No. 804,496. PATENTED NOV. 14, 1905.

L. PAGE.

BUNSEN BURNER.

APPLICATION FILED SEPT. 20, 1904.

Fig. 1.

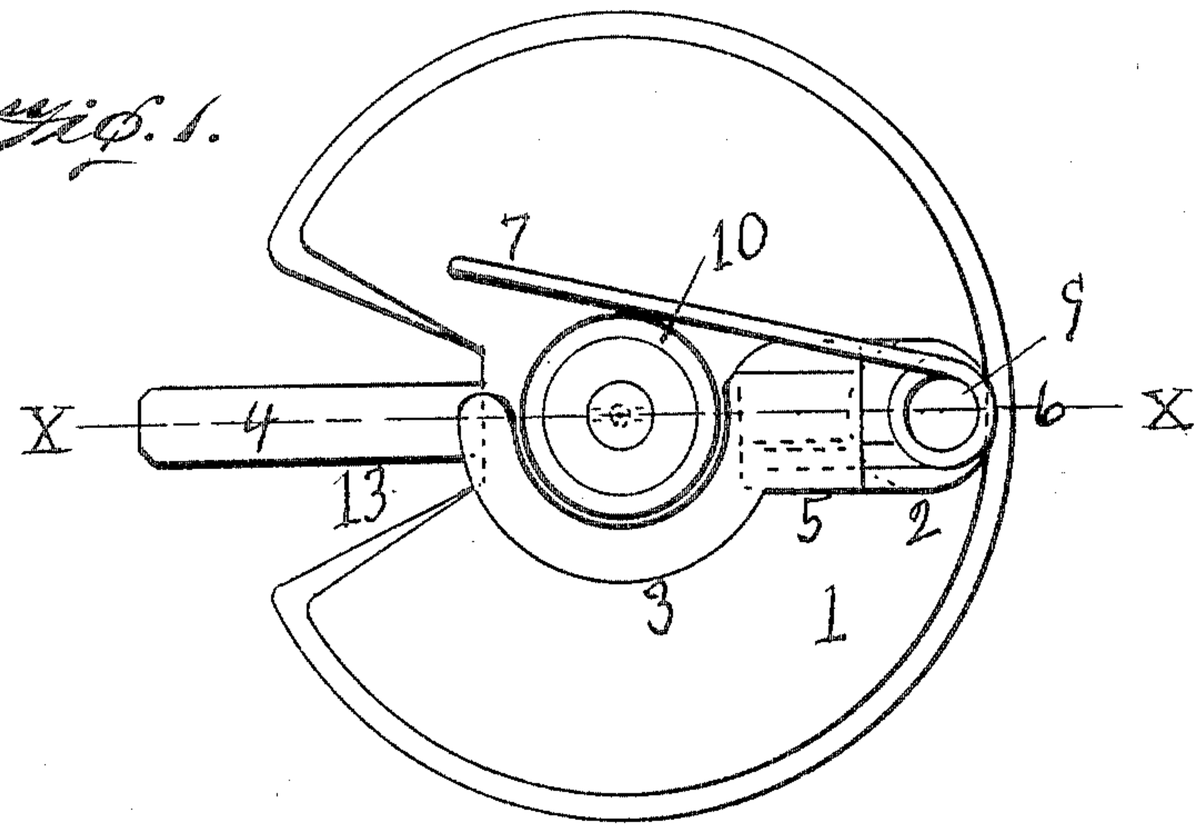
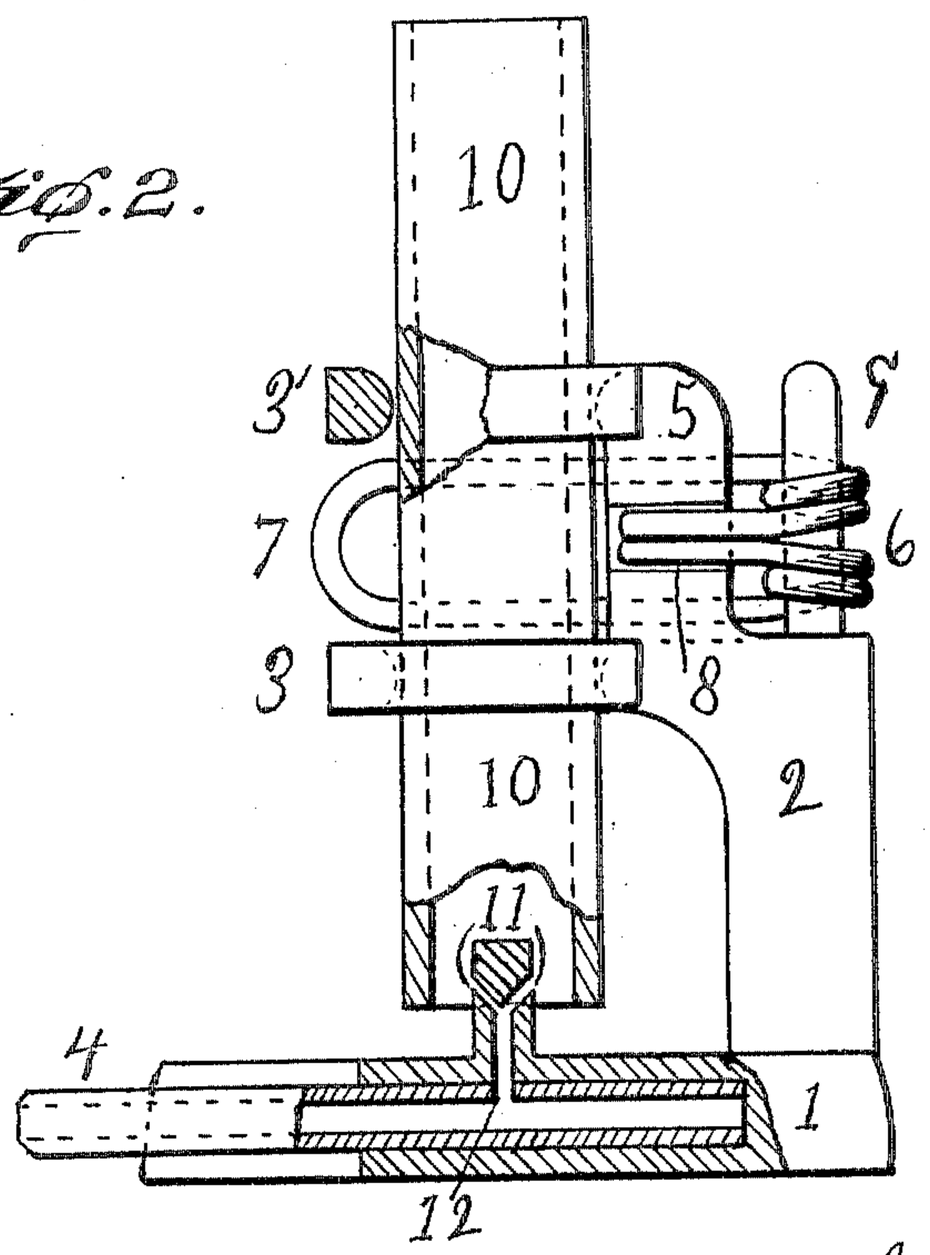


Fig. 2.



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BUNSEN BURNER.

No. 804,496. Specification of Letters Patent. Patented Nov. 14, 1905.

Application filed September 20, 1904. Serial No. 225,272.

To all whom it may concern:

Be it known that I, LARRANCE PAGE, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented a new and useful Bunsen Burner, of which the following is a specification.

My invention relates to improvements in Bunsen burners—that is, those gas-burners in which air is admitted to and mixed with the incoming gas before the latter is ignited.

In particular my invention relates to improvements in such burners which prevent their sticking and clogging and at the same time lessen the cost to manufacture. I attain these objects by means of the construction shown in the accompanying drawings, in which—

Figure 1 is a plan of the completed burner; Fig. 2, an elevation of the same, partly in section, the section being taken on the line X X of Fig. 1.

The completed burner is composed of three main parts, viz: the casting, (different parts of which are designated by the numerals 1 2 3 5,) the mixing-tube 10, and the spring 6 7, assembled as shown.

The casting is made of iron or brass cast in a single piece. It consists of a base 1 and an upright 2. Integral with the latter are several smaller parts, to be described later. In the side of the base is a recess 13, extending to near the center. It is flat at the bottom, and through this flat part and perpendicular to it extends the gas-admission tube 4. The object of the recess is to lighten the casting, thereby saving metal, and to allow for the attachment of the admission-tube 4 without its projecting outside the circle of the base. (This tube is shown as projecting a little beyond the said circle, but it is readily seen that it need not project at all.) The admission-tube 4 is of wrought-iron pipe turned to the proper shape and size for the attachment of a flexible connecting-tube for leading in the gas. The metal of the base is cast around it, as shown by the lower sectional part of Fig. 2. In other words, the admission-tube is cast in the base. The tube extends well past the center of the base, so that the exit for the gas is made by simply drilling down, as shown at 12. This method of construction saves the cost of drilling the hole for the attachment of the tube, as well as that of threading both the hole and the tube. It is also much stronger. A further advantage of this arrangement of recess and admission-tube is that the flexible connecting-tube rests on the table, (instead of being some distance above it,) where it takes up the least possible room and is least in the way.

While I have described the admission-tube as being attached to the base by being cast in it, I do not limit myself to that mode of attachment. In the better finished forms, where cheapness is no longer imperative, the tube will be attached by drilling at the bottom of the recess far enough to pass beyond the center and by cutting screw-threads in the ordinary way.

The gas-nipple through which the gas enters the mixing-tube 10 is shown at 11, Fig. 2. This nipple instead of having a single hole passing directly through it, as in the usual construction, has a hole that branches as it passes upward, the branches terminating in orifices at the sides of the cylindrical nipple and not at the top, as is shown. The figure shows two such branches drilled at an angle of forty-five degrees to the cylindrical surface of the nipple. While this is the preferred form of construction, I do not limit myself to that particular number or angle. Any number from one up of such tubes might be used, and they might make any angle from ninety degrees to almost zero degrees with the surface of the nipple. The object of this construction is to prevent the clogging of the openings in the nipple by matter accidentally falling down the tube. Such falling matter will either lodge on the top of the tube, where there are no openings to be closed, or fall entirely past the openings, as is clear from the drawings. This nipple is fastened in a hole drilled in the base for its reception, said hole extending into the admission-tube 4, as shown at 12, and being drilled from above, as hereinbefore mentioned. Ordinarily the nipple will be held by screw-threads. This, however, is no part of the invention and is not shown.

While I have described the nipple as cylindrical in form, it would accomplish the same result if it had a square, hexagonal, or any polygonal cross-section, the essential thing being that the surface where the orifices are located be vertical—that is, parallel to the axis of the mixing-tube 10. Hence I do not limit myself to a cylindrical nipple, though that is the preferred form.

The gas-mixing tube 10 is a straight tube of brass or iron cut off smooth and square at each end. There is no threading or other work on

it. It is held by the guides 3, which embrace it for about half (not more) of its circumference. It is held against these guides by the spring 6 7, which presses against it between the guides. The spring is strong enough to hold the tube in place and by the aid of the guides keeps it properly centered with respect to the nipple 11. At the same time the spring is not strong enough to prevent the tube being moved up or down to admit at the bottom as much air as is necessary for the flame desired or none at all. In the latter case the square end of the tube rests against the flat upper surface of the base. This up or down movement of the tube for controlling the air-supply is best made while rotating the tube between the thumb and fingers. To prevent the tube sticking from corrosion or accumulation of dirt, &c., the guides are given the peculiar shape shown in section at 3′. Wherever they touch the tube, they have a like cross-section, so that the metal surfaces in contact are reduced to very narrow bands. Whatever sticking occurs, and there will be a little, can be readily overcome by moving the top of the tube back and forth perpendicular to the paper, Fig. 2. The shape of the guides, which embrace the tube for not more than half of its circumference, and the yielding of the spring allow this to be done.

While I have shown the guides as being substantially semicircular in cross-section where they touch the tube, I do not limit myself to this particular shape. An angular cross-section with the apex of the angle in contact with the tube would accomplish the same result. I have chosen the one shown because it is more readily cast. These guides are spaced some distance apart, as shown, so that there is ample room between them for the spring to act. They are connected by the yoke 5, cast in one piece with them, and also with the upright 2. The latter is continued upward at the right of the yoke 5 to form the pin 9, about which are wound the coils 6 of the spring, the said pin also being a part of the casting. The spring is double, as shown at 6, the two parts being made of a single piece of wire, the middle connecting portion of the wire forming the loop 7, the two sides of which press against the tube 10, as is best seen in Fig. 1. The metal of the yoke 5 is cut away, as shown, to give the spring room to act. The free ends of the wire forming the spring are held in a recess 8, Fig. 2, cast in the sides of the yoke. This arrangement, acting with the pin 9 and the tension of the spring, holds the latter securely when the tube 10 is moved up or down.

The spring is made of spring brass or steel large enough to have ample strength after it has corroded and beco ne covered with a thick coating of oxidized metal, as is apt to be the case in chemical laboratories.

As there is always corrosion, there is always a tendency to clog and stick; but this burner reduces that tendency to a minimum, and it is so constructed that the one using it can overcome this tendency with very little effort.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a Bunsen burner, the combination of spaced guides for supporting the mixing-tube, said guides having narrow reduced edge portions in contact with the tube, a mixing-tube movable in the guides, and yielding means between said guides for holding the tube in any one of its positions in the guides.

2. In a Bunsen burner, the combination of spaced guides for supporting the mixing-tube, said guides embracing the tube for a portion of its circumference, a mixing-tube movable in the guide, and a spring between the guides for holding the tube in the guide.

3. In a Bunsen burner, the combination of spaced guides for supporting the mixing-tube, said guides embracing the tube for a portion of its circumference, and having narrow reduced edge portions in contact with the tube, a mixing-tube movable in the guide, and a spring located opposite a point between the guides for holding the tube in the guides.

4. In a burner of the Bunsen type, a vertically-disposed mixing-tube, spaced guides for said tube, means for holding the tube to the guides, a gas-supply located at the lower end of the mixing-tube and consisting of a nipple having a closed top and substantially vertical sides, a gas-supply connecting with the base of the nipple, and an opening in the nipple extending upward from the gas-supply and terminating in upwardly-divergent discharge-passages opening through the vertical sides of the nipple.

5. In a Bunsen burner, the combination of spaced guides for supporting the mixing-tube, the said guides embracing the tube for a portion of its circumference, a mixing-tube movable in the guides, and means for holding the tube against the guides.

6. In a Bunsen burner, a vertically-disposed mixing-tube, a support in which said tube is movable and adjustable, said support comprising inclosing horizontal arms with reduced inner edges contacting with a portion of the periphery of the tube, and an elastic spring contacting with the opposite side of said tube.

7. In a burner, a vertically-disposed open-ended mixing-tube, means for adjustably supporting the tube, said means comprising vertically-separated partially-inclosing arms having reduced inner contact-surfaces, an elastic spring fixed to contact with the opposite side of the tube between the fixed supports.

8. In a Bunsen burner, the combination of a fixed member and a movable member, the movable member being supported by separated partially-embracing arms having reduced edge portions in contact with the said movable member, and a spring to hold the said movable member against the said arms,

one of the said members having a suitable gas-admission tube and nipple, the other member being a mixing-tube disposed to receive gas from the said nipple and air from an adjustable space between portions of the two members.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LARRANCE PAGE.

Witnesses:
KATE H. PAGE,
CHARLES W. FREDERICK.