C. BENNETT & P. BURNHAM.

Ore-Separator.

No. 223,102. **Patented Dec. 30, 1879.**

Fig: 1.

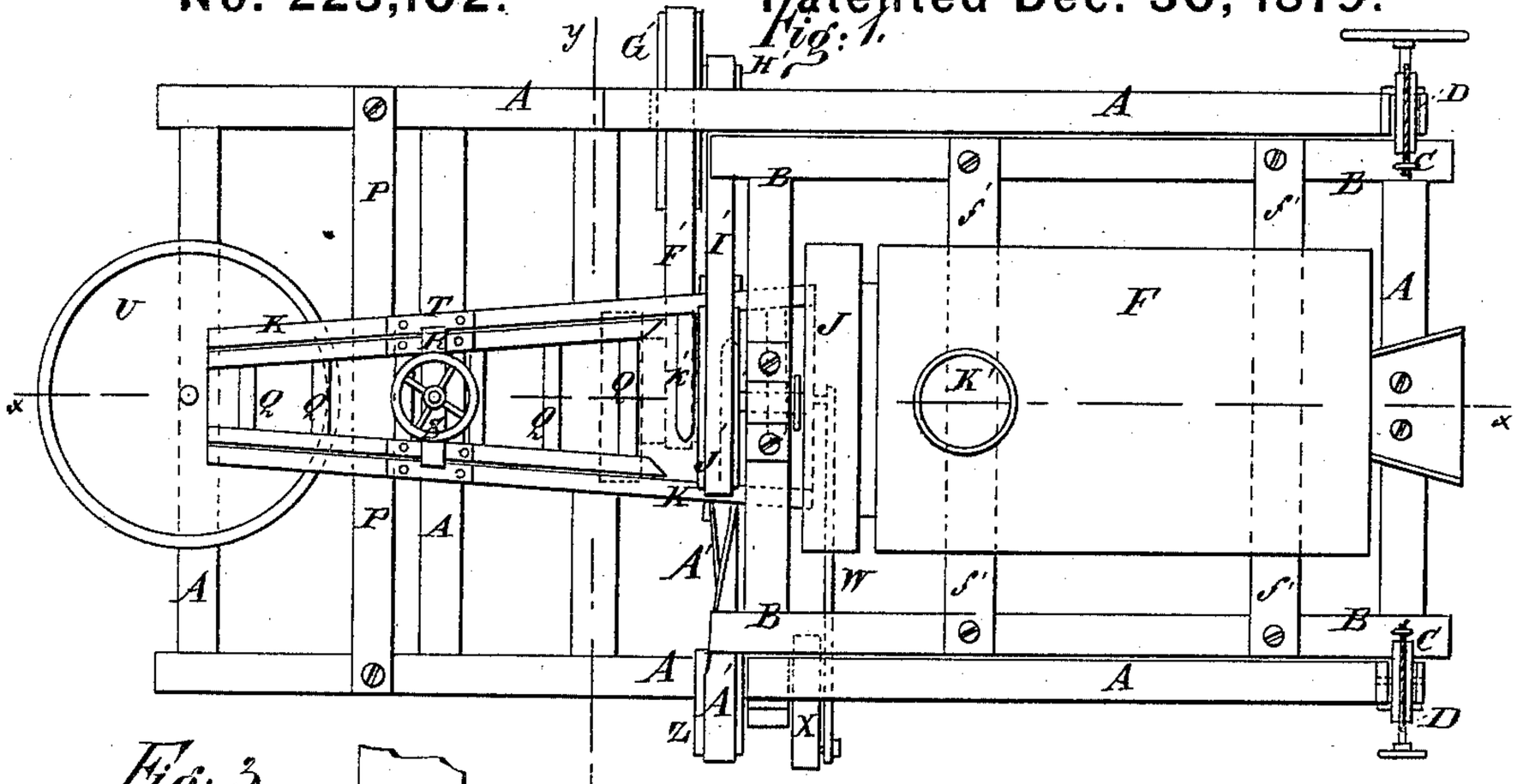

Fig: 3

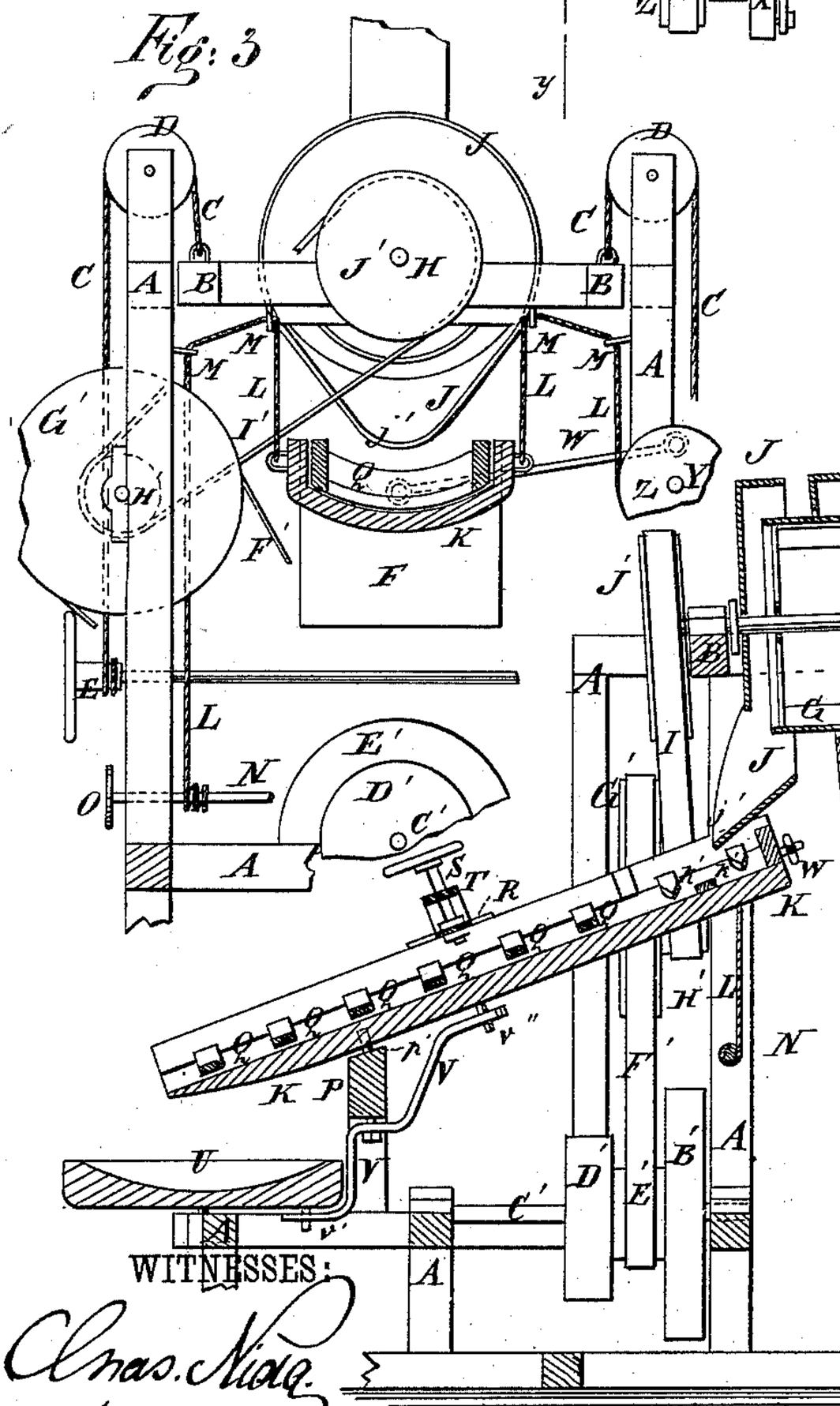

Fig: 4

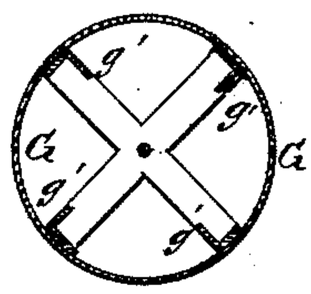

Fig: 2

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UNITED STATES PATENT OFFICE.

CORNELIUS BENNETT AND PARKER BURNHAM, OF SILVER CITY, TERRITORY OF NEW MEXICO.

IMPROVEMENT IN ORE-SEPARATORS.

Specification forming part of Letters Patent No. **223,102**, dated December 30, 1879; application filed July 17, 1879.

To all whom it may concern:

Be it known that we, CORNELIUS BENNETT and PARKER BURNHAM, of Silver City, in the county of Grant and Territory of New Mexico, have invented a new and Improved Ore-Separator, of which the following is a specification.

Figure 1 is a top view of our improved machine. Fig. 2 is a vertical longitudinal section of the same, taken through the line *x x*, Fig. 1. Fig. 3 is a vertical cross-section of the same, taken through the line *y y*, Fig. 1. Fig. 4 is a detail cross-section of the revolving pulverizing-cylinder, taken through the line *z z*, Fig. 2.

The object of this invention is to furnish an improved apparatus for separating gold and other metals from dirt and other sediment by what is known as the "dry" process, and which shall be simple in construction, convenient in use, and effective in operation.

The invention consists in combining detachable riffles connected at their ends by side bars, the cross-bar R, swiveled screw S, and arched crossbar with the separator-spout; also, in combining with the separator suspension-cords, guide-eyes, drum, crank-wheel, arch-bar, and pivot-pin, all as hereinafter described.

A represents the frame-work of the machine, the forward part of which is made low, and its rear part is extended upward. To the forward upper corners of the rear part of the frame A are pivoted the forward corners of a frame, B, to the rear corners of which are attached the ends of two ropes or chains, C. The ropes or chains C pass over pulleys D, pivoted to the projecting upper ends of the rear corner-posts of the frame A, pass down along the outer sides of the said posts, and their ends are attached to small drums E, pivoted to the lower parts of the said posts. The drums E are provided with hand-wheels or cranks for convenience in operating them, and should be provided with pawls and ratchet-wheels to hold them in any position into which they may be turned.

F is a furnace, to the sides of which are attached the lower ends of the bars *f'*, the upper ends of which are attached to the side bars of the frame B. The top of the furnace F is arched to adapt it to serve as a jacket to the cylinder G. The cylinder G is hollow, is open at both ends, and is attached to the shaft H, which revolves in bearings attached to the end bars of the frame B. To the inner surface of the hollow cylinder G are attached a number of longitudinal flanges, *g'*, to keep the dirt stirred up while passing through the said cylinder to pulverize it, and insure its being thoroughly dried.

To the rear cross-bar of the frame B is attached a spout, I, to guide the material into the open rear end of the cylinder G.

With this construction, by turning the drums E a greater or less inclination may be given to the cylinder G and furnace F, to cause the dirt or sediment to pass faster or slower through the said cylinder G, as circumstances may require.

If desired, the frame B, furnace F, and cylinder G may be supported and adjusted by hand-screws, the cords, pulleys, and drums C D E being omitted.

The forward end of the cylinder G projects beyond the furnace F, and is covered by a hood or cap, J, the lower part of the disk of which is cut away to form a discharge-opening, and the lower part of its rim beneath the said discharge-opening is extended to form a spout, *j'*, or has a discharge-spout attached to it to guide the discharged material into the separator K.

To the opposite sides of the upper end of the separator K are attached the ends of two cords or chains, L, which pass through guide-eyes or around guide-pulleys M, attached to the front cross-bar of the frame B and to the side posts of the frame A, and their ends are attached to a drum or shaft, N. The journals of the drum or shaft N revolve in bearings attached to the side posts of the frame A, and to one of the said journals is attached a crank or hand-wheel, O, for convenience in turning the said shaft or drum to raise and lower the rear end of the separator K, as may be desired, to hasten or retard the passage of the dirt through the said separator.

The shaft or drum N should be provided with a ratchet-wheel and pawl to hold it in any position into which it may be turned.

The lower part of the separator K rests upon the middle part of the arched bar or stationary rocker P, the ends of which are attached

to the top side bars of the lower part of the frame A.

To the highest point of the arched bar P is attached a pin, p', which enters a hole in the lower side of the lower part of the separator and keeps it in place, while serving as a fulcrum upon which it may rock and oscillate freely. The bottom of the separator K is concaved, as shown in Fig. 3, and to the said bottom, at the upper end of the said separator, are attached two or three cleats, k', which extend alternately from one side nearly to the other, forming a zigzag passage for the material from the upper end of the separator, where it is received, to the riffles Q. The riffles Q are so formed as to fit the concave bottom of the separator K, and their ends are attached to side bars which fit against the sides of the said separator.

To the middle part of the side bars of the riffles Q are attached the ends of a cross-bar, R, to the center of which is swiveled the end of a hand-screw, S. The hand-screw S passes down through a screw-hole in the center of the bar T, the ends of which are bent downward and are attached to the sides of the separator K. With this construction, by turning the screw S the riffles Q may be raised from the bottom of the separator K, to allow the dirt and gold stopped by the said riffles to pass down to the settler U, when desired.

The settler U is a shallow cup, which is pivoted at the center of its bottom to the front cross-bar of the frame A. To the rear part of the bottom of the settler U is attached a pin, v', to receive the slotted forward end of the lever V, which is pivoted to the lower side of the center of the arched bar P.

The rear end of the lever V is slotted to receive a pin, v^2, attached to the bottom of separator K, so that the movement of the said separator K may oscillate the settler U to keep the dirt stirred up, and cause it to pass out over the edge of the said settler, while the gold or other metal settles to the bottom.

To the upper end of the separator K is pivoted the inner end of a connecting-rod, W, the outer end of which is pivoted to the crank-pin of a crank-wheel, X, attached to the end of a short shaft, Y, which revolves in bearings attached to a side post of the frame A.

To the other end of the shaft Y is attached a pulley, Z, around which passes an endless belt, A′, which also passes around a pulley, B′, attached to the driving-shaft C′. The shaft C′ revolves in bearings attached to the cross-bars of the forward part of the frame A, and to it is attached a pulley, D′, to receive the driving-belt, and a pulley, E′, around which passes a belt, F′. The belt F′ passes around a pulley, G′, pivoted to the side posts of the frame A, and with it is rigidly connected a smaller pulley, H′, around which passes an endless belt, I′. The belt I′ also passes around a pulley, J′, attached to the forward journals of the pulverizing-cylinder G, for giving motion to the said cylinder G.

To the arched top of the furnace F is attached the stack K′, through which the smoke and other incombustible products of combustion escape, and which should be made of such a height as will give the requisite draft to the furnace.

The operation is as follows: The wet dirt is guided by the spout I into the cylinder, where it is dried, pulverized, and carried forward to be discharged on the riffles, which retard and regulate the flow of pulverized dirt to the separator. From thence the gold and dirt are caused to pass down to the settler, which is a shallow pan with a forwardly and backwardly jerking motion. It also rocks on its center to cause the gold to settle at the bottom, while the dirt is made to drop over the edge.

What we claim as new is—

1. The combination of the detachable riffles Q, connected at their ends by side bars, the cross-bar R, the swiveled screw S, and the arched cross-bar T with the separator-spout K, substantially as herein shown and described.

2. The combination of the suspension-cords, guide eyes or pulleys, and shaft or drum L M N, the connecting-rod and crank-wheel W X, and the arched bar and its pivot-pin P p' with the separator K, substantially as herein shown and described.

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Witnesses:
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R. V. NEWSHAM.