

(No Model.)

A. FRIEDLÄNDER.
PORTABLE GALVANIC BATTERY.

No. 402,915.

Patented May 7, 1889.

FIG. 5

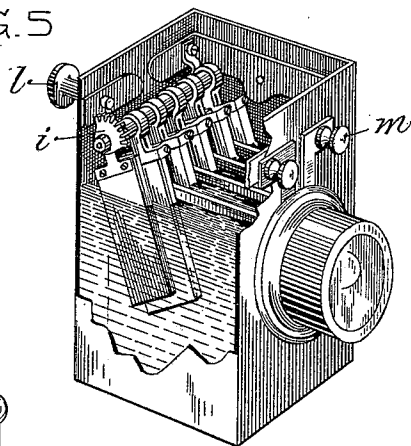


FIG. 1

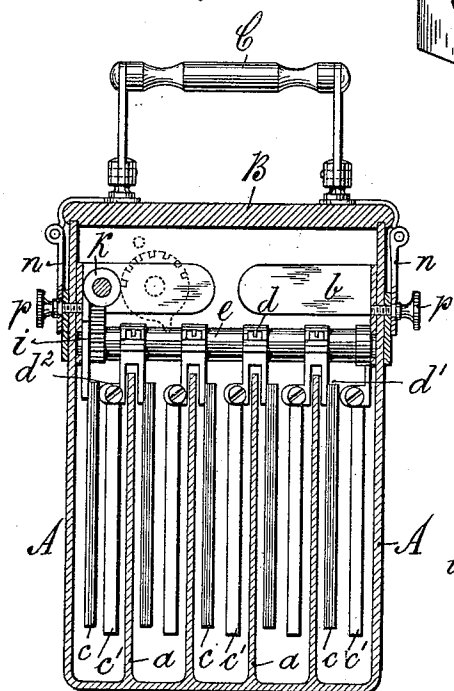


FIG. 2

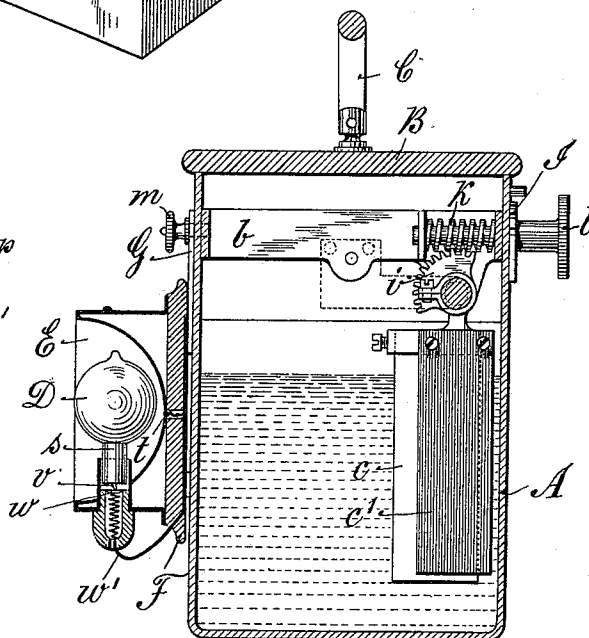


FIG. 4

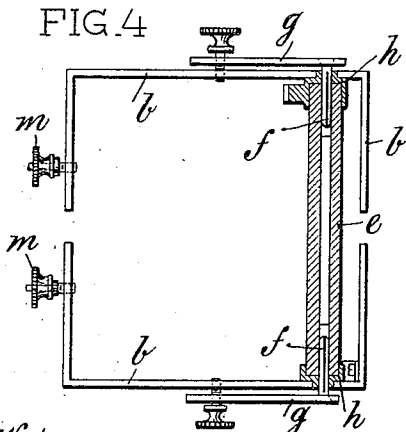
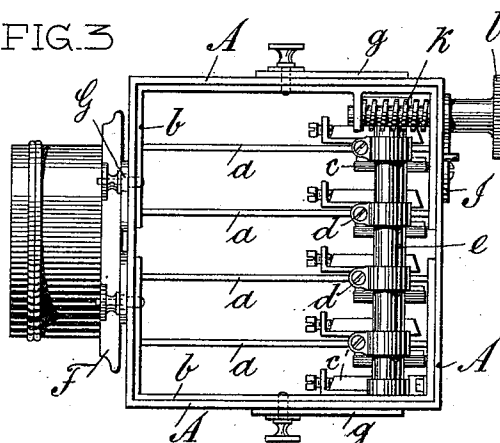


FIG. 3



Witnesses:
E. R. Brown
E. L. Richards.

Inventor.
Albert Friedländer
By *Richardson*
Attorneys.

UNITED STATES PATENT OFFICE.

ALBERT FRIEDLÄNDER, OF BERLIN, GERMANY.

PORTABLE GALVANIC BATTERY.

SPECIFICATION forming part of Letters Patent No. 402,915, dated May 7, 1889.

Application filed April 30, 1888. Serial No. 272,261. (No model.) Patented in England March 21, 1887, No. 4,213; in France October 25, 1887, No. 186,590; in Belgium October 31, 1887, No. 79,375, and in Austria-Hungary March 12, 1888, No. 40,817 and No. 6,157.

To all whom it may concern:

Be it known that I, ALBERT FRIEDLÄNDER, a subject of the King of Prussia, and residing in the city of Berlin, Prussia, German Empire, have invented certain new and useful Improvements in Portable Galvanic Batteries, (for which I have obtained Letters Patent in the following countries: France, October 25, 1887, No. 186,590; Belgium, October 31, 1887, No. 79,375; Austria-Hungary, March 12, 1888, No. 40,817, and No. 6,157, and England, March 21, 1887, No. 4,213,) of which the following is a full, clear, and exact description.

My invention relates to an improved electric portable battery; and it consists, chiefly, of an immersion-battery which provides the electric current for an electric incandescent lamp, said lamp being attached to the immersion-battery in any suitable manner.

Now, my improved immersion-battery and the parts pertaining to the same are so constructed that a minimum of space only is required, so that the battery can be readily set in operation, and the depth of immersion, and consequently the strength of the current, be regulated according to desire from the outside of the battery by operating a suitable thumb-piece or its equivalent, said thumb-piece being at its inner end in gear with the mechanism for lowering and raising the elements or series of zinc and carbons or other suitable electrodes. The elements of the battery are arranged near the one side wall of the vulcanite, ebonite, glass, or other suitable casing, and are attached to a suitable spindle or shaft, onto which is mounted a wheel or sector with curved teeth corresponding to the threads of a worm attached to the inner end of the thumb-piece mentioned above.

I am aware that immersion-batteries as such are not new, as various immersion-batteries have been proposed for use in which the elements are attached to a frame-work provided with a rack or screw, so that the said elements can be raised in the vertical plane out of or lowered into the fluid by operating the pinion to the rack, or the nut to the screw, or the screw itself; but all of these batteries pos-

sessed the disadvantage of requiring too much space. The receptacle must be of proportionate height, in order to permit the raising and lowering of the elements, or if the height is decreased the other dimensions must be proportionately increased. Now, in order to avoid all these disadvantages, I have invented a compact immersion-battery which can be readily operated, and which only requires to be made one-half the height of the batteries hitherto known.

The strength of the current can be regulated with the greatest possible accuracy by operating the spindle or shaft carrying the elements so that the elements are more or less immersed in the exciting-fluid.

Figure 1 is a vertical section, some of the parts being represented in elevation. Fig. 2 is a vertical section at a right angle to Fig. 1, some of the parts being shown in elevation. Fig. 3 is a top view of the lamp and battery with the lid or cover removed. Fig. 4 is a top view of the device for stiffening the receptacle and for receiving the spindle or hollow axis which carries the elements and their clamps, and also the sector for operating the said spindle. Fig. 5 is a perspective view of the lamp and battery with the lid and handle removed and a portion of the walls of the receptacle broken away in order to better show the parts, the worm on the spindle of the thumb-piece being also omitted.

The receptacle or vessel A, of ebonite, glass, or other suitable non-conducting material which is not liable to be attacked by the exciting-fluid, can be made of any appropriate form and size, the walls of the same being stiffened by the metallic frame b, said frame serving at the same time to receive and support the elements and the parts connected to the same. The receptacle or vessel is provided with a number of partitions, *a*, corresponding to the number of elements *c c'* employed, the said elements being connected by means of clamping-rings *d* to the spindle or shaft *e*. This spindle or shaft *e* is hollow or bored out at both ends a sufficient distance to receive the split pivots or pins *f* of the metallic contacts *g g*. The spindle or shaft *e*

does not run through the walls of the receptacle, but has its bearings in suitable boxes or cups, *h*, which fit into borings in the frame *b*, and are bored out to allow the split-springy pins or pivots *f* to pass into the interior of the shaft or spindle *e*, in order to secure the safe operation of the battery and the passage of the current through the frame *b*.

c are the carbon elements, which are attached to the one arm *d'* of the forked clamping-rings *d*, while the zinc element *c'* is held in the second arm, *d''*, of the clamping-ring *d* by means of a pressure-screw or in other appropriate manner.

i is a toothed sector, which is either formed of one piece with one of the caps or bearings *h* for the shaft or spindle *e* or securely fixed to the same, said toothed sector being operated by the worm *k* on the stem to the thumb-piece *l* in such manner that when the thumb-piece *l* and its worm *k* are rotated in the one direction the sector *i* and with it the shaft or spindle *e* and the elements *c c'*, attached to the same, will also be so rotated that the elements *c c'* are immersed into or raised free of contact with the exciting-fluid.

m m are screws fixed or screwed into the ends of the frame *b* and to which the contacts *G G*, leading to the lamp, are attached, said contacts being preferably made in the form of hook-plates, which are hung onto the screws *m m* and then securely fixed by screwing in the said screws on the thumb-nuts arranged on the same.

B is the lid or cover, which is provided with the handle *C*, and is securely held to the receptacle *A* by means of suitable jointed lugs, *n n*, and screws *p*.

D is an incandescent lamp; *E*, the reflector to the same, said reflector being attached to a wooden or other suitable backing, *F*.

The lamp is connected with the battery in the following manner: One pole of the filament or incandescent body is in electric contact with the sheath *s* to the lower part of the lamp, said sheath being in its turn in electric contact with the reflector *E*, and through the connecting-wire *t* with one of the hooks or plates *G*, fixed to the backing *F* of the lamp, whereas the pole *v* is in contact with a contact-plate, *w*, on the spiral wire *w'*, which leads to the second contact-plate or hook *G*, so that when the lamp is hung or placed on the screws *m* the lamp will be in connection with the frame *b*, and through the same with the elements of the battery.

I is an indicator-disk attached to the casing *A*, and operated on by means of a tooth fixed to the thumb-screw *l*, in order to indicate the depth of the immersion of the elements in the exciting-fluid and the position of the said elements.

Instead of employing the worm *k* and sector *i*, the thumb-piece can be attached direct to the hollow or other shaft and be held by friction in such manner that the electrodes can be given any desired degree of immersion.

Having now particularly described the nature of my invention, what I claim is—

1. An improved compendious galvanic battery for strong currents and especially for producing electric light in portable lamps in which the electrodes are attached by means of clamping-rings to a hollow rotary shaft, said shaft being rotated by operating a thumb-piece outside of the battery and connected to the rotary shaft in such manner that the electrodes can be immersed into or raised out of the exciting-fluid, substantially as and for the purpose described and shown.

2. In a portable galvanic battery for strong currents, the combination of the receptacle *A* and cover *B* with the hollow shaft *e*, clamps *d*, electrodes *c c'*, and thumb-piece *l*, substantially as and for the purpose described and shown.

3. In a portable galvanic battery, the combination of the receptacle *A* and partitions *a* with the frame *b*, electrodes *c c'*, clamps *d*, shaft *e*, caps or boxes *h*, segment *i*, worm *k*, and thumb-piece *l*, substantially as and for the purpose described and shown.

4. In a portable galvanic battery, the combination of the receptacle *A*, partitions *a*, frame *b*, electrodes *c c'*, clamps *d*, and shaft *e* with the caps or boxes *h*, segment *i*, worm *k*, thumb-piece *l*, and the split pins *f* and contacts *g*, substantially as and for the purpose described and shown.

5. In a portable galvanic battery, the combination of the receptacle *A*, partitions *a*, cover *B*, frame *b*, electrodes *c c'*, clamps *d*, shaft *e*, thumb-piece *l*, with the tooth or spur on said thumb-piece *l*, and the indicator *I*, for showing the depth of immersion of the elements in the exciting-fluid, substantially as and for the purpose described and shown.

6. In a portable galvanic battery for strong currents, the combination of the receptacle *A*, cover *B*, electrodes *c c'*, clamps *d*, shaft *e*, thumb-piece *l*, indicator *I*, and frame *b* with the screws *m*, for receiving the electric lamp and connecting the same with the frame *b* and thus with the battery, substantially as and for the purpose described and shown.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ALBERT FRIEDLÄNDER.

Witnesses:

B. ROY,

ANTHONY STEFFEN.