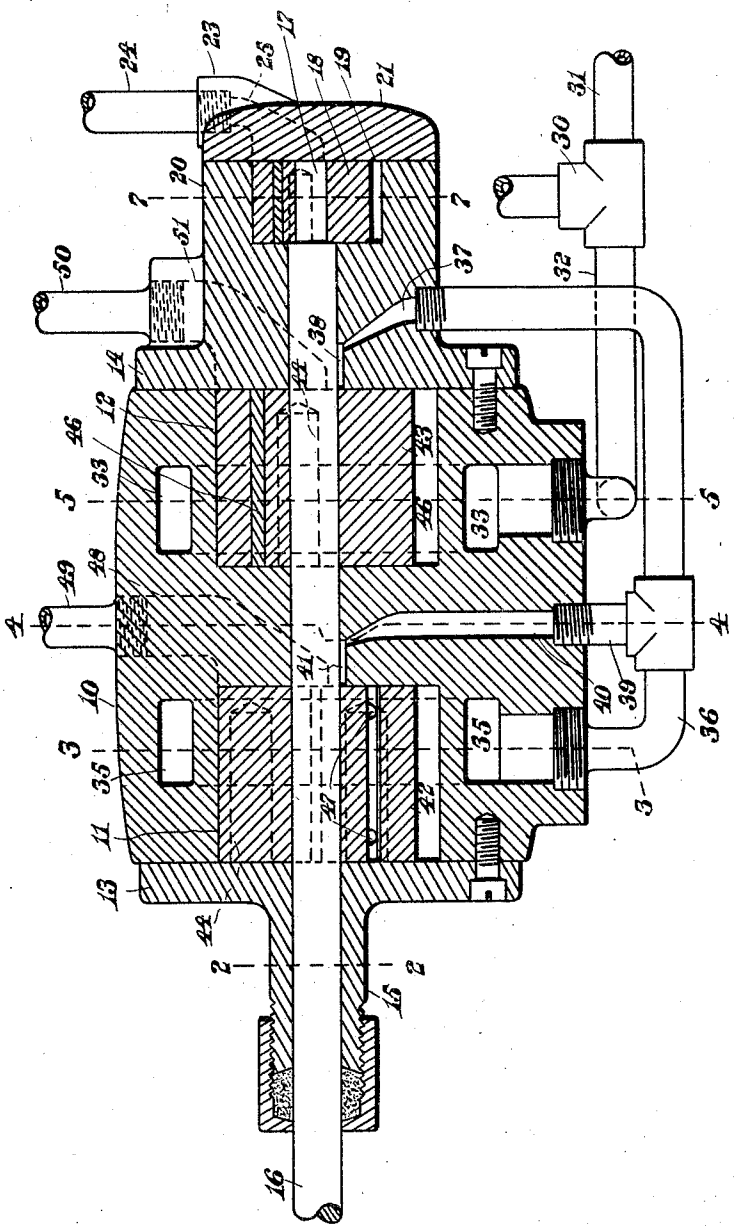
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Fig. 1.



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Fig. 2.

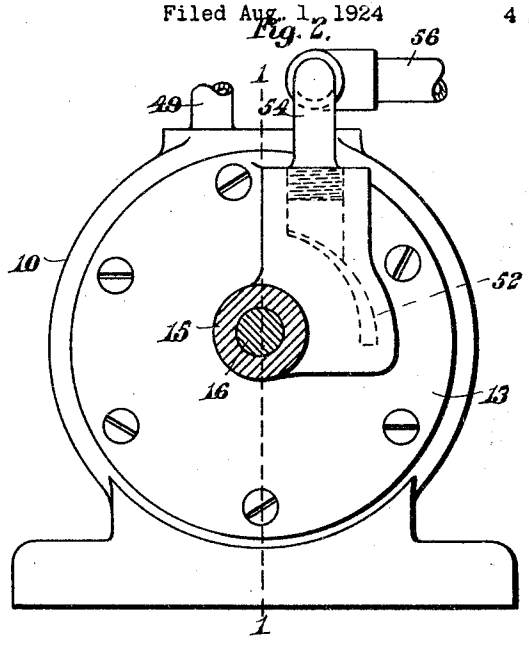
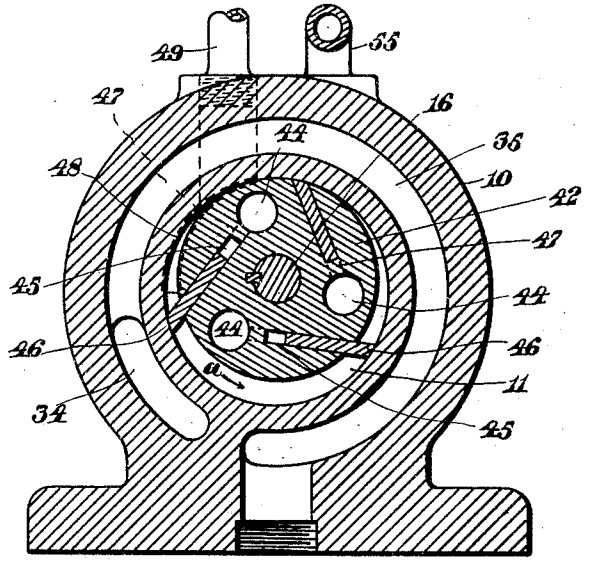


Fig. 3.



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Fig. 4.

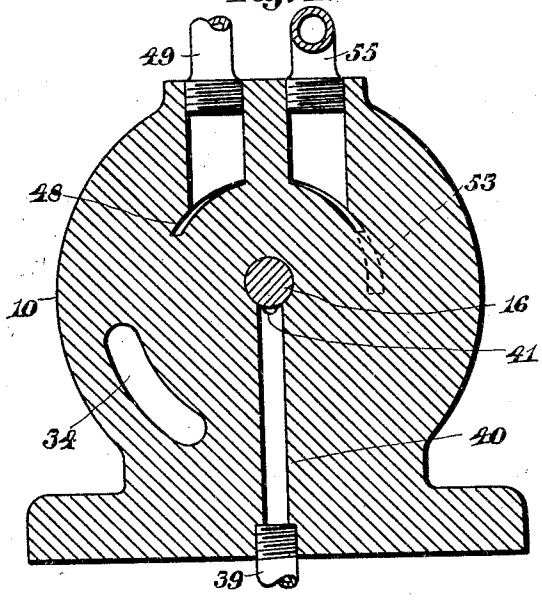
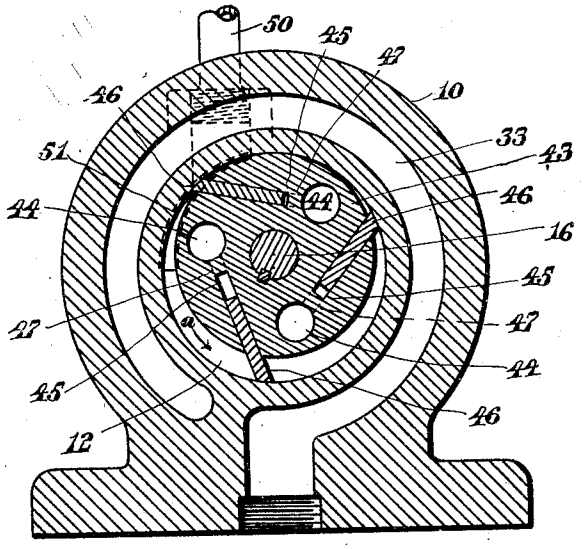


Fig. 5.



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Fig. 6.

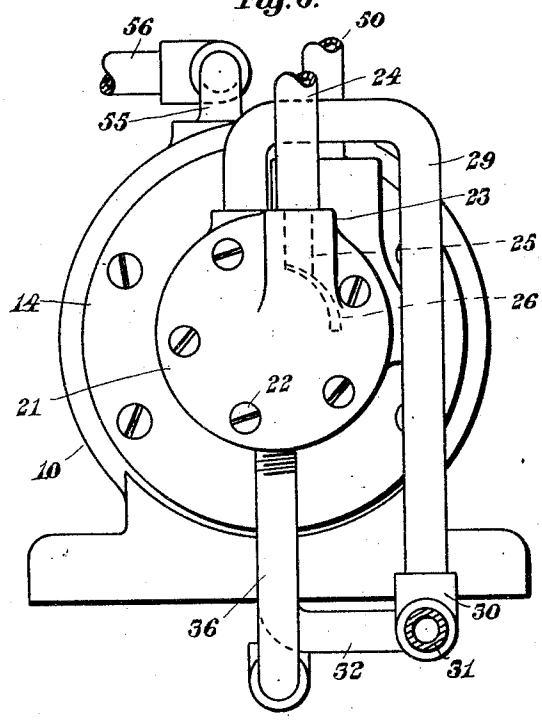


Fig. 7.

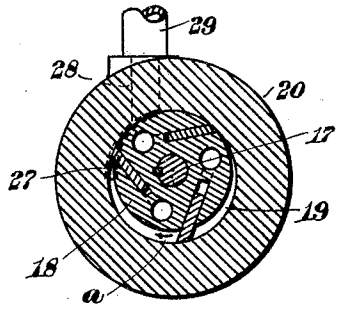
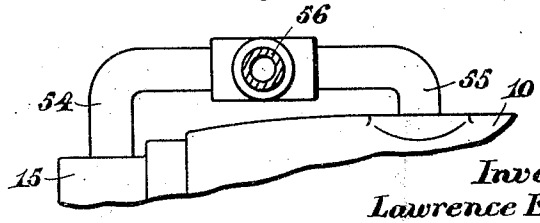


Fig. 8.



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Patented Dec. 11, 1928. 1,694,783

UNITED STATES PATENT OFFICE.

LAWRENCE E. JOHNSON, OF MELROSE, SINIUS M. HANSEN, OF LYNN, AND JOHN T. McTARNAHAN, OF BRIGHTON, MASSACHUSETTS; SAID HANSEN AND SAID JOHNSON ASSIGNORS, BY MESNE ASSIGNMENTS, TO VICTOR SHOE MACHINERY COMPANY, OF LYNN, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

PUMP.

Application filed August 1, 1924. Serial No. 729,461.

This invention relates to compressors and has for its object the production of a machine of this character to which air and oil may be admitted and compressed to form a mist in which condition it may be delivered to an oil burner.

These objects are attained by the machine illustrated in the accompanying drawings.

For the purpose of illustrating the invention, one preferred form thereof is illustrated in the drawings, this form having been found to give satisfactory and reliable results although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized and the invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described except as required by the scope of the appended claims.

Of the drawings:

Figure 1 represents a vertical section of a compressor embodying the principles of the present invention, the cutting plane being on line 1, 1, on Fig. 2.

Figure 2 represents a transverse section of same on line 2, 2, on Fig. 1.

Figure 3 represents a transverse section of same on line 3,3, on Fig. 1.

Figure 4 represents a transverse section of same on line 4, 4, on Fig. 1.

Figure 5 represents a transverse section of same on line 5, 5, on Fig. 1.

Figure 6 represents an end elevation of same.

Figure 7 represents a transverse section on line 7, 7, on Fig. 1, and

Figure 8 is a detail and elevation showing the delivery pipe from the compressor to an oil burner.

Similar characters indicate like parts throughout the several figures of the drawings.

In the drawings, 10 is a casing having chambers 11, 12 therein, the outer ends of which are closed by the end plates 13 and 14 respectively.

The end plate 13 has an outwardly extending hub 15 having a bearing therein for the revoluble shaft 16 which extends through bearings in the casing 10 with its opposite end disposed in a bearing in the end plate 14.

This opposite end of the shaft 16 has a reduced end 17 to which is keyed a disk or piston 18 rotatable with said shaft 16 in the chamber 19 formed in the hub 20 of the end plate 14.

The chamber 19 is closed by a cap 21 secured to the end of hub 20 by screws 22 and having thereon a boss 23 to which is threaded one end of an oil supply pipe 24 communicating with one end of a passage 25, the opposite end of which communicates with the chamber 19 through a port 26 which is wide at one end and gradually tapers to a point where the passage 25 communicates therewith.

The chamber 19 on its inner face has a similarly shaped outlet port 27 leading therefrom, the thinner end of which communicates with a passage 28 in the hub 20.

A pipe 29 leads from the outer end of passage 28 to a by-pass valve 30 which may be of any well known construction.

From this valve 30 extends a pipe 31 to the source of oil supply and another pipe 32 extends to a passage 33 surrounding the chamber 12. The passage 33 communicates through the port 34 (Figs. 3 and 4) with one end of a similar passage 35 surrounding the chamber 11.

The opposite end of the passage 35 communicates with one end of a pipe 36, the opposite end of which communicates with a passage 37 leading to a recess 38 beneath the shaft 16 and extending to the chamber 12.

The pipe 36 has a branch pipe 39 extending to the passage 40 the opposite end of which communicates with a recess 41 beneath the shaft 16, which recess communicates with the chamber 11.

The shaft 16 is eccentrically disposed within the chambers 11, 12, and secured thereto and revoluble therewith are the oppositely disposed pistons 42 and 43, the former being positioned in chamber 11 and the latter in chamber 12.

Each of these pistons has a plurality of cylindrical pockets 44 extending parallel to and offset from the axis of the shaft and located inwardly from the pressure side. Inclined slots 45 extend from end to end of each piston.

Each slot 45 has a blade 46 therein and the

inner end of each slot 45 has passages 74 extending therefrom to one of the pockets 44 so that the material under compression within said pockets may pass through said passages 47 and force the blades 46 outwardly with their outer ends in contact with the cylindrical wall of said chambers 11 and 12.

The chamber 11 has an inlet port 48 (Fig. 3) through which air is admitted to said chamber from any suitable source of supply through the pipe 49.

From the same source of air supply a pipe 50 leading to the port 51 admits air to the chamber 12.

The pistons 42, 43 and 18 revolve in the direction of the arrow *a* on Figs. 3, 5, and 7.

As the pistons 42, 43 revolve the air in the chambers 11, 12 will be compressed and while under compression will be ejected from said chambers 11, 12 through the pressure ports 52 and 53 respectively, the port 52 communicating with the delivery pipe 54 and the port 53 communicating with the delivery pipe 55.

Both pipes 54 and 55 connect with the pipe 56 leading to an oil burner.

The pistons 42, 43 are always in contact at one point with the cylindrical wall of the chambers 11, 12 and the inlet ports 48, 51 and discharge ports 52, 53 are uncovered at all times.

These ports are all wider at one end and tapered towards the opposite end, and air will be admitted to a chamber 11 or 12 in advance of a blade 46 and as the blade advances the air pocketed between it and the preceding blade will be compressed in the space between the pistons 42, 43 and the cylindrical wall of the chambers 11, 12.

When one of the blades 46 commences to pass a pressure port 52, 53 the compressed air behind it and in front of a succeeding blade will be ejected through said delivery ports in gradually decreasing quantities owing to the tapered shape of said ports.

The piston 18 of the oil pump is constructed in a manner similar to the construction of the pistons 42, 43 and as the piston 18 rotates the oil admitted to the chamber 19 will be forced into the pipes 29, 32 and then through the passages 33, 35 and from the passage 35 through pipes 36, 39 to the recesses 38, 41 where it will lubricate the shaft 16 and its bearings.

The pistons 42, 43 are not so closely fitted within the chambers 11, 12 but that portions of the oil within the recesses 38, 41 will leak into the chambers 12, 11 and mix with the air being compressed in said chambers.

Only a small proportion of oil is used as for instance 1% of oil to 500% of air.

When the air and oil have been thoroughly mixed and the mixture compressed it will be in the form of a very fine mist and when in this condition and being discharged through the pipe 56 into an oil burner it will be very combustible.

Obviously this makes a very economical fuel for use in oil burners.

In the rotation of the pistons 18, 42 and 43, the blades are so disposed that each in moving away from an intake port creates a vacuum in the piston chamber causing material (oil or air) to be drawn into the chambers 19, 11 and 12, which material will be compressed by the forward movement of the next succeeding blade after it has passed said intake port and then under pressure this materail will be ejected through the outlet port.

The device is very compact and the wearing surfaces are reduced to a minimum with the result that said device will last indefinitely.

It will be noted that the oil pumped into the air chambers not only passes around said chambers in the passages 33, 35 and tends to keep the chambers from over-heating, and lubricates the bearings and movable elements but also forces the blades 46 outwardly into contact with the cylindrical walls of the air chambers. This oil having performed these functions is then mixed with the air in the chambers 11, 12 and compressed to such an extent that the mixture forms a highly inflammable mixture particularly adapted for use in oil burners and the like.

It is absolutely noiseless which is an advantage particularly desirable in the heating systems of private homes.

As the oil in the pockets 44 passing through the openings 47 into the pockets 45 move the blades 46 outwardly the use of springs for this purpose is made unnecessary.

Without further description, it is believed that the operation and many advantages of the invention will be fully apparent.

Having thus described our invention, we claim:

1. In a compressor, the combination of a cylindrical chamber; a revoluble shaft; a piston in said chamber on said shaft and having slots therein and pockets parallel with and offset from the axis of said shaft and extending inwardly from one end thereof; blades in said slots; means for admitting material to said chamber and through holes extending to the inner ends of said slots from said pockets and against the inner ends of said blades to force said blades outwardly.

2. In a compressor, the combination of a cylindrical chamber; a revoluble shaft eccentrically disposed therein; a piston thereon within said chamber contacting with the cylindrical wall thereof at one point only; compressing mechanism carried by said piston; an inlet port at one end of said chamber on one side of said contacting point; and an outlet port at the opposite end of said chamber on the opposite side of said contacting point.

3. In a compressor, the combination of a

cylindrical chamber; a revoluble shaft eccentrically disposed therein; a piston thereon within said chamber contacting with the cylindrical wall thereof at one point only; compressing mechanism carried by said piston; an inlet port at one end of said chamber on one side of said contacting point; and an outlet port at the opposite end of said chamber on the opposite side of said contacting point, said ports having their greatest width at the bottom and gradually decreasing in width to their upper ends.

4. In a compressor, the combination of two cylindrical chambers; a revoluble shaft eccentrically disposed therein; pistons on said shaft within said chambers contacting at one point only with the cylindrical walls of said chambers; movable blades in slots formed in said pistons, the blades of one piston being oppositely disposed relatively to the blades of the other piston; means for admitting air to both chambers at one end thereof; and means for discharging compressed air at the opposite ends of said chambers.

5. In a compressor, the combination of a casing having two cylindrical chambers; a shaft extending through and located eccentrically in relation to said chambers; pistons fast on said shaft in said chambers; said pistons having slots therein, and pockets offset from the axis of the shaft, communicating with said slots and extending to ends of said pistons; blades in said slots; passage in the casing leading to the chambers; and means for forcing liquid through said passages and into said pockets, thereby to press the blades outwardly against the surfaces of the chambers.

Signed by us at Lynn, Mass., this 24th day of July, 1924.

LAWRENCE E. JOHNSON.
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JOHN T. McTARNAHAN.