L. H. MARCIL.

ENGINE.

APPLICATION FILED JAN. 15, 1906.

920,165.

Patented May 4, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

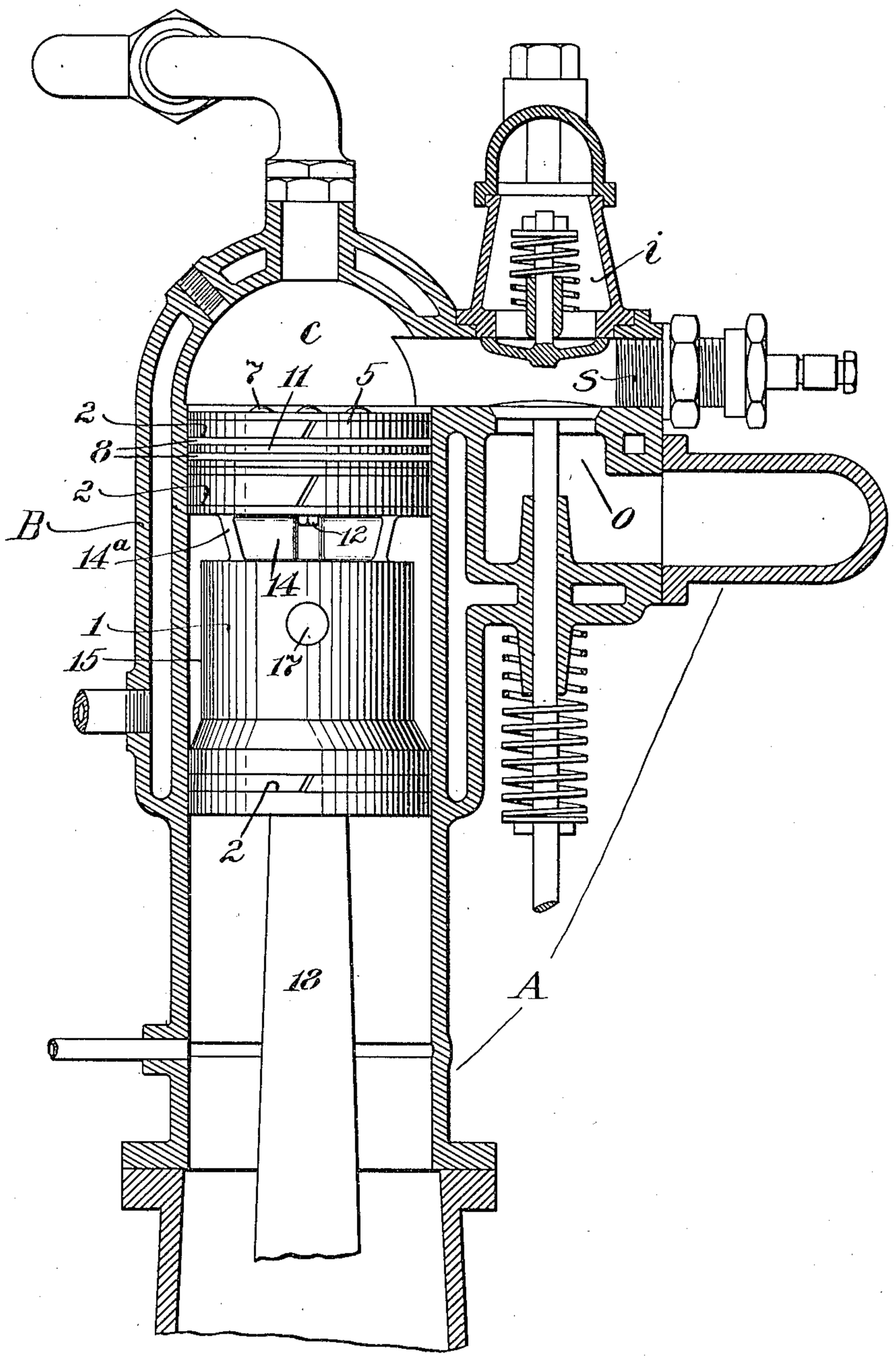

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Fig. 3.

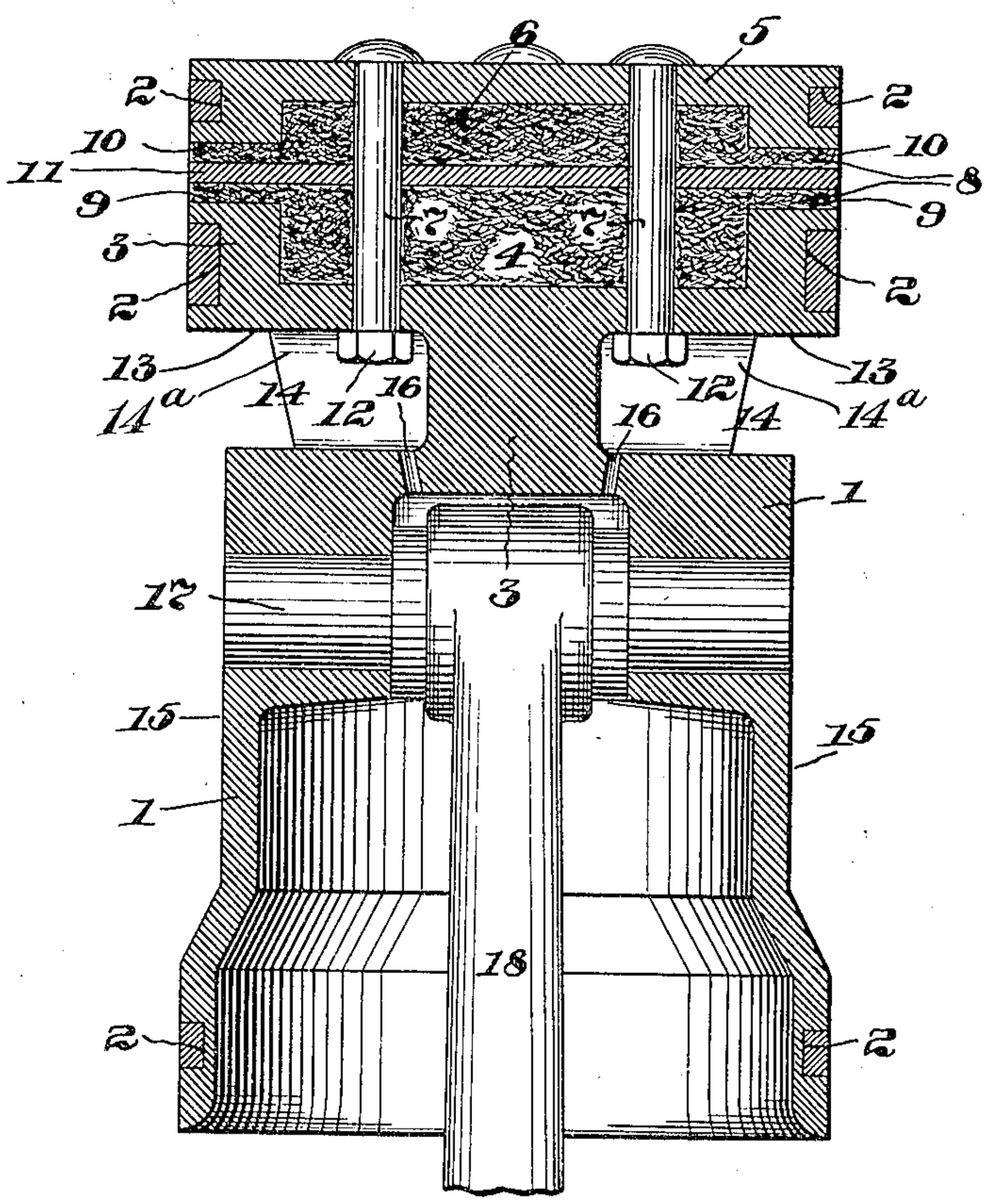
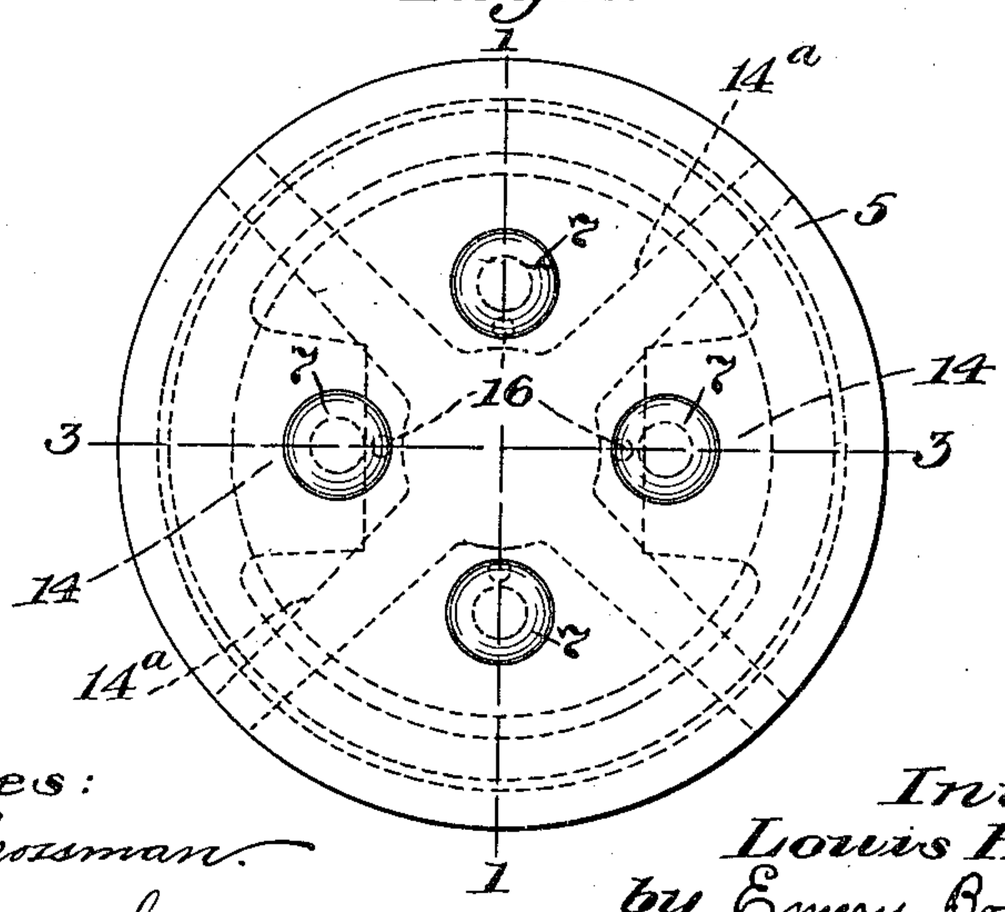


Fig. 2.



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UNITED STATES PATENT OFFICE.

LOUIS H. MARCIL, OF NEWTONVILLE, MASSACHUSETTS, ASSIGNOR TO CHARLES P. DOLAN, OF BOSTON, MASSACHUSETTS.

ENGINE.

No. 920,165. Specification of Letters Patent. Patented May 4, 1909.

Application filed January 15, 1906. Serial No. 296,079.

To all whom it may concern:

Be it known that I, LOUIS H. MARCIL, a citizen of the United States, residing at Newtonville, in the county of Middlesex and Commonwealth of Massachusetts, have invented an Improvement in Engines, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

My invention relates to engines and particularly to improvements in trunk or guide pistons for internal combustion engines.

My invention will be best understood and appreciated from the following description when considered in connection with the accompanying drawings illustrating one embodiment of my invention, while its scope will be more particularly pointed out in the appended claims.

Referring to the drawings,—Figure 1 is a longitudinal section of an internal combustion engine selected for illustration; Fig. 2, an enlarged plan of its piston; and, Fig. 3, a vertical section thereof, taken on line 3—3, Fig. 2.

It being essential in gas engines to avoid such high degrees of temperature as would cause carbonization of the lubricating oils and the "grinding" resulting therefrom, the present invention aims to provide a piston to prevent heat being communicated from the explosion chamber or head of the piston, to those parts of the piston comprising or forming bearing surfaces of said piston, or the cylinder in which it reciprocates. To add to the efficiency of the piston, the structure of the guide or trunk piston is such that lubricating oil is prevented from reaching the heated parts of the cylinder or piston where such carbonization would be possible.

Referring to Fig. 1, a truck or guide piston is shown in connection with an internal combustion engine, A, such as commonly used in automobiles, launches or the like, the cylinder, B, in which said piston reciprocates, being provided with the usual explosion chamber, *c*, at its inner end and with inlet and outlet ports, *i*, *o*, and spark plug, *s*. In order to secure such non-carbonizing results as have been referred to, the body of the guide or trunk piston, 1, having the usual circumferential grooves, 2, to receive packing rings, has its end, 3, formed to present a recess or chamber, 4. A head or plate, 5, having a similar recess, 6, to oppose that in the body or trunk, is secured to the latter by any suitable means here shown as bolts, 7. The recesses, 4 and 6, are filled with a heat-resisting or non-heat conducting substance, 8, as asbestos, to overlie the opposed faces, 9 and 10, of said body or trunk and said head, and a separating disk, 11, is interposed between them, the threaded ends of the bolts, 7, passing through alined holes drilled in said disk, head, and through and clamped by nuts, 12, against the faces, 13, of lateral or radial recesses or chambers, 14, in said trunk, separated by partition walls, 14^a.

In running the engine, the head of the usual piston becomes heated to a degree that produces carbonization of such oil as penetrates between the bearing faces of the cylinder and piston sufficiently to contact the hot surfaces of the head, 3, but by separating the head from the body of the piston, transmission of the heat from the hot head to the body of the piston is greatly reduced, if not entirely prevented. Moreover, by packing and compressing asbestos, or other heat-resisting medium, between the head and the body, and by securing additional separation and compression by means of the separating or spacing disk, 11, the efficient action of the piston as a non-conductor of heat, is greatly improved, so that it is practically impossible for heat to be transmitted or conducted from the head of the piston to the greater bearing surfaces thereof. The compressed asbestos also provides a very efficient packing in addition to that secured by the packing rings. To still further prevent lubricating oil from penetrating or reaching the head where carbonization would be possible, I have provided the piston with structural means to positively interrupt and prevent surplus oil from coming in contact with said head; and by "surplus oil" is meant more than enough to efficiently lubricate the bearing surfaces.

It will, of course, be understood that when carbonization of the oil is effected, the carbonized particles resulting therefrom impair the running of the engine and tend to produce serious injury to its parts, from the so-called "grinding" that ensues. The structural means, just referred to for interrupting the flow of lubricating oil, is secured by providing the piston with an intermediate por-

tion of less diameter than that of its ends, or by what amounts to the same thing, by providing the bearing surface of the piston with an inwardly flaring circumferential and longitudinal recess or groove, 15, to collect and carry said oil during reciprocations of the piston. This recess is provided adjacent the heated end of the piston with radial recesses, 14, already referred to, which, at their inner ends, are provided with oil channels, 16, to enable the oil to run freely within the piston to lubricate the usual wrist pin, 17, and connecting rod, 18. The oil is thus prevented from penetrating or reaching the hot head of the piston, the oil being retained on or within those portions of the cylinder and piston which are maintained at a comparatively low temperature, whereby carbonization of the lubricating oil is prevented. The head, 5, is also shown as provided with a circumferential groove, 2, for a packing ring, similar to those of the body of the piston.

I claim.

1. An engine piston comprising, in combination, a body portion; a two-part head portion having its parts separated by heat-resistant material; and a slender neck member connecting the head and body portions which are separated from each other by an open chamber around the neck member, whereby the body portion of the piston is separated from the explosion chamber by both said heat-resistant material and said open chamber.

2. An engine piston comprising, in combination, a two-part head, each part having a peripheral bearing surface; a plurality of layers of heat-resistant material separating the parts of said head and said bearing surfaces; stiffening means between the layers of heat-resistant material and means to secure said elements together.

3. An engine piston comprising, in combination, two axially disposed parts, oppositely chambered internally to contain a thick body of heat-resistant material, each said part having a peripheral bearing surface; and heat-resistant material between said chambered parts and projecting laterally outward to supply packing interposed between said peripheral bearing surfaces.

4. An engine piston comprising, in combination, a head member having a peripheral bearing surface; a body member having a peripheral bearing surface, the piston being shaped to provide an extensive lubricant-containing chamber between said bearing surfaces and isolating them one from the other; and provision nearer one bearing surface than the other for conducting superfluous lubricant from said chamber.

5. An engine piston comprising, in combination, a head member having a peripheral bearing surface; a body member having a peripheral bearing surface remote from that of the head member, the piston between said bearing surfaces being reduced to form an extensive separating chamber therebetween; and provision for a conduit 16 proximate the head member, giving communication between said chamber and a point exterior to said chamber.

6. In an engine, the combination of a two-part piston, said parts being oppositely recessed; a separator disk intermediate said parts; heat-resistant material intermediate said disk and each said part; and securing means for clamping said parts and disk in position to compress the heat-resistant material to form an efficient bearing surface and to prevent conduction of heat from one piston part to the other.

7. In an engine, the combination of a two-part piston; a packing ring sunk in the bearing surface of each said part; a plurality of layers of heat-resistant material intermediate said piston parts; separating and strengthening means between said layers of heat-resistant material; and securing means to clamp together the piston parts and to compress and compact the heat-resistant material to form packing intermediate and additional to the said packing rings.

8. The combination of an engine cylinder, with a mushroom piston; a wrist pin and connecting rod for the piston; the piston having a reduced portion intermediate its ends to supply an extensive lubricant-receiving chamber; and provision for conducting lubricant from one end of said chamber to said wrist pin.

9. An engine comprising, in combination, a two-part piston-head having a part 3 provided with a recess 4, and a part 5 having an opposed recess 6; an intermediate separator disk 11 interposed between the piston-head parts; heat-resistant material 8 intermediate the disk 11 and said parts 3 and 5, respectively; and means for securing said elements together.

10. In an engine, a piston provided with a peripheral or circumferential recess, 15, and radially extending recesses, 14, communicating therewith, a wrist pin, 17, diametrically mounted in said piston and a connecting rod, 3, having a head recessed with said piston and pivotally connected with said wrist pin, said radially extending recesses, 14, having inwardly extending channels, 16, communicating with the recess in which said wrist pin and connecting rod head are mounted for supplying lubricant thereto.

11. An engine piston comprising, in combination, separate peripheral bearing surfaces, one at the head end of the piston toward the explosion chamber, said bearing surfaces being separated by an extensive lubricant-receiving chamber; and provision proximate the head end bearing surface for conducting away superfluous lubricant from

said chamber, whereby lubricant is discharged from said chamber proximate the hottest end of the piston.

12. An engine piston comprising, in combination, a cylindrical head portion having a peripheral bearing surface; a body portion having a flared end remote from the head portion supplying a second peripheral bearing surface and having a reduced cylindrical portion; a slender neck member connecting the cylindrical head portion and the reduced part of the body portion; and stiffening means 14ª interposed between the head portion and reduced part of the body portion to reinforce the slender neck member while preserving a substantially open chamber around the same.

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

LOUIS H. MARCIL.

Witnesses:

CHAS. P. DOLAN,

JOSEPH L. MARCIL.