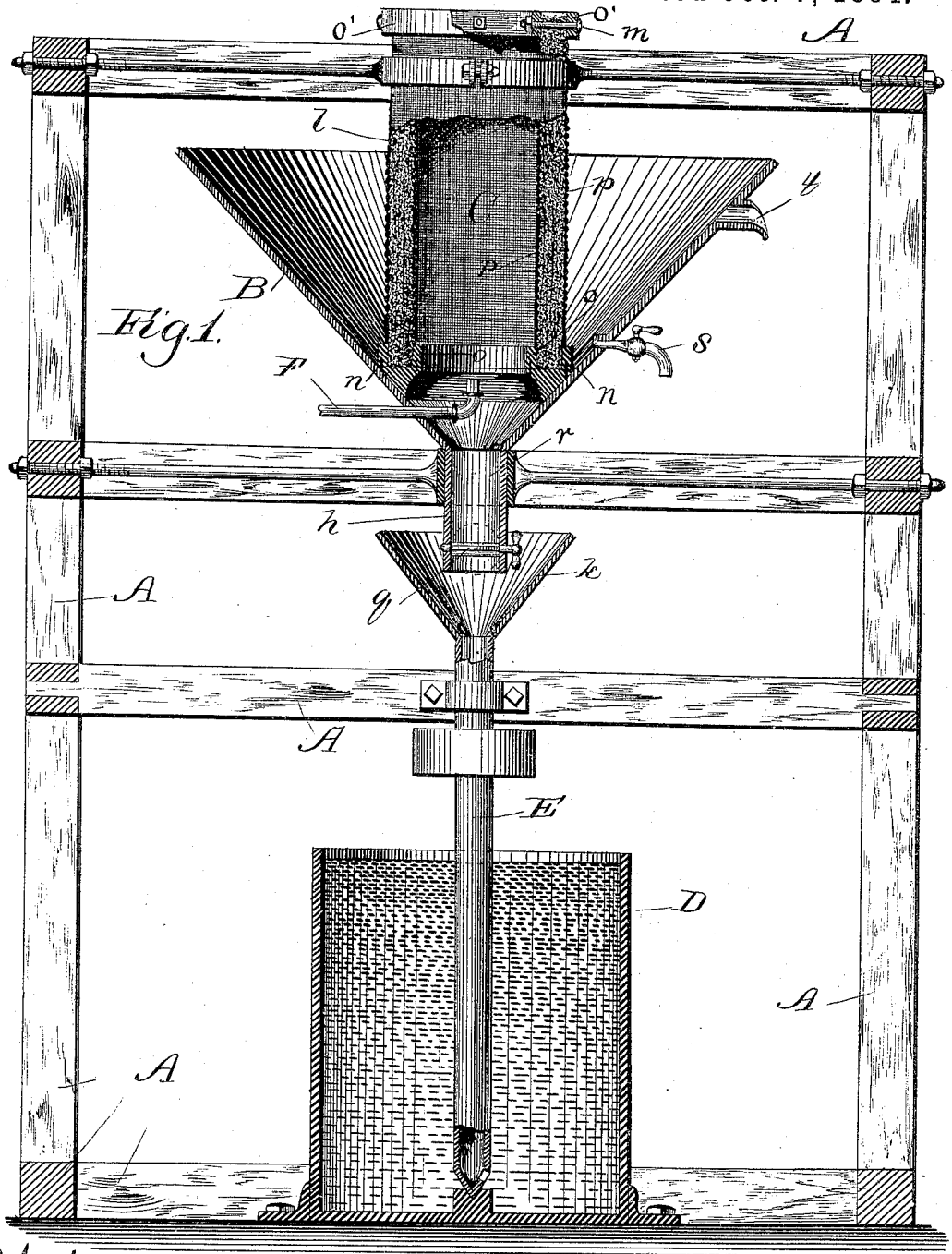
(No Model.)

A. H. BLISS.

APPARATUS FOR SEPARATING METALS FROM THEIR ORES.

No. 306,213. Patented Oct. 7, 1884.



Witnesses:
Chas. E. Gaylord
Douglas Dysenforth

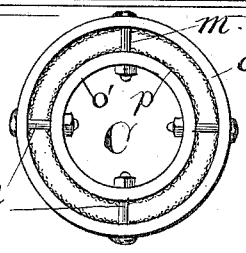


Fig. 2.

Inventor:
Abel H. Bliss
by Dysenforth and Dysenforth,
Attorneys.

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

ABEL H. BLISS, OF CHICAGO, ILLINOIS.

APPARATUS FOR SEPARATING METALS FROM THEIR ORES.

SPECIFICATION forming part of Letters Patent No. 306,213, dated October 7, 1884.

Application filed March 8, 1884. (No model.)

To all whom it may concern:

Be it known that I, ABEL H. BLISS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Apparatus for Separating Metals from their Ores; and I hereby declare the following to be a full, clear, and exact description of the same.

Various apparatuses have been patented and are in common use in which the comminuted ore, after leaving the stamps or other pulverizing apparatus in the form of a pulp, is introduced into a stand-pipe and passed into the base of a column of mercury contained in a vessel and permitted to rise through the mercury, whereby the separation is effected by the twofold action of amalgamation and gravity. With such apparatuses, and with other separators in which mercury is employed, two difficulties exist, which it is the object of my invention to overcome. One of these difficulties always exists where the wet pulp is conveyed to the mercury directly from the pulverizer, and consists in the fact that the quantity of water in the pulp is liable to be so great as to interfere with the action of the mercury. Devices have accordingly been contrived to drain the pulp of surplus water before introducing it into the mercury, and one of the objects of my invention is to accomplish a like end. A second difficulty exists where the ore contains soluble or semi-soluble substances incompatible with mercury, which is notably the case with talcose ores. The talcose ores here referred to are not those in which talc constitutes the prevailing ingredient, since to such the mercury treatment cannot be successfully applied. There is, however, a large class of ores into which talc enters as an ingredient in quantities sufficient to interfere materially with the action of the mercury, though in which other ingredients not incompatible with the mercury predominate. My invention permits the removal by filtration of a sufficient quantity of the incompatible substances to overcome, or at least greatly lessen, this difficulty.

In the drawings, Figure 1 is a central vertical section showing my improved apparatus applied to an amalgamating and separating device in which the pulp is introduced into the base of a body of mercury, and Fig. 2 a plan view showing one form in which the filtering-receptacle may be constructed.

A is a supporting-frame of any suitable construction.

B is a pan, preferably flaring, and provided near its top with an overflow, *t*, and at or near its bottom with a draw-off cock, *s*. The pan terminates with a discharge, *r*, (preferably cylindrical, if the pan is circular,) provided with a valve, *q*.

C is a filter, which may be cylindrical, as shown, or of any other convenient form, standing upon a suitable ledge within the pan B, and open at both ends. It is to form a filtering-receptacle for the pulp, and may be constructed in a variety of ways. As shown, it is formed of two walls, *p*, of wire mesh, held in position at the bottom by rings *o* and an annular plate, *n*, and at the top by rings *o'* and bolts *m*, with a filtering substance, *l*, interposed between the walls. Any other construction that will afford a tubular filter may, however, be employed instead.

D is the mercury-vessel, into which the ore, after leaving the filtering device above described, is introduced by way of the hopper *k* and stand-pipe E. It has not been deemed necessary, however, to represent this device complete, since it is merely employed to represent a class which is well known and variously constructed. Upon leaving the stamp-mill or other pulverizer the pulp is introduced into the filtering-cylinder C, with the valve *q* so regulated as to retard the escape of the pulp sufficiently to allow enough of the water to drain off through the filter to reduce the pulp to the proper consistency for introduction into the mercury. The surplus water escapes at the overflow *t*. If the pulp contains talcose matter, a portion of the latter will be dissolved by the water, and, the filter being necessarily coarse, it will incidentally be carried off through the same, leaving the pulp in better condition for treatment in the mercury than it otherwise would be. The same is true with regard to any other soluble or semi-soluble substances incompatible with the action of mercury which the ore may contain. For the purpose of freeing the pulp from such incompatible substances, it may in some cases be de-

sirable to inject additional water into the pulp. This may be effected by means of a pipe, F, leading from a water-supply to the interior of the filter C.

The contents of the pan may be drawn off, when desired, by means of the draw-off cock, *s*.

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

1. In combination with an apparatus for separating metals from their ores by means of mercury, a device for draining the pulp before it enters the mercury bath, comprising, in combination, a receptacle for the pulp having its walls composed of material sufficiently porous to allow the surplus water to pass through without carrying with it the mineral, a non-porous overflow-receptacle, within which the filtering-receptacle stands, and a valved discharge for regulating the flow of pulp from the filtering-receptacle to the mercury, substantially as described.

2. In combination with an apparatus for separating metals from their ores by means of mercury, the pan B, provided with an overflow and with a valved discharge, *r*, a filtering-receptacle, C, standing within the said pan, and a suitable supporting-frame, substantially as described.

3. In combination with the stand-pipe E and hopper K, for conveying ore-pulp to the base of a body of mercury, a filtering-receptacle above the said hopper, for receiving the pulp and draining it of its surplus water before it is transferred to the hopper, substantially as described.

ABEL H. BLISS.

In presence of—
DOUGLAS DYRENFORTH,
EPHRAIM BANNING.