No. 753,138. PATENTED FEB. 23, 1904.

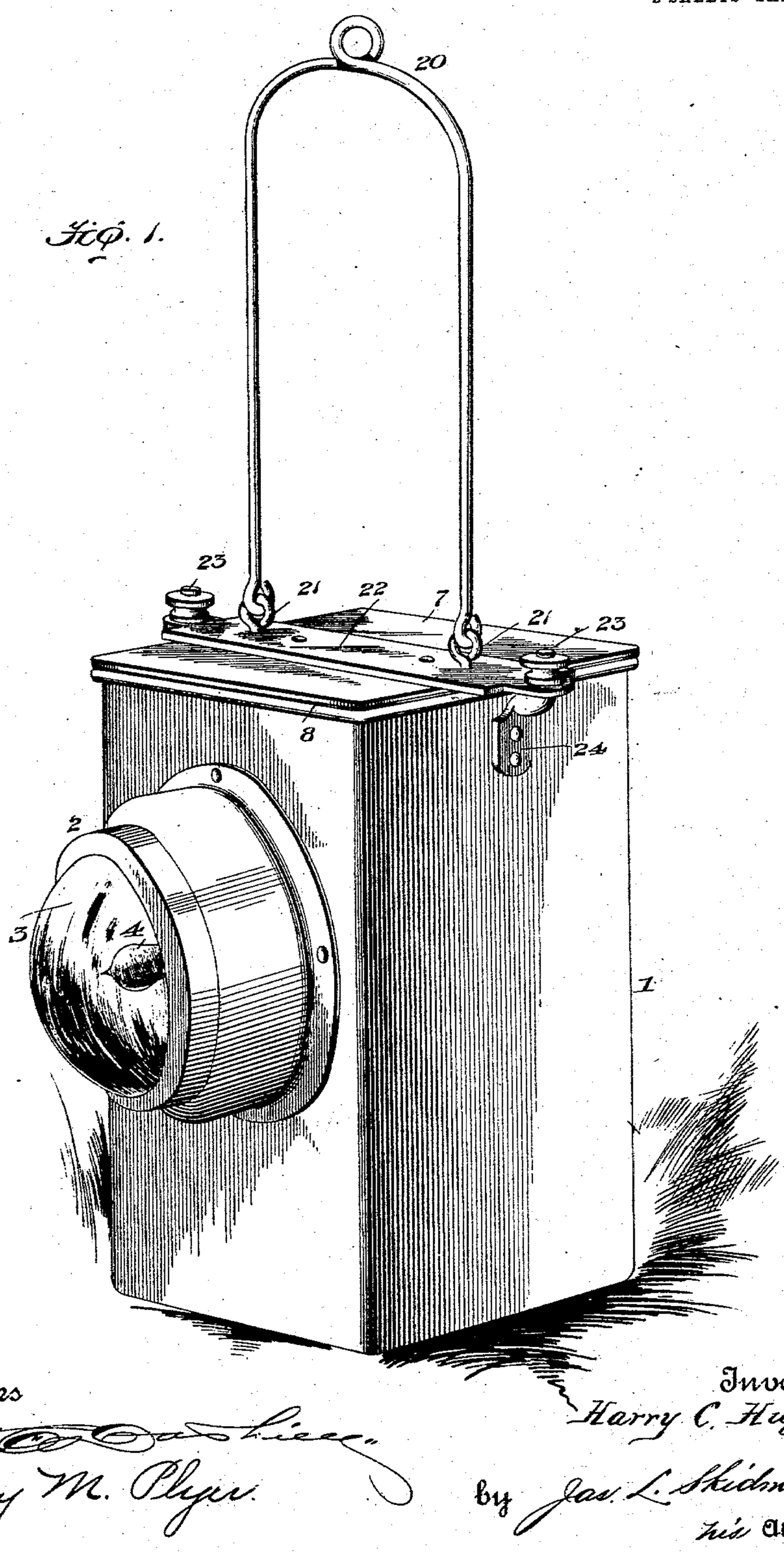
H. C. HUBBELL.

PORTABLE ELECTRIC LAMP.

APPLICATION FILED JULY 2, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

May M. Plyer.

Inventor.

Harry C. Hubbell

by Jas. L. Skidmore

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Fig. 3.

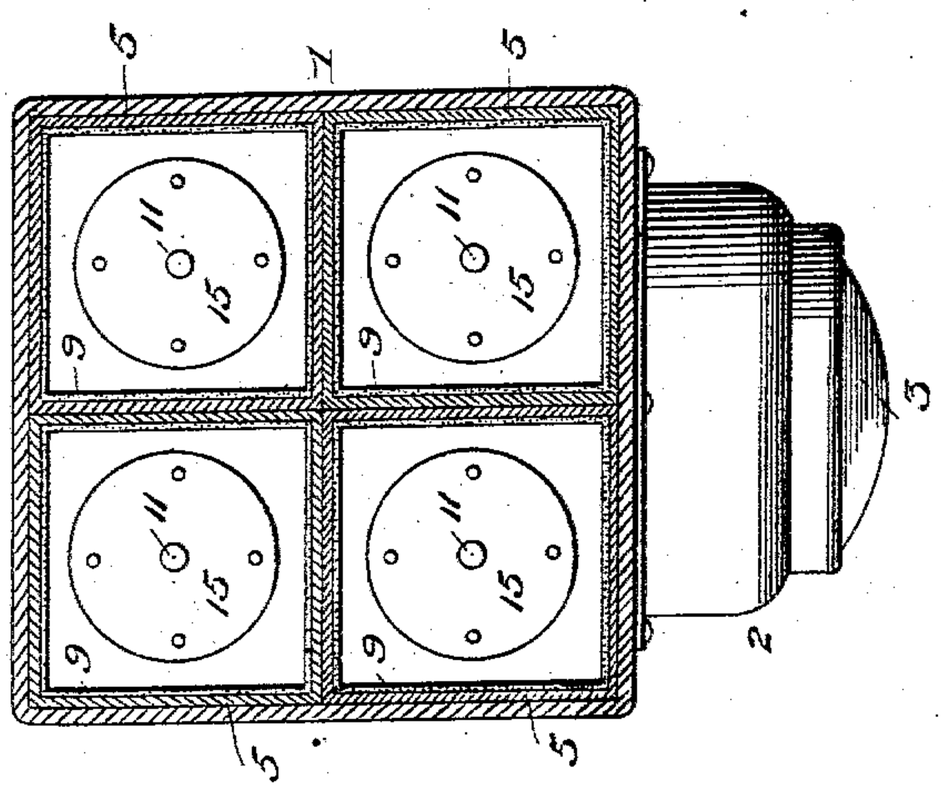

Fig. 2.

Witnesses

[illegible]

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No. 753,138. Patented February 23, 1904.

UNITED STATES PATENT OFFICE.

HARRY C. HUBBELL, OF BROOKLYN, NEW YORK, ASSIGNOR TO HORACE W. FULLER, OF NEW YORK, N. Y.

PORTABLE ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 753,138, dated February 23, 1904.

Application filed July 2, 1903. Serial No. 164,040. (No model.)

To all whom it may concern:

Be it known that I, HARRY C. HUBBELL, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Portable Electric Lamps, of which the following is a specification.

This invention relates to portable electric lamps, and has especial reference to portable electric hand-lamps for miners' use.

The invention has for its object to provide a portable electric lamp for miners' use or for other purposes which will be safe, efficient, and durable.

Referring to the accompanying drawings, in which similar figures of reference indicate like parts, Figure 1 is a view in perspective of the exterior of a portable electric hand-lamp constructed in accordance with this invention. Fig. 2 is a view in elevation, showing in vertical section the body of the lamp and its internal construction. Fig. 3 is a transverse sectional view through the upper portion of the body and cells of my improved lamp, made on the line 3 3 and looking in the direction of the arrow shown in Fig. 2.

In the construction of the lamp the body is formed of a box 1 of suitable material, preferably thin sheet-steel, which may be coated on the outside with agate or porcelain. Upon one of the sides of the box 1 is secured a reflector 2, preferably of thin sheet-steel, and coated on the inside preferably with white porcelain. A thick oval or concave glass 3 is mounted in the front of the reflector, and its joint therewith and the joint of the reflector with the side of the box are made water and vapor tight by a suitable packing. Within the reflector 2 in the side of the box 1 is mounted the electric-light bulb 4, which is electrically connected before the reflector is secured in place.

A number of cells 5—as, for example, four—are located in the box 1 and rest on a block of wood 6, which serves merely as a base, and a filling in the box to bring the tops of the cells 5 adjacent to the top of the box 1. The block of wood 6 is saturated or coated with paraffin to repel moisture. The cells 5 are preferably of thin sheet-steel, and their tops are even with the top of the box 1, whereby when the cover or lid 7, with its felt or rubber gasket 8, is placed on top of the box it will cover the tops of the cells 5 and prevent their contents from slopping out or into each other. These cells 5 are lined on the sides with a suitable metal lining 9, such as thin sheet copper or brass or other metal which can be amalgamated and is not affected by the solution. A quantity of zinc amalgam is placed in the bottom of each cell 5 in direct contact with it.

Passing through the center of the bottom of each cell 5 and insulated from it, as at 10, is an iron wire 11, extending upward nearly to the top of the cell and threaded at its ends, as at 12. The lower end of the wire 11 is secured to the bottom of the cell by a nut 13 and washer 14, and its upper end is screwed into an iron disk 15. The wire 11 is protected from the solution by a tube 16, of glass or other suitable material. The tube 16 also serves to stiffen the wire 11 and prevent its bending.

Suspended from the disk 15 radially from its center are a number of nickel or iron nickel-plated wires 17, screwed at their upper end into the disk 15 or otherwise suitably secured thereto. These wires 17 are surrounded by spongy or porous pure silver 18, which is wound or wrapped with cloth, paper, or other suitable material 19 to prevent its falling off from the wires 17 by a sudden jar and also to keep particles of zinc or mercury from forming a contact with it. The cells 5 are partly filled with a solution 18 of caustic potash or caustic sodium. On charging the cells 5 by means of an electric current the porous or spongy silver absorbs oxygen, while hydrogen is given off on the sides of the cell. On discharging the zinc enters the solution from the amalgam in the bottom of the cell and the silver oxid is reduced to pure silver. On charging the cells the second time the zinc is deposited from the solution onto the amalgamated-copper lining of the cell, where it presents a much larger surface to the solution than it did when it was all contained in the

amalgam in the bottom of the cell. If any part of the deposited zinc should fall off from the copper lining, it will again enter into the amalgam in the bottom of the cell and be available.

The cells 5 are suitably electrically connected, one contact being the steel cell itself and the other, where the iron wire 11 projects through the bottom of the cell, being in contact with the silver cathode. On account of the cost of silver only a limited number of the silver pencils need be used in accordance with the storage capacity of the battery required.

The cover 7 is provided with a suitable bail or handle 20, connected by screw-rings 21 to a strap 22, fastened to the cover 7, and having holes at its ends through which projects screw-threaded pins 23 on brackets 24, mounted on the sides of the box 1. The cover is secured in place by means of thumb-nuts 25, which screw onto the pin 23.

It will be understood that the cells may be insulated from each other by the use of any suitable or desirable insulating material.

By means of this invention an efficient and durable portable electric hand-lamp is provided which will afford a good strong light for a considerable length of time and which is especially adapted for mines and other localities where a naked light cannot be safely exposed. The body of the lamp being sealed, as set forth, presents this advantage, and the contents are kept intact, besides dispensing with the use of acid and maintaining the efficiency of the lamp.

Having described my invention, I claim—

1. In a portable, electric, hand-lamp, a cell having a lining of metal capable of being amalgamated, and containing a zinc amalgam, an alkaline solution, and silver oxid, suspended in said cell, and forming the cathode, as herein set forth.

2. In a portable, electric, hand-lamp, a steel cell, having a lining of metal capable of being amalgamated, and containing a zinc amalgam, an alkaline solution, and a number of silver-oxid pencils suspended in said cell, and forming the cathode, as herein set forth.

3. In a portable, electric, hand-lamp, a steel cell, having its sides lined with a metal capable of being amalgamated, a zinc amalgam; an alkaline solution; a wire projecting upward from the bottom of the cell, and protected from the solution; and one or more silver-oxid pencils suspended from the upper part of the wire, and forming the cathode, as herein set forth.

4. In a portable, electric, hand-lamp, a body portion, consisting of a steel box; a number of steel cells located in said box; each cell having its sides provided with a lining of metal capable of being amalgamated; a wire projecting up from the bottom of each cell; a protecting-tube inclosing the wire; a zinc amalgam in the bottom of each cell; an alkaline solution in each cell; and one or more silver-oxid pencils suspended from the upper end of each wire, and forming the cathode, as herein set forth.

5. A portable, electric, hand-lamp, consisting of a box; a number of cells, located side by side in said box; each cell having its sides provided with a lining of metal capable of being amalgamated, and a wire projecting upwardly from the bottom of the cell, with a tube surrounding said wire; a zinc amalgam in the bottom of each cell; an alkaline solution in each cell; one, or more silver-oxid pencils suspended from the upper end of each of said wires; and a cover and gasket fitting over the top of the box and the tops of the cells, and sealing the same; and means for securing said cover and gasket in place, as herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HARRY C. HUBBELL.

Witnesses:
J. D. H. BERGEN,
DE HART BERGEN.