

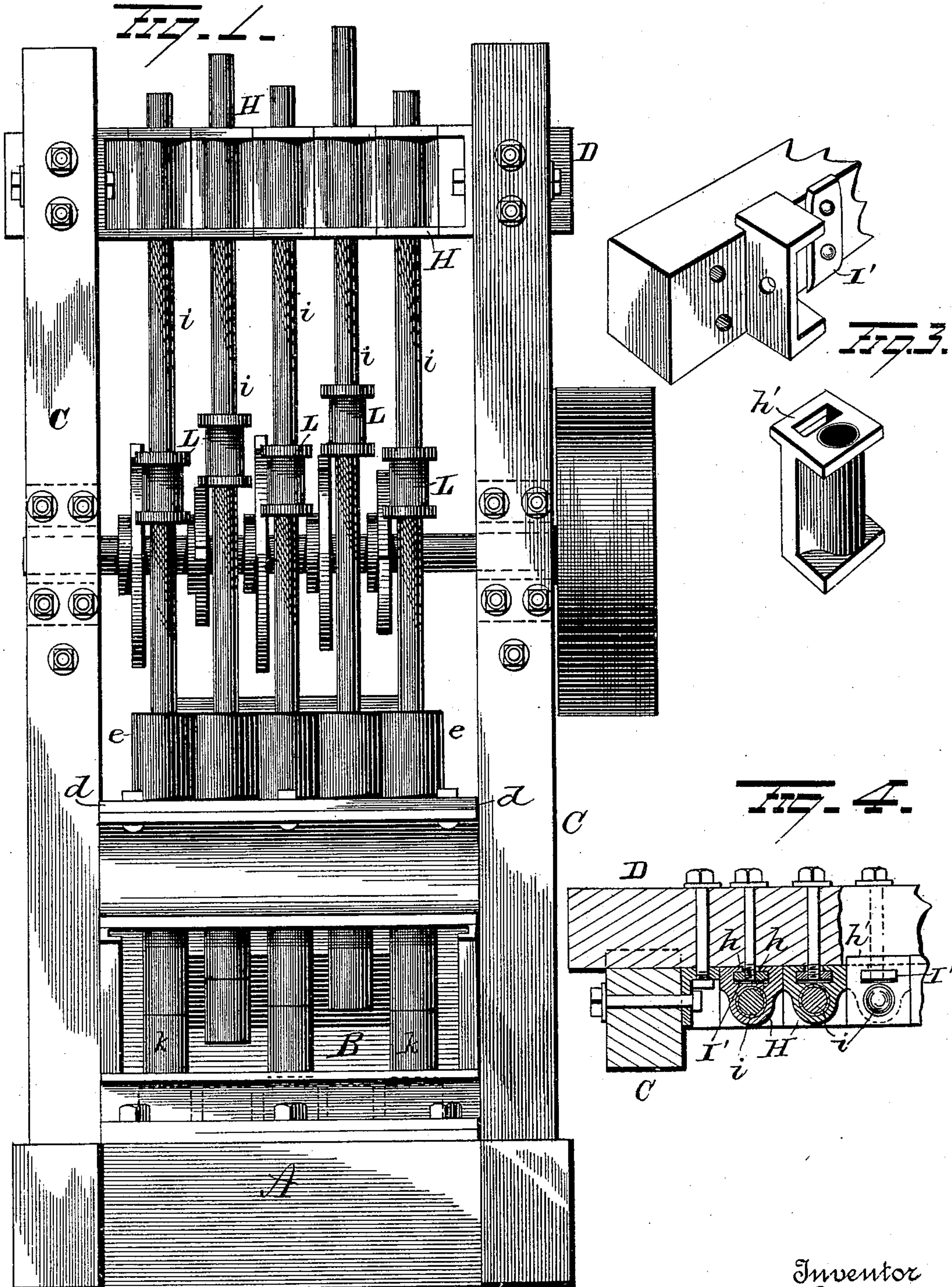
(No Model.)

2 Sheets—Sheet 1.

J. M. McFARLAND.
STAMP MILL.

No. 467,187.

Patented Jan. 19, 1892.



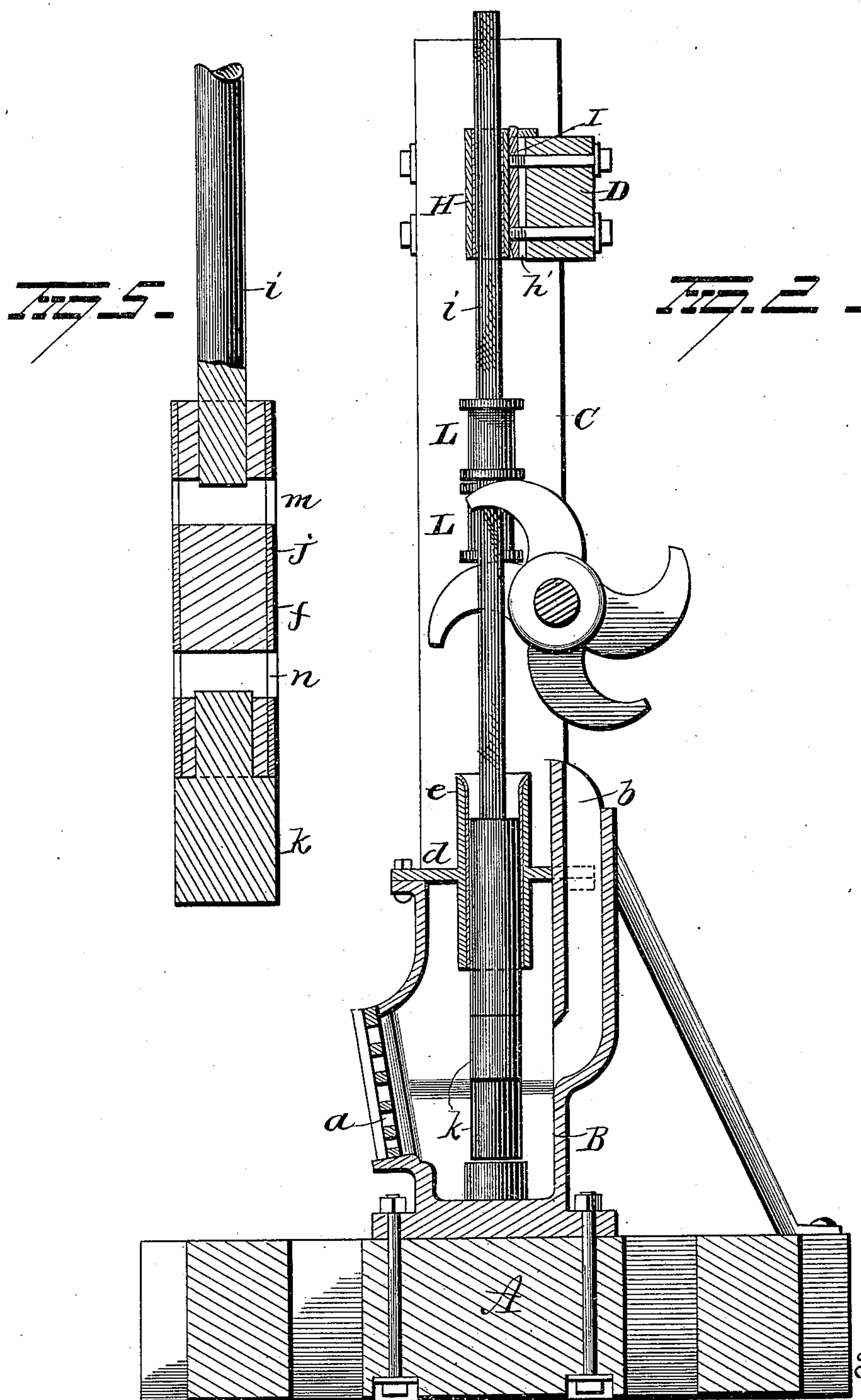
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UNITED STATES PATENT OFFICE.

JAMES M. MCFARLAND, OF VIRGINIA CITY, NEVADA.

STAMP-MILL.

SPECIFICATION forming part of Letters Patent No. 467,187, dated January 19, 1892.

Application filed May 11, 1891. Serial No. 392,370. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. MCFARLAND, of Virginia City, in the county of Storey and State of Nevada, have invented certain new and useful Improvements in Stamp-Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in stamp-mills.

The stamp mill or battery as actually used is constructed about as follows: A solid foundation, called the "mortar-block," is constructed of heavy timbers set up on ends and bolted together, the bottom ends resting on masonry or other firm foundation. The foundation-timbers for the frame-work of the mill are preferably independent of the mortar-block, so that the former will not be affected by the constant and continuous jar to which the latter are subjected. The posts which carry the cam-shaft and guides are secured to the foundation-timbers, the inside distance between the posts being equal to the length of the mortar. The upper ends of the posts are held apart and supported near the top by a cross-beam, and are further braced and supported by a second cross-beam placed so as to come slightly above the top of the mortar, these two cross-beams carrying the guides for holding the stamps in vertical position. The mortar, which is located between the posts on the mortar-block, is a heavy cast-iron box, extra heavy at the bottom to successfully resist the blows of the stamps, with sides extending up three or four feet, forming a casing or housing around the lower ends of the stamps. In one side of the housing is an opening for the screen, through which the pulp or sand is discharged, and in the other side is a feedway. The mortar having been bolted to the mortar-block and the dies placed therein, the apparatus is ready for the reception of the stamps, each of which ordinarily consists of a stem, a head on lower end of stem, a shoe in the lower end of the head, and the tappet secured on the stem in a position to be engaged on its under side by its cam. The cam-shaft, with the cams thereon, is then

placed in position and pipes arranged to conduct water into the mortar, if for wet crushing, and the battery is complete. With a stamp-mill thus constructed the wear on the stem of the stamp and the guides supporting the stem is considerable, and more particularly on the lower guides and the portion of the stems which move in contact with said guides. To prevent this wear on the stems, the guides are in some instances made of wood, and when the shoes and dies become slightly worn and the stamps are dropping on hard rock the stamps are forced from side to side, and the lower guides being from five to six feet above the dies the leverage against the walls of the guides is so great as to soon enlarge the guideways, so that the friction of the cams draws the stamps away from the center of the dies. When in this condition, the crushing capacity of the battery is reduced, and the expense of keeping these guides in repair amounts to considerable. Again, the stamp-stems frequently break and it is often necessary to remove a stamp for repair, when if the guides are made of wood and the battery contains five stamps it is necessary to remove from twelve to sixteen nuts from their bolts and drive the bolts back to allow the front section of the guides to be removed.

My invention relates more particularly to the bearings and stamps, the object being to so construct the bearings that but comparatively little wear results, thus causing the stamps to maintain at all times their approximately vertical position, the said bearings being so constructed and arranged that any one of the stamps can be easily and quickly removed without disturbing the others.

In the accompanying drawings, Figure 1 is a view in elevation of a stamp-mill embodying my improvements. Fig. 2 is a view in vertical section taken transversely of the mortar and through the centers of the upper and lower bearings. Fig. 3 is a view of one of the upper bearings detached, showing also the bearing-attaching devices. Fig. 4 is a view in section of the bearings and the cross-beam carrying the same, and Fig. 5 is a view of the head-shoe and section of stem adjacent to the shoe.

A represents the mortar-bed carrying mor-

tar B, and C are the side standards or supports, suitably braced and carrying the cross-beam D at or near their upper ends. The mortar is provided at one side with a screen-opening *a* and on its opposite side with a feed-opening *b*. The mortar is provided with a top plate *d*, secured thereon, the said top plate being provided with a series of cylinders or guides *e*. These cylinders or lower guides *e*, together with the top plate *d*, which closes the top of the mortar, are cast in one piece. The guides *e* extend a short distance below the plate *d* and a sufficient distance above the plate to prevent the splash from the stamps coming out at the top, and are of a diameter sufficient to permit the stamp-heads to work freely therein. To prevent wear on the inner faces of the lower guides, they are provided with bushings or linings of wrought-iron, steel, or other suitable metal, and to protect the heads of the stamps from wear by contact with said hard-metal lining they are incased in close-fitting jackets *f* of wrought-iron or steel or other suitable metal. When the bushings or casing wear to any extent, they can be readily replaced by others, and thus all wear is practically taken off the permanent or fixed parts of the apparatus. As the mortar is more rigid than the frame, and as these guides are carried by and in fact are parts of the mortar, it follows that these guides are more substantial than guides carried by the upright supports could possibly be. Again, the guides being near the dies there is not so much strain or leverage against them when the stamps strike a glancing blow.

As the principal work done by stamp-mills is wet-crushing, it is evident that the water can be carried into the mortar through the guides, thus washing the sand down and effectually lubricating the contact-surfaces of the guides and stamps.

I have previously stated that some stamp-mills employ wooden guides and stated the objections to the use of such guides. Metal guides are also extensively used, and it is claimed that they are not so troublesome and expensive to keep in repair. These metal guides are, however, made in two parts similar to common shaft-boxes, the parts forming the guides for each stamp being separate from and independent of the other guides. As these sectional guides are secured to the cross-bars of the frame by means of bolts and nuts, it follows that it is necessary to remove the bolts and nuts before the bearings or guides can be removed.

By my construction of upper guides I dispense altogether with sectional bearings and so construct the boxes that they can be removed from the frame and off the stem of the stamps without removing bolts or nuts.

Each bearing or guide H consists of a box having a cylindrical bore for the stem of the stamp, with a dovetailed or T groove in its

rear face and with a top flange *h'*, adapted to overlap and rest on the cross-beam I, which carries the entire series of upper bearings or guides.

I' represents the anchors or clamps rectangular in shape and preferably beveled at their upper ends to enable them to be readily and quickly entered in the slots in the rear sides of the bearings. Each bearing is adapted to receive one clamp or anchor, and each clamp or anchor is held in place by two bolts engaging same preferably near its upper and lower ends, the ends of the bolts being screw-threaded and entering screw-threaded holes in the anchor or clamp. Thus it will be seen that by simply turning the bolts to lessen the pressure of the clamps or anchors against the shoulders *h* of the bearings, any or all of the bearings can be readily removed and lifted off the stem. These guides or bearings are lined with bushings of soft metal to prevent rapid wear of the stems. These bushings are preferably in the shape of tubes of proper diameter and length, and are held in place, preferably, by turning the end of the bushing over the upper and lower ends of the bearings or guides.

The stamps J consist, essentially, of a stem *i*, head *j*, and shoe *k*, the stem carrying a tap-pet L, which is engaged by its cam on the cam-shaft. As before stated, the head of the stamp is incased in a hard metal covering to protect it from wear. The head is also provided with transverse slots *m* and *n*, the former crossing the bore *o* for the lower end of the stem and the latter crossing or communicating with the bore for the shank of the shoe. The stem and shank of the shoe both project slightly beyond the outer edges of their adjacent or respective transverse slots, so that a wedge or key passed into either slot will engage the end of the shank or stem, as the case may be. Thus it will be seen that by driving the wedge or key into the transverse slot the stem or shank can be forced out or so loosened as to permit of its ready removal.

It is evident that slight changes might be made in the form and arrangement of parts herein shown without departing from the spirit and scope of my invention, and hence I would have it understood that I do not confine myself to the exact form and construction herein described; but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a stamp-mill, the combination, with a mortar and a cover therefor, the latter carrying a series of cylindrical guides provided with removable hard metal linings, of a series of stamps, the heads of which are provided with a hard metal jacket or covering, substantially as set forth.

2. In a stamp-mill, the combination, with a frame, a mortar, a series of stamps, and means for elevating the latter, of a series of upper

guides, each provided with a slotted rear face, an anchor-bar adapted to rest in said slot, and bolts securing the anchor-bars to the frame, substantially as set forth.

5 3. In a stamp-mill, the combination, with a frame and stamps, of a series of bearings, each of the latter having a dovetailed or T-shaped groove in its rear face, the said groove being open at the lower end, an anchor-bar adapted to enter said slot at the open end, and
10 bolts for locking the clamping-bar to the frame.

4. In a stamp-mill, the combination, with a frame and stamps, of a series of upper bearings, each having a rearwardly-projecting
15 flange and a dovetailed or T-shaped groove open at its lower end, an anchor-bar adapted

to enter said groove, and bolts securing the anchor-bar to the frame, substantially as set forth.

5. In a stamp-mill, the combination, with a frame and stamps, of a series of bearings, each having a cylindrical bore and a dovetailed or T-shaped groove, and bolts carrying devices adapted to enter said groove and lock
25 the bearing in place on the frame, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JAMES M. McFARLAND.

Witnesses:

F. P. LANGAN,
E. U. MCCABE.