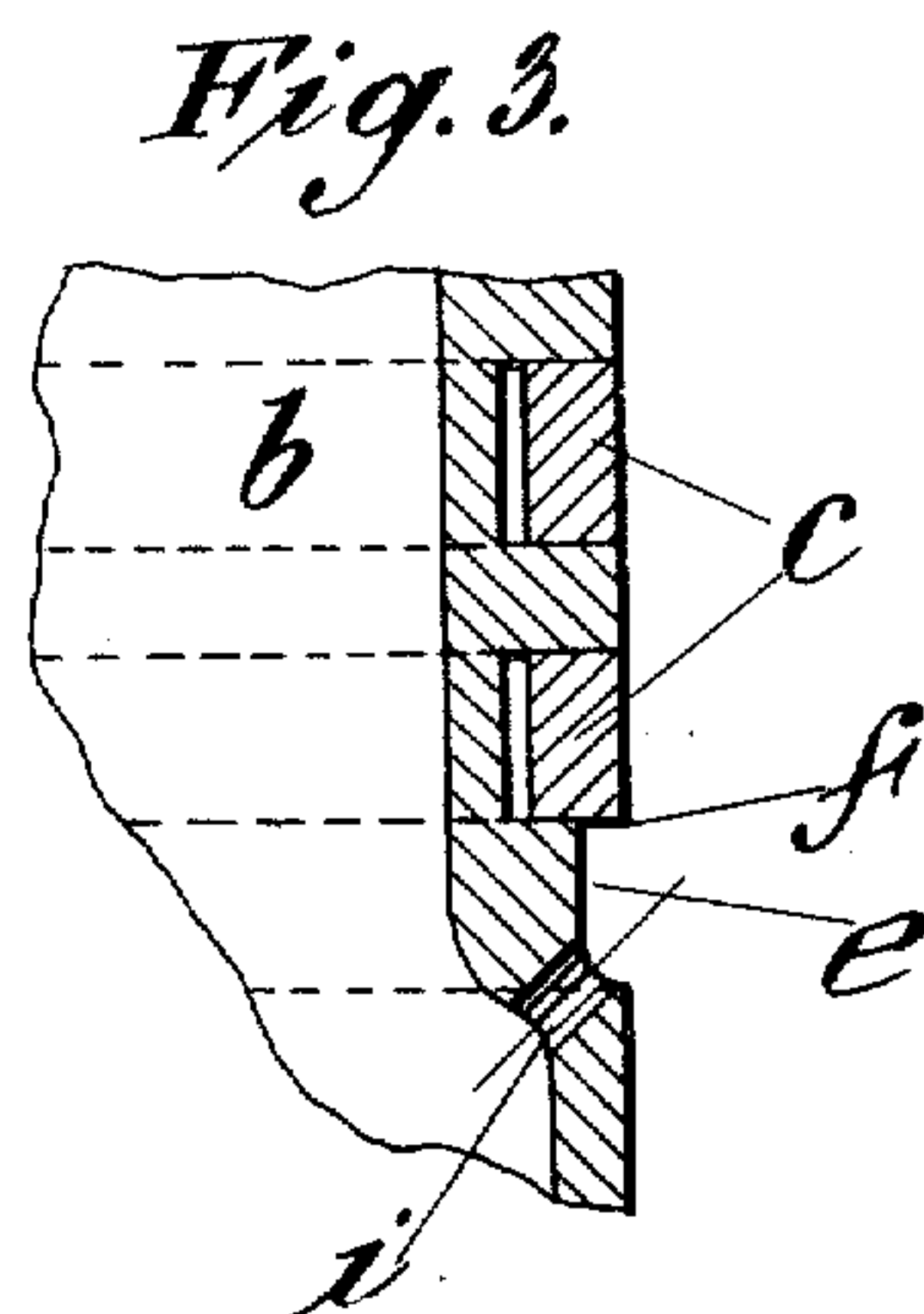
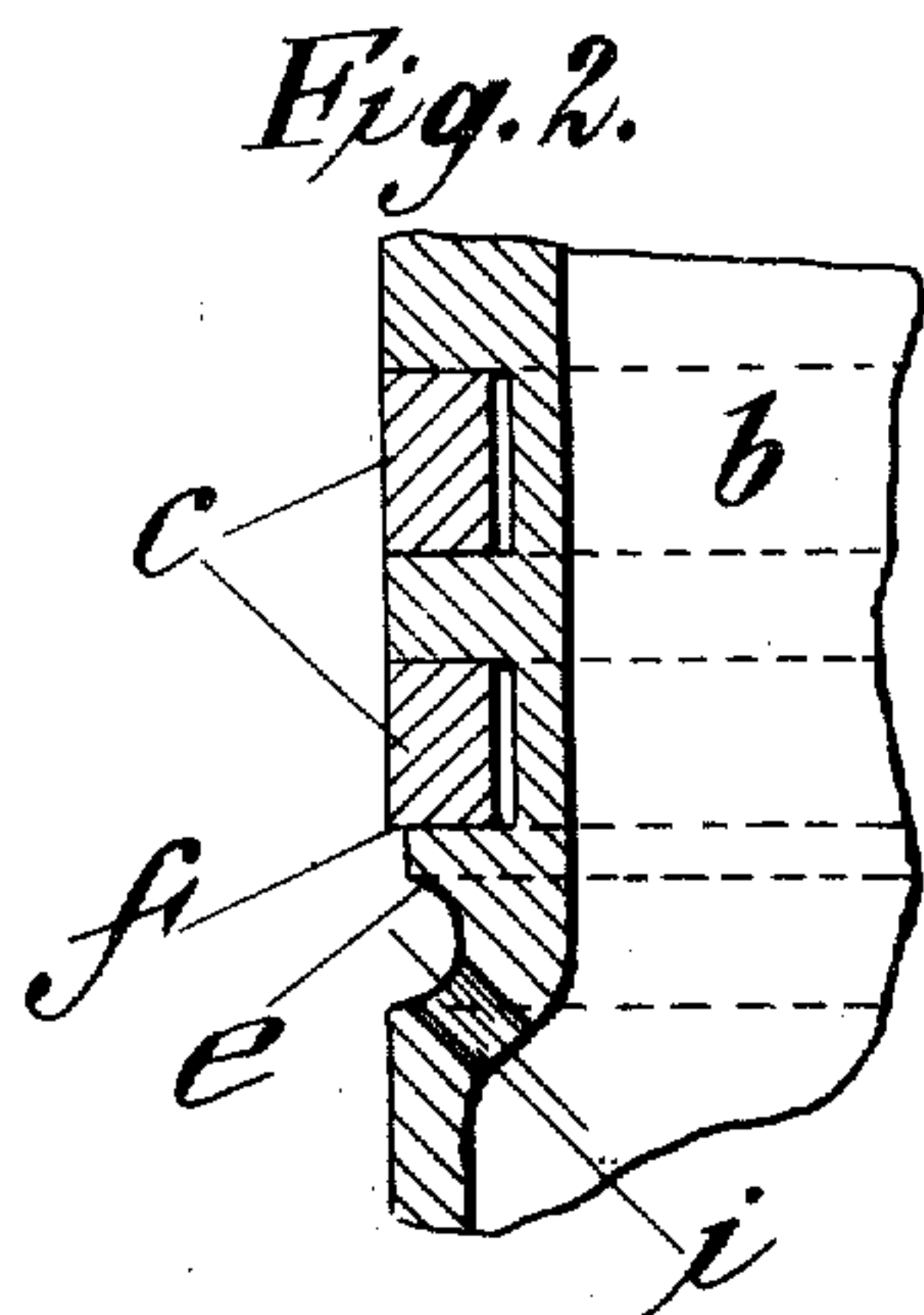
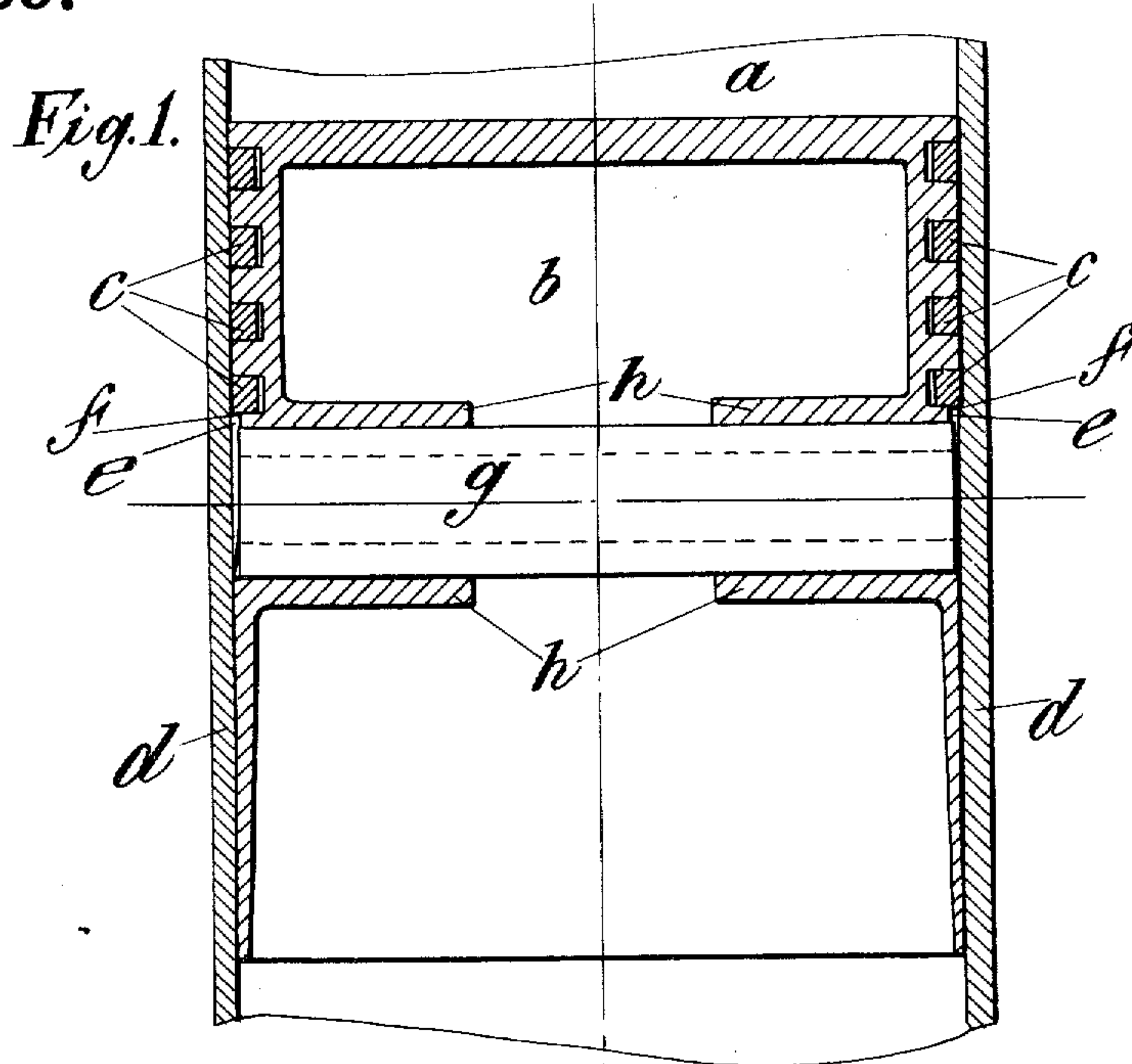


F. D. HOWE.
ENGINE.

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908,569.

Patented Jan. 5, 1909.



WITNESSES:

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FRANK D. HOWE, OF PORT WASHINGTON, NEW YORK.

ENGINE.

No. 908,569.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FRANK D. HOWE, a citizen of the United States, residing in Port Washington, county of Nassau, and State of New York, have invented certain new and useful Improvements in Engines, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

It is desirable particularly in internal combustion engines, to reduce to a minimum the amount of lubricating oil which commonly works by the piston into the combustion chamber. If some means are not provided toward this end, the film of oil around the piston upon the sides of the cylinder gradually works inwardly into the combustion chamber where it becomes more or less carbonized and interferes to a considerable extent with the even running of the engine.

A common way of lubricating the cylinder of an explosion engine and particularly an upright explosion engine is what is known as the "splash" method, in which a quantity of lubricating oil is provided in the closed crank-case of the engine so that the crank, revolving therein, will splash the oil up into the open end of the cylinder, thus keeping a film of oil on the interior surface of the same. It frequently happens, however, that this film of oil, which, of course is constantly renewed by the splashing, is carried up above the piston and the oil caused to accumulate in the upper part of the cylinder, where it is decomposed or carbonized by the heat produced by the explosions, fouling the parts and impairing the operation of the engine, chiefly by carbonizing the sparker or igniter and thus interfering with ignition. It is necessary, of course, that a certain quantity of oil be spread over the cylinder surface, for lubrication, and hence it is only the excessive traveling or creeping of the oil that should be prevented.

The object of the present invention is to provide a very simple means for avoiding this objection almost altogether, which means shall not necessitate the addition of extra parts or involve any considerable expense in its embodiment in an engine.

Broadly considered the invention consists in providing means upon the piston such as a sharp edge for shearing off the film of oil around the piston upon the sides of the cylin-

der as the piston moves forward, and a recess in the piston adjacent to said edge, whereby, as the film of oil is sheared off it will be deposited in the recess whence it may find its way back to the source of lubrication or elsewhere through a suitable relief.

The invention is illustrated in the drawings as embodied in an engine having a vertically working piston, and in said drawings, Figure 1 is a view in vertical central section of the engine showing the piston in side elevation, and, Figs. 2 and 3 are detail views in central vertical section through two pistons showing modifications.

The working cylinder, or more specifically, if the engine be of the internal combustion type, the combustion chamber is indicated by the letter *a* and the piston which, as shown, is of the ordinary hollow variety, by the letter *b*. The piston may be provided with any suitable number of packing rings which are sprung into peripheral recesses in the piston as usual so as to bear outwardly against the sides of the cylinder *d* forming the working chamber. Just ahead of one of the rings, preferably the foremost ring as shown, a recess *e* is provided which may extend around the entire piston, and the edge *f* of this ring, the edge toward the forward end of the piston, is made quite sharp. Cooperating with the recess *e* is a relief therefor, which as shown in Fig. 1 is afforded by the space formed between a wrist-pin *g* to which the pitman may be attached and the bearings *h* in the piston for such wrist-pin. In Fig. 2 channels *i* are illustrated connecting the recess *e* with the interior of the piston to afford a relief for the recess. It will be obvious that a relief for the recess may be provided in various ways.

In operation, the forward movement of the piston, that is its movement away from or out of the cylinder, causes the sharp edge *f* of the ring adjacent to the recess *e* to shear off the film of oil around the sides of the cylinder and to deposit such oil in the recess *e* whence it finds its way back through the relief to the source of lubrication or to some other convenient depository. In practice, the lubricating oil in vertical engines is often deposited below the piston and is splashed by the pitman against the sides of the cylinder. In such a case, the oil escaping through the relief can obviously be allowed to drip

back through the interior of the piston into the oil beneath.

It is obvious that the improvements may be embodied in other ways than those shown, described or referred to herein.

I claim as my invention:

1. In an engine, the combination with the engine cylinder, of a piston therein, a piston ring pressing against the walls of the cylinder, a recess to receive oil from the inner surface of the cylinder, and a relief for the recess.

2. In an engine, the combination of a working chamber, a piston therein having a peripheral recess, and a ring in the recess pressing against the walls of the chamber, said piston having a second recess arranged next to the ring so as to receive the oil scraped by the ring from the walls of the working chamber.

3. In an engine, the combination of a working chamber, a piston therein having a peripheral recess, a ring in the recess pressing against the walls of the chamber, said piston having a second recess adjacent to the ring, and a relief for said second recess.

4. In an engine, the combination of a working chamber, a piston therein having a peripheral recess, a ring in the recess having a sharp edge toward the forward end of the piston, said piston having a second recess adjacent to the ring, and a relief for said second recess into the interior of the piston.

5. In an engine, the combination of a working chamber, a hollow piston therein having a peripheral recess, and a ring in the recess having a sharp edge toward the forward end of the piston, said piston having a second recess extending around its periphery

just ahead of the ring, and channels connecting said recess with the hollow of the piston.

6. In an engine, the combination with the engine cylinder, of a piston therein, a piston ring pressing against the walls of the cylinder, a recess next to the ring to receive oil from the inner surface of the cylinder, and a relief for the recess.

7. In an engine, the combination with the engine cylinder, of a piston therein, and a sharp edge extending around the periphery of the piston adapted to remove the oil from the inner surface of the cylinder as the piston moves in a direction away from the cylinder or out of the cylinder.

8. In a vertical engine, the combination with the cylinder, of a piston working therein, and provided with means for removing oil from the inner surface of the cylinder as the piston moves downwardly and discharging it from a point removed from said surface.

9. In an engine, the combination with the engine cylinder, of a piston therein having a wrist-pin, a piston ring pressing against the walls of the cylinder, a recess to receive oil from the inner surface of the cylinder, and a relief for the recess around the wrist-pin.

10. In an engine, the combination with the engine cylinder, of a piston therein, a piston ring, a recess into which the ring is adapted to scrape oil, and a relief for the recess.

This specification signed and witnessed this 20th day of June, A. D., 1906.

FRANK D. HOWE.

Signed in the presence of—

HOMER H. SNOW,

FRANCIS E. VARNEY.