No. 748,001. PATENTED DEC. 29, 1903.

G. McCADDEN.

COOLING APPARATUS FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED APR. 21, 1903.

NO MODEL.

Fig. 1.

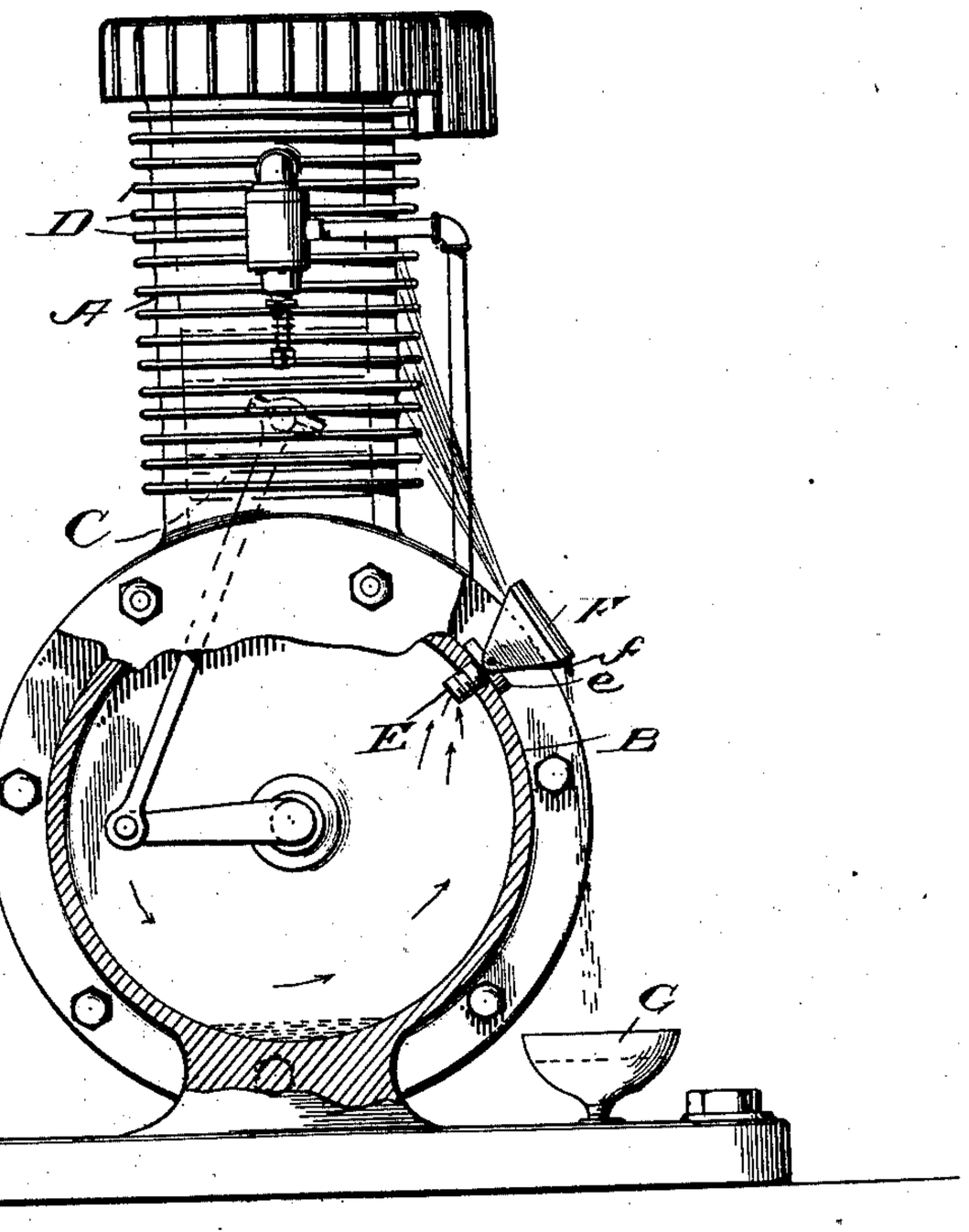


Fig. 2.

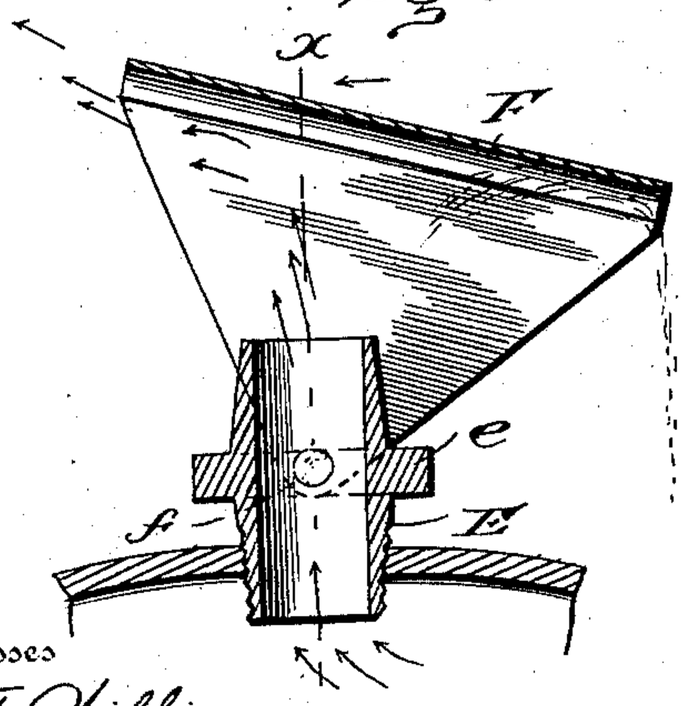
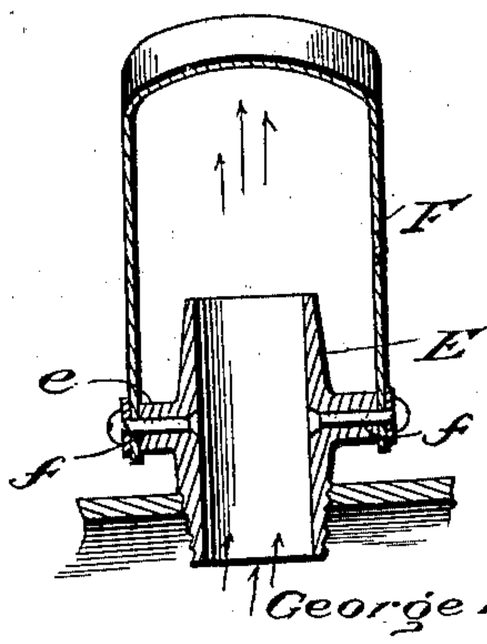


Fig. 3.



Witnesses
H. A. Williams
K. W. Richmond.

Inventor
George McCadden

By E. E. Masson.
Attorney

No. 748,001. Patented December 29, 1903.

UNITED STATES PATENT OFFICE.

GEORGE McCADDEN, OF ST. CLOUD, MINNESOTA.

COOLING APPARATUS FOR INTERNAL-COMBUSTION ENGINES.

SPECIFICATION forming part of Letters Patent No. 748,001, dated December 29, 1903.

Application filed April 21, 1903. Serial No. 153,663. (No model.)

To all whom it may concern:

Be it known that I, GEORGE McCADDEN, a citizen of the United States, residing at St. Cloud, in the county of Stearns and State of Minnesota, have invented certain new and useful Improvements in Cooling Apparatus for Internal-Combustion Engines, of which the following is a specification.

My invention relates to means for cooling the cylinders of internal-combustion engines, and more particularly to air cooling systems wherein the crank-casing of the engine constitutes the compression-chamber.

The improvements are directed more particularly to means for supplying a cooling agent interior and exterior of the cylinder, and they also include means for recovering the lubricant that accumulates in the bottom of the crank-casing or compression-chamber and which is forced out by the compressed air.

The nature, characteristic features, and scope of the invention will be more readily understood from the following detailed description, taken in connection with the accompanying drawings, forming a part hereof, wherein—

Figure 1 is a sectional elevational view of an internal-combustion engine embodying features of my present invention. Fig. 2 is a sectional view of the air-projector and its tubular part or mounting, and Fig. 3 is a section on line *x x* of Fig. 2.

Having reference to the drawings, A represents the cylinder of the engine, which is closed at the top, as usual, and open at the bottom in respect to the crank-casing B, within which casing is the usual cranked shaft and connecting-rod, the upper end of said rod being pivoted to a piston C, traversing the cylinder A. It will thus be apparent that the crank-casing B in its described relation to the piston and cylinder constitutes an aspirating and compression chamber.

One side of the crank-casing is tapped for the reception of a threaded short tubular part or mounting E, having an annular shoulder *e*, upon which is secured the air deflector or projector F, arranged transversely of the outlet E. Said projector may consist of a hood-shaped member, as shown, formed of soft metal—as Russian iron, for instance. The hood or projector F is riveted, as at *f*, to the shoulder *e*.

When the piston moves upward, air is aspirated or sucked into the crank-casing through the part E, which incoming air acts to cool the internal walls of the cylinder. On the downward movement of the piston the air is compressed and forcibly ejected from the casing and, impinging on the hood or projector F, is deflected and acts to direct currents of cool air upon the hottest parts exterior of the cylinder. A may be provided with ribs D to further this cooling action.

Mounted below the projector F and in line therewith—for instance, on the bed-plate of the machine—is an oil-cup G, which serves to collect the oil or lubricant forced out with the air and which runs down the inner face of the projector.

Having described the nature and objects of the invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the cylinder of an engine and its cylindrical crank-casing having an outlet in its convex portion, a tubular part secured within said outlet, and a deflector mounted in relation to said outlet to project air upon the cylinder of the engine, substantially as described.

2. The combination of the cylinder of an engine, and its cylindrical crank-casing having an outlet, a tubular part secured partly within said outlet on the curved periphery of said casing, and a hood in front of said outlet, and operating to direct currents of air upwardly on the cylinder of the engine, substantially as described.

3. The combination with the cylinder of an engine and its cylindrical crank-casing, a short tubular part mounted upon the convex portions of said casing and communicating with the interior thereof, and a hood mounted upon said tubular part and arranged to direct currents of air upon the cylinder of the engine, substantially as described.

4. The combination with the cylinder of an engine and its convex crank-casing, a short

tubular part mounted upon the convex portion of said casing and communicating with the interior thereof, a hood embracing two sides of, and mounted at an angle to said tubular part, and arranged to direct currents of air upwardly upon the cylinder, and oil downwardly, and a device for collecting lubricant disposed below the hood and outwardly of the casing, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE McCADDEN.

Witnesses:

ANDREW C. ROBERTSON,

PETER BRICK.