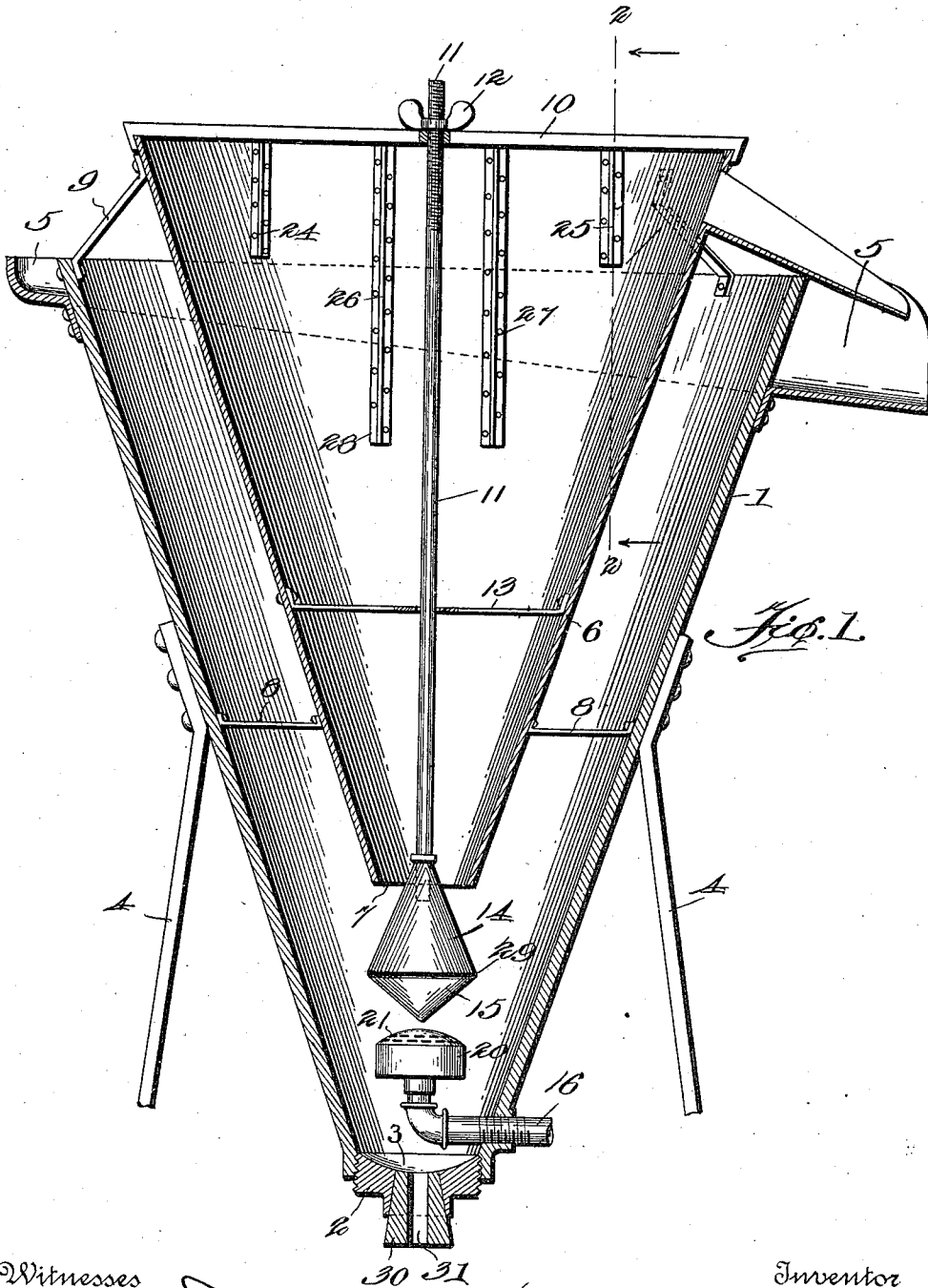


A. D. J. MALCHUS.
ORE CLASSIFIER.
APPLICATION FILED JUNE 27, 1910.

975,971.

Patented Nov. 15, 1910.

2 SHEETS—SHEET 1.



Witnesses
W. Map. Dmell.
Byron B. Collins.

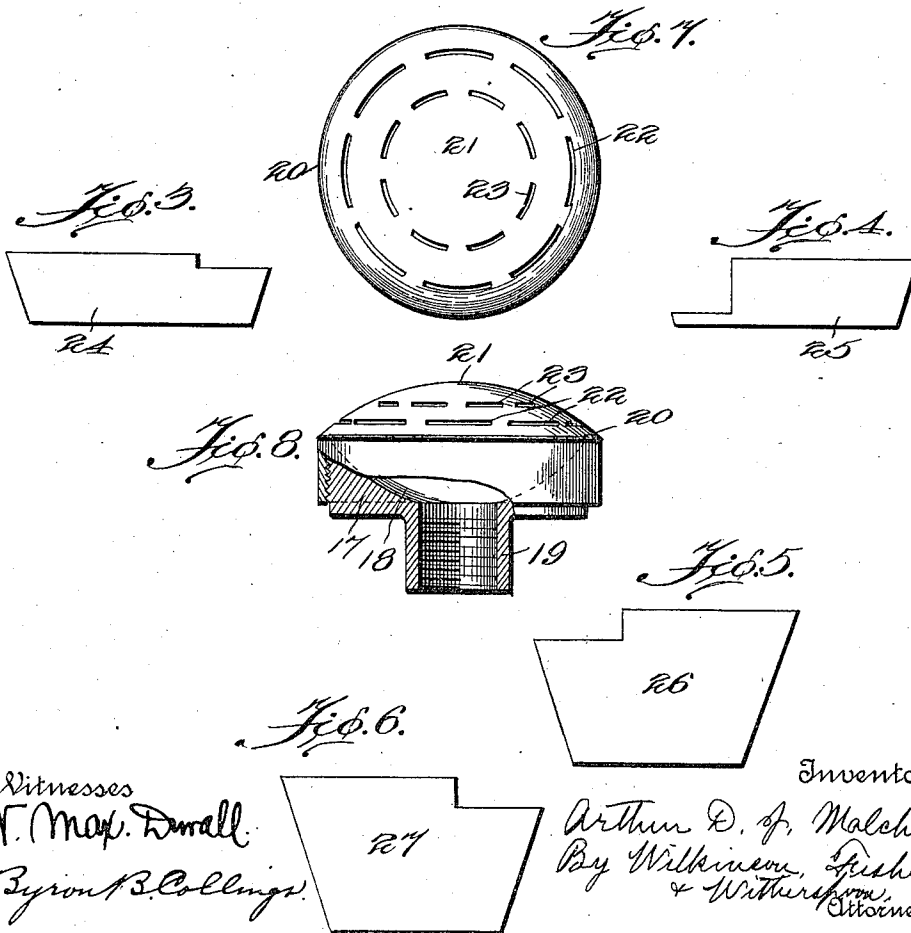
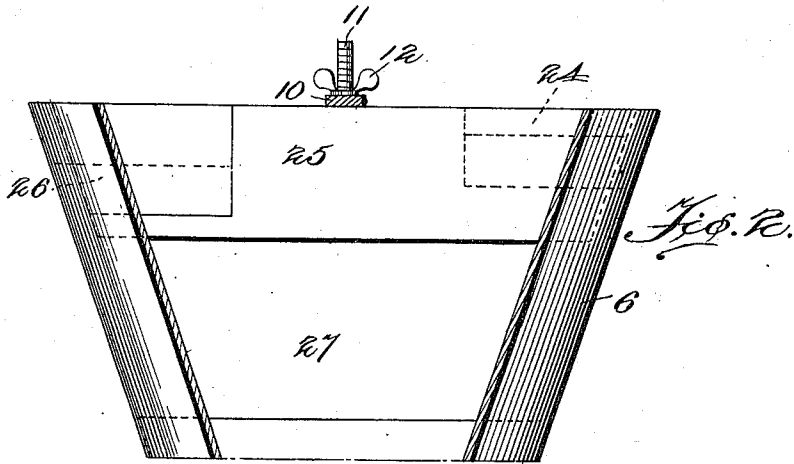
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2 SHEETS—SHEET 2.



Witnesses
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UNITED STATES PATENT OFFICE.

ARTHUR D. J. MALCHUS, OF SILVERTON, COLORADO.

ORE-CLASSIFIER.

975,971.

Specification of Letters Patent.

Patented Nov. 15, 1910.

Application filed June 27, 1910. Serial No. 569,094.

To all whom it may concern:

Be it known that I, ARTHUR D. J. MALCHUS, a citizen of the United States, residing at Silverton, in the county of San Juan and State of Colorado, have invented certain new and useful Improvements in Ore-Classifiers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in ore classifiers, and the object of my invention is to produce a simple apparatus using water under a considerable pressure, by means of which concentration and classification of the ore may be readily effected in the apparatus, simply by the pressure of the water.

With this object in view, my invention consists in the construction and combinations of parts as hereinafter described and claimed.

In the accompanying drawing—Figure 1 is a vertical section showing my invention. Fig. 2 is a section of the same, taken on the line 2—2 of Fig. 1, and looking in the direction of the arrows. Figs. 3, 4, 5, and 6 are side views of the different forms of baffle plates. Fig. 7 is a top plan view of the water jet nozzle, and Fig. 8 is a side view thereof, partly in section.

1 represents the outer part of the apparatus, which is in the form of the frustum of a cone, having its lower and smaller end open and closed by a plug 2, which is screwed into the bottom of the part 1 and has a cup-shaped central depression 3 and an outwardly flaring central orifice. Into this orifice, a tapering plug 30, provided with a central opening 31, may be driven. This plug is preferably of wood, so that it may be readily removed and others having different sizes of discharge apertures substituted. The cone 1 is supported by braces 4 bolted thereto, said braces being fastened to any suitable support.

Bolted to the upper part of the cone 1 and surrounding the same, is a trough 5, inclined downwardly as shown, and having its lower end open for the discharge of the water and light portions of the ore.

Within the cone 1 is an inner cone 6, having its lower end cut off, leaving an opening 7, both of the cones 1 and 6 being open at the top and bottom. Bars 8 and 9, the lat-

ter being inclined, are bolted to the cones 1 and 6 and serve to hold them always parallel with each other.

Across the top of the inner cone is a bar 10, centrally perforated, and through this bar passes a rod 11, screw-threaded at its top and provided with an adjusting nut 12. Near the lower end of the cone 6 is another bar 13, centrally perforated, through which the rod 11 passes, the bars 10 and 13 serving to guide the rod 11.

Secured in any suitable manner to the lower end of the rod 11 is a deflecting block formed in the shape of a double cone with their bases together on the line 29, the lower cone 15 being blunter than the upper one 14. 16 represents a pipe, entering the cone 1 at its lower end and then bent upwardly and terminating in a nozzle. This nozzle consists of a body portion 17, with a cup-shaped depression 18 in its interior and secured by a nipple 19 to the upper part of the bent pipe 16. Around the top of the part 17 is screwed a cap 20, dome-shaped in general outline and having its central portion imperforate, as shown at 21, and provided with rows of slits 22 and 23, each row being arranged in the form of a circle and the slits in the different rows being formed so as to break joints with each other. This particular form of nozzle I have found of great importance in the actual operation of the device.

24, 25, 26, and 27 represent baffle plates. These plates are adapted to be let down into grooved strips 28, secured on the inside of the cone 6, or the side of the cone may be grooved out, if desired. The baffle plates are simply slipped into the grooves in the plates or bars 28 and are held by the tapering sides of the cone 6. The two inner baffle plates 26 and 27 are longer than the two outer baffle plates 24 and 25, and each plate is cut away on one corner, as shown in the drawing, so that the ore, as it is fed into the open upper end of the cone 6, will pass downwardly in a spiral path, it being noted that the cut in the baffle plate 25 is considerably deeper than that in the corresponding baffle plate 24, and similarly that the cut in the baffle plate 27 is deeper than that in the baffle plate 26.

The operation is as follows:—Water is delivered through the pipe 16 to the distributing nozzle under a considerable head, so that it issues through the slits 23 and 24

with great force. The ore is fed into the upper part of the cone 6 and traveling in a circular path gradually settles, passing out through the opening 7 around the cone 14.

5 Just as the ore slides past the lower end of the cone 14, it is struck by the jets of water issuing with great force from the slits 22 and 23 in the form of two parallel cones, and these jets strike the ore at practically

10 right angles as it descends. The result is that the lighter and worthless particles are immediately carried by the strong jets of water up to the top of the cone 1, and are discharged over its edge into the trough 5.

15 The heavier and valuable particles settle down into the cup 3, from whence they pass downwardly through the perforation 31 in the plug 30.

The rod 11, as above described, is adjustable up and down to vary the size of the opening 7 and to vary the distance between the deflecting block and the water nozzle.

I claim:—

25 1. In an ore classifier, the combination of two conical vessels open at the top and bottom, a double cone adjustably arranged just below the lower, smaller end of the inner conical vessel, and a bent pipe provided with a water delivery nozzle, located immediately

30 beneath said double cone, said nozzle having a rounded upper surface provided with slits, substantially as described.

2. In an ore classifier, the combination of two conical vessels, open at each end and ar-

35 ranged parallel to each other and fastened together, a discharge trough around the open, larger end of the outside vessel, a double cone located underneath the smaller, lower end of the inner vessel, means for ad-

40 justing said cone, and a water delivery nozzle located immediately below said double cone, said nozzle being provided with a rounded upper surface, the inner portion of which is imperforate and the outer portion

45 of which is provided with circular rows of slits, substantially as described.

3. In an ore classifier, the combination of two parallel conical vessels secured together, one within the other, and each open at both ends, a delivery trough fastened around the

50 upper end of the outer vessel, a double cone located below the lower, open end of the inner vessel, means for adjusting said cone, a water delivery nozzle having a dome-shaped upper surface imperforate in the

55 center and provided with concentrically arranged rows of slits outside of said imperforate portion, and a series of baffle plates secured in the upper part of the inner conical vessel, said baffle plates each having one

60 corner cut away, substantially as described.

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

ARTHUR D. J. MALCHUS.

Witnesses:

W. H. CROCKER,
LOUIS SCHAFER.