Dec. 23, 1930. H. A. FLOGAUS 1,785,861

AIR COOLED INTERNAL COMBUSTION ENGINE

Filed Oct. 26, 1927 2 Sheets-Sheet 1

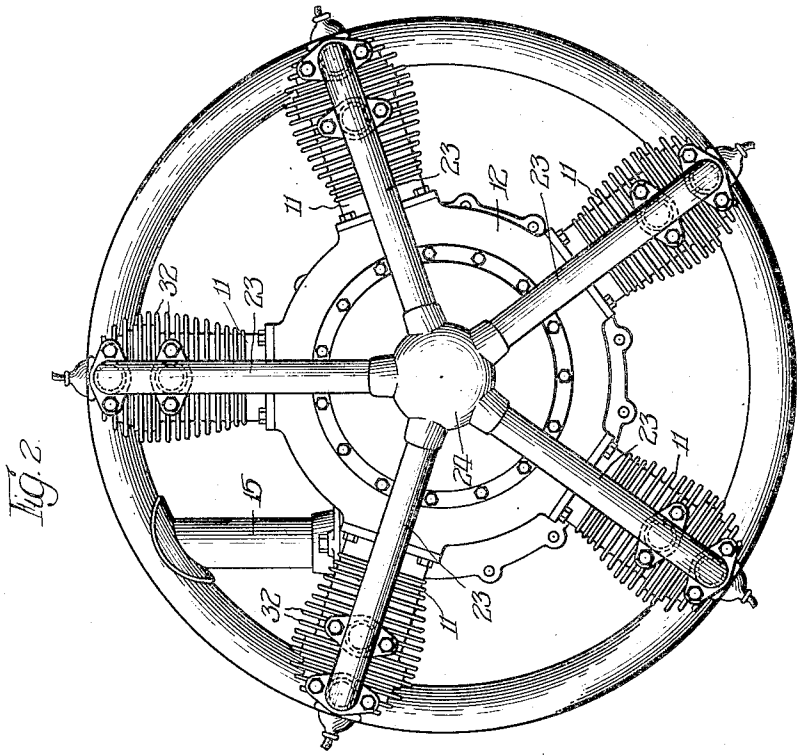


Fig. 2.

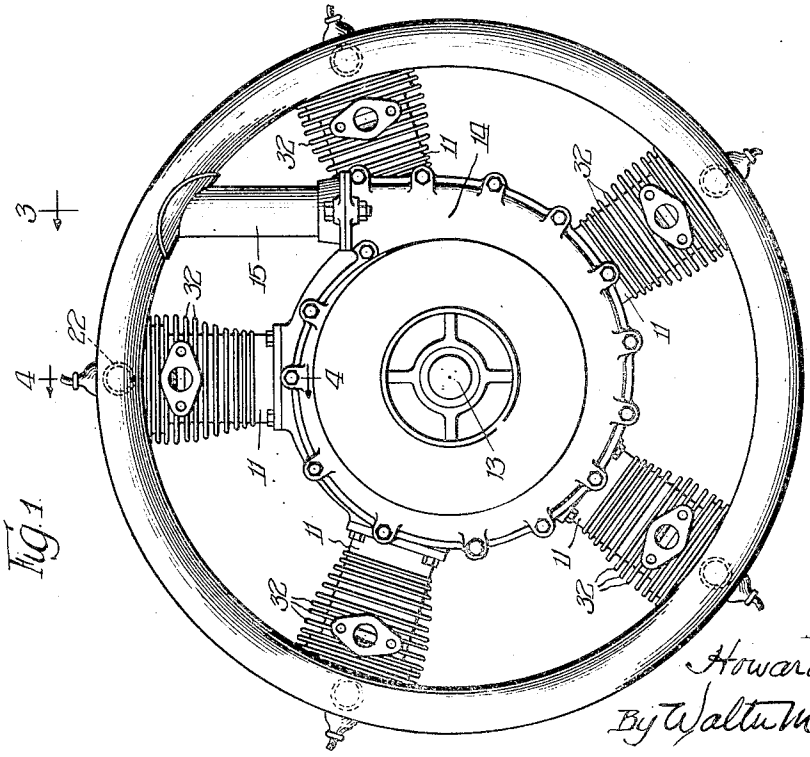


Fig. 1.

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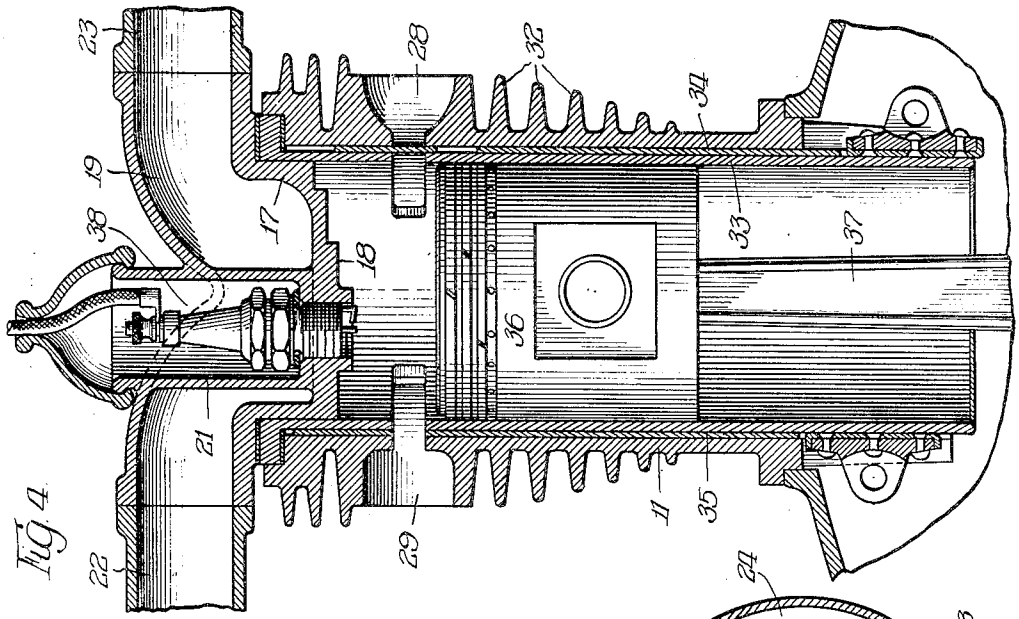


Fig. 4

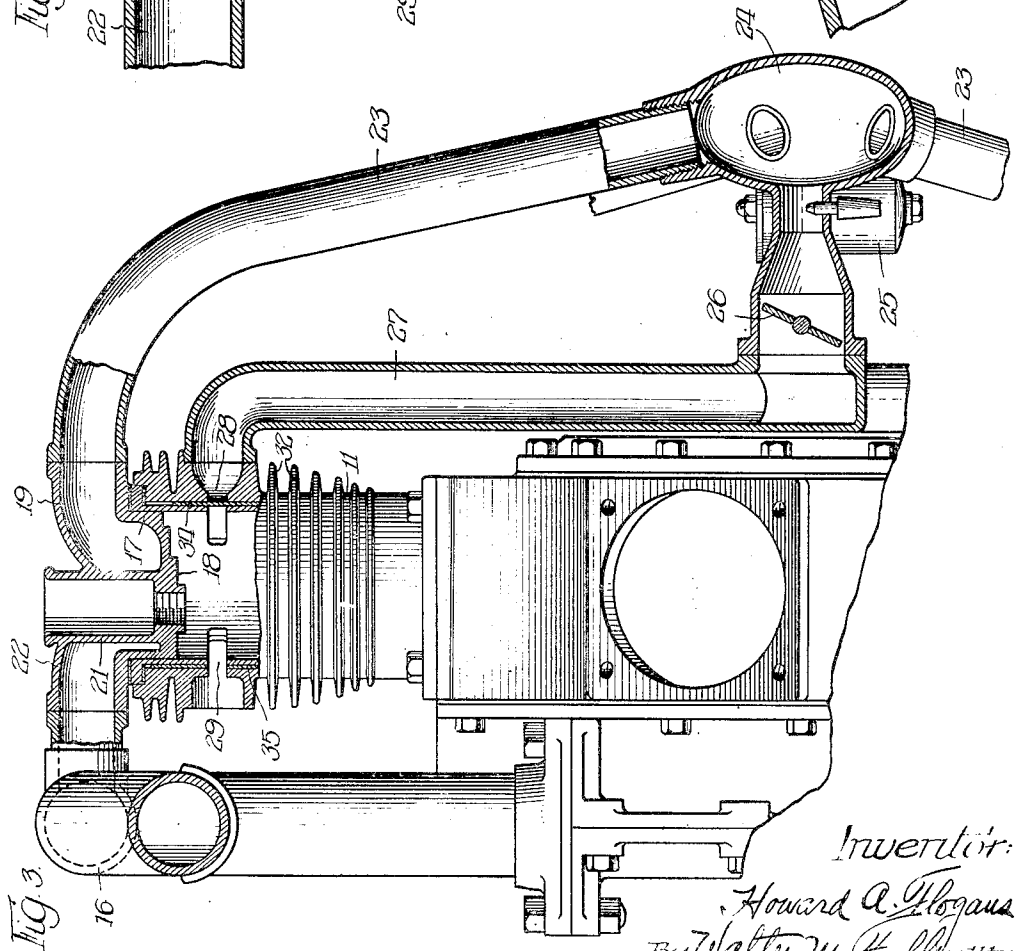


Fig. 3.

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UNITED STATES PATENT OFFICE

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AIR-COOLED INTERNAL-COMBUSTION ENGINE

Application filed October 26, 1927. Serial No. 228,741.

This invention concerns new means and arrangements of associated elements to cool the heads and cylinders of an internal-combustion motor and to supply heated air under pressure to the carbureter, the invention being adapted for satisfactory employment with airplane engines which are subject to radical changes or variations in the eternal atmospheric conditions due to their rise and descent, but it is not necessarily limited to such particular use.

A present preferred embodiment of the invention has been fully illustrated in the accompanying drawings forming a part of this specification and throughout the views of which like reference numerals have been employed to designate the same parts, it being understood, however, that the invention is susceptible of incorporation in physical form in various ways and is not restricted to this particular embodiment.

In these drawings:

Figure 1 is a side elevation of the engine showing the air-blower;

Figure 2 is an elevation of the opposite side of the engine, illustrating the air connections to the carburetor;

Figure 3 is a fragmentary cross-section on line 3—3 of Fig. 1 on an enlarged scale and with parts broken away; and

Figure 4 is an enlarged cross-section through one cylinder of the engine on line 4—4 of Fig. 1.

Referring to these drawings, it will be understood that the multicylinder rotary engine has a plurality of radially disposed cylinders 11 all connected to a central casing 12 accommodating the crank-shaft 13 equipped at one end with an air-blower 14 receiving external air and delivering it under pressure through a discharge-pipe 15 to a circular manifold 16.

Each cylinder, as is shown in Figures 3 and 4, has a somewhat depressed or sunken anti-detonating head 17 having a stepped or abruptly shouldered inner surface 18 which acts to so commingle the gases as to prevent a too-rapid gas combustion and any objectionable sound of detonation, each such head having a bent air jacket or conduit 19 through which the spark-plug socket 21 extends.

One end of each such passage 19 is connected by a pipe 22 to the ring-shaped air-supply manifold 16 and the opposite end of the jacket 19 is joined by a radially-disposed pipe 23 to a central diffusing or mixing chamber 24 connected to the carburetor 25 whose throttle-valve 26 controls or governs the supply of gaseous fuel mixture under pressure to the radiating, fuel, inlet pipes 27 communicating at their outer ends to the intake-ports 28 of the cylinders, each of the latter having an opposed exhaust-port 29 and an associated discharge-pipe 31.

Each cylinder 11, equipped exteriorly with a plurality of separated, circular, outstanding, cooling fins or flanges 32, 32, has within it a stationary inner cylinder or sleeve 33, reciprocatory, ported, sliding valves 34 and 35 operating between them to open and close the inlet and discharge ports at the proper times, each specified inner cylinder having the usual piston 36 and its connecting-rod 37.

From the foregoing it will be clear that the air-blower acts as a super-charger for the carburetor, the air from the blower being fed under pressure through each cylinder-head to perform its cooling function.

On entering each such head, by reason of the central depression 38 in the top wall of the air-jacket of the head, the current of air is deflected downwardly directly on to the upper surface of the anti-detonating wall of the head, whereby it more efficiently and adequately cools such wall, thus permitting the latter, by reason of its reduced temperature, to perform its explosion retarding or anti-detonating function more satisfactorily and more effectively.

Those skilled in this art will readily understand that this invention is not limited and confined to this particular embodiment of the invention and that more or less radical mechanical changes may be incorporated in the structure without departing from the heart and essence of the invention as defined by the appended claims, and without the loss of any of its material benefits and advantages.

For example, the position of the blower in the system may be varied, it merely being required that such blower shall cause the air to traverse the air-jackets and be delivered after being thus heated to the carbureter.

I claim:

1. In an internal-combustion engine, the combination of an engine-cylinder and its head, the latter having a cooling air-jacket with admission and discharge ports, a carbureter and its connections to feed the fuel-mixture to said cylinder, an air-blower operated by the engine, means to conduct the air from said blower to said air-jacket admission-port, and means to convey the air from said jacket discharge-port to the air-intake of said carbureter.

2. In an internal-combustion engine, the combination of a plurality of engine-cylinders, each having an air-jacketed head with admission and discharge ports, a carbureter and its connections to feed fuel-mixture to said cylinders, an air-blower operated by the engine, means to conduct the air from said blower to all of said air-jacket admission-ports, and means to convey the air from all of said jacket discharge-ports to the air-intake of said carbureter.

In witness whereof I have hereunto set my hand.

HOWARD A. FLOGAUS.