

L. S. STEWART.
ORE SAMPLER.
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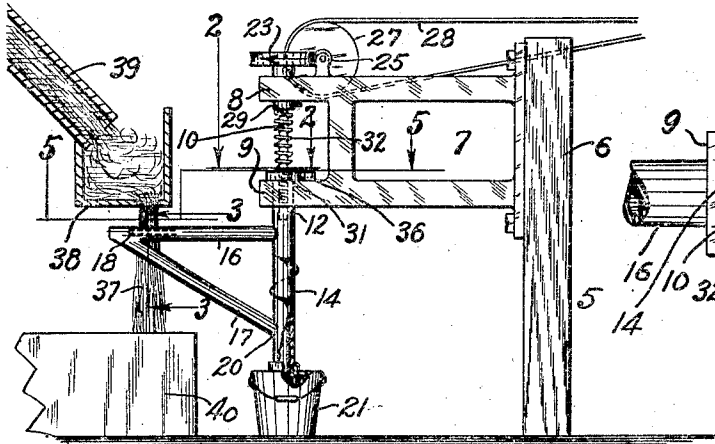


Fig. 1.

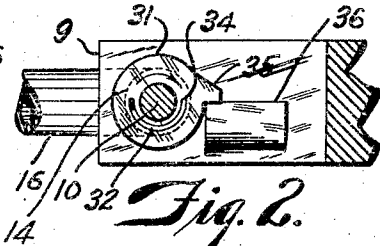


Fig. 2.

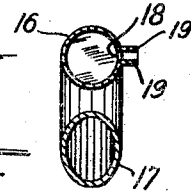


Fig. 3.

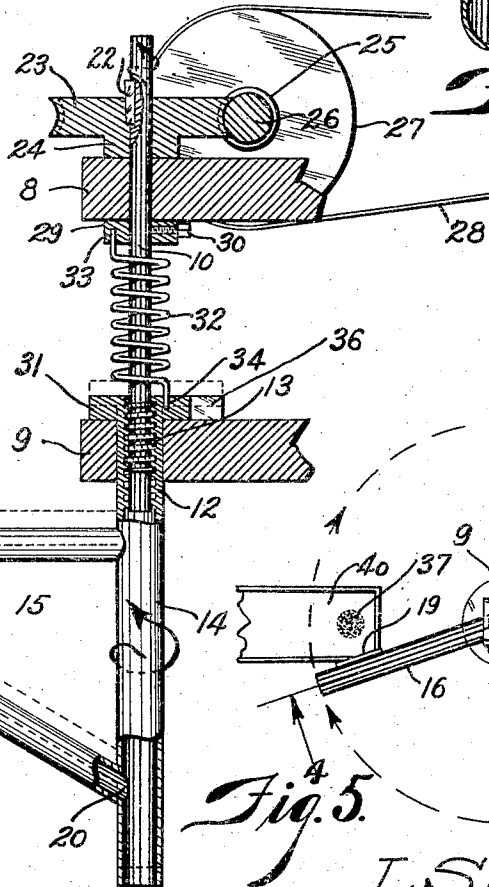
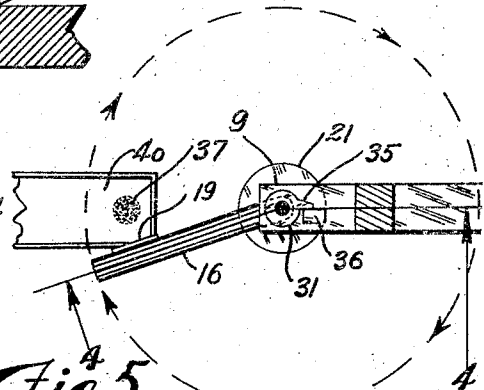


Fig. 4.

Fig. 5.



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ORE-SAMPLER.

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To all whom it may concern:

Be it known that I, LUCIUS SPRAGUE STEWART, a citizen of the United States, residing at Idaho Springs, county of Clear Creek, and State of Colorado, have invented certain new and useful Improvements in Ore-Samplers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in ore samplers, or devices adapted to remove intermittently, but at regular intervals of comparatively short duration, small quantities of ore from a stream of pulp, whereby from a relatively small quantity of pulp, the value of a large amount may be determined.

In my improvement I employ a shaft which has a worm gear connection, whereby it is slowly given a continuous rotation in one direction. This shaft carries a fast collar with which one extremity of a spiral spring is connected, the other extremity of the spring being connected with a collar formed at one extremity of a sleeve upon which is mounted a sampler arm of triangular shape, the shaft having a coarse thread engaging cooperating threads formed in the sleeve, the collar of the sleeve having a tooth or projection adapted when the sleeve is at its lowest limit of movement to engage a stop which prevents the rotation of the sleeve and the sampler arm carried thereby. Assuming that the tooth of the sleeve is in engagement with the stop, as the shaft is slowly rotated, the spiral spring will be placed under tension until the sleeve is raised sufficiently by virtue of the action of the screw on the shaft, to disengage the tooth of the sleeve from its stop, in which event the recoil of the spring will impart to the sleeve and the sampler arm one complete rotation in the direction of the rotation of the shaft, but as the sleeve under the influence of the recoil action of the spring travels so much faster than the shaft, during the making of a single revolution of the

sleeve and sampler arm, the latter will be lowered sufficiently to cause the tooth of the sleeve to again engage the stop. During this revolution of the sampler arm the latter passes through a stream of pulp and cuts out a small quantity, the sampler arm being hollow where it passes through the pulp and slotted, there being short projections or ribs on each side of the slot to aid in removing the small quantity of ore which the sampler arm collects during each revolution.

From this it will be understood that the shaft is continuously rotated under the influence of the worm gear while the sampler arm and its screw threaded sleeve is intermittently actuated, its travel through the stream of pulp being relatively rapid, whereby a very small quantity only is removed. It should be explained that the movement of the sampler arm is in a horizontal direction and the slot in said arm is on the side thereof, so that the pulp enters the slot in a horizontal direction which is favorable to the removal of a small quantity at each operation or swinging movement of the arm. Furthermore, the sampler arm has an inclined tubular member extending downwardly from its outer extremity through which the pulp passes into the lower portion of a conduit member which is a continuation of the screw threaded sleeve. The quantity of pulp removed by the sampler arm is first carried outwardly by centrifugal force into the outer extremity of the arm, but as the sleeve and arm come to a position of rest, the pulp flows downwardly through the inclined arm and passes into a receptacle below for receiving the sample.

Having briefly outlined my improvement I will proceed to describe the same in detail, reference being made to the accompanying drawing in which is illustrated an embodiment thereof. In this drawing:

Figure 1 is an elevation partly in section of my improved sampler.

Fig. 2 is a section taken on the line 2—2, Fig. 1 looking downwardly, the parts being shown on a larger scale.

Fig. 3 is a section taken through the outer slotted portion of the sampler arm on the line 3—3, Fig. 1 the parts being shown on a larger scale.

Fig. 4 is an enlarged view of the operating parts of the sampler shown chiefly in section and on a larger scale than in Fig. 1. The sectional portion of this view is indicated on the line 4—4, Fig. 5.

Fig. 5 is a section taken on the line 5—5, Fig. 1 looking downwardly, the parts being shown on a somewhat larger scale.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a suitable frame work consisting, as shown in the drawing, of an upright 6 and a bracket 7 extending laterally from the upper portion of the upright, the bracket being bifurcated at its outer extremity forming two spaced members 8 and 9. A vertically disposed shaft 10 is journaled in the part 8 of the bracket and extends downwardly into and through an interiorly threaded sleeve 12, the shaft having a threaded part 13 cooperating with the thread of the sleeve. Below the interiorly threaded part of the sleeve 12, the latter is provided with a conduit member 14 carrying a sampler arm 15 composed of a horizontal member 16 and an inclined member 17, the two parts 16 and 17 forming with the conduit member 14 of the sleeve a right angled triangle. The outer portion of the member 16 is hollow and provided with a slot 18 on one side thereof, from which lips 19 extend outwardly. The outer hollow extremity of this member 16 is in communication with the adjacent extremity of the inclined member 17, the lower end of the latter communicating, as shown at 20, with the lower part of the conduit member 14, the latter being positioned to discharge into a receptacle 21 of any suitable character.

Keyed to the upper extremity of the shaft, as shown at 22, is a worm wheel or gear 23 having a hub 24 which rests upon the upper surface of the part 8 of the bracket 7. The worm wheel is engaged by a worm 25 on a horizontally disposed shaft 26 which is actuated from a pulley 27 fast thereon, the pulley being connected by means of a belt 28 to a suitable motor (not shown). Immediately below the part 8 of the bracket and in contact with the lower surface thereof, a collar 29 is secured to the shaft by means of a set bolt 30. The upper extremity of the sleeve 12 is provided with a collar 31 forming a shoulder for supporting the sleeve upon the lower part 9 of the bracket. Between the collar 29 of the shaft and the collar 31 of the sleeve, a spiral spring 32 is coiled around the shaft, one extremity thereof being connected with the collar 29, as shown at 33, while the other extremity is connected with the collar 31 as shown at 34, the last named collar being provided with a tooth or projection 35 which when the sleeve is in the normal or lowermost position engages a stop 36 with which

the part 9 of the bracket is provided. When the sleeve is in this position, the sampler arm 15 is stationary and maintained out of the path of a stream of pulp 37 issuing from an opening in a launder 38 which is supplied by a conduit 39, the stream of pulp entering a receptacle 40 of any suitable size.

In describing the operation of the sampler, I will assume that the sleeve 12 and the sampler arm 15 are in the lowermost position, whereby the collar 31 engages the upper surface of the bracket part 9 with the tooth 35 of the collar in engagement with the stop 36 to prevent the rotation of the sleeve when the shaft is initially operated.

Now, as power is applied to the shaft 26 through the pulley 27, the worm 25 will slowly operate the worm wheel and consequently the shaft in a clockwise direction, with the result that the spring 32 will be placed under tension, since its upper extremity must rotate with the shaft while its lower extremity is held against travel. The construction and arrangement of the mechanism is such that during one complete rotation of the shaft 10 the sleeve 13 will be raised by virtue of its screw threaded connection with the shaft, sufficiently to release the tooth 13 of the collar 31 from the stop block 36, with the result that the spring is released and its recoil acting on the sleeve, through the collar 31, will impart a quick revolution to the sleeve and the sampler arm, causing the latter to pass through the stream of pulp and cut out a small quantity therefrom, by virtue of the slot 18 formed in the arm and the lips 19 projecting exteriorly on opposite sides of the slot. During this rotation of the sampler arm, the sleeve, by virtue of its screw threaded connection with the shaft, will be moved downwardly to its lowest limit of movement, causing its tooth 35 to engage the stop block 36. This result follows by virtue of the fact that though the shaft 10 is rotating continuously in the direction of the sleeve, during its rotary movement, the travel of the sleeve is so much more rapid than that of the shaft that the sleeve is lowered to the desired position and its movement stopped until the shaft has made another complete revolution, when the operation will be repeated. It will be understood, that the small quantity of the pulp cut out of the stream 37 during each revolution of the sampler arm will in the first instance be thrown to the outer extremity of the member 16 and into communication with the upper extremity of the conduit member 17 of the arm. Now, as soon as the rotary travel of the arm is stopped this small quantity will pass downwardly through the conduit member 17 into the lower part of the conduit member 14 which forms a continuation of the sleeve and thence into the receptacle 21.

Having thus described my invention, what I claim is:

1. A sampler comprising a continuously rotating shaft, a sampler element mounted to have intermittent rotation around the axis of the shaft, a member connected to said element and rotatable therewith, and an operative connection between the shaft and said member, including cooperating threaded means for elevating said member, and means to produce said intermittent rotation.

2. A sampler, comprising a continuously rotating shaft, a sampler element mounted to have intermittent rotation around the axis of the shaft, a member connected to said element and rotatable therewith, a projection on said member, a stationary part adapted to be engaged by said projection, an operative connection between the shaft and said member, including cooperating means to elevate said member to release said projection from said part, and means to produce said intermittent rotation when said projection is so released.

3. A sampler comprising a continuously rotating shaft, a sampler element mounted to have intermittent rotation around the axis of the shaft, a member connected to said element and rotatable therewith and an operative connection between the shaft and said member including cooperating screw threads for elevating said member and a torsionally acting spring to produce said intermittent rotation.

4. A sampler comprising a continuously rotating shaft, a sampler element mounted to have intermittent rotation around the axis of the shaft, a member connected to said element and rotatable therewith and an operative connection between the shaft and said member including cooperating screw threads for elevating said member, a torsionally acting spring to produce said intermittent rotation, a stationary part and a projection on said member adapted to engage said part, said projection being releasable from said part through the elevation of said member.

5. A sampler comprising a vertically disposed shaft, means for imparting continuous rotation thereto, a horizontally disposed

sampler arm provided with a sleeve having a screw-threaded connection with the shaft, the latter being locked against longitudinal travel while the said sleeve is free to travel on the shaft due to the screw thread connection, a spiral spring surrounding the shaft and having one end connected therewith, and the other connected with the sleeve, a stop for locking the sleeve against rotation when in the normal position but arranged to release the sleeve after it has traveled a predetermined distance along the shaft to allow the sleeve and sampler member to rotate around the axis of the shaft by virtue of the recoil of the spring.

6. A sampler having a vertically disposed rotary member, an arm projecting laterally from said member and having a slot in one side thereof to take a sample when the arm is passed through a stream of pulp, the said arm having lips projecting on opposite sides of the slot, the portion of the arm being hollow where the slot is located.

7. A sampler having a vertically disposed rotary member, an arm projecting laterally from said member and having a slot in one side thereof to take a sample when the arm is passed through a stream of pulp, the said arm having lips projecting on opposite sides of the slot, the portion of the arm being hollow where the slot is located, and a conduit member in communication with and extending downwardly from the outer extremity of the sampler member.

8. A sampler having a vertically disposed rotary member, an arm projecting laterally from said member and having a slot in one side thereof to take a sample when the arm is passed through a stream of pulp, that portion of the arm where the slot is located being hollow, and a conduit member in communication with and extending downwardly at an angle from the outer extremity of the hollow portion of said sampler member to the axis upon which said member rotates, there being a tubular part at said axis with which said conduit communicates, and from which the sample is discharged.

In testimony whereof I affix my signature.

LUCIUS SPRAGUE STEWART.