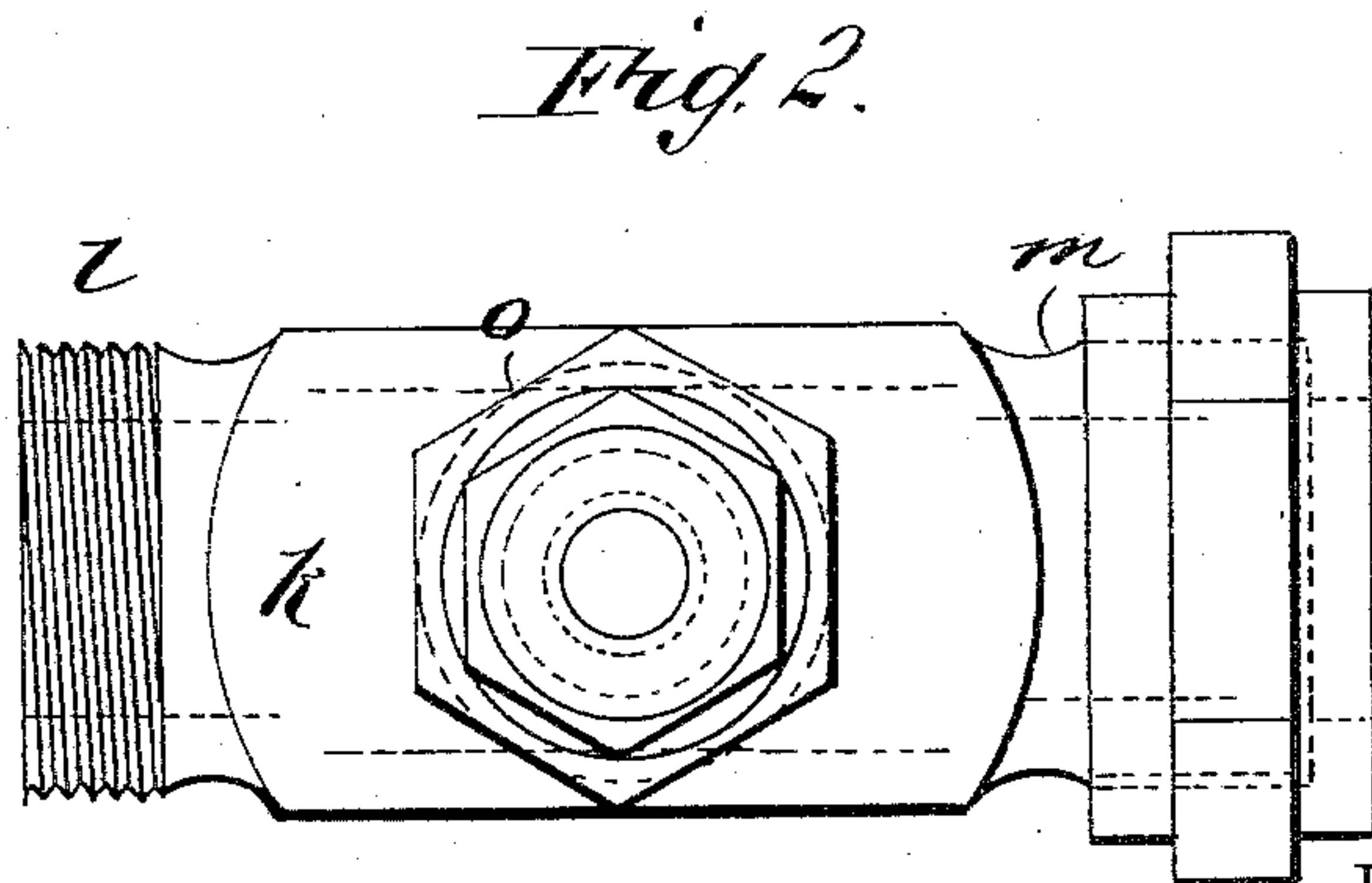
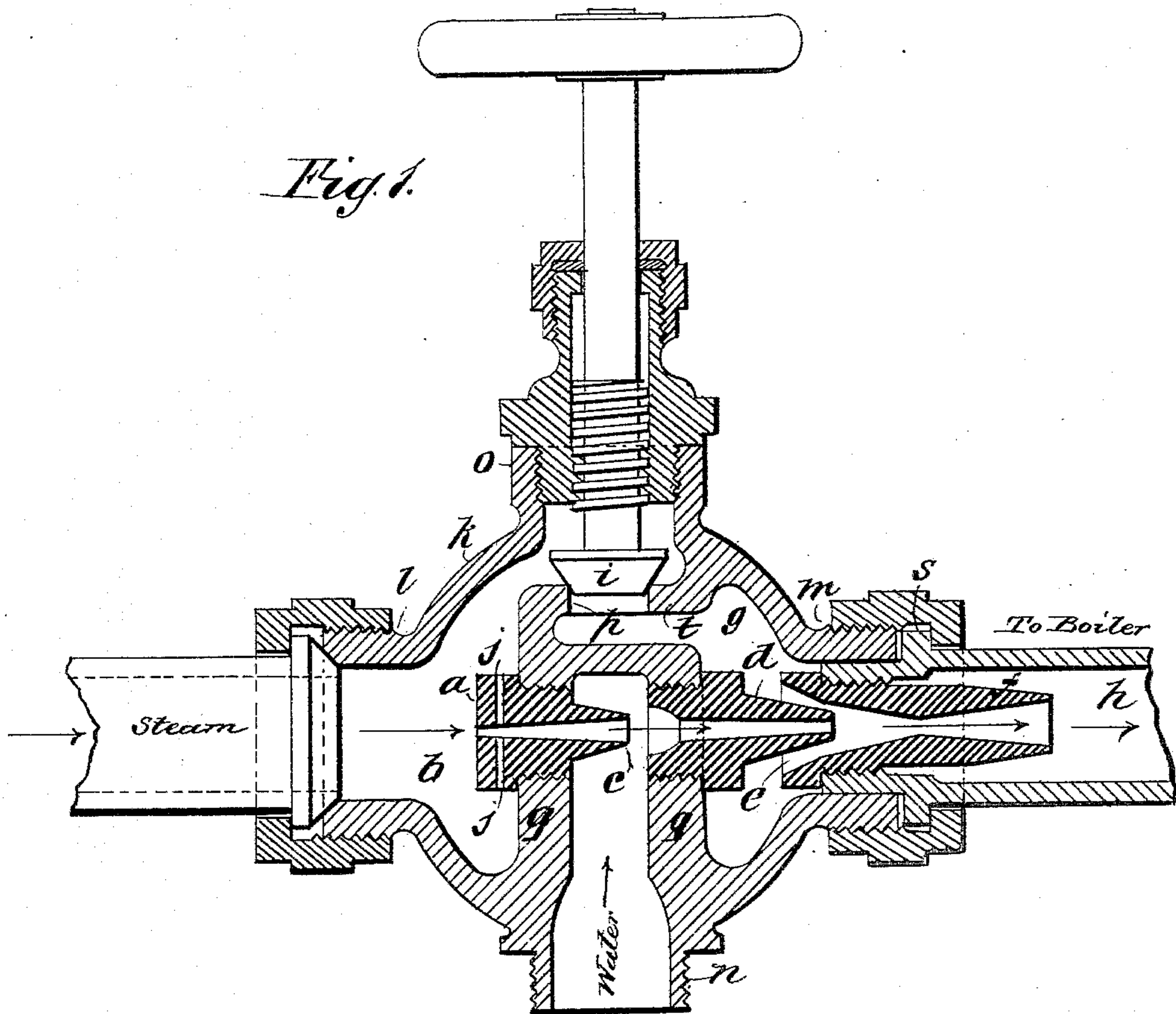


(Model.)

S. W. MORELAND.
INJECTOR.

No. 304,119.

Patented Aug. 26, 1884.



WITNESSES:

Francis McArthur.
H. Sedgwick.

INVENTOR:

S. W. Moreland
BY *Myers & Co.*

ATTORNEYS.

UNITED STATES PATENT OFFICE.

SILAS W. MORELAND, OF GENEVA, OHIO.

INJECTOR.

SPECIFICATION forming part of Letters Patent No. 304,119, dated August 26, 1884.

Application filed December 29, 1883. (Model.)

To all whom it may concern:

Be it known that I, SILAS W. MORELAND, of Geneva, in the county of Ashtabula and State of Ohio, have invented a new and Improved Injector, of which the following is a full, clear, and exact description.

My invention consists of an improved construction of injectors for utilizing an auxiliary steam-jet to re-enforce and accelerate the effect of a primary jet, so as to render the injector more effective with any pressure of the steam and more reliable with varying pressures; and it is also designed to provide a simple and cheap arrangement of construction, all as hereinafter fully described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in both the figures.

Figure 1 is a sectional elevation of my improved injector, and Fig. 2 is a side elevation.

In the first place, I have a nozzle, *a*, through the bore of which a jet of steam discharges from the steam-space *b* into the water-chamber *c*, into which the water is drawn by the steam-jet, which partly condenses by the water surrounding it, and from which a jet of water is established through the passage of another nozzle, *d*, placed in line with nozzle *a*, and discharging from the water-space *c* into the throat *e* of another nozzle, *f*, also placed in line with nozzles *a* and *d*, and receiving an annular jet of steam from the space *g*, and surrounding the water-jet, which is thereby greatly accelerated and delivered through nozzle *f* with great force into the pipe *h*, leading to the boiler. A valve, *i*, is located in partition *t* between steam-spaces *b* and *g*, which valve is to be closed when steam is first admitted to chamber *b* until the jet through nozzle *a* draws the water into space *c* and causes a discharge through the overflow. (Not shown, but to be located at any suitable position along the pipe to the boiler.) Then valve *i* is to be opened for establishing the annular jet in re-enforcement of the central jet first started, which jets then jointly inject the water with such powerful effect and steady action as to insure constant action under all variations in the pressure of the steam.

To prevent the stoppage of the passage through nozzle *a* by any solid matter falling on the top of said nozzle, I have provided lat-

eral passages *j* through the upper part into the central passage, by which the liability of the stoppage of the injector by obstructions is avoided.

By the arrangement of all the nozzles in line with each other and with the delivery-pipe *h* the action is more certain and effective than when the auxiliary jet is arranged laterally to the primary jet.

The construction of the injector-case is very simple, the same being a globe, *k*, with steam and delivery pipe connections *l m* arranged in line, and with the water-pipe connection *n*, stuffing-box connection *o*, and valve-opening *p* in another line and at right angles to the steam and water pipe connections; and the arrangement of the nozzle is also simple, nozzles *a* and *d* being screwed into the partitions *q* through the pipe-connections *l* and *m*, respectively, and the nozzle *f* being screwed in the end of the delivery-pipe *h*, and said end of the pipe is fitted to extend into the steam-space *g* sufficiently to support the nozzle *f* in the right position relatively to nozzle *d* for controlling the annular steam-jet. The annular space in the throat *e* can be regulated by packing between the shoulder of flange *s* and the end of pipe-connection *m*.

The stuffing-box and the pipe connections are screwed on in the usual way.

The injector may also be used as an ejector, when desired.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The injector herein described, consisting of the globe *K*, formed with pipe-connections *l m* in line with each other, water-pipe and stuffing-box connections *n o* in line with each other and at right angles to the connections *l m*, vertical partitions *q q*, and horizontal partition *t*, forming chambers *b g c*, central opening, *p*, in the partition *t*, in line with the water-chamber *c* and connecting the chambers *b g*, and valve *i* above said opening, nozzles *a d* in the walls *q q*, the former extending into the chamber *c*, and the delivery-pipe *h* and its nozzle *f*, having a throat, *e*, surrounding the end of nozzle *d*, the three said nozzles being in alignment with each other, substantially as set forth.

SILAS W. MORELAND.

Witnesses:

HENRY MEANS,
BERT BOND.