

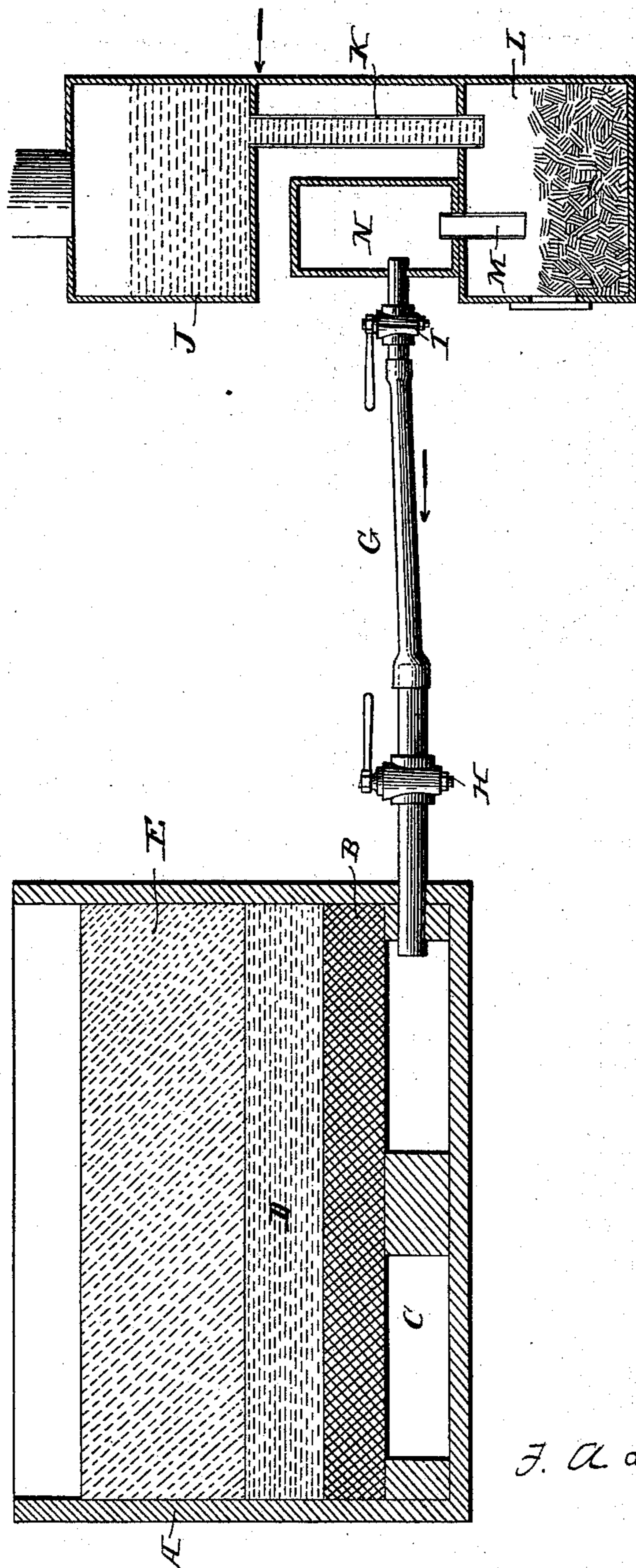
(No Model.)

F. A. LUCKENBACH.

PROCESS OF PREVENTING THE FLOURING OF MERCURY.

No. 410,171.

Patented Sept. 3, 1889.



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Inventor

Witnesses

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UNITED STATES PATENT OFFICE.

FREDERIC A. LUCKENBACH, OF NEW YORK, N. Y.

PROCESS OF PREVENTING THE FLOURING OF MERCURY.

SPECIFICATION forming part of Letters Patent No. 410,171, dated September 3, 1889.

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To all whom it may concern:

Be it known that I, FREDERIC A. LUCKENBACH, of the city, county, and State of New York, have invented a certain new and useful Process of Preventing the Flouring of Mercury when it is Employed for Extracting Gold and Silver from their Ores by Amalgamation; and the following is a full, clear, and exact description thereof.

My invention relates to an improved process of treating mercury, by which its purity and quickness is fully preserved, and at the same time my process prevents the waste or loss of the mercury by oxidation and consequent disintegration, commonly known as "flouring" or "sickening," when it is employed for amalgamating purposes.

The important object of my invention is to obtain (by amalgamation) the highest percent. of the precious metals contained in the ores being worked, and I accomplish this result by charging the body of mercury and water or pulp of ores with a continuous and sufficient supply of hydrogen, which unites with the oxygen contained in the mercury and pulp of ores, and thus leaves the mercury in a pure, quick condition, rendering it more effective for amalgamating the precious metals when they come into contact with it.

A second object of my improved process is to prevent waste of mercury due to flouring—viz, oxidation—which is a well-known cause of its disintegration into minute globules covered with a film or oxidized surface, and commonly known as "sick" or "floured" mercury sufficiently light in gravity to float upon the water or pulp of ores, thus resulting in great waste.

I am aware that heretofore it has been proposed to prevent the flouring or sickening of mercury in the extract of precious metals from their ores by subjecting the mercury to the influence of currents of electricity in the presence of an electrolyte—as, for instance, caustic alkali—and that some limited beneficial results have been obtained thereby; but the objections to such processes are not only that they are comparatively expensive, but that they do not appear to produce the necessary action to prevent the sickening thereof. My process differs materially from these, and is

based upon the discovery that the use of hydrogen in volume and under pressure which can readily be controlled will produce far better results than those obtained heretofore, and thereby not only is the process less expensive, but by applying the hydrogen separately generated and in a gaseous state the quantity and pressure of the hydrogen can be readily controlled, so that the quantities sufficient and under proper conditions to prevent sickening of the mercury can be applied.

My process will be readily understood by reference to the accompanying drawing, which represents one form of apparatus which may be successfully used.

A is a sectional view of the mercury pan or tank.

B is a porous plate or diaphragm, which may be made of any suitable porous substance, such as fire-brick, red brick, earthenware, &c.

C is a chamber beneath said diaphragm B, for holding hydrogen under light pressure.

D is the mass or body of mercury lying upon the porous diaphragm B.

E is the pulp of ores lying upon the mercury D.

The pipe G, having the two stop-cocks H and I, connects the hydrogen-chamber C with the hydrogen-generator, a useful form of which I have found to be that represented in the drawing, in which J is a vessel or chamber holding acidulated water in the proportions of, for instance, one part sulphuric acid to eight parts water.

K is a tube leading from the chamber J to the second chamber L, containing zinc or iron filings, and the hydrogen generated from these iron filings or zinc by the acidulated water is received through the tube M in the chamber N, with which the tube G is connected.

The operation of my device is as follows: The hydrogen generated in the generator F and stored in the chamber N is admitted in the quantity desired through the pipe G to the chamber C in the amalgamating-pan A, it being contained in the chamber C under light pressure. It will then pass up through the porous diaphragm B to the mercury and pulp

of ores, where, by its affinity for oxygen, it will prevent the oxidation or flouing of the mercury.

5 The active evolution of the hydrogen will be shown by the production of numerous small bubbles, which break upon the surface of the pulp of ores, and the result of this process is that there is no floured or sickened mercury floating upon the surface and carried away with the discharge of the pulp of
10 ores, and the remarkable purity of the mercury, especially when the pulp of ores contains an excess of sulphur and other rebellious elements, and which ordinarily cause in
15 the greatest degree the oxidation and consequent loss of mercury.

I have obtained the best results by my process when the mercury and pulp of ores are heated to about 160° Fahrenheit.

20 I do not limit myself to any precise form of apparatus for practicing my process, nor to any particular means for generating hydrogen in volume, exclusive of the method of electrolysis, which is not suitable for my purpose.

25 Many modifications in the apparatus shown might be easily devised by any practical mechanic without departing from the spirit of my invention.

What I claim is—

1. In the process of amalgamating gold and silver by means of mercury, the application of hydrogen in volume held under pressure and control to a body of mercury and pulp of ores, substantially in the manner and for the purposes set forth. 30

2. In a process for amalgamating gold and silver by means of mercury, the simultaneous generation of hydrogen in volume by means of acids, water, and metals, and the application of such hydrogen held under pressure and control to a body of mercury and water or the pulp of ores, substantially in the manner and for the purpose described. 35 40

3. In the process of amalgamating gold and silver by means of mercury, the application of hydrogen in volume held under pressure and control to a body of mercury and pulp of ores, the hydrogen being distributed upward through the body of mercury and pulp of ores in numerous small streams or particles, substantially as set forth. 45 50

FREDERIC A. LUCKENBACH.

In presence of—

J. NOTTINGHAM WILLIAMS,
HARRY S. GOODRIDGE.