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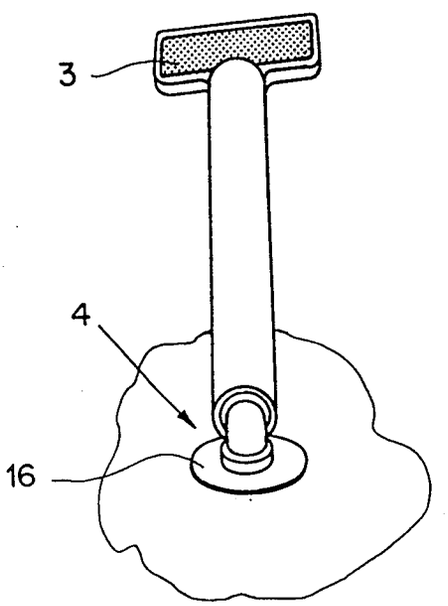
(54) Anticollision road marker.

(57) A road edge marker comprising a reflector support divided into two aligned portions joined together by means of a hinge which allows the two portions to shift in case of collision. The hinge consists of sleeves fixed to said portions, connected to one another by an elastic member, such as a spring or a caoutchouc tube, which brings them back to their original position.



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COMPLETE DOCUMENT

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"ANTI-COLLISION ROAD MARKER"

Description

The present invention relates to a road edge marker of the type with a support for a reflector (cat's eye) which indicates the road way.

It is well known that road way edges are marked laterally by red reflectors on the driver's side and white ones on the apposite side. The reflectors must maintain a precise position so that the driver can see their reflection; so that it is very important

for the reflector support to be in position as well.

Known supports of the rigid type obviously stay in position, unless they are hit by an automibile or the like or are moved in any way, in which case manual intervention is required to return them to their position. In fact, given the large number of road way markers and the extension of the road system, the manual intervention to bring the road markers back consumes a very high proportion of the working hours of the road maintenance crews. Therefore, while the rigid markers are economical to manufacture, they involve high maintenance costs.

To solve this severe problem, flexible markers have been made out of rubber material, which return automatically to position in case of collision or displacement. However, these flexible markers have high manufacturing costs, since to maintain their flexibility for an acceptable period while exposed to atmospheric agents, they must be made of specially treated synthetic rubber. Even then however, their duration in inclement weather is fairly limited and so they must be replaced frequently. Therefore from an economical point of veiw, this type of flexible marker has not resolved the problem posed above.

According to the present invention, this problem is solved by means of a marker made of rigid material highly resistant to inclement weather, which gives offering no resistance in case of collision by a vehicle and returns exactly to the initial position automatically.

The marker according to the invention is therefore made of less expensive material and can solve the problem posed above.

According to the present invention, the anticollision road edge marker comprises a reflector support of the tubular type divided into at least two portions connected by an elastic swivel joint comprising a first sleeve which is fixed coaxially and internally in a rigid fashion to one end of the first portion and projects slightly from said end, as well as a second sleeve which is fixed coaxially and internally in a rigid fashion to one end of the second portion and is recessed slightly in said end. Said sleeves are equipped with engagement means comprising for example a projection and indentation pair opposite to one another, which reciprocally engage said sleeves so as to define a precise relative position. The sleeves are also attached to an elastic member, for example a caoutchouc tube or a spring, so that said first and second portions of the support are kept in alignment

as long as the first and second sleeve are engaged to each other, while in case of collision or the like, the two portions are allowed to go out of alignment because of the elasticity of the elastic member, which then brings the marker back to its initial position by means of its elastic return and the engagement means provided on the sleeves.

The invention will be descrived below in detail with reference to the attached drawings, in which:

figure 1 is an exploded view of the elastic swivel joint of the marker according to the invention;

figure 2 is a sectional view of the joint in its normal rest position;

figure 3 shows the joint is its position when out of alignment and illustrates its operation;

figure 4 is an example of an embodiment of the road marker according to the invention;

figure 5 shows the marker of figure 4 in the non-aligned position;

figure 6 shows another embodiment of the road marker;

figure 7 shows the marker of figure 6 in the non-aligned position;

figures 8 and 9 show another embodiment of the joint according to the invention; and

figure 10 is a preferred embodiment of the point.

Figures 4 and 5 show how the road marker according

to the invention comprises a support consisting of a point 1 and a post 2 which supports a cat's eye reflector 3. The two portions of the support consisting of point 1 and post 2 are connected to one another at the point indicated with 4, by means of swivel joint which allows post 2 to go out of alignment with the point, or even to lay against the ground, as shown in figure 5, and then to return to its proper position as shown in figure 4.

The joint is described in detail with reference to figures 1 to 3. In these figures, the two portions of the support to be connected at the joint are indicated respectively with 5 (lower part) and 6 (upper part), which in the road marker shown in figure 4 correspond to the point 1 and the post 2.

The joint includes two sleeves, a lower one 7 and an upper one 8, which as shown more clearly in the section in figure 2, are fixed to the respective parts 5 and 6 in a rigid way, for example by means of pins indicated with 9 and 10 respectively.

The sleeves 7 and 8 are equipped with engagement means indicated respectively with 11 and 12 and consisting, in one embodiment, of tapered projections 11 on the sleeve 7 and of complementary indentations

12 on the sleeve 8, which are placed in correspondence with a diametral position of the sleeve. Therefore the sleeves are engaged on contact in a determined position, which is fixed by the engagement between the projections 11 and the indentations 12. Obviously, the engagement means 11 and 12 may be of a different shape, sicne the only important aspect is that the engagement ensure a very precise relative position for the sleeves 7, 8 which in turn determines the position of the reflector 3 of the road marker.

As shown in figures 2 and 3, one of the sleeves, for example sleeve 7, projects slightly above the respective portion 5, while sleeve 8 is slightly indented in its respective portion 6 of the support. This arrangement facilitates the exact alignment of portions 5 and 6 of the support.

Inside the sleeves 7 and 8 is an elastic member, in this embodiment a small rubber tube 13, which is fixed to both sleeves 7, 8 by means of pins 14, 15, respectively. The rubber tube 13 is a preferred embodiment of the elastic means, which in any case may be realized in various ways, for example by means of special springs.

A natural rubber or caoutchouc tube vulcanized at 200° C has been found to be an elastic member of good

performance.

Therefore, in the road marker's normal position (figure 2) the two portions 5,6 of the support are exactly aligned and the engagement means 11, 12 ensure that the reflector is oriented precisely as it should be. As shown, the two portions are perfectly sealed to external atmospheric agents (sun, rain, dust) which thus affect only the outer surface of portions 5 and 6 of the support, which is made of inexpensive material resistant to these agents. In particular, the rubber tube 13 remains well protected, even though as a very small piece its cost is extremely low.

In case of collision or of a reciprocal shift (dis-alignment) of portions 5 and 6 (figure 3), the rubber tube 13 gives easily and bends, allowing practically any reciprocal position of the portions 5 and 6 of the support, and then returns to its initial non-bent condition, bringing portions 5 and 6 back to alignment and their proper orientation, thanks to the engagement means 11, 12 of the sleeves 7, 8.

The joint shown in figures 1 to 3 may be placed in the most suitable position of the marker. In figures 4 and 5, the joint is located between the point 1 and the post 2, so that the marker is made up of two portions. In this case the lower sleeve of the joint has a flange 16

(indicated with slotted lines in figure 1) which serves to drive the point into the ground using an appropriate device.

Figures 6 and 7 show another embodiment of the marker according to the invention, in which there are two joints in the positions indicated with 17 and 18. In this case the support consists of three parts, that is a post 19, a lower arm 20 and an upper arm 21 which supports the reflector 3. The lower arm 20 is connected to a point 22. This embodiment has the advantage of keeping the reflector 3 away from the post 19, so that the splashes of water and mud which reach the post have difficulty reaching the reflector 3. Figure 7 shows the marker folded at joint 18. Obviously, it may also be subject to deviations at joint 17.

Figures 8 and 9 show another embodiment of the joint for road markers according to the invention, in which the elastic memeber of the joint consists of a helical spring.

As in the preceding embodiments, the joint comprises an upper sleeve 27 and a lower sleeve 28 equipped respectively with projections 42 and indentations 43 to fix their relative positions. In analogy with the preceding embodiments, sleeve 27 receeds into the upper

portion 45 of the post, and sleeve 28 protrudes with respect to the lower portion 46 (figure 9). The lower sleeve in equipped with a flange 44.

Inside cavity 33 of sleeve 27 and cavity 34 of sleeve 28 are arranged respectively an upper plug 26 and a lower plug 29, equipped with longitudinal grooves 32 and 35. The spring 25 is compressed between an abutment 48 integral to upper plug 26 and a free bearing 24.

A flexible, tracction-resistant cable 31 is fixed at the top to a screw 47 which can be screwed into a nut 23 resting aganinst the other side of the support 24 of spring 25.

Cable 31 is preferably a strand of galvanized or tinned steel.

Pins 36 and 37 fix the members of the joint to the upper and lower portions 45 and 46 respectively 36 passing through an opening 40 in upper plug 26 and another opening 38 in upper sleeve 27, and 37 passing through an opening 39 in lower sleeve 28 and an opening 41 in lower plug 29.

The cable 31 is fitted in the grooves 32 of the upper plug 26 and in the grooves 35 of the lower

plug 29, winding a pulley 30 at the lower end of plug 29. The screw 47 passes through an opening of the support 24 and is engaged by nut 23, which thus fixes the cable 31 in position and in engaging with the screw 47 causes a certain degree of compression of the spring 25.

The operation of this embodiment of the joint is analogous to that described for the previous embodiments, in that displacement of the upper portion 45 of the post with respect to the lower portion 46 leads to compression of the spring 25 which tends to bring the two portions of the post back into alignment, and moreover into the exact position established by the engagement of the projections 42 with the indentations 43.

This embodiment moreover allows the reflector post to be brought back to the exact position desired, even when the upper post 45 is rotated 180° with respect to the lower post 46 and the projections 42 and indentations are engaged backwards. This situation leads to the inversion of the cat's eye reflector's colour on the marker.

In the present embodiment this position would not be stable, since it would cause the cable 31 to cross with conseguent compression of the spring 25 which

immediately brings the marker back to the correct position.

As can be seen, in this embodiment as well the members of the joint are completely sealed from the external environment, so that their duration for very long periods is ensured.

Obviously this embodiment of the joint may be realized even without the pulley 30, even though it does improve the efficiency of the operation.

Moreover, this embodiment is particularly strong and the elastic return produced by the spring is much smoother than that with the caoutchouc member.

In addition to the shape illustrated above the point of the marker may also be shaped like a spade so that the point may be inserted simply by tapping it in; a preferred shape is shown in figure 10.

As shown in figure 10, the point consists of two egual pieces of sheet metal joined face to face, for example by means of spot welding.

Thus the point has a generally spade - like shape, preferentially indicated with 50, and a tubular

sleeve 51 which may also comprise the lower portion of the marker which contains the lower sleeve of the joint.

Laterally the spade 50 presents a saw tooth profile indicated with 52, which provides resistance to attempted extraction of the point from the ground.

A hook 53 may be provided near the point of the spade to increase resistance to extraction.

The surface of the spade is moreover equipped with openings which facilitate packing of the spade in the ground where it is fixed.

With this shape point, the marker can thus be placed in operation simply by tapping it into the ground, with no need for digging a hole first, therefore reducing installation costs.

The marker according to the invention conforms to article 92 of the Italian Highway Code.

Preferably in the embodiments shown, the reflector support is a cylindrical section since in this way the supported reflector in less exposed to splashes of water and mud which may strike the support.

Therefore, the present invention allows realization of a relatively low cost, long- lasting marker which maintains its operational position even when disturbed and which, even if it does not return to its exact initial position after a collision, may be fixed manually with great facility. Furthermore, the material exposed to the elements may be selected so as to be long-lasting, while the more sensitive parts remain protected.

The portions of the support may be selected as desired, so that the same joint may be used for reflectors applicable to walls, guard-rails, bridge parapets and the like.

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Claims

1. Anti-collision road marker characterized in that it comprises, within a tubular support consisting of at least two portions, an elastic joint connecting one of said portions to the other, said joint including: a first sleeve (7,28) fixed coaxially and internally in a rigid way to one end of the first portion (5) and projecting slightly form said end; a second sleeve (8,27) fixed coaxially and internally in a rigid way to one end of the second portion (6) and indenting slightly from said end; engagement means (11,12; 42,43) on the first and second sleeve for their reciprocal engagement so as to define their precise relative position; and an elastic member (13,25) engaged with the first and second sleeves so that said first and second portions remain aligned while the first and second sleeves are engaged with one another, and disalignment of said portions is allowed by the giving of said elastic member, the return force of which brings the road marker back to its initial position.

2. Road marker according to claim 1, in which said elastic member is a small tube of vulcanized natural caoutchouc (13) which operates on traction.

3. Road marker according to claims 1 and 2, in which said portions (5,6) and said caoutchouc tube are joined rigidly to said sleeves by means of pins (9,10; 14,15).

4. Road marker according to claim 1, in which said elastic member is a helical spring (25) which operates by compression and also includes: an upper plug (26) and a lower plug (29) equipped with two opposite longitudinal grooves (32,35) in the cavities of the upper and lower sleeves respectively and fixed with respect to them; a flexible and traction resistant ring-shaped cable (31) placed to run along said grooves of said plugs; a screw (47) fixed to the upper end of said ring-shaped cable; a support (24) equipped with an opening for said screw; and a nut (23) engaged with said screw and with the upper surface of said support, said screw resting on the lower surface of said support and above the upper sleeve so that a relative displacement of the upper and lower portions of the road marker causes compression of said spring.

5. Road marker according to any of the preceding claims in which said engagement means (11,12; 42,43) on said sleeves are a pair of tapered projections and indentations exactly opposite to one another.

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6. Road marker according to any of the preceding claims, in which the sleeve projectiong from the end of the respective portion is equipped with a flange which covers said end.

7. Road marker according to any of the preceding claims, in which said tubular support is of circular section.

8. Road marker according to any of the preceding claims comprising a flattened spade-shaped point (50), equipped laterally with a saw tooth profile (52), with openings (54) in its surface and a hook (53) near the point.

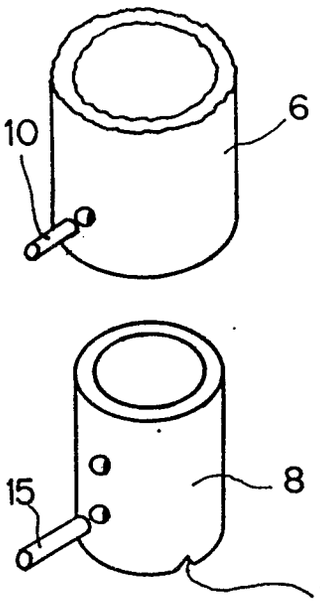


FIG.1

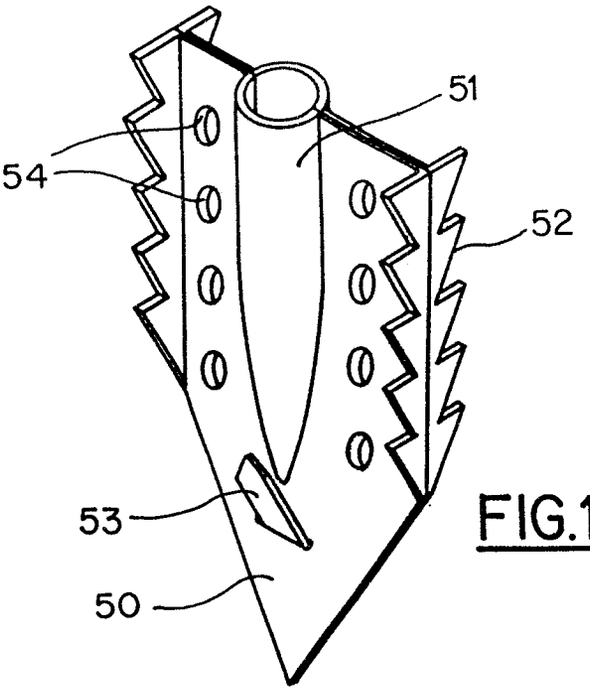


FIG.10

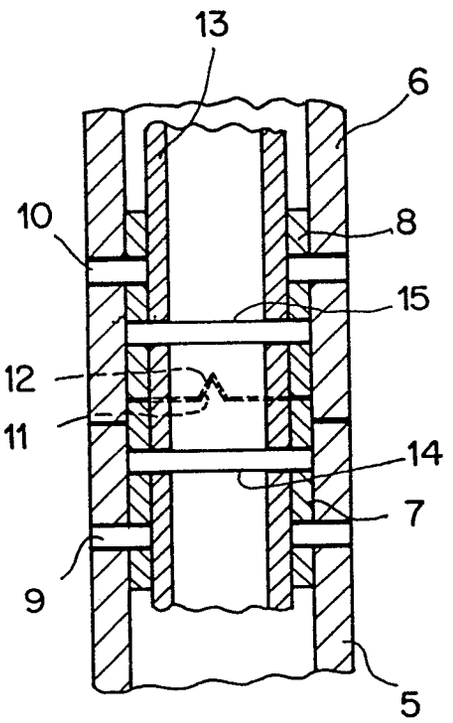


FIG.2

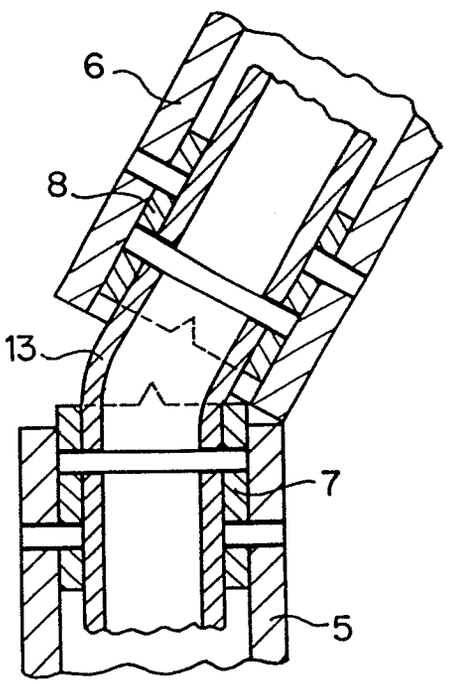


FIG.3

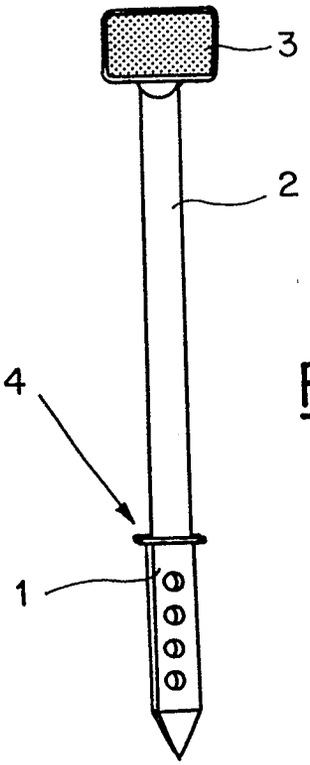
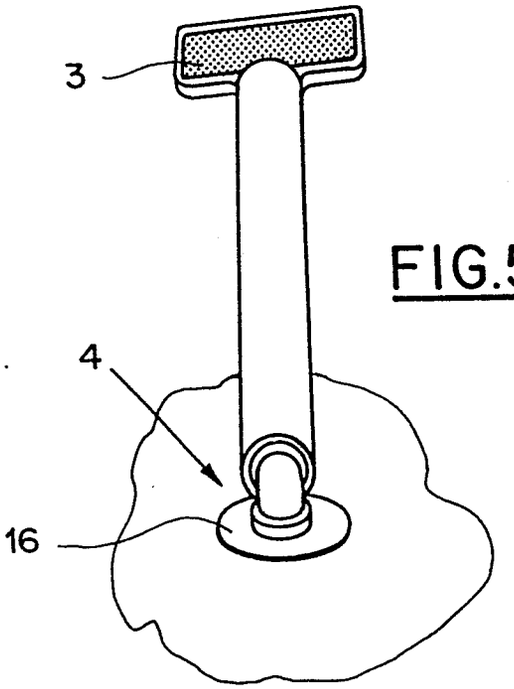


FIG.4



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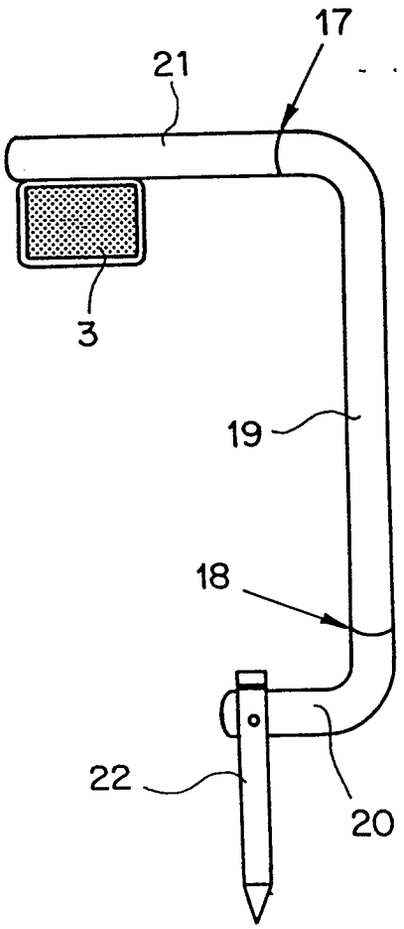
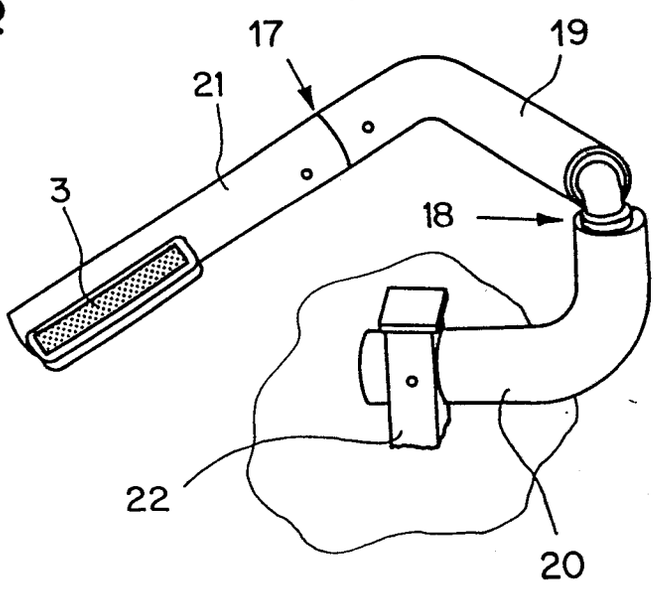


FIG.6

FIG.7



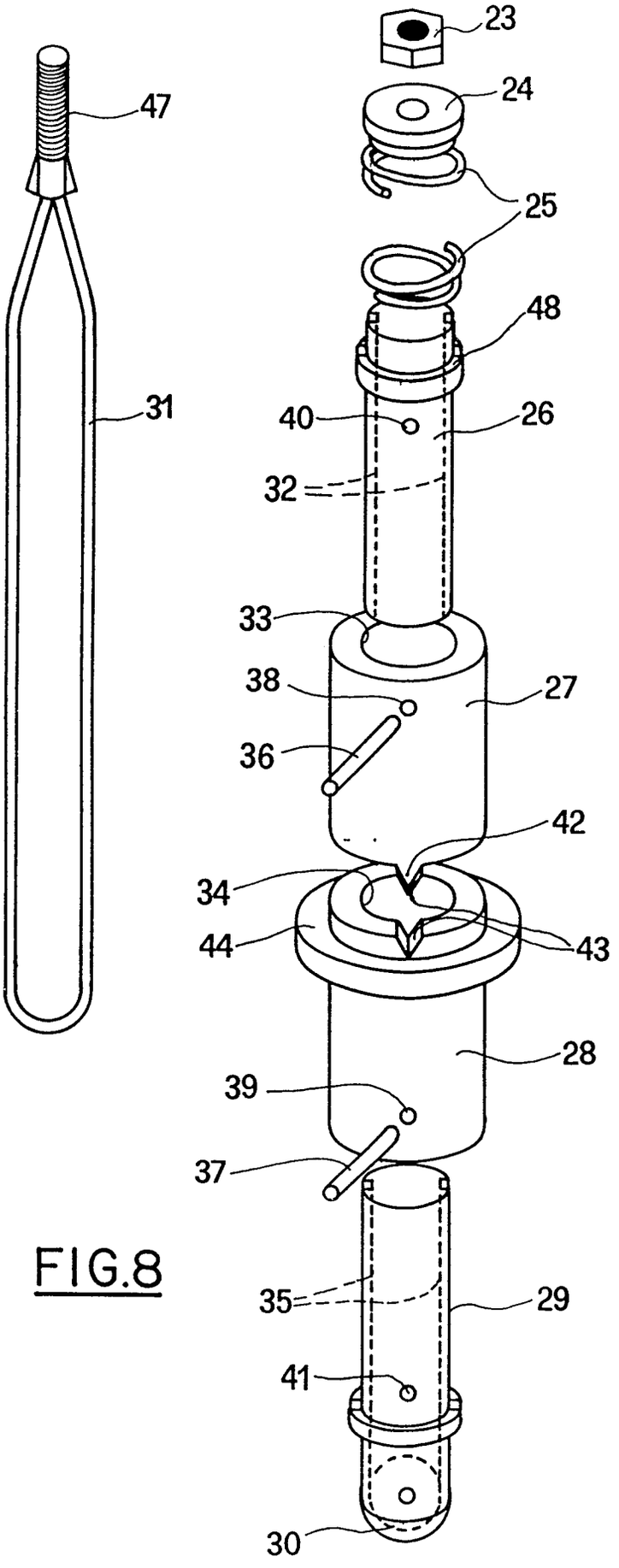

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FIG.8

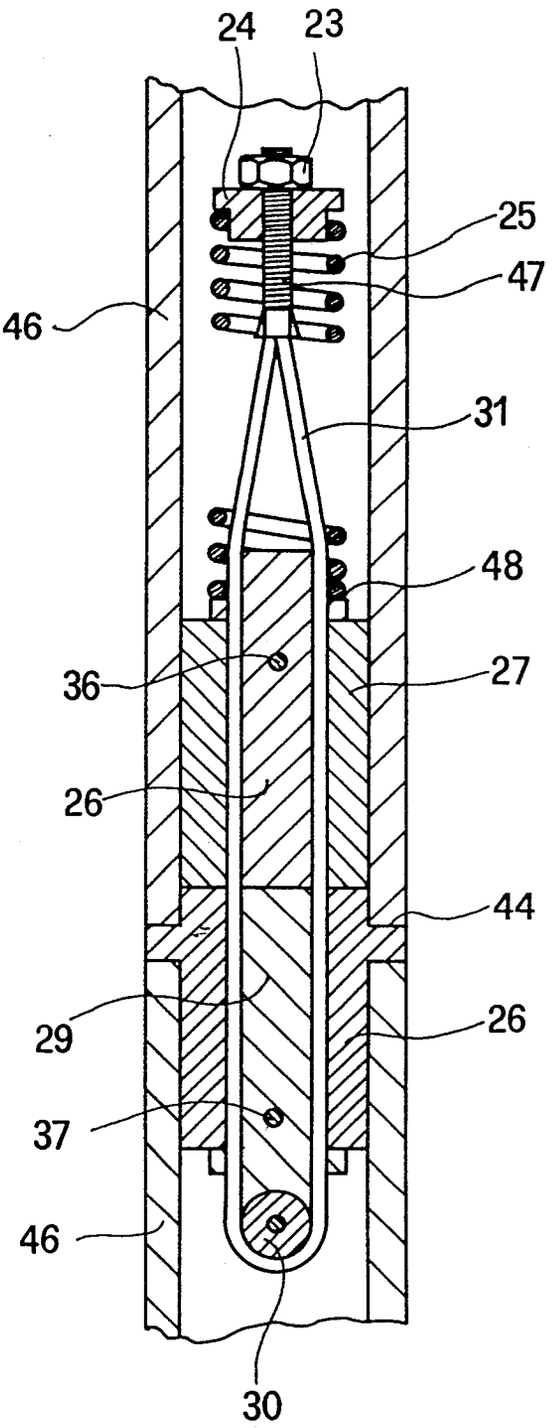
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FIG.9