

LE ROY V. JACOBSEN ET AL

BILATERALLY AND UNIFORMLY EXTENSIBLE UNIT

3 Sheets-Sheet 1

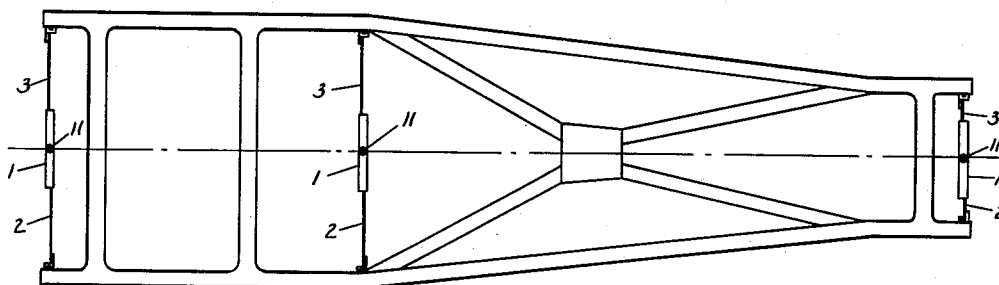


FIG-1

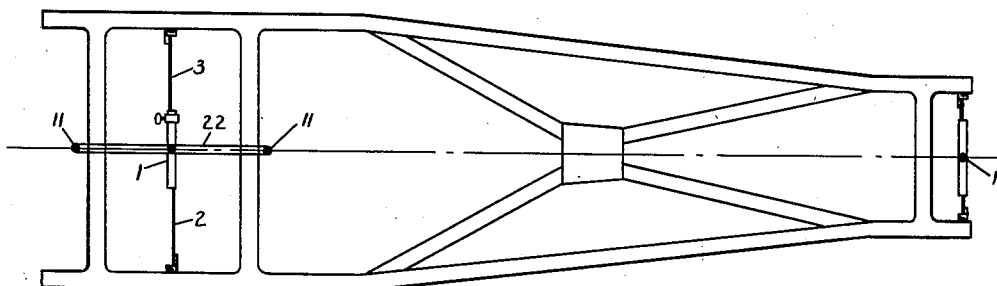


FIG-2

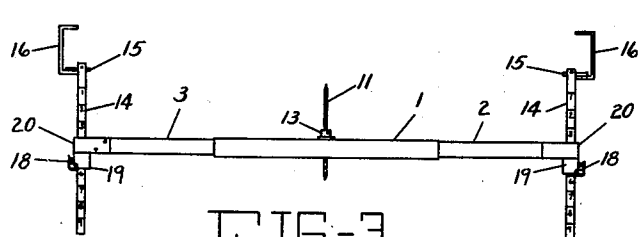


FIG-3

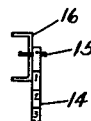


FIG-4

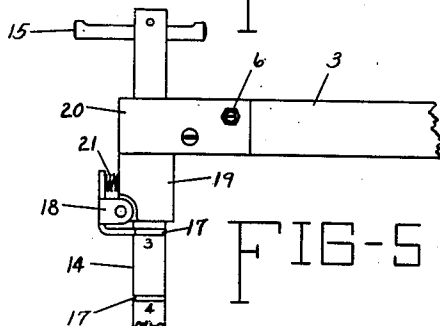


FIG-5

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BILATERALLY AND UNIFORMLY EXTENSIBLE UNIT

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3 Sheets-Sheet 2

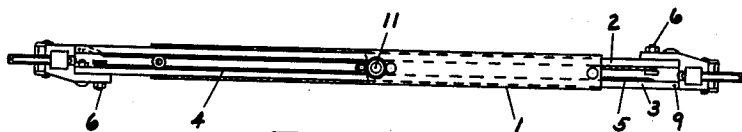


FIG-6

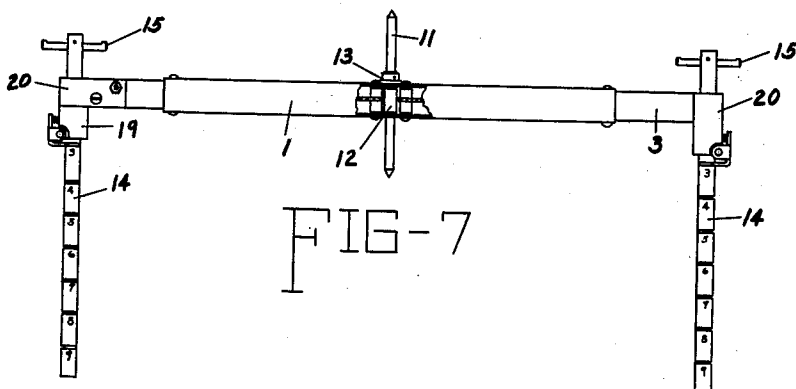


FIG-7

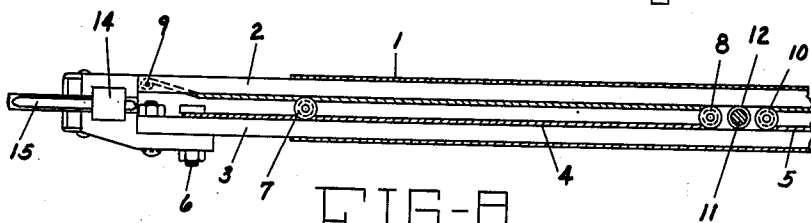


FIG-8

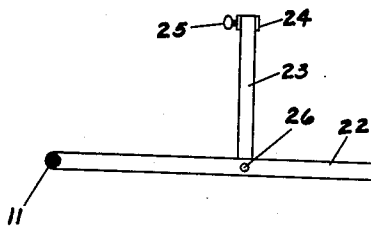


FIG-9

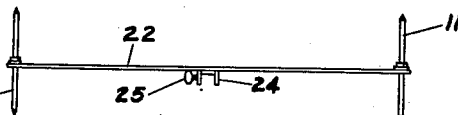


FIG-10

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3 Sheets-Sheet 3

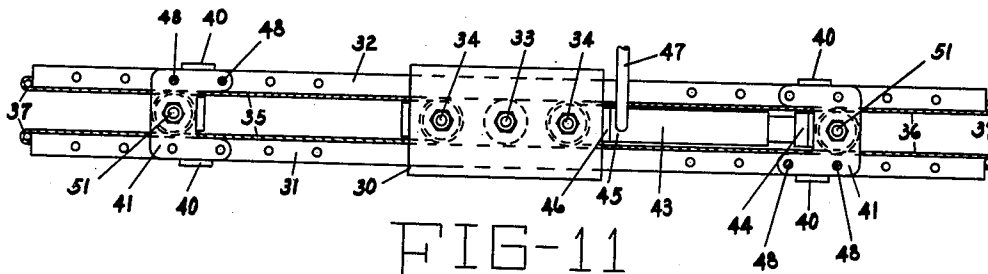


FIG-11

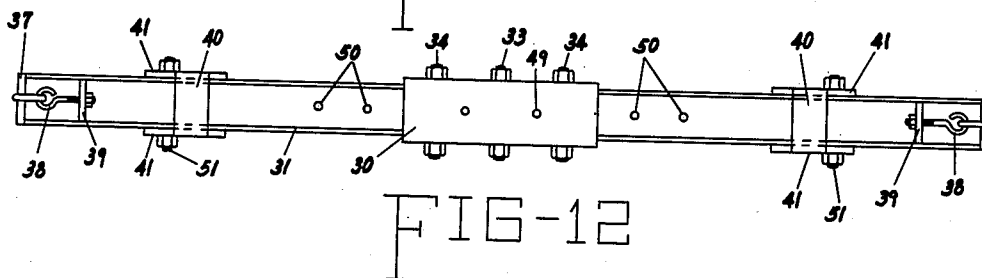


FIG-12

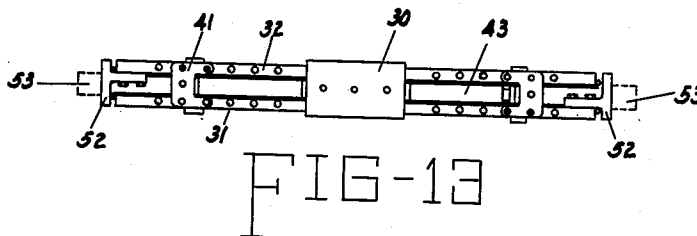


FIG-13

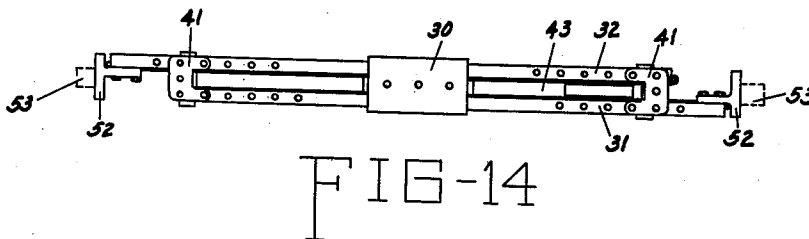


FIG-14

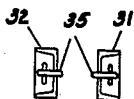


FIG-15

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2,581,021

BILATERALLY AND UNIFORMLY
EXTENSIBLE UNIT

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5 Claims. (Cl. 33—191)

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Our present invention relates to a sight-supporting means or force-applying means which is uniformly or evenly extensible at both ends, one use of which is illustrated in Figs. 1 and 2 of the annexed drawings and another use of which is as a force-exerting means, as shown in Figs. 11 to 14. Among the objects of this invention are the provision of an extensible unit which will extend outwardly from the middle, at both ends, when force is exerted to produce extension thereof; the provision of an improved supporting bar for supporting sighting means for use in checking the shape of the frame of a motor vehicle; the provision of a bar for exerting an extensive pushing force; and such further objects, advantages, and capabilities as will hereafter appear and as are inherent in the structure disclosed herein. Our invention further resides in the combination, construction, and arrangement of parts illustrated in the accompanying drawings and, while we have shown therein what is now regarded as the preferred embodiment of this invention, together with a slight modification thereof, we do not desire this disclosure to be interpreted in a limiting sense but rather to be regarded as illustrative only.

In the drawings annexed hereto and forming a part hereof,

Fig. 1 shows the outline of a motor vehicle frame and the positioning of three units carrying sighting means whereby the frame may be checked for correctness of shape;

Fig. 2 is a similar view showing a different mode of checking frame form;

Fig. 3 is an end view of the structure shown in Fig. 1, showing how the structure is suspended from a vehicle frame;

Fig. 4 is a fragmentary elevation of an end unit, as shown in Fig. 3, applied to the outside of the vehicle frame and illustrating how the unit may be suspended from the outside of the frame instead of the inside;

Fig. 5 is an enlarged fragmentary elevation of one end of this unit;

Fig. 6 is a reduced plan view, partly in section, showing one of these units completely collapsed;

Fig. 7 is a front or back elevation of one of these supporting units, partly in section;

Fig. 8 represents an enlargement of the left hand end of the structure shown in Fig. 6;

Fig. 9 is an enlarged plan view of a modified form of sighting device, used as shown in Fig. 2;

Fig. 10 is an elevation of the structure shown in Fig. 9;

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Fig. 11 is a plan view of a modified form of the extensible unit;

Fig. 12 is a side elevation of the structure shown in Fig. 11;

Fig. 13 is a fully collapsed view of a slightly modified form of the structure shown in Figs. 11 and 12;

Fig. 14 is a similar view, partly extended, showing the structure of Fig. 13 being used to exert pressure; and

Fig. 15 is an end view of the structure shown in Fig. 12.

The construction and use of the structure shown in Figs. 1 and 2 will first be described and then the differences between this and some other structures will be pointed out. In the structure as shown in Fig. 1, there is a central housing unit 1 which contains laterally extensible units 2 and 3 which are so connected by cables 4 and 5 that extension of either unit 2 or 3 will cause extension of the other. This sleeve is preferably of metal. This connection is shown in Fig. 8 in which one end of the cable 4 is shown connected to the unit 3 by a bolt 6. This cable passes around pulleys 7 and 8 and then back to the element 9 where it is connected to the extensible unit 2. As a result of this, if the extensible unit 3 is pulled out of the central housing 1 to elongate the bar, the cable 4 will also be pulled out and will cause the extensible unit or member 2 to move in the opposite direction from the motion of the unit 3. Therefore, this results in the entire construction being extended equal amounts from the middle of the housing 1. At the second end, the cable 5, passing around the pulley 10, has its ends connected to the units 2 and 3, reversely, that is, the bolt 6 passes through the end of the unit 2 and secures one end of the cable 5 thereto while the element 9 secures the second end of the cable 5 to the second end of the unit 3. Consequently, when either the extensible element 2 or 3 moves outwardly or inwardly, the other one does the same so that the outer ends of these units are kept identically the same distance from the center of the sighting means or pointer 11. It will be understood that the ends of units or bars 2 and 3 are enclosed in a housing 1 and are referred to herein as "adjacent ends."

A sleeve 12 is mounted in the housing 1 and the pointer 11 is mounted movably therein, being provided with a collar 13 which prevents the pointer from dropping through. The extensible units 2 and 3 are provided in their outer ends

with transverse openings for the reception of the suspending or supporting members 14, each of which is provided in its upper end with a transversely slidable supporting member 15 which, as shown in Figs. 3 and 4, may suspend the entire unit from the side frame members of the vehicle. The members 15 are shown in Fig. 3 as resting on the lower flanges of the channels 16 but, in Fig. 4, the members 15 are shown as extending through an opening in the flat body wall of the channel member. Each of the suspending members 14 is provided with a plurality of transverse grooves 17 which are spaced a definite distance apart, the space being, preferably, one inch (1"). A latching member 18 is pivotally mounted on a downward extension 19 from the part 20 which forms a part of the units 2 and 3. This latching means 18 is actuated by a spring 21 into latching engagement with the supporting member 14 and, by engagement in a transverse groove 17, holds the parts in definitely adjusted position.

As shown in Fig. 1, the intention is to have the three sighting members 11 directly in line in the center of the vehicle frame, unless that is bent, in which event the sighting members 11 will be out of alignment and the frame will then have to be straightened.

The structure shown in Figs. 9 and 10 may, as shown in Fig. 2, replace one of the sighting elements of Fig. 1. This structure of Figs. 9 and 10 comprises a bar 22 and a bar 23 secured at a right angle to the bar 22 and having a clip 24 arranged at the outer end of the bar 23, in one side of which clip is threadedly secured a thumb screw 25 which can be tightened against the housing 1 to hold the bar 22 at right angles to the housing 1. The bar 22 is provided with an opening 26 which may cooperate with a pointer 11 in the sleeve 12 in holding the bar 22 in properly centered position with relation to the vehicle frame. By this arrangement, the bar 22 holds the sighting means 11 in the axial plane of the vehicle so that, if the vehicle is straight, the two sighting means 11 at the rear end of the vehicle in Fig. 2 will be in alignment with the sighting means 11 at the front thereof.

The structure shown in Figs. 11 to 15 embodies the same principle as the structure described above but the use thereof is somewhat different in that the two bars, corresponding to the extensible units 2 and 3, are used to push elements or structures apart rather than suspending a sighting means from a vehicle frame. The housing 30 surrounds the channel members 31 and 32 and is held in fixed position with relation thereto by the bolts 33 and 34. As indicated in Fig. 11, a roller surrounds the bolt 33, inside of the housing 30 and pulleys are mounted on the bolts 34 and have cables 35 and 36 passing over them and over the pins 37 at the ends of the channel members 31 and 32, being fastened to the screw eyes 38, located in the channels, as indicated in Fig. 12. These screw eyes 38 are fastened in crossbars 39, secured to the flanges of the channels by suitable means, such as welding. The nuts on the screw eyes enable any slack in the cables to be taken up so that there will be no lost motion at either end of the tool. They also enable the making of adjustments so that the ends of the pushing bars will be equally distant from the mid-point 33.

Cross plates 40 connect together the U-shaped plates 41 and form guiding frames through which the channels 31 and 32 are slidable. These

guiding frames serve as abutments for the hydraulic jack 43, the head 44 of which bears against one of the guiding frames, and the second end 45 of which bears against a cross plate 46 connecting opposite plates 30 together. Fluid is supplied to the hydraulic jack 43 through the pipe 47. A jack 43 may be placed at either or both ends of the central housing 30.

In order to prevent the guide housing 40, 41 from sliding relatively to the channel members, when a jack is being used to cause relative motion thereof, pins 48 are put through the plates 41 and one of the channels 31 or 32, at the second end of the device. Therefore, both channels are free to move in either direction and each channel will carry with it one of the guide housings, due to the fact that the pins connect the housing to the channel. When the housing has been extended substantially to its limit, the pins 48 are withdrawn and the jack is collapsed so that the pins 48 may be put into other openings in the channels 31 and 32. In order to hold the device against collapsing when the pins 48 are withdrawn, a pin is inserted through the openings 49 and 50, as shown in Fig. 12, to prevent relative sliding of the channels 31 and 32. Guide pulleys for the cables 35 and 36 are mounted on the bolts 51 and help to hold the cables in their proper positions. The bolts 51 help to make the guide frames 40, 41 rigid and to withstand the pressure of the jack 43.

As is clear from Figs. 13 and 14, T-shaped blocks 52 may be secured to the ends of the channel members 31 and 32, and this will help to get the direction of push against the objects, for example, frame members, substantially in the axial line of the jack. The lengthening of this device will be seen by a comparison of Figs. 13 and 14. The resisting force is represented by the rectangles 53.

This device may be used in many ways, one of which is shown in Figs. 1 and 2 which consists in the supporting of sighting instruments. Another use is illustrated in Figs. 13 and 14 and represents the application of a force laterally. This device may also be used in the application of force vertically, as, for example, in the hoisting of an automobile. The device may have many other uses and it is therefore not intended to set them forth completely but only to indicate typical examples.

It will of course be understood that various departures from the structure disclosed herein may be made without departing from the spirit of this invention or being outside of the scope of the appended claims.

Having now described our invention, we claim:

1. In a mechanism of the type described, a pair of relatively slidable elongated metal members surrounded at their central portion by a housing and having their adjacent ends overlapped and connected by a flexible member, pulleys in said housing and rotatably held in the housing in relatively fixed position in relation to the housing, pivots connecting the pulleys to the housing, and cables connecting adjacent ends of said metal members and a centrally arranged pulley and passing around the pulleys in the housing whereby to connect the members to move in opposite directions simultaneously.

2. A structure as defined by claim 1 in which a sighting member is connected medially to the housing and extends transversely to the length of said metal members.

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3. A structure as defined by claim 1 in which a sighting member is connected medially to the housing and extends transversely to the length of the said metal members and has a sighting point at each of its ends.

4. A structure as defined by claim 1 in which each of the members has a head at its end remote from the housing and a suspending member extending transversely through the head, said suspending member having grooves therein to be engaged by a holding means whereby to hold the suspending means in vertically adjusted position with relation to the metal members, and holding means connected to the head and engageable with the grooves and holding the suspending means in adjusted positions.

5. A sighting means for a motor vehicle checking means comprising a supporting means which is readily adjustable in length from a central point outwardly in both directions simultaneously, and a sighting element attached thereto midway of its length, said sighting ele-

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ment comprising an elongated arm having a sighting point at each end and, at its mid-point, an arm extending transversely thereof and secured at a right angle to the axis of the first arm, the second arm, at its end remote from the junction, having a clamping means whereby the sighting element may be held perpendicular to the structure by which it is supported, said clamping means being secured to the end of the second arm remote from the first arm.

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The following references are of record in the file of this patent:

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