

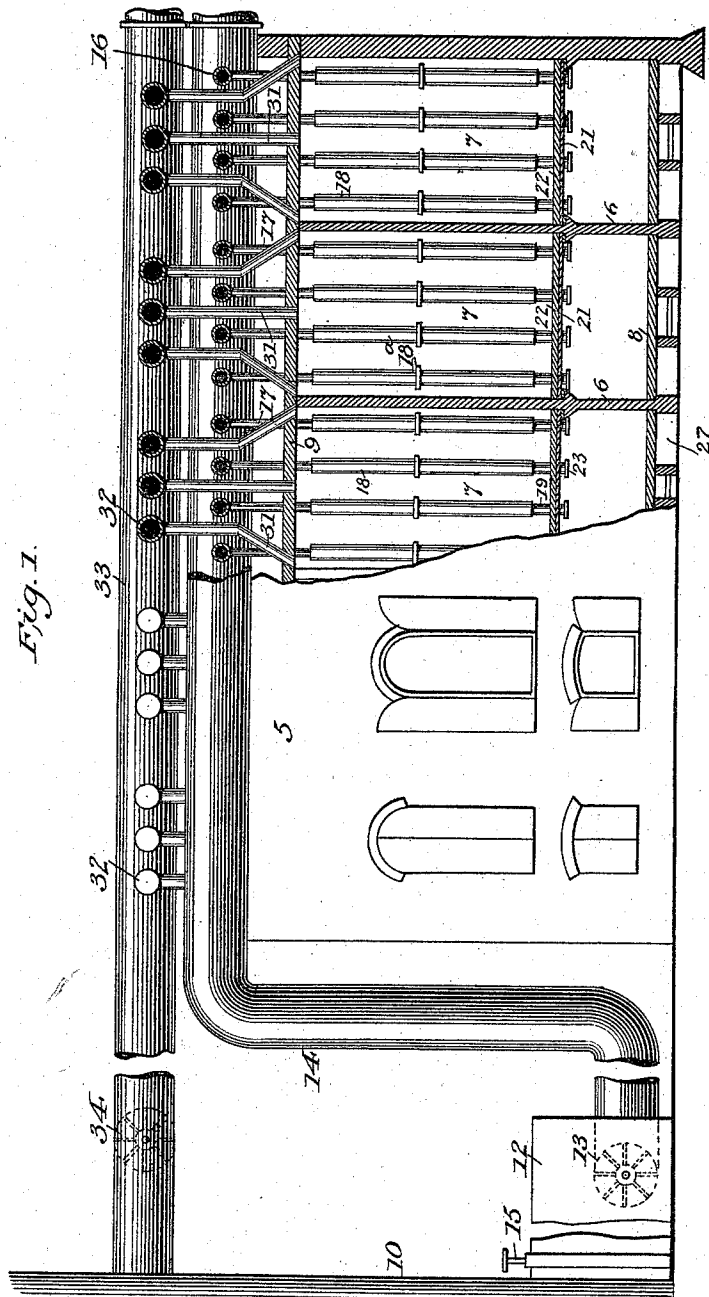
(No Model.)

2 Sheets—Sheet 1.

J. ROURKE.
CONDENSING APPARATUS.

No. 530,553.

Patented Dec. 11, 1894.



Witnesses.
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

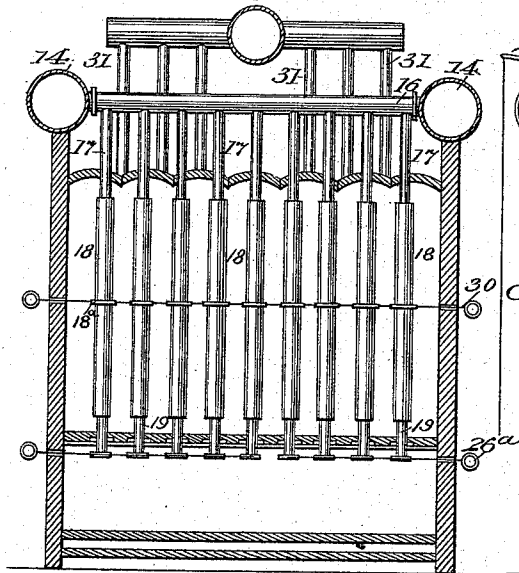


Fig. 2.

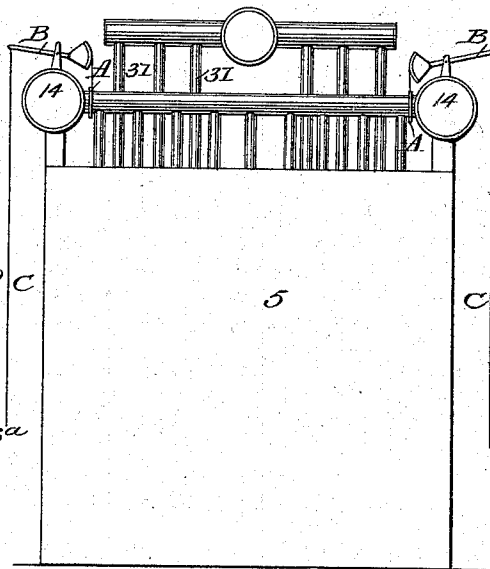


Fig. 4.

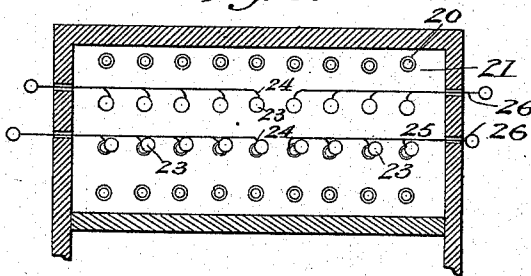
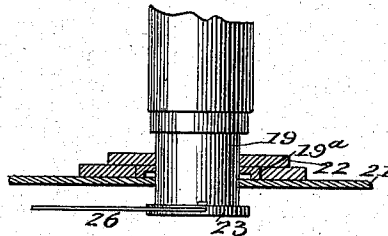
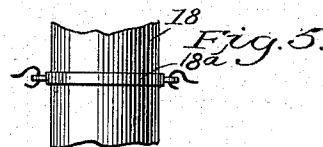
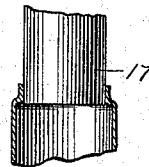
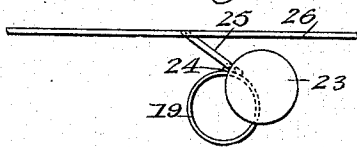


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN ROURKE, OF SALT LAKE CITY, UTAH TERRITORY.

CONDENSING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 530,553, dated December 11, 1894.

Application filed May 21, 1894. Serial No. 511,950. (No model.)

To all whom it may concern:

Be it known that I, JOHN ROURKE, a citizen of the United States of America, residing at Salt Lake City, in the county of Salt Lake and Territory of Utah, have invented a certain new and useful Condensing Apparatus; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to an improved condensing apparatus for use in connection with smelting plants; and its object is the saving of that portion of the precious metals which is otherwise carried away with the smoke, vapors and gases of the furnace. My improved apparatus is connected with the stack of the furnace. The fumes from the stack are carried to a condensing and depositing chamber through a suitable conduit, by the aid of a fan or other suction inducing mechanism. The valuable portion of the fumes, namely, the precious metals which have escaped from the furnace in the form of vapor, is caught in tubes which are of such construction that the valueless portion of the fumes is allowed to escape by passing through the walls of the tubes. These poisonous, or other vapors, after leaving the tubes, enter the surrounding compartments of the chamber, and pass thence through suitable outlets into a return conduit or pipe connected with the stack at a point above where the fumes are originally taken from the stack. The tubes in which the metals are deposited protrude through apertures formed in a false floor located a suitable distance above the true floor of the chamber. The protruding extremities of these tubes are normally closed by valves controlled from the outside of the chamber, whereby the contents of the tubes are discharged at intervals into the compartment located below the false floor. These condensed metal deposits thus pass to the true floor of the chamber, whereby they may be further reduced or treated as may be desired, by heat from fire boxes located beneath the true floor or bottom of the chamber. The tubes in which the

metallic deposition takes place may be shaken from the outside of the chamber to prevent them from clogging. This shaking mechanism is attached to the tubes and projects through the outer wall of the chamber.

Having thus explained the purposes and objects of my invention, and having briefly outlined the construction of the mechanism, I will now describe in detail, the apparatus, reference being made to the accompanying drawings in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a side elevation of the apparatus, the front wall of the chamber being partly broken away to show the mechanism within. Fig. 2 is an end elevation of the same. Fig. 3 is a vertical cross-section taken through the condensing chamber. Fig. 4 is a horizontal section taken through the wall of the chamber, and presenting an underneath view of the false floor. Fig. 5 is a fragmentary view in detail and on a larger scale, illustrating one of the tubes in which the metal particles are caught. Fig. 6 is a detail view illustrating the valve attached to the collar located at the lower extremity of a depositing tube.

Similar reference characters indicating corresponding parts or elements of the mechanism in the several views, let the numeral 5 designate the condensing chamber divided by partitions 6 into any suitable number of compartments 7. Besides the vertical walls, the chamber is provided with a floor 8 and a top 9. Connected with the stack 10 of the smelting furnace (not shown) is the blast chamber 12 in which is located a suction fan 13. From this chamber leads a pipe 14 which is carried upward and supported above the top of the chamber 5.

In the drawings (see Figs. 2 and 3), two pipes 14 are illustrated. There may, of course, be any number of these conduits, whose function is to carry the fumes from the stack to the chamber 5.

The blast chamber is provided with a damper 15, whereby the communication between the stack and chamber may be cut off at will.

The pipes 14 are closed at their farther extremities, whereby their only outlet is via the chamber 5. These pipes extend longitudinally of the chamber, and are connected by

transverse pipes 16 from which lead depending branch pipes 17 which pass downward through the top of the chamber. To the lower extremities of these branch pipes 17 are attached the tubes 18 which are composed of any fibrous material,—wire cloth of any suitable mesh, or a combination of wire cloth and sponge, cotton, wool, hair, mineral wool, asbestos, &c. The construction of these tubes is such, that while they retain metal particles, they allow the poisonous gases and worthless portion of the fumes to escape. To the lower extremities of these tubes 18 are attached metal collars 19 which protrude through apertures 20 formed in a false floor 21 composed of sheet iron supported at a suitable distance above the true floor. These collars are provided with projections 19^a which engage the upper surface of the sheet iron floor or horizontal partition. These collars are held in place by a layer 22 of brick placed around them and covering the sheet iron portion of the floor. This false floor is so constructed, and so connected with the walls and vertical partitions of the chamber, that it may be removed if at any time it should be found desirable so to do. To the lower extremities of the collars, which extend beneath the false floor, are attached valves composed of disks 23 hinged at 24 and provided with arms 25 connected with a rod 26 which extends through an aperture formed in the wall of the furnace, and terminates in a hand piece 26^a on the outside. A number of these valves are connected with each rod, whereby a corresponding number of the tubes 18 may be opened and closed by a single act for the purpose of discharging their contents to the floor 8 below forming the bottom of the chamber.

Beneath the floor 8 are the fire boxes 27 employed for the purpose of matting or further reducing the material discharged upon the floor. It will thus be seen that by the use of the false floor, I am able to carry on the process of catching and matting simultaneously.

Attached to the tubes 18 at a point midway of their length, are bands 18^a having eyes whereby a number of the tubes may be connected and operated by a rod 30 protruding through the outer wall of the chamber, and provided with a suitable hand piece on the outside. By these means, the tubes may be shaken from the outside of the chamber, and all tendency toward the clogging of the tubes with the deposits, thoroughly overcome. Any convenient number of the tubes may be connected and shaken through the instrumentality of a single rod.

The waste fumes which escape from the fibrous or porous tubes 18 pass out of the chamber through pipes 31, and thence *via* a transverse pipe 32 into a longitudinal pipe 33 which leads to the stack and communicates therewith at a point above where the pipes 14 are connected.

In case the draft of the stack should not be sufficient, a suction fan 34 is located in the

pipe 33 which acts in aid of the stack draft for the purpose of removing the waste fumes from the chamber.

From the foregoing description, it will be observed that the apparatus is controlled entirely from the outside of the chamber. By reason of this feature, I economize labor, and at the same time, obviate the necessity of the operator coming in contact with the poisonous fumes of the furnace, which, under ordinary conditions, are a constant menace to health, and even life itself. I have thus, it is believed, solved the problem of complete sanitation in this class of work.

It will be observed that each pipe 16 is provided with a damper A located at its junction with the pipe 14. This damper is controlled by a lever B operated by a chain or cord C which hangs downward within reach of the operator while he stands on the ground. By means of these dampers, the depositing tubes 18 of any compartment 7 of the chamber, may be cut off from communication with the pipe or conduit 14, when for any reason, this may be desirable.

Having thus described my invention, what I claim is—

1. The combination with a pipe leading from the furnace stack, of a condensing and depositing chamber divided into any suitable number of compartments, tubes connected with the pipe leading from the stack and projecting into the chamber, said tubes being composed of some fibrous material adapted to catch the mineral particles, and allow the waste portion to escape, a false floor having apertures through which said tubes project, valves attached to the lower extremities of the tubes, and means for controlling said valves from the outside of the chamber, whereby the contents of the tubes may be discharged upon the bottom or matting floor of the chamber, substantially as described.

2. In an apparatus of the character described, the combination with the pipe leading from the stack, of the chamber, the depositing tubes connected with said pipe into the chamber, the false floor through which said tubes protrude, the valves attached to the tubes and controlled from the outside of the chamber, and means connected with the tubes above the false floor for shaking said tubes from the outside of the chamber, as and for the purpose set forth.

3. In an apparatus of the character described, the combination with the pipe leading from the stack, of the closed chamber, the depositing tubes connected with the pipe and projecting into the chamber, the false floor through which said tubes protrude, valves attached to the tubes beneath the false floor and controlled from the outside of the chamber, shaking means attached to the tubes above the false floor and controlled from the outside of the chamber, and a suitable outlet from the chamber for the waste fumes, whereby they are carried to the stack and delivered

at a point above the connection of the first named pipe, substantially as described.

4. In an apparatus of the character described, the combination with the pipe leading from the furnace stack, of the closed condensing chamber, depositing tubes located therein and connected with said pipe, and valves located at the lower extremities of said tubes and controlled from the outside of the chamber, substantially as described.

5. In an apparatus of the character described, the combination with the pipe leading from the furnace stack, of a condensing chamber, depositing tubes located therein

and connected with said pipe, valves located in the lower part of the tubes and controlled from the outside of the chamber, and shaking means attached to the tubes above the valves, whereby the tubes may be shaken from the outside of the chamber, substantially as described.

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

JOHN ROURKE.

Witnesses:

J. E. COBB,

GEORGE M. DOWNEY.