

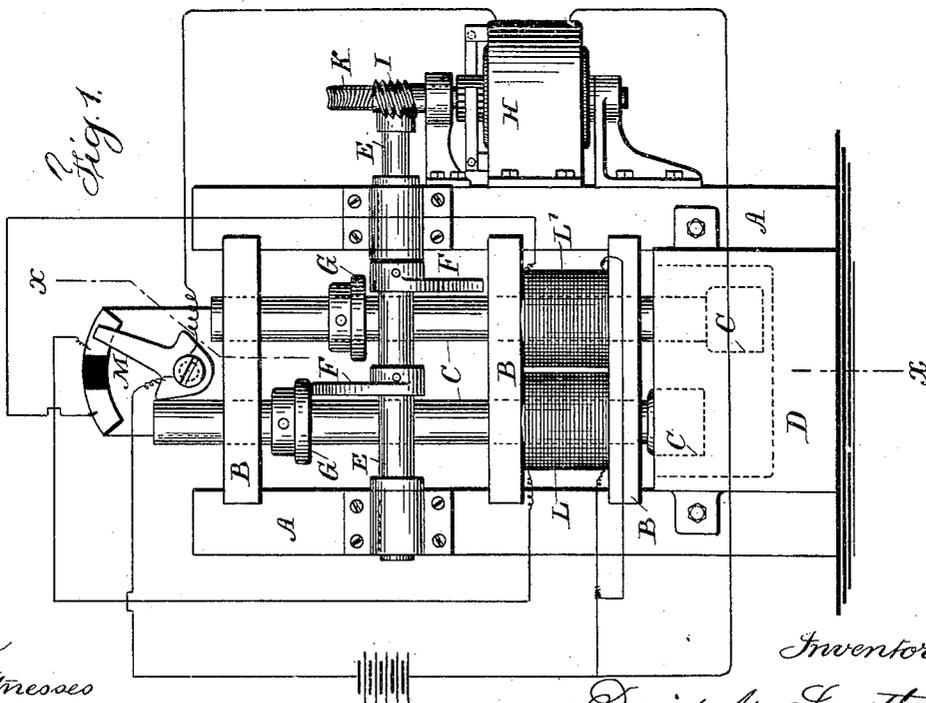
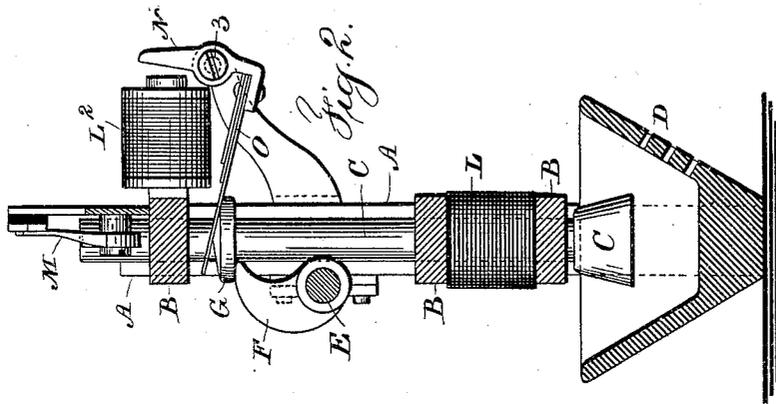
No. 654,420.

Patented July 24, 1900.

D. M. & J. E. SMYTH.
ORE STAMP.

(Application filed Mar. 31, 1898.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

DAVID M. SMYTH AND JOSEPH E. SMYTH, OF PASADENA, CALIFORNIA.

ORE-STAMP.

SPECIFICATION forming part of Letters Patent No. 654,420, dated July 24, 1900.

Application filed March 31, 1898. Serial No. 675,855. (No model.)

To all whom it may concern:

Be it known that we, DAVID M. SMYTH and JOSEPH E. SMYTH, citizens of the United States, residing at Pasadena, in the county of Los Angeles and State of California, have invented an Improvement in Ore-Stamps, of which the following is a specification.

Ore-stamps have been extensively used in which there is a shoe upon the lower end of the vertical sliding bar and the stamp has been raised by the action of cams and falls by gravity. Air and metal springs have also been used to accelerate the fall of the stamp, and helices have also been used for raising the stamp and for accelerating the fall thereof; but where springs are made use of the mechanism that raises the stamp has to act against the resistance of the spring, and where a helix is used to raise the stamp the entire stamp has to be remodeled, whereas by the present improvement the stamp can be raised by cams in the ordinary manner and the fall of the stamp accelerated by an electric device that is not operative until the stamp has been raised, or nearly so. Hence the mechanism does not have to act against a resistance. In our application, Serial No. 660,077, filed November 29, 1897, the stamp is represented as raised by an electromagnet and the fall accelerated by an electromagnet and intervening spring; but the spring is acted upon by a moving core and not by an armature, and a cam is not made use of in raising the stamp. We also find it advantageous to employ an electric motor for running the shaft and cams that raise the stamps, and the cams are arranged with reference to raising the stamps in succession, and the upward movement of one stamp is availed of in turning the current into its helix slightly before the cam clears the elevated stamp, so that the power of the electromagnet is fully availed of in throwing down the stamp with a greatly-accelerated force.

In the drawings, Figure 1 is an elevation of a stamp-mill fitted with the present improvement, and Fig. 2 is a section at the line $x x$ of Fig. 1 and representing an electromagnet acting through a spring in giving an accelerated movement to the stamp as it falls.

Any suitable framework (illustrated at A) is provided with cross-pieces B, forming

guides for the vertical reciprocating stamps C, and the ore is supplied into any suitable mortar or bowl D, together with the water that carries away the fine earthy materials. The shaft E is provided with cams F, acting upon the collars G upon the stamps C for raising such stamps and allowing them to fall, and the shaft E is rotated by suitable power. We, however, prefer and use an electric motor H with a worm-pinion I upon the axis of the armature acting upon a wheel K upon the cam-shaft E. The helices L L' surround the vertical stamps C, and the bars of the stamps form cores for the helices, and these cores are drawn down when the helices are energized by the electric current passing through them in consequence of the helices surrounding the lower portions of the cores.

The switch M is adapted to be moved by either of the vertical stamps just before the termination of the upward movement of such stamp, so that when the stamp has been raised by the cam and the cam is about to separate from the collar upon the stamp the switch is moved so as to close the circuit to the helix of the stamp and energize the same for causing the magnetism to accelerate the fall of the stamp and cause the shoe to strike a powerful blow upon the material to be pulverized. It is of course advantageous to turn off the current from the helix of the stamp before the cam commences to raise the same, and with this object in view the two stamps work together advantageously, because one stamp is being raised during the time that another stamp falls, and the stamp that is being raised is to be so timed and the switch so constructed that the current will be turned off from the first helix by the movement of the second core before its cam commences to raise the first helix, and in this manner the helices will be energized alternately and there will be a period during the movement of the switch when the current will be turned off from both of the helices, and hence such current can act with full force in the motor in completing the raising of the stamp and the switch will turn the current onto the helix of the stamp just before the cam allows the same to drop.

Under some circumstances it is advantageous to make use of a spring and electro-

magnet in giving the accelerated motion to the falling stamp instead of using a solenoid-core around the stamp itself. This device is illustrated in Fig. 2, in which the helix L^2 has a stationary core, and there is an armature N pivoted at 3 and provided with a spring O, resting upon the collar of the stamp. In other respects the parts are the same as shown in Fig. 1, and the switch turns the current through the helix L^2 immediately before the cam clears the collar G, so that the magnetism acting upon the armature N commences to strain the spring O, and as soon as the cam F separates from the collar G the spring O throws down the stamp with an accelerated velocity and increasing power due to the armature swinging into the magnetic field and its power becoming augmented. In Fig. 2 we have also represented the helix L around the bar of the stamp, as both helices may be employed, if desired.

The circuit connections that may be employed are indicated in Fig. 1.

We claim as our invention—

The combination with the stamp and a shaft and cam for raising the same, of an electromagnet, circuit connections and a switch actuated immediately before the cam separates from the stamp, for turning the current into the electromagnet, and a spring intervening between the electromagnet and the stamp and acted upon by the armature of the magnet for applying the power of the magnet through the leverage of the spring in accelerating the fall of the stamp, substantially as set forth.

Signed by us this 16th day of March, 1898.

DAVID M. SMYTH.
JOSEPH E. SMYTH.

Witnesses:

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