Sept. 22, 1925. 1,554,788

H. R. CORWIN

VACUUM FLUID BURNER

Filed June 24, 1924 2 Sheets-Sheet 1

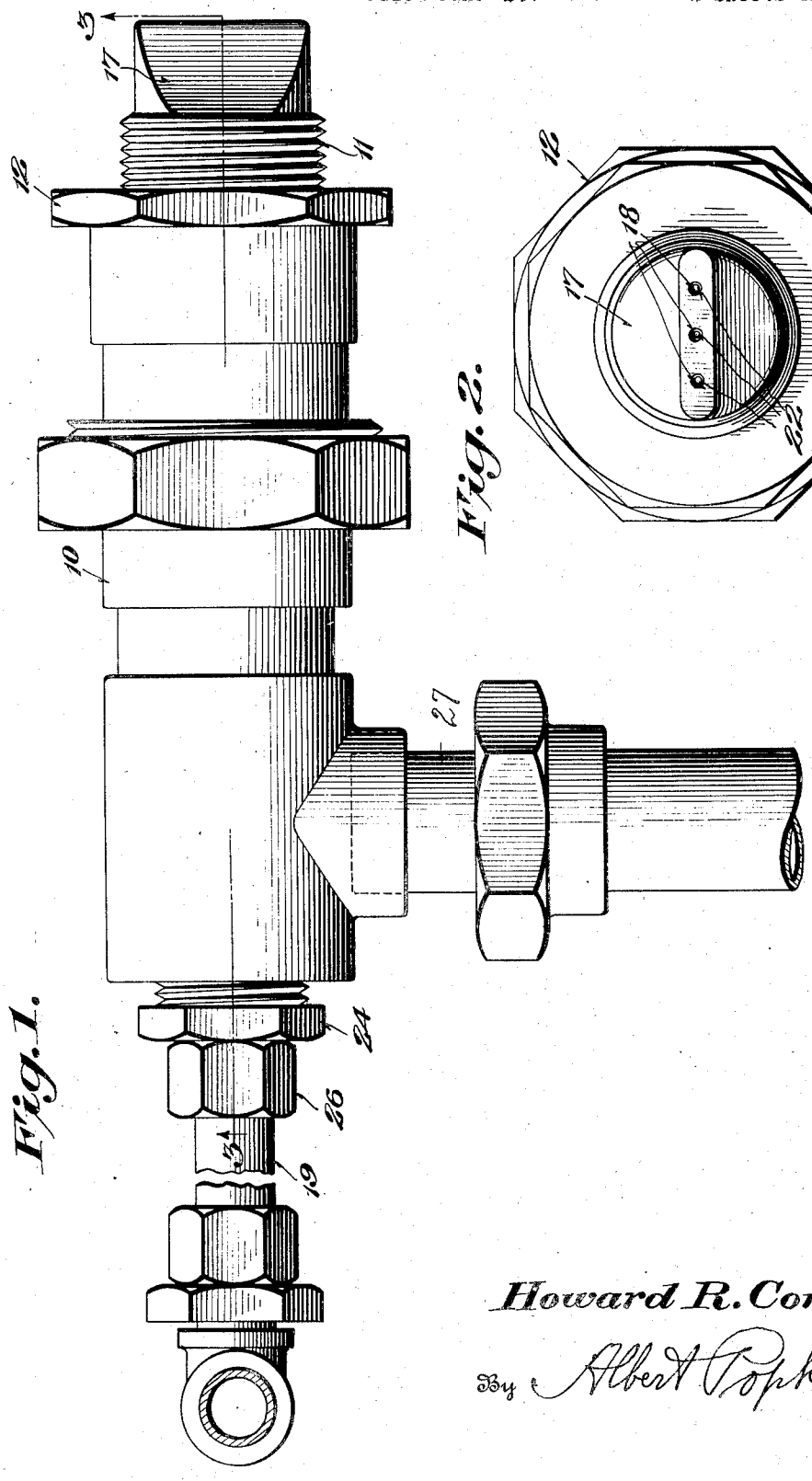


Fig. 1.

Fig. 2.

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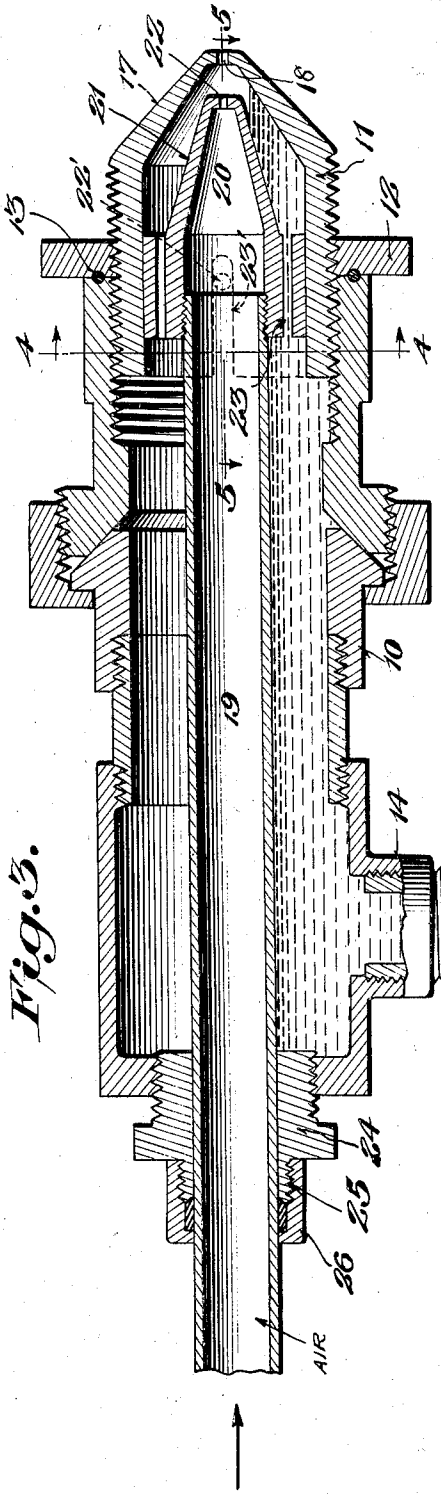


Fig. 3.

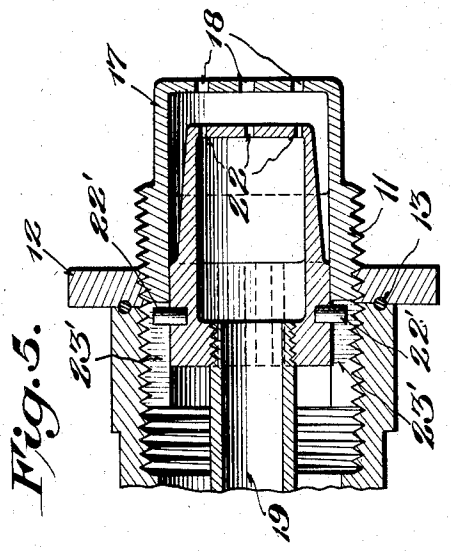


Fig. 5.

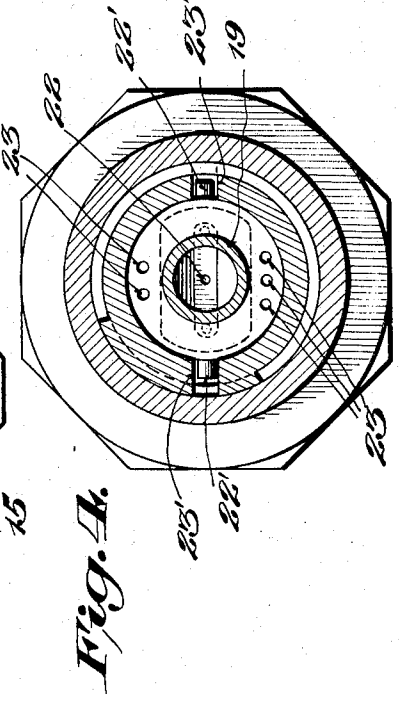


Fig. 4.

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UNITED STATES PATENT OFFICE.

HOWARD RUSSELL CORWIN, OF NEWARK, NEW JERSEY.

VACUUM FLUID BURNER.

Application filed June 24, 1924. Serial No. 722,091.

To all whom it may concern:

Be it known that I, HOWARD RUSSELL CORWIN, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Vacuum Fluid Burners, of which the following is a specification.

This invention relates to improvements in liquid burners for the consumption of inflammable liquids, (such as hydrocarbon fluids, alcohol and so forth) mixed with air or gaseous substance, an object being to provide a vacuum fluid burner, or a burner wherein the air and fluid mixture is discharged by the creation of a partial vacuum within the burner.

Another object of the invention is the provision of a burner of this character in which the liquid is evenly distributed over the entire inner wall of the burner so as to be thoroughly broken up and separated for proper mixture with air.

Another object of the invention is the provision of a burner which includes an outer fuel discharge nozzle and an inner air supply nozzle, the nozzles being capable of relative adjustment to regulate the length of the flame and the degree of heat.

With the above and other objects in view, the invention further includes the following novel features and details of construction, to be hereinafter more fully described, illustrated in the accompanying drawings and pointed out in the appended claims.

In the drawings:—

Figure 1 is a top plan view of a burner constructed in accordance with the invention.

Figure 2 is an end view of the same.

Figure 3 is a longitudinal sectional view, on the line 3—3 of Figure 1.

Figure 4 is a transverse section on the line 4—4 of Figure 3.

Figure 5 is a section on the line 5—5 of Figure 3.

Referring in detail to the drawings wherein like characters of reference denote corresponding parts, the burner as shown comprises an outer shell 10 which is made up of a number of threadedly connected sections and which has threadedly secured in one end an outer or fuel discharge nozzle 11. This nozzle is held in place by means of a lock nut 12 and clamped between this nut and the end of the shell 10 is a gasket or packing 13. One section of the shell is provided with a nipple 14 to which is secured one end of an oil supply pipe 15, the securing means including a packing gland 16. The nozzle 11 has its discharge end flattened or tapered upon opposite sides as indicated at 17 and the outer reduced end is provided with one or more discharge openings 18.

Extending into the shell 10 is an air supply pipe 19 through which air under pressure is supplied to the burner. The inner end of this pipe has threadedly secured thereon a nozzle 20 whose outer end is tapered upon opposite sides as indicated at 21 so as to provide a flattened discharge end having one or more openings 22 therein. The openings 22 are in alignment with the openings 18 and are preferably smaller in size than the openings 18.

The nozzle 20 has extending therefrom an annular enlarged portion or flange which is provided with ports or passages 23 extending therethrough. Liquid supplied to the shell 10 will pass through these passages into the nozzle 11 so that a liquid supply chamber is provided in the burner.

The nozzle 20 is capable of adjustment longitudinally within the burner and relatively to the nozzle 11 and to permit this, the nozzle 20 has extending therefrom pins 22′ which enter slots 23′ provided in the nozzle 11, the said slots extending longitudinally of the said nozzle. The nozzle 20 may thus be moved axially of the burner while the openings 22 will remain in a line with the openings 18.

The pipe 19 extends through the opposite end of the shell 10 and the latter is provided with a nut 24 having an opening for the passage of the pipe. This nut carries a threaded extension 25 which is engaged by a combined packing and binding nut 26. By loosening the nut 26, the pipe and consequently the burner 20 may be adjusted longitudinally and when the desired adjustment is obtained the nut 26 may be tightened to hold the nozzle 20 against accidental movement.

In operation, air under pressure entering the burner through the pipe 19 will pass outward through the openings 22 and will provide a partial vacuum around the nozzle 20, causing the fluid to form a circular spray with the oil evenly distributed entirely around the circumference of the dis-

charge end of the said nozzle 20 so that this spray will be picked up by and mixed with the air and the mixture discharged through the openings 18 of the nozzle 11. The oil emitted is projected from the openings 18 of the nozzle 11; into the fire box, is atomized and coned like a funnel about the air which passes through the air supply pipe while the atmospheric air is forced ahead and outside of the supply of oil thereby effecting complete combustion.

By the adjustment of the nozzle 20 toward or away from the discharge end of the nozzle 11, the length of the flame and the degree of heat may be regulated so as to adjust the burner for different fire boxes.

By making the openings 22 smaller in size than the openings 18 a more perfect breaking up or atomization of the fluid is effected. This not only provides a more perfect mixture but prevents the formation of carbon. In all fluid burners of this type the oil is forced ahead of the air, while in this device by means of the air coming through openings 22 draws the oil after it from in front of the nozzle 20 and discharges it through the openings 18 of the nozzle 11.

The burner as a whole is mounted upon a suitable swivel support 27 which will permit the vertical up and down movement of the same.

It is obvious that minor changes may be made in the form, proportions and details of construction of the invention without in any way departing from the material spirit thereof. It is not, therefore, desired to confine the invention to the exact form herein shown and described, but it is wished to include all such as properly come within the scope of the appended claims.

Having described the invention what is claimed is:—

1. A burner comprising an outer shell, a nozzle at one end of the shell, an air supply pipe extending longitudinally within the shell, a nozzle at the inner end of the pipe, the last mentioned nozzle being located within the shell nozzle, means whereby liquid may be supplied to the shell, an annular enlargement on the inner nozzle centering it relative to the outer nozzle, said enlargement having passages therethrough and said shell nozzle having longitudinally disposed guide slots therein, pins extending from the inner nozzle into said slots, whereby the inner nozzle may be longitudinally adjusted and means for holding the inner nozzle in adjusted position.

2. A burner comprising a shell adapted to be supplied with a liquid, an outer nozzle at one end of the shell, an air conduit extending within the shell, an inner nozzle at the inner end of the conduit, said outer nozzle and inner nozzle being each provided with diametrically spaced openings with the openings of both nozzles disposed in axial alignment, means whereby the nozzles may be relatively adjusted and means for maintaining axial alignment of the openings of the outer and inner nozzles.

3. A burner comprising a shell adapted to be supplied with a liquid, an outer nozzle at one end of the shell, an air conduit extending within the shell, an inner nozzle at the inner end of the conduit, said outer nozzle and inner nozzle being each provided with diametrically spaced openings with the openings of both nozzles disposed in axial alignment, means whereby the nozzles may be relatively adjusted and a slot and pin connection with the outer and inner nozzles to prevent relative rotary movement.

4. A burner comprising an outer shell, adapted to be supplied with a liquid, an outer nozzle at the end of the shell, an air supply pipe extending longitudinally within the shell, a nozzle at the inner end of the pipe, the last mentioned nozzle being spaced from and surrounded by the outer nozzle defining a partial vacuum chamber, said outer and inner nozzles being each provided with diametrically spaced openings with the openings of both nozzles disposed in axial alignment, means whereby the nozzles may be relatively adjusted and means for maintaining axial alignment of the openings of the outer and inner nozzles.

In testimony whereof I affix my signature.

HOWARD RUSSELL CORWIN