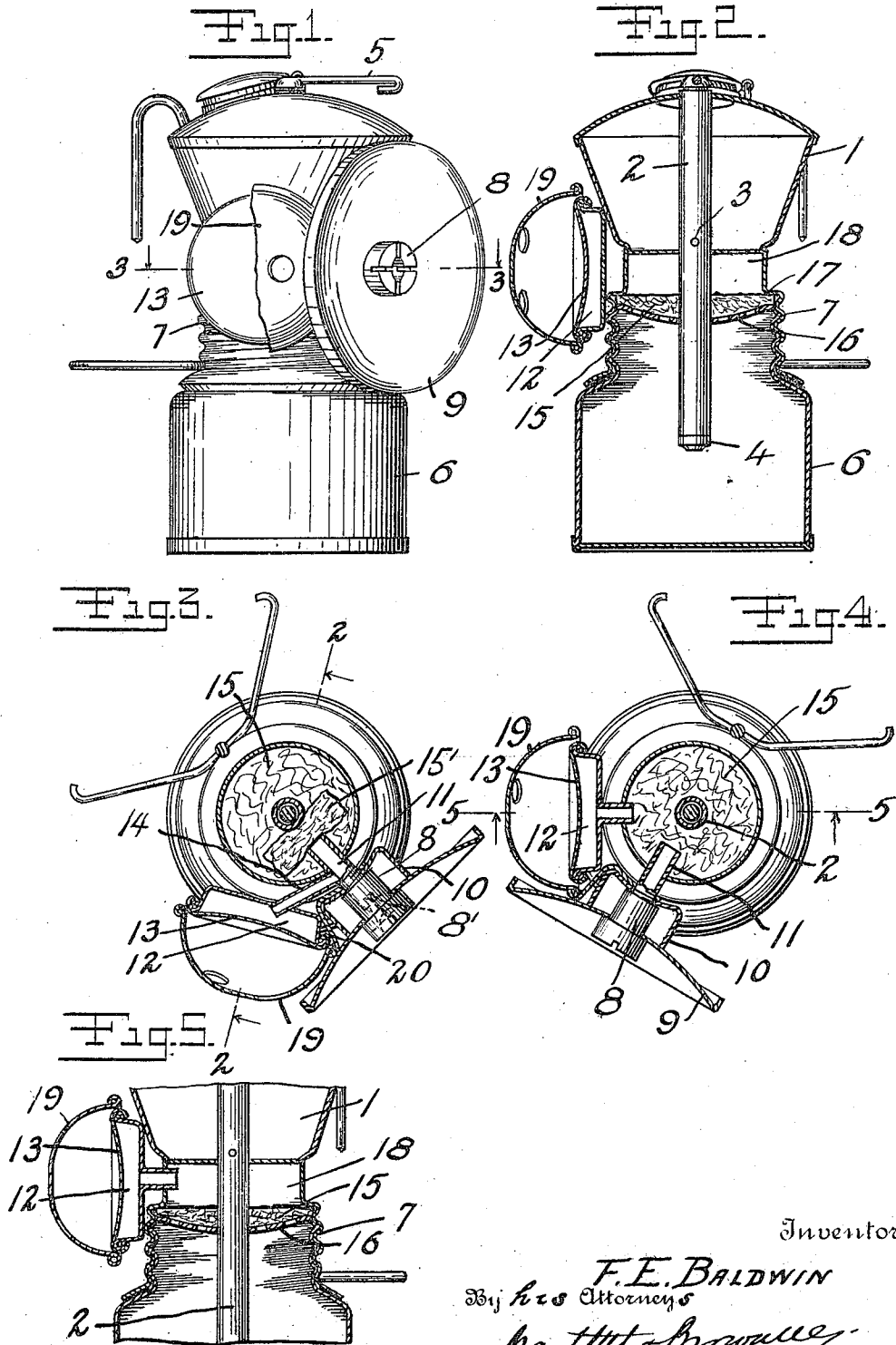


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MINER'S GAS LAMP.
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1,237,450.

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To all whom it may concern:

Be it known that I, FREDERIC E. BALDWIN, a citizen of the United States, residing in the city of Greater New York, county of Richmond, State of New York, have invented certain new and useful Improvements in Miners' Gas-Lamps, of which the following is a full, clear, and exact description.

My invention relates to acetylene miners' gas lamps and has for its object to produce a lamp which will not be extinguished when exposed to an abrupt rise of great violence in the atmospheric pressure, as when heavy charges of explosives are used in small and low workings in a mine. Upon the explosion of such charges under such conditions it seems that the wave of pressure generated by the explosion is not a gradual increase up to the maximum but that substantially its full intensity is felt at once as if it were a blow from a hammer. For this reason in order that the flame of the lamp may be maintained in spite of such explosions peculiar problems are involved, it being necessary that the pressure behind the burner be brought up to the maximum as rapidly as possible.

The following is a description of a lamp embodying my invention, reference being had to the accompanying drawings, in which—

Figure 1 shows in side elevation a lamp embodying my invention;

Fig. 2 shows a vertical section of the same on the line 2—2 Fig. 3;

Fig. 3 shows a horizontal section on the line 3—3 Fig. 1;

Fig. 4 shows a horizontal section of a modified lamp taken on the same line as Fig. 3.

Fig. 5 shows a vertical section of the lamp of Fig. 4 on a plane corresponding to Fig. 2.

Referring more particularly to the drawings, 1 is a water chamber from which depends a water tube 2 having an opening 3 and at its lower end a valve 4 controlled by the handle 5 in a well known manner. The lower end of the tube 2 extends into a carbid or generating chamber 6 having screw threads at its upper end which engage with a screw thread 7 depending from the upper portion of the lamp. 8 is a locking nut carrying the burner tip 8' of the lamp and 9 is the reflector. The reflector is held in place by the nut, which is screwed upon

the burner tube 11. These features above enumerated are old in acetylene lamps.

10 is a removable reflector support, also held in place by the locking nut.

In order to provide against the extinguishing of the lamp under the conditions above referred to, I provide a chamber 12 preferably consisting of a small cup-shaped portion or box, whose mouth is closed by a

loosely stretched cover 13. This cover is made of yielding material, preferably of rubber with a thickened turned over edge holding the cover in place and forming a

gas tight joint with the metal cup-shaped

portion. The edge of the box, if of brass, is preferably nickel plated so as to prevent the cover adhering to the box and facilitate its removal and renewal. The interior of

the chamber 12 is in free communication

with the burner tube 11, so that there can be a free passage of air or gas from the

chamber 12 to the tube 11. In the form shown in Figs. 1, 2 and 3 this communication is effected by a tube 14, which opens

into the chamber 12 and also into the tube 11, as close to the burner as convenient. If

the flexible container in the construction thus far described is sufficiently large it is

effective in preventing the extinguishing of

the flame when the rise in atmospheric pressure is not very abrupt, but in the event of a

very abrupt rise, the pressure produced in the tube 11 by the collapsing of the cover

13 would be largely expended in the body

of the lamp and would therefore act slowly in bringing up the pressure at the inner end

of the burner even though the flexible container were of large dimensions. In order

that this flexible container may be made of small dimensions I have found it necessary

to localize the pressure and to this end I provide a fibrous washer 15 of felt or the

like, which is held above a perforated diaphragm 16, which diaphragm is held in

place by the upper end of the screw threaded extension of the generating chamber 6.

This causes a substantially gas tight joint between the fibrous washer 15 and the flange

17, producing a chamber 18, in which the gas is confined except as it may slowly force its

way through the felt washer 15. This washer should tightly fit the water tube 5

and be as dense as possible and yet permit a slow flow of gas from the carbid chamber

to the burner. When this washer is used the pressure in the generating chamber

under normal conditions forces the gas slowly upward through the fibrous washer of felt 15 and out through the burner tube 11. If now an explosion occurs, the pressure due to the collapsing of the cover 13 is confined to the tube 11 and the chamber 18 and is usually sufficient to very quickly raise the pressure behind the burner so as to prevent the extinguishing of the flame when the lamp is used in large mining chambers, where the effect of an explosion is less violent. I attain substantially the same results by the use of a felt plug 15', which is held between the water tube 2 and the inner end of the burner tube 11, so as to be located between the carbid chamber and the connection point where the tube 14 connects with the burner tube 11. In fact, the results are somewhat improved by the plug 15', since the plug acts to limit the dissipation of the pressure due to the collapsing of the cover 13, so as to confine it to the smaller space within the tube 11. The plug and washer when used together supplement each other.

25 In order to protect the cover 13 I provide a perforated cap 19, which carries an arm 20, having a perforation which fits over the outer end of the burner tube 11, being held between the reflector support 10 and the lamp body, so as to be held in place by said support, reflector and locking nut 8. This protector thus serves to protect the cover 13 but is removable for the purpose of renewing the cover, and if desired, may be omitted altogether.

In the modification shown in Figs. 4 and 5, I connect the chamber 12 directly with the chamber 18 formed above the felt washer 15 omitting any plug at the rear end of the burner tube 11. The chamber 12 is then freely connected with the burner tube 11 through the chamber 18. The device then works substantially the same as the device shown in Figs. 1, 2 and 3 would work if the supplemental plug 15' were omitted, although somewhat slower since the passage leading from the chamber 12 is of larger diameter and less direct. The construction shown in Figs. 4 and 5 is otherwise similar to that shown in Figs. 1, 2 and 3.

The action of the device is as follows:

Upon an explosion the cover 13 is forced inward, compressing the air in the chamber 12 and raising the pressure in the tube

11, so as to counteract the pressure at the burner opening, the pressure due to the action of the cover 13 being confined to a small space and therefore not dissipated in the carbid chamber. In the construction of Figs. 1, 2 and 3, it is mostly confined to the small space within the flexible container and the burner tube proper, while in the construction shown in Figs. 4 and 5, it is confined in the small but somewhat larger space including that above the washer 15.

It is of importance that the cover 13 should not be stretched too tightly over the box, as the abrupt fall in external pressure after the explosion and the recoil of the cover would otherwise be apt to produce a partial vacuum within the lamp, sucking the flame back and putting out the lamp. In fact, it were better that the cover be slightly flabby.

As will be evident to those skilled in the art, my invention permits of various modifications without departing from the spirit thereof or the scope of the appended claims.

What I claim is:

1. In an acetylene lamp, the combination of a flexible container for gas attached to an acetylene gas lamp having a rigid base, a rubber diaphragm, the edge of the diaphragm being sufficiently smaller than the circumference of the base to engage same with a gas tight joint, and a burner tube, there being a gas communication between said burner tube and the space between said base and diaphragm, said diaphragm being low in resiliency so that in case of an abrupt fall in external air pressure the burner flame will not be sucked in and extinguished.

2. In an acetylene lamp, the combination of a flexible container for gas attached to an acetylene gas lamp having a rigid base, a rubber diaphragm, the edge of the diaphragm being sufficiently smaller than the circumference of the base to engage same with a gas tight joint, and a burner tube, there being a gas communication between said burner tube and the space between said base and diaphragm, the edge of said base being nickel plated, said diaphragm being low in resiliency so that in case of an abrupt fall in external air pressure the burner flame will not be sucked in and extinguished.

FREDERIC E. BALDWIN.