

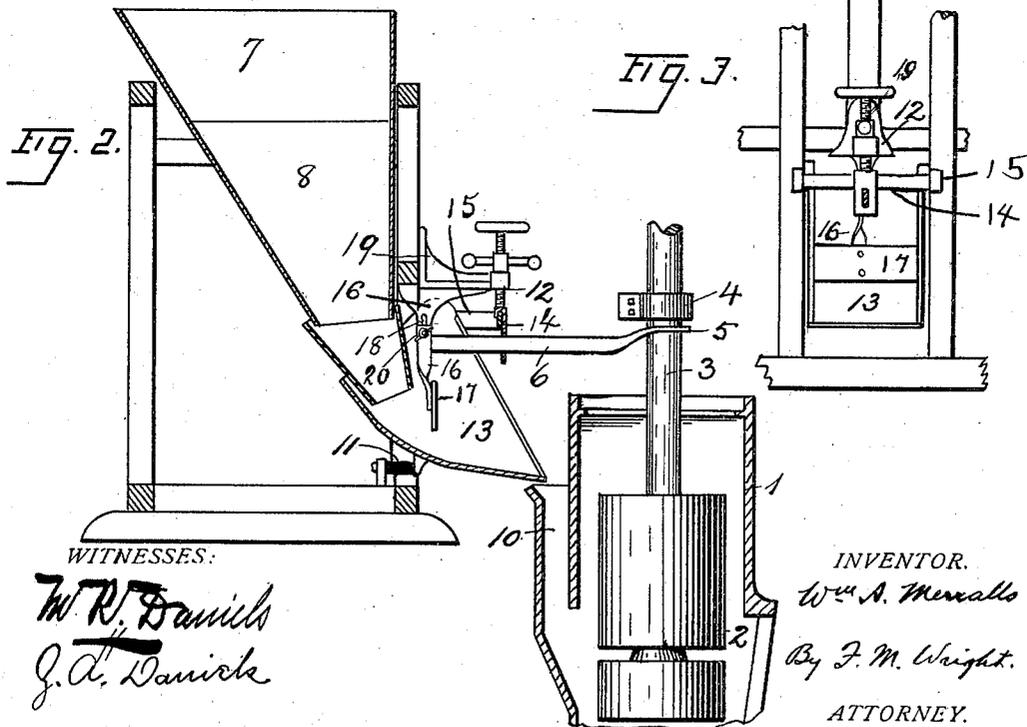
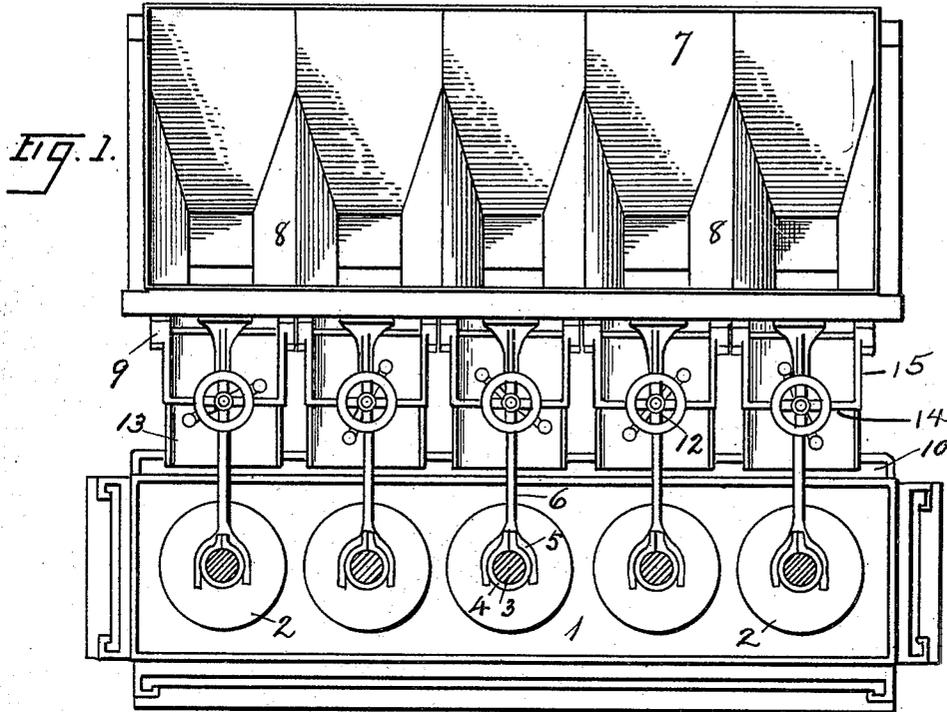
No. 756,873.

PATENTED APR. 12, 1904.

W. A. MERRALLS.
STAMP MILL.

APPLICATION FILED DEC. 5, 1900.

NO MODEL.



UNITED STATES PATENT OFFICE.

WILLIAM A. MERRALLS, OF SAN FRANCISCO, CALIFORNIA.

STAMP-MILL.

SPECIFICATION forming part of Letters Patent No. 756,873, dated April 12, 1904.

Application filed December 5, 1900. Serial No. 38,735. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. MERRALLS, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Stamp-Mills, of which the following is a specification.

My invention relates to improvements in stamp-mills, the object of my invention being to provide a stamp-mill which will effect great economy over those at present in use both in the saving in the gold extracted from the ore and in the amount of power required to operate the stamps in proportion to the work accomplished.

For the past fifty years in this country and much longer in European countries stamp-mill practice has been carried on at a great loss in two respects—first, in the amount of the precious metal lost in the tailings, and, secondly, in the excessive expenditure of power used to operate the stamp-mill.

The ordinary stamp-mill as built at the present time has only a single feeder to feed the entire battery of stamps, whether there are two, three, four, five, or more stamps in the mortar. In the present system of feeding stamp-mills the middle stamp of a five-stamp battery is the feed-stamp, being provided with means for automatically operating the feeder through the vertical reciprocation of the stamp-stem. The other stamps of the battery are fed from the central stamp by what is known as a "swash-feed." The swash of the central stamp feeds the ore to the other stamps, so that the two stamps next to the center stamp get a little of the coarse ore; but the two outside stamps receive only the fine. In this imperfect manner of feeding the outside stamps undergo a large wear and tear and do little actual good. There results a great loss of capacity and great wear and tear, because of the insufficient quantity of ore between the shoe and the die, so that the wear of the end stamps is very rapid in comparison with that of the central stamp. Moreover, the power expended in raising the end stamps is to a great extent wasted, because these end stamps are doing very little crushing work. A further defect is that the end stamps produce a

large amount of slimes, making it difficult to concentrate and to save the gold. The swash-feed is objectionable not only because it destroys the effective value of the battery and causes great wear and tear, but because it cuts the quicksilver and cuts both the silver and the gold amalgam off the copper plates. Notwithstanding all these objections and losses occasioned by the use of the swash-feed this method of feeding a mortar having a plurality of stamps has been the only one used up to the present time so far as my knowledge extends. The loss that has been occasioned thereby has undoubtedly amounted to many millions of dollars.

The object of my invention is to provide a stamp-mill which will save this immense loss both in precious metal and in power.

My invention therefore resides in the novel construction, combination, and arrangement of parts for the above ends, hereinafter fully specified, and particularly pointed out in the claim.

In the accompanying drawings, Figure 1 is a plan view of my improved stamp-mill. Fig. 2 is a vertical section of the same. Fig. 3 is a front view of one of the feeders.

Referring to the drawings, 1 represents the mortar, and 2 the stamps therein, in the present case five in number. Each stamp-stem has thereon a collar 4, engaging the forked end 5 of a lever 6 for operating the feeder. There is a separate feeder for each stamp, although I preferably provide a single hopper 7 for the ore. Said hopper 7 is divided by partitions 8 at the bottom, so that there are five feed-holes for the ore, one for each stamp. Each lever 6 is attached by means of a cross-piece 14 and side pieces 15 to a basket 13, swinging on trunnions 9, and the inner end of the lever is pivotally attached to the hanger 16, which supports the feed-gate 17. This hanger is adjustably secured by means of an adjusting or clamping screw 20 in a slot 18 to a bracket 19, mounted on the hopper 7.

The fall of the stamp-stem by means of the collar 4 engaging the lever 6 moves said basket rearwardly, thereby causing a small quantity of the ore at the lip or outer edge of said basket to drop through the feed-hole 10

in the mortar into the mortar beneath the corresponding stamp. Thus each stamp has an independent feed.

Should the quantity of ore beneath any stamp-shoe unduly pile up, so that its collar 4 does not in its drop reach the forked end 5 of the corresponding lever 6, it is evident that there will be no operation of the feeder. There is therefore a certain minimum reciprocation of the stamp-stem for which the corresponding feeder is entirely motionless. Above this minimum the extent of oscillation of the feeder is proportional to the excess of the stroke of the reciprocation over and above the minimum stroke, this minimum stroke being that which is sufficient to bring the collar 4 into engagement with the fork 5. For each stamp-stem, therefore, and for each corresponding feeder the extent of oscillation of the feeder is proportional to the length of stroke of the reciprocation of the stamp-stem over and above the minimum.

The feed-hole 10 extends the length of the mortar. This tends to equalize the feed to the different stamps, for any excess of ore fed to one stamp will overflow to the adjoining stamps and be crushed thereby.

11 represents a rubber spring for returning the basket when released by the upward movement of the stem, and 12 is an adjustable stop limiting said return movement. Said stop 12 can be screwed down far enough to entirely

cut off the feed by shifting the lever 6 below the range of action of the collar 4.

The feeder here shown is an old form of 35 feeder and forms no part of my invention, which consists in the means above described for increasing the capacity of the mill.

By feeding each stamp separately a much greater crushing capacity is obtained for the 40 amount of power expended, there is much less wear and tear on the stamps, and slimes are avoided. Thus by introducing the above improvement the savings effected are so great that many mines now lying idle can be made 45 to pay a nice profit.

I claim—

A stamp-mill having a battery of vertical reciprocating stamps in alinement, individual intermittently-moving feeders therefor, and 50 means for proportioning the extent of movement of each feeder to the excess of stroke of reciprocation, over and above a minimum stroke, of its corresponding stamp-stem, whereby each feeder is entirely controlled by 55 the amount of ore between the corresponding shoe and die, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM A. MERRALLS.

Witnesses:

F. M. WRIGHT,
Z. A. DANIELS.