W. WILEY, Jr.

Condensing Fumes from Smelting-Furnaces.

No. 213,722. Patented Mar. 25, 1879.

Fig. 1.

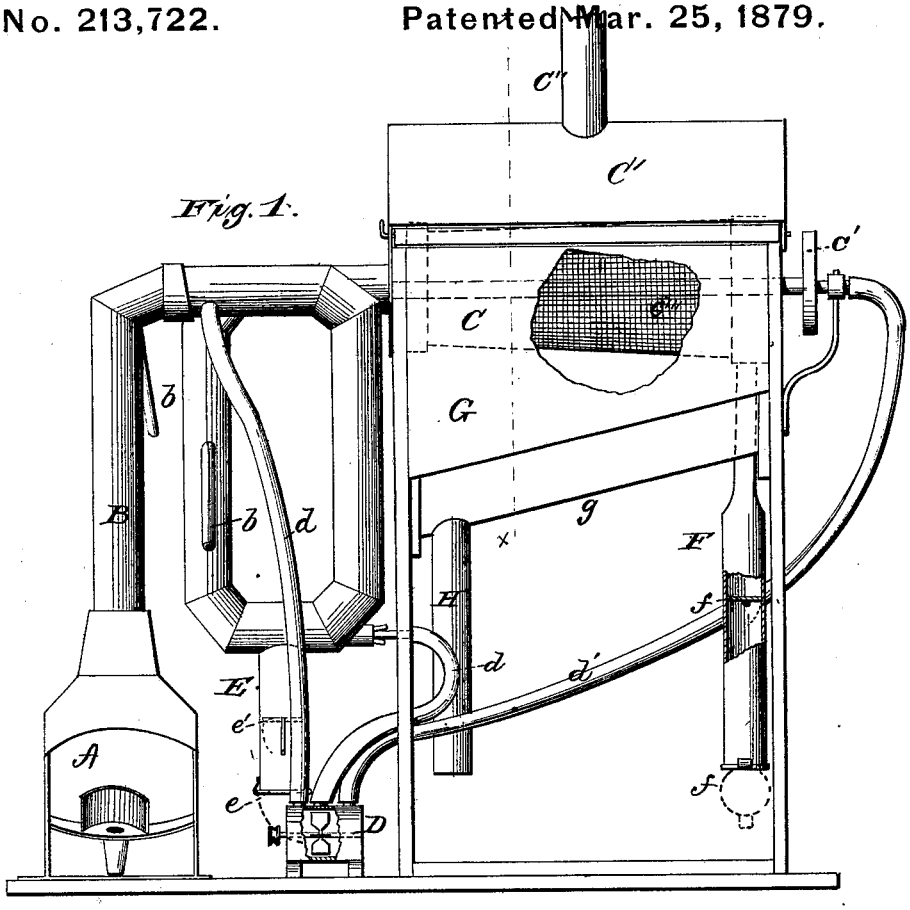
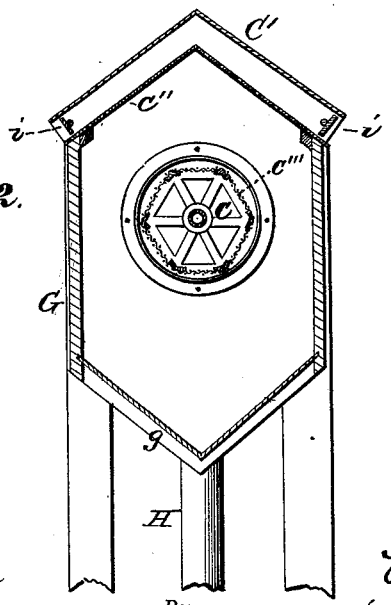


Fig. 2.



WITNESSES.

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WILLIAM WILEY, JR., OF JOPLIN, MISSOURI.

IMPROVEMENT IN CONDENSING FUMES FROM SMELTING-FURNACES.

Specification forming part of Letters Patent No. **213,722**, dated March 25, 1879; application filed July 10, 1878.

To all whom it may concern:

Be it known that I, WILLIAM WILEY, Jr., of Joplin, in the county of Jasper and State of Missouri, have invented certain new and useful Improvements in Condensing or Metalizing the Smoke Fumes or Vapor of Gold, Silver, and Lead, of which the following is a specification:

Figure 1 is a side elevation of a device embodying the present invention, with parts broken away to disclose more fully the internal construction. Fig. 2 is a vertical central section on line *x x* of Fig. 1.

The object of the present invention relates to improvements in devices for cooling and condensing the smoke, fumes, and vapors of lead or any metal which volatilizes under heat as they issue or escape from the furnace; and it consists more particularly in the application and use of atmospheric injectors, in combination with a blast from a blower, to cool or dampen the smoke, fumes, or vapors, and to decrease the velocity of the escaping current thereof through coils of pipe on their way to the condenser; in producing a reverse current upon the rear part of the condenser; and in a revolving condenser, covered with flannel, perforated rawhide, or any analogous material, to receive and discharge the residuum or metal substance extracted or collected from the smoke, fumes, or vapor; and in a close chamber or apartment about the condenser to collect and receive the escaping residuum from the condenser and duly convey it off to a place of deposit; and in pipes and valves for controlling the draft or carrying off the escaping fumes, noxious gases, and the like; and in the general combination of parts and the construction of my said device, all as will now be more in detail set out and explained.

In the drawings, A denotes any ordinary furnace for treating metals. Connected with this is the escape-pipe B, which is preferably made in form of a coil, in as many folds as may be desired. At its rear end it enters the condensing-chamber C, and along its length are placed at convenient points atmospheric injecting tubes *b*, as many as may be necessary for the proper admission of air. Beside these are blast-pipes *d*, connected at one end with said pipe B, and filled by means of blower D. By means of streams of air from said pipes and the blast-pipes *d* the currents of smoke, fumes, or vapors escaping from the furnace A in their passage through the coil B can be almost thoroughly dampened and cooled, and this will cause the deposit of a larger portion of the metallic burden carried along by said currents, and said deposit can be caught in pipe E at the lower part of the coil. The continuing current will be in like manner subject to the influence of the blast-pipe *d* placed in the coil beyond said deposit-pipe E; and, if desired, air-pipes similar to *b* may be used here also. The pipe E has a hinged cap, *e*, at its lower end, or any like device, for the removal of deposit; also, a valve or cut-off, *e'*, at any convenient point along its body. These air-pipes *b*, in number and location, are so adapted and applied that they will insure the ends designed, and not give vent or way of escape for the fumes, vapor, or smoke. The smoke, fumes, and vapor that finally pass from the said coil escape into the revolving condenser C, which is suitably mounted in bearings at either end, and covered with flannel or perforated rawhide *c'''*, or any equivalent material. The heavy residuum of the said smoke, fumes, and vapor, or the metal substance therein, will here be more thoroughly extracted or condensed, and either collect in the pipe F, near the rear head of the cylinder, or, passing through said perforated covering *c'''*, will fall down the incline base *g* of the covering G, and thence pass away through pipe H to any convenient receptacle.

In the escape-pipes any suitable caps and valves or cut-offs may be used for more effectually cutting off the draft, as when the cap at the end of the pipe is opened, or otherwise aid in operating said pipe. To assist or insure the cooling of the fumes, smoke, or vapor in the revolving chamber C, a reverse-current blast can be introduced through pipe *d'* at the rear end of said chamber, the object of this reverse current being to agitate the contents of the cylinder and insure a reduction of the metallic portion of the fumes and smoke. Revolving motion can be communicated to said chamber by means of the wheel *c'* and suitable bands connecting with a motor. The covering G, which surrounds this condenser C, is made

quite tight, but in such a way as to afford easy access to the interior. From its upper part or top extends the escape-pipe C′. By means of said pipe, in which may be suitable dampers, the draft can be thoroughly controlled, and all noxious gases conducted away.

The roof c' of said casing is double, and the under part c'' is perforated. Between the two walls of the roof so made, in the eaves, are placed dampers or valves *i*.

By means of this peculiar construction of the roof the operation of my device may be made yet more useful and effectual for the uses and purposes above set forth and explained.

In this way, and substantially as above described, I am enabled to secure a nearly complete deposit from the fumes, smoke, and vapor of all metallic or valuable material. The admission of air, as above described, serves to supply the needed amount of coolness and dampness to produce the results desired, while by the peculiar arrangement of jets along the passage-way and in the rear of the condensing-chamber I am enabled to attain the most perfect results.

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

1. In combination with furnace A and escape-pipe B, having air and blast pipes, as described, the revolving condenser C and its perforated cover c''', substantially as described.

2. In combination with casing G *g*, having double roof C′ c'', the revolving condenser C, provided with perforated cover c''' and rear blast, d', substantially as and for the purposes set forth.

3. The combination of the revolving cylinder C, having perforated cover c''', with casing G, having inclined base *g*, leading to escape-pipe H, and front pipe, F, connecting with the rear end of the said cylinder, substantially as and for the purpose set forth.

4. The revolving cylinder C, having perforated cover c''', in combination with a cold-air-blast pipe and a furnace, whereby said cylinder serves as a condenser of the fumes, substantially as and for the purposes set forth.

5. The combination of air and blast pipes in the escape-pipe with a reverse blast in the condenser, substantially as described.

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

WILLIAM WILEY, JR.

Witnesses:
WM. B. HALYARD,
ASHTON B. STODDART.