Nov. 14, 1950 H. WIEDERKEHR ET AL 2,529,984

AIR-COOLED SUPERCHARGED COMBUSTION ENGINE

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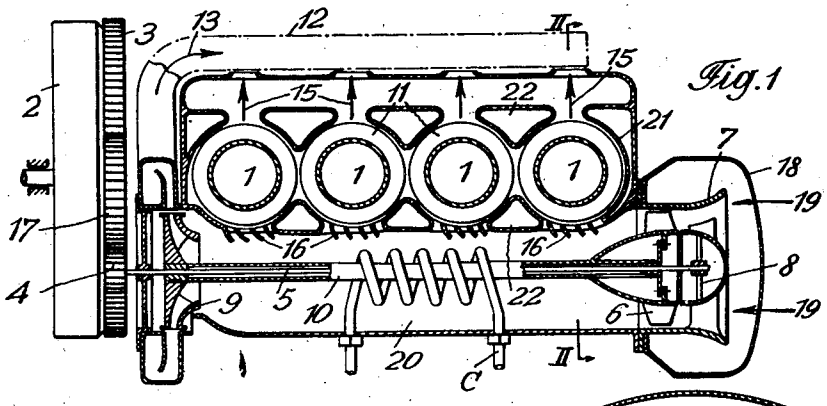


Fig. 1

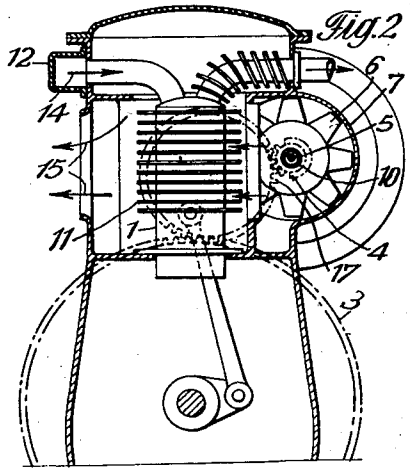


Fig. 2

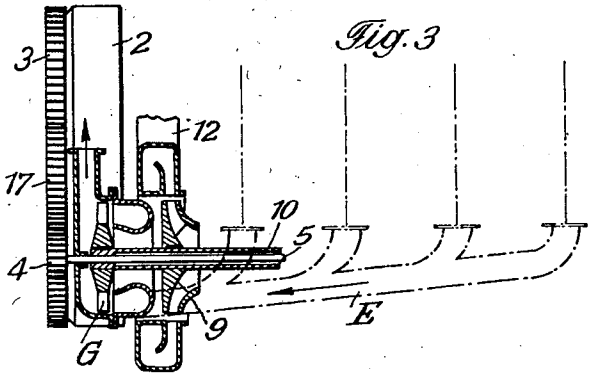


Fig. 3

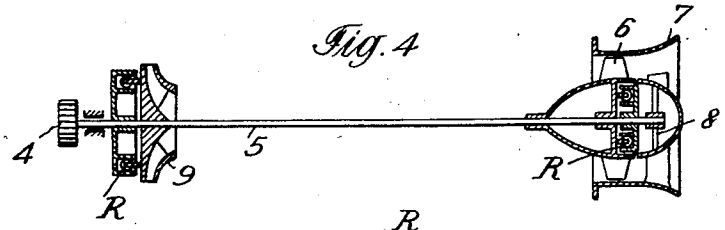


Fig. 4

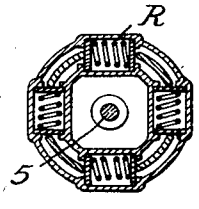


Fig. 5

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AIR-COOLED SUPERCHARGED COMBUSTION ENGINE

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1 Claim. (Cl. 123—41.65)

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This invention relates to improvements in air-cooled supercharged internal combustion engines cooled by an axial blower and supercharged by a radial blower, and consists in that the two blower impellers are secured to a common shaft-assembly, the cooling blower supplying the air to be drawn into the supercharging blower.

The annexed drawing illustrates, by way of example, one embodiment of the present invention, in which

Fig. 1 is a horizontal section of a vertical motor with cylinders in line, and with the blowers in plan;

Fig. 2 a cross-section through the motor on the line II—II of Fig. 1;

Fig. 3 a partial horizontal section of an embodiment comprising a gas turbine;

Fig. 4 a partial horozizontal section of a modification comprising a resilient coupling; and

Fig. 5 a cross section, in a larger scale, of the latter.

As represented in the drawing the engine has a plurality of vertically disposed cylinders 1 arranged in line. Numeral 2 designates an engine flywheel. The blowers are operated from the flywheel-side of the motor, where the speed variations are smallest, by way of a gear wheel 3 secured to the flywheel 2, an intermediate spur wheel 17, and a pinion 4 keyed to the shaft 5 running longitudinal of the motor besides the cylinders. The said shaft 5 may be adapted as a torsion-spring rod, and carries the cooling-blower impeller 6 keyed thereon, and its end is mounted in the bearing 8 which is fixedly secured to the suction funnel 7 which opens into a cowling enclosing at least substantial parts of the engine cylinders. The supercharging-blower impeller 9 is loosely mounted on the shaft 5, and fixedly connected to the cooling blower impeller 6 by means of the tube 10.

The cooling blower impeller 6 sucks outside air through a filter and suction silencer 18 in the direction of the arrows 19 and ejects it into the space 20 provided within the cowling. From the latter, part of the air flows toward the cooling fins 11 of the cylinders 1, and the remainder to the supercharging blower 9. The latter supplies the air required for super-charging and scavenging the cylinders 1, which is fed to the cylinders through the duct 12, partly shown by dash-and-dot lines, in the direction of the arrows 13, 14. The cooling air passes from the chambers of the cylinder cooling-fins 11 in the direction of the arrows 15. For the purpose of guiding the cooling air, guide vanes 16 and baffles 21, 22 are provided.

Pipe coils c for cooling the lubricating oil may be disposed in the space 20. An exhaust-turbine wheel G may be keyed onto the tube 10, permitting of utilising the energy of the exhaust gases for driving the blowers. Such a modification is shown in Fig. 3, wherein E denotes the exhaust manifold.

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The supercharging-blower impeller 9 also could be secured to the shaft 5 directly (Fig. 4), thus eliminating the tube 10. In such a case, the supercharging impeller and also the cooling impeller are preferably connected to the shaft 5 by means of a resilient coupling R.

What we claim and desire to secure by Letters Patent is:

In an air-cooled supercharged internal combustion engine comprising, a casing, a plurality of cylinders in line, a cowling secured to the casing and enclosing parts of the engine cylinders, a flywheel outside the casing, at one end of the line of cylinders, a first blower for supplying both cooling air and combustion air, and a second blower for compressing the combustion air, the impellers of both blowers being fixed to a common shaft which is journaled in the engine casing and driven by the engine, and the air supplied by the first blower being conducted in two parallel branches, one of the latter supplying engine cooling air and the other engine combustion air, the improvement comprising disposing the second blower immediately adjacent that engine cylinder which is next to the flywheel, and forming the conduit which conducts the air from the first blower along the said shaft to the second blower as part of the engine cowling, said cowling having baffles which separate said conduit from the engine cylinders, so that the air passing to the second blower through said conduit does not contact any of the cylinder walls.

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