

(Model.)

2 Sheets—Sheet 1.

W. R. PARK.
INJECTOR.

No. 524,685.

Patented Aug. 14, 1894.

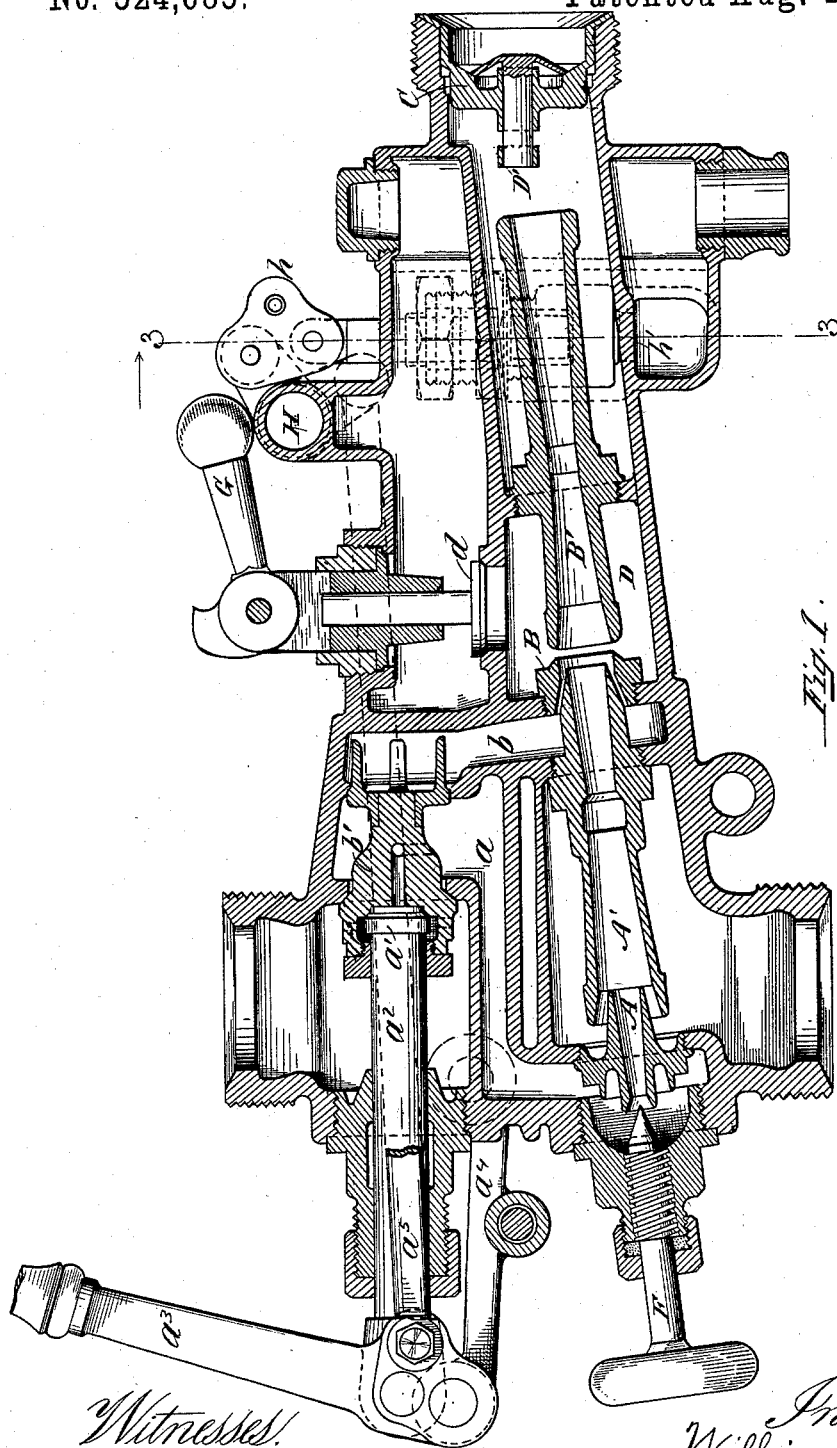


Fig. 1.

Witnesses:
John R. Brown,
H. C. Remick W.

Inventor
William R. Park,
by his attorneys,
Mcquadrin & Beach.

(Model.)

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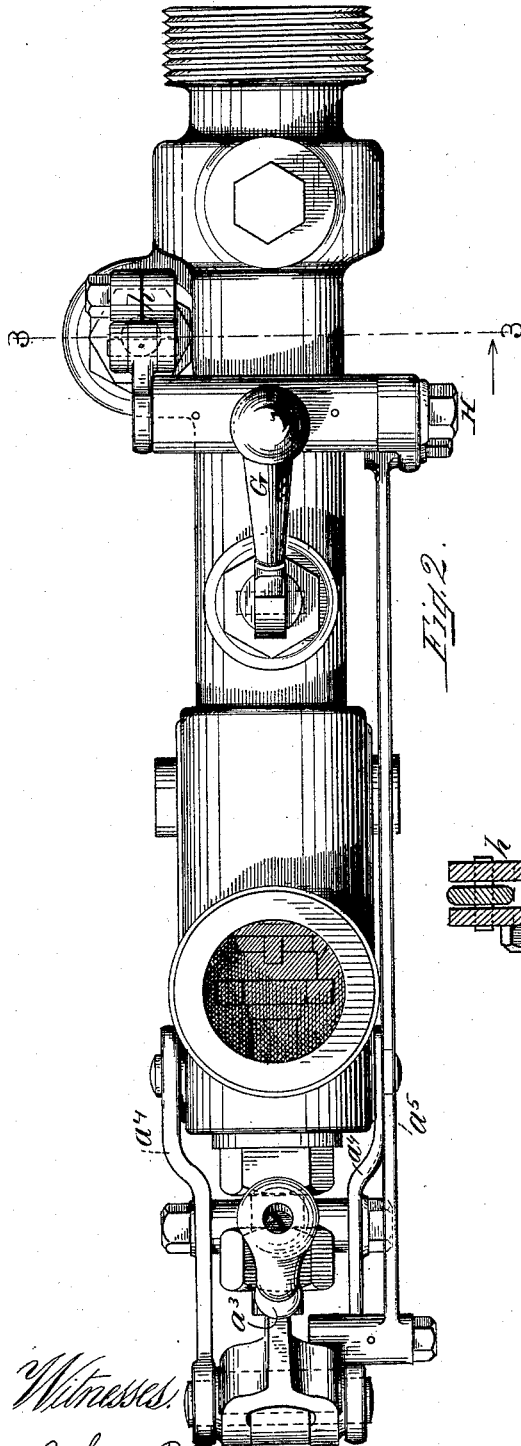


Fig. 2.

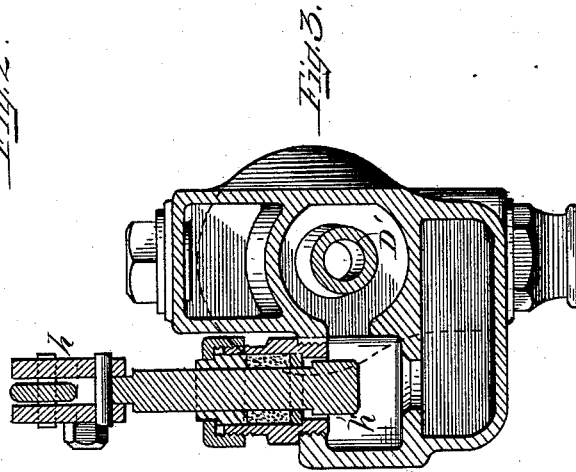


Fig. 3.

Witnesses:

John R. Snow.
H. E. Runkle, Jr.

Inventor:
William R. Park
by his attorneys,
Magradier & Beach.

UNITED STATES PATENT OFFICE.

WILLIAM R. PARK, OF TAUNTON, ASSIGNOR, BY MESNE ASSIGNMENTS, TO
HIRAM H. JENKINS AND GEORGE O. JENKINS, OF WHITMAN, MASSACHUSETTS.

INJECTOR.

SPECIFICATION forming part of Letters Patent No. 524,685, dated August 14, 1894.

Application filed September 25, 1891. Serial No. 406,787. (Model.)

To all whom it may concern:

Be it known that I, WILLIAM ROBERT PARK, of Taunton, in the county of Bristol and State of Massachusetts, have invented an Improved
5 Injector, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a lengthwise section; Fig. 2 a plan, and Fig. 3 a section on line 3—3 of Fig. 2, of my improved injector.

Injectors with a lifter and forcer combined have long been known; and in my Patent No. 370,405, dated September 27, 1887, I describe an injector in which the jet from the lifter
15 passes through the annular steam nozzle of the forcer.

My invention is shown as embodied in this class of injectors and consists in the combination of a lifter; a forcer; a main valve controlling the flow of steam into the two passages leading to the lifter and forcer, and a
20 regulating valve between the lifter and the main valve and controlling the flow through the passage to the lifter. These four elements are singly old but I am the first to supply both lifter and forcer from a common source through one main valve and to regulate the supply to the lifter at pleasure without adjustment of the main valve.

In practice after the jet is established through the lifter the steam can be shut off wholly from the lifter nozzle by the regulating valve in my combination, and thereby
25 give the minimum rate of feed; or the steam can be turned full onto the lifter nozzle by opening the regulating valve to its full extent, and thereby give the maximum rate of feed.

In the drawings A is the lifter nozzle, and
40 A' its tube.

B is the forcer nozzle made annular by the end of tube A' projecting into it, and B' its tube.

The steam is first admitted through the
45 forcer nozzle A, entraining the water and forces the jet through tube A', and when in full operation this jet accelerated by the steam from the annular forcer nozzle B passes through tube B' filling high pressure cham-

ber D', and lifts check valve C and enters the
50 boiler, as will be clear without further description; and it will also be clear to all skilled in this art that the jet from A' at first fills overflow chamber D and escapes through overflow valve d; and that valve d closes as
55 soon as the full jet is established, for then chamber D becomes a vacuum chamber; also that water escapes from high pressure chamber D' until the overflow valve h' is closed.

The regulating valve F, shown as a screw
60 plug with a conical end, regulates the quantity of steam which flows through the lifter nozzle A, and thereby tends to regulate the quantity of water passing through tube A'; but as the steam from the forcer nozzle B
65 will also in my apparatus keep up a jet through tube A', after such a jet is once established, valve F may be screwed down close on its seat (the mouth of nozzle A) without breaking the jet.

In that form of my apparatus shown steam
70 is admitted to the lifter nozzle A through conduit a which is controlled primarily by valve a' carried by rod a²; so that at the first part of the outward movement of rod a² valve a' is moved from its seat in valve b' and steam
75 flows past valve a' and through passages in valve b' to conduit a and through lifter nozzle A. But when rod a² is moved farther, it carries with it valve b', allowing a free flow
80 of steam into conduit a, and also into conduit b, which supplies forcer nozzle B.

Rod a² is pinned to lever a³ whose fulcrum is on links a⁴; the inner ends of which fit on trunnions projecting from the body of the in-
85 jector.

The long link a⁵ actuates rock shaft H one arm of which is connected by link h with the overflow valve h' from the high pressure chamber; as will be fully understood by all
90 skilled in the art.

The cam lever G serves to force overflow valve d on its seat and hold it there when required.

The operation is as follows: The regulat-
95 ing valve F being open, lever a³ is moved admitting steam first to lifter nozzle A; and starting the jet, water flowing out of the

overflow and through both overflow valves *d* and *h'* until the jet is strong enough to make a partial vacuum in chamber D, when overflow valve *d* closes automatically. The further motion of lever *a*³ in the same direction admits steam to forcer nozzle B, increasing the force of the jet, and also closing overflow valve *h'* from the high pressure chamber D', the pressure in which chamber has then become sufficient to force open the check valve C, against boiler pressure. The rate of feed is then regulated by the regulating valve F, which affects the operation of both nozzles, throwing more and more the duty of a lifter nozzle on the forcer nozzle B, as it diminishes the duty of the lifter nozzle A. The reverse motion of lever *a*³ opens overflow valve *h'* and

shuts off steam from the forcer nozzle B, and the lifter nozzle A.

What I claim as my invention is—

In an injector the combination of a lifter composed of a steam nozzle and its tube; a forcer composed of an annular steam nozzle and its tube; a main valve controlling the flow of steam into the passages leading to the lifter and forcer, and a regulating valve between the main valve and the lifter and controlling the flow of steam through the passage leading to the lifter, substantially as described.

WM. R. PARK.

Witnesses:

J. E. MAYNADIER,
EDWARD S. BEACH.