

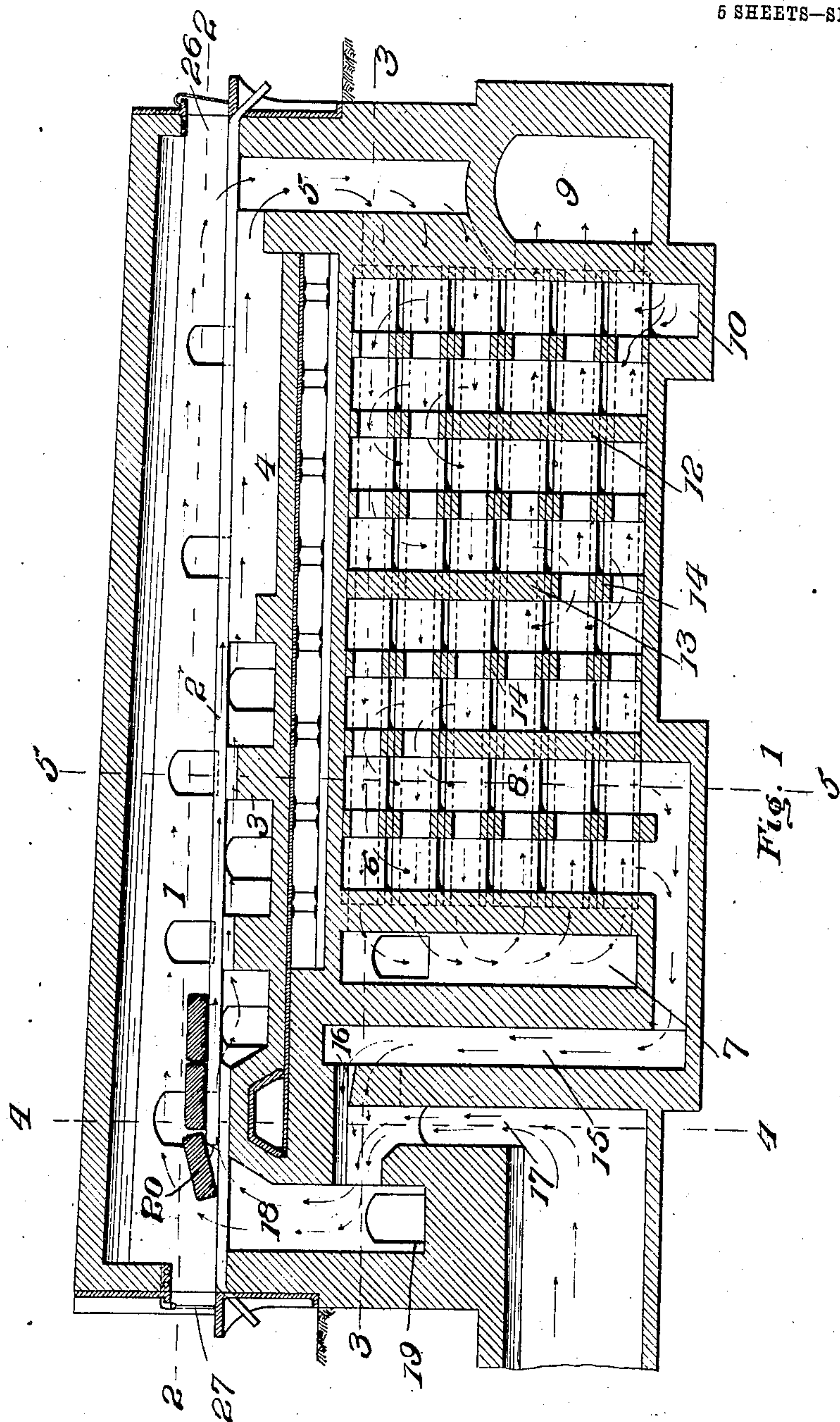
No. 875,458.

PATENTED DEC. 31, 1907.

J. REULEAUX.
CONTINUOUS HEATING FURNACE.

APPLICATION FILED OCT. 5, 1906.

5 SHEETS—SHEET 1.



Witnesses

Witnesses
James
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Inventor.

Josef Reuleaux

by *Charles Sumner* Attorney

Attorney

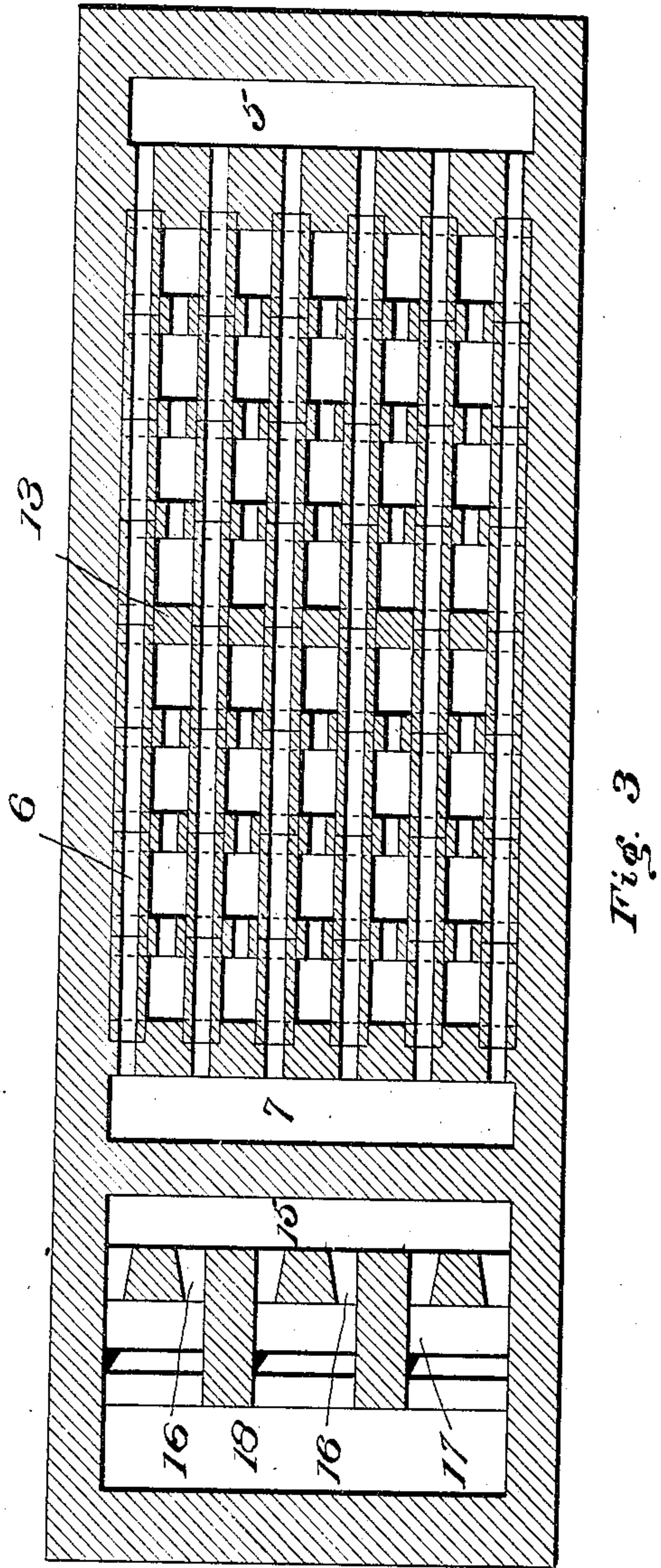
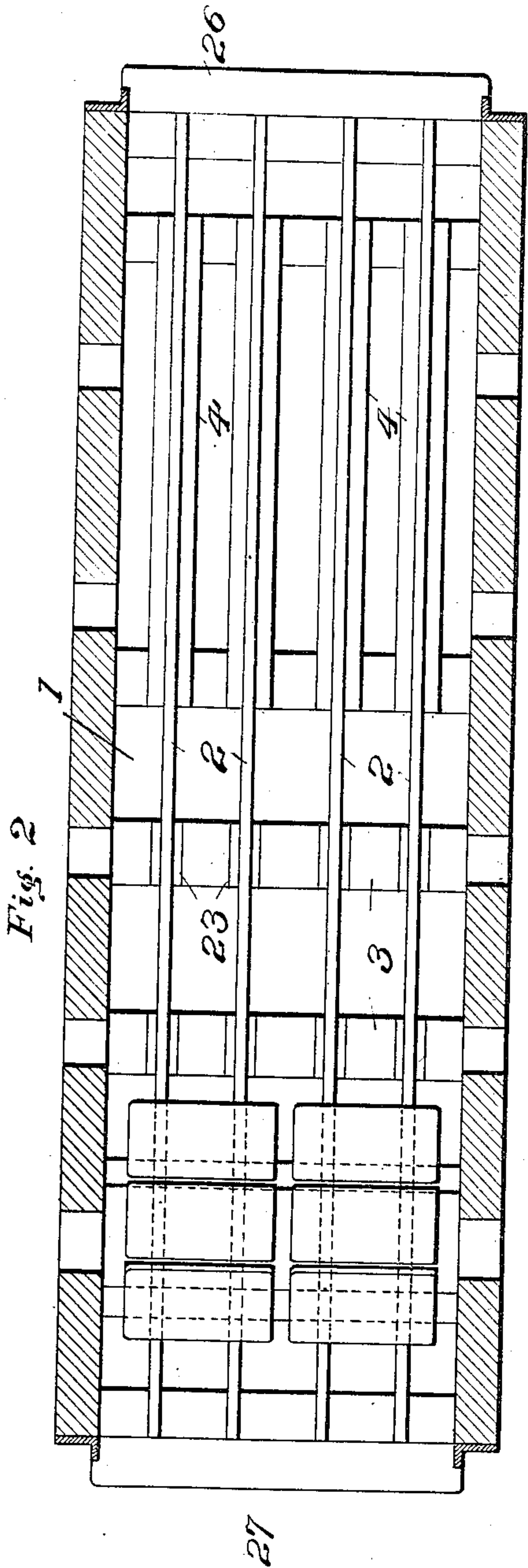
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5 SHEETS—SHEET 2.



Witnesses

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5 SHEETS—SHEET 3.

Fig. 5

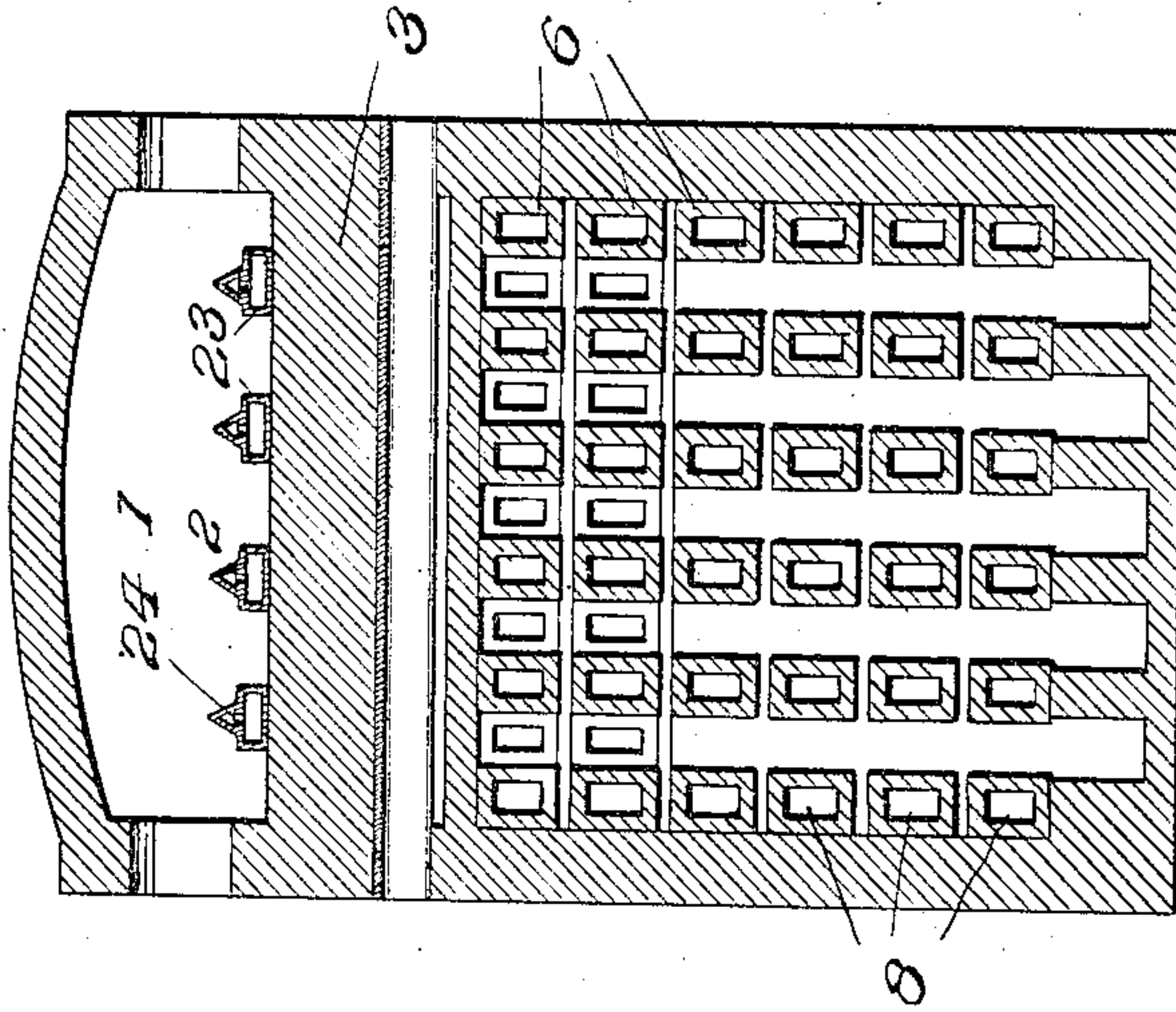
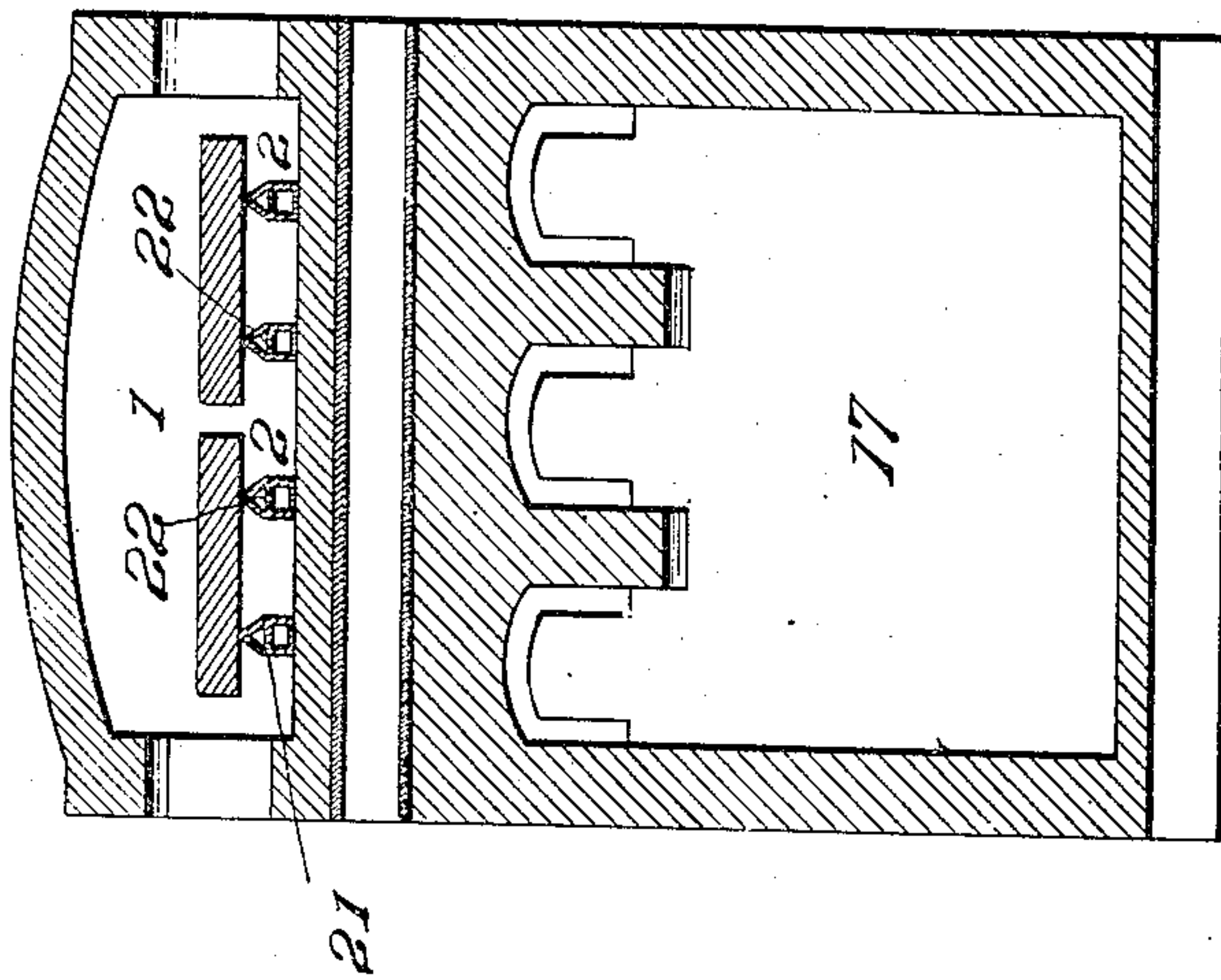


Fig. 4



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5 SHEETS—SHEET 4.

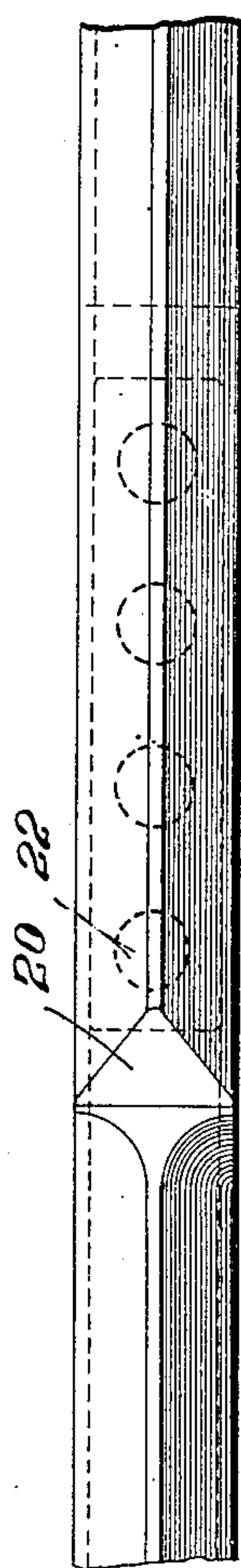


Fig. 6

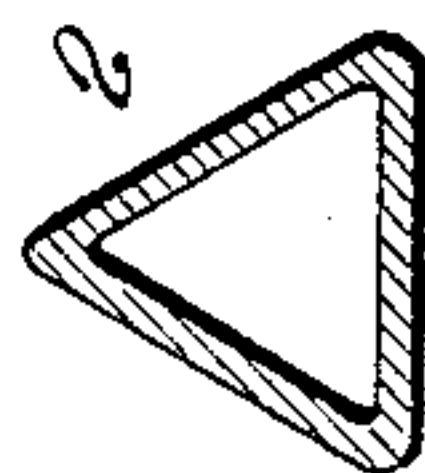


Fig. 8

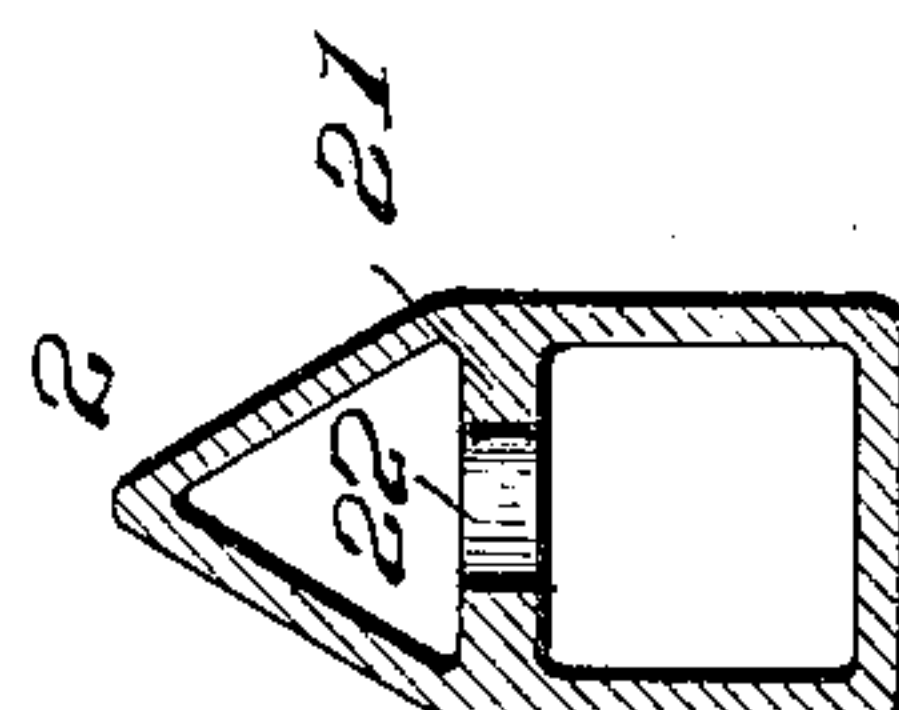


Fig. 9

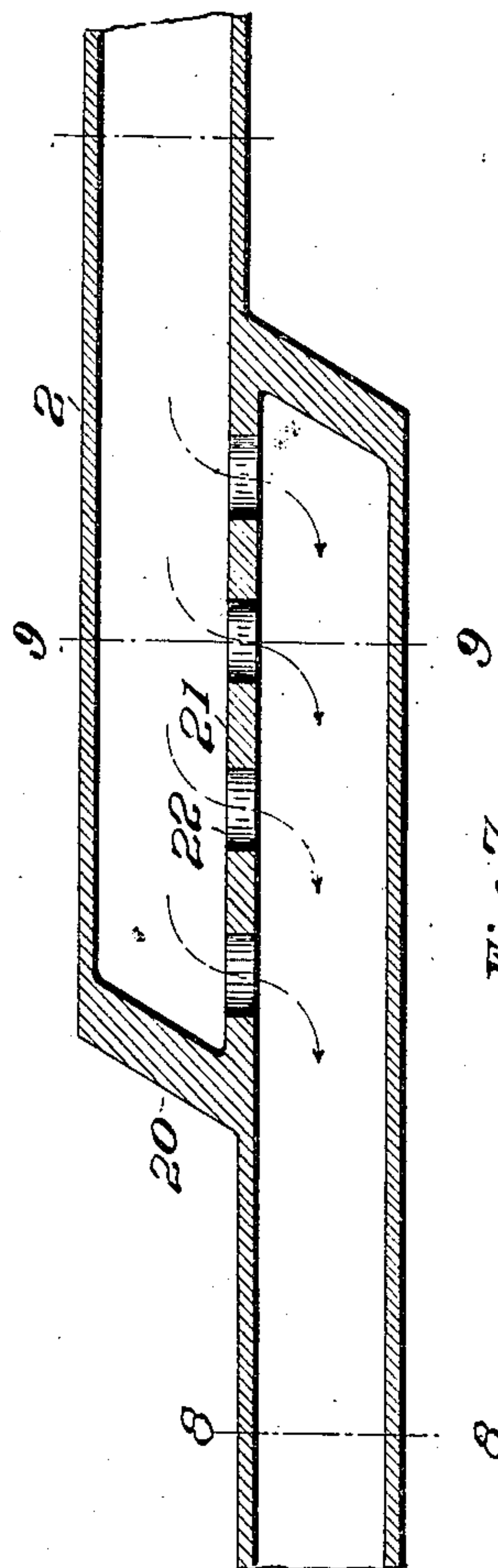


Fig. 7

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5 SHEETS—SHEET 5.

Fig. 10.

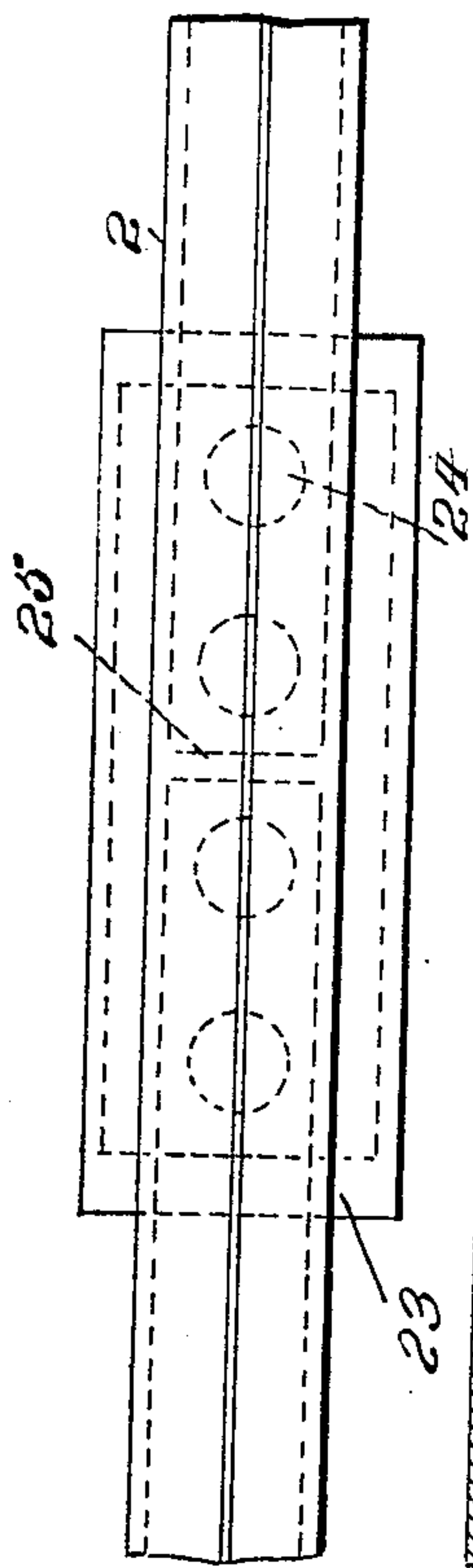


Fig. 11.

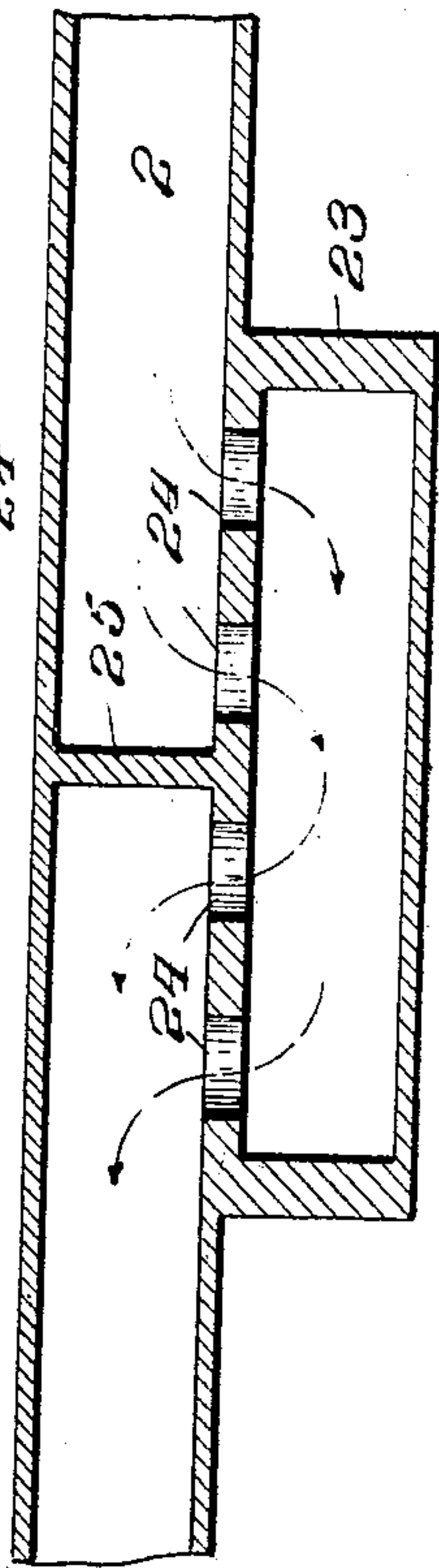


Fig. 12.

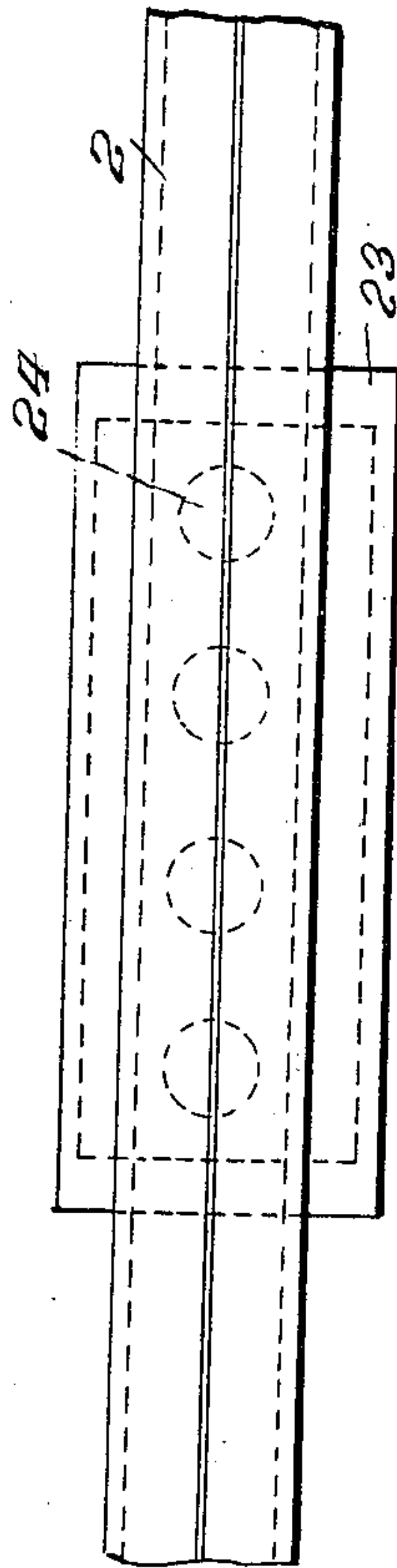
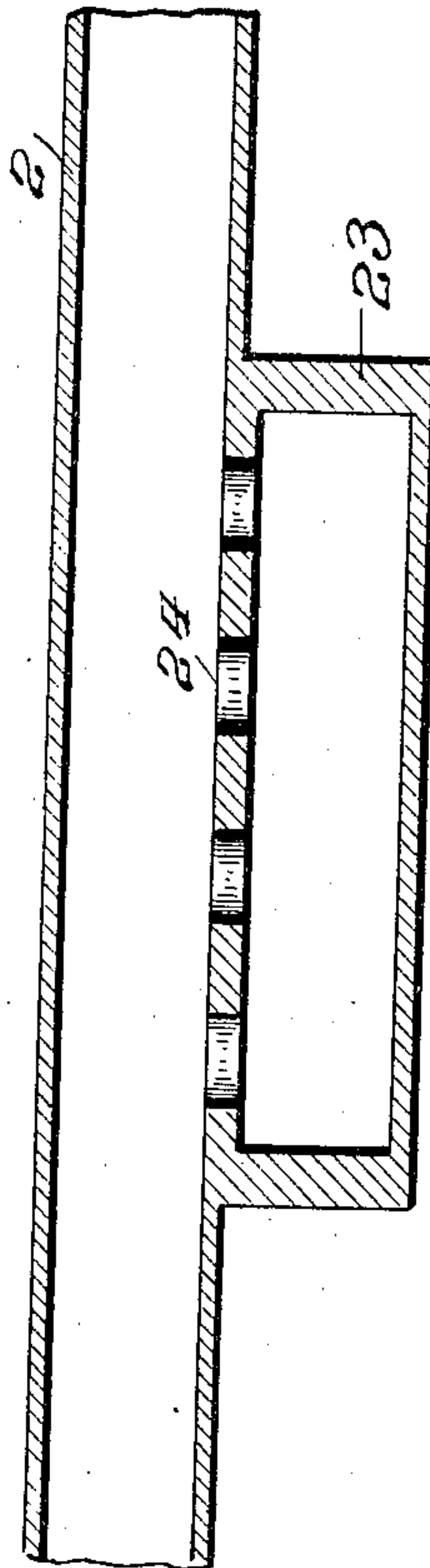


Fig. 13.



Witnesses

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UNITED STATES PATENT OFFICE.

JOSEF REULEAUX, OF WILKINSBURG, PENNSYLVANIA, ASSIGNOR TO ALEXANDER
LAUGHLIN, OF PITTSBURG, PENNSYLVANIA.

CONTINUOUS HEATING-FURNACE.

No. 875,458.

Specification of Letters Patent.

Patented Dec. 31, 1907.

Application filed October 5, 1906. Serial No. 337,592.

To all whom it may concern:

Be it known that I, JOSEF REULEAUX, of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Continuous Heating-Furnaces; and I 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.

The primary object of this invention is to provide improved means for overcoming the formation of dark streaks on slabs or billets consequent upon their contacting with the cooled supports upon which they bear while being heated.

A further object is to allow of the free passage of the heat between the transverse piers and the supports, and to keep the supporting legs and piers cool.

The invention will be hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal sectional view of a furnace embodying my improvements. Figs. 2 and 3 are horizontal sectional views on lines 2—2, and 3—3, respectively, Fig. 1. Fig. 4 is a vertical sectional view on line 4—4, Fig. 1. Fig. 5 is a similar view on line 5—5, same figure. Fig. 6 is a plan view of a portion of one of the supporting rails. Fig. 7 is a central longitudinal sectional view thereof. Figs. 8 and 9 are cross-sectional views on lines 8—8 and 9—9, respectively, Fig. 7. Fig. 10 is a plan view, and Fig. 11 a longitudinal sectional view of that portion of a supporting rail located above a transverse pier. Figs. 12 and 13 are plan and longitudinal sectional views of a slight modification.

Referring to the drawings, 1 designates the combustion chamber; 2 the longitudinally-extended supports; 3 the transverse piers, and 4 the longitudinal piers upon which the supports 2 are mounted. The waste gases or products of combustion upon reaching the far or receiving end of the furnace pass downwardly into a chamber 5, and thence, through a series of conduits 6 to the other or discharge end of the furnace; and thence into a chamber 7, and thence back upon themselves through a second, or lower, series of conduits 8 leading to the stack or

outlet flue 9. The two series of conduits 6 and 8 are located in the air-heating chamber into which air is introduced through ports 10, one of which is shown in Fig. 1, and is caused to travel tortuously over and beneath partitions 12 and 13. The several superposed rows of conduits 6 and 8 are spaced apart by blocks 14 to permit of a thorough circulation of the air. The latter being thus preheated passes into a chamber 15 and through openings 16 into the gas supply port 17. The mixture of air and gas then enters the heating chamber through the fuel port 18, over which extend the billet supports 2, and beneath which is the cinder pocket 19. This arrangement for heating the air is the subject of a separate application for patent.

The supports 2 are made hollow so as to permit of the constant flow of water or other cooling medium. To overcome the dark streaks usually present on the undersides of the slabs or billets, I form the supports with abrupt drops or steps at a point coincident with, or in close proximity to, the fuel port 18, so that those portions of the slabs or billets previously bearing on the supports will be held away therefrom, and subjected to the direct action of the heat. For this purpose each supporting rail, at a point near the fuel port, is dropped and prolonged or continued on a lower plane substantially parallel with the upper portion, so as to form, at the end of its upper portion, an abrupt shoulder 20 against the edge of which each slab or billet will rest while the lower forward edge bears upon the lower prolongation. Both portions of each rail are hollow, and in the partition 21 are holes or ports 22 for the passage of the cooling medium. Preferably each rail is of triangular formation, in cross-section, but it is manifest that any suitable formation may be adopted.

To dispense with the brick legs ordinarily built upon the transverse piers, to form bearings for the supporting rails, and which legs are usually destroyed by the intensity of the heat, I form the supporting rails 2 with depending hollow legs 23 which bear directly upon and cover the upper faces of the transverse piers 3. These legs are supplied with water from the supporting rails, ports 24 permitting of free circulation, and if desired a partition 25 may be located intermediate the

length of each leg so as to divert the circulation of the water or other cooling medium. The depending leg may be of any desired width, thus enabling me to secure ample base for the supports, and yet permit the heat products to have free access to and around the supports and the water bearing legs. The cooling medium within the legs also cools the large surface of the supporting pier, and prevents its destruction by the action of the flame. Dispensing with the brick legs results in a great saving both in construction and maintenance.

It will be understood that the slabs or billets are introduced into the heating chamber at the receiving end 26, and are gradually forced therethrough, upon the supports 2, by any suitable mechanism, not shown. As they reach the point of highest heat, each will in its turn assume the inclined position indicated by the foremost billet in Fig. 1, thereby permitting the dark streaks on the underside thereof to be removed by the direct action of the heat, whereupon the billet will be discharged from the furnace at the delivery or outlet end 27.

Not only am I enabled to effectively remove the dark streaks, but the life of the furnace is greatly prolonged by the hollow water legs displacing the brick legs heretofore used.

I claim as my invention:

1. In a continuous heating furnace having its point of highest heat at or near one end, supports for the material being heated extended from the receiving end of the furnace over such point of highest heat, and at or near such point formed with a step or shoulder and a prolongation on a lower plane, the underside of the material being held away from the supports in passing from the upper to the lower portions thereof.

2. In a continuous heating furnace having its point of highest heat at or near one end, supports for the material being heated extended from the receiving end of the furnace over such point of highest heat, each support having a prolongation on a lower plane, the upper and lower portions being substantially parallel and on such planes that the underside of the material is held away from the

support in passing from the upper to the lower portions thereof.

3. In a continuous heating furnace having its point of highest heat at or near one end, supports for the material being heated extended from the receiving end of the furnace over such point of highest heat, each support being hollow and at or near such point having a prolongation on a lower plane with passages for a cooling medium between the upper and lower portions of the support, a shoulder being formed by the end of the upper portion of the support for causing the material to occupy a position different from that which it occupies when wholly on either the upper or lower portions of the supports.

4. In a continuous heating furnace having transverse piers, supports for the material being heated composed of rails extending lengthwise of the furnace and having depending legs forming parts thereof constructed to contain a cooling medium and form a covering for the upper faces of the piers upon which they rest.

5. In a continuous heating furnace having transverse piers, supports for the material being heated composed of hollow rails extending lengthwise of the furnace and designed to convey a cooling medium, and depending hollow legs forming parts of said rails and communicating therewith, said legs being constructed to form a covering for the upper faces of the piers upon which they rest.

6. In a continuous heating furnace having transverse piers, supports for the material being heated composed of hollow rails designed to convey a cooling medium, depending hollow legs communicating with such rails and forming coverings for the upper faces of said piers, and means for diverting the cooling medium from the rails into said legs.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

JOSEF REULEAUX.

Witnesses:

FRANCIS S. MAGUIRE,
VERNON E. WEST.