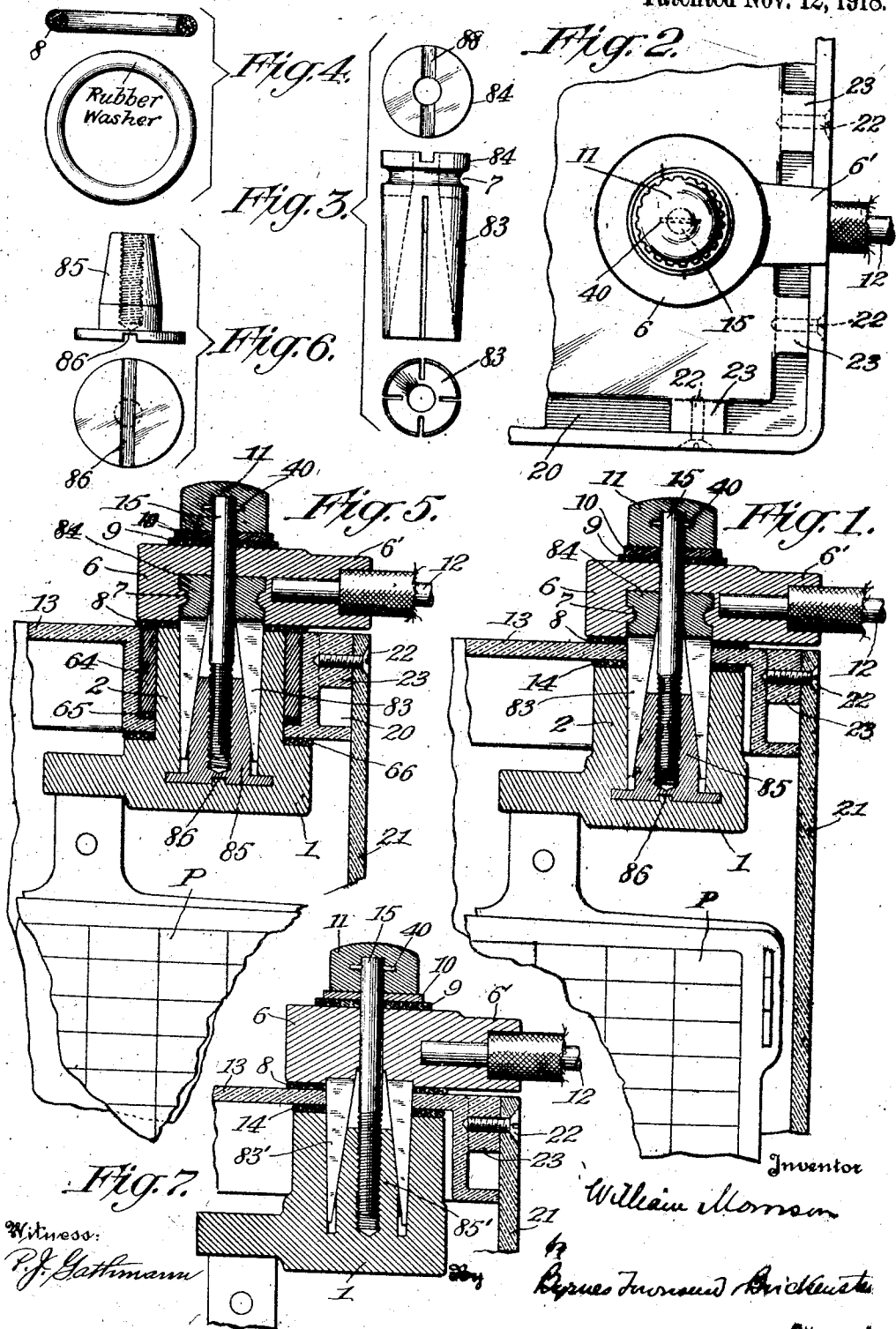


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 CONNECTOR FOR STORAGE BATTERIES.
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CONNECTOR FOR STORAGE BATTERIES.

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To all whom it may concern:

Be it known that I, WILLIAM MORRISON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Connectors for Storage Batteries, of which the following is a specification.

My invention relates to a connector for storage batteries, though capable of use in other relations.

The object of the invention is to provide a connector which will be acid-proof, readily attachable and detachable and in which a good electrical connection is provided.

A further object of my invention is to provide means whereby the operation of the connector will at the same time make a liquid-tight seal with the cover of the battery.

Another object of my invention is to use relatively movable contact members which are inclosed in a chamber completely sealed against access of acid or other liquid.

The invention will be understood from the accompanying drawings, in which—

Figure 1 is a sectional elevation;

Fig. 2 is a plan view of Fig. 1;

Fig. 3 is a top, side and bottom view of the expansible member;

Fig. 4 shows details of a preferred form of washer;

Fig. 5 shows a modification;

Fig. 6 shows an elevation and plan of the frusto-conical expanding member.

Fig. 7 illustrates a modification.

Referring to the drawings, 1 is a lead or lead alloy plate to which the terminals of battery plates P are burned on. This plate 1 has extending from it a portion 2 having therein a cavity or well whose inner wall is preferably given a slight downward taper, though it may be cylindrical. Fitting snugly within this cavity is a hollow wedge-member of brass or other good conductor. This wedge-member preferably has an upper head portion 84 and a lower portion, which may be expansible and may consist of a series of legs 83, formed by sawing through the member, as shown in Fig. 3. Preferably

the parts 83 and 84 are made integral, but obviously the legs 83 might be separate from the head portion 84.

The outer surfaces of these legs have a taper corresponding to that of the inner wall of the well, and are reamed out to provide inner tapering surfaces. Within the cavity so formed is located a correspondingly shaped frusto-conical plug 85 having therein a screw-threaded bore and provided at its lower end with a holding flange cast into the plate 1. A transverse slot 86 extending across the bottom of the plug prevents rotation. The upper portion 84 has cast around it a head 6 of non-corrodible material, preferably a metal or alloy, the head and upper portion having interconnecting fastening means, such as a ring 7 and transverse slot 88.

Between the head 6 and the cell cover 13 is interposed a sealing washer 8 of rubber, preferably formed as a rubber ring circular in cross-section, as shown in Fig. 4, although flat washers may be used.

Extending through the head 6 and the expansible member is a screw-threaded rod 15 having its lower end in screw-threaded engagement with the plug 85 and at its upper end a nut 11, preferably formed by casting thereabout a hard non-corrodible material such as metal or alloy. The rod 15 is prevented from turning in the nut by any suitable means, such as a pin 40. Between the lower face of the nut 11 and the upper face of the head 6 are interposed, if desired, a rubber washer 9 and a metal washer 10. These washers may, however, be omitted as the meeting faces of the nut 11 and the head 6, will, when the parts are screwed together, make an acid tight joint. The head 6 is formed at one side with an outwardly extending portion 6' into which is cast or soldered the end of the insulated wire 12, as shown.

Between the cell cover 13 and the portion 2 is a rubber washer 14. While I have shown rubber washers as the means for sealing joints, other means may be used. Thus, any two cooperating parts may be provided with interconnecting grooves and flanges, which when tightly pressed together will

form a liquid-tight joint. The cell cover is provided with a peripheral groove 20 and fits within the cell casing 21 to which it is secured by screws 22, the cover having projecting lugs 23 for receiving the screws.

The operation of the device will be apparent from the above description. After the parts have been assembled with the rod 15 in screw-threaded engagement with the plug 85, the further turning of the nut will force the head 6 downward, and the legs 83 will, because of their engagement with the plug 85, be forced outwardly into firm contact with the inner wall of the cavity, and at the same time the sealing washers 8, 9 and 14 will be compressed to make liquid-tight joints.

It will be apparent that there is thus provided a connector in which the parts through which a rubbing electrical contact is made are of material which is not only good conducting but adapted to withstand wear of this kind, while these parts which are necessarily made of brass or other good conducting material which is more or less readily attacked by acid are all inclosed in a sealed chamber to which access of acid is prevented by providing walls of non-corrodible material and sealing the joints against access of acid or other liquid.

In Fig. 5 the construction is in general like that of Fig. 1. Surrounding the head portion 2 is a metal sleeve or bushing 64, and between its lower end and the cover is a sealing washer 65, an additional sealing washer 66 being located between the plate 1 and the bottom of the cell cover. When the parts are screwed together the washers 8, 65 and 66 will be compressed and a liquid tight seal effected, not only between the portion 2 and the head 6, but a double seal will be made by the washers 65 and 66 between the connector and the cell cover. The use of the sleeve 64 which is preferably made of hard metal, such as ship nail metal, is also an advantage in that it prevents any possible distortion of the portion 2 which is necessarily made of relatively softer material.

In Fig. 7 is shown a modification, which in the main corresponds to Fig. 1, except that the legs 83' are formed integrally with the head 6; and the frusto-conical wedging member 85' is formed integrally with the plate member 1. The legs 83' are formed either by casting or sawing as before described; or instead of subdividing this depending portion into legs, it may be made as one piece.

The operation of this form of device will be apparent, the cooperating contact members 83' and 85' being brought into wedging contact by screwing down the rod 15, the parts being so proportioned that this same

operation compresses the various sealing washers 8, 9 and 14. In this form of device, the plate-member 1 and the head 6 are made of any sufficiently hard alloy, such as some of the well known antimony, lead or tin alloys.

I claim:

1. An electrical connector having cooperating relatively movable wedging contact-members and comprising a sealed chamber, within which said contact-members are inclosed.

2. An electrical connector having cooperating relatively movable wedging contact-members inclosed in a sealed chamber, the parts being so constructed and arranged that bringing the parts into contact effects the seal.

3. An electrical connector having cooperating relatively movable wedging contact-members inclosed in a separable sealed chamber, and rubber-washers for forming the seals between the parts of said chamber.

4. An electrical connector comprising a plate-member having a cavity therein, a wedge-member having a wedge portion fitting into the cavity, means for sealing the joint between the wedge-member and the top of the plate-member, a wedging member within said wedge portion and a headed screw bolt extending through said wedge-member and into screw-threaded engagement with the wedging member, and means for sealing the joint between the head of the bolt and the wedge-member.

5. An electrical connector as claimed in claim 4 in which the bolt-head, the wedge-member and the plate-member are made of non-corrodible material.

6. An electrical connector comprising a plate-member having a cavity therein, a wedge-member comprising a tapering contact-member fitting into said cavity, a frusto-conical plug adapted to engage said contact-member and having a screw-threaded bore, a bolt having a head and a screw-threaded shank extending through said wedge-member into said bore, and means for sealing the joint between the wedge-member and the plate member.

7. A connector as claimed in claim 4 in combination with a cell cover having an opening, sealing means between a portion of said plate member and the bottom of the cell-cover, and sealing means for the joint between the top of the cover and wedge-member.

8. A connector as claimed in claim 7 in which the sealing means are rubber washers.

9. A connector as claimed in claim 6 in which the cavity has an inwardly tapering wall and the outer surface of the contact-member has a corresponding taper.

10. A connector as claimed in claim 4 in which the head of the screw-bolt is of non-corrodible material and cast onto the shank. bushing extending between said sealing means and the wedge-member. 10

11. A connector as claimed in claim 4 in combination with a cell cover, a bushing surrounding the portion of the plate member above the cover, sealing means between the end of the bushing and the cover, the 5
12. A connector as claimed in claim 11 in which the sealing means are rubber washers.
In testimony whereof, I affix my signature.

WILLIAM MORRISON.