

[54] DEVICE FOR STRAIGHTENING DEFORMED VEHICLES OR VEHICLE PARTS

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[22] Filed: **Nov. 30, 1973**

[21] Appl. No.: **420,384**

[30] Foreign Application Priority Data

Dec. 13, 1972 Sweden..... 16266/72

[52] U.S. Cl. 72/447; 72/455; 72/705

[51] Int. Cl.² B21D 1/12; B21D 37/06

[58] Field of Search 72/705, 447, 456, 455

[56] References Cited

UNITED STATES PATENTS

2,442,425	6/1948	Merrill et al.	72/705 X
2,597,234	5/1952	Elam	72/705 X
2,717,020	9/1955	Dobias	72/705 X
3,141,493	7/1964	Textor, Sr.	72/705 X
3,340,720	9/1967	Chartier	72/705 X

3,590,623	7/1971	Hunnicut	72/705 X
3,625,047	12/1971	Lunardini	72/705 X
3,626,747	12/1971	Rouis	72/705 X
3,630,066	12/1971	Chisum	72/705 X
3,689,030	9/1972	Backus	72/705 X
3,698,230	10/1972	Buske	72/705 X
3,776,022	12/1973	Lionello	72/705 X
3,835,693	9/1974	Majersky	72/705 X

FOREIGN PATENTS OR APPLICATIONS

329,131	1970	Sweden	72/705
713,232	9/1966	Italy	72/705

Primary Examiner—C. W. Lanham

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[57]

ABSTRACT

A method and device for straightening deformed vehicles which employ at least one support member attached to a frame member for mounting the vehicle and pivoted thereon, means for locking the support member in place and means for exerting a force between the support member and the vehicle for straightening the latter.

4 Claims, 9 Drawing Figures

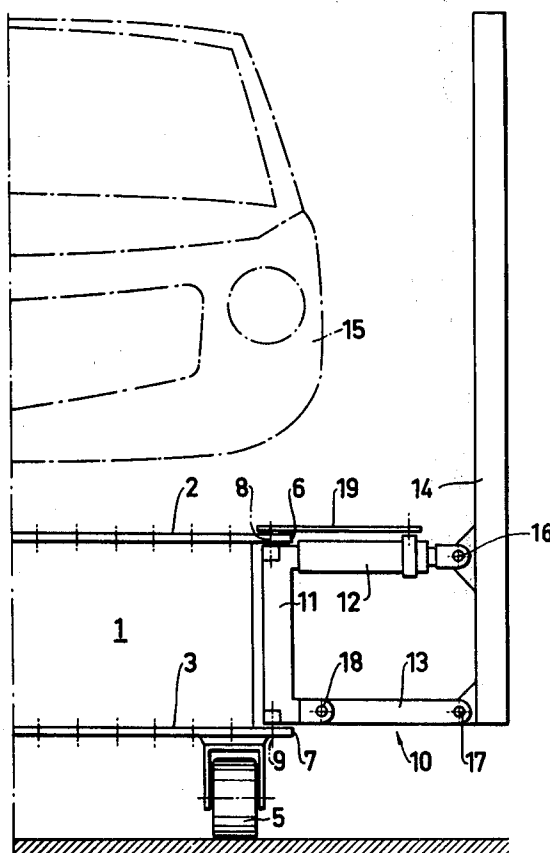
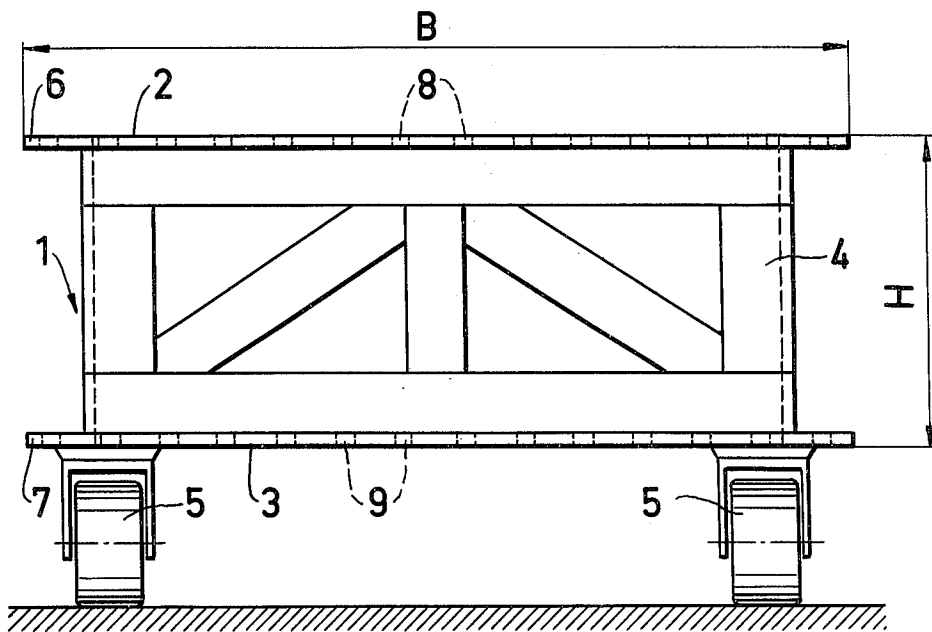


FIG. 1



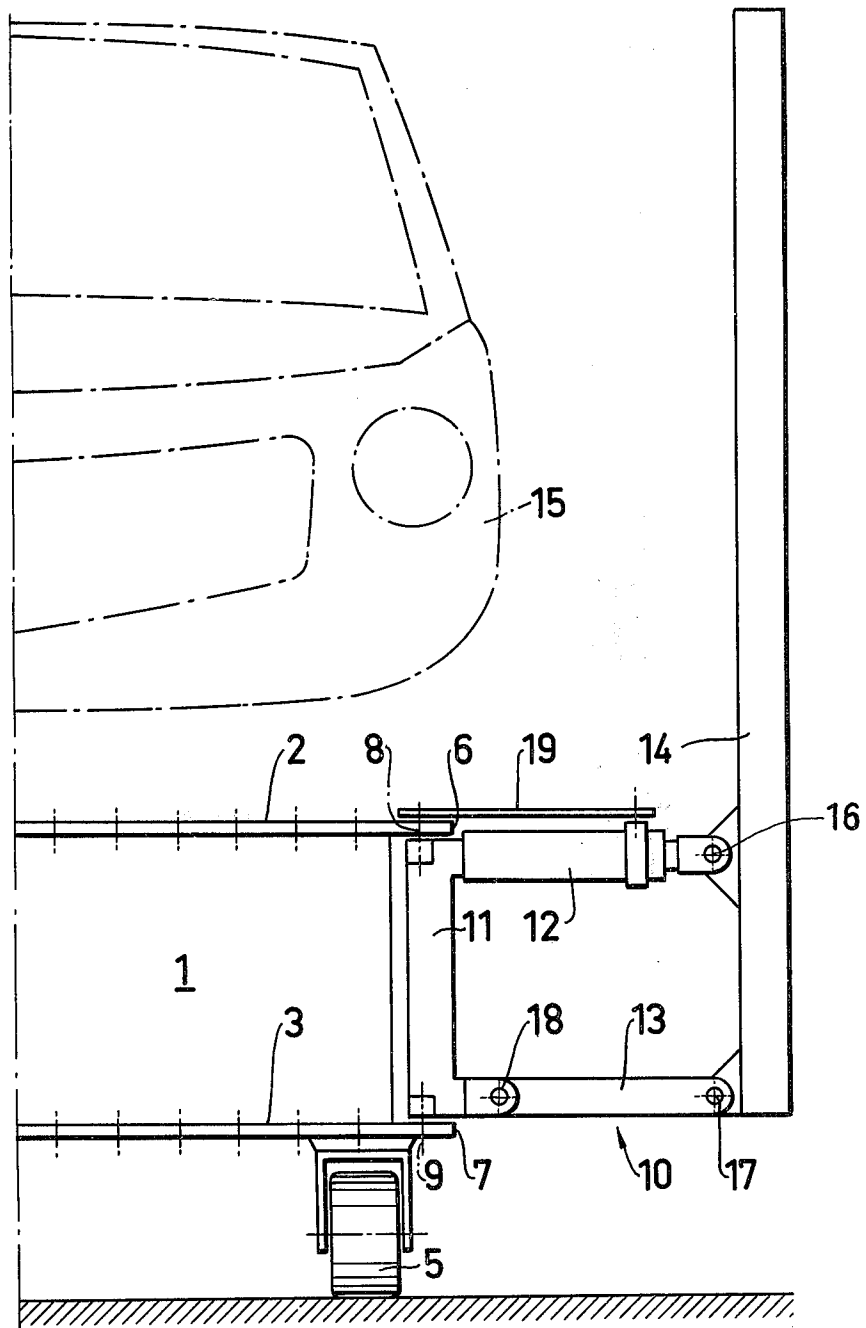


FIG. 3

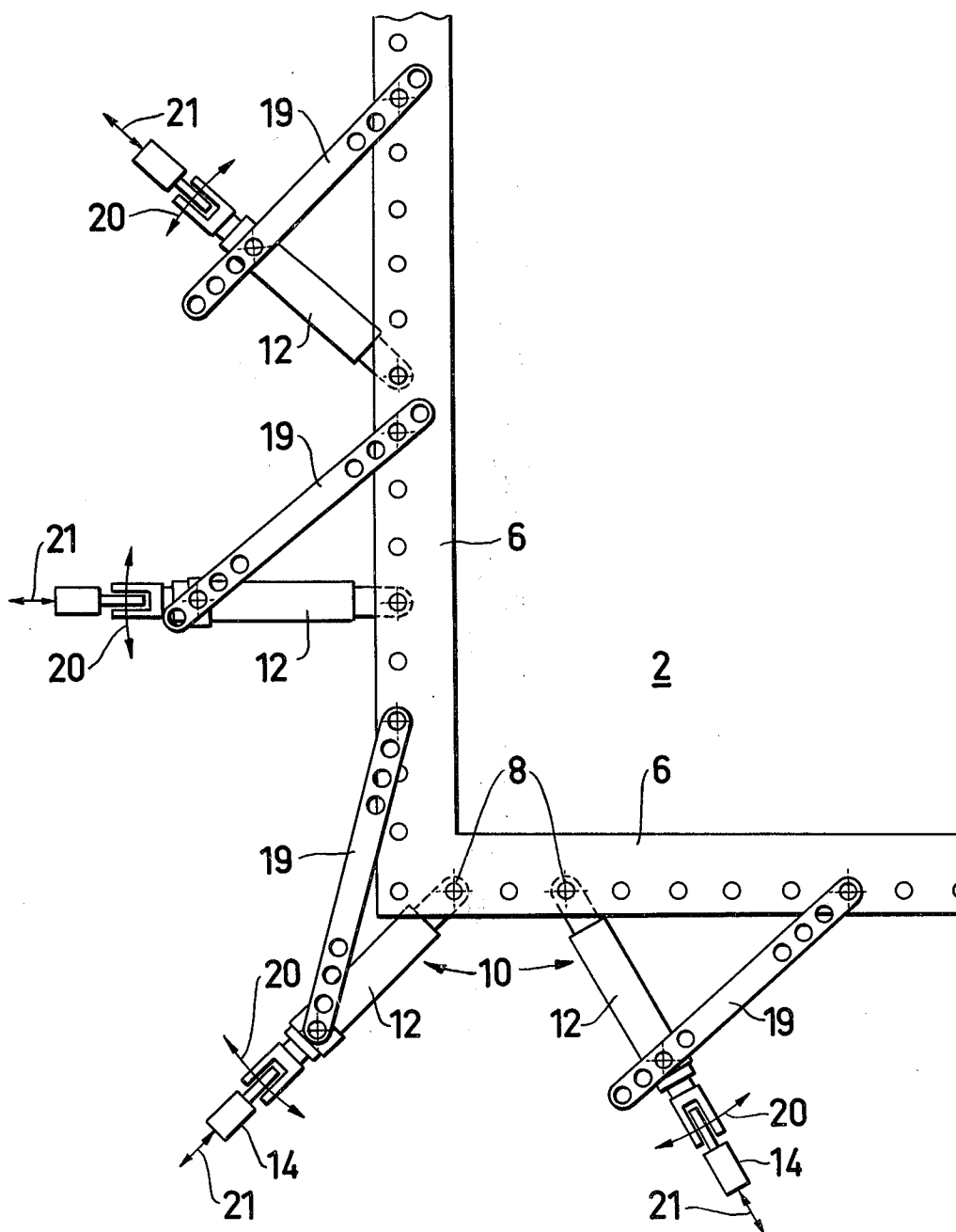


FIG. 4

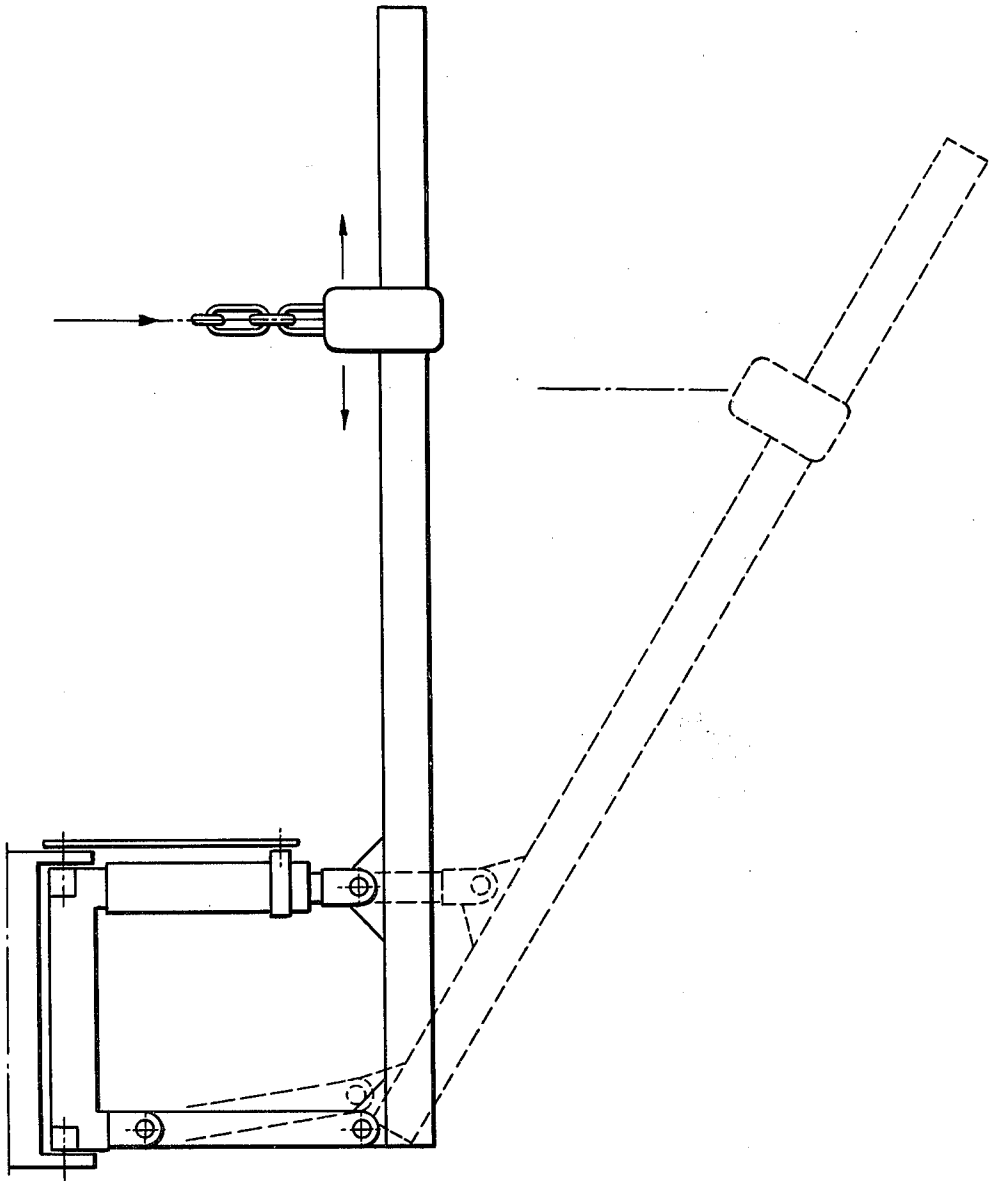


FIG. 5

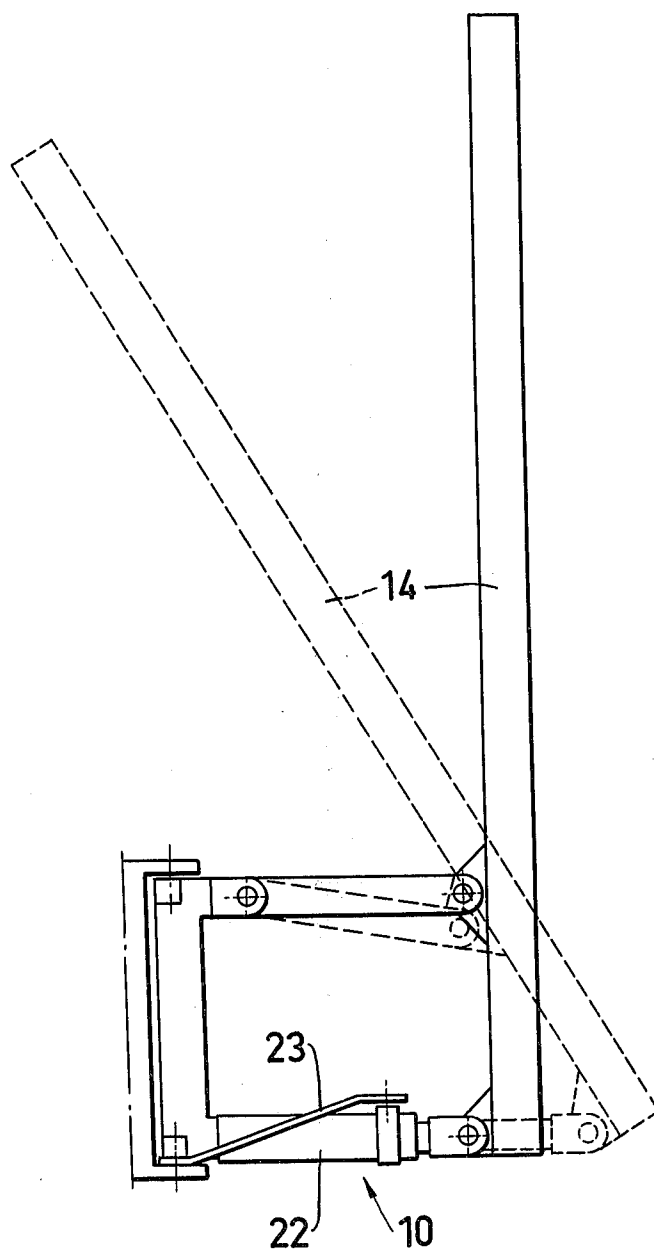
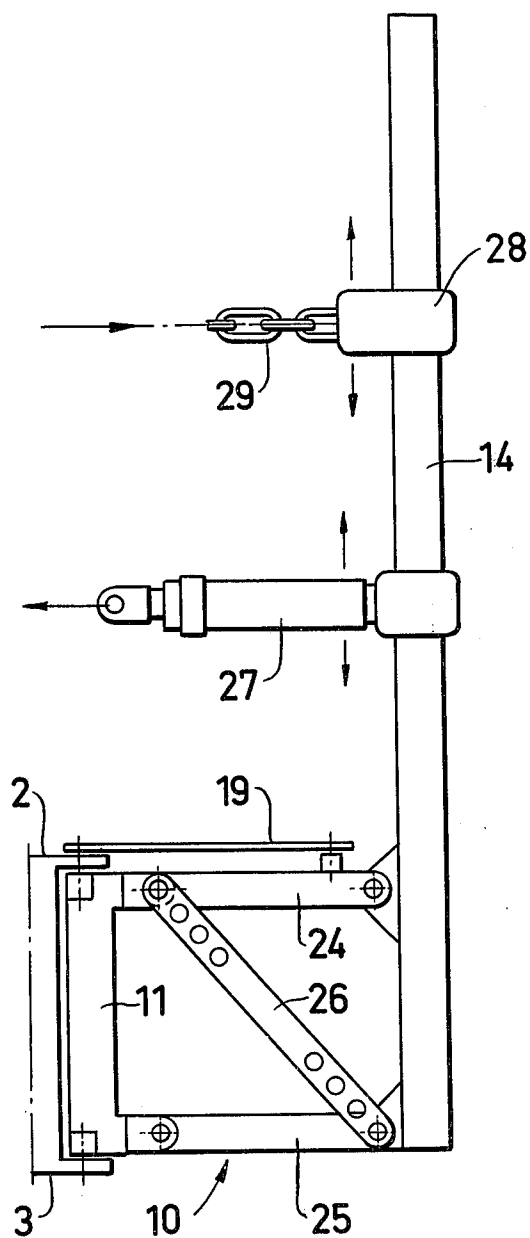


FIG. 6



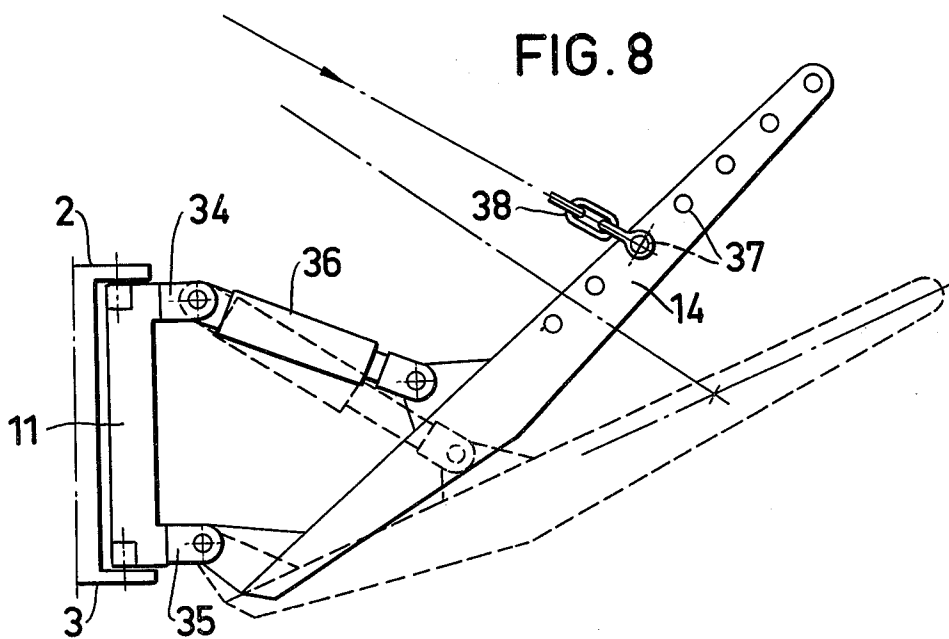
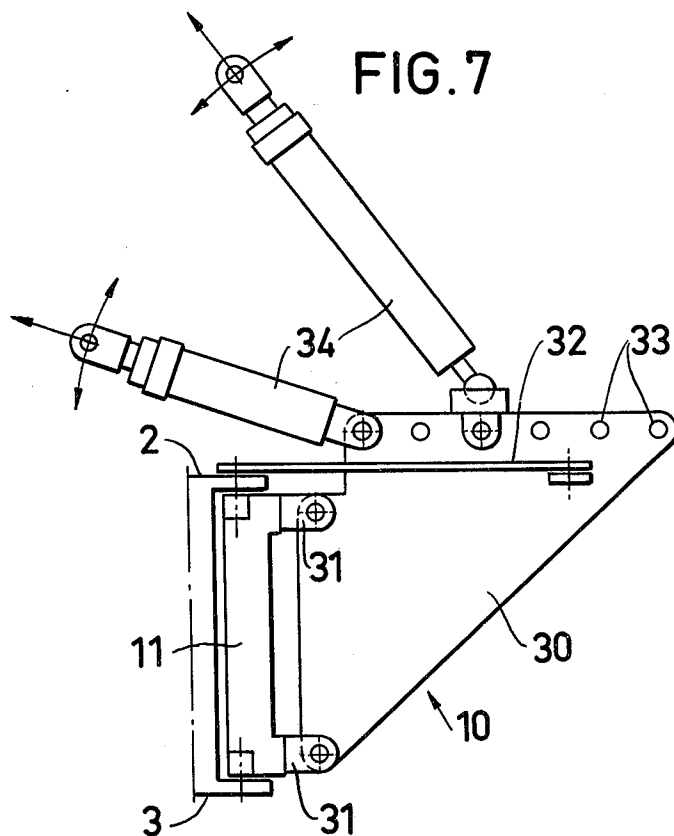
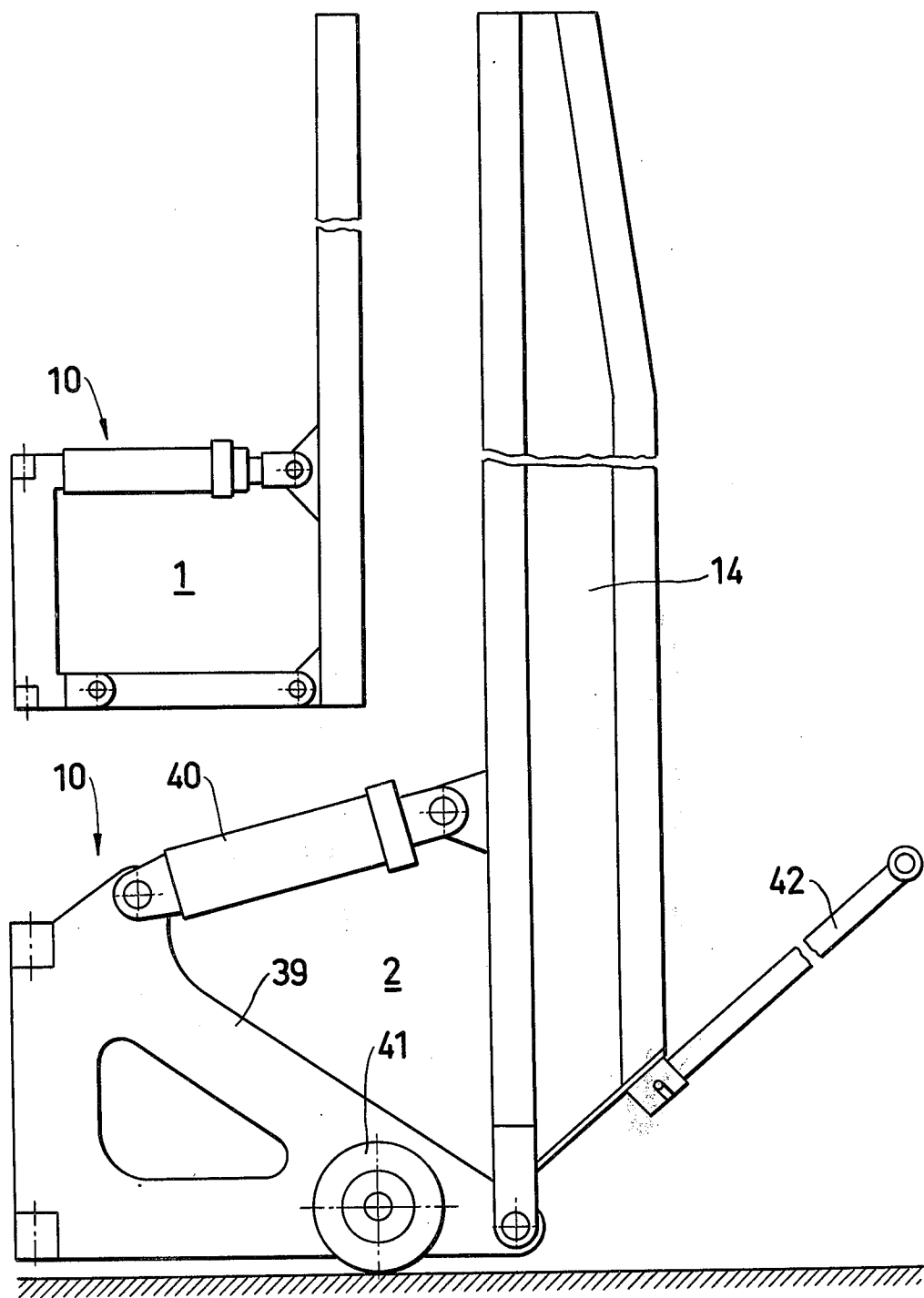


FIG. 9



DEVICE FOR STRAIGHTENING DEFORMED VEHICLES OR VEHICLE PARTS

The present invention relates to a method and a device for straightening deformed vehicles or vehicle parts by means of jacks. The device comprises a platform, to which the vehicle is anchored.

It is the object of the invention to simplify the straightening work on deformed vehicles or vehicle parts, possibilities also being present to straighten or repair vehicles of different size and with different deformations with a minimum of labour. The invention presupposes the use of jacks or the like for achieving the necessary tensional forces, pressures as well as tensile forces being included in the term tensional force.

What characterizes the invention is apparent from the annexed claims. Some embodiments of the invention will be described in the following with reference to the enclosed drawings.

FIG. 1 is a front view of a platform according to the invention. FIG. 2 is a front view of a part of the platform with accessories and a positioned vehicle. FIG. 3 is a plane view and FIG. 4 shows a detail of an embodiment of the invention. FIG. 5 shows a detail similar to that in FIG. 4 but a varied embodiment thereof. FIG. 6 illustrates a detail similar to that in FIGS. 4 and 5 but another embodiment thereof. FIG. 7 is another embodiment of means for applying the tensional forces and FIG. 8 shows another embodiment thereof. FIG. 9 shows a last illustrated embodiment within the scope of the invention.

In FIG. 1 a front view of a platform according to the invention is shown. The platform 1 comprises an upper disc 2 and a lower disc 3 held together by a frame 4. The platform is supported by wheels 5 adapted to the lower disc 3. The vehicle to be straightened is placed on the platform 1 and anchored in a suitable manner to said platform, the anchoring means used not being comprised within the inventive idea. Edges 6 extend along the upper disc 2, and in the edges around the upper disc 2 mounting holes 8 are made. The use of these mounting holes appears from the text below. Lower holes 9 are made in the same way along the edges 7 of the lower disc, and at the embodiments shown the holes 8 and 9 are placed vertically over each other. This is however not necessary, but the upper and the lower holes can be reciprocally offset within the scope of the invention.

In FIG. 2 a front view of the invention is shown, i.e. the right half thereof. It is schematically illustrated that the vehicle 15 is anchored to the platform 1. At the edges 6 and 7 of the platform holding means for the tensional forces are adapted. The means comprises a link system 10 supporting a standard 14. The standards support chains or rods, not shown, which are adapted to suitable points of the vehicle for carrying out the straightening operation. The straightening operation is known technique per se, which is not described more closely in the present application. A number of holding means for adapting the tensional forces and necessary for the straightening operation are placed along the edges of the platform. The link system 10 consists of a vertical arm 11 and a horizontal arm 12, which are reciprocally combined rigidly, preferably at right angles. The vertical arm 11 is adapted to the upper holes 8 and the lower holes 9 by means of pivot pins and can

in this way perform pivotal motion horizontally but not vertically. The standard 14 is also adapted to the horizontal arm 12 at a joint 16, which arm is a jack in the embodiment shown. The standard 14 is also adapted to the lower portion of the vertical arm 11 via an articulated arm 13 and two joints 17 and 18. Hereby the standard 14 moves towards and from the platform, viz. the vehicle 15, when the jack is projected and retracted. The tensional forces on the vehicle are exerted in this manner.

In order to prevent the link system to turn away upon the exertion of the tensional forces, the link system is locked, when the tensional forces are to be applied, by means of a locking arm 19. The locking length of this arm can be varied by a plurality of holes with pins cooperating in the horizontal arm 12, i.e. the jack and the holes 8 in the upper disc. It is evident from FIG. 3 how the locking arm functions for adjusting the locking of the holding means in a suitable vertical plane, and FIG. 3 thus illustrates a plane view of a corner of the platform but with the vehicle removed. Thus it is apparent from the figure how four link systems are adapted along the edges 6 of the upper disc 2 in their holes 8. The arc-shaped arrows 20 illustrate the pivotal adjusting possibility of the link systems 10 by means of the locking arms 19 and the straight arrows 21 illustrate how the standards 14 can be pivoted inwardly towards the platform or outwardly from the platform depending if pressure force or tensional force is to be applied by means of the standard 14. In FIG. 5 another embodiment of the holding means is shown and it is shown that an horizontal, rigid arm in the form of a jack is arranged at the lower edge of the link system and is designated 22. A locking arm 23 is also arranged at the lower edge and corresponds to the locking arm 19 in FIG. 1. If the jack 22 makes a projecting motion the standard 14 will in this embodiment be tilted inwards the platform and thus exert a pressing force. Otherwise, in every respect the link system 10 in FIG. 5 is designed similarly to the link system 10 in FIG. 2.

In FIG. 6 another embodiment of the link system 10 and the holding means are shown. In this embodiment both the horizontal arms 24 and 25 are made rigid in connection with the vertical arm 11 by the arrangement of a stay 26 diagonally in the link system 10. Like the embodiment according to FIG. 2 there is arranged a locking arm 19 against the upper horizontal arm 24. The standard 14 is in this embodiment fixed, and instead a jack 27 is arranged displaceable upwardly and downwardly on the standard 14 and the jack exerts the necessary tensional forces. A second holding means may also be arranged, and in one embodiment it is illustrated as consisting of a sleeve 28 slideable on the standard 14 in which sleeve a chain 29 is adapted. This chain 29 can take up tensile forces from the vehicle.

In FIG. 7 another embodiment is illustrated. The link system 10 comprises in this embodiment a vertical arm 11 like in the foregoing embodiments and has a triangular washer 30 adapted to eyes 31 at the vertical arm 11. A locking arm 32 holds the link system 10 in a set position relative to the platform 1. At the upper edge of the washer 30 there is a number of holes 33 and in these holes jacks 34 can be adapted, which can be single-acting to exert tensile force or pressure force, or be double-acting and exert both of said force directions. In FIG. 8 still another embodiment is shown, and this comprises as before a vertical arm 11 adapted to the upper disc 2 and the lower disc 3 of the platform 1.

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Two horizontal arm pieces 34 and 35 are arranged, and at their ends a jack 36 is articulatedly arranged to the upper edge of the link system. At the other end the standard 14 is adapted, which at its lower end is adapted to the lower horizontal arm 35 via an eye. A chain 38 can for instance be adapted to the arm 14 in different holes 37.

FIG. 9 shows a last embodiment, where the holding means is arranged substantially more heavy and strong than in previous embodiments and intended to take up greater forces. Thus the link system 10 is in this case closed and designed as a washer 39. At the upper corner of the washer 39 a jack 40 is adapted and at the lower right corner of the washer the standard 14 is articulatedly arranged and higher up articulatedly connected with the jack 40. The washer has a support roller or two support wheels 41 depending on the weight of the holding means. The standard 14 is preferably designed as an I-beam and a handle 42 is arranged to push or draw the holding means to its right position for attachment to the platform (not shown). In the upper left corner of FIG. 9 the holding means according to FIG. 2 is shown but dismounted from the platform.

Additional embodiments can be considered within the scope of the following claims. This especially applies to the design of the link system, the jacks and the standards.

What is claimed is:

1. Apparatus for straightening a vehicle component comprising, a platform for supporting a vehicle component, said platform having a side edge, a vertically extending support arm having opposite ends connected to said platform adjacent said side edge for pivotal movement of said support arm about a generally vertical arm axis, a vertically extending force transmitting

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member spaced outwardly from said support arm and having upper and lower ends, a link member extending between said support arm and the lower end of said force transmitting member and having opposite ends pivotally interconnected with said support arm and force transmitting member at horizontal axes generally parallel to one another, extendable and retractable jack means between said support arm and said lower end of said force transmitting member and generally parallel to and vertically spaced from said link member, said jack means having one end rigidly connected with said support arm and the other end pivotally interconnected with said force transmitting member at a horizontal axis parallel to said axes at said link member ends, whereby extension and retraction of said jack means pivotally displaces said upper end of said force transmitting member in a vertical plane toward and away from said platform edge, said support arm, said link member and said jack means supporting said force transmitting member for pivotal movement along an arcuate path about said vertical arm axis and relative to said platform edge, thus to vary the angle of said vertical plane with respect to said platform edge, and means on said force transmitting member for connection with said vehicle component.

2. The apparatus as defined in claim 1, wherein said jack means is vertically spaced below said link member.

3. The apparatus as defined in claim 1, and a locking arm releaseably connected to said jack means at a location between said ends thereof and releaseably connected to said platform at a location along said side edge spaced from said arm axis.

4. The apparatus as defined in claim 3, wherein said jack means is vertically spaced below said link member.

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