

Oct. 21, 1924.

1,512,295

H. B. MASSEY
AIR COOLED CYLINDER

Filed Dec. 21, 1921

2 Sheets-Sheet 1

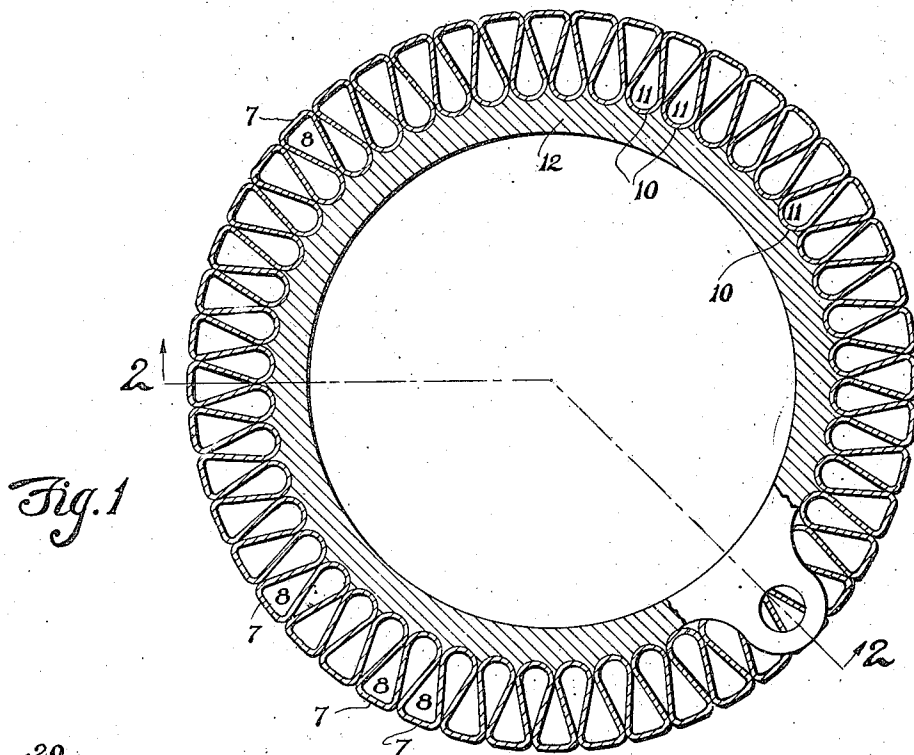
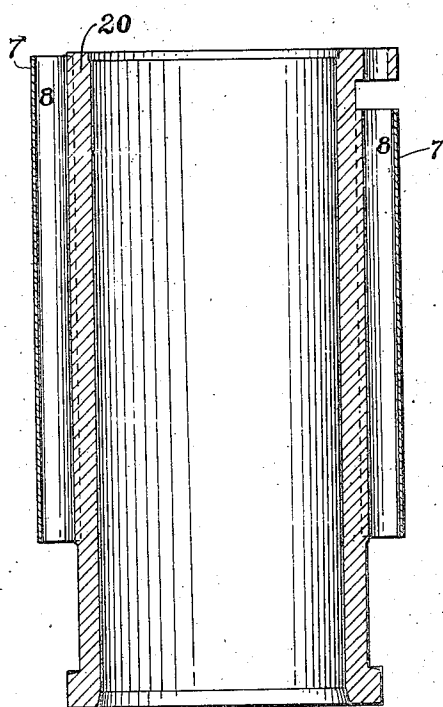


Fig. 2

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2 Sheets-Sheet 2

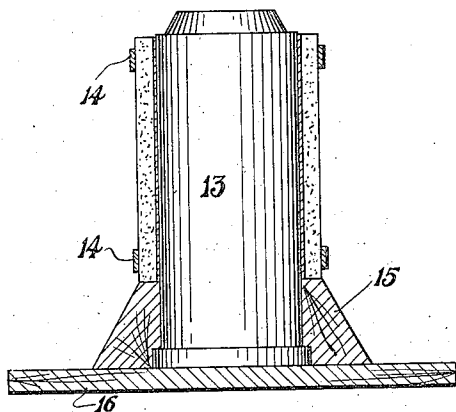


Fig. 3

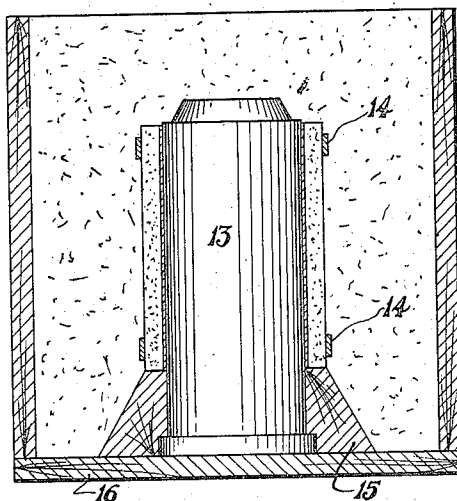


Fig. 4

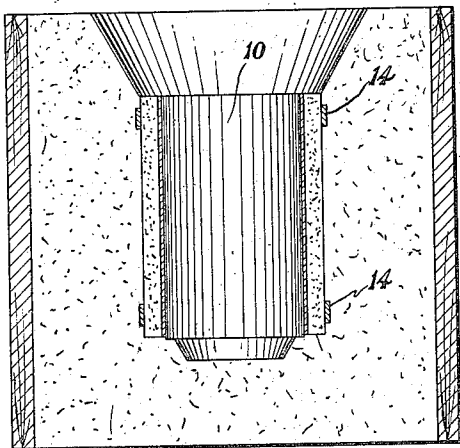


Fig. 5

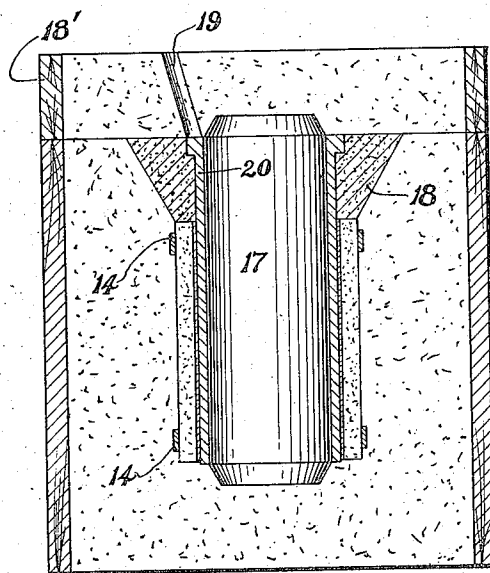


Fig. 6

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UNITED STATES PATENT OFFICE.

HEMSLEY B. MASSEY, OF CANTON, OHIO.

AIR-COOLED CYLINDER.

Application filed December 21, 1921. Serial No. 523,929.

To all whom it may concern:

Be it known that I, HEMSLEY B. MASSEY, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented a new and useful Air-Cooled Cylinder, of which the following is a specification.

The invention relates to air cooled cylinders for internal combustion engines which are provided with radial cooling fins surrounded by a jacket forming longitudinal flues, through which air is drawn or forced for the purpose of cooling the cylinder.

Cooling fins cannot be cast sufficiently thin and close enough together to produce a maximum cooling efficiency; and it has been customary to make the same of thin strips of sheet metal; but again in practice such fins cannot be used thin enough nor can they be placed close enough together to obtain the maximum cooling efficiency.

The present invention involves the use of a continuous sheet of metal crimped and closed together to form alternately reversed triangular tubes; the outer bases of the triangles comprising a continuous jacket and the inner bases of the triangles being preferably rounded and cast or welded to the periphery of the cylinder.

The invention may be embodied in the manner illustrated in the accompanying drawings, forming part hereof, in which—
Figure 1 is a transverse section of the improved cylinder;

Fig. 2, a longitudinal section of the same on line II—II, Fig. 1;

Fig. 3, a longitudinal section of the crimped sheet on a mandrel pattern resting on a core print and bottom board;

Fig. 4, a similar view, showing the drag section of a flask in position and filled with sand;

Fig. 5, a similar section of the drag section inverted and the core print and mandrel pattern removed; and

Fig. 6, a section through the cope and drag section of a flask, showing sand cores in position and a cylinder cast in the flask.

Similar numerals refer to similar parts throughout the drawings.

The improved cylinder may be made by crimping a sheet of metal to form a series of reversely positioned triangles, with the sides of their bases in abutment, thus form-

ing reversely positioned triangular tubes as shown in Fig. 2; the ends of the sheet being welded together to form a continuous sheet.

The bases 7 of the outer triangular tubes 8 together form a continuous jacket integral with the common walls of the adjacent tubes; and the bases 10 of the inner tubes 11 are preferably rounded to form angular or pointed ovoids, the rounded bases of which are fused or welded integral with the periphery of the wall 12 of the cylinder.

The continuous sheet metal fins and jacket thus described may be fused or welded upon the periphery of a cylinder by placing the same in a mold around a mandrel pattern 13, and retaining the same in proper diameter by means of hoops or rings 14, the crimped sheet being temporarily supported upon a core print 15 and all the parts being temporarily supported upon a bottom board 16.

In this position the triangular flues may be filled with sand, after which the drag of a flask may be placed upon the bottom board around the mandrel pattern and then filled with sand as shown in Fig. 4.

The drag may then be inverted and the mandrel pattern and core print removed to complete the mold, as shown in Fig. 5. Sand cores 17 and 18 are then inserted in the mold, and a cope section 18' filled with sand and provided with a gate 19 is then placed in position as shown in Fig. 6.

By pouring metal through the gate, a cylinder 20 is cast around the core and within the surrounding bases of the triangular tubes 11 which are thereby fused or welded integral with the metal of the cylinder, the sheet metal being preferably coated with tin if desired to facilitate the operation, in a well known manner.

By thus forming the fins of a continuous sheet, crimped into triangular tubes, much thinner metal can be used which can be readily handled in the foundry processes. There is only one continuous part to place in the mold and all the tubes naturally find their proper position when mounted around a mandrel pattern and sustained thereon by surrounding hoops or rings.

An equal or greater cooling area is obtained by the use of thinner metal as compared with separate strip fins, and the use of a separate jacket is obviated by the jacket



formed by the integral bases of the outer triangular tubes, which being integral, increases the area of the radiating surface.

I claim:

5 1. The method of making engine cylinders comprising shaping a sheet of metal to provide cooling fins and an annular jacket integral with the same, placing the same in a mold, and casting a cylinder within the
10 same.

2. The method of making engine cylinders comprising shaping a sheet of metal to provide cooling fins and an annular jacket integral with the same, coating the sheet with

tin, placing the same in a mold, and casting 15 a cylinder within the same.

3. The method of making engine cylinders comprising shaping a sheet of metal to form a continuous plurality of oppositely tapered tubular portions, enclosing the same in an 20 encircling ring, placing the same in a mold, and casting a cylinder within the same.

4. The method of making engine cylinders comprising shaping a continuous sheet of metal to form a continuous plurality of 25 oppositely tapered tubular portions and fusing the same to a cylinder.

HEMSLEY B. MASSEY.