(No Model.)

W. McDERMOTT.

ORE SAMPLING MACHINE.

No. 354,203. Patented Dec. 14, 1886.

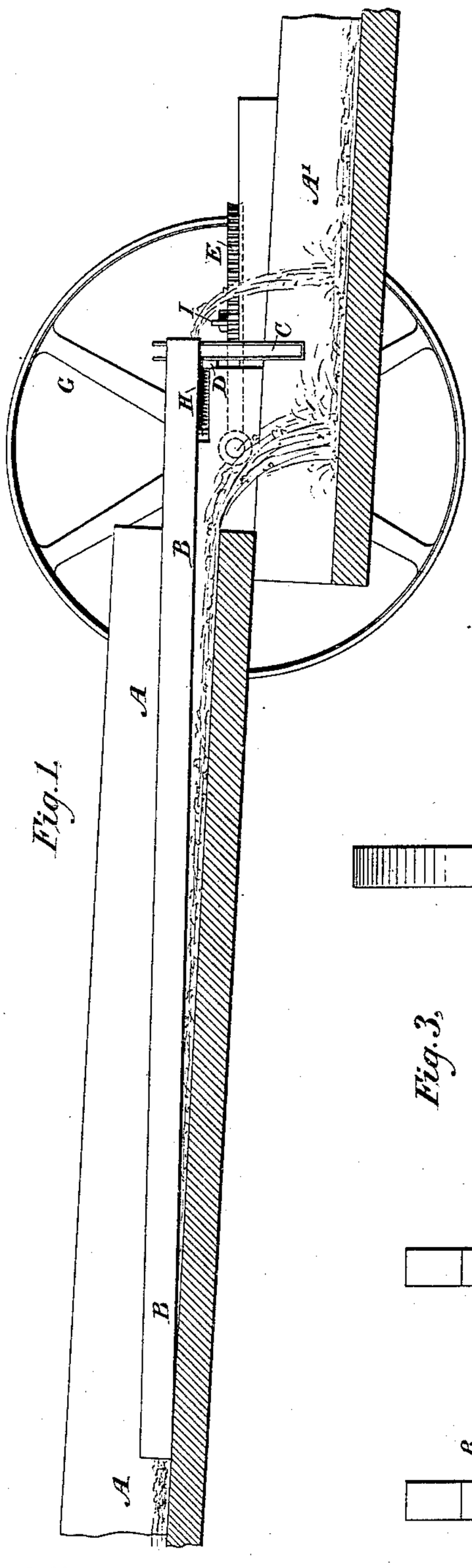

Fig. 1.

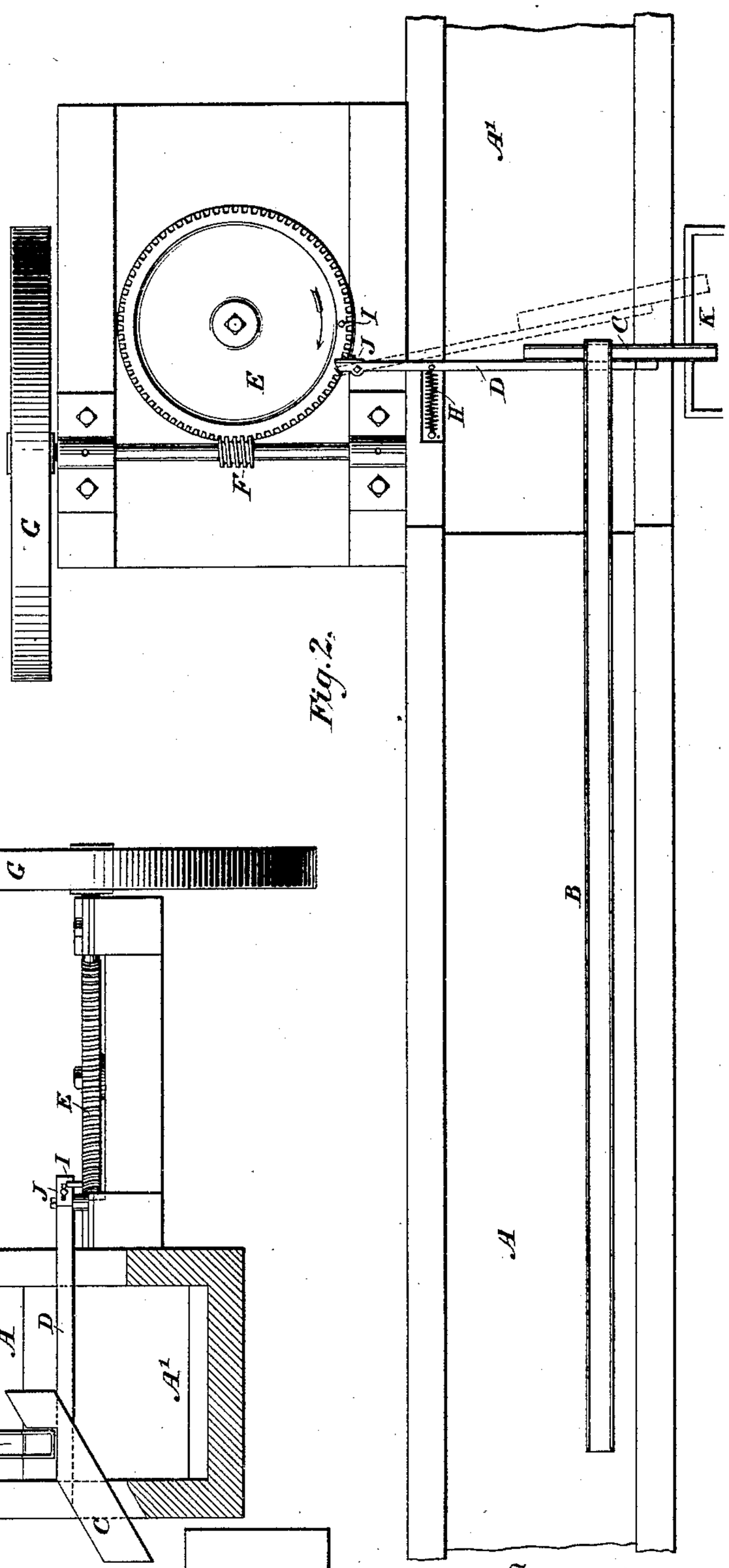

Fig. 2.

Fig. 3.

Witnesses

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WALTER McDERMOTT, OF BRICK CHURCH, NEW JERSEY.

ORE-SAMPLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 354,203, dated December 14, 1886

Application filed January 2, 1886. Renewed November 10, 1886. Serial No. 218,507. (No model.)

To all whom it may concern:

Be it known that I, WALTER McDERMOTT, of Brick Church, New Jersey, have invented a new and useful Improvement in Ore-Sampling Machines, of which the following is a specification.

This invention relates to the class of machines known as "automatic sampling-machines," the object of which is to take a small and exactly average sample from a large quantity of crushed ore for the purpose of determining the value of the same by assay.

The purpose of the particular invention is to arrange a simple machine which can be readily attached to existing crushing-mills, and which at regular intervals shall take a small quantity from a flowing stream of crushed ore, either falling dry or suspended in a current of water, and deposit these successive samples in a separate vessel arranged to receive them.

In the drawings, the application of the machine is shown in the case where the crushed ore is suspended in a flowing stream of water, as represented by the pulp or the tailings discharge of a wet-crushing ore-mill. Where dry-crushing is employed the action of the machine is the same as illustrated herewith, but the channels down which the ore flows would be more steeply inclined, or in some cases vertical.

In the accompanying drawings, Figure 1 is a side view of the machine, partly in section; Fig. 2, a plan, and Fig. 3 an end view, partly in section.

The following is a description of the invention.

A A′ is the channel or launder down which the stream of crushed ore and water flows from one point of the mill to another. Technically, the ore and water direct from the crushing machinery is known as "pulp," and the discharge or waste ore, after treatment, is known as "tailings," and these terms are so used in the following specification. The launder A A′ has a break or drop in it of a few inches at some convenient point, so as to make a fall of the entire stream, and so allow of the introduction under it of the sampling-spout C.

In the annexed drawings I have shown an arrangement by which the sampling-spout does not pass under the main stream of pulp, but under a small section of the same taken out by the small inclined sheet-iron spout B. The object of this arrangement is to reduce the size of the falling stream sampled, and so reduce the quantity of each sample taken. Where the launder A has a steep inclination, it is not necessary to make a break in its level, as the sheet-iron launder B can alone be used and allow the passing under it of the sample-spout C. The inclined sheet-iron spout C is attached to the long arm of a lever, D, which is held in place by a light spring, H, so that the spout C, when at rest, is under the end of iron launder B, or under the projecting lip of launder A, in cases where the whole stream of pulp is sampled.

E is a horizontal gear-wheel, made to revolve slowly by means of a worm, F, driven by pulley G. On the upper side of wheel E, and near the outer edge of same, one or more iron pins, I, project. These pins engage the short arm of lever D, which is thrown out into position marked by dotted lines, Fig. 2, being brought back into its first position by spring H as soon as the pin has released the end of the lever. The face of the lever D is protected from wear by an adjustable metal piece, J, which also regulates the extent of movement of the lever D, according to the quickness of release by the pin I.

The operation of the machine is as follows: The stream of pulp or tailings flowing down launder A A′ is split by small sheet-iron launder B, a certain proportional part flowing down the latter, and this fraction being regulated by the width of B. The main stream of pulp passes down A A′, and the discharge of B drops into A′, rejoining the main stream. The spout C is so arranged that anything falling on it is deflected into the sample-pail K, placed to receive it. The gear-wheel E revolves very slowly by means of a small belt on pulley G, driven from any convenient shafting, the shaft acting as a driving-pulley, and the object being to give a very slow motion to E. This last may also be obtained by introducing a small and large gear-wheel between worm F and operating-wheel E. The slow motion of the periphery of wheel E is converted into a relatively-quick motion of the sampling-spout C at the long end of the lever D, and the spout C is therefore quickly passed through the falling stream of pulp from end of B, and back

again rapidly to its position of rest as soon as released by the motion of the pin I. In this way a small sample is deflected at regular intervals from the stream of pulp into sample-pail K; and the very slow motion necessary for wheel E to avoid too frequent sampling is offset by the relatively-rapid motion of spout C, which avoids too large a sample being taken.

It will be seen that by putting two pins into wheel E twice the number of samples in a given time will be taken than if one pin be used. The relative lengths of the arms of lever D regulate the length of time spout C is passing through the falling stream of pulp, and so the quantity each time deflected into K. These, with the regulation of the speed of wheel E and size of launder B, give almost unlimited means of simply regulating the quantity of sample taken according to requirements.

My improvement is particularly useful in that it enables me to take a small sample at comparatively long intervals from a large moving stream of dry ore or pulp, and to apply this mechanism to existing mills where there is but little fall to spare in the various conducting-channels.

I claim—

1. In combination, the launder, a trough mounted on the long arm of a lever, a spring so arranged as to hold said trough out of the descending current of ore, and mechanism, substantially as described, whereby said trough is repeatedly swung into said current and released to pass out of said current under the influence of the spring, as set forth.

2. In combination, the launder, a narrow trough, B, whereby a portion of the pulp or ore flowing down said launder is separated from the main stream, and a vibrating trough arranged at the end of trough B, substantially as described, whereby samples may be taken from time to time from the ore or pulp flowing from the trough B.

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Witnesses:
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