

G. J. SLALINE.  
SMOKE CONSUMING FURNACE.  
APPLICATION FILED APR. 27, 1908.

930,423.

Patented Aug. 10, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

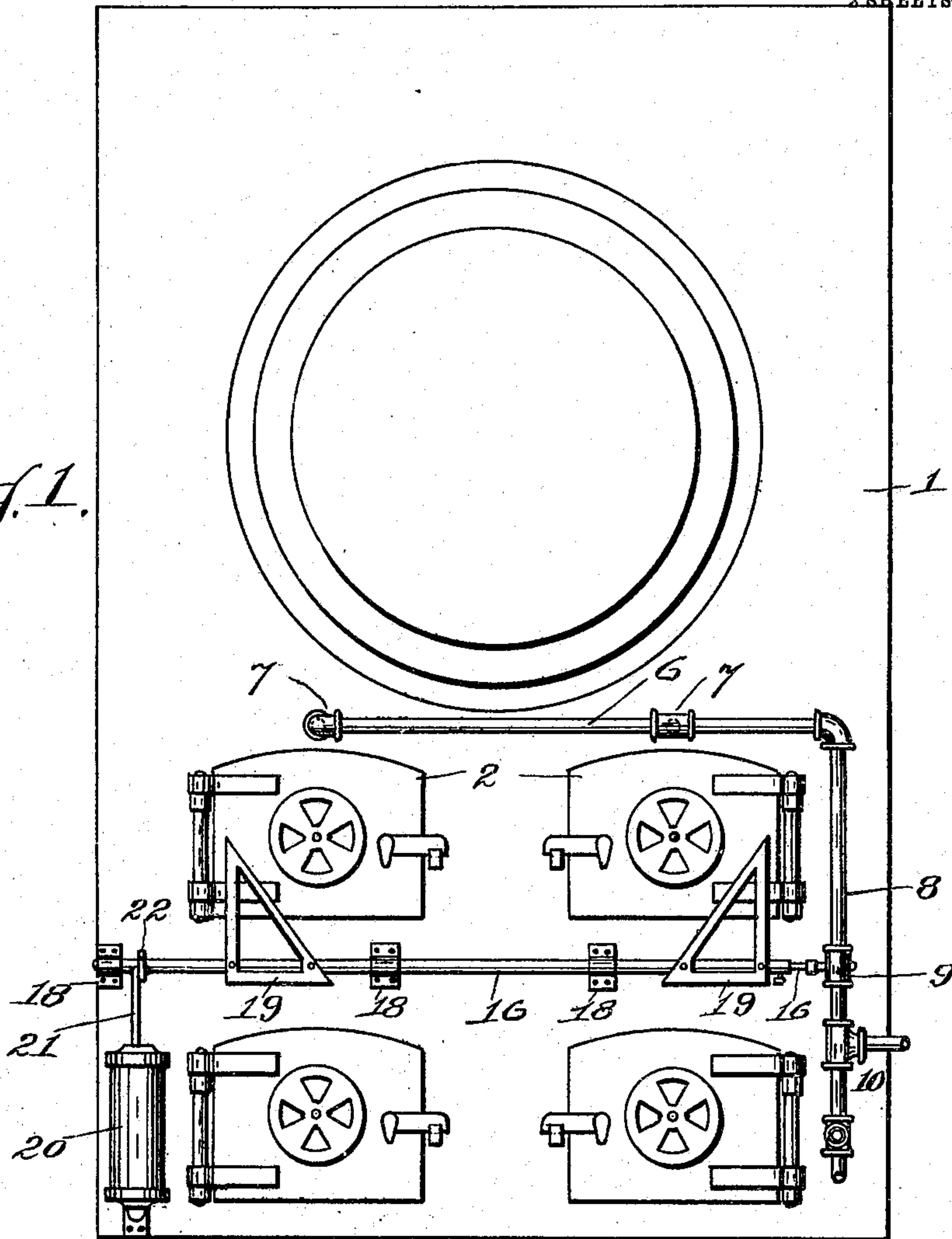
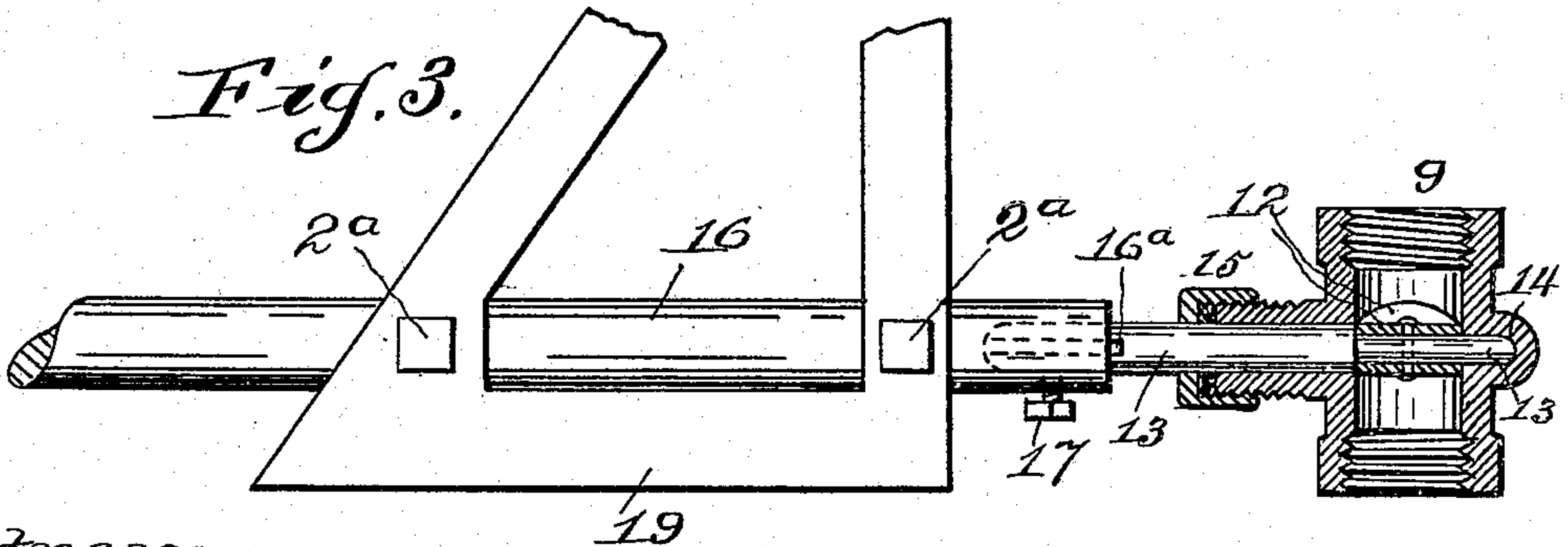


Fig. 3.



Witnesses:

Wm. E. Volk Jr.  
V. H. Whitman

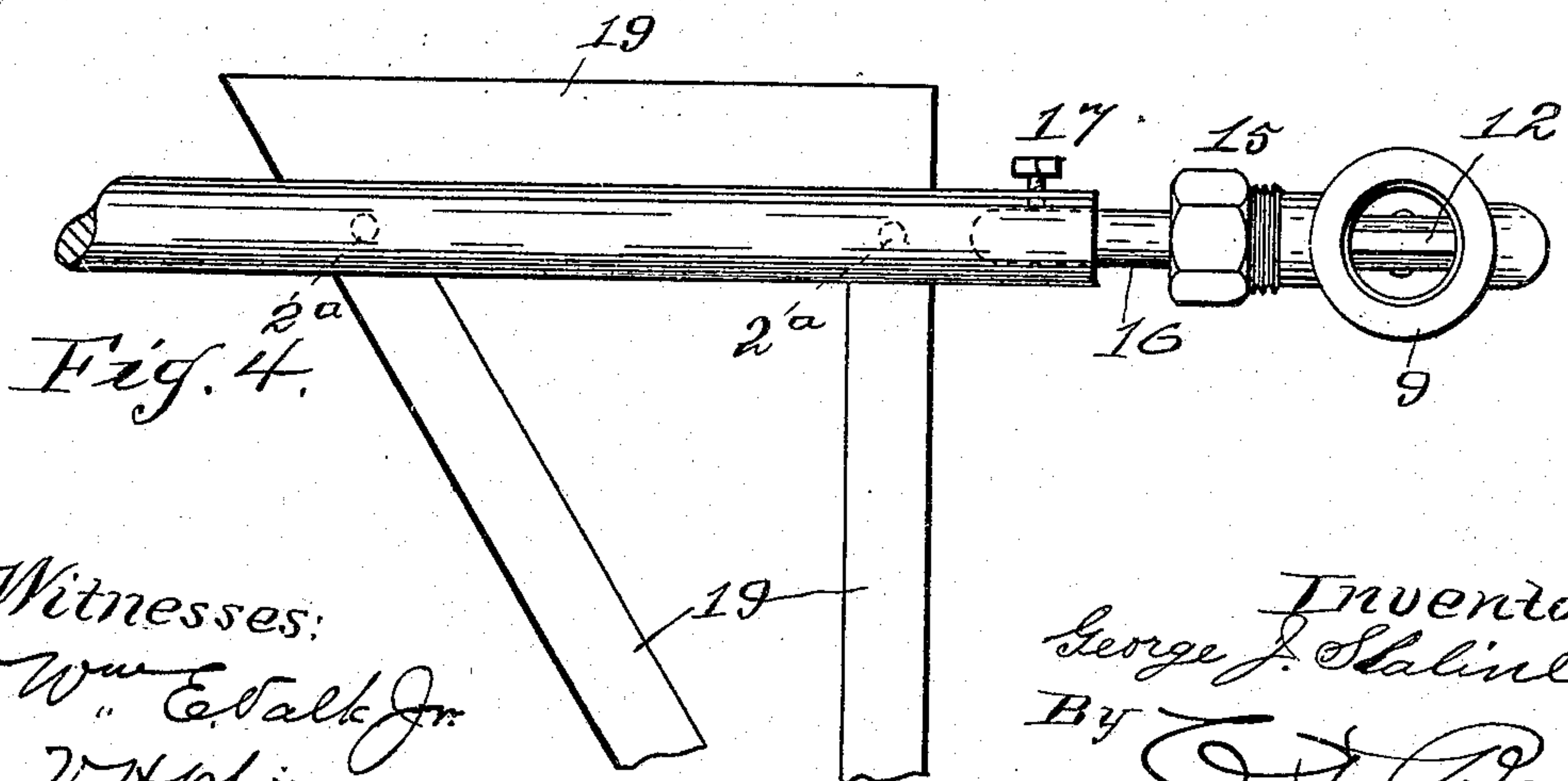
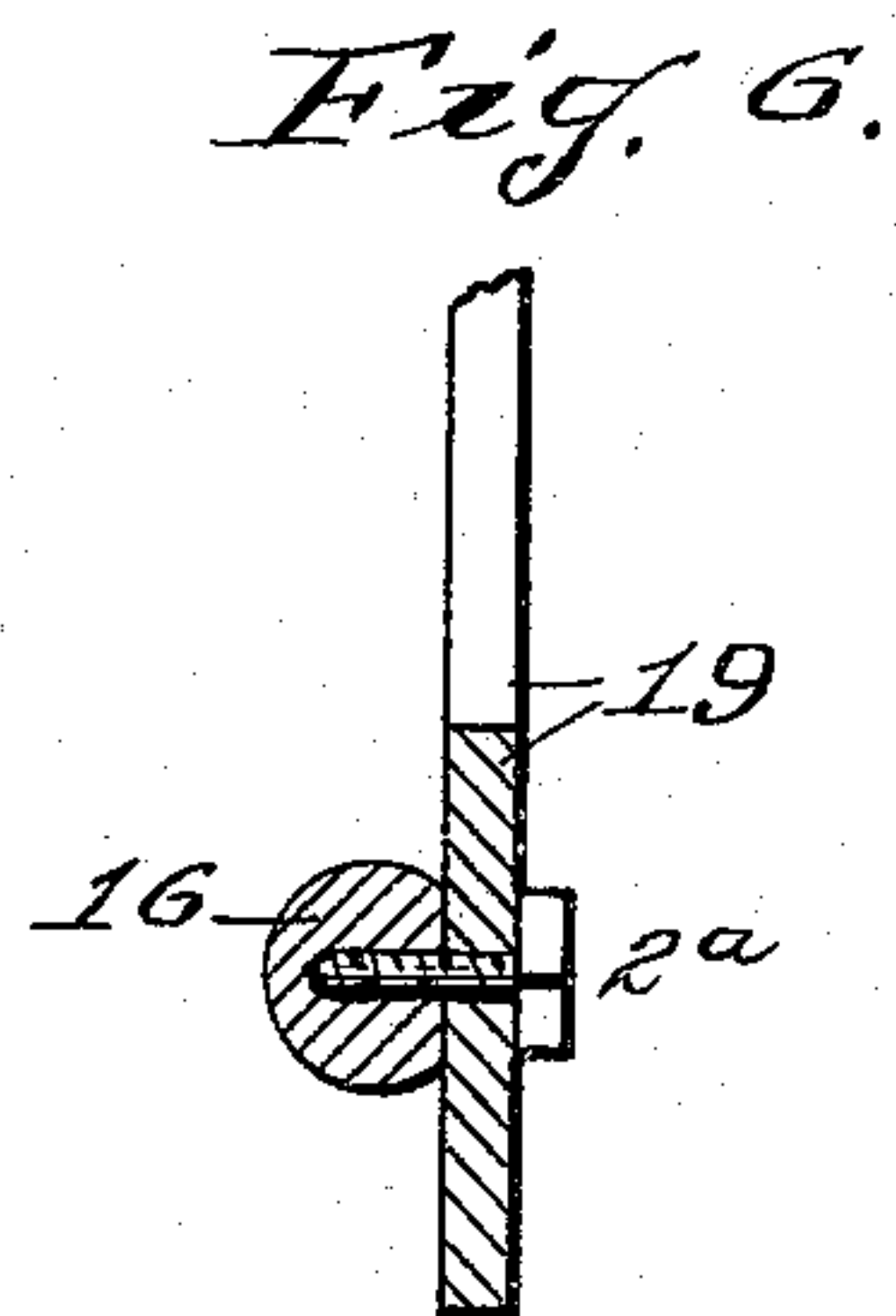
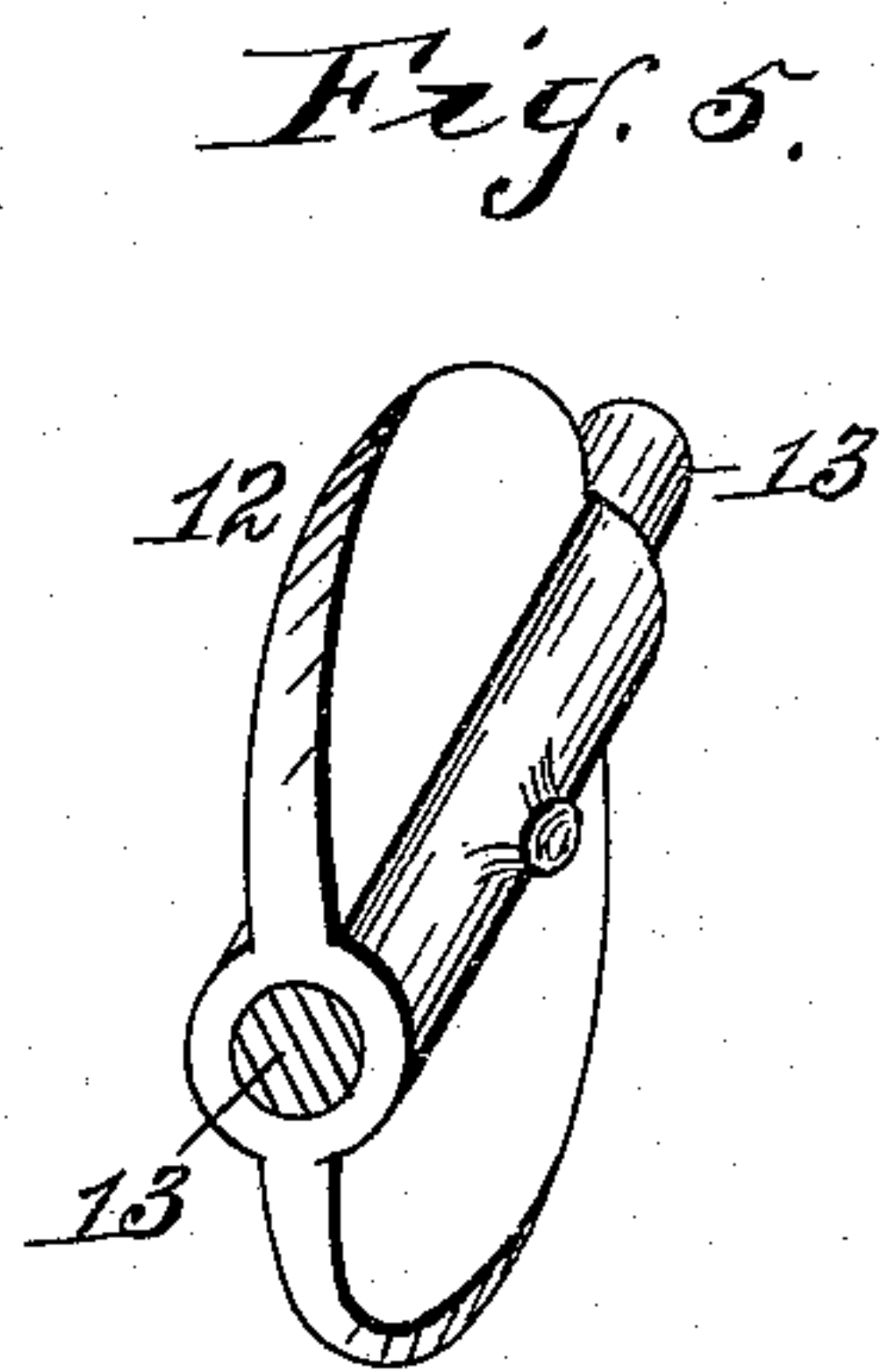
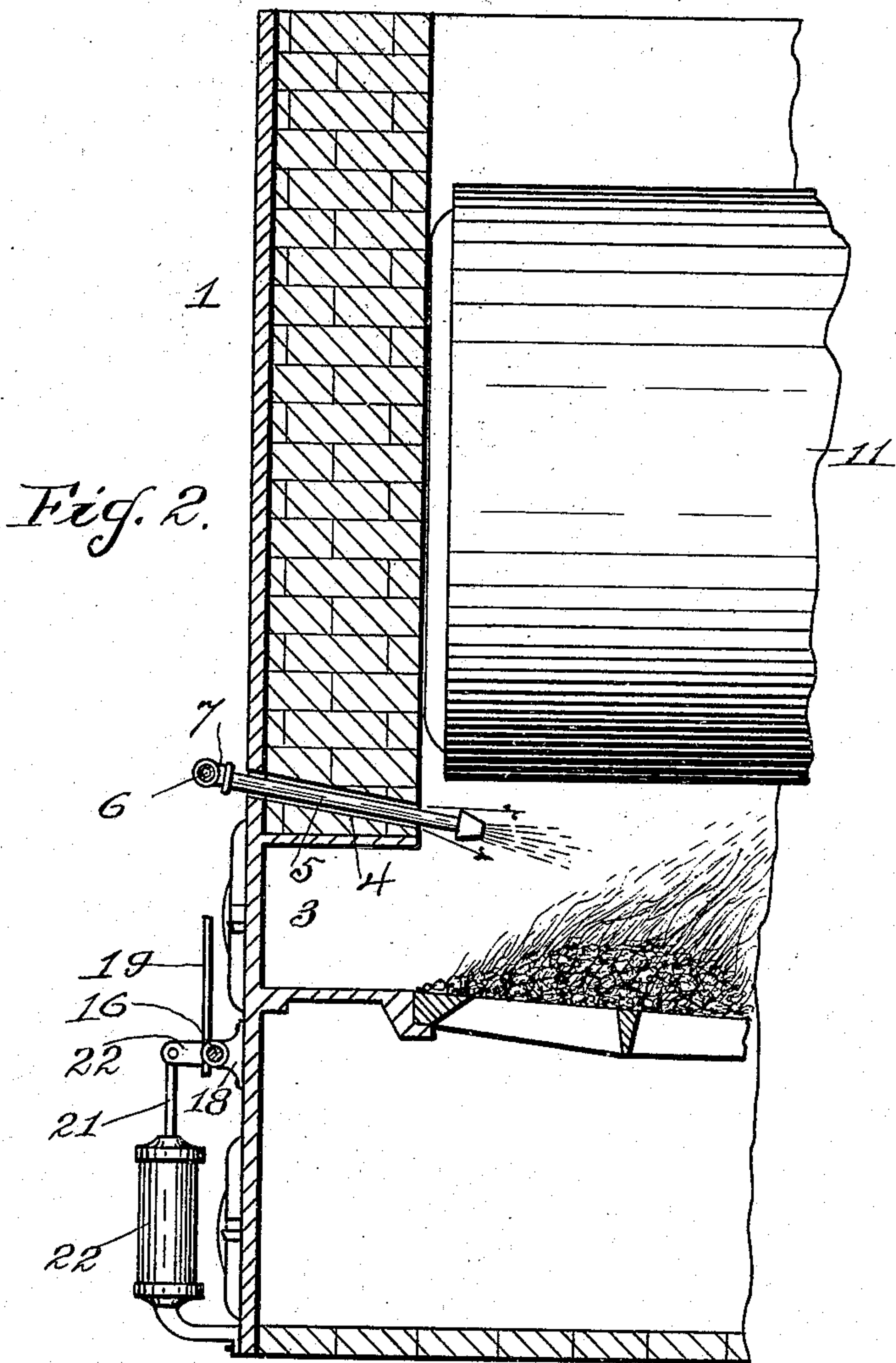
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

GEORGE J. SLALINE, OF CINCINNATI, OHIO.

## SMOKE-CONSUMING FURNACE.

No. 930,423.

Specification of Letters Patent.

Patented Aug. 10, 1909.

Application filed April 27, 1908. Serial No. 429,526.

To all whom it may concern:

Be it known that I, GEORGE J. SLALINE, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Smoke-Consuming Furnaces, of which the following is a specification.

This invention relates to smokeless combustion furnaces, and pertains especially to improvements in smoke consuming furnaces.

The object of the invention is to provide novel and peculiar means for introducing jets of steam and air combined into the fire box and over the fuel simultaneously with the opening of the furnace door for stoking whereby a more complete oxidation of the fuel and the prevention of smoke is attained.

A further object of the invention is to provide novel and peculiar means connected with a steam valve and operated by opening the furnace door or doors for injecting steam to the fire box simultaneously with the opening of such doors, such means adapted to automatically close the door and simultaneously cut off such injection.

Other special objects, advantages and improved results are attainable through and by the construction and arrangement of the several parts, as will be hereinafter fully disclosed.

In the accompanying drawings forming part of this application: Figure 1 is a front view of a portion of a furnace showing the application of the invention. Fig. 2 is a sectional view partly broken away. Fig. 3 is a detail sectional view of the steam valve in closed position, and its coupling, showing the valve-stem and one of the door operated brackets (partly broken away) and the bracket-shaft in elevation. Fig. 4 is a detail top view of the parts shown in Fig. 3, showing the position of the part when the valve is open. Fig. 5 is a detail perspective view of the valve and part of its stem. Fig. 6 is a sectional view showing manner of connecting the brackets with the valve-rod.

The same reference numerals denote the same parts throughout the several views of the drawings.

The furnace 1, is provided with the usual hinged and latch-doors 2, and suitable fuel chambers 3. Air is admitted into the fuel-chambers by an inclined air-duct 4 having a steam induction pipe 5 located therein and

discharging into the said chambers over the fuel through a spray-tip on the end of the pipe 5. There is a pipe 5 for each of the two or more fuel chambers as may be in the furnace, the said pipes are connected to a pipe 6 on the outside of the furnace by couplings 7. The pipe 6 extends across the front of the furnace above the doors 2 and is connected to a vertical steam pipe 8, on the outside of the furnace. The pipe 8 is supplied with steam through a valve coupling 9, hereinafter particularly described, by a pipe 10, from the boiler 11, of the furnace.

The coupling 9 contains a valve 12 secured to a valve stem 13, working in a cavity 14 of the coupling 9, and through a packing gland 15 of the coupling 9. The valve 12 is slightly larger than the diameter of the coupling 9, so as to make its seat in said coupling to close communication between the pipes 8 and 10. A shaft or rod 16 is adjustably connected at one end to the valve stem 13, preferably by a key 16<sup>a</sup> and a set-screw 17, and said shaft is journaled in hangers 18 on the front of the furnace below the doors 2; to this shaft 16 is secured by suitable bolts 2<sup>a</sup> a pair of triangular brackets 19 one in front of each door 2 of the furnace. The brackets 19 are so fixed to the shaft 16 as to permit the doors 2 to strike the inclined arm of the brackets as the doors are opened and thereby turn the shaft 16 to open the valve 9 simultaneously with the opening of the doors, so that steam may be admitted to the fuel chamber only while the doors are open.

The device for closing the doors and the valve automatically consists of a compressed air cylinder 20, attached to the front of the furnace and having a piston and piston-rod 21 connected to the end of the shaft 16 opposite the valve-stem by a link 22, fixed to the shaft and pivoted to said rod.

It will be observed that the pipes 5 project through the air ducts into the fuel chamber and over the fuel at a downward angle or incline from the front of the furnace and in direct line with the air currents admitted into such chambers through the doors, and that the pressure of steam through the spray tips will create a vacuum in the fuel chambers so as to draw air currents through the ducts and into the fuel chambers where the air and steam is mixed with the products of combustion, practically consuming the smoke of the furnace.



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

1. In a smokeless combustion furnace having fuel chambers and a suitable boiler, the combination with swinging doors for the fuel chambers, steam induction pipes leading downwardly from above the doors to the fuel chambers with an air induction passage around said pipes to the fuel chambers, spray tips in which said pipes terminate, a supply pipe from the boiler to said induction pipes, and a valve in the supply pipe, of a shaft adjustably coupled to the valve to turn the latter, brackets fixed to the shaft and having an inclined arm engaged by the doors in opening them for turning the brackets and the shaft, and means for reversing the movement of the shaft and the brackets to close the doors and the valve simultaneously comprising a compressed air cylinder having a suitable piston, a piston rod, and a link connecting said rod with the said shaft.
2. In a furnace, the combination with hinged furnace doors for opening and closing

the fuel chambers of the furnace, steam induction pipes extending downwardly from above the doors to the fuel chambers, air ducts around said pipes to the fuel chambers, and a valve for controlling steam induction through said pipes, of means connecting the doors with the valve for opening it simultaneously with the opening of the doors, comprising a shaft journaled under the doors and adjustably coupled to the valve, brackets fixed to the shaft in front of the doors and having an inclined arm engaged by the bottom of the doors in opening to turn the brackets downwardly thereby turning the shaft and opening the valve, and means for closing the doors and the said valve simultaneously comprising a compressed air cylinder having a piston, a piston rod, and a link connecting the piston rod with said shaft.

In witness whereof I hereunto set my hand in the presence of two witnesses.

GEORGE J. SLALINE.

Witnesses:

GEO. C. KUHN,

WM. H. SCHWEIKERT.