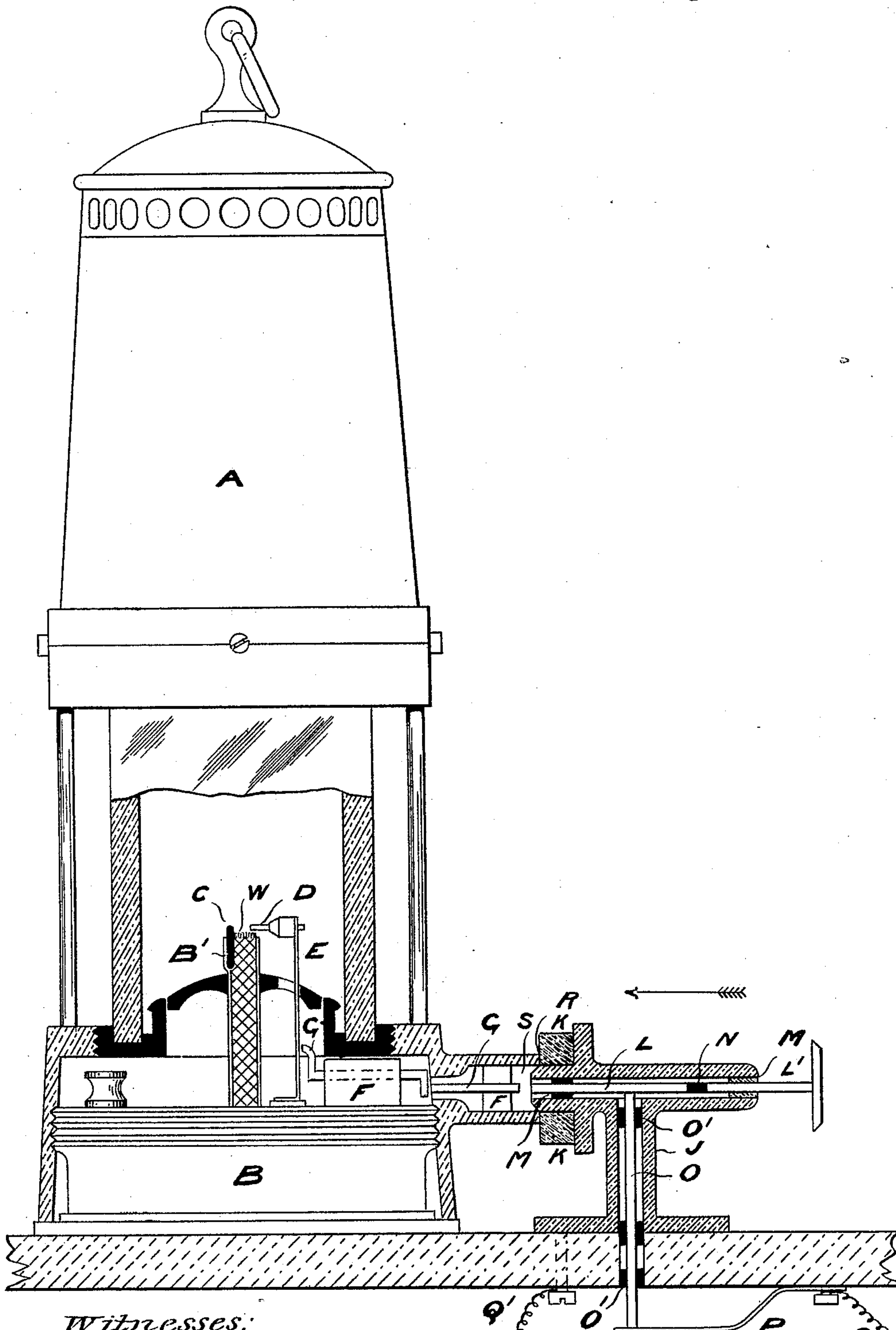


(No Model.)

J. GRAHAM & H. CHAPMAN.  
MINER'S SAFETY LAMP.

No. 517,520.

Patented Apr. 3, 1894.



Witnesses:

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Their Attorneys



# UNITED STATES PATENT OFFICE.

JESSE GRAHAM AND HARRY CHAPMAN, OF MORLEY, ENGLAND.

## MINER'S SAFETY-LAMP.

SPECIFICATION forming part of Letters Patent No. 517,520, dated April 3, 1894.

Application filed October 7, 1893. Serial No. 487,452. (No model.) Patented in England April 10, 1893, No. 7,286.

*To all whom it may concern:*

Be it known that we, JESSE GRAHAM and HARRY CHAPMAN, subjects of the Queen of Great Britain and Ireland, residing at Morley, in the county of York, England, have invented certain Improvements in the Method of Lighting Miners' Safety-Lamps, (for which we have obtained Letters Patent in England, No. 7,286, dated April 10, 1893,) of which the following is a specification.

This invention relates to improvements in lighting miners' safety lamps, and has for its object the construction of certain portions of the lamps in such a manner that they can be lighted when required after the lamps have been locked and sealed and thus obviate the necessity of having to light the lamps before locking and sealing and keep them burning some time in readiness for the miners entering the pit, thereby to effect a saving in oil and make it unnecessary to send a lamp out of the mine for lighting should it be extinguished.

In order that our invention may be fully understood, we will describe the same in detail by making reference to the accompanying drawing of a miner's safety lamp shown partly in section for the purpose of more clearly illustrating the novel parts of our invention.

The lamp casing A is of the ordinary construction, the oil vessel B being secured and supplied with oil and wick in the ordinary manner.

In a recess formed in the burner tube B', we secure a carbon C in such a manner that a good electrical contact is made with the burner or wick tube B'. The top of the said carbon projects a short distance above the top of the burner or wick tube B' and wick W therein, and near to the said burner is another carbon D held by a vertical metallic spring E, mounted on the oil reservoir or vessel B, and insulated therefrom at the bottom so that there is no metallic connection between the spring and other portions of the lamp, except with the sliding bar or bars G supported by insulating material at F. F. and extending to the outside of the lamp casing.

Upon a table of non-conducting material, we secure a hollow bracket J. provided with an india rubber or other flexible washer K in

the position shown. In the interior of the said hollow bracket are mounted in a horizontal position two metallic spindles L and L' insulated from the bracket at M and connected together by insulating material at N. so that no flash can be got by making a metallic connection between the spindle L' and bracket J. In the vertical portion of said hollow bracket is placed a vertical metallic spindle O, insulated from the bracket at O' and kept in metallic contact with the horizontal spindle L by spring P. connected by a wire Q. to one pole of an accumulator or dynamo. The hollow bracket J is connected to the other pole of the accumulator or dynamo by wire Q'. and on placing the lamp in the position shown, in contact with the flexible washer K. the latter is compressed to an extent that, a metallic portion of the lamp is brought in contact with the hollow bracket at R. and an air tight chamber S formed where the outside connection of the other pole is made for completing the circuit. This is accomplished by pressing the horizontal spindles L and L' in the direction of the arrow, and forcing the sliding bar or bars G in contact with the metallic spring E. bending the latter in the direction that, the current is allowed to pass from carbon D to carbon C. By the said carbons being brought near together and the current allowed to pass, they become hot, the carbon C converting the oil absorbed from the wick into gas, which is ignited by an arc light or sparks passing from carbon D to carbon C on the release or withdrawal of the horizontal spindles L and L', thus lighting the wick of the lamp after the latter is locked and sealed. The circuit through the lamp is accomplished by arranging the current to pass from spring P up vertical spindle O to the spindle L. then through sliding bar or bars G. to the vertical metallic spring E. and carbon D. returning through carbon C down tube B' and metallic portion of lamp to the point at R. where the lamp is in metallic contact with the hollow bracket J. to which the negative wire Q' is connected.

As will be readily understood by persons skilled in the art of electricity, our object may be accomplished by dispensing with the carbons C and D. and other electrical con-



ductors utilized, the lighting of the wick W of the lamp being effected on the operation of the spindles L' and L. by an arc light or series of sparks passing between the electrical conductors mounted substantially in the same manner as the carbons C and D.

By forming an air tight compartment S by a flexible washer K or the like where the current is completed; lamps may be lighted in the mine in the manner as before described and all danger of an explosion obviated by the confinement of any flashing or sparking between L and G within the air tight space S.

What we claim as our invention is—

1. In combination in a miner's safety lamp, the burner, the electric lighting means arranged adjacent thereto, the contact piece carried by the lamp, the air tight chamber in which the contact is located, the circuit connections leading from a suitable source and the means for closing the circuit at the contact within the air tight chamber whereby sparking will not cause explosions, substantially as described.

2. In combination, in a miner's safety lamp, the burner, the electric lighting means arranged adjacent thereto, the chamber S carried by the lamp and the contact piece G extending into the same, substantially as described.

3. In combination in a miner's lighting apparatus, the burner, the electric lighting

means arranged adjacent thereto, the chamber S carried by the lamp, the contact therein, the electric circuit, the bracket having the movable contact L, and the flexible washer K on said bracket arranged to be borne upon by the chamber S, substantially as described.

4. In combination in a miner's lighting apparatus, the burner, the electric lighting means arranged adjacent thereto, the electric circuit connections, the bracket having the movable contact L, the flexible washer K and the contact point R, the contact carried by the lamp and the chamber S also carried by the lamp and arranged to contact with the washer K and with the contact point R to close the circuit at this point, substantially as described.

5. In combination in a miner's safety lamp, the burner, the electric lighting device, the contact piece and the chamber S containing the same, the walls of said chamber being adapted to form part of the circuit, substantially as described.

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

JESSE GRAHAM.  
HARRY CHAPMAN.

Witnesses:

JNO. GILL,  
WM. PREST.