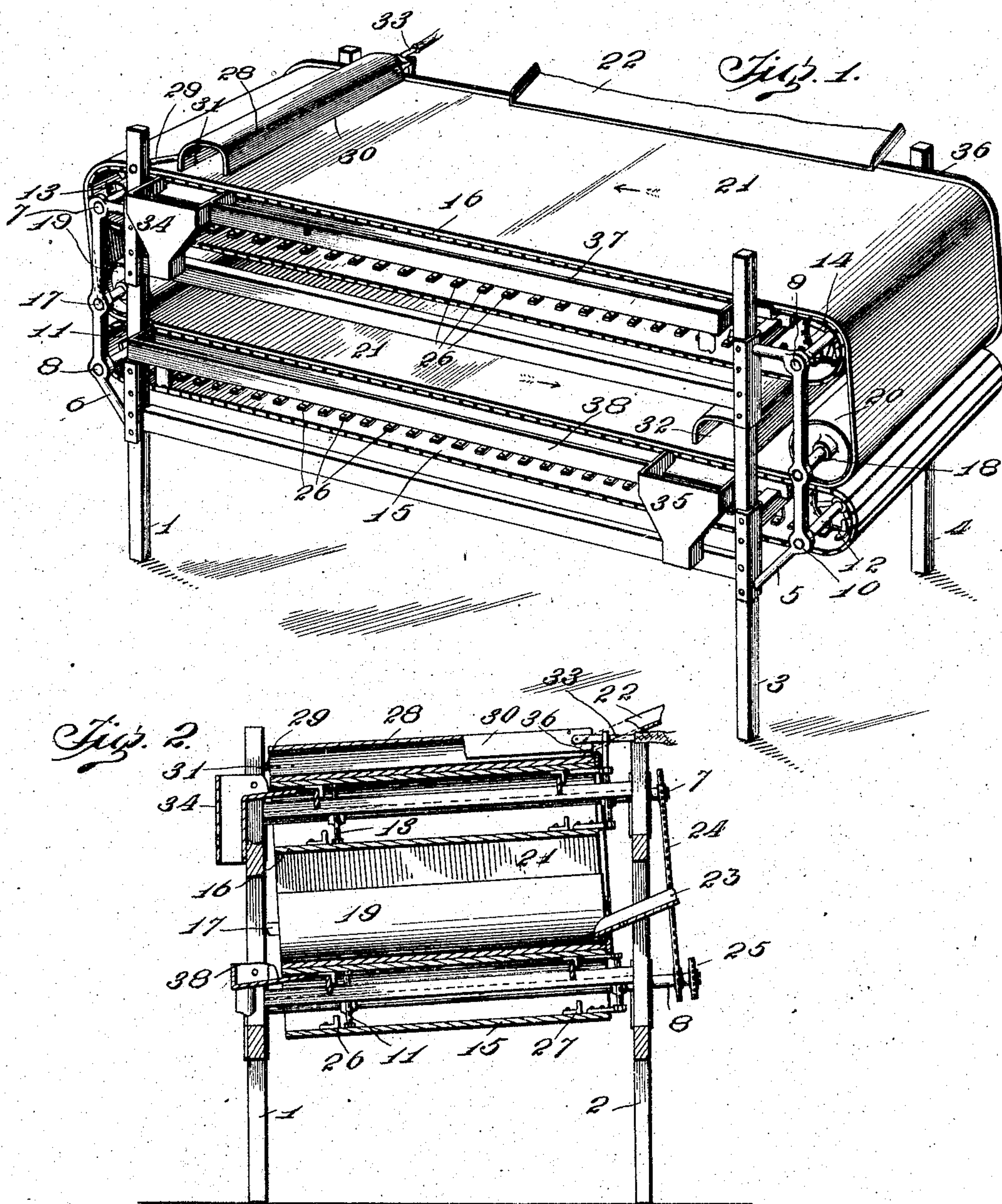


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PATENTED APR. 11, 1905.

P. H. CRAVEN.  
ORE CONCENTRATOR.  
APPLICATION FILED APR. 17, 1903.



Witnesses

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## UNITED STATES PATENT OFFICE.

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## ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 786,799, dated April 11, 1905.

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*To all whom it may concern:*

Be it known that I, PETER H. CRAVEN, a citizen of the United States of America, residing at Rossland, in the county of Kootenay and Province of British Columbia, Canada, have invented certain new and useful Improvements in Ore-Concentrators; 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.

This invention relates to machines for concentrating ores, and especially to that class of machines in which the ore after having been crushed or ground and mixed with suitable fluids is discharged upon tables provided with means for separating the slime from the solid matters.

The object of the invention is to simplify, cheapen, and improve the construction and operation of said machine; and with this object in view the invention consists in an ore-concentrator the improved construction, arrangement, and combination of parts of which will be hereinafter fully described and afterward specifically set forth in the claims.

In the accompanying drawings, Figure 1 illustrates a machine embodying my invention in perspective view, the trough for discharging the ore upon the table being broken away; and Fig. 2 represents a transverse vertical sectional view of the same.

Like reference characters indicate the same parts in both figures.

Referring to the drawings specifically, 1, 2, 3, and 4 indicate four upright legs which form part of and support the frame of the machine. Brackets 5 and 6 are secured to the frame at opposite ends in which to form bearings for shafts 7, 8, 9, and 10 at opposite ends of the machine. Upon shafts 7, 9, 8, and 10, respectively, are pulleys (or it may be drums) 13 14 11 12, upon which are mounted slatted endless belts 15 and 16, the former on the lower shafts and the latter on the upper shafts. Shafts 17 and 18 are also journaled in the brackets 5 and 6 and carry drums 19 and 20, about which is mounted a flexible endless belt

21, the lower side of which is supported upon the upper side of the slatted belt 15 and the upper side upon the upper side of the slatted belt 16, the endless belt also passing over the drums 13 and 14 on the shafts 7 and 9 outside of the slatted belt 16. The upper and lower sides of the endless belt 21 form the tables upon which the ore is discharged from troughs 22 and 23, said ore being discharged upon the upper surface of each of the upper and lower sides of said endless belt. The shafts 7 and 8 carry at one end sprocket-wheels, upon which is engaged a sprocket-chain 24, by means of which the shafts are driven at the same speed and in the same direction, motion being communicated to shaft 8 through the medium of a sprocket-chain (not shown) engaging a sprocket-wheel 25 on said shaft 8 and actuated from any suitable source of power.

Upon the inside of each of the slatted belts 15 and 16 are secured two continuous series of right-angle brackets 26 and 27 near the respective ends of said belts, which prevent the slipping or moving of said slatted belts which might occur on account of the amount of lateral inclination of the shafts, belts, and tables necessary to the proper operation of the machine.

The upper side of the endless belt 21 moves to the left, as indicated by the arrow in Fig. 1, and near the left-hand end above the belt is a trap 28, secured on arms 29, projecting from the frame, said trap being in the form of an inverted trough, with one side, as at 30, slightly raised above the surface of the belt and the other side, as at 31, closer to or in contact with the belt. A trap or inverted trough 32 is mounted over the right-hand end of the lower side of the endless belt 21, which moves to the right, as indicated by the arrow in Fig. 1, said trough 32 having one edge raised from the belt and the other edge in contact therewith in the same manner as described with reference to the trough 30. At the upper end of the trap 30 is a suitable jet by means of which a stream of suitable fluid may be forced through the trap transversely



of the belt, and at the lower end is a hopper or funnel 34, having a purpose hereinafter described, a similar jet device (not shown) being used at the upper end of the trap 32 and  
5 a similar funnel 35 being secured at the lower end of said trap.

Along the upper edge of the endless belt 21 is a supporting-flange 36 to prevent the material being operated upon from slipping or being  
10 pushed over that edge of the belt.

In the operation of the machine the properly pulverized and mixed ore is discharged from the troughs 22 and 23 upon the upper and lower portions of the endless belt 21,  
15 which, as before stated, form the separating-tables, and the slime spreading out upon the tables gradually works its way transversely down the inclined surfaces and is discharged into troughs 37 and 38, extending along the  
20 sides of the machine beneath the lower edges of the belt 21. The solid portions carried along by the belt pass under the raised edges of the traps 30 and 32 and are held from further motion by the far edges of said traps in  
25 contact with the belt, the jets working in the ends of the traps, as at 33, serving to force their contents down the inclined tables and into the funnel-shaped hoppers 34 and 35. The endless belt 21 has both its upper and lower  
30 halves, which form the tables, supported throughout their entire extent by means of the two slatted belts, as before described, the slatted belts being rotated in unison and the endless belt 21 passing around the drums or  
35 wheels on the shafts 7 and 9 and the idler-drums 19 and 20 on the shafts 17 and 18. Lateral motion of these slatted belts is prevented by means of the flanges 26 and 27, thus securing accuracy of movement, and the upper  
40 edge of the endless belt 21 is guarded by the flange 36, thus insuring against waste of material in that direction, said flange 36 also moving in contact with the end of the slatted belt 15 and serving to prevent the transverse  
45 displacement of the endless belt 21, which might occur on account of the inclined position.

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

50 1. An ore-concentrator comprising a plurality of slatted belts, and a single concentrating-belt traveling with and upon the longitudinal upper surfaces of said supporting-belts, unyielding supports extending longitudinally of the upper stretches of said slatted  
55 belts, and means for feeding ore to both the upper and lower stretches of the concentrating-belt.

60 2. An ore-concentrator comprising a plurality of supporting-belts, continuous stiff supports for maintaining the upper stretches of the supporting-belts uniformly in the same plane, a single concentrating-belt traveling

with and resting upon the upper stretches of said supporting-belts, and means for feeding  
65 pulp to the upper and lower stretches of the concentrating-belt.

3. An ore-concentrator comprising an upper supporting-belt and a lower supporting-belt, supporting-bars for maintaining the upper  
70 stretches of the said belts in the same plane, throughout, the said bars extending from the drums at the adjacent ends of the slatted belts to the drums at the other ends of said belts, a concentrating-belt traveling over  
75 and with the upper stretch of the upper belt and returning upon the upper stretch of the lower supporting-belt, thus forming two concentrating-surfaces, and means for feeding  
80 pulp to both the stretches of the concentrating-belt.

4. An ore-concentrator comprising an upper slatted belt and a lower slatted belt, angle-bars for preventing the sagging of the  
85 slats of the belts upon the upper stretches of the latter, a concentrating-belt traveling with and upon the upper supporting-surfaces of both of said slatted supporting-belts, and means for feeding pulp to both the upper and  
90 lower stretches of the concentrating-belt.

5. In an ore-concentrator the combination with the frame thereof, of an endless belt suitably mounted for rotation to carry its upper and lower sides in opposite direction, said  
95 belt being transversely inclined, troughs for discharging the material upon the upper surfaces of the upper and lower sides of said endless belt, traps secured in position above the surfaces of the upper and lower sides of said  
100 endless belts in the form of inverted troughs, the inner edges of said traps being slightly raised above said surfaces, and the outer edges in contact therewith, longitudinal troughs along the lower edges of the two tables formed  
105 by said endless belt, funnel-shaped hoppers at the lower ends of said traps, and means for discharging suitable sprays transversely through said traps, substantially as described.

6. An ore-concentrator, comprising an upper and lower endless transversely-inclined  
110 supporting-belt, means for preventing the belts from slipping laterally and an ore-concentrating belt traveling upon the entire upper horizontal surfaces of each of the supporting-belts.  
115

7. An ore-concentrator, comprising upper and lower inclined supporting-belts, a concentrating-belt traveling over the same and guide-bars supported in the frame of the concentrator and engaging the supporting-belts for  
120 preventing them from slipping laterally.

8. An ore-concentrator, comprising upper and lower inclined slatted belts, projections carried by the said slats and extending inwardly therefrom and guide-bars upon the  
125 frame of the concentrator for engaging said



projections and preventing the lateral slipping of the supporting-belts and a concentrating-belt traveling over said slatted belts.

9. An ore-concentrator comprising a concentrating-belt and transverse traps or sheds extending across the same, one edge only of each trap engaging the belt and means for directing streams of water through the said sheds.

10. An ore-concentrator comprising a concentrating-belt and transverse inverted-U-

shaped traps or sheds extending across the same, one edge only of each trap engaging the belt and means for directing streams of water through the said sheds.

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

PETER H. CRAVEN.

Witnesses:

W. S. DEACON,

A. H. MACNEILL.