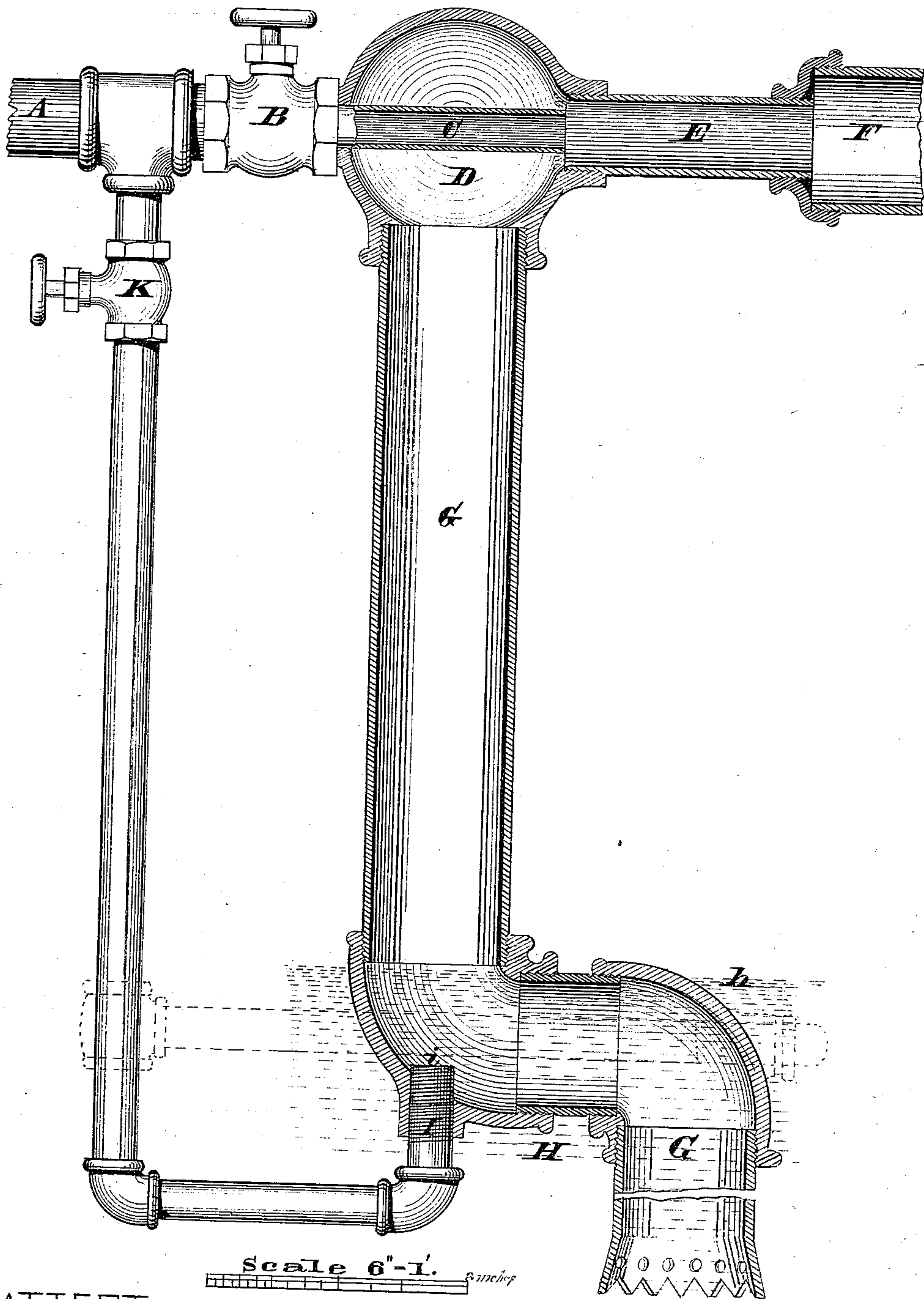


WILLIAM ARTHUR.

Improvement in Steam-Water Elevators.

No. 126,246.

Patented April 30, 1872.



ATTEST.
Geo. L. Ewin
Walter Allen

INVENTOR,
William Arthur
By Knight & Bro. Attys.

UNITED STATES PATENT OFFICE

WILLIAM ARTHUR, OF NEWPORT, KENTUCKY.

IMPROVEMENT IN STEAM WATER-ELEVATORS.

Specification forming part of Letters Patent No. 126,246, dated April 30, 1872.

Specification describing a certain Improved Steam-Pump, invented by WILLIAM ARTHUR, of Newport, in the county of Campbell and State of Kentucky.

This invention relates to a pump for raising water by the direct action of steam; and consists, first, in the construction of the injecting device, and, second, in associating therewith an additional injector, whose mouth is placed below the surface-level of the water-supply, so that it will always be at a temperature sufficiently low to condense the steam, for a purpose hereinafter explained.

The drawing is a side view of my apparatus partly in section.

A is the steam-pipe. B is a globe-valve or cock between the steam-pipe A and the jet-nozzle C, passing centrally across the water-chamber D. E is a cylindrical portion of pipe leading from the water-chamber D to the discharge-pipe F, to which water-hose may be coupled. G is the suction-pipe communicating with the supply-water H, having a surface-level, *h*. Projecting into the supply-pipe beneath the water-level is a steam-jet, *i*, the pipe I of which communicates with the steam-pipe A² through a valve or cock, K. The steam-jet *i* may, if desired, enter the supply-pipe in a horizontal direction, as shown by dotted lines.

The operation of my pump is as follows: The pipe F is supposed to be always filled with water that may be retained therein by a check-valve, if necessary. To set the pump in operation the valve B is opened, and the steam issuing from the nozzle C and into the cylindrical neck E will force the water through the discharge-pipe F. If the water in the cham-

ber D and pipe E becomes heated, owing to its having been long at rest in proximity to the steam-pipe A—and from this cause the steam when turned on is not condensed with sufficient rapidity to render the injector effectual—then the valve B is closed and the valve K opened; and by this means the lower steam-jet *i* is put in operation, and this jet, being surrounded by cool liquid, will always be at a sufficiently low temperature to condense the steam and allow the steam current to gain sufficient momentum to raise or propel the water. When the current is established the valve B is opened and valve K closed, and the liquid is pumped by the jet C alone, the additional jet *i* being only used for the purpose above mentioned.

The form of the throat or neck E is a matter of paramount importance, because if this is enlarged within a small distance of the nozzle C an eddy is formed at the point of enlargement, and more or less regurgitation takes place.

I claim as my invention—

1. The throat E, having an unvarying diameter from end to end and discharging into a chamber or pipe, F, of larger diameter, substantially as and for the purposes set forth.

2. In combination with an upper injector, C E F, the auxiliary jet I *i*, arranged substantially as and for the purpose set forth.

In testimony of which invention I have hereunto set my hand.

WILLIAM ARTHUR.

Witnesses:

SAML. KNIGHT,
HENRY G. ISAACS.