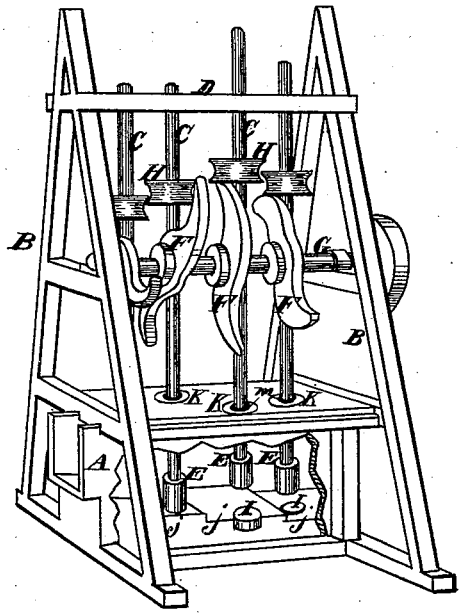
D. F. HAWKES.

Flume-Battery.

No. 163,867. Patented June 1, 1875.

*Fig. 1.*

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# UNITED STATES PATENT OFFICE.

DANIEL F. HAWKES, OF TIMBUCTOO, CALIFORNIA.

## IMPROVEMENT IN FLUME-BATTERIES.

Specification forming part of Letters Patent No. **163,867**, dated June 1, 1875; application filed November 18, 1874.

*To all whom it may concern:*

Be it known that I, DANIEL F. HAWKES, of Timbuctoo, Yuba county, State of California, have invented a Flume-Battery; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention without further invention or experiment.

My invention consists in the employment in flumes, such as are used for conveying away the wash from hydraulic mines, and in which the gold is caught, of a battery or other equivalent crushing apparatus, by which the unbroken and undissolved pieces of earth or cement which attempt to pass through the flume will be thoroughly pulverized and broken.

Many of our hydraulic claims are composed of a hard blue cement or clay in which the pieces and particles of gold are contained. During the process of hydraulicing many large pieces of this hard cement get into the flume, and are carried away with the refuse or tailings in an unbroken condition, so that whatever gold there may be contained in the lump is run away and lost.

In order to more fully illustrate and explain my invention, reference is had to the following description and the drawings accompanying this specification, in which the figure is a perspective view of my invention.

A represents a section of a mining-flume, through which the earth or cement is conveyed after it has been washed from the bank by the stream of water for the purpose of separating and saving the particles of gold contained in the earth or cement. Over the flume-section A I construct a suitable frame, B B. C C C are stamp-stems, the upper ends of which pass through holes in the cross-beam D of the frame A, while their lower ends pass through suitable holes in the top of the sluice-section. To the lower ends of these stems C inside of the flume are attached strong metal stamps E, which are operated by cams F on the shaft G, which lift the stamps by the tappets H. The stems C, with their stamps, are arranged diagonally and alternately across the flume, so that whatever might escape one line of stamps will be operated upon by the alternating stamps in the next diagonal line. This arrangement necessitates the placing of some of the stamp-stems farther from the cam-shaft G than others. It is, therefore, necessary to make the operating-cams F longer for some of the stamps than for others; but this will be readily understood and arranged by any mechanic. The dies I I I, upon which the stamps fall in the bottom of the flume, consist each of a block of suitable metal embedded in the wood of the bottom of the flume, so as to rest above or upon the cross-timbers, which pass across under the flume.

I shall usually construct the bottom of the flume-section A in a series of steps or benches, *j*, so that each stamp, or row of stamps, as most convenient, will strike upon a different step or bench, thas providing a descending series of benches for the stamps to operate upon.

In order to get rid of the large stones and bowlders which are constantly passing into and through this class of flumes, and which would, if allowed to pass through the flume-battery, prevent, in a large degree, its successful operation, I construct a side or turn-out flume, A, leading from the main flume A′, and in this turn-out flume I place the battery-section. This turn-out or side flume branches off from the main flume at some proper and suitable point, and, after making a detour, again enters the main flume at a point below. At the point where this turn-out or side flume branches off from the main flume, I place a number of parallel bars, *a′*, across the bottom of the main flume, so as to form a grating, through which the large rocks or bowlders cannot pass, while the water, earth, or cement, and smaller stones will fall through into the turn-out flume below and be carried through it and under the stamps. After the water and material pass through the turn-out flume, they are again discharged into main flume, while the large rocks and bowlders which were screened out will again intermingle, and continue down the main flume with them.

In order to prevent the stamp-stems C from being bent or broken by the striking upon such rocks as will necessarily pass through the turn-out flume, I pass each of them through an india-rubber cushion, K, in the top of the flume.

These elastic cushions are large enough to provide the desired side yield, and are firmly secured in an opening in the top of the flume. A metal bushing or tube, *m*, is fixed in the center of each cushion, and the stamp-stem passes through the tube.

By means of the above-described arrangement it will be impossible for any loose lump of clay, cement, or other substance to pass through the battery-section without being crushed.

As many stamps may be used as is necessary to properly crush the earth or cement, and their weight and arrangement can be varied, according to the necessities of each case.

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

1. In combination with a main flume, A′, provided with the grating *a′*, the turn-out flume A, provided with one or more battery-stamps, E, substantially as and for the purpose set forth.

2. As an improvement in hydraulic mining, the process of reducing the unbroken pieces of cement, earth, or other light material by passing the wash from the mines through a flume which leads through a stamp-battery, whereby the lumps or pieces will be carried by the water underneath the stamps and subjected to a crushing action in their passage through the flume, substantially as and for the purpose set forth.

In witness whereof I hereunto set my hand and seal.

DANIEL FRANKLIN HAWKES. [L. S.]

Witnesses:

JNO. L. BOONE,

C. M. RICHARDSON.