To all whom it may concern:

Be it known that I, William A. MacKenzie, a citizen of the United States, residing at Long Beach, in the county of Los Angeles and State of California, have invented new and useful Improvements in Self-Sealing Poles for Storage Batteries, of which the following is a specification.

My invention relates to storage batteries, and more particularly to the terminals thereof, the purpose of my invention being the provision of a storage battery terminal by means of which the effective connecting and hermetical sealing of the cell casing is accomplished to prevent in the latter instance the escape of electrolyte and the disadvantages arising therefrom.

I will describe two forms of battery terminals embodying my invention and will then point out the novel features thereof in claims.

In the accompanying drawings, Figure 1 is a view showing in top plan, a cell cover having applied thereto one form of terminal embodying my invention.

Fig. 2 is a view, partly in vertical section and partly in side elevation showing the cell and terminals of Fig. 1.

Fig. 3 is an enlarged detail view showing in top plan, the strap connector and post comprised in the terminal shown in the preceding views.

Fig. 4 is a view showing the strap connector and post in side elevation.

Fig. 5 is a detail view partly in section showing the sleeve end of the cell connector comprised in the terminal embodying my invention.

Fig. 6 is a top plan view of Fig. 5.

Fig. 7 is a vertical sectional view of a modified form of terminal in applied position within a cell cover embodying my invention.

Similar reference characters refer to similar parts in each of the several views.

Referring specifically to the drawings and particularly to Fig. 2, I have here shown a conventional form of cell cover designated at K which as usual includes sockets 15 through which the strap connector posts are adapted to extend to a point exterior of the cover. The terminal forming the subject matter of my invention in this instance, comprises a strap connector post P which includes a circular body portion 16 that has its surface screw-threaded as is clearly shown in Fig. 2. At the upper end of body portion 16 a conical extension 17 is formed, this extension and the body portion being formed of lead or other suitable metal and cast in such manner as to fixedly secure therein the shank 18 of a fastening member F, one end of which is provided with a head 19, while its opposite end is provided with a screw-threaded extension 20 that projects from the upper end of the extension 17 as clearly shown. The body portion 16 is adapted to threadedly receive a plug G which is formed with a threaded bore, while its periphery is provided with an annular groove 21 in which is adapted to repose a sealing ring 22 formed of any suitable sealing agent. As clearly shown in Fig. 2, the periphery of the plug G is so shaped as to have a snug fit within the socket 15, and through its threaded connection with the post P serves to retain the latter within the socket. The conical extension 17 of the post P is adapted to fit within the conical socket 23 of a sleeve S, the latter being formed integrally with a cell connector C.

As shown in Fig. 5, the sleeve S is formed to provide an upper socket 24 which is also of conical form, but arranged in reverse relation to the socket 23. This socket 24 is adapted to receive a sealing collar 25 preferably formed of lead and so cast as to embrace a nut 26 adapted to threadedly engage the threaded extension 20. The nut 26 is formed with an annular groove adapted to receive a portion of the collar 25 and in such manner as to effect an interlocking of the two. As clearly shown in Figs. 2 and 5, the upper end of the socket 24 is provided with an annular lip 27 which is adapted to be bent inwardly for the purpose of retaining a sealing plate 28 in overlying relation to the nut 26 to seal the socket 24.

In the applied position of the terminal 100 within the socket of the cell cover, the post P serves to sustain the strap connector in proper position in the cell, and a gasket 29 embraces the post at a point between the lower end of the socket 15 and the strap connector, thereby providing a liquid tight seal between these two elements. With the plug G in applied position it is adapted to be permanently retained therein by a proper heating of the sealing agent 22 so as to
render it fluid, therefore when the agent sets it will provide a hermetic seal between the plug and socket 15.

When applying the cell connector, the socket 23 receives the conical extension 17 with a gasket 30 interposed between the lower end of the socket and the body portion 16 of the post, it being particularly noted that the upper side of the plug G is recessed to accommodate this gasket and is also formed at intervals with notches 31 (Fig. 1) to facilitate the rotation of the plug in applying the latter to the post.

With the sleeve S in position upon the post, the nut 26 together with the sealing collar 25 are now applied and after the nut has been screwed home to firmly clamp the sleeve against the gasket 30, the plate 28 is inserted into the socket 24 and the sealing lip 27 bent inwardly to secure the plate within the socket.

In order to prevent turning movement of the sleeve S with respect to the post P, a conical extension 17 is provided with tapering recesses 31 in which are attached corresponding shaped projections 32 the latter being formed on the wall of the socket 23 which is clearly shown in Fig. 5.

Referring now to Fig. 7, I have here shown a strap connecting post P' including a conical body portion 33, which is extended through the socket 15 of the cover plate, and is provided at its upper end with a tapered extension 34, the latter being of reduced diameter to provide a shoulder at the upper end of the body portion 33. A sealing plug G' is seated within the socket 15 and is arranged in embracing position with relation to the body 23 of the post P. This plug G' is also formed with an annular groove on its periphery adapted to receive a sealing agent 22 designed to permanently retain the plug within the socket and provide a liquid tight seal between the two. The extension 34 is adapted to receive the sleeve S' of the cell connection, and this sleeve in the present instance forms a conical bore. The upper end of the sleeve is provided with a retention lip 36 adapted to be bent to retain a sealing plate 37 within the sleeve and in spanning relation to the upper end of the bore. As the post P' including the body 33 and the extension 34 is formed of lead or other suitable metal, it will be clear that annealing of the plug G' and the sleeve S' with the body 33 and the extension 34, respectively, can be readily effected to permanently retain these elements in fixed relation to each other. This construction eliminates the necessity of threadedly associating the plug with the post and the provision of the sealing collar and nut as shown and described in connection with the first form of terminal.

From the foregoing description taken in conjunction with the accompanying drawings, it will be manifest that in both forms of battery terminals an effective connection for the strap and cell connector is provided, while in addition thereto the terminals are so constructed as to permit of their being hermetically sealed to prevent the escape of electrolyte from the cover. In the form shown in Fig. 2, the sealing of the terminal is such as to permit of the removing of the terminal for repairing purposes, while in the form shown in Fig. 7, the sealing is so obtained as to render it necessary to mutilate the connecting post P when removing the terminal.

Although I have herein shown and described only two forms of battery terminals each embodying my invention, it is to be understood that various changes and modifications may be made herein without departing from the spirit of the invention and the spirit and scope of the appended claims.

I claim as my invention:

1. A battery cell cover having a socket therein, a post sustaining plug within the socket, and a fusible sealing agent between the wall of the socket and said plug.

2. A battery cell cover having a socket therein, a post sustaining plug within the socket and provided with a groove, and a fusible sealing agent within said groove adapted to be fused to provide a hermetic seal between the plug and socket.

3. A terminal for storage batteries comprising a post, a tapered extension formed on the post, a plug fitted on the post and having a groove in its periphery, a fusible sealing agent in the groove, a sleeve fitted on the extension, and means for locking the sleeve against removal from the extension.

4. A terminal for storage batteries comprising a post including an extension, a plug threadedly engaging the post and having a groove in its periphery, a sealing agent in the groove, a gasket overlying the joint between the post and plug, a sleeve fitted on the extension and engaging the gasket, means for locking the sleeve against rotation on the extension, and means for locking the sleeve against removal from the extension.

5. A battery cell cover having a socket therein, a post extending into the socket and having a threaded portion, and a plug engaging the threaded portion within the socket and having a groove in its periphery adapted to receive a fusible sealing agent.

6. A battery cell cover having a socket therein, a post extending into the socket and having a threaded portion, a plug engaging the threaded portion within the socket and having a groove in its periphery adapted to receive a fusible sealing agent, a gasket between the lower end of the socket and said post, a second gasket overlying the
upper end of the joint between the plug and post, and a member mounted on the post and engaging the second gasket.

7. A battery cell cover having a socket therein, a post sustaining plug within the socket and having an annular groove in its periphery, and a ring of fusible sealing material in said groove.

8. In a post sealing means for batteries, a plug having a recess in its periphery, and a fusible sealing agent in said recess.

9. A battery cell cover having a socket therein, a post sustaining plug within the socket, and a fusible sealing agent between the two.

10. A post sustaining plug for batteries having a recess in its periphery, and a fusible sealing agent in said recess.

In testimony whereof I have signed my name to this specification.

WILLIAM A. MacKENZIE.