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A. H. SNYDER & J. STARKENSTEIN.

STORAGE BATTERY.

APPLICATION FILED AUG. 28, 1912.

1,080,852.

Patented Dec. 9, 1913.

2 SHEETS—SHEET 1.

Fig. 1,

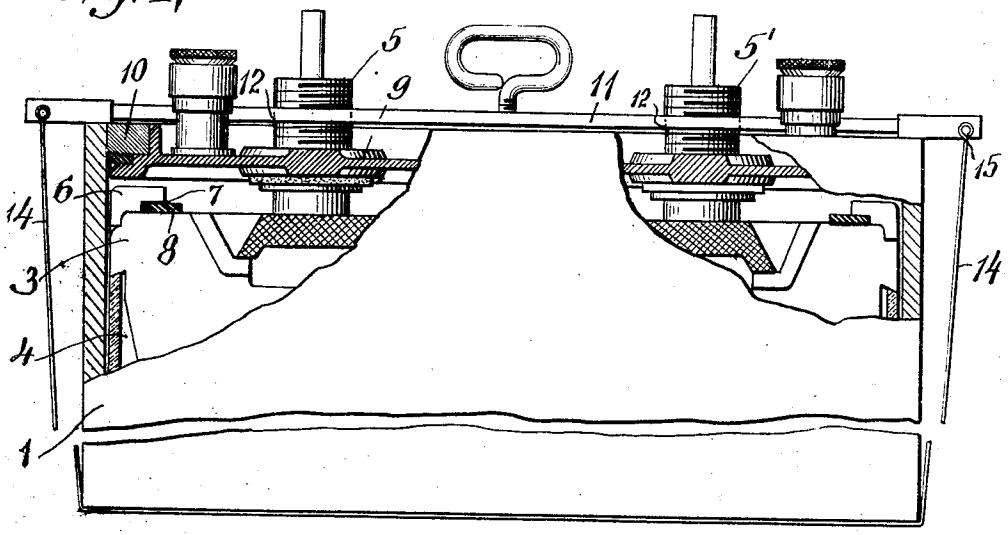


Fig. 2,

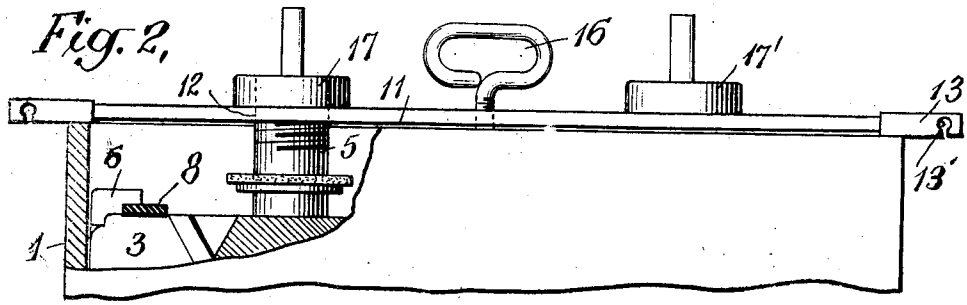
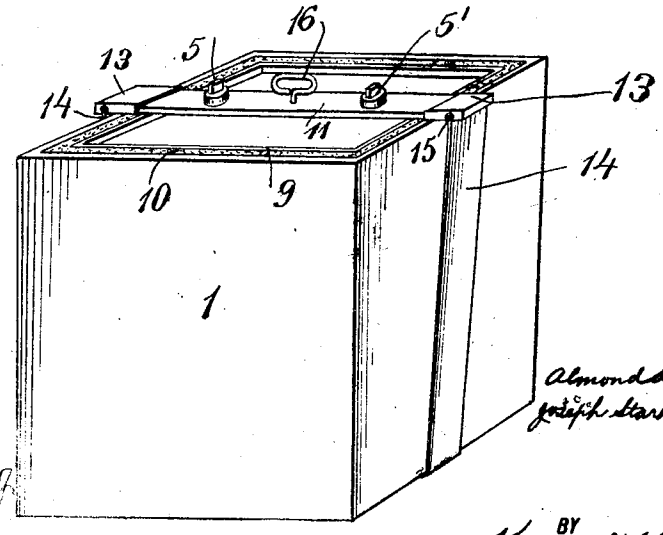


Fig. 4,



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

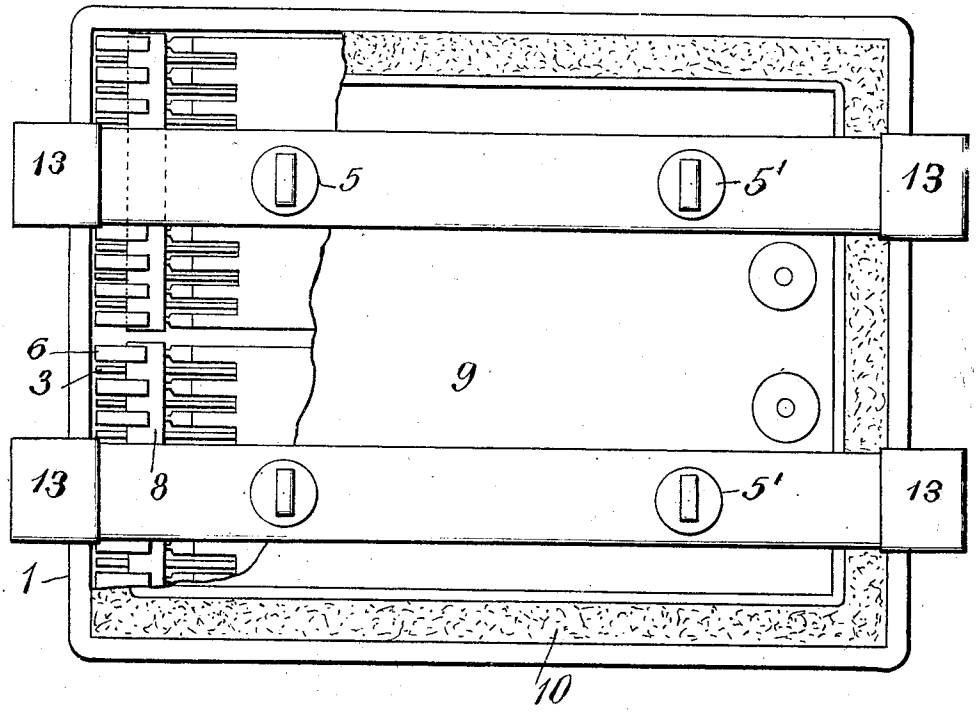


Fig. 5,

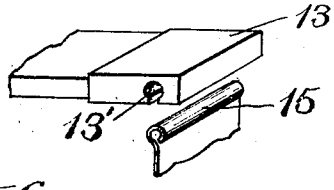
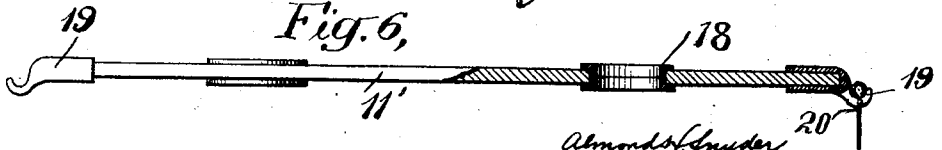


Fig. 6,



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UNITED STATES PATENT OFFICE.

ALMOND H. SNYDER, OF LANCASTER, AND JOSEPH STARKENSTEIN, OF NEW YORK, N. Y., ASSIGNORS TO GOULD STORAGE BATTERY COMPANY, A CORPORATION OF NEW YORK.

STORAGE BATTERY.

1,080,832. Specification of Letters Patent. Patented Dec. 9, 1913.

Application filed August 28, 1912. Serial No. 717,483.

To all whom it may concern:

Be it known that we, ALMOND H. SNYDER, a citizen of the United States, and a resident of Lancaster, county of Erie, and State of New York, and JOSEPH STARKENSTEIN, a citizen of the United States, and a resident of New York city, borough of the Bronx, in the county and State of New York, have invented a certain new and useful Improvement in Storage Batteries, of which the following is a specification.

Our invention relates to storage batteries and more particularly to apparatus for lifting a storage battery as a unit or for lifting the battery plates out of the jar.

One of the objects of the invention is to provide a simple and durable apparatus that may be readily applied to battery jars for lifting them.

Another object of the invention is to provide lifting apparatus which may be readily applied to the battery jar to lift it, or which may readily be attached to the terminals of the plates or to the terminals of a certain number of the plates, so that the plates may be lifted together out of the jar.

In the preferred form of our invention, we provide means whereby the plates may be lifted without disturbing their relative operative positions.

Our invention will be more readily understood and further objects of the invention will more fully appear from the following description taken in connection with the accompanying drawings forming a part of this specification and in which—

Figure 1 shows a side view of a storage battery equipped with a lifting device embodying one form of our invention for lifting the entire jar; certain parts being broken away and others shown in section; Fig. 2 shows a side view of said jar, with certain parts broken away and others in section, having the lifting device secured to the terminals of the battery for lifting the plates out of the jar; Fig. 3 shows a top view of a jar having two positive and two negative terminals, with the lifting device secured to a pair of terminals of opposite polarity, certain parts of the cover being broken away; Fig. 4 shows a perspective view of a jar with the lifting device attached thereto; Fig. 5 shows a detail; and Fig. 6 shows a modification of the lifting device.

Referring to the drawings, 1 is a battery jar, preferably made of hard rubber or similar suitable insulating material, having a series of positive plates 3 and a series of negative plates 4 suitably supported and spaced in the jar, all or a suitable number of the positive plates 3 being burned to the base of a threaded terminal 5. The negative plates, or any desired number of them, are similarly connected to the threaded terminal 5′. Each plate at its end away from its terminal, is provided with a hooked portion or overhanging flange 6 extending above and overhanging the top edges of the plates of opposite polarity, the construction being such that a groove or passage 7 is formed between the lower edge of the flanges 6 and the edge of the plates of opposite porality, the groove extending across the plates. These grooves, one at each end of the plates, are adapted to receive a locking piece or key 8, preferably made of fiber or other strong insulating material, for the purpose of holding the otherwise unsupported ends of the plates from sagging when being lifted, and thus avoiding any shearing strains on the terminals or the connections of the terminals to the plates. The locking pieces also enable the plates to be lifted out of the jar without disarranging their relative positions, so that they may be lifted and replaced without any readjustment.

The particular form of battery shown is provided with a suitable cover 9 which is sealed on the jar by means of a suitable cementing compound 10, but it will be understood that the invention is equally applicable to uncovered batteries.

In order not to crush the edges of the jar in lifting the jar as a whole, a rigid piece 11, preferably in the form of a bar, is placed across the top of the jar with its ends projecting over the side of the jar. The bar, in the preferred form of our invention, is made of wood and is provided with openings 12 through which the threaded terminals 5, 5′ project. The extremities of the bar are provided with suitable means such as metal caps 13 with sockets 13′ for securing the ends of a sling 14. Since the jars are usually made of glass or hard rubber, which cannot be safely subjected to rough handling or uneven strains, we make the sling in the form of a flat band, preferably of sheet metal, the band being provided at its ends with reinforced portions 15 by

means of which the band is secured to the extremities of the bar. In the present form of the invention, we have shown the ends of the sling or flexible sheet metal band curved back upon itself to make the enlarged or reinforced portion 15 cylindrical in form so that it may be slipped laterally into the socket 13'. The bar 11 may be provided with any suitable hook 16 or other device by means of which a chain or rope may be attached to the bar. If desired, the bar may be made of metal, as shown in Fig. 6, and provided with insulating bushings 18 fitting the terminal openings, and with hooks 19 which are adapted to engage in eyelets 20 formed in the metal band.

If it is desired to lift the jar as a whole, the terminal nuts 17, 17' are removed and the bar is slipped over the terminals which project through the holes 12, in the bar until the bar rests upon the upper edge of the jar. The sling is then slipped under the jar and the reinforced end portions are slipped into the sockets 13 or other securing means, whereupon a suitable rope or chain is made fast to the hook 16 and the jar is ready to be lifted. After lifting the jar out of position, or before lifting it out of position, if it is desired to lift the plates out of the jar or any number of them connected to the terminals 5, 5', the sling is dispensed with and the terminal nuts 17, 17' screwed down over the terminals, so as to hold the bar from being lifted off. The locking pieces or keys 8 are then placed in the grooves 7 and the plates are now ready to be lifted by connecting a suitable rope or chain into the hook 16. The ends of the positive plates 3 which are connected to the terminal 5 will support the adjacent ends of the negative plates 4 which are hooked over the key or locking piece 8, and likewise the terminal ends of the negative plates 4 will support the adjacent ends of the positive plates 3 which are hooked over the locking piece 8 at that end; so that as the bar is lifted, the plates will be prevented from sagging down at their otherwise unsupported ends, and will be properly spaced and in their relative operative positions so that they may be readily replaced in the jar without rearrangement.

While we have shown and described the best form of our invention now known to us, it will be obvious to those skilled in the art that various modifications and changes may be made in the same, and that certain features of the invention may be utilized without other of the features, without departing from the scope or spirit of our invention, and we do not wish to be understood as limiting ourselves other than as indicated in the appended claims.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:

1. The combination with a storage battery jar, battery plates and terminals extending up therefrom, of a rigid bar extending across the top of the jar and provided with openings for receiving the terminals from the plates, means for detachably securing the bar to the terminals, and a detachable sling extending from the ends of the bar around beneath the jar, whereby the plates may be lifted out of the jar or the whole jar lifted, depending upon whether the sling is secured to the cross bar.

2. The combination with a storage battery jar, battery plates and terminals extending up therefrom, of a rigid bar extending across the top of the jar and provided with openings for receiving the terminals from the plates, a flexible band extending from the ends of the bar around beneath the jar, and means for detachably securing the ends of the band to the extremities of the bar.

3. The combination with a storage battery jar, battery plates and terminals extending up therefrom, of a rigid bar extending across the top of the jar and provided with openings for receiving the terminals from the plates, a flexible metallic band extending from the ends of the bar around beneath the jar, the band being provided with enlarged portions, and means at the extremities of the bar for detachably securing the enlarged ends of the band thereto.

4. The combination of a storage battery jar, a series of negative and positive plates respectively connected to common terminals, a rigid bar extending across the top of the jar and provided with openings through which the terminals project, means for removably securing the bar on the terminals, and a detachable sling extending from the ends of the bar around beneath the jar.

5. The combination of a storage battery jar, a series of negative and positive plates respectively connected to common terminals, a rigid bar extending across the top of the jar and provided with openings through which the terminals project, means for removably securing the bar on the terminals, a detachable sling extending from the ends of the bar around beneath the jar, the ends of the sling being reinforced, and means at the extremities of the bar for detachably securing the reinforced ends of the sling thereto.

6. The combination of a storage battery jar, a series of negative and positive plates respectively connected to common terminals, the terminals having threaded extensions, a rigid bar extending across the top of the jar and provided with openings through which the threaded terminals project, nuts threaded on the terminals for removably

securing the bar thereon, and a sling detachably secured to the ends of the bar and extending around beneath the jar.

7. The combination of a storage battery jar, a plurality of positive plates and a plurality of negative plates therein, a common terminal for the said positive plates to which they are connected at one end, a common terminal for the said negative plates to which they are connected at their ends opposite the positive terminal, and means for preventing the ends of the negative and positive plates opposite their terminals from sagging when being lifted from the jar by their terminals, said means comprising transverse grooves in the respective positive and negative plates with a key for each groove engaging the respective negative and positive plates to lock each set of plates from sagging when being lifted from the jar by their terminals.

8. The combination of a storage battery jar, a plurality of positive plates and a plurality of negative plates therein, a common terminal for the said positive plates to which they are connected at one end, a common terminal for the said negative plates to which they are connected at their ends opposite the positive terminal, means adapted to be detachably secured to the terminals for simultaneously lifting the said positive and negative plates secured to said terminals, and means for preventing the ends of the said negative and positive plates opposite their terminals from sagging when being lifted from the jar, said means comprising transverse grooves formed in the top edges of the positive and negative plates near their ends opposite their respective terminals, the grooves having openings through which a key may be slipped laterally therein, and keys adapted to be placed in the grooves through said openings when the plates are to be lifted from the jar.

9. The combination with a storage battery jar having negative and positive plates therein and terminals extending up therefrom, of a rigid metal bar extending across the top of the jar and provided with openings for receiving the terminals from the plates, insulating bushings for preventing short circuiting of the battery through the bar, a flexible band extending from the ends of the bar around beneath the jar, and means for detachably securing the ends of the band to the extremities of the bar.

In testimony whereof, we have signed our names to this specification, in the presence of two subscribing witnesses.

ALMOND H. SNYDER.

Witnesses:
L. METZEN,
P. W. ENGLISH.

JOSEPH STARKENSTEIN.

Witnesses:
HUGO PETER,
O. B. PETERSON.