May 5, 1925.

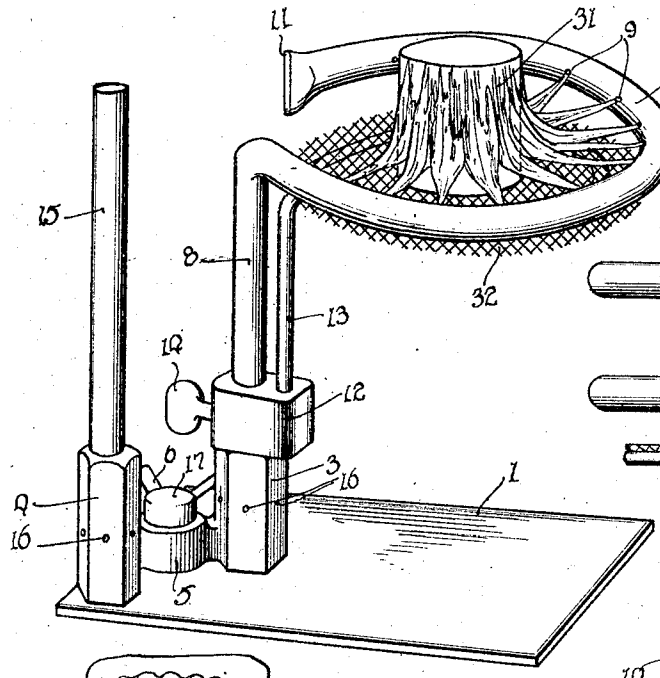
1,536,079

E. E. DALTON

DENTAL BURNER

Filed Feb. 23, 1923

Fig. 1



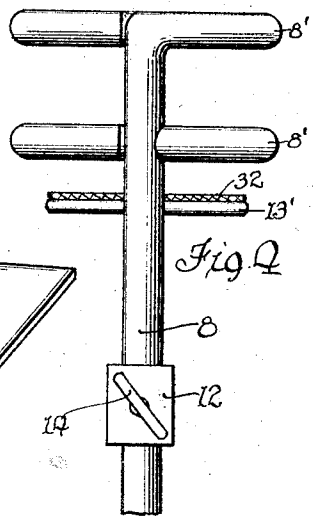


Fig. 4

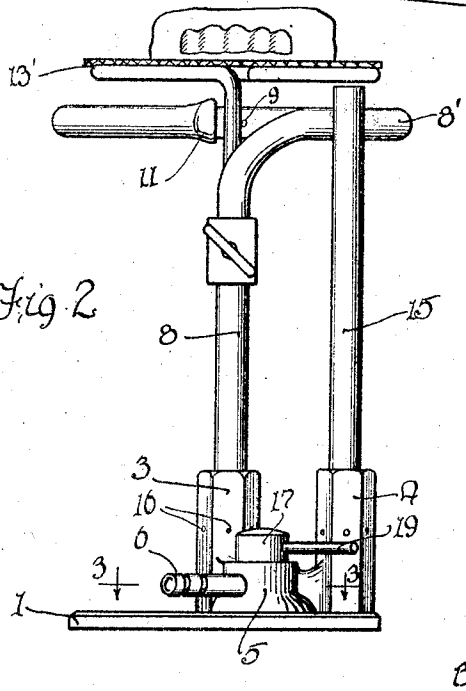


Fig. 2

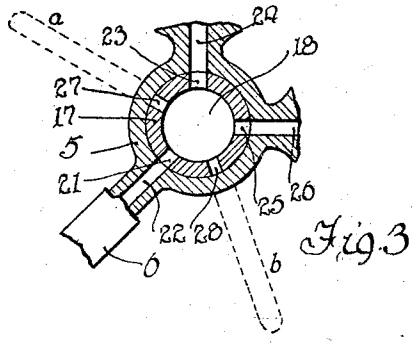


Fig. 3

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UNITED STATES PATENT OFFICE.

ERNEST E. DALTON, OF CHICAGO, ILLINOIS.

DENTAL BURNER.

Application filed February 23, 1923. Serial No. 620,601.

To all whom it may concern:

Be it known that I, ERNEST E. DALTON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Dental Burners, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

The present invention relates to burners, and more specifically to a design of burner having particular utility in dental laboratories for performing certain dental operations.

One of the principal objects of the invention is to provide a burner which will eliminate the wax from dental casting cases with more uniformity, thoroughness and expediency. The preferred embodiment of burner by which I accomplish this object comprises a circular burner tube having a plurality of inwardly opening burner jets arranged around its inner circumference for projecting flames radially inward against the circular sides of the casting ring. This distributes the heat uniformly around the sides of the casting ring where the heat should be applied, and results in an even, thorough drying of the investment and elimination of the wax.

A further object of the invention is to provide an adjustable support for the casting case, whereby the case can be raised or lowered to cause impingement of the radial jets of flame at any point along the casting case, or for accommodating casting cases of different sizes.

A further object is to provide an adjustable support for the burner which can be raised above the plane of the burner ring, whereby the device may be employed for heating cases for soldering.

A further object is to provide a device which, in addition to performing the above heating operation, will have all the other uses and utilities of the old style Bunsen burner.

In the accompanying drawing illustrating a preferred embodiment:—

Figure 1 is a perspective view of the burner unit, showing the mode of eliminating wax from casting cases;

Fig. 2 is an end elevational view of the burner unit;

Fig. 3 is a horizontal sectional view taken approximately on the plane of the line 3—3 of Fig. 2; and

Fig. 4 is a fragmentary end elevation of a modified embodiment.

The device is assembled upon a base plate 1. Two tubular standards 3 and 4 rise from this base plate, preferably having reduced extensions at their lower ends which are riveted or expanded in holes in the base plate. A valve housing 5 is cast integral with the lower ends of the standards 3 and 4, and is provided with a gas inlet in the form of a nipple tube 6 for receiving the end of the gas hose.

Extending upwardly from the upper end of the standard 3 is a burner tube 8 of wrought tubing. The upper end of the tube 8 is bent into a horizontal circular loop 8′ having a plurality of radial jets or ports 9 around its inner circumference. The end of the tube is closed at 11 by pressing the walls thereof together, or soldering or plugging the end of the tube in any other preferred manner. The adjustable support for carrying the casting case or other article being heated, comprises a block 12 slidably mounted on the vertical portion of the tube 8 and carrying a rod 13, which is rigidly anchored in the block 12. The upper end of the rod 13 is bent into a horizontal circular loop 13′, similarly to the tube 8, but the loop 13′ is of smaller diameter than the loop 8′, so that it can be passed up and down through the burner ring by sliding the block 12 up or down along the vertical portion of the tube 8. A thumb screw 14 screws into the back of the sliding block 12, and affords a clamping means for clamping the block to the tube 8 with the supporting ring 13′ at any desired height relative to the burner ring 8′.

Rising from the other standard is a typical Bunsen burner tube 15. Each standard 3 and 4 is provided with a plurality of air ports 16 around its polygonal sides for admitting air into the stream of gas flowing up through their respective burner tubes.

The valve housing 5 is formed with a valve socket, preferably of tapering form, for receiving the rotatable valve 17. As shown in Fig. 3, this valve is hollow to form a central chamber 18 from which radiates the plurality of ports for controlling the flow of gas to the respective burner tubes 8 and 15. An operating arm 19 extends laterally from the top of the valve element

17. Formed in line with the operating arm 19 is a relatively large inlet port 21 which is adapted to register with the inlet passageway 22 leading from the nipple 6. When the port 21 and passageway 22 are in registry, as shown, a relatively large port 23 is also in registry with a passageway 24 leading to the burner tube 8, and a relatively large port 25 is also in registry with a passageway 26 leading to the Bunsen burner tube 15. It will therefore be obvious that in this position of the operating arm 19, both burner tubes receive a full supply of gas for maximum heating at each burner tube. By slightly turning the operating arm 19 to either side, the registering areas of the ports 21, 23 and 25 can be reduced for cutting down the flow of gas to each burner tube and thereby diminishing its intensity of flame.

In close proximity to the port 23, the valve is provided with a companion port 27, and in close proximity to the port 23 and located on the other side thereof is another companion port 28. By rotating the operating arm 19 clockwise into dotted line position *a* the port 27 is brought into registry with the passage 24 leading to the burner tube 8, and the port 28 is brought into registry with the inlet passageway 22. At this time the passageway 26 leading to the other burner tube is blocked off by a solid portion of the valve, whereby all the gas is diverted into the burner tube 8. By rotating the operating arm 19 to the other side into dotted line position *b*, the flow is shunted into the Bunsen burner tube 15 and cut off from the circular burner tube 8, because at this time the port 27 is in registry with the inlet passageway 22 and the port 28 is in registry with the Bunsen burner passageway 26, while the passageway 24 is blocked off by a solid portion of the valve. In either of these latter positions the flow to the burner tube can be regulated by slight shifting of the operating handle 19. The solid portion of valve between the ports 21 and 27 can be revolved across the inlet passageway 22 for shutting off the flow of gas to either burner tube.

For eliminating the wax impression in a casting case, the case which is designated 31 in Fig. 1, is set upright in the center of a circular screen 32 which is placed upon the supporting ring 13′. As is well known to those skilled in the profession, the case 31 contains a wax impression imbedded in a plaster filling which is packed into the case 31 in a wet, plastic condition. The object of heating the casting case is to dry and harden the plastic filling and also carbonize or boil out the wax impression. The multiplicity of flame jets playing around the sides of the case 31 impart an evenly distributed heat to the case 31 and result in a gradual uniform drying of all parts of the plastic filling. When the boiling out technique is to be employed, the casting case is set upon the screen 32 with the sprue hole extending from the wax impression pointed downwardly, so that as the wax liquefies, it can flow down through the sprue hole and drop through the screen 32. When the carbonizing technique is employed the case 31 is reversed so that the sprue hole points upwardly. In this process, the wax is eliminated by vaporizing it entirely out of the plaster filling through the sprue hole. In either of the foregoing methods, when an investment or plaster filling is subjected to an unevenly distributed heat, the same is caused to disintegrate its particles unevenly, resulting in a poor casting, whereas, if subjected or exposed to a heat which will permeate evenly all portions of the investment at the same time, a truer matrix results, which makes possible a sharper or more accurate casting. The present arrangement of a multiplicity of small but powerful jets of flame directed upon all sides of the investment simultaneously, secures a uniform distribution of steady and conveniently adjustable heat throughout the interior of the investment, permeating every particle thereof and making possible a true homogeneous cast.

When it is desired to heat cases for soldering, the supporting ring 13′ is raised upwardly through the burner ring 8′ to a plane above the burner ring, and the case is then set upon the wire screen 32 resting upon this supporting ring. Such adjustment of the burner is illustrated in Fig. 2. This elevated position of the supporting ring 13′ also affords a convenient rest for a pan, sterilizing receptacle or other vessel for containing water or other liquid to be heated. This is always of advantage in a laboratory. By raising or lowering the supporting ring 13′ the pan or other receptacle can be brought directly into the center of the several jets of flame, or can be raised to any desired height above the jets. The supporting ring 13′ can be swung out of the way entirely by lowering it through the burner ring 8′ and swinging it to the left around the tubular standard 8. Where a more intense concentrated heat is desirable the Bunsen burner tube 15 comes into play. The wire screen 32 is shown as being readily removable from the supporting ring 13′ but, if desired, it can have its edges crimped over the supporting ring.

As shown in Fig. 4, I also contemplate constructing the burner with a plurality of superposed burner rings 8′. This is of advantage when large casting cases holding a full upper or lower impression are to be heated. The two or three burner rings evenly distribute the heat along the greater

height of these casting cases. When the direct contact of the flames on the casting case is undesirable, an outer oven ring can be placed over the casting ring to provide an intervening air space.

I do not intend to be limited to the particular details herein shown and described except as they are defined in the appended claims.

I claim:—

1. In a device of the class described the combination of a support for an article to be heated and an open burner ring for surrounding the article, said burner ring having a plurality of orifices discharging radially in the direction of the plane of the ring, the flames from said orifices striking that part of the article lying in the plane of the ring irrespective of the dimension of the article in the direction of said plane.

2. In a device of the class described the combination of a support for an article to be heated, an open burner ring surrounding the article and provided with a plurality of orifices for discharging flames radially upon the article, and an adjustable mounting for said support, said adjustable mounting permitting adjustment of the support in a direction substantially normal the plane of the burner ring to adjust different parts of the article into position to receive said flames.

3. In a device of the class described the combination of a support for an article to be heated, said support being adjustable, means for securing same in adjusted position, and a burner ring surrounding the article in its different adjusted positions and provided with a plurality of orifices for discharging substantially radially upon the article.

4. In a burner of the class described, the combination of an annular burner element having a plurality of burner jets around its inner circumference, and an adjustable support movable up and down through the opening defined by said annular burner element.

5. In a burner of the class described, the combination of a substantially upright standard, a circular burner element at the upper end of said standard, said burner element having a plurality of jets around its inner circumference, a support for the article to be heated, said support being adjustable up and down said upright standard and means for securing said support in adjusted position.

6. In a burner of the class described the combination of a burner tube, means for admitting gas to the lower part of said tube, the upper part of said tube being formed into a substantially circular loop, a plurality of radial jets around the inner circumference of said loop, a supporting ring adjustable through said loop, and means for clamping said supporting ring in adjusted position.

7. In a dental burner, the combination of a base, a tubular standard rising from said base, means permitting gas into said tubular standard, an annular burner ring connected to said tubular standard and receiving the gas therefrom, said burner ring having a plurality of burner jets around its inner circumference, a clamping member shiftable along said tubular standard, and a supporting member carried by said clamping member and movable above and below the plane of said burner ring.

8. In a burner of the class described, the combination of a burner tube, means for admitting gas to the lower part of said tube, the upper part of said tube being bent into a substantially circular loop, a plurality of radial jets around the inner circumference of said loop, a supporting ring movable through said burner loop, and means for adjustably clamping said supporting ring to said burner tube.

9. In a dental burner, the combination of a base, socket means, a burner tube mounted in said socket means and extending upwardly from said base, the upper end of said tube being bent into a substantially horizontal ring, means for admitting gas to the lower end of said tube, a plurality of burner jets in said burner ring arranged to discharge radial jets of flame, a supporting ring movable up and down through said burner ring, and a clamping block carrying said supporting ring and adapted to be adjustably clamped along the upright portion of said burner tube.

10. In a device of the class described, the combination of a mounting base, a ring burner fixedly supported thereon, a Bunsen burner fixedly supported thereon, and a single distributing valve for controlling the supply of gas to said burners.

11. In a dental burner, the combination of a mounting base, a ring type of burner fixedly supported on said mounting base, a straight type of burner fixedly mounted on said base, and a common valve for selectively controlling the operation of each of said burners.

12. In a dental burner, the combination of a mounting base, a first burner tube supported on said base, a burner ring having radial burner jets supported by said first burner tube, an adjustable support movable above and below said burner ring, a second burner tube, and a common valve operable to selectively admit gas to either or both of said burner tubes, and to control the flow to either or both of said tubes.

13. In a dental burner, the combination of a mounting member, a first burner tube fixedly carried on said mounting member, a

ring burner having substantially radial burner jets carried by said first burner tube, a second burner tube, fixedly mounted on said base, a valve housing, a supply passageway entering said valve housing, passageways leading from said valve housing to each of said burner tubes, and a rotatable valve element in said housing having a plurality of ports therein operable to selectively admit gas to either of said burner tubes and to control the amount so admitted.

14. In a device of the class described, the combination of a plurality of superposed burner rings, each of said rings having a plurality of burner jets around its inner circumference, a support for the article to be heated, and means for relatively adjusting said support and said burner rings.

In witness whereof, I hereunto subscribe my name this 13th day of February, 1923.

ERNEST E. DALTON.