

(No Model.)

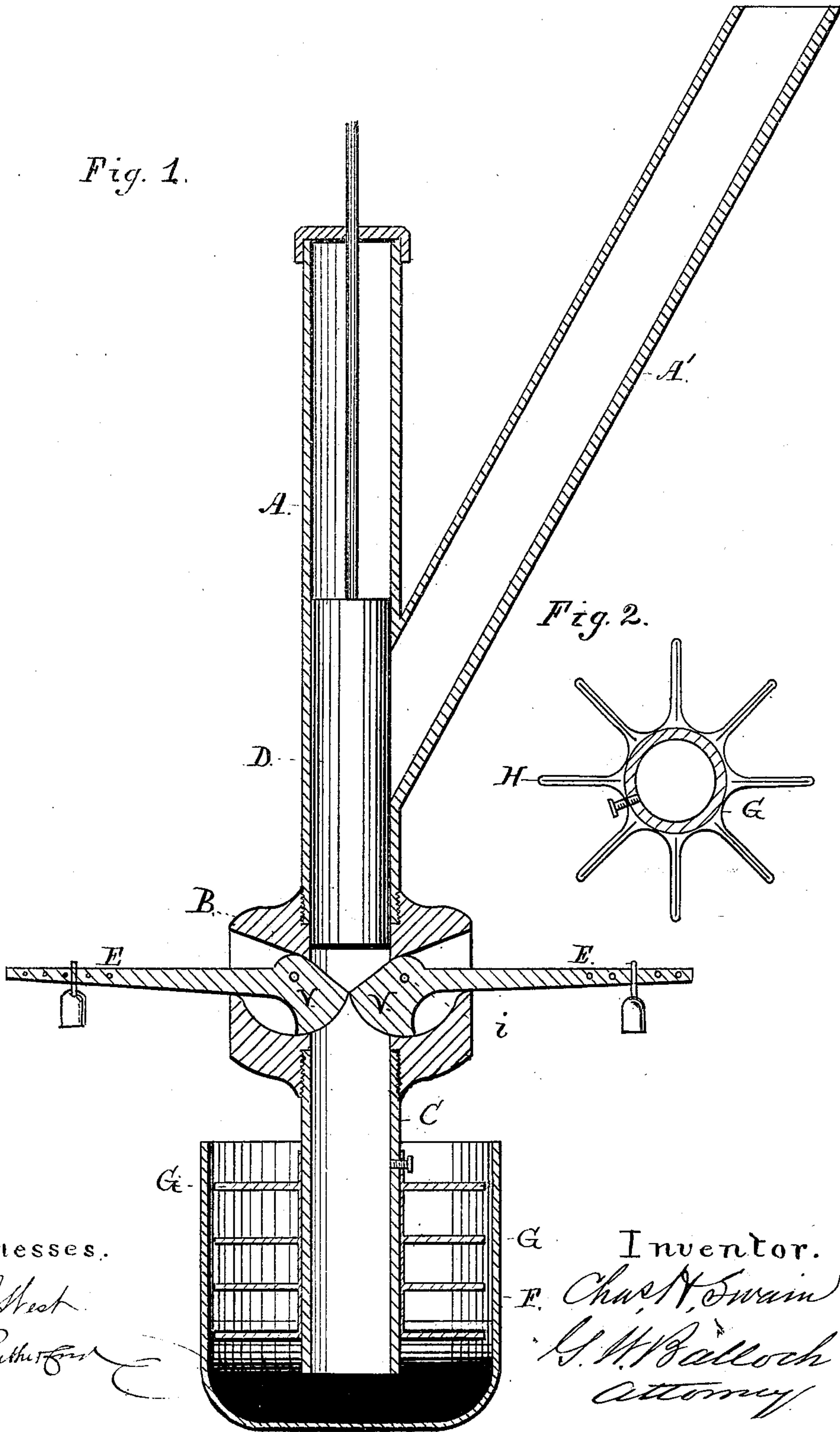
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APPARATUS FOR AMALGAMATING ORES.

No. 252,978.

Patented Jan. 31, 1882.

*Fig. 1.*



*Fig. 2.*

Witnesses.

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# UNITED STATES PATENT OFFICE.

CHARLES H. SWAIN, OF NEW YORK, N. Y.

## APPARATUS FOR AMALGAMATING ORES.

SPECIFICATION forming part of Letters Patent No. 252,978, dated January 31, 1882.

Application filed December 8, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. SWAIN, of New York, in the county of New York and State of New York, have invented a new and useful Apparatus for Amalgamating Ores; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

10 The affinity of gold and silver for lead, zinc, antimony, copper, &c., is a well-known fact in chemistry, and no claim can be made for any knowledge in that direction. Various devices have been used to utilize this affinity in the separation of the precious metals from ores. Among  
15 the more recent are those of W. H. Devair, No. 34,673, and D. E. Rose, No. 240,548. This chemical affinity is, however, the basis upon which the application of the mechanical device  
20 herein described is made for the extraction of gold and silver from ores in which they occur by means of the passage of same, when finely pulverized, through a bath of molten lead.

The machinery, process, and manner of using the same are more fully described as follows:

Figure 1 is a vertical sectional view. Fig. 2 is a detail view in section.

30 A is a cylinder, in which a piston, D, is made to move up and down by any power desired, the lower end of which rises upward above the upper side of the inlet from the feeding-hopper A', so as to allow the space below to fill with pulverized ore from the feeding-hopper  
35 A', and when moved downward the upper end of the piston-head D must not pass below the upper side of the inlet from the feeding-hopper A'. Otherwise the space in the cylinder above the piston-head D will be filled with  
40 pulverized ore.

A' is the feeding-hopper, which conveys the pulverized ore to the cylinder A. B is head carrying controlling-valves. C is lower extension of cylinder, forming a supply-pipe immersed in a vessel containing molten lead. D  
45 is piston-head. E E are valve-arms. F is a suitable vessel for containing molten lead; G, annulus having radial distributing-arms H; H, radial distributing-arms; I, rod or pivot-pin; V V, controlling-valves.

In operating this device I proceed as follows: I have a vessel in which are placed bars of lead, and so arranged that sufficient heat can be applied to melt the lead and bring it to the desired temperature. I then place at a  
55 suitable elevation any kind of furnace for desulphurizing the ores to be worked, which have been first finely pulverized, and discharging the desulphurized ore into a hopper so arranged as to receive it direct from the furnace, and  
60 properly protected to retain the heat acquired in process of desulphurizing. From the hopper the pulverized ore passes to the under side of the piston in cylinder. Thence by the downward movement of piston the ore is forced  
65 down and opens the valves, passing below them through the pipe or cylinder extended into the bottom of the bath of molten lead. Except for the closing of the valves when the piston is moved upward the difference in the  
70 specific gravity between the lead and ore would cause the latter to be forced upward as far as the piston was moved. The valves, by instantly closing when the pressure is removed, hold the ore below them until the next downward  
75 movement of the piston again opens the valves and allows the ore to be again forced downward. As the ore is forced out of the pipe into the molten lead its tendency is to instantly rise through the lead to the surface. To re-  
80 tard this movement I have previously placed a number of radial distributors around the pipe from the lower end up to near the surface of the lead in the vessel. As the ore reaches the surface of the molten lead it overflows the  
85 vessel and is removed.

I do not confine myself to any size or shape of the valves. They may be automatic or otherwise, as may be desired.

I do not confine myself to any size or shape  
90 of the pump or the angle of the feed-hopper. The number of pumps, valves, and distributors is left to the option of the party using the same, being governed by the different characters of ores to be used.

I do not confine myself to the exact position  
95 in which the valves, pistons, distributors, and feed-pipes shall be placed.

Having thus described my invention, I claim—



In combination with vessel containing molten lead, the cylinder A, feeding-hopper A', extension-cylinder C, piston-head D, valve-arms E, controlling-valves V, pivot-pin I, and annulus  
5 G, having radial distributing-arms H, substantially as described, and for the purposes set forth.

This specification signed and witnessed this  
8th day of December, 1881.

CHAS. H. SWAIN.

Witnesses:

THO. J. WEST,  
R. G. RUTHERFORD.