

O. ADAMS.

Improvement in Puppet-Valves.

No. 130,099.

Fig. 1

Patented Aug. 6, 1872.

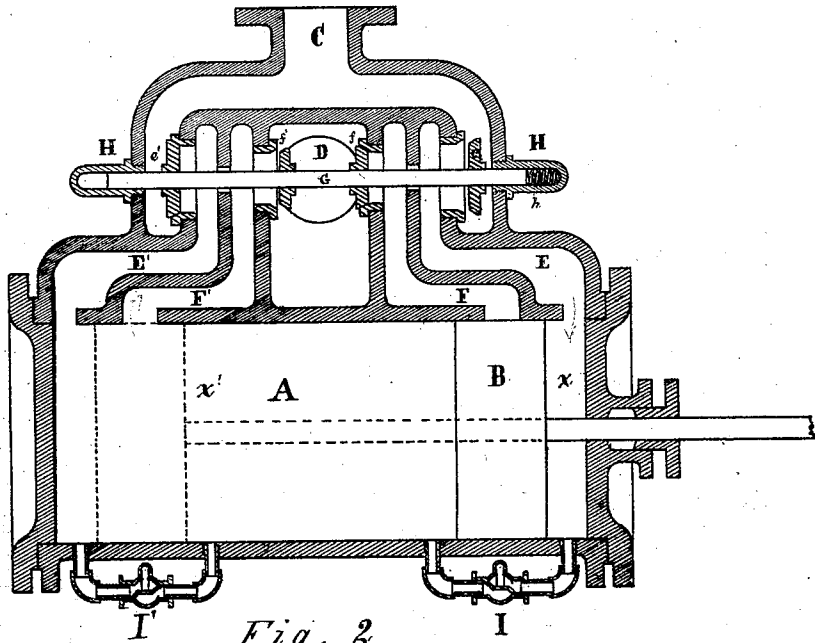
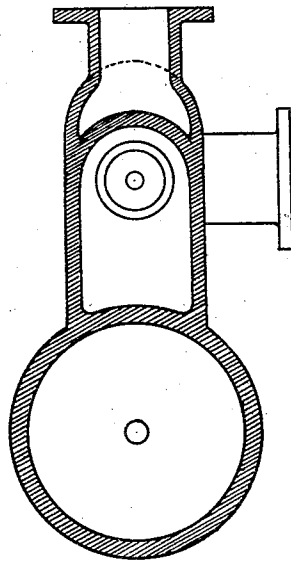


Fig. 2



Witnesses

George Parry
Edward Yorke

Scale 2 inches=1 foot

Inventor

Otis Adams

UNITED STATES PATENT OFFICE.

OTIS ADAMS, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN PUPPET-VALVES.

Specification forming part of Letters Patent No. 130,099, dated August 6, 1872.

Specification describing an Improved Arrangement of Valves for Steam-Engines for Pumps, invented by OTIS ADAMS, of the city and county of San Francisco, State of California.

This invention relates to the arrangement of a set of puppet-valves in connection with steam-passages of peculiar design, so that the steam from the working cylinder may be made to operate directly upon these valves for the purpose of supplying steam to the working-cylinder and releasing it therefrom, under the conditions necessary in the case.

The principle of operating valves by steam from the cylinder, as I do in this case, is not new, (see the patent granted N. W. Wheeler, July 31, 1855, No. 13,369;) but the peculiar arrangement and combination of parts that I have made is claimed to be novel and improved upon what has gone before.

In the accompanying drawing, Figure 1 is a longitudinal section of a steam-cylinder and steam-chest, showing supply and exhaust valves. Fig. 2 is a cross section of the same.

In Fig. 1, A is the working cylinder. B is the piston. C is the supply-nozzle. D is the exhaust-nozzle. E E' are the induction-passages; e e', the induction-valves. F F' are the eduction-passages; f f', the eduction-valves. G is the stem upon which all the valves are securely held. H H' are the guides which support the valve-stem. A spiral spring, h, may be inserted in one of these guides when the cylinder sits horizontally. This spring will serve to throw the valves whenever the regular action of the steam might fail to do so. I I' are pipes, with a check-valve in the middle, as shown, which pipes supply a passage-way from behind to before the advancing piston when it shall reach certain points, for the purpose herein-after shown.

It will be seen that the valves e e' are of greater diameter and area than the valves f f'. Let

it be assumed the valves f f' are four inches area and the valve e e' six inches area; then, the operation is as follows: The valves being in position, as shown in Fig. 1, the valves e and f' have just been thrown open, because the steam in the cylinder has acted with a pressure of, say, seventy pounds per square inch on the combined areas of these valves, equal to ten inches at seventy pounds per inch, or seven hundred pounds total pressure, while the only resistance overcome was that due to the pressure of, say, one hundred pounds per square inch on the six inches of area of the valve e, which gave only six hundred pounds of resistance; the difference between the pressure and the resistance, in this case one hundred pounds, served to throw open the valves, as shown. The cylinder is now receiving steam through the passage E and exhausting through the passage F'. The check-valve at I will not permit the steam to pass from x to x'; but when the piston arrives at where the dotted lines indicate, then the exhaust-passage F' will be closed and all pressure be removed from the valve f', while the passage I' will be open and the steam in x will pass to x' to operate on the valves e' and f' as before on the valves e and f'. Thus an alternating opening and closing of the valves is obtained, for the purpose of supplying and exhausting the steam as the piston arrives at the points indicated in the drawing. To this engine steam or water may be applied as the motive power.

I claim—

The arrangement and combination of the four puppet-valves on the stem G in connection with the passages E E' and F F' and the pipes I and I', as and for the purposes set forth.

OTIS ADAMS.

Witnesses:

GEORGE PARDY,
EDWARD YORKE.