

J. O. BARDILL.
AUTOMATIC SAMPLING MACHINE.
APPLICATION FILED DEC. 11, 1911.

1,063,494.

Patented June 3, 1913.

Fig. I.

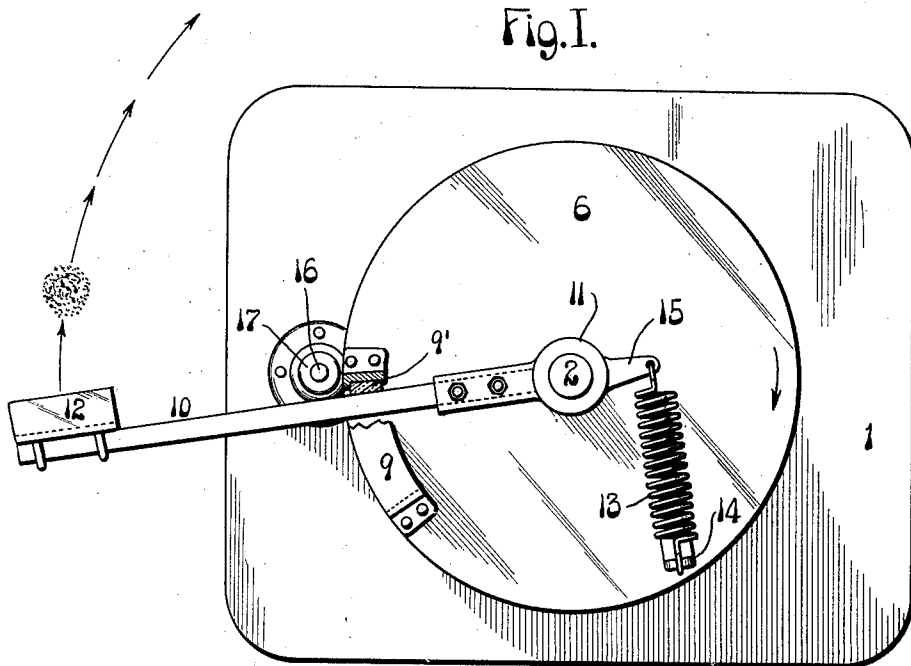
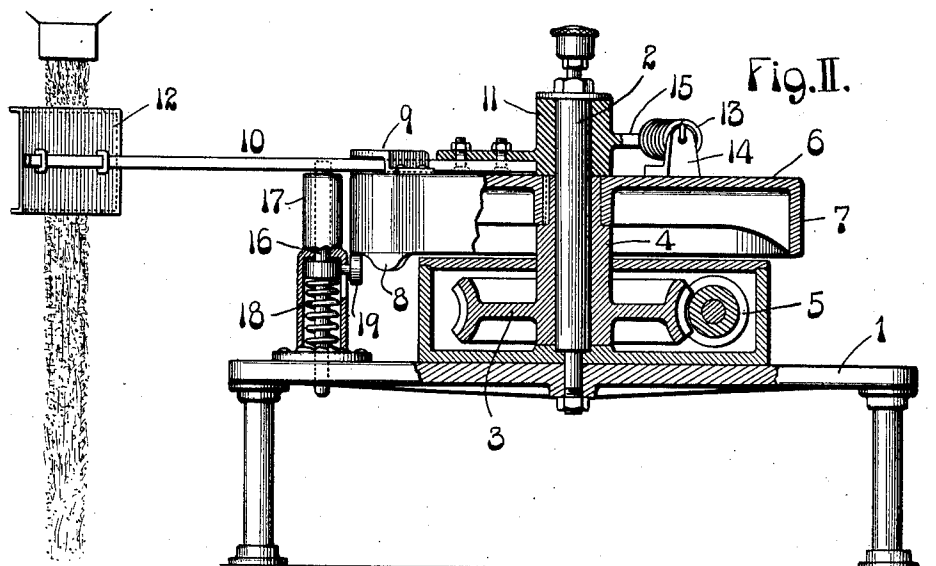


Fig. II.



Attest
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UNITED STATES PATENT OFFICE.

JOHN O. BARDILL, OF HERCULANEUM, MISSOURI.

AUTOMATIC SAMPLING-MACHINE.

1,063,494.

Specification of Letters Patent.

Patented June 3, 1913.

Application filed December 11, 1911. Serial No. 664,942.

To all whom it may concern:

Be it known that I, JOHN O. BARDILL, a citizen of the United States of America, residing at Herculaneum, in the county of Jefferson and State of Missouri, have invented certain new and useful Improvements in Automatic Sampling-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to a machine for securing samples from streams of material, such for instance, as ores.

In securing samples of materials, such as crushed ore, while in transit in streams, it is highly necessary, in order that accurate samples may be obtained, to cut the samples from the streams of material by so passing the sample gathering member therethrough as to secure an approximate right angled section of the stream of material; it is also necessary that such samples be taken from the stream at regular intervals. Numerous sampling devices intended to give the desired results have, to my knowledge, been produced in the past; but as a rule, these devices have been so constructed that the sample securing members passed through the streams of material in such manner as to preclude the possibility of meeting one of the requirements mentioned, namely: the obtaining of samples that were right angled sections of the streams from which the samples were taken. The object of my invention is to produce a sampling machine that meets both the requirements I have referred to, this object being obtained by so mounting a movable sample gathering member that it may be caused to cut the stream of material to be sampled transversely thereof, and provide for the passage of said sampling member through the stream with a movement that is practically instantaneous.

Figure I is a top or plan view of my sampling machine. Fig. II is in part a vertical section and in part an elevation of the machine.

In the accompanying drawings: 1 designates the bed of my machine surmounted by a vertical post 2 that serves as a bearing or pivot member on which certain parts of the machine operate.

3 designates a worm wheel loosely fitted to the post 2 and adapted to operate thereon, the said wheel being provided with a hub

sleeve 4, and being arranged to be driven by a worm 5.

6 designates a rotatable driver fixed to the worm wheel 3. This driver is preferably in the form of a disk having a downwardly extending flange 7 that is provided at its lower edge with a cam 8, the utility of which will hereinafter appear. The driver is surmounted by a keeper 9.

10 designates a sweep arm that extends from a sweep hub 11 loosely fitted to the post 2, and located above the driver 6. The sweep, comprising the arm 10 and hub 11, is adapted to partake of movement independently of the movement of the driver 6, and the sweep arm extends loosely through the keeper 9, which serves to hold the arm in a horizontal plane.

9' is a bumper against which the sweep arm normally rests. The sweep arm 10 carries a cutter or sample gathering member 12 which is adapted to be carried through a stream of material, from which samples are to be secured, that flows in the path of movement of said gathering member, as illustrated in the drawing.

13 designates an operating spring that governs the movement of and actuates the sweep arm 10. This sweep operating spring is secured at one end to an element 14, carried by the driver 6, and at the other end to a finger 15 extending from the sweep hub 11.

The sweep arm 10 of my machine is caused to rotate with the driver 6, due to the connection furnished by the spring 13, but its movement is discontinued for an interval, during each complete rotation of the driver, in order that power may be stored in the sweep operating spring 13 by placing it under tension, and a sudden impulse be given by said spring to the sweep arm and the sample gathering member carried thereby. The sample gathering member is thus caused to pass quickly through a stream of material from which a sample is to be secured, and adjacent to which the movement of the sample gathering member is discontinued previous to the impartation of the sudden impulse. To provide for the cessation of rotation of the sweep arm, while the driver continues to rotate, I employ a suitable detent device that is movable into and out of the path of the arm. This detent device, as illustrated in the drawing, comprises a slidable detent bolt 16 loosely arranged in a vertical

housing 17 alongside the driver 6, and normally upheld by a lift spring 18 that acts to project the upper end of the bolt into the path of movement of the sweep arm 10.

5 The detent bolt is equipped with an anti-friction roller 19 that is disposed in the path of travel of the cam 8, carried by the driver 6, adapted to engage said anti-friction roller during rotation of said roller.

10 In the practical use of my sampling machine, the driver 6 is caused to rotate at any desired speed due to its operation by the driving mechanism provided therefor; as it rotates, the sweep arm 10, with its sample carrying member, moves in a circular path and at a speed corresponding to that at which the driver moves. During the main portion of each rotation of the parts mentioned, the sweep arm 10 moves idly with the driver, and when said sweep arm comes into contact with the detent 16, its rotation ceases, while the rotation of the driver 6 continues. The result is the distention of the sweep operating spring 13, storing power therein, and the advance of the bumper 9' to a point considerably in front of the sweep arm. Immediately after the sweep operating spring 13 has been distended to store power therein, the cam 8 carried by the driver 6 strikes the anti-friction roller 19, causing withdrawal of the detent bolt 16 from its position in front of the sweep arm 10, thereby releasing said sweep arm. As a consequence, the sweep operating spring 13 exerts its power impulsively upon the sweep, causing the sample gathering member 12 to be forced instantaneously through the stream of material in front of it, in a line substantially transverse of said stream, whereby an approximately right angled section of the stream is cut therefrom. The quick impulsive movement of the sample gathering member under the influence of the spring 13 is continued only until the sweep arm 10 strikes the bumper 9, in which action the gathered sample is forcibly removed from the gathering member, due to jar of the sweep arm against the bumper, so that the entire sample is removed from the gathering member and deposited at the point adjacent to the machine where deposit is intended to be made.

I wish it understood that, while I have shown and described a spring for imparting an impulse to the sweep of my sampling machine, I may use any suitable equivalent, such as a weight, to perform the office performed by the spring described.

I claim:—

60 1. In an automatic sampling machine, a driver, a sweep coöperable with said driver and movable independently thereof, said sweep being provided with a cutter whereby an approximate right angled section may be removed from a stream of material,

means for temporarily holding said sweep in restraint, and means for imparting an impulse to said sweep for sample gathering action.

2. In an automatic sampling machine, a rotatable driver, a sweep coöperable with said driver and pivotally movable independently thereof, said sweep being provided with a cutter whereby an approximate right angled section may be removed from a stream of material, means for temporarily holding said sweep in restraint, and means for imparting an impulse to said sweep for sample gathering action.

3. In an automatic sampling machine, a driver, a sweep movable with said driver, means for temporarily holding said sweep in restraint during movement of said driver, and means for actuating said sweep for sample gathering action after it is freed of restraint.

4. In an automatic sampling machine, a driver, a sweep coöperable with said driver, said sweep being provided with a cutter whereby an approximate right angled section may be removed from a stream of material, means for temporarily holding said sweep in restraint during movement of said driver, and means for actuating said sweep for sample gathering action after it is freed of restraint.

5. In an automatic sampling machine, a driver, a sweep movable with said driver, means for temporarily holding said sweep in restraint during movement of said driver, and means for actuating said sweep for sample gathering action after it is freed of restraint; said last named means being put in condition for action during the restraint of said sweep.

6. In an automatic sampling machine, a driver, a sweep coöperable with said driver, said sweep being provided with a cutter whereby an approximate right angled section may be removed from a stream of material, means for holding said sweep in restraint during movement of said driver, and means for actuating said sweep for sample gathering action after it is freed of restraint.

7. In an automatic sampling machine, a driver, a sweep coöperable with said driver, said sweep being provided with a cutter whereby an approximate right angled section may be removed from a stream of material, means for holding said sweep in restraint during movement of said driver, and a spring for imparting an impulse to said sweep for sample gathering action after it is freed of restraint.

8. In an automatic sampling machine, a driver, a sweep coöperable with said driver, means for holding said sweep in restraint during movement of said driver, and means for actuating said sweep for sample gathering action after it is freed of restraint;

said last named means comprising a spring in which power is stored during the movement of said driver while said sweep is held in restraint.

5 9. In an automatic sampling machine, a driver, a sweep coöperable with said driver, a detent for holding said sweep temporarily in restraint during movement of said driver, and a sweep operating spring in which
10 power is stored by said driver while said sweep is held in restraint.

10 10. In an automatic sampling machine, a driver, a sweep coöperable with said driver, said sweep being provided with a cutter
15 whereby an approximate right angled section may be removed from a stream of material, a detent for holding said sweep temporarily in restraint during movement of said driver, a sweep operating spring, and
20 means for freeing said detent to permit the actuation of the sweep by said spring.

11. In an automatic sampling machine, a rotatable driver, a sweep coöperable with

said driver, a detent for holding said sweep temporarily in restraint during movement 25 of said driver, a sweep operating spring connecting said sweep and driver adapted to be placed under tension during movement of said driver, while the sweep is under restraint, and means for freeing said detent 30 to permit the actuation of said sweep by said spring.

12. In an automatic sampling machine, a driver, a sweep coöperable with said driver, a detent for holding said sweep temporarily 35 in restraint during movement of said driver, and a sweep operating spring connecting said sweep and driver adapted to be placed under tension during movement of said driver while the sweep is under restraint; 40 the said driver being provided with means for operating said detent to free said sweep.

JOHN O. BARDILL.

In the presence of—

GENEVIEVE DRURY,

OSCAR E. KASTEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."