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**DEVICE FOR TESTING CABLE CLAMPS IN CABLEWAYS.**

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## Description

The present invention relates to a device for testing cable clamps of ski lifts. In a number of ski lifts, in particular chair lifts, problems arise in certain cases due to the fact that the cable clamps do not obtain a correct clamping force on the pulling cable. A number of near-accidents are described where cable clamps have slid on the cable due to insufficient clamping force.

The design of cable clamps can be divided into two main types, viz. fixed clamps and releasably connected clamps. In fixed clamps the clamping force is obtained by means of washer springs, which are tightened against a stop member or with a dynamometric wrench. In releasable cable lifts, which are particularly used at chair lifts and cabin cableways, the clamping force is normally obtained by means of washer springs, but also other solutions exist.

Variation of the clamping force of cable clamps depends upon a number of factors, among which can be mentioned:

Reduction of the diameter of the cable due to elongation, and wear of the cable wires of the pulling cable;

Wear on the cable engaging surfaces of the clamping plates. It is to be expected that such wear arises i.a. due to movement of the cable clamps and at passage of the clamps over roller locations and turntables. Recesses in the engagement surfaces can furthermore result in the outer wires of the cable "sinking" into the clamping plates;

Elastic deformation of the cable due to the pressure exerted on the cable by the movable clamping plate. This deformation may amount to 0.5 - 1.5 mm.

At a cable diameter reduction of 2 mm, which is a relevant value, wear on the clamping plates of together 1.5 - 1.7 mm, and simultaneously elastic deformation of the cable, there is a risk that a correct clamping force does not exist and that the cable clamps start to slide.

It is important that cable clamps are supervised with respect to wear. Lift suppliers present recommended values for the wear that can be accepted. Also small deviations and wear and effects of the above three factors have resulted in cable clamps sliding on pulling cables. Cable clamps should therefore be regularly tested with respect to safety against sliding in the longitudinal direction of the pulling cable. The lift suppliers therefor in their instructions for the respective lift give information with respect to the limits within which the pulling force is allowed to vary. According to existing regulations regular testing of the cable clamps shall be carried through for determining the pulling force at which they begin to slide on the pulling cable. Existing devices for testing said pulling force are complicated to apply and to use, and the risk is great that such a device therefor seldom is

used to the intended extent.

The object of the invention is to suggest a device for testing cable clamps for ski lifts which is simple to apply and preferably can be fixedly mounted in association with a lift.

This object has been attained in that the device according to the invention comprises

a pulling implement designed to be applied in a pulling position over a cable clamp so that it can exert a pulling force on the clamp in the direction of the cable,

a mounting means for suspending the pulling implement in association with the cable,

a manipulating means for moving the pulling implement to and from the pulling position, respectively, and

a pulling means connected to the pulling implement via a pulling force sensor.

The mounting means is preferably arranged for fixed mounting of pulling implement, manipulating means, pulling means and pulling force sensor on a supporting structure belonging to the lift.

According to a very advantageous embodiment a pulling implement supporting frame, manipulated by the manipulating means, also supports an opening means for opening a cable clamp to be tested, for allowing movement of the same on the cable before testing.

Further advantageous embodiment appear from the rest of the sub-claims.

The invention will now be described more closely below with reference to an embodiment shown on the attached drawings. On the drawings

Figure 1 is a simplified perspective view of a device for testing cable clamps of ski lifts,

Figure 2 is a view from above of the device according to Figure 1,

Figure 3 is a section in the direction of arrows III-III in Figure 2,

Figure 4 is a view in the direction of arrows IV-IV in Figure 2 of the device according to the invention,

Figure 5 is a view in the direction of arrows V-V in Figure 3 of a further detail of the device according to the invention.

In the Figures a fixed part, by way of example shown as a beam, of a supporting structure in a ski lift, not shown, is designated 2. This supporting structure can be located e.g. in association with a station. The pulling cable of the lift is designated 4. A cable clamp, being partly sectioned in Figure 1 for the sake of clearness, is designated 6. The chair carried by the same has been omitted from the Figures. In the embodiment shown and described the clamp is supposed to be a releasably connected clamp of a type earlier known per se. More particularly, the type here intended, at its end remote from the clamp end, has a pressure point 8 (Figure 5) at the pressing in of

which the clamp spring, not shown, is actuated so that the clamp is momentarily loosened from the cable 4.

The beam 2 carries a cradle generally designated 10. The cradle 10 comprises two upper parallel side beams 12 and 14, respectively, pivotally carried at one end thereof by the beam 2 at horizontal pivots 16 and 18, respectively. Between a transverse beam 20, rigidly joining the beams 12 and 14, and the beam 2 two operating cylinders 22 and 24, respectively, are pivotally connected for moving the cradle 10 about the pivot points 16 and 18. The pivot point 18 of the beam 14 in fact extends through a further beam 26 attached to the underside of the beam 2 on line with the beam 14.

In section the beams 14 and 26 are essentially square and in the interior thereof serve as a guide for each a carriage 28 and 30, respectively. The carriages 28, 30 via a longitudinal slot in the bottom of the respective beam 14 and 26 carry a pulling implement, generally designated 32, and pulling force sensor 34, respectively. The pulling implement 32 comprises a pulling bar portion 36 extending in parallel with the beam 14, below the same, and is pivotally connected with one end of the pulling force sensor 34 about a horizontal pivot 38. A pulling piston 40 of a pulling cylinder 42 is pivotally connected to the other end of the pulling force sensor 34 about a horizontal pivot 44. The cylinder 42 is mounted to a further fixed structure 46, not described, of the cableway. More particularly, the cylinder 42 is pivotally suspended via brackets 48 in the structure 46 about a pivot axis 50 parallel to the pivots 38 and 44.

The pulling bar portion 36, extending vertically over the cable 4 with part of its length, in the vicinity of the end portion of the beam 14 remote from the pivot 18 is curved at 52 so as to obtain a portion 50 (Figure 3) extending in parallel with the beam 20 and via a bend 56 (Figure 2) passing into a portion 58 (Figure 2) parallel to the beam 14. The portion 58 which is parallel to the portion 36 thus becomes sidewardly shifted with respect to the portion 36. More particularly, this shift is such that the portion 58 is located in a vertical plane extending in close vicinity to the clamp portion, designated 60, of the cable clamp 6 where this clamp portion 60 has just passed into a flat and wide portion of the control housing 62 of the clamp. The portion 58 via a further bend 64 passes into a portion 66 vertically extending in said vertical plane, and extending essentially in a longitudinal vertical plane of symmetry of the clamp 6 to immediately above the upper side of the housing 62. From the portion 66 a pulling hook formed by three further bends 68, 70 and 72, respectively, finally extends. This pulling hook extends in said vertical plane for close engagement about the housing 62 in the way shown in the Figures.

To each end of the beam 12 a vertically extending plate shaped strut 74 and 76, respectively, is attach-

ed. Between the lower ends of the struts 74 and 76 a canted guide beam 78 with a quadrature section extends in parallel with the beam 12. On the guide beam 78 a carriage 80 is movably arranged along the length thereof. The carriage 80 partly encloses the beam 78 with a curved wall, at the inside of which four roller pairs 82 are attached for engaging each its side of the beam 78. More particularly, the carriage 80 can be of the type WV3-25F from Vahle and need therefor not be described more closely here.

The said curved wall of the carriage 80 via a short web 84, protruding in parallel with the beam 20, carries a mounting plate 86 for a pressure cylinder 88. More particularly, the mounting plate 86 is fixedly arranged with respect to the hook end 68, 70, 72 of the pulling implement 32 by means of two transverse struts 90 and 92, respectively, extending between the plate 86 and the pulling implement. The transverse strut 90 extends from the vicinity of the periphery of the plate 86 to the inside of the bend 64 of the pulling implement where it is fixed by welding. The transverse strut 92 extends in parallel with the strut 90 from the vicinity of the periphery of the plate 86 into engagement in the bend 68 of the pulling implement, where it is fixed by welding, and from where the transverse strut 92 is bent downwardly to a portion 94 provided for engagement against the outside of the clamp portion 60 of the clamp 6.

The pressure cylinder 88 is attached to the plate 86 so that its pointed pressure piston 96 is directed towards the pressure point 8 at the end of the clamp 6 remote from the clamp portion 60 and so that the pressure point 8 lies within the length of stroke of the piston 96.

The pulling force sensor 34, which can e.g. be of the Öhrnell strain gauge type LOD-G, is connected, in a manner not shown, to a central instrument with digital display of peak value and mean value of the exerted pulling force.

The function of the device described shall now be explained more closely below.

In a disabled position of the device, the cradle 10 and the parts carried thereby are pulled up around the pivots 16, 18 by means of the cylinders 22 and 24 so that clamps attached to the cable 4 are kept clear from the pulling hook 68, 70, 72.

A first step for use of the equipment is now to lower the cradle 10 so that the pull bar 36 grips the clamp 6 by means of the pulling hook 68, 70, 72 in the manner described above.

In a second step the pressure piston 96 of the pressure cylinder 88 via the pressure point 8 presses in the spring of the cable clamp 6 so that the cable clamp is released from the cable. In this state of the clamp 6, released from the cable 4, the cylinder 42 is activated to pull the clamp 6 via the pulling implement 32 along the cable to the intended testing position. The last mentioned step should be carried through of-

ten in order not to damage the cable by the testing.

With the clamp 6 located over the chosen testing location the pressure piston is pulled back so that the spring of the clamp 6 becomes released and the cable clamp becomes clamped up to the cable.

In a further step pulling force testing of the cable clamp is now carried through by means of the hydraulic cylinder 42. More particularly, the hydraulic cylinder 42 is caused to pull until the clamp 6 loosens from the cable 4. During the pulling step the exerted pulling force is continuously sensed by the pulling force sensor 34, the signal of which is received by the above mentioned central instrument, which stops on the highest pulling value. Thereby information is received whether the cable clamp adheres with the correct pressing force in accordance with the recommendations of the manufacturer. Depending on the type of cable clamp the pulling force uses to vary between 600 and 1000 kg.

When the testing of a clamp is finished, the cradle 10 is pulled up so that the cable clamp can be driven further and a new test cycle with the next clamp be started.

Operation and measuring value recording are suitably carried through from an operator's cabin located in association with the cable way. The measured values can be stored in a computer if desired, which gives a continuous check of the clamps. The condition of the clamps can then be continuously supervised, which leads to a safe operation of the cable way and cassation of the clamps at the right time.

As an alternative to the hydraulic cylinder 42 a mechanical screw jack or a manually operated capstan can be used as a pulling means. Although the equipment is contemplated to be mounted on the lift, also movable variants of the same are conceivable. For a fixedly mounted equipment a hydraulic cylinder or a mechanical capstan are most suitable as pulling means.

The advantage of a fixedly mounted equipment is that testing of the pulling force can be carried through more regularly and in a safe and comfortable way.

To sum up it should be emphasized that, considering the accidents and near-accidents which have occurred where cable clamps have been the cause, it is important that they become tested. With the testing device according to the invention it is possible to test the clamping force of the cable clamps on the pulling cable in a simple way.

In the further drawings

Figure 6 is a sketch of principle of a further embodiment replacing the whole arrangement shown in Figure 1,

Figure 7 is a view from above illustrating three steps at use of the device according to Figure 6, Figure 8 is a view in the direction of arrows VIII-VIII in Figure 7,

Figure 9 is an end view in the direction of arrows

IX-IX in Figure 8,

Figure 10 is a simplified side view of still a further embodiment of the device according to the invention.

The embodiment according to Figures 6-9 comprises two wedges 100 connected to a beam 102, e.g. of aluminium. The beam 102 carries a pulling piston 104 connected to a pulling hook 108 via a pulling force sensor 106. With respect to their function elements 104, 106 and 108 correspond to elements 42, 34 and 68-72, respectively, of the preceding embodiment, the pulling piston 104 being also used for moving the pulling hook to and from its operation position and thereby replacing the cylinders 22/24 of the earlier embodiment.

The pulling hook 108 is pivoted at 110 so that it is upwardly swingable in the direction of the arrow 112 when the pulling hook contacts a stop 114 on the side of the beam 102 under the influence of the pulling hook being shifted out by the pulling piston 104. Thereby the hook 108 gets clear from the cable clamps. From the above it appears, at a comparison with the earlier embodiment, that the pulling piston has taken over also the function of cylinders 22, 24 to lift the pulling hook clear from the cable clamps.

In the embodiment according to Figures 6-9 the control housing 115 of each cable clamp carries an attachment, generally designated 116, for the clamp, designated 117 in Figure 7. The clamp housing 115 contains a clamp actuating spring, not shown.

More particularly, the attachment 116 includes a rod 118 for operating the clamp (the spring). The outer end of the rod 118 carries a wheel pair 120. The attachment 116 is carried on the end of the housing 115 at 122 and there has a clamping end 124 facing the wheel pair 120.

With the pulling hook in the position shown in Figure 6 it can grip a clamp in a similar way as has been described in connection with the preceding embodiment.

During pulling of the clamp 117 by means of the cylinder 104, the clamp takes the successive positions A, B, and C shown in Figure 7. In the position A the wedges 100 are moved in between the clamping end 124 and the wheels 120. In the second position B the wedges 100 have pressed the wheels 120 outwardly so that the spring releases the clamp 117, which can thereby be moved to the intended testing place in the same way and for the same purpose as has been described for the preceding embodiment. At the testing location, position C, the wedges 100 allow the wheels 120 to return so that the clamp is fixed and can be exposed to pulling tests with the arrangement shown in Figure 6. As should have appeared from the above, the distance between the positions A and B is a releasing distance, and the distance between the positions B and C is a moving distance for the clamp 117.

In the embodiment according to Figure 10 the

pulling hook, here designated 130, is likewise moved to and from its operating position by means of the pulling cylinder, here designated 132. More particularly, the pulling cylinder 132 is connected at 134 to a cradle 136 which is pivotally carried at 138 by a slide 140. The slide 140 is linearly guided on a guide 142 included in a frame, generally designated 144. Furthermore the slide 140 has a supporting roller or sliding rib 146 engaging the guide. At the fore end of the guide 142 a stop abutment 148 is arranged. In association with the stop abutment 148 also a cam profile 150 for the supporting roller 146 is arranged on the end side of the frame 144. An attachment point 152 is provided for attaching one end of a pulling force sensor 154, the other end of which is connected to the end 156 of the cylinder 132 remote from the cradle 136. The pulling force sensor 154 has the same function as the pulling force sensor 34 in the first embodiment.

As indicated in Figure 10 the cradle 136, besides the pulling test position shown with solid lines, has a position shown with dashed lines, in which it is swung up, out of the moving path of the cable clamps, analogous to the case in the previous embodiments. This position is reached after the cradle operated by the piston 132 has been stopped by the stop abutment 148, and under the continuing action of the piston 132 has rotated about the pivot point 135, forcing the supporting roller 146 to move upwardly on the cam profile 150 to the position shown.

The slide 140 can carry a means (not shown) for supervising the clamping force of a clamp.

## Claims

1. A device for testing cable clamps (6) in ski lifts, characterized by
  - a pulling implement (32) designed to be applied in a pulling position over a cable clamp (6) so that it can exert a pulling force on the clamp in the direction of the cable (4),
  - a mounting means (10) for suspending the pulling implement (32) in association with the cable,
  - a manipulating means (22,24) for moving the pulling implement (32) to and from the pulling position, respectively, and
  - a pulling means (42) connected to the pulling implement (32) via a pulling force sensor (34).
2. A device according to claim 1, characterized in that the pulling implement (32) comprises a pulling rod (36), of which one end is connected to the pulling force sensor (34) and the other end has a pulling hook (68, 70, 72) intended for application over the cable clamp (6) close to the cable.
3. A device according to claim 1 or 2, characterized

in that the mounting means comprises means (28,30) for movably suspending the pulling implement (32) and the pulling force sensor (34) along the cable.

4. A device according to any of the preceding claims, characterized in that the pulling implement (32) is pivotally connected to the pulling force sensor (34) for allowing swinging the implement up from the cable clamp (6) by means of the manipulating means (22,24).
5. A device according to claim 4, characterized in that the pulling force sensor (34) and the pulling implement (32) are movably suspended in a respective guide (26 and 14, respectively) intended to be applied in parallel with the cable (4), said guides being pivotally connected to each other, and in that the manipulating means includes a lifting means (22,24) acting upon the guide (14) of the pulling implement (32).
6. A device according to any of the preceding claims, characterized in that the pulling means (42) is pivotally suspended and pivotally connected to the pulling force sensor (34) by means of a pulling end (44).
7. A device according to any of the preceding claims, characterized in that the mounting means (10) is arranged for fixedly mounting the pulling implement (32), the manipulating means (22,24), the pulling means (42) and the pulling force sensor (34) on a supporting structure (2,46) associated with the lift.
8. A device according to claim 7, characterized in that a frame (12,14,20) movable by the manipulating means (22,24) and mounting the pulling implement (32) also carries a means (88,96) for opening a cable clamp (6) to be tested, for allowing movement of the same along the cable before testing.
9. A device according to claim 8, characterized in that the opening means (88,96) is arranged to open the cable clamp (6) when the pulling implement (32) is in engagement therewith, and that, following thereon, the pulling means (42) is arranged to pull the cable clamp (6) to a desired testing location on the cable, where the cable clamp is again clamped for testing.
10. A device according to claim 5 and 9, characterized in that the clamp (6) is of a type, known per se, which may be opened by engagement with a manipulating implement at a spot (8) of engagement on the clamp, that the frame (12,14,20)

comprises a beam (12) arranged sidewardly of the pulling implement (32) and extending in parallel with and rigidly connected to the guide (14) of the pulling implement, and is pivotable about a pivot axis (16) which is coaxial with the pivot axis (18) of the guide of the pulling implement, said beam (12) serving to carry a carrying means (80,86), movable along the beam, for the opening means (88,96), which form said manipulating implement, said carrying means (80,96) being connected with the pulling implement (32) and carrying the manipulating implement (88,96) so as to be movable to the spot (8) of engagement of a cable clamp (6) on which the pulling implement (32) is applied in a pulling position.

11. A device according to any of the preceding claims, characterized in that the pulling force sensor (34) is connected to an indicating means for the highest pulling value to which it is exposed during the test.

12. A device according to any of the preceding claims, characterized in that the pulling means comprises a hydraulic cylinder, a mechanical screw jack or a manually operated capstan.

13. A device according to any of the preceding claims, characterized in that the pulling means (104) is used as said manipulating means.

14. A device according to any of the preceding claims, characterized in that a means for opening the cable clamp is carried by the structure of the pulling implement.

## Patentansprüche

1. Vorrichtung für das Prüfen von Drahtseilklammern (6) in Skiliften, gekennzeichnet durch

- ein Zugwerkzeug (32), vorgesehen, um in einer Zugposition über einer Drahtseilklammer (6) angebracht zu werden, so dass es eine Zugkraft auf die Klammer in Richtung des Kabels (4) ausüben kann,
- ein Befestigungsmittel (10) für das aufhängende Anordnen des Zugwerkzeuges (32) in Übereinstimmung mit dem Kabel,
- ein Betätigungsmittel (22,24) für das Bewegen des Zugwerkzeuges (32) zu resp. von der Zugposition, und
- ein Zugmittel (42), verbunden über einen Zugkraftsensor (34) mit dem Zugwerkzeug (32).

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, dass das Zugwerkzeug (32) eine Zugs-

tange (36) umfasst, deren eines Ende mit dem Zugkraftsensor (34) verbunden ist und deren anderes Ende einen Zughaken (68,70,72) aufweist, vorgesehen für das Anbringen über der Drahtseilklammer (6), nahe zum Drahtseil.

3. Vorrichtung nach einem der Ansprüche 1 oder 2, dadurch gekennzeichnet, dass das Befestigungsmittel Mittel (28, 30) umfasst für das verschiebbare hängende Anordnen des Zugwerkzeuges (32) und des Zugkraftsensors (34) entlang dem Drahtseil.

4. Vorrichtung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, dass das Zugwerkzeug (32) drehbar mit dem Zugkraftsensor (34) verbunden ist, um das nach Oben-Schwenken des Werkzeuges von der Drahtseilklammer (6) mittels des Betätigungsmittels (22,24) zu ermöglichen.

5. Vorrichtung nach Anspruch 4, dadurch gekennzeichnet, dass der Zugkraftsensor (34) und das Zugwerkzeug (32) beweglich in einer entsprechenden Führung (26 resp. 14) angeordnet sind, vorgesehen, um parallel zum Drahtseil (4) angelegt zu werden, wobei die besagten Führungen zueinander drehbar miteinander verbunden sind, und dass das Betätigungsmittel ein Hebemittel (22,24) mit einschliesst, welches auf die Führung (14) des Zugwerkzeuges (32) wirkt.

6. Vorrichtung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, dass das Zugmittel (42) drehbar hängend angeordnet und drehbar mittels eines Zugendes (44) mit dem Zugkraftsensor (34) verbunden ist.

7. Vorrichtung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, dass das Befestigungsmittel (10) angeordnet ist für das feste Anordnen des Zugwerkzeuges (32) des Betätigungsmittels (22,24), des Zugmittels (42) und des Zugkraftsensors (34) auf einer Befestigungsanordnung (2,46) in Übereinstimmung mit dem Lift.

8. Vorrichtung nach Anspruch 7, dadurch gekennzeichnet, dass ein Rahmen (12,14,20) bewegbar mittels des Betätigungsmittels (22,24) und tragend das Zugwerkzeug (32) ebenfalls ein Mittel (88,96) trägt für das Öffnen einer Drahtseilklammer (6), welche zu testen ist, vorgesehen, damit dieses entlang dem Drahtseil bewegt werden kann vor der Durchführung der Prüfung.

9. Vorrichtung nach Anspruch 8, dadurch gekennzeichnet, dass das Öffnungsmittel (88,96) angeordnet ist, um die Drahtseilklammer (6) zu öffnen,

wenn das Zugwerkzeug (32) an dieser angreift, und dass nachfolgend dazu das Zugmittel (42) angeordnet ist, um die Drahtseilkammer (6) an eine gewünschte Prüfstelle auf dem Drahtseil zu ziehen, wo die Drahtseilkammer erneut zur Prüfung geschlossen wird.

10. Vorrichtung nach Anspruch 5 und 9, dadurch gekennzeichnet, dass die Klammer (6) von der Art ist, bekannt per se, welche geöffnet werden kann durch das Eingreifen mit einem Betätigungswerkzeug an einem Druckpunkt (8) an der Klammer, dass der Rahmen (12,14,20) einen Balken (12) umfasst, angeordnet seitlich zum Zugwerkzeug (32) und der sich in parallel mit und starr verbunden zur Führung (14) des Zugwerkzeuges erstreckt, und der drehbar um eine Drehachse (16) ist, die koaxial ist zur Drehachse (18) der Führung des Zugwerkzeuges, wobei der besagte Balken (12) dazu dient, um ein Haltemittel (80,86) zu tragen, das entlang dem Balken bewegbar ist für das Öffnungsmittel (88,96), welches das besagte Betätigungswerkzeug bildet, und wobei das besagte Haltemittel (80,86) mit dem Zugwerkzeug (32) verbunden ist und das Betätigungswerkzeug (88,96) trägt, um so zum Druckpunkt (8) für den Eingriff in eine Drahtseilkammer (6) bewegbar zu sein, an welcher das Zugwerkzeug (32) angelegt ist in einer Zugposition.
11. Vorrichtung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, dass der Zugkraftsensor (34) mit einem Anzeigemittel verbunden ist für den höchsten Zugwert, welchem er während der Prüfung ausgesetzt ist.
12. Vorrichtung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, dass das Zugmittel einen hydraulischen Zylinder, eine mechanische Schraubspindel oder eine manuell betreibbare Haspel bzw. Winde umfasst.
13. Vorrichtung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, dass das Zugmittel (104) als besagtes Betätigungsmittel verwendet wird.
14. Vorrichtung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, dass ein Mittel für das Öffnen der Drahtseilkammer durch die Struktur des Zugwerkzeuges getragen wird.

## Revendications

1. Dispositif pour tester des pinces-câbles (6) dans des ski-lifts, caractérisé par un mécanisme de traction (32) prévu pour être appliqué dans une

position de traction au-dessus d'une pince-câble (6) de telle manière qu'il puisse exercer une force de traction sur la pince en direction du câble (4), des moyens de montage (10) pour suspendre le mécanisme de traction (32) associé au câble, des moyens d'actionnement (22,24) pour déplacer le mécanisme de traction (32) dans et hors la position de traction respectivement et des moyens de traction (42) connectés au mécanisme de traction (32) par l'intermédiaire d'un détecteur (34) de la force de traction.

2. Dispositif selon la revendication 1, caractérisé en ce que le mécanisme de traction (32) comprend une barre de traction (36) dont une extrémité est connectée au détecteur de la force de traction (34) et l'autre extrémité présente un crochet de traction (68,70,72) destiné à être appliqué sur la pince-câble (6) au voisinage du câble.
3. Dispositif selon la revendication 1 ou 2, caractérisé en ce que les moyens de montage comprennent des moyens (28,30) pour ajustablement suspendre le mécanisme de traction (32) et le détecteur de la force de traction (34) le long du câble.
4. Dispositif selon l'une quelconque des revendications précédentes, caractérisé en ce que le mécanisme de traction (32) est articulé au détecteur de la force de traction (34) pour permettre de pivoter vers le haut le mécanisme à partir de la pince-câble (6) par l'intermédiaire des moyens d'actionnement (22,24).
5. Dispositif selon la revendication 4, caractérisé en ce que le détecteur de la force de traction (34) et le mécanisme de traction (32) sont mobilement suspendus dans des guides (26,14) prévus pour s'étendre parallèlement au câble (4), les guides étant articulés l'un à l'autre, et en ce que les moyens d'actionnement comprennent des moyens de levage (22,24) agissant sur le guide (14) du mécanisme de traction (32).
6. Dispositif selon l'une quelconque des revendications précédentes, caractérisé en ce que les moyens de traction (42) sont suspendus de manière pivotante et articulés au détecteur de la force de traction (34) par une extrémité de traction.
7. Dispositif selon l'une quelconque des revendications précédentes, caractérisé en ce que les moyens de montage (10) sont prévus pour fixer le mécanisme de traction (32), les moyens d'actionnement (22,24), les moyens de traction (42) et le détecteur de la force de traction (34) sur un support (2,46) associé au lift.

8. Dispositif selon la revendication 7, caractérisé en ce qu'un cadre (12,14,20) déplaçable par les moyens d'actionnement (22,24) et portant le mécanisme de traction (32) porte également des moyens (88,96) destiné à ouvrir une pince-câble (6) à être testée, pour permettre son déplacement le long du câble avant le test. 5
9. Dispositif selon la revendication 8, caractérisé en ce que les moyens (88,96) sont disposés pour ouvrir la pince-câble (6) lorsque le mécanisme de traction (32) est engagé avec elle, et en ce que les moyens de traction (42) sont disposés pour ensuite tirer la pince-câble (6) dans une position de test désirée sur le câble où la pince-câble en vue d'être testée est à nouveau fixée. 10  
15
10. Dispositif selon les revendications 5 et 9, caractérisé en ce que la pince (6) est d'un type connu en soi qui peut être ouverte au moyen d'un outil à un point (8) d'engagement sur la pince, que le cadre (12,14,20) comprend une poutre (12) montée latéralement par rapport au mécanisme de traction (32) et s'étendant parallèlement au guide (14) du mécanisme de traction tout en étant fixée à ce guide mais pouvant pivoter autour d'un axe de pivotement (16) coaxial avec l'axe de pivotement (18) du guide du mécanisme de traction, ladite poutre (12) étant prévue pour porter des supports (80,86), déplaçable le long de la poutre, pour les moyens (88,96) pour ouvrir la pince formant lesdits moyens d'actionnement, les supports (80, 86) étant accouplés au mécanisme de traction (32) et portant les moyens d'actionnement (88,96) de manière à pouvoir être déplacés jusqu'au point (8) d'engagement d'une pince-câble (sur lequel le mécanisme de traction (32) est appliqué dans une position de traction. 20  
25  
30  
35  
40
11. Dispositif selon l'une quelconque des revendications précédentes, caractérisé en ce que le détecteur de la force de traction (34) est connecté à un indicateur pour la plus grande valeur de la traction à laquelle il est exposé lors du test. 45
12. Dispositif selon l'une quelconque des revendications précédentes, caractérisé en ce que les moyens de traction comprennent un cylindre hydraulique, une broche filetée de traction ou un cric manuel. 50
13. Dispositif selon l'une quelconque des revendications précédentes, caractérisé en ce que les moyens de traction (104) sont utilisés comme moyens d'actionnement. 55
14. Dispositif selon l'une quelconque des revendications précédentes, caractérisé en ce qu'un mécanisme pour ouvrir la pince-câble est porté par la structure du mécanisme de traction.



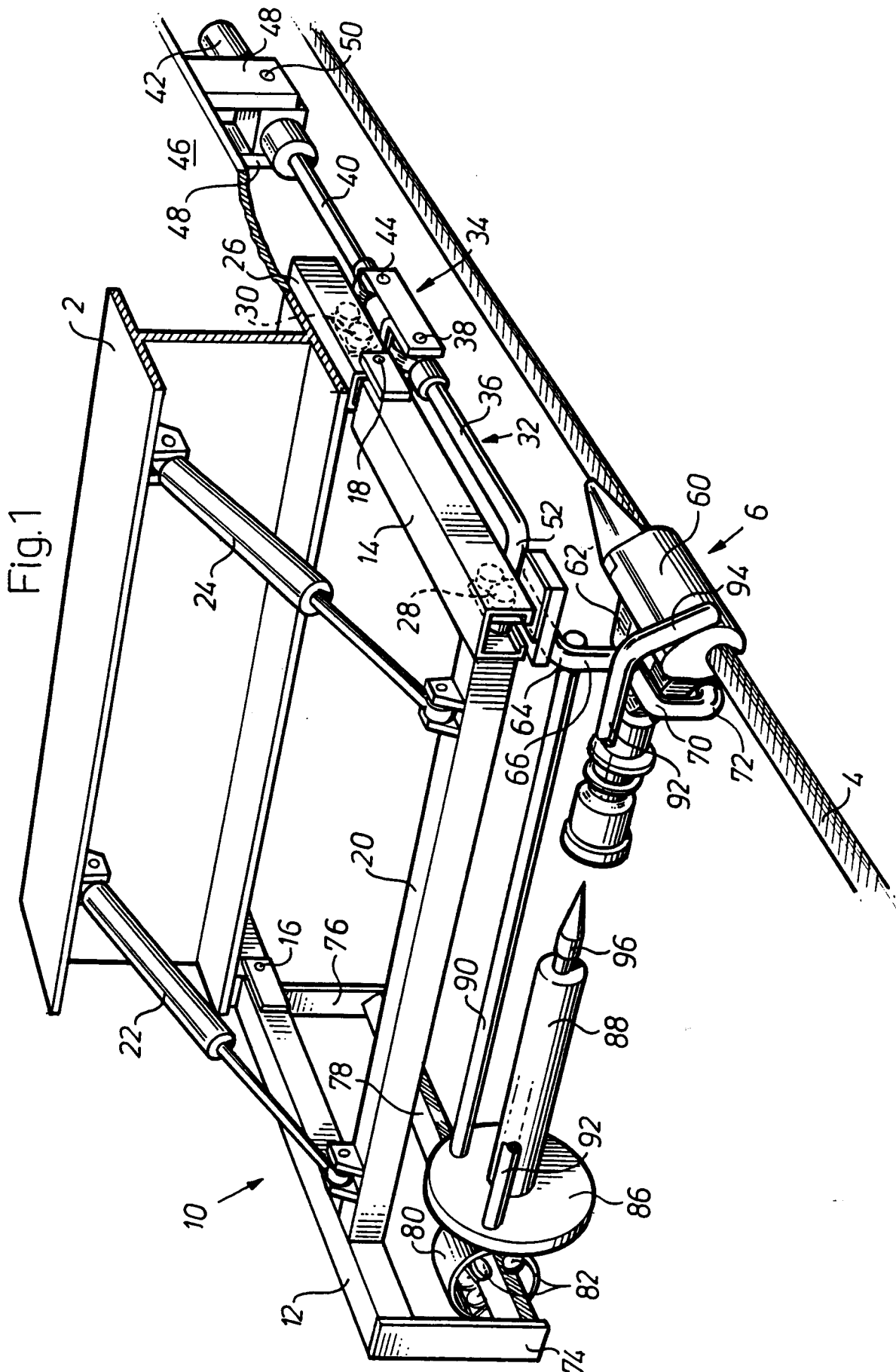


Fig. 2

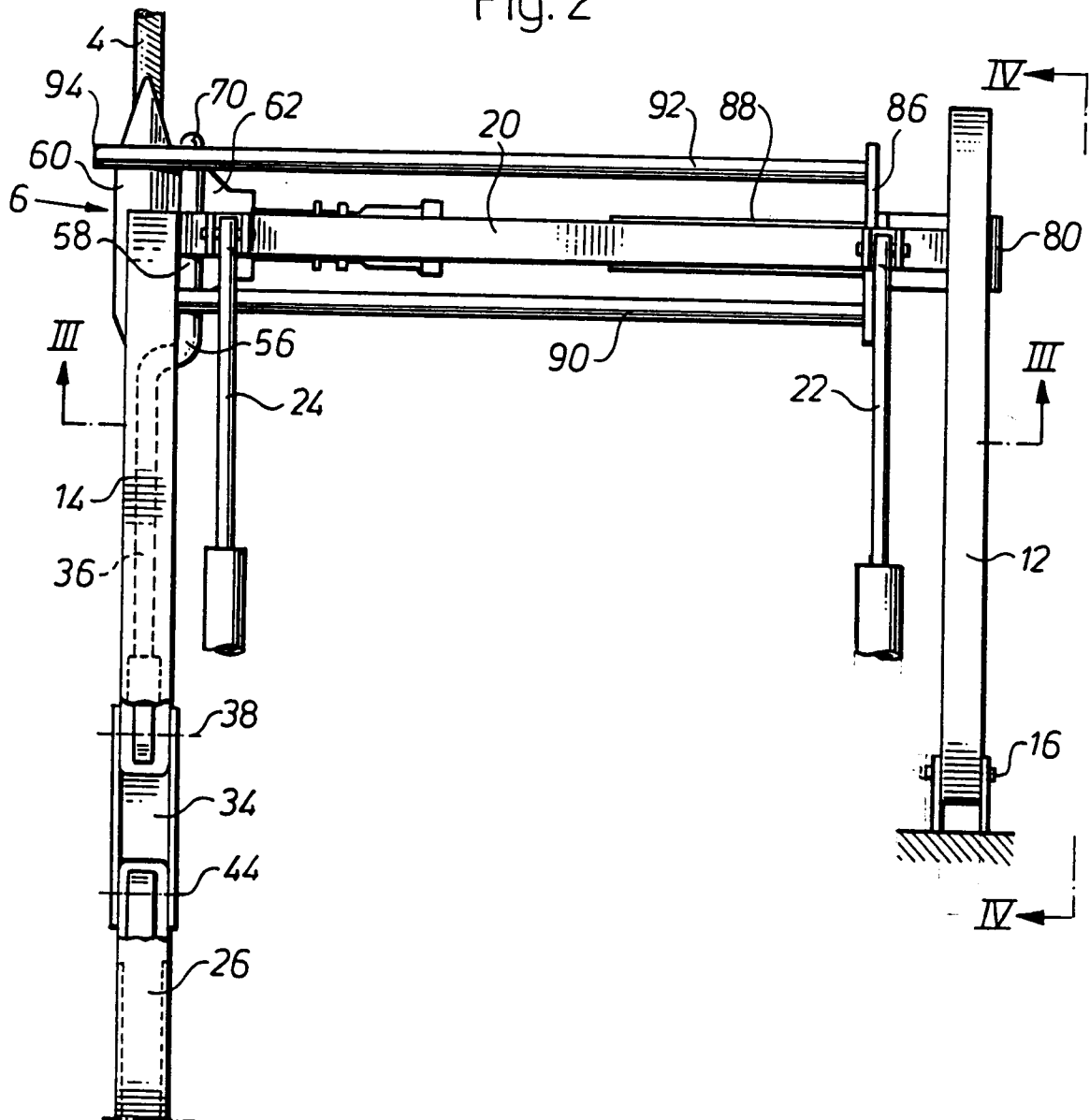


Fig. 3

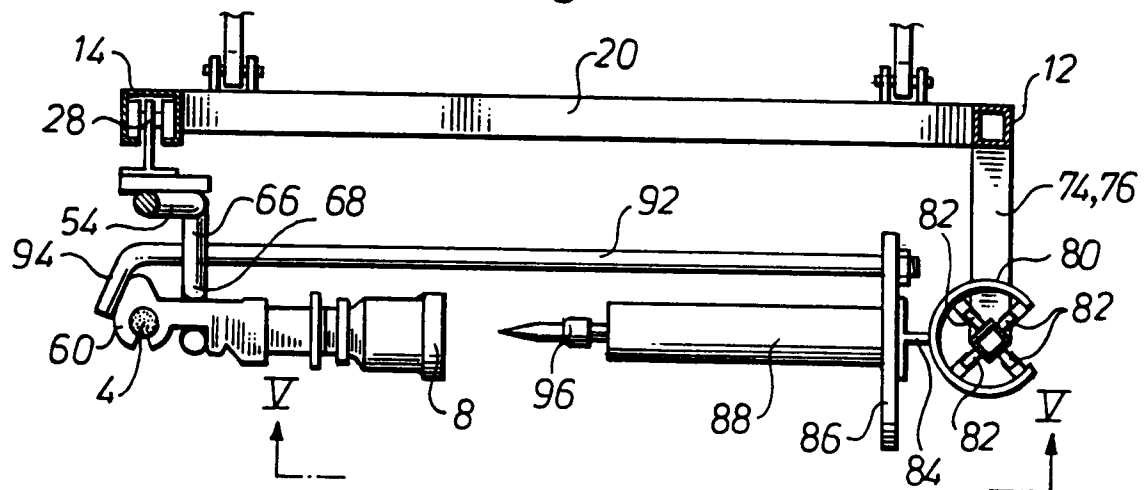


Fig. 4

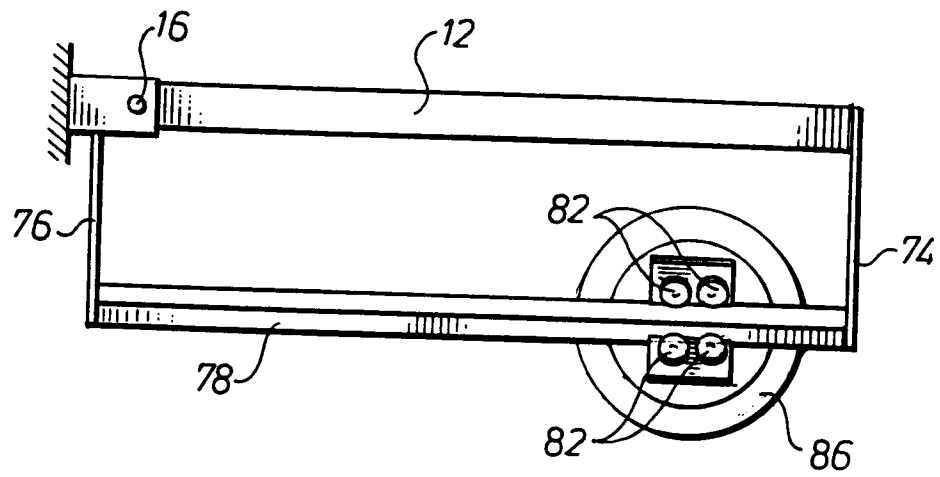


Fig. 5

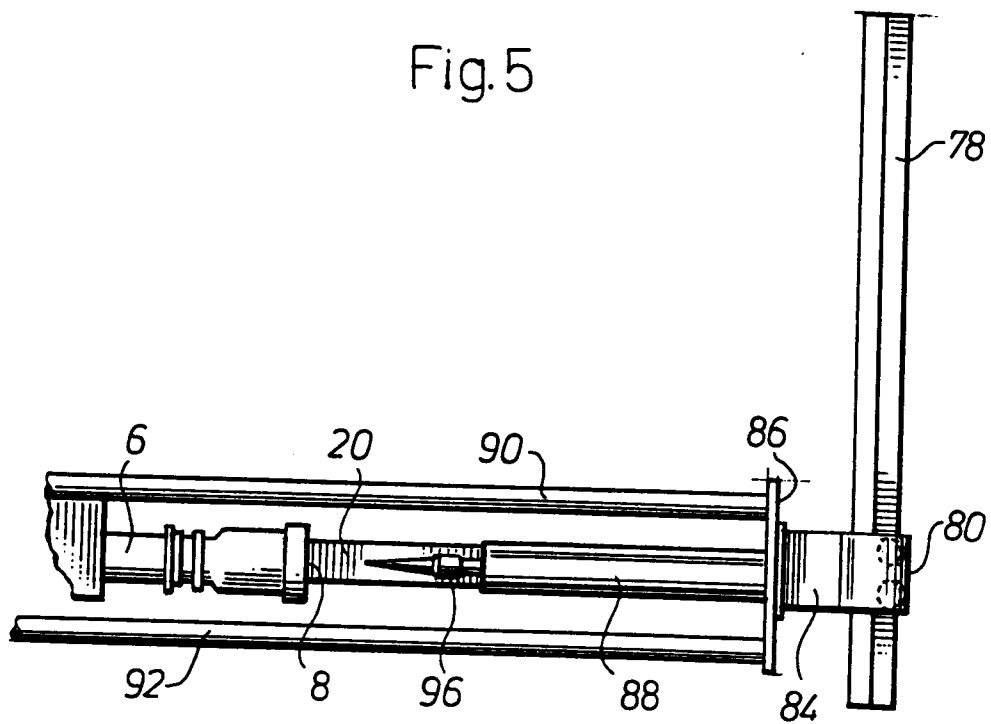
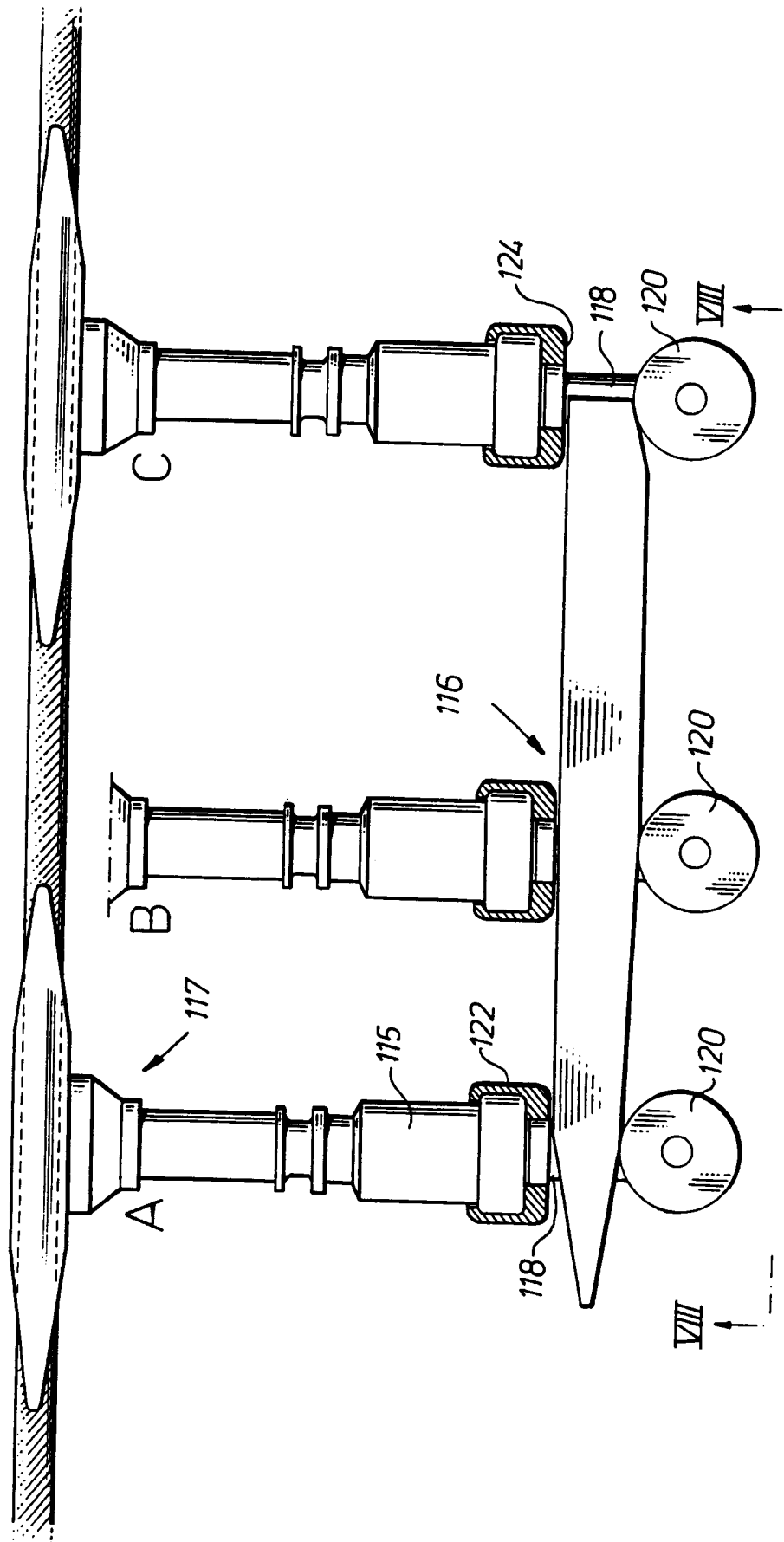


Fig. 7



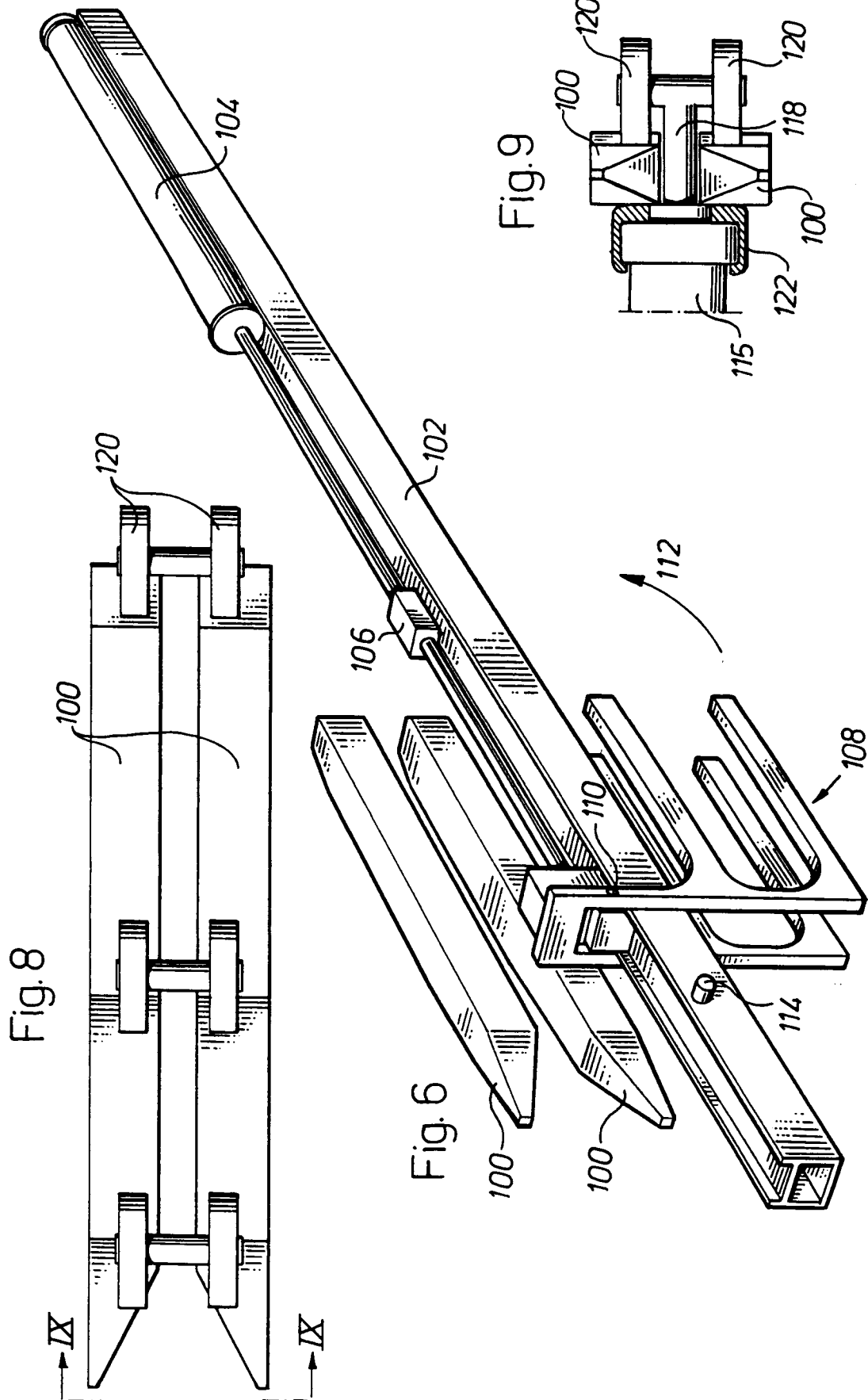


Fig. 10

