

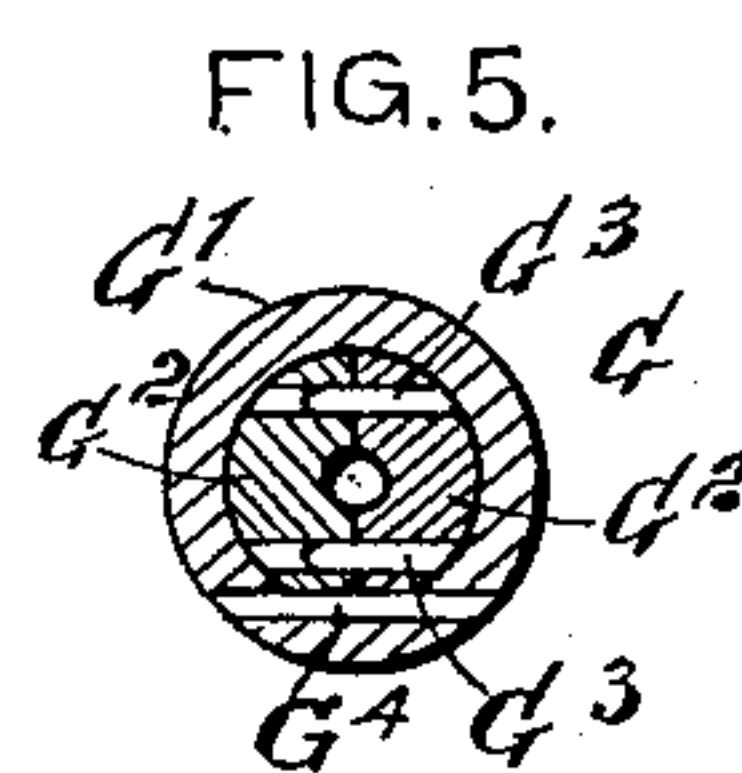
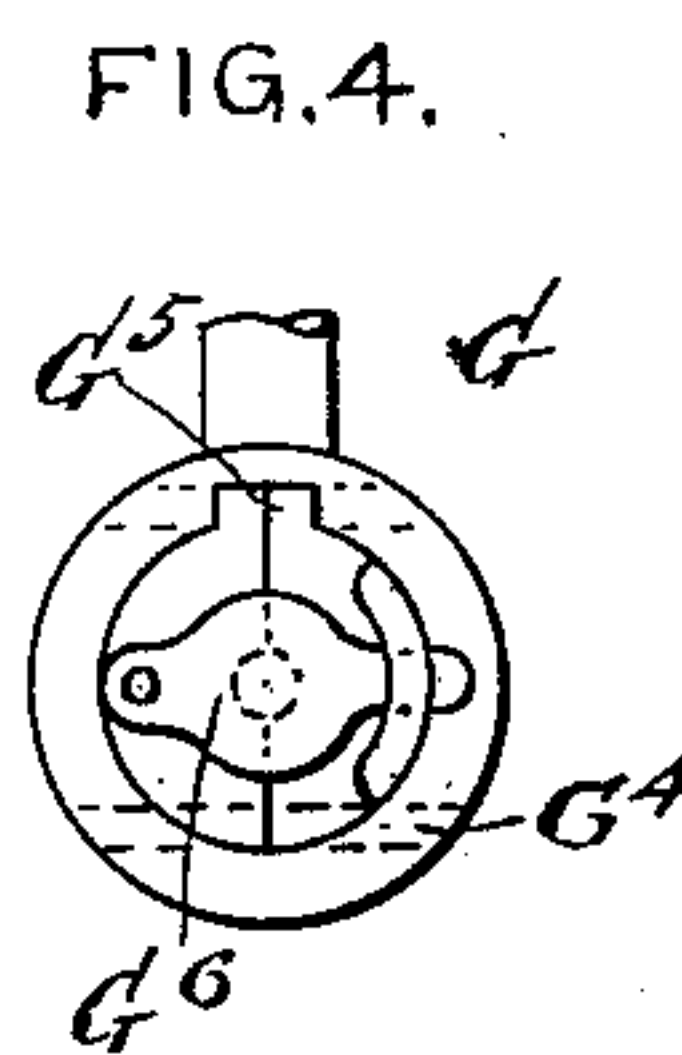
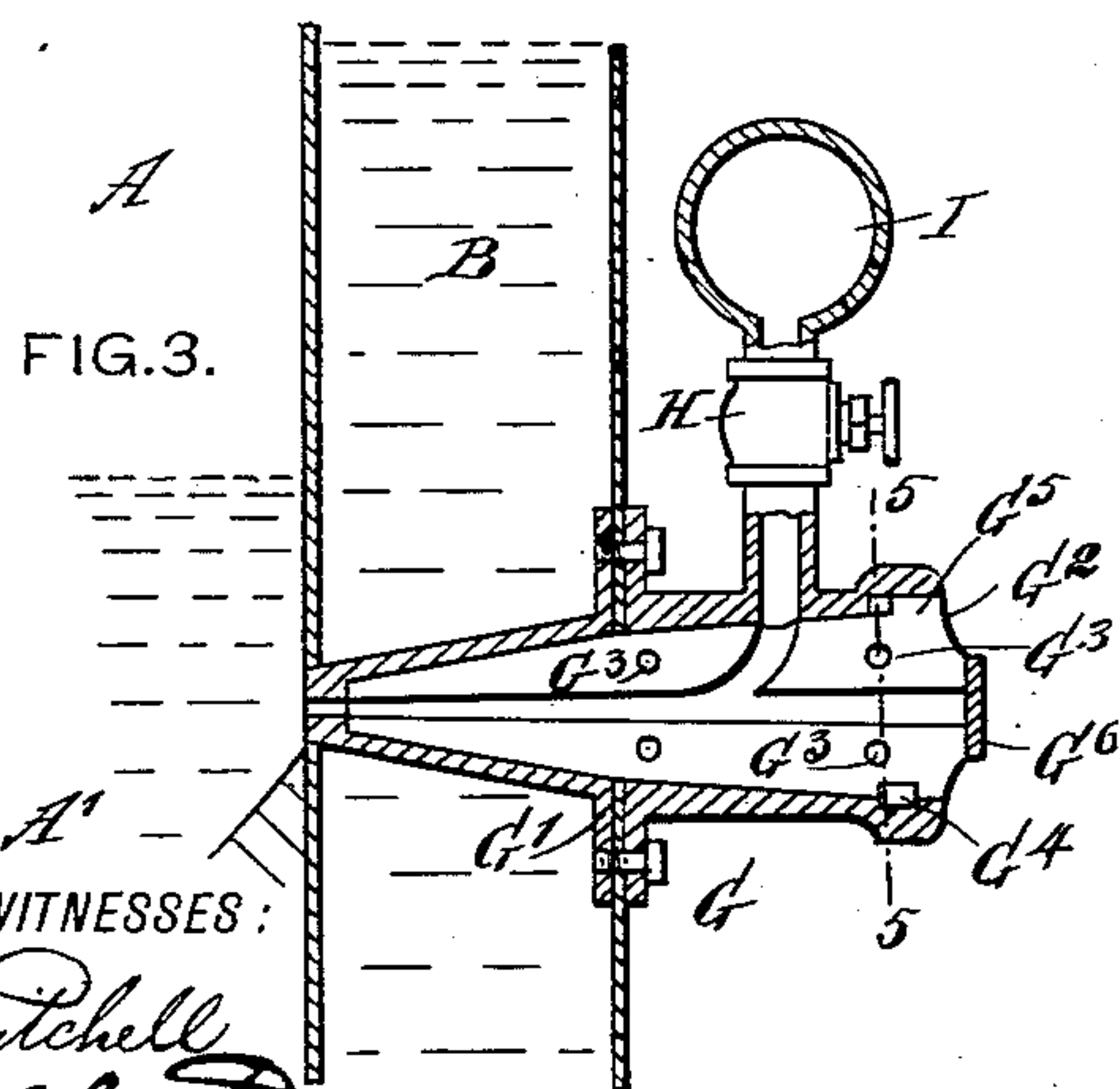
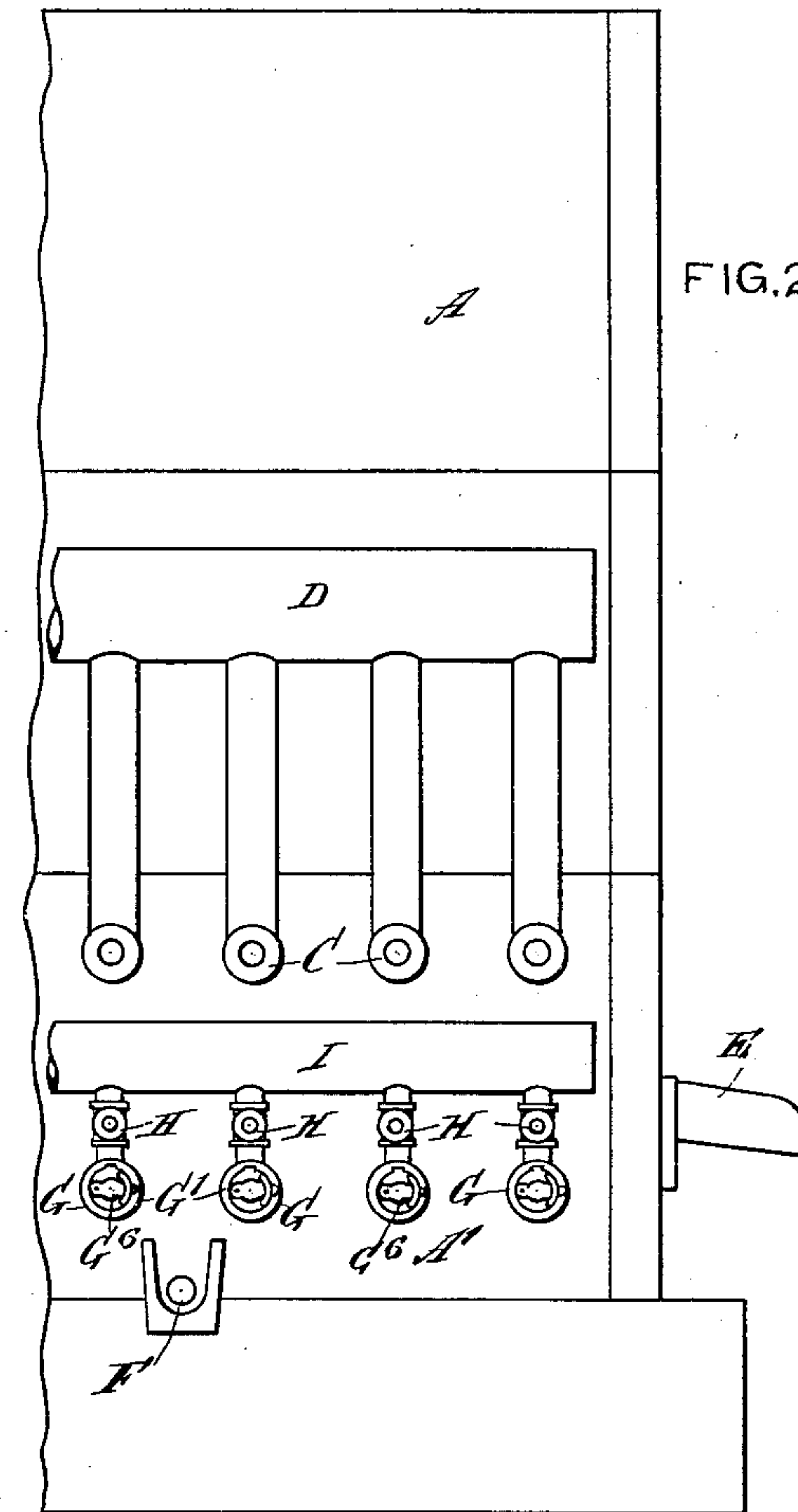
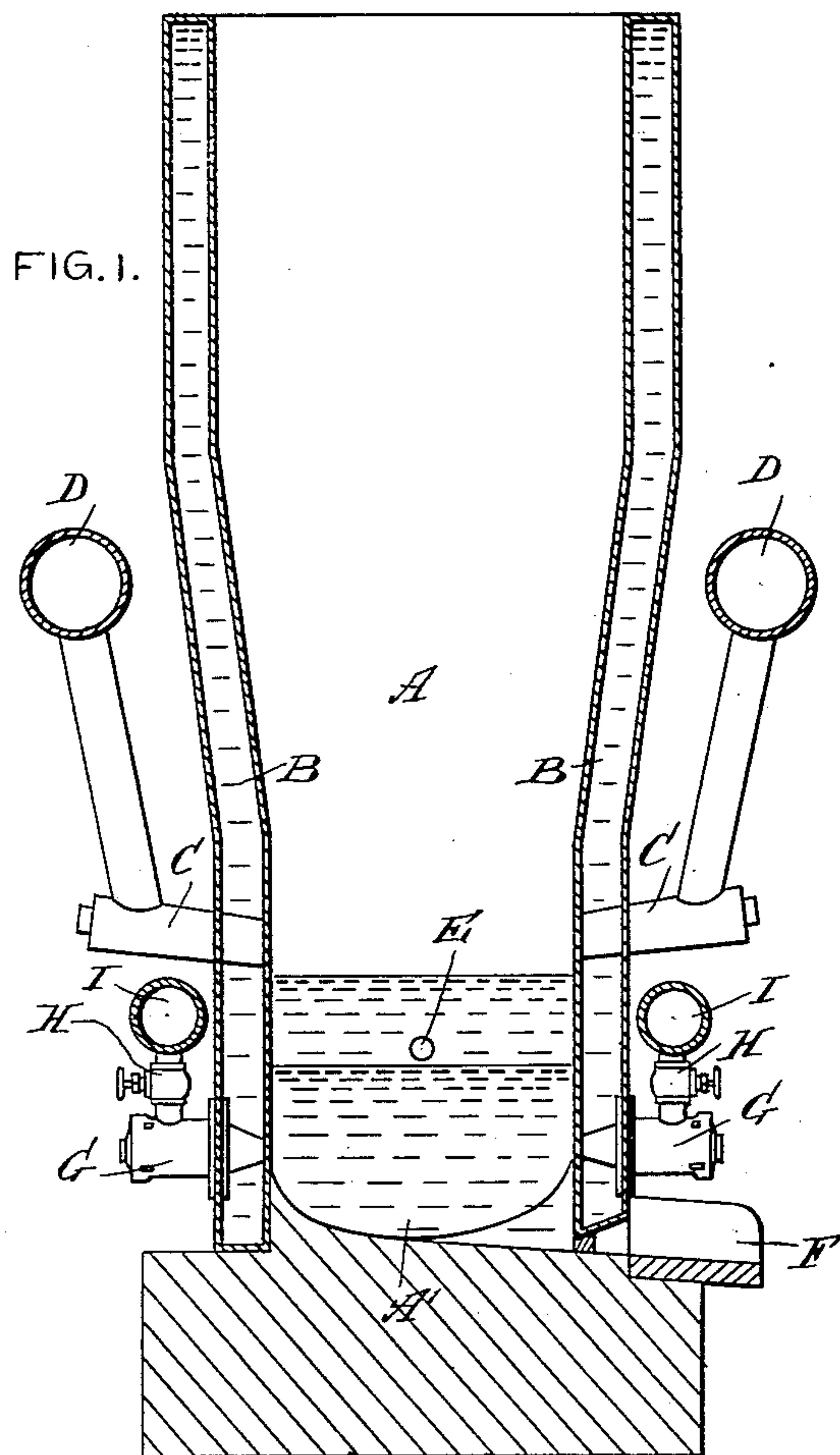
(No Model.)

J. L. WELLS.

APPARATUS FOR DESULFURIZING MATTE OR OTHER FURNACE PRODUCTS.

No. 593,447.

Patented Nov. 9, 1897.



WITNESSES:

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JAMES L. WELLS, OF EL PASO, TEXAS.

APPARATUS FOR DESULFURIZING MATTE OR OTHER FURNACE PRODUCTS.

SPECIFICATION forming part of Letters Patent No. 593,447, dated November 9, 1897.

Application filed December 8, 1896. Serial No. 614,952. (No model.)

To all whom it may concern:

Be it known that I, JAMES L. WELLS, of El Paso, in the county of El Paso and State of Texas, have invented a new and Improved
5 Apparatus for Desulfurizing Matte or other Furnace Products, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved apparatus for reducing
10 low-grade matte and other furnace products into high-grade matte or metal in a very simple and economical manner.

The invention consists of certain parts and details and combinations of the same, as will
15 be fully described hereinafter and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indi-
20 cate corresponding parts in all the figures.

Figure 1 is a cross-section of a furnace with the improvement. Fig. 2 is a side elevation of the same. Fig. 3 is an enlarged longitudinal section of one of the twyers as applied.
25 Fig. 4 is an end view of the same, and Fig. 5 is a transverse section of the same on the line 5 5 of Fig. 3.

The blast-furnace is provided with the usual stack A, having a water-jacket B and
30 twyer C, connected with a pipe D, connected with a suitable air-blast. The air passing from the pipe D into the stack A through the twyers C serves in the usual manner in reducing the ore contained in the furnace, the
35 matte or molten metal accumulating in the crucible A' of the stack A. The slag discharges in the usual manner through a slag-hole E. From the bottom of the crucible A' leads a tap-hole F for discharging the molten
40 metal from the crucible whenever the said hole is tapped.

Twyers G are arranged on opposite sides of the furnace and open into the molten metal at a suitable distance below the slag-hole E,
45 as is plainly shown in the drawings, each of the twyers G being connected by a valve branch pipe H with an air-blast pipe I, connected with a high-pressure air-supply.

It is evident that when the molten metal
50 has accumulated in the crucible A' and the valves and branch pipes H are open then air

under high pressure passes through the twyers G into and through the molten metal, so as to cause the sulfur and other impurities to be oxidized, the bases combining with the
slag and the volatile matter passing upward
55 through the charge in the stack A, and thereby forming high-grade matte or metal, which is run off in the usual manner at the tap-hole F, the slag being run off in the usual manner
60 at the tap-hole E.

Each of the twyers G is preferably of the construction shown in detail in Figs. 3, 4, and 5—that is, each twyer is provided with a shell G', which comprises a flanged inner section
65 extending through the water-jacket B and an outer section likewise flanged, the two flanges taking between them the outer wall of said water-jacket. (See Figs. 1 and 3.) In the shell is arranged a plug made in two
70 sections G², forming a longitudinal bore, and a branch leading therefrom to the pipe H, as is plainly shown in Fig. 3. The sections G² are fastened together by suitable pins G³, and the outer ends thereof are engaged by a
75 key G⁴ for holding the plug in place in the shell. The upper ends of the plug parts are formed with offsets G⁵, fitting into a corresponding recess in the shell to prevent the
80 plug parts from turning and to permit of nicely fitting said parts in position. The outer end of the longitudinal bore formed by the plug parts is normally closed by a hinged door G⁶, which permits when opened of clean-
85 ing the bore when said bore is clogged. By removing the key G⁴ the plug can be readily removed from the shell, and this is necessary in case the air-supply should be suddenly
90 stopped, in which case the slag and matte rush into the bore of the plug and fill the same, the metal cooling in the bore and clog-
ging the same. If this happens, the plug can be readily removed from the shell, and by taking the plug parts apart the chilled metal
95 is dropped out and the plug can be reinserted in the shell, and the opening in the inner end of the shell can be tapped by a suitable tool, so as to again establish a passage for the air from the pipe I to the matte in the crucible.

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

1. A twyer consisting of a shell, a plug made in longitudinal grooved sections set in said shell, and a transverse pin extending in said sections to fasten them together, substantially as described.

2. A twyer consisting of a shell, a plug made in longitudinal grooved sections set in said shell, and a key engaging both sections and the shell, to hold the plug in place in the shell, substantially as described.

3. The combination of the tubular twyer-shell and the longitudinally-bored plug set in said shell and provided with a projection engaging a corresponding recess of the shell

to prevent the plug from turning relatively to the shell, substantially as described.

4. The combination of the tubular twyer-shell and the longitudinally-divided plug having recesses in its sections to form a longitudinal bore, the sections also having abutting projections engaging a corresponding recess of the shell to prevent the plug from turning therein, substantially as described.

JAMES L. WELLS.

Witnesses:

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