No. 897,214. PATENTED AUG. 25, 1908.

P. J. LONERGAN.

ROTARY STAMP MILL.

APPLICATION FILED JUNE 4, 1907.

3 SHEETS—SHEET 1.

Fig. 1.

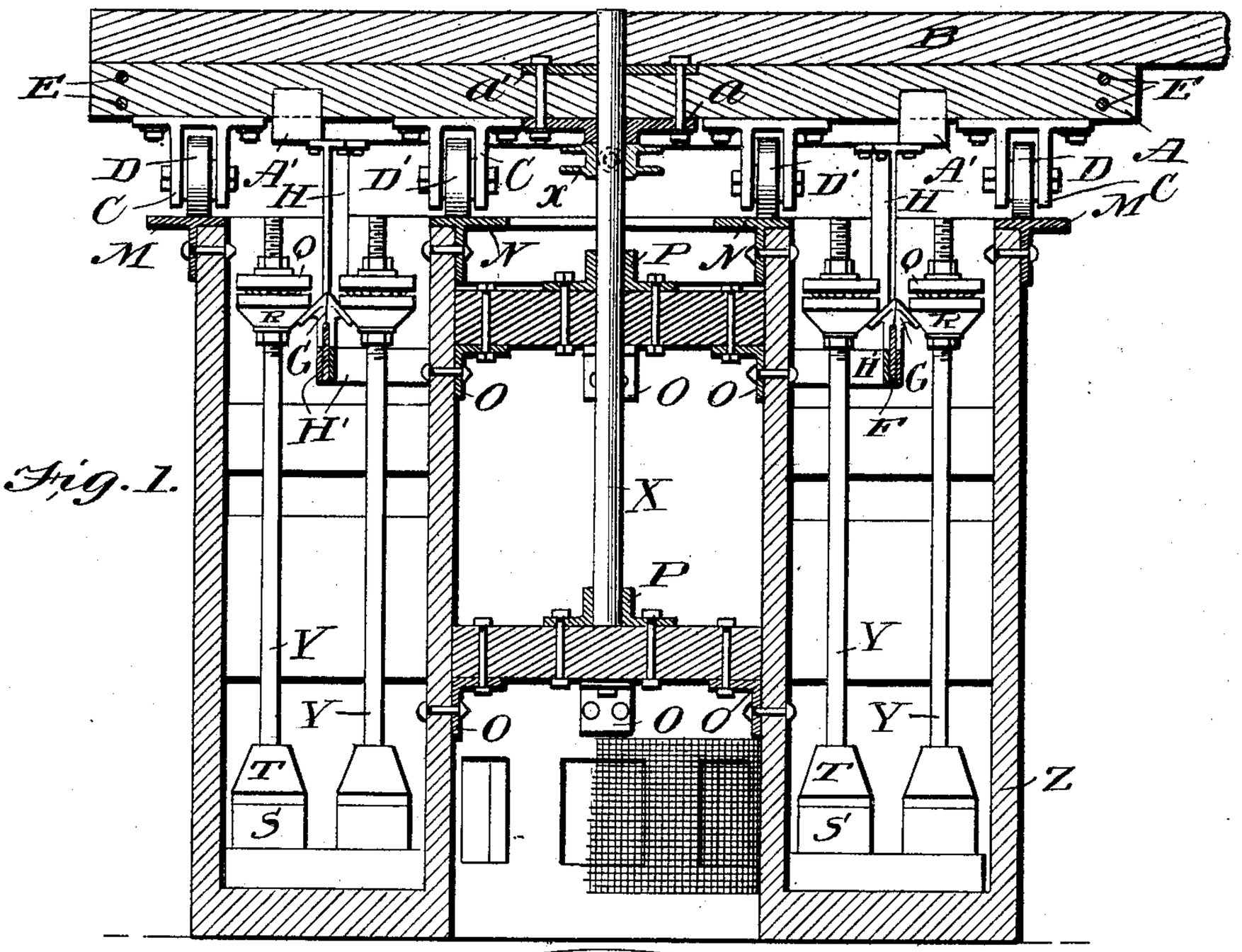
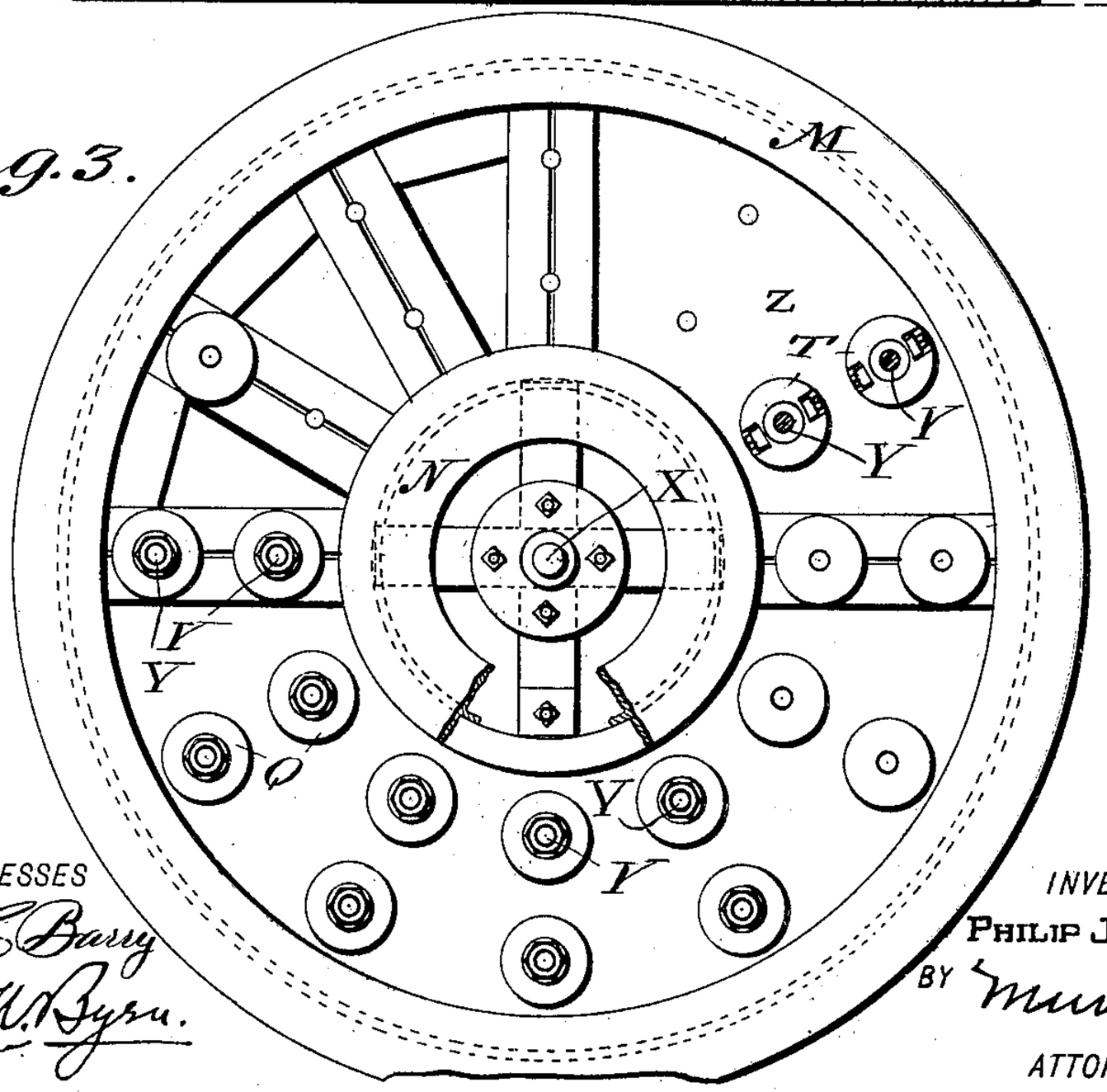


Fig. 3.



WITNESSES

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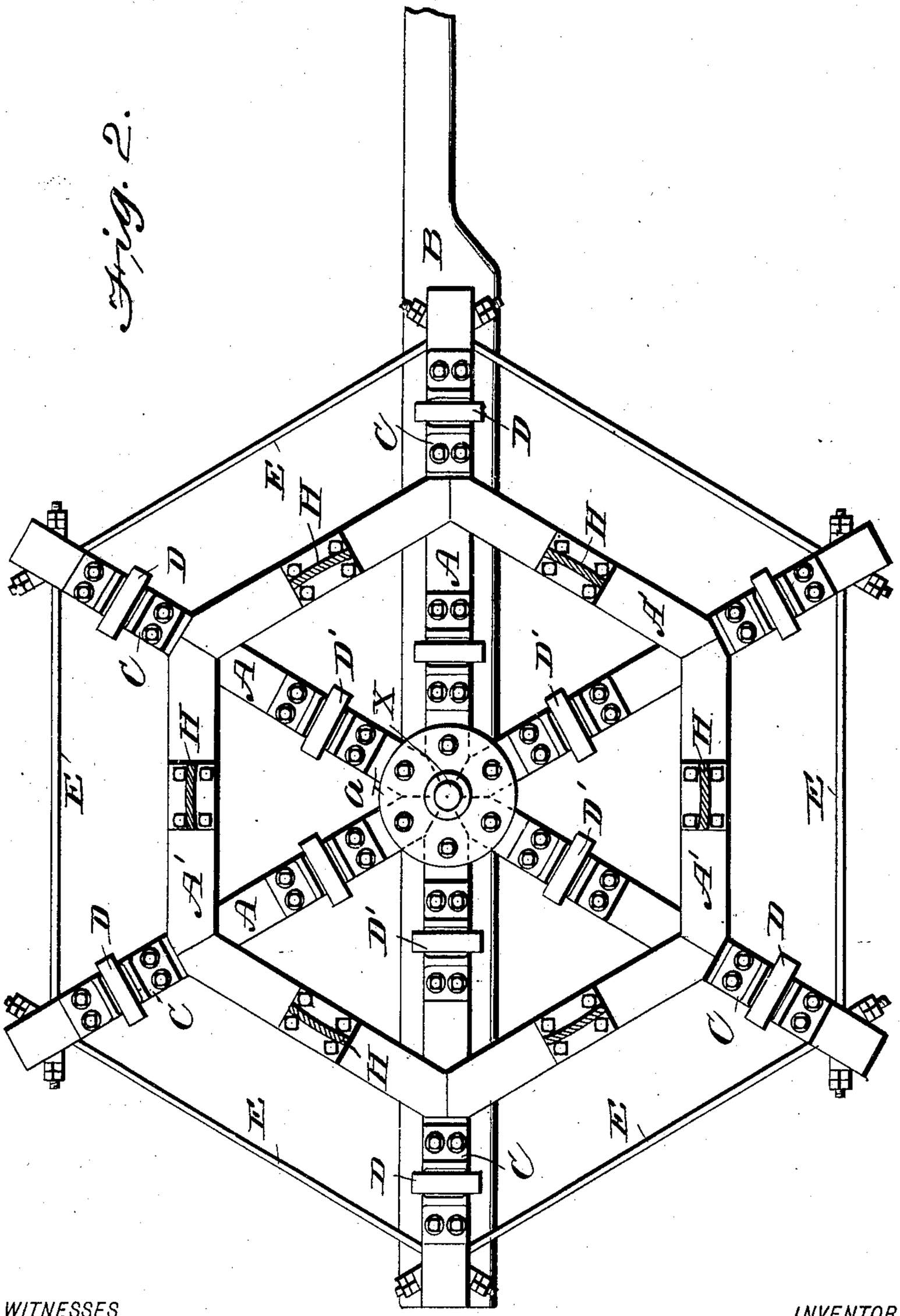
3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 4.

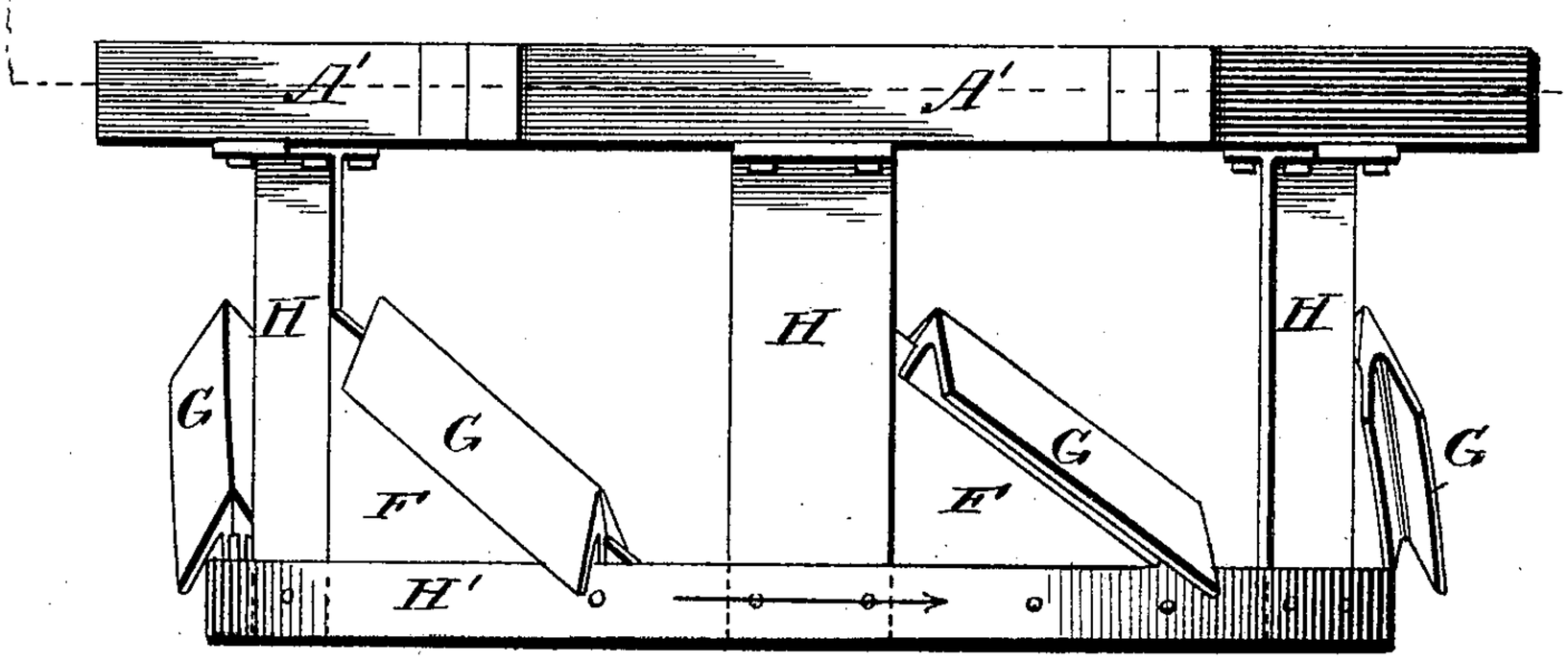
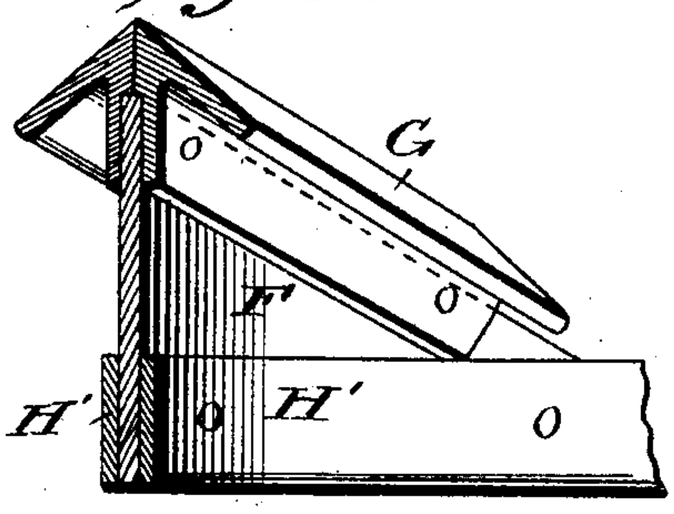


Fig. 5.



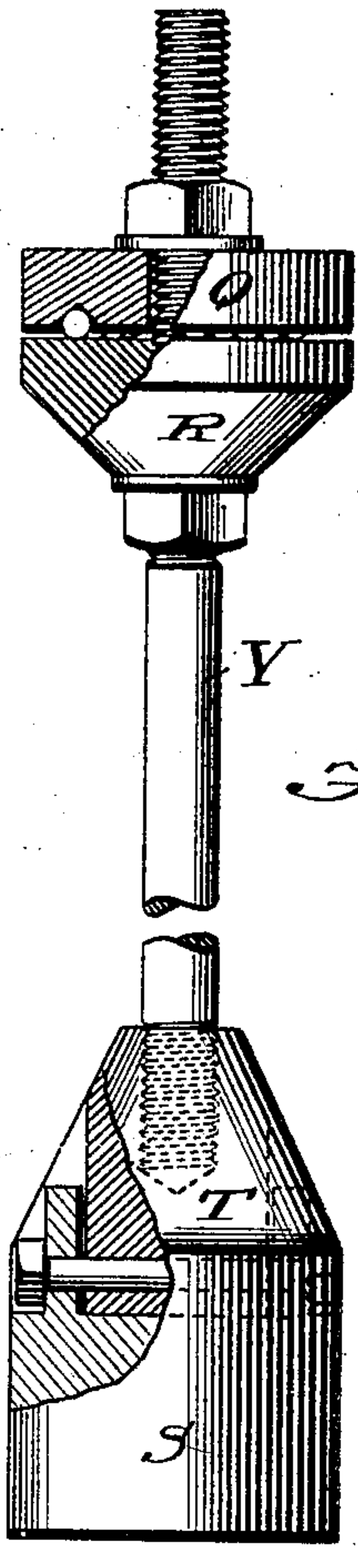


Fig. 6.

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UNITED STATES PATENT OFFICE.

PHILIP J. LONERGAN, OF DENVER, COLORADO.

ROTARY STAMP-MILL.

No. 897,214. Specification of Letters Patent. Patented Aug. 25, 1908.

Application filed June 4, 1907. Serial No. 377,134.

To all whom it may concern:

Be it known that I, PHILIP J. LONERGAN, a citizen of the United States, and resident of Denver, in the county of Denver and State of Colorado, have invented an Improvement in Rotary Stamp-Mills, of which the following is a specification.

My invention is in the nature of a new stamp mill of the type in which vertically reciprocating stamps are arranged to operate upon the ore in a subjacent mortar for the purpose of crushing the same preparatory to extracting the valuable metals contained therein.

My invention is designed to provide an economical and efficient mill of this type, capable of being operated either in a small installation by horse power, or equally efficient on a large scale when operated by power.

The general principles of my stamp mill comprise a circular series of vertically reciprocating stamps combined with a superposed cam wheel mounted above the same on a concentric axis and carrying a circular cam carrier with a series of inclined cams designed to operate upon and successively lift and drop the stamps as said cam wheel is rotated about its center.

An annular mortar is arranged concentrically beneath the circular series of stamps, forming a mill of very high efficiency and of very compact limits as to space.

Figure 1 is a vertical central section through my improved stamp mill. Fig. 2 is an inverted plan view of the cam bearing wheel. Fig. 3 is a plan view partly broken away of the annular mortar. Fig. 4 is a side view in detail of the lower part of the cam wheel with its suspended circular cam carrier. Fig. 5 is a sectional detail on a larger scale showing the connections for the cams with the cam carrier; and Fig. 6 is an enlarged view partly in section of one of the stamps.

Referring to Figs. 1 and 3, Z represents the annular mortar within which are arranged in vertical position, two circular series of stamps Y, Y, guided in suitable radial cross bars.

At the upper edges of the inner and outer walls of the annular mortar, are arranged two circular track rails M and N, upon which are arranged to travel, bearing wheels D, D′, contained within hangers C attached to the lower side of a rotating cam wheel or turn table A, turning about a central vertical shaft X. This cam wheel A is composed of radial bars—see Fig. 2—connected at their outer ends by brace rods E, and connected also by a series of polygonal cross bars A′ bearing downwardly projecting hangers H—see Fig. 4—. The inner or hub portion of this wheel—see Figs. 1 and 2—is provided with a central bearing plate *a* connected by bolts with a plate *a′* on the upper side of said cam wheel. This bearing plate *a* rests upon the top of a rigid collar *x* secured to the central shaft X.

The central shaft X is held in position in cross bars inside the inner walls of the annular mortar, which cross bars are connected to said walls by brackets O. Central bearing plates P are bolted to the cross bars and maintain the vertical shaft X in upright position. To the top portion of the cam wheel A is attached a sweep or lever B extending out radially from the mill, to which sweep or lever is attached a horse, who, in the operation of the mill, travels round and round the same in a circular path. When power is employed for rotating the cam wheel, suitable gearing will be employed to produce the same result.

The hanger bars H depend from the bottom of the cam wheel A in middle position between the outer and inner walls of the annular mortar, and at their lower ends are bolted between two circular rings H′. At intervening points between said hangers, are arranged double cams G in circular series. These double cams—see Figs. 4 and 5—consist of two equal angular wings whose vertical members are bolted on opposite sides of triangular webs F whose lower edges are bolted between the two circular rings H′. The cams G have a double inclination, that is to say, they both incline from the ridge downwardly on each side, while the ridge itself following the inclination of the supporting web F, is also inclined to the vertical, so that one end of the double cam G is relatively low and the other end relatively high.

The stems Y are screwed at their lower ends into coupling blocks T, which in turn are bolted to detachable steel hammer faces S. Near the upper end of the stems are swiveling conical collars R, and at a point above the same are secured ball bearing plates Q which are fastened to the upper part

of the stamps by a screw thread on the stamp shaft, and a screw nut engaging therewith. Between the swiveling conical collar R and the plate Q, is arranged a series of ball bearings. The position of the cams G between the two series of stamps is such that the flanges of said cams ride beneath the swiveling collars R of the two series of stamps, and as this series of cams travels with the superposed wheel or turn table, it will be seen that the inclination of the cams G causes them to engage with the lower conical surface of the swiveling collars on the stamps and to lift them successively as the cams G travel in their circular path. The cam carrier—see Fig. 4—travels in the direction of the arrow in Fig. 4 so that the cams G first engage the stamp collars at their lower ends, and then as the cams progress beneath the stamp collars, the latter rise with a swiveling motion, lifting the stamps until the conical collars reach the upper ends of the cams, at which time the stamps drop off the cams to produce the crushing or hammering blow within the annular mortar.

By having the turn-table arranged above and extending over the upper ends of the stamps and having a suspended cam carrier, I am enabled to employ a plurality of circular series of stamps and thus greatly increase the efficiency of the stamp mill. This construction also permits of the employment of a radial sweep or arm for directly rotating the turn-table by a team without gear wheels or power connection.

I claim:

1. A stamp mill, comprising two concentric circular series of vertical stamps and a superposed and concentric turntable extending over all the stamps and bearing on its under side a cam-carrier with a plurality of double faced cams arranged between the two series of stamps and acting upon the same to lift the stamps of both series and means for rotating the turntable.

2. A stamp mill, comprising a circular series of vertical stamps having each a lifting device composed of an upper rigid collar and a lower swiveling collar freely turning about the stamp stem, means for supporting the swiveling collar, a concentric turntable with pendent cams arranged to act upon and lift the stamps by contact with their swiveling collars and means for rotating the turntable.

3. A stamp mill, comprising a circular series of vertical stamps having each a lifting device consisting of a conical swiveling collar with a ball bearing plate above it fixed to the stamp, and means for supporting the swiveling collar, a concentric and superposed turntable bearing on its lower side cams arranged to engage said collars and lift the stamps and means for rotating the turntable.

4. A stamp mill, comprising a circular series of vertical stamps, a superposed, concentric and horizontal turntable extending over all the stamps and having hangers on its under side, a circular cam carrier attached to the lower ends of the hangers, inclined cams attached to the cam carrier between the hangers and arranged to successively engage and lift the stamps, and means for rotating the turntable.

5. A stamp mill, comprising a circular series of vertical stamps, a superposed, concentric and horizontal turntable extending over the stamps and having hangers on its underside, a circular cam carrier attached to the hangers and composed of two rings secured to the lower ends of the hangers, triangular web-plates bolted between the rings, double inclined cams secured to the upper inclined edges of the triangular web-plates, and means for rotating the turntable.

6. A stamp mill, comprising an annular mortar having two circular tracks, one around each upper edge of both its side walls, a circular series of vertical stamps arranged in the annular mortar and provided with collars, a superposed turntable arranged concentrically above the mortar and extending over all the stamps and provided with two sets of wheels running upon the two tracks, a pendent circular cam carrier attached to the lower side of the turn table and carrying inclined cams adapted to engage the stamp collars and alternately lift and drop the stamps, and means for rotating the turn table.

7. A stamp mill, comprising a plurality of circular series of vertical stamps and a superposed and concentric turntable extending over all the stamps and bearing on its underside a cam carrier with a plurality of suspended cams arranged to act successively upon and lift the stamps, and a sweep arm directly connected to the turntable for actuating the same without gears.

8. A stamp mill, comprising a circular series of vertical stamps, a circular track rail arranged outside of the said series of stamps, a superposed and concentric turntable extending over the stamps and having rollers bearing on said track rail and having inside of said rollers hanger bars bearing suspended cams arranged to successively act upon and lift the stamps, and means for rotating the turn table.

PHILIP J. LONERGAN.

Witnesses:
JOHN LONERGAN,
JEAN R. ATKINS.