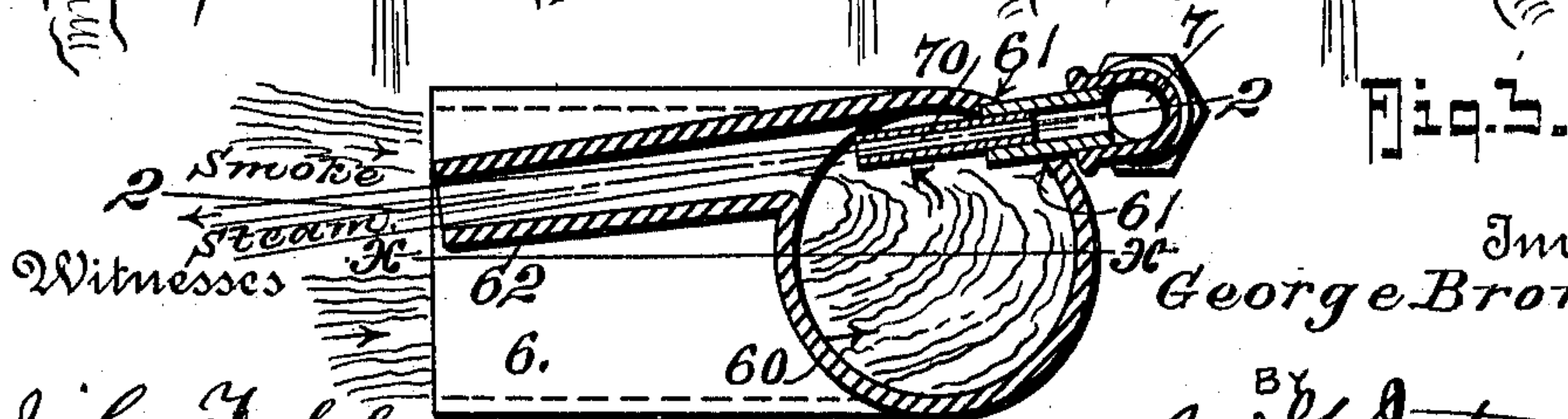
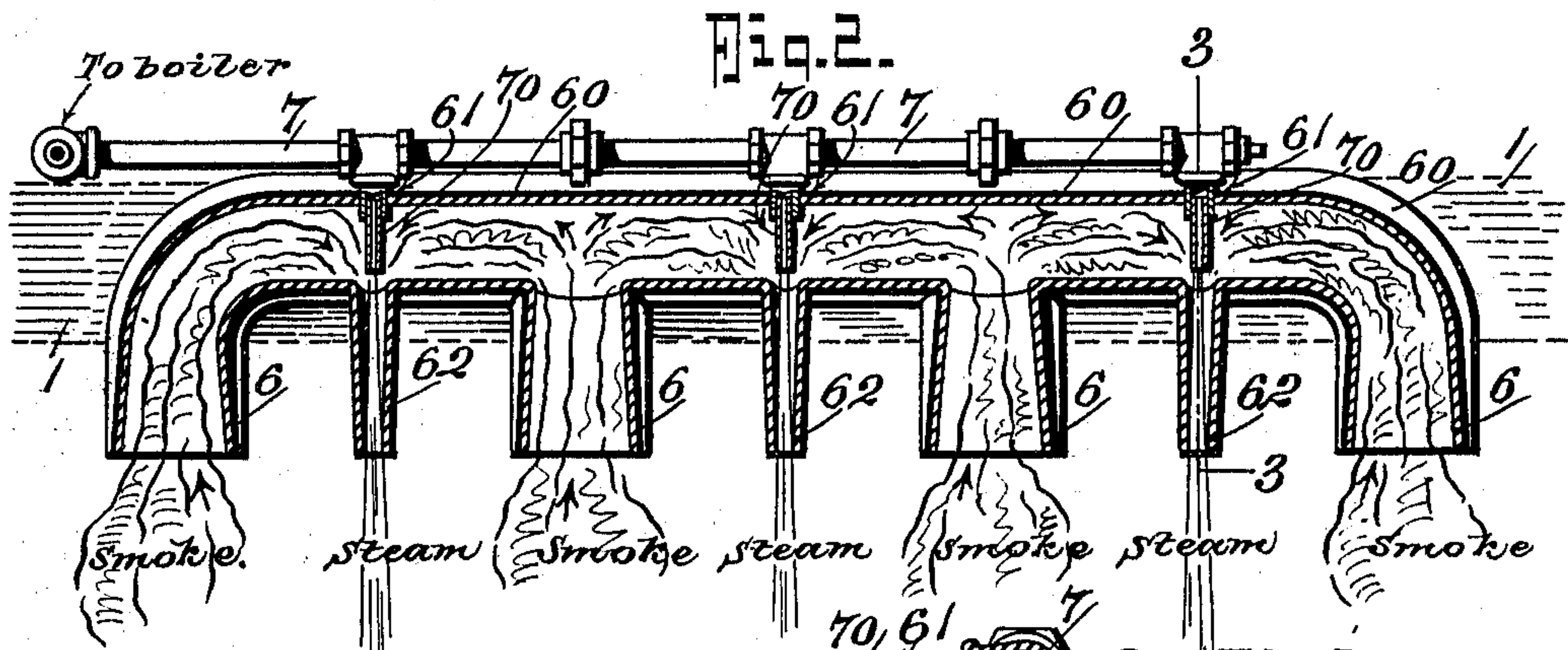
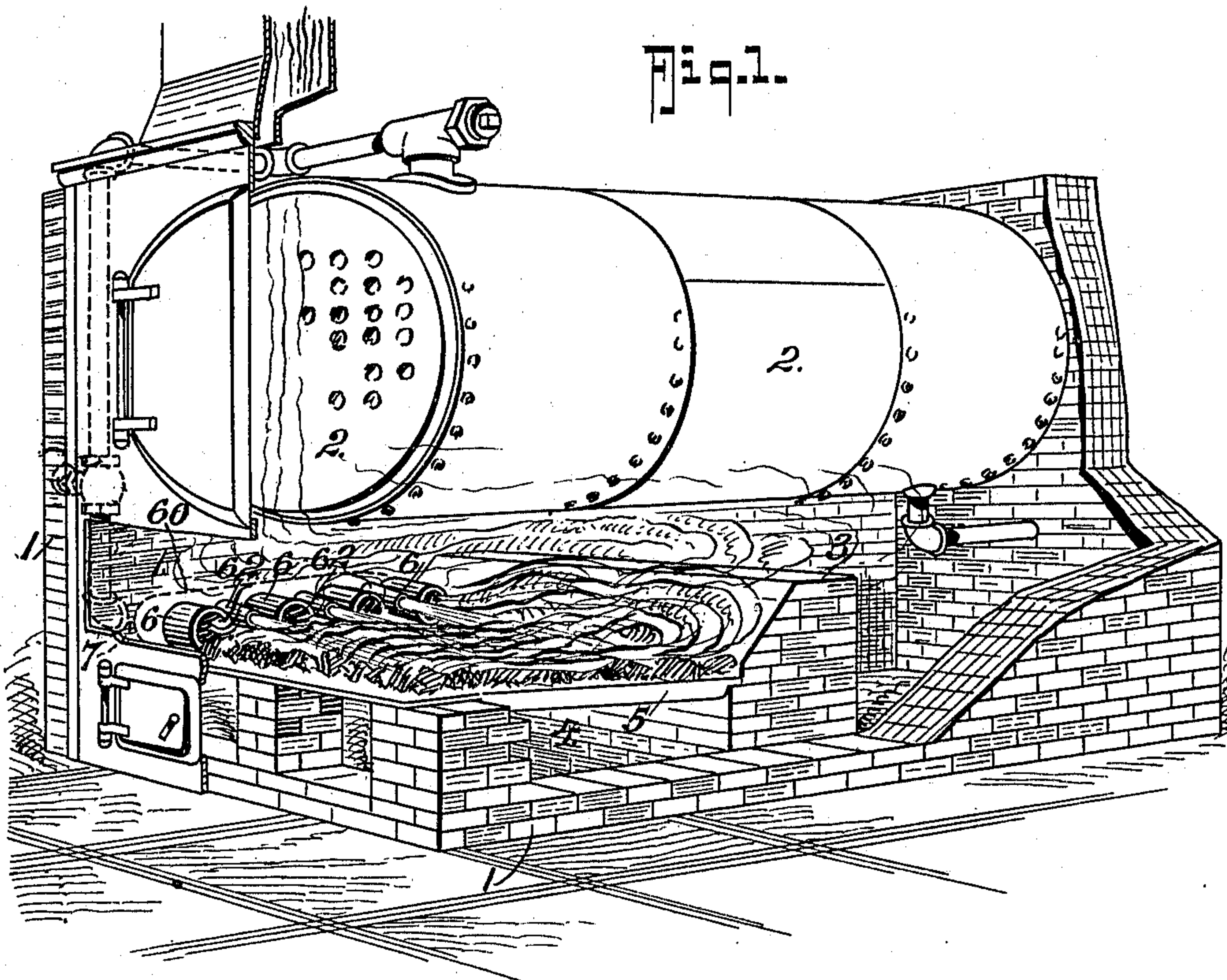


G. BROMM.
SMOKE CONSUMER.
APPLICATION FILED DEC. 23, 1910.

993,148.

Patented May 23, 1911.



John E. Schrott
May E. Smith

Inventor
George Bromm.

BY
Fred L. Dutcher
Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE BROMM, OF SAGINAW, MICHIGAN, ASSIGNOR OF ONE-THIRD TO JOHN DENGLE
AND ONE-THIRD TO JOHN L. SCHWAB, BOTH OF SAGINAW, MICHIGAN.

SMOKE-CONSUMER.

993,148.

Specification of Letters Patent.

Patented May 23, 1911.

Application filed December 23, 1910. Serial No. 598,893.

To all whom it may concern:

Be it known that I, GEORGE BROMM, residing at Saginaw, E. S., in the county of Saginaw and State of Michigan, have invented a new and Improved Smoke-Consumer, of which the following is a specification.

My invention has for its object to provide an improved means for furnaces that controls the smoke, gases and other products of combustion in such manner that the said products are substantially consumed in the fire box or chamber so that danger of loss of fuel energy, and the passing of partly consumed smoke and gases from the stack or chimney is reduced to the minimum.

With other objects in view that will hereinafter appear, my invention comprises an improved arrangement of parts whereby a siphon like action on the smoke and gases is obtained, for continuously circulating the gases and smoke within the fire zone before they have an opportunity of passing into and out of the offtake flue.

My invention consists in the coöperative arrangement and combination of parts, all of which will be hereinafter explained, specifically pointed out in the appended claims and illustrated in the accompanying drawing, in which:

Figure 1, is a perspective view of so much of a furnace necessary to illustrate the practical application of my invention. Fig. 2, is a horizontal section of my smoke consuming device, on the line 2—2 on Fig. 3. Fig. 3, is a transverse section thereof on the line 3—3 of Fig. 2 and on a slightly enlarged scale.

In the drawing, 1 designates the furnace casing, 2 the boiler, 3 the bridge or fire wall, 4 the ash pit and 5 the grate, all of which may be of any well-known or preferred structure, since these, *per se*, form no part of my invention.

My invention resides particularly in the attachment for boilers best shown in Figs. 2 and 3 and which consists of a series of smoke nozzles 6 that project through and are built within the side wall of the casing 1, as best shown in Fig. 2, and all of the nozzles 6 are located in line with the fire, and in plane with and just above the fire grate 5, the several nozzles being of uniform diameter throughout their length. All of the nozzles 6 extend through the side or casing wall and are joined by a main flue 60 built

into the side wall of the casing 1. The several nozzles 6 may be independent of and connected to the main flue 60 but on the score of strength and economy of manufacture I make the nozzles 6 and the main flue a single casting. Coöperatively connected with the flue 60 is a steam injector or blowing device consisting of a feed pipe 7 located back of the flue parallel therewith and at the upper edge thereof, see Fig. 3, for reasons presently explained.

The pipe 7 has a number of jet nozzles 70 coupled therewith that extend through openings 61 in the upper back edge of the flue 60 and nearly across the said flue and in line with blowing nozzles 62 that project inwardly from the main flue 60 and through the side wall of the casing 1, one of the said nozzles 62 being provided between each pair of the smoke nozzles. The nozzles 62 may be attached to the flue 60 but are preferably cast integral therewith, as is clearly shown.

By referring now more particularly to Fig. 3, it will be noticed the steam or blowing nozzles 62 project from the flue 60 at a tangent and they incline downwardly with respect to the grate surface while the smoke flue nozzles are parallel with the said grate surface.

By reason of the peculiar construction and arrangement of parts shown and described, it will be readily understood, by those skilled in the art to which this invention relates, that a siphon action is created when the device is in practical use. The steam is discharged into the fire at a point above the central horizontal axis x (see Fig. 3) of the smoke nozzles 6, and by projecting the steam nozzles through the flue but not entirely across the same, a suction or siphon action is created, as indicated by the arrows. The smoke and gases from the fire pot, as they mix with the steam, are drawn into the sucker nozzles 6 and whirled into the flue 60, and by the blowing action of the steam jets the said smoke and gases are ejected through the nozzles 62, and as they are now saturated they drop back into the fire to be again consumed. It is obvious that so long as the steam jets are applied, the consuming process continues, thereby making it possible to practically consume all of the products of combustion, and at the same time acting as a heat producer, since gases generated by the combustion of the fuel, when brought into

the presence of steam and injected into the fire box at the proper point will ignite, forming flaming jets and thus greatly intensify the heat in the fire box as well as
 5 completely consume imperfectly burned substances that leave the fire box and pass into the flues 6.

What I claim is:

1. The combination with the furnace, of a
 10 smoke consuming attachment comprising a main flue having a series of smoke flues projecting through the side wall of the furnace, said flues being projected at right angles from the main flue, a series of supplemental
 15 nozzles that project from the upper edge of the flue and incline downwardly with respect to the smoke flues and blower devices that enter the main flue and eject into the supplemental nozzles thereof.

2. In a furnace, the combination with the fire box and the bridge wall; of a flue comprising a pipe, the ends of which terminate in laterally projecting smoke flues, ejector
 nozzles laterally projected from the flue intermediate the smoke flues, said ejector
 25 nozzles being projected from the upper edge of the main flue and inclined downwardly with respect to the smoke flues, a steam supply pipe mounted parallel with the main flue and in the plane of the upper edge of the
 30 said flue, said pipe having a series of nozzles that project into the main flue and in line with the ejector nozzles.

GEORGE BROMM.

Witnesses:

JOHN F. O'KEEFE,
 CLARA E. BOTCKE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
