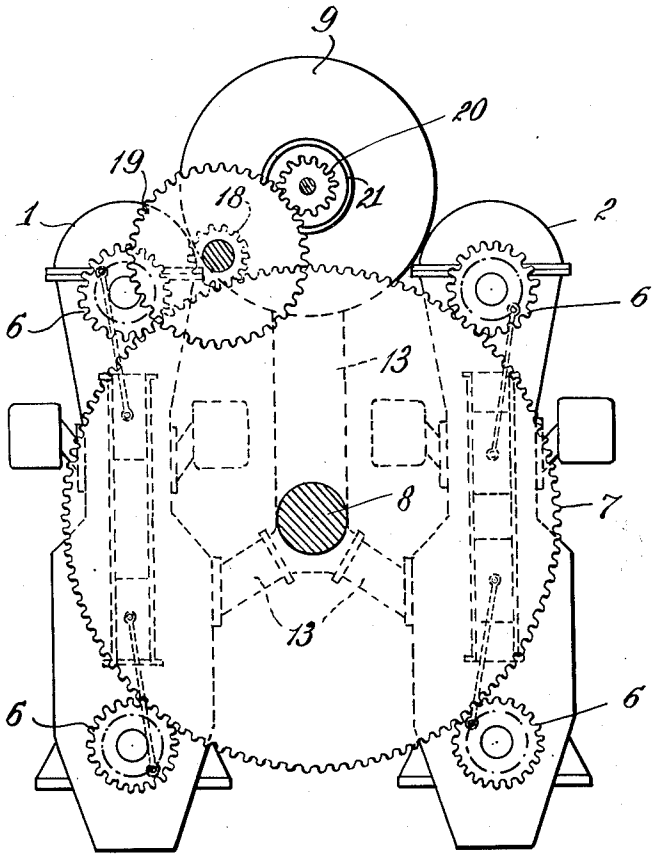
Sept. 26, 1944. E. WAEBER 2,359,065

DOUBLE-SHAFT OPPOSED-PISTON ENGINE SET

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Fig. 1,



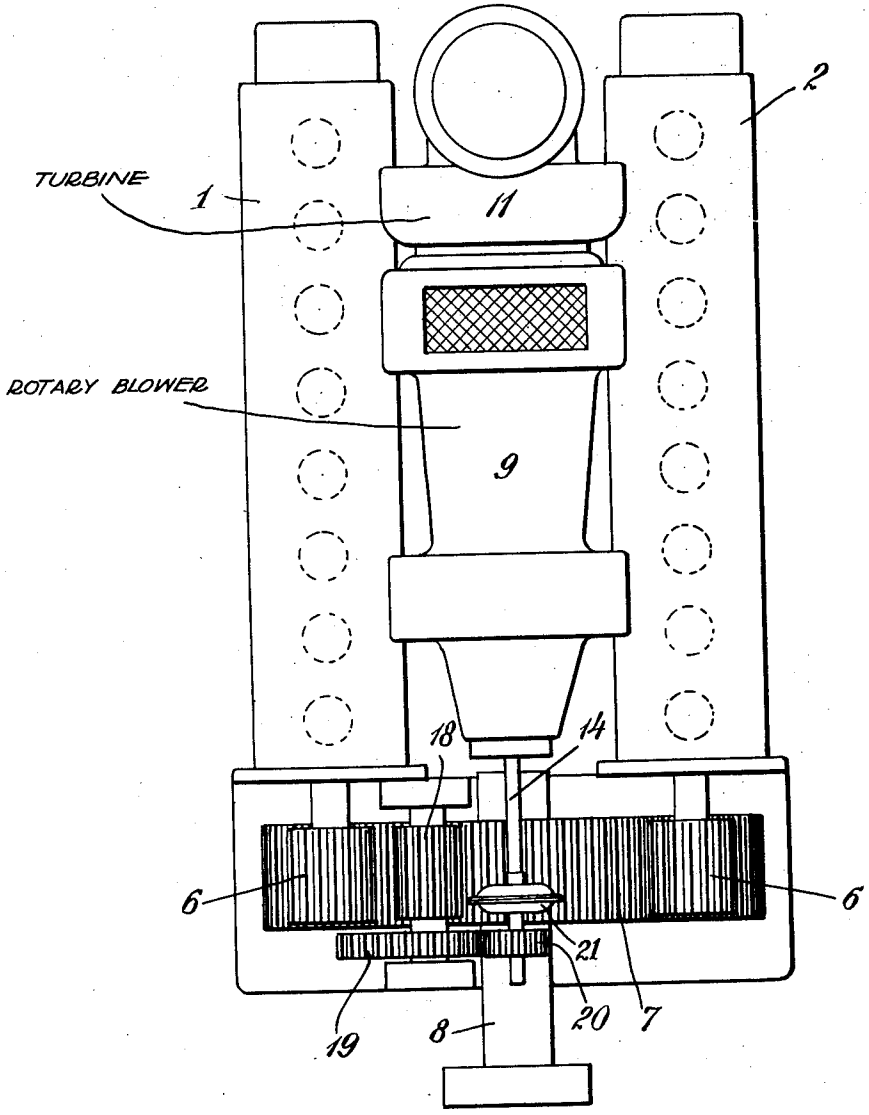
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Fig. 2.



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DOUBLE-SHAFT OPPOSED-PISTON ENGINE SET

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Application December 27, 1941, Serial No. 424,642
In Switzerland April 28, 1941

1 Claim. (Cl. 60—13)

The invention relates to an internal combustion engine set consisting of two double-shaft opposed-piston internal combustion engines, in which the crankshafts drive the main shaft through a central gear and the drive of the machine supplying the combustion air is taken from the central gear. It has already been proposed in double-shaft opposed-piston internal combustion engines to drive a scavenging-air pump from the central gear. The scavenging-air pump was then placed outside the internal combustion engine set, at the side of one of the engines. This gave rise to the drawback that the distances to be traversed by the air in passing from the pump to the engines were not always the same, so that regularity of working was disturbed. In addition to that, the scavenging-air pump also came outside the profile of the internal combustion engines, so that more space was required. These drawbacks are avoided by the invention. It consists in that a rotary blower is adopted for supplying the combustion air, this blower being arranged between the engines and driven from the central gear by intermediate speed-increasing gear which is also arranged between the engines.

Between the central gear and the rotary blower a flexible member or a slip coupling may also be fitted. Preferably the rotary blower will be driven in addition by an exhaust gas turbine. At full load, for instance, it may happen that the exhaust gas turbine develops a greater output than the machine supplying the combustion air can absorb. The excess power is then delivered in the contrary direction as useful work over the intermediate gear to the central gear, and thus transmitted to the main shaft.

One example of the subject matter of the invention is illustrated diagrammatically in the drawings, in which Fig. 1 shows a front view and Fig. 2 a view from above.

Two double-shaft opposed-piston internal combustion engines 1 and 2 form an internal combustion engine set, their crankshafts driving the main shaft 8 with the help of pinions 6 through a central gearwheel 7. Combustion air is supplied by a rotary blower 9 through pipes 13 to the engines 1 and 2, the blower being coupled to an exhaust turbine 11.

The rotary blower 9 is arranged between the engines 1 and 2 in such a way that it can be driven from the central gearwheel 7 through an intermediate speed-increasing gear consisting of toothed wheels 18, 19 and 20, respectively and through a shaft 14.

When working with small partial loads, power is transmitted from the gearwheel to the blower, and when working with greater loads, or with full or overload, the excess power developed by the turbine 11—especially when working with high supercharging—is transmitted in the contrary sense from the exhaust gas turbine through the blower to the central gearwheel and the central shaft.

Between the central gear and the rotary blower a flexible member, for instance in the form of a flexible coupling or a flexible shaft, may be fitted. The shaft 14 may be of such dimensions that it acts as a flexible member. In addition to that, also a slip coupling 21, for example, the so-called Föttinger coupling, may be fitted between the central gear and the blower; this allows slip to take place and prevents the transmitting elements from becoming inadmissibly loaded, if the torque become excessively high, which may occur for instance in consequence of oscillation phenomena, or because of some trouble in the rotary machines.

I claim:

Internal combustion engine set consisting of two double-shaft opposed-piston internal combustion engines which comprises a main shaft, two shafts for each of the two engines, a pinion gear driven by each of the two shafts of the two engines, a central gear wheel connected to the main shaft and in operative geared engagement with each of the pinions, said gears being on the ends of their respective shafts and said central gear being considerably larger in diameter than the pinion gears, a rotary blower for supplying the engines with combustion air and an exhaust gas turbine for driving the blower comprising a charging set which is arranged between the two engines, an intermediate speed-increasing gear connected to the central gear wheel, a shaft connected to the blower, and a slip coupling operatively connecting the shaft to the intermediate speed-increasing gear.

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