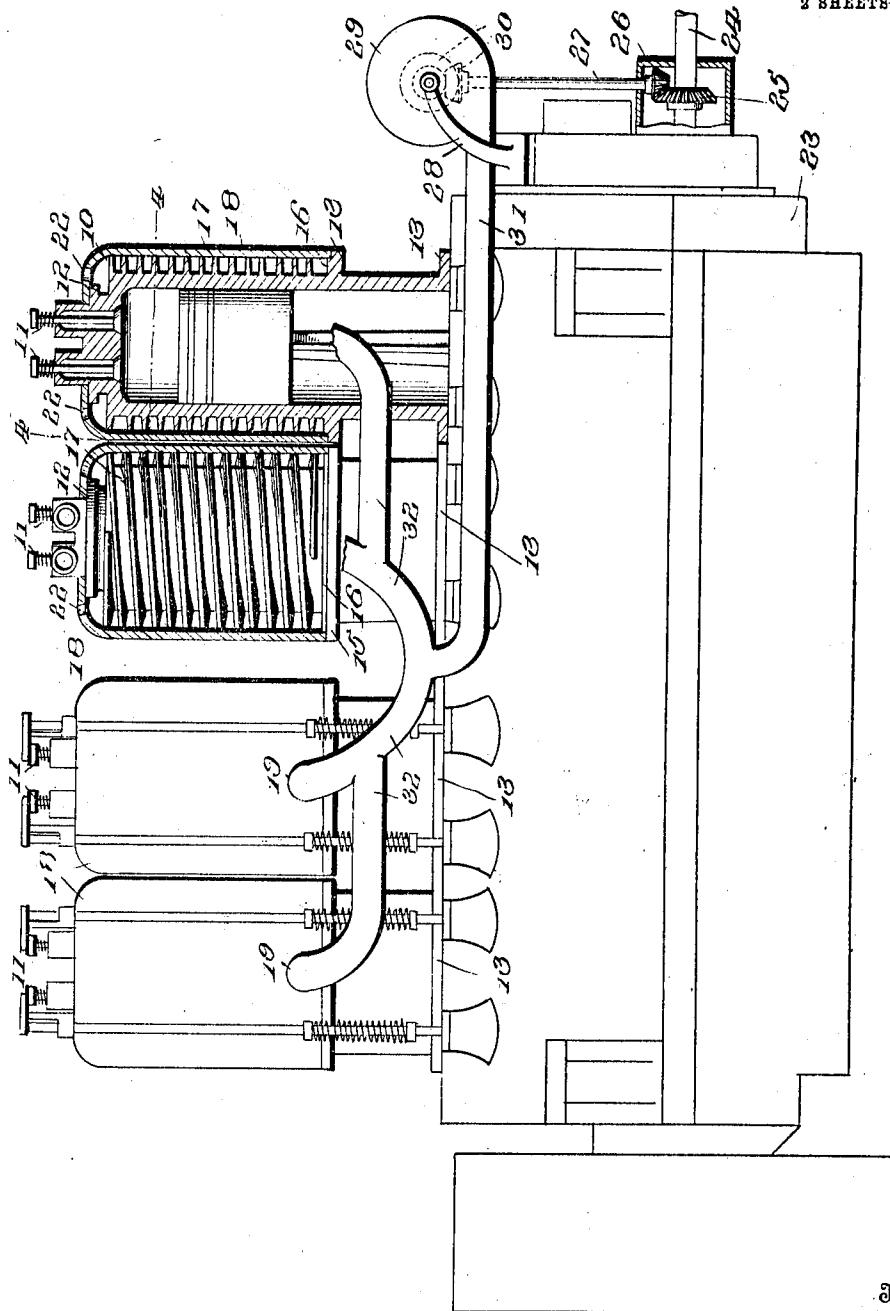


1,035,391.

2 SHEETS—SHEET 1.



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INTERNAL COMBUSTION ENGINE CYLINDER.
APPLICATION FILED DEC. 2, 1910.

1,035,391.

Patented Aug. 13, 1912.

2 SHEETS-SHEET 2.

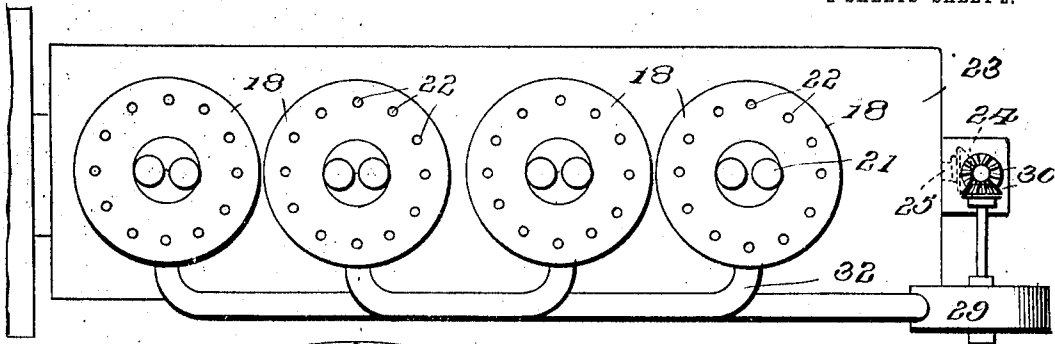


Fig. 1.

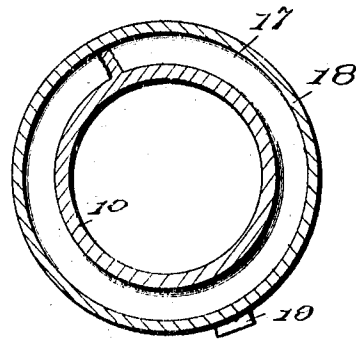
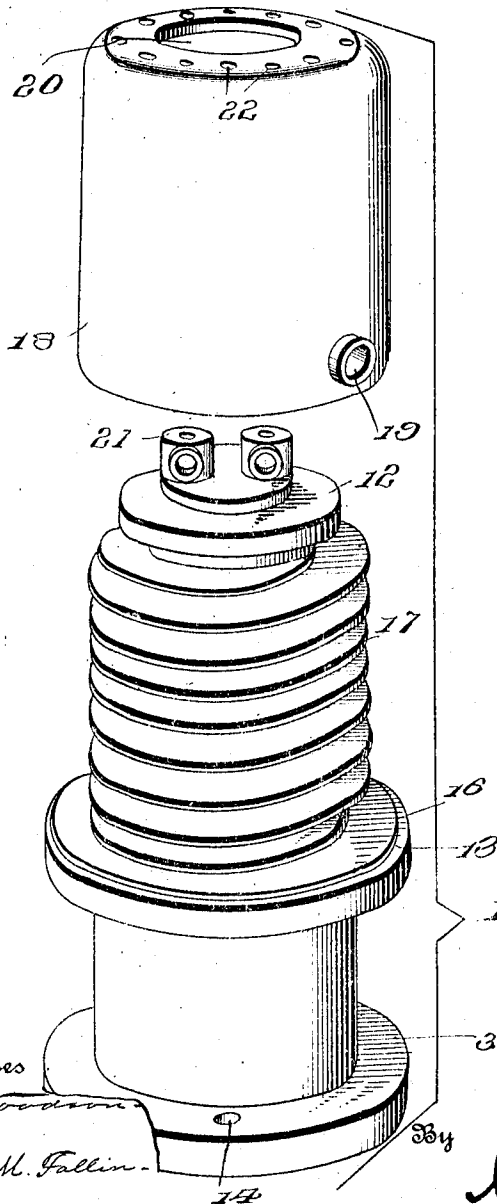


Fig. 3.

Fig. 2.

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UNITED STATES PATENT OFFICE.

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INTERNAL-COMBUSTION-ENGINE CYLINDER.

1,035,391.

Specification of Letters Patent.

Patented Aug. 13, 1912.

Application filed December 2, 1910. Serial No. 595,276.

To all whom it may concern:

Be it known that I, HORATIO S. SIMPSON, citizen of the United States, residing at Fairbury, in the county of Jefferson and State of Nebraska, have invented certain new and useful Improvements in Internal-Combustion-Engine Cylinders, of which the following is a specification.

This invention relates to internal combustion engines and has particular reference to a peculiar form of cylinder adapted to effect the cooling of the same by a forced current of air.

An object of this invention is to peculiarly form a cylinder for an explosive engine in which a current of air is introduced about the cylinder in such a manner as to confine the heat of the cylinder in the head of the same and to prevent the radiation of the heat to the lower part of the engine.

The invention has for another object to provide a cylinder with a spiral fin and a jacket engaging snugly over the fin to form a spiral channel or passage about the cylinder for the reception of an air current, the jacket and fin being so formed as to introduce the air current at the base of the cylinder and exhaust the same at the head of the cylinder. In conjunction with this feature it is designed to pass an air current about the cylinder from the base to the head thereof and to drive back and to exhaust the radiating heat from the head of the cylinder, from the upper end of the cylinder, and to thereby offset the passage of the heat into the base of the cylinder and the crank case of the engine.

The invention further contemplates a cylinder of this nature which is of simple construction so that the same can be readily manufactured and applied to internal combustion engines of the common type.

For a full understanding of the invention reference is to be had to the following description and accompanying drawings, in which:—

Figure 1 is a side elevation of an internal combustion engine having four cylinders, parts of the same being disclosed in section and showing the application of the improved cylinder thereto. Fig. 2 is a top plan view of the same. Fig. 3 is a detail perspective view of the improved cylinder, showing the jacket removed therefrom.

Fig. 4 is a transverse section on the line 4—4 of Fig. 1.

Corresponding and like parts are referred to in the following description and indicated in all the views of the accompanying drawings by the same reference characters.

Referring to the drawings, particularly to Figs. 3 and 4, the reference numeral 10 designates a cylinder which is of the form of an elongated hollow circular body closed at its upper end and provided in the usual manner with the valves 11. The upper end of the cylinder 10 is provided with an annular flange 12 which is of a diameter slightly greater than the cylinder 10. The cylinder 10 is provided with a base 13 suitably apertured as at 14 for the reception of screw-bolts, or the like, to hold the cylinder in position. The cylinder 10 is provided with a flange 15 having an annular boss or shoulder 16. A spiral fin 17 is formed about the cylinder 10 between the flanges 12 and 15, the spiral fin having a radius equal to the radius of the boss 15 and terminating at its ends in spaced relation from the flange 12 and the base 13. By terminating the fin 17 in spaced relation from the flange 12 and the base 13, annular uninterrupted channels or passages are formed at the opposite ends about the cylinder 10.

A detachable jacket 18 is fitted over the cylinder 10 and snugly receives the spiral fin 17 so as to close the passage about the edges thereof and provide a spiral channel extending the entire length of the cylinder 10. The lower end of the jacket 18 seats snugly against the shoulder 16 and, upon the flange 15. The shoulder 16 is adapted to seal the crevice between the lower end of the jacket 18 and the flange 15.

An air inlet 19 is formed in one side of the jacket 18 and at its lower end registering with the lower annular channel about the cylinder 10. The upper end of the jacket 18 is provided with a central circular opening 20 receiving the valves 11 which project above the cylinder 10. The jacket 18 is further provided with a plurality of openings 22 which are disposed in circular relation about the opening 20 and beyond the edge of the annular flange 12 opening the upper annular channel about the cylinder 10 to the atmosphere.

Fig. 1 of the drawings discloses the im-

proved cylinder as applied to an internal combustion engine adapted particularly to motor vehicles, and shows a crank case 23 supporting four of the improved cylinders.

- 5 A crank shaft 24 is journaled longitudinally within the crank case 23 and is provided with a beveled gear 25 meshing with a correspondingly beveled pinion 26 carried upon the lower end of a connecting shaft 27. The
10 crank case 23 is provided with a supporting arm 28 carrying a rotary blower 29 which is connected to the shaft 27 through the intermeshing beveled gears 30. The blower 29 is provided with a feed pipe 31 having
15 branch pipes 32 connecting with the inlets 19 in the lower ends of the jackets 18. It is thus seen by this construction that the rotation of the crank shaft 24 of the engine operates the blower 29 to force a draft of
20 air through the feed pipe 31 and branches 32 in the lower ends of the jackets 18. The air enters the inlet 19 of each of the jackets 18 and circulates within the annular channel at the lower end of the cylinder 10. The
25 air is forced from the annular channel about the fin 17 and travels spirally about the cylinder 10 toward the head thereof. The cool air passing up about the cylinder 10 is adapted to force back the radiating heat
30 from the head of the cylinder and exhaust the same through the outlet openings 22 in the upper end of the jacket 18.

- An important feature of this invention is in passing the cool air from the base to the
35 head of the cylinder and in providing a distributing spiral fin to insure the passage of cool air about every portion of the cylinder 10 to effect the uniform cooling of the same and to thereby offset the radiation of
40 the heat from the head of the cylinder.

After the explosion of the gas in the head of the cylinder, the head of the cylinder is the source from which the heat radiates, and by forcing a cooling medium from the base of the cylinder to the head, the heat is directed toward the upper end of the cylinder and confined at such point. 45

It will be understood that any suitable means may be employed for forcing the current of air into the lower end of the jacket 50 18 other than that disclosed in Figs. 1 and 2.

Having thus described the invention what is claimed as new is:—

In an explosive engine, an engine cylinder formed upon its outer surface with a 55 spiral fin, the said cylinder being provided exteriorly with a flange at one end of the fin and with a flange at the other end of the fin, the latter flange being of less diameter than the cylinder, the end helices of the 60 fin being in a plane substantially parallel to the adjacent flanges and spaced therefrom, a jacket fitted over the cylinder and its fin and having a head resting against the outer face of the second mentioned flange upon the 35 engine cylinder and formed through its said head with openings located beyond the periphery of said flange and communicating with the annular air space between the head of the jacket and the adjacent end helix of 70 the fin, the other end of the jacket fitting the periphery of the first mentioned flange upon the cylinder, and an air conduit opening through the jacket at its last mentioned end.

In testimony whereof, I affix my signature in presence of two witnesses. 75

HORATIO S. SIMPSON. [L. S.]

Witnesses:

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