F. E. BALDWIN.

NON-CLOGGING BURNER TIP.

APPLICATION FILED MAR. 6, 1913.

1,075,960.

Patented Oct. 14, 1913.

Fig. 1.

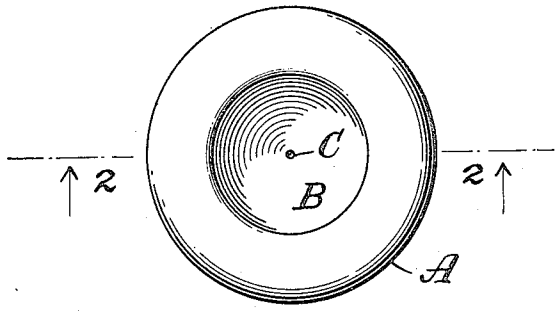
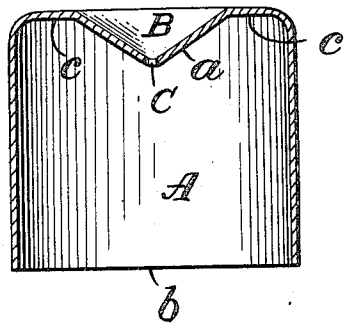



Fig. 2.




Attest:

Edgeworth Greene

Lillian E. Lindquist.

Frederic E. Baldwin Inventor:

by J. P. Preble his Atty

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

FREDERIC E. BALDWIN, OF NEW YORK, N. Y.

## NON-CLOGGING BURNER-TIP.

1,075,960. Specification of Letters Patent. Patented Oct. 14, 1913.

Application filed March 6, 1913. Serial No. 752,279.

*To all whom it may concern:*

Be it known that I, FREDERIC E. BALDWIN, a citizen of the United States, and a resident of Richmond borough, New York city, New York, have invented certain new and useful Improvements in Non-Clogging Burner-Tips, of which the following is a specification.

The object of my invention is to provide a burner tip which will not get clogged by dust or other particles carried in the stream of gas or vapor which passes through the burner. Some gases and vapors naturally carry more dust or fine particles of ash or unconsumed products of combustion than others. And my invention is particularly applicable to acetylene lamps, where the tendency for the flowing gas to carry particles of carbid dust or ash is very great. But it will also be found valuable and useful in other styles of lamps or burners in a degree proportioned to the amount of particles of dust or other unconsumed solids which their igniting gas or vapor normally carries, and to the minuteness of the aperture through which said gas or vapor exits from the burner.

A gas or vapor absolutely free from any foreign particles held in suspension, is rarely met with in the practical use of burners, and I have found that the clogging of burner tips comes from the fact that these particles are naturally propelled into the fine exit aperture, or apertures, of the tip by the shape of the interior of the tip and the force of the flowing gas or vapor.

Burner tips are provided sometimes with a single exit aperture, and sometimes with a plurality of exit apertures, but in all cases, so far as I am aware, these apertures are set at the bottom of what may be called a pocket. In other words, the interior chamber or channel of the burner tip is tapered, or otherwise narrowed toward the aperture, so that the exit hole is placed at the narrowest part of extreme point of the channel. In this way the gas or vapor is, of course, concentrated upon the exit-orifice or aperture, and the force at that point is increased by such concentration. But, at the same time, any particles of dust, soot, ash, or other foreign substances which may be carried into suspension in the gas or vapor are also concentrated to the same point. Whenever therefore, one or more particles too big for the exit hole are brought thither, by the outflowing gas, or vapor, or even when smaller particles which individually might escape through the orifice, are pushed together by the pressure of the flow, the orifice is sure to clog. The light then flickers or goes out, as the case may be. This is particularly apt to occur in acetylene lamps, especially those of a small size, where the single exit-orifice is of minute caliber. As is well known, acetylene gas is an attenuated gas, and minuteness is a requisite for the burner orifice. And, when the acetylene is generated in the reservoir part of the lamp itself, it is next to impossible by strainers or otherwise, to free the gas from all the minute particles of the disintegrated carbid, or ash, so as to prevent them from reaching the burner tip. Clogging constantly results, and cleaning pins or other devices are in frequent demand to open up the clogged orifices. To obviate these difficulties, I provide a burner tip in which the interior chamber or channel is so shaped, that instead of concentrating these floating or suspended particles at the exit hole, I force them away from said hole by the very force of the flowing gas or vapor itself. In other words, that part of the inner wall of the burner tip which is pierced by the exit-orifice, instead of tapering in the direction of the flow to form a pocket with the exit hole at the bottom, I taper in a directly opposite direction, that is taper against the flow so that it serves as a sort of cut-water or deflector which throws aside the floating particles into pockets or recesses which are beyond the exit hole. By this means, no suspended particle can reach the exit-orifice, unless it is shot straight at it, and held straight toward it by the center line of the gas or vapor stream; a thing almost impossible to occur in actual use.

In the accompanying drawing, I have shown the simplest form of my improved burner tip, being one with a single exit-orifice.

Figure 1 is a top plan. Fig. 2 is a vertical section in line 2—2 of Fig. 1.

Same letters indicate similar parts in the different figures.

A, is a burner tip shell which is preferably made of brass, or other convenient and suitable material.

B, is the mouth of said tip, which is pref-

erably funnel-shape, although the exterior funnel shape is not so important as the interior taper of the wall *a*, as shown in Fig. 2.

C, is the exit-orifice.

From the foregoing description, it will be readily seen, by looking at the drawing, that gas or vapor entering this tip from the burner in which the end, *b*, is of course inserted as usual, will flow straight toward the upper end of the burner, but only the center line of the stream will go through the exit-orifice C. All suspended particles will be carried against the end of the burner into the pockets *c*, *c*, where they will be held, confined and motionless by the pressure of the gas, or vapor, all of which will tend to increase the pressure of the center stream through the exit-orifice, but the particles in suspension will never emerge from the pockets or acquire any tendency to clog the exit-orifice, as they will never get into the straight center of the stream, where the onward pressure is greatest.

The great advantage of my improved burner tip will, I think, now be readily understood without further explanation.

I claim:—

A non-clogging acetylene burner tip which consists of a shell the end of which surrounding the exit-orifice forms a reëntrant cone, one surface of which serves as a flame chamber, and the other surface as a conical baffle projecting against the direction of the flow, the gas exit-orifice being approximately circular in form and located at the apex of the reëntrant cone.

FREDERIC E. BALDWIN.

Witnesses:
LILLIAN E. LINDQUIST,
W. P. PREBLE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents Washington, D. C."