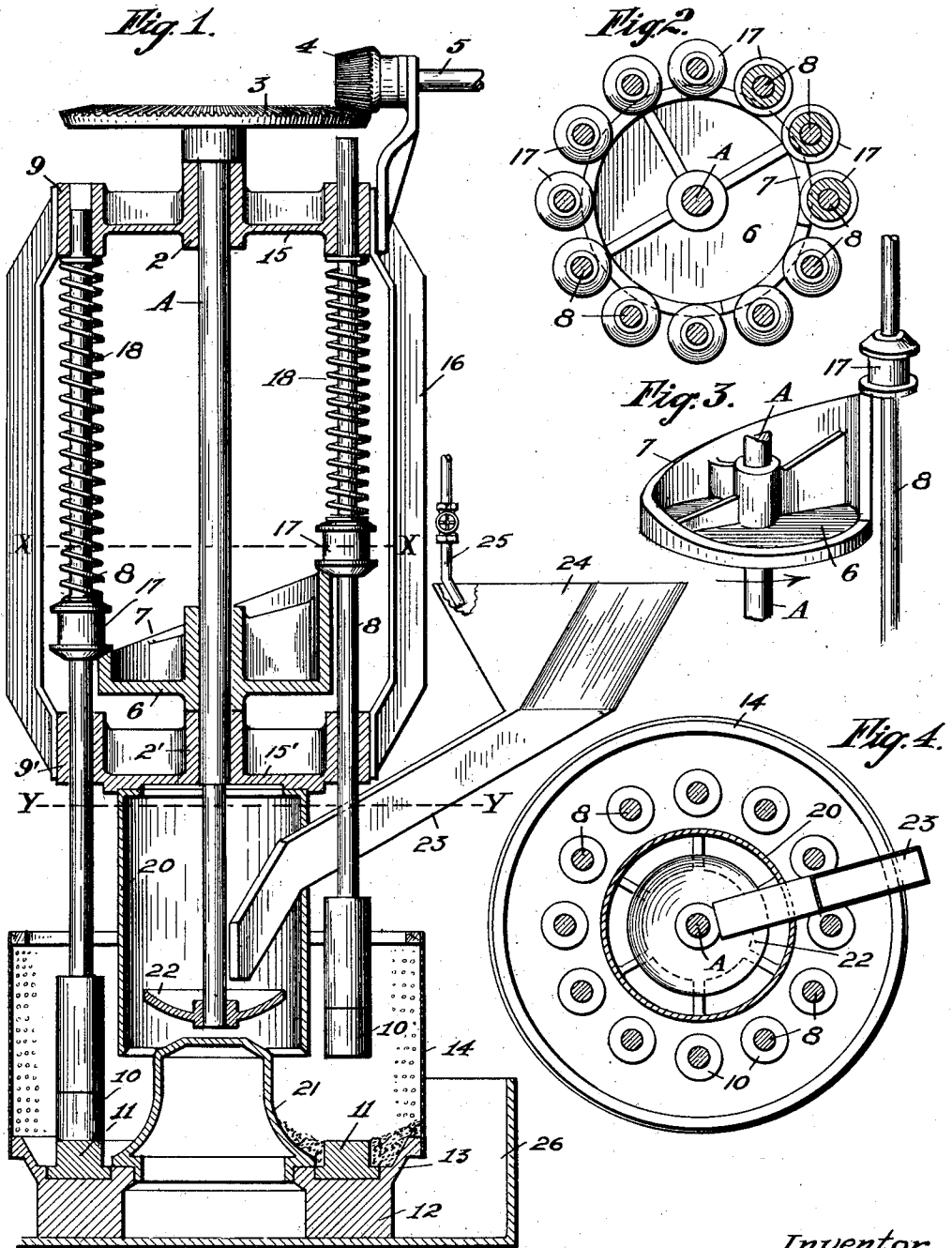


W. B. STRAUB.
STAMP MILL.
APPLICATION FILED OCT. 9, 1911.

1,038,019.

Patented Sept. 10, 1912.



Witnesses;
A. S. Berry
Chas. F. Koberg

Inventor
William B. Straub
By *G. H. Strong*
Att'y.

UNITED STATES PATENT OFFICE.

WILLIAM B. STRAUB, OF OAKLAND, CALIFORNIA, ASSIGNOR OF ONE-HALF TO JOHN J. KNIGHT, OF ALAMEDA, CALIFORNIA.

STAMP-MILL.

1,038,019.

Specification of Letters Patent.

Patented Sept. 10, 1912.

Application filed October 9, 1911. Serial No. 653,484.

To all whom it may concern:

Be it known that I, WILLIAM B. STRAUB, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Stamp-Mills, of which the following is a specification.

This invention relates to a stamp mill and particularly pertains to a mill for crushing and pulverizing ore-bearing rock or other materials.

It is the object of this invention to provide a stamp mill which is simple in construction and efficient in operation and which is designed and arranged so as to be compact and occupy but small floor space in proportion to its capacity.

Another object is to provide a stamp mill in which the driving power is evenly distributed and which is capable of operating at high speed so as to crush and pulverize the materials being worked with great rapidity, thus producing a compact machine of large output.

Further objects will appear in the following specification.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a vertical section of the invention. Fig. 2 is a horizontal section on the line X—X of Fig. 1. Fig. 3 is a detail in perspective of the cam and tappet. Fig. 4 is a horizontal section on the line Y—Y of Fig. 1.

In the drawings A represents a vertically disposed shaft, revolubly mounted in bearings 2 and 2', and adapted to be continuously rotated by means of a bevel gear 3, mounted on its upper end which meshes with and is driven by means of a beveled pinion 4 on a drive shaft 5, from any suitable source of power.

Rigidly mounted on the shaft A adjacent the bearing 2' is a cam comprising a horizontally disposed disk 6 on the outer edge of which is formed a vertical flange 7; the upper edge of the flange 7 which constitutes the cam face being in the shape of a volute or spiral to form an upwardly inclined plane starting at a point adjacent the disk 6 and terminating abruptly at its highest point, as shown in Fig. 3.

Disposed around the periphery of the horizontal cam disk 6 and adjacent thereto, is a series of vertically arranged stamp stems 8 supported near their upper and lower ends in suitable guide bearings 9—9'. The stems 8 are each provided with the usual shoe 10 on their lower ends, which shoes are adapted to crush the materials delivered between them and dies 11, as later described. The dies 11 are supported on a base plate 12; on the outer upper edge of which is formed an outwardly and upwardly diverging annular flange 13, which surrounds the dies 11 and carries a vertically disposed screen 14, of any suitable height which surrounds the ring of shoes 10 in the manner and for the purpose common in stamp mill construction. The stem guide bearings 9—9' and the bearings for the shaft A are formed integral with disks 15—15' and are mounted on and supported by a frame work 16 of any suitable description.

Mounted on each of the stems 8 and rigidly secured thereto is a collar or tappet 17 which is so positioned on the stem as to be moved in an upward direction by the cam 7 when the latter is revolved; the spiral face of the cam engaging the under-side of the collar 17 and acting on the principle of the inclined plane to elevate the stem 8 through the collar 17 until the highest point of the cam passes from beneath the collar, which action releases the stem and allows it to fall downwardly.

A helical spring 18 is mounted on each stem 8 and bears between the guide bearing 9 and the collar 17 on the stem 8 in such manner as to be compressed when the stem is moved in an upward direction. The function of the spring 18 is to accelerate the downward movement of the stem 8 when the latter is momentarily freed from the cam 7; the spring being compressed under considerable tension when the stem 8 is in its uppermost position.

Disposed beneath the bearing disk 15' in the space surrounded by the stamp stems 8 is a hollow drum 20 which opens at its lower end around a circular outwardly and downwardly diverging deflector 21 arranged centrally therebeneath. The shaft A extends into the drum 20 and has a saucer-shaped disk or distributor 22 mounted on its lower end.

An inclosed chute 23 leading from a hopper 24 passes between adjacent stamp stems 8, as shown in Fig. 4 and opens downwardly a short distance above the distributor 22 close to the shaft A, and is provided as a means for delivering and discharging the ores or other materials to be crushed into the distributor 22 from the hopper 24.

In the operation of this invention, the materials to be crushed and reduced to a powder, are fed into the hopper 24 in any suitable manner, together with a requisite quantity of water from a pipe 25. The materials pass down the chute 23 and fall upon the distributor 22, which by reason of being rotated at considerable speed acts to throw the materials delivered thereto in a radial direction within the drum 20 from whence it passes by gravitation out the open lower end of the latter onto the curved deflector 21, which acts to direct it upon the dies 11 beneath the shoes 10 on the stems 8. The shaft A in revolving carries the cam 7 therewith; the inclined face of the latter acting to successively elevate the stems 8 in opposition to the springs 18; each stem dropping to cause the shoe 10 thereon to crush the material on the die therebeneath, when the highest point of the cam passes from under the collar 17, the lower part of the cam then reengaging the collar 17, to again elevate the stem to its highest position. It will be seen that the horizontal cam will act to raise all the stems 8 but one, at one time, and that each stem will be elevated and dropped once in every revolution of the cam. This arrangement admits of a large number of blows of the shoes being delivered in a short space of time, in this case twelve stamp stems being employed so that twelve blows will be delivered on each revolution of the cam.

It is obvious that the number of stamp stems employed may be increased or diminished as desired, according to the size of the disk 5 and the capacity of machine required.

The length of the stroke of the reciprocating stamp stems 8 is such that when the shoes 10 strike the dies 11, the collars 17

will be disposed a short distance above the cam 7 so as not to come in contact therewith on the fall of the stem; the cam picking up one stem the moment the one falling drops. By this arrangement the cam is constantly lifting the same weight so that a uniform power will be exerted in lifting the stamp stems, thereby relieving the driving mechanism of intermittent strains. As the materials beneath the shoes 10 become sufficiently pulverized, they are passed through the screen 14 in the usual manner and drop into a receptacle 26 from whence they are discharged in any suitable manner.

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

1. A stamp mill consisting of an annular mortar, and dies, vertically guided stems with stamp heads at the lower ends registering with the dies, a central vertical rotary shaft, having a cam fixed to and revolvable with it, spring-pressed tappets upon the stamp stems successively reciprocated by the cam and springs, a concave disk fixed to the lower part of the central shaft and means to deliver ore thereto, and a cylindrical drum located between the disk and the line of travel of the stamps.

2. A stamp mill consisting of an annular mortar, and dies, vertically guided stems with stamp heads at the lower ends registering with the dies, a central vertical rotary shaft, having a cam fixed to and revolvable with it, spring-pressed tappets upon the stamp stems, successively reciprocated by the cam and springs, a concave disk fixed to the lower part of the central shaft and means to deliver ore thereto, a cylindrical open bottomed drum fixed between the disk and the line of travel of the stamps and a deflector between the drums and the mortar.

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

WILLIAM B. STRAUB.

Witnesses:

J. E. LUDOVICI,
E. S. PAGE.