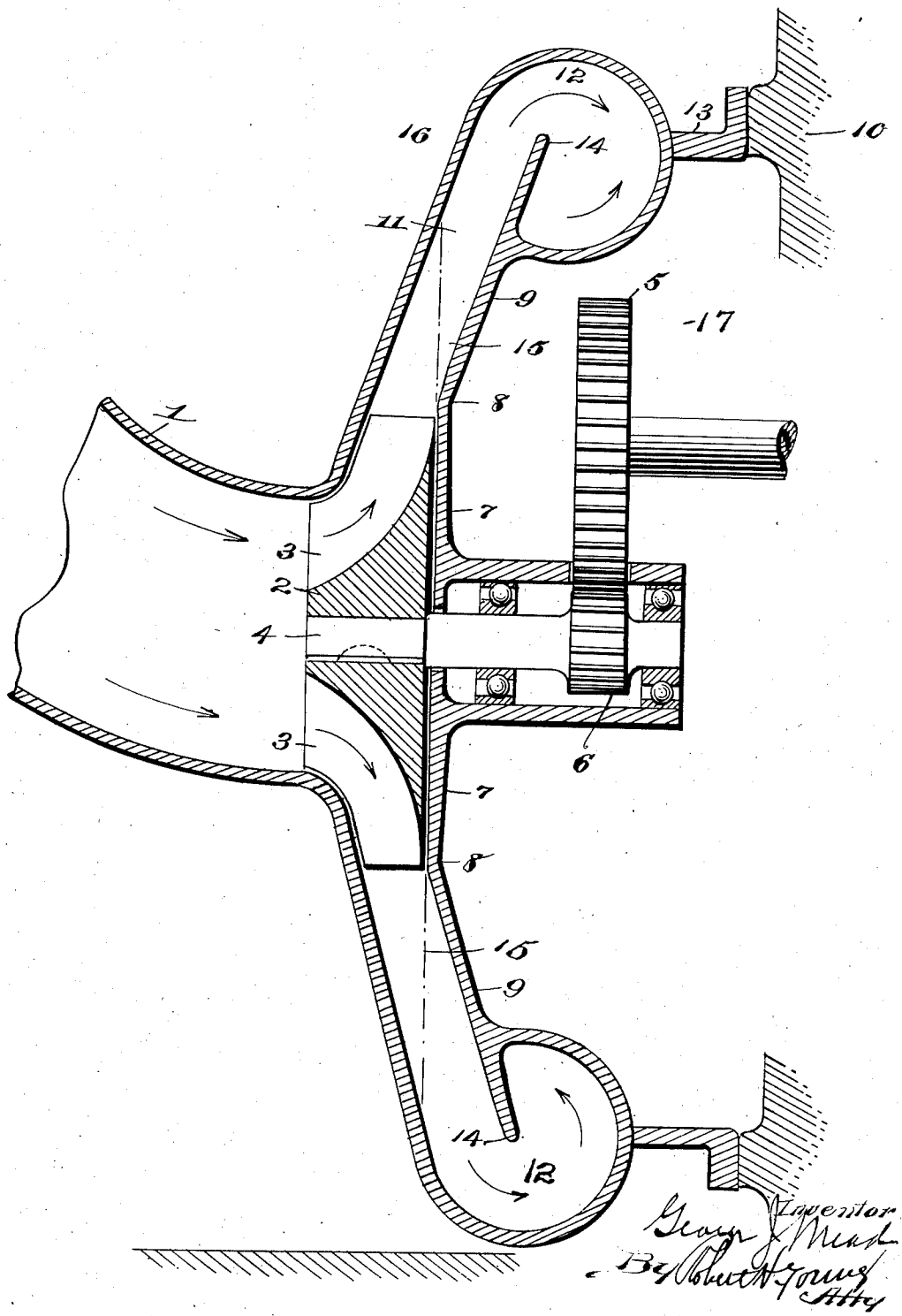
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SUPERCHARGER CONSTRUCTION

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SUPERCHARGER CONSTRUCTION

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This invention relates in general to superchargers for internal combustion engines and is more particularly directed to an improved design and arrangement of the diffuser section of a supercharger for use on aircraft and other automotive vehicles.

In automotive vehicles, and especially in aircraft, the space around the engine is necessarily limited and every effort is made to reduce the number and size of the accessories and parts which are exterior of the engine proper though mounted thereon or adjacent thereto. Superchargers with their driving means and compressing means are necessarily bulky and their disposition in the limited space available difficult.

It is the object of my invention to provide my supercharger with a slanting diffuser section so that the collector pipe may be disposed closely adjacent the engine proper leaving the space forward thereof free for use in installing other accessories to the engine. This structure additionally cleans up the design of the engine compartment and leaves more space for the maintenance operations of mechanics.

It is another object of my invention to dispose my impeller at an angle to the slanting diffuser section to provide a more intimate mixture of the fuel particles and to break up and atomize any particles of liquid fuel carried by the flow of fuel gases.

Other objects of my invention will appear in the accompanying specification and claims and will be disclosed in the accompanying drawings in which

The figure is a vertical diametrical section through my device.

Referring now with greater particularity to the drawings it will be seen that my device is comprised as follows:

At 1 is shown the inlet pipe for conducting the explosive mixture into the supercharger and against the vanes 3 of the impeller 2. The impeller 2 is mounted on a shaft 4 and is operated at high speed through suitable gearing, partly shown at 5 and 6, from the crank shaft of the engine.

The spacing of the impeller from the engine proper depends upon the space required for the gearing 5, 6, and the inner wall 7 of the impeller casing extends at right angles to the impeller shaft for a distance equal to the diameter of the impeller. From the point 8 the inner wall 9 of the casing is slanted sharply toward the engine 10 and forms, with the outer wall of the impeller casing, the slanting diffuser section 11 comprising the principal improvement of my invention. Ordinarily, the diffuser section is radial to the impeller shaft but it will be seen that my structure is substantially conical in shape, thus allowing the collector pipe 12, into which the diffuser section merges, to be placed close to the engine 10 to which it is secured at 13 forming with the engine a housing 17 for the gear train.

The collector pipe 12 is partially separated from the diffuser section by a web 14 forming an extension of the wall 9, this structure serving to reduce the necessary overall diameter of the supercharger. The slanting diffuser section thus leaves the space at 16 radially of the impeller and within the engine compartment free for mounting other accessories.

The foregoing construction which provides for terminating the impeller 2 at a point within the diffuser casing 11, which is intermediate the fuel inlet pipe 1 and the collector pipe 12, so that the line of vertical axis of the impeller which is indicated at 15 crosses the diffuser casing at a point between the extremity of the impeller 2 and the collector pipe 12, furnishes a very advantageous result. Particles of liquid fuel reaching the impeller are thrown off the impeller vanes by centrifugal force in the direction of the axial line 15, and thus cross the main stream of fuel gas within the diffuser casing. The result is that instead of adhering to the inner faces of the diffuser casing, said particles of liquid fuel become thoroughly mixed with the main fuel stream before entering the collector pipe 12.

The operation of my device has been described in conjunction with the description of its construction.

I claim:

1. A supercharger for internal combustion engines including a diffuser casing, a fuel inlet pipe, an impeller within the diffuser

casing, a shaft for the impeller, and speed multiplying gearing for the impeller shaft, the said diffuser casing slanting from the fuel inlet pipe toward said gearing, the said impeller terminating within the inner and outer extremities of the diffuser casing in such manner that the line of vertical axis of the impeller crosses the diffuser casing at a point intermediate the inner and outer extremities thereof, and beyond the impeller therein, for the purposes set forth.

2. A supercharger for internal combustion engines including a diffuser casing, a collector pipe, a fuel inlet pipe, an impeller within the diffuser casing, a shaft for the impeller and speed multiplying gearing for the impeller shaft, the said diffuser casing slanting from the fuel inlet pipe over said gearing to house, in connection with the collector pipe, the said gearing, said impeller terminating within the diffuser casing at a point intermediate the fuel inlet and the collector pipe, in such manner that the line of vertical axis of the impeller crosses the diffuser casing at a point between the extremity of the impeller and the collector pipe, for the purposes described.

3. A supercharger for internal combustion engines, including a diffuser casing, a collector pipe, a fuel inlet pipe, an impeller within the diffuser casing, a shaft for the impeller, the said diffuser casing slanting from the fuel inlet pipe toward the collector pipe, said impeller terminating within the diffuser casing at a point between the fuel inlet pipe and the collector pipe in such manner that the line of vertical axis of the impeller crosses the diffuser casing at a point between the extremity of the impeller and the collector pipe, for the purposes described.

4. A device of the character described for application to an internal combustion engine, including a diffuser casing, a collector pipe, a fuel inlet pipe, an impeller within the diffuser casing, a shaft for the impeller and intermediate driving means between the impeller shaft and the engine, the diffuser casing slanting toward the engine and cooperating with the collector pipe to house the intermediate driving means, the said impeller terminating within the said diffuser casing in such manner that the line of vertical axis thereof crosses the said diffuser casing at a point beyond the extremity of the impeller for the purposes set forth.

In testimony whereof I affix my signature.

GEORGE J. MEAD.