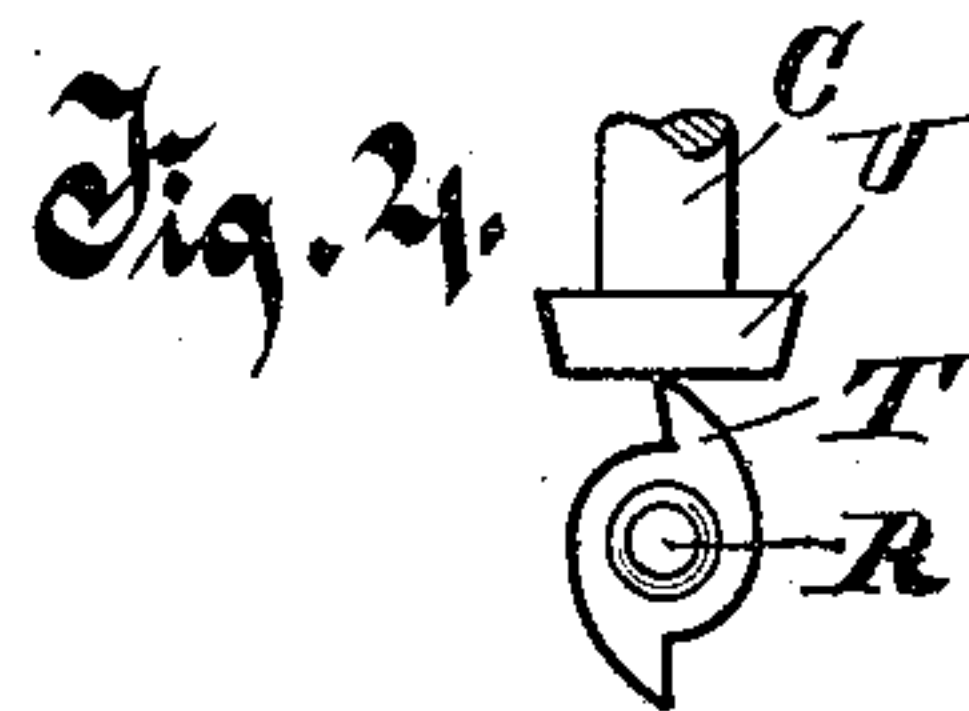
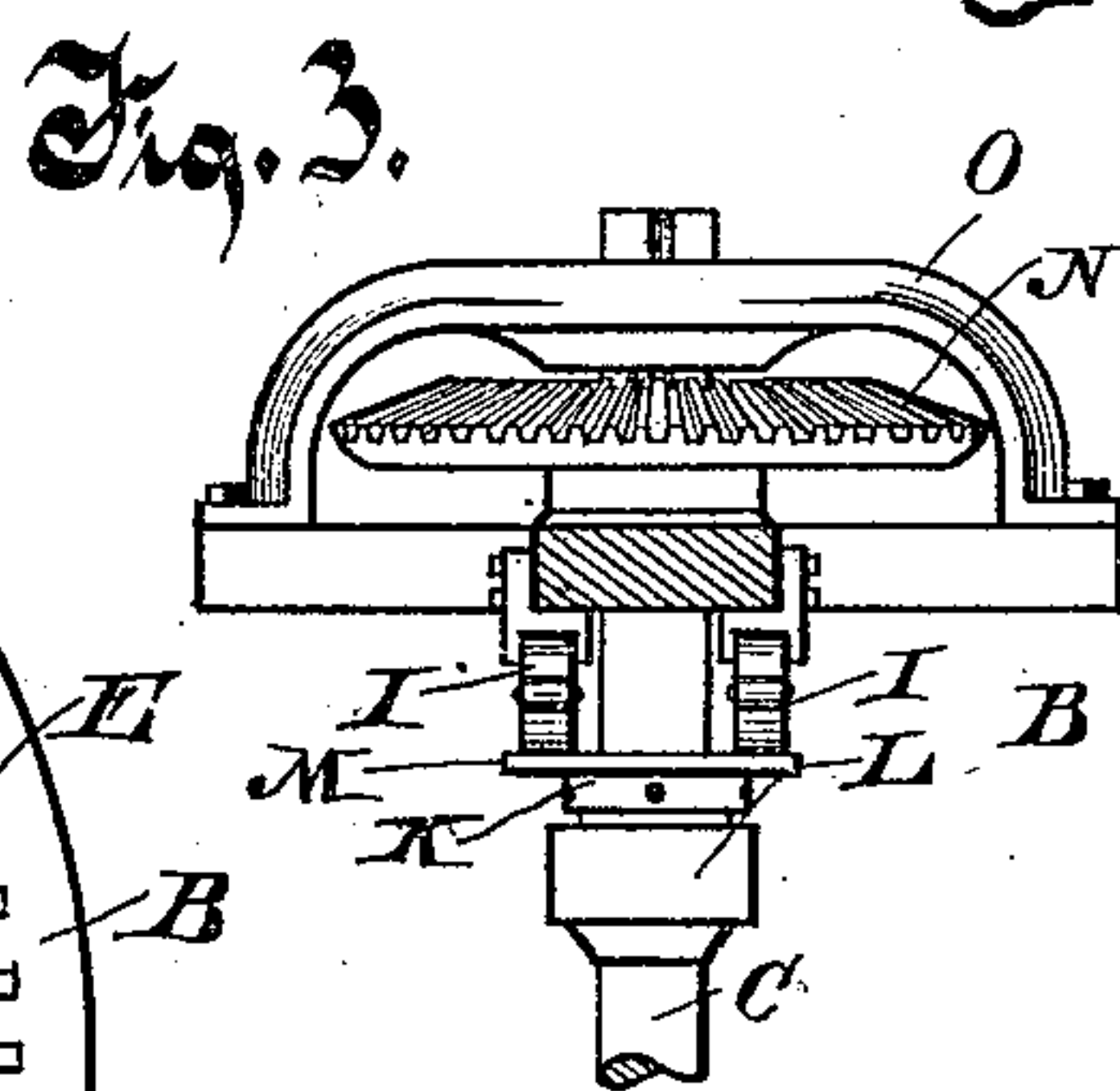
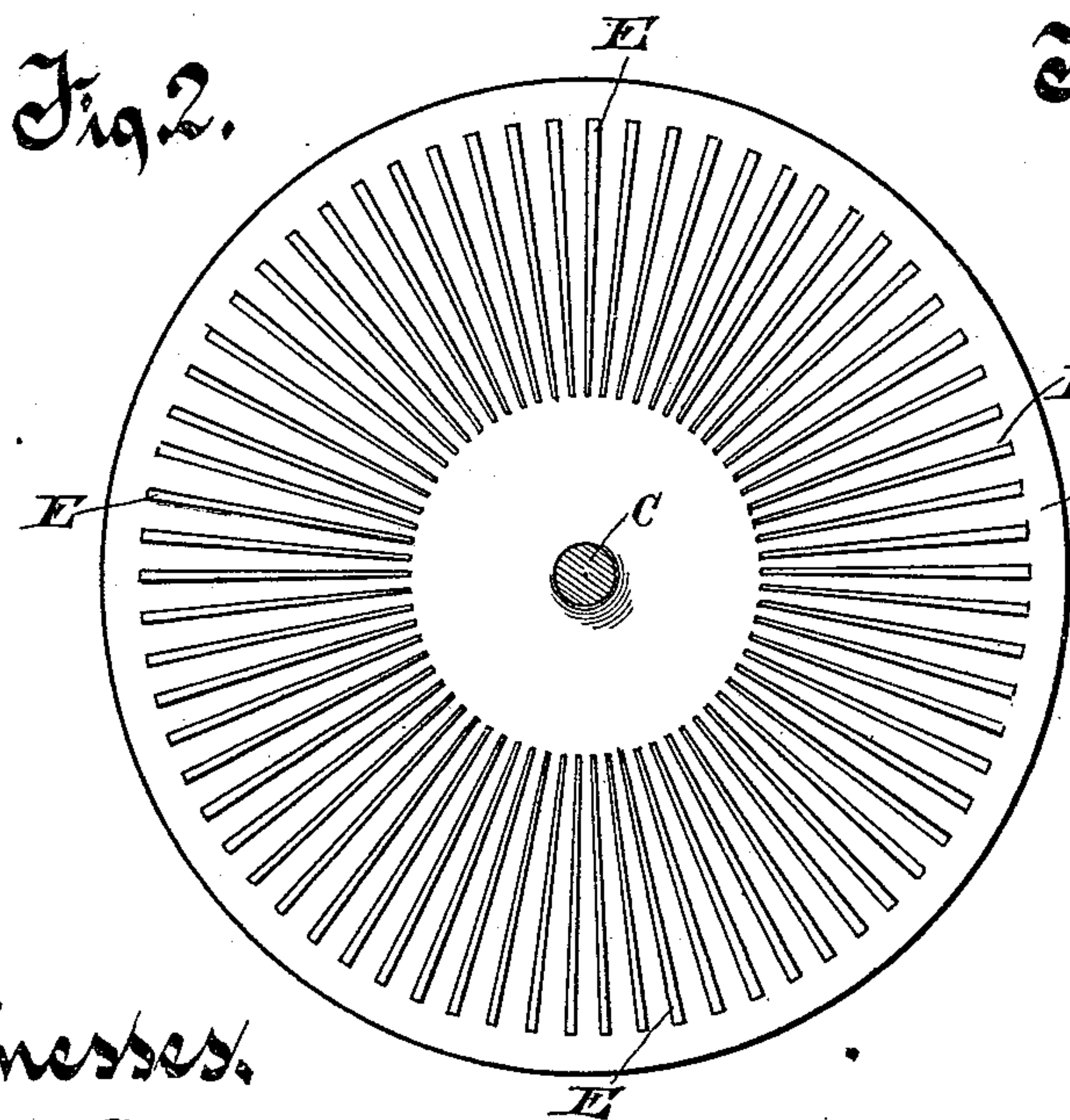
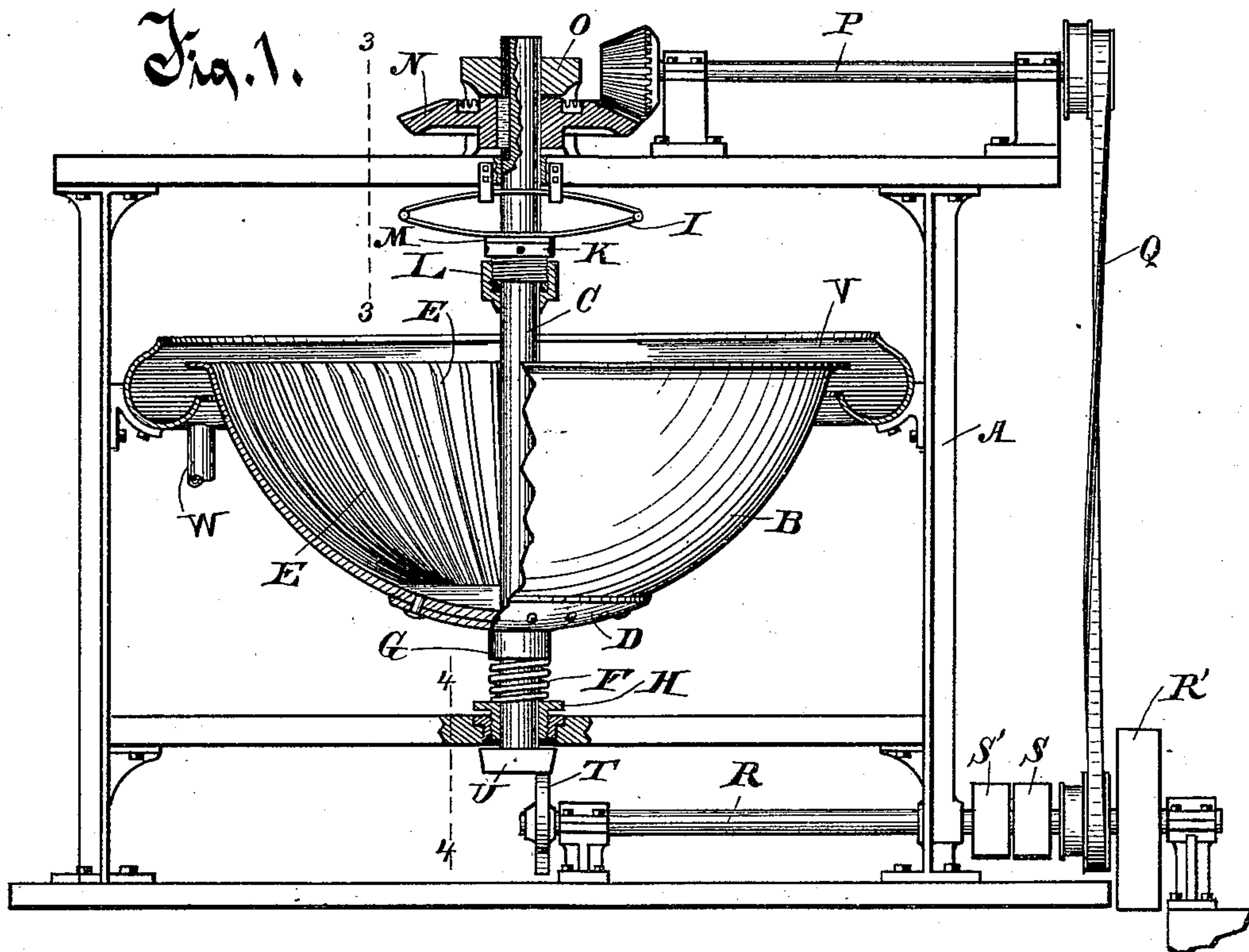


(No Model.)

C. E. SEYMOUR.  
ORE CONCENTRATOR.

No. 459,858.

Patented Sept. 22, 1891.



Witnesses.

*W. Keeney.*

*Anna C. Faust.*

Inventor.

*Charles E. Seymour*

*Charles W. Benedict*  
Attorney.



# UNITED STATES PATENT OFFICE.

CHARLES E. SEYMOUR, OF HURLEY, WISCONSIN.

## ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 459,858, dated September 22, 1891.

Application filed December 26, 1890. Serial No. 375,794. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. SEYMOUR, of Hurley, in the county of Ashland and State of Wisconsin, have invented a new and useful Improvement in Ore-Concentrators, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention comprises a concentrator-bowl and mechanism for operating it.

The device belongs to that class of concentrators in which heavy ores are separated from earth and pulverized refuse by the use of water and the action of centrifugal force and the attraction of gravitation.

In the drawings, Figure 1 is an elevation of my complete device, parts being broken away and other parts shown in section for convenience of illustration. Fig. 2 is a top plan view of the concentrator-bowl. Fig. 3 is a detail in elevation of that part of the device seen in Fig. 1 at the right of line 3 3. Fig. 4 is a detail of the device seen at the right of line 4 4 in Fig. 1.

A is the frame on which the bowl and operative parts of the mechanism are supported. The bowl B is fixed on the vertical centrally-piercing shaft C. A strengthening-plate D is secured to the under side of the bowl about the shaft C. The bowl is provided on its inner surface with a number of radial ribs or elevated corrugations E E, extending from a point at a little distance from the center of the bowl to near its outer edge. These radial ribs serve as riffle bars or dams, behind which the concentrates will gather, and being thus protected and out of the rotary and centrifugal motion of the water will gradually move down toward and settle at the center of the bowl. The shaft C has its bearings in the frame, in which it has rotary and endwise movement. A spring F, coiled about the shaft C, bearing at its upper end against a collar G on the shaft C and at its lower end against the journal-block H, is adapted to support the shaft and bowl yieldingly on the frame. The journal-block H is screw-threaded and turns thereby into a support therefor in the frame. By this construction the journal-block H is made adjustable up and down.

Another spring, preferably in the form of

a pair of elliptical springs I I, is secured above to the frame, and below bears against a sleeve K, turning by screw-thread into a collar L, fixed on the shaft C. These springs I I serve to hold the shaft and bowl down yieldingly and to carry the bowl down more rapidly than gravitation would move it after it has been raised and released from its support by the means hereinafter to be described. A washer M is interposed between the springs I I and sleeve K.

A gear-wheel N, loose on the shaft C, is provided with a rigid spline which enters a longitudinal groove therefor in the shaft C, whereby the wheel is held to rotary motion with the shaft. The gear-wheel N is also held against vertical movement, its hub therefor resting below on the shaft journal-box fixed in the frame and above bearing against the yoke O, fixed on the frame. The counter-shaft P is geared to the shaft C through the wheel N and is driven by the belt Q, running thereon and on the driving-shaft R. The driving-shaft R is provided with a fly-wheel R' and fast and loose pulleys S S'. The driving-shaft is also provided with a cam T, arranged to bear against a disk U, fixed on the lower end of the shaft C, and adapted by the revolution of the shaft R to raise and permit the fall of the shaft C with the bowl B, producing, when the device is in operation, a rapid vertical movement of the bowl at the same time that it is revolved horizontally. An annular trough V about the bowl B at its upper edge is adapted to catch the overflow therefrom and permit it to run off through the discharge-pipe W.

In use the bowl is supplied with water, and a quantity of mingled ore and refuse in a comparatively fine or pulverized condition is placed in the bowl in the water therein, and the bowl being rapidly revolved and at the same time made to jump up and down by the mechanism provided therefor the material in the bowl will be carried around and agitated by frictional contact with the bowl, and a portion of the water and the lighter parts of the refuse will by the centrifugal force be carried over the top of the bowl into the trough V and discharge therefrom, while the heavier parts and especially the concentrates or ore

will remain in the bowl with another portion of the water and when the bowl is ultimately stopped will settle to the bottom of the bowl, from which they may be removed in any convenient manner.

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

1. The combination, with an ore-concentrator bowl fixed on a vertical shaft, and suitable mechanism for revolving it horizontally, of a driving-shaft, a vertically-rotating cam fixed thereon, and a disk on the bowl-shaft against which the cam bears, whereby the bowl is alternately lifted and permitted to fall, substantially as described.

2. The combination, with a concentrator-bowl fixed on a central vertical shaft, which shaft has vertical movement in its bearings, of a gear-wheel splined on the shaft and held

against vertical movement, a driving-shaft geared to the wheel on the bowl-shaft, and a cam fixed on the driving-shaft and bearing against a disk on the bowl-shaft and adapted by its revolution to lift the bowl and let it fall, substantially as described.

3. The combination, with a concentrator-bowl arranged to be revolved horizontally, and suitable mechanism for jumping it up and down, of radial corrugations or ribs on the inner surface of the bowl, which ribs serve as riffle bars or dams to accumulate concentrates, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES E. SEYMOUR.

Witnesses:

F. C. STEWART,  
THOS. E. ALLEN.