No. 843,086. PATENTED FEB. 5, 1907.

L. B. HUNTER.

ORE SEPARATOR.

APPLICATION FILED MAR. 17, 1906.

2 SHEETS—SHEET 1.

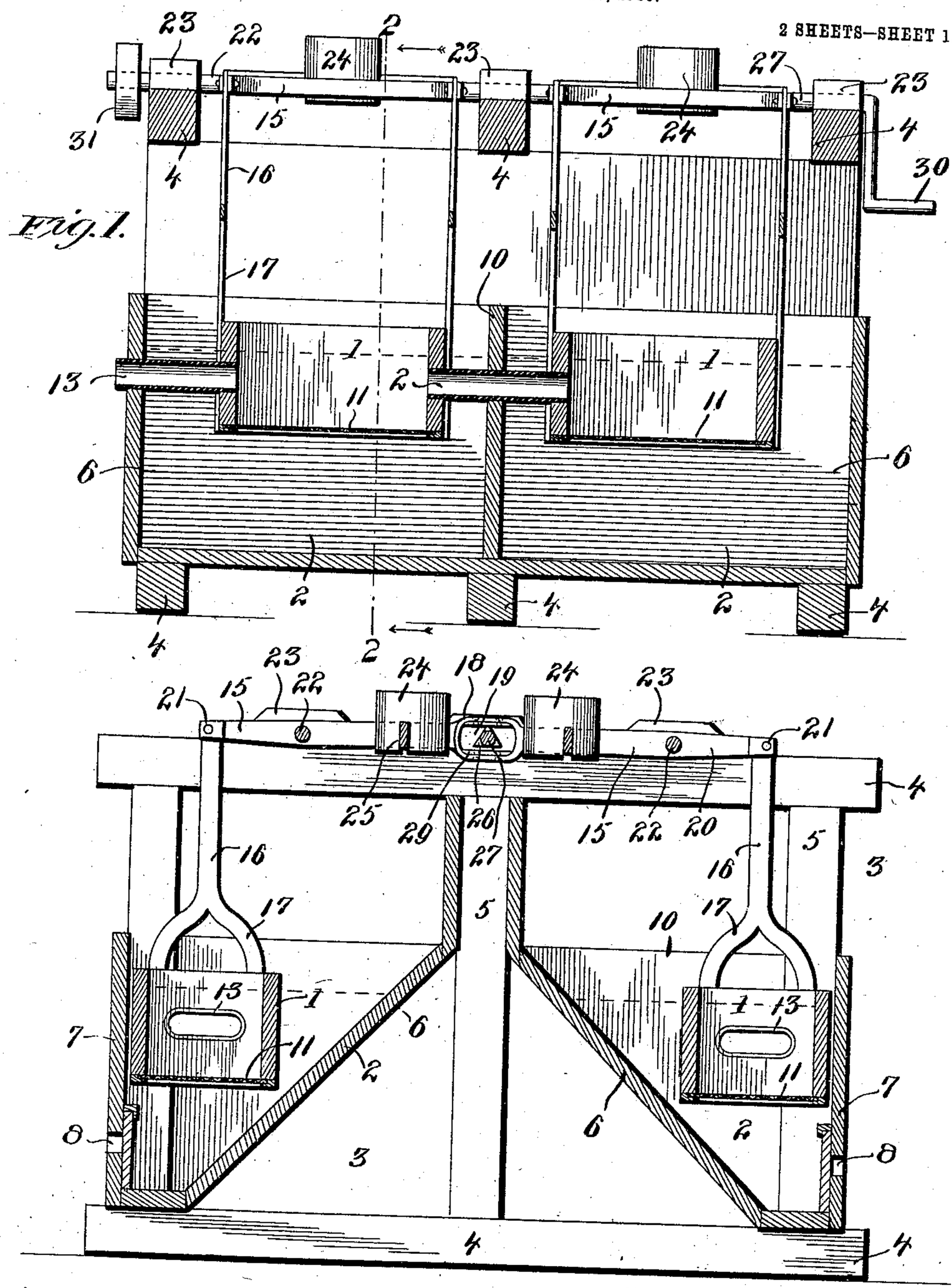

Fig. 1.

Fig. 2.

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2 SHEETS—SHEET 2.

Fig. 3.

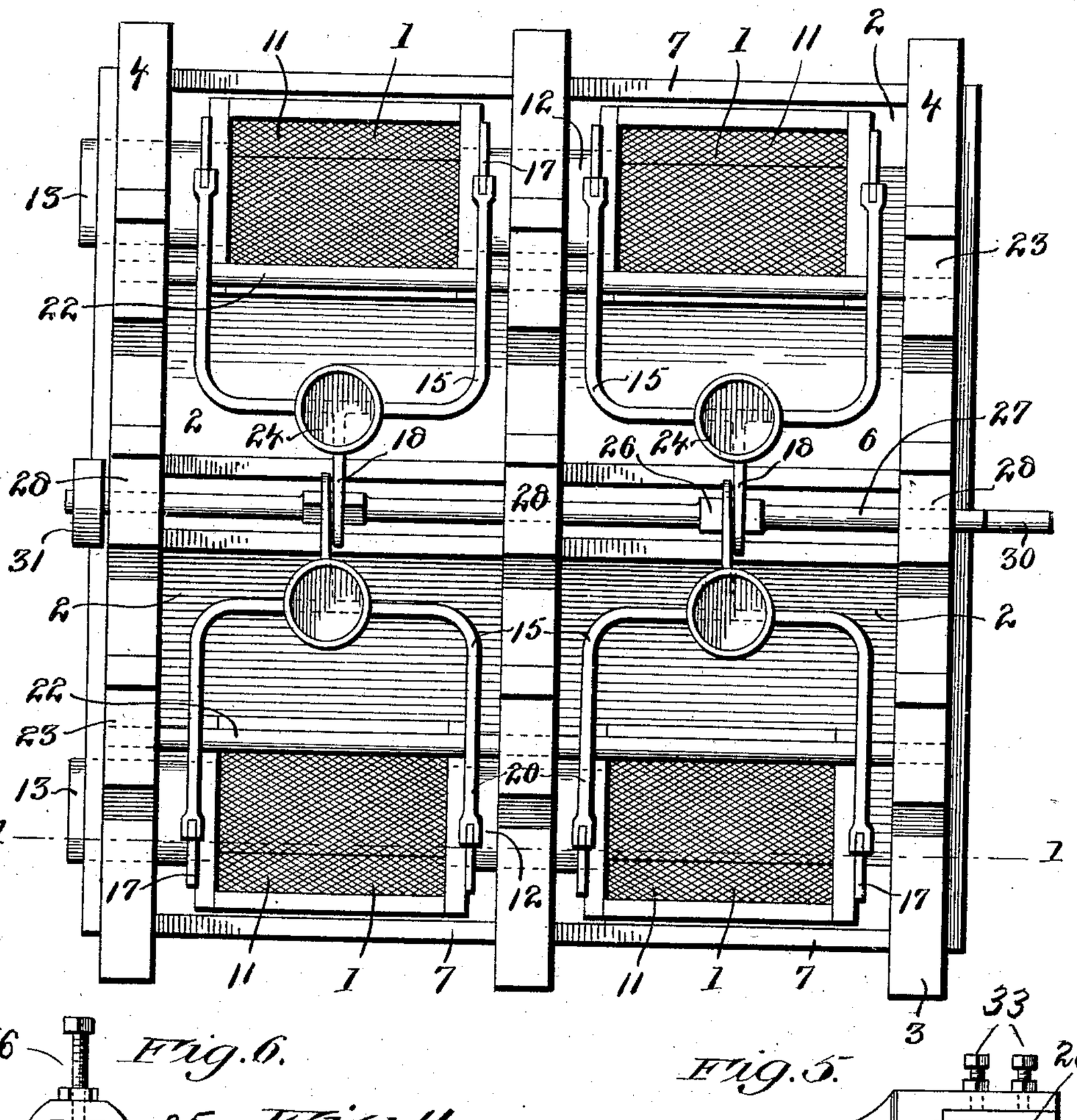


Fig. 6.

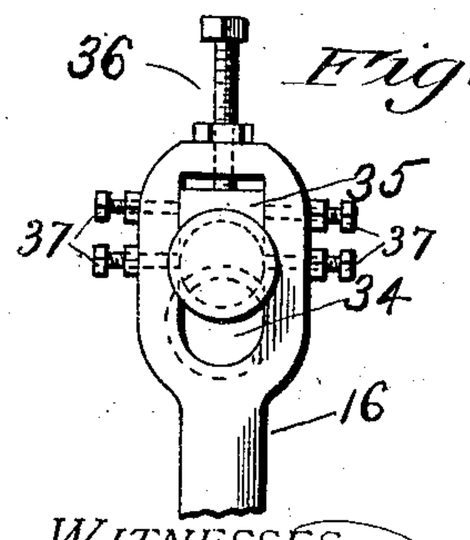
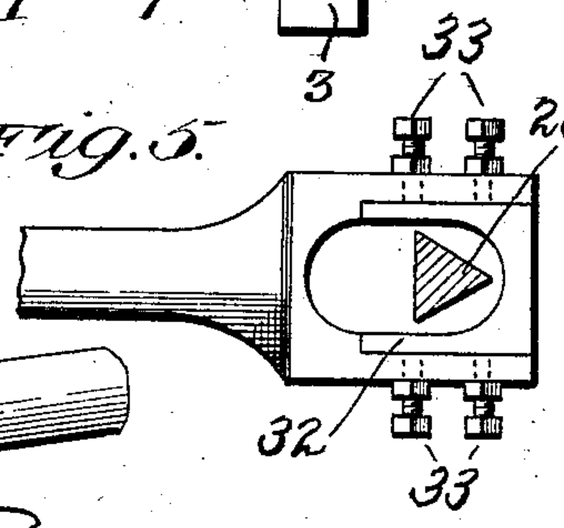


Fig. 4.

Fig. 5.



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No 843,086. Specification of Letters Patent. Patented Feb. 5, 1907.

Application filed March 17, 1906. Serial No. 306,647.

To all whom it may concern:

Be it known that I, LUCIAN B. HUNTER, a citizen of the United States, residing at Greeley, in the county of Weld and State of Colorado, have invented certain new and useful Improvements in Ore-Separators, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in ore-separators of that class in which reciprocating jig-boxes are employed.

One object of the invention is to provide an apparatus of this character which is of simple, light, strong, and durable construction, so that it may be readily erected at a comparatively small cost and taken apart to permit it to be conveniently transported.

Another object of the invention is to provide an apparatus of this character having a plurality or series of balanced jig-boxes which may be simultaneously operated by hand or power to produce most efficient results.

A further object of the invention is to improve and simplify the construction and operation of apparatus of this character and thereby render the same more effective and durable and at the same time less expensive.

Other objects and advantages of my invention, as well as the structural features by means of which these objects are attained, will be made clear by an examination of the following specification, taken in connection with the accompanying drawings, in which the same reference-numerals indicate corresponding portions throughout, and in which—

Figure 1 is a vertical longitudinal sectional view through my improved ore-separator, the plane of the section being indicated by the line 1 1 in Fig. 3. Fig. 2 is a vertical transverse sectional view through the apparatus, taken on the plane indicated by the line 2 2 in Fig. 1. Fig. 3 is a top plan view of the apparatus. Fig. 4 is a detail perspective view of one of the triangular-shaped cams for operating the jig-boxes. Fig. 5 is a sectional view showing a U-shaped wear-plate in one of the levers; and Fig. 6 is a detail view of an adjustable pivot-bearing for one of the jig-box hangers.

The embodiment of my invention shown in the drawings comprises a plurality of jig-boxes 1, mounted for simultaneous reciprocation in series of tanks or receptacles 2, the latter being arranged in longitudinal rows and disposed opposite each other or in pairs. These tanks 2 may be of any desired form and construction and are preferably mounted in a frame or support 3, consisting of lower and upper transversely-extending beams 4, connected by uprights 5 and the tanks 2, which latter have inclined inner sides 6 and vertical outer sides 7, in which are formed outlet-openings 8 for the discharge of the tailings. The openings 8 may be closed by sliding gates or closures of any other description. While any number of pairs of tanks may be employed, but two are shown in the drawings, the tanks of each pair being separated and the adjoining tanks of each row being made independent by transverse partitions 10, which form the inner ends of the tanks. The jig-boxes 1 may also be of any desired form and construction, but, as shown, they consist of rectangular boxes or receptacles, which have their bottoms closed by screens 11. The latter may be in the form of woven-wire fabric, as shown, or in the form of perforated metal plates or other foraminous material. The jig-boxes are suspended so that their open tops are above the level of the water in the tanks 2, and the boxes in each longitudinal row are connected so that the discharge from one passes into the next adjacent. As clearly shown in Fig. 1, this is effected by providing flexible pipes or conductors 12 between the two jig-boxes and similar flexible pipes or conductors 13 between the last or endmost box and the outer end of the last tank, the pipes 13 serving as outlets or discharges for the apparatus. The pipes or conductors 12 and 13 are here shown as in the form of flattened tubular pipes of flexible material, which permits of the reciprocation of the jig-boxes; but they may be of any other form and arranged in any suitable manner. The pipes 12 extend through the partition 10 and have their ends secured in centrally-disposed openings in the boxes 1, while the pipes 13 have their inner ends secured in openings in the last jig-box and their outer ends projecting through the outer end wall of the last tank. The jig-boxes are suspended from operating-levers 15 by hangers 16, which have their lower ends 17 bifurcated and secured upon the ends of the boxes 1. The levers 15 have their inner ends 18 formed with longitudinal slots 19, and their outer ends are forked or bifurcated to form

parallel arms 20, which have the upper ends of the hangers 16 pivoted, as at 21, between their forked outer ends. The levers are fulcrumed by means of longitudinally-extending rods or shafts 22, which extend through the arms 20 and are journaled in suitable bearings 23 upon the upper beams 4 of the frame 3. The jig-boxes are counterbalanced by means of weights 24, provided upon the inner ends of the levers 15. As shown, these weights are detachably mounted by forming in their bottoms T-shaped slots 25 to receive the similarly-shaped portions of the levers, as shown in Figs. 1 and 3, and in their tops are formed recesses or cavities in which additional weights may be placed when found necessary to overbalance the jig-boxes. The levers 15 are rocked or oscillated for the purpose of reciprocating the jig-boxes by means of triangular-shaped cams or tappets 26, secured to or formed upon a longitudinal shaft 27, journaled in bearings 28 upon the centers of the upper beams 4. These cams or tappets are so disposed on the operating-shaft 27 that each one extends through the slots 19 in the inner ends 18 of one pair of the levers 15, said slots being of sufficient size to permit the cams to rotate therein. The weights 24 force the ends 18 of the levers downwardly into engagement with the uppermost faces or parts of the cams, so that as the latter are rotated the levers will be rocked or oscillated. The upper and lower faces or walls of the slots 19 are preferably faced with wear-plates 29, which may be replaced from time to time as they are worn away by reason of their engagement with the angular cams or tappets. The shaft 27 may be operated manually by turning a crank-handle 30, which may be formed or secured upon one of its ends, or it may be operated by power by providing a belt wheel or pulley 31 upon one of its ends and driving the same by a belt or band, as will be readily understood.

Instead of employing the wear-plates 29 upon the faces or walls of the slots 19, as shown in Fig. 2, I may construct the inner ends of the levers 15 as shown in Fig. 5 of the drawings. It will be noted that in this construction said end of the lever is forked or bifurcated to receive a substantially U-shaped wear-plate 32, within which the cam 26 rotates and which is adjustably and removably secured in position by means of set-screws 33.

If desired, the hangers 16 of the jig-boxes may be adjustably suspended from the pivot pins or bolts 21 in the bifurcated outer ends or arms 20 of the levers 15, as shown in Fig. 6, in which said hanger 16 has its upper end enlarged and formed with a slot 34 to receive an adjustable bearing-block 35. The latter has a concave lower end or face to engage the pivot 21, and it is secured in an adjusted position by a set-screw 36, provided in the top or extreme end of the hanger, as shown. If desired, set-screws 37 may be provided in the sides of the enlarged slotted portion of the hanger to impinge against the sides of the block 35, and in such case the screw 36 may be omitted.

The operation of the apparatus is as follows: After water has been placed in the tanks 2, so that they are about two-thirds full, the ore to be separated is placed in the jig-boxes 1 and the shaft 27 is rotated. The cams or tappets 26 thus impart a rocking movement to the levers 15, and the latter reciprocate the boxes 1 in the water in the tanks to cause the minerals to pass through the screens 11 in the bottoms of the boxes and the lighter or waste matter to pass through the series of boxes and out of the apparatus.

The apparatus may be used for separating lead, copper, and zinc as well as gold, and it is very effective in operation, no skilled operator being necessary, as is the case with the ordinary "hand-jig." It is of simple, strong, durable, and comparatively inexpensive construction, so that it may be easily erected by any mechanic and may be readily taken apart for transportation.

While I have shown and described the preferred embodiment of my invention, it will be understood that I do not wish to be limited to the precise construction herein set forth, since various changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In an ore-separator, the combination, of a plurality of tanks, a jig-box in each tank, flexible conductors connecting the jig-boxes, levers having one end slotted and the other end forked to form arms, pivot-shafts passing through the arms, hangers pivoted to the ends of the arms, the jig-boxes secured between the lower ends of the hangers and depending into the tanks, counterbalance-weights having intersecting slots to engage and rest on the forked portions of the levers, and means for oscillating the levers.

2. In an ore-separator, the combination, of a plurality of tanks, a jig-box in each tank, flexible conductors connecting the jig-boxes, levers having one end slotted and the other end forked to form arms, a pivot-shaft passing through the arms, hangers pivoted to the ends of the arms, the jig-boxes secured between the lower ends of the hangers and depending into the tanks, counterbalance-weights freely removable on the levers and having depressions or cavities in their tops, and means for operating the levers.

3. In an ore-separator, the combination, of a plurality of tanks, a jig-box in each tank, flexible conductors connecting the jig-boxes, levers pivotally mounted above the tanks, a jig-box pivotally connected with one end of each lever and depending into one of the tanks, a counterbalance-weight freely removable on the other end of each lever, said weights having depressions or cavities in their tops, and means for oscillating the levers.

4. In an ore-separator, the combination, of a plurality of tanks, a jig-box in each tank, flexible conductors connecting the jig-boxes, slotted levers pivotally mounted above the tanks, wear-plates carried by the levers, a jig-box pivotally mounted on one end of each lever and depending into one of the tanks, a slotted counterbalance-weight freely removable on the other end of each lever, and means for rocking the levers.

5. In an ore-separator, the combination, of a plurality of tanks, a jig-box in each tank, flexible conductors connecting the jig-boxes, levers having one end slotted and the other end forked to form arms, a removably and adjustably mounted wear-plate carried by each lever at its slotted end, a pivot-shaft passing through said arms, hangers adjustably suspended from the arms of each lever, a jig-box secured between the lower ends of each hanger and depending into one of the tanks, a slotted counterbalance-weight freely removable on each lever at its forked end, and means for rocking or oscillating the levers.

6. In an ore-separator, the combination, of rows of tanks arranged in pairs, a jig-box in each tank, flexible conductors connecting the jig-boxes, pairs of counterbalanced levers having their inner ends overlapping and slotted, and the other ends forked to form arms, pivot-shafts passing through said arms, the jig-boxes suspended in the tanks from the forked ends of the levers, counterbalancing-weights having intersecting slots to engage the forked portions of said levers, and cams or tappets extending through the slots in said levers for operating the levers.

7. In an ore-separator, the combination, of a tank, a lever having one end slotted and its other end forked to form arms, a pivot-shaft passing through said arms, hangers pivoted to the ends of said arms, a jig-box secured between the lower ends of said hangers, a counterbalancing-weight having intersecting slots to engage the forked portion of said lever, and an angular cam or tappet extending through the slot in said lever for operating the latter.

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

LUCIAN B. HUNTER.

Witnesses:

WM. ONEILL,

CHAS. H. GILLESPIE.