

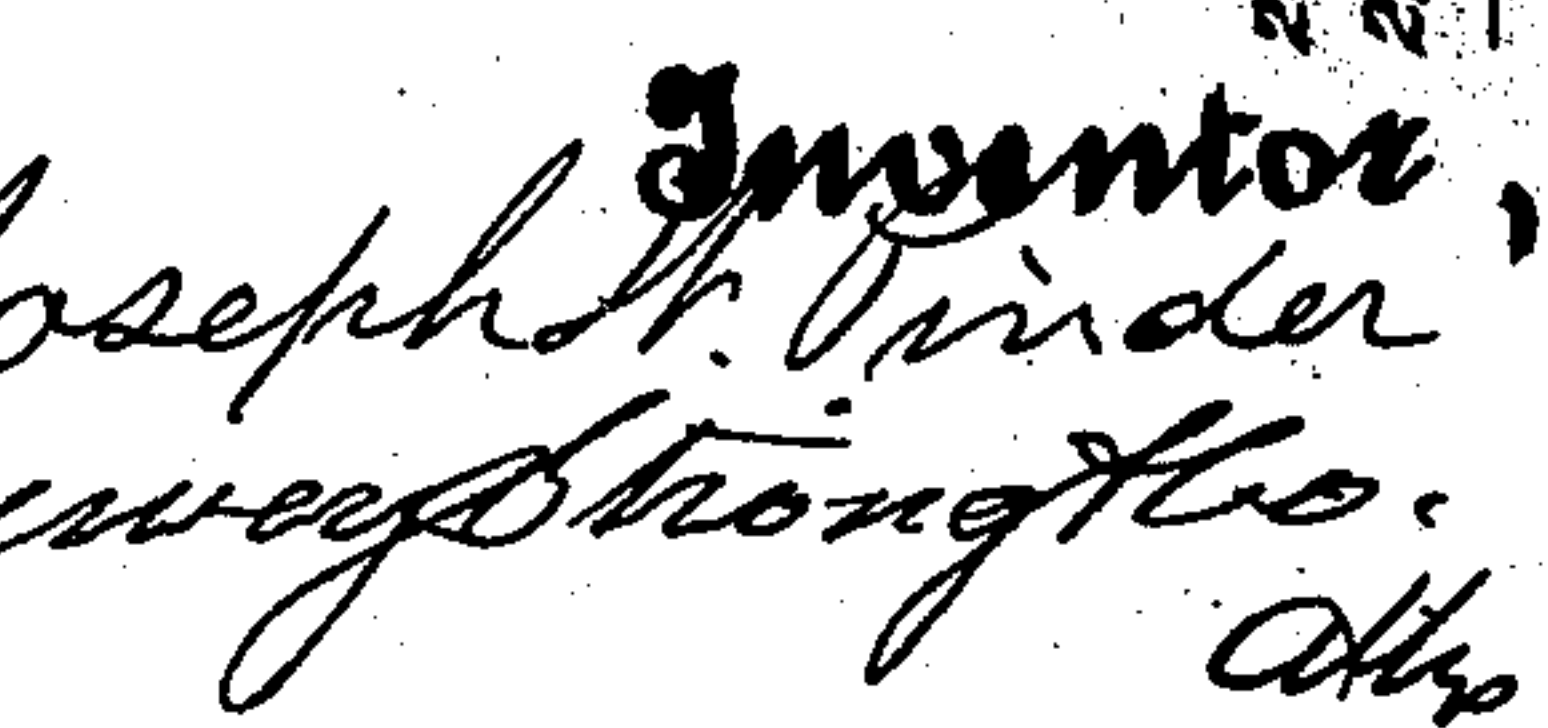
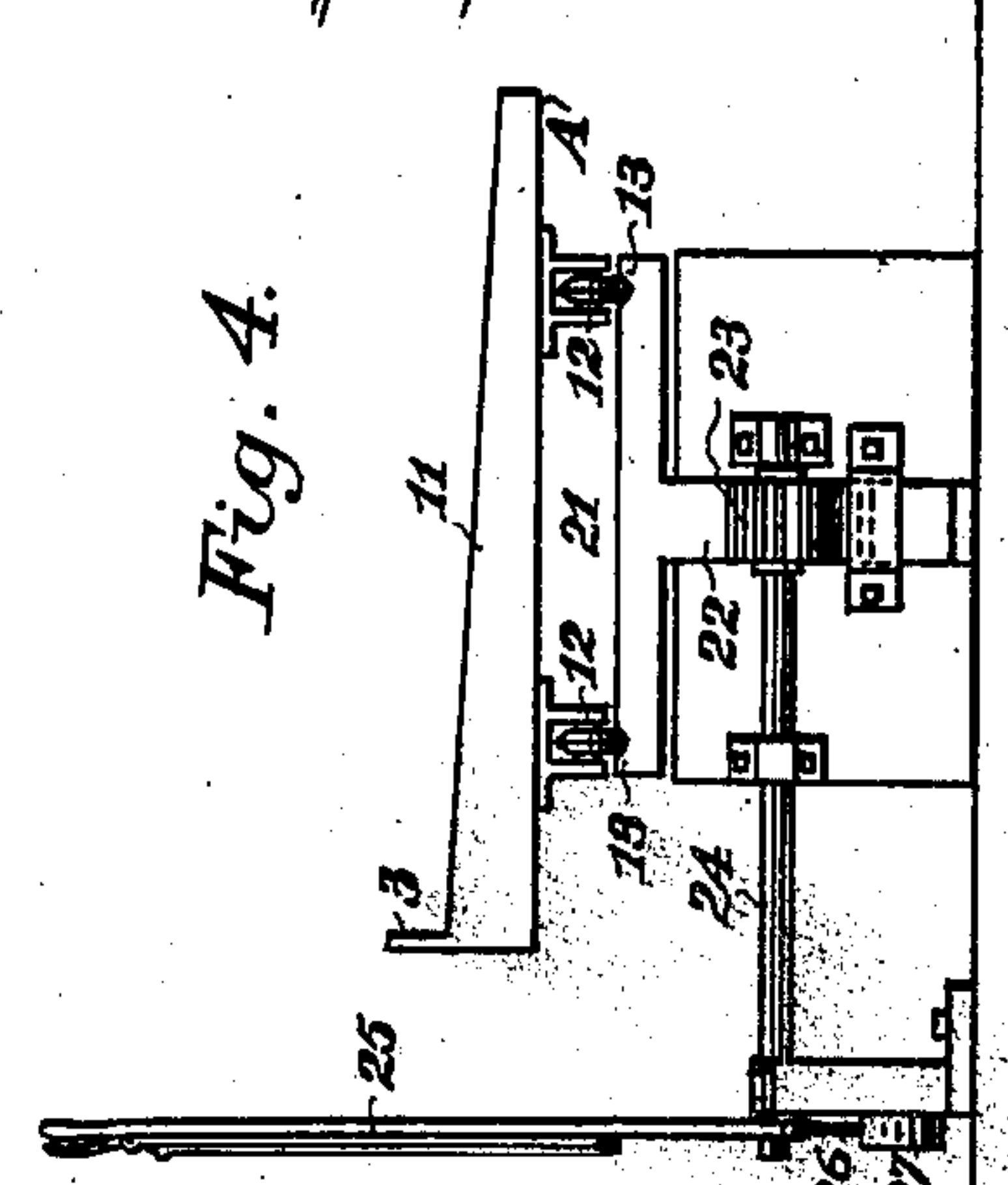
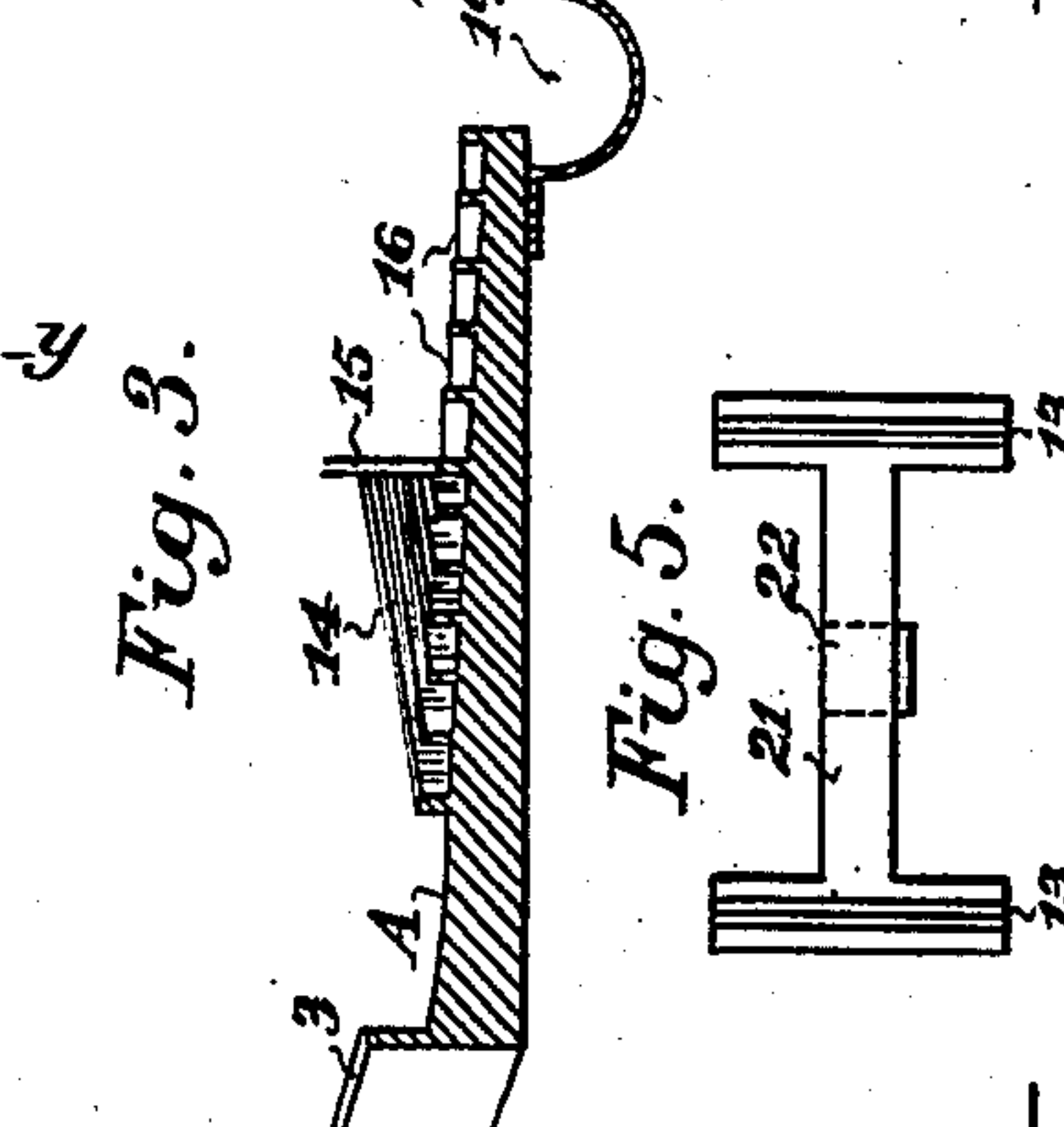
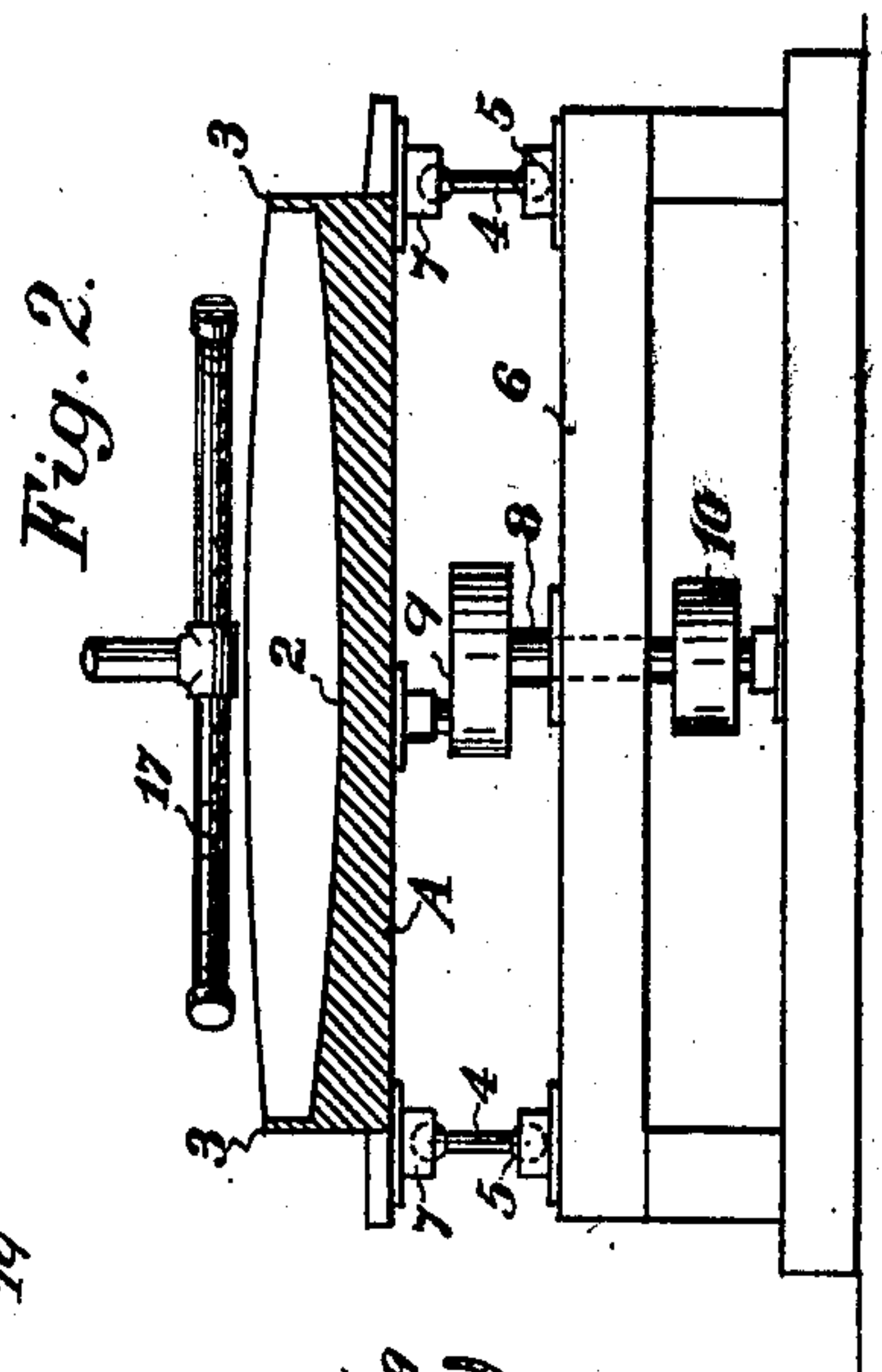
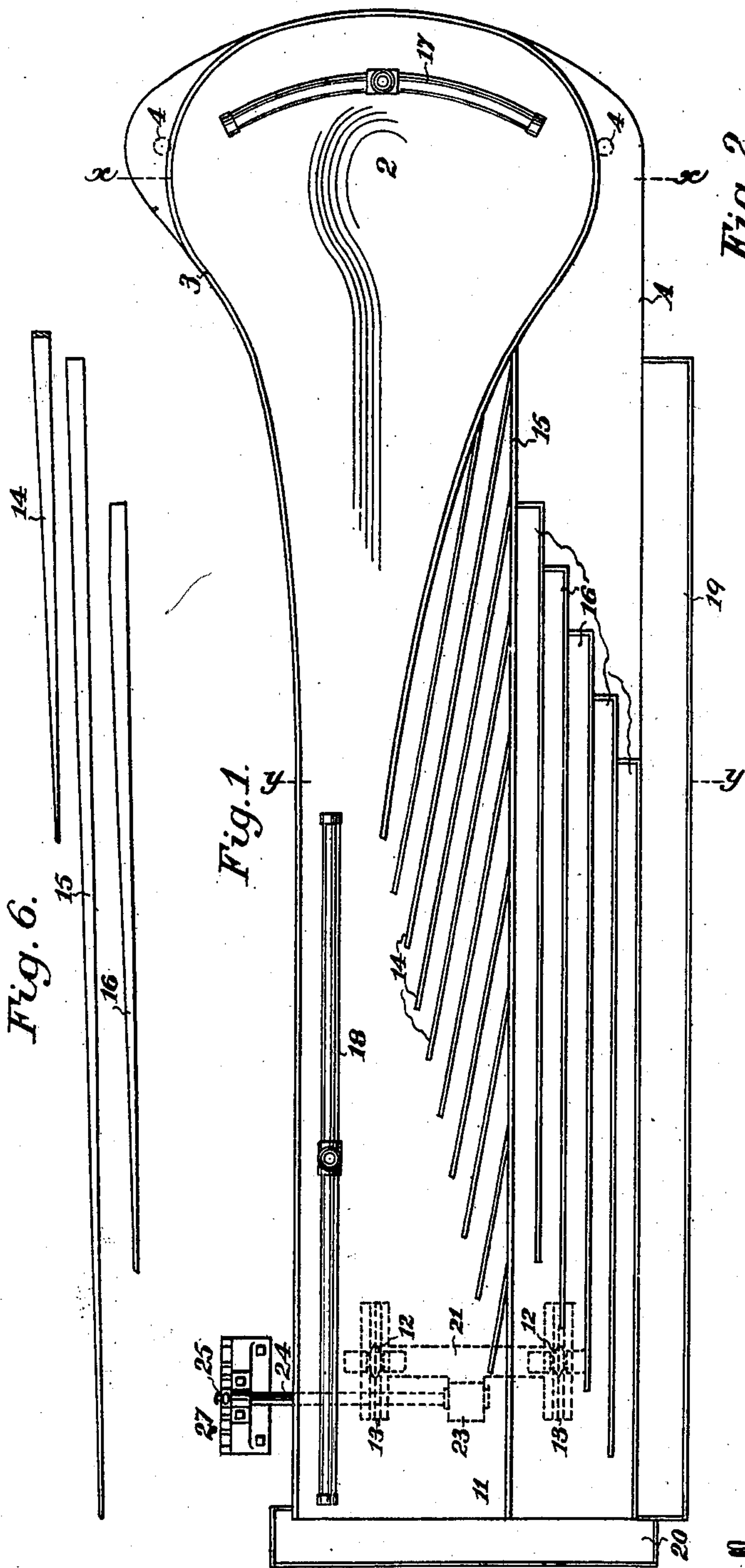
No. 658,120.

Patented Sept. 18, 1900.

J. W. PINDER.  
CONCENTRATOR.

(Application filed July 12, 1900.)

(No Model.)



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# UNITED STATES PATENT OFFICE.

JOSEPH W. PINDER, OF GROVELAND, CALIFORNIA.

## CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 658,120, dated September 18, 1900.

Application filed July 12, 1900. Serial No. 23,333. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH W. PINDER, a citizen of the United States, residing at Groveland, county of Tuolumne, State of California, have invented an Improvement in Concentrators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a device for first concentrating heavy materials and afterward separating the lighter and worthless material therefrom.

It consists of a table, the head of which is made concave, and the lower end connecting with said head portion is inclined both lengthwise and sidewise, and in conjunction with this table are a series of diagonally-disposed tapering riffles and another series of riffles parallel with the side of the table and separated from the first-named series and means for receiving the discharge from each series of riffles. The upper end of the table is supported upon vertical standards upon each side with heads which allow a perfect freedom of movement, and a vertically-disposed crank-wheel is connected with the central portion of the head, so that a revolving motion is given to the head, while the lower end of the table is supported upon wheels or rollers which allow a longitudinal movement of this end, the compound movements serving to first concentrate and afterward separate the material.

My invention also comprises details of construction which will be more fully explained by reference to the accompanying drawings.

Figure 1 is a plan of the concentrator. Fig. 2 is a transverse section on the line  $x x$  of Fig. 1. Fig. 3 is a transverse section on the line  $y y$  of Fig. 1. Fig. 4 is an end elevation. Fig. 5 is a plan of the grooved tracks. Fig. 6 shows elevations of some of the riffles.

The table A is made, preferably, of light wood or of other suitable material, and its upper end forms an enlarged rounded head, which narrows into the body and extends to any suitable length to form the lower portion of the table. This upper or head portion of the table is made slightly concave, as shown at 2, and it has a rim 3 around it of sufficient height to prevent the escape of material therefrom. This table is supported upon short

vertical standards 4, which may have ball-bearings or other suitable heads, and these heads at the lower end rest in sockets at 5, which are supported upon the frame-timbers or other supports 6. The upper ends of the standards fit in similar sockets 7, which are fixed to the table at each side of the head. Intermediate between these supports is a vertical shaft 8, having a crank-wheel 9 upon it, the crank-pin of which connects with the lower part of the table, and power is derived to rotate the crank-shaft from any suitable source through a belt in the pulley 10, fixed upon the shaft 8, so that the rotary motion of this head portion is produced, the standards 4 having a universal movement, so that they easily follow the movement of the crank. This motion serves to concentrate and settle the heavy material in the deeper portion 2 of the head, and as the material accumulates it gradually flows outward down the straight portion of the table, the concaved depression of the head gradually merging itself into the lower or tail portion of the table. This lower end 11 of the table is supported upon journaled wheels 12. These wheels run in grooved tracks, as at 13, so that the rotary motion imparted to the head of the apparatus becomes a longitudinal shaking motion at the lower end.

Upon one side of the table are the riffles 14, which consist of tapering strips, the higher ends of which connect with an upwardly-projecting rib 15, and this rib separates the riffles 14 from another series of riffles 16, which are upon the outer side of the rib and toward the edge of the table, as shown. These ribs are all deepest at their upper ends and gradually taper down to a point where the lower ends terminate upon the table.

Material is fed into the upper end of the apparatus in any desired regular manner, and a supply of water is discharged into the head of the table through a curved perforated pipe 17.

A second water-supply pipe 18 is located at a suitable point along the side of the table opposite the riffles and the operation will then be as follows: The apparatus being set in motion the rotary movement of the head of the table concentrates the heavy portion into the central part of the head, while the lighter por-



tion upon the surface gradually flows down toward the foot of the table. The body of concentrates accumulates in the concavity of the table, and when a sufficient amount has  
 5 been settled they begin to flow downward; but by reason of the incline of the table they will also flow over the riffles 14 successively, and the lighter material flowing over these riffles with the concentrates will also flow over  
 10 the interposed rib 15 and into the riffles 16, the angle of which, as before stated, differs from the angle of the riffles 14, as plainly shown in the drawings. The "seconds," so called, flowing over this rib 15 into the riffle  
 15 16 are rapidly separated from the concentrates and the latter are also graded by the various ribs or riffles over which they pass. Material which passes over the edge of the table is received into a trough 19, which con-  
 20 veys it away, and the concentrates which reach the lower end of the table are similarly received into a conducting trough or chute 20.

In order to vary the grade of the table to suit the character of the material which is be-  
 25 ing treated, I have shown the grooved tracks 13, connected by a cross-timber 21, which is supported by a vertical standard 22, having rack-teeth upon one side, and these rack-teeth are engaged by a pinion 23, mounted  
 30 upon a suitably-journaled shaft 24. The outer end of this shaft has fixed to it a hand-lever 25, with a suitable spring-controlled pin at the lower end, as at 26, and this pin is adapted to enter holes in a concaved segment  
 35 27, so as to hold the device at any desired point of adjustment. Thus the grade of the table in the direction of its length can be readily changed at any time to suit the conditions of the material which is being acted  
 40 upon.

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

1. In a concentrator, a table having a  
 45 rounded, concaved head with a surrounding rim, an extension into which said head gradually merges, said extension being inclined from one side toward the other, and also inclined in the direction of its length, standards  
 50 supporting the opposite sides of the head and capable of universal movement, a crank connection with the center of the head whereby a rotary movement is produced, and rollers upon which the lower end of the table is sup-  
 55 ported whereby a longitudinal movement of this end of the table is produced, and riffles upon the lower side of the table.

2. A concentrating-table consisting of a  
 60 rounded head with the bottom sloping gradually to the center, and a peripheral rim, an extension forming the lower end of the table into which the concavity of the head merges, said extension being inclined transversely,

means whereby a rotary movement of the head and a longitudinal reciprocating movement  
 65 of the lower end of the table are produced, a series of divergent riffles extending from the side of the table toward the center a rib parallel with the side of the table against which the upper ends of said riffles abut, and a sec-  
 70 ond series of riffles exterior to the rib and parallel with the side of the table.

3. A concentrating-table consisting of a rounded head having a bottom sloping toward a central point and a surrounding rim, the  
 75 lower end of the table forming a continuation of said bottom into which it merges, said lower end being approximately flat and inclined longitudinally and also transversely with a rim upon its upper edge, pipes by which wa-  
 80 ter is delivered into the head portion and along the sides of the lower portion, a tapering rib connecting with the rim of the head portion and extending toward the lower end, approximately parallel with the discharge  
 85 side of the table, tapering riffles having their deeper ends contacting with the tapering rib and diverging toward the center of the table, other tapering riffles exterior to the rib and approximately parallel with the side of the  
 90 table, troughs at the lower discharge side and end respectively to receive the materials separated upon the table and means whereby a rotary motion of the head, and a longitudinal movement of the lower end of the table are  
 95 simultaneously produced.

4. A concentrator comprising a table having a rounded concaved head, with surround-  
 ing rim, the lower end forming a continuation  
 100 of the bottom of the head portion and inclined longitudinally, and from one side to the other with a series of ribs and riffles for separating the materials flowing down the table, stand-  
 105 ards supporting the opposite sides of the head and having a universal movement, a crank-shaft connecting with the central portion of the head, and means for rotating said shaft to produce a rotary movement of the head, rollers journaled to the lower end of the table, guiding supports upon which the rollers are  
 110 adapted to travel, a stem upon which said supports are carried having rack-teeth upon it, a pinion mounted upon a horizontally-journaled shaft engaging the rack-teeth of the stem, a lever fixed to the shaft by which it is  
 115 turnable to raise or lower the table-support and change the grade thereof, and a spring-pressed pin and segment whereby the parts are retained at any position of adjustment.

In witness whereof I have hereunto set my  
 120 hand.

J. W. PINDER.

Witnesses:

E. G. STINE,

W. B. FORSYTH.