

[54] VEHICLE FRAME STRAIGHTENING TOOL	3,340,720	9/1967	Chartier.....	72/705
[76] Inventor: Robert B. Hoffman, P.O. Box 505, Burlingame, Calif. 94010	3,566,666	3/1971	Berendt et al.	72/705
	3,566,667	3/1971	Hagerty	72/705
	3,612,482	10/1971	Eck.....	72/705

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[21] Appl. No.: 447,470

Related U.S. Application Data

[63] Continuation of Ser. No. 244,821, April 17, 1972.

[52] U.S. Cl.....	72/442, 72/705
[51] Int. Cl.....	B21d 1/12
[58] Field of Search	72/705, 305, 302, 457, 72/442

[56]

References Cited

UNITED STATES PATENTS

3,122,194	2/1964	Bronson.....	72/705
3,149,660	9/1964	Smith.....	72/705
3,338,083	8/1967	Eck.....	72/705

Primary Examiner—C. W. Lanham

Assistant Examiner—M. J. Keenan

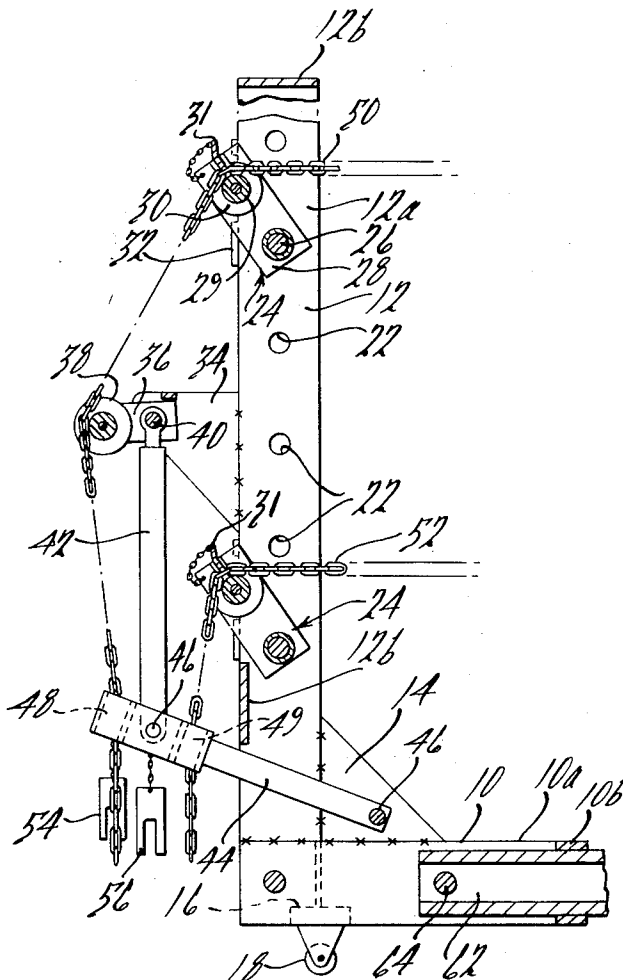
Attorney, Agent, or Firm—Harness, Dickey & Pierce

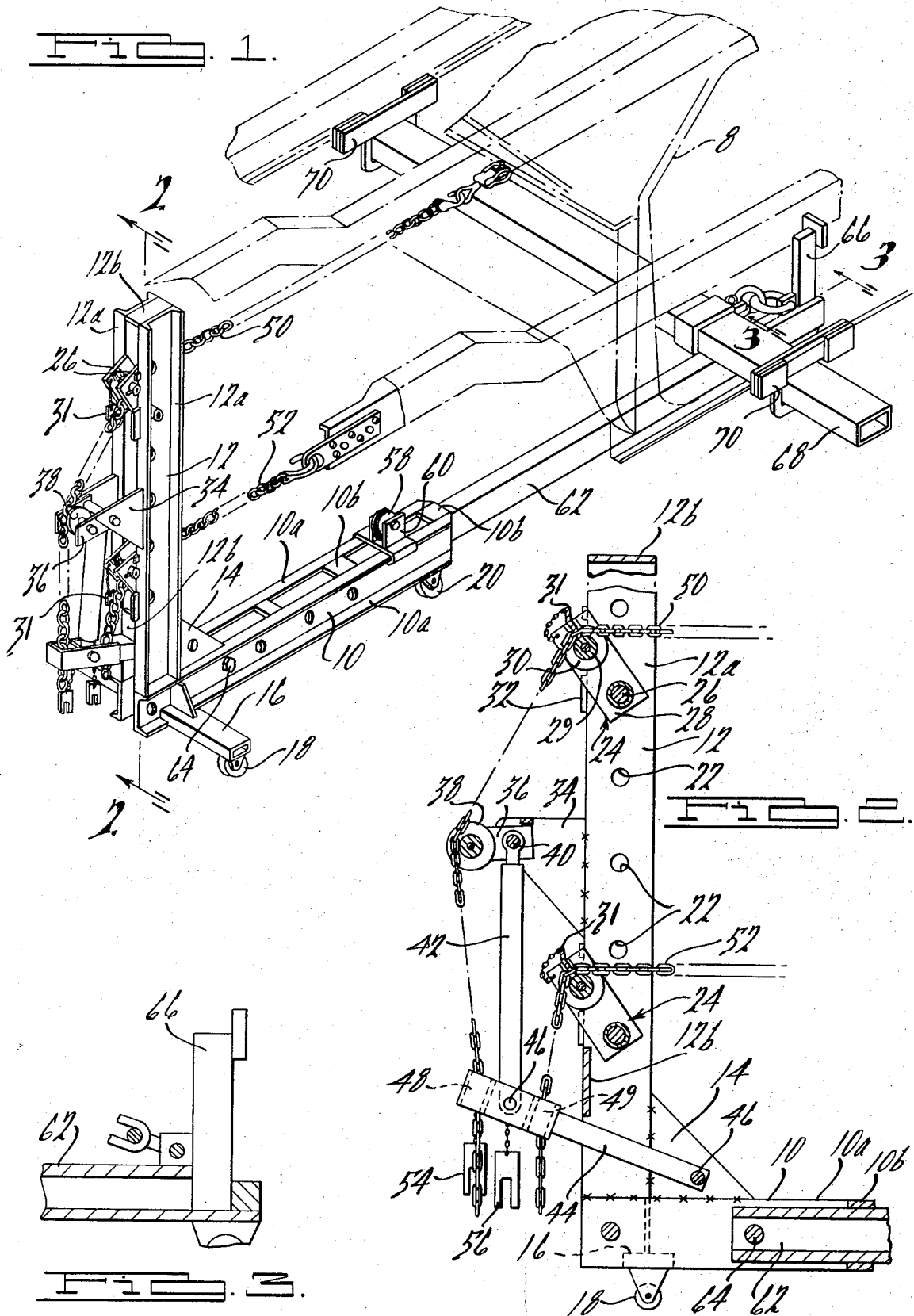
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ABSTRACT

A portable frame straightening machine in which a vertical post is fixed to one end of a horizontal beam that is adapted to be positioned under an automobile body to be straightened. A lever pivoted on the machine adjacent the bottom of the post is operated by a hydraulic ram and is capable of pulling two separate chains which pass over pulleys adjustably positioned on the vertical post.

6 Claims, 3 Drawing Figures





VEHICLE FRAME STRAIGHTENING TOOL

This is a continuation of application Ser. No. 244,821, filed Apr. 17, 1972, now abandoned.

BACKGROUND OF THE INVENTION

A wide variety of frame straightening machines have been proposed for the repair of damaged automobile bodies and frames. Such devices ordinarily employ chains which are designed to be connected to a portion of the automobile body or frame to be repaired. Many of such devices have lacked portability and have been rather cumbersome and time consuming to use. The frame straightening machine of the present invention is distinguished by its ability to make two simultaneous pulls on different portions of the vehicle body and either pull may be started or stopped at any desired time. The machine of the present invention is further characterized by its wide versatility of use, its easy portability which permits it to be positioned adjacent any portion of the automobile, the ability of the chains to pull from any given elevation on the vertical post, its rugged and durable construction and its ability to be manufactured at a reasonable cost.

BRIEF DESCRIPTION OF THE ILLUSTRATED VIEWS OF THE DRAWING

FIG. 1 is a perspective view of the frame straightening machine of the present invention shown in operative relation to an automobile body;

FIG. 2 is a sectional view of the structure illustrated in FIG. 1 taken along the line 2—2 thereof; and

FIG. 3 is a sectional view of the structure illustrated in FIG. 1 taken along the line 3—3 thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The frame straightening machine of the present invention includes a horizontal beam 10 which is made from two spaced, parallel channel members 10a having their channels arranged in outwardly facing positions and connected by cross members 10b. A fixed post 12 is positioned at one end of the horizontal beam 10 and is made from two spaced, parallel channel members 12a which are connected by cross members 12b. Deflection of the post 12 relative to the beam 10 is resisted by a pair of triangular gusset plates 14.

A pair of arms 16 project from opposite sides of the beam 10 in a location beneath the post 12. Casters 18 are positioned on the bottoms of the arms 16 at the outer ends thereof while a caster 20 is positioned on the bottom of the beam 10 at the end thereof opposite from the arms 16. Thus, the device is rendered fully portable for movement about a garage floor to a desired location adjacent an automobile body to be repaired, as shown in phantom at 8.

It will be seen that pairs of aligned apertures 22 are formed in the channel members 12b of the post 12 for the purpose of supporting a pair of roller assemblies 24. Each roller assembly 24 is held in a desired position on the post 12 by a fastened bolt 26 which passes through a pair of apertures 22 and through an aperture in the roller assembly 24. Each roller assembly 24 will be seen to include a pair of spaced parallel plates 28 having a tube 29 welded therebetween to rotatably support a chain guiding roller 30. A chain locking fork 31 is carried on each roller assembly 24 and can be selectively

fitted in a chain locking position between the plates 28 as shown in FIG. 2. Alternatively, the forks 31 may be disengaged from their associated chains as illustrated in FIG. 1. A pair of abutment plates 32 are welded to the plates 28 to abut the outer side of each channel member 12a to cooperate with the bolt 26 in securing the roller assembly in a desired angular position on the post 12.

Fixedly mounted on the outer side of the post 12 at about its mid-length are a pair of spaced brackets 34 supporting a pair of spaced arms 36. The arms 36 serve to rotatably support a chain guiding roller 38 and a pivot bar 40. Connected to the pivot bar 40 at its upper end is a hydraulic actuating cylinder 42, the lower end of which is connected to a power arm 44. The cylinder is designed to be operated by any conventional hydraulic pump (not shown). The power arm 44 is pivotably fastened to a bolt 46 extending between the gusset plates 14. The construction of the power arm 44 is of particular importance and include a pair of openings 48 and 49 formed therein on opposite sides of the bolt 46.

A pair of chains 50 and 52 are adapted to be connected to portions of the automobile body to be pulled. The chain 50 will be seen to be guided over the upper one of the roller assemblies 24, over the guide roller 38 and thence down through the opening 48. The chain 52 will be seen to be guided over the lower roller assembly 24 and thence down through the opening 49. When hydraulic fluid is delivered to the hydraulic cylinder 42, the cylinder is moved downwardly to pivot the power arm 44 in a downward direction. This movement is transmitted to the chains 50 and 52 through notched latching plates 54 and 56 which are loosely fitted on the chains 50 and 52, respectively, and abut the lower side of the power arm 44. Either latching plate 54 or 56 may be engaged with or disengaged from its chain 50 or 52 at any time during the downward movement of the power arm 44. It will be appreciated that the positions of the two roller guide assemblies 24 may be changed to make the desired pulls at any given elevation coincident with a pair of the apertures 22.

The lower chain 52 can, if desired, be run beneath the roller 58 of a roller assembly 60 which is slidably guided on the upper surface of the horizontal beam 10. Thus, a substantially downward pull can be made by running the chain 52 under the roller 58, thence over the lower guide roller assembly 24 and thence into the opening 49.

Two alternative means are shown for providing a reactive force to the pulling force of the chains. One includes an extension leg 62 which fits between the channel members 10a of the horizontal beam 10 and is locked in a given position thereon by means of a bolt 64. An upstanding foot 66 is removably fitted on the free end of the leg 62 to abut a portion of the automobile body or frame. Alternatively, the extension leg 62 may be connected to a cross bar 68 fitted through clamps 70 clamped to a portion of the automobile body. Ordinarily, either the foot 66 or the cross bar 68 with its clamp 70 would be used. Both would not be used simultaneously.

What is claimed is:

1. A portable vehicle frame straightening machine including a horizontal beam adapted to be positioned beneath an automobile body to be repaired, a fixed vertical post disposed at one end of said beam and having

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a plurality of vertically spaced openings therein, a pair of guide roller assemblies positionable at any one of said openings, a selectively engageable chain locking means on each of said guide roller assemblies, a power arm pivoted on said machine adjacent the lower end of said post, said arm having a pair of spaced chain receiving means, a pair of pulling chains extending over said guide roller assemblies and each passing through one of said pair of chain receiving means, a hydraulic cylinder for pivoting said power arm in a downward direction and means for supporting said cylinder on said post in a position above said power arm and means for selectively and independently connecting both of said chains to said power arm chain receiving means whereby said chains may be pulled simultaneously by said power arm, one of said chains then being disengaged from said power arm and locked by the chain locking means of its associated roller assembly and the pull connected on the other of said chains.

2. The structure set forth in claim 1 in which said hydraulic cylinder is connected to said power arm in a location between said pair of chain receiving means.

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3. The structure set forth in claim 1 in which said horizontal beam comprises a pair of outwardly facing channel members connected by a plurality of cross members.

4. The structure set forth in claim 1 including a pair of gusset plates connecting said post to said horizontal beam, said power arm being pivotally supported between said gusset plates.

5. The structure set forth in claim 1 in which said roller assemblies each comprise a pair of plates having a roller supported therebetween.

6. The structure set forth in claim 1 in which said post includes a pair of outwardly facing spaced channel members and in which said guide roller assemblies comprise a pair of spaced parallel plates adapted to be fitted between said channel members and having aperture means therein adapted to be aligned with a pair of aligned apertures in said channel members and fastener means adapted to connect said guide roller assembly to said post at a pair of apertures thereof.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,835,692 Dated September 17, 1974

Inventor(s) ROBERT B. HOFFMAN

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, line 18 (Claim 1, line 22), "connected" should
be -- continued --.

Signed and sealed this 17th day of December 1974.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents