

No. 715,569.

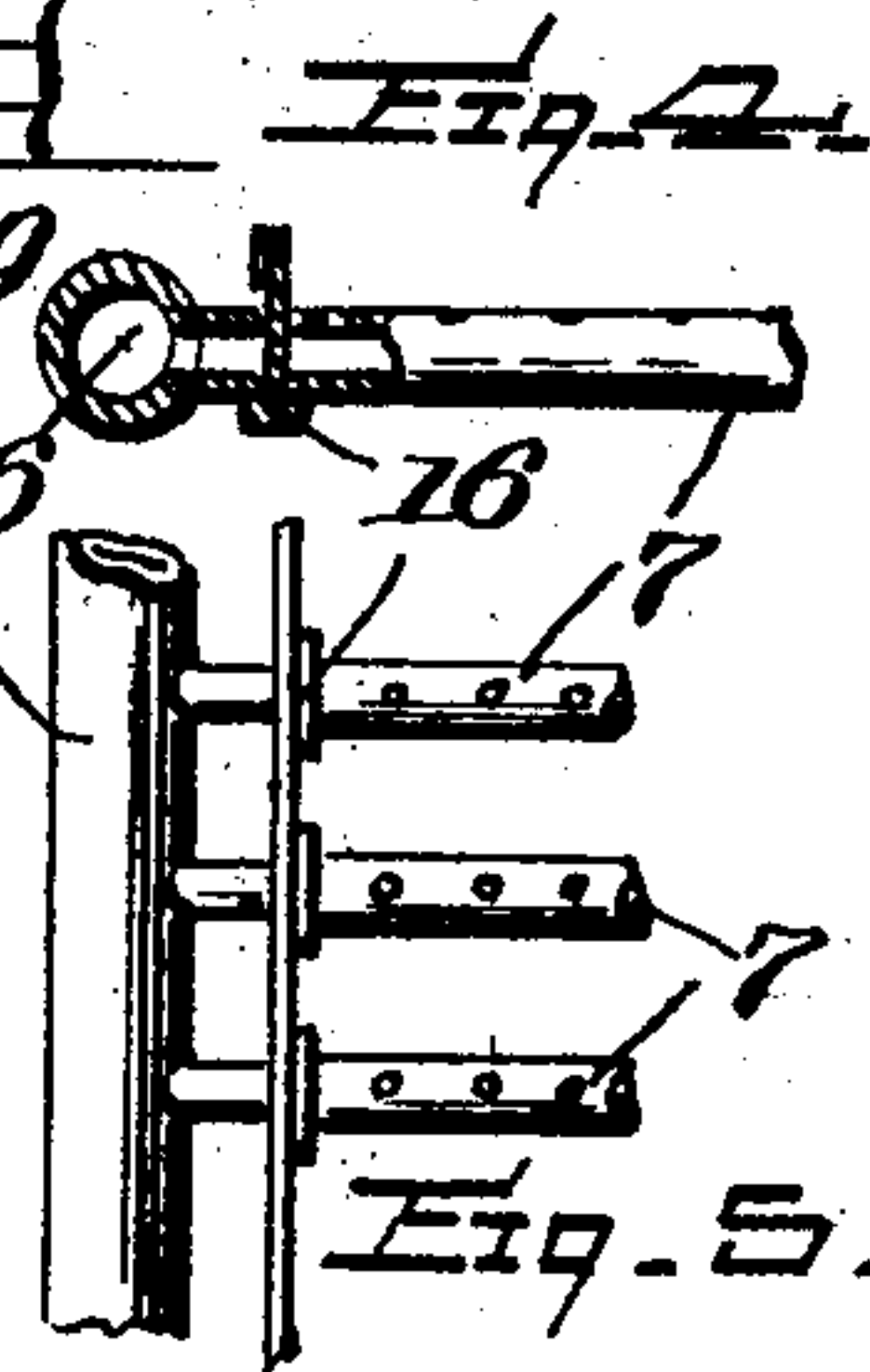
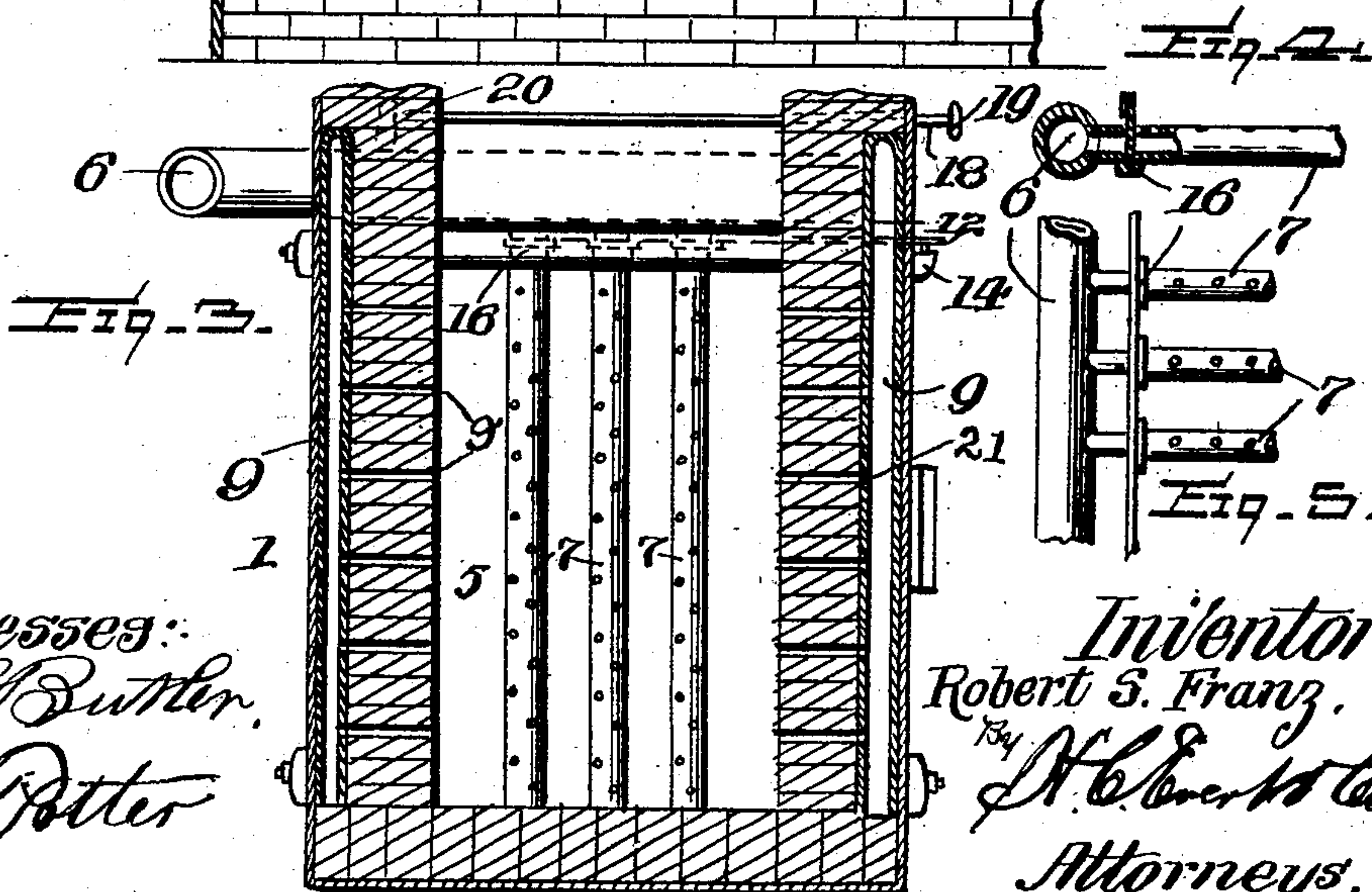
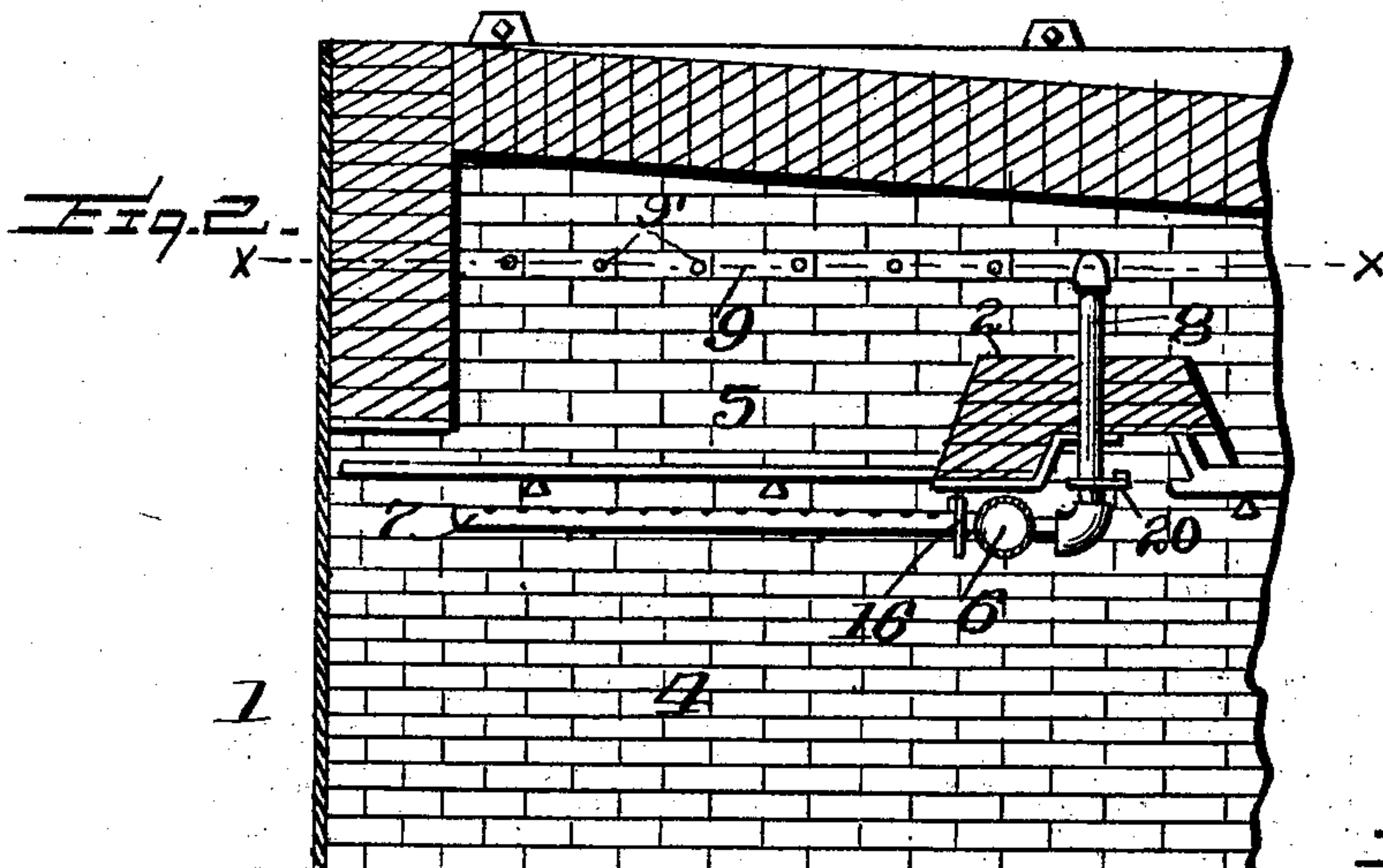
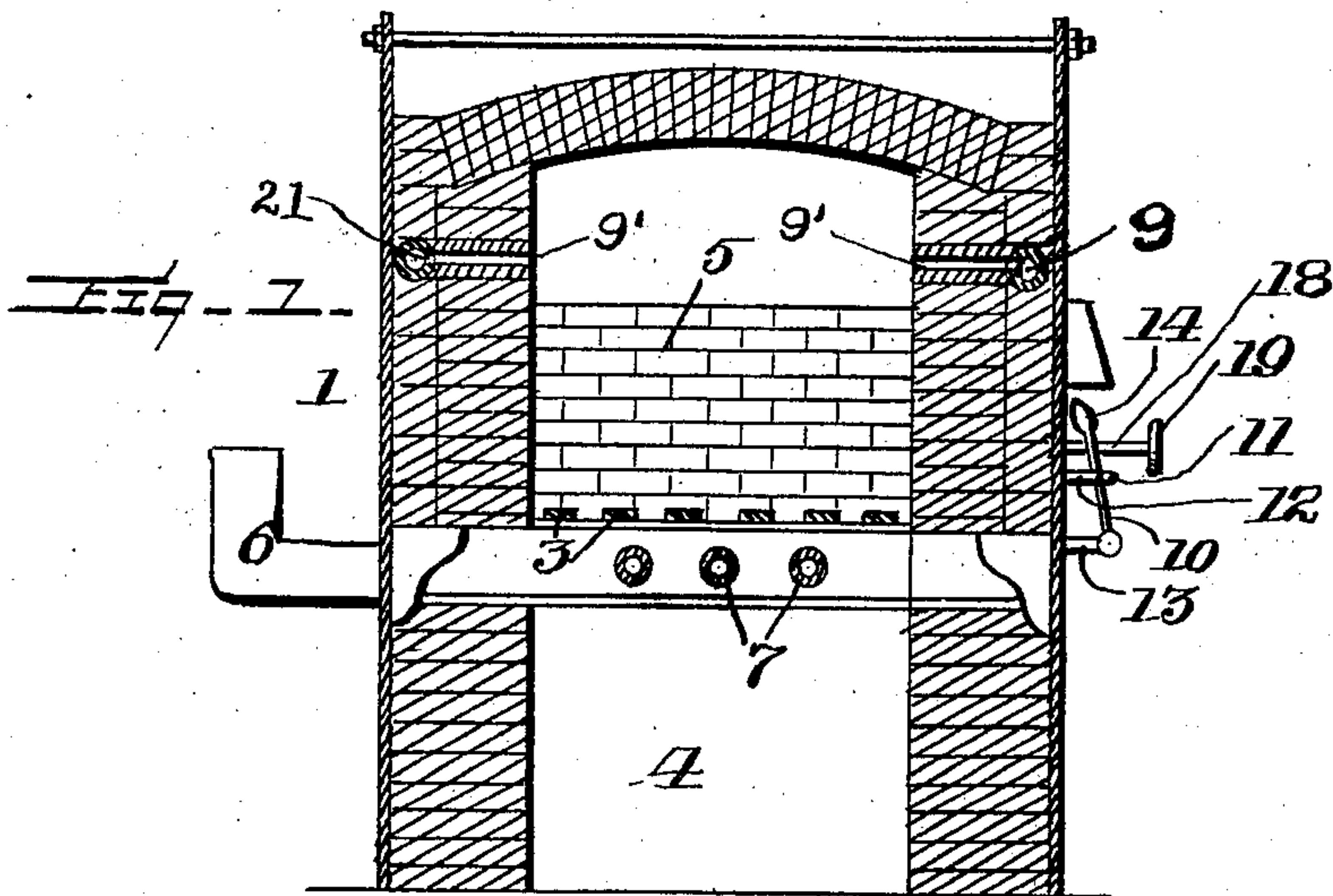
Patented Dec. 9, 1902.

R. S. FRANZ.

FURNACE.

(Application filed July 9, 1901.)

(No Model.)



Witnesses:
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UNITED STATES PATENT OFFICE.

ROBERT S. FRANZ, OF ETNA, PENNSYLVANIA.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 715,569, dated December 9, 1902.

Application filed July 9, 1901. Serial No. 67,614 (No model.)

To all whom it may concern:

Be it known that I, ROBERT S. FRANZ, a citizen of the United States of America, residing at Etna, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Furnaces, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain new and useful improvements in furnaces of all kinds, such as boilers, heating-furnaces, puddling-furnaces, and any kind of roller-mill furnaces, steel-mill furnaces, glass-house and gas-house
15 furnaces; and the object of my invention is to produce a furnace improvement and attachments thereto which may be applicable to all kinds of furnaces.

20 A still further object of my invention is to construct a furnace and its attachment in such a manner that by having compressed or forced air it may be delivered in a heated condition into the fire-box through contracted air-pipes, so as to secure a more perfect and
25 thorough combustion within the furnace.

30 A still further object of my invention is to apply a series of air-pipes above and below the grate-bars or fireplace in such a position as to create a force draft of air in sufficient quantities in order to obtain a perfect combustion, also through pipes below the grate-bars to the entire lower surface of the furnace, which, being forced upwardly to the mass of burning fuel, causes an equal and perfect
35 combustion and a regular heat from material that would not be valuable if burned by ordinary methods.

40 A still further object of my invention is to accomplish, by forcing the supply of heated air into the combustion-chamber, a current of air being directed in such a manner as to produce a whirling circulation or counter cross-current of the products of combustion and at the same time a cross-pressure of air-blast, thereby securing an intermixture of the air
45 supply with the gases, effecting a complete burning of said gases and the products of combustion carried therewith in suspension before their final escape from the furnace or
50 stack.

My invention further aims to construct a furnace of the above-described class that will

be extremely simple in construction, strong, durable, and comparatively inexpensive to manufacture; furthermore, one that will be
55 highly efficient in its use.

With the above and other objects in view the invention consists in the novel combination and arrangement of parts to be hereinafter more fully described, and specifically
60 pointed out in the claim.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, and wherein like numerals of reference indicate corresponding parts throughout the several views,
65 in which—

Figure 1 is a vertical sectional view of the furnace. Fig. 2 is a longitudinal sectional view of a portion of the furnace. Fig. 3 is a
70 sectional view looking down through line *xx*, Fig. 2. Fig. 4 is a detail view showing one of the connections of the main air-supply pipes and the connection therewith. Fig. 5 is a similar view showing the manner of connecting
75 the series of pipes to the main air-supply pipe.

In the drawings the reference-numeral 1 indicates the furnace proper, and 2 represents the bridge-wall.
80

3 represents the grate-bars, and 4 the ash-pit.

The reference-numeral 5 indicates the combustion-chamber, and 6 represents the air-supply pipe. The air may be forced in
85 said pipe by means of a fan or other suitable methods. The said air-supply pipe extends into the furnace under the bridge-wall 2 and has leading therefrom a number of perforated pipes 7, extending under the grate-bars directly under the combustion-chamber. From
90 said supply-pipe 6 upwardly-extending pipes 8 are connected to each side of the furnace, leading upwardly into the walls of the furnace and extends into the combustion-
95 chamber, carrying pipes 9. These pipes 9 are perforated and are embedded in the side walls of the furnace. Thus when air is introduced into these pipes there will be two
100 currents of air, one from each side wall, which will thus effectually cover the whole space above the grate-bars and between the side walls and tend to direct the unconsumed products into the fire.

The reference-numeral 10 represents a lever, which is pivoted at 11 to the bracket 12. This lever carries a handle 14 and is pivoted at its lower end to the rod 15. This rod 15 carries check-valves 16 to regulate the pipe 7.

The reference-numeral 18 represents a rod carrying a handle 19, operating the bell-crank 20, which carries a check-valve regulating the pipes 8.

The side walls are provided with passages 9', which communicate with the perforations 21 of pipes 9 and the interior of the combustion-chamber.

The operation of my improved furnace is as follows: Air being forced into the supply-pipe 6 will become heated when it enters the furnace and will tend to heat the pipes 7, 8, and 9, thereby creating a hot blast both below the grate-bars to increase the intensity of the combustion and also the blast in the combustion-chamber above the fire in a direction that will tend to direct the unconsumed products again into the blaze. By this arrangement the smoke from the stack will be almost entirely eliminated.

The many advantages obtained by the use of my improved furnace will be readily apparent from the foregoing description taken in connection with the accompanying drawings.

It will be noted that various changes may be made in the details of construction with-

out departing from the general spirit of my invention.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The combination with a furnace, provided at its rear with a bridge-wall; of perforated air-pipes embedded in the side walls of the furnace above the grate-bars, and having their forward ends closed, a supply-pipe arranged transversely of the furnace below the bridge-wall of the furnace and having one of its ends projecting through the furnace-wall, vertical pipes arranged at the opposite sides of the furnace in the said bridge-wall and communicating with the said supply-pipe and perforated air-pipes, a series of horizontally-disposed perforated pipes communicating with the said air-supply pipe, and arranged beneath the said grate, a check-valve mounted in each pipe of the said series, a rod connected to each of the said valves, and a lever fulcrumed to the exterior of the furnace and connected to the said rod, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

ROBERT S. FRANZ.

Witnesses:

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E. E. POTTER.