Dec. 13, 1955 W. W. FULTZ 2,726,703

AXLE AND FLANGE STRAIGHTENER

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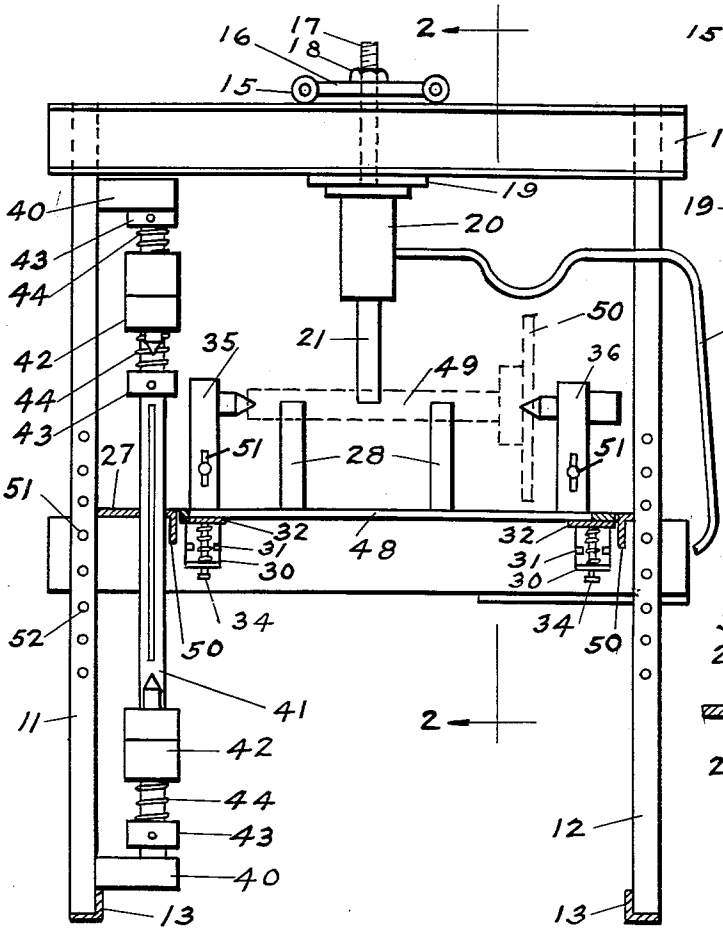


FIG 1

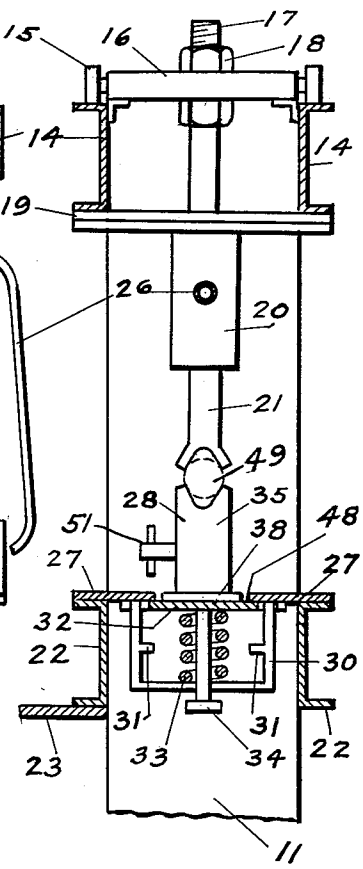


FIG. 2.

INVENTOR.

WILLIAM W. FULTZ.

BY Howard J. Whelan.

ATTORNEY.

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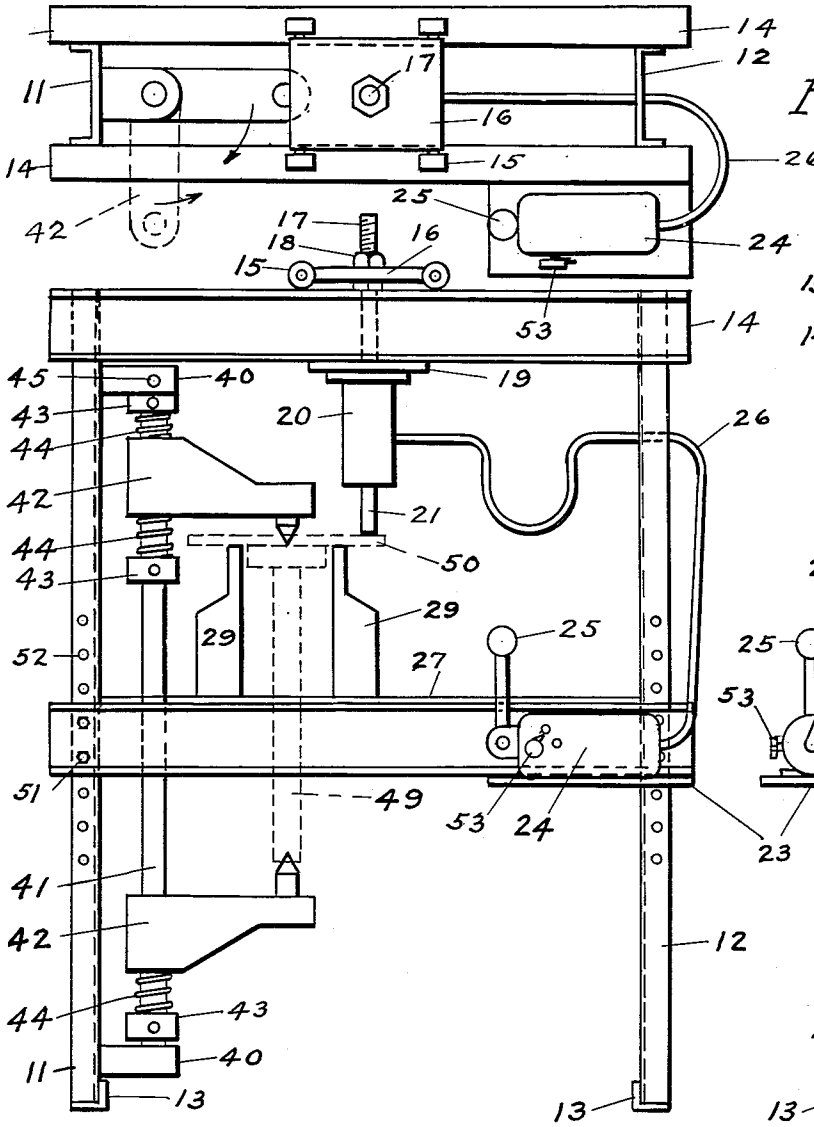


FIG. 3.

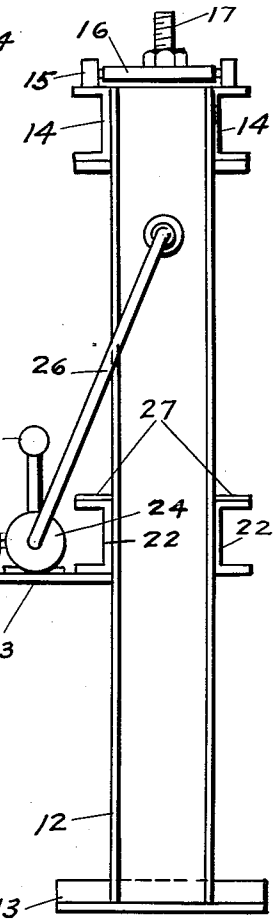


FIG. 5.

FIG 4

INVENTOR.

WILLIAM W. FULTZ.

BY Howard J. Whelan.

ATTORNEY.

United States Patent Office 2,726,703 Patented Dec. 13, 1955

2,726,703

AXLE AND FLANGE STRAIGHTENER

William W. Fultz, Baltimore, Md.

Application January 24, 1952, Serial No. 268,055

3 Claims. (Cl. 153—52)

This invention relates to apparatus for straightening axles and more particularly to a device for straightening rear automobile axles with wheel flanges attached thereto.

At the present time there is a lack of axle and wheel flange straighteners and it is customary and cheaper to discard the bent rear axle and bent wheel flange and replace them with new ones, than it is to attempt to straighten them with the equipment now available.

It is an object of the invention to provide a single unit for centering and straightening the rear axle and the wheel flange of an automobile while cold.

A further object of the invention is to provide a spring tensioned centering device for straightening rear axles and wheel flanges.

A further object of the present invention is to provide a new and improved portable axle straightening device with a removable centering device to enable the machine to be used for straightening wheel flanges.

It is an additional object of this invention to provide a straightening device of the spring tensioned type compressible when the straightener pressure is applied and automatically returning to its starting position when the pressure is released.

It is an additional object of this invention to provide a new and improved straightening device having a spring loaded platform which is depressed a predetermined amount until it stops, straightening the bent article and returning to its starting point after the pressure is removed.

Other objects of the invention will become apparent as the invention is more fully set forth.

For a clearer understanding of the invention and the objects thereof, reference is made to the accompanying drawings, wherein a particular form of the invention is indicated. These drawings when used in conjunction with the following description serve to illustrate the invention, its principles and the operation thereof, while the claims indicate the scope thereof.

In the drawings:

Figure 1 is a front elevation of the axle and flange straightener embodying this invention showing the machine adjusted for straightening the axle, shown in dotted outline;

Figure 2 is an enlarged sectional view taken along line 2—2 of Figure 1;

Figure 3 is a front elevation similar to Figure 1, except that the machine is set up for straightening the wheel flange;

Figure 4 is a plan view of Figure 3, showing the centering device in full lines in position for straightening the wheel flange and in dotted outline when moved out of the way when using the axle straightening device, as shown in Figure 1; and

Figure 5 is an end elevation of Figure 3.

Similar reference characters refer to similar parts throughout the drawings.

In the construction shown in the drawings the side uprights 11 and 12 are provided with bearing angles 13 at their lower ends to distribute the load over a greater area of the floor the machine is positioned on. The upper ends of the side uprights 11 and 12 are tied together by top members 14. The upper face of each member acts as a bearing surface for rollers 15, attached to a plate 16, to roll over. The plate 16 supports a stud 17 attached to it by nuts 18. The lower end of the stud 17 passes through a bearing plate 19 and supports a hydraulic jack 20 which can be slid along the members 14 to suit the location of the bend in the axle to be straightened. The lower end of the jack is provided with interchangeable pusher bars 21 to suit the shape of the axle or flange to be worked on. Channels 22 are positioned on the side uprights 11 and 12 below the members 14 preferably by bolts 51 positioned in holes 52 to allow these channels to be adjustably positioned on the side uprights to suit the job to be worked on. A shelf 23 is preferably attached to the lower end of the front channel 22 to support a hydraulic pump to be operated by a handle 25 to force the pressure medium through the hose 26 to operate the jack 20. The hydraulic jack, and pump mentioned herein are of conventional construction and design and their operation are well known to those versed in the art.

A slotted plate 27 is attached to the upper face of the channels 22 and acts as a guide for the anvils 28 and 29 loosely positioned on floating supports 32. The plate 27 also supports U members 30 projecting downwardly therefrom that act as guides for supports 32 resting on springs 33 which move upwardly until they contact the lower face of the plate 27 and move downwardly until they reach the stops 31. Plungers 34 are attached to the supports 32 and move with them. A pair of centers comprising a dead center 35 and a live or spring tensioned center 36 of conventional design are positioned on a removable plate 38 that rests on the floating supports 32. The plate 38 and the centers are removed from the plate 27 to provide access to a slot 48 as noted in Figure 2 so that the axle 49 can project through it to be attached to the vertical centers. Handles 51 are used to tighten the centers 35 and 36 to the plate 38 when properly adjusted.

The vertical centering unit is used after the axle has been straightened and forms part of the wheel flange straightener and comprises a pair of brackets 40 affixed to the side upright 11 and supporting a shaft 41 having a key 41 which align the vertical centering bearing 42. Springs 44 and collars 43 are positioned on the shaft and adjusted to tension and cushion the vertical center bearings 42 to suit the length of the axles they are to be used with. The shaft 41 is held against rotation by a pin 45 that holds it in fixed relationship to the brackets 40 as shown in Figures 1 and 3 during the flange straightening operation.

One method of operating the device is to place the axle 49 between the centers 35 and 36 (see Fig. 1) and the anvils 28 are positioned under the axle. The handle 25 is moved back and forth causing the hydraulic pump to pump the hydraulic medium through the hose to the jack 20, causing the pusher bar 21 down against the axle 49, this causes the centers 35 and 36, anvils 28, axle 49 and removable plate 38 to depress the floating supports 32 until they reach the stops 31 which limits its downward travel, further pressure by the pusher bar 21 against the axle 49 bends it sufficiently to straighten it. The valve 53 on the hydraulic pump is reversed and reverses the action of the jack 20 and raises the pusher bar 21 allowing the axle, anvils 28 and centers 35 and 36, removable plate 38 and floating supports 32 to rise through the action of springs 33 until the floating supports contact the plate 27. The axle 49 is pressed against the spring loaded center 36 and removed from between the centers 35 and 36. The removable plate 38 and centers are re-

moved from the plate 27, leaving a slot or hole therein. The vertical centers 42 are then swung into the position shown in Figure 3, and the axle 49 is extended through the slot 48 and then placed between the centers 42, the anvils 28 are then placed under the flanges as shown in Figure 3, the valve 53 is then positioned, the handle 25 is moved forcing the hydraulic medium from the pump through the hose 26 to the jack 20 forcing the pusher bar 21 against the flange 50 and straightening it. The valve 53 is reversed allowing the pusher bar 21 to be retracted upwardly, and the straightened axle and wheel flange to be removed from the centers 42. The pin 45 is removed and the centers 42 are then swung out of the way as shown in dotted lines in Figure 4, and the removable plate 38 and centers 35 and 36 are then replaced and another axle is affixed to be straightened and the operation repeated.

While but one general form of the invention is shown in the drawings and described in the specification, it is not desired to limit this application for patent to this particular form as it is appreciated that other forms of construction could be made that would use the same principles and come within the scope of the appended claims.

Having thus described the invention, what is claimed is:

1. A straightening apparatus of the kind described comprising a frame composed of a pair of side members and an upper cross member connecting the upper ends of the side members, a jack carried by said cross member and slidable therealong, a plate carried by said side members below the cross member, a pair of spaced-apart centering elements adapted to engage the ends of a bent axle therebetween, in proximity to the aforesaid jack, a

pair of anvils located between the centering elements and supporting the bent axle, and means for yieldingly supporting said centering elements and anvils on the aforesaid plate while the jack presses the axle back to shape.

2. A straightening apparatus as set forth in claim 1 wherein the yielding supporting means consist of a pair of U-shaped brackets mounted on and beneath the plate, a pair of supports, said plate having a longitudinal opening and said supports extending beneath the said opening, each of said supports having a stem depending therefrom and being guided by the cooperating U-shaped bracket, and a helical spring abutting the U-shaped bracket and coiled about the stem.

3. A straightening apparatus as set forth in claim 2 including stops carried by the U-shaped bracket to limit the yielding movement of the supports.

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