(No Model.) 2 Sheets—Sheet 1.

J. H. BEAN.

KEROSENE GAS BURNER.

No. 263,672. Patented Sept. 5, 1882.

Fig. 1.

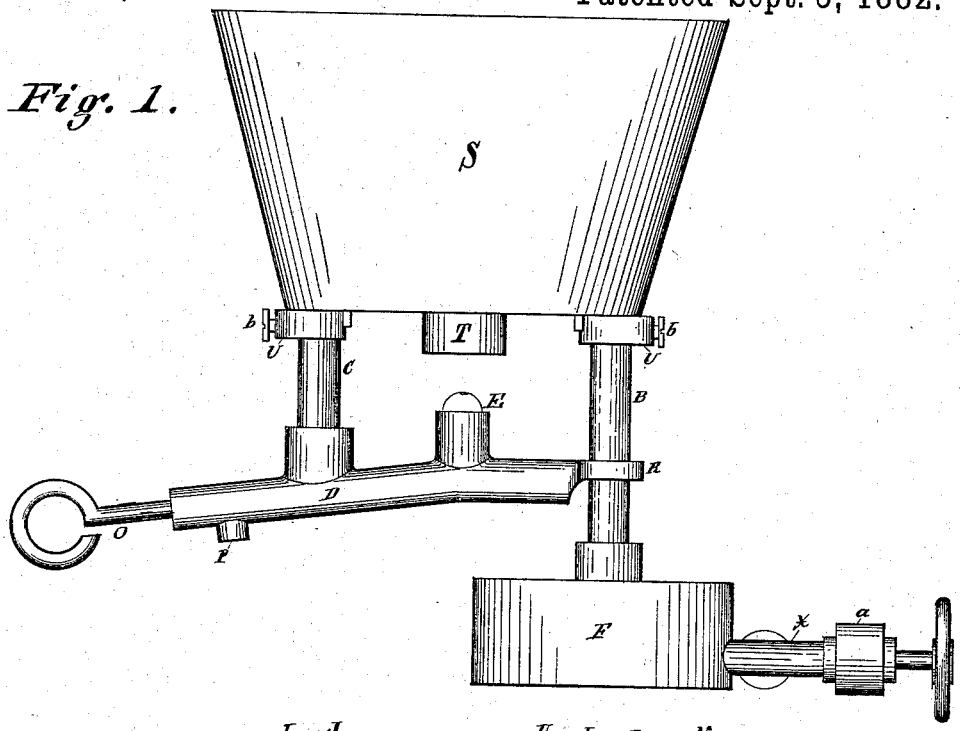
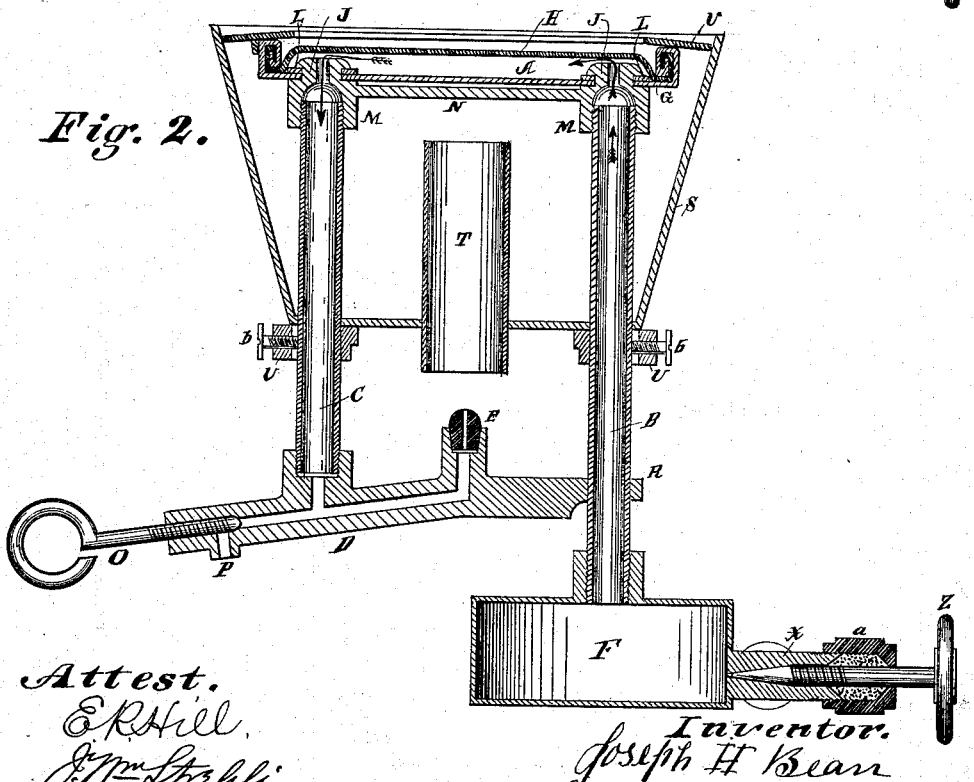


Fig. 2.



Attest.
E. R. Hill.
J. McStrahli

Inventor.
Joseph H. Bean

(No Model.) 2 Sheets—Sheet 2.

J. H. BEAN.

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Fig. 3.

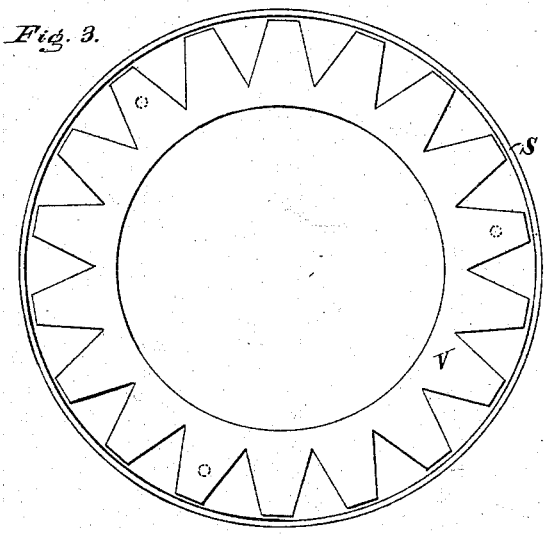


Fig. 4.

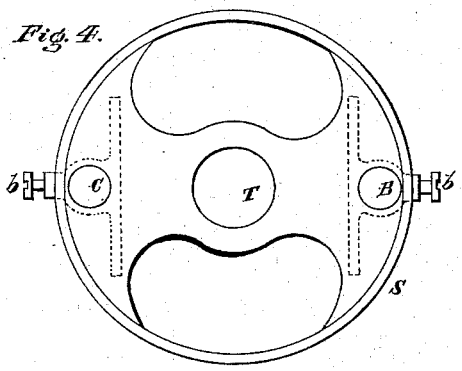


Fig. 5.

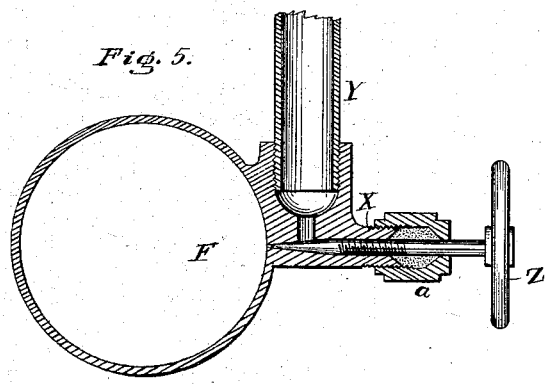


Fig. 6.

Fig. 7.

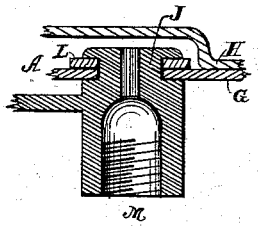


Fig. 8.

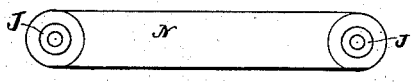
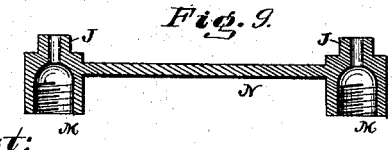


Fig. 9.



Attest:
E. R. Hill.
J. Wm. Stubbs

Inventor:
Joseph H. Bean

UNITED STATES PATENT OFFICE.

JOSEPH H. BEAN, OF CINCINNATI, OHIO.

KEROSENE-GAS BURNER.

SPECIFICATION forming part of Letters Patent No. 263,672, dated September 5, 1882.

Application filed March 17, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH H. BEAN, of Cincinnati, county of Hamilton, and State of Ohio, have invented new and useful Improvements in Kerosene-Gas Burners, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings and letters of reference marked thereon.

The object of my invention is to produce gas from heavy kerosene-oil by means of a simple and inexpensive burner, which produces the heat necessary to decompose the oil and convert it into gas, and then throw the entire volume of the flame against the vessel to be heated, using but a single jet of gas to accomplish both purposes. This is done by a certain combination of parts, which I will describe in detail, so as to be better understood.

Figure 1 is a front elevation of my burner as seen when in use; and Fig. 2, a sectional view of the same, taken through the center of all the parts, so as to show the internal construction of each and the course of the oil and gas, as indicated by the arrows. The other figures will be described as I proceed.

The generator A is composed of two round disks of sheet-copper or other suitable metal. The lower one, G, is a little larger than the upper one, H, and has two holes punched in it, which drop over the studs J, which are plainly shown in Fig. 1. These studs are shown in Fig. 9 in connection with the sockets M M and binding-plate N, with which they are solidly cast. These studs are milled off perfectly smooth before the disk is put on, leaving a perfectly-smooth shoulder, on which the disk rests. On the stud and above the disk is placed a washer, L, of any suitable metal. Then the stud is firmly riveted down on the washer, as shown in Fig. 7. This makes a perfectly-tight joint. Over these studs and on the disk G is placed the raised disk H, as shown in Figs. 2 and 7. Then the edge of the disk G is turned over on the disk H, and then both turned over together, and then half-way again, and left edge up, as plainly shown in Fig. 6. These edges are firmly pressed together by suitable dies, thus making a joint that is not loosened by the most intense heat.

The studs J, with their sockets and binding-plates, are plainly shown in Figs. 2, 8, and 9, and as broken away in Fig. 7. The sockets are tapped to receive the pipes B and C, and a small hole is bored through the studs J, after they are riveted down, for the oil to pass in and the gas out of the generator A. Onto the lower end of the pipe C is screwed the valve and tip seat D. This is made on an incline, so as to release the pipe E from a certain heavy inconvertible portion of the kerosene-oil, causing this residuum to flow down against the valve O. This residuum is occasionally let off by slightly opening the valve O and letting it flow out of the gasways by the opening P. The valve-seat D is also the seat for the gas-tip E. This is an ordinary lava tip with a single opening in the center. This tip is easily removed and another with a larger or smaller opening inserted, thus enabling me to use any grade of oil I choose in the burner by simply changing the tip. The lava tip, as is well known, never gums or corrodes, and is far superior to metal for kerosene-gas, as the oil contains a large per cent. of paraffine. It is this paraffine that stops up and ruins all kerosene-oil-gas burners where such burners are used to convert the oil into gas before burning it. I fully provide against this trouble by the inclined gasway in the valve-seat D, the valve O, and outlet P. The pipe B is made to pass through an eye cast in the end of the valve-seat D, as shown at R, Figs. 1 and 2.

Over and around the generator A is placed the inverted cone S. This has openings in the bottom for the passage of the pipes B and C and the gas-tube T. These openings, with the openings for the inlet of air to the generator, are shown in Fig. 4. This cone is held in place by the collars U, slipped on the pipes B and C, and held in place by means of set-screws *v*. The shape of these collars and their set-screws is plainly shown in Fig. 4. The cone S is used to shield the generator from the cold air and concentrate the heat thereon. On the generator is placed the gas-spreader V. This spreader is composed of a light flat ring of cast or wrought metal with a number of teeth around it, as shown in Fig. 3. This gas-spreader drops inside of the top of the cone S and serves to spread and regulate the flame all around the generator A. Onto the lower end

of the pipe B is screwed the pressure-well F and valve-seat X. This well, valve-seat, and the socket for the reception of the oil-supply pipe are all cast in one piece, and are plainly shown in the cross-section, Fig. 5. The flow of oil to this well and the generator is regulated by the needle-valve Z. This valve is surrounded by the stuffing-box *a*, which is made funnel-shaped on the inside, and the end of the valve-seat X is countersunk, so that the stuffing-box and valve-seat present the appearance of a double funnel, as is plainly shown in Figs. 2 and 5. The object of this arrangement is to powerfully compress the packing around the valve-stem as the box is screwed on. This cannot be done with the ordinary stuffing-box, so as to hold kerosene-oil in the pipes, as the ends are flat, and it soon leaves a loose joint around the valve-stem; but with this shaped box the joint is always tight. The pressure-well F is made many times larger than the pipe B, and is supplied by means of an exceedingly small opening at the point of the needle-valve Z.

Kerosene is very rich in carbon, and can only be decomposed and converted into gas by being brought slowly in contact with a surface brought up to a red heat, and when it is converted into gas it must be mixed with a large quantity of air to produce a perfect flame free from smoke. To properly convert it into gas of good quality, thoroughly mix it with the atmosphere, and then burn it without smoke or making a roaring noise, unendurable in a cooking-stove, has been thought a thing impossible to accomplish; but by means of my generator, when made as described, with its broad bottom, and the oil being compelled to remain in it for several seconds before it can escape, it is perfectly decomposed, and by means of the large supply of air admitted at the bottom of and around the burner, and this air highly heated, the gas burns with a clear, beautiful, clean flame. The noise is abated by so adjusting the gas-tube T as to let the most of the air mix with the gas close to the under side of the generator instead of between the tip E and the bottom of the tube T.

My burner is inexpensive, simple, and easily controlled, having but one valve to handle, durable, thoroughly reliable, is nearly noiseless, perfectly safe, makes a powerful heating-flame from the heaviest "head-light" oil as easily as the ordinary hydrocarbon-burner can from gasoline. This, I believe, has never been done before with the heavy oils for domestic uses, notwithstanding the hundreds of attempts heretofore made by inventors so to do. There is a certain something in kerosene-oil that cannot be converted into gas, but forms into a gum, which clogs up and ruins the burners in a short time. This trouble I effectually remove by means of my peculiarly-arranged valve-seat D and the substitution of the lava for the metal tip.

The advantages of my invention over others are the use of a heavy and comparatively-safe oil for domestic uses instead of the volatile and dangerous naphtha usually employed for such purposes, and without the troublesome and dangerous wick, which is so often turned down too far or is too loose, and lets fire into the oil-reservoir with frightful and often fatal results.

With my invention it is utterly impossible for fire to enter the oil-pipe and reach the fount.

What I claim as my invention is—

1. In a kerosene-gas burner, the generator A, in combination with the washers L, studs J, sockets M, and binding-plate N, as and for the purpose described.

2. In a kerosene-gas burner, the combination of the generator A, inverted cone S, gas-spreader V, pipes B and C, collars U, set-screws *b*, and gas-tube T, as and for the purpose set forth.

3. In a kerosene-gas burner, the combination of the generator A, pipes B and C, valve and tip-seat D, well F, valve-seat X, stuffing-box *a*, and valve Z, as and for the purpose set forth.

JOSEPH H. BEAN.

Attest:
WM. E. JONES,
WM. BUEHLER.