

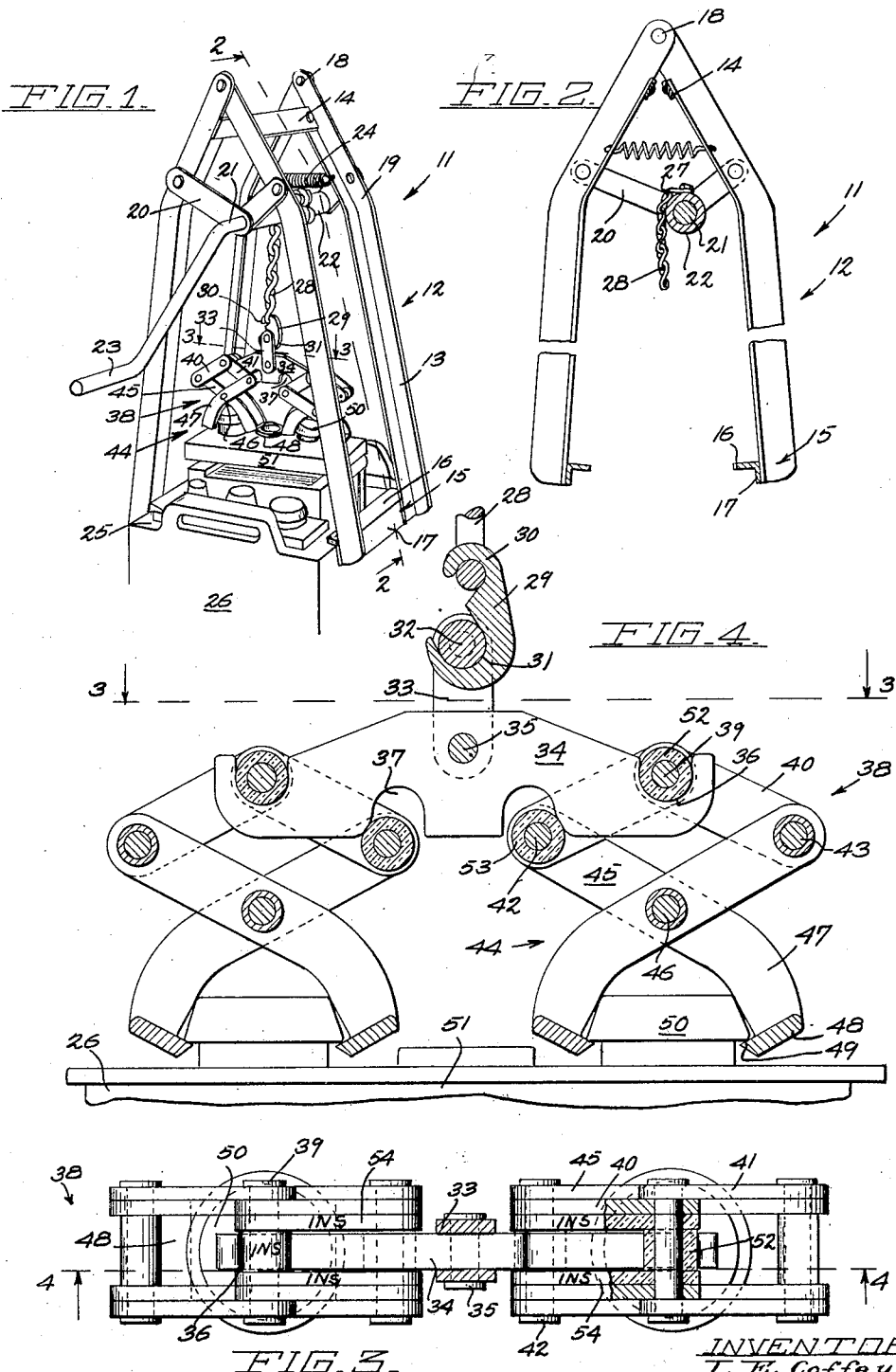
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I. E. COFFEY

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BATTERY CELL HOIST

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INVENTOR
I. E. Coffey
BY
Hayward & Miller
ATTORNEYS.

UNITED STATES PATENT OFFICE

IRVEN E. COFFEY, OF PLAYA DEL REY, CALIFORNIA

BATTERY CELL HOIST

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My invention relates to a device having sufficient strength to permit pulling of a cell from a storage battery without the necessity of loosening the composition connecting one cell and the next.

An object of my invention is a small hoist, the legs of which may be mounted or fitted on the rim of a storage battery and this hoist having a winding device such as a hoist chain with a pair of grappling jaws, each jaw being adapted to engage a terminal of the cell, one of which engages the terminal after the terminal strap connecting to the adjacent cell has been cut.

Another feature of my invention is the utilization of a balance beam to equalize the pulling action between the two grappling jaws and also to allow these to operate at different elevations.

Another feature of my invention relates to the use of the device as a single pulling hoist in which the balance arm or beam may be removed and one of the grappling jaws connected directly to the hoist chain.

Another feature of my invention comprises the manner of insulation of the grappling jaws from the balance lever to prevent short circuiting of the battery cell.

Another detailed feature relating to the mounting of the device is a supporting frame having legs with a spring drawing the legs together and shoes on the legs to engage the sides of the battery, the hoist being operated by a rotating drum or shaft.

My invention is illustrated in connection with the accompanying drawings, in which:

Fig. 1 is a perspective view of the hoist;

Fig. 2 is a vertical section on the line 2—2 of Fig. 1 in the direction of the arrows;

Fig. 3 is a horizontal section on the line 3—3 of Figs. 1 or 4 in the direction of the arrows;

Fig. 4 is a vertical section on the line 4—4 of Fig. 3 in the direction of the arrows.

In my construction I employ a hoist frame 11 having two sides 12, each side having a pair of legs 13 which are illustrated as formed of angles and having a transverse plate 14 between these legs adjacent the top and an angle 15 between a pair of legs at the bottom,

such angle having a horizontal flange 16 and a vertical flange 17. The sides are connected by hinge pivots 18 at the top connecting the legs of each side. These legs are illustrated as having a slight bend at 19 and above this bend there are a pair of toggle links 20 connecting through each of the opposite pair of legs, and in these toggle legs there is rotatably mounted a shaft 21 having a drum 22 thereon, this shaft having a crank 23. A tension spring 24 secured between the opposite sides tends to pull these sides together, thus readily holding a device mounted on the edge 25 of a storage battery 26. The spring action readily allows this device to be clamped as one of the angles 15 can be fitted over the battery on one side, then the other angle caught on the other side. The upper end 27 of the flexible chain 28 is connected to the drum. This chain has a removable hook 29 at the bottom, such hook having a small eye 30 connecting on the lower link of the chain and a larger eye 31 which attaches to a journal pin 32, this journal pin having a pair of links 33 connected thereto. The balance lever 34 is connected to the links 33 by means of a pin 35. Such balance lever has an opposite pair of notches 36 at its opposite ends. The balance lever is also provided with two clearance notches 37 on the bottom.

There are a pair of grappling jaws 38, both being similar, each of which has an upper pin 39 which connects two pairs of top links 40 and 41. These links again have pins 42 and 43 therethrough and connect to the jaw forming levers 44, each of which has an upper part 45 above the lower pin 46 and a curved portion 47 below. Each lower end 47 has a strap 48 connecting the opposite sides, this strap having an inwardly projecting gripping edge 49 which is preferably somewhat sharpened to engage and grip a terminal 50 on a battery cell 51 of a storage battery.

In order to prevent short circuiting the pin 39 has an insulating bushing 52 thereon, the pin 42 on the inside has an insulating bushing 53, and there are two insulating plates 54 fitting on the inside and between the links 40. Thus, as the pin 39 is insulated

from the balance lever 34 and the weight is carried by the bushing in the notch 36. Also, the pin 42 has the insulating bushing 53 which fits into the upwardly extending notch 37. The insulating plates 54 prevent contact with the sides of the balance lever 34, thus each of the grappling jaws is insulated from the balance lever and, therefore, from the rest of the appliance, preventing any short circuit between the terminals of the cell.

It is believed that the manner of using this device is quite clear. However, it may be stated that the grappling jaws operate somewhat on the principal of lazy tongs. The rear portion may be gripped on the cell terminals, it being necessary to cut the strap connecting one cell to the next. The crank is operated to wind a chain on the drum 22 and thus raise the cell out of the battery.

Presuming only one grappling jaw is required, the balance lever may be disconnected from the hook 29 and one of the grappling jaws fitted therein in which case the bushing 52 will form a bearing in the eye 31 of the hook 29.

A relatively important feature of my invention is that the hoist frame, when pulling a cell, gives a lateral support to the battery box or case. The sides of the batteries are usually made quite thin and sometimes in pulling the cell the side wall is forced out of alignment to such an extent that the transverse walls are broken or cracked, especially at their junction line with the side wall, but with my construction the downward pull on the toggle links 20 due to the rotation of the drum 22 tends to pull the sides 12 having the legs 13 together; that is: there is an inward pressure on the angle plate 15, the vertical flange of which presses against the outside top portion of the side of the battery box and thus tends to resist pressures which might force such side outwardly.

Various changes may be made in the details of construction without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. A battery cell hoist comprising, in combination, a hoist frame having means for support on a battery, a tension means connected thereto, a balance lever connected to the tension means, a plurality of grapples, each having a pivot connected to the balance lever, and each having a plurality of links extending from the pivot with levers connected to the links, such levers having jaws, said pivots having insulation, and said links being provided with insulating plates insulating each grapple from the balance lever.

2. A battery cell hoist comprising, in combination, a hoist frame having means for support on a battery, a tension means connected thereto, a balance lever connected to the tension means and being formed of a flat bar,

a pair of grapples, each having a pivot removably fitted in the balance lever, a pair of links extending from each pivot, each link having a pair of bars, a pair of levers connected to the links by second pivots, and said levers being pivotally connected together forming in effect a lazy tong, the levers being formed of spaced bars with a jaw at the lower end of each lever, the main pivot connected to the balance lever having an insulating bushing, a pair of bars forming one of the links having an insulating plate, and the balance lever having a notch in its lower edge to accommodate one of the pivots connecting one of the links and one of the levers, such pivot having an insulating bushing, thereby insulating the grapples from the balance lever.

3. A battery cell hoist as claimed in claim 2, the tension means having a removable hook supporting the balance lever, and said hook being adapted to engage the main pivot of the grapple and to operate the grapple directly.

4. A battery cell hoist comprising, in combination, a hoist frame having a pair of sides with legs, the sides being pivotally connected at the top and the legs having means for support on a battery at the bottom, a tension spring between the sides, toggle links connected to the opposite sides and having a rotatable shaft journaled therein, a flexible tension means connected to the shaft, and a grapple connected to the tension means.

5. A battery cell hoist comprising, in combination, a hoist frame having a pair of sides, each with a pair of legs, the legs being pivotally connected at the top, each pair of legs having an angle bar connection at the bottom, a pair of toggle links connected to the legs of the opposite sides, and the toggle links at their junction having a crank shaft journaled therein, a contraction spring between the legs of the opposite sides, a flexible chain connected to the shaft, and a grapple connected to the chain.

6. A battery cell hoist comprising, in combination, a hoist frame having means for support on a battery, a tension means connected thereto having a hook, a balance lever disconnectibly connected to the hook, a pair of grapples each having an insulated pivot disconnectibly connected to the balance lever and each having a plurality of links extending from the pivots with levers connected to the links, such levers having jaws, and the hook being adapted for removal from the balance lever and to engage said pivot of either of the grapples.

7. A battery cell hoist comprising, in combination, a hoist frame having a pair of sides pivotally connected at the top and having means for support on a battery at the bottom, a pair of toggle links depending downwardly and inwardly from the two sides and

having a rotatable shaft connected to the intersection of said links, a flexible tension means connected to the shaft, and a grapple connected to said tension means.

5 8. A battery cell hoist comprising, in combination, a hoist frame having a pair of sides pivotally connected together at the top and having means for support on the upper side edges of a battery at the bottom, a tension means with grapples, and connecting devices
10 suspending the tension means from the two sides and adapted to exert an inward pull on the lower end of said sides when raising a battery cell.

15 9. A battery cell hoist comprising, in combination, a hoist frame having a pair of sides with legs, the sides being pivotally connected at the top, and legs having means for support on the upper side edges of a battery at the
20 bottom, toggle links connected to the opposite sides and having a rotatable shaft journaled therein, a flexible tension means connected to the shaft, and a grapple connected to the tension means, said toggle links being adapted
25 to transfer a tension to said sides exerting an inward pull on the bottom of said sides when pulling a cell from a battery.

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

30 IRVEN E. COFFEY.