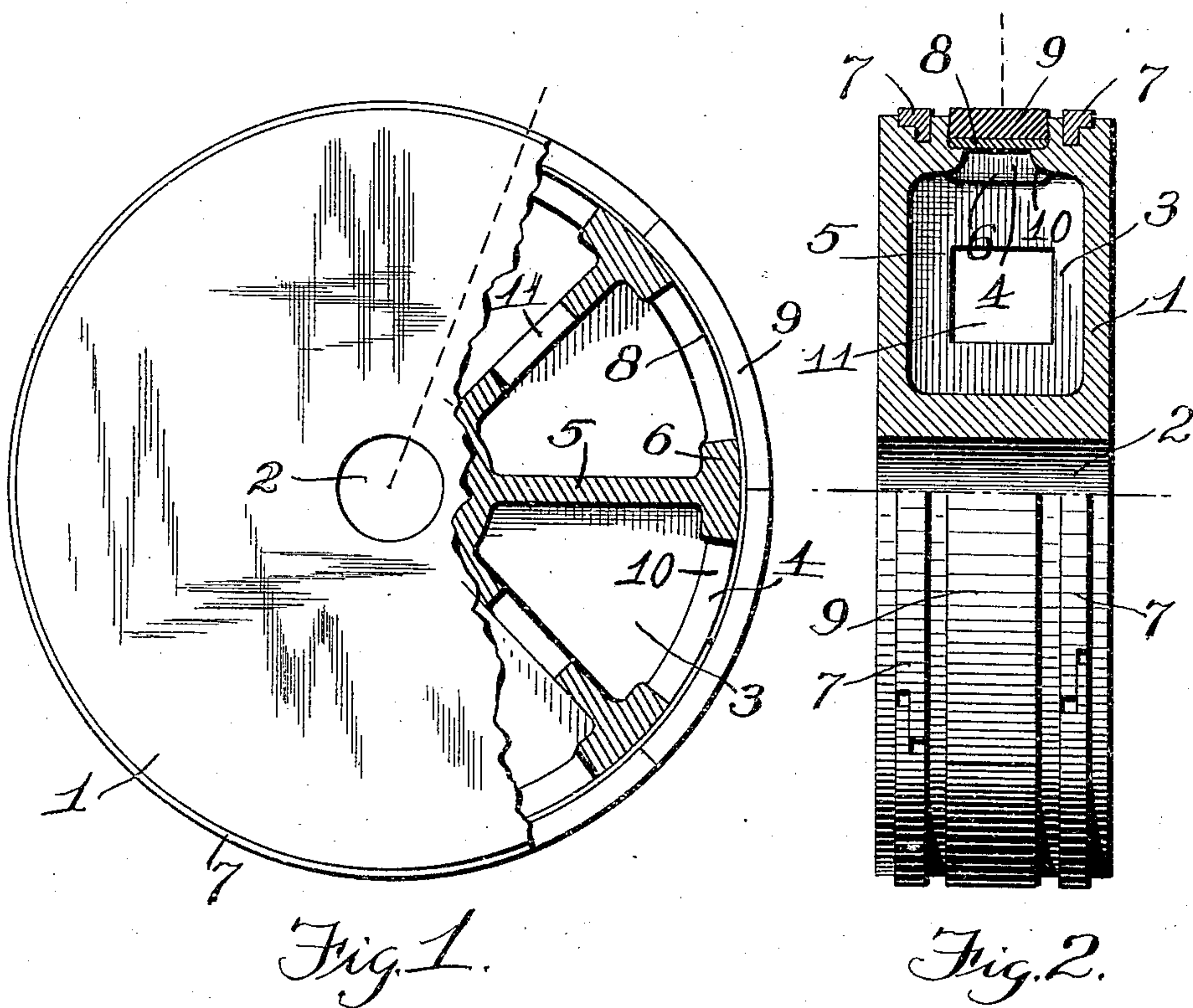


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PISTON.

APPLICATION FILED APR. 21, 1909.

938,481.

Patented Nov. 2, 1909.



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PISTON.

938,481.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed April 21, 1909. Serial No. 491,280.

To all whom it may concern:

Be it known that I, THOMAS HALL, a subject of the King of Great Britain, residing at Ridgway, Elk county, Pennsylvania, have
5 invented certain new and useful Improvements in Pistons, of which the following is a specification.

This invention, pertaining to improvements in pistons for engines, pumps etc.,
10 will be readily understood from the following description taken in connection with the accompanying drawing in which:—

Figure 1 is a front elevation, part vertical section, of a piston embodying my present
15 construction, while Fig. 2 is a side elevation, part vertical section, of the same.

In the drawing:—1, indicates the piston body, of usual disk form: 2, the rod-hole therein: 3, an annular series of segmental
20 cavities in the piston body each cavity extending radially from the hub to the rim of the piston body: 4, a port extending outwardly from each of the cavities 3 entirely through the rim of the piston: 5, radial partitions
25 extending from the hub to the rim of the piston and separating the segmental cavities: 6, circumferential projections from the outer ends of the partitions 5 at the rim of the piston: 7, packing rings, of common
30 type, seated in grooves in the periphery of the piston: 8, a hoop disposed within a central circumferential groove in the body of the piston and resting on the outer ends of the partitions and on the circumferential
35 projections 6 therefrom and on shoulders at the side margins of the ports 4: 9, a hoop of comparatively soft metal disposed within the central groove of the piston around hoop 8, the groove being preferably dovetailed:
40 10, the side margins of the ports 4, formed by the inward projections from the sides of the piston-body and extending circumferentially between the projections 6: and 11, ports extending through the radial parti-
45 tions.

Assume, for the instant that ports 11 are absent, the segmental chambers 3 in such case being disconnected from each other. In constructing the piston the segmental chambers are formed by cores, and in the above
50 assumed construction, each individual core would be supported by a print extending outwardly from its individual peripheral port 4, there being as many of these ports
55 as there are segmental chambers. But when

the ports 11 through the radial partitions are provided then contiguous segmental cores may give each other support and it no longer becomes necessary to provide a peripheral port 4 for each of the segmental
60 chambers, indeed, it is sufficient if only enough of the peripheral ports be provided to permit of the proper support and proper removal of the core or cores. It will be understood that the radial partitions are
65 merely strengthening elements, there being no special reason, aside from mere strength, for dividing the interior of the piston up into individual chambers.

In the drawing the rings 7 and 9 are
70 shown as projecting beyond the periphery of the piston, but this is a mere matter of preference, a flush construction being preferable under some conditions. It will be understood that the hoop 8 furnishes a means
75 for closing the peripheral ports and furnishing a backing for the soft-metal hoop 9, a construction permitting of large peripheral ports in the piston, and of a comparatively thin soft-metal hoop. Where the peripheral ports are few, or small, or where the
80 hoop 9 is of sufficient thickness or hardness, the inner hoop 8 may be dispensed with. My preference is to employ the hoop 8, formed by bending a strip of metal to suitable size
85 and springing it into the groove of the piston. The soft-metal hoop may then be placed, in any suitable manner, my preference being to cast this hoop in segments which are placed in the groove and then
90 peened to tightness, the exterior of the soft-metal hoop being then properly turned. No machine work is necessary in the groove containing hoops 8 and 9.

In the particular form of piston chosen
95 to illustrate my invention, the peripheral ports of the piston are closed by a hoop centrally disposed and flanked by packing rings, this being the preferred construction. But there may obviously be more than one cir-
100 cumferential line of peripheral ports with covering hoops, and the packing rings, if employed, may be intermediate instead of flanking elements.

I claim:—

1. A piston having a peripherally grooved hollow body provided with one or more ports through its rim and placing the groove in communication with the interior of the piston, a hoop disposed in the base of the groove
110

over the port or ports therein, and a covering-ring of softer material than the hoop disposed in the groove exterior to said hoop, combined substantially as set forth.

5 2. A piston having a peripherally grooved hollow body provided with one or more ports through its rim and placing the groove in communication with the interior of the piston, a hoop disposed in the base of the groove
10 over said port or ports, and a ring formed of segments of softer material than the hoop secured in said groove over said hoop, combined substantially as set forth.

15 3. A piston having a peripherally grooved hollow body provided with one or more ports through its rim and placing the groove in communication with the interior of the piston, said port or ports being provided with inwardly projecting side margins, a circumferential series of radial partitions dividing
20 the hollow of the piston into segmental chambers communicating with said port or ports, and a covering-ring disposed in the groove of the piston, closing said ports and resting
25 on the side margins thereof, combined substantially as set forth.

4. A piston having a peripherally grooved hollow body provided with one or more ports through its rim and placing the groove in
30 communication with the interior of the piston, said port or ports being provided with side margins projecting inwardly from the

walls of said groove, and a covering-ring disposed in said groove and resting on said inwardly projecting side margins, combined
35 substantially as set forth.

5. A piston comprising a peripherally grooved hollow body provided with ports placing the groove in communication with the interior of the piston, a covering ring
40 disposed in said groove and covering said ports, and packing rings carried by the body on opposite sides of the covering ring.

6. A piston having a peripherally grooved hollow body provided with internal radial
45 partitions, the rim of the body having ports therein located at points between the partitions and establishing communication between the groove and interior of the piston, and a covering ring disposed in the groove
50 covering the ports therein.

7. A piston comprising a hollow body provided with a peripheral groove with ports in said groove leading to the interior of the piston, said ports having side margins projecting
55 inwardly from the walls of the groove, a backing hoop disposed in said groove and resting on said inwardly projecting side margins, and a segmental ring secured in said groove over the hoop.

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