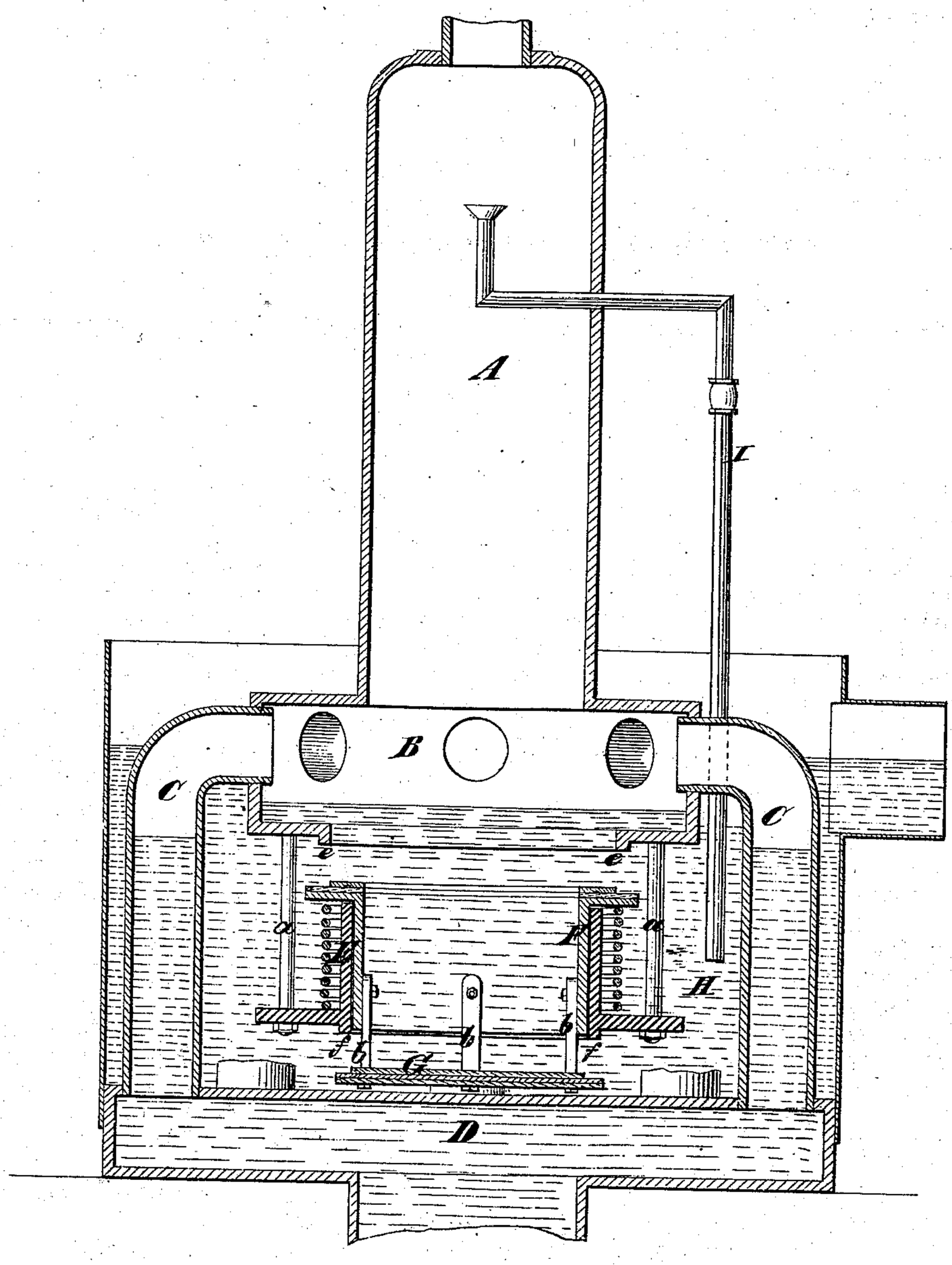
W. BURDON.

Steam Vacuum Pumps.

No. 152,896. Patented July 14, 1874.



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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. **152,896**, dated July 14, 1874; application filed December 17, 1872.

CASE W'.

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 double-seated valve with seats provided on the vacuum-vessel, whereby a very large opening is obtained with very little motion of the valve, and the expeditious discharge of the vessel is greatly facilitated.

The accompanying drawing represents a central vertical section of an apparatus constructed according to my invention.

A is the vacuum-vessel, which is erected on a chamber, B, of larger diameter, communicating, by pipes C C, with a water-chest, D, to which the suction-pipe of the pump leads. E is an annular guide, within which the valve works. It is arranged some distance below the chamber B, and is secured thereto by bolts *a a*. The valve is composed of two parts—an annular piece, F, having a flange at its upper edge, and a plate, G, secured to it at some distance from its lower edge by straps or rods *b b*. Both the flange on the piece F and the upper side of the plate G are faced with leather washers, and the latter closes against a seat, *f*, on the bottom of said guide, and the former against a seat, *e*, formed on the bottom of the chamber B. A spiral spring surrounding the valve-guide forces the valve to its seats when not held open by other means. A condensing-pipe, I, leads from a discharge-box, H, erected on the water-chest D to the upper part of the vacuum-vessel. A vacuum having been formed in the vessel A by the condensation of steam therein or other means, water is forced into it by atmospheric pressure. When the vessel is full, steam is admitted to it, and, by destroying the vacuum, enables the water to be discharged by its gravity, the valve F G of course opening to permit this. As soon as the receding water gets below the bottom of the vacuum-vessel, the steam follows it into the chamber B, and is suddenly expanded, and consequently its pressure is reduced. About this time the supply of steam is shut off, the discharge-valve F G closes, and the condensing-pipe I is induced to operate. Thus a vacuum is formed and water is caused to flow up into the vessel from the water-chest. When the vessel is full, steam is again admitted, and, by destroying the vacuum in the vessel A, enables its contents to discharge themselves through the valve F G. Thus the operation continues.

The great advantage of the discharge-valve F G, constructed as described, is that with a very short motion a very large opening is presented for the discharge; one opening being presented between the end of the bottom of the guide F and the plate G, and another between the flange of the piece F and the bottom of the chamber B.

What I claim as my invention is—

The combination of the double valve F G and the seats *e* and *f*, when constructed and arranged to operate substantially as and for the purpose herein set forth.

WM. BURDON.

Witnesses:
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