A. R. LAMBERT.

AIR CLEANER FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED DEC. 2, 1919.

1,340,058. Patented May 11, 1920.

Fig. 1.

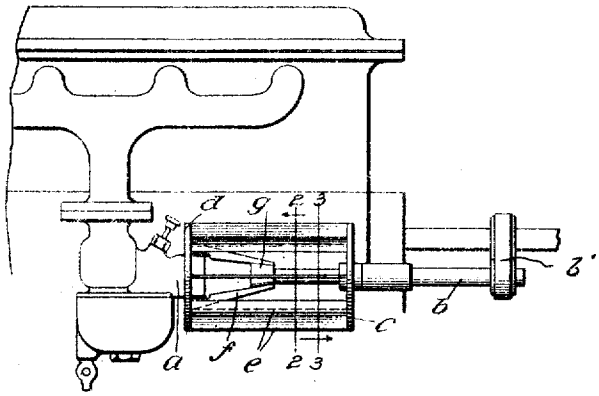


Fig. 2.

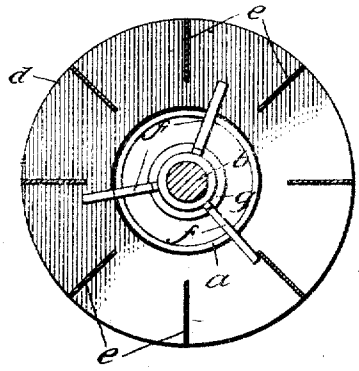
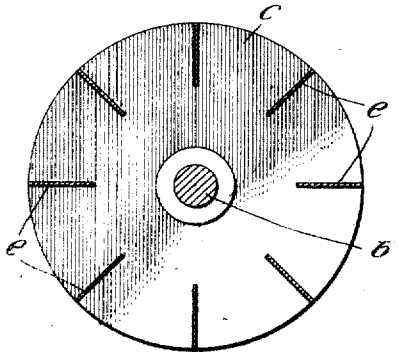


Fig. 3.



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AIR-CLEANER FOR INTERNAL-COMBUSTION ENGINES.

1,340,058. Specification of Letters Patent. Patented May 11, 1920.

Application filed December 2, 1919. Serial No. 341,946.

To all whom it may concern:

Be it known that I, ALVAN R. LAMBERT, a citizen of the United States of America, and a resident of Anderson, county of Madison, and State of Indiana, have invented certain new and useful Improvements in Air-Cleaners for Internal-Combustion Engines, of which the following is a full and clear specification.

The object of this invention is to remove the dust from the air that is inspirated into the carbureter of an internal combustion engine, to thereby insure an ample supply of clean air. Heretofore many expedients have been tried out and put into practice for accomplishing this purpose, but so far as I am aware they have either been defective to the point of impracticability or have been of such nature as to demand more attention on the part of the attendant than can be obtained in the general run of cases. It is my object to provide a simple apparatus and method requiring no attention on the part of the attendant or operator and which will not gather and collect the dust separated from the air but will throw it t into the surrounding atmosphere. Obviously my invention will have its highest utility in connection with gasolene tractors, in which machines the problem of obtaining a supply of clean air is an exceedingly important as well as difficult one.

In the drawing—

Figure 1 is a side elevation of an appliance embodying one form of my invention;

Figs. 2 and 3 are transverse sectional views looking in the direction of the arrows respectively applied to each line.

In the drawing annexed, *a* designates the intake pipe of the carbureter of an internal combustion engine; *b* a shaft arranged in alinement with the center of the intake-end of the pipe and terminating a short distance from said end. This shaft is adapted to be rotated rapidly in any suitable manner, preferably by connection with one of the adjacent shafts of the engine.

Affixed to the shaft *b* so as to rotate therewith is a fan-like device consisting of an imperforate disk *c* affixed to the shaft at a distance from its end, another disk *d* loosely surrounding the intake pipe *a* a short distance from its intake-end, and a series of blades *e* rigidly connecting the disks or heads *c* and *d* and consisting of flat straight blades radially arranged with respect to the axis of the shaft and having their longitudinal edges lying approximately parallel therewith. These blades are preferably equally spaced around the disks *c*—*d* and their inner longitudinal edges terminate short of a circle described by the inlet-end of the intake pipe, so as to thereby form a sort of cage surrounding the intake pipe.

To brace the head *d*, I connect the same by means of bars *f* with a hub *g* fastened on the extreme inner end of the shaft *b*, these bars inclining inwardly and being arranged in spaced relation around the intake pipe.

In operation, the shaft *b* is driven rapidly from a suitable shaft of the engine to thus keep the body of air surrounding the intake pipe in whirling motion. The rapidly rotating blades *e* not only whirl the air body but also serve to strike and throw away from the intake-end any particles of dust that would be entrained in the air that is inspirated by the engine into the intake pipe. It will be understood that this fanning appliance is rotated very rapidly and that in addition to the cleaning action exerted by impact on the dust particles there will be a further force, namely, centrifugal force, tending to drive the particles to the outer edge of the whirling mass of air. I have been unable to determine from actual tests of this apparatus whether or not the impact action of the blades is of greater influence in cleaning the air than merely centrifugal action, as it is impossible to devise any testing method which would determine which is the most important factor. I have found, however, from actual tests that heavily-dust-laden air is thoroughly cleaned of its dust by an apparatus built in accordance with my drawings before it enters the intake, and I have further observed that no appreciable rarefaction of the air at the center of the revolving body of air takes place, so that an ample supply of air at approximately atmospheric pressure is maintained at all times at the center of the fan appliance, where the intake air is drawn from. In actual tests, I have found that

the engine produces practically the same horse power with my appliance in operation as it did without the appliance, thus showing that the air within the fan is maintained at least approximately at atmospheric pressure. In practice, I have slightly inclined the blades outwardly so as to increase the tendency of the blades to throw the dust outwardly away from the fan, but I believe it to be essential that the blades shall not be inclined to the radial to any considerable extent, as that would, in my judgment, tend to rarefy the air at the center and thus materially counteract the inspirational function of the engine.

It will be understood that I am not confined to the specific construction of apparatus herein shown and described, as the same may be greatly varied without departing from the spirit of the invention as defined in the claim appended.

The nature and scope of the invention having been thus indicated and its preferred embodiment having been specifically described, what is claimed as new is:

In combination with the intake of the carbureter of an internal combustion engine, a shaft terminating short of said intake and having means for driving it from the engine, an imperforate disk fastened to said shaft at a distance from the end thereof, another disk having a central hole into which the end of the intake pipe of the carbureter extends, brace bars rigidly connecting this latter disk with the end of the shaft, and a series of blades or paddles extending from one disk to the other and arranged in a circumferential series, the inner longitudinal edges of these blades terminating short of the center of the disks to thereby provide a free air-space at the center of the fan appliance in line with the intake of the carbureter.

In testimony whereof I hereunto affix my signature.

ALVAN R. LAMBERT.