Sept. 20, 1949. R. D. SMITH 2,482,738

FRAME STRAIGHTENER TOOL

Filed Dec. 4, 1945 2 Sheets-Sheet 1

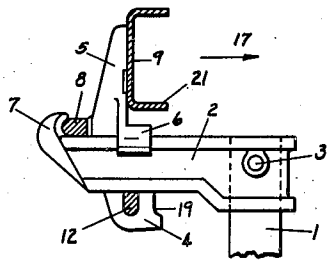


FIG-1

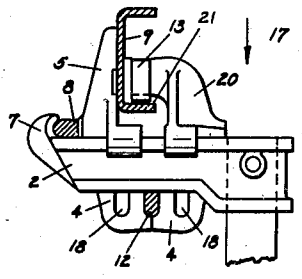


FIG-2

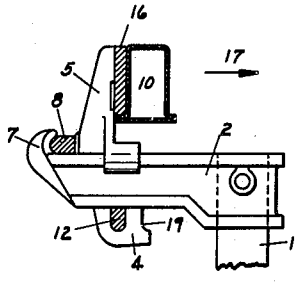


FIG-3

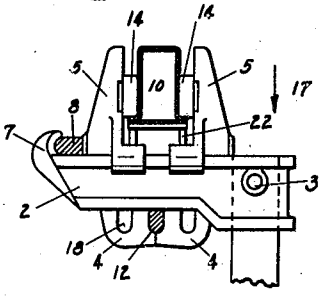


FIG-4

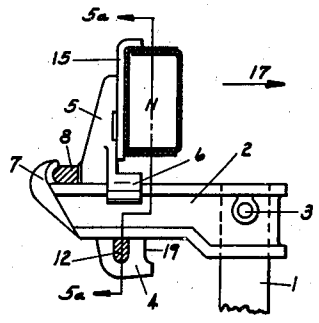


FIG-5

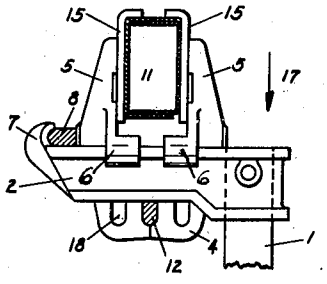


FIG-6

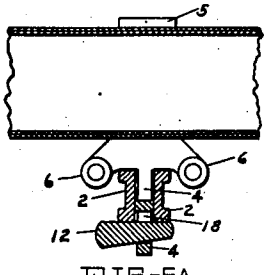


FIG-5A

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FRAME STRAIGHTENER TOOL

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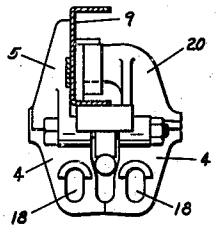


FIG-7



FIG-9

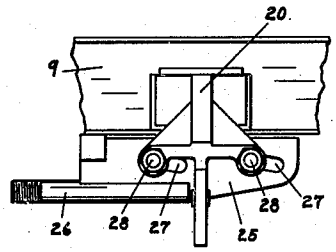


FIG-8

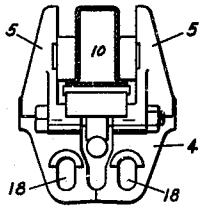


FIG-10



FIG-12

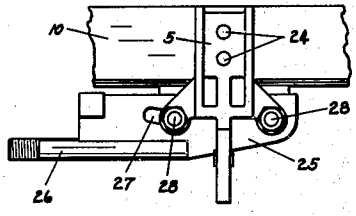


FIG-11

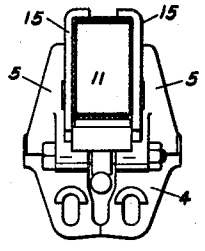


FIG-13

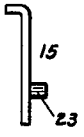


FIG-15

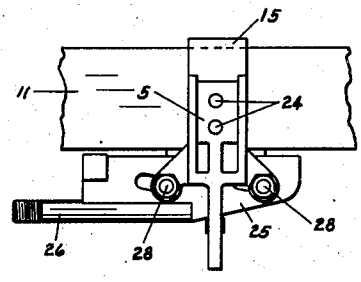


FIG-14

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FRAME STRAIGHTENER TOOL

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Application December 4, 1945, Serial No. 632,621

10 Claims. (Cl. 153—32)

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My present invention relates to a tool for use with machines used in the straightening of motor vehicle frames. Among the objects of this invention are to provide, as nearly as possible, a universal tool adapted for use with all types of automobile frames; to provide a tool which can be used with any one of several kinds of frame straighteners; to provide a tool which can be easily clamped to or unclamped from a frame element of a motor vehicle; and such further objects, advantages, and capabilities as will hereafter appear and as are inherent in the construction disclosed herein. My invention further resides in the combination, construction, and arrangement of parts illustrated in the accompanying drawings and, while I have shown therein what is now regarded as the preferred embodiment of this invention, I desire the same to be understood as illustrative only and not to be interpreted in a limiting sense.

In the drawings annexed hereto and forming a part hereof,

Figs. 1, 3, and 5 show the use of my tool in connection with motor vehicle frames of the three most common types, as used in making sidewise bends in a frame element or a complete frame;

Figs. 2, 4, and 6 are comparable to Figs. 1, 3, and 5, respectively, in which my new tool is illustrated as being used for the making of vertical bends in frame members;

Fig. 5*a* is a fragmentary vertical section taken substantially along the broken plane indicated by the line 5*a*—5*a*, Fig. 5;

Fig. 7 is an end elevation, taken from the left hand side of Fig. 8 showing the application of this tool in the making of an endwise pull on a motor vehicle frame to correct what is commonly referred to as diamond frame, or to stretch a frame member;

Fig. 8 is a side elevation of the structure shown in Fig. 7;

Fig. 9 represents a vertical transverse section through an adapter used in conjunction with this tool in working upon one type of a motor vehicle frame member;

Fig. 10 shows this tool applied to another type of motor vehicle frame for the correction of diamond frame or for stretching a frame member;

Fig. 11 is a side elevation of the structure shown in Fig. 10;

Fig. 12 is a side elevation of the adapter used in the set-up shown in Figs. 10 and 11;

Fig. 13 shows the set-up for making diamond pull with another type of motor vehicle frame;

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Fig. 14 is a side elevation of the structure shown in Fig. 13; and

Fig. 15 is a side elevation of the adapter used with a frame of the type shown in Figs. 5, 6, 13, and 14.

Reference will now be made in greater detail to the annexed drawings for a more complete description of this invention. In these drawings, Figs. 1 to 6, inclusive, illustrate the use of this apparatus for horizontal and vertical bending of frame members, while Figs. 7, 8, 10, 11, 13, and 14 illustrate uses of this invention as applied in the correction of diamond frames or in the stretching of frame members. Figs. 9, 12, and 15 show adapters for use with the tool of this invention in the carrying out of any of the operations illustrated, with the exception of Fig. 1, in which arrangement no adapter is needed.

A standard or post 1 is provided which is supported in the usual manner by one of the transverse beams of a frame straightener of common construction. A crossbar 2 is secured to the post or standard 1 by a pin 3, passed transversely through the two. As shown in Fig. 5*a*, the crossbar 2 has a longitudinal slot therethrough for the reception of the leg 4 extending downwardly from the head 5 of this tool. The head 5 has a pair of legs 6 which, as shown in Fig. 5*a*, extend downwardly alongside the upper part of the bar 2. The free end of the crossbar 2 is provided with a hook 7 which serves as an abutment for the pin 8 which is driven in between the hook 7 and the head 5 to compress the latter against the motor vehicle frame member, which may be of various constructions, three of which are shown in Figs. 1, 3, and 5, denoted, respectively, by the numerals 9, 10, and 11. Pin 12, like pin 8, is tapered longitudinally, as shown in Fig. 5*a*, so that it acts as a wedge to pull the head 5 downwardly into tight engagement with the top of the crossbar 2.

Various adapters are shown at 13, 14, and 15, in Figs. 9, 12, and 15. These adapters are not needed in connection with the head 5 when operating against a frame member of the type shown at 9 in Fig. 1. However, when the head 5 is used in connection with a frame member of the type shown at 10 or 11, some sort of adapter is needed. In Fig. 3, I have shown an adapter 16 which is of the general type shown in Fig. 12, being provided, however, with a longer upward extension than that shown in that figure. In Figs. 5 and 6, the adapter 15 is shown between the head or jaw 5 and the box beam 11. The arrows 17 ap-

pearing in Figs. 1 to 6, inclusive, show the direction of pull in the operation illustrated.

In Figs. 1, 3, and 5, the tapered pin 12 is shown as passing through an opening 18, indicated in Figs. 2, 4, and 6. The legs 4 are shown as being provided with a half opening 19, which is one-half the size of an opening 18. Therefore, when two legs 4 are placed together, as shown in Figs. 2, 4, and 6, there is provided a complete aperture for the reception of a pin 12, as shown in these figures. When the back of a leg 4 is pressed against the end of the longitudinal slot in the crossbar 2, as shown in Figs. 4 and 6, and the other head or jaw 5 is compressed in the same direction by the pin 8, a complete opening is formed for the reception of a pin 12, and this can be driven into the opening to draw the heads down into tight engagement with the upper surface of the crossbar 2. Therefore, the pins 8 and 12 will hold the parts definitely assembled and prevent their inadvertent separation.

In Fig. 2 there is shown a head 20 of a different form from that illustrated at 5. This is needed to get into the channel of the frame member 9 and avoid pressing against the flange 21 thereof, in making lateral bends. This head or jaw 20 has the same type of legs as the head 5 and these function in the same way.

It is clear that the adapter 13, in the arrangement shown in Fig. 2, bears against the web of the frame member 9 and, when the pull is in the direction indicated by the arrow 17, this adapter pulls against the flange 21, close to the web, thereby avoiding any distortion of the flange. In the set-up shown in Fig. 4, the adapters 14 pull downwardly on the flanges of the beam 10, a stand 22 being provided under the flanges to prevent them from being bent by the downward pull of the adapter thereon.

The adapters 14 and 15, shown in Figs. 12 and 15, are each provided with a lug 23 which engages in a cooperating opening 24 in the head 5. In Figs. 11 and 14 there are shown two of these openings 24, the use of which is dependent upon the size and shape of the motor vehicle frame member and whether adapter 14 or 15 is used.

In the set-ups shown on Sheet 2, use is made of a pulling block 25 provided with a rigidly connected rod 26 having a threaded end for connection to a pulling instrumentality, not shown. This unit 25 has a pair of slots 27 which are formed slightly diagonally with relation to the length of this unit. Bolts 28 are passed through these openings 27 and the legs 4 and serve to draw the heads, with their adapters, into tight engagement with the sides of the frame member, whether that be of the type shown at 9, 10, or 11. These bolts 28 hold the heads against separation and hold the legs 4 in close engagement to complete the opening formed by the two half-openings 19.

As indicated heretofore, the upper inclined faces of the slots 27 draw the heads and adapters downwardly to produce holding engagement with the frame members.

It will of course be understood that the specific description of structure set forth above may be departed from without departing from the spirit of this invention as set forth herein and in the appended claims.

Having now described my invention, I claim:

1. A tool for use with a frame straightening machine in the straightening of motor vehicle frames, comprising a standard for attachment to the frame machine, a crossbar secured to said standard, a frame-engaging head having downwardly extending legs straddling said crossbar with its legs extending below the top thereof, another leg provided with an opening for the reception of a securing pin, said other leg extending through a longitudinal slot in said crossbar, and a tapered securing pin passing through said opening and drawing the head downwardly into tight engagement with the crossbar whereby to hold the head in laterally adjusted position.

2. A tool for use with a frame straightening machine in the straightening of motor vehicle frames, comprising a standard for attachment to the frame machine, a crossbar secured to said standard, a frame-engaging head having downwardly extending legs straddling said crossbar with its legs extending below the top thereof, another leg provided with an opening for the reception of a securing pin, said other leg extending through a longitudinal slot in said crossbar, and a tapered securing pin passing through said opening and drawing the head downwardly into tight engagement with the crossbar whereby to hold the head in laterally adjusted position, the crossbar having, at its free end, an upstanding abutment for engagement by a tapered tightening pin, in combination with a tapered pin between the abutment and the head for adjusting the position of the head and tightening it against a workpiece.

3. A tool for use with a frame straightening machine in the straightening of motor vehicle frames, comprising an upstanding post for attachment to and support by a frame straightening machine, a crossbar attached to said post and extending substantially horizontally therefrom, said crossbar having a slot extending longitudinally thereof, a pair of heads resting on and each having a leg extending through said crossbar, said heads being adapted to receive between them a side frame member of a motor vehicle, and means for securing said heads to said crossbar.

4. A tool for use with a frame straightening machine in the straightening of motor vehicle frames, comprising an upstanding post for attachment to and support by a frame straightening machine, a crossbar attached to said post and extending substantially horizontally therefrom, the crossbar having a slot extending longitudinally thereof, a pair of heads resting on and each having a leg extending through said crossbar, said heads being adapted to receive between them a side frame member of a motor vehicle, and means for securing said heads to said crossbar, the said means including means for pulling the heads downwardly against the crossbar.

5. A tool for use with a frame straightening machine in the straightening of motor vehicle frames, comprising an upstanding post for attachment to and support by a frame straightening machine, a crossbar attached to said post and extending substantially horizontally therefrom, the crossbar having a slot extending longitudinally thereof, a pair of heads resting on and each having a leg extending through said crossbar, said heads being adapted to receive between them a side frame member of a motor vehicle, and means for securing said heads to said crossbar, said means including means for clamping the heads laterally against a motor vehicle side frame member.

6. A tool for use with a frame straightening machine in the straightening of motor vehicle frames, comprising an upstanding post for attachment to and support by a frame straightening machine, a crossbar attached to said post and extending substantially horizontally therefrom,

a slot in the crossbar extending longitudinally thereof, a pair of heads resting on and each having a leg extending through said crossbar, said heads being adapted to receive between them a side frame member of a motor vehicle, and means for securing said heads to said crossbar, said means including a tapered member for compressing the heads laterally against a motor vehicle frame member and a tapered member for pulling the heads downwardly into tight engagement with the crossbar.

7. A motor vehicle frame-engaging and holding tool comprising a pair of jaws for lateral engagement with a frame member, attachment pieces for attachment to the jaws to adapt them for use with frame members of different shapes, and clamping means for clamping the jaws to a frame member, the clamping means comprising a tapered pin for causing motion of the jaws transversely of the frame member.

8. In a frame straightening apparatus having an upright standard, a frame-gripping tool comprising a horizontal arm projecting laterally from the standard and provided with a longitudinal slot, a jaw for engagement with a motor vehicle frame, said jaw having downwardly extending legs, one being located in said slot and the others on opposite sides of the arm, and means for clamping the jaw to the arm.

9. In a frame straightening apparatus having a post for attachment to the frame of the straightening apparatus, a frame-gripping tool comprising a horizontal arm projecting laterally from the standard and provided with a longitudinal slot, a jaw for engagement with a motor vehicle frame, said jaw having downwardly extending legs, one being located in said slot and the others on opposite sides of the arm, and means for clamping the jaw to the arm, the jaw being provided with an interchangeable frame-engaging attachment whereby to adapt the jaw to fit frames of different shapes.

10. A motor vehicle frame engaging and holding tool, comprising, in combination, heads to engage a frame member laterally and to be drawn into tight engagement therewith, a longitudinally slotted support for supporting said heads, said heads having downwardly extending legs extending through the slotted support and below the frame member, and means between the legs and acting upon them simultaneously for drawing them downwardly.

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REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
755,384	Palmer	Mar. 22, 1904
1,305,321	Tooker	June 3, 1919
1,404,275	Cowles	Jan. 24, 1922
1,751,329	Hancock	Mar. 18, 1930
1,879,979	Countryman	Sept. 27, 1932
1,944,862	Fransen	Jan. 23, 1934
2,013,785	Merrill	Sept. 10, 1935
2,042,856	Merrill	June 2, 1936
2,174,947	Ramsey	Apr. 14, 1938
2,361,971	Shipman	Mar. 4, 1942
2,384,148	Yeager	Sept. 4, 1945