(No Model.) 2 Sheets—Sheet 1.

J. W. MARSHALL.

ORE STAMPING MILL.

No. 493,384. Patented Mar. 14, 1893.

Fig. 2.

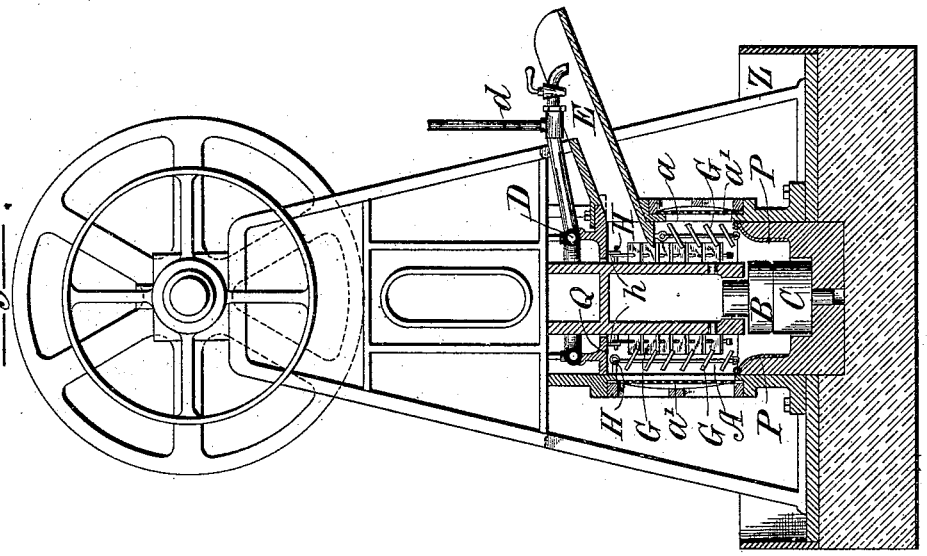
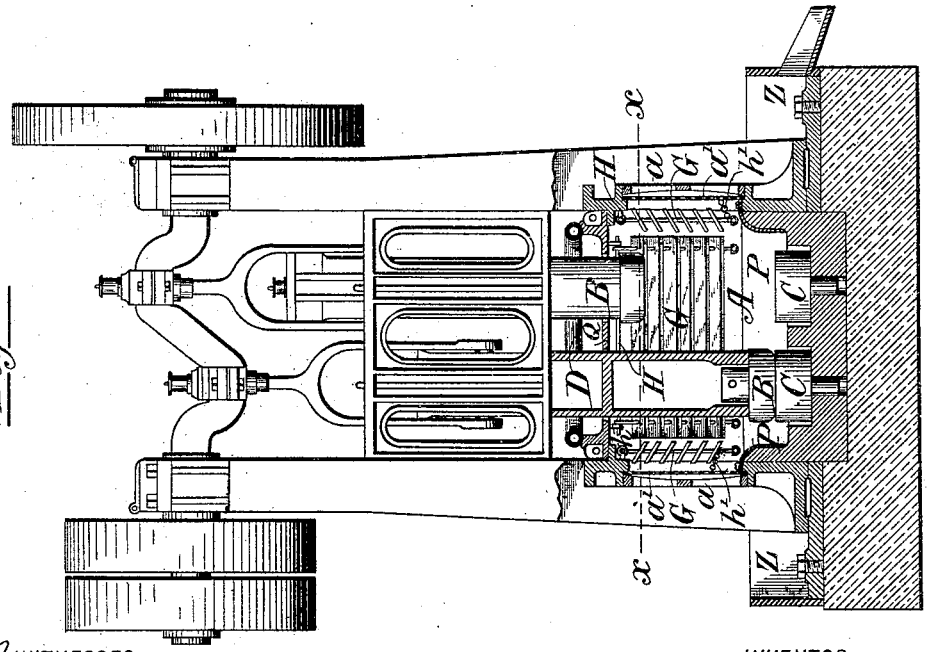


Fig. 1.



WITNESSES:

Robt. A. Kellogg

M. B. Harris

INVENTOR.

John W. Marshall

BY

Witter & Kenyon

ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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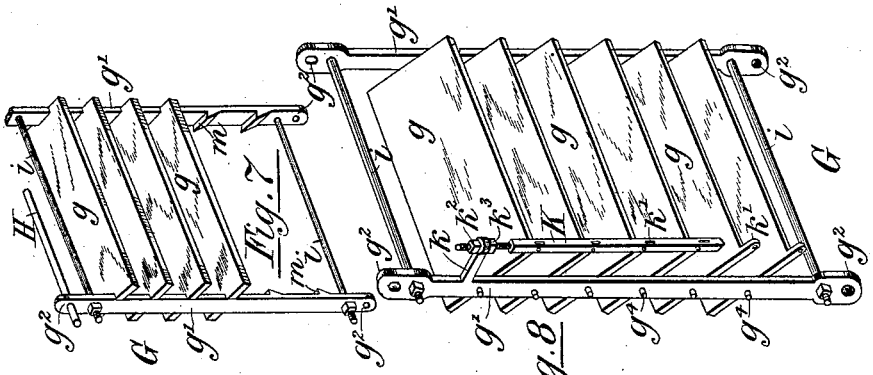

Fig. 7

Fig. 8

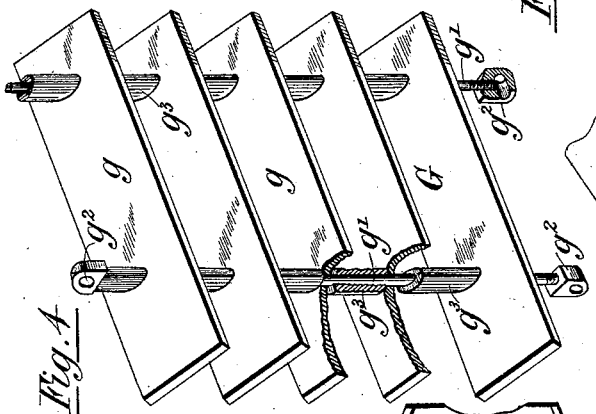

Fig. 4

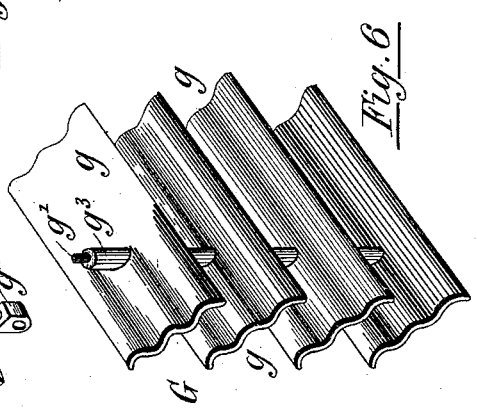

Fig. 6

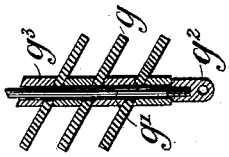

Fig. 5

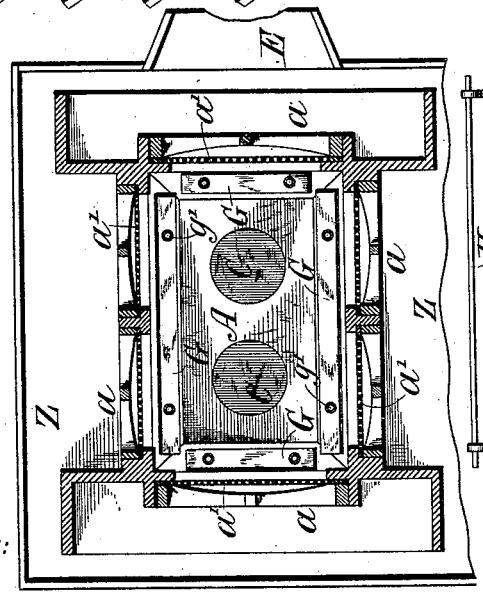

Fig. 3

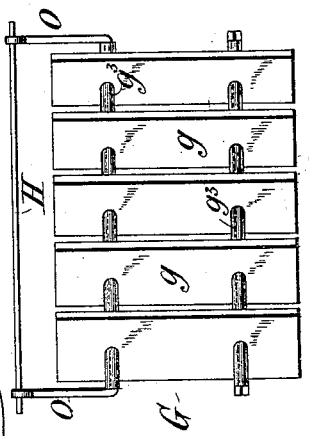

Fig. 9

WITNESSES:

Robt. A. Mellon.

M. B. Harris.

INVENTOR

John W. Marshall

BY

Witter & Kenyon

ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN W. MARSHALL, OF BROOKLYN, NEW YORK.

ORE-STAMPING MILL.

SPECIFICATION forming part of Letters Patent No. 493,384, dated March 14, 1893.

Application filed May 14, 1892. Serial No. 432,954. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. MARSHALL, a citizen of the United States, residing in the city of Brooklyn, in Kings county, State of New York, have invented a certain new and useful Improvement in Ore-Stamping Mills, of which the following is a specification.

This invention relates to stamping mills for the reduction of quartz, and the like, containing gold and other precious metals, and has particular reference to the amalgamating devices used in connection therewith.

The special object of my improvement is to increase the area of the amalgamating surfaces exposed to the particles of metal and quartz which are projected outward from the stamps and dies, so that a greater proportion of the precious metal may be saved from the tailings before they pass through the screens of the coffer.

The main feature of my invention consists of a grille, or grating, formed of plates, or bars, of copper or other suitable metal coated with quicksilver, or amalgamated upon their surfaces, arranged within the coffer or stamping chamber in the path of the material projected toward the screens and outlets of the coffer during the operation of stamping. Other amalgamating surfaces are also provided, and certain details of construction and arrangements of parts are included in my invention, for full comprehension of which reference must be had to the following detailed description and to the accompanying drawings forming part hereof.

In the various figures of said drawings, similar letters of reference indicate like parts.

Figure 1 is a front elevation partly in section, of a double stamping mill embodying my improvement. Fig. 2 is an end elevation also partly in section. Fig. 3 is a sectional plan taken on line x, x, Fig. 1. Fig. 4 is a perspective view, partly broken away, of the amalgamating grille in one of its simplest forms. Fig. 5 is a sectional detail showing spacing thimbles &c., and Figs. 6, 7, 8 and 9 perspective views of modifications thereof.

The stamping mill shown is for wet-stamping, and is a double header, having two each of the pneumatic cylinders, pistons, shoes and dies, and four screened openings for the escape of the pulverized material from the coffer or stamping chamber, but it must be understood that my invention is also applicable to dry-stamping mills, and machines of less capacity, and of other construction. I will therefore only describe so much of the mill as is immediately concerned in the application of my improvement.

A is the coffer or stamping chamber, rectangular in this case and having four openings a, a, one at each face of the mill, each being provided with the usual wire-cloth screen a', through which the material passes after it has been pulverized between the stamping shoes B and dies C.

D is the pipe through which water is supplied to the coffer from any convenient source, and d a branch pipe having a cock by which water may be also supplied to the ore as it passes to the coffer through the supply chute or hopper E which is located at one side thereof, as seen in Fig. 2. My chief aim being to avail myself of every possible opportunity for increasing the area of the amalgamating surface, in addition to my other devices I prefer to line the walls of the base of the coffer A with silvered plates P, P, so that they surround the stamping dies C on all sides. These plates are preferably curved around the edges of the base walls as shown, and held in place with screws, or by other means, and, being in four pieces, they are readily removable through the openings a. The crown plate Q of the coffer, and the stamping shoes and plungers themselves may also be silvered to form amalgamating surfaces, but such constructions would not be essential for the proper carrying out of the main features of my invention now to be described.

G G represent grilles, or gratings, made up of a series of amalgamating plates g, g, preferably of copper and silvered on both sides and edges,—these plates being bound together, while preserved at regular distances apart, by rods or hangers g', g'. The grilles, or gratings thus constructed are placed within the coffer A, preferably one at each side so as to practically present amalgamating surfaces at every point, and to intercept the precious metal as it flies from the stamps before the particles can pass out through the screens a', a', and into the trough Z with the tailings. In the preferable forms of my in-

vention, the amalgamating plates, g, g, are set upon the hangers g', g', so as to incline toward the interior of the coffer, in order to facilitate the catching of the metallic particles, and also to enable such pieces of quartz as may not be sufficiently reduced to roll off and fall back under the stamps for further pulverization. I prefer to suspend the grilles G from horizontal rods H secured in eyes h within the coffer, the ends of the hangers g', g' being provided with suitable eyes g^2, g^2 through which said rods H will pass. By having the eyes g^2 on both projecting ends of the hangers, I am enabled to reverse the positions of the grilles G, end for end, so as to insure the presentation of every part of the plate surface to the flying particles and thus insure the maximum amount of amalgamation from the entire silvered area.

The grilles suspended from the rods H are free to vibrate or swing, or to yield within limits to the impact of the pulverized material, which motion not only tends to insure a thorough amalgamation of the particles of precious metal, by causing same to roll slightly against the mercury on the plates before they finally adhere,—but also prevents the lodgment thereon of pieces of quartz requiring further pulverization. Short chains h', or other suitable stop devices are employed to limit the movement of the grilles and keep them clear of the stamps.

As a convenient means of retaining the plates g, g, at proper distances apart, I have shown in Figs. 4, 5, 6 and 9—short thimbles or sleeves g^3, chamfered at their ends to agree with the slope given to the plates, and strung loosely upon the hangers g', g' between each pair of plates and between the top and bottom plates and the eyes g^2, g^2;—the latter are screwed to the ends of the hangers, in this construction, so as to permit of the parts being readily fitted together and taken apart. Here the angle or slope of the plates can be varied by substituting other thimbles chamfered at a different angle,—but I may see fit to adjust all of the plates in the grille G simultaneously, in which case the construction will be somewhat like that shown in Fig. 8. In this modification the hangers g', g' are situated at the ends of the plates g, g, and the latter have end pivots g^4 projecting into correspondingly-spaced holes in the hangers, which latter and the plates are held together by tie-rods i, at top and bottom of the grille. One of the hangers has a lateral arm k, projecting therefrom for a distance slightly beyond the edges of the plates to afford a bearing for an adjusting rod K which has pivoted to it short lugs k' projecting from the edges of the plates g, g. This rod is threaded at its upper end for some distance on either side of the arm K whereby jam nuts K^2, K^3, may be employed to hold said rod and the plates connected thereto in any adjusted position.

The modification, Fig. 6—simply represents my grille plates as corrugated, as this is an efficient means of increasing the amalgamating surface,—and Fig. 7 shows a knock-down construction of grille which may be conveniently employed when it is desired to silver, or to rub off each amalgamating plate separately. The hangers g' are tied together by rods i, and the plates g are notched at their ends to embrace the hangers, and the latter have projections m for the plates to rest upon. This construction allows each plate to be removed separately by simply lifting or canting one end of the plate and thus freeing the other end, as will be readily understood.

Fig. 9 shows the grille G, with the amalgamating plates arranged vertically upon tie rods, the upper one of which has upwardly bent ends O, O, terminating in eyes whereby the grille is suspended from the rods H. The grille G will also be found of service in other ore-reducing, pulverizing and amalgamating apparatus than stamp mills, and I propose to employ it in substantially the same form wherever it may be suitable.

It will be apparent that by my invention a great deal of time and labor is saved in the renewal of the amalgamating surfaces of the mill, as it is only necessary to remove the screens a' and unship the rods H before the grilles G can be removed through the openings a, to be either reversed as mentioned, or to have the amalgamated precious metal rubbed off. The construction, also, is such that extra grilles, ready silvered, may be quickly inserted to take the place of those already charged with precious metal to their full capacity, and the operation of stamping be only suspended for the minimum time. Furthermore, by my grille-like arrangement of the amalgamating plates, I am enabled to practically cover the openings a of the coffer A with such plates, while not obstructing the free passage of the pulverized detritus, thus saving a much larger percentage of precious metal than can be done at present at the first operation, and obviating the necessity, to a large extent, of further manipulation of the tailings.

What I claim, and desire to secure by Letters Patent, is as follows:

1. In an ore-stamping or pulverizing mill, the combination with the coffer or stamping chamber having a discharge opening,—of a series of amalgamated plates connected together in the form of a grille or grating removably-fastened within said coffer or stamping chamber at such point as will cover such discharge opening and intercept the particles of ore while allowing the other pulverized material to freely escape, substantially as set forth.

2. In an ore stamping, or pulverizing mill, a grille, or grating formed of a series of amalgamating plates suspended within the discharge opening of the stamping chamber, or coffer, so as to yield or vibrate under the impact of the pulverized material, substantially as and for the purpose set forth.

3. The amalgamating grille or grating herein described, consisting, essentially, of a series of parallel inclined plates, and supporting rods whereby the same may be suspended from either end, substantially as set forth.

4. An amalgamating grille or grating, consisting of a series of plates *g g*, having notched ends,—hangers *g'*, *g'*, embraced by said notched ends and having projections for supporting the plates,—and tie rods *i*,—so combined that each plate may be removed independently, substantially as set forth.

JOHN W. MARSHALL.

Witnesses:
SIDNEY MANN,
T. E. RAFTERY.