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M. BRESSON

PORTABLE LIGHTING APPARATUS

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Fig. 1.

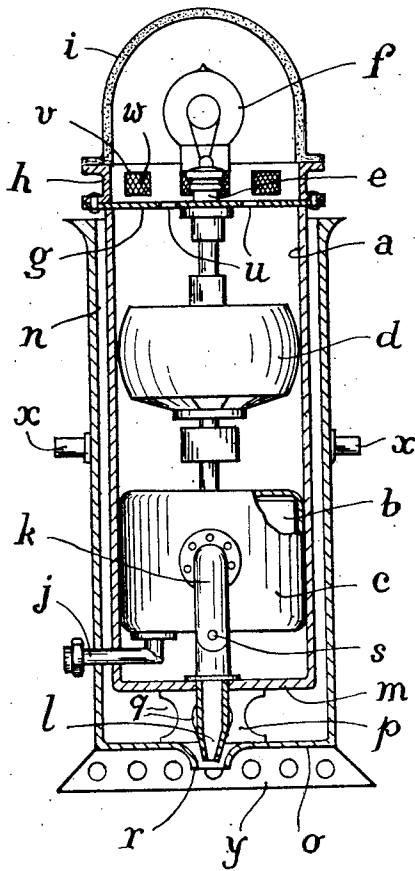
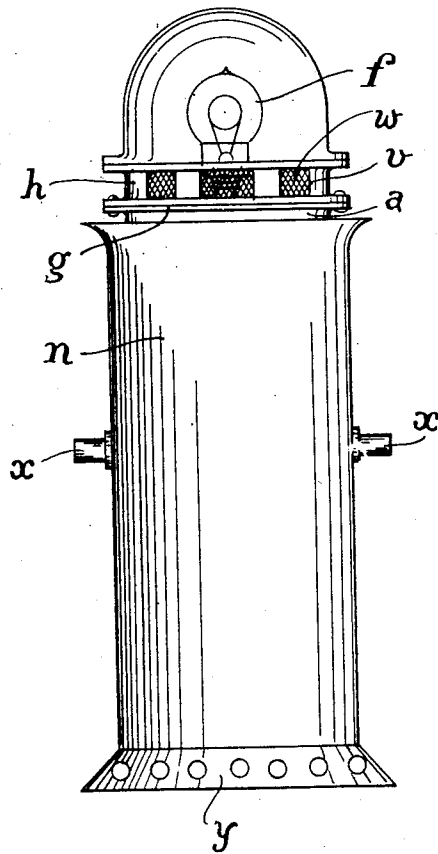


Fig. 2.



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PORTABLE LIGHTING APPARATUS.

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To all whom it may concern:

Be it known that I, MAURICE BRESSON, a citizen of the French Republic, residing at 42 Rue du Polygone, Douai, Nord, France, have invented new and useful Improvements in Portable Lighting Apparatus, of which the following is a specification.

This invention relates to portable electric lighting apparatus of the kind comprising one or more electric bulbs mounted on a casing containing an electric generator such as a magneto or a dynamo machine driven by a motor actuated by air or other fluid pressure, such motor preferably being directly coupled to the generator.

The chief object of this invention consists in carrying out the expansion of the fluid in the motor in such manner that when escaping to the atmosphere or within the casing of the apparatus the fluid undergoes a further expansion, such expansion being used for cooling the apparatus and if desired for ventilating the surrounding atmosphere.

To this end the motor, or at least its outlet, is separated from the other parts of the apparatus by an inner casing provided with one or more discharge openings so proportioned that the fluid will only complete its expansion as it issues therefrom. This inner casing may advantageously be extended, on the side remote from the bulb, by a discharge pipe opening, as in an ejector, into a flaring nozzle connected to a cooling jacket surrounding the outer casing of the apparatus. The discharge of motive fluid through this pipe thus produces through the said jacket a circulation of the surrounding medium which is operative both to cool the apparatus and to ventilate the atmosphere, which is of great importance in mines. Moreover part of the discharging fluid may be caused to escape through one or more calibrated openings affording direct communication between the discharge pipe and the inside of the apparatus, whereby an inner circulation of fluid may be created for cooling the inner parts of the apparatus and the electric bulb or bulbs, and for preventing the accumulation of deleterious gases within the apparatus.

Referring to the accompanying drawing which illustrates, by way of example, a miners' safety lamp embodying the present invention. Fig. 1 is a longitudinal axial section and Fig. 2 a side view of the lamp.

The lamp herein shown comprises a cylin-

drical outer casing *a* in which are mounted side by side a compressed air motor or turbine *b* enclosed in an inner casing *c* and a magneto *d* with rotating field, connected to the mounting *e* of the electric bulb *f*. Said mounting *e* is secured to the casing cover *g* to which is also fastened by screws a ring *h* carrying a protecting glass globe *i*.

Through the casings *a* and *c* extends the feeding pipe *j* of the motor which is adapted to be connected to a supply of air pressure for example. From the inner casing *c* extends a bent discharge pipe *k* which is provided with a constricted outlet *l* extending axially of the casing *a* through the bottom *m* thereof.

In order to produce a cooling fluid circulation around the sides of the apparatus the casing *a* is surrounded, at a slight distance, by an outer sleeve or jacket *n* the bottom *o* of which is secured to the bottom *m* of casing *a* by a tubular member *p* provided with lateral openings *q*. Centrally of the bottom wall *o* is a hole merging into a nozzle *r* of decreasing cross-section which surrounds the nozzle *l* ejector fashion.

In order to obtain a cooling fluid circulation within the apparatus, the discharge pipe *k* may be provided with a small lateral hole *s* while openings *u* and *v* are provided in the cover *g* and in the ring *h* respectively, the openings *v* being fitted with one or more layers of metal gauze *w* when the lamp is intended for use in mines.

The apparatus may be provided with side trunnions *x* and with a perforated foot *y* so that it may be journaled in a stand or placed in an erect position without interfering with its operation.

In use the pipe *j* is connected to a supply of compressed air for example. Motive fluid being admitted through this pipe, the motor *b* and generators *c* are caused to rotate with increasing speed and the bulb *e* lights up when the normal speed of rotation is reached. The air escaping from the motor is separated from the remaining parts of the apparatus by the inner casing *b* and the pipe *k* the outlet openings of which are so proportioned that the air will not be fully expanded until it issues therefrom.

A portion of the air escapes from the pipe *k* through the small aperture *s* and expands within the casing *a* from which it passes into the globe *i* through the openings *u* and escapes to the atmosphere through the open-

ings *v*. The inner circulation of air thus created cools the inner parts of the apparatus and the electric bulb. As this circulation is started so soon as the motor is put in motion, the atmosphere within the casing *a* is renewed and the deleterious gases which might have accumulated therein are expelled before the lamp lights up.

The greater portion of the air escaping through the pipe *k* issues through the outlet *l* where it completes its expansion and creates a suction through the nozzle *r* and the outer jacket *n*. An outer circulation of fluid is thus created around the globe *i* and the casing *a*, whereby these parts are efficiently cooled and the surrounding atmosphere is at the same time ventilated. The apparatus may be wholly or partly immersed in water, whereby the cooling effect of the outer circulation may be increased without interfering with the inner circulation above referred to.

The apparatus described may be used with equal advantages as a portable lamp or as a stationary light. The motor may be of any suitable construction and instead of being actuated by compressed air it may be operated by any suitable fluid pressure, for example by the previously cooled waste gases from an internal combustion engine. The use of compressed air however is more particularly recommended in coal mines where the lamp according to this invention will be of great use while answering the strictest safety requirements.

It will be understood that some of the features described may be omitted or modified without departing from the scope of this invention.

I claim:

1. In a portable electric lighting apparatus, the combination of a casing, an electric bulb on said casing, a fluid pressure motor and an electric generator driven thereby, both said motor and generator being mounted in said casing, a receptacle within said casing for separating from said generator the fluid escaping from said motor, an outlet for discharging the fluid from said receptacle at a pressure above atmospheric pressure, and means for causing the discharging fluid to produce a fluid circulation for cooling the apparatus.

2. In a portable electric lighting appa-

ratus, the combination of a casing, an electric bulb on said casing, a fluid pressure motor and an electric generator driven thereby, both said motor and generator being mounted in said casing, a receptacle within said casing for confining the fluid escaping from said motor, an outlet for discharging the fluid from said receptacle into the atmosphere at a pressure above atmospheric pressure, a cooling jacket surrounding said casing, said jacket ending in a nozzle surrounding said outlet.

3. In a portable electric lighting apparatus, the combination of a casing, an electric bulb on said casing, a fluid pressure motor and an electric generator driven thereby, both said motor and generator being mounted in said casing, a receptacle within said casing for confining the fluid escaping from said motor, an outlet for discharging the fluid from said receptacle into said casing at a pressure above atmospheric pressure, and an opening connecting said casing with the atmosphere.

4. In a portable electric lighting apparatus, the combination of an outer casing, an electric bulb on said casing, a fluid pressure motor and an electric generator driven thereby, both said motor and generator being mounted in said casing, an inner casing surrounding said motor, a discharge pipe leading from said inner casing to the atmosphere, said pipe having a constricted outlet opening on the side of said outer casing remote from said bulb, and a jacket surrounding said outer casing and ending in a nozzle surrounding said outlet.

5. In a portable electric lighting apparatus, the combination of an outer cylindrical casing, an electric bulb on said casing, a fluid pressure motor and an electric generator driven thereby, both said motor and generator being mounted in said casing, an inner casing surrounding said motor, a discharge pipe connected to said inner casing, a cylindrical jacket surrounding said outer casing, said jacket ending in a nozzle, an opening connecting said outer casing to the atmosphere, and constricted outlets for said discharge pipe opening respectively into said nozzle and into said outer casing.

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

MAURICE BRESSON.