T. WALKER.

AMALGAMATOR.

No. 191,272. Patented May 29, 1877.

Fig. 1

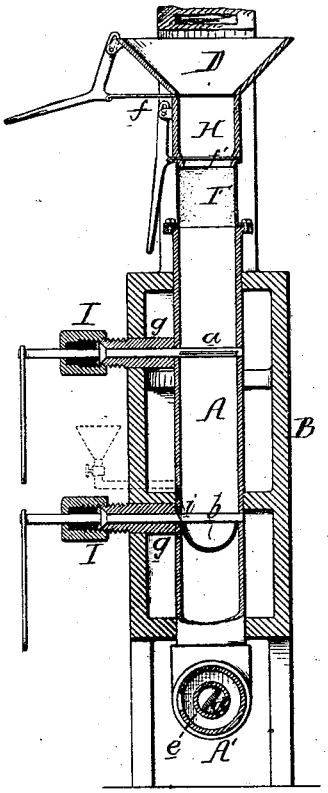


Fig. 2.

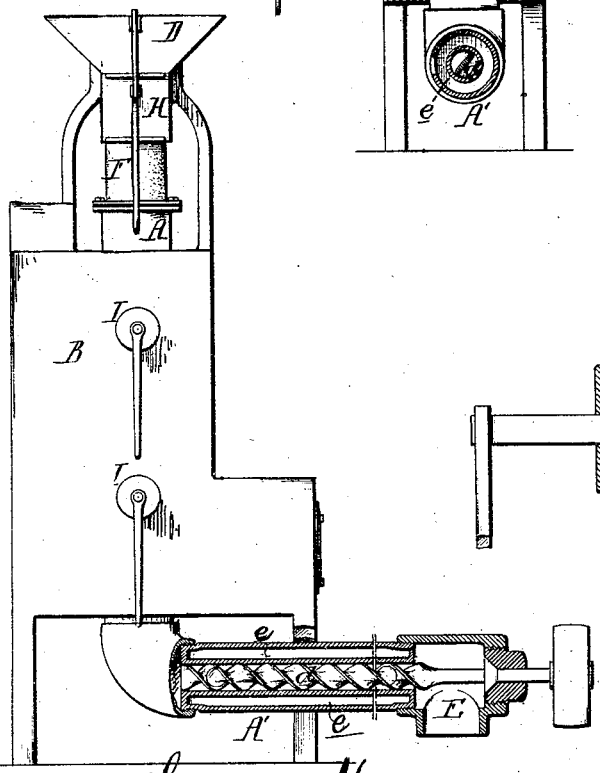
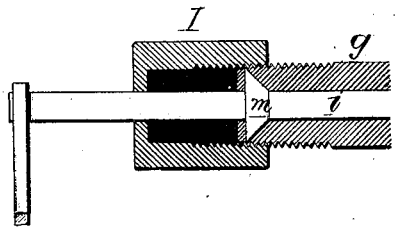


Fig. 3



Witnesses

Hermann Moessner

Harry Smith

Inventor.

Thomas Walker

by his Attorneys

Howson and Sons

UNITED STATES PATENT OFFICE.

THOMAS WALKER, OF PHILADELPHIA, PA., ASSIGNOR TO THOMAS WALKER, JOSEPH W. BANCROFT, AND S. H. SAFFORD, OF SAME PLACE.

IMPROVEMENT IN AMALGAMATORS.

Specification forming part of Letters Patent No. **191,272**, dated May 29, 1877; application filed September 18, 1876.

To all whom it may concern:

Be it known that I, THOMAS WALKER, of Philadelphia, Pennsylvania, have invented certain Improvements in Amalgamators, of which the following is a specification:

My invention relates to certain improvements in the amalgamator for which Letters Patent were granted to J. W. Bancroft and myself on the 23d day of November, 1875; the objects of my invention being to prevent the hot air which accumulates in the apparatus from interfering with the charging operation, and to provide an efficient device for cooling the ore as it passes from the apparatus.

These objects I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawing, in which—

Figure 1 is a vertical section of my improved amalgamator; Fig. 2, a side view, partly in section; and Fig. 3, an enlarged sectional view of a portion of the same.

I will briefly describe, in the outset, the above-mentioned patented amalgamator, reference being had to Fig. 1 of the drawing.

A vertical retort, A, is arranged within a furnace, B, having flues of such a character that the products of combustion, in passing from the fire-place to the chimney, are caused to take a circuitous course around, and in contact with, the retort, which becomes highly heated.

The upper portion of the retort projects above the top of the furnace, and into this portion of the retort the ore is fed through a suitable hopper, D, the charge resting upon a valve, *a*, where it is subjected to the vapor arising from mercury previously introduced into the cup-shaped valve *b*. After being subjected to this preliminary treatment for a proper length of time, the ore is dumped directly into the valve *b*, and is there subjected to the full effect of the mercury vapor, a fresh supply being placed upon the valve *a*. As the mercury vapor comes in contact with the cold ore in the top of the retort it is condensed, and descends until it is again vaporized.

After the ore on the valve *b* has been sufficiently heated it is dumped into an extension of the retort, where it is permitted to become cool.

In the Bancroft and Walker patent this extension was inclined, and the ore was permitted to pass gradually down the same; but this plan has been found to be objectionable in practice, partly on account of the space which the extension occupied, and partly because the cooling of the ore was not as expeditious as is desirable.

In place of this inclined extension I make an extension, A′, at right angles, or thereabout, to the retort A, and communicating therewith at a point below the valve *b*.

In this extension I place a screw, *d*, which removes the ore from the lower portion of the retort A, and delivers it at the outlet E. I make the walls of this extension double, with an intervening annular chamber, *e*, through which cold air or water is caused to circulate, thus forming an air or water jacket around the ore-passage, for it has been found in practice that the bringing of water into direct contact with the ore at this point causes the generation of vapor, which ascends into and interferes with the operation of the retort A.

The charging of the above-mentioned patented apparatus was also attended with some difficulty, owing to the fact that the air contained in the charge became expanded by heat, so that when the upper portion of the retort was opened to introduce a new charge the expanded air escaped in puffs, and scattered the ore just introduced.

This objection I overcome by providing the upper portion of the retort A with a porous section, F, which allows the air to escape as it expands, and thus prevents the creation of a detrimental pressure in this portion of the retort.

The hopper D has, in the present instance, a tubular shaft, H, which is provided with two slides, *f* and *f′*, so that the quantity of each charge can be determined, and so that the upper slide *f* can be closed before the lower slide *f′* is opened, thereby preventing the escape of gases at this point.

In order to prevent the escape of the mercury vapor, the tubes *g*, through which the

stems *i* of the valves *a* and *b* pass, are provided at their outer ends, which project beyond the walls of the furnace, with stuffing-boxes I, packed with asbestus, or other material not injuriously affected by heat; and in order to still further prevent the chance of escape of the mercury vapor, I prefer to form on each valve-stem *i* a collar, *m*, adapted to a ground seat in the end of the tube *g*, as shown in Fig. 3.

I claim as my invention—

1. The retort A, provided at or near its upper end with a porous section, F, as set forth.

2. The combination of the retort A with the annular extension A′, having double walls, forming an annular chamber, *e*, and with means, substantially as described, for conveying the ore through this extension, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOS. WALKER.

Witnesses:
HENRY HOWSON, Jr.,
HARRY SMITH.

1875