

(No Model.)

3 Sheets—Sheet 1.

W. A. KONEMAN.
ORE SCOURING APPARATUS.

No. 560,856.

Patented May 26, 1896.

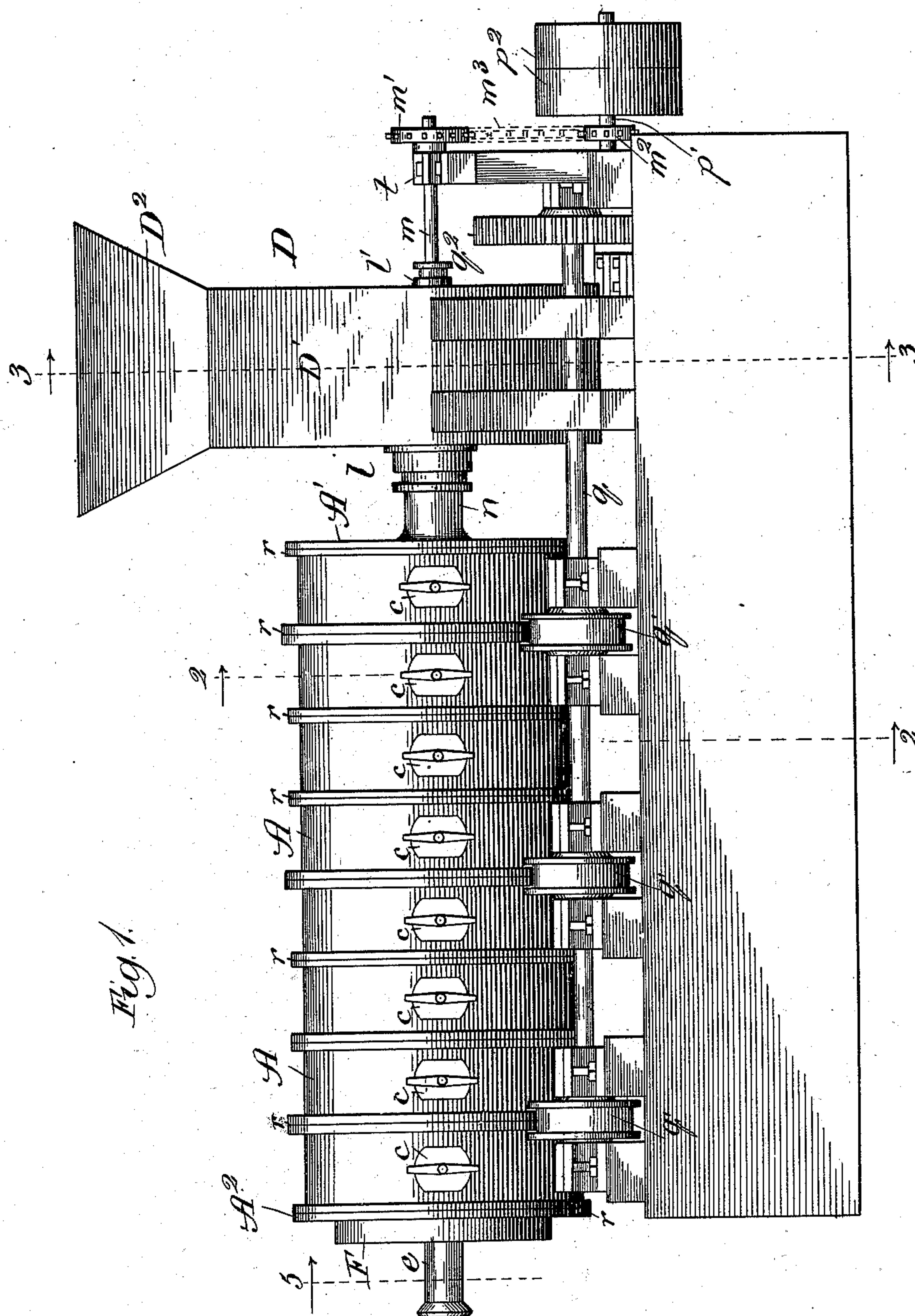


Fig. 1.

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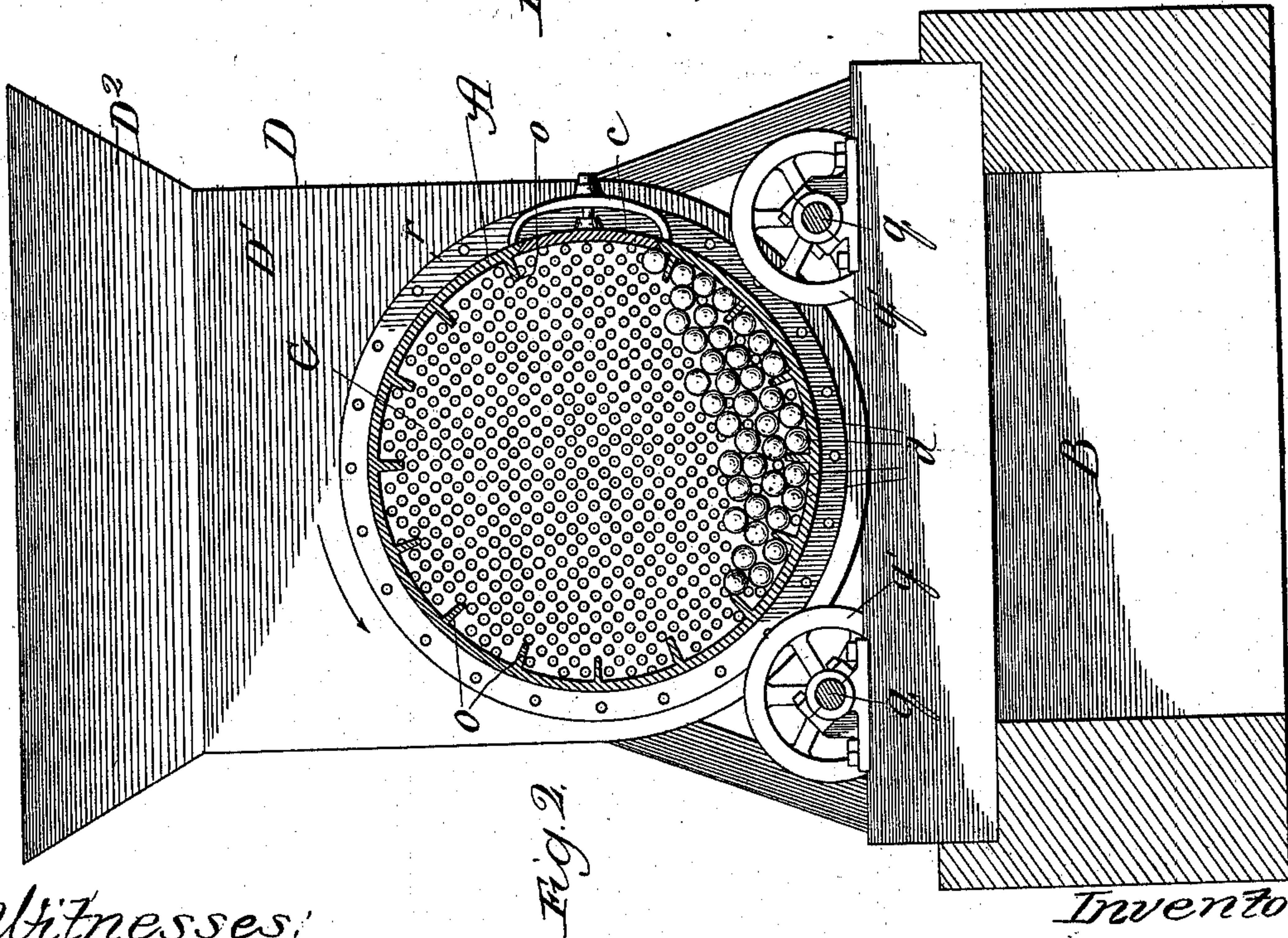
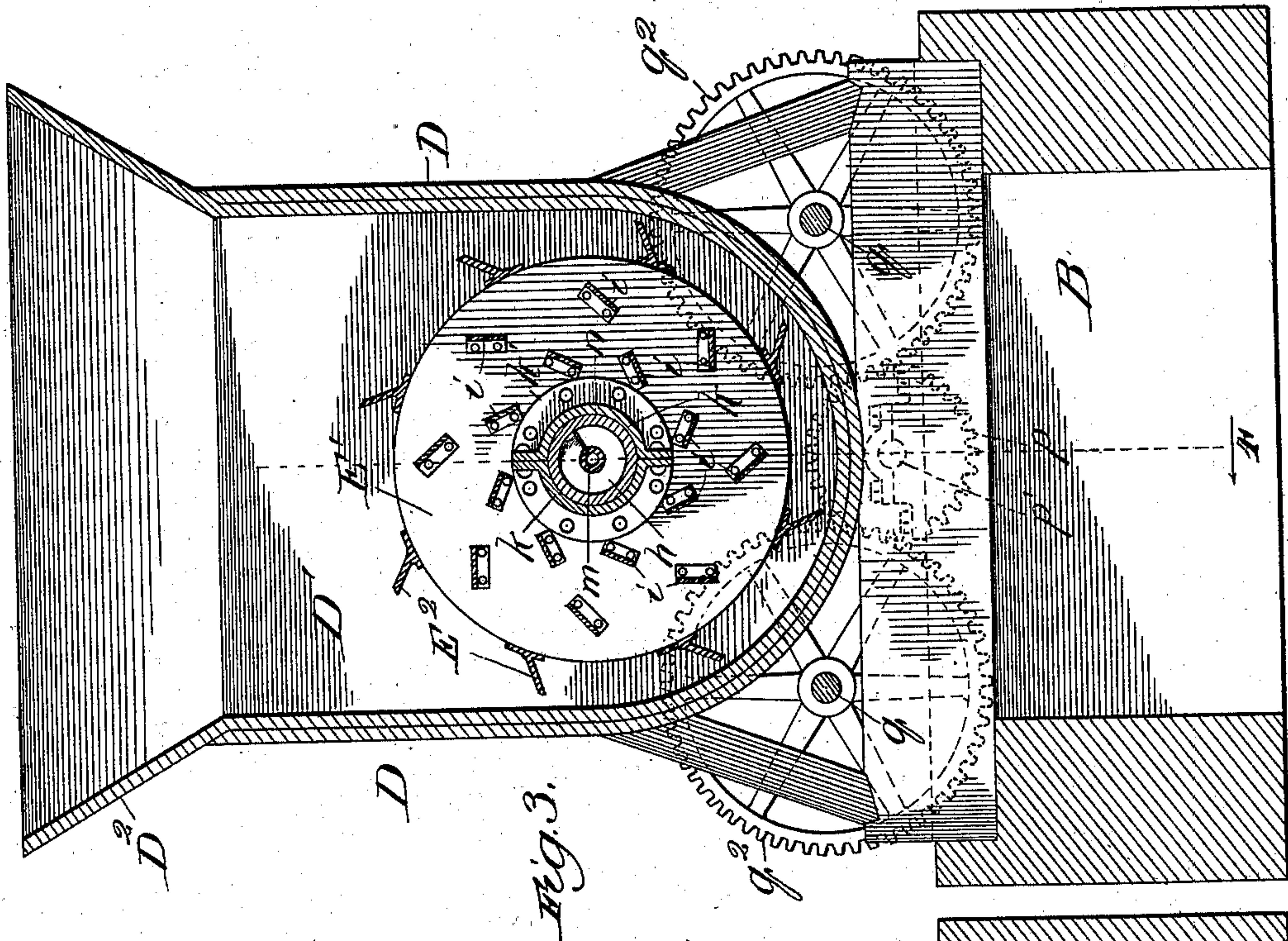
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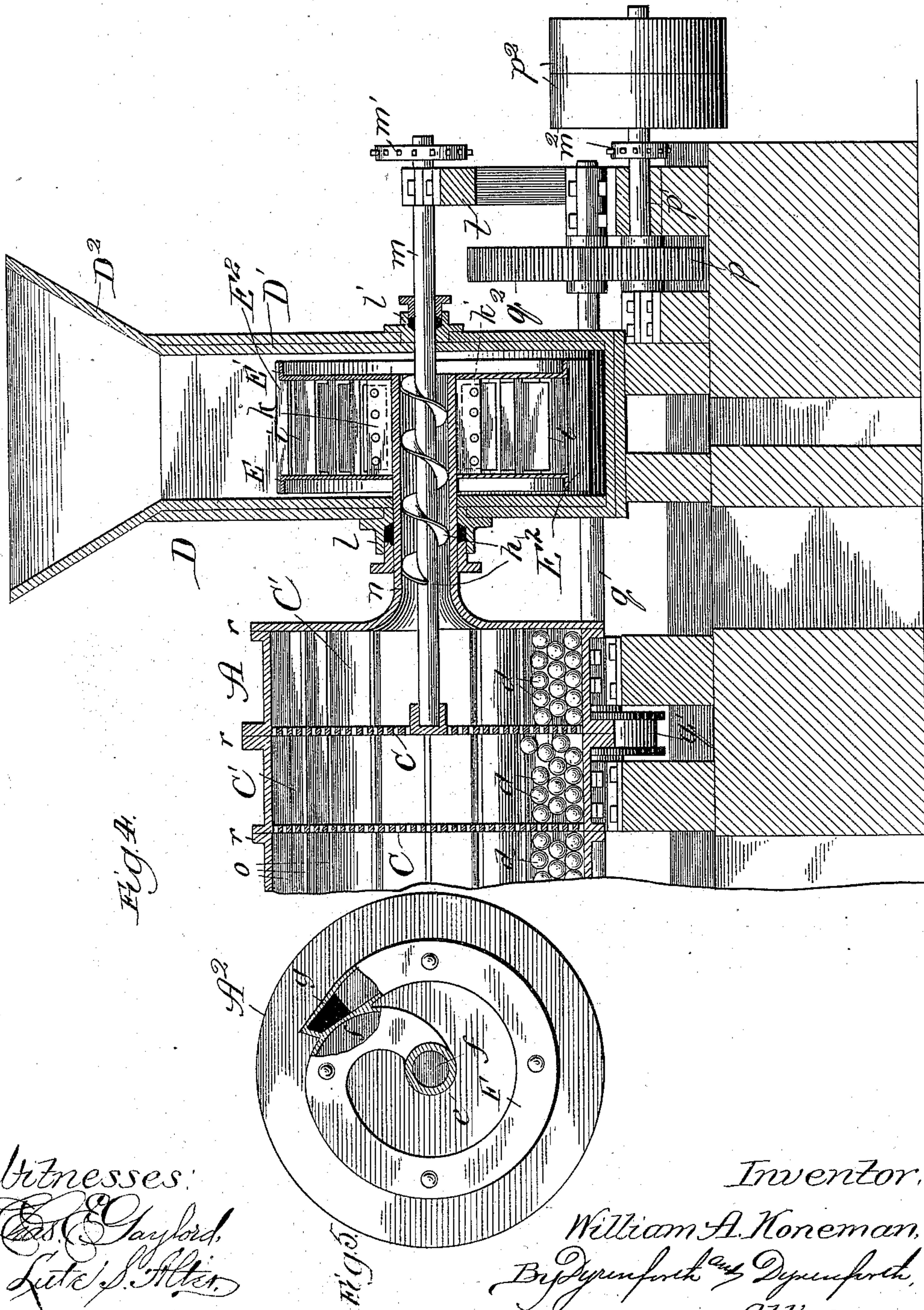
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ORE SCOURING APPARATUS.

No. 560,856.

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UNITED STATES PATENT OFFICE.

WILLIAM A. KONEMAN, OF CHICAGO, ILLINOIS.

ORE-SCOURING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 560,856, dated May 26, 1896.

Application filed March 6, 1894. Renewed October 24, 1895. Serial No. 566,783. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. KONEMAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Ore-Scouring Apparatus, of which the following is a specification.

The object of my improvement is to provide an apparatus of novel construction, rendering it peculiarly effective in its purpose for scouring pulverized ore, particularly of the variety bearing precious metal (gold or silver) after it has been subjected to roasting, and thereby cleanse the contained atoms of gold or silver of any substance or coating-film tending to hinder or retard amalgamation or interfere with any other treatment to which the ore is subsequently subjected for recovering from it the precious metal, and as an incident of the construction and manner of operation of my improved apparatus it is my further object to provide for a tendency of its reducing the pulverized ore, while undergoing the scouring operation, to a condition of greater fineness.

Referring to the accompanying drawings, Figure 1 is a view representing my improved apparatus in side elevation. Figs. 2 and 3 are sections taken, respectively, at the lines 2 and 3 on Fig. 1 and viewed as indicated by arrows. Fig. 4 is a broken section taken at the line 4 on Fig. 3 and viewed in the direction of the arrow; and Fig. 5 is a broken section taken at the line 5 on Fig. 1, viewed in the direction of the arrow and enlarged.

As the generally-stated construction of my improved apparatus, it may be described as involving a drum rotatably supported in recumbent position and divided by internal screen-diaphragms into a series of intercommunicating chambers provided at intervals about the inner wall of the drum with transversely-extending ribs for raising and dropping, and thereby thoroughly agitating the ore by the rotation of the drum, there being interposed between the ore-feed and inlet end to the drum a mixer and the outlet from the drum, involving a construction whereby the discharge is directed from a side of the final chamber to the center of the drum-head, whence it is emitted in a stream.

A is the drum, shown as of cylindrical shape

and as formed in annular flanged sections fastened together at the circumferential flanges r , at some of which the drum rests between the flanges of rollers q' on shafts q , journaled in bearings on the bed B of the apparatus to extend lengthwise of the drum along opposite sides of its longitudinal center. At one end of the shafts q they carry gear-wheels q^2 , between which is interposed to mesh with them a pinion p on the drive-shaft p' , provided with a tight and loose belt pulley p^2 . Within the drum at desired intervals, preferably corresponding with the flanges r , are fitted the perforated or screen-like diaphragms C, which divide the interior of the drum into chambers C', by preference eight in number, and across which at intervals on the inner wall of the drum extend radially inward the ribs o . The head A' of the drum has a central tubular trunnion extension n , which enters the upright trough-shaped case D' of a mixer D through one of its sides, and which trough may be built of wood and is surmounted by a hopper D², and through the hollow trunnion extends from the opposite side of the trough, where it is journaled in a bearing t , a rotary shaft m , preferably hollow, and having its inner bearing, as shown in Fig. 4, at the center of the first of the series of diaphragms C. At the entrances of the hollow trunnion and shaft m into the mixer-case are provided the stuffing-boxes l and l' .

E and E' are disk-shaped heads, formed of boiler metal and surrounding the trunnion n to revolve with it, being to that end riveted to the annular flanges k' at opposite ends of a sleeve k , formed in two flanged sections fastened together on the trunnion. (See Fig. 3.) The two heads are rigidly united by a number of interposed metal blades i , and at intervals about the peripheries of the heads are provided rigid paddles E².

The shaft m carries a conveyer h and a sprocket-wheel m' , connected by an endless chain m^3 with a sprocket-wheel m^2 on the shaft p' .

The head A² at the discharge end of the drum has an outlet-opening g between its center and periphery, (see Fig. 5,) from which proceeds on the outer face of the head a snail-like housing F, bolted in place and affording a passage f , leading to the center of the head

and there terminating in a forwardly-protruding discharge-spout *e*.

In the chambers *C'*, I provide chilled-iron balls *d*, about, say, one and one-half inch in diameter, or broken pieces of hard rock or the like, to afford attrition-pieces, in sufficient quantity to fill each chamber about one-fourth full.

The operation is as follows: The pulverized ore mixed with water to reduce it to the consistency of a pulp is fed through the hopper *D*² to the mixer *D* while the shaft *p'*, and consequently the drum, the heads *E E'*, and the worm-shaft *m*, is revolving. The amount of material fed into the mixer should be sufficient to keep the level therein somewhat above the point of discharge at the outlet-opening *g*. The action of the mixer thoroughly agitates and works the pulpy mass, which enters the trunnion *n* and is therein worked into the drum by the conveyer *h*, which is geared to rotate at a somewhat higher speed than the drum to tend to prevent sediment in the hollow trunnion. On entering the first chamber *C'* the mass is subjected to the attrition action of the balls *d* by the showering through it produced by the lifting and dropping action upon them of the ribs *o*, to which treatment the mass in each chamber is subjected, the chambers becoming successively supplied by percolation of the material through their screen-walls. In the final chamber *C'* the discharge takes place at the opening *g* and is directed through the snail-like passage *f* to the central spout *e*, whence the outflow is in the form of a regular stream.

When a run of the apparatus is completed, the drum should be brought to a standstill with its series of manholes *c*, with one of which each chamber *C'* is provided, at the bottom, so that on removing the manhole-covers at the end of a run the contents of the chambers may be readily dumped.

What I claim as new, and desire to secure by Letters Patent, is—

1. In an ore-scouring apparatus, the combination of a rotatably-supported drum *A* divided internally by perforated partitions *C* into chambers *C'* and having a discharge-outlet in one head, and a hollow trunnion *n* on its opposite head, and an ore-mixer *D* comprising a trough and heads *E* and *E'* secured on said trunnion, connected by blades *i*, and carrying paddles *E*² on their periphery, substantially as described.

2. In an ore-scouring apparatus, the combination of a rotatably-supported drum *A* divided internally by perforated partitions *C* into chambers *C'* and having a discharge-outlet in one head and a hollow trunnion *n* on its opposite head, an ore-mixer *D* comprising a trough and heads *E* and *E'* secured on said trunnion and connected by blades *i* carrying paddles *E*² on their periphery, and a worm-conveyer *h* in the trunnion on a rotatably-supported shaft *m* geared to the driving-shaft of the apparatus, substantially as described.

3. An ore-scouring apparatus comprising, in combination, the rotatably-supported drum *A* divided internally by perforated partitions *C* into chambers *C'*, ribs *o* extending transversely of the chambers at intervals about the inner wall of the drum, attrition-pieces *d* in the chambers, an outlet-opening *g* in the drum-head *A*² and a snail-like discharge-passage *f* on said head, a hollow trunnion *n* leading centrally from the drum-head *A'*, an ore-mixer *D* comprising a trough *D'* surmounted by a hopper *D*², heads *E* and *E'* fastened on the trunnion, connected by blades *i* and carrying paddles *E*² on their periphery, and a worm-conveyer *h* in the trunnion on a rotatably-supported shaft *m* geared to the driving-shaft of the apparatus, the whole being constructed and arranged to operate substantially as described.

WILLIAM A. KONEMAN.

In presence of—

M. J. FROST,

W. N. WILLIAMS.