Coombs & Bassett.

Lamp.

No. 93,178. Patented Aug. 3, 1869.

Fig. 1.

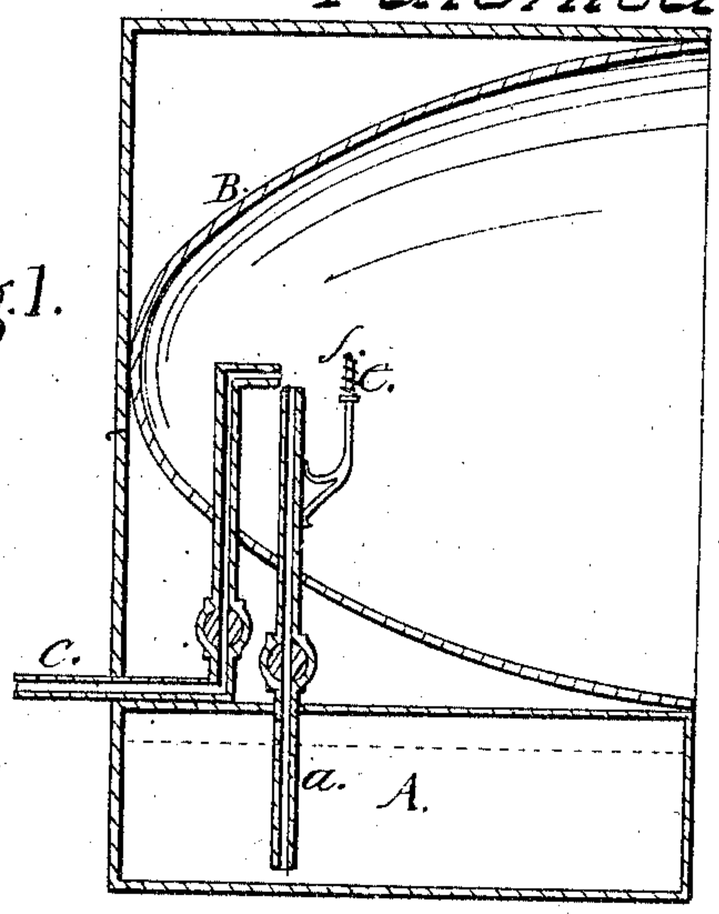
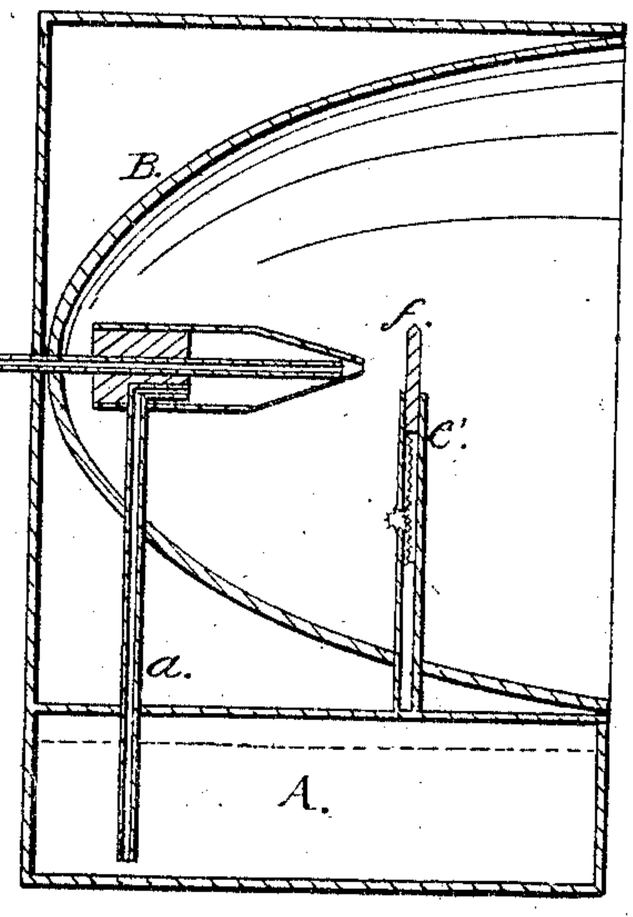


Fig. 2.



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Letters Patent No. 93,178, *dated August* 3, 1869.

IMPROVEMENT IN METHOD OF PRODUCING CALCIUM-LIGHTS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, CHARLES L. COOMBS, of Washington city, in the District of Columbia, and JOHN A. BASSETT, of Salem, in the county of Essex, and State of Massachusetts, have invented a new and useful Improvement in the Method of Producing Calcium-Light; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Our invention is peculiarly adapted to use on railway-locomotives, for head-lights, and to other uses in which a strong light is desired, and where the use of gases, to produce a calcium-light in the ordinary way, is impracticable or inconvenient.

By means of our invention, we are enabled to produce a powerful calcium-light, without the use of any previously-generated gas, and our apparatus occupies so little space that it may be carried on a locomotive, without the least inconvenience.

Instead of the hydrogen-gas ordinarily used in producing the calcium-light, we use light hydrocarbon-spirits, and we use, as a substitute for oxygen, atmospheric air, which, to produce the best effects, should be heated.

In the accompanying drawings—

Figure 1 is a sectional view of our apparatus; and

Figure 2 is a similar view of the same, in a modified form.

A is a reservoir, for the naphtha or hydrocarbon-spirits; and

a is a tube, extending through the top of said reservoir, and terminating near the focus of the reflector B.

C is a pipe, connected with any suitable blast-apparatus, (not shown,) said pipe, in the modification shown in fig. 1, terminating just above and in close proximity to the pipe *a*.

In the modification shown in fig. 2, the pipe C and pipe *a* both enter a nozzle, D, the pipe C extending nearly to the point of said nozzle, but the pipe *a* terminating some distance back, as shown in the drawing.

In fig. 1, *e* is a cage or basket, of platinum wire, held in the focus of the reflector, to hold a piece of lime, *f*, such as is used to produce the calcium-light in the ordinary way; and

e', in fig. 2, is a tube, for holding the lime, with a rack and ratchet, for raising and depressing it.

The pipe C, before reaching the lantern, may be made to pass through the fire-box or the locomotive, to heat the air, or the same may be heated in any other suitable way.

In the pipes *a* and C are two cocks, one in each, to regulate the blast and the flow of hydrocarbon-spirits. These cocks may be placed as shown at *a'* and *c'*, fig. 1, or at any other convenient points in said pipes.

The blast may be created by any known blowing-apparatus, to be operated by the engine or otherwise.

A reservoir, to contain sufficient compressed air to create the necessary blast when the engine or other motive-power is not operating, may be added, and said reservoir may be supplied with air by a hand-pump if necessary.

The operation is as follows:

On turning the cocks *a'* and *c'* so as to open them, and starting the blast, the current of air escaping from the end of pipe C, creates a vacuum, or partial vacuum, in the pipe *a*, which causes the naphtha or hydrocarbon-spirit to rise in the pipe *a*, to supply the place of the exhausted air, and to be thus drawn out of the open upper end of said pipe *a*, where it meets the air-blast, and is immediately vaporized or reduced to a fine spray, and driven on to the lime, where it is consumed, producing a light similar in effect to the calcium-light produced in the ordinary way, by the consumption of gases.

If platinum wire be used to hold the lime, it will be unnecessary to apply any fire to start the light, for the mixed vapor and air will ignite immediately on touching the wire; but if the lime be otherwise supported, the mixture may be ignited by a taper.

The intense heat of the burning mixture of air and vapor will quickly render the lime incandescent, and the carbon is all consumed.

The current of air and flow of the hydrocarbon-spirits being once properly adjusted, by means of the cocks *a'* and *c'*, the lantern will require no further care, except to replenish the hydrocarbon when consumed.

It is manifest that our invention consists, essentially, in the use of hydrocarbon-spirits, (or any sufficiently volatile liquid hydrocarbon,) applied in the form of vapor or fine spray upon the lime, or any equivalent thereof, instead of the gases heretofore used to produce the calcium-light. Hence, we do not limit ourselves to the particular apparatus herein described for carrying our invention into effect, the same being susceptible of many modifications; as, for instance, conducting the hydrocarbon-spirits down from a reservoir above the burner, instead of drawing it up from below. Nor do we limit ourselves to the use of said mixture of hydrocarbon-spirits and air, when blown upon and burned in contact with lime,

as other substances may be substituted for the lime; but

What we claim as our invention, and desire to secure by Letters Patent, is—

The method of producing a strong and brilliant light, by blowing a mixture of atmospheric air and hydrocarbon-spirits, (or the vapor thereof,) upon a piece of lime, or its equivalent, and burning said mixture in contact with the lime, or its equivalent substantially as set forth and described.

In witness whereof, we have subscribed our name to the foregoing specification.

C. L. COOMBS.
JOHN A. BASSETT.

Witnesses:
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JUSTIN HINDS.