This is a car repair jack for manually or electrically applying pushing or pulling pressure to automobile body or bumper parts which have become bent, as in an accident, to straighten them out as much as possible. It utilizes a jack consisting of a stanchion which is inserted in a socket fixed in the pavement. Pivoting journaled on the top of the stanchion is a screw rotatable in either direction by a manually operable crank handle or low power reversible electric motor. The screw is threaded through a nut pivotally secured at the top of an angular arm whose bottom end is pivotally clamped on the stanchion substantially below the top. A bracket, in the same plane with the screw, is adjustably pivoted by a removable pivot pin to the angular arm, and extends beyond the stanchion and has a screw thread therein in which a hook or a push-bar may be threaded. A chain is placed on the hook, so that a suitable clamp or hook may be placed about a bumper for pulling out a dent, and a push-bar may be threaded into the bracket instead of the hook for applying push pressure to any part of the car body or bumper.

11 Claims, 8 Drawing Figures
JACK FOR REPAIRING CAR BODY PARTS

Further, both the angular arm and the bracket are provided with a number of pivot pin receiving holes so that the mechanical ratio may be varied as desired. Additionally, instead of placing the crank handle directly on the screw, it may rotate one gear of an intermeshing gear on the screw, the gear ratio being as desired 2 to 1, 3 to 1, etc.

Also, a reversible electric motor may be substituted for the crank handle in either form. It is particularly intended for use in a small garage or building, and as many as eight or more sockets may be spaced about the car position, so the stanchion may be placed in any one socket at a time. When not in use, the sockets are preferably closed with a removable cap.

To operate in as small an area as possible, the crank handle is preferably placed nearer the car, but it may obviously be placed at the other end of the screw, if ample space is available. The bracket is preferably oblong in shape and extends on the outside of the stanchion and the angular arm. A low power electric motor may be substituted for the crank handle, to operate the screw at low speed, so as to keep the straightening process under ready visual control.

OBJECTS OF THIS INVENTION

It is an object of this invention to provide a low power operable jack that can apply pulling or pushing pressure to a bent part of an automobile or other type of vehicle for straightening the part to its proper position.

A still further object of this invention is to provide a pressure or tension applying tool wherein its mechanical advantage may be adjusted so that low power manual or electric motor operation is still sufficient to provide the necessary pull or push to do the straightening.

Yet a further object of this invention is to provide a car body or bumper straightening that may be manually or electrically operated and yet provide sufficient power to straighten bent bumpers as well as bent body panels.

Still, a further object of this invention is to provide a manually or electrically operable bar part straightening device that can apply straightening pressure or tension at a slow rate that can be visually observed and thus easily controlled to just the right amount without great difficulty.

Another object of this invention is to provide a car body part straightening device that can be set up in a small space, such as a garage, and wherein the device may be selectively positioned to as many as eight or more positions for working on different car parts without relocating the car.

Yet another object of this invention is to provide a vehicle body or bumper straightening device that may be used on vehicles such as campers, travel homes, heavy cars, tractors, etc.

A further object of this invention is to provide a vehicle straightening tool that is readily adjustable to apply easily controlled pressure or tension on any vehicle body or bumper part, so that just enough pressure or tension is applied without applying any excess in pressure or tension.

A further object of this invention is to provide a vehicle part straightening jack that may be manually operated by a crank handle, or may be electrically operated by a low power reversible electric motor at as slow a rate as manual crank operation, so that the same visual control of the straightening process is maintained.

Yet a further object of this invention is to provide a vehicle body part straightening jack with an adjustable mechanical advantage that may be operated either manually or by a low power reversible motor at a slow rate of speed to avoid continuing the pulling or pushing process any longer than just enough to straighten the part without overdoing it.

BRIEF SUMMARY OF THE INVENTION

In brief, this invention is a car repair jack and is a screw-threaded jack having a stanchion that may be selectively placed and supported in any one of a number of sockets surrounding the vehicle area, particularly in a small garage area, so that low power pressure or tension may be applied to the car or bumper or other parts thereof for straightening any parts that have been bent or dented in an accident. The screw is operated by a manually or electrically rotatable crank handle, the screw being journaled in a sleeve pivoted to the top of the stanchion, and a nut on the screw is pivoted to the top end of an angular arm whose bottom end is pivoted to a clamp about the stanchion. A bracket is adjustably pivoted to the angular arm, both the arm and bracket having a number of pivot holes through which a pivot pin is selectively inserted, and one end of the repair tool mounting bracket is threaded to receive either a push-bar or a hook for a chain. The push-bar is used for applying pressure to appropriate bent parts of a vehicle, while the chain will have a suitable clamp or hook for pulling on a car part, such as a bent bumper. The stanchion sockets may be closed by a plug cap when not in use.

Obviously, a reversible electric motor may be connected to the screw in place of the hand crank, but in view of the mechanical advantage provided by this jack only a low power motor should be used, so as to keep the straightening process under visual control without bending the parts more than desired.

BRIEF DESCRIPTION OF THE FIGURES

With the above and other objects in view, this invention consists in the details of construction and combination of parts, as will be more fully understood from the description, when read in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of this car repair jack applied to a bent car bumper.

FIG. 2 is a plan view of a push-bar.

FIG. 3 is an elevational view of the jack with a chain receiving hook thereon, the stanchion socket support being shown in section.

FIG. 4 is a section through a socket with a plug cap closing the same when not in use.

FIG. 5 is a section on line 5—5 of FIG. 3, showing the jack pivoted to the angular arm.

FIG. 6 is a sectional view on line 6—6 of FIG. 1, showing a screw journal sleeve and pivot.

FIG. 7 is similar to FIG. 6, but showing a pair of intermeshing gears between the crank handle and the screw for providing a better mechanical advantage, and including an electric motor.

FIG. 8 is a plan view of a push-bar.

DETAILED DESCRIPTION OF THE INVENTION

There is shown at 10 the car repair jack of this inven-
tion as installed in position in a selected socket 12 anchored in a concrete pavement 14. The sockets not in use may be closed by a removable plug cap 16 to keep liquids or debris from accumulating therein. Extending in upright position into the selected countersunk socket 12 is the stanchion 18 of the jack 10. The stanchion 18 is circular in cross section, with its top end flattened at 20 and apertured to cooperate with a pivot 22 extending therethrough and through a pair of depending ears 24 of a journal sleeve bearing 26. The pressure tension jack screw 28 has a rounded shaft part 30 terminating in polygonal end 32 over which a complementary socket 34 of a crank handle 36 is placed for manually rotating the screw 28. Instead of the crank handle, a low power versatile electric motor 108 supported on sleeve bearing 26 or a gear box and bearing 82 may be used. A pair of collars 38, one on either side, hold the screw shaft part 30 in thejournal sleeve bearing 26, set screws 40 holding the collars on screw shaft part 30.

The free end of screw 28 is threaded through a nut 42 having an ear 44 secured by a pivot pin or bolt 46 between the double bars 48 providing an angular arm whose lower end is pivoted by a pivot pin 50 to a clamp 52 secured on a lower portion of stanchion 18.

An oblong repair tool mounting bracket 54 is selectively pivoted by a removable pivot bolt 56 through pivot holes 58 in the bracket 54 and through holes 60 in angular arm 48. The free ends of bracket 54 are secured together by a bolt 62, while the rounded end is provided with a threaded aperture therethrough to selectively receive the repair tool, either the threaded tail 64 of a chain receiving hook 66, or the threaded tail 68 of a push-bar 70 whose other end is suitably shaped with a face 72 according to the surface it will be pushed against, it being understood that a number of push bars may be provided, each with a different suitable push face.

As shown in FIG. 1, a chain 74, possibly eight feet in length, of suitable strength, is placed on hook 66 and its other end is provided with a suitable hook or clamp 76 for grasping a bent car bumper for pulling it to a straightened condition.

When a push, rather than a pull, is desired, hook 66 is removed and push-bar 70 is substituted. Then suitable pressure may be applied, as desired, to the bent vehicle part, but rotating the screw in the opposite direction.

A reversible electric motor 108 having a three position reversing switch 110 could obviously be mounted on the journal sleeve 26 and cooperate with the socket receiving end 32 of screw 28 to controllably rotate the jack 28 at the same controllable speed as the crank handle.

In view of the pivot holes 58 and 60 for the pivot 56, the mechanical advantage may be selected, as desired, enabling the manually operated crank handle 36 or reversible electric motor 108 to apply the pulling or pushing pressure to the bent part at a rate visually controllable to just straighten the part without overdoing it.

The chain 74 and the push-bar 70 are each of suitable length, eight feet, more or less, leaving plenty of working room between the car repair jack 10 and the vehicle.

Instead of placing the crank handle 36 or reversible electric motor 108 directly on the polygonal end of screw 28, it may be attached, as shown in FIG. 7, to a shaft 80 journaled in a gear box and bearing 82, suitably pivoted by its ear 84 to the top of the stanchion.

The motor 108 has a three position reversing and cut off switch 110 and is suitably mounted on the gear box and bearing 82 in any conventional manner. If no gear box is present, it could be supported on the journal sleeve bearing 26. The motor shaft 112 is connected to gear shaft 80. Within the gear box and bearing 82, a small gear 86, secured to shaft 80 by a set screw 88, is in mesh with a large gear 90 secured by set screw 92 to the round shaft end 94 of jack screw 96, a pin end thereof extending exteriorly of gear box and bearing 82 and secured in position by a collar 100 and set screw 102. The gears 86 and 90 may be of any desired ratio to each other, according to the mechanical advantage that is desired. It is obvious that the greater number of teeth that the jack gear 90 has than the crank handle or motor gear 86 has, the easier it will be for the operator to rotate the crank handle.

Obviously, the crank handle 36 and motor 108 may be interchangeable on the polygonal end of the screw shaft.

**OPERATION OF THE INVENTION**

In operation, the car 104 to be worked on is placed on the pavement 14 on the area surrounded by the sockets. As shown in FIG. 1, the car 104 has a bent bumper 106 which is to be worked on. The jack stanchion 18 is placed in the socket nearest to the bent bumper 106, and the chain 74 is attached to hook 66 with its clamp 76 secured appropriately on the bent bumper. By having the crank handle 36 or motor 108 on the car side of the jack 10, the jack operator is nearer to the damaged part and can watch it more closely as he turns the screw 28 or 96 to apply pulling tension on the bumper 106 to gradually straighten it.

Obviously, if desired, the jack may be made or assembled with the crank handle 36 or motor 108 on the far side, but, in operation, it has been found desirable, in a small garage location, to assemble it as shown.

**ABSTRACT OF THE DRAWINGS**

In the drawings, like reference numerals refer to like parts, and, for the purpose of explication, marshalled below are the following reference numerals of this car repair Jack for Repairing Car Body Parts.

10 car repair jack
12 stanchion socket
14 concrete pavement
16 socket plug cap
18 stanchion
20 flattened top of 18
22 pivot through 18 and 24
24 depending ears of 26
26 journal sleeve bearing
28 jack screw
30 rounded shaft part of jack 28
32 polygonal end of 30
34 crank handle socket
36 crank handle
38 collar at ends of 30
40 set screws through 38
42 nut for jack 28
44 ear on nut 42
46 pivot bolt through 44 and 48
48 double bar angular arm
50 pivot through bottom end of 48 and through 52
52 clamp on bottom area of 18
3,906,777

54 oblong bracket
56 pivot bolt through 58 and 60
58 pivot holes through bracket 54
60 pivot holes through arm 48
62 fastening bolt on end of 54
64 threaded tail of hook 66
66 chain receiving hook
68 threaded tail of push-bar 70
70 push-bar
72 push face of 70
74 chain
76 clamp on end of chain 74
80 shaft
82 gear box and screw shaft bearing
84 ear for pivotally securing 82 on 18
86 small gear
88 set screw 86 on 80
90 large gear
92 set screw 92 on 94
94 round shaft end of screw 96
98 pindle end of 94
100 collar on 98
102 set screw through 100 to 98
104 car being worked on
106 car bumper
108 reversible electric motor
110 3-position reversing switch
112 motor shaft

Although this invention has been described in considerable detail, such description is intended as being illustrative rather than limiting, since the invention may be embodied in various specific forms and the scope of the invention is to be determined as claimed.

I claim:

1. A car body repair jack (10) comprising a stanchion (18), an angular arm (48), means (50) pivoting said angular arm at one end thereof to a clamp (52) secured on said stanchion (18) adjacent one end of said stanchion, a pressure applying means (28), a means (42) pivotally securing on end of said pressure tension means (28) to the other end of said angular arm (48), means (26) pivotally securing the other end of said pressure tension means (28) to said stanchion (48) adjacent the other end of said stanchion, means (36,108) for actuating said pressure tension applying means (28), a car body repair tool (66,70), and a tool mounting bracket (54) pivoted (56) to said angular arm (48) in combination with means (12) for selectively mounting said stanchion against horizontal movement in any one of several different locations for operation of said jack (10) on differently located car body parts without relocating the car (104) whose parts are being repaired comprising a plurality of stanchion receiving and supporting sockets (12) countersunk in a pavement (14) surrounding a car locating area on said pavement, said pressure tension applying means comprising a screw (28), said means (42) pivotally securing one end of said pressure tension means (28) to the other end of said angular arm (48) comprising a nut (42) through which said screw (28) is threaded, said actuating means (26,108) for said pressure tension means (28) including controllable means (36,108) for rotating said screw (28) through said nut (42), said means (26) pivotally securing the other end of said pressure tension means (28) to said stanchion (18) adjacent the other end of said pressure tension means comprising a shaft bearing (26) through which said screw (28) is journaled.

2. The jack of claim 1, and a chain mounting hook (66) secured at the free end of said bracket (54) for holding a chain (74) thereon.

3. The jack of claim 1, said tool comprising a push-bar repair tool (70) secured at the end of said bracket (54).

4. The jack of claim 1, and a screw thread in the free end of said bracket (54) for threadedly securing the repair tool (66, 74; 70, 72) thereto.

5. The jack of claim 1, and means (56) for pivotting said bracket (54) to said angular arm (48).

6. The jack of claim 5, said pivot means comprising a pivot pin (56) and a plurality of pivot holes (58) through said bracket through which said pivot pin (56) may be selectively placed.

7. The jack of claim 5, said pivot means comprising a pivot pin (56) and a plurality of pivot holes (60) through said angular arm (48) through which said pivot pin (56) may be selectively placed.

8. The jack of claim 1, said controllable means comprising a manually operable crank handle (36), and means (32, 34) connecting said crank handle to said screw (28).

9. The jack of claim 8, said crank handle (36) connecting means comprising a gear (86) secured to said crank handle (36) and a different size intermeshing gear (90) secured to said screw (96).

10. The jack of claim 1, said screw rotating means comprising a reversible electric motor (108), and means (112, 90, 94) connecting said motor to said screw.

11. The jack of claim 10, said motor connecting means comprising a gear box (82) and intermeshing gearing (86, 90) connected to the motor shaft (112) and to said screw (96).

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