

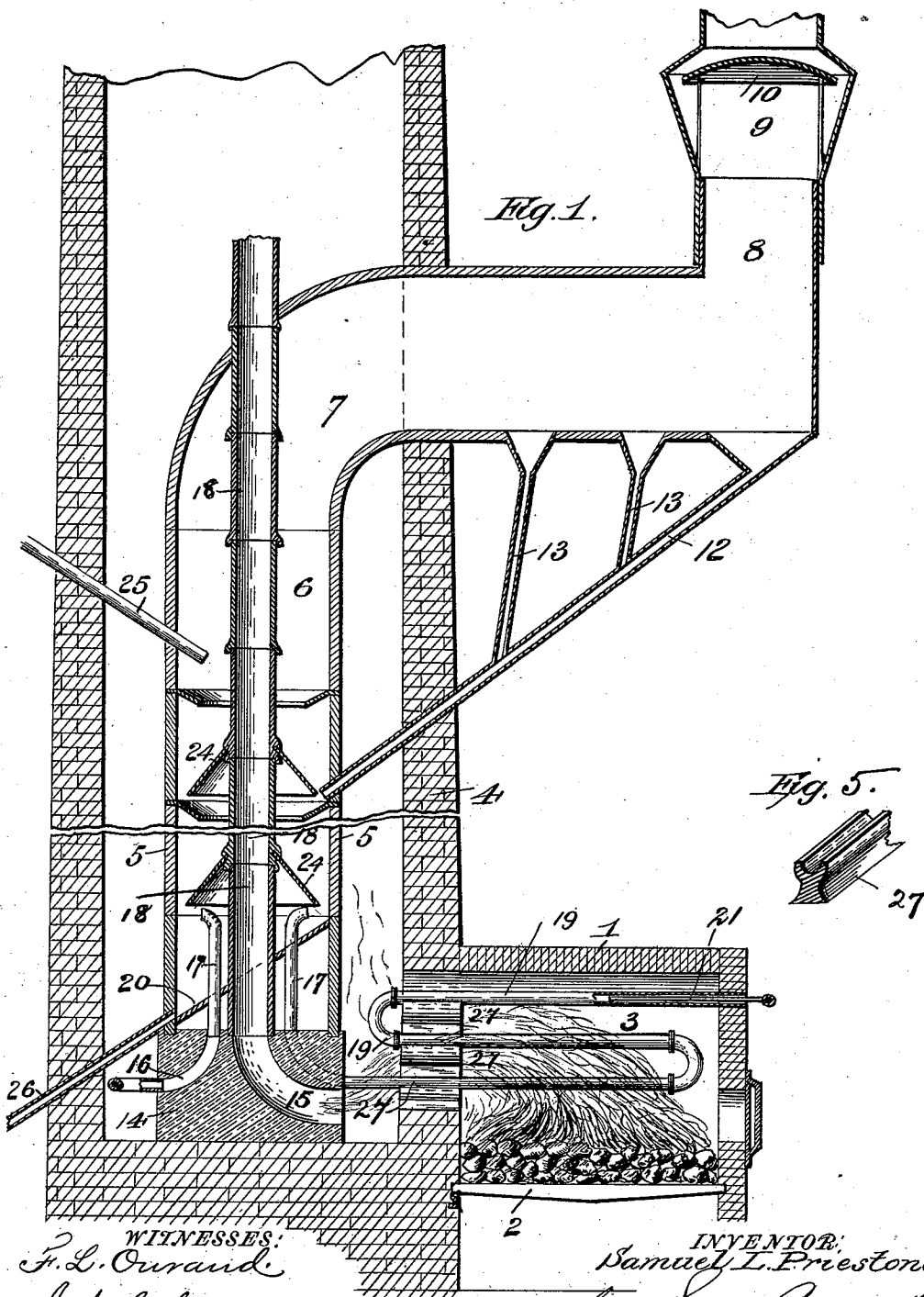
(No Model.)

2 Sheets—Sheet 1.

S. L. PRIESTONE.
OXIDIZING FURNACE.

No. 534,517.

Patented Feb. 19, 1895.



WITNESSES:
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W. L. Coombs

INVENTOR:
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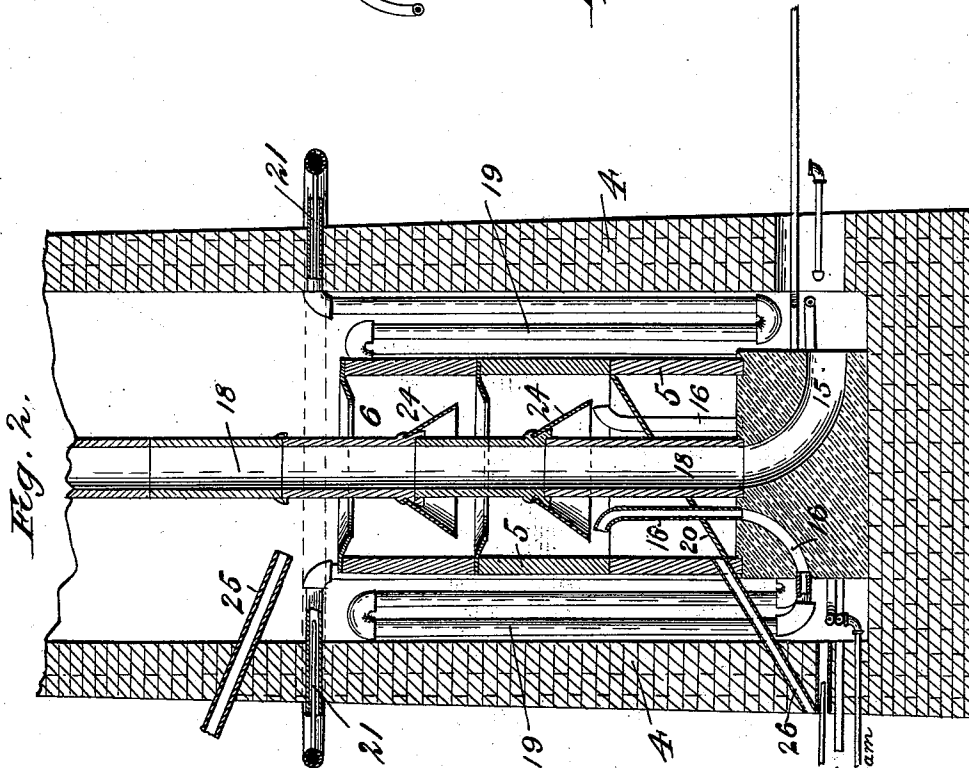
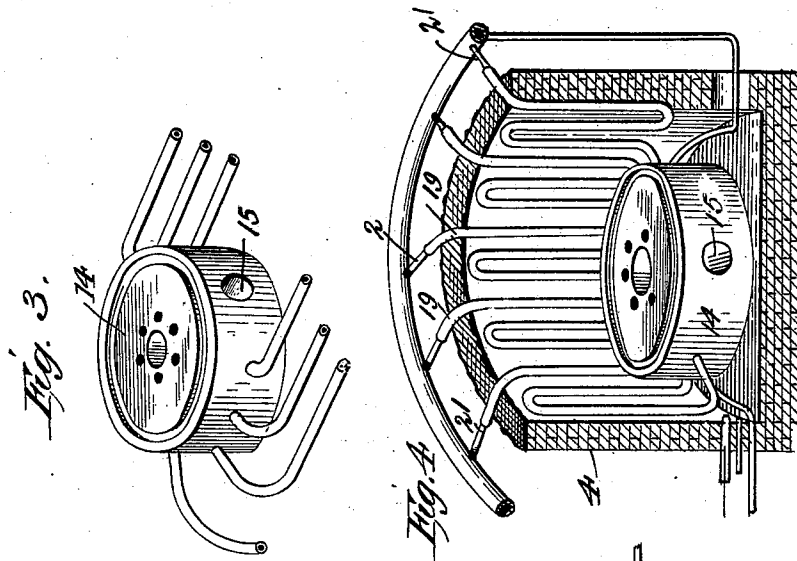
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INVENTOR:
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Attorneys.

UNITED STATES PATENT OFFICE.

SAMUEL LOUIS PRIESTONE, OF WARD, COLORADO, ASSIGNOR OF ONE-HALF
TO THOMAS J. THOMPSON, OF SAME PLACE.

OXIDIZING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 534,517, dated February 19, 1895.

Application filed April 19, 1894. Serial No. 508,119. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL LOUIS PRIESTONE, a citizen of the United States, and a resident of Ward, in the county of Boulder and State of Colorado, have invented certain new and useful Improvements in Oxidizing-Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in oxidizing furnaces, for the treatment of ores, especially those containing gold and silver, preparatory to amalgamation; and it consists in the novel construction and combination of parts hereinafter fully described and claimed.

In the accompanying drawings: Figure 1 is a longitudinal sectional view of an oxidizing furnace constructed in accordance with my invention. Fig. 2 is a similar view of the same, showing a modified construction and arrangement of the pipes for supplying the oxidizing gases to the oxidizing chamber. Fig. 3 is a detail perspective view of the base or foundation of the oxidizing chamber. Fig. 4 is a view of part of the furnace, shown in Fig. 2. Fig. 5 is a detail perspective view of one of the plates for supporting the air-pipes.

In the said drawings, the reference numeral 1 designates the furnace made of brick work, formed with a grate 2, and a fire-box or chamber 3. At one end this furnace is provided with a stack 4, with which the fire-box communicates at the lower end. Located within this stack is a cylinder 5, made of fire-brick or other suitable refractory material, with a flue hereinafter described, forming an oxidizing chamber 6 for the escape of the products of combustion, from the fire-chamber. The cylinder 5 at its upper end is formed with an elbow 7, communicating with a vertical shaft 8 for carrying off the noxious gases from the oxidizing chamber. This shaft is formed with a chamber 9, near its upper end, the walls of which taper from the center to the upper and lower ends respectively, in which is located a deflecting plate 10, for arresting any particles of dust carried into said shaft

with the gases and causing them to fall to the bottom of the stack, from whence they escape through the inclined pipe 12, back into the oxidizing chamber, with which said pipe is connected. Vertical pipes 13 are also connected with said pipe and with the elbow 7, for a similar purpose. The upper ends of these pipes 13, where they connect with the elbow, are made flaring, as shown in Fig. 1, so that the dust and other solid substances will be conducted to said pipes.

The lower end of chamber 5 is connected with a cylindrical base 14 having a central curved flue 15, communicating with the lower part of the stack and with a vertical flue, hereinafter described. Said base is also formed with a series of flues 16. Connected with this base is a vertical flue 18, of suitable refractory material, located centrally within the chamber 5, and passing through the inner end of elbow 7 and communicating with a stack 4. The lower end of this flue is connected with flue 15 which communicates with the lower part of the stack so that the heat and products of combustion from the fire-box pass therethrough, as well as around the outside of chamber 5. By this means the oxidizing chamber can be heated to a very high degree.

Connected with the lower ends of flue 16 are a number of air-pipes 19, made of fire-clay and have located therein steam jet-pipes 21. These pipes are made to take a tortuous route along the sides of the fire-box, so as to be subjected to a very high degree of heat, and their outer ends extend through the walls of the furnace, the air pipes communicating with the atmosphere while the steam jet pipes located therein are connected with a suitable generator, not shown. Connected with the upper ends of flue 16 are pipes 17 which extend up through vertical plates 20 and terminate in the oxidizing chamber formed by the flue 18 and cylinder 5. In Fig. 2 these air and steam pipes are arranged vertically within the stack 4, while in Fig. 1 they are arranged horizontally in the fire-box. The latter arrangement is preferred when coal or wood is used as fuel, and the former when oil or gas is employed.

Alternately secured to the inner side of chamber 5, and the outer surface of the flue

18, are deflecting plates or shelves 24, which serve to retard the fall of the material to be oxidized which is fed to the chamber 6 by means of pipes 25 extending outside of the stack 4.

Near the lower end of the chamber 6 is an inclined plate 20, with which is connected a delivery-pipe or chute 26.

From the above it will be seen that the products of combustion of the fire-box are wholly excluded from the oxidizing chamber, so that the deleterious gases therein will not come in contact with the material being oxidized.

The operation is as follows: A fire is made in the furnace and steam and air admitted to the pipes 19 and 21, when they become intensely heated, and escape into the oxidizing chamber, the steam jets serving to draw the air into the same. The products of combustion will pass through the flues 6 and 18 highly heating the oxidizing chamber. The material to be oxidized is fed through the pipes 25, when it will fall upon the deflecting plates or shelves which serve to retard its downward movement, until it reaches the inclined plate 20 from where it can be removed through the chute 26. During its passage through the chamber 6 the material is subjected to the action of the highly heated oxygenous gases and thoroughly oxidized. The noxious gases are conveyed from the chamber 5, by means of the elbow 7 and shaft 8, and any dust or solid particles which may contain precious metals will be returned to the oxidizing chamber through pipes 12 and 13, and by the deflecting-plate 10.

As before stated there being no communication between the oxidizing chamber and the fire-box, the oxygenous gases are not contaminated by coming in contact or mixing with the products of combustion of the furnace.

While my invention is intended more especially for oxidizing gold and silver-bearing ores, it may be employed with equal advantage in oxidizing metallic substances generally.

In Fig. 5 is shown a plate 27 for supporting the inner ends of the air-pipes.

Having thus described my invention, what I claim is—

1. In an oxidizing furnace, the combination with the stack, the vertical cylinder, the con-

centric vertical flue forming with said cylinder an oxidizing chamber, and the cylindrical base formed with a central flue communicating with the lower end of the stack and with said central flue, and also formed with a concentric series of flues, of the air-pipes communicating with the flues of said concentric series, the steam jet pipes located within said air-pipes, the pipes connected with the flues of said concentric series and leading to the oxidizing chamber and the alternating deflecting plates secured to said cylinder and flues, substantially as described.

2. In an oxidizing furnace of the character described, the combination with the vertical oxidizing chamber, the elbow and the shaft, of the inclined pipes having flaring ends connected with said elbow and the inclined pipe leading to the oxidizing chamber with which said pipes are also connected; substantially as and for the purpose specified.

3. In an oxidizing furnace of the character described, the combination with the oxidizing chamber, the central flue, the fire-box and air pipes connected with said oxidizing chamber the gas pipes connected with said air pipes, the elbow and the shaft, of the deflecting plate located in said shaft, the inclined pipe connected with the bottom of said shaft and with the oxidizing chamber and the inclined pipes having flaring ends connected with the elbow and with the inclined pipe; substantially as specified.

4. In an oxidizing furnace, the combination with the fire-box, the stack communicating therewith, the oxidizing chamber, the inclined bottom plate and chute, the cylindrical base, the air and steam jet pipes connected with said chamber, the central flue communicating with the fire-box, the alternating deflecting plates located in said chamber, and the feed pipes, of the elbow, the shaft connected therewith, the deflecting plate located in said shaft, the inclined pipe connected with the shaft and oxidizing chamber, and the flaring pipes connected with said elbow and inclined pipe; substantially as described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

SAMUEL LOUIS PRIESTONE.

Witnesses:

THOMAS JEFFERSON THOMPSON,
WILLIAM WILLARD OLIVER.