

J. W. BANCROFT & T. WALKER.

AMALGAMATOR.

No. 170,329.

Patented Nov. 23, 1875.

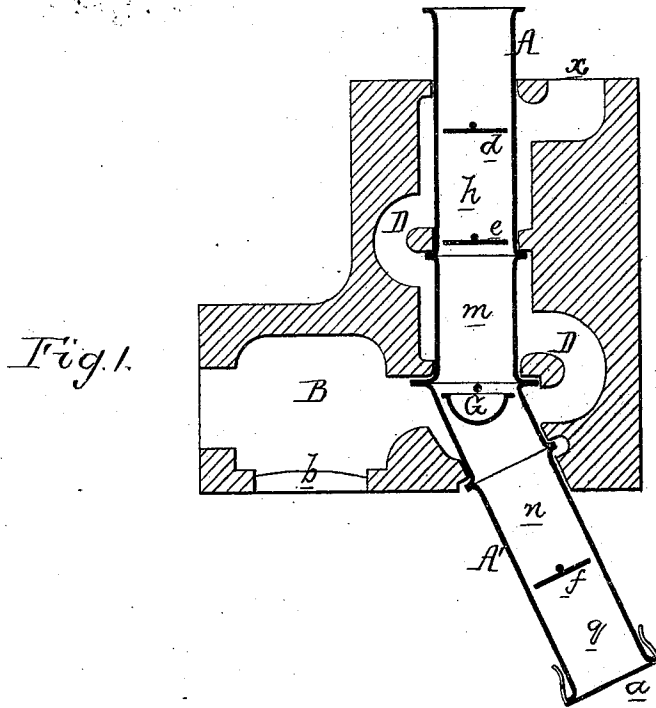


Fig. 3.



Fig. 2.

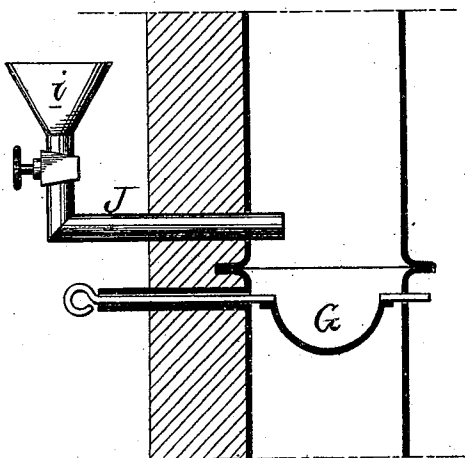
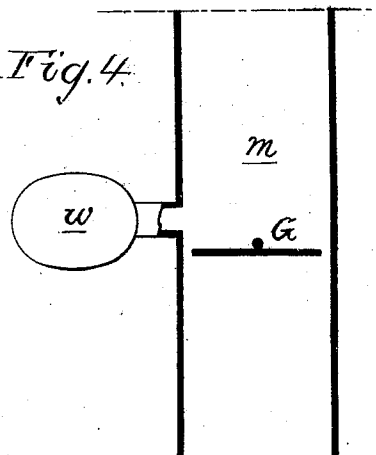


Fig. 4.



Witnesses,
Hubert Haysen
Harry Smith

Joseph W. Bancroft and
Thomas Walker,
by their Attorneys,
Horsman and Son

UNITED STATES PATENT OFFICE.

JOSEPH W. BANCROFT AND THOMAS WALKER, OF PHILADELPHIA, PA.

IMPROVEMENT IN AMALGAMATORS.

Specification forming part of Letters Patent No. **170,329**, dated November 23, 1875; application filed April 17, 1875.

To all whom it may concern:

Be it known that we, JOSEPH W. BANCROFT and THOMAS WALKER, both of Philadelphia, Pennsylvania, have invented an Improved Amalgamating Apparatus, of which the following is a specification:

The object of our invention is to so conduct the process of treating ores by amalgamation that there may be but little interruption in the continuity of the said process; and this object we attain in the manner which we will now proceed to describe, reference being had to the accompanying drawing, in which—

Figure 1 is a vertical section of our amalgamating apparatus, and Fig. 2 a transverse vertical section.

A is a retort, the lower portion A' of which is, by preference, continued in an inclined direction from the upper portion, the lower end being furnished with a detachable plate, *a*, or other equivalent contrivance. The upper portion of the retort is contained within a suitable furnace, of which B is the fire-place, *b* the grate, and D a flue, through which the products of combustion take a circuitous course in contact with the retort until they escape at *x* to the chimney. Within the upper portion of the retort we arrange one or more valves, *d* and *e*, which we prefer to make like ordinary throttle-valves, the spindles passing through the brick-work of the furnace, so that either valve can be made to assume the position shown by dotted lines.

It should be understood that these valves either fit so freely within the retort or are so perforated that the vapors of mercury referred to hereafter can pass upward through the retort, the valves being merely supporters of the pulverized ores. At or near the junction of the upper with the lower portion of the retort we suspend within the same a cup-shaped valve, G, having trunnions adapted to bearings, as shown in Fig. 3, one of the trunnions projecting through the brick-work, and being provided with a handle, so that the valve may be tilted, and its contents discharged into the lower portion of the retort. This valve is so tight to its seat when closed as to cut off the communication between the upper and lower portions of the retort, this

lower portion being provided with a valve, *f*, similar to the valves *d* and *e*.

In using the above-described apparatus the pulverized ore containing the precious metals is permitted to pass from a hopper into the upper portion of the retort, where it is supported by the valve *d*; then, by tilting this valve, the ore is permitted to fall onto the valve *e* of the chamber *h*. In the meantime mercury has been deposited in the receptacle of the valve G by pouring it into the funnel *i*, and permitting it to flow thence through the pipe J into the said receptacle. The charge of ore, having been gradually heated in the chamber *h*, is now permitted to fall onto the valve G by tilting the valve *e* preparatory to the introduction of a new charge of ore into the said chamber *h*. In the chamber *m* the ore is subjected to the direct action of the vapors of mercury; in fact, more or less of these vapors pass upward through the ore in the chamber *h*, through that in the chamber above, where it is condensed by contact with the fresh cold ore. After the ore has remained in the chamber *m* for a sufficient length of time the cup-like valve G is tilted, and the contents of the chamber discharged into the chamber *n* in the lower portion A' of the retort, where it is permitted to become somewhat cool, and is finally discharged into the lowest chamber *g*, from which it may, after closing the valve *f*, and by removing the cover or valve *a*, be permitted to fall into water, where it can be washed in the usual manner, so as to separate the earthy particles from the amalgamated metals, which may be separated by the usual treatment.

Although we prefer the placing of the mercury in the receptacle of the valve G, this is not absolutely essential to our invention. There may, for instance, be a vessel, *w*, projecting from one side of the retort into the flue of the furnace, as shown in Fig. 4, or into a separate furnace, the mercury being introduced into this vessel through a pipe projecting through the side of the furnace, and the vapors passing into the retort at a point above the valve G.

It will be seen that the operations of charging the retort with ore, subjecting the latter

to the vapor of mercury, and the discharge of the heated ore from the retort may be conducted without any interruption other than that demanded in subjecting each charge of ore to the mercury treatment.

We claim as our invention—

1. An amalgamating-retort combined with a furnace, and having a movable valve, G, for supporting a charge of ore while it is being subjected to the vapor of mercury, and for discharging the ore, all substantially as set forth.

2. The cup-shaped valve G, hung within the retort, in combination with the pipe J, through which mercury may be introduced into the receptacle of the valve, all substantially as set forth.

3. The combination, in the retort, of a tight-fitting ore-supporting valve, G, with valves *e* and *d*, for supporting the ore without obstructing the outward passage of the vapor of mercury, as specified.

4. The combination, in the retort, of the valves G and *f*, and a stopper or cap detachable from the lower end of the retort, as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOS. W. BANCROFT.
THOS. WALKER.

Witnesses:

HARRY SMITH,
HUBERT HOWSON.