No. 773,819.

PATENTED NOV. 1, 1904.

F. T. SNYDER.

SAMPLER.

APPLICATION FILED JUNE 4, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

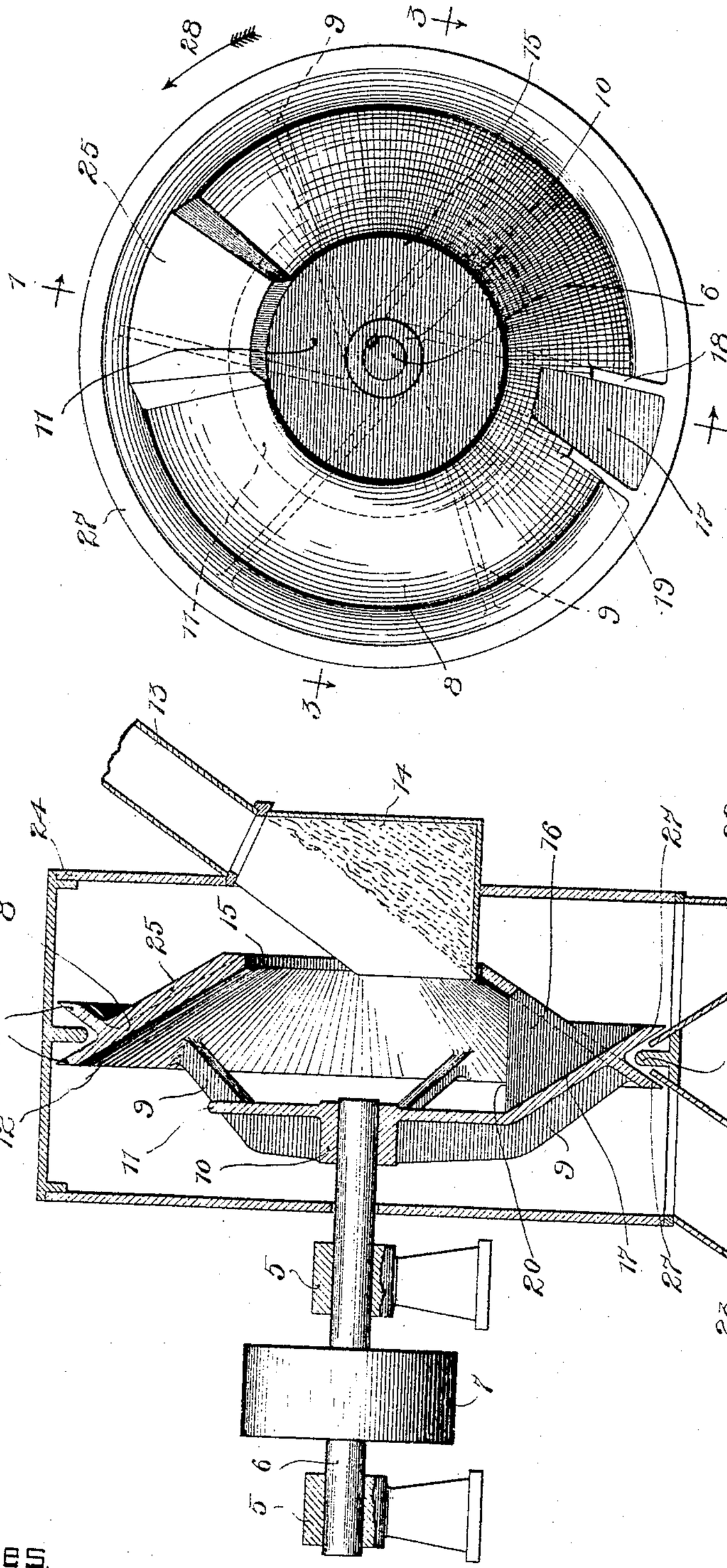

Fig. 2

Fig. 1

Witnesses,
Leonard W. Novander
Lynn A. Williams

Inventor
Frederick T. Snyder
By Charles A. Brown
Attorney

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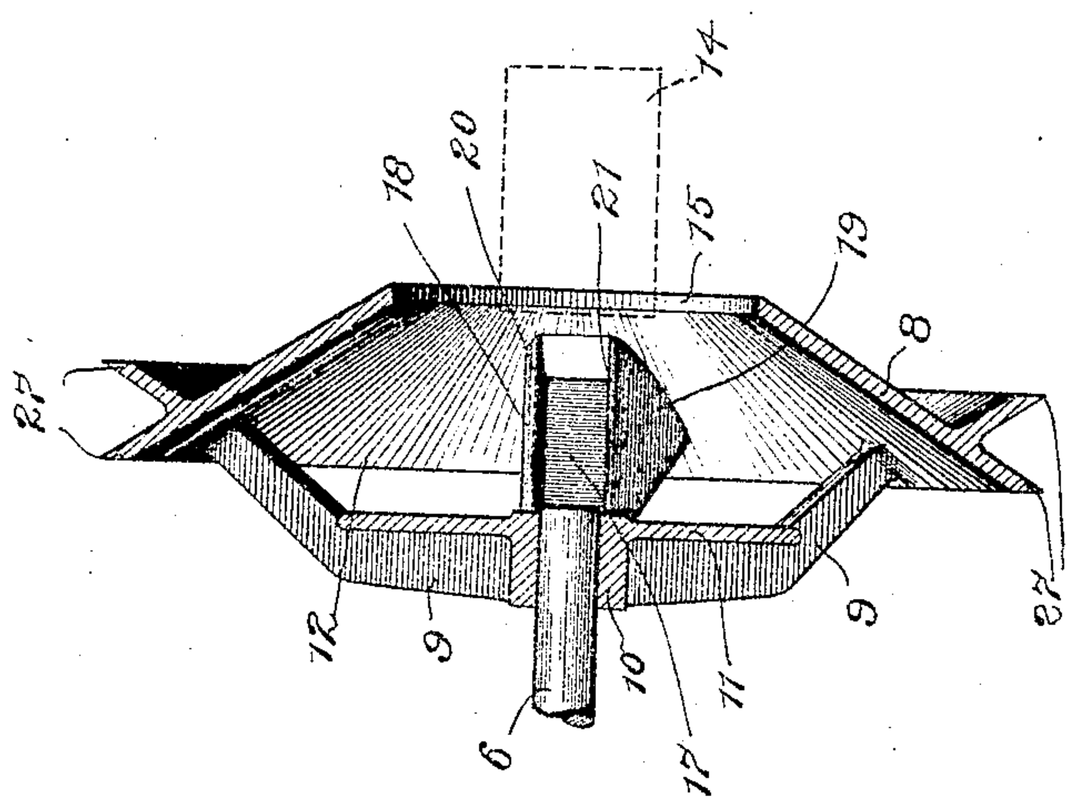

Fig. 3

Witnesses,
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No. 773,819. Patented November 1, 1904.

UNITED STATES PATENT OFFICE.

FREDERICK T. SNYDER, OF OAK PARK, ILLINOIS.

SAMPLER.

SPECIFICATION forming part of Letters Patent No. 773,819, dated November 1, 1904.

Application filed June 4, 1903. Serial No. 160,017. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK T. SNYDER, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Samplers, (Case No. 10,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to tollers or samplers, such as may be employed for the purpose of obtaining a fair sample of a large quantity of ore and for accurately dividing a quantity of grain or similar material into parts of any desired ratio.

The principal objects of my invention are to provide a sampler which will accurately divide the ore to be sampled into the desired proportional parts and at the same time one which shall occupy a comparatively small space and require but a small amount of head room where gravity conveyers or troughs are used for conveying the materials to be sampled.

The further objects of my invention are to provide a sampler of great simplicity and durability in construction.

As is well known by those skilled in the art, when ores are conveyed through conveyer-troughs between devices utilized for the purpose of carrying out various milling operations the fine ores tend to collect near the bottom and sides of the trough, while the coarser materials travel in paths near the center of the trough.

As distinguished from certain samplers of the prior art, my invention provides means whereby sections are cut from a practically continuous stream of materials passing through the trough, these sections being of the same thickness throughout their area, whereby the sampler accurately obtains an equal proportion of all grades of material passing through the conveyer-troughs, thereby making the sample deflected by the sampler a fair average of the ore which is being sampled thereby.

It is a common practice to convey ores from one device to another by means of inclined conveyer-troughs, through which the ore travels, due to the force of gravity. In order that a mill in which such a conveyer system is employed may not be of excessively great height, it is desirable to make the vertical distance between successive operating-machines as small as possible and also to make the vertical fall while traveling through any one of the devices used in the milling of the ore as small as possible.

It is one of the objects of my invention to provide a sampler in which the vertical fall of the materials to be sampled in passing through the sampler shall be comparatively small.

As distinguished from many samplers of the prior art, my improved device provides means whereby the major portion of the ore to be sampled passes through the feed-trough, the sampler, and the discharge-trough in substantially the same general direction and in practically a continuous stream. The portion of the ore which is removed as a sample and which usually is only a small percentage of the total quantity passed through the sampler is deflected in its course into a suitable receptacle.

My invention will be readily understood by reference to the accompanying drawings, in which—

Figure 1 is a central longitudinal cross-sectional view taken on line 1 1 of Fig. 2. Fig. 2 is an end elevation of the rotating member of my improved sampler, the inclosing housing being removed to more clearly illustrate the interior construction. Fig. 3 is a cross-sectional view taken on line 3 3 of Fig. 2.

I have illustrated bearings 5 5, within which is rotatably mounted the shaft 6, provided with a driving-pulley 7, which may be connected by means of a belt (not shown) with any desired source of power.

Within the housing 24 the sampler-ring 8 is fixed upon the forward end of the shaft 6 to be rotated thereby. This ring is of conical shape and the material to be sampled passes through said ring, along the lower portion of the inner surface thereof. The material is

led in by the inclined chute 13 and feed-box 14, and after passing through the ring is discharged therefrom into the similarly-inclined conveyer-trough 23, so that the main body of the material flows in a practically continuous stream through the sampling apparatus without requiring change of direction. An opening 16 is provided in the circumference of the ring, through which a portion of the material is diverted when in the rotation of the ring this opening comes beneath the body of material moving through the ring. In the preferred form of my invention, as shown, this opening is in the form of a deflecting-chute or sample-spout having side walls or raised margins 18 19 and a bottom wall 17, inclined toward the front of the sampler. This bottom wall 17 of the sample-spout forms a sort of blade or deflector which in the rotation of the ring is temporarily interposed in the path of the material flowing through the ring to divert said material through the opening 16 into a sample-receiver 22. The wall or deflector-plate 17 is inclined at an abrupt angle, preferably almost a right angle, to the direction of movement of the materials flowing through the ring. The side walls 18 19 of the sampler opening or chute 16 extend toward the shaft 6 in planes which preferably do not pass through the axis of said shaft, but rather are substantially tangential to a cylinder which might be described about said axis. The cutting edges 20 21 of said walls 18 19 are preferably substantially parallel to the axis of the shaft, subtending at all points equal angles at said axis, so that the sample cut from the stream of material may be of uniform thickness throughout. Immediately at the rear of the cone and preferably constituting a part of the supporting-framework thereof is a circular disk 11, said disk being here shown as cast integrally with the hub or spider which supports said conical ring. This disk forms a wall or shield at the rear of the rotating chamber, an annular opening being left between the edge of the disk and the edge of the conical ring, through which the stream of material may pass out of the ring, except at the point where the blade or bottom wall 17 of the sampler-chute is located. Said wall 17 forms an angular extension from the periphery of the disk and may be cast integrally with said disk.

An annular flange is preferably provided near the edge of the conical ring 8, sloping forward oppositely to the incline of the cone. This flange is located outside or beyond the outer edge of the sampler-opening 16, so as to form a lip for the sampler-spout. The outer edge of the cone 8 and the flange together form a groove around the periphery of the rotating ring, V-shaped in cross-section, and the housing 24 is preferably provided with a partition wall or rib 26, having a circular opening adapted to accommodate said grooved portion of the ring, the rims whereof lie on either side of said partition-wall.

A counterweight 25 is preferably cast upon the outside of the ring 8 to counterbalance the weight of the walls 17 18 19 of the deflecting-chute.

The operation of my improved sampler may be described as follows: The ring 8 is rotated by means of power supplied through the pulley-wheel 7 in the direction indicated by the arrow 28. The ore or other material to be sampled is fed through the feed-conveyer 13 and the box 14 within the smaller opening 15 of the ring 8. During the larger part of the revolution of the ring 8 the materials fed into the ring from the feed-conveyer trough 13 slide across the interior conical surface of the ring, and thence into the conveyer-trough 23. When the deflecting-chute 16 passes under the point at which materials are discharged from the conveyer-trough into the conveyer-ring, the materials are received between the side walls 18 and 19 of the deflecting-chute 16 and striking the bottom wall 17 are deflected toward the front of the sampler and into the sample-trough 22. The dividing edges 20 and 21 of the side walls 18 and 19 being parallel with each other and with the axis of rotation of the conical ring, these cutting edges describe a cylindrical surface and travel in what may be termed a "cylindrical path." Thus the interval of time during which ore passes between the cutting edges of the deflecting-chute from any one portion of the stream fed within the sampler is equal to the time during which materials from any other portion of the stream passes between the cutting edges. In this manner there is cut during each revolution of the ring 8 a section from the stream of ore passing through the feed-trough, this section being of uniform thickness throughout. The distance between the cutting edges 20 and 21 may be made such that any desired percentage of the total quantity of materials passing through the sampler may be deflected into the sample-trough 22. The wall 26 and the forked edges of the ring prevent materials from passing from one side of the ring to the other without passing through the ring.

The housing may be of any suitable construction to prevent the escape of dust from the sampler. The side walls 18 and 19 of the deflecting-chute 16 are laid back away from the direction of rotation in order that the falling ore will not be struck by these walls during its downward passage.

It will be seen that the general direction of movement of the major portion of the materials passing through the sampler is substantially constant and unchanged. This in connection with the fact that the ore to be sampled is both fed to the rotating element and discharged therefrom below the axis of rotation

enables me to construct a sampler in which the vertical fall of materials passing therethrough shall be comparatively small.

While I have herein shown and described one preferred embodiment of my invention, it will be apparent to those skilled in the art that many modifications may be employed without departing from the spirit thereof. I do not wish to limit myself, therefore, to the precise disclosure herein set forth; but,

Having described my invention, I claim as new and desire to secure by Letters Patent—

1. In a sampler, the combination with a conical ring, having a slot through the circumference of said ring, raised margins along the sides of said slot, a disk concentric with said ring forming a shield at one end of said slot, and an annular flange on the outer surface of said ring, of a housing surrounding said ring having a partition-wall lying between said flange and the lower rim of said ring, means for delivering material to be sampled to the inner surface of said ring through the smaller end thereof, and means for rotating said ring.

2. In a sampler, the combination with a conical ring, having a slot through the circumference of said ring, raised margins along the sides of said slot, a disk concentric with said ring forming a shield at one end of said slot, and an annular flange on the outer surface of said ring, of means for delivering materials to be separated to the inner surface of said ring through the smaller end thereof, and means for rotating said ring.

3. In a sampler, the combination with a conical ring, having a slot through the circumference of said ring, raised margins along the sides of said slot, and a disk concentric with said ring forming a shield at one end of said slot, of means for delivering material to be sampled to the inner surface of said ring through the smaller end thereof, and means for rotating said ring.

4. In a sampler, the combination with a conical ring, having a slot through the circumference of said ring, and raised margins along the sides of said slot, said margins lying in planes tangent to a cylinder generated about the axis of said ring, of means for delivering material to be sampled to the inner surface of said ring through the smaller end thereof, and means for rotating said ring.

5. In a sampler, the combination with a conical ring, having a slot through the circumference of said ring, and raised margins along the sides of said slot, said margins subtending at all points equal angles at the axis of said ring, of means for delivering material to be sampled to the inner surface of said ring through the smaller end thereof, and means for rotating said ring.

6. In a sampler, the combination with a conical ring, having an opening through the circumference of said ring, and a raised margin about said opening, of means for delivering material to be sampled to the inner surface of said ring through the smaller end thereof, and means for rotating said ring.

7. In a sampler, the combination with a conical ring rotatable upon a horizontal axis, said ring having a sample-opening through its circumference, of means for feeding material to the inner surface of said ring through the smaller end thereof, and a deflector-plate 17 extending from the lower edge of said opening at an angle to the surface of the ring, in position to divert a section of material through said opening in the rotation of said ring.

8. In a sampler, the combination with a ring adapted to rotate about a horizontal axis, and having an opening through the circumference of said ring, a deflecting-chute mounted within the ring, the edges of the side walls of said chute being parallel to said axis, of means for delivering material to be sampled to the inner surface of said ring, and means for rotating said ring.

9. In a sampler, the combination with a conical ring adapted to rotate upon a horizontal axis, of a feed-chute 13 and a discharge-chute 23 in substantial alinement with each other and with the lower inside surface of said ring, said ring having a sample-opening in the side thereof, and means for deflecting through said opening a section of the material passing through said ring, during the rotation of said ring, as described.

10. In a sampler, the combination with a feed-spout, of a disk, having a sample-spout adapted to rotate therewith about the axis of said disk and by said feed-spout, the bottom of said sample-spout when passing said feed-spout being directed downwardly away from said axis and substantially perpendicular to the bottom of said feed-spout, and means for rotating said sample-spout.

11. In a sampler, the combination with a conical ring adapted to rotate about a horizontal axis, having a sample-spout carried by said ring, the bottom of said spout being substantially perpendicular to the adjacent elements of the interior surface of said conical ring, the dividing edges of said spout being substantially parallel with the axis of said ring, and a disk concentric with said ring and partially closing the larger opening thereof, means for delivering material to be sampled to the lower inner surface of said ring through the smaller opening thereof, and means for rotating said ring.

12. In a sampler, the combination with a horizontally-rotatable conical ring, of an inclined conveyer-chute registering with the smaller end of said ring, a receiving-chute leading downwardly from the lower portion of the larger end of said ring, to receive material passing from the conveyer-chute through the ring, said receiving-chute lying in approximately the same plane as the conveyer-chute, a sample-chute, and a deflector carried

by said ring adapted during the rotation thereof to divert a section of said material into the sample-chute; whereby the said material passes through the conveyer-chute, ring and receiving-chute in substantially the same direction, and its vertical fall is made comparatively small.

In witness whereof I hereunto subscribe my name this 27th day of May, A. D. 1903.

FREDERICK T. SNYDER.

Witnesses:
LYNN A. WILLIAMS,
JOHN STAHR.