A. W. Hall.

Amalgamator.

No. 46560 Patented Feb. 28, 1865

Fig. 1.

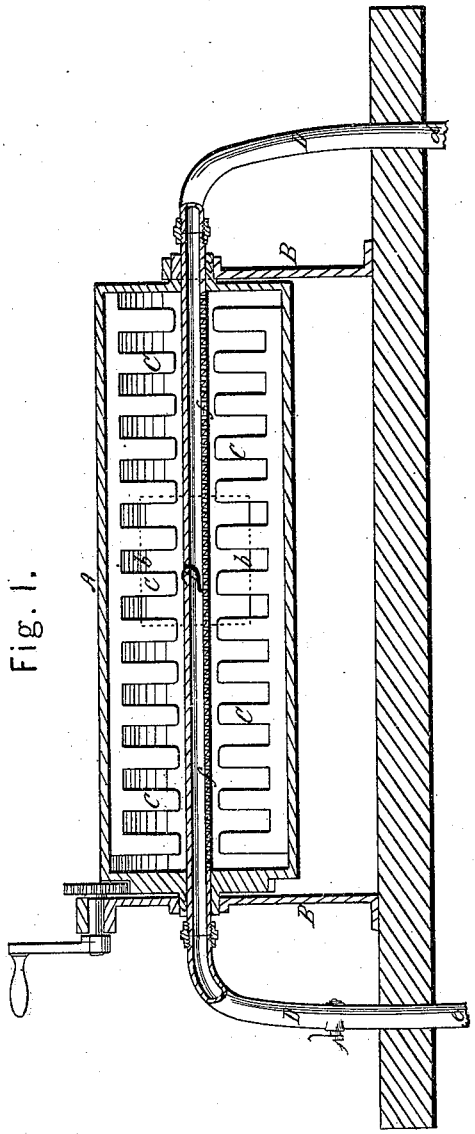
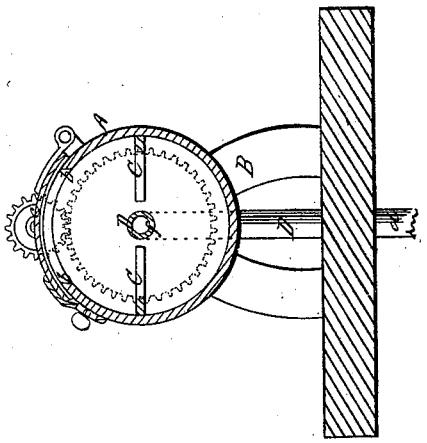


Fig. 2.



Witnesses

J. D. Coombs

G. W. Reed

Inventor.

Alex. W. Hall

per Brown Coombs & Co

Attorneys

UNITED STATES PATENT OFFICE.

ALEXANDER W. HALL, OF NEW YORK, N. Y.

IMPROVED AMALGAMATOR.

Specification forming part of Letters Patent No. **46,560**, dated February 28, 1865.

To all whom it may concern:

Be it known that I, ALEXANDER W. HALL, of the city, county, and State of New York, have invented a new and Improved Amalgamator for Extracting Gold and other Metals from their Ores; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a central longitudinal vertical section of the amalgamator. Fig. 2 is a transverse vertical section of the same.

Similar letters of reference indicate corresponding parts in both figures.

This amalgamator is for amalgamating gold or other metals by the introduction among the pulverized quartz or ore of the vapor of quicksilver.

It consists of a horizontal rotating air-tight cylinder provided internally with lifters, for the purpose of lifting up and turning over the pulverized quartz or ore contained within it, and having hollow journals through which is inserted a stationary perforated tube, for the introduction in jets of the vapors of quicksilver, admitted from a retort connected with one end of the said tube, the other end of which enters a condenser, in which any vapors escaping under the control of a pressure-regulating valve or cock near the outlet of the tube are condensed and collected.

To enable others skilled in the art to make and use my invention, I will proceed to describe it with reference to the drawings.

A is the horizontal cylinder, having its hollow journals *a a* supported in bearings in standards B B at each end, and having an opening, *b*, for the introduction of the pulverized quartz or ore, said opening being fitted with an air-tight door or cover, *c*, which is closed after a charge of quartz or ore has been introduced.

C C are the lifters attached to the inner periphery of the cylinder, and extending as far toward the center of the cylinder as is desirable in a radial or other direction, which will enable them to lift up and turn over the contents of the cylinder as the latter rotates.

D is the stationary perforated tube extending longitudinally through the cylinder and through the hollow journals *a a* thereof. The end *d* of this tube is to be connected with a retort, in which the quicksilver for amalgamation is vaporized by heat, and the other end, *e*, is intended to dip into water contained in a suitable vessel, in which any escaping vapor of quicksilver can be condensed. Between the cylinder and the end *e* of the tube there is a cock or valve, *g*, for regulating the pressure of the vapor within the cylinder. The opening of the cock or valve may be adjusted by hand or by a proper construction of the said cock or valve, and by the application to it of a spring the pressure in the cylinder may be regulated automatically. The perforations *f f* in the tube D are in the under side only, so that none of the pulverized ore lifted up by the lifters C C and falling on the tube may enter the said perforations and choke them up or enter the tube. The tube need not, however, be continued all through the cylinder; but two separate tubes may be used, terminating just within the cylinder-head, and would be equivalent to the perforated tube extending right through.

The rotary motion of the cylinder necessary for the operation of the amalgamator is produced by suitable gearing, driven by any suitable motor; and when the cylinder has been charged with a suitable quantity of ore and tightly closed, and the quicksilver-evaporating retort set in operation by kindling fire under it, the operation of the amalgamator is as follows: The vapor of the quicksilver entering the cylinder by the perforations of the tube D is thoroughly distributed among the pulverized quartz or ore, as the latter has its fine particles turned over, separated, and turned up by the rotation of the cylinder and the lifters, and as fast as condensation of the vapors within the cylinder takes place amalgamation of the gold with the quicksilver is effected. The cock or valve *g* acts as a safety-valve by which to control the pressure of the vapor within the cylinder and prevent its being burst, and any vapors which escape by the said cock or valve are collected in the condenser, and thereby saved. The time necessary to effect the amalgamation and coating of the gold contained in quartz or ore to a profitable degree or extent will depend upon the richness of the quartz or ore and the degree of fineness to which it has been pulverized, and will have to be determined by practice or experience. When the amalgamation

and coating of the gold as far as profitable have been effected, the rotation of the cylinder is stopped, the door or cover *c* opened, and the contents of the cylinder removed, to be subjected to the ordinary process of washing and saving the gold.

In order to provide for the rapid cooling of the cylinder and condensation of any vapor of quicksilver that may remain therein, after amalgamation has been completed and before opening the cylinder for a new charge, an air pump or blower may be connected with the tube D, between the retort and the cylinder, for the purpose of blowing cold air into and through the cylinder, the said air escaping through the condenser.

What I claim as my invention, and desire to secure by Letters Patent, is—

An amalgamator consisting of a horizontal rotating cylinder with internal lifters, C C, a stationary perforated tube or its equivalent inserted through the hollow journals of the said cylinder for the introduction of the vapor of quicksilver thereinto, and a cock or valve, *g*, to regulate or control the pressure of the vapor within the said cylinder, the whole combined, arranged, and operating substantially as herein specified.

A. W. HALL.

Witnesses:
J. W. COOMBS,
GEO. W. REED.