No. 782,235. PATENTED FEB. 14, 1905.

A. G. GULLBERG.

ORE SAMPLER.

APPLICATION FILED OCT. 10, 1904.

2 SHEETS—SHEET 1.

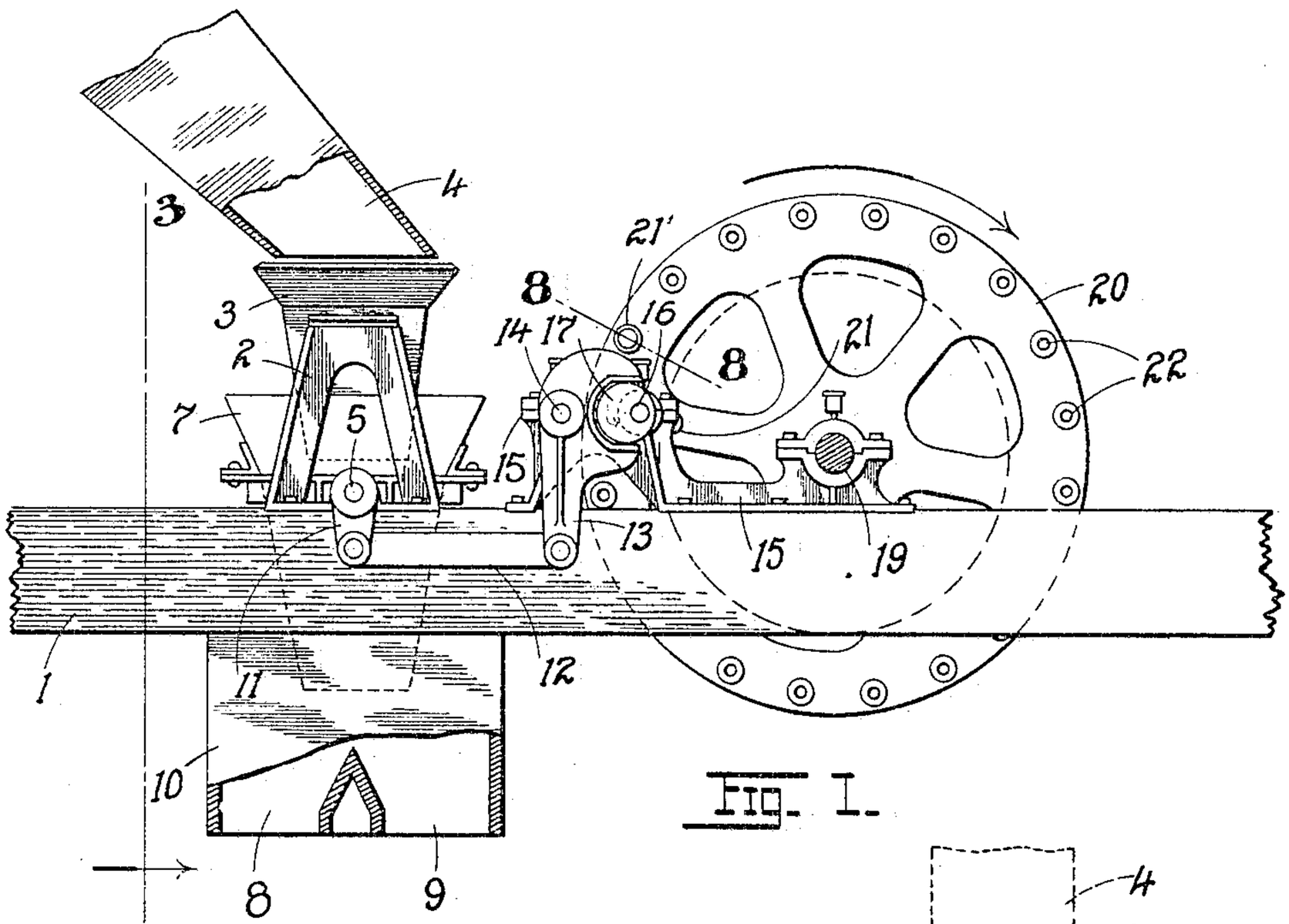

Fig. 1.

Fig. 2.

Fig. 3.

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2 SHEETS—SHEET 2.

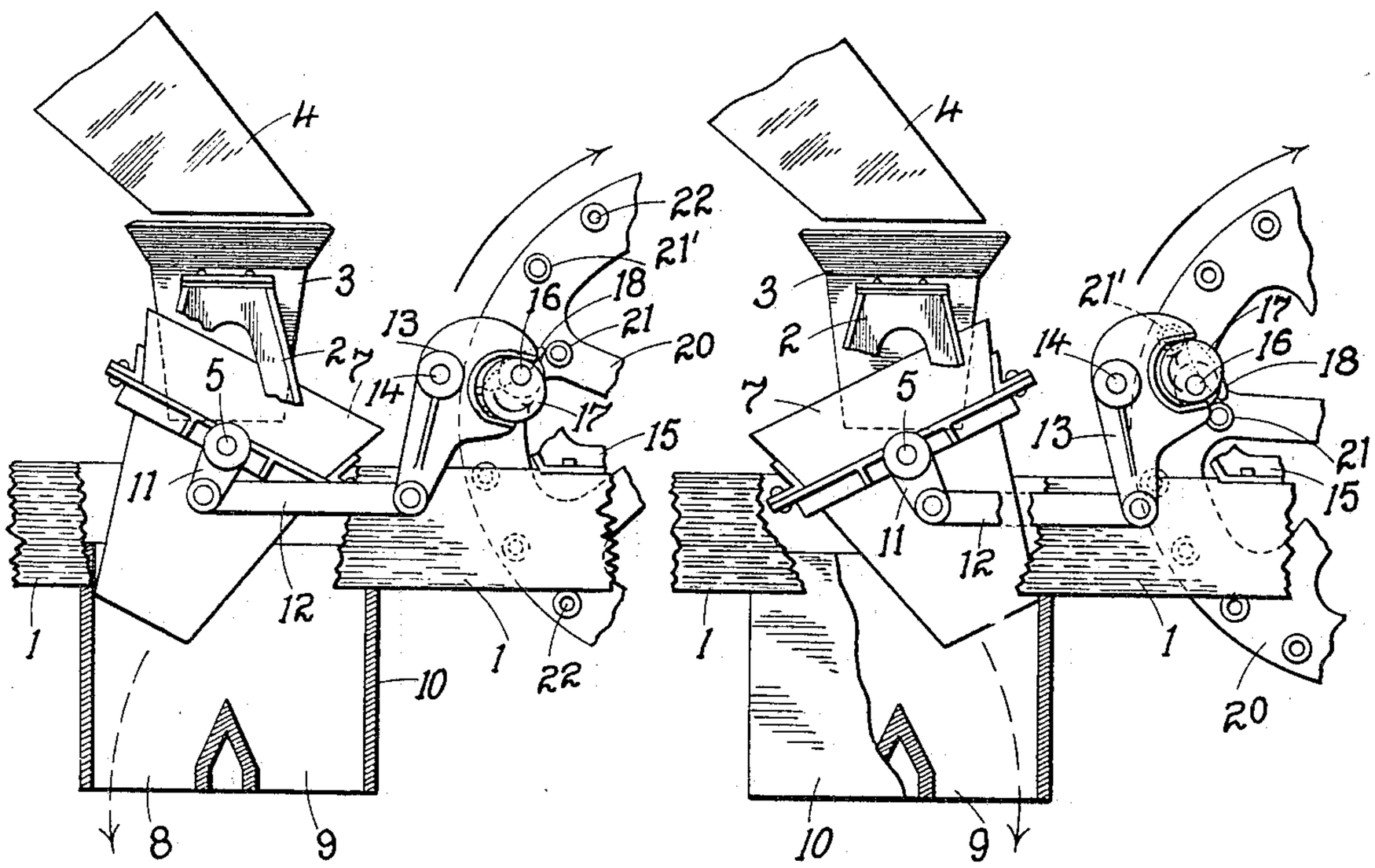

Fig. 4.

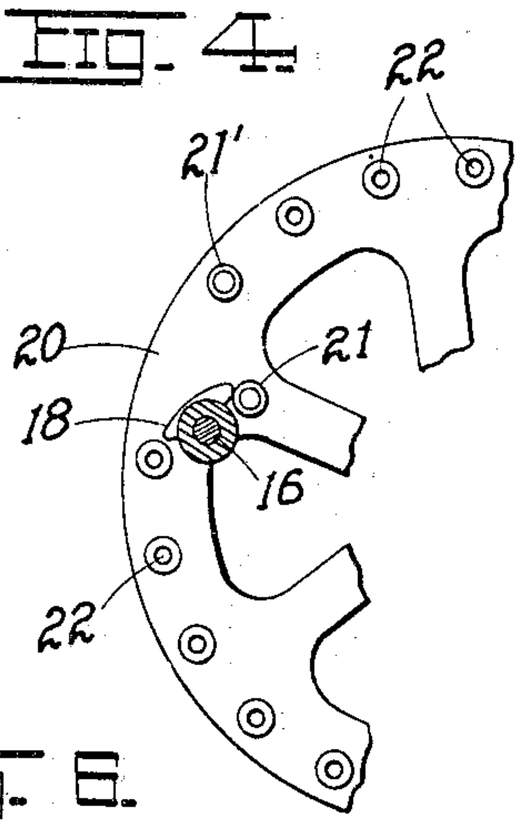

Fig. 6.

Fig. 5.

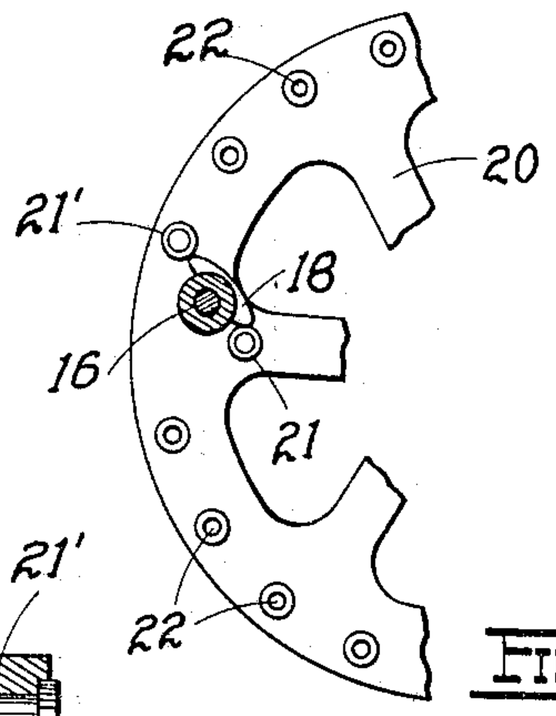

Fig. 7.

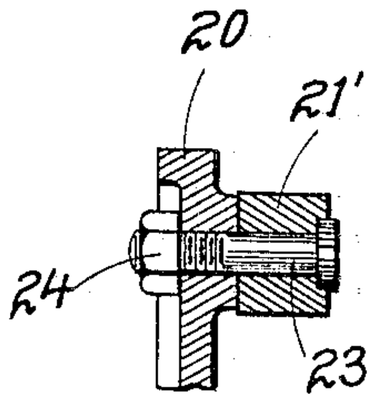

Fig. 8.

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No. 782,235. Patented February 14, 1905.

UNITED STATES PATENT OFFICE.

ANDREW G. GULLBERG, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO FRANK KLEPETKO, OF NEW YORK, N. Y.

ORE-SAMPLER.

SPECIFICATION forming part of Letters Patent No. 782,235, dated February 14, 1905.

Application filed October 10, 1904. Serial No. 227,892.

To all whom it may concern:

Be it known that I, ANDREW G. GULLBERG, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Ore-Samplers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in automatic ore-samplers; and it consists in the novel construction and combination of parts more fully set forth in the specification, and pointed out in the claims.

In the drawings, Figure 1 is a combined section and side elevation of the machine, showing the sample-hopper in its central position, the section being taken on line 1 1 of Fig. 2. Fig. 2 is a top plan of the machine. Fig. 3 is a vertical transverse section on the line 3 3 of Fig. 1. Fig. 4 is a vertical sectional elevation showing the sample-hopper in one of its extreme positions. Fig. 5 is a similar view showing the sample-hopper in the opposite extreme position. Fig. 6 is a sectional detail on line 6 6 of Fig. 2, showing the relation between the inner roller of the disk wheel and the cam or tappet actuated thereby. Fig. 7 is a similar view showing the outer roller in contact with said tappet; and Fig. 8 is a sectional detail on the line 8 8 of Fig. 1, showing manner of mounting the tripping-roller on the disk wheel.

The object of my invention is to construct an automatic ore-sampler capable of abstracting a sample ranging from five to fifty per cent., according to the adjustment of the parts directly controlling the sample hopper or cutter, one in which the cutter at all times takes the whole stream of ore as it is delivered to the sampler, one in which the cutter remains positively locked during the time a sample is taken, one in which the position of the cutter from the sampling to the discarding position is changed instantly and positively by mechanism which is simple and durable, and one possessing further and other advantages better apparent from a detailed description of the invention, which is as follows:

Referring to the drawings, 1 represents the main supporting-timbers of the machine. To these are bolted the standards 2 2, which serve to support the feed-hopper 3, whose mouth is directly beneath the elevator-spout 4, from which the ore (or other material) is delivered.

Suspended from suitable trunnions or trunnion-shaft 5, mounted in bearings 6 on the timbers at the base of the standards 2 2, is the oscillating sample hopper or cutter 7, which for one of its extreme positions delivers the ore to the discard-chute 8 and in the other extreme position to the sample-chute 9 of the receiving-hopper 10, carried by the timbers 1 1.

Keyed to one end of the trunnion-shaft 5 is one end of a crank-arm 11, whose opposite end is pivotally coupled to the adjacent end of a link 12, which in turn is connected pivotally to the end of the long arm of a lock-lever 13, keyed on the operating-shaft 14. The operating-shaft is mounted in two cast-iron bearing-sections 15 15, supported by the main timbers. The shaft 14 and lock-lever are connected with the parallel rock-shaft 16 by means of the eccentric 17, keyed to the latter at one end thereof, said rock-shaft (or eccentric-shaft) being likewise mounted in similar bearing-sections 15. To the opposite end of the eccentric-shaft is keyed the cam or tappet 18. Mounted on the main drive-shaft 19, (likewise carried in bearing-sections 15,) on the end adjacent the cam 18 is the disk wheel 20, which at a certain radial distance from the center thereof is provided with an inner striking or tripping impact-roller 21 and at a greater radial distance with an outer striking-roller 21′, there being nineteen holes or sockets 22, disposed along the disk adjacent to the periphery thereof, for receiving the stud 23 of the outer impact or tripping roller 21′. The stud is held in position by the nut 24. The opposite end of the drive-shaft is provided with tight and loose pulleys P P′, respectively. As seen from the drawings, the sockets 22 and the roller 21 are disposed along radii which are eighteen degrees apart, (there being nineteen sockets 22 and one roller 21 between two adjacent sockets, thus making twenty equal divisions for three hundred and

sixty degrees,) so that, as presently to be seen, it is possible to abstract a sample ranging from five per cent. to fifty per cent., depending on the position of the outer roller 21′ relatively to the fixed inner roller 21. The percentage just referred to is obvious, since there being twenty divisions for the entire circumference of the disk-wheel one division would represent five per cent. of said circumference. This will be better apparent from a description of the operation of the device, which is as follows: Rotation being imparted to the drive-shaft, and consequently the disk wheel, in the direction shown by the arrows, the inner roller 21 (for example) will strike the adjacent end of the cam or tappet 18, tripping it to the position indicated in Fig. 6 and rocking the rock-shaft or eccentric-shaft 16 in a direction to bring the eccentric periphery of the eccentric 17 to the position indicated in Fig. 4, (the parts in Figs. 4 and 6 corresponding,) the said eccentric rotating, as indicated by the arrow in Fig. 4, depressing the lower member of the jaw or fork formed in the lock-lever 13 and oscillating the latter away from its vertical position and in a direction as shown in Fig. 4. The intermediate connections thereupon between the lever and cutter 7 rock the latter to the extreme position therein shown, the ore thus discharging into the discard-chute 8 of the receiving-hopper 10. As the disk wheel 20 continues its rotation in the direction indicated the roller 21 will pass off the cam 18, leaving the parts locked in the position shown in Fig. 4, the cutter discharging into the discard-chute 8 until the opposite end of the cam 18 is struck and tilted by the outer roller 21′ to the position indicated in Fig. 7. The eccentric 17 will now rotate or rock in the opposite direction, forcing the upper member of the jaw of the lock-lever upward, Fig. 5, when the cutter will be swung to the opposite extreme position, Fig. 5, discharging its contents into the sample-chute 9. This will continue until the cam is again struck by the inner roller 21, when the parts will resume the position indicated in Figs. 4 and 6. As shown in the drawings, the rollers 21 21′ are set eighteen degrees apart, so that the period of discharge into the sample-chute will correspond to one-twentieth of a revolution of the disk wheel—that is to say, the sample will be a five-per-cent. sample. By shifting the stud 23 to any one of the sockets 22 (the nut 24 being first removed) the arc between the radii passing, respectively, through the rollers 21 21′ may be increased to as much as one hundred and eighty degrees and the sample increased to fifty per cent., as is obvious. The present machine is constructed to deliver a minimum sample of five per cent., the shortest arc between the two rollers being eighteen degrees; but it is apparent that this relation may be varied without departing from the nature or spirit of my invention. The eccentric 17 when rocked to either one of its extreme positions becomes securely locked to the lock-lever 13, and the several parts controlled or actuated by said lever will remain permanently locked in the position to which they were actuated until released and actuated in the opposite direction by the action of the roller next to strike or impinge against the adjacent end of the cam 18. Whatever may be the position of the cutter, however, the stream of ore is constantly passing through it, said stream being first delivered to the chute 8 and then the chute 9, as already explained.

The device is of course applicable to other material besides ore.

Having described my invention, what I claim is—

1. In an automatic sampler, a suitable oscillating cutter or sample-hopper, an oscillating lock-lever, intermediate connections between the lever and cutter, and suitable driving mechanism for actuating the lock-lever and cutter, substantially as set forth.

2. In an automatic sampler, a suitable oscillating cutter or sample-hopper, an oscillating lock-lever, intermediate connections between the lever and cutter, and suitable driving mechanism for actuating the lock-lever and temporarily locking the same at the end of its oscillations, substantially as set forth.

3. In an automatic sampler, a suitable oscillating cutter adapted to receive the material to be sampled, an oscillating lock-lever, intermediate link connections between the lever and suspension axis of the cutter, and suitable driving mechanism for actuating the lock-lever and temporarily locking the same at the end of its oscillations, substantially as set forth.

4. In an automatic sampler, a suitable oscillating cutter adapted to receive the material, an oscillating lock-lever, intermediate link connections between the lever and suspension axis of the cutter, a rotating disk wheel, an eccentric-shaft adjacent to the wheel, a cam at one end of the shaft, an eccentric at the opposite end coöperatively connected to the lock-lever, and devices on the disk wheel for successively tapping the opposite ends of the cam and rocking the eccentric-shaft, and in turn actuating the lock-lever and cutter connected thereto, substantially as set forth.

5. In an automatic sampler, a suitable oscillating cutter adapted to receive the material, an oscillating lock-lever, intermediate link connections between the lever and suspension axis of the cutter, a rotating wheel, an eccentric-shaft adjacent thereto, an eccentric at one end of the shaft coöperatively connected with the lock-lever, the latter having a fork or jaw embracing said eccentric, a cam at the opposite end of said shaft, and projections on the wheel adapted to be set circumferentially at different distances apart for successively strik-

ing the opposite ends of the cam and rocking the eccentric-shaft and oscillating the lock-lever and parts linked thereto, substantially as set forth.

6. In an automatic sampler, a suitable oscillating cutter adapted to receive the material, an oscillating lock-lever, intermediate link connections between the lever and suspension axis of the cutter, a rotating wheel, an eccentric-shaft or rock-shaft adjacent thereto, an eccentric at one end of the shaft connected cooperatively with the lock-lever, and intermediate connections between the rock-shaft and wheel for rocking the former upon rotation of the wheel, and simultaneously oscillating the lock-lever and parts linked thereto, substantially as set forth.

7. In an automatic sampler, a wheel having a stationary impact-roller, and an adjustable roller removed radially from the center of the wheel a distance different from that of the stationary roller, and sockets for mounting the adjustable roller at different distances from the stationary roller, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ANDREW G. GULLBERG.

Witnesses:
D. M. GREGORY,
M. A. PESTANA.