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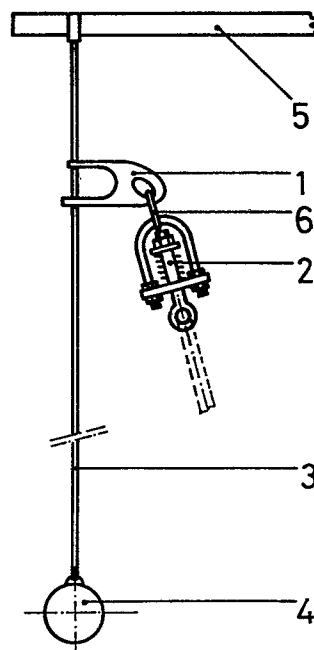
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⑤④ **Improved safety harness restraining fixture.**

⑤⑦ A safety harness restraining fixture to provide protection against falls for people working on building and construction sites, which embodies a rope (3) with a counterweight (4) to keep it taut, a restrainer piece (1) in the shape of an asymmetrical «U» whose arms possess oblong holes of varying section through which a rope is threaded, with a shock absorber unit (2) to attach the person to the restrainer piece.



Title: An improved safety harness restraining fixture

The present invention relates to an improved safety harness restraining fixture.

There are numerous jobs (mainly in building works, on scaffolding and suchlike) where there is a risk of building workers falling.

For this reason it is necessary to use some safety device which tends to prevent such falling. Present-day devices either fail to be efficient, or involve some complicated construction.

The safety harness restraining fixture covered by this invention is simple in design and is applicable for use with all kinds of scaffolding, structures and suchlike, since it embodies a restrainer piece which is able to travel freely along a counterweighted rope or cable when there is no undue strain and accordingly no accident risk. Said restrainer piece is also connected to a rope or cable to hold the person, but with an intermediate shock absorber assembly arranged so that in the event of operating, there is a sharp pull applied between the restrainer piece and the counterweighted rope, but not between this restrainer piece and the person who is held, and the safety harness becomes secured at a particular position on the counterweighted rope, and prevents the person from falling.

The invention will now be described further by way of example with reference to the accompanying drawings, in which:-

Figure 1 is a general diagrammatic view of a safety harness restraining fixture according to the invention, located on scaffolding (5) and provided with all its component parts,

Figure 2 is an enlarged view of the restrainer piece (1) showing part of its basic features, and where a portion of rope

or cable (3) is also shown , upon which the former slides freely or, when applicable, is locked stationary at a particular position when a sudden pulling force or jerk takes place,

Figure 3 is a cross-section view upon the lines A:A in Figure 2, which shows the arrangement of its eye (11) wherein the shock absorbing assembly is located, and which in actual practice, is linked to the person to be held, and where the enlargement (130) can likewise be seen on the end of its lugs, in which there is a hole (131) having a varying width section,

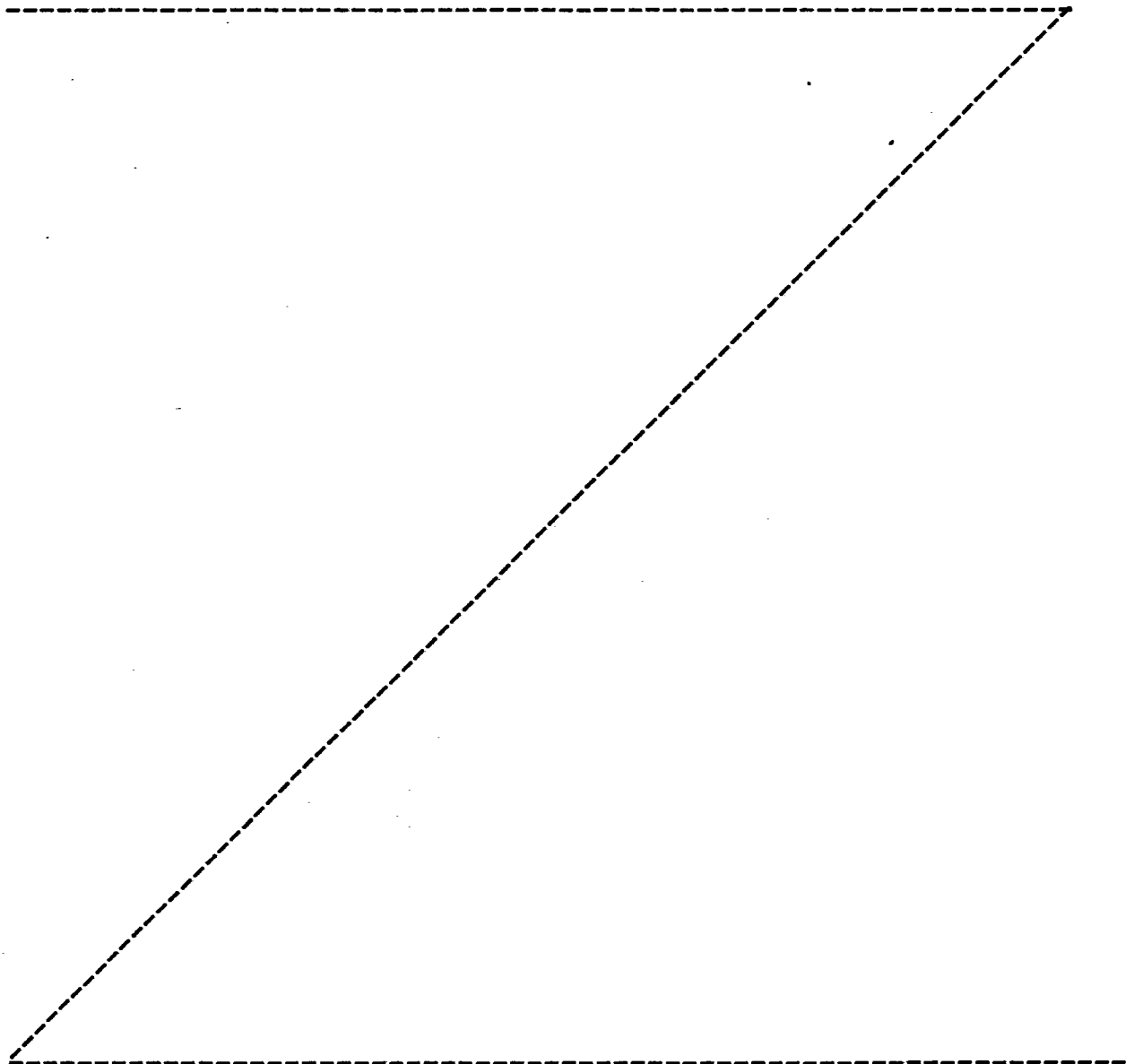


Figure 4 is a cross-section view upon the lines B:B in Figure 2 which shows also the hole (11) and the enlargement (120) on the other lug (12) in which there is a hole (121) having a varying width section and being placed the opposite way about from the aforementioned hole (131),

Figure 5 depicts an elevational view of one of the possible restraining arrangements that are included under the present invention. This figure includes a partial section to allow a more fully detailed view of hole (251) provided in plate (25) to enable its centre pin (20) to be capable of travelling by a degree in accordance with the amount of pull applied by the person held by the end hole (201), or by the dampening spring (22) which surrounds said pin and abuts against plate (25) and against the opposite end of pin (20),

Figure 6 is a general schematic view of the safety harness restraining fixture covered by the invention, where same is fitted onto scaffolding (5), and where shock absorbing assembly (2) is located between same and rope (3), and

Figure 7 is an elevational view of another of the possible arrangements for the shock absorbing assembly as included in the present invention.

The same notations are used in this figure to denote the component parts as in other figures, except that here they are distinguished with an apostrophe (').

In accordance with this invention and as shown in the construction of same as illustrated, the improved safety harness restraining fixture is basically made up from the following components:

- A restrainer piece (1), and
- A shock absorbing assembly (2).

Restrainer piece (1) is capable of travelling along or becoming engaged upon a rope or cable (3) which is counterweighted at one of its ends (4), and secured at the other to the structure being built, the scaffolding or similar (5), whilst in a different area, said restrainer piece (1) is linked in space to the shock absorbing assembly (2), by means of which it secures the body of workman, likewise by means of rope or cable. See Figure 1.

In accordance with another assembly arrangement of this invention as shown in Figure 6, restrainer piece (1) is capable of sliding along or becoming engaged upon a rope or cable (3) that is counterweighted at one of its ends (4), and secured at the other to the shock absorbing assembly (2), by means of which it is attached to the structure being built, the scaffolding or similar (5). The restrainer piece (1) is linked, likewise by means of rope or cable, to the body or workman.

As may be seen by examining Figures 2, 3 and 4, the restrainer piece (1) possesses, in accordance with a practical construction thereof, a general asymmetrical "U" shape whose curved web is provided with a hole (11), whilst its lugs (12 and 13) each have enlargements (120 and 130 respectively) on their ends, and which enlargements are each provided with a hole (121 and 131 respectively) going through same, the width of which varies evenly and where one such hole (121) is located the other way about from the other (131).

The shock absorbing assembly (2) as illustrated in the practical construction depicted by Figure 5 is comprised of two pins, of which one is straight (20), and the other is "U" shaped (21), these being assembled upon a plate (25) in such a manner that pin (20) can travel and pin (21) is stationary. Such attachment is accomplished by means of two sets of nuts (24), each screwed onto one of the threaded portions (211) of pin (21) securing same at either side of plate (25).

The straight pin (20) on the other hand, goes through a hole (251) located in the centre of the plate, and at one of its ends there is a lug provided with a hole (201), while at the other there is a threaded length (202), where in the former a cable or rope is placed to secure the person or workman, while upon the latter there is a nut (23) that holds a stop washer, between which stop washer and plate (25), a dampener spring (22) is fitted.

The freely swivelling linkage between the restrainer piece (1) and the shock absorbing assembly (2) is accomplished in this practical construction of the invention with a washer (6) placed in the hole (11) on the restrainer piece (1) and linked in turn to pin (21) in the shock absorbing assembly (2).

The shock absorbing assembly (2') illustrated in Figure 7 is comprised of two pins, of which one is straight (20') and the other shaped in the form of a "U" (21'), the tips of whose arms (25') are bent outwards in order to make a stop.

Pin (21') is fitted with a washer (26') that has holes at its centre and across its diameter which accommodate pins (21') and (20') respectively, this latter being secured with a nut (23') that holds a stop washer (26'), between which stop washer and bent tips (25'), a dampening spring (22') is fitted.

The freely swivelling linkage between the rope (3) and the shock absorbing assembly (2') is accomplished in this practical construction of the invention by means of threading said rope (3) through a hole (201') that is provided on the end of pin (20'). Said shock absorbing assembly (2') is then secured to the structure or scaffolding (5) by means of a ring (6).

When assembling the safety harness restraining fixture, the rope or cable (3) counterweighted at (4) and secured to the structure or scaffolding (5), is threaded through holes (121 and 131) in their wide sections, so that free travel is afforded in the direction shown by the counterweighted rope (3).

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When, however, there is an impending accident, a pulling force is exerted upon said restrainer piece (1) through the shock absorbing assembly (2) (so as to prevent any possible injury to the individual due to jerking). Such abnormal pulling causes the restrainer piece (1) to travel in angular direction with respect to the rope or cable (3), and to do so downwards (this being the only possible direction, because of the force of gravity), whereupon said rope or cable (3) travels linearly within holes (121 and 131) towards the narrow sections, which grip it firmly to the extent of locking it securely.

CLAIMS:

1. A safety harness restraining fixture for use on scaffolding, building works and suchlike, comprising a rope or cable attached to a secure point on the structure or scaffolding, and ultimately connected to the individual to be protected, and characterised in that said rope or cable, whose free end carries a counterweight that keeps same permanently taut, is fitted with a restrainer piece generally shaped in the form of an asymmetrical "U", with a curved web, varying section and slightly divergent lugs, where said rope or cable is threaded through two holes in the widened ends of the lugs.

2. A safety harness restraining fixture in accordance with claim 1 characterised in that the holes provided in the ends of the two lugs on said restrainer piece are elongated and varying in section, with the arrangement of one being opposite to that of the other.

3. A safety harness restraining fixture in accordance with claim 1 or 2 characterised in that an elliptical hole is provided in the web of said restrainer piece, one of whose edges is essentially parallel to the outside of the piece at the area, and to which a shock absorbing assembly is assembled either directly or with the aid of an intermediate ring, and which assembly is ultimately tied by means of a rope or cable to the

person being afforded protection, in such a manner that under ordinary conditions, said restrainer piece is able to move freely in the direction of the axis of the counterweighted rope, but under extreme conditions, a change in the direction of the pull takes place and as a result there is an angular motion of said restrainer piece (1) with respect to the counterweighted rope (3) so that this latter tends to become wedged inside the narrowing sections of the holes, which thereupon hold it and render it motionless.

4. A safety harness restraining fixture in accordance with any one of the preceding claims characterised in that it embodies a shock absorbing assembly included either between the restraining piece and the individual to be protected, and/or between the rope or cable and the structure or scaffolding, in either case by means of a ring, so that the individual suffers no sudden jerking.

5. A safety harness restraining fixture in accordance with claim 4 characterised in that the shock absorbing assembly is comprised of two pins, of which one is straight and the other shaped like a "U", which are assembled upon a plate in a stationary and travelling manner respectively, and wherewith a damper spring, exerting a pulling effect, is arranged between said plate and a stop washer.

6. A safety harness restraining fixture in accordance with claim 4 characterised in that the shock absorbing assembly is comprised of two pins, of which one is straight and the other is "U" shaped whose tips are bent outwards, which are assembled upon a stop washer in a stationary and travelling manner respectively, and wherewith a damper spring, exerting a pulling effect, is arranged between this stop washer and the bent tips.

Fig. 2

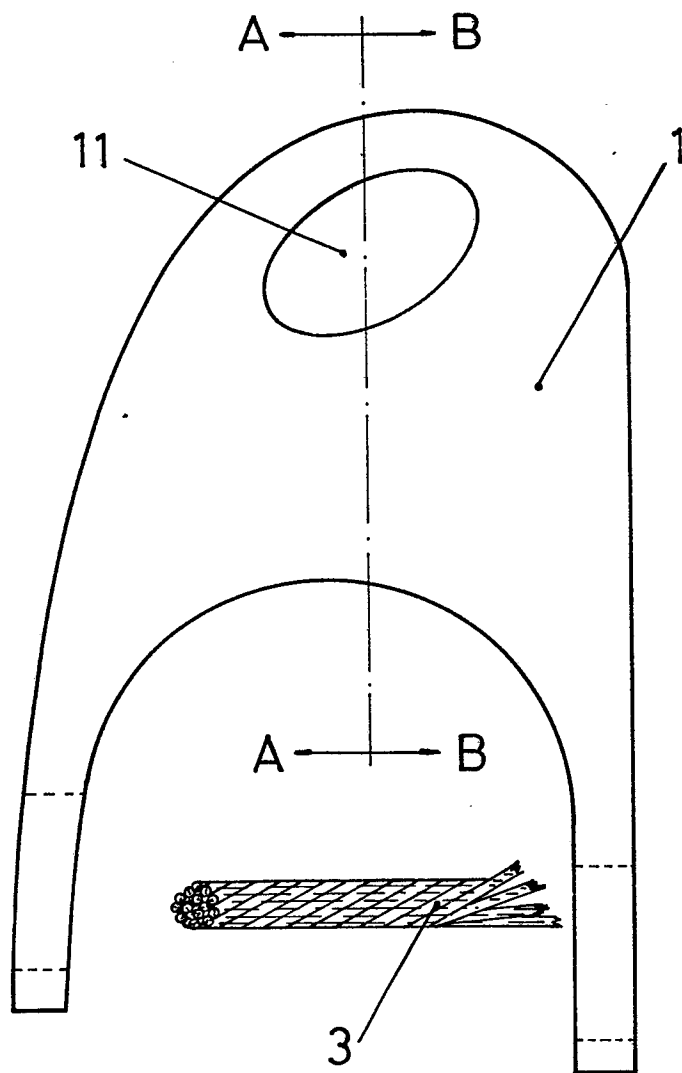


Fig. 1

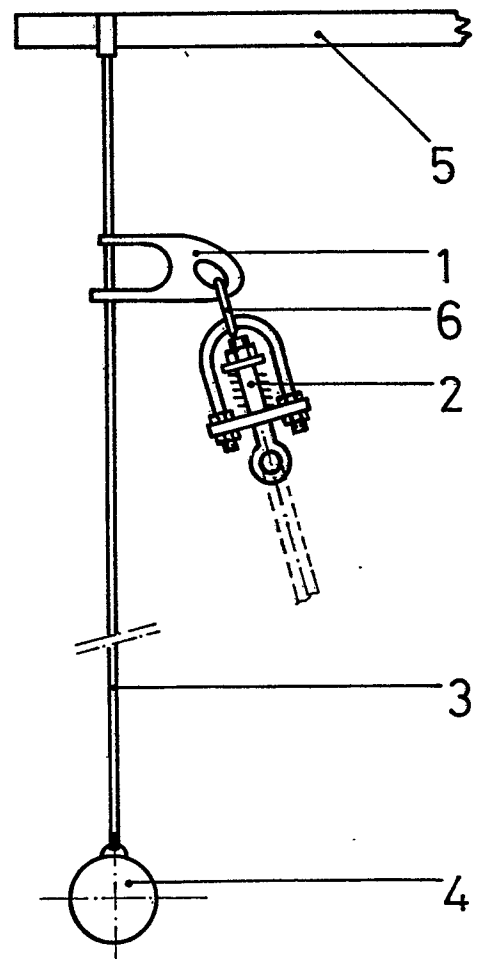


Fig. 5

Fig. 3

Fig. 4

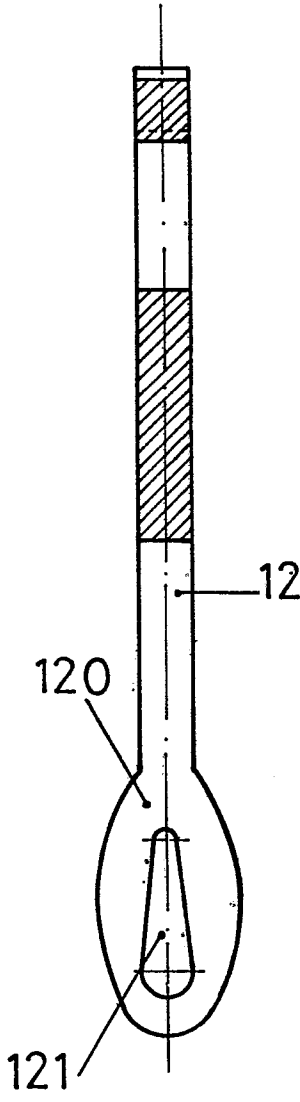
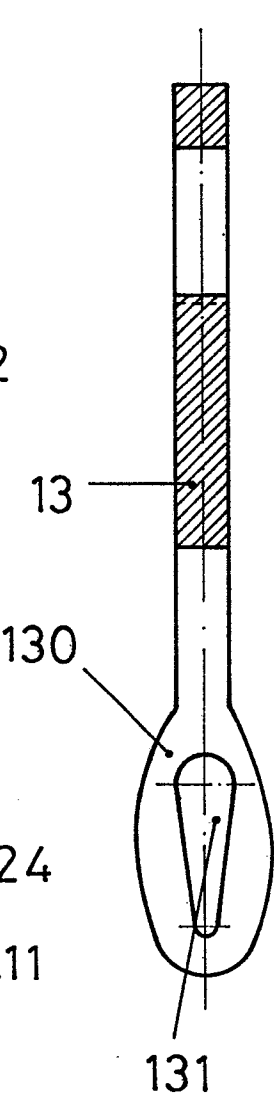
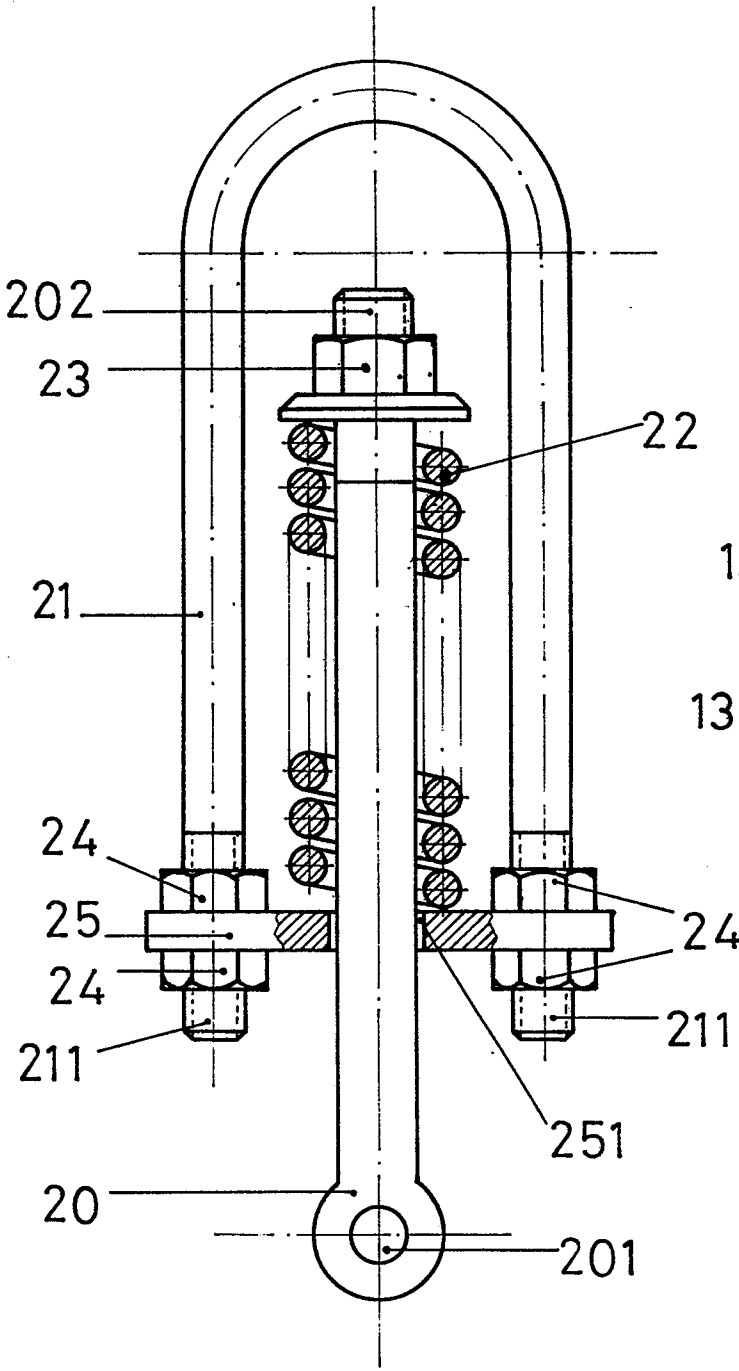


Fig. 7

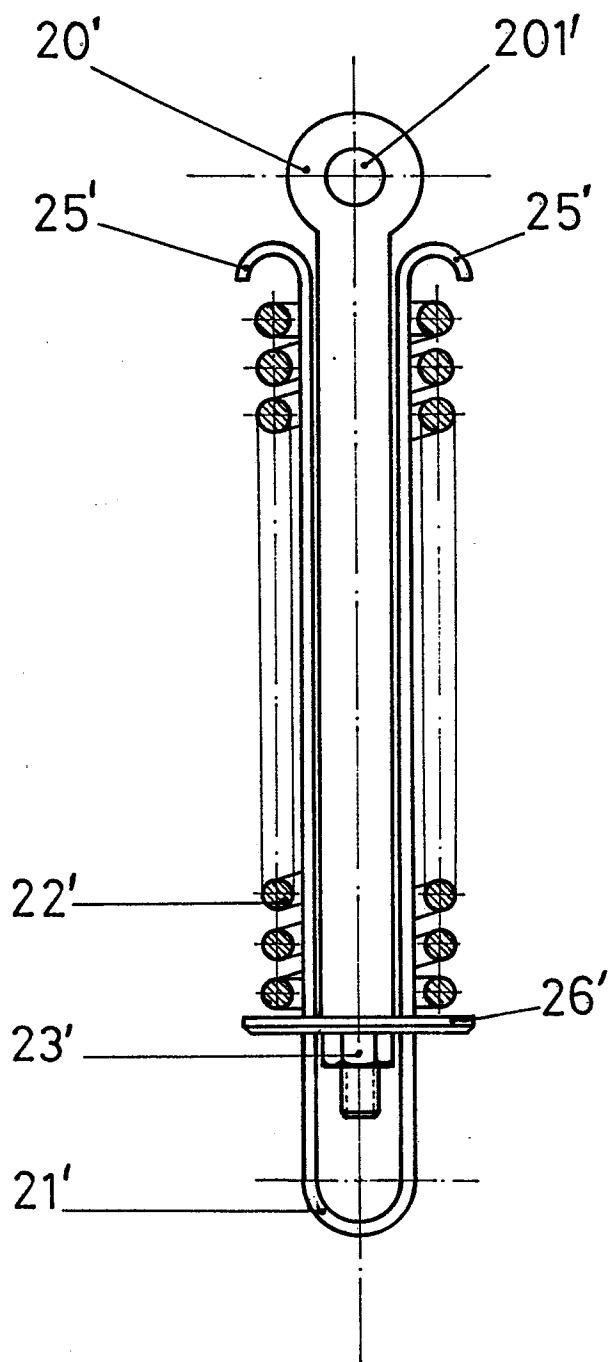
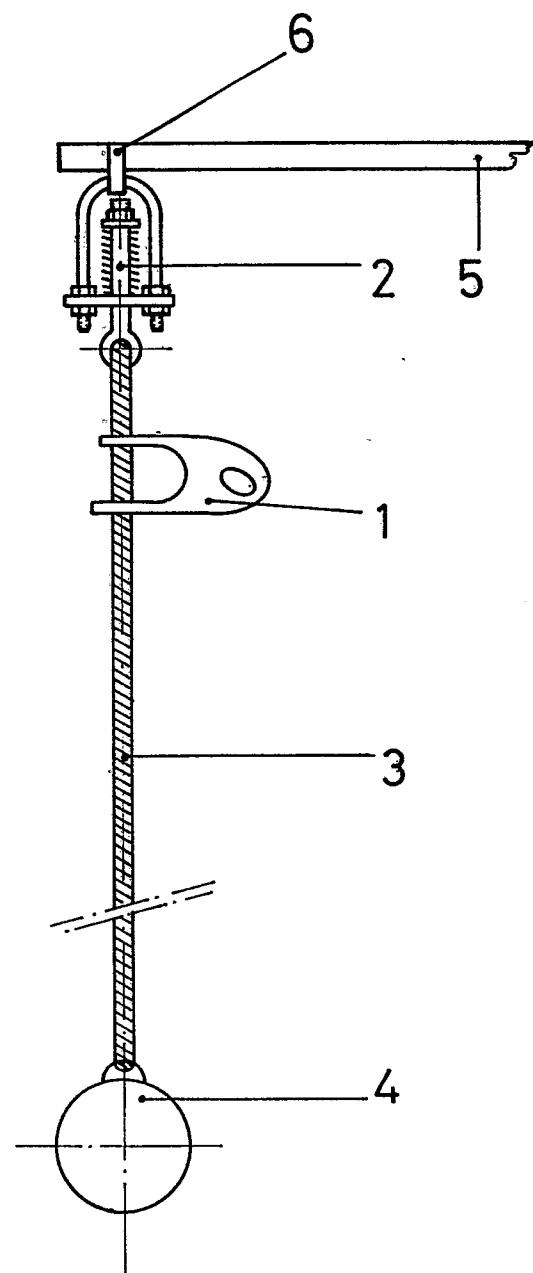


Fig. 6





European Patent
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EUROPEAN SEARCH REPORT

0075055
Application number

EP 81 30 4373.4

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
Y	<u>US - A - 4 090 584</u> (WAGNER) * claim 1; fig. 1 * ---	1	A 62 B 35/00 E 04 G 21/32
Y	<u>US - A - 2 172 094</u> (VOIGT) * claim 1; fig. 4, 5 * ---	1	
Y	<u>CH - A - 354 378</u> (GENGENBACH) * fig. 1 * ---	1	
Y	<u>DE - U - 7 125 115</u> (DUNKELBERG) * claims 1, 2 * ---	1	TECHNICAL FIELDS SEARCHED (Int.Cl. ³)
A	<u>GB - A - 1 218 432</u> (BARROW HEPBURN & GALE LTD.) * fig. 1, 2 * ---	1	A 62 B 1/00 A 62 B 35/00 B 63 B 29/00 E 04 G 21/32 E 06 C 7/18 F 16 G 11/00
A	<u>CA - A - 1 028 124</u> (LEDUC) * claim 1; fig. 5 * ---	1,2	
A	<u>DE - B - 1 784 726</u> (FAHRLEITUNGSBAU GMBH) * claim 1 * -----	1,4	
			CATEGORY OF CITED DOCUMENTS
			X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons
<input checked="" type="checkbox"/> The present search report has been drawn up for all claims			&: member of the same patent family, corresponding document
Place of search Berlin		Date of completion of the search 04-05-1982	Examiner KANAL