A. J. McCONE.

ORE SAMPLING APPARATUS.

APPLICATION FILED MAR. 3, 1909.

949,284. **Patented Feb. 15, 1910.**

2 SHEETS—SHEET 1.

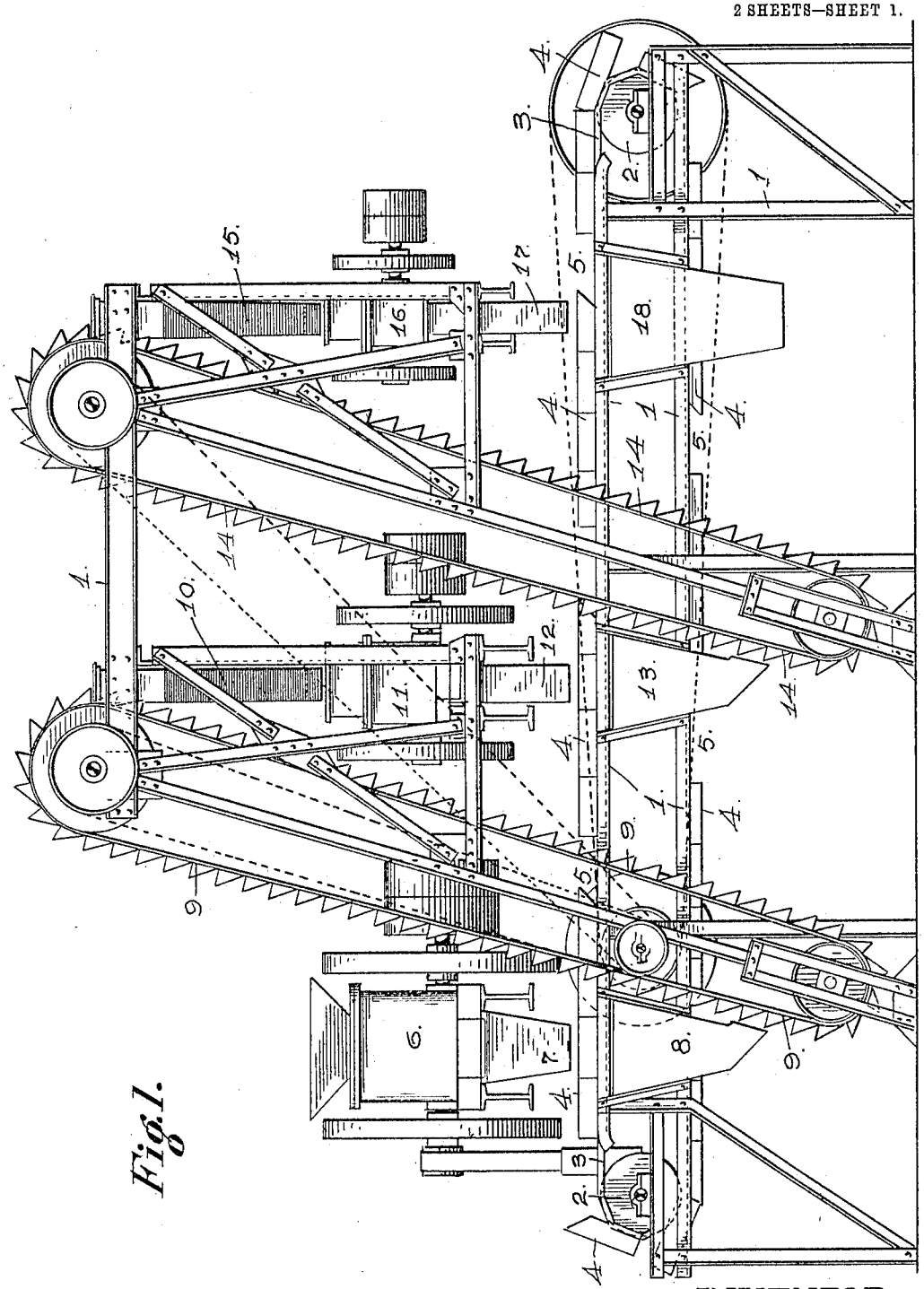

Fig. 1.

WITNESSES.

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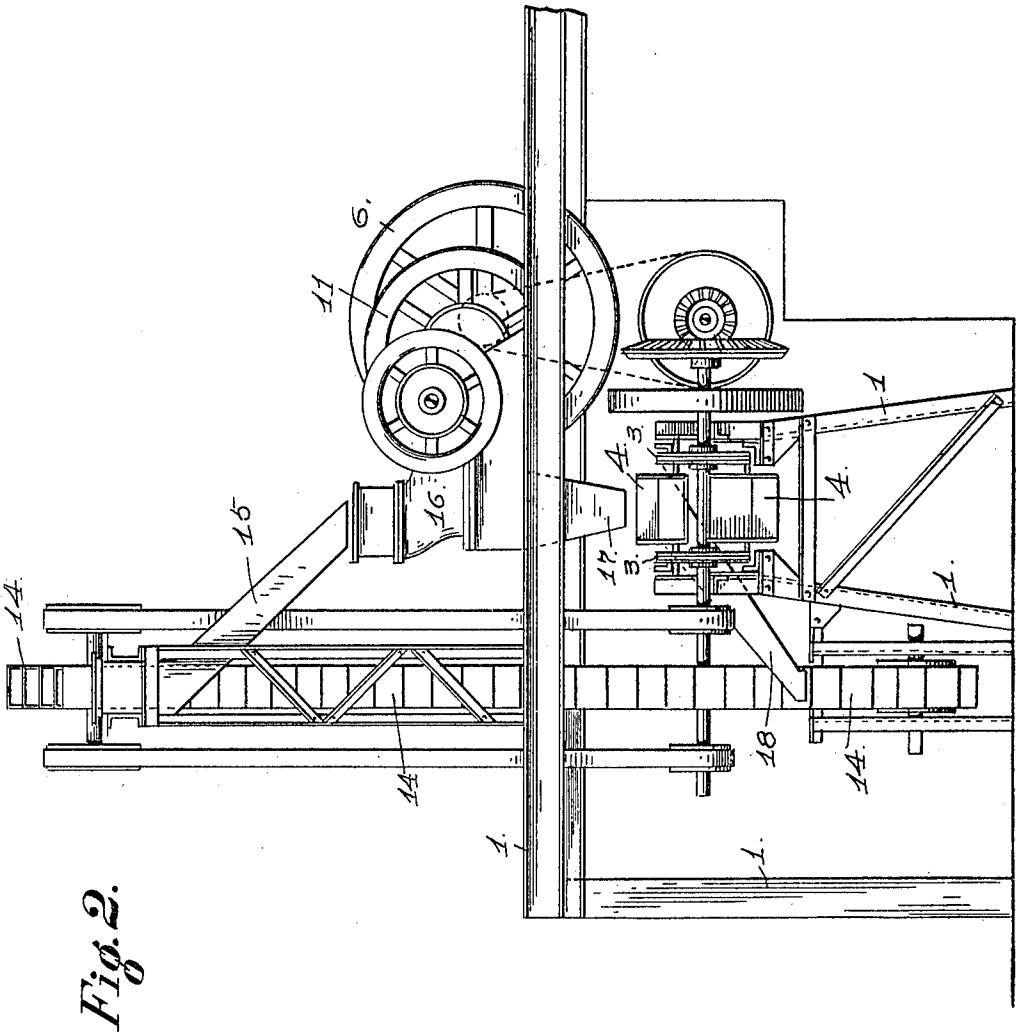

Fig. 2.

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UNITED STATES PATENT OFFICE.

ALEXANDER J. McCONE, OF RENO, NEVADA.

ORE-SAMPLING APPARATUS.

949,284. Specification of Letters Patent. Patented Feb. 15, 1910.

Application filed March 3, 1909. Serial No. 481,073.

To all whom it may concern:

Be it known that I, ALEXANDER J. McCONE, a citizen of the United States, residing at Reno, in the county of Washoe and State of Nevada, have invented certain new and useful Improvements in Ore-Sampling Apparatus, of which the following is a specification.

My invention relates to the class of ore-sampling devices. Its object is to provide a simple and effective means for taking a fair, representative sample from the ore while being transferred from the crusher to the mill, or storage bins, or cars, as the case may be, without interfering with such transfer, and without waste of time, labor or material.

My invention consists, primarily, in a traveling carrier having a succession of pans separated by open intervals bearing a given lesser proportion to said pans, whereby the ore which is supplied in a continuous stream to the passing succession of pans and open intervals, is divided into two portions, the lesser, which passes through the intervals, being taken as the sample.

My invention further consists in means for successively extracting lesser proportions of the first extraction, and for crushing these proportions to successively increasing fineness, all in a continuous operation, until the sample finally taken is fair and representative.

Referring to the accompanying drawings:—Figure 1 is a side view of my ore-sampling apparatus. Fig. 2 is an end view of the same.

1 is a frame, in which is mounted, upon sprockets 2, an endless traveling pan-conveyer, comprising side chains 3 and pans 4. These pans may be of any suitable form, as, for example, that here shown, each consisting of separate sections overlapping on their sides, the end sections being terminally flanged, thus forming one long pan adapted to turn about the sprockets. There may be any number of these pans, and they may have any given length. The pans are separated by given intervals indicated by 5, which intervals must be of a length bearing a stated proportion to the length of the pans, say, for example, one-fourth. At these intervals the conveyer is open. Above the conveyer, near its head, is a crushing device 6 of any suitable character, which is adapted to crush the ore to any given initial fineness, say, for example, to reduce it an inch and a half mesh or ring. The crusher 6 discharges the ore into a chute 7, which lies above the conveyer and which delivers said crushed ore in a continuous stream to the pans 4 and to the open intervals 5 of the conveyer as they pass under it.

Directly under the upper course of the conveyer and in line with the delivery end of the chute 7 is the open mouth of a hopper 8, which inclines outwardly and is adapted to deliver to an elevator 9, which in turn delivers to a feed-hopper 10 above. Under the feed-hopper 10 is a second crushing-device 11, of suitable character adjusted to crush the ore to a greater fineness than that resulting from the operation of the first crusher, say, for example, the crusher 11 reduces the ore to a three-quarter inch mesh or ring. The crusher 11 discharges into a chute 12 which delivers to the passing succession of pans and open intervals of the conveyer. Under the conveyer, in line with said chute 12 is a hopper 13, which delivers to a second elevator 14. This elevator delivers to a feed-hopper 15 of a third crushing-device 16, which is adjusted to reduce the ore to a still greater fineness, say, for example, to a quarter inch mesh or ring. The crusher 16 delivers to a chute 17 which delivers to the conveyer, as before, and to a hopper 18 under said conveyer. This may terminate the series, as illustrated; though it is evident, that said series may be extended at either end, as may be desired.

I need not describe in detail the various power-transmitting devices to operate the conveyer, the crushers and the elevators, as these form no part of my invention and are sufficiently indicated in the drawings.

The operation of the apparatus is as follows:—The ore is supplied in any way, as by hand or from a chute, to the first crusher 6, by which it is reduced to a given initial fineness, as before stated. In this condition it is continuously delivered from the chute 7. In the proportion above stated, between the pans 4 and the open intervals 5, four-fifths of the ore will fall into each passing pan, and one-fifth, which is taken for the sample, will fall through each open interval 5. This sample portion falls into the hopper 8, and is carried up by the elevator 9 and delivered through the feed-hopper 10 to the second crusher 11. In this crusher it is reduced to a greater fineness, as before stated,

and, thus reduced in fineness, it is delivered, four-fifths to the passing pans 4 and one-fifth to the open intervals 5. This one-fifth sample is, of course, now one twenty-fifth of the whole, and said diminished sample is delivered by the hopper 13 to the second elevator 14, which, through the feed-hopper 15, delivers it to the third crusher 16. In this crusher it is reduced to still greater fineness, as stated, and from the crusher it is delivered, four-fifths to the pans 4 and one-fifth to the open intervals 5; and this one-fifth sample is now, of course, one one-hundred and twenty-fifth of the whole. This sample is taken from the final hopper for assay purposes to determine the value of the ore. On account of its successive extractions and because of its successive reductions in the crushers it is a fair, representative sample. In practice, with the proportions above given and the successive selections as stated, it is 16 pounds to the ton, which if we multiply by ten represents 160 pounds to 10 tons which is a good working sample. The main body of the ore is, of course, delivered by the pan conveyer to storage bins or to the mill or the cars, as the case may be. The sampling is continuous and not wasteful, nor does it involve extra labor, for the rejected four-fifths of the successive extractions are returned to and commingled with the main body of the ore.

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

1. In an ore-sampling apparatus, the combination with a traveling carrier having a succession of containers separated by intervals bearing a given lesser proportion to said containers, means for supplying ore continuously to said carrier, and means for receiving the ore which passes through one of the intervals in the carrier and again feeding said ore to the traveling carrier.

2. In an ore-sampling apparatus, the combination of a traveling carrier having a succession of pans separated by intervals bearing a given lesser proportion to said pans; a succession of independent feeders to supply ore to the passing succession of pans and separating intervals at successive stations along the length of the carrier; means for receiving the portion of ore supplied by each feeder to the separating intervals; and means for transferring said portion from one receiving means to the succeeding feeder.

3. In an ore-sampling apparatus, the combination of a traveling carrier having a succession of pans separated by intervals bearing a given lesser proportion to said pans, said intervals being open through the carrier; a succession of independent feeders to supply the ore in continuous streams to the passing succession of pans and open intervals at successive stations along the length of the carrier; a succession of underlying receptacles to receive the portion of ore supplied by each feeder to the open intervals; and means for transferring said portion from one receptacle to the succeeding feeder.

4. In an ore-sampling apparatus, the combination of a traveling carrier having a succession of pans separated by intervals bearing a given lesser proportion to said pans, said intervals being open through the carrier; a succession of overlying chutes to supply ore to the passing succession of pans and open intervals at successive stations along the length of the carrier; a succession of underlying receptacles to receive the portion of ore supplied by each chute to the open intervals; and a succession of elevators to transfer said portion from one receptacle to the succeeding chute.

5. An ore-sampling apparatus comprising a traveling carrier having a succession of pans separated by intervals bearing a given lesser proportion to said pans; a succession of ore-crushers at stations along the length of the carrier, said crushers being adjusted to successively increasing fineness of ore-reduction; a chute under each crusher to deliver the ore therefrom to the passing succession of pans and separating intervals of the carrier; a succession of receiving means to take the portion of ore supplied to the separating intervals by the chutes; and means for transferring said portion from one receiving means to the succeeding crusher.

6. An ore-sampling apparatus comprising a traveling carrier having a succession of pans separated by intervals bearing a given lesser proportion to said pans, said intervals being open through the carrier; a succession of ore-crushers at stations along the length of the carrier, said crushers being adjusted to successively increasing fineness of ore-reduction; a chute under each crusher to deliver the ore therefrom to the passing succession of pans and open intervals of the carrier; a succession of hoppers under the carrier to receive the portion of ore dropping through the open intervals; and a succession of elevators to transfer said portion from one hopper to the succeeding crusher.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALEXANDER J. McCONE.

Witnesses:
R. F. Roy,
N. E. Otterson.