

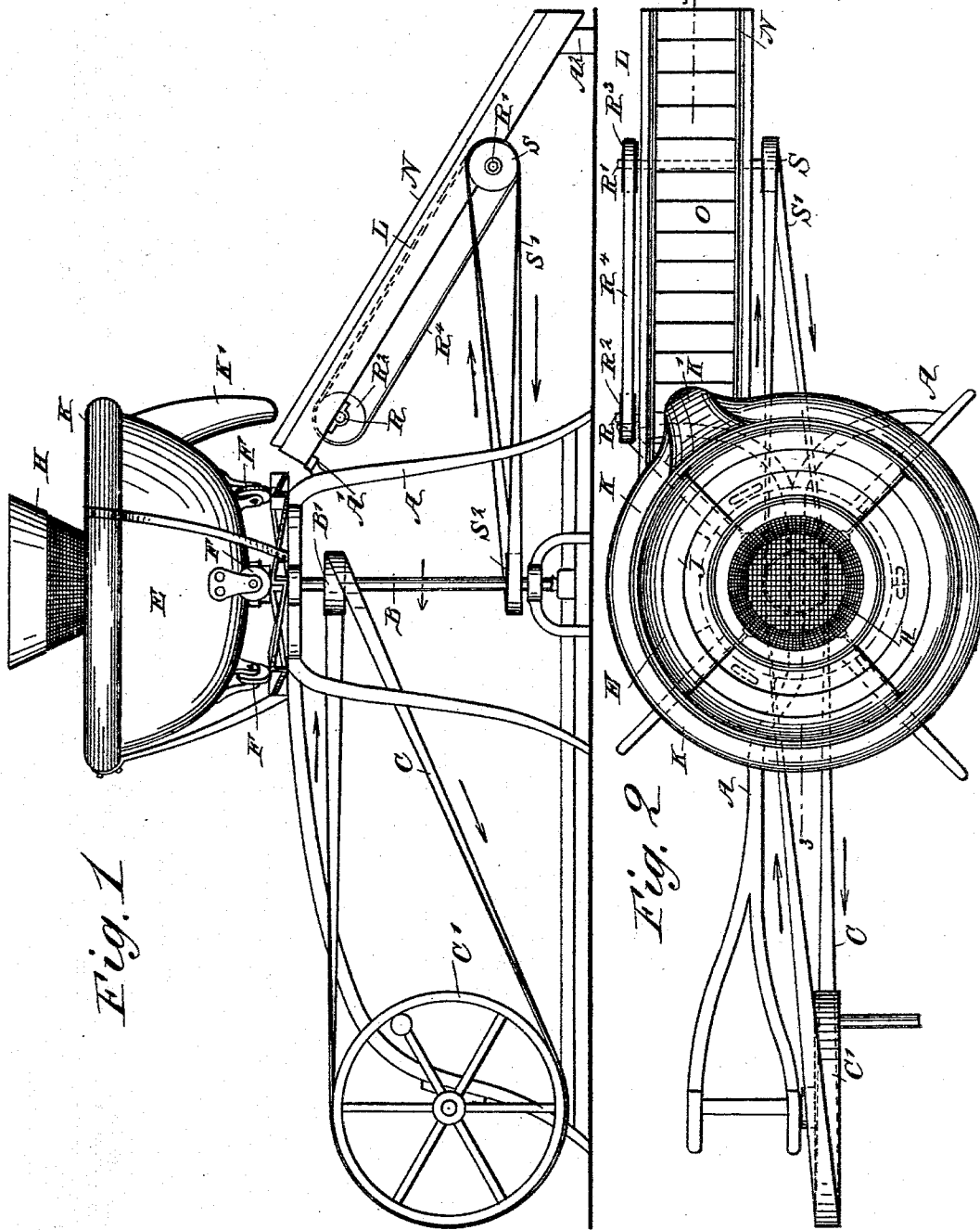
(No Model.)

2 Sheets—Sheet 1.

C. G. PINGEL.
ORE CONCENTRATOR.

No. 516,021.

Patented Mar. 6, 1894.



WITNESSES:
C. Neveu
Co. Sedgwick

INVENTOR
C. G. Pingel
BY *Munn & Co*
ATTORNEYS.

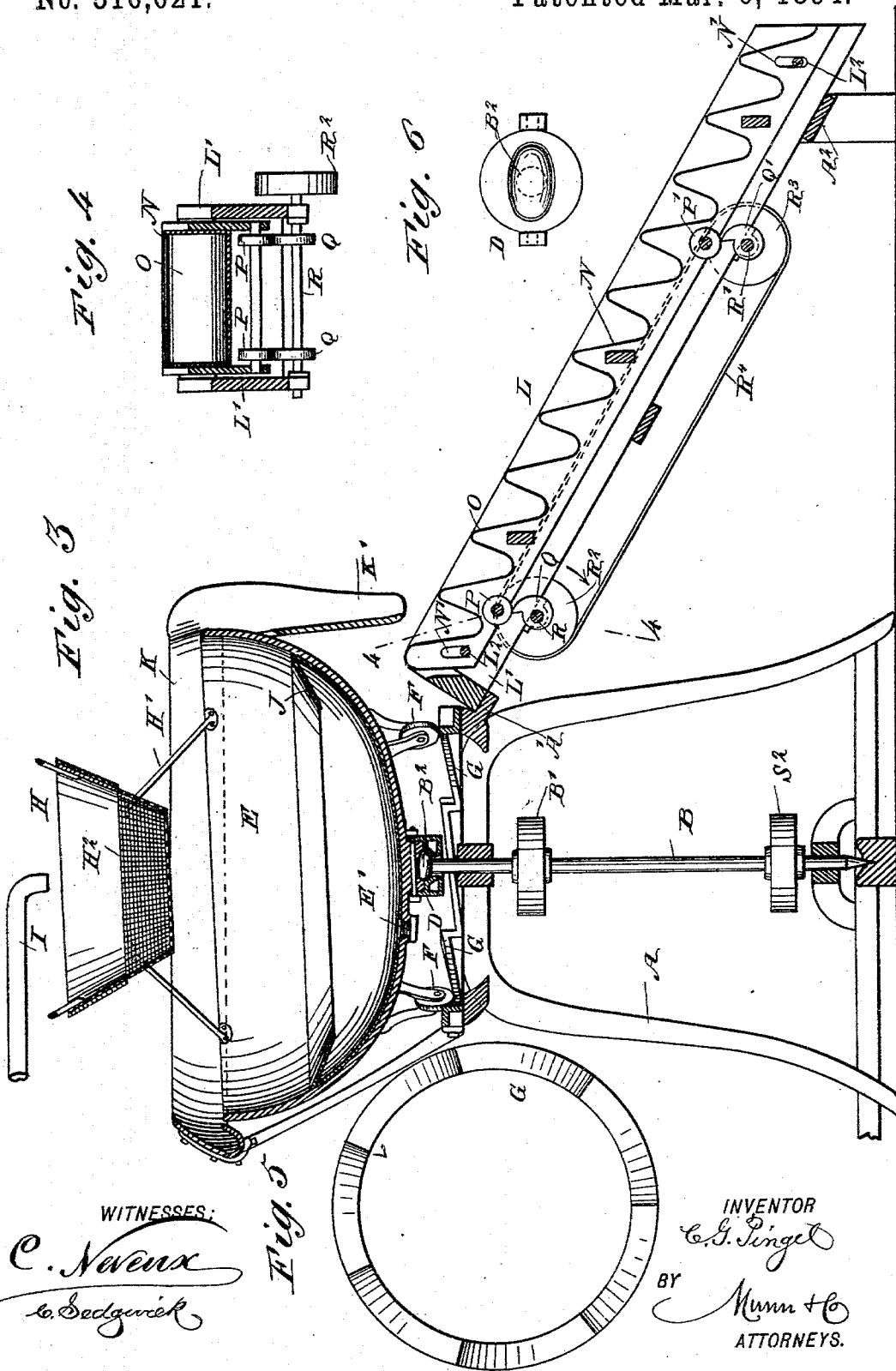
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Fig. 5

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UNITED STATES PATENT OFFICE.

CARL G. PINGEL, OF BUTTE, MONTANA.

ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 516,021, dated March 6, 1894.

Application filed June 14, 1893. Serial No. 477,583. (No model.)

To all whom it may concern:

Be it known that I, CARL G. PINGEL, of Butte city, in the county of Silver Bow and State of Montana, have invented a new and Improved Ore-Concentrator, of which the following is a full, clear, and exact description.

The invention relates to placer mining appliances, and its object is to provide a new and improved ore concentrator, which is comparatively simple in construction and very effective in operation.

The invention consists principally of a bowl having a rotary and jiggling motion and provided with a spout discharging into a jiggling sluice.

The invention also consists of certain parts and details, and combinations of the same, as will be hereinafter described and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged sectional side elevation of the improvement. Fig. 4 is a transverse section of part of the sluice on the line 4—4 of Fig. 3. Fig. 5 is a plan view of the track for the revolving bowl; and Fig. 6 is a plan view of the shaft connection with the bowl.

The improved ore concentrator is provided with a suitably-constructed frame A in which is journaled the vertically-disposed shaft B carrying a pulley B' connected by a belt C with a driving pulley C' rotated either by hand or by power, as desired, so that a rotary motion is imparted to the shaft B. The upper end of the shaft B is provided with an elongated and rounded head B² fitted into a correspondingly-shaped socket D arranged on the under side and in the middle of a bowl E carrying on its bottom a number of wheels F adapted to travel on a track G having a series of inclines with abrupt steps so that the wheels F drop off the upper ends of the inclines onto the lower part of the next following inclines thus imparting a jiggling motion to the revolving bowl E carried around by the shaft B.

The ore to be concentrated is placed in a

hopper H supported by inwardly and upwardly extending bracket arms H' from the upper edge of the bowl E, the said bracket arms supporting the hopper centrally over the bowl so that the sand bearing the precious metal passes directly into the bowl. The lower part and bottom of the hopper H is preferably made as a screen, as illustrated at H² in Fig. 3, so as to retain heavy lumps and to permit of passing only sand and fine, precious metals, into the bowl E.

In order to facilitate the washing of the sand and ore in the bowl, a stream of water is continuously discharged through a pipe I into the top of the hopper H. The bowl is preferably made of iron having a copper bottom, and at the junction of the copper and iron is arranged an inwardly and downwardly-extending annular flange J, which serves to prevent the quicksilver in the bottom of the bowl from escaping with the waste and dirt which is thrown off over the edge of the bowl into an annular gutter K surrounding the upper edge of the bowl and firmly supported by suitable brackets attached to the track G or the upper part of the frame A. In the gutter K is arranged a downwardly-extending spout K' which discharges into an inclined jiggling sluice L. The jiggling sluice L consists of a fixed frame L', supported at its upper end on a projection A' forming part of the main frame A, and at its lower end on a standard A², and a second frame N fitted to slide vertically in the fixed frame L'. The frame N is provided near its upper and lower ends with vertical slots N', through which pass the rods L² secured in the sides of the fixed frame L'. The bottom O of this second frame N is made of a corrugated copper plate to form riffles for the retention of the precious metal contained in the discharge from the bowl E.

In order to impart a vertical jiggling motion to the second frame N, I provide the same with sets of friction wheels P and P' engaged by sets of cams Q and Q' respectively, secured on transversely extending shafts R and R' respectively, journaled in suitable bearings in the sides of the fixed frame L. The shafts R and R' carry pulleys R² and R³ respectively, connected with each other by a

belt R⁴ and on the shaft R' is secured a second pulley S, connected by a belt S' with a pulley S² on the revoluble shaft B.

The operation is as follows: When the main driving shaft B is rotated, a rotary motion is transmitted by its head B² to the bowl E, which, on account of the wheels F dropping off the ends of the inclines on the track G, receives a jiggling motion, so that the waste and dirt contained in the material under treatment within the bowl is thrown off the upper edge of the bowl into the gutter K from which the said material passes into the spout K' and down the same into the jiggling sluice L. The spout K' discharges the material into the uppermost riffle formed by the corrugated bottom O and as the frame N supporting the said riffles has a jiggling motion, the material is jiggled from one riffle to the next lower one, whereby the heavy precious metals are retained in the bottom of the riffles, while the tailings pass from one riffle to the other to be finally discharged over the lowermost riffle. It is understood that the rotary motion of the shaft B imparts by the pulleys S² and S, and the belt S', a rotary motion to the shaft R', which, by its connection with the shaft R rotates the latter so that both sets of cams Q and Q' simultaneously impart a jiggling motion to the sliding frame N containing the riffles. As previously described, the annular flange J retains the quicksilver in the bottom of the bowl E, and after the operation has been continued for a certain length of time and the precious metal retained and amalgamated in the bottom of the bowl E, then the said material is drawn off from the bowl through a capped outlet E' in the bottom of the said bowl. It is understood that during this operation the machine is held at a standstill.

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

1. An ore concentrator, comprising a bowl provided on its under side with wheels, a shaft having a loose connection with the said bowl for rotating the same and permitting the same to tilt, and a track having inclines on which travel the said wheels, substantially as shown and described.

2. An ore concentrator, comprising a bowl provided on its under side with wheels, a shaft having a loose connection with the said bowl for rotating the same and permitting

the same to tilt, a track having inclines on which travel the said wheels, and a fixed annular gutter surrounding the upper edge of the said bowl and provided with an outlet spout, substantially as shown and described.

3. An ore concentrator, comprising a bowl provided on its under side with wheels, a shaft having a loose connection with the said bowl for rotating the same and permitting the same to tilt, a track having inclines on which travel the said wheels, and an annular flange arranged within the said bowl at the junction of its copper bottom with its iron body, substantially as shown and described.

4. In an ore concentrator, a jiggling sluice, comprising a fixed inclined frame, a second frame fitted to slide bodily and vertically in the fixed frame, and having its bottom formed of a corrugated plate to form riffles, and cams below the second frame for imparting an up and down movement to said second frame, substantially as described.

5. In a jiggling sluice for ore concentrators, the combination with a fixed frame, of a second frame in the fixed frame, having a riffled bottom and provided with vertical slots at its ends, rods passing through the said slots and secured to the fixed frame, rollers or wheels on the second frame, and cams below the rollers or wheels and engaging the same, substantially as described.

6. An ore concentrator, comprising a bowl having a rotary and jiggling motion and provided with an annular gutter at its upper edge and a spout leading therefrom, an inclined sluice having a riffled bottom and arranged below the spout and into which the said spout discharges, and means for imparting an up and down motion bodily to said sluice, substantially as described.

7. An ore concentrator, comprising a bowl provided with an annular gutter and a spout leading therefrom, means for imparting a rotary and a jiggling motion to the bowl, an inclined sluice having a corrugated bottom, into which the spout discharges, and means for imparting a jiggling motion to the sluice, said means being operated from the bowl operating shaft, substantially as herein shown and described.

CARL G. PINGEL.

Witnesses:

G. H. KORNBERG,
J. H. LEYSON.