No. 754,121. PATENTED MAR. 8, 1904.

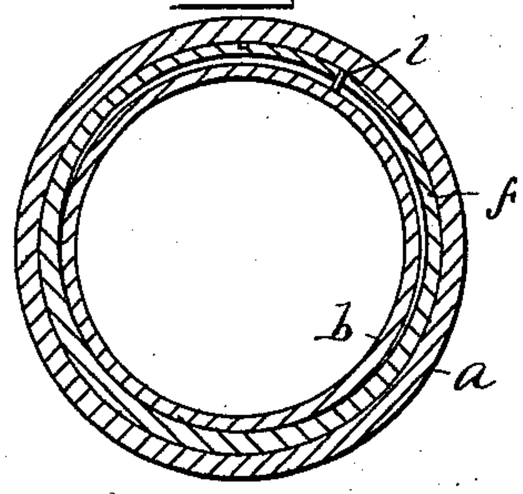
A. P. BRUSH.

MEANS FOR CYLINDER LUBRICATION OF INTERNAL COMBUSTION ENGINES.

APPLICATION FILED NOV. 30, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 4.



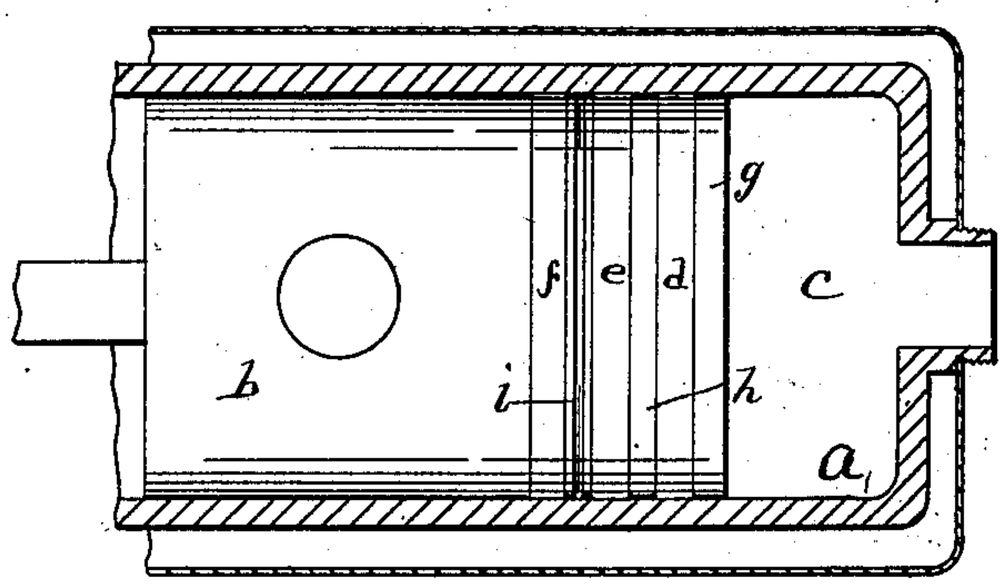
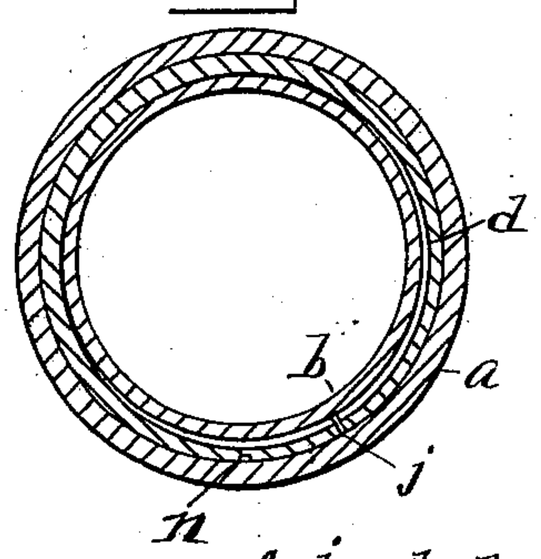


Fig. 1.

Fig. 5.



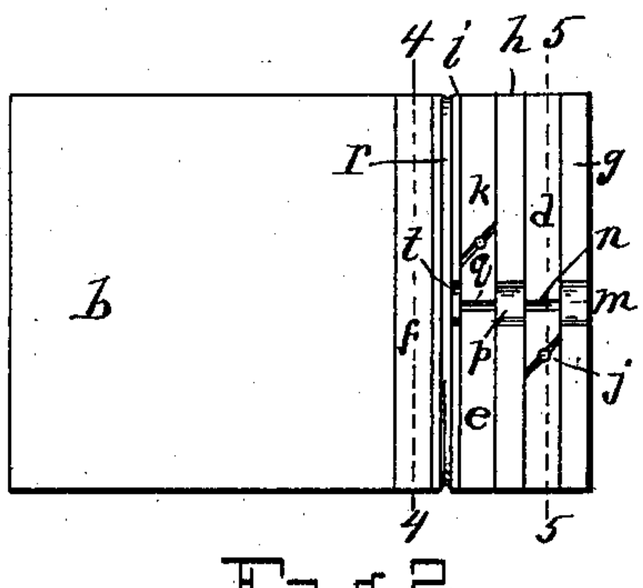
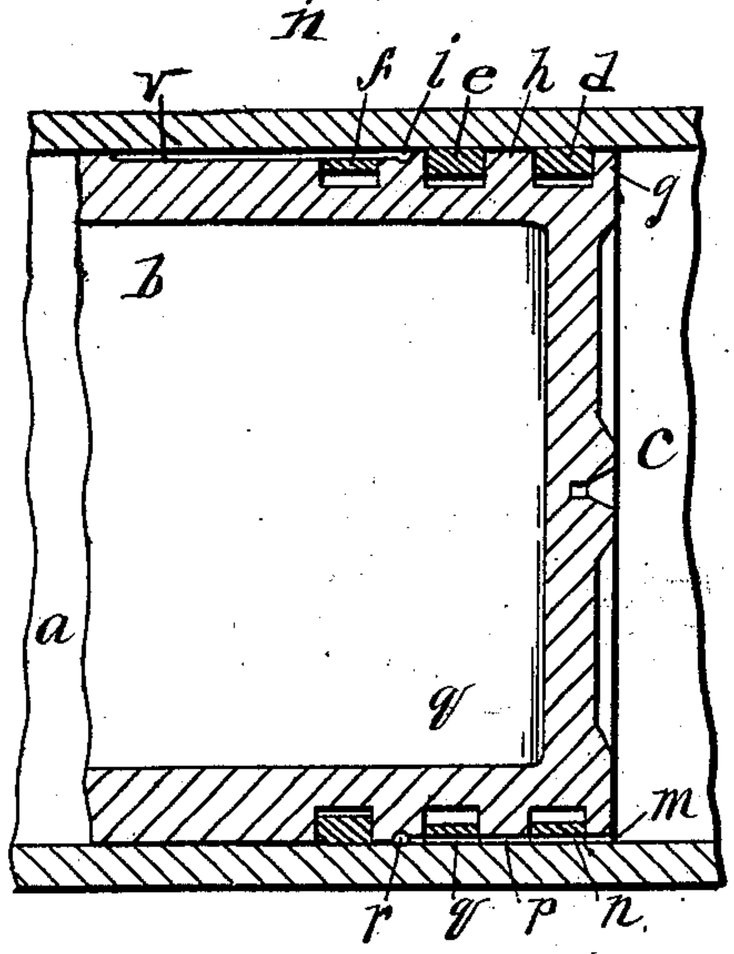


Fig. 2.



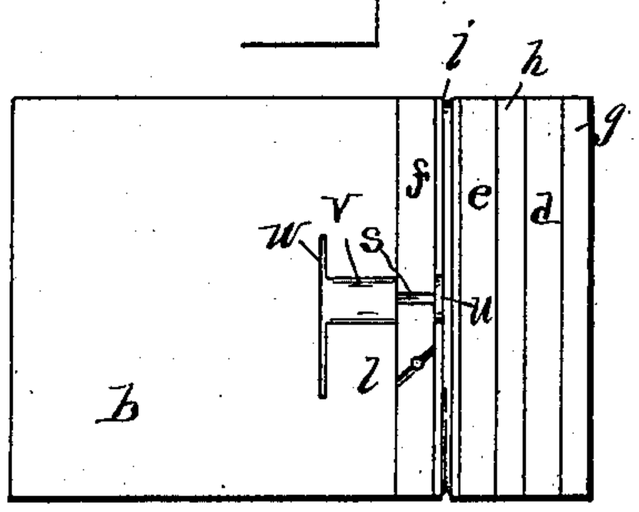


Fig. 3.

Fig. 6.

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NO MODEL. 2 SHEETS—SHEET 2.

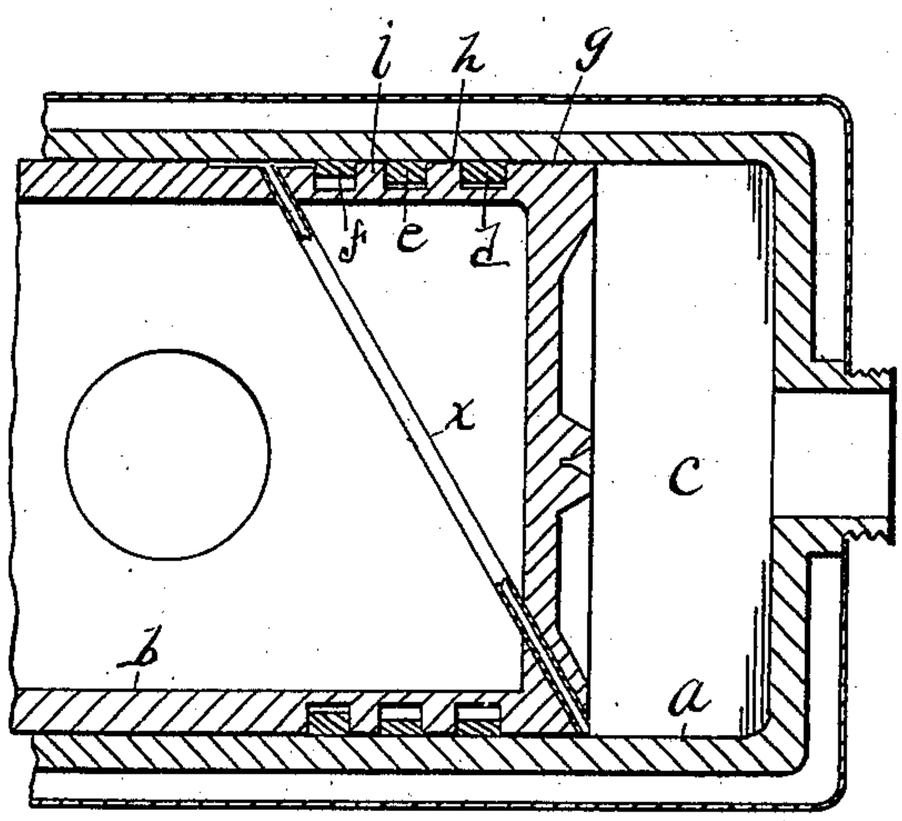

FIG. 7.

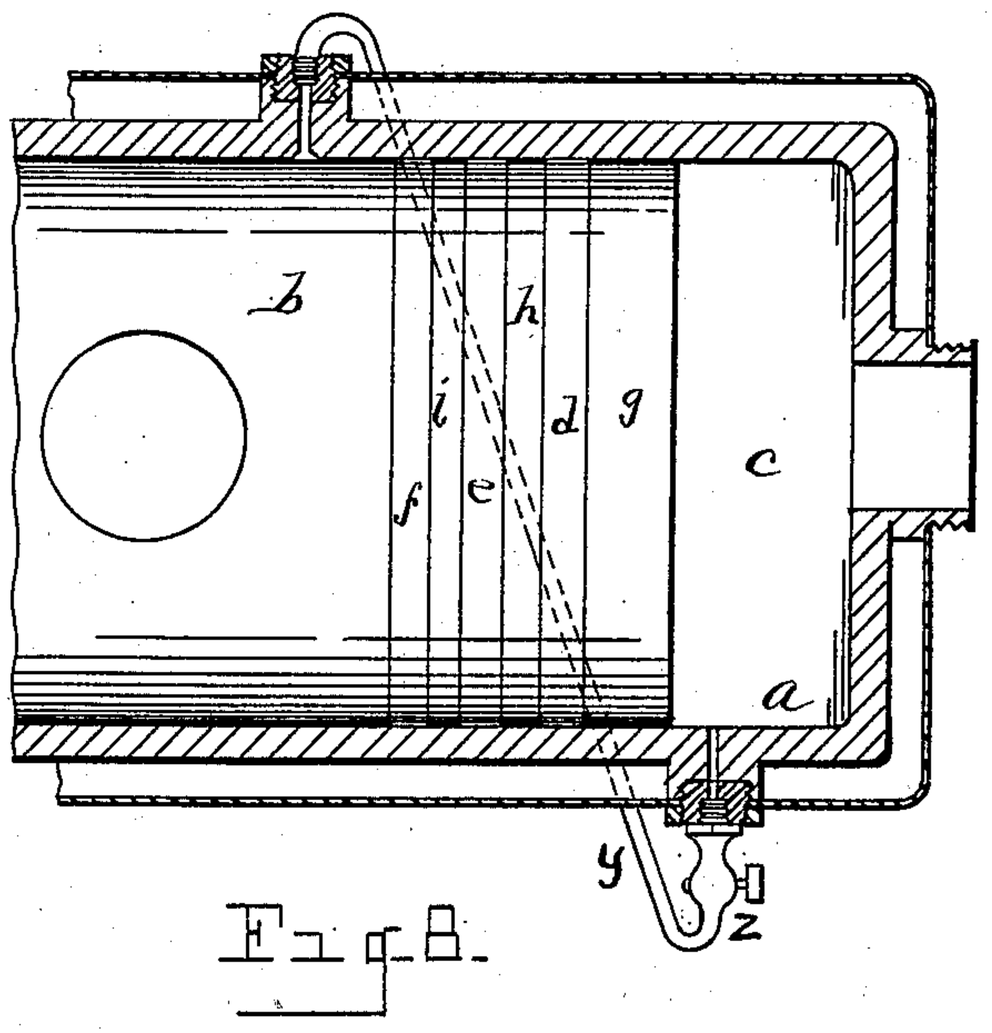

FIG. 8.

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UNITED STATES PATENT OFFICE.

ALANSON P. BRUSH, OF DETROIT, MICHIGAN.

MEANS FOR CYLINDER LUBRICATION OF INTERNAL-COMBUSTION ENGINES.

SPECIFICATION forming part of Letters Patent No. 754,121, dated March 8, 1904.

Application filed November 30, 1903. Serial No. 183,116. (No model.)

To all whom it may concern:

Be it known that I, ALANSON P. BRUSH, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Means for Cylinder Lubrication of Internal-Combustion Engines, of which the following is a specification, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object to provide improved means of cylinder lubrication for internal-combustion engines; and it consists of the construction and arrangement of devices hereinafter described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a view showing the cylinder in longitudinal section and the piston in elevation. Fig. 2 is a detail view of a piston in inverted plan, the view showing the bottom of a horizontally-moving piston. Fig. 3 is a plan view from the opposite side of the piston. Fig. 4 is a view in cross-section on the line 4 4, Fig. 2. Fig. 5 is a view in section on line 5 5, Fig. 2. Fig. 6 is a vertical view in longitudinal section through the piston. Fig. 7 illustrates a modification in the construction of the piston, and Fig. 8 illustrates another modification wherein the oil-passage is carried about the cylinder.

My invention relates more particularly to means for lubricating cylinders of horizontal internal-combustion engines.

It will be readily understood that owing to the position of the cylinder and piston the oil tends by gravity constantly to flow to the bottom of the cylinder and away from the top of the piston.

My invention is designed to provide means whereby oil will be effectually forced to the top of the piston to afford efficient lubrication thereat.

Another object of my invention is to eliminate the bad effects of an excess of oil in the cylinder—viz., deposit of carbon on the walls of the combustion-chamber and on the igniting device, and also smoke and odor caused by the burning of the oil.

These results I accomplish as follows:

As shown in the drawings, *a* is a cylinder, and *b* a piston. The combustion-chamber of the cylinder is indicated at *c*. The piston is provided, preferably, with three or more packing-rings (indicated by the letters *d*, *e*, and *f*) of customary construction except as hereinafter noted, the body of the piston being provided with junk-rings *g*, *h*, and *i*. The customary pins between the meeting ends of the packing-rings are indicated at *j*, *k*, and *l*. To form a channel for oil to be disseminated about the end of the piston, the junk-ring *g* may be formed with an elongated channel *m* on the lower side thereof and the packing-ring *d* with a more contracted channel or groove *n*. The junk-ring *h* may be constructed with an elongated transverse channel *p* and the packing-ring *e* with a contracted transverse channel *q*, communicating with a peripheral groove (indicated at *r*) leading about the junk-ring *i*. The groove *r*, on the upper side of the piston, communicates with a transverse groove *s* of the packing-ring *f*, the junk-ring *i*, at one side thereof, being formed with an elongated groove *t* to communicate with the groove *q* and upon the opposite side of the piston with an elongated groove *u* to communicate with the groove *s*. The body of the cylinder may be provided with a channel or groove communicating with an elongated groove *w*, extending on the arc of a circle a desired distance. Turning to Fig. 2, which shows the bottom of the cylinder. where the oil obviously gravitates, it will readily be seen that an oil-passage is provided through the channels *m*, *n*, *p*, *q*, and *t*, on the bottom of the piston, into the peripheral groove *r* and that a channel is formed on the opposite or upper side of the piston from the peripheral groove through the channels *u* and *s* into the channels *v* and *w*. It will thus be evident that when an explosion takes place in the combustion-chamber of the cylinder the oil will be driven through the communicating channel, above described, at the base of the

piston, the oil being forced about the peripheral groove *r* to the upper side of the piston and distributed therefrom through the channels *u s v w* to the upper surface of the piston. In this manner the piston may effectually be surrounded with a suitable amount of oil, both at the top as well as at the bottom of the piston.

It will be evident that by making the channels *m* and *p* of the junk-rings *g h* on one side of the piston and the channels *u v* on the other side of the piston wider than the corresponding channels of the packing-rings that the channels of the packing-rings will still communicate with the corresponding channels adjacent thereto either when the packing-rings are compressed or expanded and as the packing-rings gradually expand from wear.

It will readily be seen that by regulating the size of the peripheral groove and of the grooves communicable therewith that a sufficient amount of oil may be forced to the top of the piston at each explosion occurring in the cylinder and yet without liability of the passage or leakage therefrom of the gases in the combustion-chamber to an extent sufficient to cause any appreciable loss of power.

While I have shown and hereinabove described the piston formed with channels as above stated, I would have it understood that I do not limit myself solely to this particular method of carrying out my invention, and therefore in Fig. 7 I have shown a modification in which the piston is provided with a tube *x*, extending therethrough from the lower side of the piston to the upper side thereof, the lower end communicable with the compression-chamber and the upper end opening from the piston on the upper surface on the opposite side of the packing-rings. My invention therefore contemplates any means for forcing oil by the explosion in the combustion-chamber from the lower side of the combustion-chamber, where it naturally collects, onto the upper side of the piston and upon the opposite side of the packing-rings of the piston or on the side of the packing-rings away from the combustion-chamber. The use of the compression and explosion pressure to force the oil which may collect in the combustion-chamber to some other part of the machine obviously not only causes a better distribution of lubrication, but does away effectually with any appreciable excess of oil in the combustion-chamber.

In Fig. 8 I have shown another modification in carrying out my invention, in which the cylinder is provided with an oil-passage *y*. This passage may consist of a tube connected at one end, as through a valve *z*, into the bottom of the combustion-chamber, the tube being led about the exterior of the water-jacket and entering the cylinder on the top or other suitable part of the engine.

What I claim as my invention is—

1. In an internal-combustion engine, a cylinder and a piston provided with a peripheral groove, the piston provided with a channel on its lower side communicating with the combustion-chamber of the cylinder at the bottom of the cylinder and with said peripheral groove, the opposite side of the piston constructed with a groove for distributing the oil from the peripheral groove over the upper surface of the cylinder.

2. In an internal-combustion engine a cylinder and piston provided with packing-rings and with corresponding junk-rings, and with a peripheral groove, one side of the piston constructed with channels communicable with the peripheral groove and with the combustion-chamber at the bottom of the cylinder, the opposite side of the piston constructed to distribute the oil from the peripheral groove on the upper surface of the piston.

3. In an internal-combustion engine a cylinder, a piston provided with packing-rings and corresponding junk-rings and with a peripheral groove between two adjacent packing-rings, the junk-rings and packing-rings on the one side of the cylinder constructed with channels on the end adjacent to the combustion-chamber of the cylinder communicating with said chamber and with the peripheral groove, and the packing-ring and junk-ring on the opposite side of the peripheral groove provided with channels for distributing the oil over the upper surface of the piston.

4. In an internal-combustion engine a cylinder, a piston provided with packing-rings and corresponding junk-rings and with a peripheral groove between two adjacent packing-rings, the junk-rings and packing-rings on the one side of the cylinder constructed with channels on the end adjacent to the combustion-chamber of the cylinder communicating with said chamber and with the peripheral groove, and the packing-ring and junk-ring on the opposite side of the peripheral groove provided with channels for distributing the oil over the upper surface of the piston, the channels of the junk-rings made wider than the channels of the packing-rings.

5. In an internal-combustion engine provided with a cylinder a compression-chamber, a piston of an oil-passage communicable at its lower end with the compression-chamber the opposite end of the oil-passage leading to a working part of the engine outside of the combustion-chamber, the piston provided with a passage the lower end of which opens into the compression-chamber and the upper end opening on a tube of the piston on the side of the packing-rings away from the combustion-chamber.

6. A piston provided with junk-rings and with an oil-channel around one of the junk-

rings, the lower side communicating with the compression-chamber at the bottom thereof and the upper side communicating with the top of the piston on the side of the packing-rings away from the combustion-chamber.

7. In an internal-combustion engine a cylinder provided with a combustion-chamber, a piston, and means whereby oil may be distributed from the bottom of the combustion-chamber to other parts of the engine by the explosive pressure in said chamber.

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

ALANSON P. BRUSH.

Witnesses:

JEAN D. BRUSH,

N. S. WRIGHT.