May 31, 1932. W. J. MEINEL 1,860,683

METHOD OF MAKING METAL STAMPINGS

Filed June 27, 1929

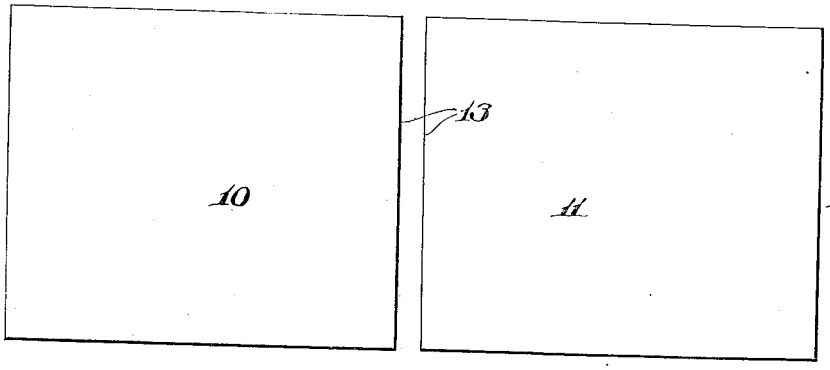


Fig. 1.

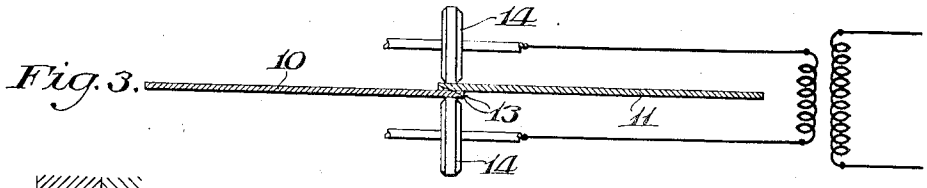


Fig. 3.

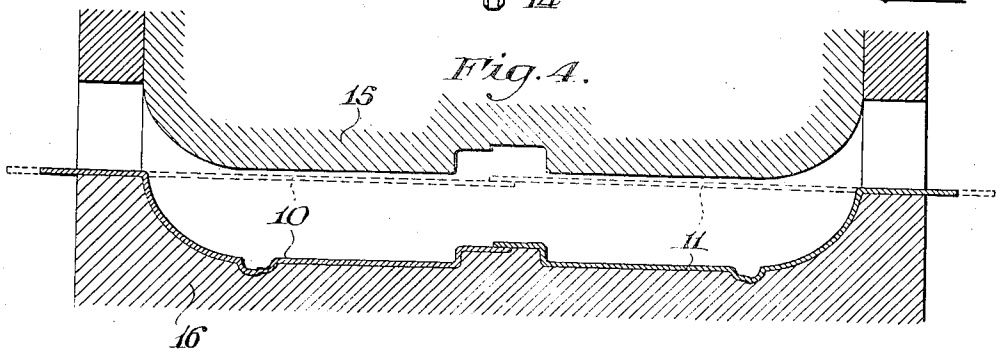


Fig. 4.

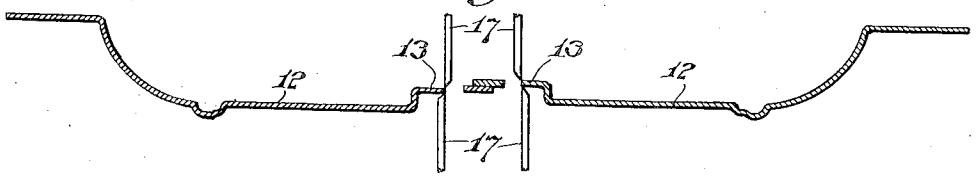


Fig. 5.

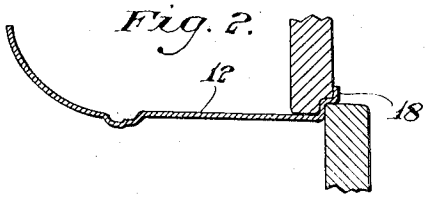


Fig. 2.

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UNITED STATES PATENT OFFICE

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METHOD OF MAKING METAL STAMPINGS

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In the practice of die stamping, there is frequently considerable waste of stock incident to the spoilation of the metal caused by its draft through hold down dies and the irregular controlling formations of those hold down dies necessary to control the flow of metal in the main forming die. The control formations of the hold down dies themselves may spoil the metal for further use in die stamping at least without special reformation, or it may be surface scored incident to its draft over the hold down surfaces. In such cases it is good for nothing except remelting as steel mill scrap at a very low price. In yet other cases there is utilized, for marginal trim purposes an inordinate amount of metal. Such metal though possibly useful in the manufacture of by-products of various description, is so utilized at much less value than as part of the principal product, and has salable value as scrap stock much less than that of the original stock.

Furthermore, considering any drawing operation as an entirety, it is much more economical of material, and in some instances at least, more efficient to control the flow of metal by opposing against each other various forces of the draw itself than to control by extraneous resistance. Control through extraneous resistance is exemplified by the commonly used hold down dies. Control through the internal opposing of one drawing force against another is exemplified through the use of opposing formations often in symmetry within the margins of the principal stamping, as for example, a depression or an embossing within the margin.

The objects of my invention are to utilize economical and efficient control by internal opposition of force, as often utilized in unitary stampings, in multiple stampings; to utilize this method available commonly in unitary stampings only within their margins also at the margns in lieu of the wasteful marginal hold down die processes, and to eliminate or minimize the loss commonly sustained through marginal trim and spoilation.

This I achieve by fabricating a number of sheet metal blanks separate from each other and each of sufficient stock to constitute a complete article, then rigidly connecting said blanks together in longitudinal series with sufficient strength of connection to resist marginal drawing strains in the articles themselves, thereupon die stamping the articles, one from each of the connected blanks, the while resisting marginal and in some cases also the internal drawing strains through the marginal connection between the blanks, and thereafter doing away with the connection to the end of separating and trimming the articles. Preferably I electrically weld the margins of the blanks toegther, by spot or seam welding since it is quick and cheap, simultaneously form the articles by a single drawing operation, and thereafter actually cut out from between the articles the seam of the weld.

In the accompanying drawings I show my invention in connection with an art in which it has particular adaptation, the fabrication of parts of automobile bodies of sheet metal. Quite obviously it has other adaptations and other embodiments and is susceptible of considerable modification, all without departing from its generic spirit.

Of the drawings,

Fig. 1 is a plan view showing a multiple number of blanks 10 formed separately from each other and each of sufficient stock to produce a completed stamping of the rear quarter of the side of an automobile body such as shown in Fig. 2.

Fig. 2 shows this rear quarter of the side of an automobile 12, as completely fabricated.

Fig. 3 is a transverse section through blanks 10 and 11 as seam welded together along their margins 13 by welding rollers 14 diagrammatically illustrated.

Fig. 4 is a transverse sectional elevation showing the rigidly connected blanks 10 and 11 as simultaneously operated upon by the compound dies 15 and 16 to die stamp each of the connected blanks 10 and 11, and completed rear quarter side stamping 12 for an automobile body. In dotted lines this figure shows the blanks 10 and 11 rigidly connected together by a seam weld of their margins 13 in position over the lower die 16 with the upper

die 15 ready to come down upon them for the simultaneous formation.

Fig. 5 is a compound view showing the two respectively completed stampings 12 severed from each other and from the rigid connection of their margins 13 by shears 17 diagrammatically illustrated.

The seam welding of margins 13 of the two or more blanks is a very rapid operation. It produces no flash liable to interfere with the dies or the drawing operation, and does not have to be cleaned. But other means of rigidly connecting together by welding or otherwise, according to different processes, may be utilized if desired.

As illustrated in Fig. 3 and in the compound view of Fig. 4, it will be seen that there is substantially no excess of metal adjoining the rigidly connected margins 13 which are finally removed. The only waste is that of the rigidly connected margins 13 and of a width of the lap of the seam itself. The adjoining and adjacent metal is all a part of the resulting stampings.

In the draw itself the marginal flow of metal as between the two adjoining stampings 12 is controlled by the opposition of the forces of the draw in the adjoining stamping through the rigid marginal connection 13. The stampings are so placed that these strains are symmetrical about the vertical plane of the connection 13. Thus both the marginal and the adjoining interior flow of the metal is controlled through this rigid connection.

Furthermore, stampings of great depth are produced by initially drawing at less depth between stampings, and thereafter completing the draw. Increasing the depth by a drawing operation develops the sides 18 of the stamping. This step of the process also makes it possible to make stampings having very abrupt sides and sharp corners such as are required in automobile door or window ways of which the rear quarter side stamping of an automobile forms a part.

The diagrammatic illustrations of the drawings themselves show how completely I have attained the object of my invention.

In the claims appended, there should be afforded me a protection commensurate with the generic spirit of the invention.

What I claim is:

1. The method of die stamping articles from sheet metal which consists in separately fabricating a number of blanks each of sufficient stock to constitute a completed stamping, rigidly connecting said blanks together by their margins in longitudinal series, simultaneously stamping a multiple number of articles from the connected blanks, one from each blank, and thereafter severing the connection between the blanks to remove all irregularities resulting from said connection.

2. The method of die stamping articles from sheet metal stock which consists in fabricating separate from each other a number of blanks each of sufficient stock to form a completed article, welding the blanks together at their margins in longitudinal series, die stamping an article from each blank of the welded whole, and thereafter cutting off the welded portions of the articles to separate them and to remove all irregularities due to the welding.

3. The method of die stamping articles from sheet stock which consists in fabricating a multiple number of separate blanks each of sufficient stock to form a completed article, connecting together a multiple number of blanks rigidly in their margins in longitudinal series, simultaneously die stamping the articles from rigidly connected blanks, one article from each blank, controlling the flow of metal in the draw and by the rigid connection between the blanks, and thereafter removing the connection to separate the blanks and to remove all irregularities resulting from said connection.

In testimony whereof I hereunto affix my signature.

WILLIAM J. MEINEL.