Aug. 21, 1945. R. C. LAURAIN 2,383,136

DOUBLE ACTION PISTON ROD

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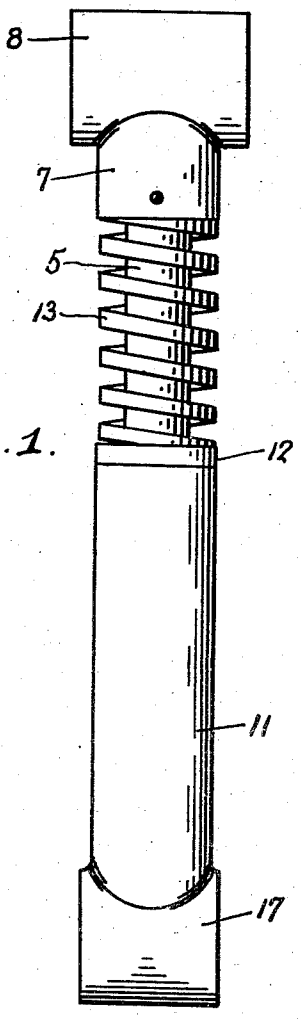


Fig. 1.

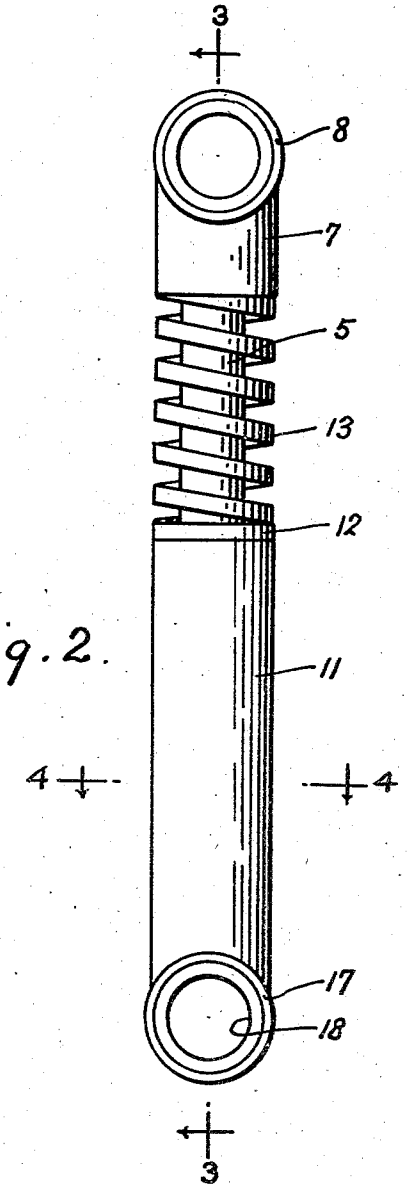


Fig. 2.

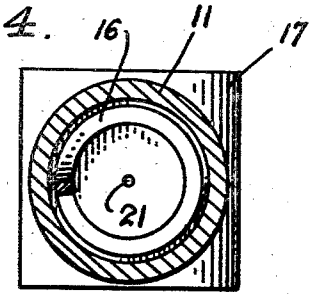


Fig. 4.

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Fig. 3.

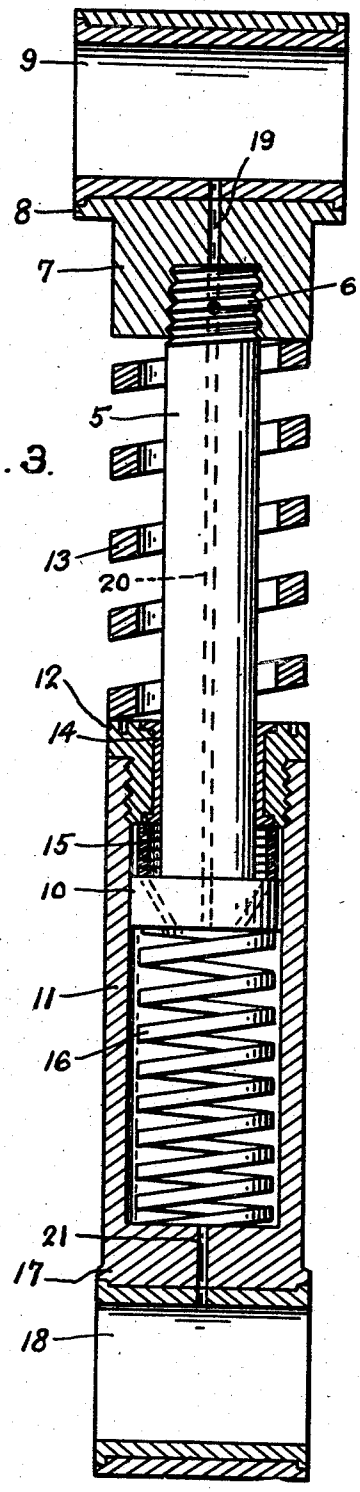


Fig. 7.

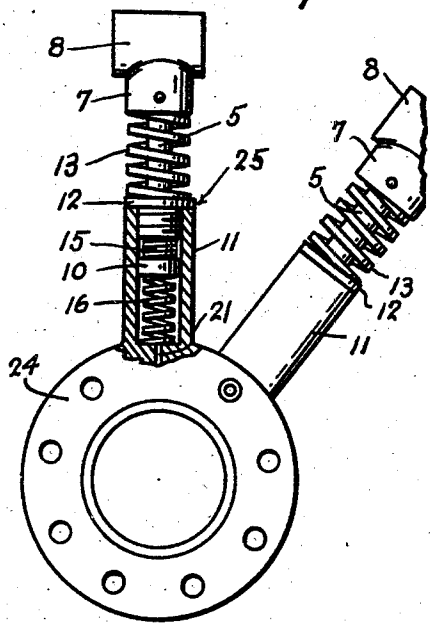


Fig. 5.

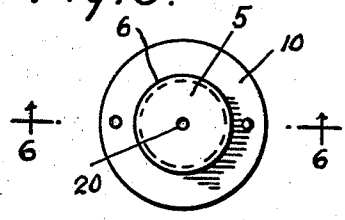
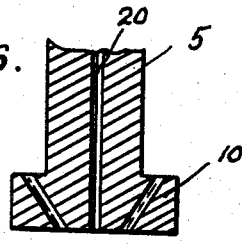


Fig. 6.



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DOUBLE-ACTION PISTON ROD

Roy C. Laurain, Dearborn, Mich.

Application July 20, 1943, Serial No. 495,508

1 Claim. (Cl. 74—582)

This invention relates to new and useful improvements in piston rods for internal combustion engines and more particularly to a rod especially adapted for use on radial engines, but which can be used for other types of engines as well.

An important object of the present invention is to provide a piston constructed in yieldable sections and adapted to operate unyieldingly to a point just below the burning point of fuel where it will yield, but which upon scavenging operation will function to move the corresponding piston to the utmost point in the companion cylinder to completely expel burnt gases.

Other objects and advantages of the invention will become apparent to the reader of the following description.

In the drawings—

Figure 1 is a side elevational view of the piston rod.

Figure 2 is a front elevational view of the rod.

Figure 3 is an enlarged longitudinal sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a cross section on the line 4—4 of Figure 2.

Figure 5 is an end elevational view looking at the inner end of the rod section.

Figure 6 is a section on the line 6—6 of Figure 5.

Figure 7 is a fragmentary side elevation showing how the rod is connected to a radial engine master ring.

Referring to the drawings wherein like numerals designate like parts, it can be seen that numeral 5 denotes a rod section having an upper threaded end 6 disposed into a socket 7 carried by a wrist pin bearing 8, the latter having a liner 9.

The other end of the rod section 5 has a head 10 slidable in a barrel, the inner end of which is internally threaded to receive a bushing 12, between which and the socket 7 a heavy coiled compression spring 13 is interposed. The bushing 12 preferably has a wear resisting liner 14.

Between the inner end of the bushing 12 and the head 10 on the rod section 5 is a weaker compression spring 15.

Numeral 16 denotes a compression spring which is stronger than the spring 15 but substantially weaker than the spring 13 and this spring 16 is interposed between the head 10 of the rod section 5 and the distal end of the barrel 11. The latter end of the barrel 11 has a master rod or crankshaft bearing 17 in which the liner 18 is located.

Oil ducts 19, 20 extend downwardly from the bearing 8 and through the rod section 5 to the barrel 11 and a duct or ducts 21 serve to communicate the bearing 17 with the interior of the barrel 11.

As will be seen, the described piston rod is adapted to be extended by the springs 13 and 16, the spring 15 functioning to cushion and limit extension of the same. On the down, intake stroke, the piston rod descends fully extended. On the compression, up stroke, it ascends fully extended until the compression overcomes the springs 13, 16, and just before full compression, said rod contracts allowing the crank shaft, not shown, to attain vertical center while the said rod is contracted and without the piston, not shown, passing from compression position. On the power stroke, the piston rod descends contracted. On the exhaust, up stroke, said rod ascends extended, so that the piston is forced into the compression space or chamber, not shown, to scavenge the same. On the power, down stroke, the spring 16 acts as a supplemental means for cushioning the rod section 5 against the force of the explosion.

Figure 7 shows how a rod constructed as above is connected with a master ring 24 of a radial engine. Numeral 25 generally refers to the fixed rod of such an engine and this fixed rod is constructed in accordance with the present invention.

While the foregoing specification sets forth the invention in specific terms, it is is to be understood that numerous changes in the shape, size and materials may be resorted to without departing from the spirit and scope of the invention as claimed hereinafter.

Having described the invention, what is claimed as new is:

A piston rod structure comprising a barrel having a bushing at one end thereof, a rod slidably disposed in the bushing and provided at one end with a head in the barrel, a bearing at the other end of the rod, a compression spring interposed between the bearing and the bushing, and means in the barrel acting on said head comprising a spring interposed between the bushing and the head of the rod and weaker than the first-mentioned spring, and a spring interposed between the head and the other end of the barrel weaker than the first-mentioned spring and stronger than the second-mentioned spring.

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