

No. 621,576.

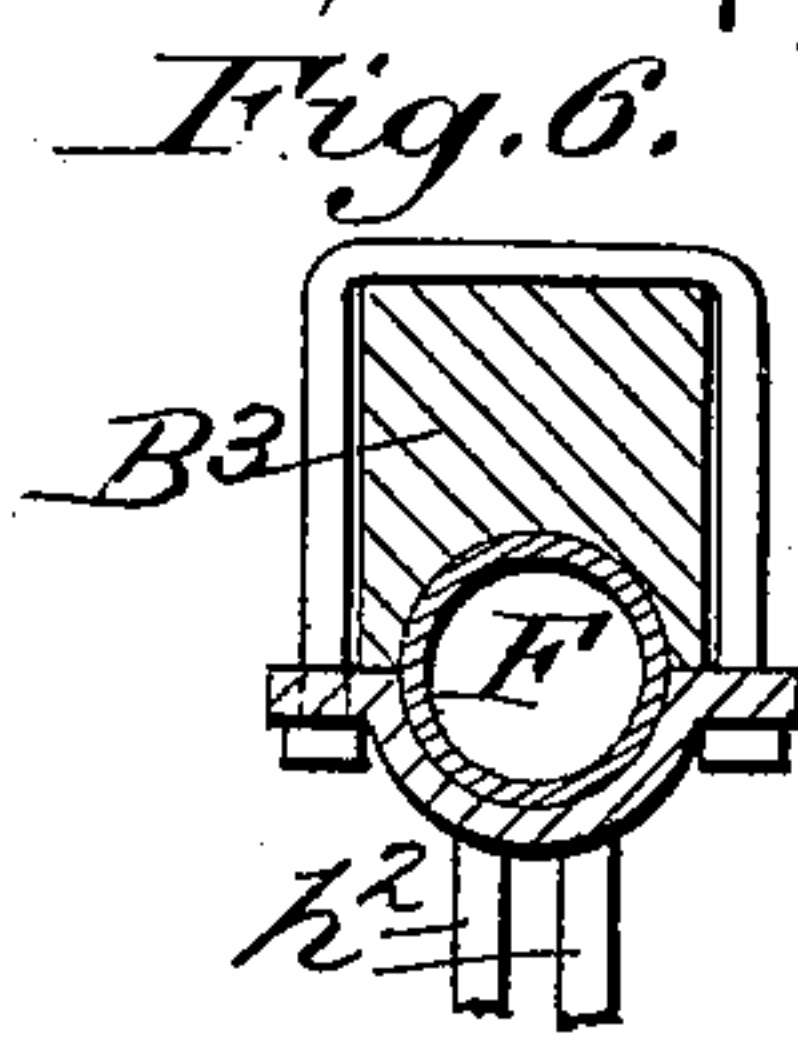
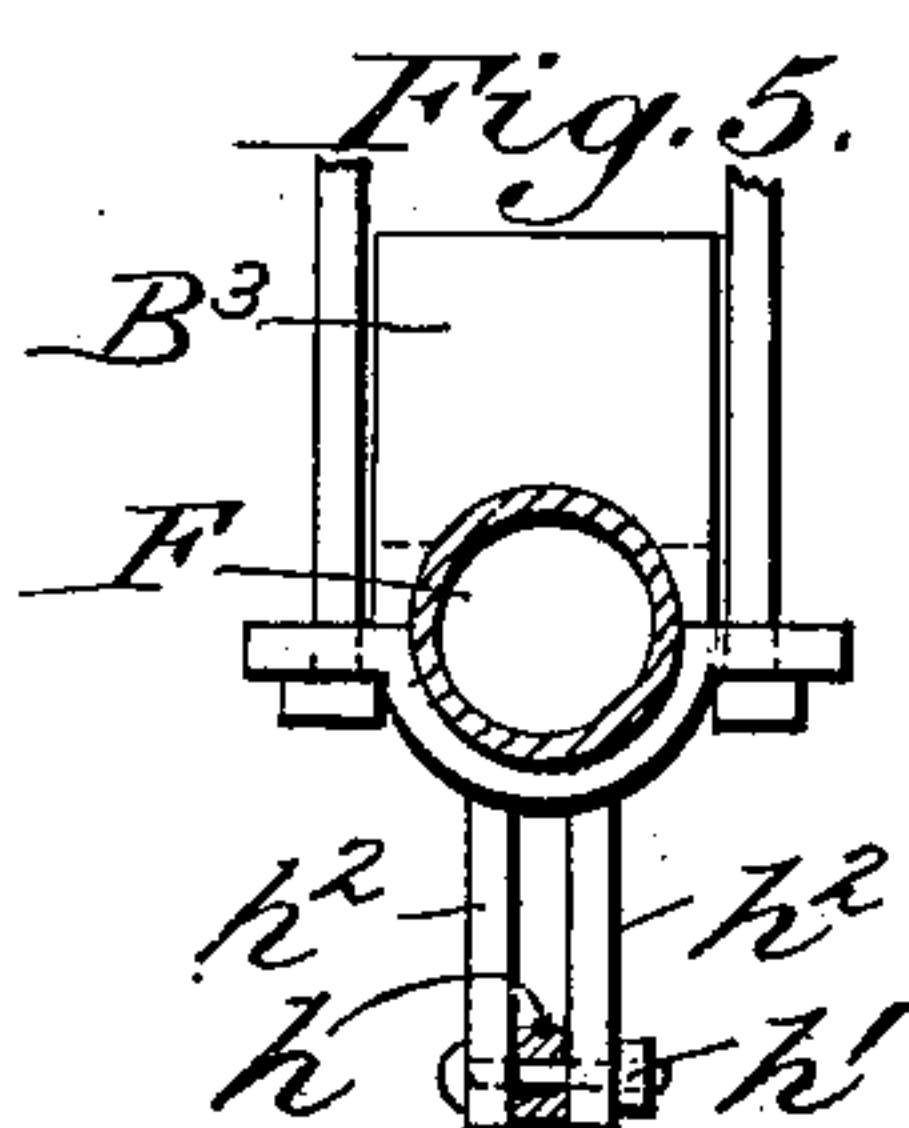
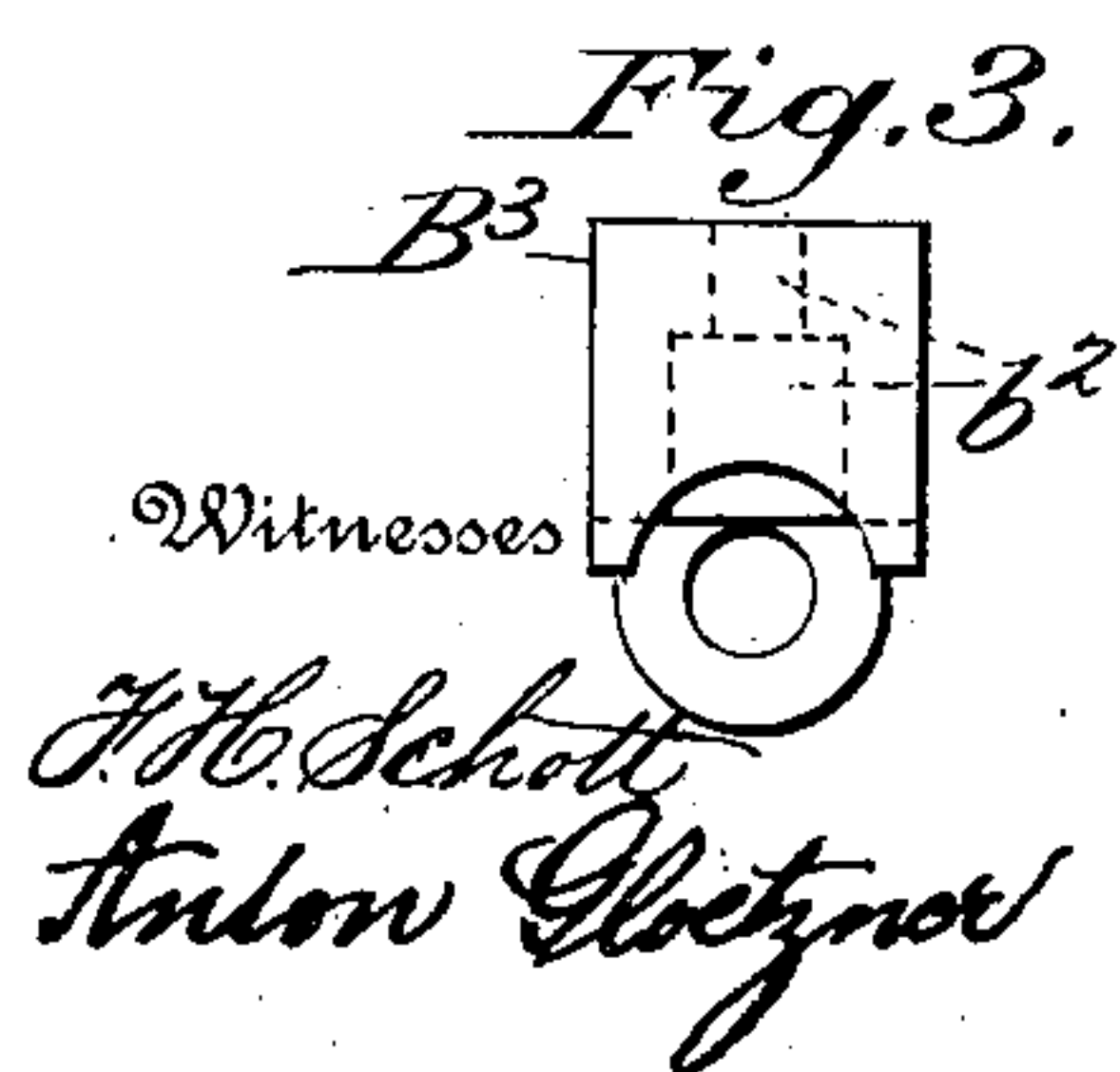
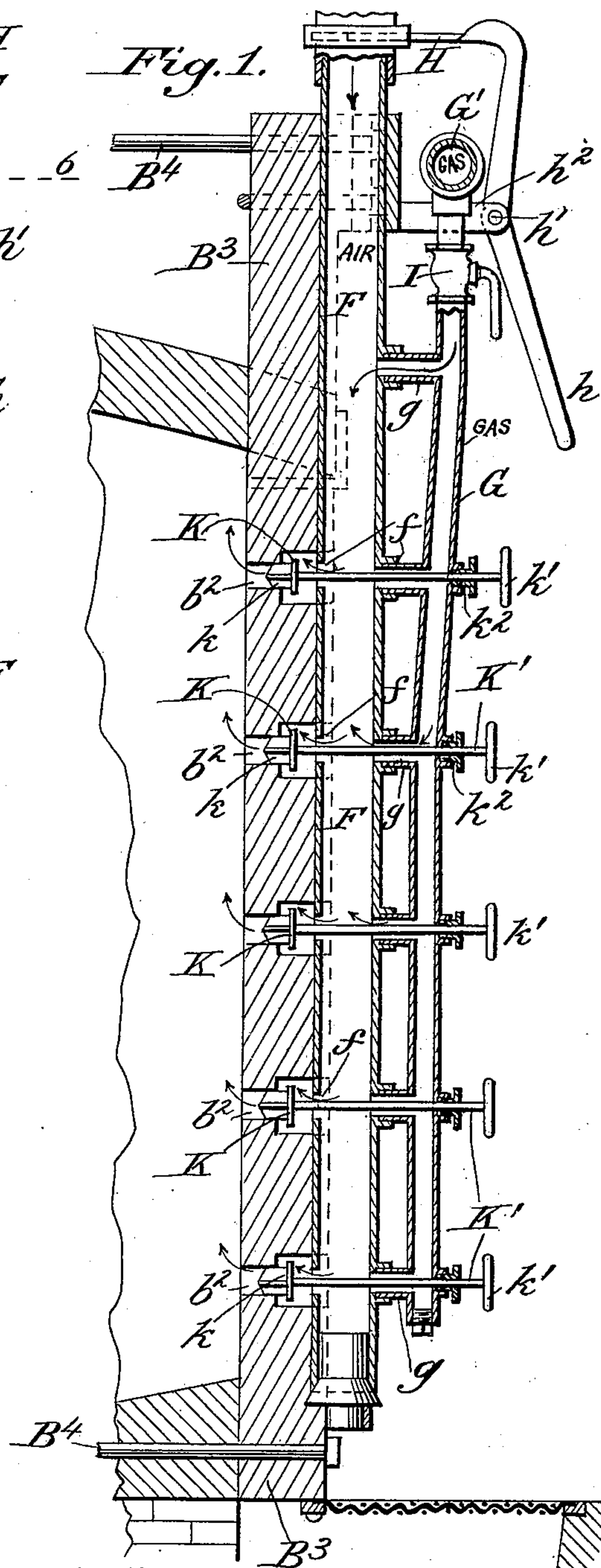
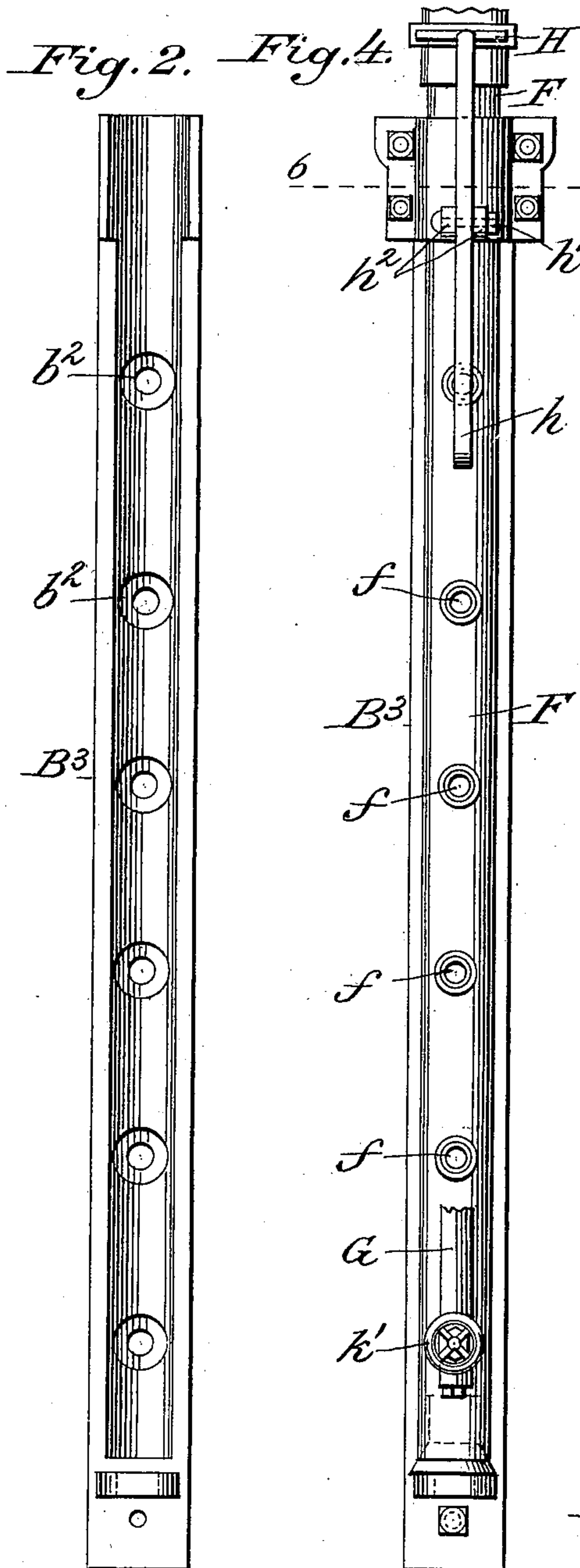
Patented Mar. 21, 1899.

W. & J. LANYON.
BUCK STAY.

(Application filed Sept. 28, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Inventors:
William Lanyon and
Josiah Lanyon
by Max Georgii
their Attorney

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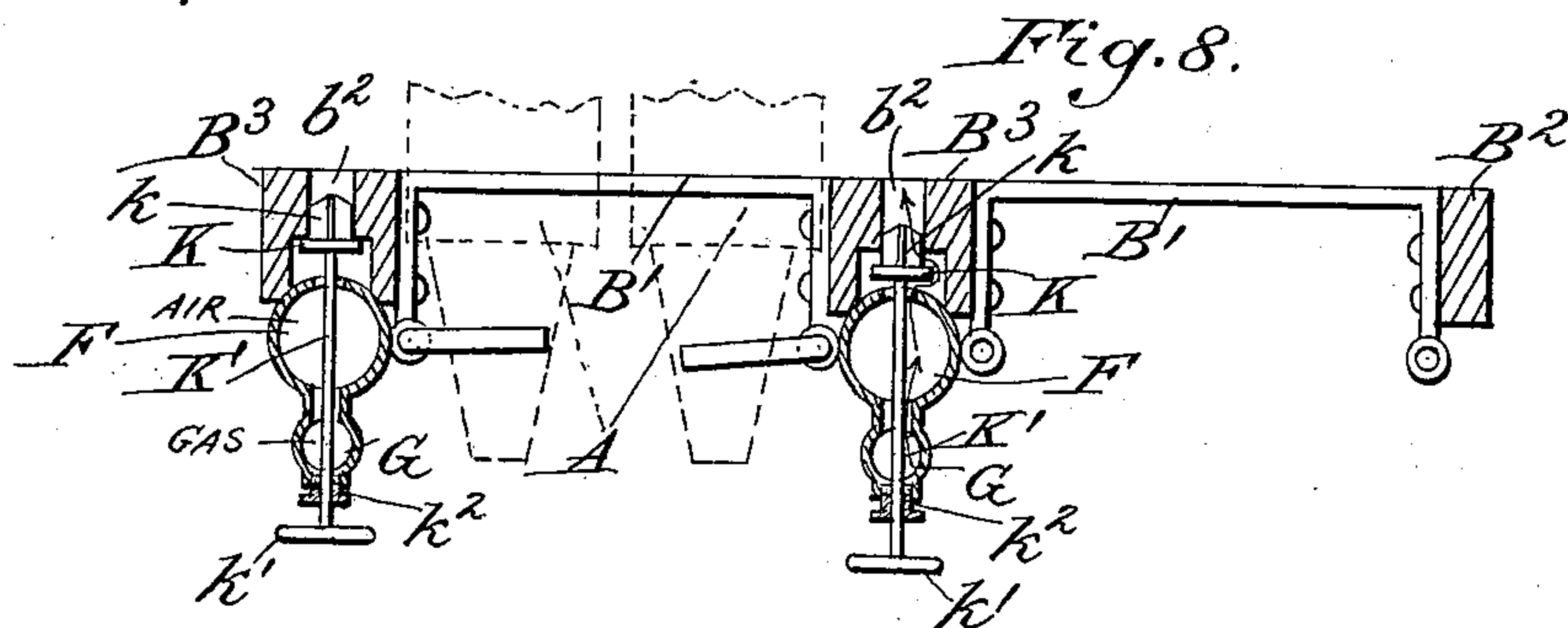
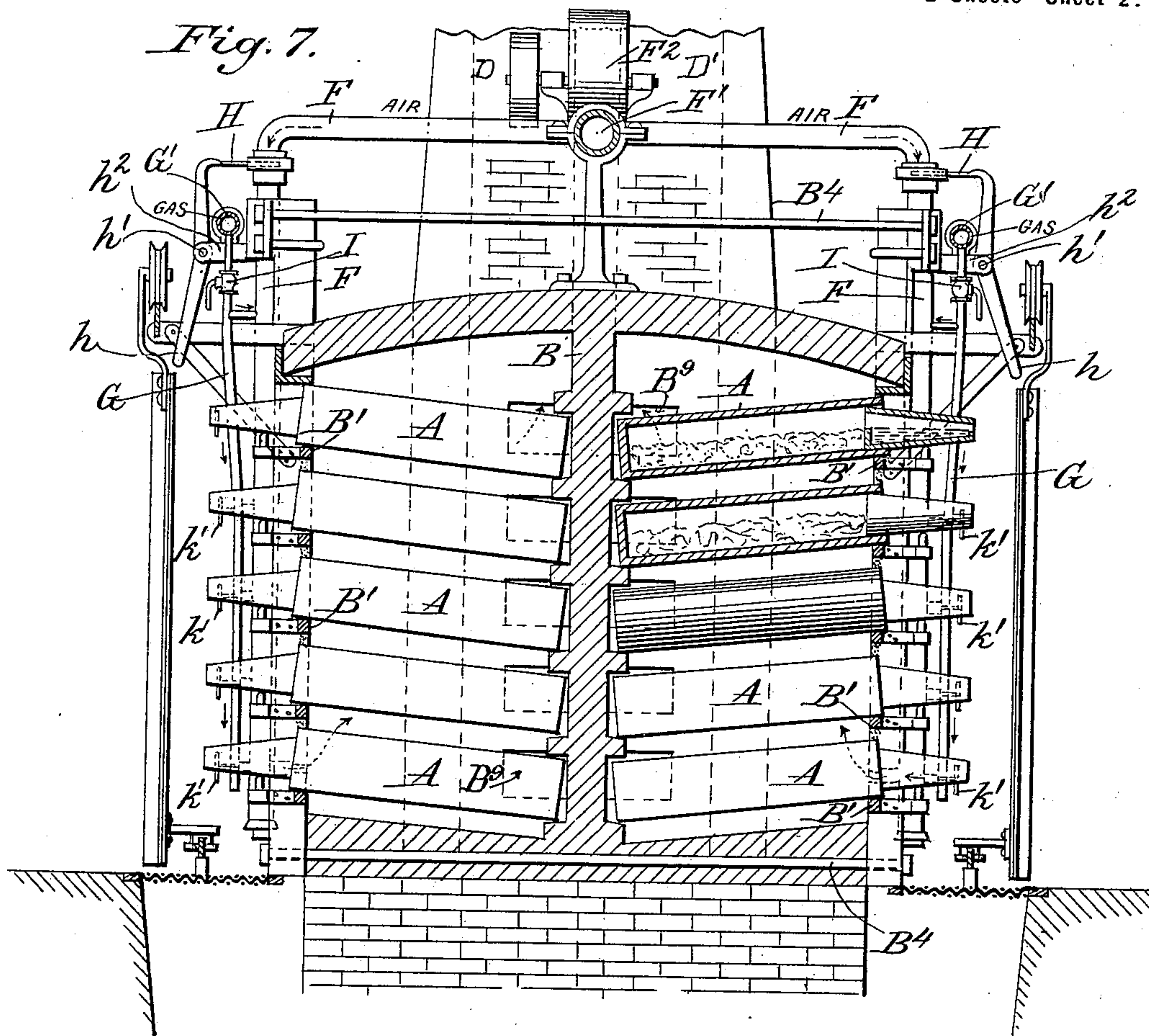
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2 Sheets—Sheet 2.



Witnesses

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UNITED STATES PATENT OFFICE.

— WILLIAM LANYON AND JOSIAH LANYON, OF PITTSBURG, KANSAS.

BUCKSTAY.

SPECIFICATION forming part of Letters Patent No. 621,576, dated March 21, 1899.

Original application filed May 25, 1898, Serial No. 681,718. Divided and this application filed September 28, 1898. Serial No. 692,128. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM LANYON and JOSIAH LANYON, citizens of the United States, residing at Pittsburg, in the county of Crawford and State of Kansas, have invented certain new and useful Improvements in Buckstays; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to buckstays for furnaces.

The object of our invention is to provide a buckstay especially arranged for use in connection with furnaces for smelting zinc in which gas is used as a fuel.

Our invention is especially useful in connection with a zinc-smelting plant, such as has been shown and described in our application, Serial No. 681,718, filed May 25, 1898, of which this application is a division.

The invention consists in the features, details of construction, and combination of parts, which will first be described in connection with the accompanying drawings and then particularly pointed out in the claims.

In the drawings, Figure 1 is a sectional view, partly in elevation, of a buckstay and its attached parts embodying our invention; Fig. 2, a front elevation of the buckstay alone; Fig. 3, a top end view of the same; Fig. 4, a front elevation of the buckstay with the air-pipe and the lower end of the gas-pipe in place, the damper-handle also being shown; Fig. 5, a top end view of the buckstay, showing the air-pipe and the damper-rod *h* in section; Fig. 6, a transverse section of the buckstay on the line 6-6, Fig. 4; Fig. 7, a transverse section of one form of furnace provided with a buckstay embodying our invention; Fig. 8, a horizontal section through three buckstays, the two at the left embodying our invention, while the one at the right is of the usual form. In this view the valves are shown in elevation and the gas and air pipes in section.

As our improved buckstay is particularly intended for use in connection with a smelting-furnace for metals such as zinc, we have

shown it in Fig. 7 in such connection, and will therefore describe it in such relation as one example of its application in order to give a clear understanding of the advantages obtained by its use.

Referring to the drawings, and in particular to Fig. 7, *A* are retorts constructed in the usual manner with closed rear ends and open front ends, these retorts being set in a furnace in such a manner as to slope rearward, being in the present instance supported at the rear by a central wall *B* and at the front by bearing-bars *B'*, each of which has its ends turned outward and riveted to buckstays *B²*, Figs. 8 and 9, which extend vertically at intervals along the sides of the furnace and are tied together in the usual manner by tie-rods *B⁴* at the top and bottom of the furnace. Certain of the buckstays—in the present instance the buckstays *B³*—are provided with transverse openings or holes *b²*, Figs. 1 and 2, through which may be supplied air or air and gas to the interior of the furnace. Suitable means for supplying either air, gas, or air and gas to the furnace through these openings is provided, the means for supplying air consisting in the present instance of vertical air-pipes *F*, one for each perforated buckstay *B³*, which air-pipes are each supplied with openings *f* opposite the corresponding openings in the buckstay. The air-pipes *F* are connected to a main air-pipe—as, for instance, the pipe *F'*, Fig. 7—located upon the top of the furnace and supplied with air from a suitable source, as a blast-fan *F²*.

The means for supplying gas to the furnace consists in the present instance of a series of vertical gas-pipes *G*, leading from a gas-main *G'*, located, preferably, above the furnace and supplied with gas from a suitable source. (Not shown.) Each gas-pipe *G* is connected, preferably by suitable nipples *g*, Fig. 1, to the respective air-pipe *F* at a point opposite the openings *b²* in the respective buckstays *B³*.

In order to control the supply of air to the furnace, suitable valves are provided, preferably in the form of dampers *H*, Fig. 1, located in the upper ends of the air-pipes *F* and controlled by hand-levers *h*, fulcrumed at *h'* on brackets *h²*, secured to the buckstays.

The supply of gas to the furnace also is controlled by suitable valves, as shown at I, these valves being preferably located in the gas-pipes G near their upper ends.

5 Means for controlling the passage of air, gas, or air and gas through the openings b^2 in the buckstays B^3 is provided, this means consisting of valve devices preferably constructed as follows: The outer ends of the openings
10 b^2 in the buckstays B^3 are enlarged to receive a valve K, having wings k , which project into the respective openings, whereby the valves are guided in their movements. To each valve is attached a stem or rod K' , passing
15 outward through the corresponding air-pipe F and gas-pipe G and provided with a suitable handle k' at the other end. The valve-stems may, if desired, be packed at the point where they pass through the gas-pipes by means of
20 an ordinary packing-gland k^2 , as shown in Fig. 1; but this is not a necessity and may be omitted.

The operation of our invention is as follows: The gas is allowed to escape into the
25 furnace by first opening the valves I, one after the other, and then the valves K, the gas being lighted at the moment it enters the furnace through the openings b^2 in the buckstays B^3 . Some lighted shavings, paper, or other
30 combustible material being thrown into the furnace, the gas is turned on and becomes ignited, whereupon the fan F^2 is started in operation, after which a supply of air may be furnished to the gas-supply by moving the
35 damper-levers h to open the damper-valves H, thus allowing the air-blast to pass down the pipes F, Fig. 7, where it unites with the gas entering the pipes F through the nipples g from the gas-pipes G. By suitably adjusting
40 the damper-valves H and the gas-valves I the desired mixture of air and gas is obtained in the pipes F, and this then can be admitted at any desired rate to the interior of the furnace by appropriately adjusting the valves
45 K by pulling out or pushing in the valve rods or stems K' through the medium of the handles k' . The products of combustion escape through the openings B^3 into the stacks D D'.

Having thus fully described our invention,
50 what we claim as new, and desire to secure by Letters Patent, is—

1. In a smelting-furnace, the combination, with a buckstay having a perforation extending transversely entirely through it, of
55 an air-supply pipe in close contact with the buckstay and provided with an opening communicating with the perforation in the buckstay, and a valve arranged to close the said perforation.

60 2. In a smelting-furnace, the combination, with a buckstay having a perforation ex-

tending transversely entirely through it, of an air-supply pipe in close contact with the buckstay and provided with an opening communicating with the perforation in the buck- 65 stay, and a valve within the perforation in the buckstay and arranged to close the same.

3. In a smelting-furnace, the combination, with a buckstay having a perforation enlarged at one portion to form a valve-seat, and
70 an air-supply pipe in close contact with the buckstay and provided with an opening communicating with the perforation in the buckstay, of a valve located in the enlarged portion of the said perforation and arranged to
75 close against the valve-seat.

4. In a smelting-furnace, the combination, with a buckstay having a perforation and a pipe outside the buckstay and arranged to
80 discharge into the perforation, of a second pipe outside the first-mentioned pipe and discharging into the latter, valves for controlling each pipe, and a valve in the perforation.

5. In a smelting-furnace, the combination, with a buckstay having a perforation enlarged at one portion, and a pipe outside said
85 buckstay and arranged to discharge into said perforation, of a second pipe outside the first-mentioned pipe and arranged to discharge into the latter, and a valve in the enlarged
90 portion of the perforation.

6. In a smelting-furnace, the combination, with a buckstay having a perforation, and a pipe outside said buckstay and arranged to
95 discharge into the perforation, of a second pipe outside the first-mentioned pipe and discharging into the latter opposite the perforation, a valve in the perforation, and a valve-stem connected to said valve and extending
100 through both pipes.

7. In a smelting-furnace, the combination, with a buckstay having a perforation, an air-supply pipe and a gas-supply pipe, the interior of each of said supply-pipes communi-
105 cating with the said perforation, of a valve in each supply-pipe for controlling it, and a valve arranged to close said perforation.

8. In a smelting-furnace, the combination, with a buckstay having a perforation, an air-
110 supply pipe and a gas-supply pipe, the interior of each of said supply-pipes communicating with the said perforation, of a valve in each supply-pipe for controlling it, and a valve within the perforation and arranged to close it.

In testimony whereof we affix our signa- 115 tures in presence of two witnesses.

WILLIAM LANYON.
JOSIAH LANYON.

Witnesses:
O. T. BROWN,
A. O. MELLETT.