

W. L. HAWLEY.
CONCENTRATOR.
APPLICATION FILED JULY 9, 1910.

1,032,281.

Patented July 9, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

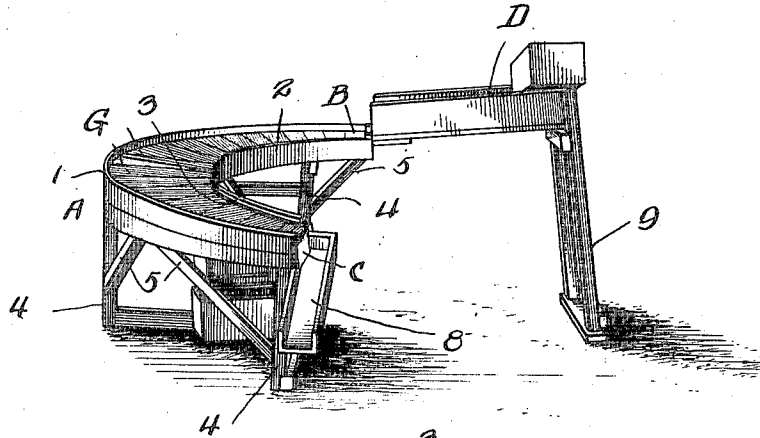
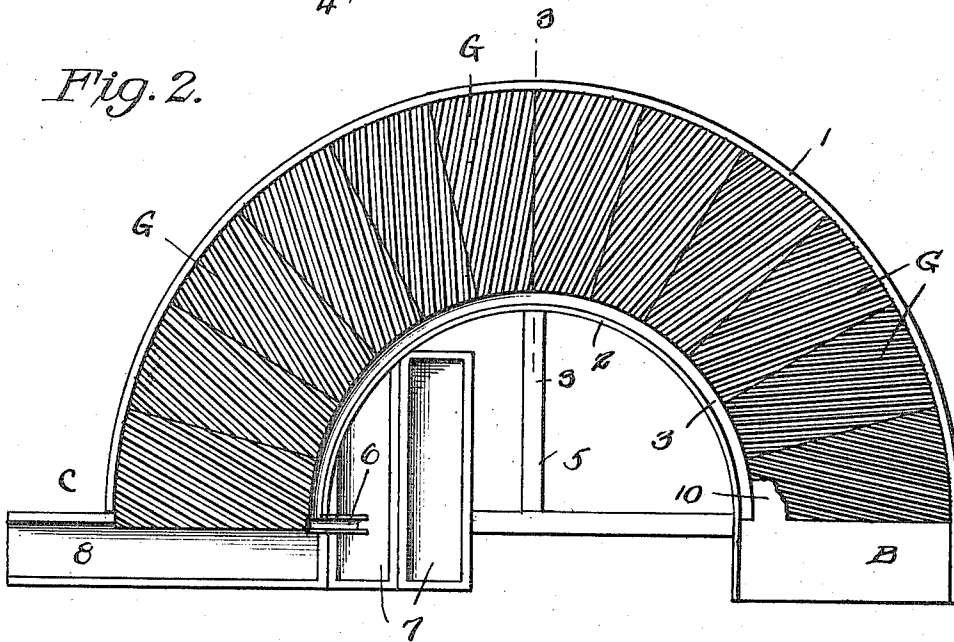


Fig. 2.



Witnesses

Fenton S. Belt
Wm. Ragger

Inventor

Walter L. Hawley

By

Victor J. Evans

Attorney

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2 SHEETS—SHEET 2.

Fig. 3.

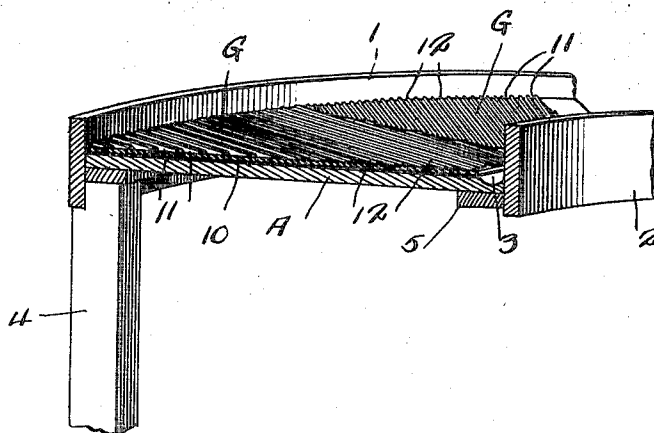
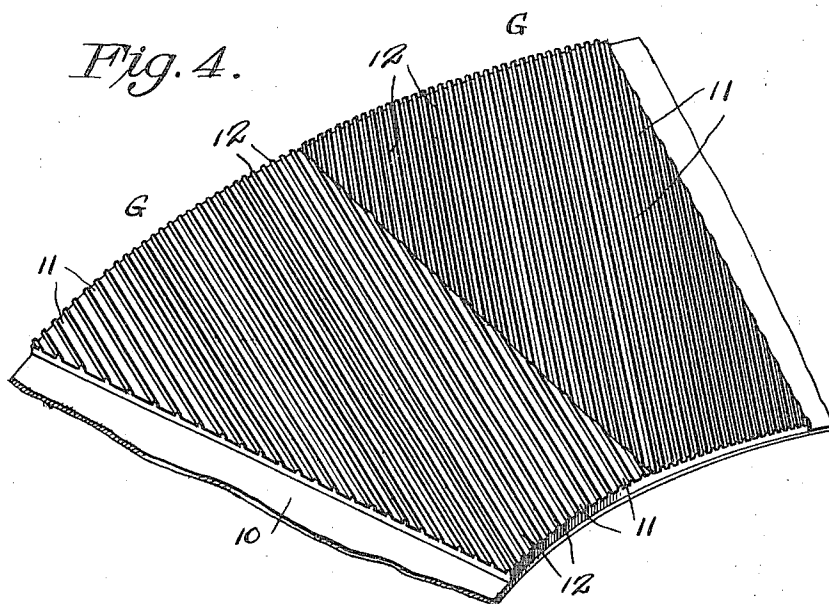


Fig. 4.



Witnesses

Anton S. Belt
Wm. R. Baggett

Inventor
Walter L. Hawley

By Victor J. Evans
Attorney

UNITED STATES PATENT OFFICE.

WALTER L. HAWLEY, OF CARTERSVILLE, MONTANA.

CONCENTRATOR.

1,032,281.

Specification of Letters Patent.

Patented July 9, 1912.

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To all whom it may concern:

Be it known that I, WALTER L. HAWLEY, a citizen of the United States of America, residing at Cartersville, in the county of Rosebud and State of Montana, have invented new and useful Improvements in Concentrators, of which the following is a specification.

This invention relates to concentrators for separating black sand, flour gold and other fine and light concentrates from the deposits wherein they are found, and it has reference to that class of concentrators in which a table is provided with riffles over which the material is washed, the values being permitted to settle by gravity in the riffles from whence they are conveyed to a place of deposit.

This invention has for its object to produce a concentrating table of approximately semi-circular form, the face of which is provided with riffle plates, said face being disposed in a spiral plane which is tilted downwardly from the receiving end to the discharge end and also tilted from the outer edge in the direction of the inner edge where a receiving groove is formed communicating with the riffles and communicating at its lower end with a discharge chute for the values.

A further object of the invention is to construct a device of the character described, which shall possess superior advantages in point of simplicity, durability and general efficiency.

With these and other ends in view which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts which will be hereinafter fully described and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the invention may be resorted to when desired.

In the drawings,—Figure 1 is a perspective view of a concentrator constructed in accordance with the invention, and showing also a feed trough connected therewith. Fig. 2 is a top plan view of the concentrating table without the feed trough. Fig. 3

is a transverse sectional view taken on the line 3—3 in Fig. 2. Fig. 4 is a perspective detail view showing some of the riffle plates detached.

Corresponding parts in the several figures are denoted by like characters of reference.

The table A, which is of arcuate form, may be of any suitable width, and it is provided adjacent to its outer and inner edges with upstanding flanges 1 and 2 which are approximately semi-circular and disposed in concentric relation. The face of the table is provided adjacent to the inner flange 2 with a groove or gutter 3. The table A, which may be suitably supported upon a framework including legs 4 and braces 5, is disposed in a spiral plane, that is to say, the receiving end B is elevated above the discharge end C, and the surface of the table is tilted downwardly from the outer edge in the direction of the inner edge, where the receiving groove or gutter 3 is located. The said groove or gutter communicates at its lower end with a discharge chute 6 over which material may be discharged into a box or receptacle, several of which have been shown at 7, it being obvious that any one of said receptacles when filled may be removed and replaced by an empty one. The table is provided adjacent to its lower end with a discharge chute 8 for waste material, and a suitably constructed feed spout or trough D having supporting legs 9 may be leaned or supported upon the table adjacent to the upper or receiving end of the latter.

Suitably supported upon the table between the outer flange 1 and the groove or gutter 3 are a plurality of riffle plates or sections G. These plates or sections, which are preferably constructed of rubber, cement or of a composition containing cement or rubber, may be secured upon a flexible backing member 10 of canvas or other suitable material for convenience in manipulation. The riffle plates or sections, which are intended to cover the entire surface of the table between the outer flange 1 and the groove or gutter 3, are made of a length to correspond with the width of the table between said flange and gutter, the end edges of said plates or sections being curved to correspond with the curvature of the flange and the gutter. The side edges of said plates G are radial to the center of the

curved side edges of the table, and the plates or sections may be individually of any desired width, the size of said plates being preferably so proportioned that about one dozen of the plates or sections shall be required to cover the surface of the table.

The plates or sections G are formed with riffles or grooves 11, separated by ridges 12, as best seen in Fig. 4, said riffles of each plate or section being disposed in parallel relation to one another and at an angle to the side edges. The riffles of each plate or section are, moreover, so disposed at an angle to the radial side edges of the plate so as to lie as nearly as possible transversely in the path of material passing over the table from the upper to the lower end. The inner ends of some of the riffles of each plate or section will communicate with and discharge into the groove or gutter 3, while the remaining riffles will communicate with and discharge into the riffles terminating at the radial side edges of the plate or section next below.

It will be observed that owing to the peculiar arrangement of the top of the sluice table, which is disposed in a spiral plane tilted downwardly in the direction of the axis of the spiral, material that is washed over the table will be impelled by centrifugal action in the direction of the outer edge of the table. This action is counteracted by the dip or incline downwardly in the direction of the axis of the table which will impel material to move in an inward direction, that is to say, in the direction of the vertical axis of the table, by gravity. It is not advisable, however, that the downward incline in an inward direction be made very pronounced, because the light particles and waste products would thereby acquire a tendency, especially when the flow is sluggish, to move in the direction of the concentrates groove or gutter along with the heavy particles and values. Now, it will be seen that if the riffles were disposed radially with reference to the vertical axis of the sluice table, the centrifugal action on the heavy particles, tending to force them toward the outer edge of the table would favor the washing of such heavy particles over the riffles and their being discharged eventually along with the waste products. By arranging the riffles as herein shown at an angle to the radius and as nearly as may be transversely in the path of the material that is being operated upon, the tendency will be for the heavy particles to move in the direction of the concentrates groove, thus enabling perfect separation to be accomplished.

Instead of providing the table with a plurality of individual riffle plates or sections, it is obvious that the riffle portion may be formed in a single piece, which, however,

will preserve the structural characteristics above described. Thus, while the surface may be properly described as being divided into a plurality of blocks or sections in each of which blocks or sections the riffles are disposed in parallel relation, the riffle blocks or sections may all be integrally joined together. Especially will this be the case when the device is formed of cement or of a cement composition, when the entire table portion may be conveniently formed by casting in a suitable mold or a plurality of molds, as the case may be. I particularly desire it to be understood that I do not limit myself with regard to the material or composition of which the riffled portion of the table is composed, and also that said riffled portion may be constructed in one or more pieces and afterward joined together in any suitable and convenient manner.

It will be seen from the construction herein described that when material containing flour gold, black sand or other heavy and valuable substances is deposited upon the receiving end of the table and is washed over the table by a stream of water, the heavy substances will settle in the riffles 11 of each riffle plate or section and will be gradually washed from such riffle either into the receiving trough 3 or into one of the riffles in an adjoining plate or section. It is evident that it is the heaviest particles that will be washed directly from the riffles 11 into the receiving trough 3, while the somewhat lighter particles will pass over successive riffles of one section until they enter the riffles of the next section. Here the operation is repeated, the heaviest particles passing off into the trough 3, while the somewhat lighter particles will be washed over the successive riffles and to the next section, the operation being repeated practically at each section or group of riffles. In this manner the heavy substances containing the values will eventually all be discharged into the receiving trough or groove 3 from which such values will be eventually discharged over the spout 6. The waste material will be discharged from the table over the discharge spout 7.

The construction of the improved concentrator is extremely simple and thoroughly effective, it being practically impossible for any heavy substances to escape without being caught in some one of the riffles.

Having thus described the invention, what is claimed as new, is:—

1. In a concentrator, an arcuate table having a surface disposed in a spiral plane and tilted downwardly in the direction of the axis of the spiral, said table being provided with upstanding flanges adjacent to its outer and inner edges and with a groove or gutter adjacent to its inner edge, in combination with groups or blocks of riffles upon the

surface of the table, the riffles of each block being disposed in parallel relation to one another, some of said riffles communicating with the groove or gutter at the inner edge of the table and some of the riffles communicating with the riffles next below leading to said groove or gutter.

2. In a concentrator, a supporting table having a groove or gutter for the reception of the concentrates, the surface of the table being tilted in the direction of said groove, and said surface being also arranged in a spiral plane, in combination with a plurality of riffle plates supported upon the surface of the table, said riffle plates being provided

with individual riffles arranged in parallel relation to one another and approximately transversely in the path of material passing over the table, some of said riffles communicating directly with the concentrates groove, and some of the riffles communicating with riffles in an adjacent plate that lead to the concentrates groove.

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

WALTER L. HAWLEY.

Witnesses:

ALVER HAMMERSTROM,
TONY PATIERO.