

No. 628,456.

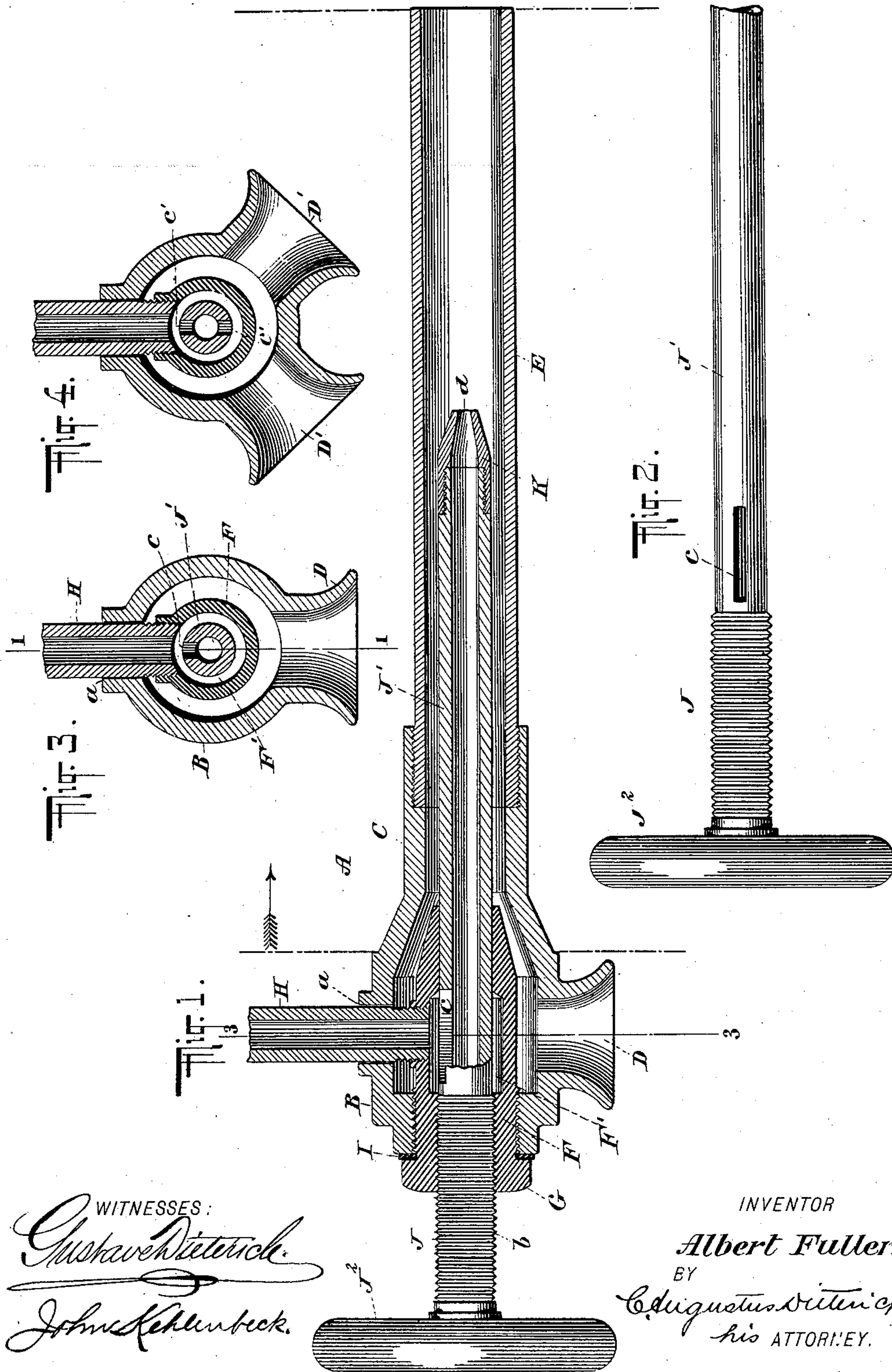
Patented July 11, 1899.

A. FULLER.

INJECTOR.

(Application filed Dec. 3, 1898.)

(No Model.)



WITNESSES:
Gustav Dietrich
John Kelenbeck

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UNITED STATES PATENT OFFICE.

ALBERT FULLER, OF GUTTENBURG, NEW JERSEY.

INJECTOR.

SPECIFICATION forming part of Letters Patent No. 628,456, dated July 11, 1899.

Application filed December 3, 1898. Serial No. 698,146. (No model.)

To all whom it may concern:

Be it known that I, ALBERT FULLER, a citizen of the United States, residing at Guttenburg, Hudson county, in the State of New Jersey, have invented certain new and useful Improvements in Injectors, of which the following is a full, clear, and exact specification.

My invention relates to improvements in apparatus for superheating air and forcing the same into a furnace to effect the more perfect combustion of the fuel used therein; and my invention has for its object more particularly to provide a simple and efficient apparatus for the purposes above specified whereby it becomes possible to more effectually superheat the air and more fully control or regulate the mixing thereof with steam before the same enters the furnace; and said invention has for its object, further, to provide an apparatus which may be readily attached to or detached from the furnace and the source of steam-supply and taken apart to permit of the cleaning thereof, and, finally, to provide an apparatus whereof the vital parts will not be directly exposed to injury by the heat of the furnace. These objects above set forth I am enabled to attain by means of my invention, which consists in the novel details of construction and in the combination, connection, and arrangement of parts hereinafter more fully described and then pointed out in the claim.

In the accompanying drawings, forming part of this specification, wherein like letters of reference indicate like parts, Figure 1 is a longitudinal section taken on the line 1 1 of Fig. 3, showing an injector constructed according to and embodying my invention. Fig. 2 is a detail top or plan view of the forward portion of the steam-nozzle, showing the steam-inlet therein. Fig. 3 is a section taken on the line 3 3 of Fig. 1 looking in the direction of the arrow, and Fig. 4 is a similar view showing the injector provided with a plurality of air and steam ports.

In said drawings, A designates the injector, comprising the cylindrical body or outer casing B, the rear end of which is tapered and terminates in the cylindrical end C, and D denotes a flaring mouth or air-port which communicates with the interior of the body or outer casing B.

E denotes a section of ordinary pipe, preferably iron, which is secured to the cylindrical end C and constitutes a continuation thereof which extends therefrom to the inner surface of the furnace-wall.

In the front end of the body or outer casing B is provided a central threaded opening, and F denotes a plug or inner casing, of smaller diameter than the interior of the outer casing B, secured in said opening and extending into said outer casing B, said plug F having a tapered inner end, a hexagonal head G at its outer end, and a central longitudinal opening extending entirely through the same, having screw-threads at its forward end and its middle portion enlarged to form a steam-chamber F', provided with an opening, into which is secured a pipe H, extending through an opening *a* in the outer casing B and communicating with a source of steam-supply, and I denotes a washer or packing disposed upon the plug F intermediate its head G and the end of the outer casing B.

J denotes the steam-nozzle, which works with the plug F and consists of a hollow stem J', provided at its outer projecting end with a hand-wheel J² and screw-threads *b* and to the rear of said screw-threads, in the portion within the steam-chamber F', with one or more slots or steam-ports, as *c*, and K denotes a nipple which is removably secured to the inner end of the hollow stem J' and provided with a reduced opening *d*.

At Fig. 4 I have shown the injector provided with a plurality of air-ports D' and steam-ports *c' c'*, whereby it becomes possible to force a larger volume of air into a furnace.

To operate the apparatus, it simply becomes necessary to turn the hand-wheel J² until the steam-port *c* in the nozzle J is partly or wholly uncovered within the steam-chamber F', whereupon steam will enter the same and thence issue from the opening *d* in the nipple K and in so doing create a suction whereby air will be drawn into the outer casing B through the port D and become heated in passing over the plug F and the long steam-nozzle J, and thence forced into the furnace. By turning the hand-wheel J² in the reverse direction until the steam-port *c* is partly within the tapered end of the plug the quantity of steam admitted to the nozzle can be di-

minished, and by continuing the operation until the screw-threads B on the stem J' contact with the inner surface of the rear or tapered end of the plug F the steam may be
5 completely shut off.

In practice I propose to have the nipple K at the inner end of the nozzle J, when adjusted to its operative position, about five inches from the end of the pipe E, and for this reason I have made both the nipple K and pipe
10 E removable to permit of the attaching of various sizes to suit the varying thicknesses of the furnace-walls.

Without limiting myself to the details of
15 construction, which may be varied within the scope of the invention, what I claim as new, and desire to secure by Letters Patent, is—

An injector comprising a cylindrical outer casing having air-ports arranged therein, a
20 removable hollow stem secured to its rear end, and a screw-threaded opening provided in the front end of said outer casing, an inner casing or steam-chamber of smaller diameter than the outer casing removably secured within
25 the threaded opening in the front end of the outer casing, an opening arranged in the top of said outer casing, a steam-supply pipe ex-

tending therethrough and into the inner casing to hold the same in position within the outer casing, and a steam-nozzle supported by
30 the inner chamber and projecting beyond the ends thereof; said steam-nozzle being provided at its inner end with a removable nipple having a reduced opening therein; adjacent to its forward ends with screw-threads
35 adapted to work in the threaded opening in the front end of the inner chamber; intermediate said threaded portion and the nipple, in the portion within the inner steam-chamber, with a longitudinal opening, and at its
40 extreme outer end with a hand-wheel whereby said steam-nozzle may be rotated within the inner casing to advance or withdraw the longitudinal opening therein into or from the solid rear end of the inner steam-chamber,
45 and thereby regulate the admission of steam, substantially as shown and described.

Signed at the city of New York, in the county and State of New York, this 25th day of November, 1898.

ALBERT FULLER.

Witnesses:

GUSTAVE DIETERICH,
JOHN KEHLENBECK.