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L. M. WHITE ET AL.
PACKAGE FOR FORMALDEHYDE SOLUTION AND METHOD OF MAKING SAME.
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Fig. 1.

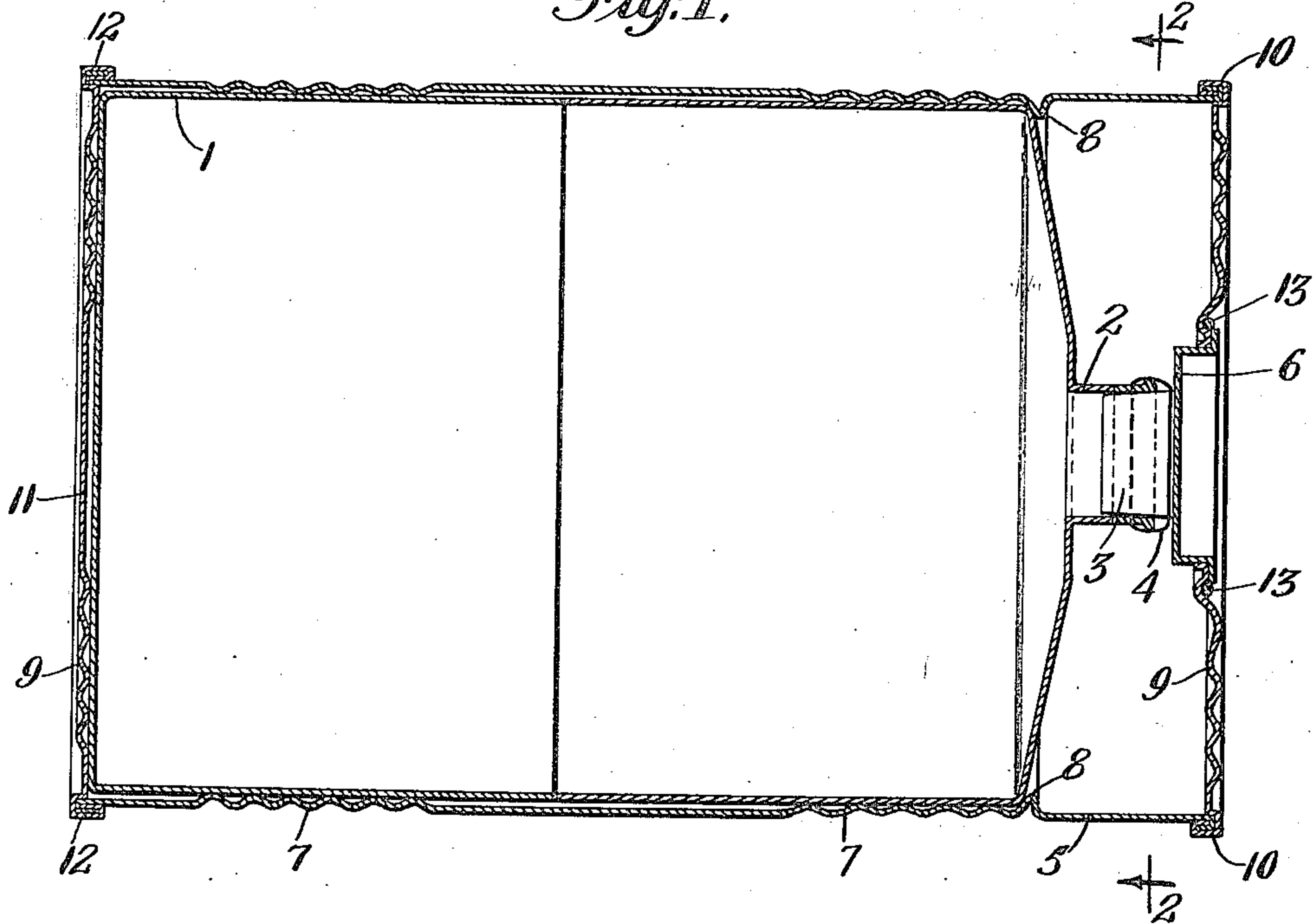
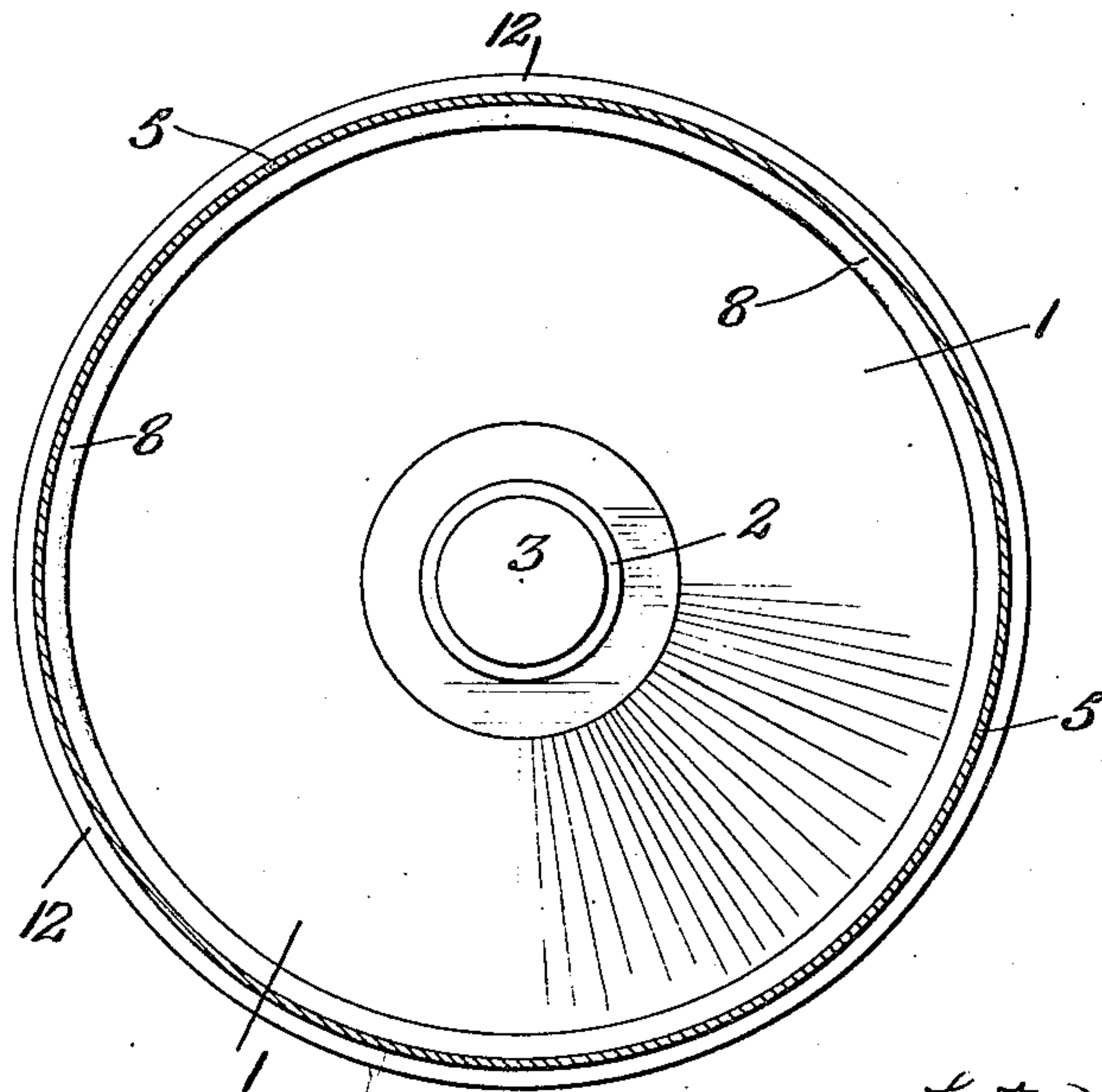


Fig. 2.



Inventors,
Lester Marius White,
Arthur Fish,
By their Attorney
J. Wooster.

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UNITED STATES PATENT OFFICE.

LESTER MARIUS WHITE AND J ARTHUR FISH, OF PERTH AMBOY, NEW JERSEY,
ASSIGNORS TO PERTH AMBOY CHEMICAL WORKS, OF NEW YORK, N. Y., A COR-
PORATION OF NEW JERSEY.

PACKAGE FOR FORMALDEHYDE SOLUTION AND METHOD OF MAKING SAME.

Application filed October 26, 1920. Serial No. 419,594.

To all whom it may concern:

Be it known that we, LESTER MARIUS WHITE and J ARTHUR FISH, citizens of the United States, and residents of Perth Amboy, in the county of Middlesex and State of New Jersey, have invented certain new and useful Improvements in Packages for Formaldehyde Solution and Methods of Making Same, of which the following is a specification.

This invention relates to packages for formaldehyde solution and method of making same, such as are used to carry said solution in considerable quantity,—for example, in quantities up to fifty gallons. The object of our invention is to provide a package which shall possess all the advantages inherent in the various types of such packages now known and avoid certain disadvantages inherent in them.

Formaldehyde is a commodity which is widely used as a raw material in the manufacture of chemicals and other products. It also finds wide application for medicinal and pharmaceutical purposes. While it is not corrosive to metals in the sense in which that term is applied to common acids, yet it does react chemically with iron, copper, wood and the other common materials from which containers are made with the result that the formaldehyde becomes contaminated with the products of such reaction and, in the case of containers made from the commoner grades of wood, leakage occurs to a prohibitive degree.

Under these circumstances, the problem of procuring satisfactory packages has been difficult.

Hitherto, the containers most commonly used have been barrels of selected white oak of the best quality sawed from the heart wood of the tree. Before use, these barrels are coated on the inside with molten paraffin.

Barrels of this type, though widely used are subject to well known disadvantages, viz., they are expensive, and even when constructed with greatest care, they permit loss of the contents by absorption and leakage. This loss is the occasion of serious annoyance and may become prohibitive in case of long distance shipments unless the barrels are from time to time recoopered while in transit. Moreover, the porous nature of even the best quality of wood

coated with paraffin causes a direct loss of the contents by reason of the absorption of the material by the wood.

A more serious objection to this type of container is that white oak of the necessary quality is becoming increasingly scarce.

A second type of package hitherto used is the type of glass carboy ordinarily used for shipments of sulphuric and other acids. These are bulky and fragile. These disadvantages have practically eliminated the use of carboys for formaldehyde shipments except in cases where leakage must be avoided at all cost and in cases where contamination of the formaldehyde, even so little as would be caused by the absorption of coloring and other matter from wooden barrels, must be avoided.

It is found that the requisite qualities of freedom from attack by formaldehyde, lightness in shipping weight, and necessary strength of container are combined in aluminum and light alloys thereof, which are now readily obtainable in sheet form for making the convenient bottle shaped form herein illustrated, with impervious seams formed by welding.

The package which we have invented is intended to be constructed primarily in sizes between five gallons and twenty gallons, and is superior to formaldehyde packages hitherto devised for quantities between these limits.

Our package is illustrated in the accompanying drawing in which:

Figure 1 is a section of my improved container;

Figure 2 is a plan view.

1 is a container of sheet aluminum having a neck 2 enclosed by a stopper 3 which may be fastened in place by a wire 4 or equivalent means. The container fits inside a metal casing 5 having a friction cap 6 which is soldered or otherwise hermetically sealed for shipment, so that the customer upon receiving the package with the seal intact will know that the package has not been tampered with, it being intended to ship this package by train, truck, boat, etc., without other protection, and the packages being of sufficient value as to be returned when empty.

The casing is provided with side corrugations 7 which resiliently and frictionally

engage the container 1, and also with a deeper corrugation, as 8, which acts as a stop for the shoulder of the container when inserted from the bottom. 9 is the top head of the casing secured to the casing by a locked seam 10, and the head also being corrugated both for resilience and stiffness. 11 is the bottom head of the casing, having similar corrugations, and is secured to the casing by the lock seam 12.

The corrugations in the sides, top and bottom of the casing stiffen it and thereby render it less subject to distortion from blows, the impact of being dropped, or striking or being struck by other freight. The corrugations serve also as cushions to hold the container firmly in place in such manner that blows or shocks delivered to the casing are dissipated before being transmitted to the container. The casing may be covered with zinc, tin, or other protective covering so as to be resistant to rust and corrosion.

In constructing the package the container is made from sheet aluminum, which is light and unaffected by formaldehyde, or from light alloys of similar characteristics, by stamping, spinning, welding, or other known method. Where more than one piece is used in making the container the seams will be preferably welded so as to produce an integral structure. The next step is to assemble the sides and top of the casing and coat the same with metal, preferably by galvanizing with zinc. The bottom and the sealing cap 6 are also similarly coated in a separate operation, it being desirable that both the inside and the outside of the casing be so protected against rust and corrosion.

Next the container 1 is inserted in the drum 5 and the bottom 11 attached so as to preferably insure a double seam at 12, the bottom being then dipped into zinc or other molten metal, so that the latter flows into the seam. In assembling it is important that the container be in firm contact with the shoulder 8, and that the container frictionally engage the corrugations 7, while the bottom 11 is so put on as to exert a pressure tending to hold the container firmly against the shoulder 8.

The package is then filled through the opening 2 in the usual manner and the stopper 3 inserted and wired in place. The last step is to apply the friction cap 6 and solder it to the head, as by using a wire 13, to enable the solder to be readily stripped.

A package of this type, holding 100 pounds of formaldehyde solution, is approximately of 14½" diameter, 22½" high, and weighing when empty approximately 17 pounds. A glass carboy of the same capacity, when completely boxed for steamer shipment, measures 17" x 17" x 30", and weighs when empty approximately 65 pounds. The space occupied by our pack-

age is 2.81 cubic feet, as compared with 5.02 cubic feet for a completely boxed carboy of like capacity.

Our new package is therefore much lighter and much more compact than a glass carboy of the same capacity and is lighter and more compact than a white oak barrel of the type now in use, even with pro rata allowance for difference in capacity, while our package has the further advantage in that the formaldehyde therein remains absolutely uncontaminated by the container even after long periods of time.

Another advantage of the new package is that unlike barrels or carboys, it contains no wood or other perishable material which can rust or decay or harbor vermin. Consequently, it requires little or no painting or other repairs and can be used repeatedly with no maintenance expense other than the trifling cost of the solder required to seal the cap 6.

Another advantage is that it is more rugged than any package heretofore used for formaldehyde.

Another advantage is that the inner container is completely enclosed in an hermetically sealed jacket. Insurance is therefore afforded against loss of the material through pilfering and against contamination thereof by malicious tampering while the package is in transit.

Another advantage is that the hermetically sealed package absolutely insures that leakage will not occur.

This freedom from leakage assumes particular importance when the package is shipped or stored in an enclosed space such as a warehouse or the hold of a ship.

What we claim is:—

1. A liquid package comprising a bottle shaped container having a shoulder portion and neck of reduced diameter, a corrugated casing contiguous to the container along its sides and bottom, and provided with a corrugation in cooperation with and extending over said shoulder portion to retain the container in place, a stopper for said container, and a corrugated upper end portion for the casing covering and securing the stopper in position.

2. A bottle shaped welded aluminum container provided with an enclosing casing, an inwardly extending flange on the casing in cooperation with the top of the bottle shaped container, a neck and closure on the container, an end wall on the casing provided with a removable closure therein adapted to seal the closure on the container.

3. A package for holding liquids comprising a welded aluminum bottle shaped container provided with a shoulder portion and a neck of reduced size, a corrugated metal casing for the container having its corrugations in contact with the sides and bottom

of the container, an enlarged V-shaped corrugation on the casing extending inwardly over the shoulder of the container to firmly position the same against the bottom of the casing, the side walls of the casing being continued above said enlarged corrugation in substantially the same direction as the main body portion of the side walls, a stopper for the neck of the container, and an

upper end wall for the casing covering the container and provided with a removable cap adapted to cooperate with the stopper and seal the container.

Signed at Perth Amboy, in the county of Middlesex and State of New Jersey, this 15 22d day of October A. D. 1920.

LESTER MARIUS WHITE.
J ARTHUR FISH.