Aug. 29, 1939. R. C. GLOVER 2,170,797

METHOD OF MAKING AXLE HOUSINGS

Filed March 11, 1938

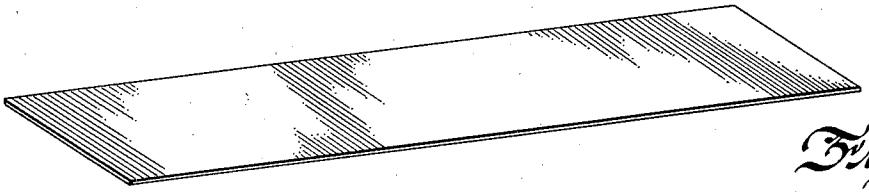


Fig. 1

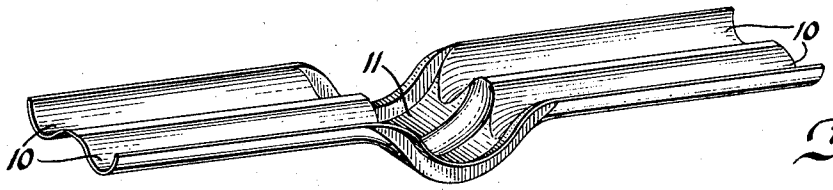


Fig. 2

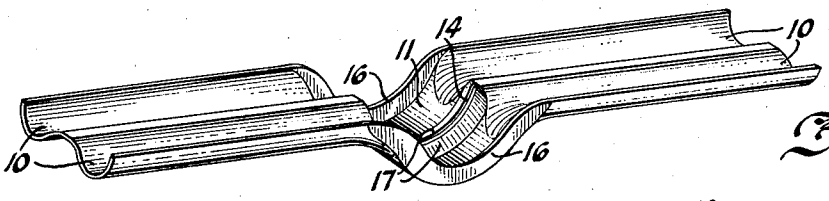


Fig. 3

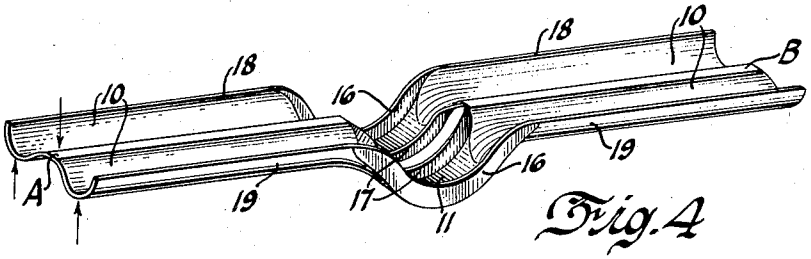


Fig. 4

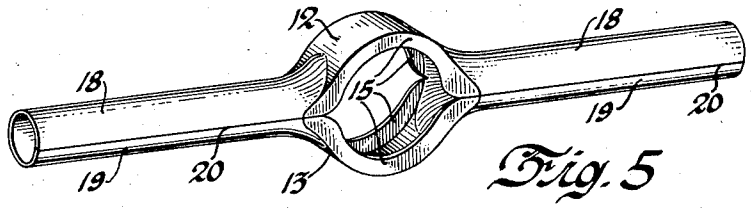


Fig. 5

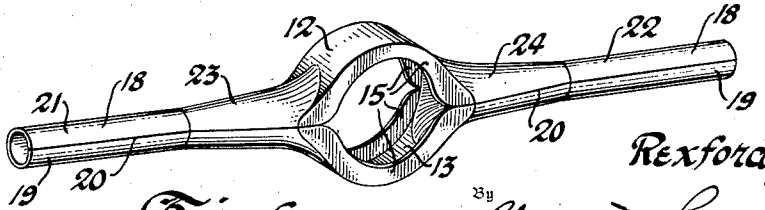


Fig. 6

Inventor
Rexford C. Glover

By Blackmore, Spencer & Flint

Attorneys

Patented Aug. 29, 1939 2,170,797

UNITED STATES PATENT OFFICE

2,170,797

METHOD OF MAKING AXLE HOUSINGS

Rexford C. Glover, Clio, Mich., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Application March 11, 1938, Serial No. 195,290

2 Claims. (Cl. 29—153.1)

My invention consists in a method of forming rear axle housings of the "banjo" type, for automobiles and other self-propelled vehicles, by bending and shaping a single strip of mild steel or equivalent material, and wherein in the finished housing there is one single welded joint or seam extending longitudinally on one side of the housing.

The drawing accompanying and forming a part of this specification illustrates various steps involved in practising the method wherein my invention consists, starting with a rectangular flat metal blank of uniform thickness and concluding with a finished axle housing.

In the drawing:

Figure 1 shows a rectangular flat metal plate of sufficient thickness to provide the requisite strength in the finished housing.

Figure 2 is a view showing the plate of Figure 1 after it has been operated upon as by suitable dies, to provide a partially formed housing member as hereinafter described.

Figure 3 is a view showing the partially formed housing after the mid-section has been slit longitudinally and trimmed to form twin half bands.

Figure 4 is a view showing the partially formed housing after it is restruck to complete the shaping of the mid-section.

Figure 5 is a view showing the housing member after the same has been folded along an axis indicated by the line A—B, Figure 4.

Figure 6 is a view showing a finished axle housing made in accordance with my invention.

In performing the method wherein my invention consists, the blank shown in Figure 1 is shaped as by suitable dies, rolls or equivalent means, so as to provide a housing member having four longitudinally extending troughs 10 at its end portions, which troughs, in the finished housing, provide tubes through which the driving axles extend.

The blank is also, and preferably by the same shaping operation, provided with a central dipped part 11 which is channeled to form continuations of the troughs and eventually forms the upper and lower parts 12, 13, Figures 5 and 6, of the central banjo portion of the finished housing. The dipped central part 11 is then slotted at 14 longitudinally of the axle housing, said slot definitely dividing the central part 11 into two dipped channels one for each trough.

During, and as a part of the first forming operation, the metal along each side of the mid-section is clamped as customarily in die work to hold the blank while the mid-section is being drawn down to shape, and as far as I am aware it is novel to so stretch and form the metal blank before any part is cut or slotted.

The next step is to finally form the side flanges 16 and 17 of the mid-section at right angles to the dipped channels 11 as clearly shown in Figure 4; these flanges being shown in their preliminary and partially formed stages in Figures 2 and 3.

The next operation in the performance of my method which follows after the housing member and flanges have been given a form substantially as illustrated in Figure 4, consists in bending or folding said member as indicated by the arrows about a central axis extending longitudinally thereof, and which axis is indicated by the line A—B, Figure 4; which bending operation folds the side troughs upward and toward one another until the edges 18 and 19 of said housing member meet, as shown in Figure 5. Thereafter the abutting edges are welded together along a longitudinally extending seam 20 as shown in Figure 5.

The axle housing produced as aforesaid, and as it is illustrated in Figure 5, is complete and finished so far as general form is concerned, although further finishing operations are commonly performed thereupon for actual use. For example, the tubular ends 21, 22, Figure 6, are commonly smoothed and reduced somewhat in diameter by suitable dies, and the parts 23, 24 may likewise be made slightly tapering, these operations being performed after the edges are welded together, as hereinbefore explained. Also, the flanges 15 (formed by the flanges 16, 16 and 17, 17) may be subjected to a final truing operation by suitable dies, and may further be reinforced by plates of general annular form so as to provide adequate threads for the cap screws which fasten the differential gearing housing and the cover plate to the banjo casing.

The operations hereinbefore referred to are performed while the initial blank and the partially completed housing member shown in Figures 2 to 5 are at atmospheric temperature, and this is made possible by first clamping the blank properly between pressure plates so the mid-section can be drawn.

Likewise, the final forming of the flanges 15 from the flanges 16, 16 and 17, 17 is done while the housing member is at atmospheric temperature, and the peculiar fashioning of the blank without cutting or slitting the same permits the parts to be readily shaped and given their requisite finished forms.

Having thus described and explained my invention I claim and desire to secure by Letters Patent:

1. The method of forming a rear axle housing which consists in shaping and drawing a flat metal blank to provide pairs of trough-shaped end portions, and a downwardly drawn mid-section between said end portions, forming a pair of channels between and joining said trough-shaped end portions; forming a slot in said mid-section between and extending longitudinally of said channels; forming four flanges substantially parallel with one another and substantially at right angles to and extending along the sides of said channels; bending said housing member along a central axis extending longitudinally thereof to fold the end troughs together and to bring the edges of the sides thereof into engagement with one another; and welding said side edges together along a seam extending longitudinally of the axle housing.

2. The method of forming a rear axle housing which consists in operating upon a flat metal blank to provide a housing member having trough-shaped end portions, and a central mid-section of channel-like form joining the inner ends of said end portions; forming four oppositely disposed partially formed flanges extending along said central section; forming a slot in said central section and extending longitudinally thereof whereby said section is divided into two parts lying alongside one another; operating upon said partially formed flanges to form four flanges substantially parallel with one another and substantially at right angles to the two parts aforesaid, and which flanges extend along the sides of said parts; bending said housing member along a central axis extending longitudinally thereof to fold the troughs together with the edges of the sides thereof in engagement with one another; and welding said side edges together along a seam extending longitudinally of the axle housing.

REXFORD C. GLOVER.