

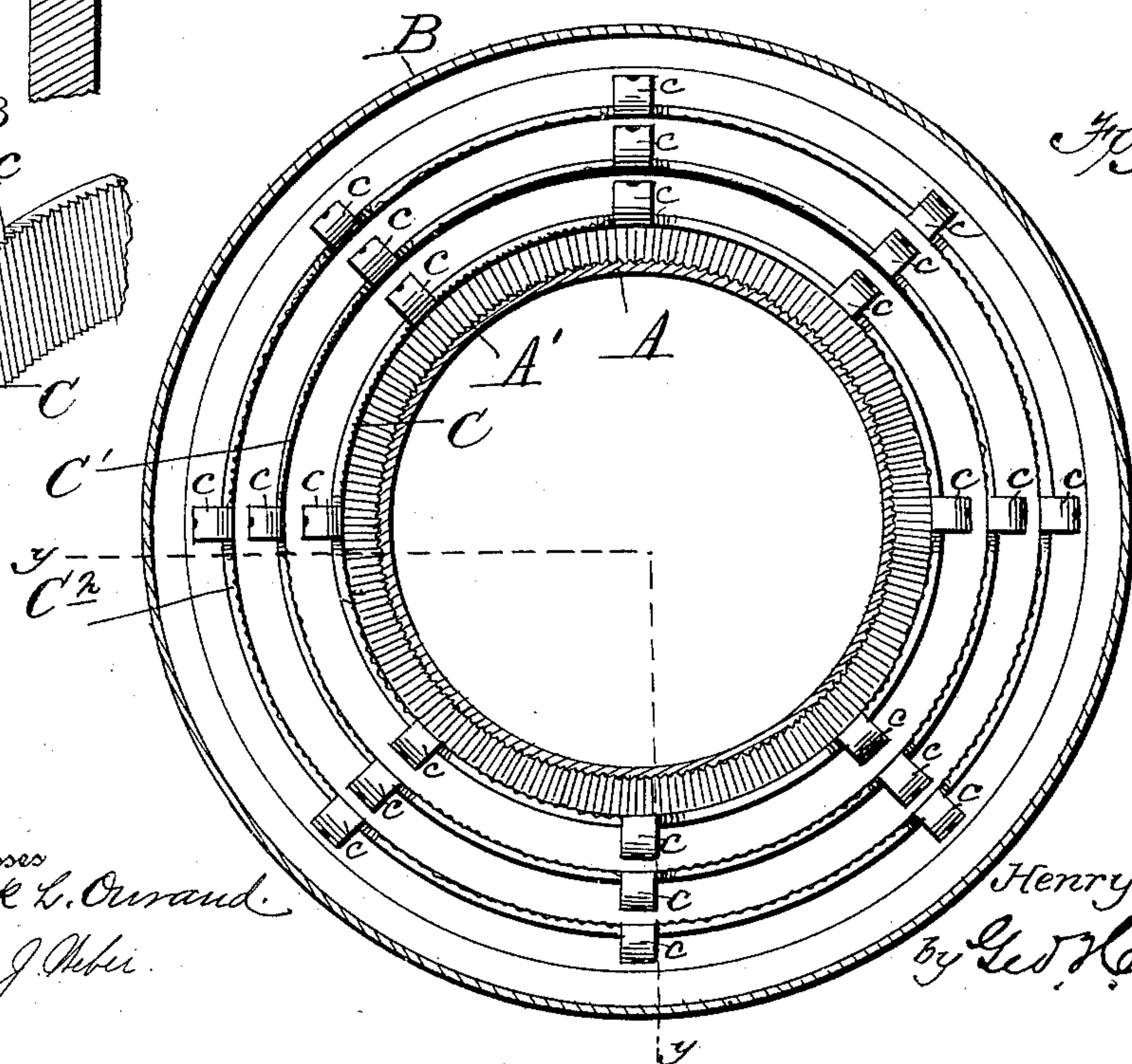
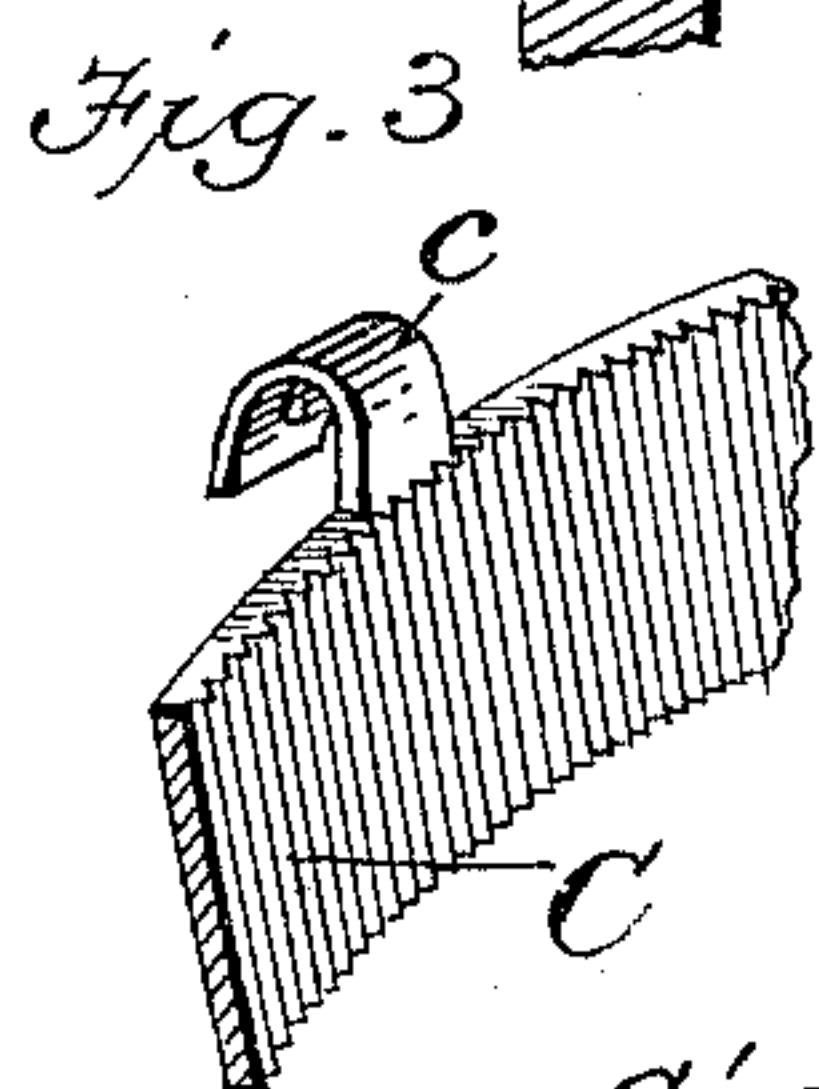
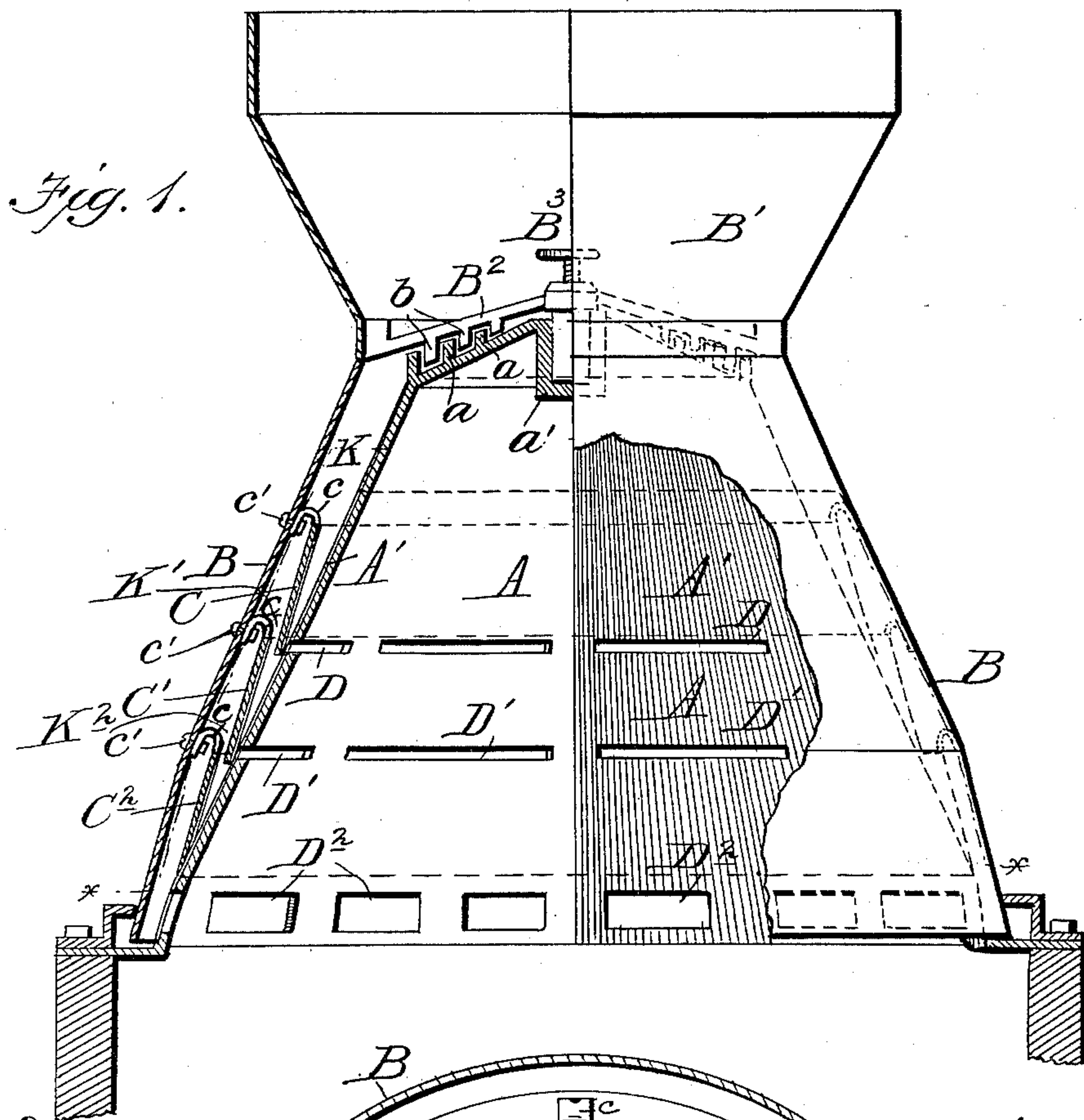
No. 612,776.

Patented Oct. 18, 1898.

H. KELLY.  
GRINDING MILL.

(Application filed Feb. 28, 1898.)

(No Model.)



Witnesses  
Frank L. Ormand  
George J. Miller

Inventor  
Henry Kelly  
by Geo. H. Evans  
Attorneys



# UNITED STATES PATENT OFFICE.

HENRY KELLY, OF WATERLOO, IOWA, ASSIGNOR TO HIMSELF AND O. B. FANEYHILL.

## GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 612,776, dated October 18, 1898.

Application filed February 28, 1898. Serial No. 671,978. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY KELLY, a citizen of the United States of America, residing at Waterloo, in the county of Black Hawk, in the State of Iowa, have invented certain new and useful Improvements in Grinding-Mills, of which the following is a specification.

My invention relates to that class of mills used for grinding grain for feed.

The objects of the invention are to provide the outer rotary conical mantle or shell with a series of internal-spaced grinding-rings lying in different horizontal planes, said rings being opposed to the outer grinding-surface of the inner stationary cone; to render such grinding-rings readily removable for repairs, &c.; to provide a series of openings in the inner cone for the exit of the grist, the said openings being overlapped by the lower edges of the respective rings, so that the grain falling down behind the uppermost ring will be guided down in front of the next lower ring and be prevented from passing in its underground condition through the grist-openings for the first ring, and, finally, to provide a grinding-mill which shall be simple, inexpensive, and comparatively light.

The above objects are accomplished by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, on line *y y*, Fig. 2, of a grinding-mill with my improvements applied, the casing being broken away to the right to expose the inner stationary cone. Fig. 2 is a sectional plan view on line *x x* of Fig. 1. Fig. 3 is a detail view showing a portion of one of the grinding-rings.

A represents the inner stationary cone, provided on its top with the usual breaking-teeth *a* and step-bearing *a'*.

D D' D<sup>2</sup> are horizontal series of circumferential grist-openings extending through the cone A in different planes, and A' represents the grinding teeth or corrugations on the outer face of the cone A. These teeth A' are virtually divided into three annular series by the grist-openings.

B is the rotary mantle or outer grinding-cone surrounding the cone A and spaced therefrom, as shown. The cone or mantle B

is provided at its upper end with a hopper B', supporting-arms B<sup>2</sup>, having break-teeth *b*, operating in connection with the teeth *a*, and adjusting spindle or screw B<sup>3</sup>, stepped at its lower end in bearing *a'* in the usual manner.

C C' C<sup>2</sup> are horizontal grinding-rings secured to the inner face of rotary mantle or cone B, one below the other and spaced from the said cone for the passage of the grain. Each grinding-ring is provided at its inner face with grinding teeth or corrugations and on the upper edge with a series of apertured lugs *c*, resting against the mantle or cone and secured removably thereto by bolts *c'*. The grinding-rings C C' C<sup>2</sup> lie in the same horizontal planes as the annular series of teeth A' on the stationary cone A, and their lower edges approach the cone A more closely than their upper edges to more readily admit the grain. The lower edges of rings C C' extend over the openings D D', respectively, to prevent the grain passing through spaces K K' K<sup>2</sup> from entering the said openings, but cause it to pass between the next lower ring and the opposed stationary grinding-surface. The lower ring C is spaced from the upper edge of ring C', and the lower edge of the latter is spaced from the upper edge of the ring C'', and so on throughout the series of rings, of which there may be any desired number. Thus any grain which fails to pass between ring C and cone A will fall back into space K', from which it passes over the upper edge of ring C' and into the space between said ring and the stationary cone A, and so on to the end of the series. The grist from the last ring passes into the receptacle at base of cone A.

From the foregoing it will be seen that the parts are few and easily gotten at for repair, replacement, &c.

What I claim is—

1. The combination with the inner cone having series of horizontally-arranged grist-openings and provided with an external grinding-surface, of an outer mantle or cone spaced from the inner cone and provided on its inner face with a plurality of rings one above the other, said rings being spaced from each other and from the inner face of the mantle

and provided on their sides next to the inner cone with grinding surfaces or corrugations; whereby the unground material falling outwardly over the upper edge of one ring will  
5 fall down behind said ring into the space between the next lower ring and the inner cone, substantially as described.

2. A grinding-mill, comprising the inner stationary cone provided on its top with break-  
10 ing-teeth and on its outer side with corrugations or teeth and with series of grist-openings in different planes, the outer rotary mantle or cone mounted adjustably on the

inner cone and provided at its upper end with a hopper and breaking-teeth, and a plu- 15  
rality of grinding rings or bands within said rotary cone, the lower edges of the bands or rings serving as guards for the grist-openings, substantially as described.

In testimony whereof I affix my signature 20  
in presence of two witnesses.

HENRY KELLY.

Witnesses:

CHARLES HEALSCH,  
A. I. BRECKENRIDGE.



It is hereby certified that the name of the assignee in Letters Patent No. 612,776, granted October 18, 1898, upon the application of Henry Kelly, of Waterloo, Iowa, for an improvement in "Grinding-Mills," was erroneously written and printed "O. B. Faneyhill," whereas said name should have been written and printed *O. B. Taneyhill*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 25th day of October, A. D., 1898.

[SEAL.]

THOS. RYAN,  
*First Assistant Secretary of the Interior.*

Countersigned:

C. H. DUELL,  
*Commissioner of Patents.*