March 5, 1946. F. A. BARTHOLOMEW 2,395,984

CONDENSING MOTOR

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Fig. 1.

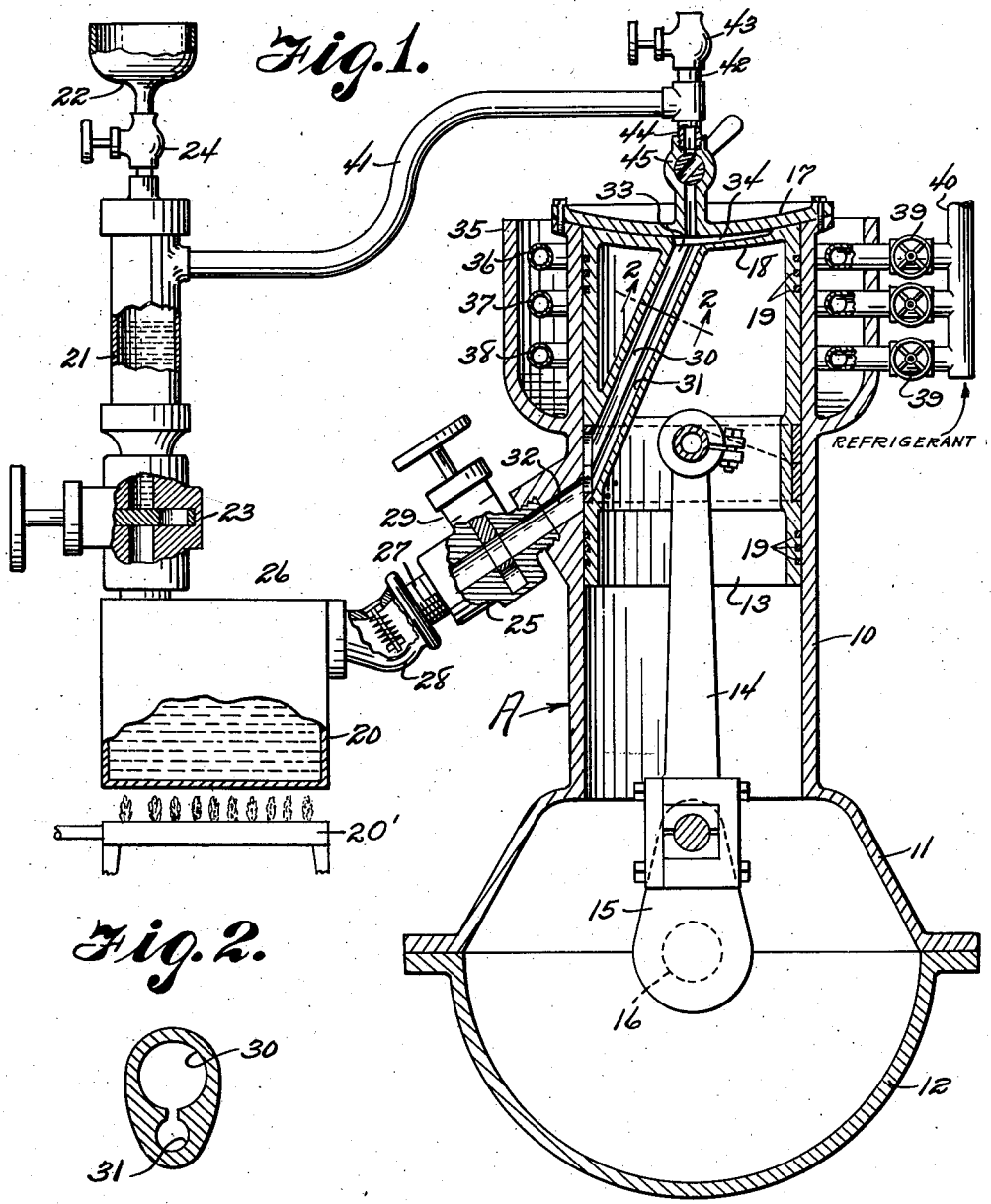

Fig. 2.

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CONDENSING MOTOR

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4 Claims. (Cl. 60—34)

The invention relates to a motor, and more especially to a condensing motor.

The primary object of the invention is the provision of a motor of this character, wherein water is turned into steam within a boiler, so that the steam is utilized for the driving of the said motor, the latter being for the purpose of creating power for the operation of machinery.

Another object of the invention is the provision of a motor of this character, wherein maximum power is had, the steam being used as a medium for operating the motor, thus eliminating the consumption of gasoline or other like fuel, the motor being or novel construction, and its speed of operation can be regulated in a convenient manner.

A further object of the invention is the provision of a motor of this character, which is simple in construction, thoroughly reliable and efficient in operation, economically actuated, strong, durable, and inexpensive to manufacture and install.

With these and other objects in view the invention consists in the features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawing, which discloses a preferred embodiment of the invention, and pointed out in the claims hereunto appended. It is to be understood that changes, variations and modifications may be made without departing from the spirit of the invention or sacrificing any of its advantages as come properly within the scope of the claims hereunto appended.

In the accompanying drawing:

Figure 1 is a side elevation partly in section of the motor and adjuncts constructed in accordance with the invention.

Figure 2 is a sectional view on the line 2—2 of Figure 1, looking in the direction of the arrows.

Similar reference characters indicate corresponding parts throughout the several views in the drawing.

Referring to the drawing in detail A designates generally the motor constructed in accordance with the invention, and comprises a piston cylinder 10 joined with a crank case 11 formed with an oil chamber 12 at its bottom, the cylinder being vertically disposed. It is of course understood that any number of cylinders may be employed for increasing the size of the motor.

Within the cylinder 10 is a reciprocating piston 13 operating a piston rod 14 connected to a crank 15 of a power shaft 16 for driving machinery or the like not shown.

The head 17 of the cylinder 10 is concavo-convexed, and also the impact end 18 of the piston 13 is likewise concavo-convexed, the piston side wall being fitted with packing rings 19 which contact the side wall of the cylinder 10 to prevent fluid leakage therebetween similar to internal combustion engines.

At one side of the cylinder 10 is a water boiler 20, preferably made from copper which may be heated in any desired manner for the heating of water contained in the boiler 20 and the generation of steam. A burner 20' is arranged below the boiler 20 for heating the same. Rising from this boiler 20 is a water stand pipe 21 having an inlet funnel 22 at its top, the pipe being provided with a hand operated cut-off valve 23. Between the upper end of said pipe 21 and the funnel 22 is a hand operated valve 24.

Leading from the cylinder 10 is an inclined feed pipe 25 which communicates with the upper dome portion 26 of the boiler 20, the nipple 27 connecting said pipe to the boiler 20 being fitted with a safety valve 28, while the pipe 25 proper is equipped with a hand operated valve 29.

The piston 13 within the cylinder 10 has formed therein a diagonally disposed intercommunicating double canal, the stretches 30 and 31, respectively, of which open through a port 32 into the feed pipe 25 at one side of the piston 13, and also such stretches 30 and 31 open through a port 33 into a basin 34 created in the end 18 of said piston centrally thereof.

Arranged at the upper portion of the cylinder 10 exteriorly thereof is a jacket 35 having three refrigerant coils 36, 37 and 38, respectively, which are disposed about said cylinder, and each coil is provided with a hand operated control valve 39, the said coils being connected to a refrigerant supply line 40 common thereto.

Leading from the water standpipe 21 is a tube 41 which is connected with an air escape nipple 42 having a hand operated cut-off valve 43 therein, the nipple 42 being extended from a valved outlet 44 in the top of the cylinder 10, the valve 45 for this outlet 44 being hand actuated and is below the nipple 42 as shown in Figure 1 of the drawing, while the valve 43 is above the tube 41 communication with the said nipple.

The shaft 16 is provided with a fly wheel (not shown), the latter being used for the cranking of the motor for the use of steam for fuel in operating the said motor.

In the operation of the motor, water is introduced into the boiler 20 through the funnel 22, this being done by opening valves 23 and 24. On filling the boiler 20 the water is cut off thereto by

closing valve 23 and on creation of steam in the dome of the boiler 20 the valve 29 is opened whereupon the steam will flow through the stretches 30 and 31 of the double canal when the piston reaches nearly the top of its upstroke within the cylinder 10, and the expanding of the steam within the upper end of said cylinder 10 drives the piston 13 downwardly therein. When the piston in its downward stroke reaches approximately one-tenth of such stroke the passages or stretches 30 and 31 of the canal are closed whereupon the expansion within the cylinder 10 together with momentum of the shaft carries the piston 13 to complete its downward stroke and finally the vapor condenses so that the piston is driven upwardly with great power and the condensed spent fluid goes into the stretch 31 of the canal to be returned to the boiler 20 and such operation is continuous. The stretch 30 is materially larger than the stretch 31 of the canal for the successful operation of the motor.

The speed of the motor is controlled by the refrigerant coils 36, 37 and 38 by opening the same in numerical order, while the motor is stopped by cutting off the heating element and opening the valves 45 and 43 in the outlet 44 and the valve 24 next to the funnel 22.

What is claimed is:

1. In a motor of the character described, a cylinder, a reciprocating piston working in the cylinder, a power shaft operated by the piston, a steam boiler having valve controlled communication with the cylinder, means for delivering water to the boiler, a double canal provided in the piston for admitting fluid to and from the boiler and cylinder above the piston, respectively, means for exhausting fluid from the cylinder, and refrigerating means about the cylinder.

2. A motor as set forth in claim 1, comprising selective refrigerant means about the cylinder at the fluid admission end thereon.

3. A motor as set forth in claim 1, comprising selective refrigerant means about the cylinder at the fluid admission end thereof, and means for controlling the delivery of water to the boiler.

4. In a motor of the character described, a vertical cylinder, a piston operating in said cylinder, a power shaft driven from said piston, a boiler, a water supply pipe having valve-controlled communication with the upper portion of said boiler, an outlet pipe leading from the upper end of said cylinder, a branch pipe connecting said outlet pipe with the water supply pipe, there being valves in the outlet pipe above and below the branch pipe, said cylinder having a port at one side, a valve controlled conduit leading from the upper portion of said boiler to said port, said piston having a side port for registering with the side port of the cylinder during movement of the piston and a port in its upper end for communicating with the cylinder above the piston, a conduit extending diagonally in said piston between the side port and the port in the upper end thereof, a shell about the upper portion of said cylinder, a supply pipe for a refrigerant, and refrigerating coils in said shell each having controlled communication with the supply pipe.

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