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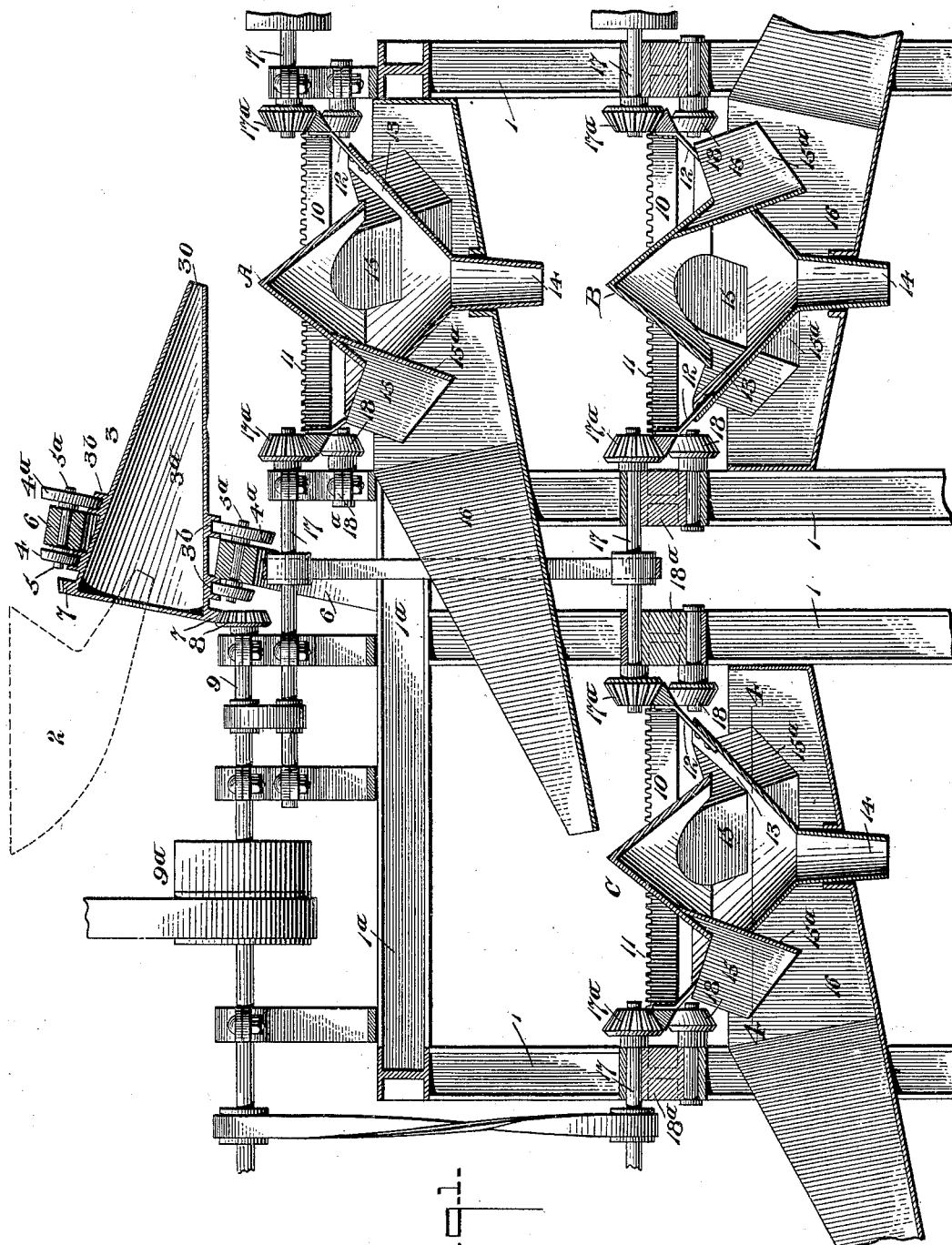
Patented May 8, 1900.

H. D. FANDERS.
ORE SAMPLING MACHINE.

(Application filed Mar. 21, 1899.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES:

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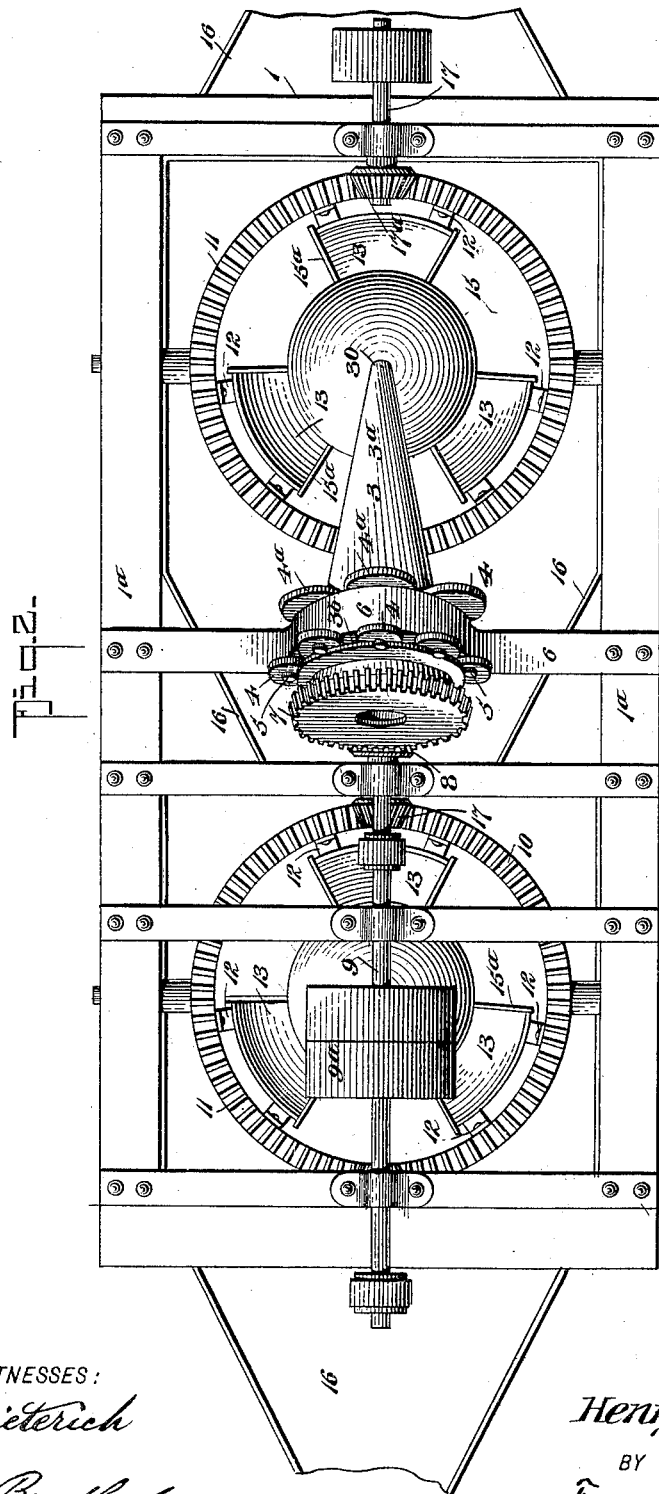
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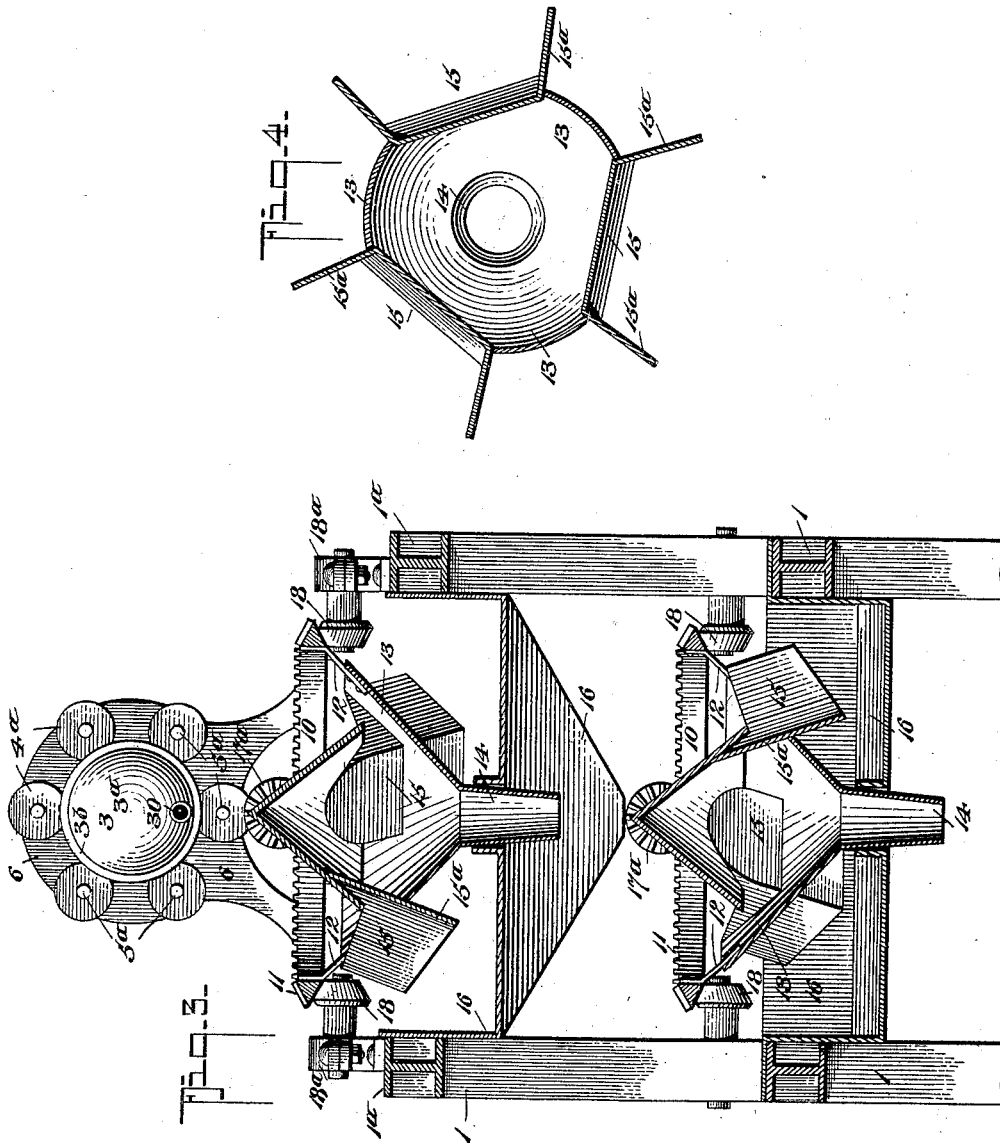
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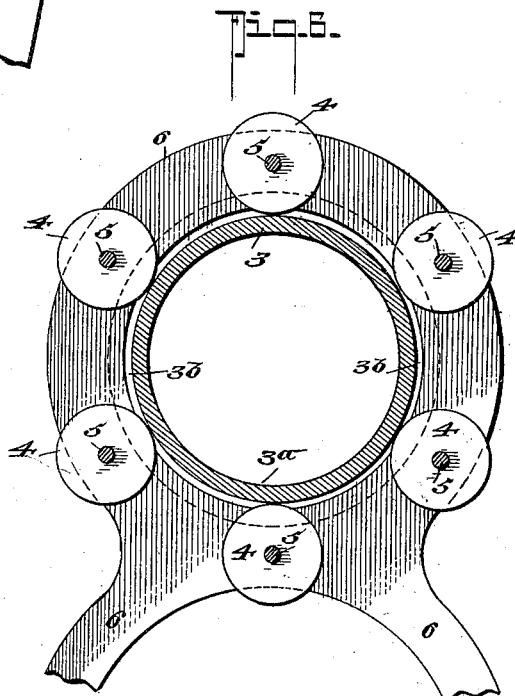
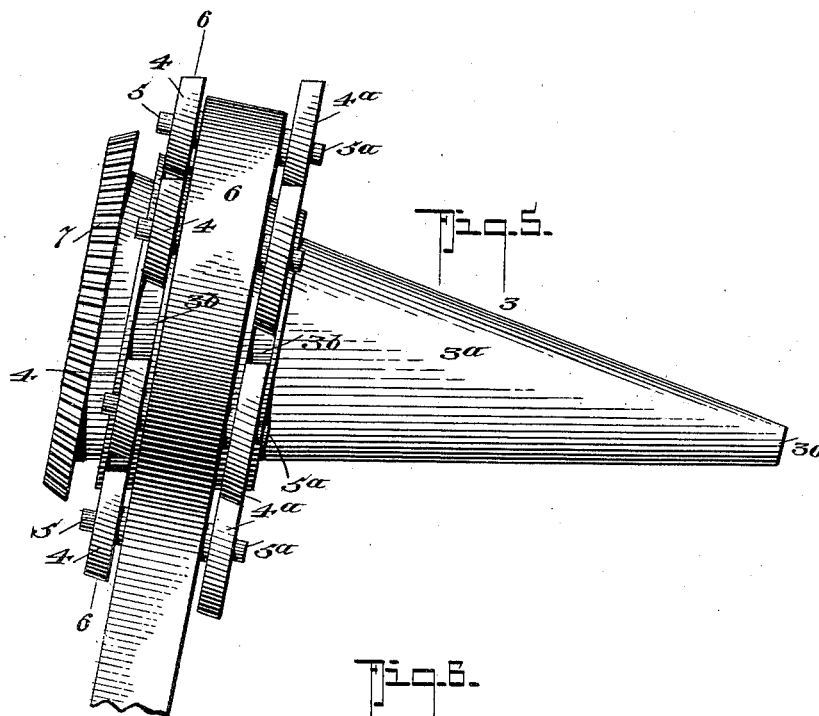
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4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

HENRY DICKS FANDERS, OF LEADVILLE, COLORADO.

ORE-SAMPLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 649,288, dated May 8, 1900.

Application filed March 21, 1899. Serial No. 709,913. (No model.)

To all whom it may concern:

Be it known that I, HENRY DICKS FANDERS, residing at Leadville, in the county of Lake and State of Colorado, have invented a new and Improved Ore-Sampling Machine, of which the following is a specification.

In the handling of ore before subjecting it to the smelting process it is usual to forward it in twenty-five to one-hundred ton lots to the smelter and when unloaded to take out a certain quantity for sampling purposes to test the grade thereof. Ordinarily this is accomplished by first reducing the ore to about the size of a walnut, after which it is shoved into a cone pile by manual labor, always dumping on the top of the pile to cause the ore to roll down to the base. Two parts (or half of the bulk) are then taken away for a duplicate sampling, and the remainder is again reduced as before, and the said operation of reducing the ore is repeated until the pile is cut down to about ten or fifteen pounds and the particles to the size of a pea.

The primary object of this invention is to effect the operation of reducing or separating the ore for sampling purposes mechanically in an effective, expeditious, and economical manner.

Another purpose of my invention is to provide a simple construction of ore-separating means comprehending a series of ore splitting or separating cones, agitator devices, and deflectors, whereby the operation of constantly separating the different ore particles can be produced and a proper divisional separation made at the same time, to thereby secure a perfect sampling of the ore.

In its subordinate features this invention comprehends certain details of construction and novel combination of parts, such as will be first described, and then pointed out in the appended claim, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal section of my improved separating-machine. Fig. 2 is a top plan view of the same. Fig. 3 is a transverse section thereof. Fig. 4 is a detail cross-section taken on the line 4 4 of Fig. 1. Fig. 5 is a side elevation of the feeder-cone; and Fig. 6 is a transverse section thereof, taken on the line 6 6 of Fig. 5.

My invention in its general nature com-

prises a suitable supporting framing or foundation upon which is mounted at its upper end a rotary feeder which receives the ore from a suitably-arranged feed hopper or chute to which the said ore is fed in any desired manner. The feeder is arranged to discharge the ore into a rotary separator, which has a series of pockets or discharges of suitable number which are equally divided, one-half thereof being arranged to discharge into an offtake-spout, while the other discharges into another rotary separator, which may be and preferably is of a reduced size, or it may be of the same size as the first receiver and have an increased number of pockets of reduced area, half of which discharge into another take-off spout and the other half into a third rotary receiver or separator, the offtake-spouts before referred to also discharging into rotary separators, which have divided discharges the same as in the other separators referred to, the several rotary separators or receivers being of a more or less number and size, according to the character of the ore to be worked, and their discharge-apertures successively decreasing in size, whereby to properly divide the different grades of ore.

Referring to the accompanying drawings, 1 indicates a supporting-frame which can be constructed of heavy timber-work or masonry, as the size of the separator may make desirable.

2 indicates a receiving-hopper suitably mounted on the top of the separating-frame, which discharges into a mixer and feeder 3. This feeder 3 consists of a hollow conically-shaped body 3^a, horizontally disposed and centrally tilted below a horizontal plane to cause the material therein to gravitate to the discharge-mouth 3^b, which is formed in the outer or apex end thereof. To facilitate the discharge of the ore therein and at the same time create a proper mixing thereof, the body 3^a has a plurality of annular guideways 3^c, supported by and rotatable upon a series of friction-rollers 4 4^a, journaled on short stub-shafts 5 5^a, mounted in suitable supporting-frames 6 6, projected upward from a cross-bar 1^a on the main frame.

To impart a rotary motion to the conical mixer and feeder, the body 3^a at its base or larger end has an external gear 7, with which

meshes a drive-gear 8, mounted on a stub-shaft 9, suitably journaled on the main frame and carrying a drive-pulley 9^a, which in practice is belted with the main power-shaft in any desired manner.

So far as described it will be readily apparent that by providing a combined mixer and feeder of the character described the ore as it leaves the first delivery-chute will be thoroughly mixed before it passes from the feeder and be thereby in a better condition for the several divider or sampling means, the construction of which forms an essential feature of this invention.

In the accompanying drawings I have shown a series of divider or separator means, the purpose of which is to separate the ore into two equal parts, whereby to leave a duplicate part for the second or duplicate sampling and whereby to gradually reduce the quantity of the ore to a condition for the proper sampling test. Each ore dividing or separating means comprises a receiver having a conical upwardly-projecting base which is projected under the discharge end of the feeder 3 and adapted to receive the ore upon the apex of its conical base, whereby to deflect the said ore uniformly toward the rim of the base into a series of apertures or pockets surrounding the said base, which pockets are divided in two equal sets, one set of which discharges at one point, while the other discharges at another point.

The drawings illustrate three ore separator or dividing means; but I desire it understood that a lesser or greater number may be employed. When a plurality of such means is used, the several different receivers, (designated by A, B, and C in the drawings,) though of the same construction and operating precisely alike, are preferably of successively-reduced sizes so far as relates to the means for dividing and discharging the ore fed therein, whereby to the more effectively separate the ore and reduce the quantity to the desired degree for sampling.

Each receiver and separator consists of an annular rim 10, having upon its upper face a gear-flange 11.

12 indicates radial arms which join the rim 10 with a series of chuteways 13, which incline convergently inward and terminate in a central tubular pendent outlet 14. Any desired number of chutes or ways 13 may be provided, and these ways are equidistantly spaced and have their receiving-throats of equal area as the spaces or throats 15 between the ways 13, the purpose of which will presently appear. The spaces 15 have pendent guide-walls 15^a, which deflect the ore that passes into the said spaces 15 onto an off-take-spout 16, which delivers half of the ore fed into the receiver at one point as the other half passes off through the chuteways 13 to another point.

To facilitate the proper separation of the ore as it enters the receiver, said receiver has

its conical portion terminating at its base over the several spaces 15 and chutes 13, and as a still further means for mixing the ore the receiver is held to rotate, it receiving motion from a short stub-shaft 17, (driven by suitable belting,) said shafts 17 each carrying a bevel-gear 17^a, which meshes with the upper rim of the receiver, as clearly shown in Fig. 2, and to properly guide the receiver and hold it steady its rim is mounted on roller-bearings 18, supported in brackets 18^a, projected inward from the main frame.

In operation the ore as it is discharged drops on the top of the conical portion of the receiver A, is disseminated thereon by reason of its rotary force, and caused to gravitate down toward the openings 14 and chutes 13, through which the divided portions of the ore fall.

When the machine is arranged as shown in the drawings, the ore that passes from the chute 13 drops on the conical base of the receiver B, which in practice is rotated in a direction reverse to that of the receiver A, while the ore that passes through the openings 15 passes from the spout 18 into the receiver C. It will thus be seen the two divided ore particles pass, respectively, into the receivers B and C, are again divided, and the two divided portions from the receivers B and C again pass out at different points. This operation can be repeated as often as may be found necessary to reduce the ore to the desired condition for sampling.

From the foregoing description, taken in connection with the accompanying drawings, it is thought the advantages of my invention will be readily apparent to those skilled in the art to which it appertains.

By the use of my improvement the ore bulk as it is treated thereby is mechanically divided into equal parts, and each part as it passes into another separating portion of the machine is again divided into equal parts, thereby providing for a small collection of the ore for sampling which by reason of the equal separations of the divided parts of the ore bulk does not in the least lose the grade or qualities which it possessed when in the said bulk.

The arrangement of the several parts as shown in the drawings is intended to illustrate the principle and operation of my invention. The parts shown, however, may be modified and somewhat changed in detail without departing from the scope of the appended claim.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

An ore-sampling mechanism, comprising in combination; a horizontally-disposed conical mixer and feeder having a discharge-opening in its apex end; a suitable supporting-rim; a receiving-hopper comprising an inverted conical body having a central pendent discharge 14; an annular gear-rim 11, fixedly connected to the upper end of the said hopper; and guide-

rolls 18, for the said rim; means for rotating
the hopper and receiver; a collecting-trough
16, disposed under the said receiver, said re-
ceiver having its discharge 14, projected down
5 through the bottom of the said trough, the
conical bottom member 10, having its apex
disposed directly under the discharge end of
the hopper, the bottom of the said member
10, being of less diameter than the adjacent
10 walls of the receiving-hopper; a series of equi-

spaced division-plates 15, fixedly connecting
the said bottom 10, to the receiving-hopper;
said pockets 15, projecting through the side
walls of the receiver-hopper and discharging
in the collecting-trough 16, all being arranged 15
substantially as shown and described.

HENRY DICKS FANDERS.

Witnesses:

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