Nov. 13, 1923. 1,473,651

R. S. SMITH

AUTOMOBILE FRAME AND PRESSED STEEL CONSTRUCTIONAL ELEMENTS THEREFOR

Filed Sept. 12, 1921

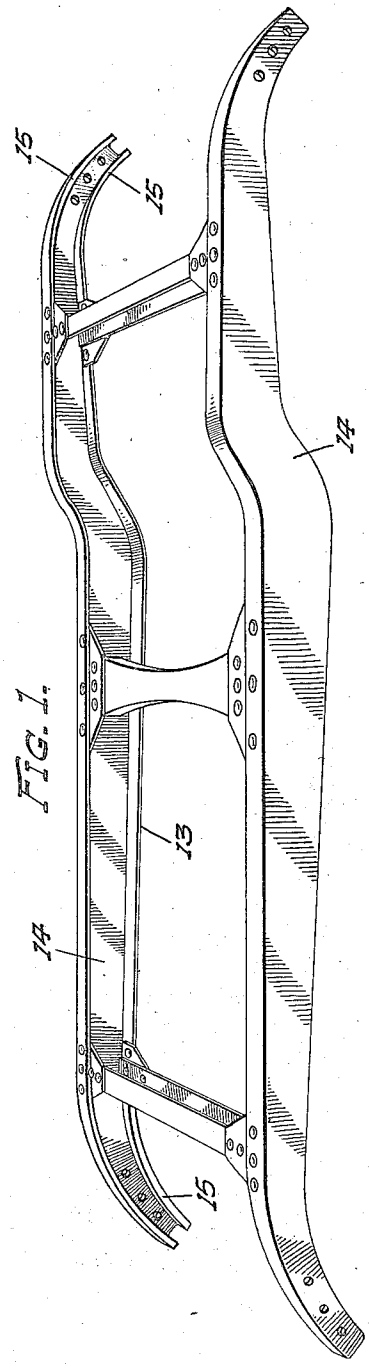


FIG. 1.

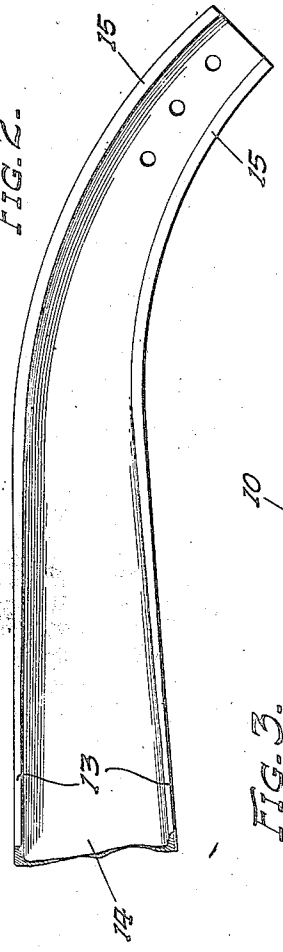


FIG. 2.

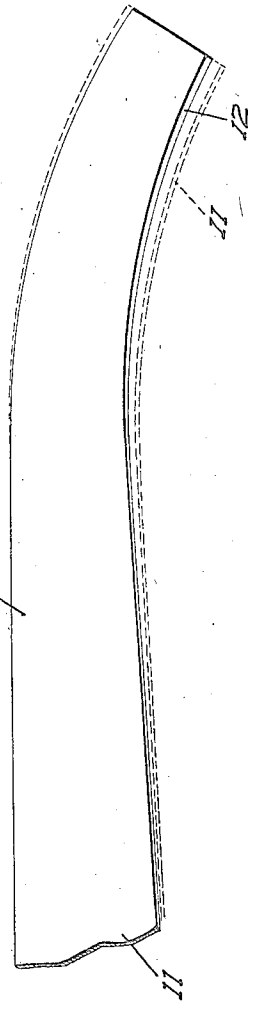


FIG. 3.

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UNITED STATES PATENT OFFICE.

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AUTOMOBILE FRAME AND PRESSED-STEEL CONSTRUCTIONAL ELEMENTS THEREFOR.

Application filed September 12, 1921. Serial No. 500,018

To all whom it may concern:

Be it known that I, REUBEN STANLEY SMITH, a citizen of the United States, and a resident of the city of Milwaukee, county of Milwaukee, and State of Wisconsin, have invented certain new and useful Improvements in Automobile Frames and Pressed-Steel Constructional Elements Therefor; and I do declare the following to be a clear, exact, and complete description thereof, such as will enable others skilled in the art to which the invention pertains to make and use the same, reference being had to the accompanying drawing for an illustration of one form in which my invention has been embodied.

The invention relates to an automobile frame or chassis, and to the members of which it is composed.

Pressed steel automobile frames having the several elements thereof united into a permanent and unitary structure are now in general use. The side bars, cross bars, and other elements constituting the frame, are usually made from strips of sheet steel of a gage which is uniform throughout each strip. The plates or blanks of curved or other outline from which the bars are drawn, are formed as channels in a manner which is well known to those skilled in the art. The channels of these parts vary in width, and are usually narrower at their ends, as, for instance, in the case of the side bars. The vertical web of the channel is perforated in its narrower portions, for the attachment of adjunctive devices, and such perforations act to weaken the bar in the vertical plane of the perforations. To avoid liability to fracture, it has been the practice to reinforce the channels at their weakest points, or at points where unusual stresses occur, by fitting a short channeled bar of smaller cross-section into the channeled side bar, and uniting the parts together. The practice outlined is an expensive one by reason of the additional operations which are involved.

My present invention enables me to reinforce the channeled side or cross bar, without resorting to the older practice of separate reinforcement. I achieve the result by producing an integral reinforcement of the material in the line of its thickness, and in this respect increase the gage of the stock out of which the bar is formed. This result is effected by compressing the flat blank in the desired sections so as to reduce the width thereof, such compression causing a lateral expansion of the sides of the blank to increase the thickness in the desired degree, and as permitted by the clearance provided in the compressing dies.

In Patent No. 1,452,225, which was granted April 17, 1923, on an application filed by me on March 31, 1920, Serial No. 370,136, I have disclosed a method of producing a curved plate, blank, and ultimately a curved, flanged bar, which is thickened throughout certain areas, for the purpose of integral reinforcement, in accordance with the present invention. In carrying out the method disclosed in the said patent, I bend a wide rectangular plate so as to distort the lateral area thereof, sufficiently to enable a curved blank having an extreme width in excess of that of the rectangular blank, to be punched therefrom. It is expedient, in producing curved plates or blanks, to utilize the bending pressure as a means for effecting the compression of the blank in the desired sections.

The novel features of the present invention will be pointed out in the appended claims.

In the accompanying drawing,

Figure 1 is an isometric perspective of an automobile frame, embodying the novel features of my invention.

Fig. 2 is an enlarged view in elevation of one end of a channeled side bar constructed in accordance with the present invention.

Fig. 3 is a perspective view of one end of a curved metal blank, showing in an approximate degree the compression to which the blank is subjected.

Referring now to the drawing, the numeral 10, Fig. 3, indicates a portion of a curved blank which is adapted to be drawn into a curved, flanged or channeled side bar for an automobile frame. This blank may be produced by cutting or punching from a rectangular plate of suitable width, or from a curved rectangular plate which has been bent edgewise, so as to receive within the

margins thereof the outlines of the curved blank which it is desired to produce. The normal gage of the stock of the blank is indicated at 11, in full and dotted lines in Fig. 3.

Pressure is exerted against the side edges of the blank in the desired sections so as to effect compression thereof in the direction of the width of the blank. Such pressure effects a narrowing of the blank, reducing its width from that shown in the dotted lines in Fig. 3 to that shown in the full lines in the same figure. At the same time, the blank is thickened in the regions of compression, as indicated at 12.

Fig. 2 shows the blank after the side margins thereof had been turned so as to provide flanges 13, such flanges standing normal to the plane of the web 14, of the channeled bar. The increased thickness resulting from the compression is indicated 15, and is readily discernible upon comparison of the sections at the points indicated by the numerals 13 and 15, the former indicating the normal gage of the stock.

Although I have in the drawing of the present case illustrated the side bars as being integrally reinforced at their narrow end portions, it is obvious that such integral reinforcement may be introduced in any sections in the length of the side bar where reinforcement may be desired, as well as in the cross bars, as disclosed in my application hereinbefore referred to.

Fig. 1 shows a conventional automobile frame constructed in accordance with my invention, the integral reinforced areas being indicated by the numeral 15, as in Fig. 2.

My invention enables me to produce a channeled side bar, or other frame element, provided with an integral reinforcement of the bar at points which are weakened by perforation, or, where subject to an excessive strain, and I achieve this result without resorting to the practice of separate reinforcement. The automobile frame thus produced is rendered superior from the standpoint of durability and economy in construction, and eliminates the liability to breakage attaching to frames not reinforced.

Having thus described my invention, what I claim and desire to secure by Letters Patent of the United States, is:

1. A curved flanged bar for an automobile frame, comprising a central web and flanges of sheet metal, the latter extending laterally from the plane of the web, the body of the flanged bar in portions being constituted of stock of normal gauge, and in other portions constituted of integrally reinforced stock of increased gauge.

2. A curved flanged bar for an automobile frame comprising a central web and flanges of sheet metal, the latter extending laterally from the plane of the web, such central web varying in width in the length of the bar, the narrow portions of the bar being integrally reinforced by an increase in the stock thereof at points subject to breaking strains.

3. A curved flanged bar for an automobile frame, comprising a central web and flanges of sheet metal, the latter extending laterally from the plane of the web, such central web varying in width in the length of the bar, the narrower portions of the bar being perforated for the attachment of adjunctive devices and integrally reinforced in the area of the perforations by an increase in the stock of the bar to resist the breaking strains.

4. A curved flanged bar for an automobile frame, comprising a central web and integral flanges of sheet metal, the latter extending laterally from the plane of the web, such central web varying in width in the length of the bar, the web and the flanges at the wider portions of the bar being constituted of stock of normal gage and in the narrower portions of stock of increased gage, whereby integral reinforcements are provided in the bar at points subject to breaking strains.

5. A curved flanged bar of pressed sheet metal for an automobile frame, composed of a widened central portion and narrowed end portions, the latter being perforated for the attachment of adjunctive devices, such narrowed end portions being integrally reinforced in the area of the perforations by an increase of the stock of which the bar is formed, whereby the bar is sustained against breaking strains.

6. An automobile frame embodying in its construction pressed sheet metal flanged frame elements of normal gage in sections and integral reinforcements of increased gauge in other sections subject to breaking strains.

7. An automobile frame embodying in its construction curved, pressed sheet metal flanged bars of normal gage in sections and integrally thickened in other sections subject to breaking strains.

8. An automobile frame comprising in its construction curved, pressed sheet metal flanged side bars of normal gage in sections and integrally formed reinforcements of increased gage in other sections.

9. An automobile frame composed of pressed sheet metal flanged side bars, and cross bars connecting the side bars, the side bars varying in width in the direction of their length, the gage of the metal in the wider sections being normal, and the gage in the narrower sections being increased, to provide an integral reinforcement at points subject to breaking strains.

10. An automobile frame composed of curved, pressed sheet metal flanged side

bars formed as channels, and cross bars connecting the side bars, the said side bars varying in width in the direction of their length, and of thickened gage in sections to provide an integral reinforcement at points subject to breaking strains.

In testimony whereof I have signed my name at Milwaukee, this 7th day of September, 1921.

R. STANLEY SMITH.

Witnesses:
W. F. WOOLARD,
EMMA HAUG.