

L. E. WARNER.
 REVOLUBLE SIZING SCREEN.
 APPLICATION FILED MAY 8, 1908.

946,476.

Patented Jan. 11, 1910.

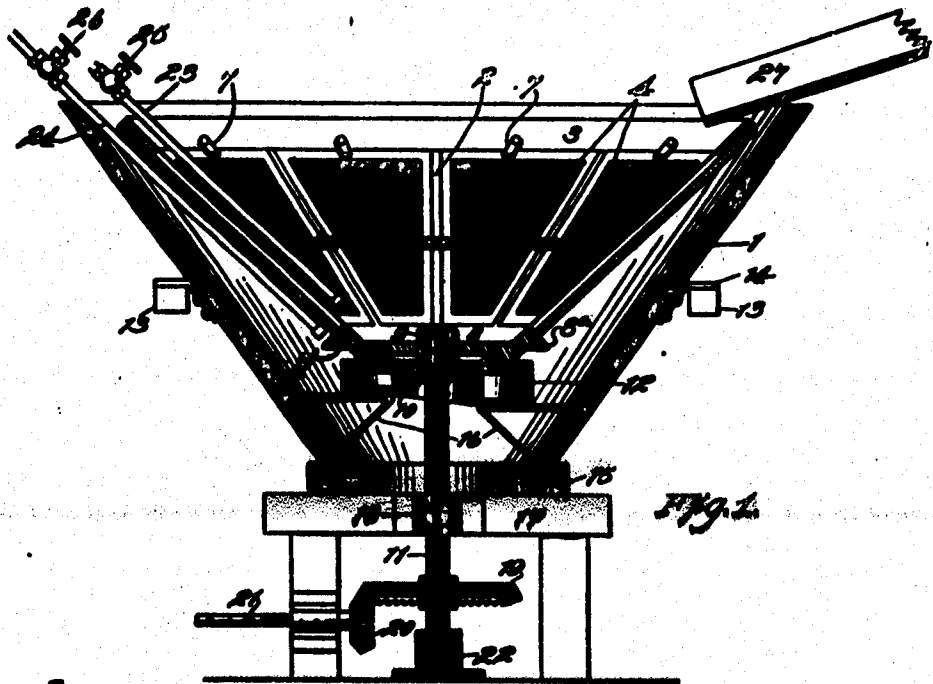


Fig. 1.

Fig. 3.

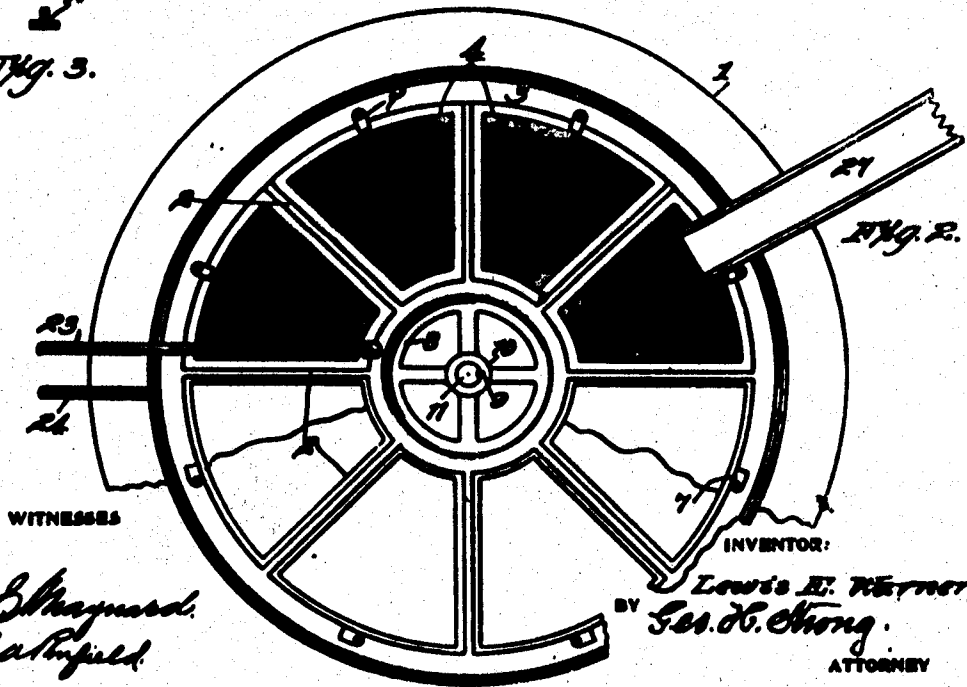


Fig. 2.

WITNESSES

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 C. A. Infield.

INVENTOR:

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UNITED STATES PATENT OFFICE.

LEWIS E. WARNER, OF KELLOGG, IDAHO, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-FOURTH TO EDWARD HEARING, ONE-FOURTH TO STANLEY A. EASTON, AND ONE-FOURTH TO GELASIO CAETANI, ALL OF KELLOGG, IDAHO.

REVOLUBLE SIZING-SCREEN.

946,476.

Specification of Letters Patent.

Patented Jan. 11, 1910.

Application filed May 8, 1905. Serial No. 481,652.

To all whom it may concern:

Be it known that I, LEWIS E. WARNER, a citizen of the United States, residing at Kellogg, in the county of Shoshone and State of Idaho, have invented new and useful Improvements in Revolvable Sizing-Screens, of which the following is a specification.

My invention relates to an apparatus which is especially designed for the screening and grading or sizing of ores.

It consists of one or more sets of downwardly convergent revolvable screens to receive the material, and in a combination of parts and details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a vertical section of the screen. Fig. 2 is a plan view with housing partly broken away. Fig. 3 is a sectional view of one of the spider arms.

It is the object of my invention to provide a screen apparatus so constructed as to size and grade the material delivered upon the screens, and to so construct the screens as to cause a substantially even wear over the whole surface of the screen.

The machine is designed to revolve at a slow rate of speed and to deliver the finer particles of ore through the screen; the coarser particles passing over it and into a launder at the bottom of the spider. The finer particles that pass through the screen, drop into an inverted cone-shaped housing, down the inclined inner wall of which they slide to a launder at the bottom of the housing.

The machine may be made of different sizes, and of different degrees of inclination for handling various classes of ore and pulp. It is designed to size the material in a concentration or ore treating plant, but may be used to advantage for the sizing of rock, sand or like material, as in concrete or pavement work, or the like.

1 is an inverted, cone-shaped housing which surrounds and incloses the revolving screen, and this housing may have an inclination of approximately 55 degrees, more or less, and dependent upon the fineness of the material to be treated, and the amount of moisture contained therein. The housing may be made of thin sheet metal.

2 is a spider or frame, which may be cast

in one piece, with supports 2' at the bottom for the screens, and a hub by which it is fixed to a vertical revolvable shaft 11.

The outer rim 3 which supports the upper ends of the screens 4, may be cast in one piece, with the spider arms, the base and hub, or these parts may if preferred be made separately and bolted together. The screens 4 are made widest at the top, and converge downwardly toward the bottom of the cone which supports them.

The material to be sized or graded is first received upon the upper portion of the screen which, being the widest, allows the material to be distributed over the greatest surface of the screen. The finer portions of the material pass through the screen, and as the material moves down toward the narrower portion of the screen, it also becomes less in quantity until the bottom is reached. This distribution of material provides the greatest amount of screen surface where the greatest amount of material is received, and the greatest wear consequently occurs; and as the amount of material diminishes in its downward flow the screen becoming narrower, is subjected to approximately the same amount of wear from top to bottom; thus when the screens wear out, the whole surface will be worn out at once.

The screen frame consists of a spider, the arms of which stand at an angle of approximately 45 degrees which allows for a gradually increasing distance between the screens and the housing from top to bottom.

7 are buttons, or other equivalent fastenings by which the screens are radially and removably attached to the spider or support.

The bottom support 8 of the screen frames connects with the hub 10, and this hub is keyed to the shaft 11 by a spline or key 9. The support 8 has a ring 8' projecting outwardly and downwardly in such a manner that any fine material which may run down the outside will be discharged outwardly so as to fall into the lower launder 15, and not into the one which receives the material not passing through the screens.

The launder 12 is adapted to receive the over-sized material which does not pass through the screen, and the launder 13 is adapted to receive the material which passes through the screen, said launders being of

a type well known in this art and each of the launders being, in practice, provided with a suitable outlet.

13 is a timber or equivalent frame, and 14 are lugs or straps riveted to the housing and adapted to rest on the frame so as to support the housing, and keep it in place. There may be as many of these lugs as the requirements of the apparatus make necessary for the proper support.

15 is the launder which carries away the under sized material that has passed through the screen, in case only one series be used.

16 are braces fixed to the interior of the housing 1, and extending in such position as to form supports for the launder 12 which may be bolted to these braces.

The upper journal-box 18 of the shaft, is supported upon a timber or part of the frame-work 17, and the lower end of the shaft is turnable in a step at 22.

19 is a bevel-gear fixed to the lower part of the shaft, and 20 is a bevel-pinion mounted upon the shaft 21, and through which power is transmitted to rotate the apparatus.

It will be manifest that any suitable driving mechanism may be substituted for that here described.

23 is a spray pipe passing over the screen, and water therefrom delivered upon the screen and material will loosen any particles of material which may adhere on the inside, thus allowing it to run down and into its receiving launder at 12. 24 is a similar spray pipe extending on the under side of the screens and between the screen and housing, and the jets from this pipe serve to loosen and force inwardly any particles of material which may stick in the meshes of the screen, and which are not readily removed by the spray from pipe 23. These spray pipes may be adapted to use water, steam, or air, depending upon the character of the material, and whether the grading is to be wet or dry.

27 is a sluice or launder from which the material is delivered into the apparatus; the flow of the material being controlled by gates or other means not here shown.

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

1. A grading apparatus consisting of a vertically disposed funnel-shaped spider, a revoluble shaft to which said spider is fixed, an exterior housing out of contact with which the spider revolves, screens, the frames of which are fitted to the openings in the spider, means by which the screen frames are removably attached to the spider, means for delivering material to be separated to the interior of the funnel, a launder to receive the material not passing through the screen, a second launder to receive the

material which has passed through the screen, a projecting flange upon the lower part of the spider, whereby fine material flowing down the outside of the screen will be discharged outwardly, means for supplying water to the inside of the screen, and a launder into which said fine material is delivered.

2. In an apparatus of the character described, a vertically revoluble shaft, a funnel-shaped spider fixed to said shaft, screens, the frames of which fit the openings in the spider, means by which the screens are attached thereto, means for supplying material upon the inner surfaces of the screens, a launder for the coarser material, a second launder for the material which passes through the screen, a directing flange surrounding the lower part of the spider to deliver said material outwardly, spray pipes extending substantially parallel with the screen upon the inside and outside thereof.

3. In an apparatus of the character described, a funnel-shaped spider having a central hub and having screen supports on its lower portion, a vertically revoluble shaft to which the hub of said spider is keyed, screens fixed upon the inclined spider and conforming to the openings therein, an exterior housing, means for supporting it out of contact with the spider, means for delivering material into the upper part of the funnel to flow down over the screens, a launder located near the bottom of the funnel, supports fixed to the housing and extending beneath the launder.

4. In an apparatus of the character described, a funnel-shaped spider, a vertically revoluble shaft to which the hub of the spider is keyed, downwardly convergent screens fixed to register with the openings of the spider, means for supplying material to the interior and upper part of the spider to flow downwardly over the screens, and spray pipes parallel with and contiguous to the inner and outer surfaces of the screens, an exterior conical housing supported out of contact with the spider and adapted to receive and direct the material passing through the screens, a launder contiguous to the bottom of the funnel to receive the coarse material, a second launder into which the material passing the screens is delivered, and an annular flange projecting below the screens to divert the material which flows down the outside and direct it into the second launder.

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

LEWIS E. WARNER.

Witnesses:
WM. I. HALL.
AL. FAULKNER.