

J. J. SPILLANE.
 PROCESS AND APPARATUS FOR FLANGING HEAVY METAL PLATES.
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1,322,147.

Patented Nov. 18, 1919.
 2 SHEETS—SHEET 1.

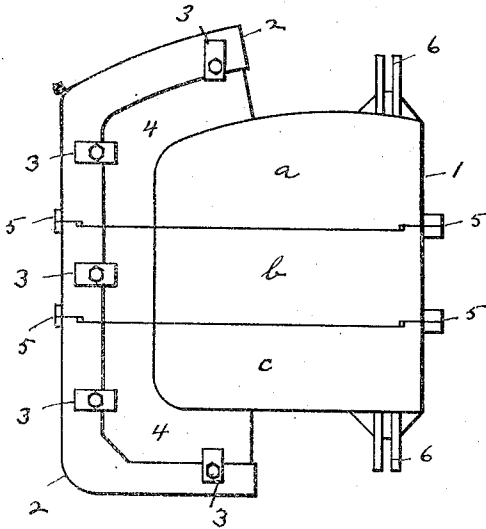


FIG. 1.

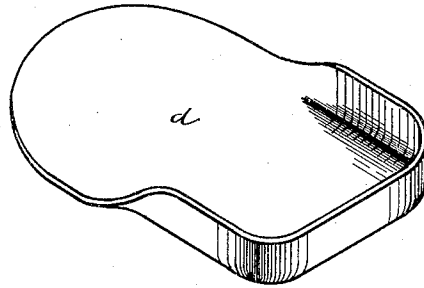


FIG. 2.

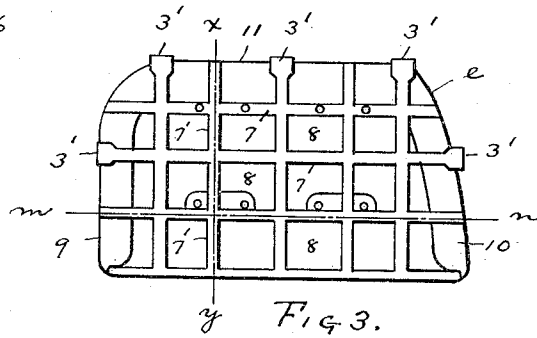


FIG. 3.

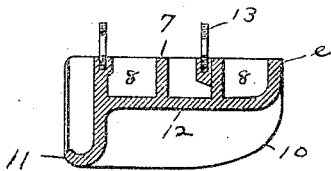


FIG. 4.

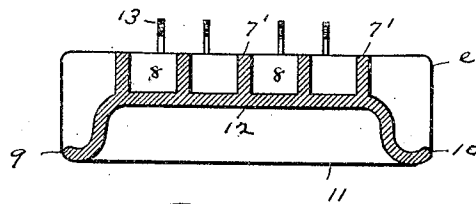


FIG. 5.

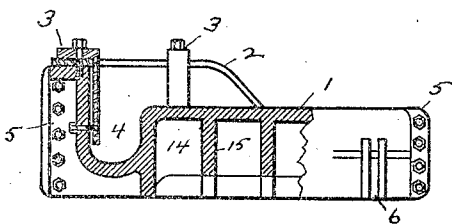


FIG. 6.

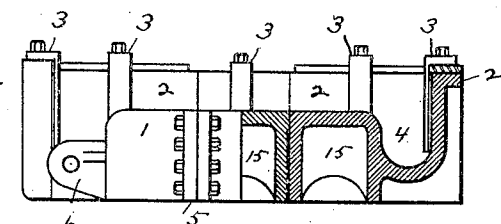


FIG. 7.

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PROCESS AND APPARATUS FOR FLANGING HEAVY METAL PLATES.

1,322,147.

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To all whom it may concern:

Be it known that I, JOHN J. SPILLANE, a citizen of the United States, residing in the city of Portland, in the county of Multnomah and State of Oregon, have invented certain new and useful Improvements in Processes and Apparatus for Flanging Heavy Metal Plates, of which the following is a specification.

The invention relates particularly to means for flanging the heavy metal plates used in boiler and tank construction and has for its object the lessening of the number of successive operations necessary to accomplish this purpose. Also the metal is drawn uniformly into the desired shape, the flanged plate being ready for use upon the completion of the flanging operation and not requiring further hand rectification before being available.

Referring to the drawings Figure 1 is a plan of the lower die or former. Fig. 2 is a perspective view of the partly flanged plate *d*. Fig. 3 is a plan of the top die. Fig. 4 is a cross section of Fig. 3 along line *x y*. Fig. 5 is a longitudinal section of Fig. 3 along line *m n*. Fig. 6 is a side elevation of the bottom die with part in section. Fig. 7 is an end elevation of the bottom die with part in section. Fig. 8 is a front elevation showing top die attached to a hydraulic press and in position above lower die.

Heretofore it has been the method of flanging heavy boiler plates, or crimping over the edges, to flange only short sections at a time, thus calling for a great number of successive flanging operations. This not only consumes much time, but after the flanging has been completed, the rectification of the corners must be done by hand and consists of heating the plate and hammering by hand an indefinite number of times, often consuming an entire day on one plate. By my method large sections of the plate are flanged at one operation, especially the curved parts, uniformly and accurately and all necessity for hand rectification is obviated.

The bottom or die 1, Fig. 1 is composed of three sections, *a*, *b*, and *c*, bolted together as shown at 5, 5, Fig. 8. It is cored underneath and strongly ribbed as shown in Figs. 6, 7 and 8, forming a flat table, with rounded corners, on which to rest the plate *d* to be flanged. Integral with this table part is

the guide part 2, Figs. 1, 6, 7 and 8. This guide is provided with a deep groove 4, adapted to receive the rounded portions 10, 11 and 12, Figs. 4, 5 and 8, of the top die *e*, and the sides and back are higher than the flat surface of the table part. Placed on the sides and back of this guide part, on the inner wall are the vertical guide strips 3. These are angle pieces as shown, faced so as to present a smooth surface to the corresponding guides 3', 3', Fig. 3, of the top die *e* and can be made adjustable so as to take up any wear, or to set in the top die a little closer to the crimping edge of the table 1 of the bottom die. The top die *e* is bolted as shown in Fig. 8 to the plungers 17 of the hydraulic press 16. The lugs 6, Fig. 1, are used to clamp the plate *d* to the table 1.

The flat plate *d*, Fig. 2, to be flanged, after being heated to a cherry red, is clamped to the table 1 of the bottom die, allowing the proper overhang of the plate over groove 4 to form the required width of flange when the edge of the plate is crimped over. The top die is bolted firmly to the plunger or plungers of the press as shown in Fig. 8. The relation of the bottom die to the top die is such that when the top die is lowered the guide bracket 2 and the guide strips 3, 3, of the lower die will engage the guide parts 3', 3' of the top die and hold the top die in perfect alinement with the bottom die, so that when the top die strikes the heavy plate *d* on the table 1, it cannot be deflected sidewise, forward or backward. The guide bracket 2 should be several inches higher than the table 1 so that the guide strips 3, 3, will have a substantial purchase on top die *e* at the time it engages the heavy plate. The curved part 11, Fig. 4, tends to throw the top die back against the guide bracket 2. The plate *d* being properly set on the table 1 of the bottom die, a pressure of about 300 tons is gradually applied and with the form of dies shown in the drawings, a heavy three quarter inch thick plate will be perfectly flanged as shown in Fig. 2.

This is much faster than the old way and involves fewer manipulations. The plate is then removed from the press and heated to redness; the dies are changed to crimp the straight sides and the operations repeated to flange the other end of the plate. It is customary when the dies are set, for

instance, to flange one end of the plate, to run through the press as many of the plates as are ready for flanging in order to avoid resetting of the dies for each plate. After
5 these manipulations and the final annealing of the plate it is ready to be used, effecting a saving of several hours labor on each metal sheet that is fashioned.

I claim,—

10 1. In an apparatus of the type described, a bottom die with former part, a guide part

integral with this former part and extending substantially higher than said former part, guide strips adjustably affixed to the inner wall of the guide part and a top die, 15 with a plurality of guide surfaces adapted to engage said guide strips of the bottom die.

2. In an apparatus of the type described, a bottom die with a former part and a guide part and adjustable strips affixed to the inner wall of said guide part. 20

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