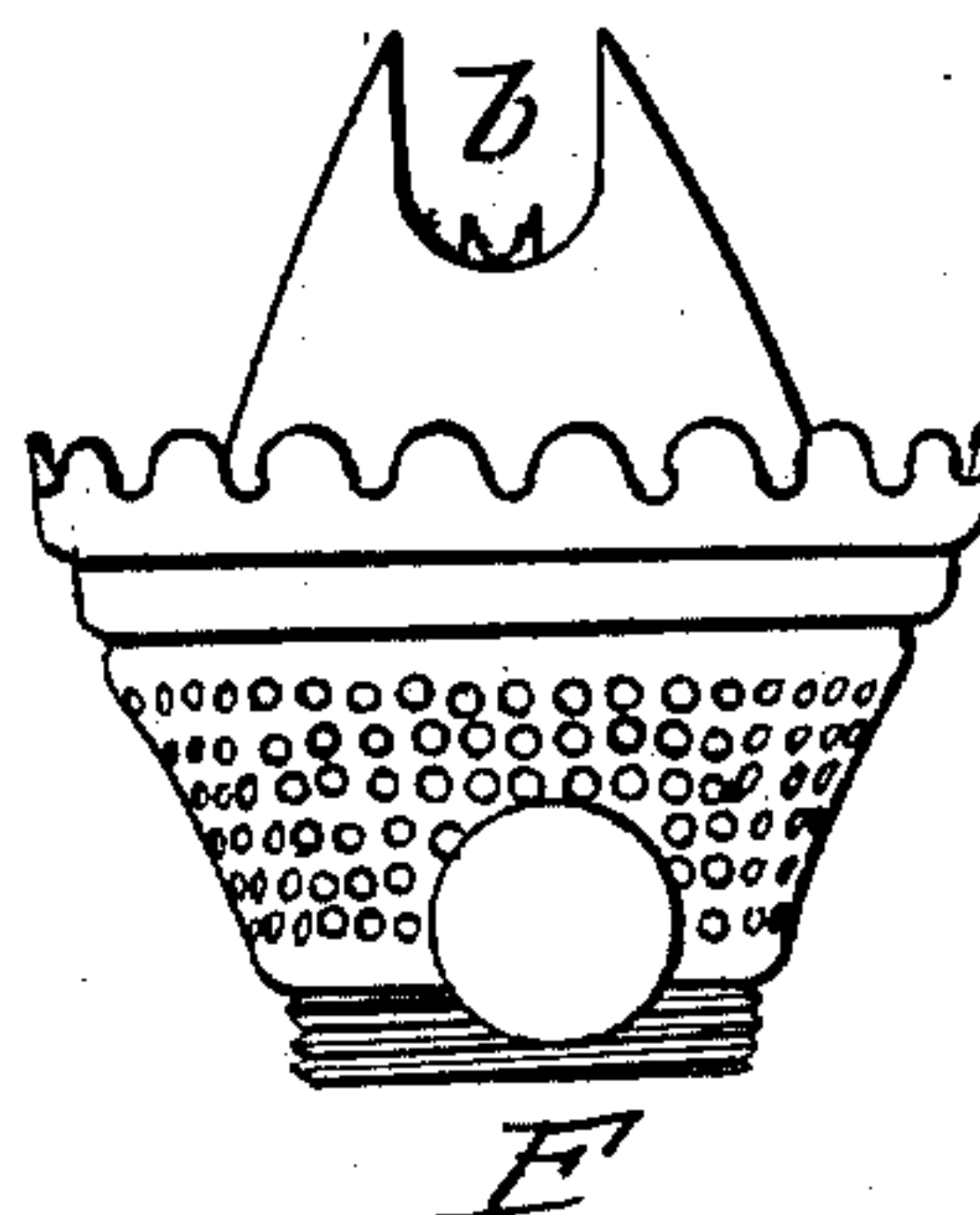
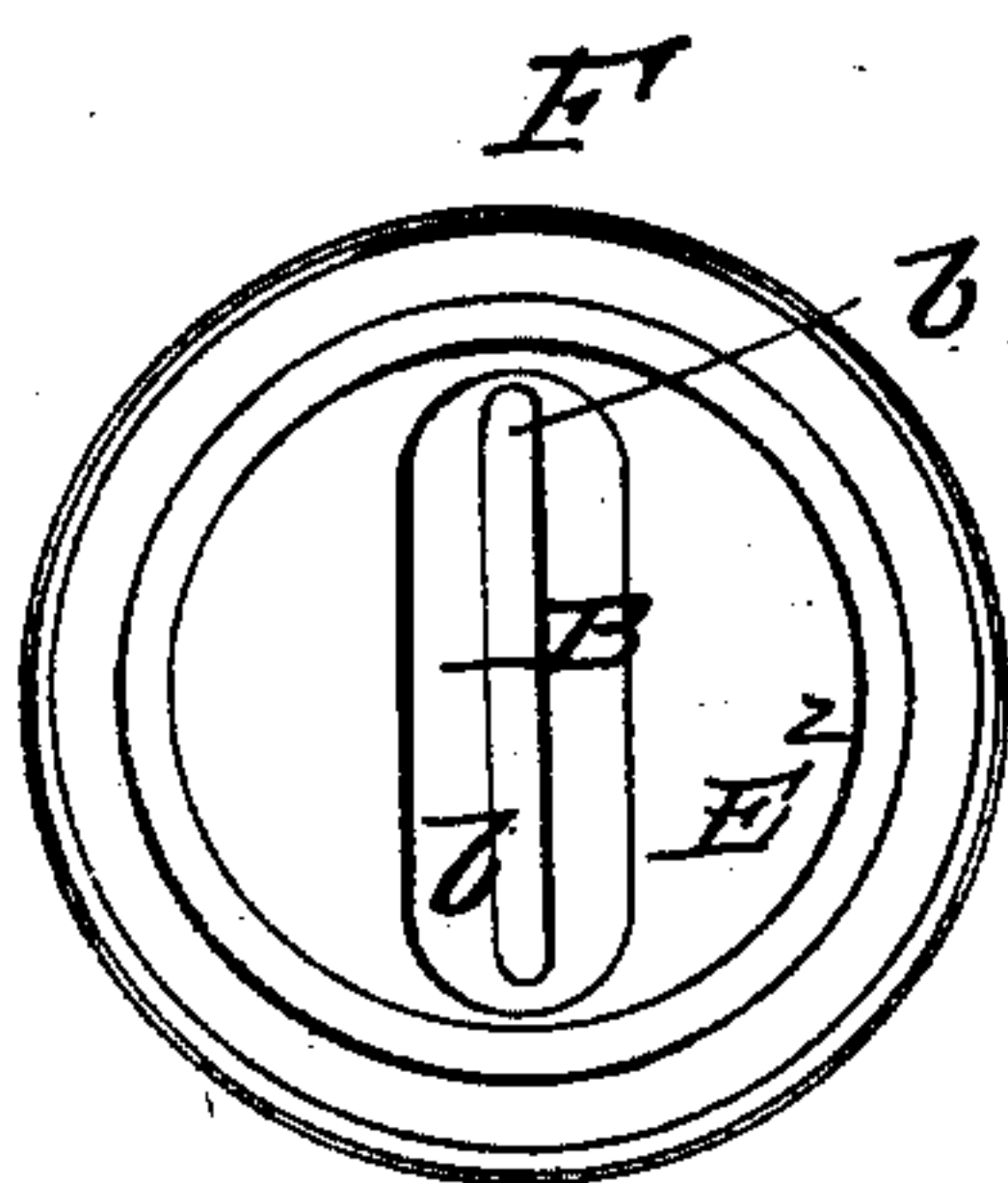
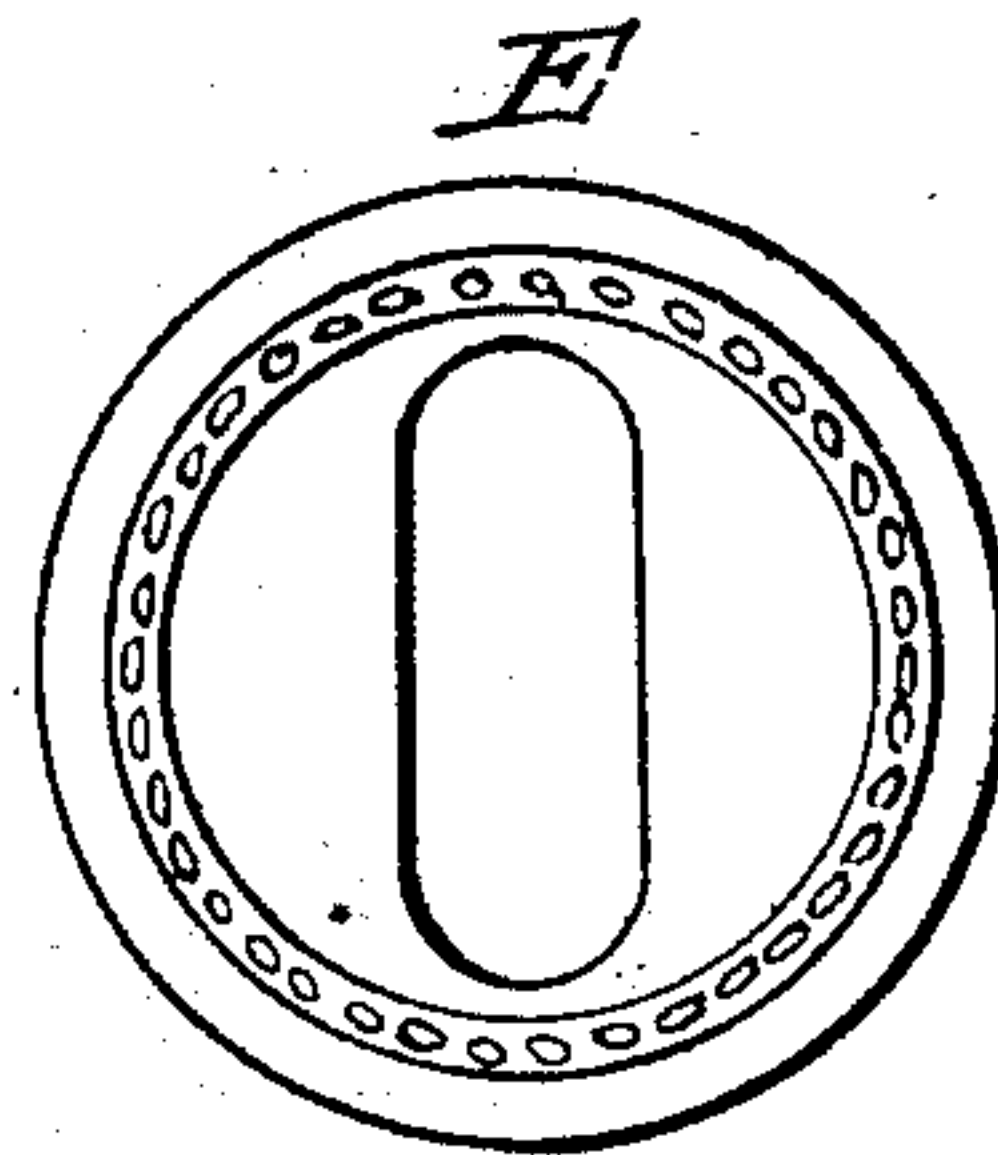
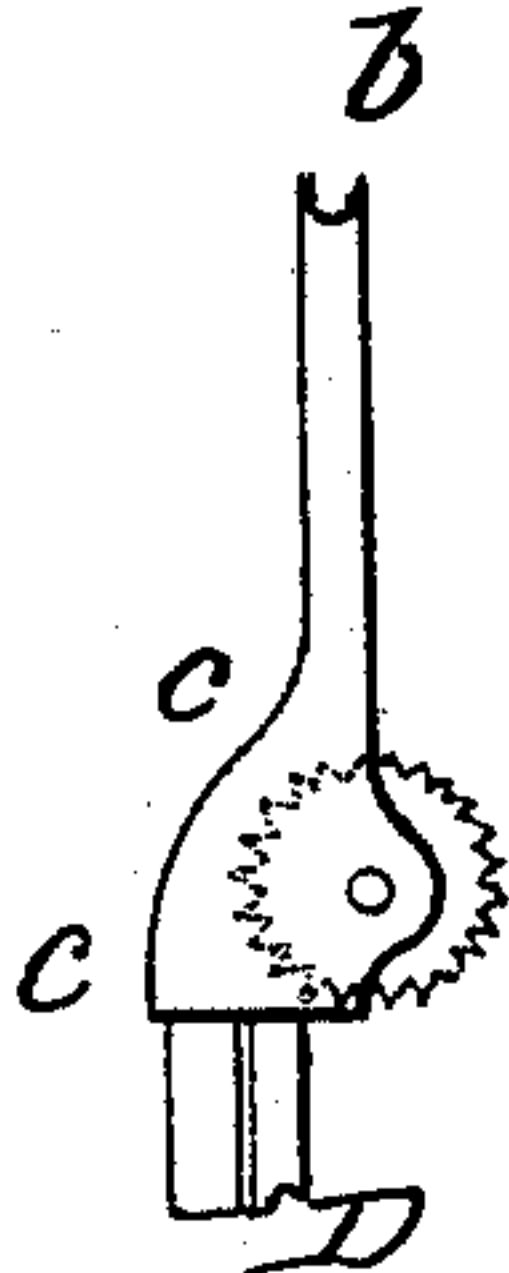
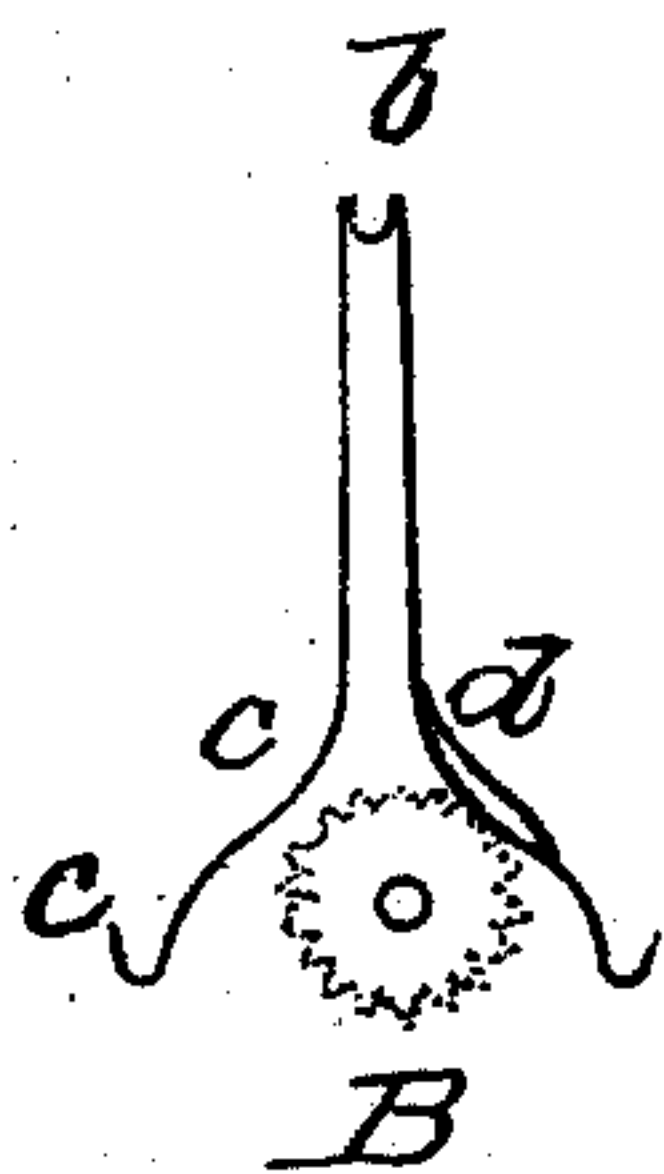
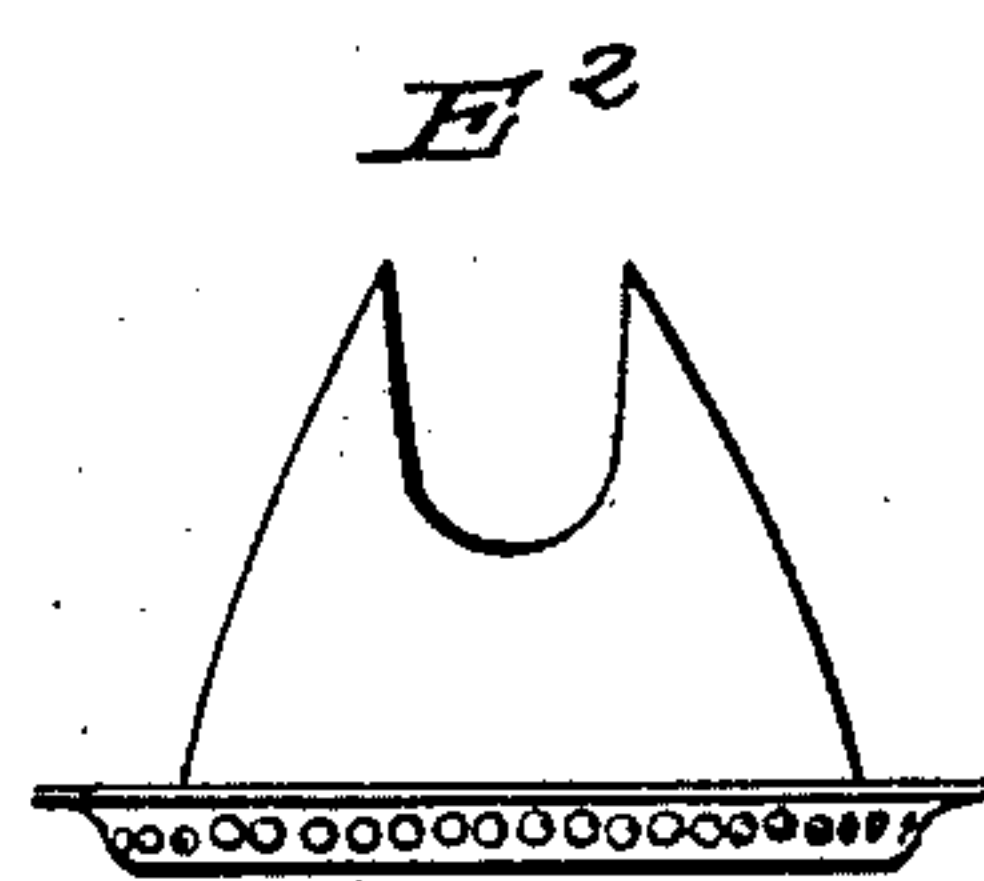
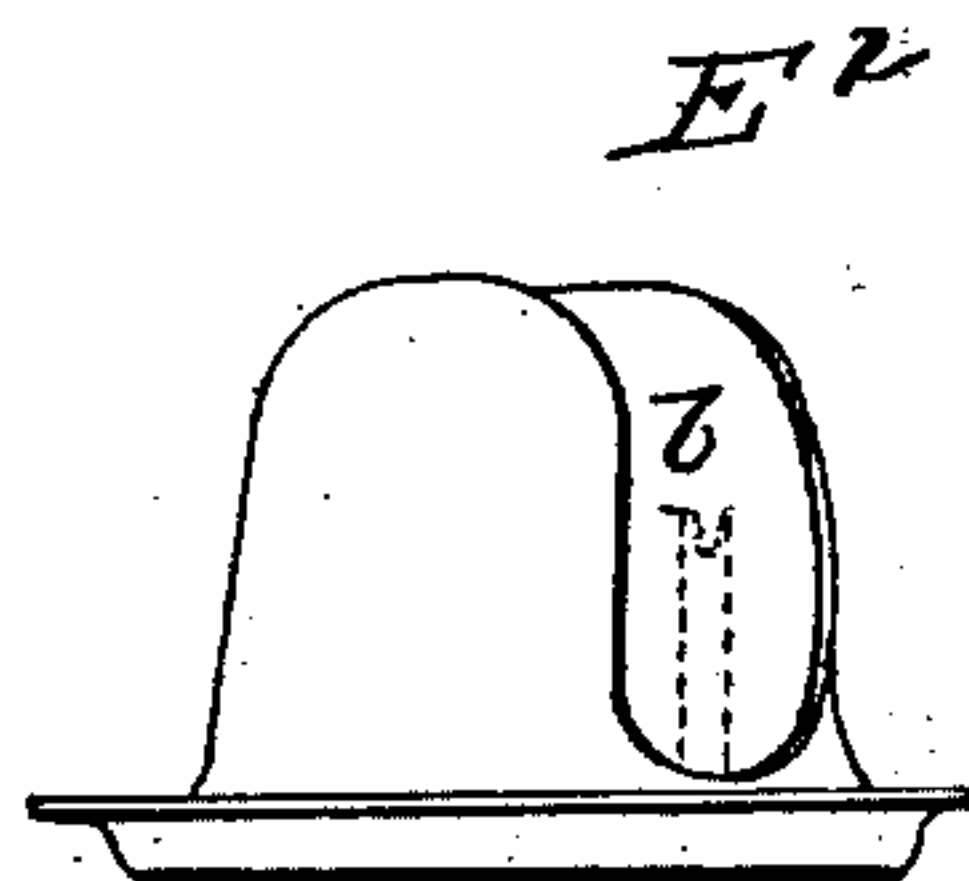
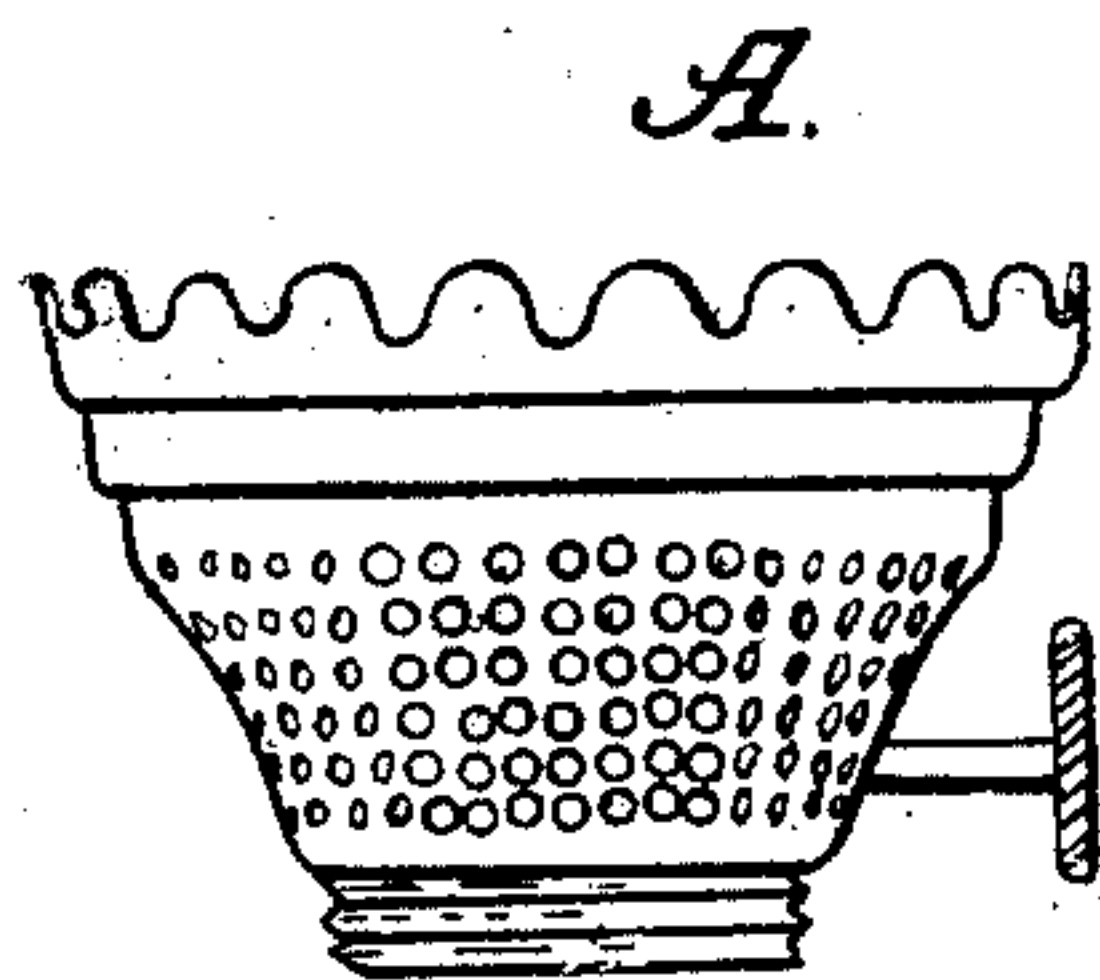


W. B. BILLINGS.

Lamp Burner.

No. 44,592.

Patented Oct. 11, 1864.



WITNESSES
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UNITED STATES PATENT OFFICE.

WILLIAM B. BILLINGS, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN PETROLEUM-LAMPS.

Specification forming part of Letters Patent No. 44,592, dated October 11, 1864; antedated April 11, 1864.

To all whom it may concern:

Be it known that I, WILLIAM B. BILLINGS, of the city of Brooklyn, county of Kings, State of New York, have invented an Improvement in the Art of Burning Petroleum, Coal Oil, and Similar Hydrocarbons; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in an improvement in the art of burning petroleum, coal oil, and similar hydrocarbons.

The manner of burning petroleum now in universal use is entirely wrong, because, first, the burners are difficult to manage, requiring too much nicety and precision in their adjustment; second, they consume at least from thirty to fifty per cent. more oil than is necessary to give the same light which they now do.

I will briefly explain the difference in the theory or principles involved in the burners in common use and my new and improved burner.

All the burners which use a flue or chimney to produce a current of air by induction are substantially alike. They use the thick double web, narrow wick, and a deflector, or, as it is commonly called, "cone." This combination makes it necessary to add a flue or chimney from six to ten inches in length to get air sufficient to produce the desired result. Now, I contend there is an excess of both carbon and oxygen consumed by using this combination, and I think my new burner will most satisfactorily prove it. I use a much broader and thinner wick, dispense with the deflector entirely, and use a simple device to carry the air directly into the flame, the draft being produced by a chimney not over three and one-half inches long, and it may be produced by one two inches long. By using the broad thin wick and a proper arrangement of the wick-tube, (which is fully explained hereinafter,) I deflect or draw out the flame without the aid of the deflector and the long chimney, as in the old burners, so that I use no more carbon and oxygen than necessary to produce the result desired.

To enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and mode of operation.

I construct a shell or frame-work similar to or like those now used in the burner, known as the "No. 1" or "A burner" (see drawing marked A,) the wick I use being much broader than that used in the No. 1 or A burner; and, as I wish to adapt my burner to the lamps in common use, my wick-tube must be of peculiar construction. I will describe two ways of making it.

First. I form a tube about one and three-fourths inch long and about nine-sixteenths of an inch in diameter at the top, and three-fourths of an inch at the bottom. The top or small end is flattened, leaving a slot about one-eighth of an inch wide or thick. The lower or larger end is left round and fastened into the shell A; but from this point of fastening it begins to flatten, and on one side, which shall be the front, where the wick is to run, the flattening is gradual and somewhat rounded up till it meets the flat part of the tube about one-half an inch from the point of fastening into the shell A. The back of the tube is flattened at a shorter angle than at the front, about one-eighth of an inch. The ratchet-wheel and shaft are put inside and through the tube, the shaft running back of the center, and the wheel coming out of the back in a slot or running in a raised groove. (See Drawing B, and raised groove *d*.) The diameter of the wheel should correspond with or be a little smaller than the section of the circle formed by the rounding up of the front of the tube and set into it, so that it will catch the wick along the segment of the circle *c c* in Drawing B. The advantages of this wick-tube are obvious. The wheel and shaft are held and covered by the tube itself, thus saving both stock and labor in its construction, and the passing of the wick over the wheel along the segment of the circle *c c* insures a much more uniform motion than can be obtained by the wheel working against a flat surface. The opening in the bottom of the shell A (where the wick passes into the lamp) should be in the form of a half-moon.

Second. The other tube I construct as follows: I form a straight tube about nine-sixteenths of an inch in diameter. The top is flattened and the bottom end rounded up on the front side to the flattened part in the same manner as in the tube B. The back is flat and straight, or nearly so, and a slot cut into

it, so as to allow the wheel to work in the segment of the circle formed by the rounding up of the front, same as in the tube B. (See Drawing D.) The corners of the wick-tube are cut away about one-sixteenth of an inch. (See *b b* in Drawings B and D.) The wick-tube is now fastened into the shell A and a device placed over it, which I call the "air-conductor" or "air-guide." It is made to fit into or onto the shell A, and upon it rests the chimney, which may be fastened by any of the various methods now in use. The mouth or opening of the air-guide is about one-half an inch wide, one and one eighth inch long, and the top about three-quarters of an inch from the top of the shell A. The corners or sides must be cut away, so that it will at least come below the notches *b b* in the wick-tube; or it may be cut away to the base or rim of the air-guide. (See Drawing E, Nos. 1 and 2.) The rim or base of the air-guide E should be smooth and even, so as to prevent any current of air within the chimney and outside of the air-guide, so that all the air used is drawn in from beneath.

The burner complete is shown in Drawings F F.

The chimney used should not be over three and one half inches long, and by closing the mouth of the air-guide E, so as to carry the air more directly into the flame, a chimney two inches long is all that need be used. But a chimney so short does not give sufficient room in the bulb for the flame, so that I think it will be found that a chimney three inches long will be the best length to use.

The object of the notches *b b* in the wick-tube is to feed the flame faster at those points than at any other, and the effect produced is to give a lateral or side motion to the flame

and spread it about one-half an inch more than if the wick-tube is even and level at the top.

Some of the practical advantages my burner possesses over those in common use may be briefly stated as follows:

The wick I use is much easier trimmed, and any slight imperfection in the trimming does not give such a badly-shaped flame as in the old burner. In other words, it is much easier to obtain a good uniform flame from my new burner than by the old one.

The short chimney I use is so much less liable to be broken either by the heat of the flame or by handling, and is so little in the way as practically to be quite near to no chimney at all.

The quality of light produced by my new burner is far preferable to that of the old one, because the proper ratio of carbon and oxygen is more perfectly attained, and therefore the light is softer, or not so sharp as in the burner in common use.

My new burner consumes from thirty to fifty per cent. less oil than the old burners, because I do not use an excess of carbon and oxygen, but just enough to produce the light required.

It will cost no more to manufacture my burner than any of the various burners now in use.

I do not claim the broad thin wick, the short chimney, the air-conductor, or any one part separately; but

What I do claim is—

The combination of all the parts of my burner in the manner substantially as described, and for the purposes represented and set forth.

W. B. BILLINGS.

Witnesses:

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WM. R. TAYLOR.