

April 27, 1926.

E. H. PEABODY
MECHANICAL ATOMIZER

Filed July 24, 1922

1,582,080

2 Sheets-Sheet 1

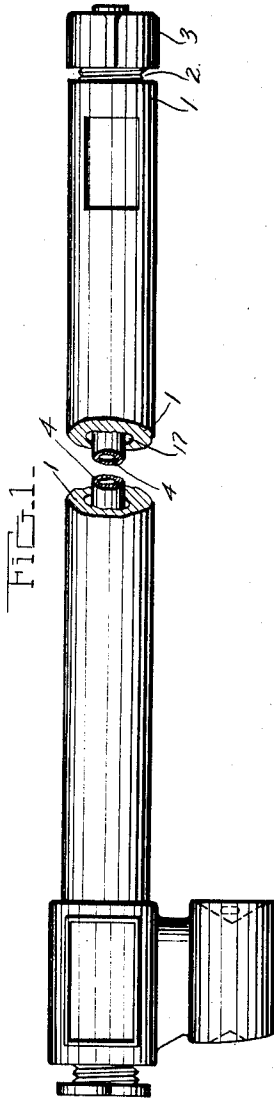


FIG. 11.

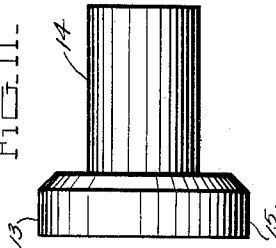


FIG. 10.

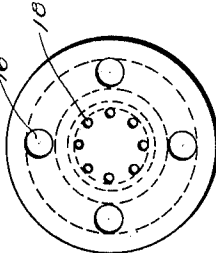


FIG. 9.

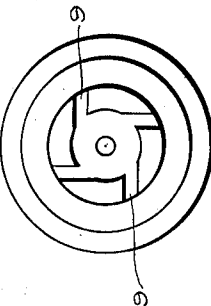


FIG. 15.

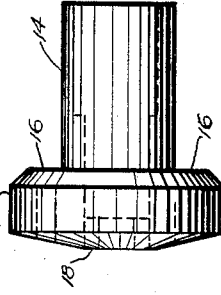


FIG. 14.

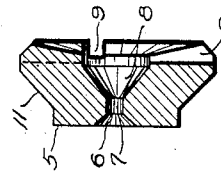


FIG. 13.

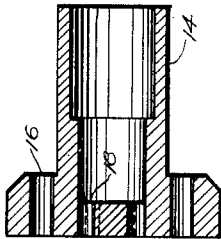
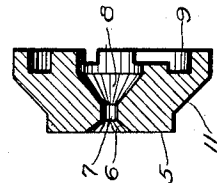


FIG. 12.



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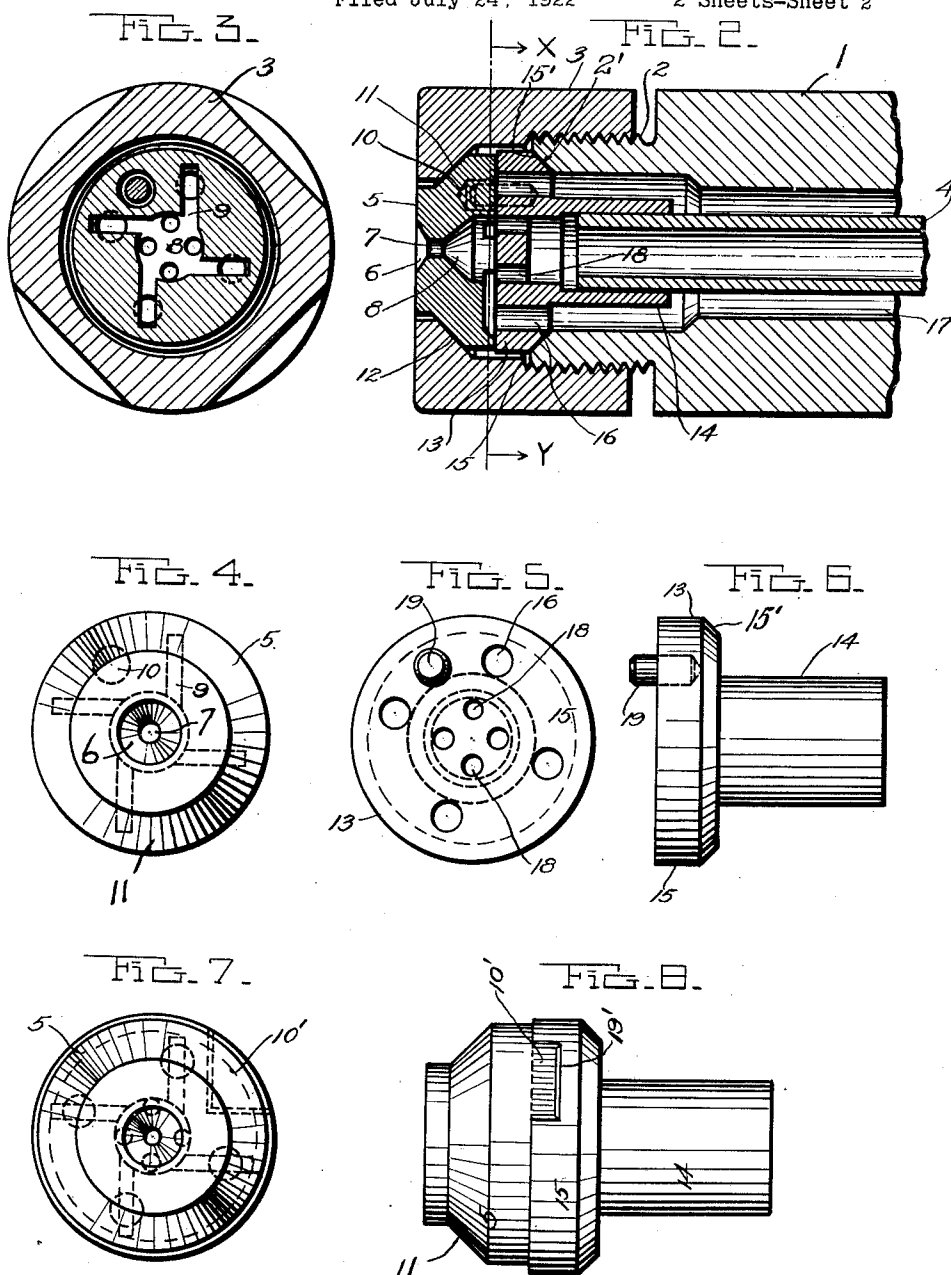
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MECHANICAL ATOMIZER

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

ERNEST H. PEABODY, OF PELHAM MANOR, NEW YORK.

MECHANICAL ATOMIZER.

Application filed July 24, 1922. Serial No. 577,315.

To all whom it may concern:

Be it known that I, ERNEST H. PEABODY, a citizen of the United States, and resident of Pelham Manor, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Mechanical Atomizers, of which the following is a full, clear, and exact description.

This invention relates to an atomizer and more particularly to that type of mechanical atomizer used for burning oil, wherein the oil is forced under pressure through a restricted passage and given a whirling motion so that it is broken up into a fine diffused spray by centrifugal force.

An object of my invention is to form an atomizer of this type wherein the effective capacity or rate at which oil is ejected from the tip may be varied over a wide range without loss of atomizing power.

Another object is to provide an atomizer constructed of a minimum number of parts, easily assembled and disassembled, and cheaper in cost than other devices of this kind.

Another object is to so arrange the parts and particularly the by-pass orifices that a more regular and efficient operation shall be obtained under all varying rates of discharge.

Other objects will be apparent from the following detailed description and appended claims.

In the drawings:

Figure 1 is a side view of my atomizer on the end of a burner, broken away to show the coaxial discharge and supply pipes.

Figure 2 is an enlarged section of the tip assembly along the axis of the burner.

Figure 3 is a cross section along the line *x-x* of Figure 2.

Figure 4 is an end view of the tip detached.

Figure 5 is an end view of the plug detached.

Figure 6 is a side view of the same.

Figure 7 is an end view of a modified form of tip.

Figure 8 is a side view of the same with the cooperating closure plug.

Figure 9 is an end view of a modified form of tip.

Figure 10 is an end view of a modified form of plug for use therewith.

Figure 11 is a side view of the plug shown in Figure 10.

Figure 12 is a longitudinal section through a modified form of tip.

Figure 13 is a longitudinal section through the form of plug cooperating therewith.

Figure 14 is a longitudinal section through still another form of tip.

Figure 15 is a side view of a plug cooperating therewith.

A main fuel supply pipe 1 is provided with a reduced threaded portion 2 on which is threaded a cap 3. The reduced portion also has a bevel 2'. A return pipe 4 for excess oil is preferably concentric with the pipe 1.

A tip 5 has a conical depression 6 in its front face communicating through a discharge orifice 7 with a rear chamber 8. The plane of the rear face of the tip is provided with grooves 9 which enter the chamber 8 tangentially to the walls thereof. The rear face of the tip 5 may be provided with a socket 10 (Figure 4) or a projection 10' (Figure 7) for a purpose hereinafter set forth, and the front face has a bevel 11 against which a bevel 12 on the inside of the cap 3 bears to properly center and hold the parts when assembled.

A closure plug 13 has a rear cylindrical portion 14 which interfits with the return pipe 4, and an enlarged annular front portion 15 provided with passages 16 which connect the grooves 9 with the interior of the fuel pipe 1. The front portion of the plug which lies opposite the chamber 8 has passages 18 which lead from the chamber 8 to the return pipe 4. The annular portion 15 also has a pin 19 (Figure 6) or a slot 19' (Figure 7) which is adapted to interfit with the socket 10 or projection 10' to insure correct assembly of the parts. The annular portion 15 also has a beveled rear face 15' which fits against the bevel 2' when the parts are assembled.

To assemble the parts, it is only necessary to slip the part 14 of the plug into engagement with the return pipe 4, locate the tip in proper relation to the plug, and then screw the cap 3 on to the threaded portion

2. The rear face of the portion 15 of the plug rests against the front end of the reduced threaded portion of the pipe 1, and the bevel 12 of the cap engaging the similar bevel 11 of the tip draws all parts into a firm relationship and in proper alignment. The depressed portion 6 is provided in order that the discharge orifice 7 shall not be deformed by accidental blows during handling, shipping, or installation.

In the preferred form illustrated, the return passages 18 lie symmetrically about the axis of the plug. They lead from the periphery of the chamber 8. Each of the passages 16 communicates with the outer end of a groove 9, while the inner end of each groove communicates almost directly with a return passage 18.

With the parts arranged as thus described, the return flow is taken care of with very little effect upon the whirl in the chamber 8, and consequently substantially complete atomization is attained regardless of the relative amount of oil that is by-passed to the return pipe.

While the preferred embodiment has been illustrated, it is obvious that certain changes may be made without departing from the spirit of my invention. It will be readily understood that any form of registering the tip 5 and the plug 13 in proper relation so that grooves 9 will communicate with the passages 16 other than that shown, may be employed and it is evident that the passage 16 may even terminate in an annular groove illustrated in alternate design in Figures 12 and 13 so that any position of the tip with respect to the plug will serve to complete the passages from the supply tube 17 to the mixing chamber 8.

In Figure 9 I have illustrated the rear plane face of the tip 5 showing the modified form in which I employ a ring connecting the tangential slots 9 at their outer ends. In Figures 10 and 11 I illustrate my plug which is adapted to fit up against the tip 5 as shown in Figure 9. With this assembly the pin 19 is not required as will be readily understood.

In the modification shown in Figures 12 and 13, the rear face of the tip is provided with an annular channel with which communicate both the tangential passages and the inlet ports in the plug.

It is also evident that the rear face of the tip may be any angle with respect to the longitudinal axis of the burner as long as the rear face of the tip 5 is in contact with the front face of the plug 13. It will be observed by referring to Figure 14 the tip as illustrated has a conical rear face the slots 9 being milled so as to form a slot of progressively decreasing cross section toward the mixing chamber. The number of return passages may be increased or de-

creased. In general, the invention may be said to be limited only by the scope of the appended claims.

I claim as my invention:

1. An atomizer comprising an oil supply pipe having a threaded end, a concentric oil return pipe, a closure plug having a rearward extension which interfits with the return pipe, and an annular portion bearing at its rear face against the end of the supply pipe, a tip fitting against the front face of said annular portion and having a front beveled end, and a cap that screws on the screw threaded portion of the supply pipe and has a bevel engaging the beveled end of the tip.

2. An atomizer comprising an oil supply pipe having a threaded end, a concentric oil return pipe, a closure plug having a rearward extension which interfits with the return pipe and an annular portion bearing at its rear face against the end of the supply pipe, a tip fitting against the front face of said annular portion and having a front beveled end, means for compelling the assembly of plug and tip in a definite relation to each other, and a cap that screws on the screw threaded end of the supply pipe and has a bevel engaging the beveled end of the tip.

3. An atomizer comprising a tip having a chamber in its rear portion, a discharge orifice leading therefrom, and tangential passages in its rear face communicating with said chamber, and a closure plug having a front portion with passages therethrough near its periphery which communicate with the outer ends of the tangential passages, said plug also having return passages leading directly from said chamber.

4. An atomizer comprising a tip having a chamber in its rear portion, a discharge orifice leading therefrom, and tangential passages in its rear face communicating with said chamber, and a closure plug having a front portion matching the rear face of the tip and provided with passages near its periphery which communicate with the outer ends of the tangential passages, said plug also having return passages leading directly from said chamber at points substantially corresponding with the inner ends of the tangential passages.

5. An atomizer comprising a tip having a chamber in its rear portion, a discharge orifice leading therefrom, and tangential passages in its rear face communicating with said chamber, a closure plug having a front portion matching the rear face of the tip and provided with passages near its periphery which communicate with the outer ends of the tangential passages, said plug also having return passages leading directly from said chamber at points substantially corresponding with the inner ends of the

tangential passages, and means for compelling the assembly of plug and tip in a definite relation to each other.

5 6. An atomizer comprising a tip having a plane rear face, a chamber in its rear portion, tangential passages leading thereto and a discharge orifice leading therefrom, a closure plug having a cylindrical portion with a front face matching the rear face of the tip and with passages therethrough communicating with the tangential passages, concentric oil supply and return pipes, an extension from the closure plug interfitting with the return pipe, and means for holding said parts in definite relation to each other.

7. An atomizer comprising a supply pipe having a beveled front end, a closure plug having a beveled annular face matching and fitting into the bevel in the front end of the pipe and a plane front end, a tip having a plane rear face matching the front end of the closure plug and a beveled front portion, and means engaging said beveled front portion for holding the parts assembled.

25 8. An atomizer comprising a supply pipe having a beveled front end with a threaded portion, a closure plug having a beveled annular face matching and fitting into the bevel in the front end of the pipe

plane front end, a tip having a plane rear face matching the front end of the closure plug and a beveled front portion, and a cap engaging the beveled portion of the tip and screwing upon the supply pipe to hold the parts assembled.

9. An atomizer comprising a supply pipe having a threaded end and beveled face portion, a return pipe within said supply pipe, a closure plug having a cylindrical portion fitting against the face of the supply pipe and a rearward extension communicating with the return pipe, a tip having a plane rear face matching the front face of the plug and a front beveled portion, and means engaging the beveled portion of the tip and threaded upon the end of the supply pipe to hold the parts assembled.

10. An atomizer comprising a supply pipe, a cap attached thereto, a tip and a closure plug interposed between the supply pipe and the cap, said closure plug and supply pipe having co-acting beveled surfaces and said tip and cap having co-acting beveled surfaces, and means for centering the tip and plug axially with respect to the supply pipe.

In testimony whereof I affix my signature.

ERNEST H. PEABODY.