March 10, 1925. 1,528,947

C. I. PRESTON

METHOD OF CASTING ENGINE CYLINDERS

Filed Dec. 14, 1922

Fig. 1.

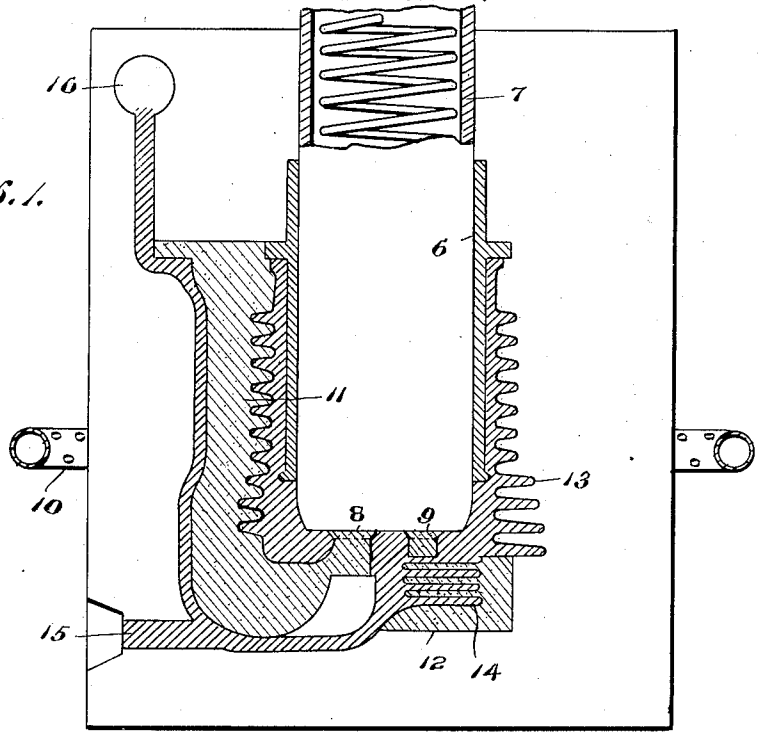


Fig. 2.

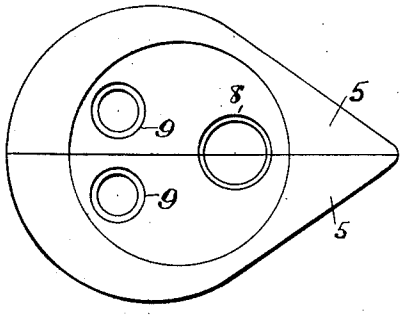
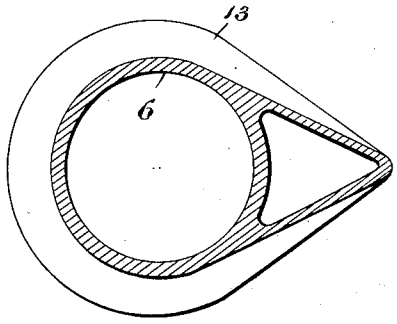


Fig. 3.



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By Robert H. Young Atty.

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UNITED STATES PATENT OFFICE.

CHARLES I. PRESTON, OF DAVENPORT, IOWA.

METHOD OF CASTING ENGINE CYLINDERS.

Application filed December 14, 1922. Serial No. 606,976.

To all whom it may concern:

Be it known that I, CHARLES I. PRESTON, a citizen of the United States, residing at Davenport, in the county of Scott and State of Iowa, have invented certain new and useful Improvements in Methods of Casting Engine Cylinders, of which the following is a specification.

This invention relates to a method of casting engine cylinders, particularly the cylinders of internal combustion engines of light weight employing an inner liner of wear-resisting metal such as cast iron or steel, and a surrounding casing of aluminum or aluminum alloy or other metal or alloy of high heat conductivity.

The invention consists in the novel features and steps herein fully described, illustrated and claimed.

In the accompanying drawings—

Figure 1 is an inner face view of one of the die sections, showing the liner and plunger in section;

Figure 2 is a top plan view of the sectional die;

Figure 3 is a transverse section through the cylinder and intake passage.

In carrying out the new and improved method of casting an engine cylinder, I employ a die which is generally cylindrical and divided diametrically into two sections 5 having flat meeting faces, as shown in Figure 2. By so dividing the die, the sections thereof are removable easily from the finished casting. The die sections are formed with cavities for several cores and for other purposes which will appear.

The die is further formed with a central longitudinal bore or cylindrical recess to receive an inner liner 6 of cast iron or steel or other wear-resisting material, said liner setting into a countersunk recess in the die, as in Figure 1. A plunger 7 is inserted into the liner 6 and has cupped portions 8 and 9 at its inner end to form valve seats in the casting, as shown. The plunger 7 is hollow or tubular and may be heated by any suitable heater such as a coil or resistance (electrical) placed therein to preheat the liner before the casting operation.

The die is preheated before casting the casing around the liner by a suitable heater 10 shown of the ring type in Figure 1. By the heating arrangement described, the inner and outer parts of the mold are heated to the proper degree before the cylinder casing is cast, thus preventing too rapid cooling of the casing which might cause separation between the casing and liner. Where the liner 6 is not cast in the casing, the plunger 7 (made slightly larger) will form the inner wall of the mold.

The intake passage core 11 and the exhaust passage core 12 are set into the die and extend to the cupped portions 8 and 9 of the plunger. Cooling flange cavities 13 and 14 are provided, as shown, to receive the molten metal which is introduced under pressure through the passage 15 at the bottom of the die, the impurities and air bubbles passing upwardly to one or more risers 16 in the die. The cylinder is cast in inverted position as shown. The casing may be cast around the preheated plunger and thereafter the liner may be forced into the casing under pressure, if so desired.

What I claim is—

1. The method of casting an engine cylinder comprising an inner liner of wear-resisting metal, and a casing surrounding said liner and composed of metal of high heat conductivity, said method consisting in employing a die for the outside of the cylinder, preheating said die before the casing metal is poured, then introducing the molten casing forming metal between the die and liner.

2. The method of casting an engine cylinder comprising an inner liner of wear-resisting metal, and a casing surrounding said liner and composed of metal of high heat conductivity, said method consisting in employing a die for the outside of the cylinder, preheating said die and liner before the casing metal is poured, then introducing the molten casing forming metal between the die and liner.

3. The method of casting an engine cylinder comprising an inner liner of wear-resisting metal, and a casing surrounding said liner and composed of metal of high heat conductivity, said method consisting in employing a die for the outside of the cylinder, inserting a plunger in the liner, preheating said die and plunger, and then introducing the molten casing forming metal between the die and liner.

4. The method of casting an engine cylinder comprising an inner liner of wear-resisting metal, and a casing surrounding said liner and composed of metal of high heat conductivity, said method consisting in employing a die for the outside of the cylinder,

preheating said die before the casing metal is poured, then forcing the molten casing forming metal into the space between the die and liner.

5. The method of casting an engine cylinder comprising an inner liner of wear-resisting metal, and a casing surrounding said liner and composed of metal of high heat conductivity, said method consisting in employing a die for the outside of the cylinder, inserting a plunger in the liner, preheating said die and plunger, and then introducing the molten casing forming metal between the die and liner, the plunger having cupped portions to form valve seats in the casing.

In testimony whereof I affix my signature.

CHARLES I. PRESTON.