(No Model.) 3 Sheets—Sheet 1.

O. BILHARZ.

HYDRAULIC JIGGING SIEVE.

No. 427,249. Patented May 6, 1890.

Fig. 1.

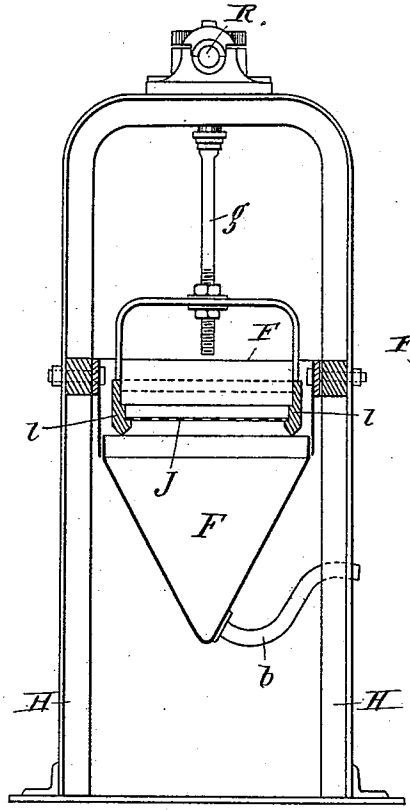


Fig. 2.

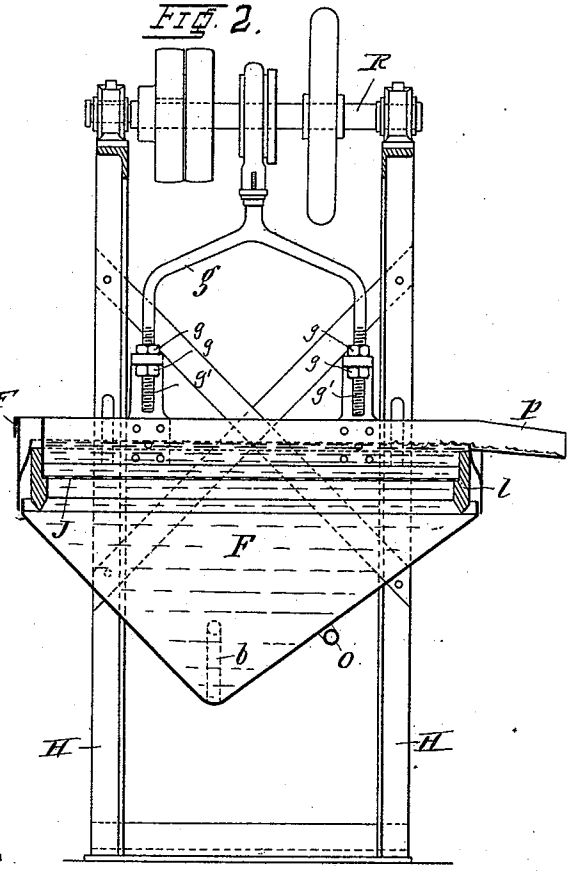
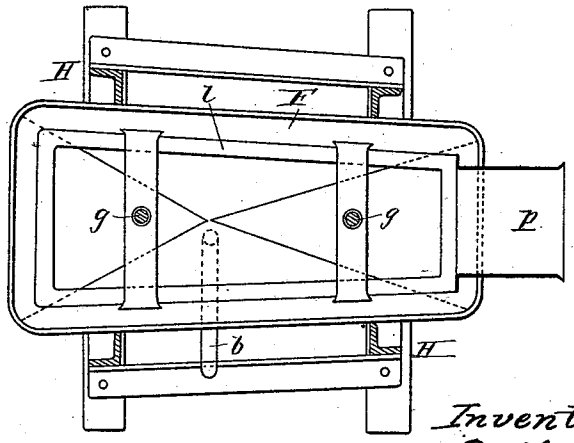


Fig. 3.



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O. BILHARZ.

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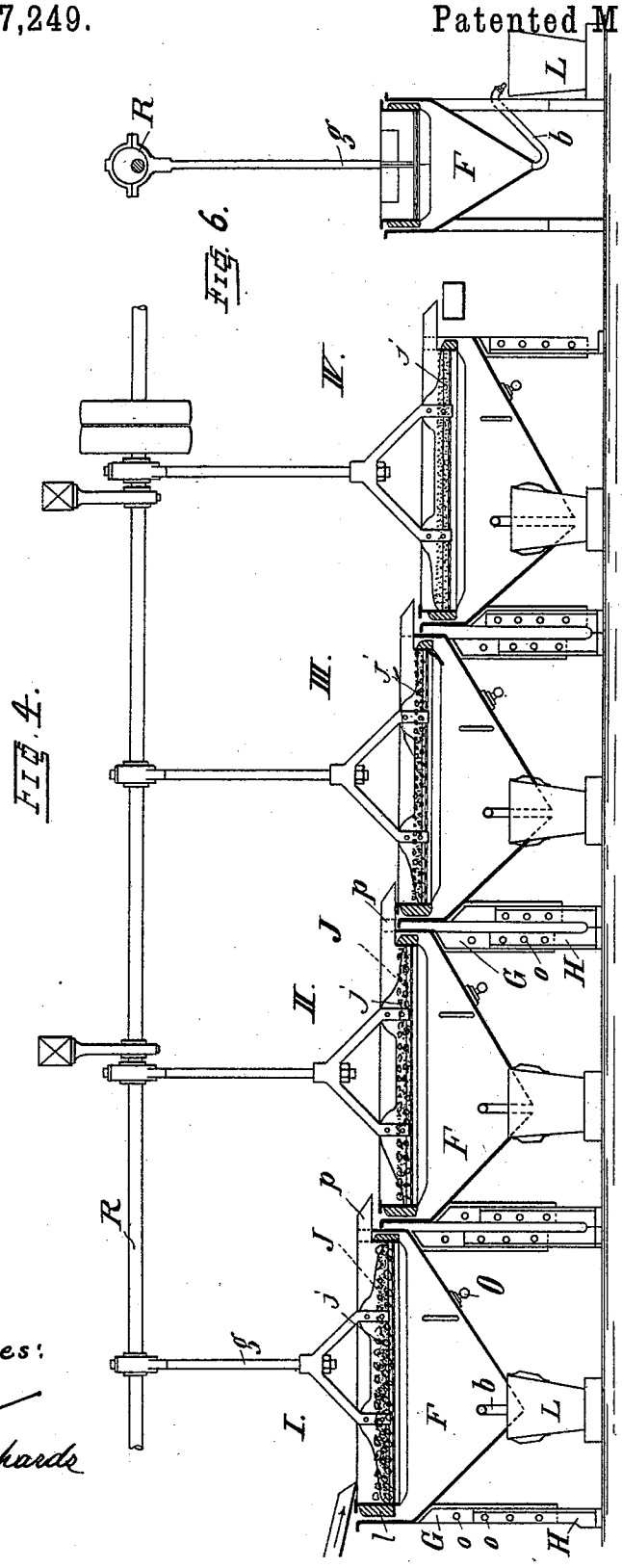


Fig. 6.

Fig. 4.

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(No Model.) 3 Sheets—Sheet 3.

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HYDRAULIC JIGGING SIEVE.

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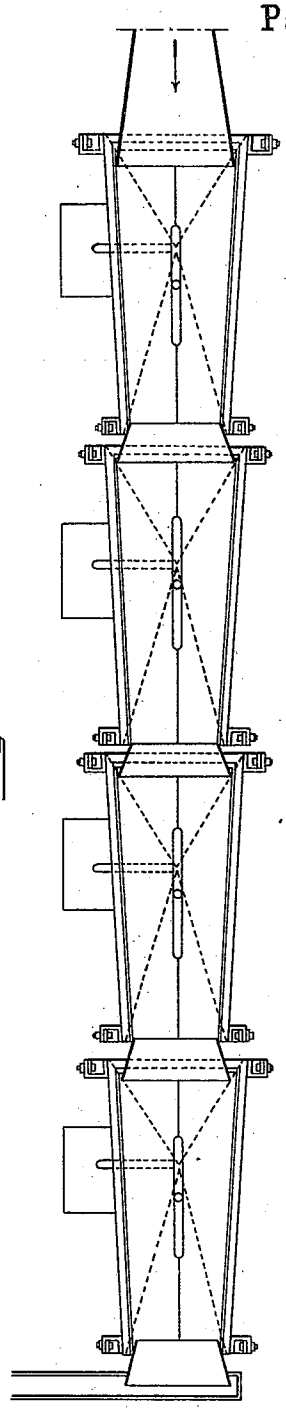


Fig. 5.

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UNITED STATES PATENT OFFICE.

OSCAR BILHARZ, OF FREIBERG, SAXONY, GERMANY.

HYDRAULIC JIGGING-SIEVE.

SPECIFICATION forming part of Letters Patent No. 427,249, dated May 6, 1890.

Application filed June 7, 1889. Serial No. 313,481. (No model.)

To all whom it may concern:

Be it known that I, OSCAR BILHARZ, a subject of the King of Saxony, residing at Freiberg, Saxony, Germany, have invented a new Hydraulic Jigging-Sieve, of which the following is a full, clear, and exact description.

My invention relates to an improved hydraulic jigger for ores, which is arranged to be operated in sets or series in such a manner that the ore carried in suspension in water is conveyed from one jig to the other, whereby I can employ as few or as many jiggers as may be necessary to completely separate the ore according to the nature of the ore to be treated, and also to obtain a separation of the ore bodies of different specific weights in different and consecutive apparatus, as will be hereinafter more fully explained.

In the annexed drawings, which form a part of this specification, Figure 1 shows a transverse vertical section of my new hydraulic jigger. Fig. 2 shows a longitudinal section of the same. Fig. 3 shows a top view with a portion of the frame in section. Fig. 4 shows a longitudinal section of several of these jiggers combined to form one continuous apparatus; and Figs. 5 and 6 show a plan and transverse sectional view, respectively, of this arrangement.

The single jigger, Figs. 1 to 3, consists of a vessel F, oblong in shape as to its upper part and pyramid-shaped in its under part, and provided with a discharge-pipe *b* at its bottom, the whole being adjustably and movably supported and attached to the grooved vertical bars G, carried by standards H. By means of these bars G the vessel F can, by the use of loose bolts, be connected with the standards H, (see Fig. 4,) the bars G and the standards H being provided to this end with holes *o*, through which the bolts pass, so that the vessel F can be placed at any suitable or desired height thereon. The sieve J is adjustably suspended to the eccentric-rod *g*, as by screw-threads *g'* and nuts, as shown, and, covered with a layer or bedding of clean ore, is supported in a vessel or hutch F, which is filled with water. The ore is fed on the top of this sieve by means of a gutter. The sieve J is encircled by a closing ring *l*, and in the bottom part of the vessel or hutch F fresh water is fed by the pipe O to replace the water lost partly at the upper part (through the sieve and ore-layer) and partly at the lower part, (through the discharge-pipe *b*.) In practice as many of these jiggers are combined as is required by the character of the ore to be treated. The jigger I is placed sufficiently high by means of the bolts placed in the corresponding holes of the bars G and the standards H, so that the flow-off conduit or gutter *p* of the vessel F conveys the ore, which is not caught and precipitated in the jigger I, into a second jigger I I, arranged somewhat lower upon its standards H for this purpose. From here the ore which is not caught and precipitated in the jigger I I flows again into a jigger I I I, placed still lower, and so on until the last jigger, when the mingled ore and water, after having passed from jigger to jigger and having been exhausted of its ore, is allowed to flow away through a suitable discharge-gutter.

The eccentrics corresponding with the rods *g* of the sieves of the different jiggers are mounted on a common driving-shaft R, supported in suitable bearings, and to which the driving-power is transmitted in the usual manner.

On the sieves of the different jiggers are placed layers or beddings *j*, of clean ore of different coarseness, so that the grains separated in the different jiggers and discharged through their discharge-pipes to the collectors L are strictly separated according to their specific weight, the heaviest being precipitated by jigger I, the next heaviest by jigger I I, and so on.

By using this apparatus I not only obtain a perfect separation of the grains contained in the mingled ore and water with regard to their specific weight and in any desired number of grades, but I can also adapt the apparatus to the nature of any ore, the only thing necessary for this purpose being to increase or decrease the number of operating-jiggers.

A further and very important advantage presented by this new arrangement is that this new and special combination of the jigs

considerably facilitates the transportation of the machine, for the reason that each jigger is complete and separate from the others, and can be transported separately and set up by itself or combined with any number of others, and thus permits of its transportation to and use at places not easily accessible and to which the machines now in use cannot be transported, by reason of their size and weight.

The operation of my jigger is as follows: The mingled ore and water is first fed into the jigger I by means of a suitable inlet-gutter. The sieve being agitated by the eccentric-rod *g*, operated by an eccentric on the driving-shaft, the ore bed or layer is kept constantly in motion, and as the mingled ore and water pass over the coarser and heavier particles of ore are caught by the layer or bedding of clean ore, carried on the sieve, and fall to the bottom of the vessel or hutch F and pass out through the pipe *b* into a suitable receptacle L. The lighter and smaller particles of ore which are not thus precipitated flow from the jigger I through the outlet-gutter *p* into the jigger I I, and are there treated in a similar manner, as above described, the heavier and larger particles of ore falling to the bottom and the lighter passing on, and so on from one jigger to the other.

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

1. A hydraulic jigger consisting of the combination, with the sieve J and means for actuating the same, of the water-vessel F, a vertically-adjustable frame connected with the latter, and the overflow-conduit *p*, substantially as set forth.

2. A jigging apparatus for the treatment of ores, consisting of a series of independent jiggers provided with sieves and with mechanism for imparting motion thereto, each jigger being mounted on a vertically-adjustable frame, forming a complete operating apparatus, and each provided with a suitable inlet and with a discharge-outlet, the whole being arranged so that the orey water shall flow from one jigger to another throughout the entire series and receive treatment in each of said jiggers before it is finally discharged, substantially as shown and described.

3. A jigging device for the treatment of ores, consisting of a series of independent jiggers, each of which is provided with a complete and separate operating mechanism, the series of the several jiggers containing ore-beddings of different degrees of coarseness, to the end that the ore particles shall be precipitated according to their specific weight, substantially as described and set forth.

4. The combination of a series of hydraulic jiggers, each consisting of a sieve, a reciprocating rod for the same adjustable as to its length, a water-vessel surrounding the sieve and having an overflow-conduit, and a vertically-adjustable frame connected with the vessel, substantially as set forth.

5. In a jigging apparatus for the treatment of ores, the combination of the vessel or hutch and its standards, of adjustable supporting-bars for said hutch and means for attaching said bars to the standards, substantially as shown and described.

6. A jigging apparatus for the treatment of ores, consisting of a series of jiggers, each jigger arranged to discharge the ore-water into the jigger succeeding it in the series, and having a vertically-adjustable frame, all of said jiggers being operated by a single operating-shaft through suitable operating mechanism connecting therewith, comprising rods adjustable as to length, substantially as shown and described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

OSCAR BILHARZ.

Witnesses:

P. SPRECKELS,

PAUL DRUCKMÜLLER.