May 6, 1924. 1,492,986

B. W. HURD

OIL BURNER

Filed Dec. 21, 1922 2 Sheets-Sheet 1

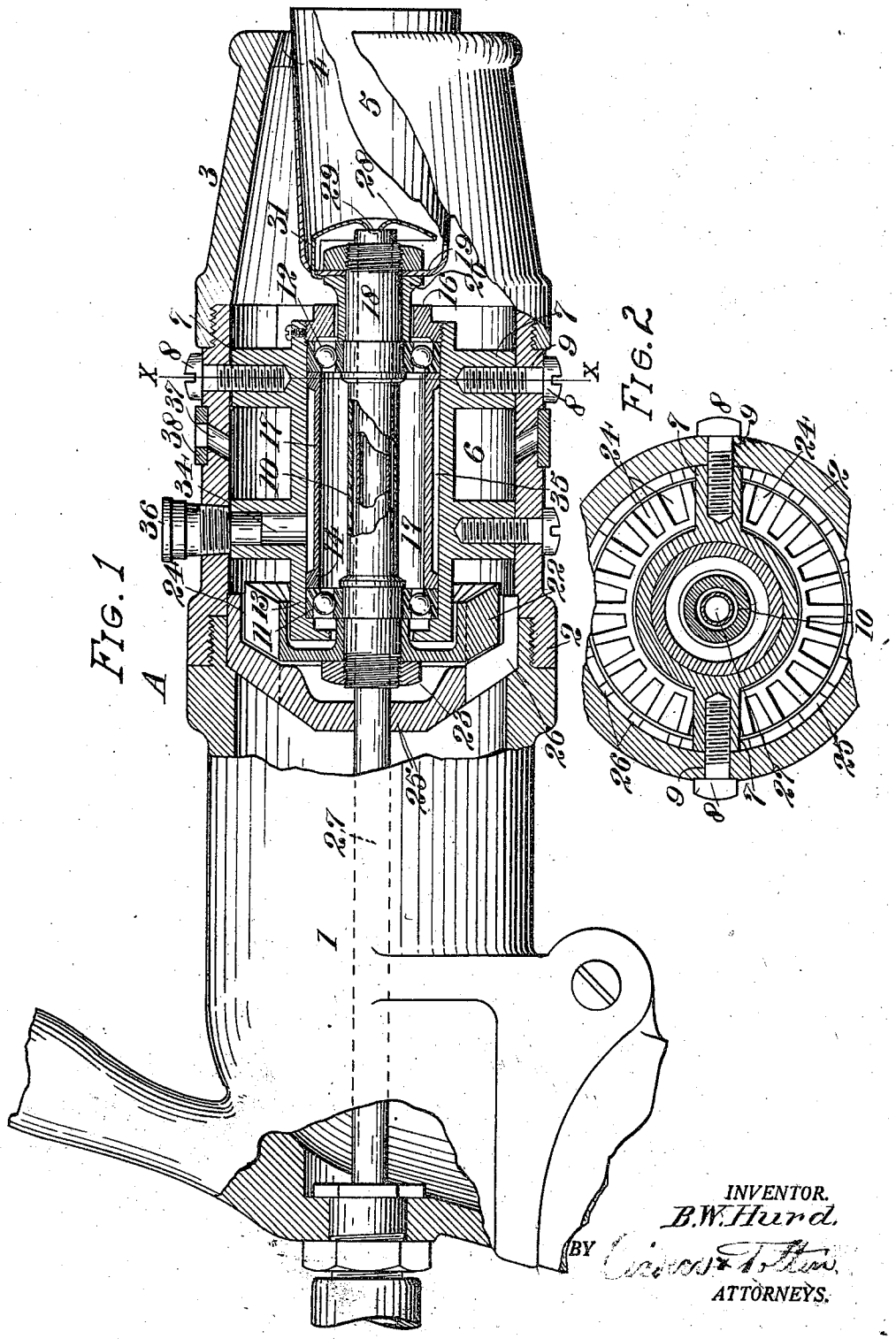


FIG. 1

FIG. 2

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FIG. 3.

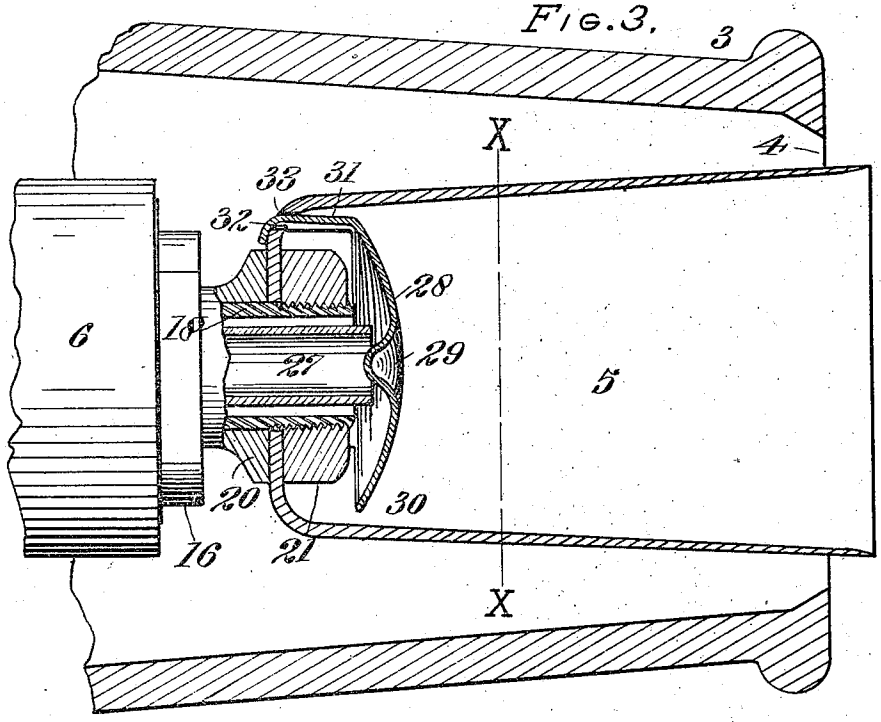


FIG. 4

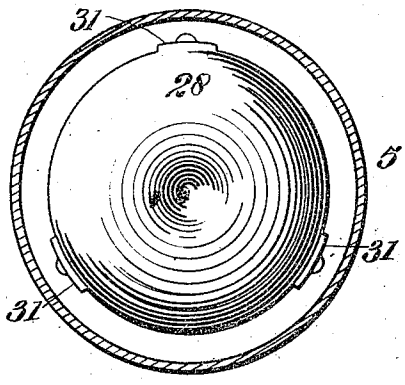
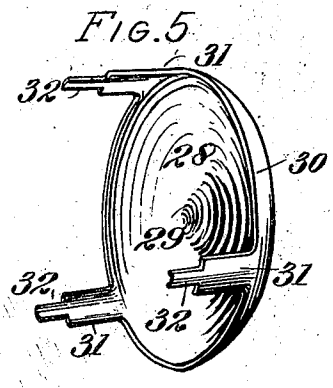


FIG. 5



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Patented May 6, 1924. 1,492,986

UNITED STATES PATENT OFFICE.

BENJAMIN W. HURD, OF SAN FRANCISCO, CALIFORNIA.

OIL BURNER.

Application filed December 21. 1922. Serial No. 608,144.

To all whom it may concern:

Be it known that I, BENJAMIN W. HURD, a citizen of the United States, residing at the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Oil Burners, of which the following is a specification.

Atomizing rotary oil burners as at present manufactured are difficult and costly to repair and require the shutting down of a plant for a considerable time when repairs are necessary. They also admit of the entrance of the oil into the cup by gravity and without universal distribution over the interior of the cup.

It is to overcome these objections that the present invention has been designed, and this invention has for its principal objects to provide a mounting for an atomizing or burner cup so constructed that the same is solely supported within the nozzle and by the nozzle enabling it to be removed therefrom as a unit. A further object is to provide a construction wherein the burner is constructed of a plurality of sections, one of which serves as a mounting for the cup and bearing enabling a new section mounting the cup and bearing to be substituted by merely disconnecting the nozzle sections. Another object is to provide a deflector plate over the end of the fuel feed pipe for deflecting the oil radially of the base of the cup.

With the above mentioned and other objects in view, the invention consists in the novel construction and combination of parts hereinafter described, illustrated in the accompanying drawings, and set forth in the claims hereto appended, it being understood that various changes in the form, proportion, size and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

To more fully comprehend the invention reference is directed to the accompanying drawings, wherein:—

Figure 1 is a view in broken side elevation of the preferred embodiment of my invention.

Figure 2 is a transverse sectional view on line X—X of Figure 1.

Figure 3 is an enlarged sectional view in detail of the cup and the deflector plate within the nozzle tip.

Figure 4 is a sectional view taken on line X—X of Figure 3, and

Figure 5 is a view in perspective of the deflector plate removed from the base of the cup.

Referring more particularly to the several views of the drawings wherein like characters of reference designate corresponding parts, A indicates an oil burner nozzle consisting of the base 1 intermediate nozzle section 2 and nozzle tip 3 all of tubular formation and detachably secured together with the intermediate nozzle section 2 forming a connecting member between the nozzle base 1 and nozzle tip 3. The nozzle tip 3 is formed with the conventional tapering discharge opening 4, within which is mounted the well known type of atomizing or burner cup 5. The cup is of a diameter less than the opening 4 to provide an air passage therearound. Within the intermediate nozzle section 2 is mounted a tubular hub supporting frame 6, of a diameter less than the interior of the nozzle section 2 to afford an air passage surrounding said hub and extending longitudinally within the section 2. Extending from opposite sides of the hub are the hub mounting lugs or fingers 7 of a length to contact with the inner wall of the nozzle section 2, and said lugs afford a means for fastening the hub supporting frame within the section 2. Securing means, as for example screws 8 may be employed for reception within threaded openings within the lugs 7, and insertion through corresponding openings 9 in the wall of the nozzle section 2 to secure the frame within said nozzle section 2. Insertable within the tubular frame 6 preferably from its forward end is a tubular cup mounting hub 10 rotatably supported at its opposite ends within the frame on the respective bearings 11 and 12. The outer race 13 of the bearing 11 abutting against the flange 14 on the frame and the outer race fitting of the bearing 12 being retained by a nut 16 threaded into the opening in the tubular supporting frame 6. A spacer 17 surrounds the hub 10 between the bearings 11 and 12. The outer end 18 of the hub extends through the base 19 of the cup 5 and said cup is clamped thereon between a sleeve 20 and the retaining nut 21 threaded over the end of the extension 18. Thus it will be observed that the cup 5 is supported solely by the hub 10

and that said hub is in turn rotatably mounted within and supported by the frame 6, which is in turn detachably secured within the intermediate nozzle section 2. To the rear end of the hub 10 is secured a rotor 22 clamped thereon by a nut 23 and formed with a radially slotted periphery 24. Said rotor is mounted adjacent to a stationary air deflector 25, also formed with a radially slotted periphery 26, and said deflector is fixed within the nozzle base 1.

The fuel oil for combustion is fed to the cup 5 through a pipe 27, which passed through the tubular hub 10 and about which said hub rotates. The pipe terminates at the base of the cup 5, and positioned over the discharge end of said pipe is an inverted conical deflector plate 28 formed in its center with an inturned conical portion 29 projecting into the discharge end of the pipe 27, and said portion 29 and deflector plate affording a means for distributing the oil discharged from the pipe 27 uniformly in all directions to the said wall of the cup 5. The peripheral edge 30 of the deflector is positioned at a point below the discharge end of the pipe 27, as in Figure 3 and said deflector plate is provided with the supporting legs 31 for securing the same to the base of the cup. The legs at their ends are reduced as at 32, and said reduced portions are adapted for insertion in openings 33, and after passing thereinto are bent over to retain the deflector within the cup to rotate therewith. One of the lugs or fingers 7 of the frame 6 is tubular as at 34 affording a lubricant entrance into the lubricant chamber 35 surrounding the hub spacer 17, and the opening in said tube 34 is adapted to be closed by a plug 36.

Under certain conditions, it has been found desirable to admit additional air into the space surrounding the frame 6 through ports 37 formed in the wall of the intermediate nozzle section 2, and said ports are controlled by the movement of a ported ring 38 encircling the section 2 and movable axially about the same.

Air under pressure for operating the rotor to cause the rotation of the cup 5 at high speed is supplied through the tubular nozzle base by any suitable mechanism, and it will be observed that the air under pressure striking the rotor 22 will act thereon to cause a rotation of the hub 10 and cup 5, which cup mounts the plate 28, the rotation of which deflects the oil striking the under side thereof toward the wall of the cup so that the same will leave the lip of the cup in a film of uniform thickness and uniformly distributed throughout the area of the cup.

Should for any reason the cup bearing or rotor become inoperative, it is only necessary to disconnect the nozzle tip section 3 from the intermediate nozzle section 2 and then disconnect the section 2 from section 1, which permits the removal of the hub supporting frame and cup as a unit and a new section 2 may be substituted in place thereof threaded to the nozzle base 1 and the nozzle tip 3 secured thereto.

I claim:—

1. A burner for liquid hydrocarbon fuels, including a tubular nozzle having a discharge tip at one end, a tubular supporting frame integrally mounted within and supported by said nozzle with its side wall in spaced relation to the inner wall of the burner affording an air passage, a tubular hub rotatably mounted therein, an atomizing cup at one end of the hub within the discharge tip, a radially slotted rotor at the other end of the hub and extending into said air passage, means for feeding fuel into the base of the cup and means for rotating said cup.

2. In combination with a tubular burner shell and including a nozzle tip and an intermediate nozzle section, a tubular hub supporting frame movably mounted within said intermediate nozzle section, a plurality of hub mounting lugs extending therefrom for retaining said frame within said section to afford an air passage therearound, a tubular hub rotatably mounted within the frame, a burner cup mounted on one end thereof and projecting into the tip, a radially slotted rotor mounted on the other end, a fuel feed pipe extending through said hub and discharging into said cup at its base, and a baffle rotatable with the cap and extending transversely across the discharge end of said pipe.

3. A rotary oil burner including a nozzle consisting of a tubular nozzle base, a tubular nozzle tip, and a tubular intermediate section all held from rotation and the latter detachably uniting said other two sections one at each end thereof in alignment, a fuel feed pipe extending through said nozzle and discharging within said tip, a rotatable burner cup within said tip and into which said pipe discharges, a bearing for said cup carried by said intermediate section with its main body spaced from the inner wall of said intermediate section, said bearing being detachably mounted within said section and removable as a unit therewith from said nozzle base.

4. A rotary oil burner including a tubular nozzle divided transversely into a plurality of separable sections, a fuel feed pipe extending longitudinally of the center thereof, a rotatable burner cup at the discharge end of said burner and axially into which said pipe discharges, a tubular rotatable hub through which said pipe extends and mounting said cup, a bearing frame integrally mounted within and supported by one of said sections and within which said hub is rotatably mounted, said frame, hub, and

burner cup adapted for removal from said pipe as a unit on the separation of said sections

5. A burner for liquid hydrocarbon fuels, including a tubular nozzle having a discharge tip at one end, a tubular supporting frame mounted within said nozzle with its side wall in spaced relation to the inner wall of the burner affording an air passage, a tubular hub rotatably mounted therein, an atomizing cup at one end of the hub within the discharge tip, a radially slotted rotor also carried by the hub and extending into said air passage, means for feeding fuel into the base of the cup, and means for rotating said cup.

In testimony whereof I have signed my name to this specification.

BENJAMIN W. HURD.