No. 785,819. PATENTED MAR. 28, 1905.

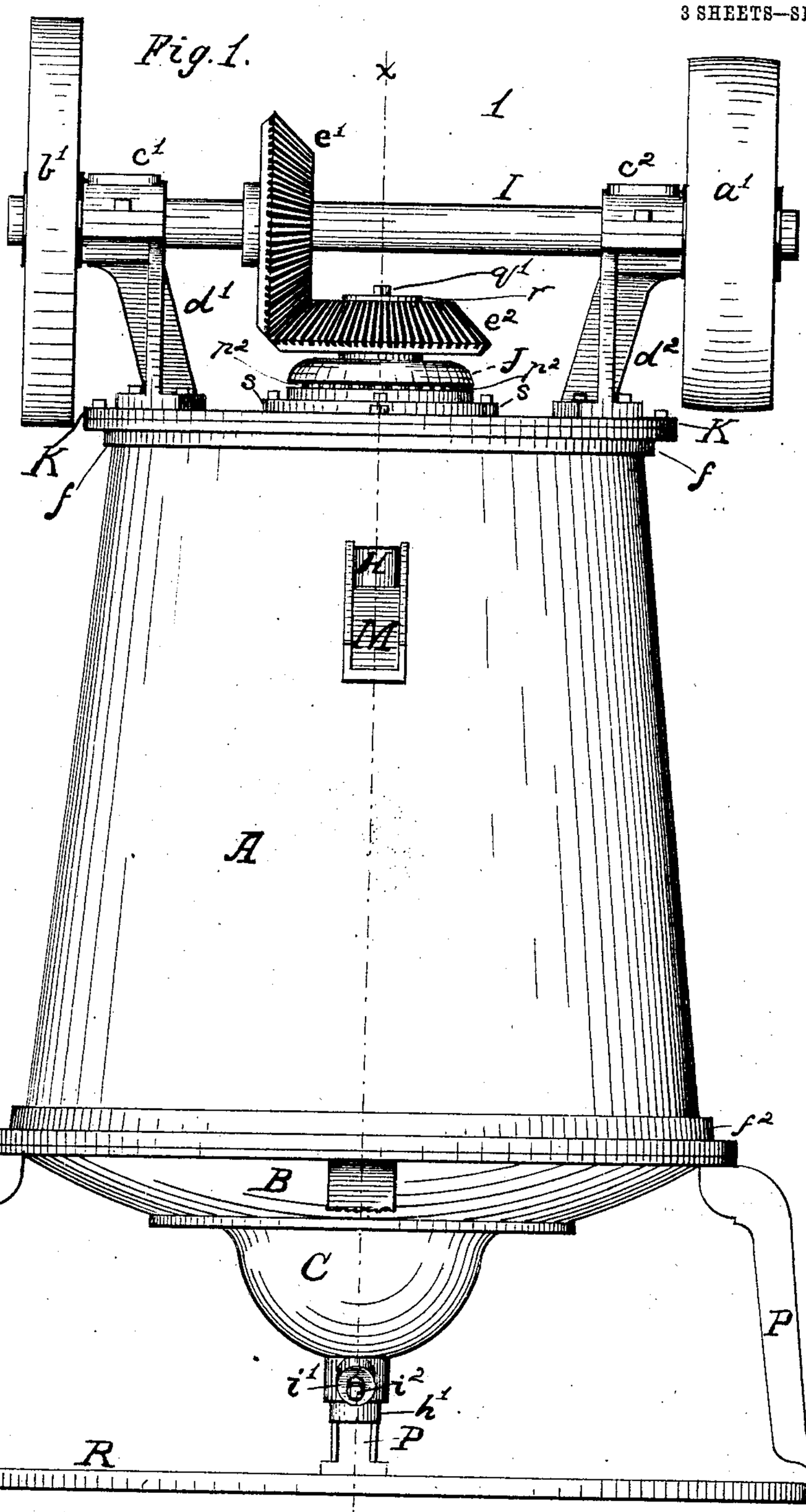
C. O. MICHAELSEN.

MACHINE FOR SEPARATING GOLD FROM SAND, &c

APPLICATION FILED SEPT. 24, 1903.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
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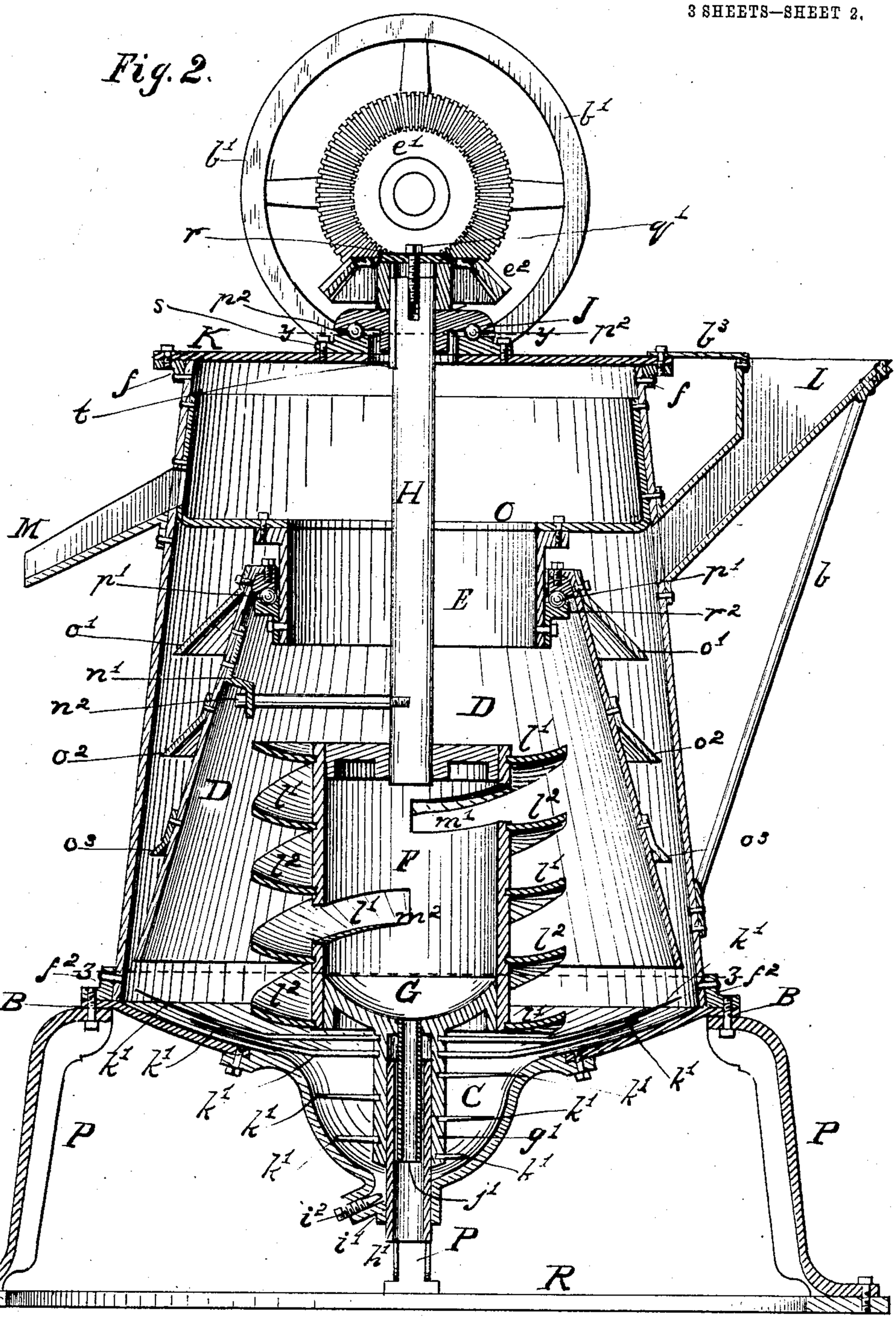
3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

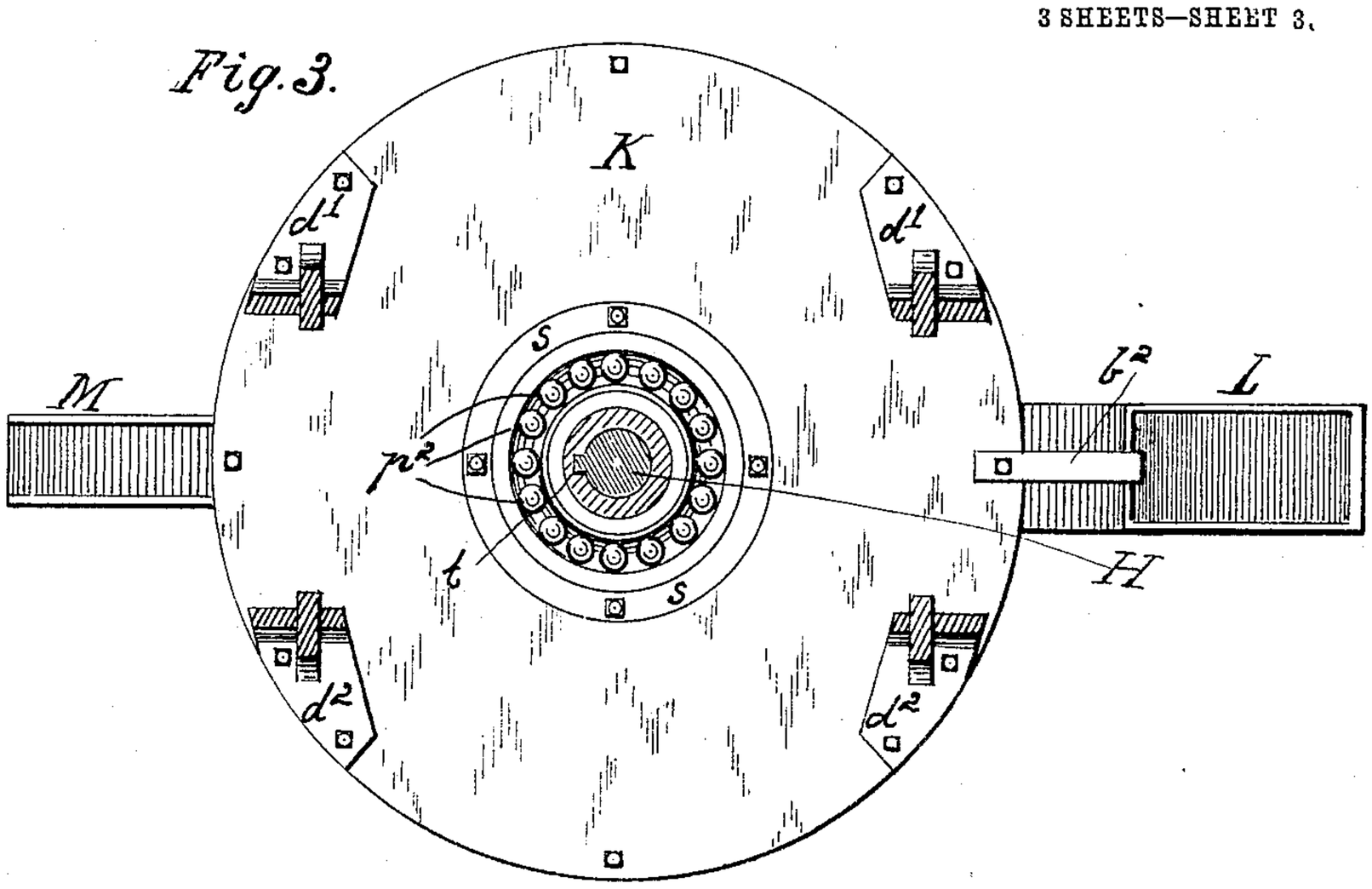
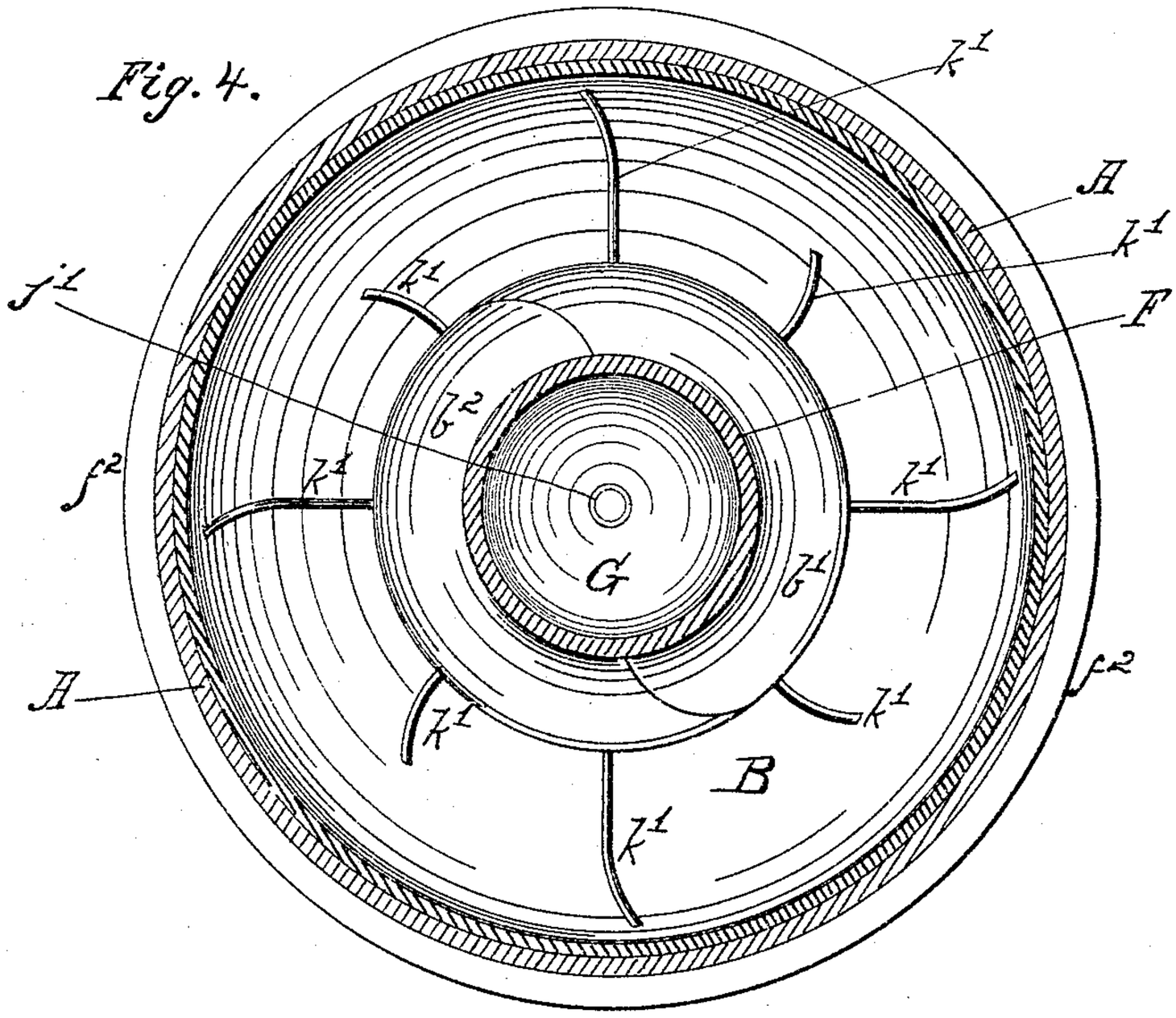


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES O. MICHAELSEN, OF SALT LAKE CITY, UTAH.

MACHINE FOR SEPARATING GOLD FROM SAND, &c.

SPECIFICATION forming part of Letters Patent No. 785,819, dated March 28, 1905.

Application filed September 24, 1903. Serial No. 174,520.

To all whom it may concern:

Be it known that I, CHARLES O. MICHAELSEN, a citizen of the United States, residing at Salt Lake City, Salt Lake county, State of Utah, have invented a new and useful Machine for Separating Gold from Sand or other Material by Mechanical Means and Without the Use of Mercury or Chemicals, of which the following is a specification.

Similar letters of reference refer to like parts throughout the several views.

Figure 1 represents exterior side view elevation. Fig. 2 represents vertical section on line $x\ x$ of Fig. 1. Fig. 3 represents horizontal section on the plane of line $y\ y$ of Fig. 2. Fig. 4 represents horizontal section on the plane of line $z\ z$ of Fig. 2.

A vertical shell A, built of any suitable material and having a diaphragm O near the top, to which diaphragm is attached overflow-cylinder E, is provided with a cap K, to the center of which cap K is firmly secured annular ball-bearing support *s*. Resting upon and carried by antifriction steel balls $p^2\ p^2$, &c., is ring J, which is firmly secured to bevel gear-wheel e^2. The bevel gear-wheel e^2 is secured on a rotating vertically-adjustable shaft H. The rotary motion of shaft H is imparted by bevel gear-wheel e^2, through the feather-key *t* engaging the converse keyways in wheel e^2 and vertical shaft H. The vertical shaft H is suspended from and secured to disk *r* by screw q' and adjusted vertically by screw q'. The lower end of shaft H is firmly attached to a vertical worm-cylinder F, which is vertically adjustable and rotatably movable and provided with ingress-ports $m'\ m^2$ and to which worm-cylinder F are firmly attached on the outside concavo-convex blades $l'\ l^2$, (double screws,) starting on opposite sides of said worm-cylinder. A funnel G is firmly attached to and forms the bottom of worm-cylinder F. Within the lower end of funnel G telescopes discharge-tube h', within which discharge-tube h' telescopes discharge-pipe j'', which discharge-pipe j'' forms a part of funnel G, being the lower end of said funnel.

The machine is operated by means of power applied to pulley a', which drives bevel gear-wheel e' on horizontal shaft I, engaging bevel gear-wheel e^2 on vertical shaft H, which vertical shaft H hangs from upper ball-bearing support J and is steadied by discharge-tube j'', (a part of funnel G.) The distributer D is aided in its work by petticoat-distributers o' o^2 o^3, attached to its outer side, and is operated by means of clutch-pin n^2, attached to vertical shaft H, engaging clutch n', attached to distributer D. The distributer D rests on ball-bearing support r^2, made to receive and hold steel balls p'. The arms $k'\ k'\ k'$, &c., are firmly attached to j'', bottom of funnel G, and bent to conform to the concave bottom B of shell A and are also curved in the direction of the motion of distributer D, as shown in Fig. 4. The concavo-convex screw-blades l' and l^2 discharge through the ingress-openings $m'\ m^2$ into funnel G. The shell A, provided with a concave bottom B, is supported and held in place by ring *f* and feet P P P, &c. The feet P P, &c., are securely held at bottom by ring R. Attached to bottom B by suitable means is pocket C, which is provided with tap-off i' and screw-tap i^2, and the machine is operated as follows: The pulverized ore or gold-bearing sand is fed into hopper L with enough water to make it free-moving, then onto petticoat-distributers $o'\ o^2\ o^3$ and distributer D, from which by the rotary motion of D the pulp is evenly deposited in a circle near the upper edge of concave bottom B, where it is caught and gently agitated and drawn to the center by the arms $k'\ k'\ k'$, &c. When sufficient pulp has been fed and drawn to fill pocket C, the screw-blades $l'\ l^2$ skim off the top and carry it up and discharge it as tailings through ingress-ports $m'\ m^2$, where it is discharged through j'' and h', while the agitation by arms $k'\ k'$, &c., the continuous feeding, and the lower discharge-suction through j'' have concentrated the mineral values in pocket C, where it is drawn off through tap-off i'.

I claim—

1. The combination with a vertical shell, built of any suitable material, with a cap, and a concave bottom; of a rotatably-movable and vertically-adjustable worm-cylinder, provided with two concavo-convex screw-blades, firmly attached on the outside of said cylinder and starting from opposite sides of said cylinder;

said cylinder being provided with ingress-ports in its wall, and a funnel firmly attached to, and forming the bottom of the worm-cylinder, to which funnel, are firmly secured, at varying distances, agitating-arms, of suitable length, and bent to correspond with the concave bottom, of the shell, and curved in the direction of the motion of the screw-blades, substantially as described.

2. A vertical shell built of suitable material, with a top, and a diaphragm, and provided with concave bottom, to which is secured a pocket, and tap-off with plug; within which shell, is fitted antifriction-ball-bearing-supported feed-distributer, with petticoat-distributers, and provided with clutch-pin, substantially as described.

3. A vertical shell provided with a feed-hopper and a concave bottom, to which bottom is attached a pocket provided with an opening and a closure therefor, distributers within the shell, and provided with clutch, a vertically-adjustable and rotatably-movable shaft, and a cylinder provided with ingress-ports in its wall, and with a funnel-shaped bottom with agitator-arms curved forwardly and bent to conform with the concave bottom of the shell.

4. The combination of an upright shell, provided with top feed, and bottom discharge, within which shell is operated rotating distributer, with petticoat extensions; and a worm-cylinder, with two concavo-convex screw-blades secured thereon, with means for operating them; the worm-cylinder being provided with ingress-openings in its wall, and a bottom funnel with a discharge-tube, the said shell being provided with a concave bottom, within which is operated agitating-arms, said bottom resting upon a ring-support, that is provided with feet, substantially as described.

5. The combination of a vertical shell, provided with a feed-hopper, and the rotating pulp-distributer, with petticoat extensions, operating within said shell, the vertical shell, being provided with cap and concave bottom, agitating-arms within the concave bottom, said arms being forwardly curved and bent to conform to the concave bottom; a pocket in the concave bottom; a worm-cylinder provided with concavo-convex screw-blades, said cylinder having ingress-openings and funnel-discharge, a discharge-pipe attached to the funnel-discharge; a diaphragm within the shell, and an overflow-cylinder attached thereto, substantially as and for the purpose described.

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