

Nov. 17, 1925.

1,562,074

S. J. BAUM

AIRPLANE GAS TANK AND METHOD OF MAKING SAME

Filed Aug. 25, 1924

4 Sheets-Sheet 1

FIG. 1.

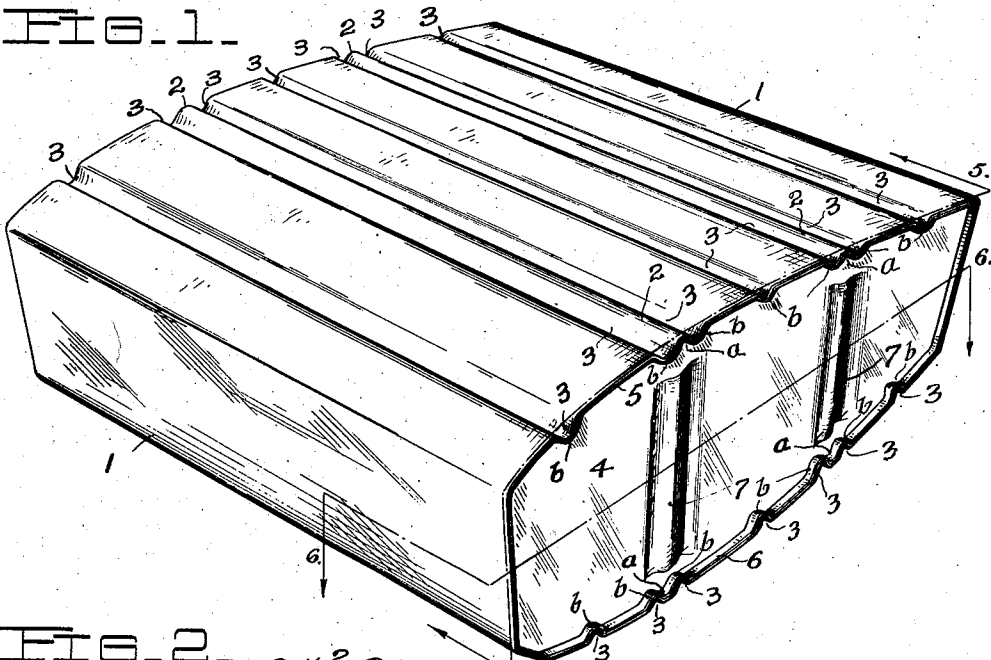


FIG. 2.

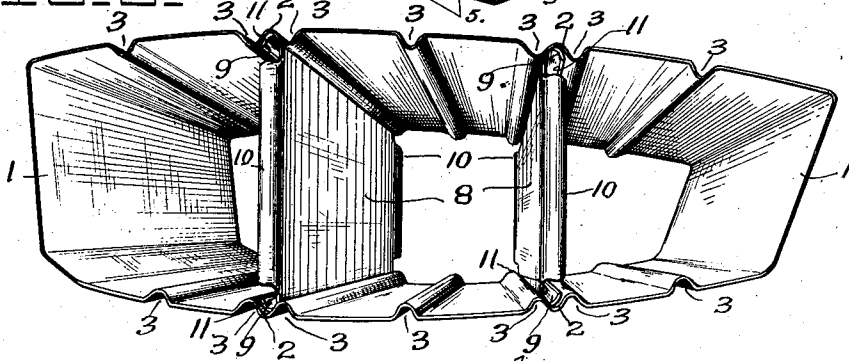
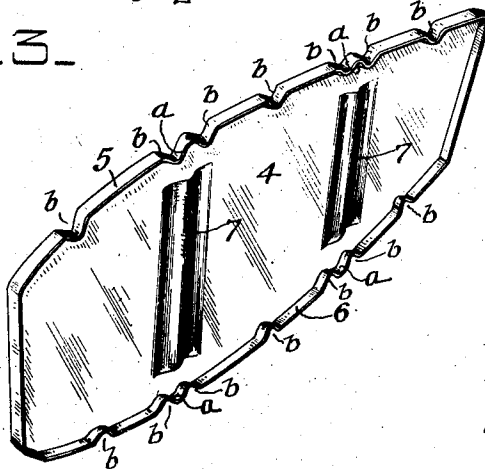


FIG. 3.



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Fig. 4

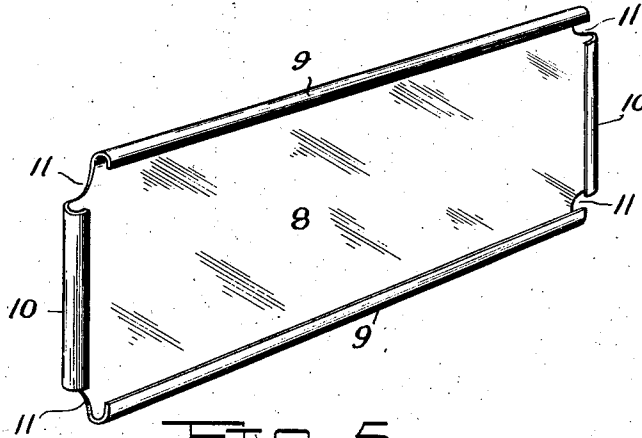


Fig. 5

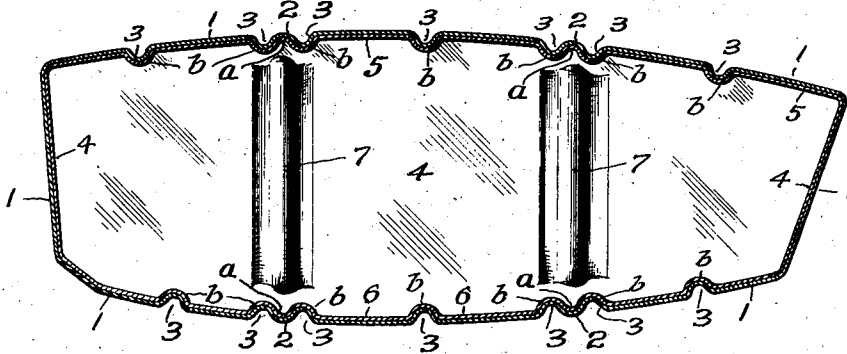
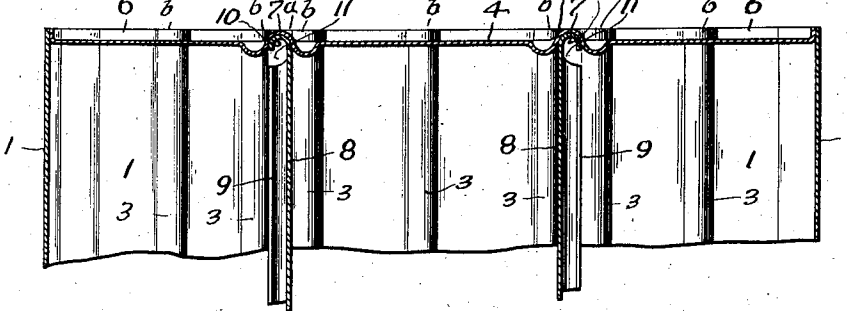


Fig. 6



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Fig. 7.

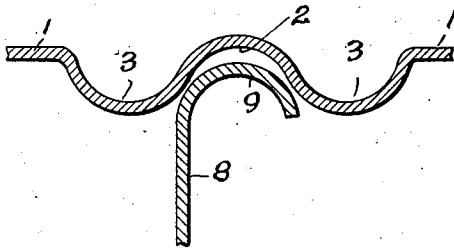


Fig. 8.

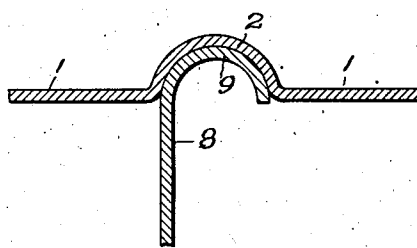


Fig. 9.

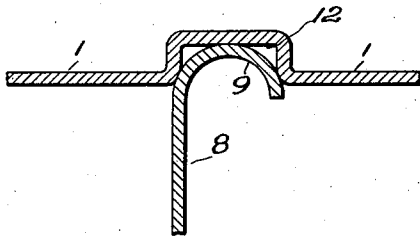


Fig. 10.

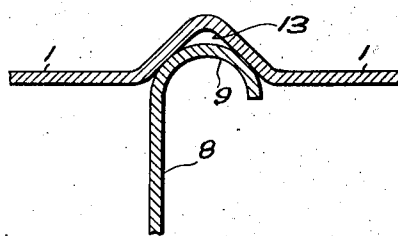


Fig. 11.

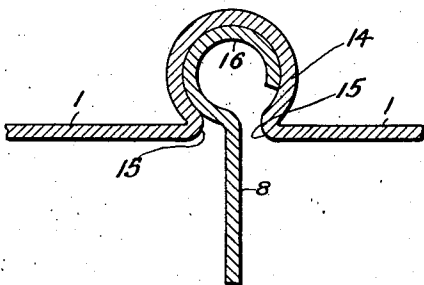


Fig. 12.

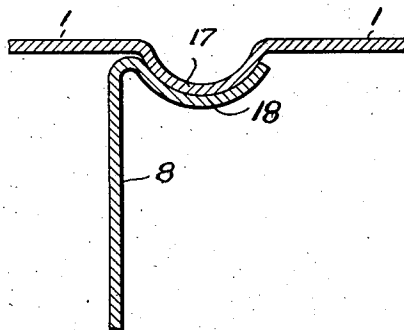
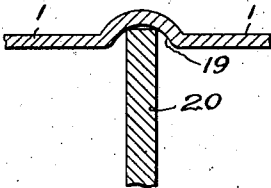
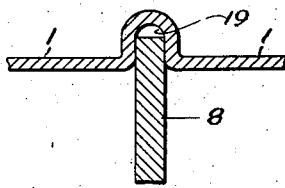


Fig. 13. Fig. 14.



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Fig. 15.

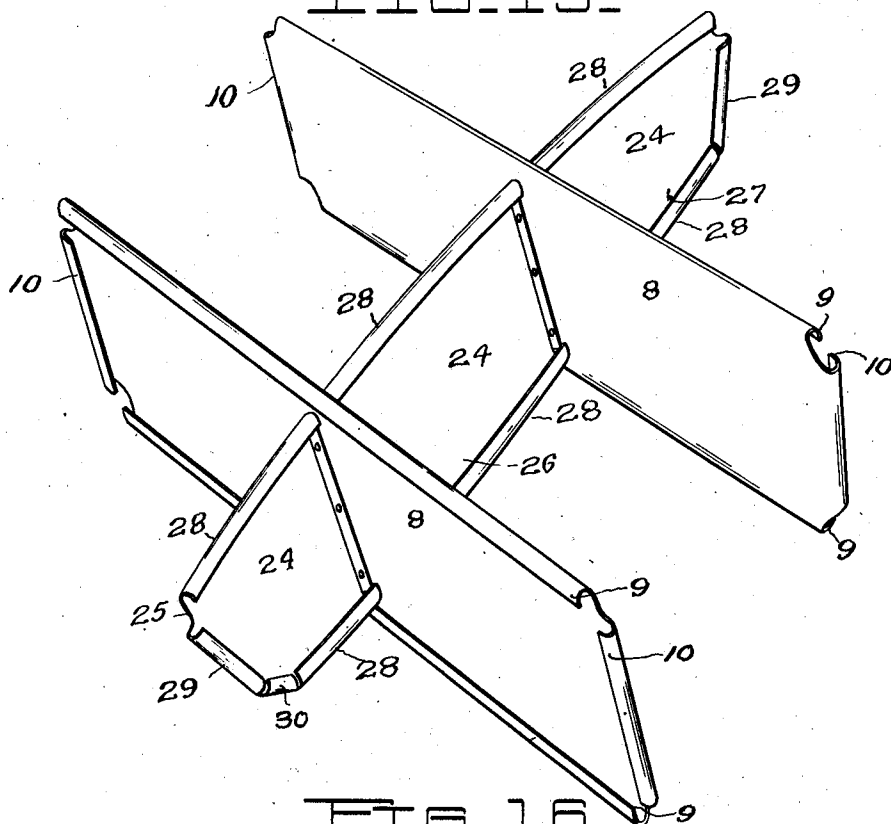
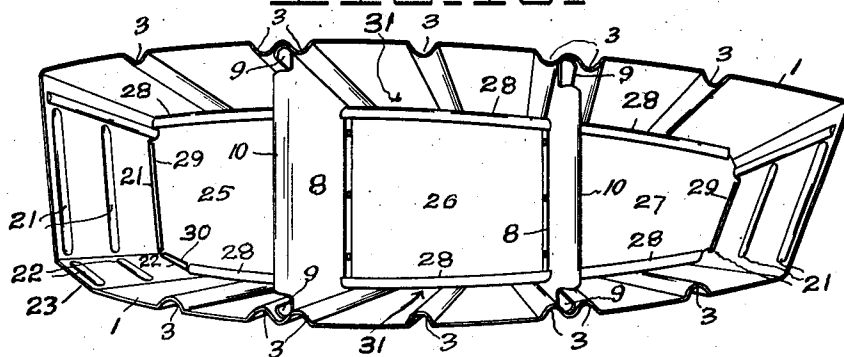


Fig. 16.



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UNITED STATES PATENT OFFICE.

SEYMOUR J. BAUM, OF FLUSHING, NEW YORK.

AIRPLANE GAS TANK AND METHOD OF MAKING SAME.

Application filed August 25, 1924. Serial No. 733,869.

To all whom it may concern:

Be it known that I, SEYMOUR J. BAUM, a citizen of the United States, residing at Flushing, Queens County, State of New York, have invented certain new and useful Improvements in Airplane Gas Tanks and Methods of Making Same; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to airplane gas tanks and the method of making the same, and has for its principal object to provide such tanks with baffle plates or partitions in such a manner that there is no welding whatsoever of the baffle plates and no openings or perforations in the walls of the tank such as would be necessary in welding or riveting the baffle plates in position.

A further object of the invention is to prevent the creation of any comparatively soft sections in the walls of the tank such as would ordinarily result from any welding or riveting of the baffle plates, thereby preventing any tendency of a tearing of the walls of the tank adjacent the welding or riveting, and the danger of corrosion of the walls of the tank at such soft sections.

A still further object of the invention is to provide an exceedingly strong and durable tank of this description, in which the baffle plates are not liable to break or rattle around.

A still further object of the invention is to prevent the corrugations in the tank from flattening out or becoming distorted.

And finally the invention aims to provide communication between the compartments formed by the baffle plates, in such a manner that, whatever may be the maneuvers of the airplane, these communications will always function.

The accompanying drawings, illustrate the invention in its preferred form and also certain modifications thereof, and form a part of this application, and are to be considered in connection with the description and claims.

In the drawings—

Figure 1 is a perspective view illustrating an airplane gas tank constructed in accordance with my invention.

Figure 2 is a perspective interior end view of the body of the tank with the baffle plates in position and without the end covers.

Figure 3 is an outside perspective view of one of the end covers.

Figure 4 is a perspective view of the preferred form of baffle plate.

Figure 5 is a section at the line 5—5 of Figure 1.

Figure 6 is a section at the line 6—6 of Figure 1.

Figure 7 is a detail fragmentary sectional elevation of the resilient lip portion shown at Figure 6 in juxtaposition with respect to its channel in the wall of the main body of the tank and showing particularly the fact that the curve of this lip has a greater radius than that of the curve of the channel.

Figure 8 is a view similar to Figure 7 but illustrating the close conformation of the lip to the channel when the baffle plate is forced into position.

Figures 9 and 10 are similar to Figure 7 and illustrate the combination between the lip of the baffle plate and different forms of channels.

Figure 11 is likewise a view similar to Figure 7 and showing a form of channel within the tank body which has a comparatively narrow neck portion, while the lip of the baffle plate is similarly formed.

Figure 12 is also similar to Figure 7 but it shows a rib curved in cross section, and extending inwardly instead of outwardly while the lip of the baffle plate extends laterally and is curved so as to be conformable to the wall of the channel and in this instance the curve of the baffle lip would be formed from a radius less than that of the curve of the rib.

Figure 13 shows a fragmentary section of a tank body provided with a channel within which the rectangular edges of a baffle plate are located, the walls of the channel being then contracted and pinched against the baffle plate so as to present the appearance illustrated at Figure 14.

Figure 15 is a detail perspective view of a baffle plate structure having a cross partition secured thereto, and

Figure 16 is a view similar to Figure 2 showing this construction properly located within the tank body.

Similar numerals of reference denote like parts in the several figures of the drawing.

Baffle plates or partitions in an airplane gas tank are quite desirable, not only in order to prevent the gasoline from flowing very rapidly from one end of the tank to

the other when the airplane is maneuvered, but also to prevent the sloshing of a considerable body of gasoline against the walls of the tank and thereby subjecting these walls to severe strains.

Heretofore, baffle plates have been secured within a gasoline tank but since it is quite impossible to perform any welding at the inside of the tank, these baffle plates have been provided with portions that extend through the walls of the tank and are welded or riveted thereto, but this welding or riveting invariably creates soft sections in the walls of the tank immediately adjacent the weld or rivet, thereby weakening the tank at these locations, and also necessitating considerable labor and expense.

According to the present invention, the body of the tank is formed with suitable channels extending from end to end on opposite sides of the tank, an end cover then being conformably fitted within one end of the tank and welded thereto and the baffle plates merely inserted in position, after which the other end cover is conformably applied and welded in position.

The present invention has nothing to do with the construction of the gas tank other than that which relates to the securing of the baffle plates, and therefore the accompanying drawings do not illustrate any bracing of the tank or any accessories or equipment thereof, other than the installation of said plates, and accordingly the following description will be likewise limited.

1 is the tank body which has within the opposite face walls channels 2 there being in the present instance two pairs of these channels, because in the tank shown there are but two baffle plates to be used, and the body of the tank has strengthening corrugations 3 located throughout the area of both faces of the body, but these corrugations have nothing to do with the present invention itself but are merely referred to incidentally.

The end covers are both exactly alike, and in the present instance are shown inserted within the ends of the tank body. One of these covers 4 is illustrated at Figure 3 and its upper and lower rims 5, 6, are formed into channels *a* and corrugations *b* that conform exactly to the corresponding channels and corrugations in the upper and lower faces of the body 1, so that when these covers are applied within the ends of the tank they will fit the same snugly in all respects, and right here it might be as well to state, that after these covers are in position their outer edges are flush with the outer edges of the tank, and these edges are then welded together.

The covers have formed within their faces channels 7 that correspond exactly with the channels 2 in the tank body, and when the covers are in position, these channels 7 will

extend at right angles to the channels 2 but will be in the same vertical plane.

8 are the baffle plates which are alike in construction and have extending from their sides and ends resilient lips 9, 10. The channels 2 and the lips 9 are curved, but in cross section the radius of the lips is greater than the radius of the channels, so that when these baffle plates are inserted endwise and forced within the body of the tank the lips will slightly contract so as to fit the channels snugly.

In forming the tank, one of the end covers is first placed in position and welded, and when the baffle plates are inserted within the tank body as just described, the end lips 10 will readily contract when they are forced within the channels 7 and will therefore fit these channels snugly. After one of the end covers and the baffle plates have been applied in the manner described, the remaining end cover is forced into position so that its channels 7 will be snugly conformed against the adjacent lips 10 of the baffle plates and this cover is then welded into position.

The entire structure is composed of sheet metal that is rendered exceedingly strong by reason of the suitably located corrugations, as well as by the channels themselves with which the baffle plate lips cooperate, and the conformation of the upper and lower rims of the covers with the channels and corrugations in the tank body greatly reinforces said channels and corrugations and is a precaution as against the flattening out or collapsing of any of the channels or corrugated parts. Particularly is this true of the construction shown at Figure 11 which would add greatly to the strength of the tank body and which would be utilized in some instances.

It will thus be noted that, by following out the present invention, an airplane gas tank has been produced in which the baffle plates are securely positioned without any welding or riveting operation whatsoever except that which is performed against the flush edges of the tank and covers at the ends of the structure, and therefore there are no notably weak parts in the formation of this body such as would be the case if riveting or welding had been resorted to in order to secure the baffle plates themselves. It will also be noted that, at the corners of the baffle plates, there are cut away portions which separate the side lips from the end lips, and when the baffle plates are in position within the tank body these cut away portions will afford openings 11 whereby the gasoline may flow from one compartment to another, and as these openings are located at all four corners of the baffle plate structure it will be clear that the gasoline can flow back and forth between the compartments irrespective of the maneuvers of the airplane

and the consequent position of the tank itself.

But passages for the flow of gasoline from one compartment to another, may, of course, be specially provided, as is usual, and the invention is not limited to the provision of these particular openings 11. Moreover, in a circular tank body these openings would not appear and special openings would be provided.

This invention is so far reaching in its novelty that it is not limited to the precise structure of the baffle plates with lips and the channels heretofore described and illustrated in detail at Figures 7 and 8, since the tank body 2 may be equipped with a substantially rectangular channel as shown at 12 in Figure 9, an inverted V-shaped channel as shown at 13 in Figure 10, or a channel 14 with a contracted neck portion 15 as shown at Figure 11, in which latter instance the baffle plates would be formed with an offset circular lip 16 which is resiliently contractible, and when it is contracted and inserted within the channel 14 it would expand and fit the channel snugly.

At Figure 12 the tank body instead of having a channel is provided with a corresponding depressed portion 17 in the nature of a rib circular in cross section, and the baffle plate has a laterally offset lip 18 which is curved in cross section, and which closely conforms to the portion 17 when the baffle plate is inserted within the tank body because the radius of the part 17 is slightly greater than that of the lip 18.

Referring to Figures 13 and 14, the tank body is formed with shallow channels 19, and a rectangular baffle plate 20 is forced into these channels, as at Figure 13, and the walls of the latter are then pinched against the plates as at Figure 14, and as this method is also carried out with respect to the end covers, it will be apparent that the baffle plates may be secured without providing them with the resilient lips. This form of baffle plate may be cut away at the corners (not shown) in order to provide the openings for the flow of gasoline from one compartment to another.

In some airplane gas tanks, cross-partitions are advisable, in addition to the baffle plates, and this invention is most adaptable to this construction.

Referring particularly to Figures 15 and 16, the tank body is provided with corrugations 21 in its opposite sides, and also with corrugations 22 in the left lower corner portion 23.

A cross partition 24 is shown at Figure 15 composed of sections 25, 26, and 27, that are secured to the baffle plates at a suitable location by welding or riveting, in the present instance by riveting, and the upper and

lower edges of these sections are formed with resilient lips 28, and resilient lips 29, similar to the lips 10, are formed at the ends of the outer sections 25 and 27, while a resilient lip 30 is formed at the lower left corner of the section 25.

When the structure shown at Figure 15, and equipped in the manner just described, is inserted within the tank body, the lips 28 will yield resiliently and will therefore maintain close contact with the various corrugations in the upper and lower faces of the tank body, while the lips 29 will also yield and will conformably fit within the proper oppositely located corrugations 21, and the lip 30 will likewise conformably fit within the suitably located corrugation 22.

It will thus be clearly understood that cross partitions may be employed securely located in position within the tank body with no welding or riveting whatever, just as in the instance of the baffle plates.

Of course, more than one of these cross partitions may be used, and the descriptions as to the single partition are all that are necessary herein.

In the event that the general equipment and connections for the tank body are located arbitrarily so as to preclude the formation of the corrugations in the sides of such body, the end sections 25 and 27 would merely be strengthened by means of ordinary tie bars (not shown) secured to said sections and the adjacent baffle plates.

When the structure shown at Figure 15 is located within the tank body as shown at Figure 16, there will be spaces 31 between the cross partition and tank body both at the top and bottom through which the gasoline may pass.

What is claimed is:—

1. An airplane gas tank, comprising a body portion having in its opposite faces elongated imperforate channels that extend from end to end, baffle plates whose opposite sides and ends terminate in lip-like extensions, and end covers for the tank which have channels corresponding to those in the faces of the body but at right angles thereto, said end covers conformably fitting the ends of the body and welded thereto, while said lip-like extensions are snugly housed within the channels both in the faces of the body and in the end covers.
2. A structure as specified in claim 1, in which the channels are circular in cross section, while the edge terminals of the baffle plates are resilient curved lip-like extensions also circular in cross section, the radius of said extensions being greater than the radius of the channels.

In testimony whereof I affix my signature hereto.

SEYMOUR J. BAUM.