

(No Model.)

2 Sheets—Sheet 1.

J. M. McFARLAND.
ORE STAMP MILL.

No. 527,620.

Patented Oct. 16, 1894.

Fig. 1

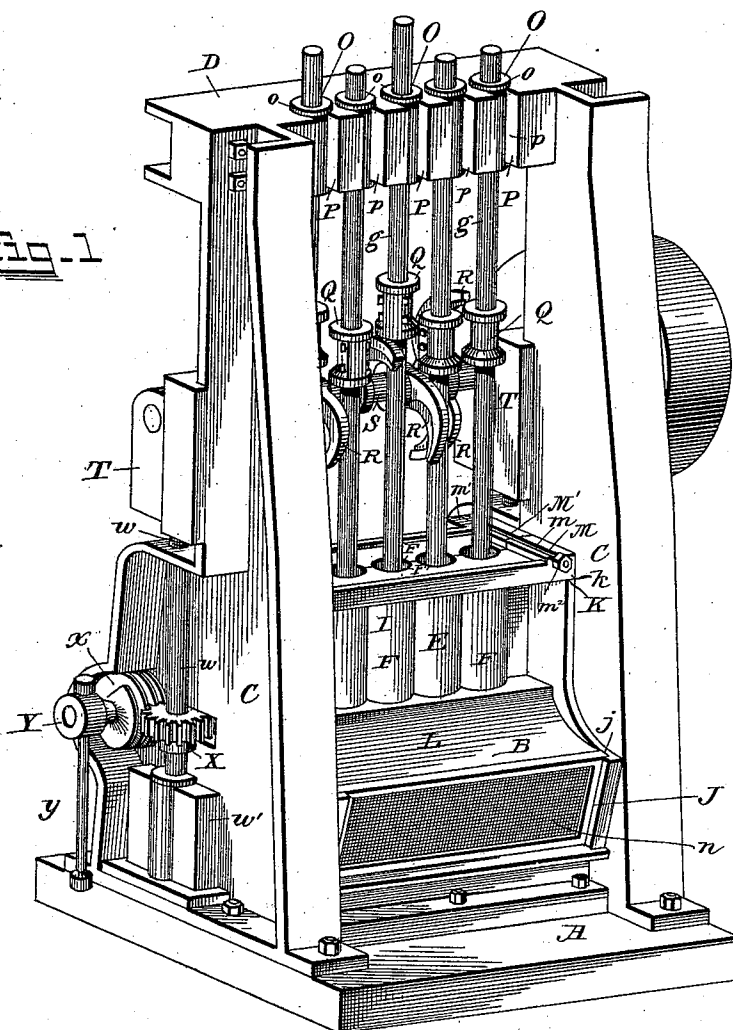
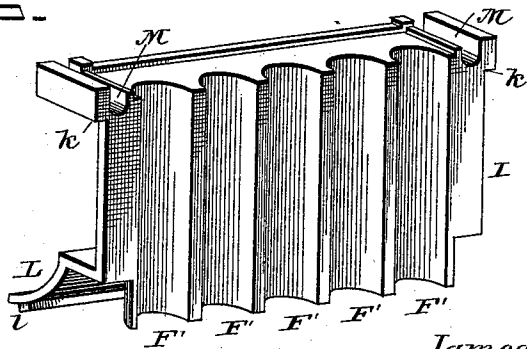


Fig. 5



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By his Attorneys,

James M. McFarland

C. A. Snow & Co.

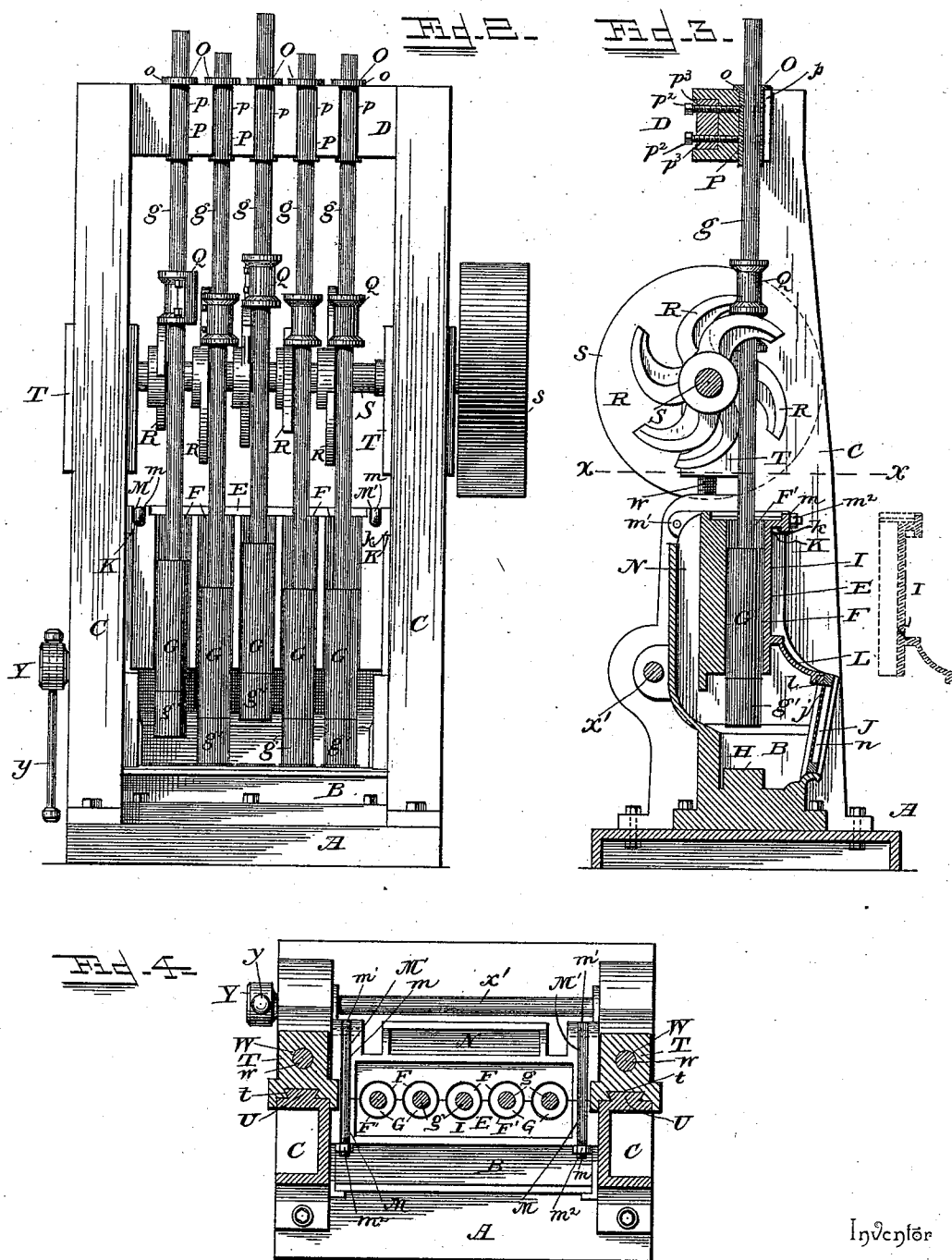
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2 Sheets—Sheet 2.

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Inventor

Witnesses

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By *his* Attorneys.

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UNITED STATES PATENT OFFICE.

JAMES M. MCFARLAND, OF COLTON, CALIFORNIA.

ORE STAMP-MILL.

SPECIFICATION forming part of Letters Patent No. 527,620, dated October 16, 1894.

Application filed January 31, 1894. Serial No. 498,630. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. MCFARLAND, a citizen of the United States, residing at Colton, in the county of San Bernardino and State of California, have invented a new and useful Ore Stamp-Mill, of which the following is a specification.

This invention relates to stamp mills; and it has for its object to effect certain improvements in stamp mills employed for stamping or crushing ores preparatory to subjecting the same to the ordinary separating or collecting processes.

To this end the main and primary object of the present invention is to provide an improved stamp mill which may be easily constructed and readily set up, and one which shall possess special improvements in the mortar, the frame, the guides and bearings, and the means of adjusting the stroke or drop of the stamps to compensate for wear thereon.

With these and other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

In the drawings, Figure 1 is a perspective view of a stamp mill constructed in accordance with this invention. Fig. 2 is a front elevation showing the removable side and screen of the mortar removed. Fig. 3 is a central vertical sectional view of the mill. Fig. 4 is a horizontal sectional view on the line $x-x$ of Fig. 3. Fig. 5 is a detail in perspective of the removable mortar side.

Referring to the accompanying drawings, A represents the mortar bed or block which is constructed sufficiently heavy in order to satisfactorily withstand the constant jarring of the mill in operation, and securely bolted on top of the mortar bed or block A, is the stamp or mill mortar B at each side of which, and also bolted to the bed A, are the upright frame sides C, spaced apart a distance equal to the length of the mortar and connected together at their upper ends by the transverse guide beam D, which beam will be more particularly referred to in connection with the mounting of the stamps to be presently described.

The mortar B, which is bolted on to the bed or block A, between the frame sides C, is of substantially the same shape as mortars used in stamp mills of this character, but in the present invention the mortar B is provided with an upper transverse guide portion E, in which is formed a parallel series of cylindrical guide tubes F, which are disposed directly above the bottom of the mortar in a line with the vertical center thereof, and said cylindrical guide tubes F are designed to form guides for the cylindrical bodies of the vertically reciprocating stamp heads G. The vertically reciprocating stamp heads G, are mounted on the lower ends of the stamp stems g , and have detachably fitted thereto by any suitable means the removable stamp shoes g' , which are adapted to be brought against the mortar dies H, arranged on the bottom of the mortar B, and projecting above the plane thereof.

The upper guide portion E, of the mortar B, is longitudinally bisected, to form a removable side I, for the mortar. The removable side I is constructed in a shape corresponding to the fixed side of the mortar, and the inner face thereof is vertically grooved with parallel grooves F', which form one-half of the cylindrical guide tubes F, of the mortar, when such removable side is placed in its proper position, and said side I, is adapted to removably inclose a side opening in the mortar which extends from the top of the screen opening J, to the top of the mortar itself, and at the opposite top edges of the mortar are formed the rest shoulders K, which are adapted to be engaged by the upper shouldered ends k , of the removable side, so that such removable side may be placed in a registering position within the side opening of the mortar. Said side is further provided at a point below the lower ends of the guide tube sections F' formed therein with a curved off-standing top flange L, which forms one top portion of the mortar, and at the outer lower corner of the flange L, are formed the shouldered notches l , adapted to register with the upper extremity of the inner sides of the guide grooves j , formed at opposite edges of the screen opening J.

The opposite top edges of the removable side I, are provided with the locking grooves

M, which register with corresponding grooves M', in the opposite top edges of the fixed side of the mortar, and are adapted to receive therein the hinged clamping bolts *m*. The clamping bolts *m*, are hinged at one end at *m'*, to the fixed side of the mortar and have their opposite threaded ends engaged by the nuts *m*², which are adapted to work against the outer edge of the side I, to removably lock the same in position.

The mortar B, is adapted to be charged in the ordinary manner through the vertical side filling opening N, arranged on the fixed part thereof and communicating with the interior of the mortar below the lower guide tubes F, and the discharge of the mortar is through the lower side screen *n*, which screen is adapted to removably engage the opposite guide grooves *j*, in front of the front lower edge of the side I. It will be obvious that by reason of the removable side I, access may be readily gained to the interior of the mortar for the purpose of adjusting the working parts of the mill therein, and by removing the side I, as well as the removable screen *n*, one side of the mortar is left entirely open from the extreme upper end thereof to the bottom, so that every part of the interior of the mortar is perfectly accessible.

By reason of the disposition and construction of the lower guides F, the cylindrical stamps are held perfectly steady in their work, and inasmuch as the principal work done by stamp mills is wet-crushing, it will be understood that suitable pipes may be arranged to supply a stream of water around each stamp at the top of the lower guide tubes F, thus washing the sand down and effectually lubricating the contact surfaces of the guides and stamps. The extreme upper end of the stamp stems *g*, which carry the stamps proper are guided to move in the cylindrical removable guide bushings O, having upper flanged ends *o*, which are adapted to hold the bushings in position in the guide openings P, formed in the transverse guide beam D, near one edge thereof. The guide openings P, are provided at one side with the vertical slots *p*, which are of a width slightly greater than the diameter of the stamp stems, so that by removing a guide bushing the stamp stems can be easily placed in and out of position in adjusting the stamps, and when properly in position the guide bushings O, are secured fast in the guide openings by means of suitable set screws *p*³, working transversely through threaded openings *p*³, in the transverse guide beam and impinging at one side of said guide bushings.

At a point intermediate of the upper and lower stamp guides referred to, the stamp stems *g*, have suitably secured thereto in the usual manner the tappets Q, under which work the double cams R, for raising such tappets and allowing the same to suddenly fall, in order to impart to the stamps the necessary drop for milling the ore. The double

cams R, are of the ordinary construction, and are arranged side by side on the vertically adjustable cam shaft S, which carries at one end the band wheel or pulley *s*, which receives a suitable belt for imparting motion to the working parts of the mill. The vertically adjustable cam shaft S, is journaled transversely in the opposite vertically adjustable bearing blocks T, which are arranged to slide at one side of the opposite frame side C. The vertically adjustable bearing blocks T, are provided at one side with the dove-tailed grooves *t*, which are adapted to engage the dove-tailed guide tongues U, fitted onto the opposite frame sides C, so as to hold the said bearing blocks steady in their vertical adjustment. The said bearing blocks are further provided in their lower sides with the threaded sockets W, which receive the upper threaded ends of the vertical adjusting screws *w*, journaled partly in the opposite frame sides and stepped at their lower ends in the step bearings *w'*.

The vertical adjusting screws *w*, carry at a point near their lower ends the horizontal worm pinions X, which are adapted to be constantly engaged by the worm-gear *x*, mounted on the horizontal adjusting shaft, *x'*, at each end thereof, and such adjusting shaft is further provided at one end with the perforated handle collar Y, in which is mounted loosely a handle lever *y*, by means of which the bearing blocks T, may be properly adjusted.

It is well understood by those skilled in the art that the constant wear on the stamp shoes and the mortar dies will in time increase the drop of the stamps and therefore interfere with their effectiveness, but by reason of the worm-gearing adjustment, the cam shaft may be adjusted to any position and held stationary in such position in order to compensate for the wear on the stamps and dies, and therefore materially increase the efficiency of the machine.

The specific construction of the herein-described stamp mill provides one which can be easily and accurately set up after leaving the machine shop, which is of considerable advantage over the ordinary stamp mills partially made of heavy timbers, and other advantages for this mill will readily suggest themselves to those skilled in the art.

Changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a stamp mill, the combination with the stamps; of a mortar having a bottom screen opening, a removable side detachably fitted in the space above said screen opening, an upper transverse guide portion and a vertical side filling opening piercing the fixed side at one side of said upper guide portion,

and means for removably locking the removable mortar side in position, substantially as set forth.

2. A mortar for stamp mills, having a lower side screen opening, an upper transverse guide portion provided with a parallel series of cylindrical stamp guides, and a removable side detachably locked in position above the screen opening and forming a section of said cylindrical guides, substantially as set forth.

3. In a stamp mill, the combination with the vertically moving stamps, of a mortar open at one side and having opposite guide grooves at the outer lower edges of the open side, an upper guide portion provided with a parallel series of cylindrical guide tubes, and rest shoulders at the opposite top edges of the open side, and a detachable mortar-side registering in the side opening of the mortar above said guide grooves and having upper shouldered ends adapted to register with said rest shoulders, and shouldered notches at the outer lower corners thereof, said notches registering with the upper extremities of the inner sides of said guide grooves, means for removably locking said mortar side in position, and the removable screen engaging said opposite guide grooves in front of the front lower edge of the mortar side, substantially as set forth.

4. In a stamp mill, the combination with the frame; of a mortar having a bottom screen opening, a removable side detachably fitted in the space above said screen opening, an upper transverse guide portion completed by said removable side and provided with a series of cylindrical guide tubes, and locking grooves at the opposite top edges of the fixed and removable sides, hinged clamping bolts hinged to a fixed point of attachment and adapted to be clamped in the aligned grooves, and the cylindrical stamps guided to move in said cylindrical guide tubes, substantially as set forth.

5. In a stamp mill, the combination with

the mortar; of the frame having an upper transverse guide beam provided with guide openings having vertical slots at one side, removable guide bushings fitted in said guide openings and having upper flanged ends, means for clamping the bushing tight in said opening the vertically moving stamps having stems, the upper ends of which work in said guide bushings, and means for reciprocating said stamp stems, said vertical side slots being of a width slightly greater than the diameter of said stems to admit of the removal and replacing thereof when the guide bushings are removed, substantially as set forth.

6. In a stamp mill, the combination with the frame having guide tongues at one side and the vertically reciprocating stamp stems having tappets; of vertically adjustable grooved bearing blocks mounted to slide on the guide tongues of said frame, the cam shaft having its ends journaled in said bearing blocks, and means for adjusting said sliding bearing blocks, substantially as set forth.

7. The combination of the frame having dove-tailed guide tongues at one side, the vertically reciprocating stamp stems having tappets, sliding bearing blocks arranged at opposite sides of the frame and having dove-tailed grooves engaging said tongues, and threaded sockets, vertically arranged adjusting screws having their threaded ends engaging the threaded sockets of said blocks, horizontal worm pinions mounted on said adjusting screws, a horizontal adjusting shaft mounted in the frame and having at each end worm gears engaging said pinions, and the cam shaft journaled in said bearing blocks, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JAMES M. MCFARLAND.

Witnesses:

EARL F. VAN LUAM,
D. J. DAWSON.