No. 741,419. PATENTED OCT. 13, 1903.

J. W. SUTTON.

COOLING ATTACHMENT FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED NOV. 22, 1902.

NO MODEL.

Fig: 1.

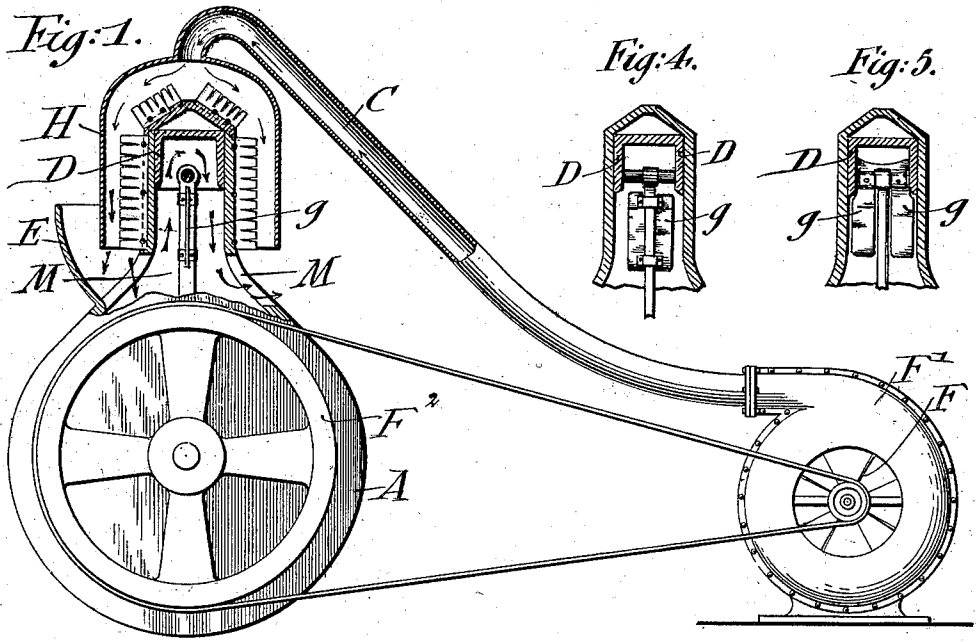


Fig: 4.

Fig: 5.

Fig: 2.

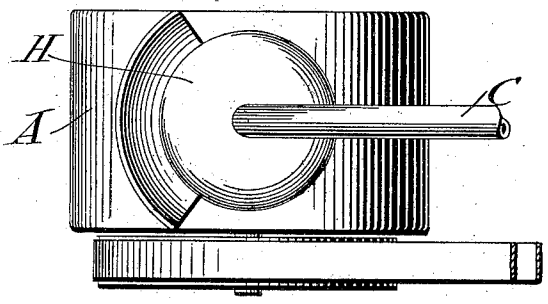


Fig: 3.

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No. 741,419. Patented October 13, 1903.

UNITED STATES PATENT OFFICE.

JOHN W. SUTTON, OF NEW YORK, N. Y.

COOLING ATTACHMENT FOR INTERNAL-COMBUSTION ENGINES.

SPECIFICATION forming part of Letters Patent No. 741,419, dated October 13, 1903.

Application filed November 22, 1902. Serial No. 132,360. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. SUTTON, a citizen of the United States, residing in New York, borough of Brooklyn and State of New York, have invented certain new and useful Improvements in Cooling Attachments for Internal-Combustion Engines, of which the following is a specification.

This invention relates to certain improvements in cooling attachments for internal-combustion engines of that class which are employed in motor-cycles, automobiles, and similar vehicles, the cooling attachment being so arranged as to supply a continuous current of atmospheric air to the interior of the piston and cylinder and to the exterior surface of the cylinder, so as to exert an effective cooling action on the heated parts without carrying along any particles of lubricating-oil supplied to the moving parts by which the heat-radiating ribs are clogged and a disagreeable smell caused by the heating of the oil, and for this purpose the invention consists of an internal-combustion engine, the crank-case of which is provided with openings, a fan rotated in connection with the crank-shaft of the motor, a channel connecting said fan-casing with a hood extending around the head and exterior portion of the cylinder, and an auxiliary channel for conducting an air-current to the interior of the piston and cylinder, so that continuous currents of air are supplied to the interior and exterior surfaces of the cylinder.

The invention consists further in diametrical deflecting-plates on the connecting-rod of the piston below the wrist-pin of the same or attached to the inside of the piston on each side of the connecting-rod, said deflecting-plates being arranged at right angles to the direction of the current, so as to deflect the current into the piston and cylinder and then through the crank-case to the atmosphere.

The invention consists further of certain details of construction and combinations of parts, which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a side elevation of an internal-combustion motor with my improved cooling attachment. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a side elevation, partly in vertical section, of a modified form of cooling attachment. Fig. 4 is a detail side view of the cylinder, showing the deflector-plates on the connecting-rod of the piston; and Fig. 5 is a detail side view of the cylinder, showing the deflector-plates attached to the interior of the piston.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the crank-case of an internal-combustion engine of that type which is used for motor-cycles, automobiles, and similar vehicles. The lower part of the crank-case is made cylindrical, while the upper part is made tapering toward the cylinder. The cylinder and the head of the combustion-chamber is provided on its exterior surface with heat-radiating ribs, plates, or fins that serve to dissipate the heat of combustion, said heat-radiating devices being inclosed by a hood H, which is connected at the upper end by a tubular channel C with the casing F′ of a fan F, said fan receiving rotary motion from the fly-wheel F^2 of the motor by a suitable belt-and-pulley transmission, as shown clearly in Figs. 1 and 3. The crank-shaft is supported in suitable bearings of the crank-case and connected by a connecting-rod with the transverse wrist-pin at the interior of the hollow piston D. The crank-case is provided with openings M at diametrically opposite points at the point of connection of the crank-case with the cylinder and alongside of one of the openings with a deflector E, so that the air that is forced down in the hood H over the heat-dissipating ribs, plates, or fins is conducted to the interior of the cylinder and piston and out to the opposite side of the cylinder by arranging on the connecting rod or piston at opposite sides of the same deflecting-plates *g g*, which are made of light sheet metal, said deflecting-plates deflecting the current of air first in upward direction to the interior of the cylinder and piston and then in downward direction to the outlet-opening M of the crank-case to the atmosphere.

In place of arranging the outlet-opening at the upper part of the crank-case the same may be arranged at the central part of the same concentrically to the crank-shaft, as

shown in Fig. 3, in which case an auxiliary or branch channel C′ is arranged that connects the main channel C with the opening M at the base of the cylinder, so that the second air-current is conducted along the deflecting-plates of the connecting rod or piston around the interior of the piston and to the opposite side of the same into the crank-case and out through the central opening N of the same. The deflecting-plates *g*, arranged at opposite sides of the connecting-rod, are made as wide as permitted by the available space at the interior of the cylinder, so as to move with the connecting-rod without interfering with the interior of the crank-case and cylinder during the up-and-down motion of the rod. The deflecting-plates may also be attached to the interior of the piston, one on each side of the connecting-rod, so as to permit the same to pass between the plates without interference. Fitting the plates on the piston offers the advantage of not closing the openings at half-stroke of the crank.

The constructions shown in the drawings have the advantage that a continuous current of air is supplied to the exterior of the cylinder and a separate air-current to the interior of the piston and cylinder, so as to produce the effective cooling of the cylinder at its exterior and interior surfaces and the cooling of the piston at its interior surface without carrying along any of the particles of lubricating-oil that are supplied to the moving parts and sometimes splashed around the interior of the crank-case and which when entrained in the air-currents settle on the dissipating ribs, plates, or fins and produce by the drying or oxidation of the same by the heated surfaces a disagreeable smell. This is entirely prevented by the air-currents deflected by the plates on the connecting-rod, while a very effective cooling action on the exterior and interior heated parts is produced.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with a crank-case, cylinder and piston of an internal-combustion engine, of means for supplying a current of air to the interior and exterior of the cylinder and head for cooling the same, inlet-openings in the crank-case for the current of air, and deflecting-plates on the connecting-rod for deflecting the current of air to the interior of the piston for cooling the same, substantially as set forth.

2. The combination, with the crank-case, cylinder and piston of an internal-combustion engine, of a hood surrounding the cylinder and head of the combustion-chamber, a ventilating-fan rotated by the fly-wheel of the engine, a fan-case, a channel connecting the fan-case with the upper end of the hood, means for supplying an air-current to the interior of the cylinder and piston, and deflecting plates or fins attached to the connecting-rod and adapted to deflect the interior air-current over the interior surface of the cylinder and piston to an outlet-opening in the crank-case, substantially as set forth.

3. The combination, with the crank-case, cylinder and piston of an internal-combustion engine, of a fly-wheel on the crank-shaft of said engine, a fan operated by said fly-wheel, a hood surrounding the cylinder and head of the combustion-chamber, a channel connecting the fan-case with said hood, heat-radiating devices on the exterior surfaces of the cylinder and head, deflecting plates or fins attached to the connecting-rod of the piston at right angles to the air-current delivered into the interior of the cylinder, means for conducting an air-current through an opening in the crank-case to the interior of the cylinder and piston, and an outlet-opening in the crank-case for conducting the air-current to the outside of the crank-case after the same has passed over the deflecting plates or fins of the connecting-rod and the interior surfaces of the cylinder and piston, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

JOHN W. SUTTON.

Witnesses:
PAUL GOEPEL,
C. P. GOEPEL.