H. A. KEINER.

SHEET METAL CONTAINER.

APPLICATION FILED JAN. 29, 1908.

929,446. Patented July 27, 1909.

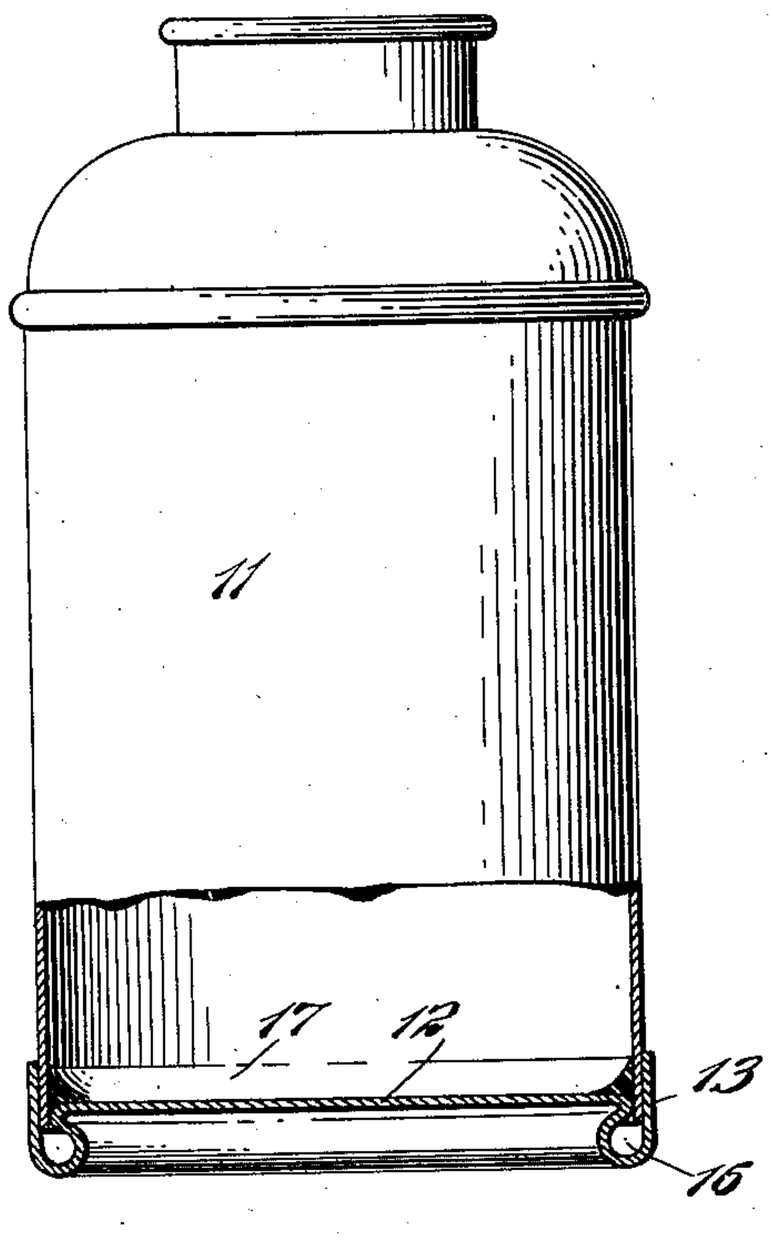

Fig. 1.

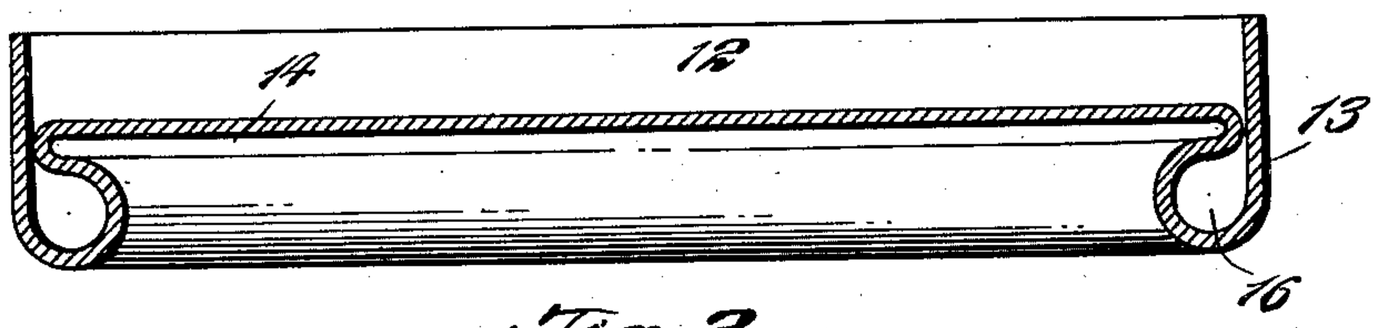

Fig. 2.

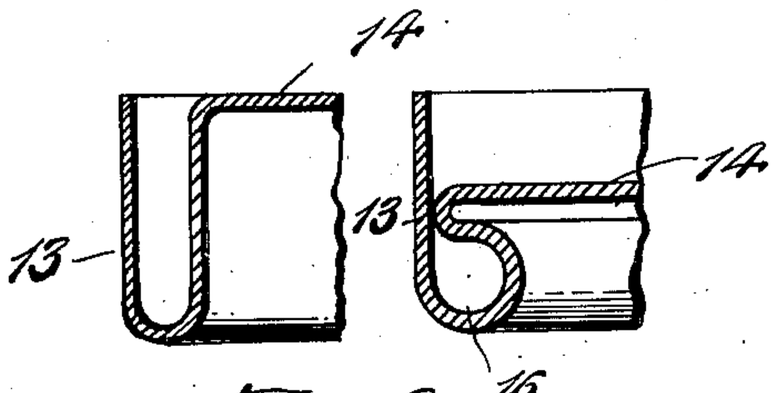

Fig. 4.

Fig. 5.

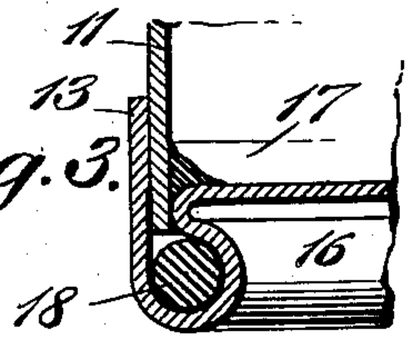

Fig. 3.

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SHEET-METAL CONTAINER.

No. 929,446. Specification of Letters Patent. Patented July 27, 1909.

Application filed January 29, 1908. Serial No. 413,151.

To all whom it may concern:

Be it known that I, HENRY A. KEINER, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Sheet-Metal Containers, of which the following is a specification.

This invention relates to sheet-metal containers, with more particular reference to dispensing tanks of comparatively large size, such as are used to contain carbonated water and other liquids and gases which exert a high internal pressure, for which purpose obviously, such a container must be of great strength. I also have in mind the large cans in which milk is usually shipped to market, and the larger sizes of oil cans, both of which when in service are subjected to hard usage and which, therefore, must be of exceedingly strong and rigid construction.

It will be apparent that the joint between the bottom and the body portion of the tank is undoubtedly the part considering both usage in handling and internal pressure, most likely to be affected by the various strains, and therefore, this joint is, the part likely to first yield to such strains and render the containers unfit for use. The present invention contemplates means for strengthening and protecting this joint and, in fact, the entire container, and this without appreciably—if at all—increasing the cost of materials and manufacture.

I am aware that there are many ways in which the bottom part of the container has been formed or constructed with the above ideas in mind, but it has been my experience that efforts to strengthen and improve upon this joint and the walls of the container adjacent thereto have generally been made at the expense of due economy in the manufacture of such containers. There is, of course, a limit of cost beyond which the manufacturer cannot profitably go, and the object of this invention is to provide a strong, durable and tight joint between the bottom and the body portions of containers of this class, and otherwise strengthen the entire structure, in the simplest possible manner, requiring the fewest possible operations in manufacture, and without employing a heavier gage of sheet-metal throughout the whole container, than would naturally be required to give the requisite strength to parts thereof other than those comprising this joint.

My invention will be more readily understood by reference to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a central sectional elevation of a sheet-metal container embodying my invention; Fig. 2 is a central section of the bottom of the container; Fig. 3 is a central section through the lower portion of a container illustrating a slight modification of the preferred form as shown in Fig. 1; Fig. 4 illustrates the successive steps of the stamping operations by which the bottom of the container shown in Fig. 1 is formed, and Fig. 5 illustrates the steps of the stamping operations by which the bottom of the container illustrated in Fig. 3 is formed.

Referring now to the drawings in detail, numeral 11 refers to the body portion of a common form of cylindrical sheet-metal container of the character to which I have referred. The bottom 12 thereof is formed from a single and separate sheet-metal blank of circular form, which is first by a suitable stamping operation provided with the depending double or U-shaped flange 13 (referring now to Fig. 4). The bottom, thus flanged, is now placed between suitable dies and by another operation that portion of the bottom bounded by the top edge of the inner member of the flange is forced downwardly in such manner that the rounded corner 14 (Fig. 4) is depressed and the inner member 15 of the flange curled or curved into the configuration shown, the bend 14 being forced into yielding contact with the outer member 13 of the flange. I have now provided said bottom, at its outer edge, with a depending substantially cylindrical rim 16, which is of sufficiently small diameter that under the well-known laws of the resistance of materials the strength of the outer edge of said bottom is materially augmented. It will be noted that in forming this annular cylindrical edge, or hollow rim, the outer member 13 of the flange remains in its original vertical position, and the interior diameter of the short cylinder formed by said flange is substantially equal to the exterior diameter of the cylindrical body 11 of the container. The lower end of this body portion 11 is now inserted within the flange of the bottom 12, and forced between

the yieldingly contacting bend 14 and flange 13 of said bottom and firmly seated, as shown in Fig. 1. Solder is now applied, preferably to both the outside and inside of the container, the flange 13 being thus rigidly secured to the sides at the end of said body portion, and a ring of solder 17 formed within the container to seal the opening between the bend 14 of the bottom 12 and the inserted end of the body of the can. This ring of solder not only seals the opening but obviously augments the strength of the joint.

It will be noted that the bottom 12 is formed by but two comparatively simple operations. Thus formed, this bottom is now applied to the can body and the soldering operations complete the container.

It will be apparent not only that I have provided a container having a bottom joint which will successfully resist ordinary internal pressure to which it may be subjected but one which is also capable of withstanding the exceedingly rough usage to which such containers are frequently subjected. It is well known that these tanks, for whatever purpose they may be employed, particularly when of large size and capacity, are, in handling usually rolled along the bottom edge, and not infrequently dropped by carriers in such position that this edge receives the full force of the impact. It will therefore be understood why it is necessary that this part of the container—that is, the lower edge thereof—be made of comparatively great strength. The cylindrical configuration of the metal at this edge, in a structure embodying my invention, as will be apparent, forms a cushion which receives and to a certain extent distributes the strains, and even should such strains be sufficient to permanently distort or indent the metal, such strains will become distributed as to be practically harmless when transmitted through the metal to the vital parts of the joint. In forming this cylindrical edge, as is well known, I have, through the sharp curvature, vastly increased the resiliency of such metal as that of which these containers are usually constructed whereby distortions due to any ordinary strains of impact will be but temporary, the original configuration of the metal being restored through its own resiliency.

For some purposes it may be desired to add an additional strengthening element to this edge and joint, and, while such addition obviously adds somewhat to the cost of manufacture, such cost may be compensated for through the increased strength of the retainer at this joint. For instance, as illustrated in Figs. 3 and 5, an annular wire ring 18 may, after the first flanging operation, be seated in the bottom of the groove provided by the U-shaped flange. When said bottom is then subjected to the second forming operation, hereinafter briefly described, the portion 15 of the double flange will, as the bend 14 is forced downwardly and outwardly, curl around the ring 18 which thus forms a core for the cylindrical rim 16.

The extent to which body portion 11 of the container is forced downwardly in the cylindrical rim 13 is obviously immaterial so far as my invention is concerned. I prefer that the lower edge of said body portion fall just below the bend 14 either where no core is employed, as clearly shown in Fig. 1, or where the ring 18 is used, as illustrated in Fig. 3. The soldering operations will now complete the container, so far as this joint is concerned.

I claim as new and desire to secure by Letters-Patent:

1. A sheet-metal container comprising a bottom and a body portion, said bottom portion being formed to provide an upwardly-directed cylindrical flange within which the end of said body portion is inserted and to which it is secured, and said bottom portion being further formed to provide a depending tubular ring intermediate the bottom proper and said flange, forming a supporting rim for said bottom and for said container and lying wholly below the plane of said bottom and within the plane of said flange.

2. A sheet-metal container comprising a bottom and a body portion, said bottom portion being formed to provide an upwardly-directed cylindrical flange within which the end of said body portion is inserted and to which it is secured, and said bottom portion being further formed to provide a depending tubular ring intermediate the bottom proper and said flange, forming a supporting rim for said bottom and for said container and lying wholly below the plane of said bottom and within the plane of said flange, and a solid ring within said tubular ring.

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