

[54] **WHEEL ALIGNMENT DEVICE**

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[58] Field of Search **72/704, 705, 389, 72/390**

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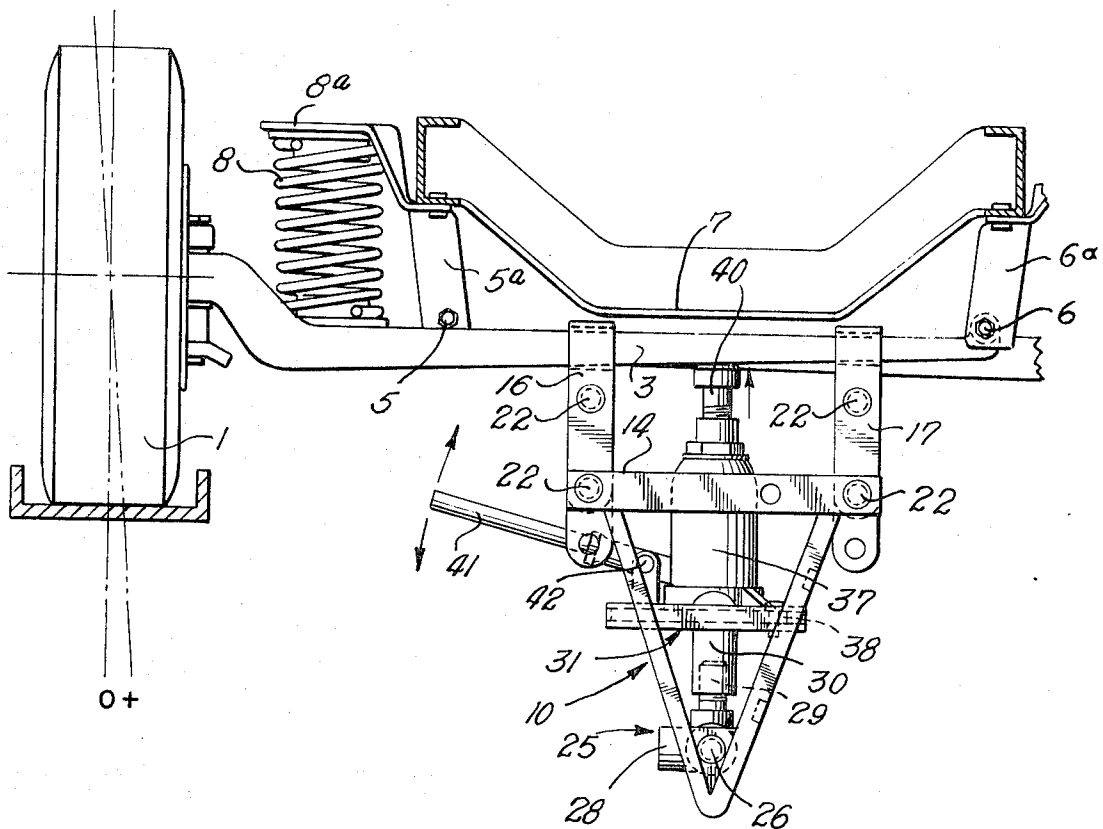
Attorney—Howard E. Moore et al.

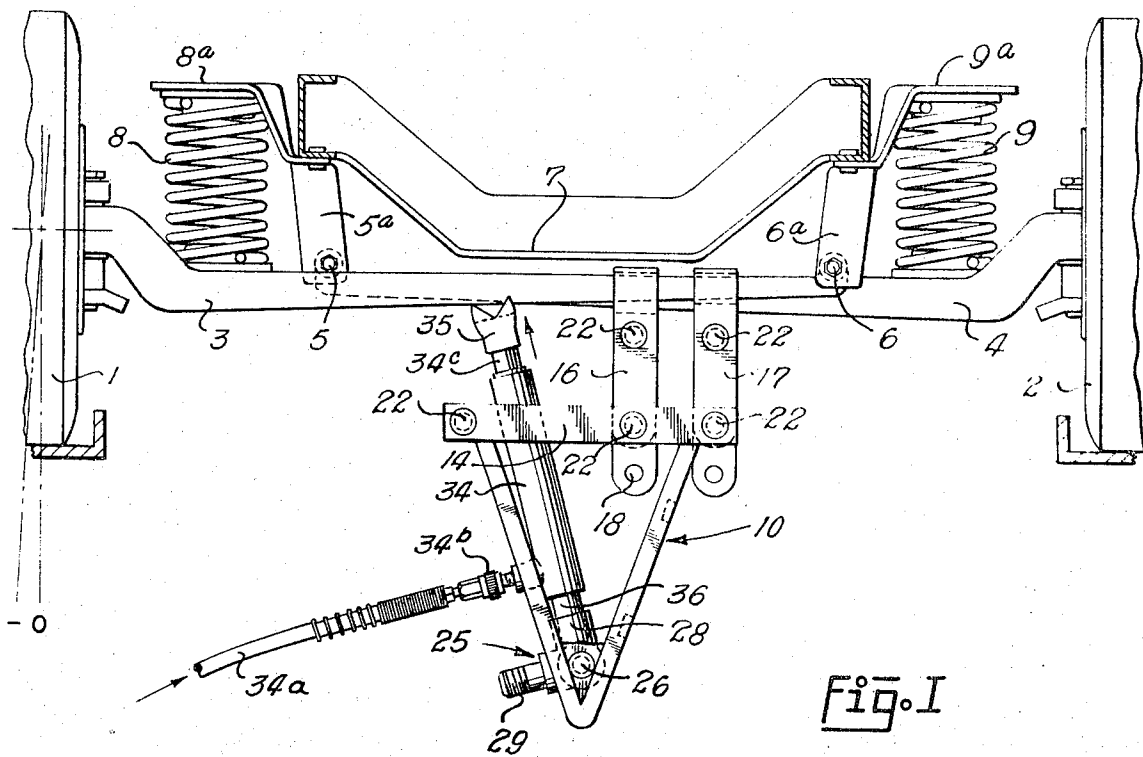
a vehicle consisting of a bifurcated frame between the sides of which is pivotally mounted either a fluid operated or mechanical jack having a force exerting member thereon arranged to engage a beam to be straightened. The frame may be suspended to the beam, and the force exerting member of the jack is engaged with the beam in position to exert a force thereagainst to straighten same. The jack is confined between the side members of the frame so that in the event it should become disengaged from the beam it is prevented from moving outwardly of the frame which might come into contact with and injure workmen using same. The suspending members for suspending the frame to the beam may be attached at selected locations along the upper sides of the beam so that the fluid pressure operated jack when employed therewith can either be placed between the suspension members to exert a straight force between the suspension members or the suspension members may be placed at one side of the force exerting member of the jack to allow the jack to engage the beam angularly with reference to the frame so that a bending force can be exerted against the beam to bend same outwardly of the suspension members.

[57] **ABSTRACT**

A device for straightening wheel suspension beams on

8 Claims, 3 Drawing Figures





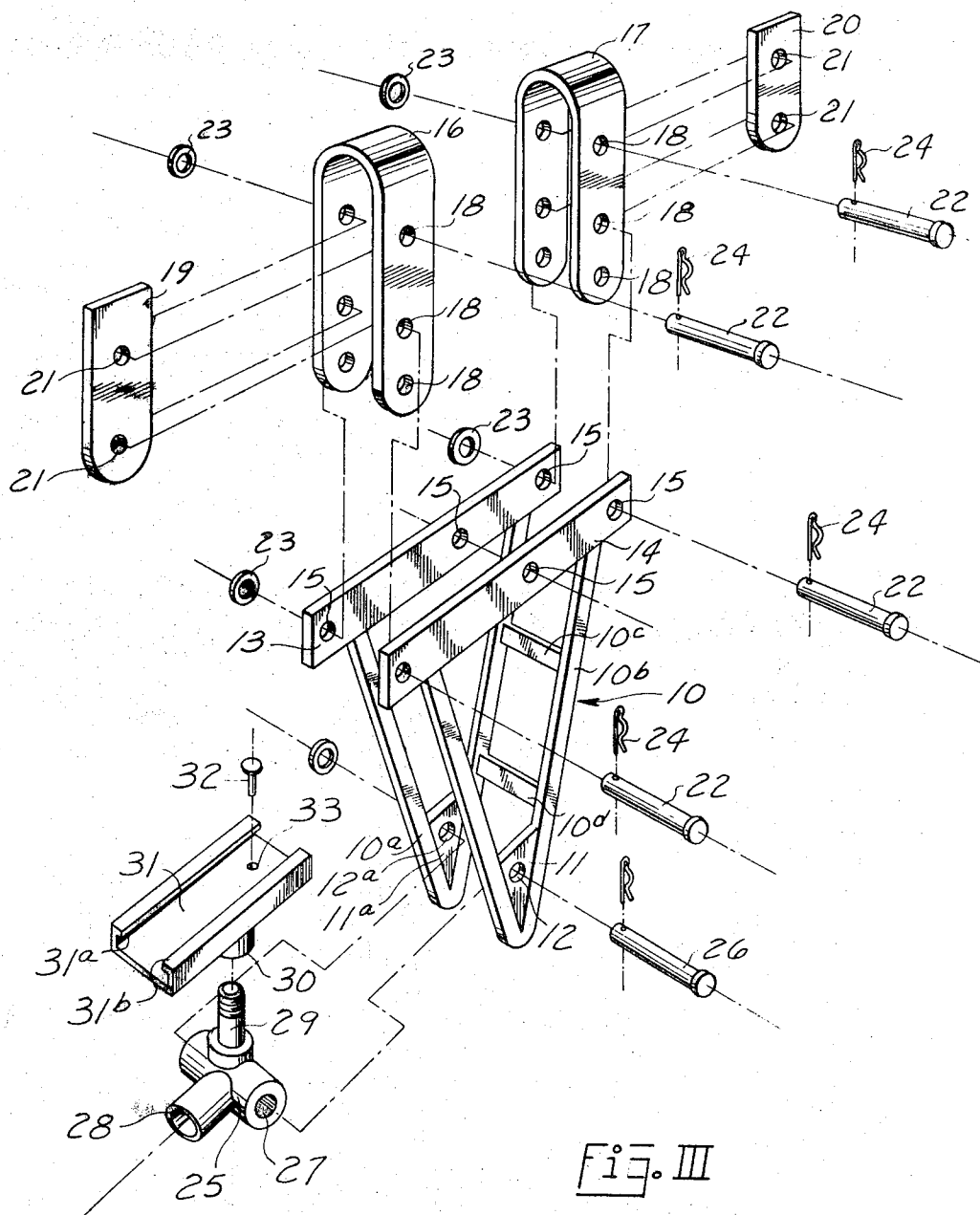


Fig. III

WHEEL ALIGNMENT DEVICE

BACKGROUND OF THE INVENTION

On automobiles and other vehicles the front wheels are pivotally mounted to the frame on separate I-beams. If the I-beams are bent the wheels thereon will be out of camber. When camber is properly set the front wheels are in alignment and the outer periphery of the wheels as they engage the ground will be slightly closer together than the upper sides thereof. If one or both of the I-beams is bent or distorted the wheel on which the beam is mounted will be out of camber which will cause difficult steering of the vehicle as well as causing irregular wear to the tire.

Heretofore devices have been provided for straightening the I-beams, which either consisted of a jack supported between a ground supported rail or frame and means attached between the ground supported member and the I-beam to support same while force is exerted thereto by the jack, or a frame suspended to the beam with the jack disposed between the frame and the beam in such a manner that if the jack became disengaged it could be ejected outwardly from the frame in such a manner as to injure workmen in the vicinity.

The improvements to which this invention is addressed are concerned with a simple, portable beam straightening device wherein the jack is confined within the frame and prevented from sidewise ejection therefrom, which can be attached to either exert a lateral force or a straight force, which is adapted for utilization of either a fluid operated or mechanical jack, and provides for complete safety in use.

It is, therefore, a primary object of the invention to provide a beam straightening device which is economical to manufacture, compact, transportable, and safe to use.

Another object of the invention is to provide a beam straightening device with which can be adapted to utilize either a fluid operated or mechanical jack.

Still another object of the invention is to provide a beam straightening device in which straightening force may be exerted either angularly or straight.

A further object of the invention is to provide a beam straightening frame which may be suspended to the beam being straightened and straightening force may be exerted therebetween and the member being straightened.

Still another object of the invention is to provide a frame straightening device having a frame with spaced sides thereof whereby a force exerting member may be pivotally mounted between said sides in a manner that it is confined therein against lateral ejection in the event it should slip.

DESCRIPTION OF THE DRAWINGS

A suitable embodiment of the invention is shown in the attached drawings, wherein;

FIG. I is a side elevational view of a preferred form of wheel alignment device wherein is employed a pressure fluid actuated jack;

FIG. II is a side elevational view of a modified form of wheel alignment device wherein is employed a mechanical jack; and,

FIG. III is an exploded perspective view of the frame, frame for the wheel alignment device, jack supporting means mountable on the frame, and suspension means for the frame.

DESCRIPTION OF A PREFERRED EMBODIMENT

Numeral references are employed to indicate various parts shown in the drawings and like numerals indicate like parts throughout the various figures of the drawings.

The numerals 1 and 2 indicate tire supporting wheels of a vehicle which are pivotally mounted on twin I-beams 3 and 4. The I-beams 3 and 4 are pivotally mounted at 5 and 6 to suspension members 5a and 6a respectively, which in turn are suspended to the frame 7 of the vehicle.

The frame 7 is resiliently supported on the springs 8 and 9 which are positioned between the I-beams 3 and 4 respectively and upper stop members 8a and 9a carried by the frame 7.

The supporting frame 10 of the wheel alignment device includes spaced substantially triangularly shaped side members 10a and 10b which are reinforced by webs 11 and 11a at the apex, having aligned bolt receiving passages 12 and 12a provided therethrough. The side members are rigidly spaced apart by brace members 10c and 10d.

The frame 10 also includes spaced parallel upper rail members 13 and 14 which have spaced aligned bolt receiving holes 15 therein for the purpose of suspending the clevises 16 and 17 thereto.

The clevises or suspension members 16 and 17 are arranged to be placed about the beams 3 or 4 for suspending the frame 10 thereto. The clevises 16 and 17 have aligned spaced bolt receiving holes therein for the purpose of attachment of same in adjusted position to the upper parallel frame members 13 and 14 by passing the bolts 22 through the aligned holes and securing same in place by cotter pins 24, after placing the washers 23 thereon.

In order to adapt the hanger clevises 16 and 17 to fit about the beams 3 or 4, flat spacer members 19 and 20, having bolt receiving holes 21 therethrough may be placed between a side of the clevises and the side frames 13 and 14 to thereby provide a firm engagement between said members.

A jack support member 25 may be pivotally attached to the frame 10 by means of a pivot pin 26 passed through the aligned holes 12 and 12a and the bore 27 extending through the support member 25.

The support member 25 includes an interiorly threaded projection 28 thereon into which an externally threaded extension 36 on the jack 34 may be threadedly engaged to support the said jack on the support 25.

The support 25 also includes a male threaded projection 29 thereon to which the pressure fluid supply line 34a may be threadedly engaged by means of a suitable fitting 34d.

A pressure fluid actuated jack 34 may be attached to the jack support member 25 by threadedly engaging a male threaded extension 36 with the interiorly threaded projection 28 thereon. The pin 26 inserted through the aligned holes 12 and 12a in the bore 27 and the support member 25 and secured in place by washer 26a and cotter key 26b respectively permits the jack 34 to pivot upon said pivot pin 26 to thereby permit the adjustment of the angle of engagement of the end 35 of jack 34 to exert force against the beam 3 or 4 with which it is engaged, when pressure fluid is applied through the hose 34a to the cylinder 34 to thereby

cause the outward movement of the rod 34c from the pressure cylinder 34.

DESCRIPTION OF MODIFIED FORM

In the modified form shown in FIG. II the wheel alignment device is adapted for use with a mechanical jack 37. The jack 37 has a base plate 38 thereon. The base plate 38 is adapted to be inserted in the channels provided by the flanges 31a and 31b on the upper edge of mounting plate 31. The hole 33 in mounting plate 31 is aligned with a corresponding hole (not shown) provided in the base plate 38 on the jack 37 so that the plates 31 and 38 may be secured together by the bolt 32 inserted through the aligned holes therein.

When the mechanical jack is employed with the frame 10 the support member 25 is rotated about the pin 26 to a position where the male threaded projection 29 extends upwardly so that the interiorly threaded socket 30 on the lower face of the mounting plate 31 is in position to be threadedly engaged therewith, to thereby support the jack 37 on the support member 25.

The jack 37 has a force applying shaft 40 adjustably threaded in the upper end of the jack which is arranged to contact a beam 3 or 4 to exert force thereagainst to straighten same when the device is suspended to the said beam by the suspension members 16 and 17 as shown in FIG. II. As shown in said figure the force applying member 40 is disposed between the suspension members 16 and 17 so that a force can be exerted upwardly on the beam 3 between the suspension members 16 and 17 to bend the beam 3 sufficiently to straighten same.

An appropriate handle 41 is pivotally connected at 42 to the base plate 38 which in turn is connected by appropriate gear arrangement (not shown) to the engaging member 40 to impart rotative motion thereto to thereby move same outwardly to exert straightening force to beam member 3 or 4.

As shown in FIG. I the suspension clevises 16 and 17 may be engaged with the holes 15 at one side of the jack 34 or 37, which permits the jack to be disposed at an angle to engage the beam 3 to thereby exert a bending force to the beam 3 to straighten same. However, it will be understood that the suspension members 16 and 17 could be spaced on opposite sides of the jack 34 or 37 as shown in FIG. II to permit the application of a straight force against the beam 3 or 4.

Thus, it will be seen that I have provided a wheel alignment device with which may be utilized either with a pressure actuated or mechanical jack, which is compact, portable, economical, simple to operate, which is safe to use, and in which bending force for straightening a beam to which the device is suspended may be di-

rected either angularly or straight.

It will be understood that other and further embodiments of the invention may be devised without departing from the spirit and scope of the appended claims.

Having described my invention I claim:

1. In a wheel alignment device, a frame, including spaced side members; parallel spaced apart rails connecting the side members at one end thereof; at least one transverse spacer member secured between the side members; a jack; means pivotally mounting the jack to the frame at the end thereof opposite said rails, said jack being freely extended between the side members and the rails and confined therebetween against movement outwardly of the frame; means attached to the rails for suspending the frame to a beam to be straightened; and a force exerting member movably extending from the free end of the jack engageable with a beam to be straightened.

2. The combination called for in claim 1 with the addition of adjustment means between the suspension means and the rail to permit the suspension means to be attached either at one side of or on both sides of the jack.

3. The combination called for in claim 2 wherein the adjustment means comprises spaced aligned holes in the rails, and holes in the suspension means arranged to be brought into alignment therewith; and detachable fastening means extendible through the aligned holes.

4. The combination called for in claim 1 wherein the jack is a pressure fluid operated jack.

5. The combination called for in claim 1 wherein the jack is a mechanically operated jack.

6. The combination called for in claim 5 with the addition of a mounting plate secured between the side members; and the base plate on the jack detachably secured to the mounting plate.

7. The combination called for in claim 5 with the addition of a jack mounting member comprising a body having a bolt receiving bore therethrough arranged to pivotally mount same to the frame; a threaded projection on the mounting plate arranged to be threadedly engaged with the threaded projection on the body; a base plate on the jack; and means to secure the mounted plate to the base plate.

8. The combination called for in claim 4 wherein the member for pivotally mounting the jack to the frame comprises a hollow body having a transverse bore therein arranged to receive a mounting member; means on the body for engagement thereof with the cylinder of the jack; and means on the body for engagement thereof with a source of pressure fluid.

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