Nov. 27, 1934. W. G. STONER 1,982,404

METHOD OF FORMING ARTICLES

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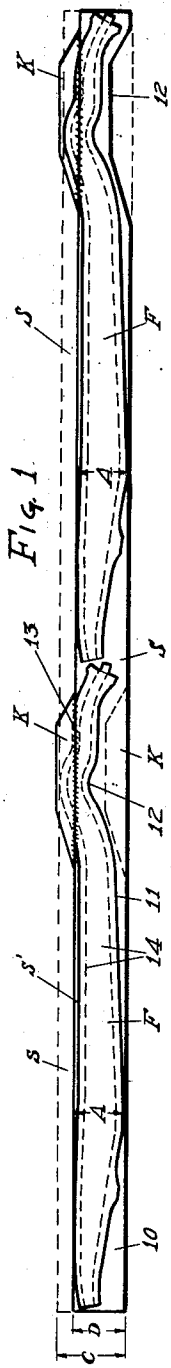


Fig. 1

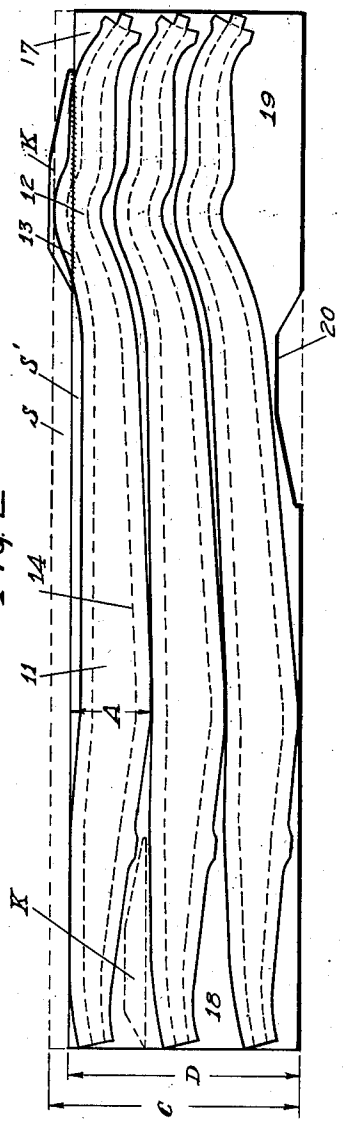


Fig. 2

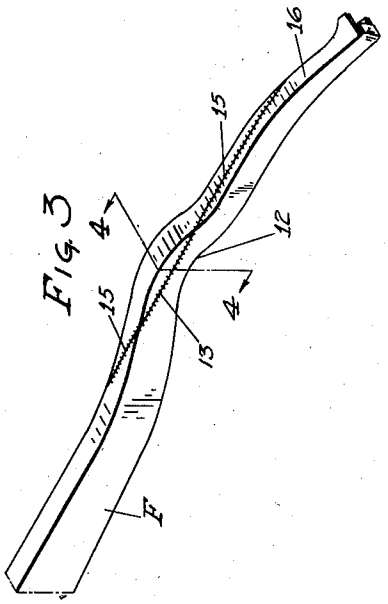


Fig. 3

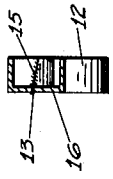


Fig. 4

INVENTOR
WILLIS GORDON STONER
BY
Louis W. Adams
ATTORNEY

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METHOD OF FORMING ARTICLES

Willis Gordon Stoner, Detroit, Mich., assignor to The Midland Steel Products Company, Cleveland, Ohio, a corporation of Ohio

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7 Claims. (Cl. 29—152)

This invention relates to the production of vehicle frame side rails and has as its object, the economical production of rails possessing offsets or kickups without necessitating the use of expensive edgewise bending operations to obtain the maximum number of body blanks of appropriate contour from the minimum amount of stock and with minimized scrap loss.

Another important object of the invention is to lay out the blanks with relation to the contour of the stock material, whereby stock material between corresponding ends of blanks usually scrapped, will be of proper contour to be used in forming those portions of the body blanks ordinarily requiring the use of wider stock, and at the same time to cause the stock material ordinarily forming the more or less useless smaller pieces of scrap to be consolidated into a larger single piece of excess material from which other larger articles of value can be economically formed.

A further object is to provide a process by which body blanks of irregular contour and possessing laterally offset portions in the same plane thereof can be formed from stock no wider than the widest portion of the finished body blank.

A still further object of the invention is to form side rails by addition of supplemental stock to the primary stock causing the rails to possess welded seams in the vicinity of the kickup or offset portion thereby strengthening the rails against bending and torsional stress.

Other objects and advantages of the invention will become apparent during the course of the following description.

In the accompanying drawing which forms a part of the descriptive matter and wherein like numerals are employed to designate like parts throughout the several views.

Fig. 1 is a plan illustrating the process of blanking side rails from strip stock.

Fig. 2 is a plan showing the process of multiple blanking such rails from plate or sheet stock whereby scrap loss is minimized.

Fig. 3 is a perspective view of the rear end of a formed side rail illustrating the relationship of the welded seam to the kickup portion.

Fig. 4 is a transverse section of the same taken on the line 4—4 of Fig. 3.

Referring now in detail to the drawing for a more comprehensive understanding of the savings effected by the herein process, the numeral 10 designates stock material furnished in the form of steel strip for the formation of vehicle side rails F. Such rails usually possess an irregular outline 11 and have at their front or rear end or both, laterally offset portions more commonly known as kickups to be disposed above the axles of a motor vehicle for the purpose of lowering the center of gravity thereof as is well understood in the art. These offset or kickup portions extend laterally from the longitudinal edge of the main body blank in the same plane therewith and are produced, either from blanks properly contoured by subjecting them to an edgewise bending operation which is very expensive and moreover does not produce satisfactory blanks due to the wrinkling of the stock in the vicinity of the offset; or by cutting out the body blanks F into final contour in the blanking operation to possess the requisite lateral offset portion 12 without further treatment. However, the latter blanking process results in considerable scrap loss arising out of the irregularly shaped stock material between individual body blanks due to the practical impossibility of arranging the body blanks any closer together than is permitted by the contour of the particular blanks being formed. In other words, blanking of the rails by the latter method would require the use of stock strip having a width C of Figs. 1 and 2 resulting in loss by scrap of the material designated by the letter S. With the use of the herein described method, it is possible to blank out these rails from much narrower and incidentally cheaper stock, possessing a width designated by the letter D in Figs. 1 and 2. Comparatively speaking therefore, the width of the stock necessary with this process need be no wider than the widest portion of the rail blank designated at A in Fig. 1; or in blanking from plate or sheet, no wider than a distance equal to the combined widest portions of all of the blanks in the sheet, as a result of which, the scrap loss laterally of the upper edge of the blank is reduced from the area S to the longitudinally extending area S'.

With the use of such relatively narrow stock, a portion of the kickup or lateral offset 12 necessarily falls beyond the upper longitudinal edge of the stock, but this deficiency of primary stock is made up by employing a portion K of the usual scrap lying below the kickup, and by welding this supplemental stock K to the longitudinal edge of the strip stock at the point where the kickup will fall in the blanking operation. Obviously, this supplemental stock K is disposed in the same plane as the primary stock 10 and is welded along the line 13 extending longitudinally of the kickup portion and substantially perpendicular to body loads. In the case of flash welding, the flash

may be permitted to remain in the finished rail to constitute a reinforcing bead, or it may be removed or other types of welding such as butt-welding may be employed where the welded seam itself possesses sufficient strength for the loads to be imposed. It will be noted that blanking of the supplemental stock K can be figured so that one longitudinal edge thereof will coincide with the longitudinal edge of the strip 10 and therefore is thus prepared for welding to the opposite corresponding longitudinal edge of the strip stock without further cutting or trimming. The edges of the supplemental stock K and primary stock of the kickup which are to be welded together, can be of any desired outline to cause the welded seam 13 to be disposed across any desired portions of the web and flanges of the rail to reinforce the same against dynamic and other stresses over the kickups. Obviously, the forward end of the rail may also possess a laterally extending offset portion or kickup to be disposed over the front axle to still further lower the center of gravity of the chassis, in which event other supplementary stock may be obtained from the strip in the region below and between the ends of adjacent blanks in the strip stock and welded to the longitudinal edge of the strip in the same manner as the supplementary stock K. The dotted lines 14 paralleling the outlining contour of the blank represent the lines along which the blanks are bent or formed into channel section as illustrated in Figs. 3 and 4.

After the supplementary pieces of stock K are welded to the edge of the strip, the rails are blanked out in a fashion causing a portion of the kickup 12 to extend into the supplementary stock. The blanks are then cut out of the strip in the customary manner and are formed into channel section, thereby causing the welded seam 13 to extend longitudinally across the arch of the kickup in the web portion of the rail with the ends 15 of the welded seam extending obliquely across the upper flange 16 of the rail at either side of the kickup to further reinforce the same against deflection or torsional stress.

In the multiple blanking of rails from sheet or plate stock such as shown in Fig. 2, the use of the herein process also results in minimizing loss by way of scrap. With sheet or plate stock having a width equal to the distance D of Fig. 2, it would only be possible to obtain two side rails therefrom and in order to obtain a third side rail from such a sheet, it would be necessary to provide stock having a width equal to the distance C of Fig. 2. In the latter method, it will be seen that the portion of a plate or sheet above the upper longitudinal edge of the upper blank would be scrap as well as those portions of the original stock, located between the corresponding ends of the blanks. The numerals and letters employed in Fig. 2 corresponding to those of Fig. 1 designate corresponding elements so that reference thereto in conjunction with the description of Fig. 1 will clarify the multiple blanking process from sheet or plate stock indicated by the numeral 17. However, in the herein disclosed multiple blanking process it will be noted that the side rail blanks are cut from the sheet or plate with their longitudinal axes extending obliquely from one side edge to the other rather than straight across the sheet as is customary, and this relationship of the blanks to the original stock causes the production of ample original stock indicated by the numeral 18 between the forward ends of adjacent blanks for the kickup material K and simultaneously creates a closer disposition of the rear ends of the blanks for the concentration or consolidation into one larger piece of excess stock 19, the smaller pieces of material lying between the rear ends of adjacent blanks, which, due to the vast irregularities of outline, can be of no great useful purpose. If desired the kickup K ran be blanked from the excess stock 19 at the point 20 and still leave a sufficiently large piece 19 for the formation of other large articles. In the multiple blanking of rails, only one welded rail is obtained from each sheet or plate stock, but where hundreds of sheets or plates are used in blanking out rails, the welded rails can be paired off into the same frame to effect equality of performance in use.

It will be apparent in either method, that the portions K forming the kickups can be cut out in final or approximately final shape and then be welded to the rail either before or after the latter is blanked, and that these portions may be cut either from the main stock or from auxiliary stock.

It is to be understood that various changes in the size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention or scope of the appended claims.

I claim:

1. The method of forming a vehicle side rail which consists in taking a piece of stock having a width as wide as the widest portion of the rail, cutting a portion of the stock therefrom, welding the same to the longitudinal edge of the stock at a point remote from the widest portion of the rail, blanking out the rail with an offset portion extending into said welded piece of stock, and then forming the rail into channel section.

2. The method of forming a vehicle side rail which comprises taking a piece of straight edge stock having a width at least as wide as the widest portion of the rail, cutting a piece of stock with one edge thereof coincident with the straight edge of the stock, welding the straight edge of the cut portion to the straight edge of the stock at a point remote from the widest portion of the rail, and blanking out the rail with an offset portion extending into said welded piece of stock.

3. The method of forming metallic articles which comprises taking a sheet of main stock having a width at least as wide as the combined width of the widest portions of the articles, cutting a piece of auxiliary stock, welding the same to the edge of the main stock at a point remote from the combined widest portions of the rails, and blanking out the rails with their longitudinal axes extending obliquely of the stock with their rear ends closely grouped to concentrate any excess material into one piece and with an offset portion of at least one of the rails extending into said welded piece of stock.

4. A method of forming a metallic article which consists in taking a piece of main stock having a width at least as wide as the widest portion of the article to be formed, welding a piece of auxiliary stock to the longitudinal edge of the main stock at a point remote from the the widest portion of said article and then blanking out the article with an offset portion extending into said welded piece of stock.

5. The method of forming a metallic article which consists in taking a piece of main stock having a width at least as wide as the widest portion of the article, blanking out an incomplete article, welding to the main stock at a point re-

mote from the widest portion thereof a piece of auxiliary stock of requisite shape to form a complete article having an offset portion at said weld, and then forming the article of the requisite cross-section.

6. The method of forming a metallic article which consists in taking a piece of main stock having a width at least as wide as the widest portion of the article, outlining an incomplete article blank on the stock and welding to the longitudinal edge of the stock at a point remote from the widest portion of the article a piece of auxiliary stock of requisite shape to form a complete article having an offset portion at said weld.

7. The method of forming metallic articles which comprises taking a sheet of main stock having a width at least as wide as the combined widest portions of the article, blanking out the articles with at least one of the articles incomplete and with their longitudinal axes extending obliquely to the stock with their rear ends closely grouped to concentrate any excess material into one piece, and welding to the main stock at a point remote from the combined widest portions of the articles a piece of auxiliary stock of requisite shape to complete the incomplete article with an offset portion at said weld.

WILLIS GORDON STONER.