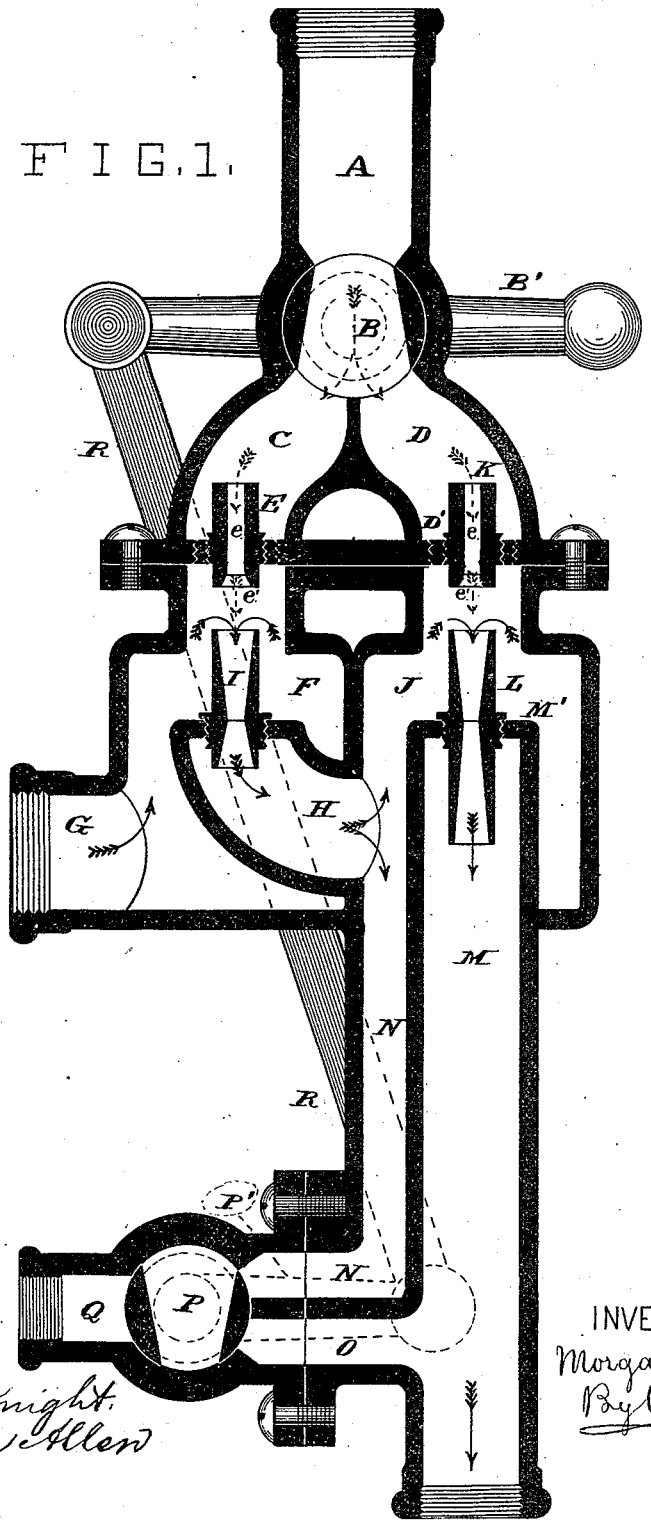
2 Sheets—Sheet 1.

# M. D. STRICKLAND.

## Injectors.

No. 208,437. Patented Sept. 24, 1878.

FIG. 1.




ATTEST.

Geo. H. Knight.
Walter Allen

INVENTOR.

Morgan D. Strickland
By Knight Bros.
Attys.

2 Sheets—Sheet 2.

# M. D. STRICKLAND.

## Injectors.

No. 208,437. Patented Sept. 24, 1878.

FIG. 2.

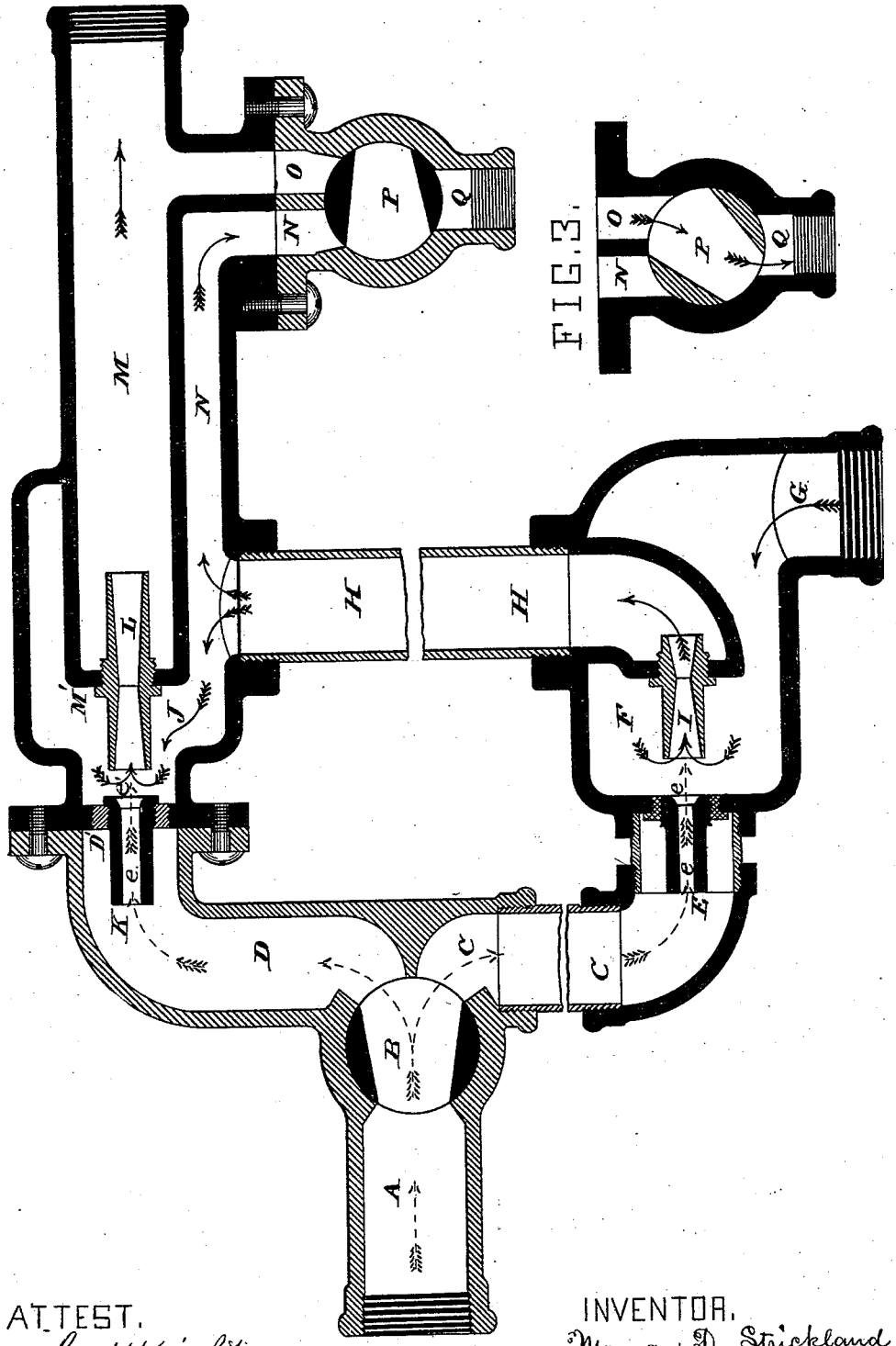



FIG. 3.




ATTEST.

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# UNITED STATES PATENT OFFICE.

MORGAN D. STRICKLAND, OF ST. LOUIS, MISSOURI.

## IMPROVEMENT IN INJECTORS.

Specification forming part of Letters Patent No. **208,437**, dated September 24, 1878; application filed August 1, 1878.

*To all whom it may concern:*

Be it known that I, MORGAN D. STRICKLAND, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Injectors, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My improvement relates to a combination of two steam-injectors; and consists in the combination, with the two injectors, of two distinct overflow-passages, governed by a single three-way cock, as set forth; also, the two steam-injectors connected by steam and water pipes capable of variation as regards length to suit the size of the apparatus, or the distance apart at which it is desired to have the injectors, and governed by a single three-way cock or valve, as set forth.

In the drawings, Figure 1 is an axial section of my compound injector in a vertical position. Fig. 2 is an axial section showing a modification, in which the two injectors are placed at a distance apart vertically to enable the raising of water from a lower level, and forcing it into the boiler or to a higher elevation. Fig. 3 is an axial section of the overflow-valve.

A is the steam-pipe, in which is a three-way cock, B, capable of closing the steam-pipe A, or opening communication between the same and either one or both of the steam-pipes C and D. In the end C′ of the steam-pipe C is secured a steam-nozzle, E, which may be of any form. I have shown it as cylindrical for the greater part, *e*, of its length, and ending in a flaring mouth, *e′*. The nozzle E leads from the pipe C into the water-chamber F.

The water-chamber F is fed by a water-supply pipe, G, which may be in communication with a supply-tank or well a number of feet below the water-chamber F, so as to depend on suction for raising the water. H is a water-pipe passing from the water-chamber F, and in communication therewith only through the nozzle I.

The nozzle I is directly in line with the nozzle E, and the jet of steam from the nozzle E forces the water through the nozzle I into the water pipe or passage H. The water-pipe H may be quite short, as shown in Fig. 1, or it may be a number of feet in length, as in Fig. 2, where it is shown broken to indicate an uncertain length. The steam-pipe C may also be of any required length.

The pipe or passage H communicates with and supplies water to a water-chamber, J, into which steam from the steam-pipe D enters through a steam-jet nozzle, K. In line with the nozzle K, which screws into the end D′ of the pipe D, is the nozzle L, which screws into the end M′ of the pipe M, through which water is ejected into the boiler or to any other place.

N is the overflow-passage from the pipe H, and O is the overflow-passage from the pipe M. These passages lead to a three-way cock, P, by which they may be both closed, as shown in Figs. 1 and 2; or either or both of them may be made to communicate with the waste-pipe Q.

The two three-way cocks B and P may be connected by a rod, R, in connection with their arms B′ and P′.

The operation is as follows: The three-way cock B is first turned so as to open communication between the steam-pipes A and C, and the three-way cock P is turned so as to open the overflow N. Then, as soon as the water overflows through the passage N and pipe Q, the cock B is turned into the position shown in Fig. 1, so that the steam-pipe A is in communication with both of the steam-pipes C and D. Then turn the cock P so as to close the overflow-pipe N, as seen in Fig. 3, and, as soon as an overflow takes place through passage O, turn the cock P into position shown in Figs. 1 and 2, so as to shut off both overflows.

The turning of the cocks B and P may be simultaneous, if they are turned slowly.

In the form shown in Fig. 2 the injector E I may be used to lift, by suction, the water twenty feet, more or less, and the pipes C and H may be twenty feet (more or less) in length,

so that water may be furnished to the injector K L forty or more feet above the level of the supply.

I claim—

1. The two injectors E I and K L, in connection with distinct overflows N O, substantially as set forth.

2. In combination with the injectors E I and K L and overflows N O, the single three-way cock P, governing both overflows, substantially as and for the purpose set forth.

3. The two steam-injectors E I and K L, in combination with the pipes C and H, so arranged as to allow the two injectors to be placed far apart vertically, substantially as and for the purpose set forth.

MORGAN D. STRICKLAND.

Witnesses:
SAML. KNIGHT,
GEO. H. KNIGHT.