H. S. DOUBLE.

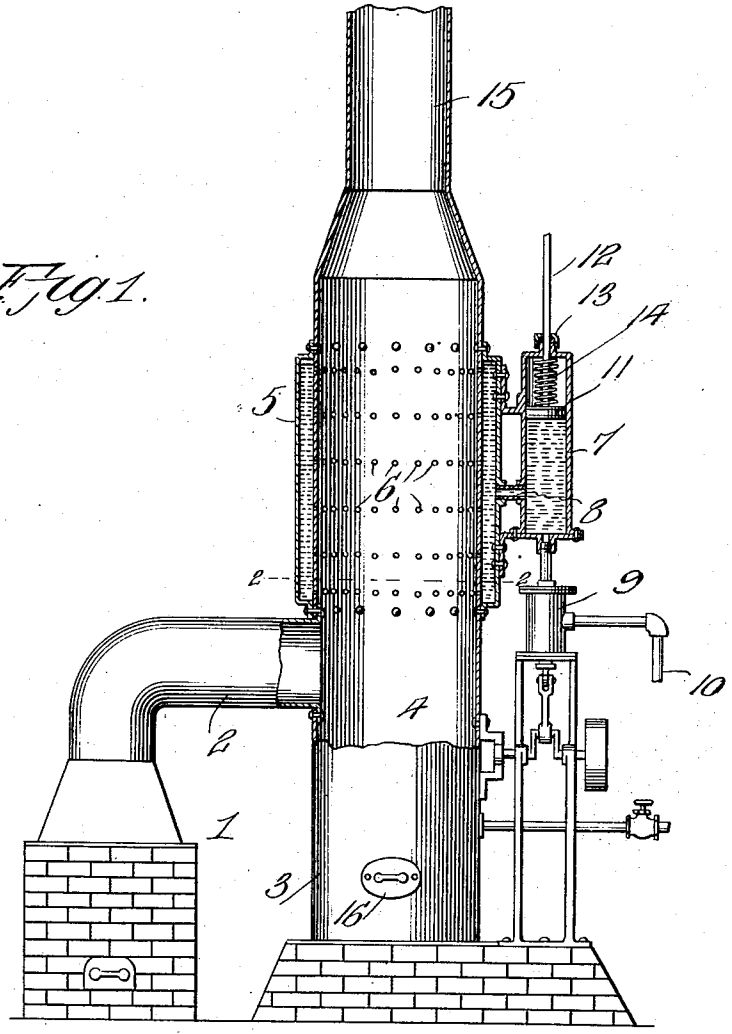
FUME ARRESTER FOR SMELTING FURNACES.

APPLICATION FILED MAY 12, 1908.

917,561.

Patented Apr. 6, 1909.

Fig. 1.



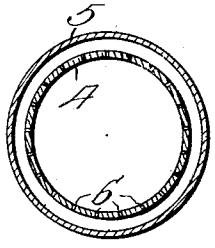


Fig. 2.

Witnesses

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UNITED STATES PATENT OFFICE.

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FUME-ARRESTER FOR SMELTING-FURNACES.

No. 917,561. Specification of Letters Patent. Patented April 6, 1909.

Application filed May 12, 1908. Serial No. 432,406.

To all whom it may concern:

Be it known that I, HORACE S. DOUBLE, a citizen of the United States, residing at Cooke, in the county of Park and State of Montana, have invented new and useful Improvements in Fume-Arresters for Smelting-Furnaces, of which the following is a specification.

This invention relates to fume arresters for smelting furnaces, the object in view being to provide in connection with a smelting furnace, means for saving the values which ordinarily escape in the fumes passing out through the chimney, the invention being designed for use in connection with any construction of smelting furnace and in addition to the value saving characteristics thereof, the device of this invention overcoming in a great measure the smoke nuisance by promoting more perfect combustion of the gases which ordinarily escape from the furnace.

With the above general object in view, the invention consists in the novel construction, combination and arrangement of parts as herein fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a front elevation of a smelting furnace, showing the device of this invention applied thereto and partly in section. Fig. 2 is a horizontal section through the precipitation chamber taken on the line 2—2 of Fig. 1.

Referring to the drawings, 1 designates a smelting furnace of ordinary construction provided with a smoke pipe or flue 2.

In carrying out the present invention, I provide a stand pipe 3 forming a precipitation chamber 4 and place the smoke pipe 2 in communication with said chamber 4, as clearly shown in Fig. 1. Above the point of entrance of the smoke flue 2, the stand pipe 3 is incased by a water jacket 5 while the inner wall of said jacket or in other words, the wall of the stand pipe 3 is provided with a multiplicity of fine perforations 6 adapted to admit a corresponding number of fine streams or jets of water into the chamber 4. At one side of the water jacket 5 there is arranged a water pressure equalizer 7 shown in the form of a cylinder which is placed in communication with the water jacket 5 by an interposed nipple or connection 8. Communicating with one end of the equalizer cylinder 7 is a water pump 9 driven in any suitable manner and having a water supply pipe 10 leading thereto. In the opposite end of the equalizer cylinder 7 there is arranged a follower piston 11, the stem 12 of which passes out of the end of the cylinder through a stuffing box 13 while between the piston 11 and the adjacent end of the cylinder there is arranged an expansion spring 14, which, by reason of its resistance to the action of the pump in forcing water into the equalizer, acts to equalize the pressure upon the water in the jacket 5 surrounding the precipitation chamber. This insures the constant pressure to the water and the proper distribution of the fine sprays of water over and through the smoke and fumes passing from the flue 2 into the chamber 4 and upward past the perforations 6 and outward through the discharge stack 15. The result is that a considerable portion of the value contained in the smoke and fumes are precipitated to the bottom of the chamber 4 where the stand pipe 3 is provided with a man hole over which is placed a manhole cover 16 which gives access to the lower portion of the precipitation chamber to enable the contents thereof to be removed at suitable periods.

The invention hereinabove described acts as a preventative of the smoke nuisance by sprinkling the poisonous gases, and the solid particles, the latter being precipitated to the bottom of the stack. The sprinkling of the gases causes their absorption by the water or causes condensation thereof. Some minerals, such as gold, silver and copper are precipitated by the application of water in the manner set forth, while arsenic, antimony or other soluble minerals are condensed which condensation falls to the bottom of the stand pipe from which it may be removed.

I claim:—

The combination with a smelting furnace, of a precipitation chamber in communication with the smoke flue of said furnace, a water jacket surrounding said chamber above the point of entrance of the smoke flue and having the inner wall thereof perforated to admit water to the precipitation

chamber, said chamber being closed on all sides except the perforated inner side a pressure equalizing cylinder communicating with said jacket, a pump for forcing water into said cylinder, and a spring pressed follower piston working in said cylinder, substantially as and for the purpose described.

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

HORACE S. DOUBLE.

Witnesses:
THOS. M. ROBBINS,
WM. BAUSE.