures their self-locking when loaded.

It should also be noted that the application of the reinforcement means does not affect at all the simplicity of the application and fixing of stringers by means of the corresponding brackets.

It should also be noted that the size of the reinforcement elements may be chosen substantially at will, thus optionally allowing to reinforce only the lower part of the upright, with a considerable saving of material and overall optimization of the structure.

It should also be noted that the particular configuration of the reinforcement elements causes them to contribute effectively to support the load together with the body of the upright.

It should also be noted that the reinforcement means according to the invention do not complicate the overall structure excessively, allowing low production costs which are in any case competitive with respect to conventional uprights, and that the stringers are protected, by means of the configuration of the upright according to the invention, against any impacts caused by loading and unloading machines.

The present invention is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept; all the details may furthermore be replaced with other technically equivalent elements.

The materials and the dimensions may be any according to requirements.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. Variable-capacity composite upright, particularly for metal shelvings, of the type comprising a longitudinally extended body obtained by cutting and bending metal plate, which is fixed to a ground resting plate at the end that is lowest upon assembly, said body being associable with supporting stringers for the shelves, said upright being characterized in that it comprises reinforcement means constituted by at least one longitudinally extended reinforcement element which is obtained by cutting and bending metal plate and is substantially shaped complementarily to part of the surface of said body, with which it is associated through first anchoring means having an upward insertion direction and which self-lock when loaded, said reinforcement element resting effectively on the ground together with said body, cooperating therewith to support the load.

2. Upright according to claim 1, characterized in that said first anchoring means comprise at least one set of first flaps obtained directly from said reinforcement element, by cutting and folding, each flap being L-shaped with its free end which is directed upwards upon assembly, each one of said first flaps being insertable, in a corresponding through hole formed in said body, so as to provide self-locking anchoring, when loaded.

3. Upright according to claims 1 and 2, characterized in that the surface portion of said body, with which said reinforcement element is associable, is shaped so as to form at least one longitudinally extended cavity which is adapted to facilitate centering, upon assembly, for a complementarily shaped portion of said element which is adapted to provide a reinforcement against flexural stresses.

4. Upright according to one or more of the preceding claims, characterized in that said reinforcement element can be anchored to said ground resting base by means of bolts or other equivalent elements.

5. Upright according to claim 1, characterized in that stringers are associated with said body by means of corresponding connecting brackets which are obtained by cutting and bending metal plate and are anchored to said body through second snap-together anchoring means which have a downward insertion direction and self-lock when loaded.

6. Upright according to claim 5, characterized in that each one of said brackets is substantially shaped complementarily with respect to the surface portion of said body with which it is associated, said second anchoring means comprising one or more sets of second flaps formed by blanking and optionally by bending, directly from the corresponding bracket, each flap being L-shaped so that the free end that is directed downwards upon assembly can be inserted in a corresponding hole formed in said body.

7. Upright according to claim 5, characterized in that said second anchoring means comprise safety elements which are adapted to stably associate, by means of their plastic deformation performed during installation by the assembly worker, the corresponding said bracket with said body by fitting in holes formed in said safety elements.

8. Variable-capacity composite upright, particularly for metal shelvings, according to one or more of the preceding claims, characterized by what is described and illustrated in the accompanying drawing sheets.

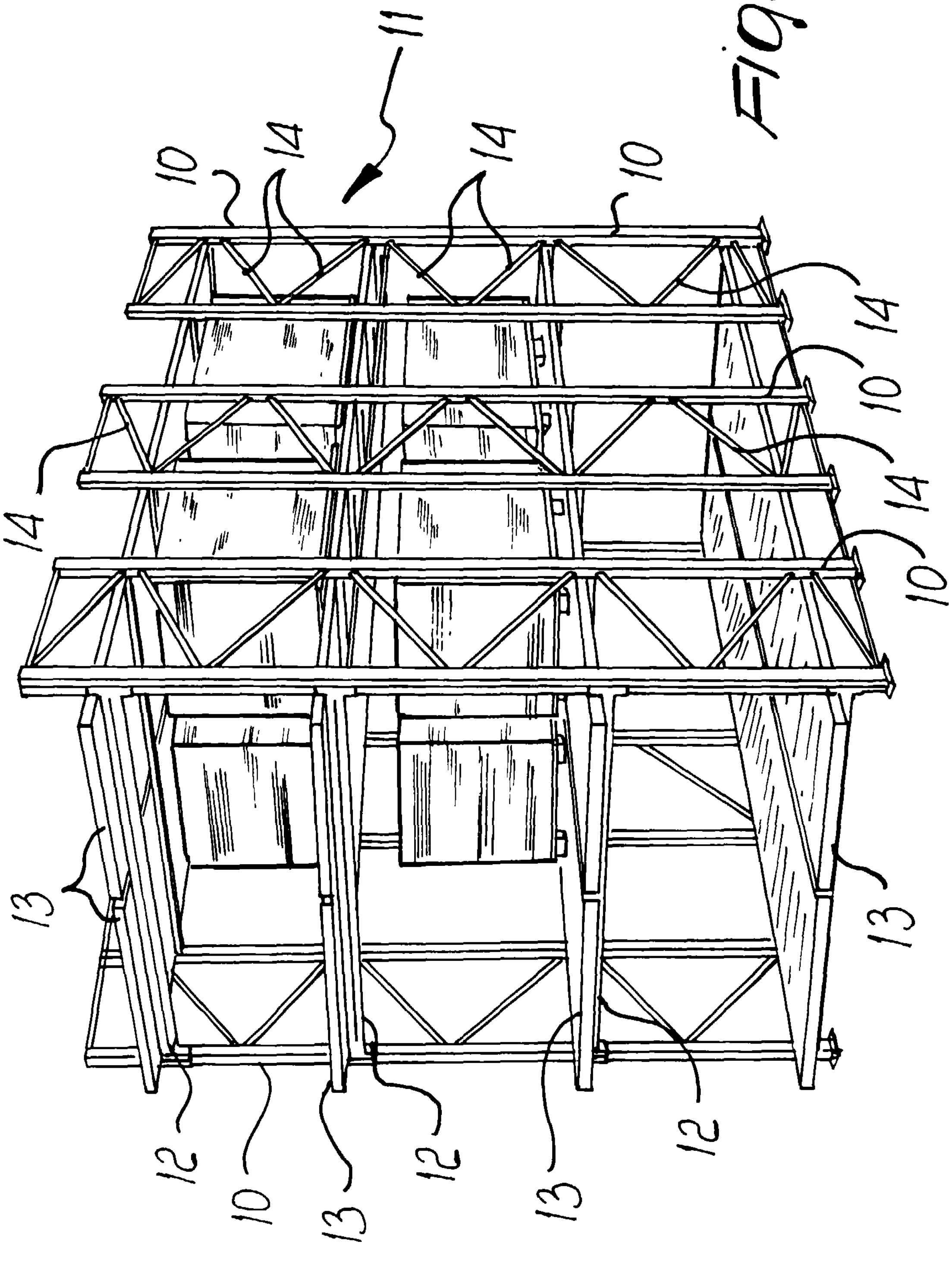

Fig.1

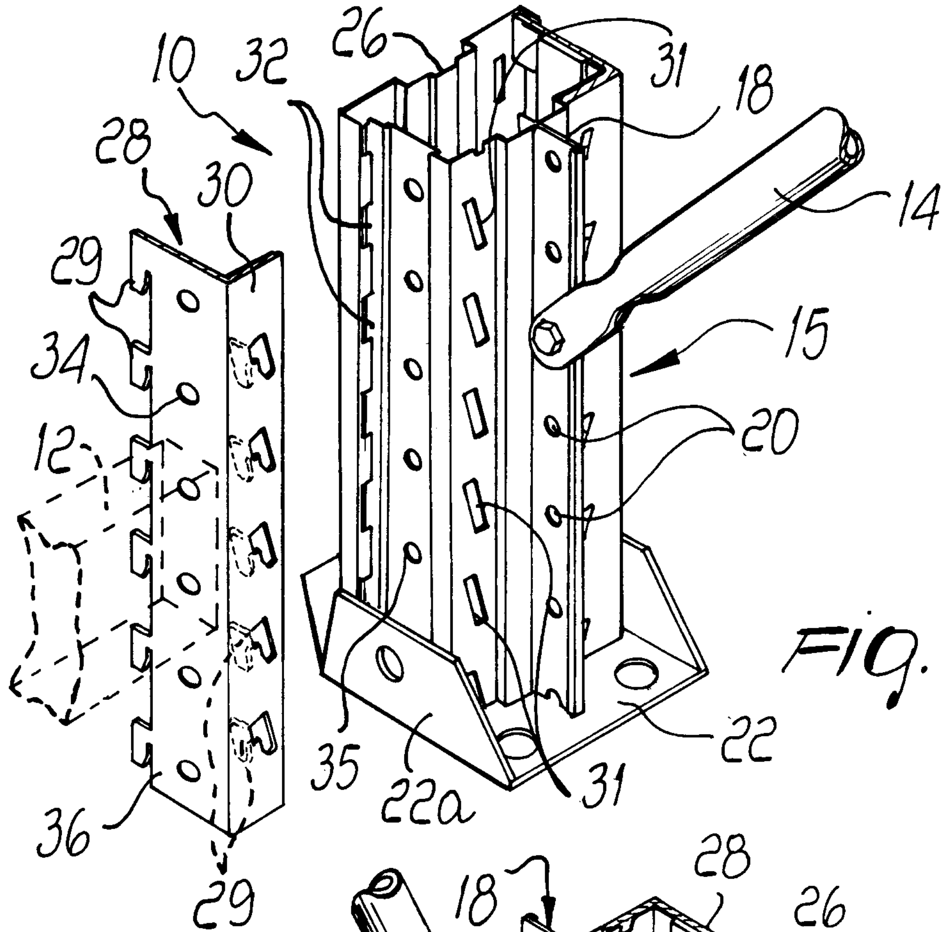
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Fig. 2

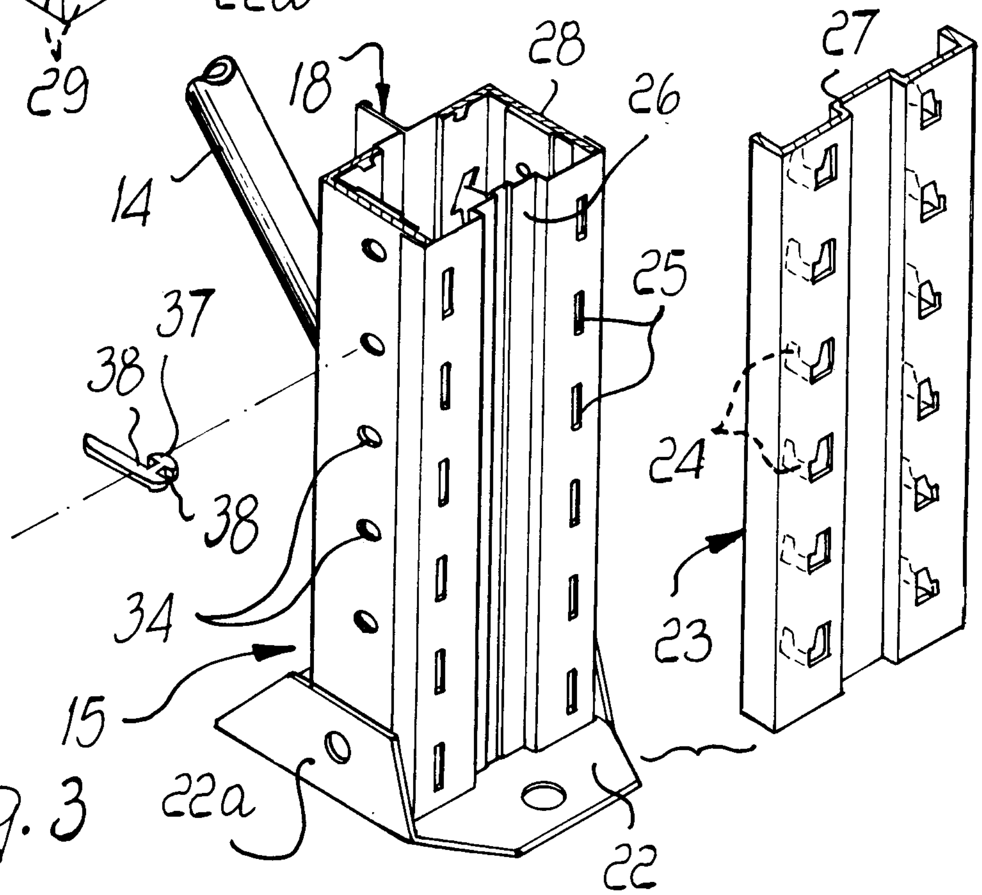
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Fig. 3

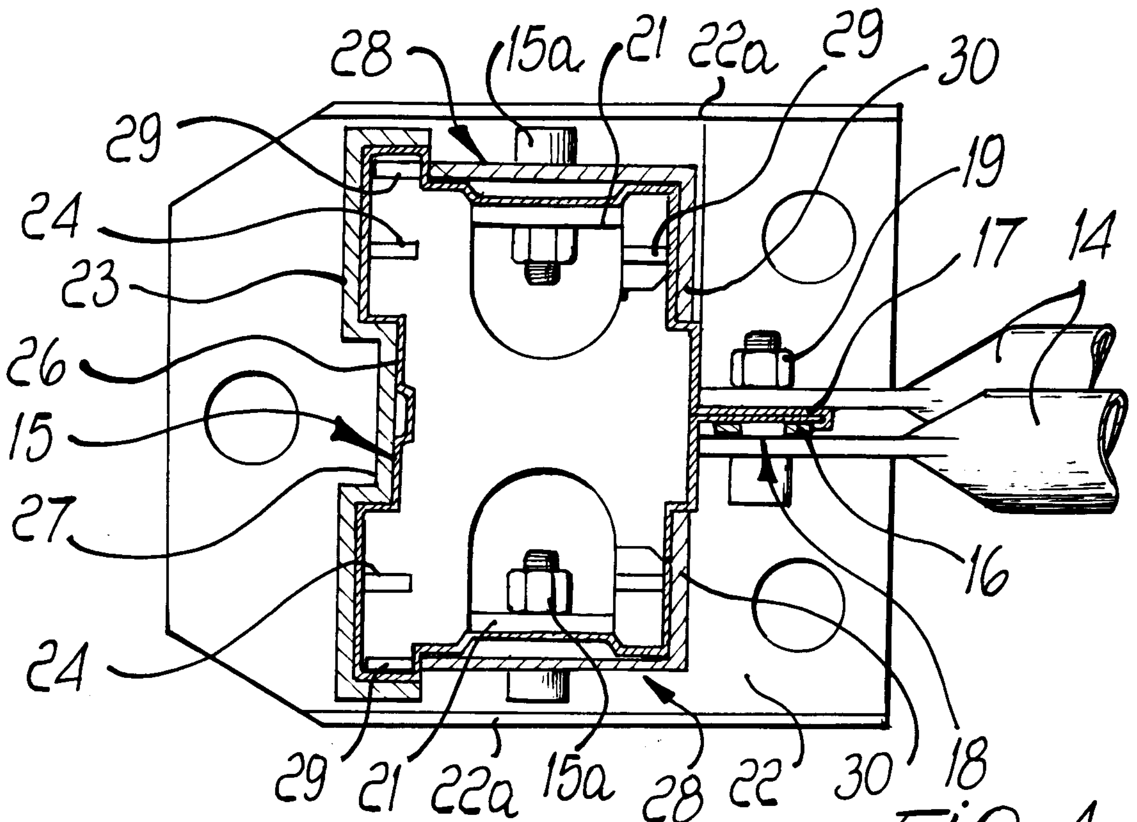
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Fig. 4

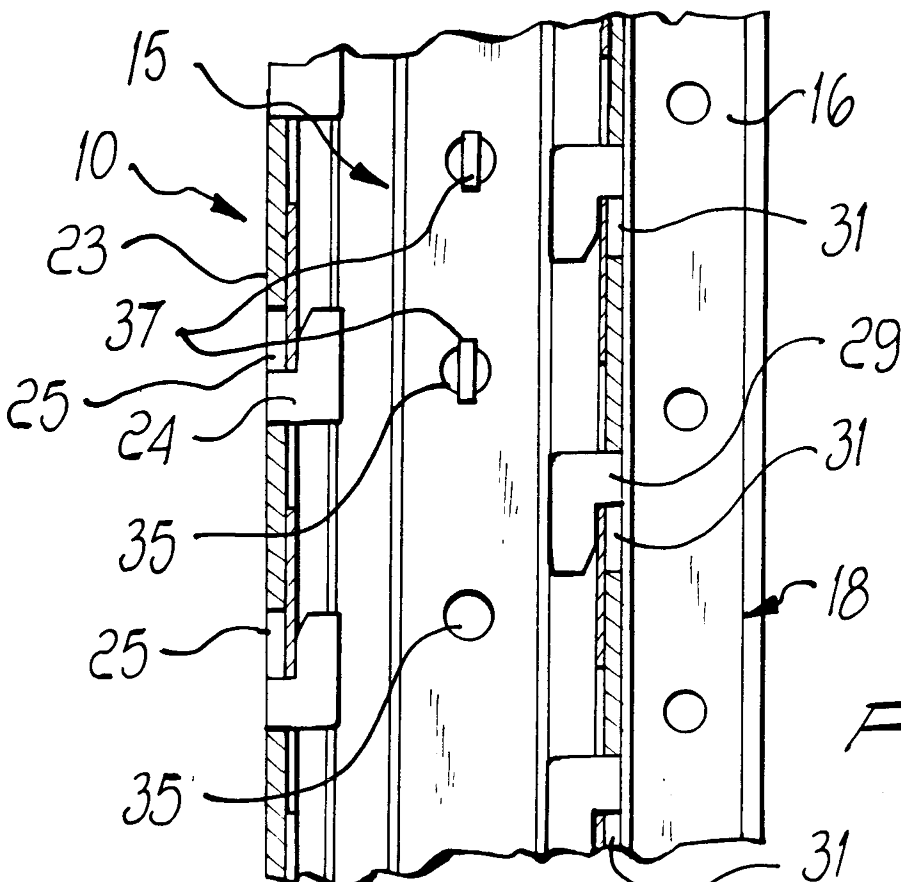
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Fig. 5