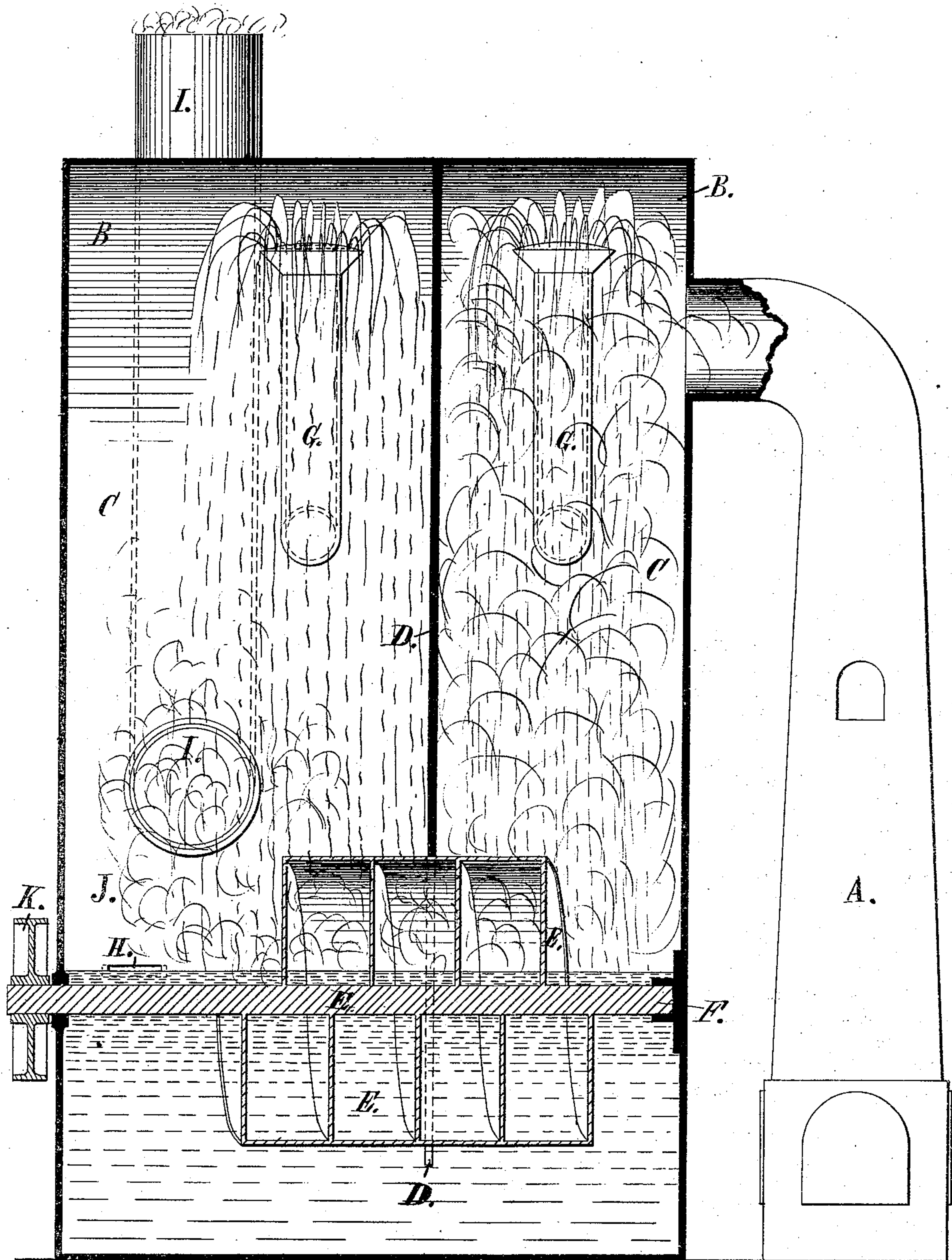


S. W. KIRK & G. R. AYRES.
Apparatus for Condensing Fumes from Smelting
Furnaces.

No. 153,173.

Patented July 21, 1874.



Witnesses

Stanley Williams
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UNITED STATES PATENT OFFICE.

SOLOMON W. KIRK AND GEORGE R. AYRES, OF PHILADELPHIA, PA.

IMPROVEMENT IN APPARATUS FOR CONDENSING FUMES FROM SMELTING-FURNACES.

Specification forming part of Letters Patent No. **153,173**, dated July 21, 1874; application filed December 16, 1873.

To all whom it may concern:

Be it known that we, SOLOMON W. KIRK and GEORGE R. AYRES, of Philadelphia, county of Philadelphia and State of Pennsylvania, have invented certain Improvements in Apparatus for Condensing Fumes from Smelting-Furnaces, of which the following is a specification:

Our invention relates to an improved apparatus for condensing the fumes from a furnace for smelting argentiferous or other ores bearing the precious metals.

In the accompanying drawings is represented a central vertical longitudinal section of an apparatus embracing my improvements.

A is a smelting-furnace, and is connected by an arched flume, B, with the condensing-chamber C. D is a division-wall, extending from the arched top of the flume B down across the condensing-chamber C to within from twelve to eighteen inches of the bottom thereof. Through this division-wall B extends the hollow cylinder E, as shown, and to the interior surface of that cylinder is attached, by air-tight joints, an archimedean screw, which is fastened to and revolves with the spindle F, which may be revolved by a band or belt traveling over pulley K. G G are pipes by which water may be conveyed into the dome of the condensing-chamber, and there discharged in small jets or spray, the outer ends of the pipes being enlarged and capped with perforated plates for that purpose, thus aiding in the condensation of the fumes.

The condensing-chamber should always contain water enough to entirely submerge the spindle F, and an aperture, H, through the wall will serve to draw off the water to the proper level. I is a smoke-stack to convey away such smoke and gas as are designed to be discharged as refuse matter. J is an air-tight doorway for entering the chamber when necessary.

Now, when the furnace is in operation the fumes from its stack bear off much gold, silver, lead, &c., and are themselves discharged into

that portion of the chamber next the furnace, where they are, to a more or less extent, condensed, and then the draft caused by the screw in revolving causes them to enter it, and travel through to the opposite compartment, and in their passage the pressure between the two volumes of water, one in each compartment, aided by its cooling effect, precipitates all their metallic parts, and the refuse passes out through stack I, as before stated.

The operation of the screw so incased in the hollow cylinder E serves to materially increase the draft from the furnace, the chamber C, as well as the division-wall D above the water-line, being air-tight up to the stack I.

We are aware of the patents of Whelpley and Storer, No. 41,251, dated January 12, 1864, and reissues of same, Nos. 4,897 and 4,898, dated May 7, 1872, and of the patent of F. Formhal, No. 73,519, dated January 21, 1868, and reissue of same, No. 3,043, dated July 21, 1868, the said Whelpley and Storer's patent being for improvement in processes of roasting, burning, and heating metallic ores and minerals, and that of F. Formhal for an improved machine for collecting and condensing metallic vapors; and we hereby disclaim the constructions, combinations, and processes shown and described in the said patents so issued and reissued as aforesaid, and confine ourselves to our own; and

What we do claim, therefore, as our invention is—

The combination of the condensing-chamber C, provided with the division-wall D and the spray-pipes G, G, and the cylinder E, provided in its interior with an archimedean screw on spindle F, each of such parts constructed and all arranged substantially in the manner and for the purpose described and set forth.

SOLOMON W. KIRK.
GEO. R. AYRES.

Witnesses:

J. TYSON,
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