Oct. 30, 1923. 1,472,166

R. T. GRIFFITHS

ACID PROOF CONTAINER

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Fig. 1.

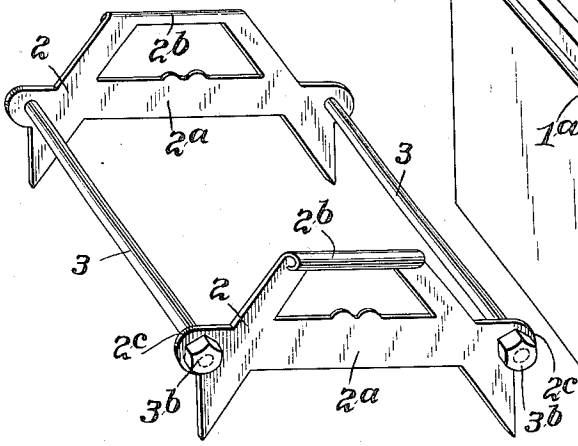


Fig. 2.

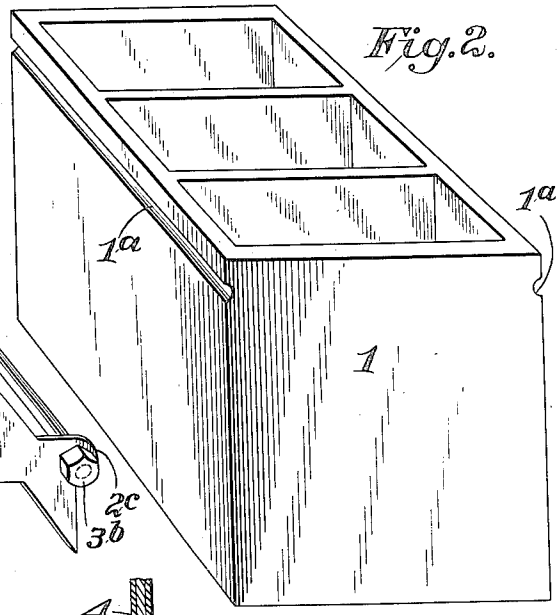


Fig. 3.

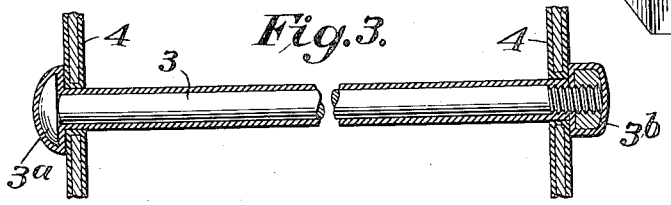


Fig. 4.

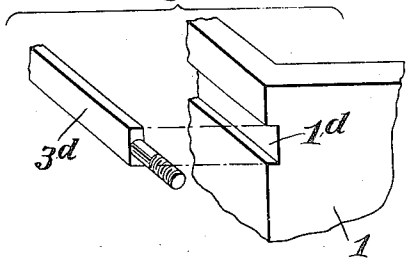


Fig. 5.

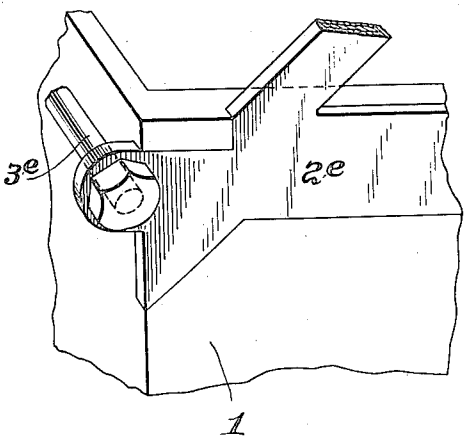
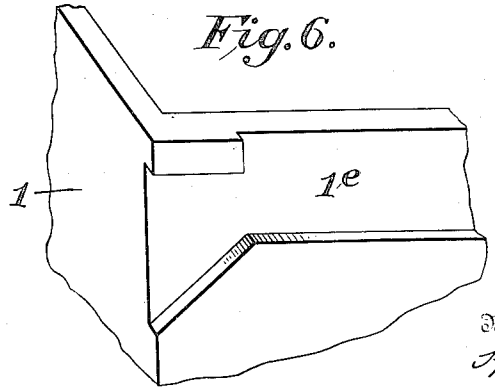


Fig. 6.



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Fig. 7.

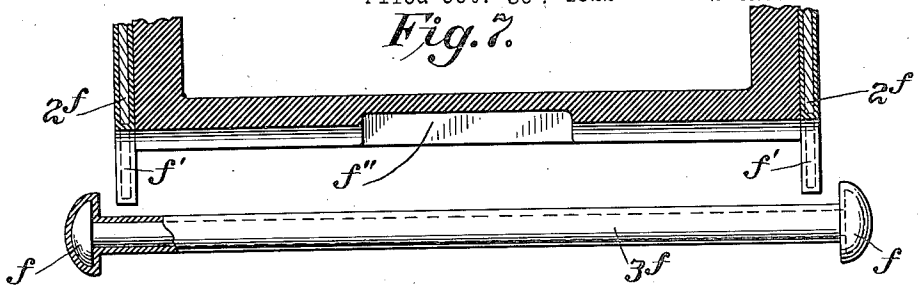


Fig. 8.

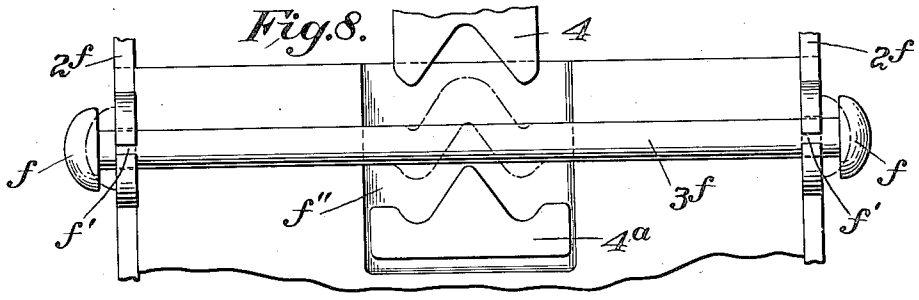


Fig. 9.

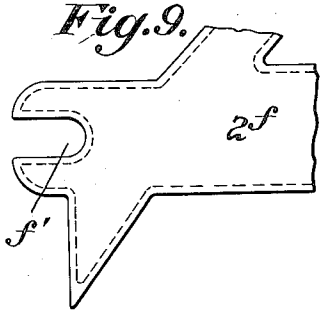


Fig. 10.

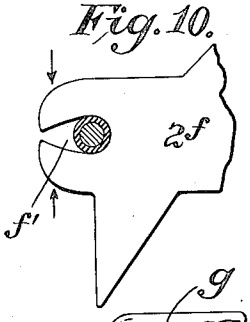


Fig. 11.

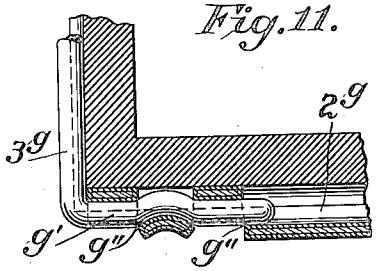


Fig. 13.

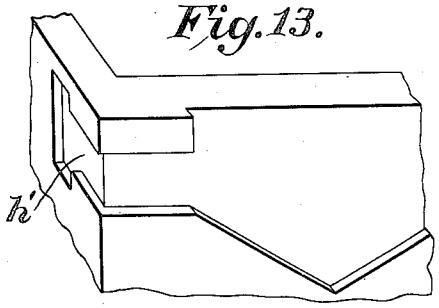


Fig. 12.

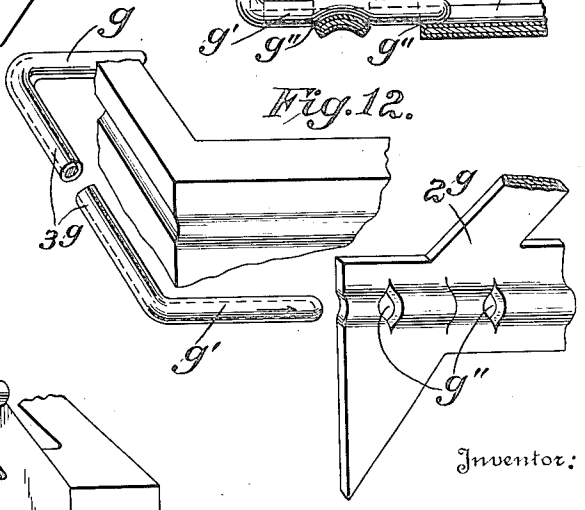
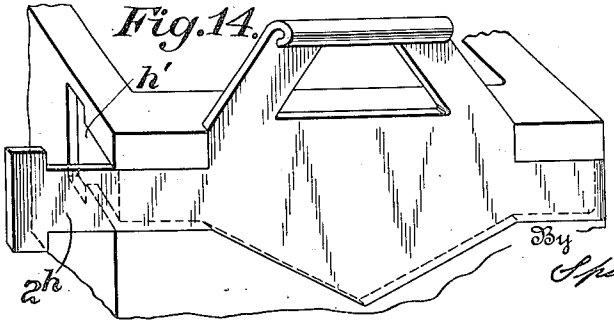


Fig. 14.



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Patented Oct. 30, 1923. 1,472,166

UNITED STATES PATENT OFFICE.

RICHARD T. GRIFFITHS, OF AKRON, OHIO, ASSIGNOR TO THE MILLER RUBBER COMPANY, OF AKRON, OHIO, A CORPORATION OF OHIO.

ACID-PROOF CONTAINER.

Application filed October 30, 1922. Serial No. 598,025.

To all whom it may concern:

Be it known that I, RICHARD T. GRIFFITHS, a citizen of the United States, and resident of Akron, in the county of Summit and the State of Ohio, have invented certain new and useful Improvements in Acid-Proof Containers, of which the following is a specification.

My present invention relates to improvements in acid-proof containers, and more particularly to what are known as battery boxes or containers.

For many years such boxes or containers were constructed almost universally from single hard rubber cells containing the secondary battery elements, such cells being embedded in a wooden outer case or container by means of an asphalt composition, such wooden case having lead covered metal handles attached thereto which served the purpose of lifting and handling the container, and also of cooperating with the hold-down devices or clamps which are generally used in connection therewith, and especially in motor vehicles and the like. Such wooden containers were open to many objections, and of late, numerous attempts have been made to place on the market multi-celled battery boxes of one-piece or integral construction molded from hard rubber or similar acid-proof material. Such integral construction appeared, at first, to be the solution of the battery box problem, but it soon developed that they retained some of the faults of the previous wood construction, and were subject to some other faults. One of the faults retained was due to the continued use of the old form of lead covered steel handle. The electrolyte used in these battery boxes (sulphuric acid) is very corrosive and notwithstanding all precautions taken, it was found impossible to prevent acid from collecting on the handles, causing them to corrode and break, the acid naturally creeping over the top of the container, or slopping out in transportation, and also emerging when the battery is being charged and the evolution of hydrogen occurs.

The lead covered metal handle was the best handle which battery manufacturers had been able to produce, but in practice the lead covered steel handle was found to become exposed in places where the fastening screws or hold-down devices caused abrasion of the surface. The replacing of these handles was considered a necessary evil and was more easily accomplished on a wooden container than a composition one, as screws could be inserted at any point on the wooden container, whereas the composition container must have metallic inserts molded therein for the reception of the screws, and these inserts themselves were susceptible to corrosion, as also were the handles and fastening screws. It was also found that the hard rubber or composition containers were liable to soften at high temperatures, such as when placed in proximity to internal combustion engines, or when flushed off with hot water at battery stations, or when steamed in the process of removing the cover plates, and when so softened, the strain on the ends of the container due to lifting the heavy weight of the battery by the handles or by the action of the hold-down clamps in the motor vehicle, was found to crack the walls of the container or cause them to bulge and break the asphalt seal around the cell covers, allowing the electrolyte to escape, and also resulting in the battery plates not being properly supported.

The present invention aims to avoid these objections and to provide a container of this type which will have handle members which are entirely proof against the action of acid, which will be held to the container by acid-proof connections, and in such a manner that in case of breakage of a handle, it can be removed and replaced, the construction being such that the handles instead of placing a strain on the walls of the container, actually serve to reinforce and brace the same.

With these and other objects in view, the invention includes the novel features of construction, arrangement and combination of parts hereinafter described, the scope of my invention being particularly defined by the claims appended hereto.

Several embodiments of my invention are illustrated in the accompanying drawing, in which:—

Figure 1 is a perspective view of a handle attachment before application to the container.

Fig. 2 is a similar view of the container adapted to receive the same.

Fig. 3 is a sectional detail.

Fig. 4 is a detail view of a modified form of rod.

Figs. 5 and 6 are views of a modified form of handle and container.

Figs. 7 to 10 inclusive show a further modification.

Figs. 11 and 12 are detail views of another modification, and

Figs. 13 and 14 are detail views illustrating still another modification.

Referring by reference characters to this drawing, the numeral 1 designates a multi-celled battery box of integral or one-piece construction and of molded acid-proof material, such for instance, as hard rubber, having the usual transverse integral partitions, as shown, The side walls of this container are provided with grooves or channels 1^a disposed adjacent the upper edges thereof. The handle members are indicated at 2 and they comprise portions 2^a designed to engage the end walls of the battery box, and upwardly projected handle portions 2^b which are designed to be grasped by the hand and also to be engaged by the hold-down devices, as will be well understood by those skilled in the art. The portion 2^a of each handle member is provided with projections or ears 2^c, having apertures which align with the grooves or channels 1^a in the battery box, when the handle members are placed in position against the end walls of the container. When so placed, these handle members are held rigidly in position by longitudinal rods 3 which pass through the eyes and rest in the channels. In my preferred construction the rods are provided with integral heads 3^a at one end and are threaded at the other end to receive nuts 3^b by which the handles may be clamped tightly against the end wall of the container. The handle members 2 are provided with a complete coating of vulcanized rubber, and in manufacture the nuts are placed on the bolts and the whole given a complete coating of vulcanized rubber by the use of a suitable mold. After vulcanization, the rubber coating is cut through just below the nut and the rubber covered nut removed from its bolt so that the handles and container may be assembled. In assembling, the replaced nuts are screwed on further so that the coating on the nut is forced into intimate contact with the coating on the rod. It will be understood that the openings in the handle members 2 are of such size as to receive the rubber coated rods. By this means a completely sealed joint is provided although if desired rubber cement may be applied to the joint as an additional safe-guard. In these figures the rubber coating is indicated at 4. If desired the grooves in the container and the rods may be of other than circular shape. For example, the rectangular form indicated at 1^d and 3^d respectively, Figure 4, may be employed.

It will be understood that the function of the grooves engaging the rods, is to prevent vertical movement of the handle members relative to the container, either when the battery is being lifted by the handles, or under the action of the hold-down clamps. This same result may be accomplished by providing the end walls of the container with recesses to receive the handle members, as shown in Figs. 5 and 6, in which the recesses in the end walls are indicated at 1^e, the handles 2^e being seated in said recesses, the side rods 3^e merely serving to connect the two handle members and these handle members being held against movement relative to the case, by the edges of the recesses in the end walls. Instead of using screw bolts as the means of connection, I may adopt the modification shown in Figs. 7, 8, 9 and 10, in which the bolts 3^f have integral heads f and the handle members 2^f have open slots f' in their projected ears into which the bolts can be slid laterally, whereafter the walls of the slots may be forced together, as indicated in Fig. 10, to retain the rods in position. To enable me to secure a tightening action in this form, analogous to the tightening secured by screwing up the nuts, I may provide the side walls with recessed portions f'' which provide spaces in which the intermediate portion of the rods may be crimped or buckled by the use of suitable dies, as indicated at 4 and 4^a, thus shortening the rods and drawing the ends together to clamp the handle firmly in position.

Instead of using rods having headed ends, I may adopt the modification shown in Figs. 11 and 12 in which the rods 3^g have angularly turned ends g' which are designed to engage eyes g'' formed by a suitable stamping operation in the handled members 2^g. In this form the side and end walls would both be provided with recesses to receive respectively the rods and the correspondingly projected portions of the handle members. A further modification is shown in Figs. 13, 14 and 15, in which the handle members are seated in recesses in the end walls of the box and are held in position by T-shaped projected ends 2^h which are designed to be bent over and seated in corresponding T-shaped recesses h' in the side walls of the box adjacent the corners.

In all these forms it will be seen that not only are the handles firmly secured to the containers in an acid-proof manner and so as to be capable of being readily removed and replaced when necessary, but they also serve to strengthen and reinforce the walls of the container and prevent the same from bulging or cracking.

The ends g' of the rods of Figs. 11 and

12 may be retained in position by binding or wedging them inwardly, as shown at g'', Fig. 11.

Having thus described my invention, what I claim is:—

1. The combination with an acid-proof container of a metal handle member having a rubber covering molded thereon, said handle being partially embedded in the wall of said container.

2. In combination, an acid-proof container of molded material having recesses molded in two walls thereof, and handle members having retaining means engaging said recesses.

3. In combination, an acid-proof container having grooves or channels in the outer faces of the opposed side walls thereof near their upper edges, handle members engaging the end walls, and rods connecting said handle members and lying in said recesses.

4. In combination, an acid-proof container having grooves or channels in the outer faces of the side walls thereof, near their upper edges, acid-resisting handle members engaging the end walls of the container, and having apertures aligning with said channels, and acid-resisting rods lying in said channels and having ends engaging said eyes.

5. In combination, an acid-proof container having grooves or channels in the outer faces of the side walls thereof near the upper edges, metal handle members having rubber coverings engaging the end walls of the container, and having openings aligning with said recesses, rubber covered rods lying in said grooves and having headed ends engaging said eyes, one of said headed ends comprising a threaded end, and a rubber covered nut engaging the same.

In testimony whereof, I affix my signature.

RICHARD T. GRIFFITHS.