J. B. HICKS.

PISTON CONNECTING ROD.

APPLICATION FILED JAN. 22, 1909.

930,473.

Patented Aug. 10, 1909.

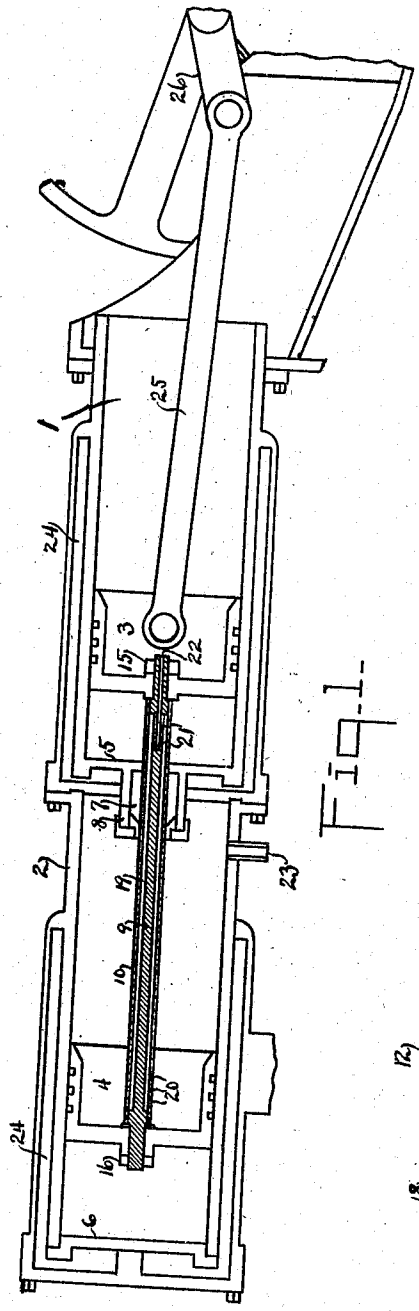

Fig. 1.

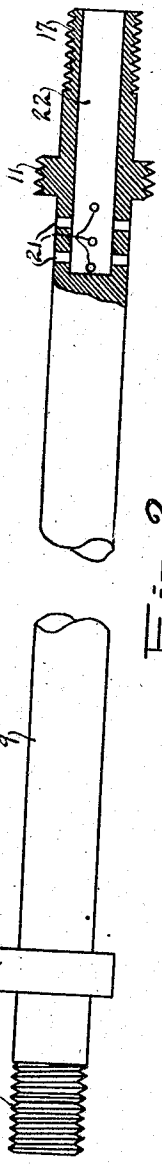

Fig. 2.

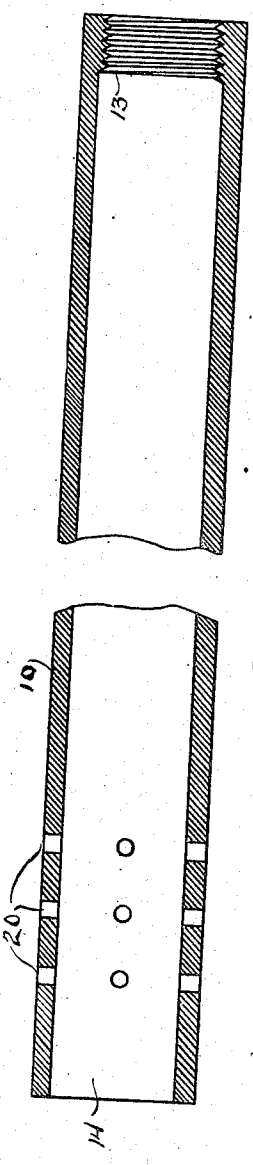

Fig. 3.

WITNESSES:

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JOHN B. HICKS, OF HOUSTON, TEXAS.

PISTON-CONNECTING ROD.

No. 930,473. Specification of Letters Patent. Patented Aug. 10, 1909.

Application filed January 22, 1909. Serial No. 473,687.

To all whom it may concern:

Be it known that I, JOHN B. HICKS, a citizen of the United States, residing at Houston, in the county of Harris and State of Texas, have invented certain new and useful Improvements in Piston-Connecting Rods, of which the following is a specification.

My invention relates to new and useful improvements in piston connecting rods, and more particularly to that class of such rods as are used to connect the pistons of tandem engines.

The object of the invention is to provide a device of the character hereinafter described, that will automatically cool itself, by means of air passages arranged in a novel manner, through which currents of air, of the temperature of the surrounding atmosphere, are forced by the operation of the pistons themselves.

Another feature of the invention resides in its novel construction whereby it is yieldably held in friction with its packing in such a manner as to reduce all unnecessary friction to a minimum.

With the above and other objects in view, my invention has particular relation to certain novel features of construction and operation, an example of which is described in this specification and illustrated in the accompanying drawings, which are made a part hereof, and wherein:—

Figure 1 is a sectional view of my device, showing also a sectional view of the pistons connected thereby, the cylinders, wherein said pistons operate, and the packing for said connecting rod. Fig. 2 is an elevation of the core of the connecting rod, partially in section, and showing one means of attaching the same to its co-acting parts. Fig. 3 is a partial sectional view of the peripheral tubing of said connecting rod.

Referring now more particularly to the drawings, the numeral 1 designates a cylinder and 2 refers to a substantially similar cylinder working tandem thereto. In these respective cylinders, pistons 3 and 4 operate. It is to be observed that these cylinders shown are of the internal combustion type, the explosion occurring in the space between pistons 3 and 4 and their respective cylinder heads 5 and 6. These pistons are held in rigid connection by means of my improved connection rod which passes through cylinder-head 5 operating in any suitable packing 7. This packing is held in place in the usual manner, by means of a suitable stuffing box 8 carried by said cylinder head.

The connecting rod comprises a core 9 preferably of steel and a tubing 10, preferably of cast iron. This core is provided with a threaded shoulder 11 and a smooth shoulder 12. The threaded shoulder 11 is adapted to engage with the threaded portion 13 of tubing 10 and at the same time the other end of said tubing, which is not threaded, is designed to fit over shoulder 12. Shoulder 11 should be made slightly lower than shoulder 12 so that it will readily pass through the tubing without coming in contact with the sides thereof, until it contacts with threads 13, and the shoulders 11 and 12 should be such a distance apart that they will, simultaneously engage with their respective tubing ends. This core extends beyond these shoulders a sufficient distance to engage pistons 3 and 4, and said pistons are secured to said core by means of jam nuts 15 and 16, screwed on to the threaded ends 17 and 18 of these extensions or in some other suitable manner. The tubing 10 is of sufficient relative diameter with respect to the core 9, and the shoulders 11 and 12 are of sufficient height to provide a tubular space 19 around said core and between the same and the tubing 10. This tubular space extends longitudinally of the connecting rod the entire distance between shoulders 11 and 12. That end of the tubing 10 which engages with shoulder 12 is provided with a plurality of orifices 20 leading from the free atmosphere chamber of cylinder 2 to tubular space 19. These orifices are sufficient in number to permit a free passage of air from this chamber to said tubular space. From the other end of space 19 a number of orifices 21 lead and connect the same with air outlet 22, leading from said orifices through piston 3 to the free atmosphere chamber of cylinder 1.

The cylinder 2 is provided with a port 23 which readily admits air into the chamber of cylinder 2. This port may be provided with means for regulating the flow of the air through the same.

The operation of my device is as follows:—Upon the occurrence of an explosion the pistons are forced back toward the open

end of the cylinders and the atmosphere in front of piston 4, unable to escape through port 23 is forced through orifices 20 into space 19 and escapes through orifices 21 and air outlet 22 to the free air. As the movement of the pistons is reversed the port 23, not being of sufficient size to admit the air with sufficient rapidity, a partial vacuum is formed in cylinder 2 and air is consequently forced by atmospheric pressure through opening 22, orifices 21, the tubular space 19 and orifices 20 into the partial vacuum. These currents of air passing through space 19 tend to keep the peripheral tubing 10 cool, which would otherwise become intensely hot by reason of the friction with the packing 7. Without some method of cooling this rod it becomes hot enough to burn the lubricant of the packing thus causing the same to become dry and also causing a noxious odor and smoke. The tubing is also yieldable and therefore minimizes the friction with the bearing and thus the prime object of my invention, to wit; prevention of the heating of the rod is attained.

Suitable water chambers 24 are provided around each cylinder through which cool water circulates and the cylinders are thus kept cool.

The piston 3 has connection with the crank connecting rod 25 which transmits motion to crank wrist 26 and through it to the driven machinery.

While I have shown this specific form of my invention, and described this particular method of its operation I desire to reserve the right to vary the form and operation thereof, when that may become necessary, so long as the principle of the invention is not departed from.

What I claim is:—

1. In a piston connecting rod, a core and means for connecting the same to a piston; one end of said core being provided with an inlet and outlet passage and perforations leading from said passage to the exterior of said core, a tubing surrounding said core and having a tubular passage way therethrough of a sufficient diameter to allow a passage-way between said core and said tubing; means interposed between the core and tubing for fixing their relation with each other; and perforations leading through said tubing from said passage-way to the free atmosphere, and located in the end thereof opposite to the end of said core carrying said inlet and outlet passage.

2. In a connecting rod, an inner core, an outer tubing, a smooth shoulder near one end and a threaded shoulder near the other end of said core, for maintaining a space between said tubing and said core, said tubing being provided with apertures at one end for the inlet of a fluid to, or the outlet of a fluid from said space, and said core being provided with an open end and openings through the walls thereof leading from said space to said open end for the inlet of a fluid to or the outlet of a fluid from said space.

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

JOHN B. HICKS.

Witnesses:
ERNEST C. GUY,
LA VERA MILLER.