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ENGINED COMPRESSOR-GENERATOR UNIT
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Fig. 1

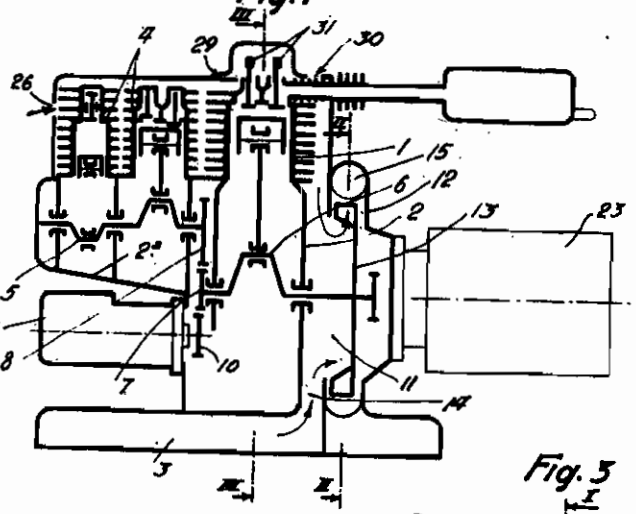


Fig. 2

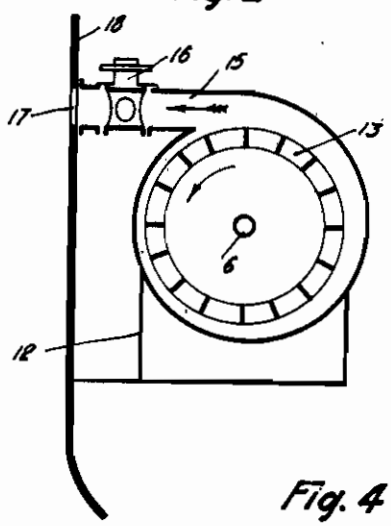


Fig. 3

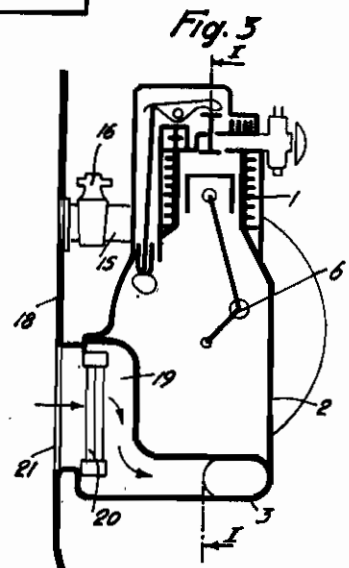
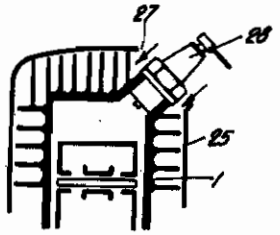


Fig. 4



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ALIEN PROPERTY CUSTODIAN

ENGINED COMPRESSOR-GENERATOR UNIT

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My invention has for its object to provide an engined compressor-generator unit of small power and reduced size and weight so that it may be easily carried and lodged, more particularly on board of an aerodyne, said unit being remarkable in that in view of this object, it comprises the combination of a high speed internal combustion engine driving, on the one hand, an electric generator, either directly or through the medium of a multiplying gear, and, on the other hand, a compressor running at a less high speed, through the medium of a reducing gear.

Another object of my invention is to provide a very flat unit that may be easily lodged in an airplane along the side of a wall, as for example that of the fuselage.

A further object is to provide for an efficient cooling of the engine, compressor and other hot points of the unit such as, for example, spark plug, spent gas outlet of engine, air delivery of compressor.

A still further object is to provide an engined compressor-generator unit intended to be used on multi-engined aircrafts to supply the various needs in electric current and compressed air, thereby relieving the propelling engines from this duty.

Other objects and features of the invention will appear from the following description of a preferred embodiment of the invention and be more fully pointed out in the claims.

In the annexed drawings:

Fig. 1 is a vertical section of the unit on the line I—I of Fig. 3, i. e. in a vertical plane containing both the crank shaft axes of the engine and the compressor;

Figs. 2 and 3 are transversal sections on the lines II—II and III—III of Fig. 1, respectively;

Fig. 4 is a fragmentary section at a larger scale of an engine cylinder, showing a detail.

In this example, the unit comprises a one-cylinder engine of light weight adapted to run normally at a high speed, say of the order of 4000 revolutions per minute, for example, the cylinder 1 of which is carried by a rather deep vertical case 2, resting in turn on a hollow base 3; at a level somewhat higher than the latter the case 2 is provided with an overhanging extension 2a which carries the cylinders 4 of the compressor,—the latter being here shown as of the two-stage type,—and which serves as a crankcase for the crank shaft 5 of said compressor. The crank shaft 5 is located in a common vertical plane with the crank shaft 6 of the engine and is parallel thereto; toothed wheels 7 and 8, respectively keyed on the ends of the crank shafts 6 and 5 (the latter being at a higher level than the former), mesh together and form a reducer between the engine and the compressor. Secured on the lower portion of the crank case 2 underneath the overhanging portion 2a is the firing magneto 9, driven by a toothed wheel 10 meshing with the wheel 7 on the end of said engine crankshaft 6. The other end of the latter projects out of the crank case 2 into a chamber 11 defined by said case and a housing 12 rising from the base 3, said chamber containing a blower or fan 13 keyed on said projecting end of the crank-shaft 6. A passage 14 opening at the lower part of said chamber 11 insures the communication between the latter and the inner space of the base 3. The part of said chamber 11 which is in a vertical plane with the fan 13 serves as a volute-like header for said fan and merges tangentially at its lower portion with an air delivery passage 15, in which is inserted a cock 16 (Fig. 2), said passage leading to an opening 17 in a wall 18 which, in the present instance, will be assumed to be the wall on an airplane fuselage. On the same side as this delivery passage 15 is an air intake 19 in which the oil cooler 20 is located and which is connected with an opening 21 in the same wall 18. This air intake 19 is formed by the wall itself of the base 3, which is conveniently shaped for that purpose and constitutes at the same time the wall of the lower part of the crank case 2. On the end of the engine crank shaft 6 is coupled, in this instance directly, an electric generator 23 fastened onto the outside of the housing 12.

On the other hand, the cylinders 1 and 4 provided externally with cooling fins are covered by elements forming a continuous cowling 25, which is preferably situated very close to the aforesaid fins and merges with the wall 12 of the aforesaid chamber 11, whose inner space thus communicates with the space existing between the crankcase, the cylinders and the cowling 25. The latter is provided with openings forming air inlets at the point 26 most removed from the fan 13 as well as at the hottest points and more particularly at point 27 round the spark plug 28 (Fig. 4), also at point 29 in order to cool the engine valves 31, at point 30 round the engine outlet pipe and round the delivery pipe, not shown, of the compressor.

It is obvious that, as the fan 13 rotates, a double induced circulation is organized as shown by the arrows (Figs. 1, 2 and 3), air flowing, on the one hand, through the air intake 21, the open-

ing 19, the inner space of the base 3 and the passage 14, thus cooling the oil cooler 20, and on the other hand, through the various air inlets of the cowling 25, through the latter and round the finned cylinders of the compressor and the engine. While this air, which is delivered by the fan 13 through the passage 16, is discharged into the open air through the opening 17, in the example shown, it might as well be recovered and used, for example, for reheating the surrounding air or otherwise.

The invention is in nowise to be construed as limited to the details of construction as shown and described as these are only given as an example.

CHARLES RAYMOND WASEIGE.