

F. D. SCHNEIDER
BURNER.
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1,241,032.

Patented Sept. 25, 1917.

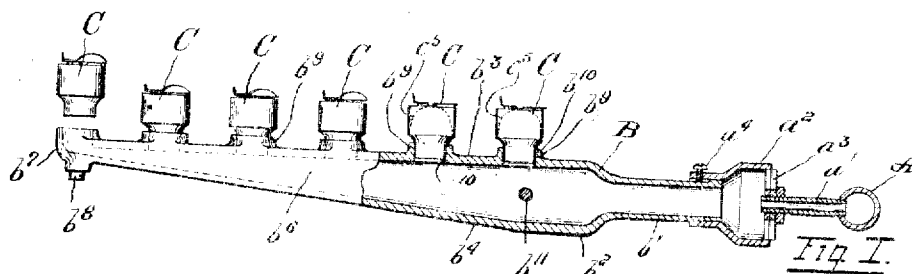


Fig. I.

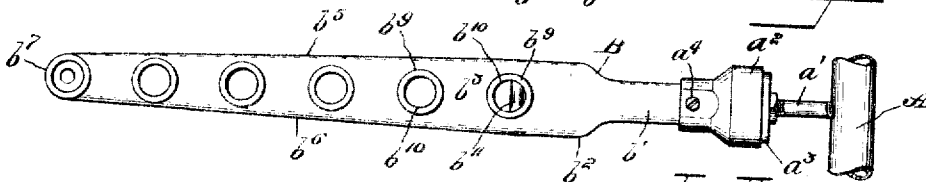


Fig. II.

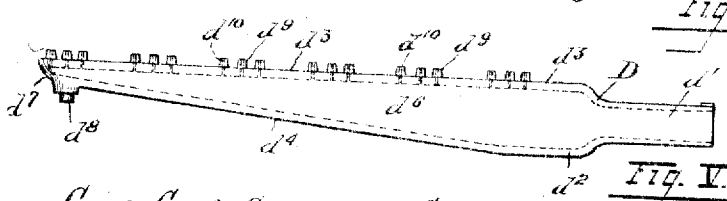


Fig. III.

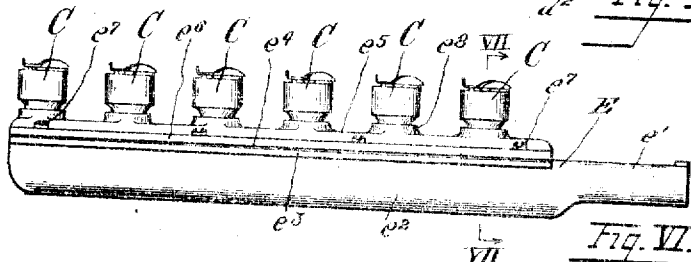


Fig. IV.

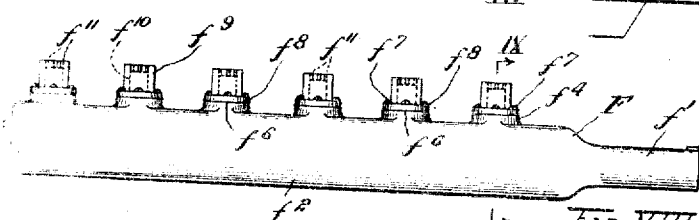


Fig. V.

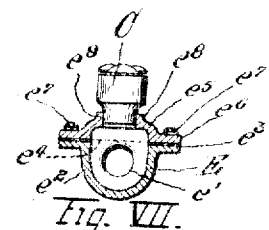


Fig. VI.

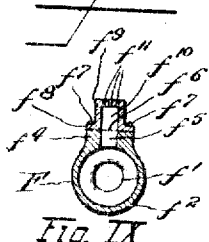


Fig. VII.

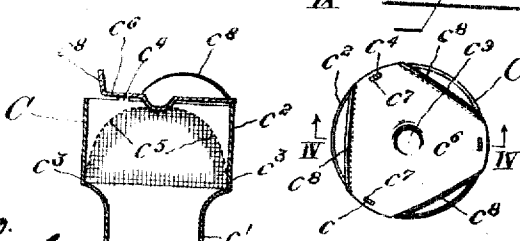


Fig. VIII.

Witnesses:
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Fig. IX.

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by his Attorney
Louis H. Mueller

UNITED STATES PATENT OFFICE

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BURNER.

1,241,032.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FREDERICK D. SCHNEIDER, a citizen of the United States, residing at New Brunswick, in the State of New Jersey and county of Middlesex, have invented a new and useful Improvement in Burners, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

This invention entitled a "burner" has more particular reference to a gas burner construction adapted for use in connection with a water heater construction shown, described, and claimed in United States Letters Patent No. 1,077,761 issued to me November 4, 1913.

The improvements which feature the subject matter of this application are the result of continued experiments extending over a period of almost two years.

My primary object has been to provide a structure of the character stated which will combine a maximum efficiency with a minimum fuel consumption, and especially in relation to an elongated burner from which flame jets issue at progressively varying distances from the common source of fuel supply.

Another object has been the provision of a burner which while proportioning the size of the common mixing chamber according to the distance of certain portions thereof from the source of supply will incidentally require a smaller amount of metal.

Still another object is an arrangement whereby the passages to individual flame jets are each provided with a distinct gauze partition.

My final object was to design a new type of burner head which would contribute toward a consumption in burning efficiency and which could be readily separated from the mixing chamber.

With the foregoing and other objects in view the invention consists of the novel construction, combination and arrangement of parts as hereinafter more specifically described and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood

that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

Directing attention now to the several views of the drawing:

Figure 1 is a part side elevation, and part section of the preferred form of burner embodying my invention, connected to a source of supply, one of the burner heads being shown lifted out of place.

Fig. 2 is a top plan of Fig. 1 showing all the burner heads removed.

Fig. 3 is an enlarged top plan of one of the burner heads.

Fig. 4 is a section on line IV—IV of Fig. 3, looking in the direction of the arrows.

Fig. 5 is a side elevation of a simplified modification.

Fig. 6 is a side elevation of a second modification of burner construction embodying my invention.

Fig. 7 is a vertical section on line VII—VII of Fig. 6, looking in the direction of the arrows.

Fig. 8 is a side elevation of a further modification.

Fig. 9 is a section on line IX—IX of Fig. 8 looking in the direction of the arrows.

A gas supply pipe A has a tributary pipe a' which connects with a hollow mixer a^2 , the air supply to which may be controlled in the usual manner by means of a disk a^3 . The farther end of the mixer is provided with a set-screw a^4 through the agency of which the reduced inlet end b' of an elongated hollow mixing chamber B may be held in place. A short distance beyond the inlet end b' at b^2 , the mixing chamber B is enlarged. The top b^2 of the mixing chamber B is preferably substantially flat whereas the bottom b^4 converges upwardly toward the top in the direction of the farther end. So also, the sides b^5 and b^6 converge toward each other in the direction of the farther closed extremity b^7 . In this manner as is apparent, the dimensions of the mixing chamber B are progressively constricted in a direction away from the enlarged portion b^2 . The closed end b^7 is fashioned underneath with a small stud b^8 adapted to functionate in the mounting of the burner construction by occupying a suitable recess in

the casing of the heater. The top b^3 is provided immediately of the portion b^2 and the end b^7 with a plurality and in this instance, with six aligned bosses b^8 provided with circular openings b^{10} of similar bore. Extending horizontally through the middle of the portion b^3 ahead of the center of that boss b^8 which is nearest the inlet b^7 is a bar b^{11} . This bar is intended to serve the purpose of a slight baffling member as will be hereinafter explained.

In describing the construction of the burner heads C which are intended to be removably mounted in the openings b^{10} , the singular number will for reasons of simplicity be adopted. Each burner head C is hollow and has its lower end of such diameter that it may be inserted into any of the openings b^{10} as a close mechanical fit. The upper end c^2 of the burner head C is of enlarged diameter to form interiorly an annular ledge c^3 , and the upper rim is fashioned with three equally spaced ears c^4 . An arched or dome-shaped strip of wired gauze c^5 is positioned upon the ledge c^3 and extends within a short distance of the upper edge of the portion c^2 , as is clearly shown in Fig. 4. A cap c^6 having slots c^7 similarly spaced as the ears c^4 is placed upon the portion c^2 such that the ears c^4 project upwardly through the slots c^7 to be suitably upset and thereby fixed relatively thereto. Intermediately of the ears c^4 portions of the annular edge of the cap c^6 are bent upwardly to form lips c^8 whereby burning orifices having the shape of segmental slots are provided. The center c^9 of the cap c^6 is indented sufficiently to engage and hold in place the crown of the gauze c^5 .

A mixture of air and gas after passing through the inlet b^7 encounters the bar b^{11} which assists in a measure to effect a thorough mixture by causing an added swirling motion. The farthestmost removed of the openings b^{10} is assured of an egress of combustible fuel in proper measure since the size of the mixing chamber therebeneath is rightly proportioned with consideration of the flow of fuel in its direction. Were it not for the baffling bar b^{11} that burner head C which is nearest the inlet b^7 would not receive a supply of fuel of sufficient pressure and it is in part for the purpose of diverting the incoming flow toward this particular burner head that such bar is provided. The facility with which individual burner heads may be removed is a valuable commercial asset since it permits of a replacement in the event of damage to any one of them. The arrangement of individual gauze partitions in each of the removable burner heads makes it possible not only to replace with a minimum of labor gauze portions which have become defective, but limits the requirement of gauze replace-

ment to the comparatively small strip that has become damaged. The specific construction of my inventive burner heads in combination with the arched gauze partitions therein is such as to effect still further a homogeneous mixture prior to ignition adjacent the lips c^8 and above the gauze as a deterrent of puffing.

The modification illustrated in Fig. 5 involves a mixing chamber constructed as an integral casting D and similarly of constricted dimension in a direction away from the inlet d^7 , because of the upwardly converging bottom d^4 and converging sides d^5 and d^6 . The top d^3 is in accordance with this form fashioned with integral burner heads d^9 having drilled holes d^{10} .

A modification with which Figs. 6 and 7 have to do involves a mixing chamber E of two component parts, which together form a chamber of similar dimensions throughout its length with the exception of a reduced inlet duct e^7 . The under portion e^2 of the major portion of the chamber E is provided with longitudinally extending lateral flanges e^3 , across the entire length of which an elongated strip of gauze e^4 is placed. The complementary or upper portion e^5 of the chamber E is similarly provided with flanges e^6 adapted to conform to and rest upon the flanges e^3 . These flanges as well as the interposed gauze are fixed relatively to each other by means of screws e^7 . Above the portion e^5 is fashioned a plurality of aligned bosses e^8 having like sized bores e^9 in which burner heads C are to be seated.

Figs. 8 and 9 illustrate a modification in which a mixing chamber F is constructed as a hollow tubular casting of uniform cross-sectional area throughout save for a reduced inlet f^7 . The bottom f^2 in view of what was stated in the preceding sentence is not beveled toward the top though the opposite end f^3 is again closed as in the other forms. Extending along the top are a plurality of bosses f^4 having openings f^6 as shown in Fig. 9. Removably mounted upon each of the bosses f^4 so as to compress a circular piece of gauze f^5 thereagainst as with screws f^7 , passing through an annular flange f^8 is a simplified burner head f^9 having below a hollowed portion f^{10} in registry with the openings f^6 . The tops of such burner heads are provided with a plurality of orifices f^{11} .

I claim:—

1. A burner comprising an elongated hollow member provided along one side with a plurality of transversely directed orifices, opposite ends of said member being closed and provided with an inlet opening respectively, said member being of progressively constricted dimension away from and of somewhat constricted dimension at said in-

let, and a bar extending across the larger portion of said chamber and below the orifice nearest said inlet.

2. A burner comprising an elongated hollow member having an intermediary portion of greatest cross sectional area, one end being closed and the other open, said member furthermore constricted toward said closed end and fashioned with a plurality of outlet orifices alined between said intermediary portion and closed end, and a baffling member disposed interiorly near said portion.

3. A burner comprising a mixing chamber having an inlet and an outlet, a hollow burner head seated in the latter and having an enlarged outer end, gauze arched upwardly within said outer end, and a cap engaging said gauze to hold it in place and forming in conjunction with the upper edge of said end a plurality of orifices.

4. A burner comprising an elongated tubular mixing chamber having one end closed and the other provided with a fuel inlet, said chamber also having a plurality of outwardly projecting hollow bosses spaced different distances from said inlet along one side of said chamber, a burner head removably fitted in each of said bosses, said chamber being of progressively reduced dimension in a direction away from said inlet, and a baffling bar fixed across said chamber near said inlet.

5. A burner comprising an elongated mixing chamber having one end closed and the opposite end open, said chamber furthermore provided with a plurality of openings alined along the upper longitudinal dimension of said chamber, burner heads detachably secured around said openings, individual gauze partitions across said burner heads and caps partially closing the tops of said heads such that said partitions are held in place thereby.

6. A burner comprising an elongated hollow mixing chamber having one end closed and provided at the other end with an inlet, said chamber furthermore provided along one side with a plurality of alined transversely directed outlet openings, a cylindrical burner head mounted over each of said openings, gauze partitions loosely occupying said heads, caps engaging said partitions and forming in conjunction with the top edges of said heads respectively segmental shaped

orifices, and means for holding said caps whereby to fix said partitions in place.

7. A burner comprising an elongated chamber provided with a single inlet, a plurality of upwardly directed outlet bosses spaced along said chamber, opposite sides and the bottom of said member progressively converging in a direction away from said inlet and a corresponding number of burner heads having circumferentially arranged openings and seated upon said bosses.

8. A burner comprising an elongated chamber provided at one end with an inlet and having its other end closed, a plurality of upwardly directed outlet bosses spaced between said inlet and said closed end, opposite sides and the bottom of said member progressively converging toward to merge with a single boss at said closed end, and a corresponding number of burner heads secured to said bosses.

9. A burner comprising an elongated progressively constricted mixing chamber provided with an inlet and a plurality of transverse outlets, hollow burner heads having orifices and removably attached to said member in open communication through said outlets respectively, and separate gauze partitions supported by said heads so as to be interposed between said outlets and orifices.

10. A burner comprising a mixing chamber provided with an inlet and a plurality of outlets, burner heads seated in said outlets and provided with caps, said caps having upwardly directed lips whereby orifices are provided in conjunction with the edges of said heads, gauze partitions beneath said caps, and means for securing the caps to the heads respectively whereby said caps engage the gauze partitions to hold them in place.

11. A burner comprising a mixing chamber provided with an inlet and an outlet, a burner head fitted over said outlet and provided with a cap, said cap having upturned lips spaced at intervals from said head whereby orifices are formed in conjunction with the latter.

Signed by me, this 28th day of November 1914.

FREDERICK D. SCHNEIDER.

Attested by—
PAUL NOTKE,
C. S. REED.