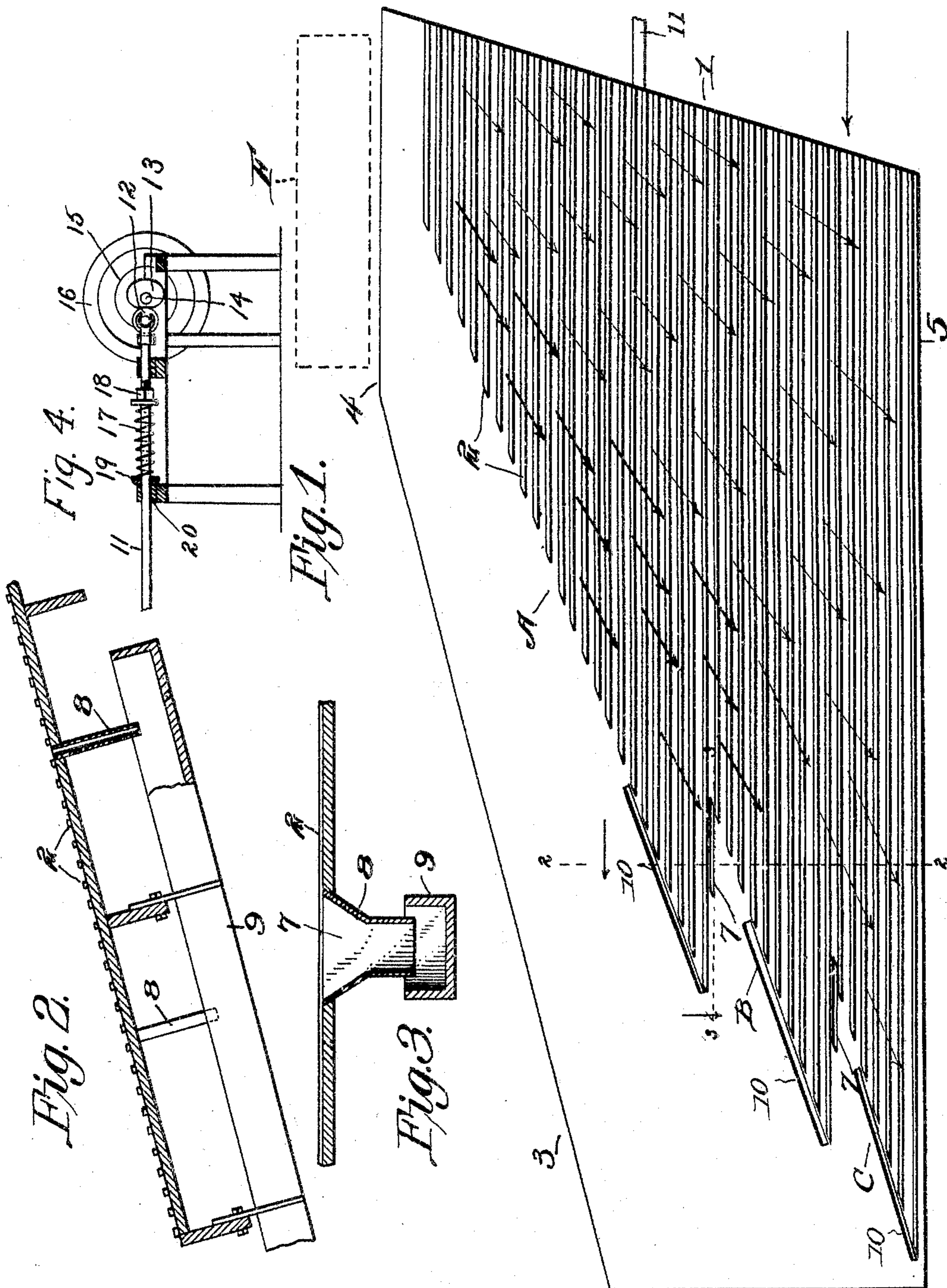


No. 780,031.

PATENTED JAN. 17, 1905.

F. E. FORSTER.
CONCENTRATOR TABLE.
APPLICATION FILED JAN. 23, 1904.



Witnesses

E. J. Stewart
Dexter Morton

Frank E. Forster Inventor
by *C. A. Snow & Co.* Attorneys

UNITED STATES PATENT OFFICE.

FRANK EDMON FORSTER, OF CLIFTON, ARIZONA TERRITORY, ASSIGNOR
OF ONE-HALF TO WILLIAM H. DE ROSEAU, OF CLIFTON, ARIZONA
TERRITORY.

CONCENTRATOR-TABLE.

SPECIFICATION forming part of Letters Patent No. 780,031, dated January 17, 1905.

Application filed January 23, 1904. Serial No. 190,393.

To all whom it may concern:

Be it known that I, FRANK EDMON FORSTER, a citizen of the United States, residing at Clifton, in the county of Graham and Territory of Arizona, have invented a new and useful Concentrator-Table, of which the following is a specification.

This invention relates to concentrator-tables, and refers more particularly to tables for concentrators of the type in which the table is disposed in an inclined plane and is given a longitudinal reciprocatory movement when the concentrator is in operation.

In concentrators of the type mentioned the ore discharged upon the table passes obliquely across the table, the heavier particles of the ore taking the more oblique course and the lighter particles moving more nearly in a direction transverse to the line of movement of the table. In such tables the action is satisfactory so far as the separation of the coarser masses of gangue and the larger particles of ore is concerned; but the separation of the metallic values contained in the slimes is not complete, because the heavier masses of gangue tend to force the slimes off the table before complete separation of the metallic values therefrom can be effected.

The principal object of the present invention is to provide a concentrator-table of the type above mentioned with a novel arrangement of riffles and slots through which most of the gangue or tailings may pass into a launder or trough and be carried away from the table, thus allowing the slimes to work forward on the table and cause a complete separation of the metallic values therefrom.

In attaining the object above mentioned and others which will appear as the invention is more fully disclosed the same consists in the novel construction of a concentrator-table, as hereinafter fully described and claimed, and illustrated in preferred form in the accompanying drawings, it being understood that changes in the minor details of construction may be resorted to without departing from the spirit of the invention or exceeding the scope of the appended claims.

In the drawings, Figure 1 is a view in per-

spective of the improved concentrator-table, the feed-box from which the ore is discharged upon the table being indicated at the upper margin of the table by means of dotted lines. Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 3 is a section on the line 3 3 of Fig. 1. Fig. 4 is a view in side elevation, partly in section, exhibiting one form of mechanism that may be employed for imparting reciprocatory movements to the table.

Referring to the drawings, in which corresponding parts are designated by similar characters of reference throughout the several views, 1 designates the back or rear margin of the concentrator-table, from which riffles 2 extend longitudinally of the table toward its forward end 3. The riffles near the upper margin 4 of the table are comparatively short and increase in length toward the lower margin 5. The riffles are preferably arranged in a plurality of groups, three groups being shown, the groups being designated A, B, and C, respectively, from the upper part of the table to the lower. Group A contains a much larger number of riffles than either of the groups B and C; but the average length of the riffles in group A is considerably less than the average length of the riffles in either of the other groups. In each group the riffles increase uniformly in length from the uppermost to the lowermost riffle, as shown in Fig. 1; but the uppermost riffle of group B is considerably shorter than the lowermost riffle of group A, and the lowermost riffle of group B is considerably longer than the uppermost riffle of group C. The object of this arrangement is to cause the heavier masses of tailings which pass downward over the riffles in the upper group from interfering with the passage of ore along the riffles in the lower groups. By so arranging the riffles the gangue or tailings may be separated into three grades, the coarsest grade passing over the ends of the riffles of group A, the intermediate grade passing over the ends of the riffles in group B, and the finest grade passing over the ends of the riffles in group C.

In order to prevent masses of gangue from passing over the riffles in an upper group and

descending upon the riffles of the next group, I provide slots 7 in the surface of the table at the points shown, a slot being provided below the lowermost riffle of groups A and B, near
 5 the forward end thereof. Chutes 8 extend downward from said slots and discharge into a trough or launder 9, along which the material discharged from the chute may be carried by water or otherwise.

10 The direction of the movement imparted to the concentrator-table is indicated by the arrow at the end of Fig. 1, and the course of the larger masses of gangue and ore over the table is indicated by heavy arrows, while the
 15 course of the finer particles, including the slimes, is indicated by the light arrows.

The ore is discharged upon the concentrator-table from the feed-box F, (indicated in dotted lines at the upper margin of the table,) and the longitudinal reciprocatory movement
 20 of the table causes the heavier masses to travel more rapidly toward the forward end of the table than the lighter and finer particles. A considerable portion of the largest particles
 25 of gangue will pass over the ends of the lower riffles in group A and will be carried off through the slot below the lowermost riffle of group A. Particles of gangue of the next finer grade will pass over the ends of the riffles in
 30 group B and be discharged through the slot below the lowermost riffle of that group, thus allowing the fine particles of ore and tailings to work forward along the riffles of group C, practically to the end thereof, and thus permit complete separation of the metallic values
 35 from the tailings.

While the table has been shown as provided with three groups of riffles only, it will be obvious that the number of groups may be
 40 increased, if desired, to separate the gangue or tailings into a greater number of different grades, and it will also be obvious that, if desired, slots may be provided, as indicated at 10, for the escape of the metallic values
 45 which work along the riffles to their ends.

Any form of mechanism may be employed for imparting reciprocatory movements to the table, the form shown in Fig. 4 being one that will be effective for the purpose and
 50 comprises a rod 11, one end of which is detachably secured in any suitable way to the under side of the table. The free end of the rod 11 carries a friction-roller 12, which contacts with a cam 13, secured upon a shaft 14
 55 and carrying fast and loose pulleys, one of which is designated 15, the said pulleys being engaged by a belt (not shown) leading to a suitable source of power. The shaft also carries a fly-wheel 16 to insure a steady motion
 60 of the shaft, as usual. Mounted upon the rod

11 is a spring 17, one end of which bears against a collar 18, adjustable on the shaft, and the other end against a washer 19, also mounted upon the shaft and held against longitudinal movement by one of the cross-pieces
 65 20 of the supporting-frame. The spring serves to hold the roller 12 in contact with the cam 13, so that when the shaft 14 is rotated the cam imparts a quick forward and backward impulse to the rod, and consequently to the table, without any rest between the two movements, a rest, however, taking place when the friction-roller engages the flat side of the cam, as clearly shown in Fig. 4.

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

1. A table for reciprocatory concentrators having a plurality of sets of riffles the upper edges of which are disposed in the same plane, each set being arranged to overlap the next lower set.

2. A table for reciprocatory concentrators provided with escape-openings and with a plurality of sets of riffles, each set being arranged to overlap the next lower set, and the openings being disposed within the line of termination of the riffles above them.

3. A table for reciprocatory concentrators having a plurality of sets of riffles, each set being arranged to overlap the next lower set, and having, further, escape-openings disposed within the line of termination of the riffles, and at the outer terminals thereof.

4. A table for reciprocatory concentrators provided with escape-slots and with a plurality of sets of riffles, each set being arranged to overlap the next lower set, and the slots being disposed parallel with the riffles and within the line of termination of the riffles above them.

5. A table for reciprocatory concentrators provided with two series of escape-slots and with a plurality of sets of riffles each set being arranged to overlap the next lower set, one series of the slots being disposed parallel with the riffles and within the line of termination of the riffles above them, and the other series being disposed at the outer terminals of the riffles.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

FRANK EDMON FORSTER.

Witnesses:

W. B. TOMPKINS,

W. H. DE ROSEAU.