

(No Model.)

2 Sheets—Sheet 1.

S. G. ROLLINS.

APPARATUS FOR ROASTING AND AMALGAMATING ORES.

No. 290,802.

Patented Dec. 25, 1883.

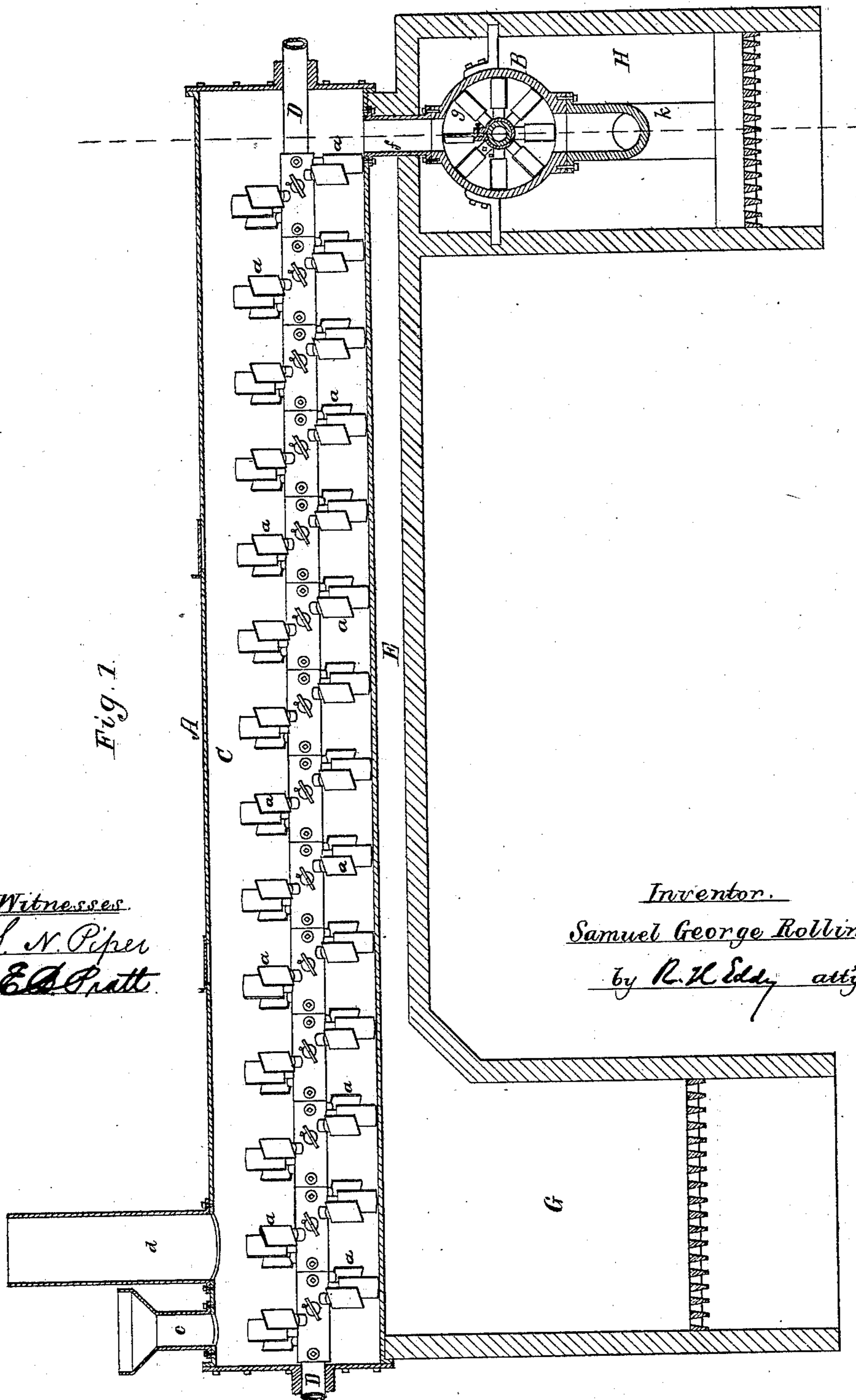


Fig. 1.

Witnesses.  
*S. N. Piper*  
*E. A. Pratt*

Inventor.  
*Samuel George Rollins.*  
*by R. H. Eddy atty.*

(No Model.)

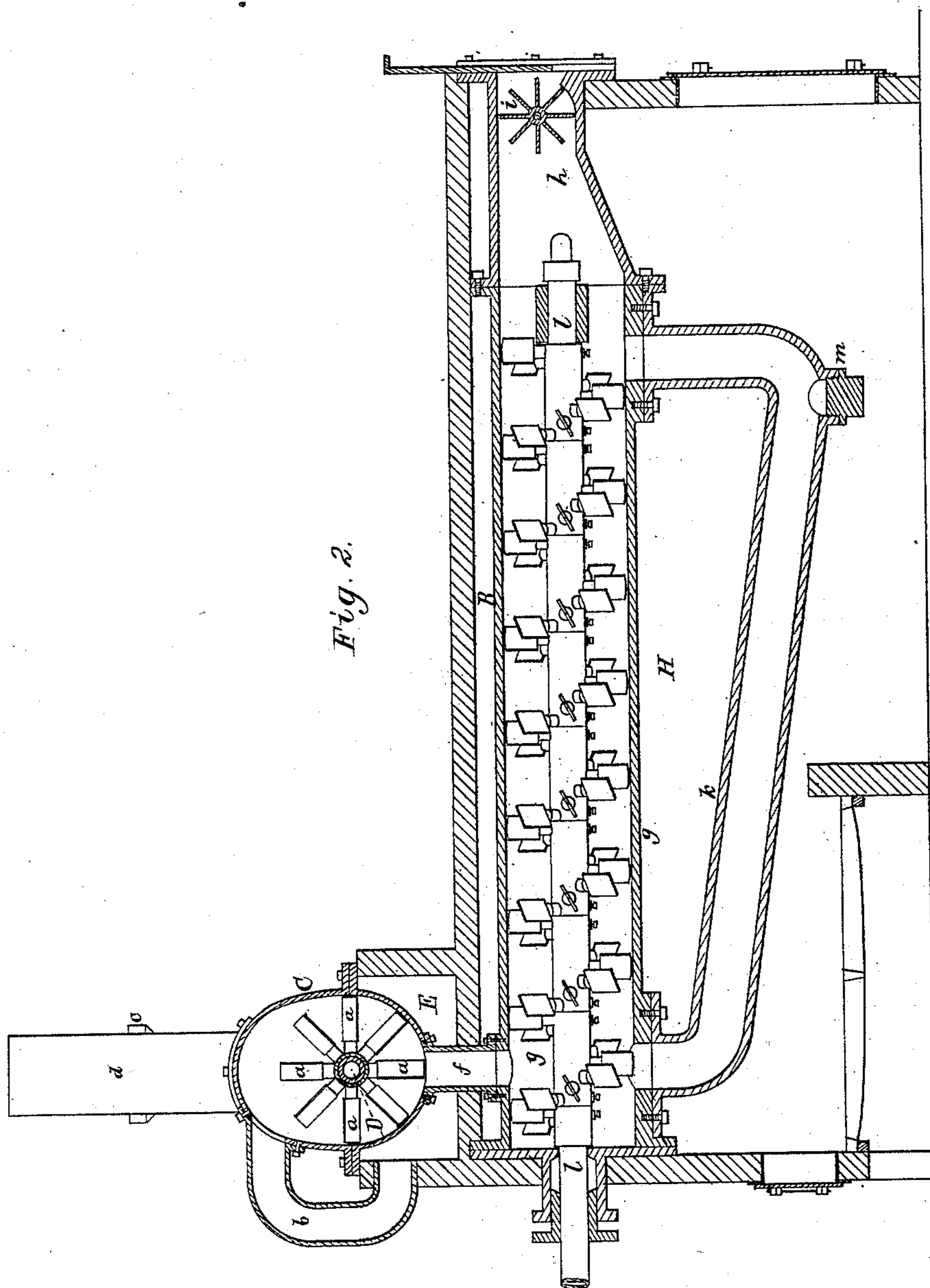
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*L. N. Piper.*  
*E. B. Pratt*

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*by R. H. Eddy atty.*

# UNITED STATES PATENT OFFICE.

SAMUEL GEORGE ROLLINS, OF BOSTON, MASSACHUSETTS.

## APPARATUS FOR ROASTING AND AMALGAMATING ORES.

SPECIFICATION forming part of Letters Patent No. 290,802, dated December 25, 1883.

Application filed August 27, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL GEORGE ROLLINS, of Boston, in the county of Suffolk, of the Commonwealth of Massachusetts, have invented a new and useful Improvement in Apparatus for Roasting and Amalgamating Auriferous or Argentiferous Ores; and I do hereby declare the same to be described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a longitudinal and vertical section of the roaster, such exhibiting the connection of it with the amalgamator. Fig. 2 is a longitudinal section of the said amalgamator.

By means of the roaster, ore in a finely broken or comminuted condition is roasted to desulphurize it, after which it is transferred and delivered into the amalgamator, containing lead in a molten state. By mechanism of the amalgamator the lead is caused to flow in a circuit in contact with the desulphurized ore and agitated therewith, so as to abstract the metal from it, the remainder of the ore being driven out of the amalgamator. The roaster, as well as the amalgamator, has a furnace for heating it, the roaster being shown at A and the amalgamator at B in the drawings. The roaster is a long oven, C, oval in transverse section, and having extended through it from end to end a tubular shaft, D, through which cool water is to be supposed to flow, to keep such shaft from being burned or destroyed by the great heat to which it may be subjected in the process of roasting the ore. This shaft has projecting from it, in a spiral around it, a series of wings, *a*, each of which may be applied to the shaft so as to be capable of being adjusted in its obliquity therewith.

Extending from the furnace G, along underneath the oven C, is a flue, E, which near that end of it which is the farther from the furnace opens into the oven near its upper part, as shown at *b*.

Near the front end of the oven is an induct, *c*, for feeding the ore into the oven, and there is also a chimney or pipe, *d*, for discharging the sulphurous gases or volatile products arising from the fuel and the ore. Near its rear end the oven C has an educt, *f*, leading down from it into the part *g* of the amalgamator B, such part being a long horizontal hollow cylinder,

closed at its front end, and provided at its rear part with a tapering educt, *h*, having within it, near its open end, a rotary propeller or paddle-wheel, *i*, to discharge from the oven the gangue or refuse ore. This wheel *i* acts as a gate, keeping the ore in, so that the proper amount may be received into the amalgamator, and yet the wheel yields to pressure, and allows the tailings, when forced against it, to pass out. Underneath the said part *g* of the amalgamator is another part, *k*, which is a tube inclined and turned upward, in manner as shown, such tube at its ends opening into the part *g* at its bottom. The amalgamator is placed within a furnace, H, the heat from whose fuel is to circulate in contact with the outer surface of the amalgamator.

Within the part *g* of the amalgamator, and extending therein concentrically, is a shaft, *l*, provided, like the shaft D, with a series of wings or paddles arranged in a spiral about such shaft, so that when the shaft is in revolution they will not only agitate the molten lead and the roasted ore therein, but propel such along toward the educt *h*, whose mouth is to be above the charge of lead and ore. By such agitation and propulsion of the charge, the lead is caused to flow in a circuit through the parts *g* and *k* and the roasted ore. In so doing the lead will abstract the metal from the ore, the refuse or remainder of the ore being finally driven out of the amalgamator by the wheel *i*.

In the lowest part of the tube *k* is an opening, *m*, for discharge of the amalgam of lead and metal, such opening being suitably stopped while the lead may be kept in circulation for abstracting the metal from the roasted ore.

In the place of lead in the amalgamator, some other suitable metal may be sometimes used to advantage.

The amalgamating portion of this device is an improvement upon that shown in my Patent No. 254,505, and such improvement consists in using the wheel *i*, so that the amalgamating-chamber can be differently arranged.

No claim is herein made for the roaster *per se*, the right to make the same in another application being reserved.

I claim—

1. The amalgamator, substantially as de-

scribed, consisting of the tubular part *g*, its educt *h*, discharging-wheel *i*, located within the educt *h*, the shaft and its propelling and agitating wings, and the tube *k* and furnace, 5 arranged and adapted substantially and to operate as set forth.

2. The roaster A, in combination with the amalgamator B, each provided with a longitudinal conveyer, such as described, the roaster 10 er having an input, *c*, and the amalgamator

an output, *h*, the roaster and amalgamator being connected as set forth, whereby the ore introduced at *c* is gradually moved along the roaster into the amalgamator properly treated in both, and the tailings passed out at *h*, as described. 15

SAMUEL GEORGE ROLLINS.

Witnesses:

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E. B. PRATT.