# W. C. FERGUSON & J. S. JONES.

## Ore-Stamp.

No. 168,245. Patented Sept. 28, 1875.

*FIG. 1.*

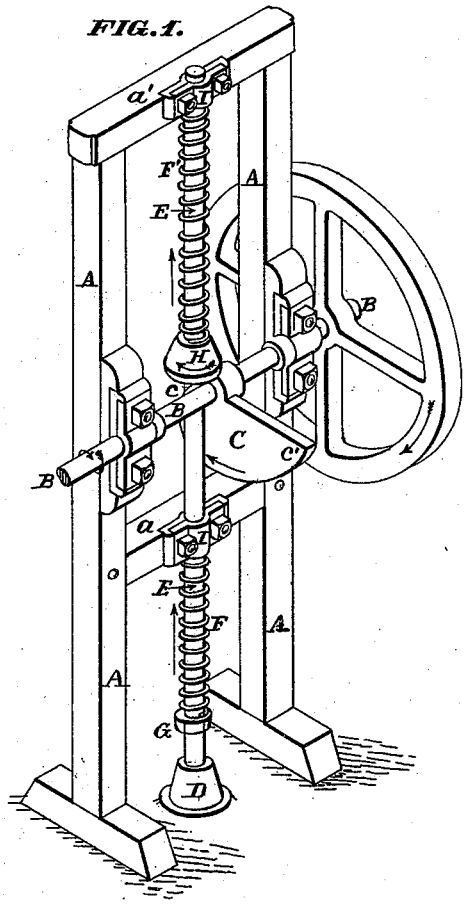
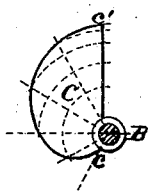



*FIG. 2.*

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# UNITED STATES PATENT OFFICE.

WILLIAM C. FERGUSON AND JOHN S. JONES, OF ST. LOUIS, MISSOURI, ASSIGNORS OF ONE-THIRD THEIR RIGHT TO JOHN L. FERGUSON, OF SAME PLACE.

## IMPROVEMENT IN ORE-STAMPS.

Specification forming part of Letters Patent No. **168,245**, dated September 28, 1875; application filed April 23, 1875.

*To all whom it may concern:*

Be it known that we, WILLIAM C. FERGUSON and JOHN S. JONES, both of St. Louis, St. Louis county, State of Missouri, have invented certain new and useful Improvements in Ore-Stamping Mills, of which the following is a specification:

The invention relates to a stamping-mill belonging to that class in which, as the stamp is lifted by a cam, a spring is compressed, whose reaction imparts a rapid downstroke to the stamp.

The present improvement consists in the combination, with said stamp, of two or more springs, one or more beneath, and the other or others above, the collar upon which the cam acts to lift the stamp; also, in the form of said cam, whose acting surface is made with a gradually-decreasing pitch from its starting-point, so that as the resistance of the springs increase, as compressed by the raising of the stamp, and as the friction-surface in contact with the collar is farther from the axis, (so as to give increased resistance to the rotation of the cam-shaft,) the lifting action of the cam is proportionately slower and more powerful, so as to overcome the increasing resistance of the spring and frictional resistance, and so conduce to the regular running of the machinery.

In the accompanying drawings, Figure 1 is a perspective view of the mill. Fig. 2 is a detail view of the cam.

A is the supporting-frame of the mill, that may be of any suitable construction. B is the driving-shaft, carrying the cam C, that lifts the stamp D by means of a collar upon its shaft E. F F′ are spiral springs surrounding the stamp-shaft, and arranged, the former between the collar G and the cross-bar *a*, and the latter between the cam-collar H and the cross-bar *a′* of the frame. The cam C is formed with a pitch gradually decreasing from its starting-point *c* to outer point *c′*, so as to raise the stamp with gradually-decreasing speed as it ascends, and so that the increasing resistance of the spring or springs to further compression will be met by a slower, and, consequently, more powerful, lifting movement, and thus the resistance to the driving-motion be equalized during the whole ascent of the stamp. In this way less power is required to drive the mill than where the usual form of cam is used, where no such device is used to compensate for the increasing resistance of the springs as the stamp ascends. In addition to this increasing tension of the springs, as the cam turns, the part of its face in contact with the collar H is farther from the axis, and, consequently, the frictional resistance increases, and the described form of cam compensates for this also. The stamp-shaft E is free to turn in its bearings I I, so that the cam, while lifting it, will impart to it a rotary motion by the friction of the cam upon the collar H.

It is evident that three or more stamps can be arranged side by side in one frame, and the lifting-cams be so arranged on a common shaft that the blows of the cams shall follow each other in regular order.

The two springs F F′ have advantage over a single spring having a like play and a power equal to the aggregate power of the two, because the two springs hold the shaft more steadily in its bearings than where the pressure is only on one point. In addition to this, in case one of the two springs should break at any time, the stamp may be run with the remaining spring until the mill is stopped, and it will not be necessary to stop the whole battery for the repair of a single spring, as would be the case where a single spring only is used, and that spring is broken.

We claim—

The combination, in a stamp-mill, of the stamp D, with shaft E, spring or springs F, with lifting-cam C, having a decreasing pitch from its point *c* to point *c′*, substantially as and for the purpose set forth.

WILLIAM C. FERGUSON.
JOHN S. JONES.

Witnesses:
SAML. KNIGHT,
ROBERT BURNS.