(No Model.)

S. DANIELS.

BURNER FOR GAS OR VAPOR STOVES.

No. 377,547. Patented Feb. 7, 1888.

Fig. 1.

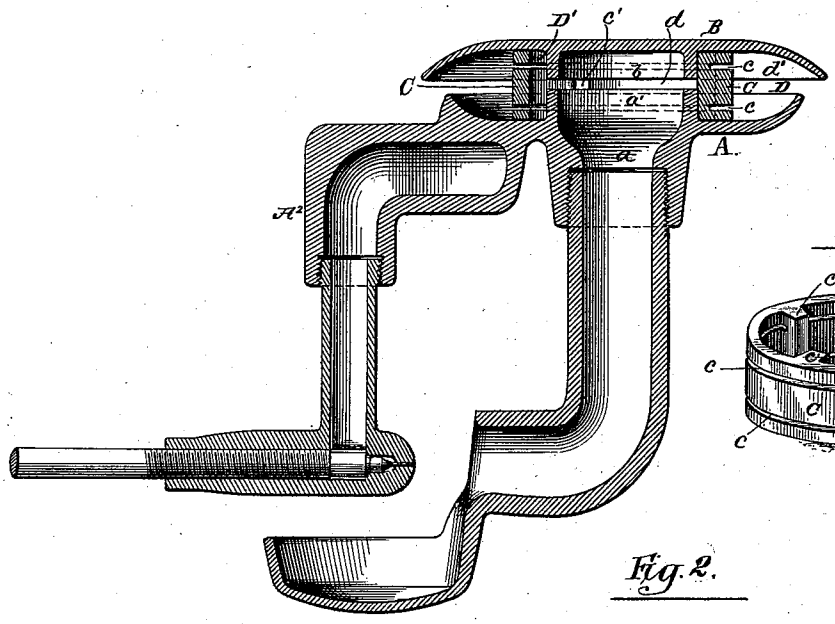


Fig. 4.

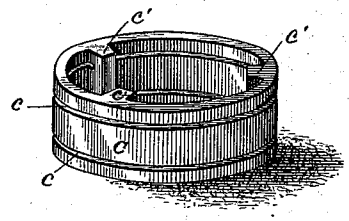


Fig. 2.

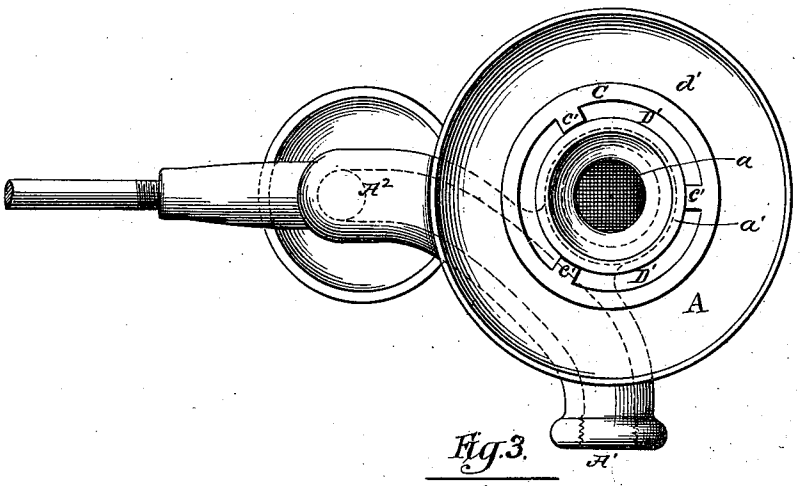
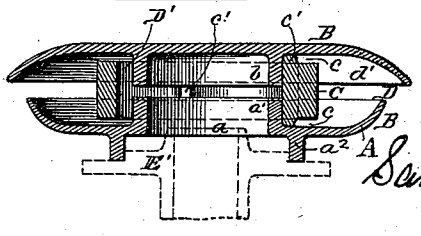


Fig. 3.



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UNITED STATES PATENT OFFICE.

SAMUEL DANIELS, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO MELVILLE E. DAYTON, OF SAME PLACE.

BURNER FOR GAS OR VAPOR STOVES.

SPECIFICATION forming part of Letters Patent No. 377,547, dated February 7, 1888.

Application filed June 8, 1885. Serial No. 167,973. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL DANIELS, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Burners for Gas or Vapor Stoves; and I 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, which form a part of this specification.

This invention relates to burners for gas or vapor; and it has for its object to produce an annular flame and one which it will not be easy to extinguish by blowing thereon or into the orifice of the burner.

The invention is shown as part of a hydrocarbon-vapor-generating burner, in which the advantage last mentioned is more important, for the reason that the vapor-flame of such burners, as commonly constructed, is very easily extinguished by a wind or sudden puff of air into the orifice, while the results of such extinguishment of the flame may be seriously disastrous in allowing the escape of hydrocarbon liquid at the needle-valve.

The said invention will be best understood from the following description and the accompanying drawings, in which—

Figure 1 is a central vertical section of the burner shown in a construction adapted for the generation of hydrocarbon vapor. Fig. 2 is a plan view of the burner and of the adjuncts shown in Fig. 1. Fig. 3 is a vertical central section of the burner proper applied to a support, (shown in dotted lines,) which support has a central orifice for the admission either of gas or of hydrocarbon vapor, this figure being intended to illustrate the applicability of such burner proper to either gas stoves or to the base-plate of a style of hydrocarbon-vapor burners now commonly in use. In said Fig. 3 is also shown a modification of the interior cylinder or ring by which the two circular plates of the burner are supported at a proper distance apart. Fig. 4 is a perspective view of a preferred form of the central cylinder or ring by which the two circular plates of the burner are held apart in proper position, the said ring being provided with annular through-grooves for the outward passage of the gas or vapor.

A represents a circular base-plate of shallow cup shape and having a central orifice or opening, *a*, surrounded by an annular upwardly-directed vertical flange, *a'*.

B is a similar cup-shaped disk, preferably somewhat larger than the disk A, and supported in an inverted position over the latter, as shown. The disk B is provided with a depending annular and concentric flange *b*, which, in the completed burner, stands opposite the flange *a'* of the lower disk, A.

C is a ring, preferably cylindric in form, intended to rest on the lower plate, A, and to support therefrom the upper plate, B, at such a distance as to afford the annular passage *d*, between the edges of the flanges *a'* and *b*, and also the annular passage D, between the edges of the disks A and B, for the emission of the vapor in a circular sheet, and to produce from such vapor, when ignited, an annular flame external to the margin of the said disks. The said ring C is provided with two horizontal parallel passages, *c c*, for the outward movement of the gas or vapor from the passage *d* to the passage D.

I prefer to construct the ring C in the particular manner clearly shown in Figs. 1 and 4, wherein it is shown as a separate cylindric casting, having a series of interior vertical ribs, *c'*, and wherein the horizontal and parallel passages *c c* are made by cutting inwardly from the outer surface of said ring through the body of the ring to or into the vertical studs *c'*, so as to make said passages practically continuous. Said ring C may, however, be less advantageously constructed with the ribs or studs *c'* projecting above and below the central body of the ring, and thereby afford passages *c c* directly between said body of the ring and the upper and lower plates of the burner, as shown in Fig. 3. This last-mentioned construction is less calculated to protect the burner from extinguishment by a sudden or violent puff of wind than that shown in said Figs. 1 and 4, because a current of air entering the opening D might in that case pass along the surfaces of the burner-plates A and B and enter said openings *c*, while in the construction

of Fig. 1 such current will strike the narrow rings between the passages *c* and the burner-plates and thus be arrested or deflected. It is also practicable and, perhaps, desirable, to cast the ring C integrally with or as part of one of the plates A B, in which case the annular through-grooves *c c* may be cut in the same way described, or by means of a turning-tool, in the same relative positions illustrated in Figs. 1 and 4.

When the ring C is a separate piece, it will be held concentrically with the several burner-plates A and B by means of the flanges *a'* and *b*, which will be cast on said burner-plates of such size as to fit within the ring-studs *c'*, as shown in Figs. 1, 2, and 3. The presence of the interior studs or ribs, *c'*, affords an annular space, D', between the ring and the flanges *a'* and *b*, into which the gas or vapor first passes from the opening *d*, and from which it emerges through the passages *c c* into the outer space, *d'*, between the burner-plates. It will be observed that, as illustrated in the drawings, the passage *d* is located centrally or about midway between the plates A and B, and also that the passage D is substantially in the same plane with the passage *d*, while the passages *c* and *c* are located one above and one below said central plane. The result of this preferable arrangement of said passages is that the stream of gas or vapor, after leaving the passage *d*, is broken up into two bodies, which pass out separately through the passages *c c*, and finally emerge through the outer annular opening, D. In the case of a vapor with which air is to be commingled, as in the case of hydrocarbon vapor, this breaking up and remixing of the fluid, together with the deflections of its course through the burner, operates to produce a thorough commingling of the air with the vapor and to thereby insure proper combustion and an exceptional steadiness and strength of flame. By reason, also, of the fact that the passages *c c* are located out of the plane of the outer passage, D, a puff of wind blowing horizontally into said outer passage, D, will not readily enter either of the said passages *c*, but will rather, in most cases, impinge against the body of the ring between said passages; and if the current of such wind-puff be directed upwardly or downwardly only it will not interfere with the egress of vapor from the passage not in line with said current. By this means the construction described renders the extinguishment of the flame difficult when the burner is in operation.

Whether the ring C be cast as a separate piece, as shown, or as part of one of the burner-plates, the flanges *a' b*, or one of them, being fitted to freely but rather accurately enter between the ribs *c'*, as set forth, enables the burner to be quickly and reliably put together or to be taken apart for any purpose.

When the burner is intended for generating as well as burning hydrocarbon vapor, the lower burner-plate, A, will desirably be cast with provisions for conducting the hydrocarbon liquid into position to be vaporized. Such a construction is shown in Figs. 1 and 2, wherein the said burner-plate is cast with connected and cored arms A' A^2, arranged in proper positions, one to admit liquid and the other to conduct the vapor to the needle-valve, in a familiar manner.

In Fig. 3 the centrally-apertured base-plate E' (shown in dotted lines) represents a familiar form of base-plate now commonly in use in hydrocarbon-vapor burners, to which ordinarily is applied a removable perforated cap, which rests on said base-plate. The present burner is shown provided with a bottom flange, a^2, adapted to fit the base-plate E', in place of said perforated cap, and so as to bring the orifice *a* of the burner-plate A concentrically over that of the base-plate E'. This construction enables the present burner to be conveniently substituted for the said ordinary perforated cap.

The construction of the slotted burner-ring C, having its parts connected by interior ribs transverse to the slots and integral with said parts of the ring, will form the subject of another application for patent, and is herein claimed only in combination with the disks A and B.

I claim as my invention—

1. The burner consisting, essentially, of two cup-shaped disks, A and B, provided, respectively, with opposing flanges *a' b*, and having their edges and said flanges separated at D and *d*, and a ring, C, interposed between the disks in position to afford a space, D', exterior to the flanges *a' b*, and having passages at *c c* out of the plane of the opening D, substantially as and for the purposes set forth.

2. The combination, with the burner-plates A and B, provided, respectively, with opposing flanges *a' b*, of a ring, C, provided with interior ribs, *c'*, and continuous slots *c c*, substantially as described.

3. The burner composed of the separate opposing flanged disks A and B and interposed ring C, substantially as described, the lower disk being provided with an annular flange, a^2, whereby the burner is adapted to be applied to a base-plate, E', substantially as stated.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

SAMUEL DANIELS.

Witnesses:
M. E. DAYTON,
OLIVER E. PAGIN.