

No. 616,475.

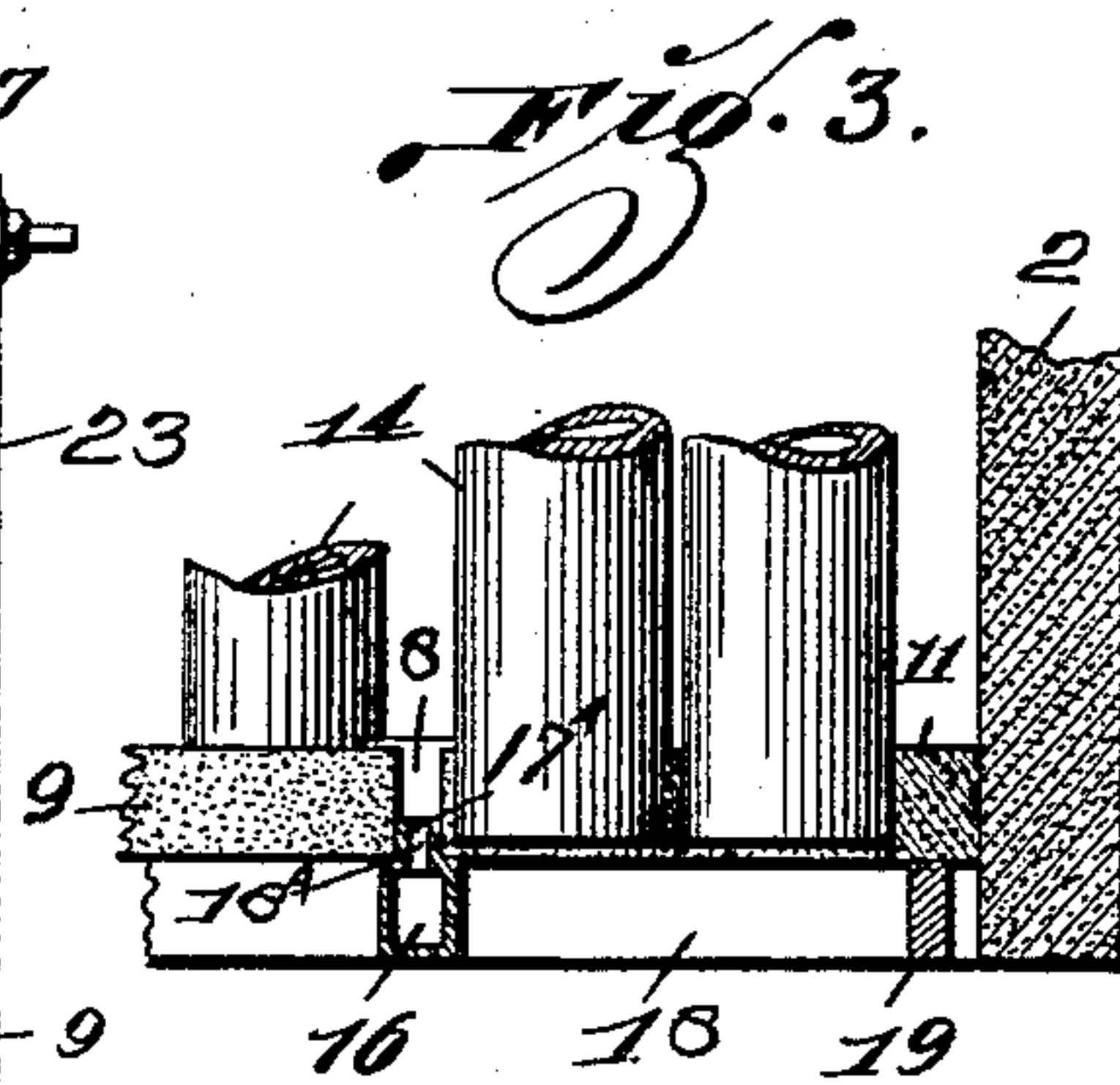
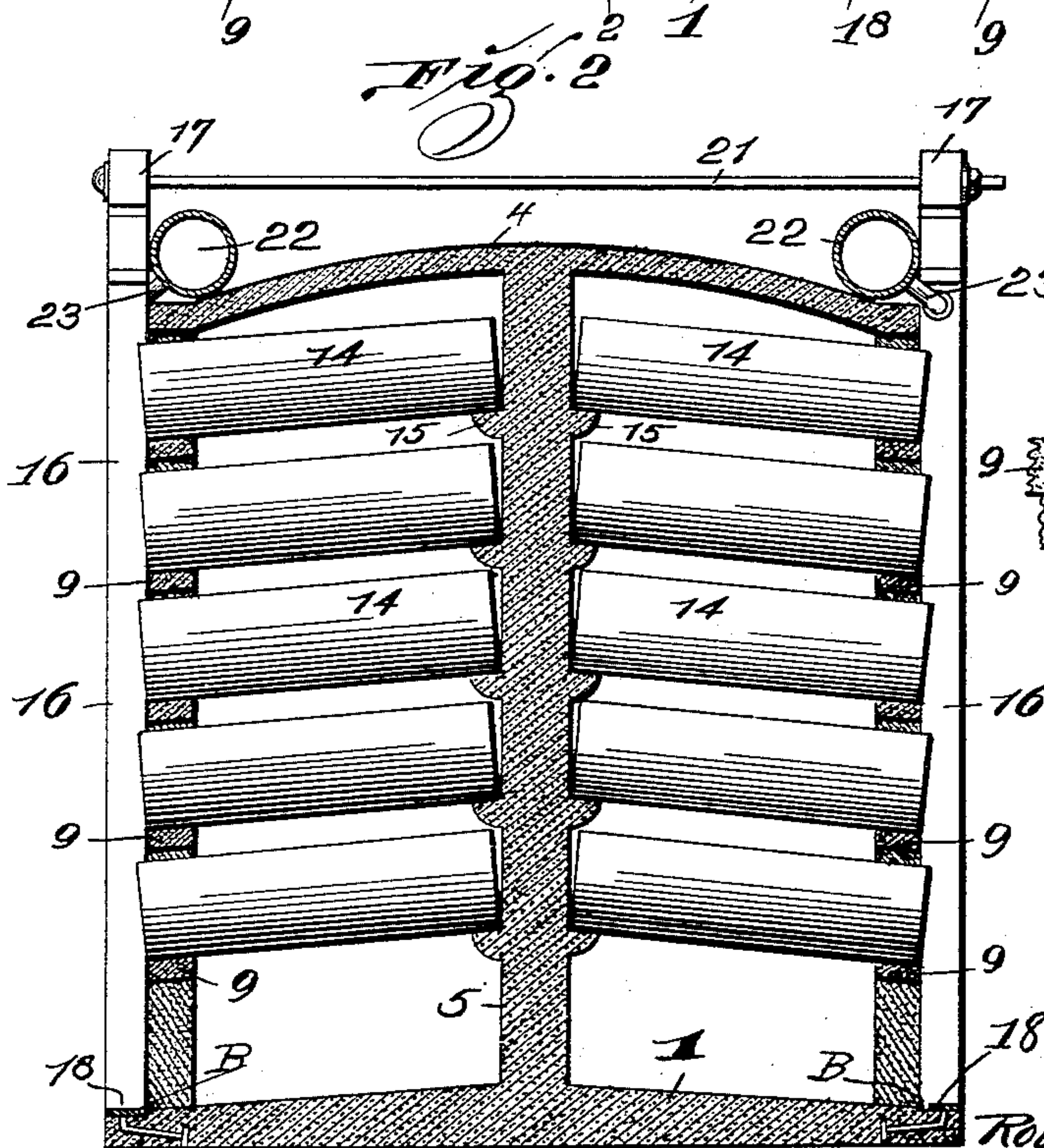
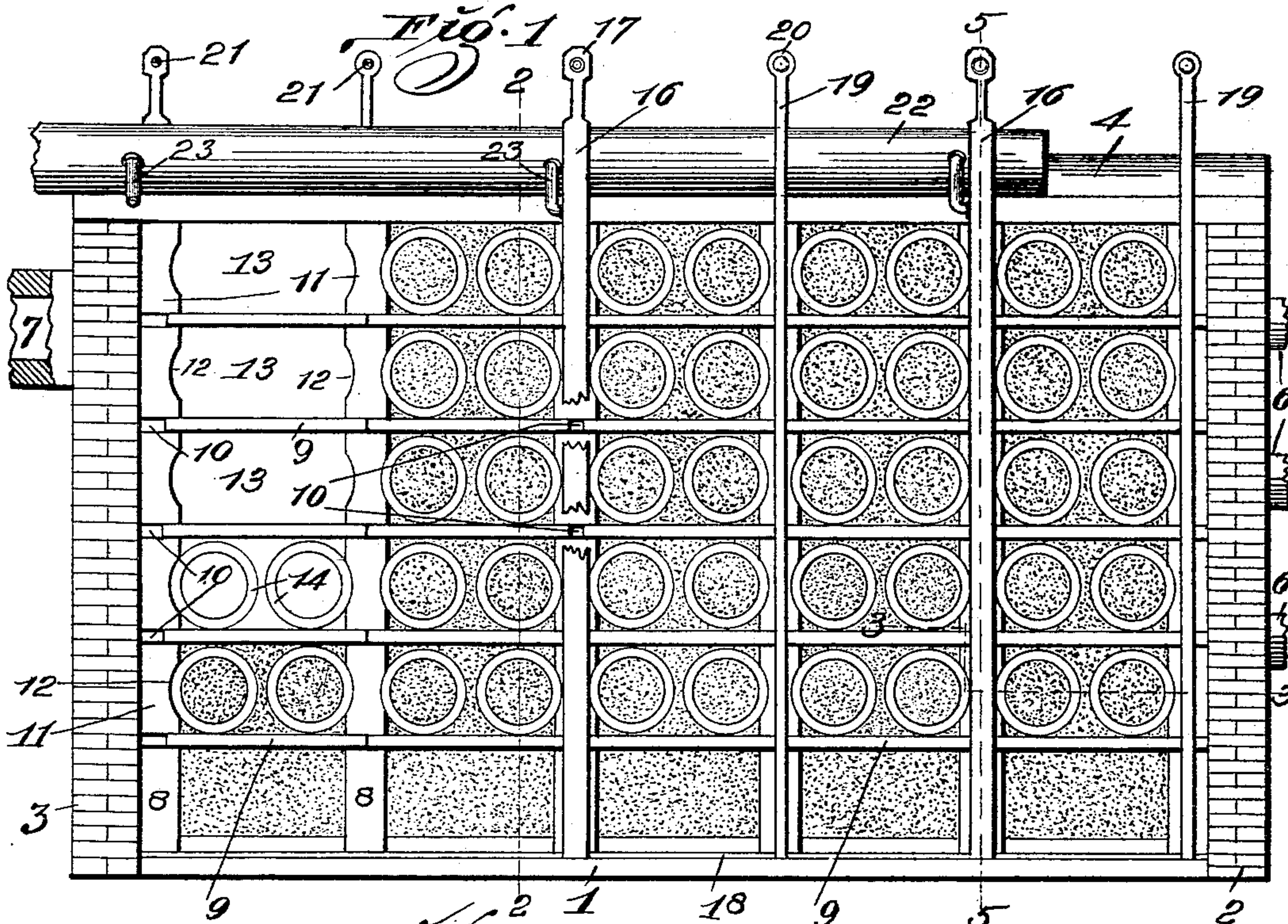
Patented Dec. 27, 1898.

R. H. & W. LANYON.  
ZINC SMELTING FURNACE.

(Application filed Apr. 5, 1898.)

(No Model.)

2 Sheets—Sheet 1.



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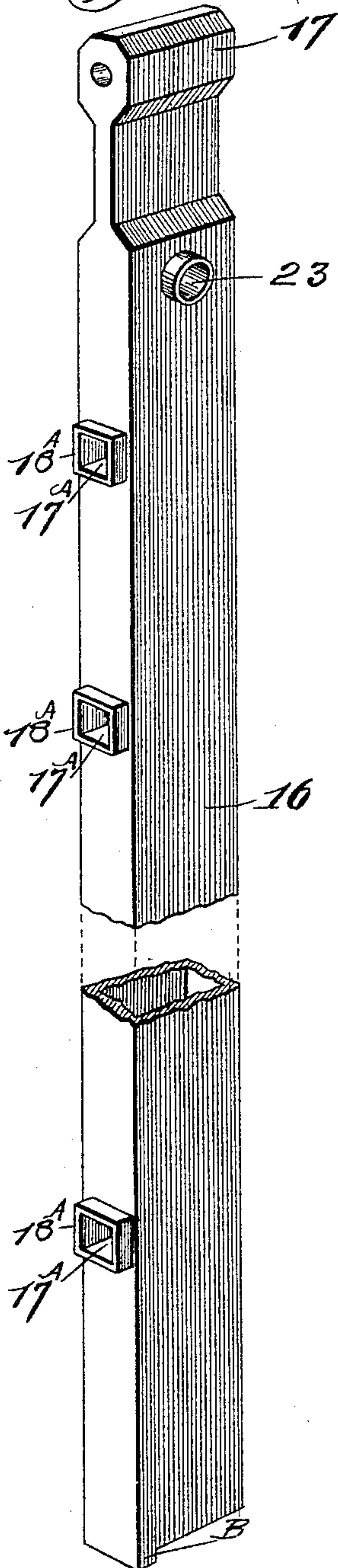
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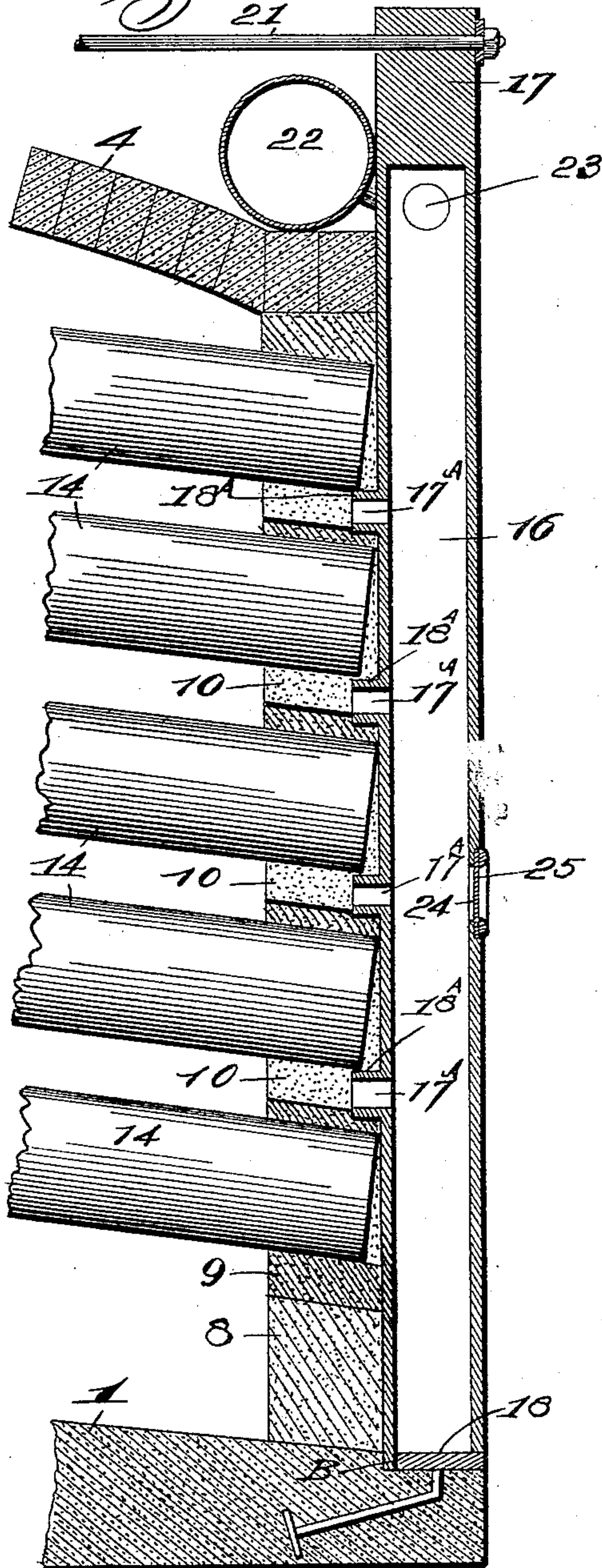
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*Fig. 4.*



*Fig. 5.*



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# UNITED STATES PATENT OFFICE.

ROBERT H. LANYON AND WILLIAM LANYON, OF IOLA, KANSAS.

## ZINC-SMELTING FURNACE.

SPECIFICATION forming part of Letters Patent No. 616,475, dated December 27, 1898.

Application filed April 5, 1898. Serial No. 676,559. (No model.)

*To all whom it may concern:*

Be it known that we, ROBERT H. LANYON and WILLIAM LANYON, of the city of Iola, Allen county, State of Kansas, have invented certain new and useful Improvements in Zinc-Smelting Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

Our invention relates to zinc-smelting furnaces; and it consists of the novel construction, combination, and arrangement of parts hereinafter described and claimed.

Figure 1 is an elevation of a furnace of our improved construction, a portion of said furnace being shown in an incomplete condition in order that the construction may be more readily understood. Fig. 2 is a vertical sectional view taken approximately on the line 2 2 of Fig. 1. Fig. 3 is a detail horizontal sectional view taken approximately on the line 3 3 of Fig. 1. Fig. 4 is a view in perspective of one of the hollow buckstays or arch-braces that we make use of in carrying out our invention. Fig. 5 is an enlarged detail sectional view taken approximately on the line 5 5 of Fig. 1.

In the construction of our improved furnace we make use of a suitable foundation 1, end walls 2 and 3, arched top 4, and the centrally-arranged vertical partition 5. Said partition 5 extends longitudinally between the ends 2 and 3 on a line midway between the sides of the foundation 1 and extends from said foundation 1 to the center of the arched top 4, and said central partition serves as a support for the inner ends of the retorts, hereinafter described.

The gas or like product that is used to heat the interior of our improved furnace enters the furnace through suitable tubes 6, located in the end wall 2, and the waste gases and smoke discharge from the interior of the furnace through a chimney or flue 7, located in the end wall 3. The foundation, end walls, central partition, and arched top are all constructed of fire-brick or analogous heat-resisting material.

The side walls of our improved furnace are built up in the following manner: A series of fire-brick pillars or blocks 8 are located at equal distances apart along each edge of the

foundation 1 and between the end walls 2 and 3, and upon this first row of fire-brick pillars are laid rectangular plates 9, of fire-clay. The ends of these plates 9 rest upon the top surfaces of the pillars 8, and at each alternate pillar a space is left between the meeting ends of the plates, which space forms a port 10 for the introduction of air to the furnace-chamber by the means hereinafter described. On top of the meeting ends of these plates 9 and in alignment with the pillars 8 are located rows of fire-clay pillars 11, in the side faces of which are formed curved recesses 12. This construction forms a series of rectangular openings 13, and the outer ends of ordinary retorts 14 occupy said rectangular openings 13, the inner ends of said retorts resting upon flanges or stays 15, formed integral with the partition 5. The outer ends of said retorts 14 rest upon the horizontally-arranged plates 9, and the sides of said retorts engage the curved recesses 12. The open space remaining around the outer ends of the retorts in the openings 13 is now filled with fire-clay or analogous material, and thus the solid side walls are formed. The ends of the retorts are closed in the usual manner at the time the ore is located in said retorts. During the construction of these side walls buckstays or arch-braces are located outside of said side walls directly against the vertical rows of fire-brick pillars, upon which rest the meeting ends of the plates 9. Certain of these buckstays are in the form of rectangular hollow columns 16, having the closed top ends, which are provided with the horizontally-apertured heads 17, and the lower ends of said hollow columns 16 are located directly upon the edges of the foundation 1 and are closed by the plates 18, which are located upon and anchored to said foundation 1. A lug 19 projects downwardly from the lower end of each column 16 back of the plate 18 and acts as a stop to limit the inward movement of said column and hold the same more securely in position. Formed in the inner wall of these hollow columns 16 is a series of discharge-openings 17<sup>A</sup>, each of which is surrounded by the inwardly-projecting flange 18<sup>A</sup>, and when these hollow columns 16 are in proper position said flanges project into the openings or ports 10, previously described. These hollow columns 16 are alter-



nated with solid buckstays 19, the upper ends of which solid buckstays are provided with the apertured heads 20, and stay-rods 21 connect the upper ends of both the solid buckstays and the hollow columns 16. Located on top of each side of the furnace so constructed are air-conveying pipes 22, and suitable tubular connections 23 extend from said air-conveying pipes 22 to the upper ends of the hollow columns 16. If desired, sight-openings 24 may be formed in the outer wall of the hollow columns 16 immediately opposite the discharge-openings 17<sup>A</sup>, and said sight-openings 24 are closed by sheets of mica 25 or the like, this feature being clearly illustrated in Fig. 5. The air-conveying pipes 22 lead from a suitably-located blast.

In operation the gas is supplied to the furnace chamber or chambers through the tubes 6 and combustion takes place within said furnace, the products of combustion passing out through the flue 7. The blast of air is led into the furnace through the supply-pipes 22, and from thence is led into the hollow columns 16, through the tubular connections 23, and from said hollow columns is discharged into the furnace-chambers through the discharge-openings 17<sup>A</sup> and ports or openings 10. The process of combustion within the furnace and around the retorts is similar to that of a blowpipe, the heat being regulated within certain limits by the pressure of a blast of air, together with the amount of gas supplied to the furnace. Thus by our improved construction a smelting-furnace is formed wherein air is discharged into said furnace at various points around the retorts, and as said air enters in the form of jets or blasts it will combine with the gas to create great heat.

The hollow columns 16 perform the func-

tions of braces or stays, as do the solid columns or buckstays 19, in addition to serving as means for transmitting air to the interior of the furnace.

We do not herein specifically claim the hollow columns 16, they being so claimed in our prior application, filed May 24, 1898, Serial No. 637,912.

We claim—

1. The combination with a zinc-smelting furnace, of hollow buckstays forming a part of the side walls of the furnace, a series of solid buckstays arranged alternately with said hollow buckstays, air-inlet pipes discharging into the chambers within said hollow buckstays, there being openings formed through the inner walls of said hollow buckstays as required to distribute air and discharge it into the furnace, and retorts in said furnace with their outer ends adjacent said buckstays, substantially as specified.

2. A zinc-smelting furnace having side walls constructed of vertically-arranged pillars, plates having their ends resting on said pillars, which plates form a rest for the outer ends of the retorts within the furnace, there being air-inlet ports left between the ends of certain of said plates, the space around the outer ends of the retorts between the pillars and plates being filled with fire-clay, and means of conveying and discharging air through the ports to the interior of the furnace, substantially as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

ROBERT H. LANYON.  
WM. LANYON.

Witnesses:

E. H. RUBLE,  
CHAS. J. BISHOP.