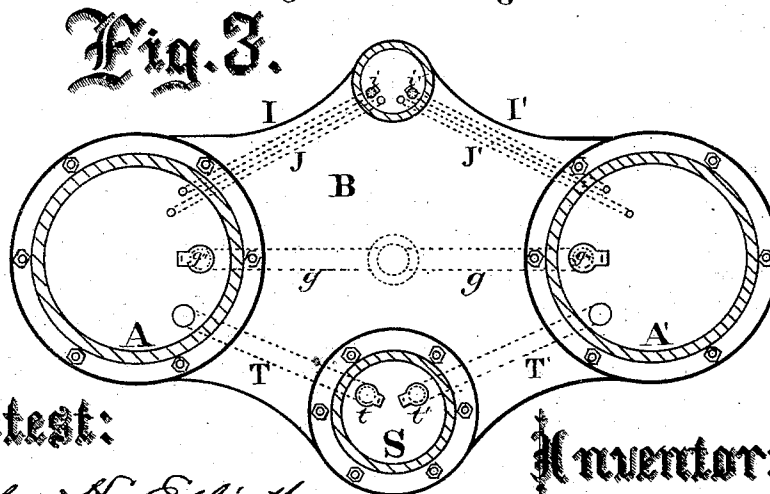
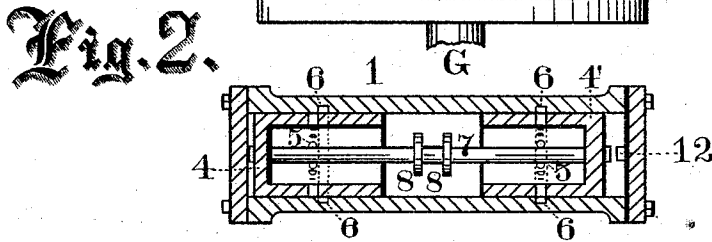
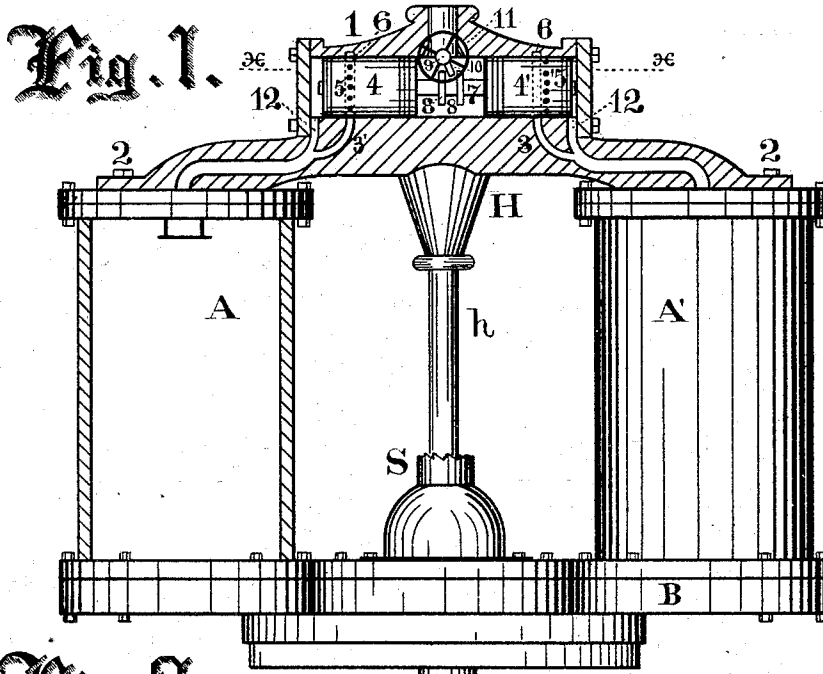


G. H. NYE.

Valves for Steam Vacuum-Pumps

No. 157,863.

Patented Dec. 15, 1874.



Attest:

John H. Elliott,
G. L. Chopin.

Inventor:

George H. Nye

UNITED STATES PATENT OFFICE.

GEORGE H. NYE, OF MONMOUTH, ILLINOIS.

IMPROVEMENT IN VALVES FOR STEAM VACUUM-PUMPS.

Specification forming part of Letters Patent No. **157,863**, dated December 15, 1874; application filed October 13, 1874.

To all whom it may concern:

Be it known that I, GEORGE H. NYE, of Monmouth, in the county of Warren and State of Illinois, have invented a new and useful Improvement in Steam Vacuum-Pumps, of which the following is a specification:

The object of the present invention is to improve the pumps patented to me November 5, 1872. The nature of the improvement consists in a steam-cylinder placed on the top of the pump-cylinders, and provided with a reciprocating double-cup valve, which, when under a proper force of steam, moves back and forth in its cylinder, and alternately conducts steam, by means of suitable ports, into the pump-cylinders, whereby water is forced out of one pump-cylinder, while a vacuum is produced in the other cylinder, and vice-versa; the mechanism in the bottom of the pump-cylinders (similar to that in the patent referred to) being hereinafter fully described and shown.

In the drawings, Figure 1 is a vertical sectional elevation of my improvement as applied to the pump-cylinders of my patents dated November 5, 1872, and numbered 132,732 and 132,731; Fig. 2, an enlarged horizontal section of the valve-cylinder, taken on line *x*, Fig. 1; Fig. 3, a plan view of the base on which the steam-cylinders are placed, showing the position of the pipes, ducts, and valves therein; also the position of said cylinders, in section, on the base.

A A' represent the pump-cylinders, which are constructed of iron, of suitable strength to withstand the required pressure of steam, and are bolted fast to a base, B, as in said patent. On top of these cylinders is placed another cylinder, 1, which is held in position by means of bolts 2, put through the ends of the conduit-pipes 3 3', which are cast solid to the cylinder 1, and communicate with it. In this cylinder 1 is placed a double-cupped steam-valve 4 4', which is provided with a series of ports, 5 5', communicating with annular grooves 6 on the inside of the cylinder 1. The rod 7, connecting the cups 4 4', is provided with two flanges, 8, between which an arm, 10, on shaft 9 operates, a wheel, 11, being fastened to said shaft for the convenience of operating the valve outside of the cylinder 1. There is also leading from the cylinder 1 and into conduit-pipes 3 ducts 12,

for a purpose stated in the operation. An air-chamber or condenser, H h, is supported by the base B, and communicates with the steam-cylinders A A' by means of ducts I I' in the base B. *i i'* are valves on the ends of the ducts in the enlarged lower end of the pipe h. J J' are smaller ducts, also leading from the cylinders A A' to the same enlarged part. T T' are pipes leading from the cylinders A A' to the discharge-pipe S, and G is the water-inlet pipe, leading by ducts *g g'*, through valves *g''* and *g'''*, into cylinders A A', as in said patent.

The operation is as follows: The pump-cylinders A A' are primed and started in the ordinary manner known to the art. The double-cup valve 4 4' being so set as to bring the ports 5 of cup 4 over the conduit-pipe 3', steam drives the water out of cylinder A, and at the same time forces so much water into the condenser H h as will compress the air therein to a corresponding pressure to that of the steam in the cylinder A. As soon as the water is all forced from the cylinder A through duct T and valve *t*, the steam comes under the water in passage T, Fig. 3, reducing the steam-pressure in cylinder A. At the same time the air in condenser H h drives the water back through duct J. Up to the time of this partial exhaust the valve 4 4' remains stationary; but now such exhaust has relieved the pressure from the outer end of cup 4 by means of duct 12. The force of steam now moves the valve 4 4' so as to bring ports 5' over conduit-pipe 3 and close conduit 3', and the operation of cylinder A' is the same as in cylinder A, causing a continuous flow of water through pipe S.

To clean the cylinder 1 of sand or other substance, turn the wheel 11 back and forth, giving the valve a reciprocating movement.

I claim as new—

A valve consisting of rod 7, flanges 8, cups 4 4', with ports 5 5' through them, in combination with cylinder 1, provided with annular grooves 6, shaft 9, arm 10, and wheel 11, conduit-pipes 3 3', and ducts 12, arranged to operate a steam vacuum-pump, substantially as described.

GEORGE H. NYE.

Witnesses:

JOHN H. ELLIOTT,
G. L. CHAPIN.