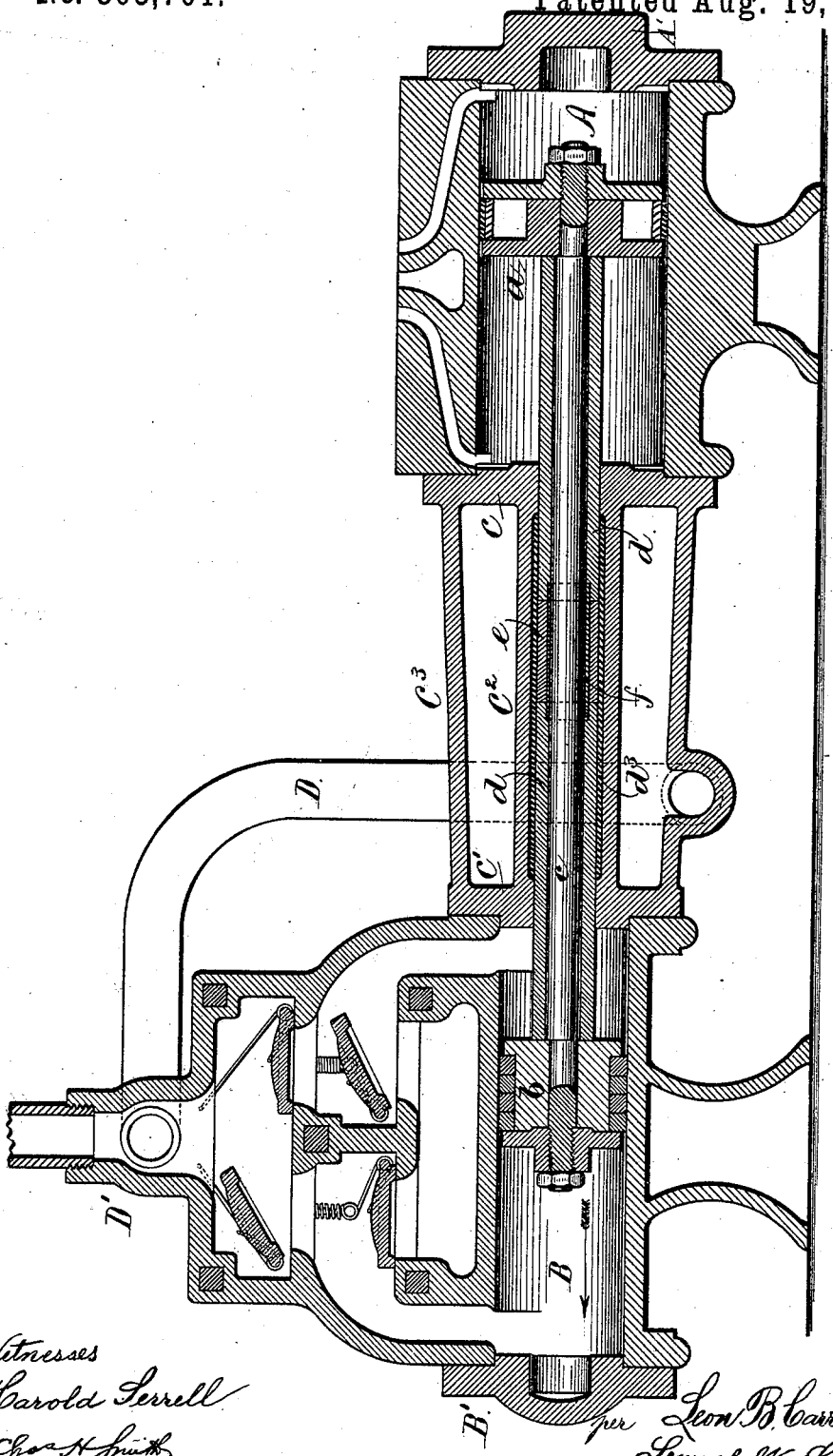
(No Model.)

L. B. CARRICABURU.

STEAM PUMPING ENGINE.

No. 303,701. Patented Aug. 19, 1884.



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UNITED STATES PATENT OFFICE.

LEON B. CARRICABURU, OF NEW YORK, N. Y.

STEAM PUMPING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 303,701, dated August 19, 1884.

Application filed June 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, LEON B. CARRICABURU, of the city and State of New York, have invented an Improvement in Steam-Pumps, of which the following is a specification.

In steam-pumps there is a difficulty in keeping the piston-rod properly packed, and considerable power is lost in friction. I make use of a tube extending from the steam-cylinder head to the water-cylinder head, through which the piston-rod passes, and packing is dispensed with, as hereinafter set forth.

In the drawing I have represented my improvement by a longitudinal section of the pumping-engine.

The steam-cylinder A is provided with heads A′ and C, and the water-cylinder B has the heads B′ and C′. The heads C C′ are connected by the tubular piston-rod guide C^2, the parts by preference being cast in one, and this piston-rod guide serves to connect the two cylinders, such cylinders being bolted to the respective heads, and there may be ribs to strengthen the heads and tubular guides. It is also preferable to have a second cylinder or shell, C^3, around the said tubular piston-rod guide C^2, to more firmly support the heads C C′, and at the same time form an air-chamber for the pump, so as to avoid the separate air-chamber heretofore usually employed with pumps. In using this air-chamber it is only necessary that a branch pipe, D, from the water-delivery pipe D′ be led to the bottom part of the said air-vessel, as represented. The air confined in this chamber forms a spring to equalize the flow of water. The piston *a* of the steam-cylinder and the piston *b* of the water-cylinder are of any ordinary or desired construction, and the piston-rod *c* extends from one to the other and passes through a tubular piston-rod guide, C^2. In most cases it will not be necessary to use a tube of copper or brass, as at *d*, around the piston-rod, but I have shown the same because by providing such tube I am able to prevent wear upon the piston-rod, and to remove such tube and replace it by another whenever required. I have also shown a separation in the middle part of such tube, where a packing, *e*, may be applied, if desired. This packing may be of fibrous materials or any suitable substance, and in order to keep the ends of the tube *d* from pressing upon the packing itself I have shown a thin tube, *f*, setting closely around the piston-rod, and occupying the space between the ends of the tubes *d* and inside of the packing.

In order to avoid the necessity of boring out the tubular piston-rod guide, it may be cored out and only the end portions bored, and Babbitt metal may be cast into recesses provided for it, as at d^3; or the entire tubular piston-rod guide may be lined with Babbitt metal, or with a tube of any suitable metal, through which the piston-rod may slide freely.

Under all circumstances there will be little or no tendency to leak through the tubular piston-rod guide, between it and the piston-rod, because there is pressure of steam in the steam-cylinder around such rod at the same time that there is pressure of water around the other part of the rod in forcing the water out of that end of the water-cylinder, and when the pump is drawing water into the water-cylinder around the piston-rod, there is an exhaust or vacuum action in the steam-cylinder around the piston-rod; hence there will be simultaneously compression at both ends of the piston-rod guide, or else simultaneously an exhaust action, and there will be no tendency for the water or lubricating material that may be within the tubular piston-rod guide to pass from one end to the other, and the said piston-rod will move with little or no friction and without requiring packing.

The pump and valves shown in the drawing form the subject of a separate application filed by me November 26, 1883, Serial No. 112,789.

I claim as my invention—

1. The combination, with the steam and water cylinders in a steam-pump, of an air-vessel between the heads of the respective cylinders and the piston-rod, and tubular guide passing through such air-vessel, substantially as set forth.

2. The combination, with the steam and water cylinders, pistons, and piston-rod, of a tubular piston-rod guide, and a removable tube surrounding and moving with the piston-rod, substantially as set forth.

3. In combination with the steam and water cylinders, pistons, and piston-rod, a tubular piston-rod guide extending from the head of the steam-cylinder to the head of the water-

cylinder, and a packing around the piston-rod and within the tubular piston-rod guide, said packing moving with the piston-rod, substantially as set forth.

4. The combination, with the steam and water cylinders, pistons, and piston-rod, of a tubular piston-rod guide, the cylinder-heads at the ends of the same, and a lining to the interior of such tubular piston-rod guide, substantially as set forth.

Signed by me this 20th day of June, A. D. 1883.

L. B. CARRICABURU.

Witnesses:
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