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J. H. JONES & F. H. BOGART.

MEANS FOR COOLING INTERNAL COMBUSTION MOTORS FOR AUTOMOBILE USE.

APPLICATION FILED JAN. 18, 1904.

NO MODEL.

Fig. 1.

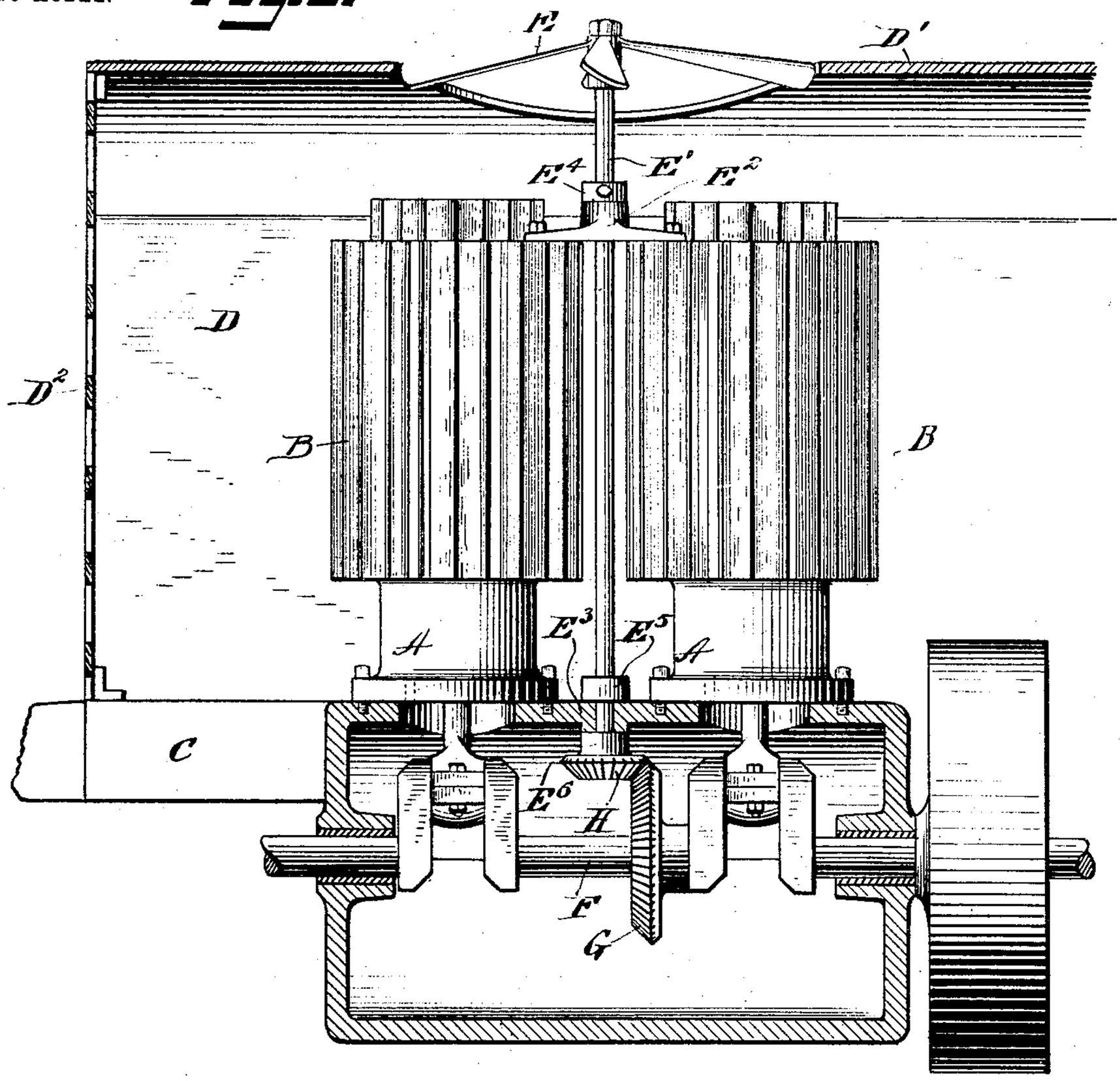
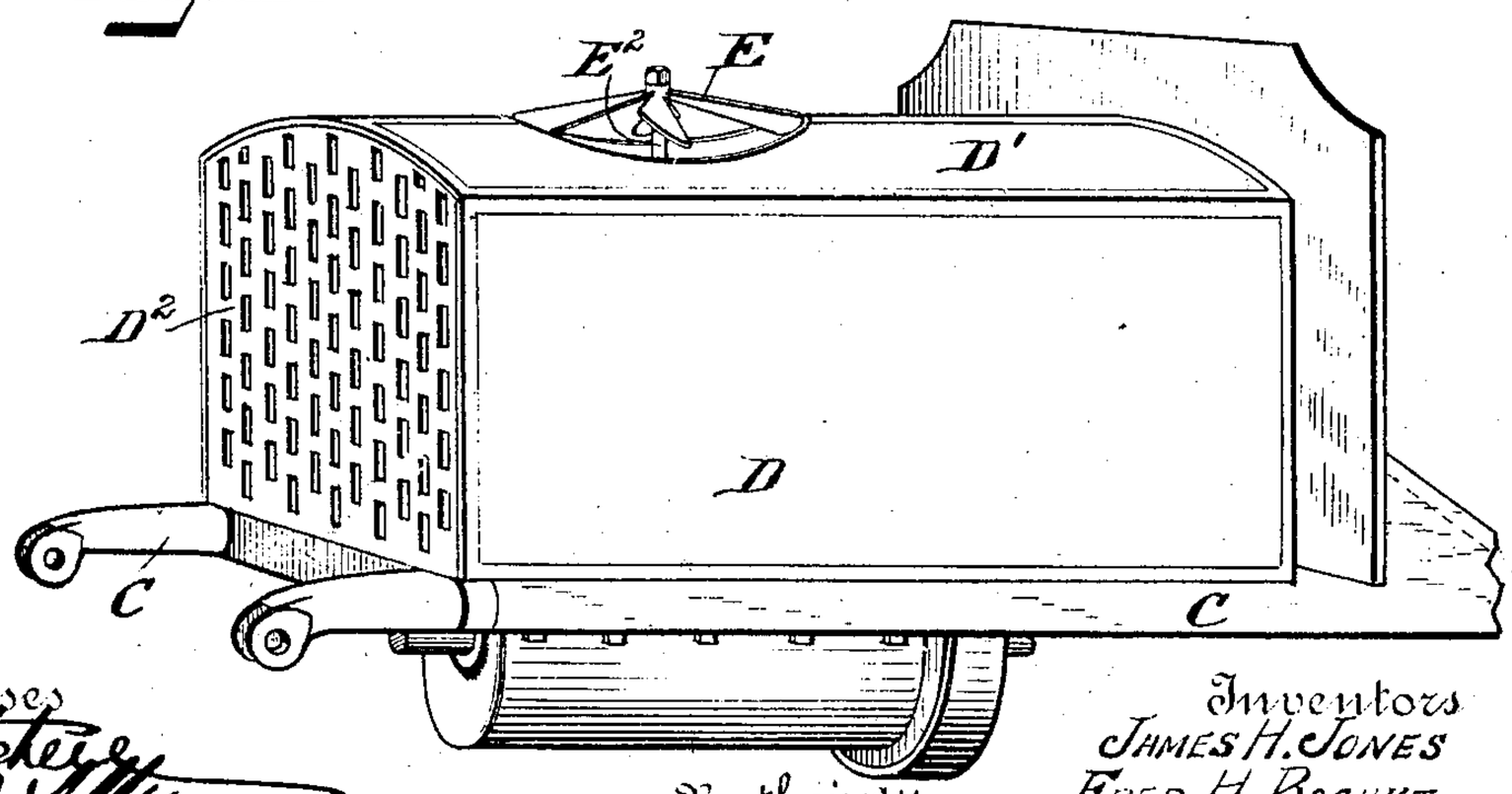



Fig. 2.




Witnesses

Inventors
JAMES H. JONES
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By their Attorney

No. 764,893. Patented July 12, 1904.

# UNITED STATES PATENT OFFICE.

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## MEANS FOR COOLING INTERNAL-COMBUSTION MOTORS FOR AUTOMOBILE USE.

SPECIFICATION forming part of Letters Patent No. 764,893, dated July 12, 1904.

Application filed January 18, 1904. Serial No. 189,430. (No model.)

*To all whom it may concern:*

Be it known that we, JAMES H. JONES, residing at Bristol, and FRED H. BOGART, residing at Hartford, in the county of Hartford, State of Connecticut, citizens of the United States, have invented certain new and useful Improvements in Means for Cooling Internal-Combustion Motors for Automobile Use, of which the following is a full, clear, and exact description.

Our invention relates to cooling apparatus for air-cooled internal-combustion motors for use on motor-vehicles.

Heretofore when air-cooled engines have been used as the motive power for vehicles it has been customary to rely upon the air directly in the path of travel of the vehicle and in front of the engine as the cooling medium. In some instances a fan located directly in front of the engine—that is, directly in the line of the path of travel of the vehicle—has been used to accelerate the natural draft. In the past comparatively low-powered engines only have been used in this capacity, because of the difficulty and supposed impossibility of successfully cooling engines of relatively high power. By our invention we have found it possible to successfully cool comparatively high-powered engines when used in this connection. This end we attain by supplementing the natural draft of air with a powerful air-blast generated by mechanical apparatus and drawn from a source that will not rob the natural draft. This apparatus while simple results in great efficiencies and may be applied at small expense to vehicles driven by gas-engines of the type here referred to.

In the drawings, Figure 1 is a longitudinal section of a portion of a motor-vehicle, showing a two-cylinder vertical hydrocarbon-engine of the air-cooled type, the cylinders therein being arranged side by side. Fig. 2 is a relatively diminished perspective view.

The construction of the engine shown in the drawings need not be described at length, because it comprises the usual working parts common to internal-combustion engines. It is, however, of the air-cooled type, and in this particular form the cylinders A A carry radiating flanges B B, around and between which the circulation of air is maintained for the purpose of keeping the temperature of the cylinders down to a point where proper lubrication may be maintained within said cylinders.

The engine shown is of the vertical type and is designed to be carried under a hood at the forward end of the vehicle. Portions of the frame of the vehicle are indicated at C C.

D is a hood having a top D′ and a perforated front $D^2$. In the engine shown radiating fins or plates B B extend vertically.

In use the forward movement of the vehicle will cause the air directly in front of the hood D to flow through the perforations in the forward end $D^2$ and against the flanges of the cylinders, the hood acting as a horizontal air-conduit arranged in line with the path of travel of the vehicle. This will to a certain extent and may in the case of very low power engines cool the cylinders to a very limited extent. By our invention, however, we provide a supplemental draft which not only adds to the natural draft without robbing the same in the slightest degree, but also in reality accelerates the natural draft, and hence produces most highly effective results.

In the particular form of our invention, E is a fan located above the engine in or near an opening in the top D′ of the hood. The fan overstands both of the cylinders A A. The fan-shaft E′ has suitable upper and lower bearings $E^2$ $E^3$, provided with shoulders or collars to take any longitudinal thrust of said shaft. These collars or shoulders are indicated at $E^4$ $E^5$ $E^6$. The shaft E′ is suitably connected with some moving part of the engine—for example, the main shaft F. In the form shown this connection comprises two bevel-wheels G H, the former being carried by the main shaft, the latter by the fan-shaft. This form of invention is particularly useful in the case

of multiple-cylinder engines, since one fan serves to produce a cooling-blast for two cylinders, the shaft E′ being located between the cylinders and the fan E overstanding both of the cylinders.

From the foregoing it will be apparent that when the vehicle is in motion the air directly in front of the engine is free to impinge against the radiating flanges thereon, which to a certain extent will be cooled thereby. This air supply or draft is termed the "natural" draft. While the engine is in motion the fan E is also in motion and will suck or draw air from the source above the plane of the engine which would otherwise be unavailable. The fan will propel this draft of air in a direction to build up and also accelerate the natural draft, so that the combined air-currents will keep the temperature of the engine-cylinders down to the desired point. This supplemental draft of air we term the "artificial" draft.

While in the form shown we have provided a perforated front $D^2$ to the hood, obviously this front might be a grating or screen, or, in fact, the front of the hood might be entirely open. The top D′ of the hood serves to protect the engine and sparking devices from the rain, and the fan E, which revolves at great velocity, will when in motion prevent rain-drops from passing through the perforation in the top in which said fan stands by reason of the fact that as soon as the rain-drops encounter the fan-blades they, being heavier than the air, will be thrown off and away from the engine by centrifugal action.

Heretofore it has been assumed to be impractical to provide an air-cooled engine of the multiple-cylinder vertical twin type in automobiles, because the rear cylinder or cylinders are largely hidden by the front cylinder and are liable to overheat. By our improvement we have demonstrated that this type of engine can be successfully used in this connection, since the air-drafts not only come from in front of the engine, but laterally thereof as well.

What we claim is—

1. In a cooling apparatus for an air-cooled motor of the internal-combustion type for use on motor-vehicles, a motor, a horizontal open-front air-conduit for conducting a natural draft of air, the cylinder portion of said motor being arranged within said conduit, mechanical means arranged laterally of said passage through said conduit and adjacent to the cylinder portion of the motor to supply an artificial draft of air supplementing and building up the natural draft and drawing said air from a source other than that which supplies the natural draft.

2. In a cooling apparatus for an air-cooled motor of the internal-combustion type for use on motor-vehicles, a motor having radiating flanges extending up and down the cylinder, a horizontally-placed open-front hood arranged over and embracing said cylinder forming a confined air-passage adjacent thereto, a fan driven by the motor and arranged above the cylinder, an opening in said hood above the motor said fan being located in said opening whereby when the motor is in operation an artificial draft of air will be generated by the fan and forced directly down on the cylinder and confined thereto by the walls of the hood.

3. In a cooling apparatus for air-cooled motors of the internal-combustion type for use on motor-vehicles, a motor having radiating flanges extending longitudinally of the cylinder, a horizontally-placed open-front hood arranged over said cylinders and forming a confined air-passage adjacent thereto, a fan driven by the motor and arranged adjacent to the end of the cylinder, an opening in the hood laterally of the passage therethrough said fan being located in said opening whereby when the motor is in operation an artificial draft of air will be generated by the fan and forced directly against the cylinder and guided and confined thereto by the walls of the hood.

Signed at New Britain, Connecticut, this 13th day of January, 1904.

JAMES H. JONES.
FRED H. BOGART.

Witnesses:
M. S. WIARD,
C. E. RUSSELL.