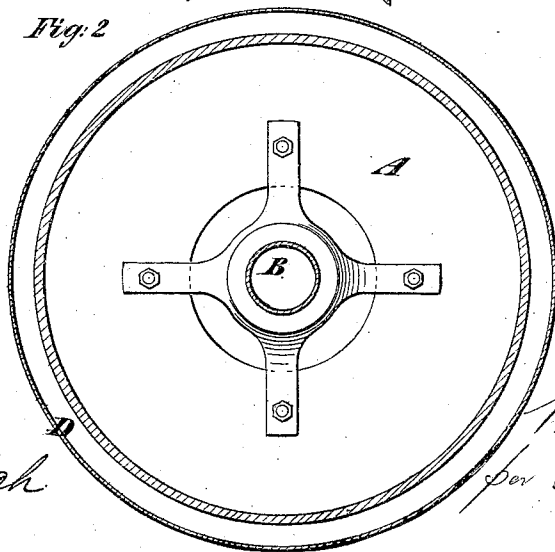
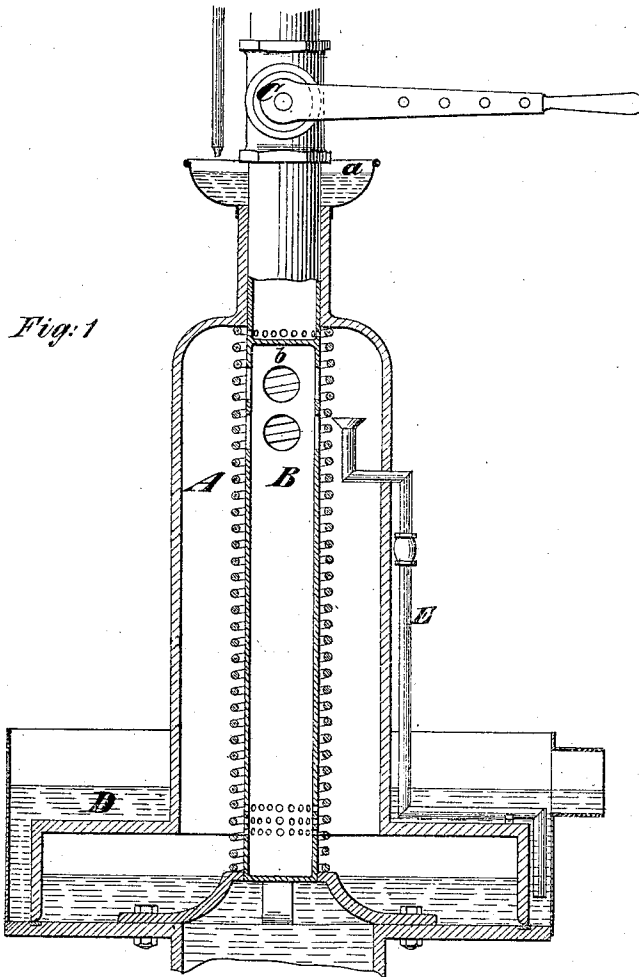


W. BURDON.
Steam Vacuum-Pumps.

No. 135,198

Patented Jan. 28, 1873.



Witnesses:
Fred Haynes
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UNITED STATES PATENT OFFICE.

WILLIAM BURDON, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN STEAM VACUUM-PUMPS.

Specification forming part of Letters Patent No. 135,198, dated January 28, 1873.

Y'.

To all whom it may concern:

Be it known that I, WILLIAM BURDON, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Steam Vacuum-Pumps, of which the following is a specification:

This invention consists in the combination of a vacuum-vessel having an enlarged lower portion, a discharge-box which constitutes its bottom, a central stem that forms the steam-inlet, and also a condensing device, whereby on the filling of the aforesaid vessel and admission thereto of steam it rises to permit the water to escape, and thereby itself constitutes the discharge-valve of the pump; also, whereby any momentum which the incoming water may acquire is not checked, but is enabled to escape by raising the vessel.

In the accompanying drawing, Figure 1 is a central vertical section of a pump constructed according to my invention; and Fig. 2 is a horizontal section of the same.

Similar letters of reference indicate corresponding parts.

A is the vacuum-vessel of the pump. Unlike those described in my previous applications for Letters Patent, it is formed without a bottom. Its lower portion is of considerably larger area than the main portion, and has an outwardly-rounded bottom edge. Its upper portion is contracted to fit a pipe or stem, B, on which the vessel slides up and down. A cup, *a*, on the top of the vessel filled with water forms a packing to keep the vessel air-tight. The stem B, just alluded to, consists of a pipe furnished with feet, which are bolted to the bottom of a discharge-box, D. It is closed at the bottom, and is divided near the top of the vessel A by a transverse partition, *b*, into two portions, the upper of which communicates with the steam-valve C, and the lower of which forms a condensing device. Holes or perforations just above the partition permit the induction of steam to the vessel, and larger holes below said partition permit the ingress of water into the condensing device at each filling of the vessel. Perforations near the bottom of the condensing device permit the escape of the water in a spray or shower, as soon as the water being discharged from the vessel recedes below them. The bottom of the discharge-box D constitutes

also the bottom of the vacuum-vessel, and where the latter comes in contact with it the said bottom is faced with India rubber or other packing material. E is a condensing-pipe which leads from the discharge-box to the upper part of the vacuum-vessel.

The operation of this pump is as follows: A vacuum is first formed in the vessel by the condensation of steam or other means, and water is forced up into it by atmospheric pressure. In filling the vessel, should the water acquire a momentum the vessel will be lifted up to permit the water to escape till the momentum be entirely exhausted. On the filling of the vessel, the steam-valve C is shifted to admit steam to it, whereby the vacuum is destroyed and the water discharged, the vessel, of course, rising to permit its escape.

I omitted to mention that when the vessel filled the condensing device forming part of the stem B is also filled.

As soon as the water recedes below the lower series of perforations in said device the water therein sprays out and condenses the surrounding steam. When the steam enters the enlarged lower portion of the vessel it is, of course, suddenly expanded, and by coming in contact with a larger area of water is somewhat condensed, and consequently its pressure is reduced. On account of this the condensing-pipe begins to shower forth water, and thereby a vacuum is formed, the supply of steam having, of course, been shut off previously. On the formation of the vacuum the vessel shuts down and fills again. When full, steam is again admitted, and thus the operation continues.

What I claim as my invention is—

1. The combination of the rising and falling vacuum-vessel A, having an enlarged lower portion, the discharge-box D, constituting the bottom thereof, and the central guide-stem B, forming both a steam-inlet and a condensing device, the whole operating substantially as and for the purpose set forth.

2. The combination, with the vessel A and stem B, of a water-cup, *a*, essentially as and for the purpose specified.

WM. BURDON.

Witnesses:

MICHAEL RYAN,
FRED. HAYNES.