W. M. RUMSEY.

AUTOMATIC SPRING PISTON FOR LIQUID, STEAM, OR GAS CYLINDERS.

APPLICATION FILED MAY 15, 1908.

917,798.

Patented Apr. 13, 1909.

Fig. 1.

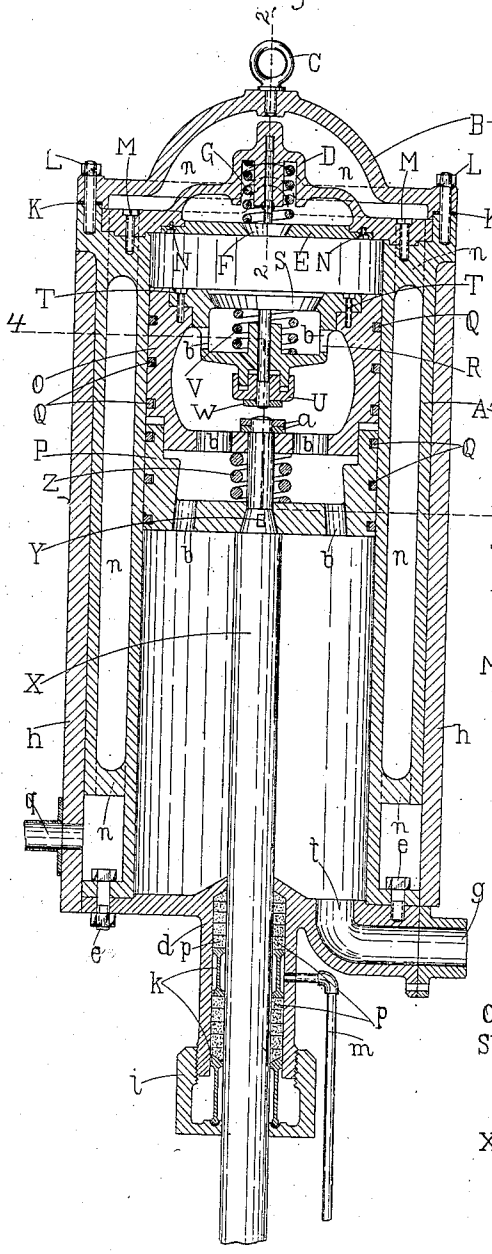


Fig. 2.

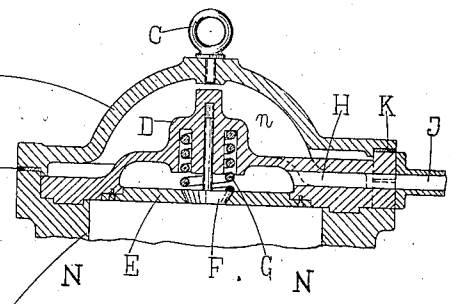


Fig. 3.

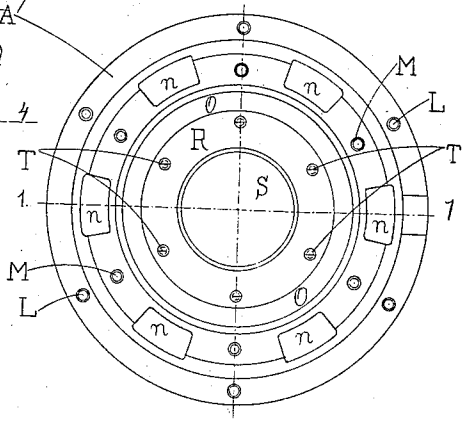
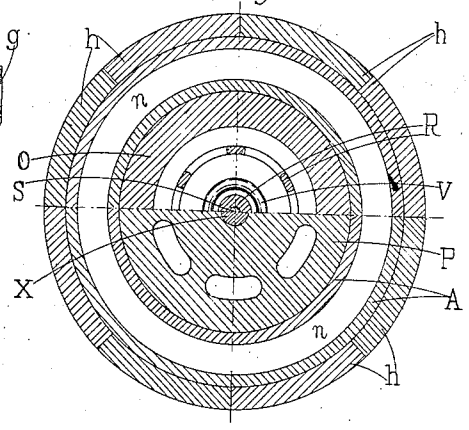


Fig. 4.



WITNESSES

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AUTOMATIC SPRING-PISTON FOR LIQUID, STEAM, OR GAS CYLINDERS.

No. 917,798. Specification of Letters Patent. Patented April 13, 1909.

Application filed May 15, 1908. Serial No. 433,129.

To all whom it may concern:

Be it known that I, WILLIAM MILO RUMSEY, a citizen of the United States, resident of San Diego, in the county of San Diego, State of California, have invented a new and useful Automatic Spring-Piston for Liquid, Steam, or Gas Cylinders, of which the following is a specification.

The object of my improvements is to provide an economically constructed automatic piston which will act upon its own pressure to relieve itself at a graduated high point of pressure and avoid the blowing out of a cylinder head, or injuring the cylinder by unusual strain. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical sectional view of a cylinder complete, used for the purpose of compressing gas or air said section being taken upon line 1—1 of Fig. 3. Fig. 2 is a sectional view of the cylinder head, showing one method or form of construction for this class of cylinders, cut in two on line 2—2. Fig. 3 is a plan view of the cylinder with the head removed, and Fig. 4 is a sectional view upon the two planes indicated by line 4—4 and at right angles to said line.

A is the walls of the cylinder. B is the head of the cylinder which forms the outside inclosure of this method of construction of a cylinder for a compressor.

C is a ring in head B to lift it from the cylinder.

D is the inner head of the cylinder.

E is a plate, which contains the valve F that is attached to the inner head D, said valve being provided with a spring G that holds it into the valve seat, and operates the valve. Said head E is fastened to part D by screws N. L is stud bolts which fasten the outer head B to the cylinder A and is provided at the joint with a gasket K to prevent leakage. The inner head D is constructed to rest between the outer head B and upon the end of the cylinder, and is held in position by screws M.

O is the upper section of the shell of the piston.

P is the lower section of the shell of the piston, and is provided with piston rings Q. The lower section of the piston is connected to the end of the piston rod X by a solid key, which holds it firm in position. The upper section O of the piston is intended to work loose over the end of the piston rod, and is provided with jam nuts *a*, that hold the upper section O firmly to spring Z. Said spring is intended to allow the upper section of the piston to yield in heavy pressure and bring the upper point of the piston rod in connection with a rod or pin on valve S which forces the valve open and allows the pressure to escape back to the suction side of the cylinder. In this manner the piston may continue in motion while the discharge valves are closed, and not blow a cylinder head out.

U is a collar with an annular groove that works in connection with a web form inner head R which contains the valve seat that receives the valve S which rests upon spring V and has port holes *b* through which the gases escape. The annular grooved collar being made fast to the stem of valve S, and secured by jam nut W which prevents it from working loose and works free in the rim of the inner head section R, with a play or sufficient space to allow the valve to open enough to relieve a high compression instantaneously.

n is a water space for cooling purposes of the compressor cylinder, which is only shown for illustration in the method of construction.

h is a wooden jacket which forms the outside of the cylinder, and is added to the cylinder for a finish only.

q is a supply pipe for water for cooling the compressor cylinder.

g is a suction pipe of the compressor through which the gases are admitted to the cylinder.

p is the packing in the stuffing box.

m is an oil pipe, to the stuffing box.

k is a lantern gland which separates the packing in the stuffing box of the piston rod inclosure, and provides an open space for oil to accumulate.

j is a stuffing box gland.

Having thus described my invention, what I claim to be new and desire to protect by Letters Patent, is:

1. In a device of the character described, the combination with a piston rod, of a two-part piston, one part of said piston being cup-like in form and being rigidly secured to the piston rod, the other part of said piston being hollow and having a reduced portion which enters the first named portion, said last named portion being slidably disposed upon the piston rod, a spring interposed between the fixed and the slidable portion of the piston, a valve carrying member carried

by the slidable portion of the piston and depending into said portion there being a seat formed in said part, a valve adapted to rest upon said seat, a spring disposed between said valve and the valve carrying member which normally tends to force said valve away from its seat, a valve stem upon which said valve is mounted, said valve stem being located in longitudinal alinement with the inner end of the piston rod, there being ports formed through the valve carrying member and through both the fixed and slidable portions of the piston, substantially as shown and described.

2. In a device of the character described, the combination with a piston rod, of a two-part piston, one part of said piston being cup-like in form and being rigidly secured to the piston rod, the other part of said piston being hollow and having a reduced portion which enters the first named portion, said last named portion being slidably disposed upon the piston rod, a spring interposed between the fixed and the slidable portion of the piston, a valve carrying member carried by the slidable portion of the piston and depending into said portion, there being a seat formed in said part, a valve adapted to rest upon said seat, a spring disposed between said valve and the valve carrying member which normally tends to force said valve away from its seat, a valve stem upon which said valve is mounted, said valve stem being located in longitudinal alinement with the inner end of the piston rod, there being ports formed through the valve carrying member and through both the fixed and slidable portions of the piston, a grooved collar in which said valve stem is slidably disposed, and a nut which holds said grooved collar upon said valve stem, substantially as shown and described.

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Witnesses:
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