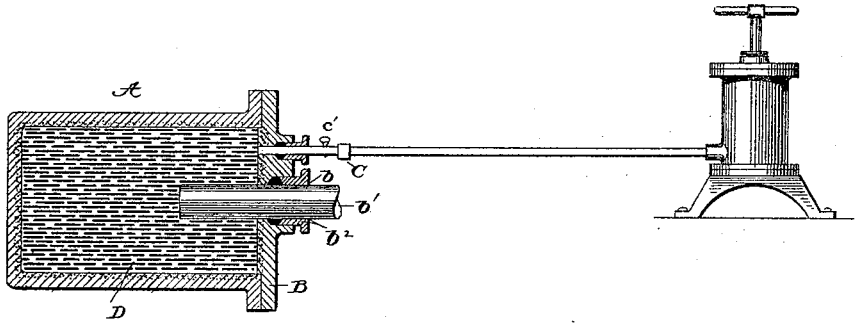
(No Model.)

C. E. CREECY.

HERMETIC METAL VESSEL.

No. 457,849. Patented Aug. 18, 1891.



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UNITED STATES PATENT OFFICE.

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HERMETIC METAL VESSEL.

SPECIFICATION forming part of Letters Patent No. 457,849, dated August 18, 1891.

Application filed February 6, 1890. Serial No. 339,466. (No model.)

To all whom it may concern:

Be it known that I, CHARLES EATON CREECY, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Hermetic Metal Vessels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to vessels for containing compressed air.

In pneumatic engines and in all apparatus in which compressed air is the motive agent the great difficulty encountered is leakage, this is owing to the porous nature of the metal of which the cylinders and reservoirs are constructed. To overcome this difficulty and provide absolutely air-tight chambers for the storage of the air under pressure is the object of this invention; and it consists in a cylinder of drawn cast-iron, steel, or other metal having its pores or interstices filled with heated sulphur in liquid form. By the application of great pressure, forcing the liquid sulphur into the pores and interstices of the metal, permeating the entire body or to sufficient depth, the same is rendered air-tight upon the evaporation of the liquid portion of the sulphur, which when cold expands and fills the pores or interstices of the metal.

In the accompanying drawing I have illustrated a simple and efficient means for treating the cylinders.

A designates a cast-iron or other metal cylinder of ordinary construction; B, the cylinder-head bolted firmly thereto, the piston-rod opening *b* in which is closed by a rod *b'*, passing through and tightly held in a stuffing-box b^2.

C designates a tube passing through the cylinder-head and communicating with the interior of the chamber and provided with a cock *c'*.

The cylinder A is first charged with the sulphur D, which is reduced to a liquid state by heat. The advantage of employing sulphur as the impregnating substance is that when heated it will contract, so that after the metal into which it is forced is cooled said substance will expand, and thus entirely fill the pores or interstices. The liquefied sulphur is then subjected to great pressure—say fifteen hundred pounds, more or less—within the cylinder, which may be accomplished by means of pneumatic pressure through the tube C. This forces the liquid sulphur into the pores and interstices of the metal, permeating the entire body to considerable depth, according to the length of time the pressure is retained thereon. The cylinder is then relieved of the pressure, the surplus sulphur removed from the interior surface of the chamber, the liquid which had been forced into the pores or interstices of the metal permitted to cool and harden therein or the liquid portion of the solution allowed to evaporate, leaving a sediment in the pores, thus effectually closing said pores or interstices, leaving the metal impervious.

The porosity of ordinary cast-iron or steel cylinders, such as now in common use in pneumatic apparatus, is very great, and when charged with air compressed at, say, four hundred pounds to the square inch, will leak so rapidly as to reduce the pressure to atmospheric in an hour or so. This is of course disadvantageous to the proper working of such apparatus and really renders it irregular and unreliable. By a cylinder constructed as herein described, however, I have been enabled to maintain a charge of air at over four hundred pounds pressure for an indefinite period with practically no leakage.

I am aware that heretofore wooden vessels have been impregnated with rosin, and also that it is not new to line or coat the inner surface of a fruit box or cask with sulphur; but I am not aware that prior to my invention metallic vessels have been rendered air-tight by impregnating the pores or interstices thereof with heated liquor sulphur applied under pressure, so that when cooled the sulphur will expand and thoroughly fill the pores or interstices.

While I have designated liquor sulphur as the impregnating agent employed, yet it will be understood that a composition of which liquor sulphur is the principal ingredient is within the scope of my invention.

Having thus described my invention, what I claim is—

As an improved article of manufacture, a metallic cylinder for pneumatic purposes having its pores or interstices filled with sulphur, which is applied when heated in a liquid state and which expands when cooled, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES EATON CREECY.

Witnesses:
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