A. BIE.

COMBUSTION ENGINE PISTON.

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1,226,631. Patented May 22, 1917.

Fig. 1.

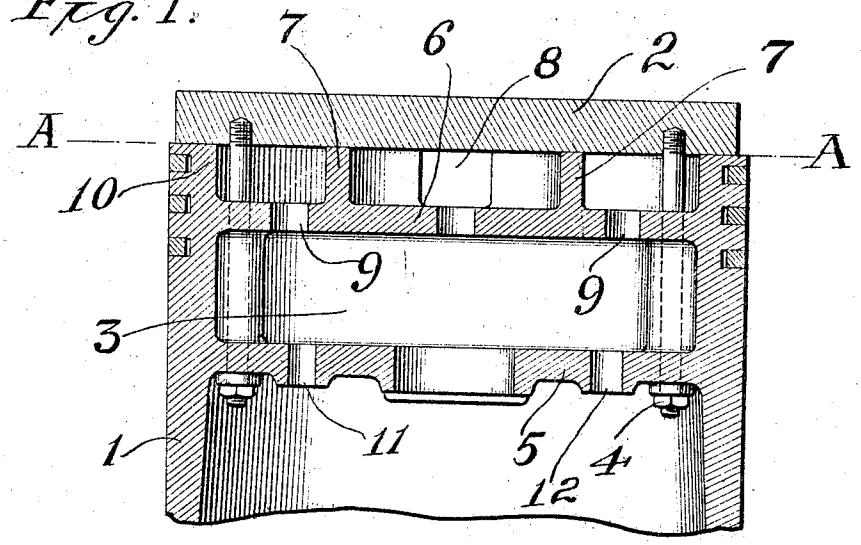
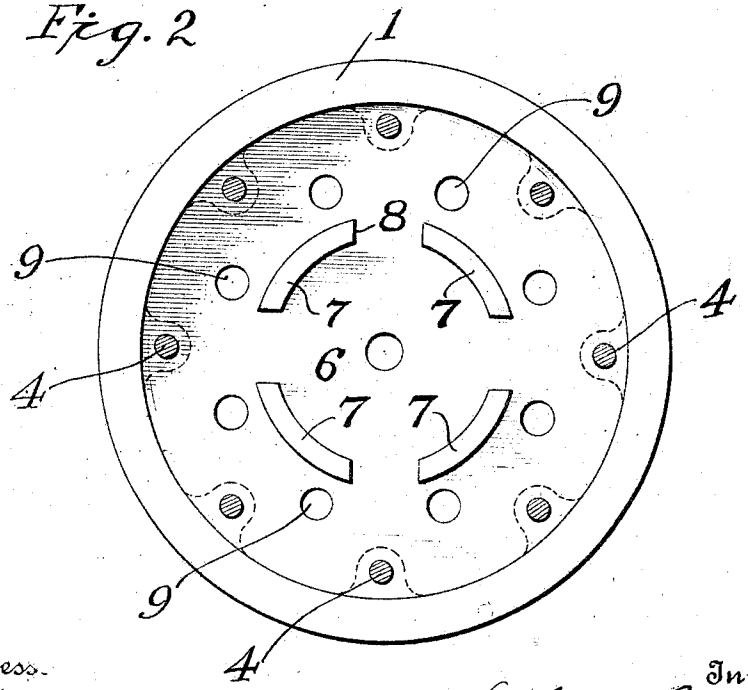


Fig. 2



Witness.

Wm. H. Hawkins

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By Atty

UNITED STATES PATENT OFFICE.

ALBERT BIE, OF WINTERTHUR, SWITZERLAND, ASSIGNOR TO BUSCH-SULZER BROS. DIESEL ENGINE COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

COMBUSTION-ENGINE PISTON.

1,226,631. Specification of Letters Patent. Patented May 22, 1917.

Application filed February 2, 1915. Serial No. 5,623.

To all whom it may concern:

Be it known that I, ALBERT BIE, a citizen of the Kingdom of Norway, residing in Winterthur, Canton of Zurich, Switzerland, have invented a new and useful Improvement in Combustion-Engine Pistons.

This invention is an improved water-cooled piston for internal combustion engines, the object of which is to render the cooling space in the piston accessible for cleaning, to enable the cooling to be made more effective, and to permit replacement of the portion exposed to the combustion gases, at the same time securing a construction which is of adequate strength and in large measure relieved of expansion stresses.

In the accompanying drawing illustrating the preferred embodiment of the invention:

Figure 1 is a longitudinal section through a piston, the portion of which toward the crank shaft is broken away for simplicity of illustration; and

Fig. 2 is a sectional plan on the line A—A of Fig. 1.

The head portion of the piston body 1 is hollow for circulation of cooling water, the cooling space being included between a transverse wall 5 and a removable end plate 2, which latter, it will be understood, is at the end exposed to the combustion gases. The cooling space is preferably divided by an interior transverse wall 6 into spaces 3 and 8, the outer of which is closed off from the combustion space by the plate 2. The said plate is suitably secured to the body, as by bolts 4, which are operated from the crank side of the piston and draw the plate firmly against the rim 10 and also against one or more projections 7, which may extend from the wall 5 but preferably from the wall 6 as shown. These projections within the cooling space may naturally be varied in number and arrangement, their function being to support the piston end plate against stresses interiorly of its circumference, thereby insuring great solidity of construction and enabling a thinner plate to be employed with better cooling effect and less expansion stresses or distortion than would otherwise be the case. At the same time the mounting of the plate is such that it is free to expand radially independently of the piston body, which is of advantage as the plate is likely to become the more highly heated of the two. In this connection it will be noted that the plate is made of somewhat smaller diameter than the body of the piston. Being a separate part, it may be made of special material, and its inner surface may be finished off smooth, thereby further increasing the efficiency of the cooling. It is readily replaced in event of wear, and when removed enables the cooling space to be cleaned of deposits.

The two cooling spaces may be in communication through the openings 9 in wall 6, the space 3 being connected by known means with supply and return connections through openings 11 and 12, or the two spaces may receive their cooling water independently if desired.

What I claim as new is:

1. An internal combustion engine piston, comprising a hollow body of cylinder diameter containing a water-cooling space, and an end plate applied against the end of the body and closing said cooling space at the side adjacent the combustion space and means for detachably holding said plate in place.

2. A water-cooled internal combustion engine piston, comprising a hollow body of cylinder diameter open at the front and having one or more projections within its cooling space located inwardly of the peripheral wall, and a removable end plate secured to the body and bearing circumferentially against the peripheral wall of the same and inwardly of its circumference against said projections.

3. An internal combustion engine piston, comprising a hollow body having a transverse wall dividing the interior of the same into water-cooling spaces, the one nearest the combustion chamber being open and provided with interior projections extending from said wall, and a removable end plate supported against the periphery of the body and against said projections and closing off said water-cooling space from the combustion space.

4. An internal combustion engine piston, comprising a hollow body of cylinder diameter containing a water-cooling space and open at the end adjacent the combustion space, and a removable plate secured against said end with freedom for independent radial expansion relative to the body.

5. An internal combustion engine piston, comprising a hollow body of cylinder diame-

ter having a transverse wall dividing the interior of the same in two water-cooling spaces each space having an independent inlet and outlet for the cooling water, and a removable end plate closing off said water-cooling spaces from the combustion space.

6. An internal combustion engine piston comprising a hollow body of cylinder diameter having a transverse wall dividing the interior of the same in two water-cooling spaces, the two water-cooling spaces being directly in communication the one with the other, and a removable end plate closing off said water-cooling spaces from the combustion space.

7. An internal combustion engine piston, comprising a hollow body containing a water-cooling space, a removable end plate closing said cooling space at the side adjacent the combustion space, and fastening means adapted to draw the plate against the body and accessible at the back of the latter.

In testimony whereof, I have signed this specification in the presence of two witnesses.

ALBERT BIE.

Witnesses:
ROBERT SCHLAEFFER,
CARL GUBLER.