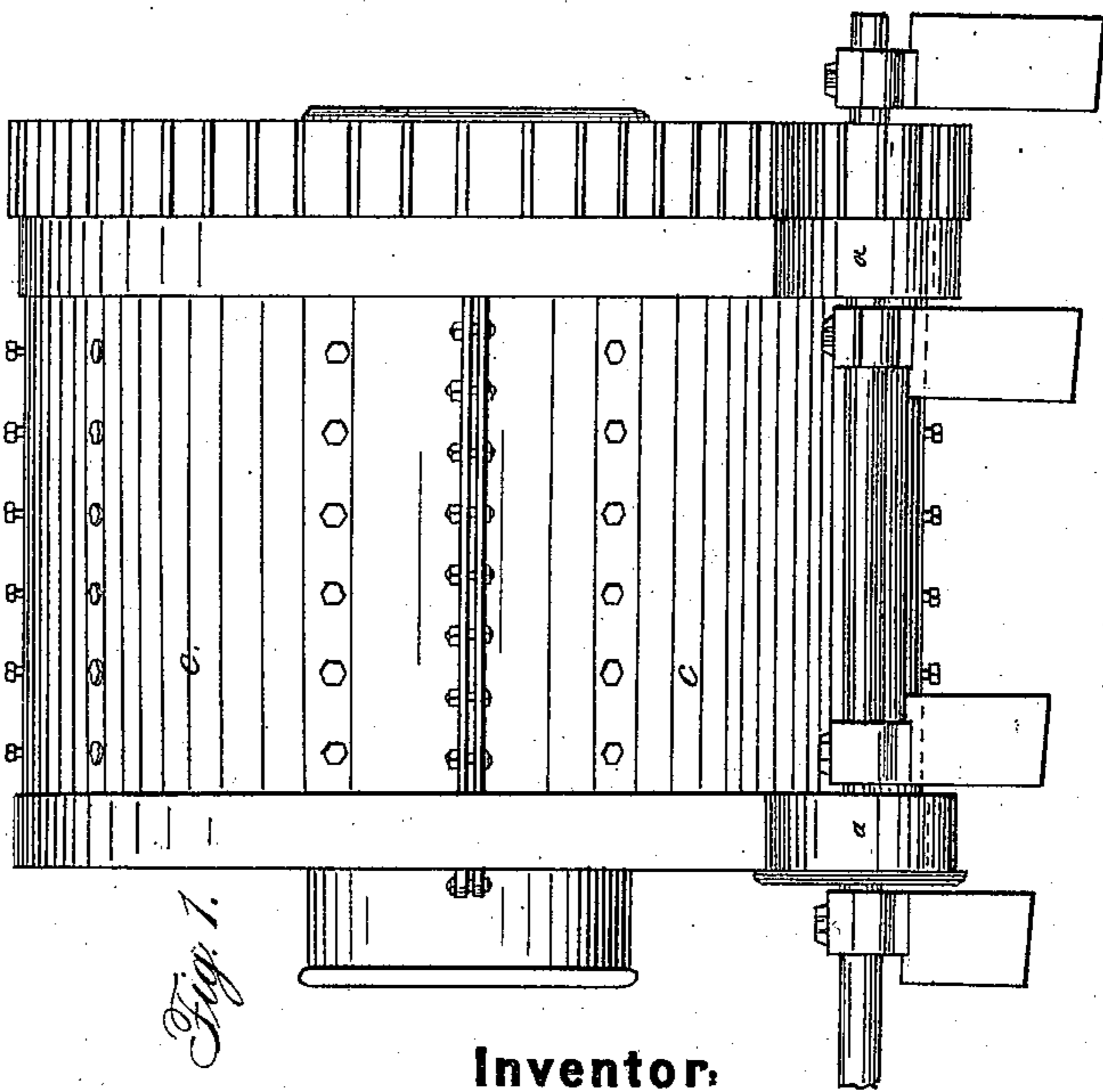
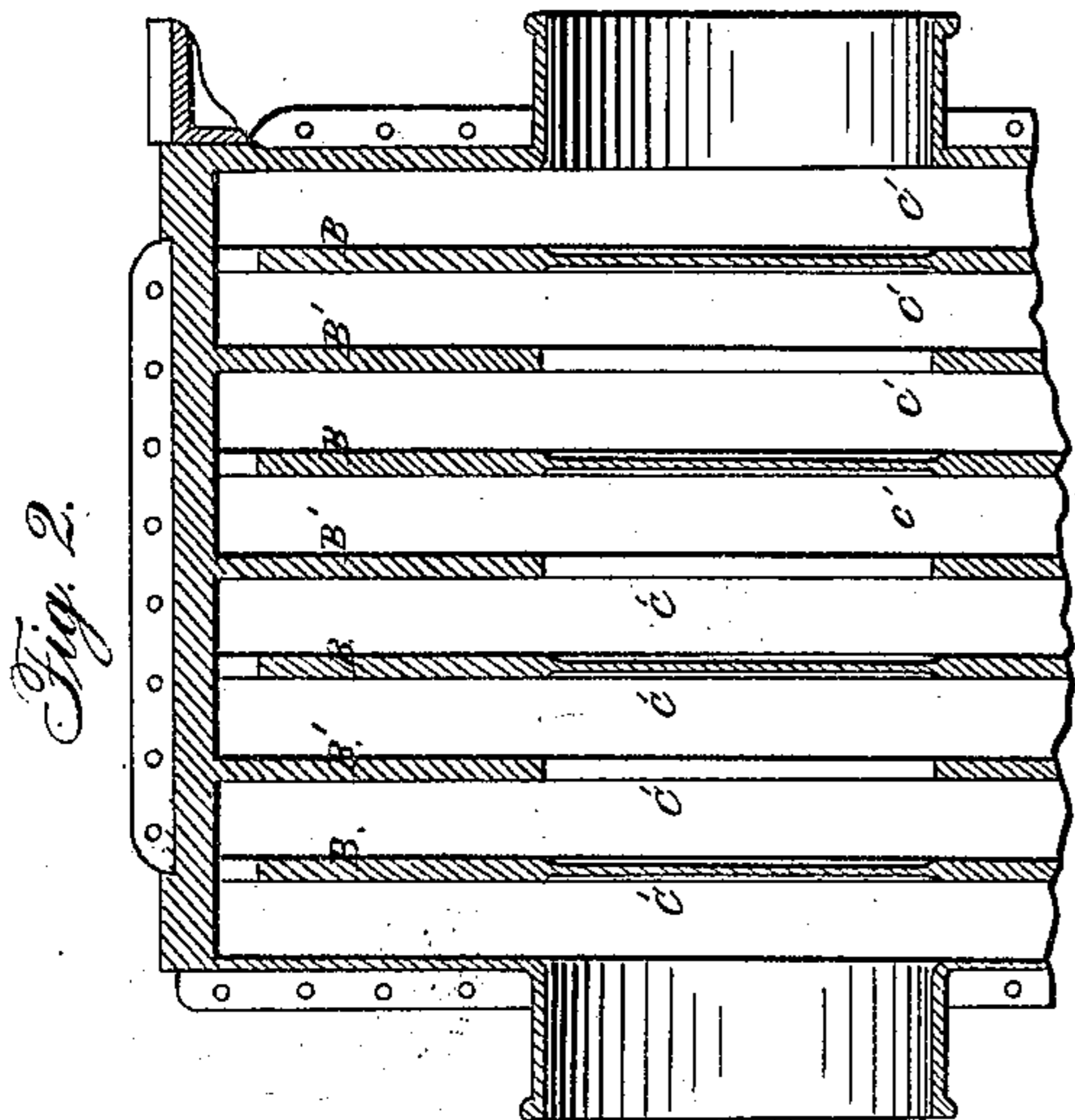
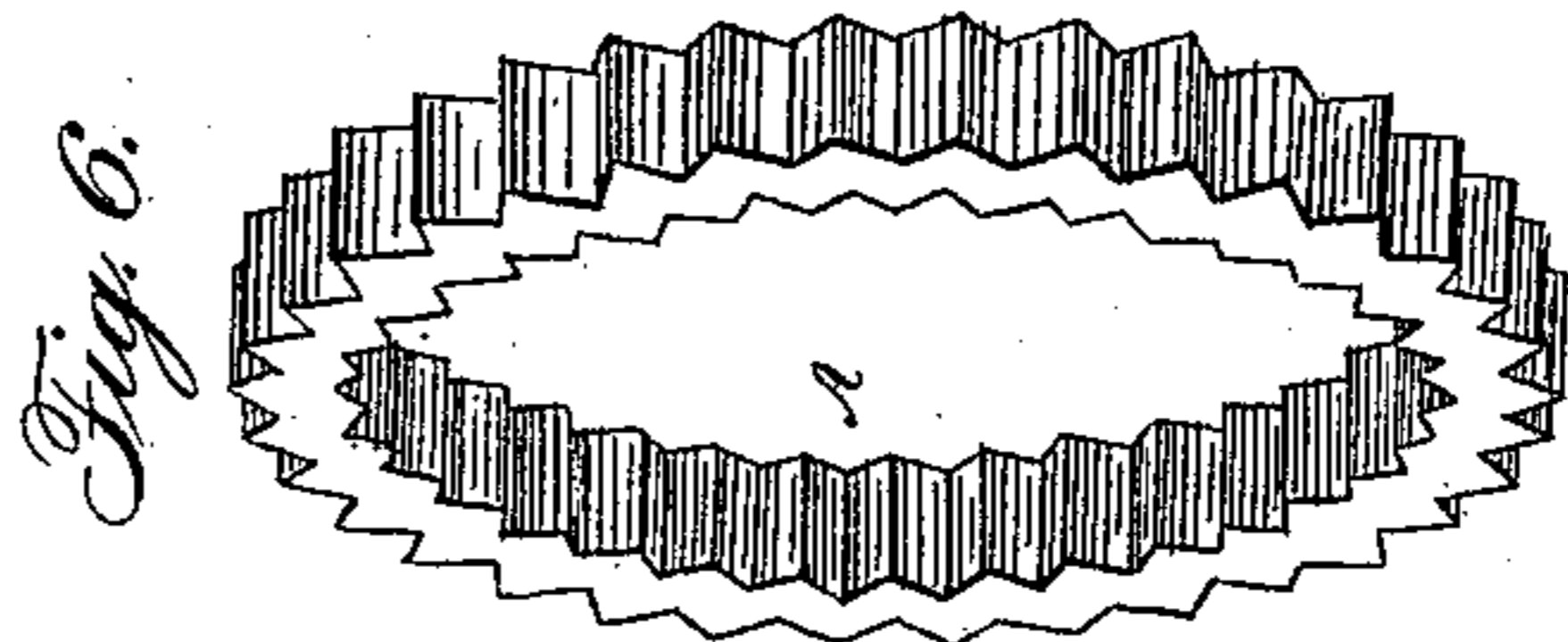
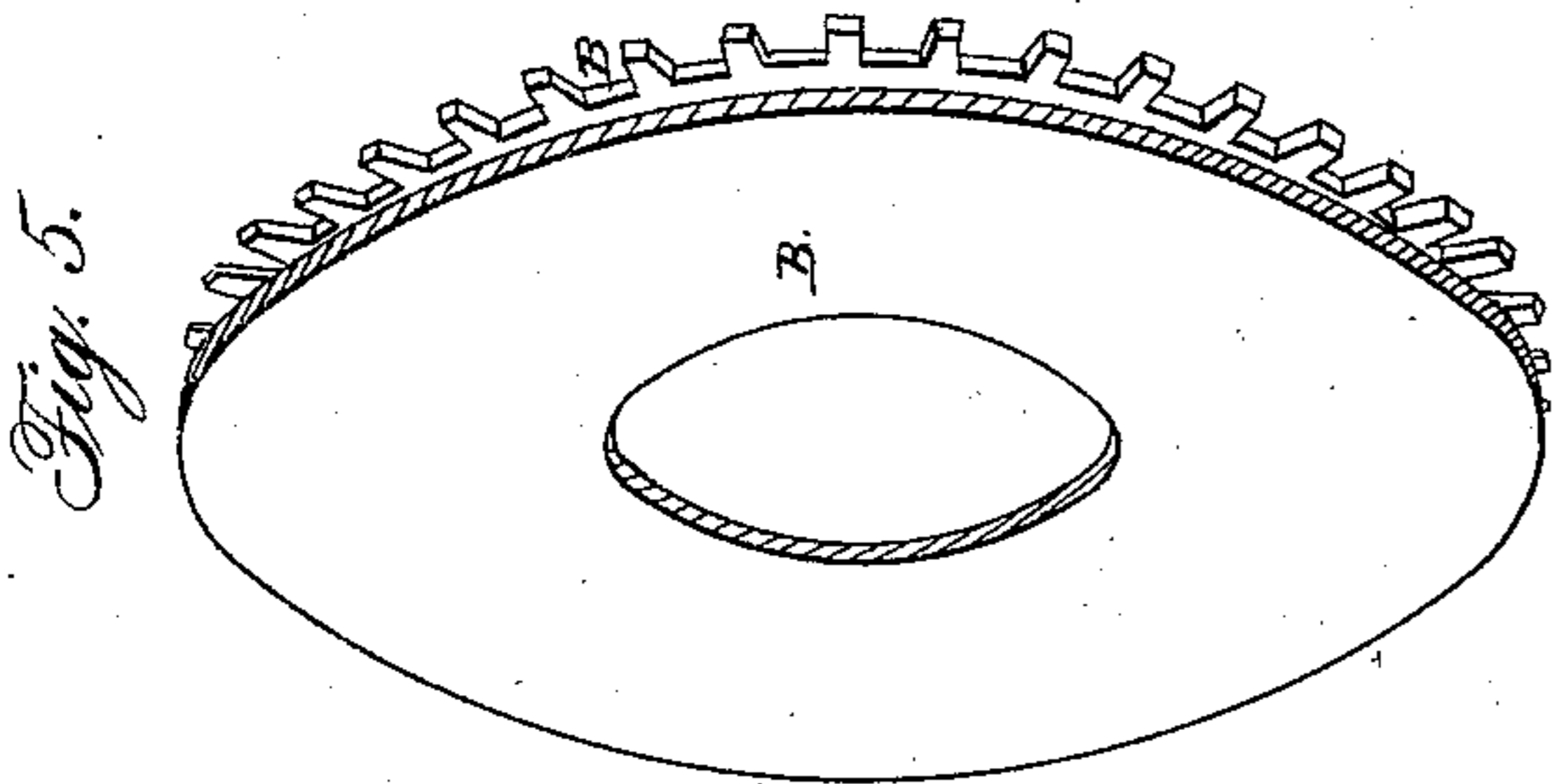
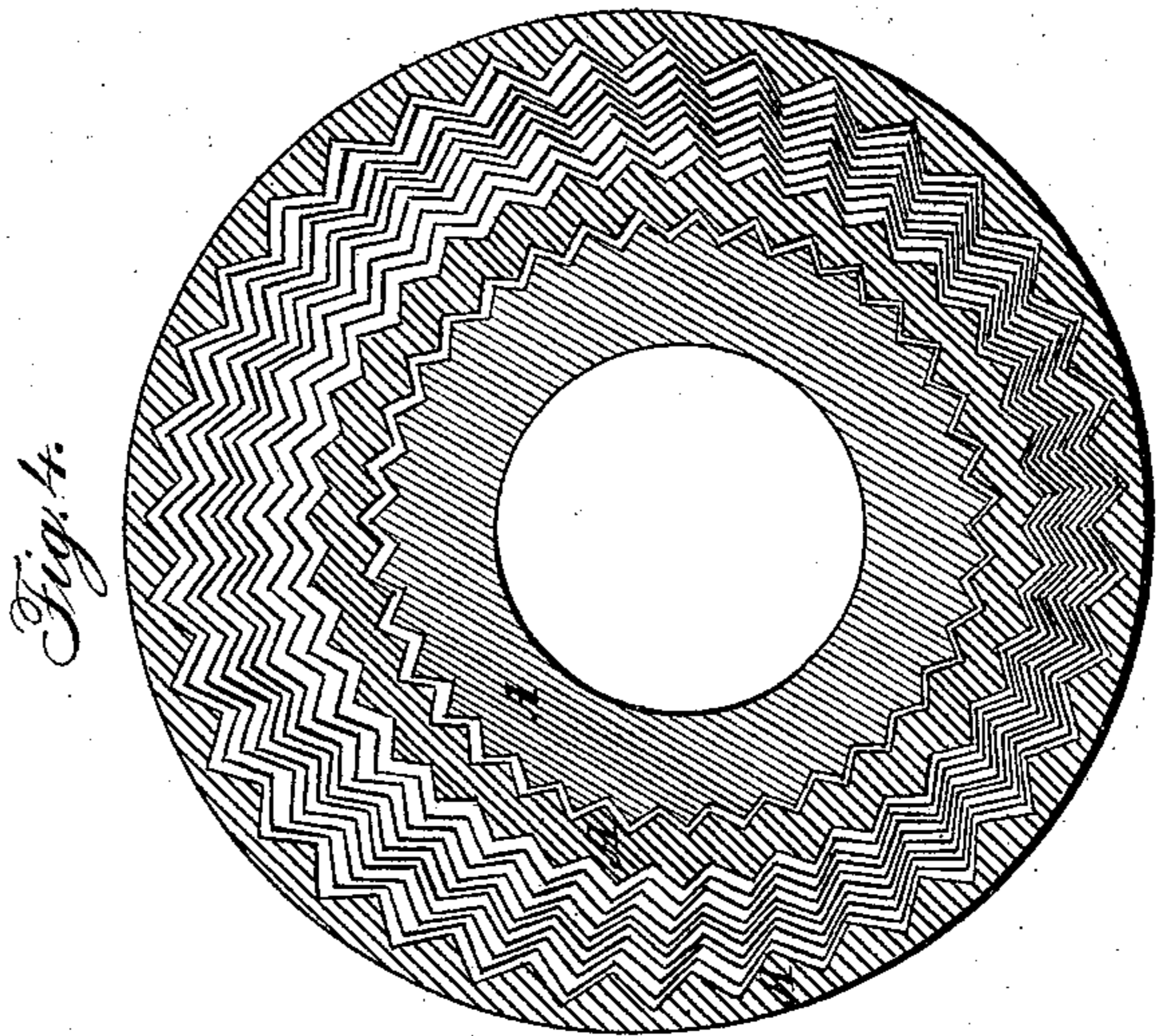
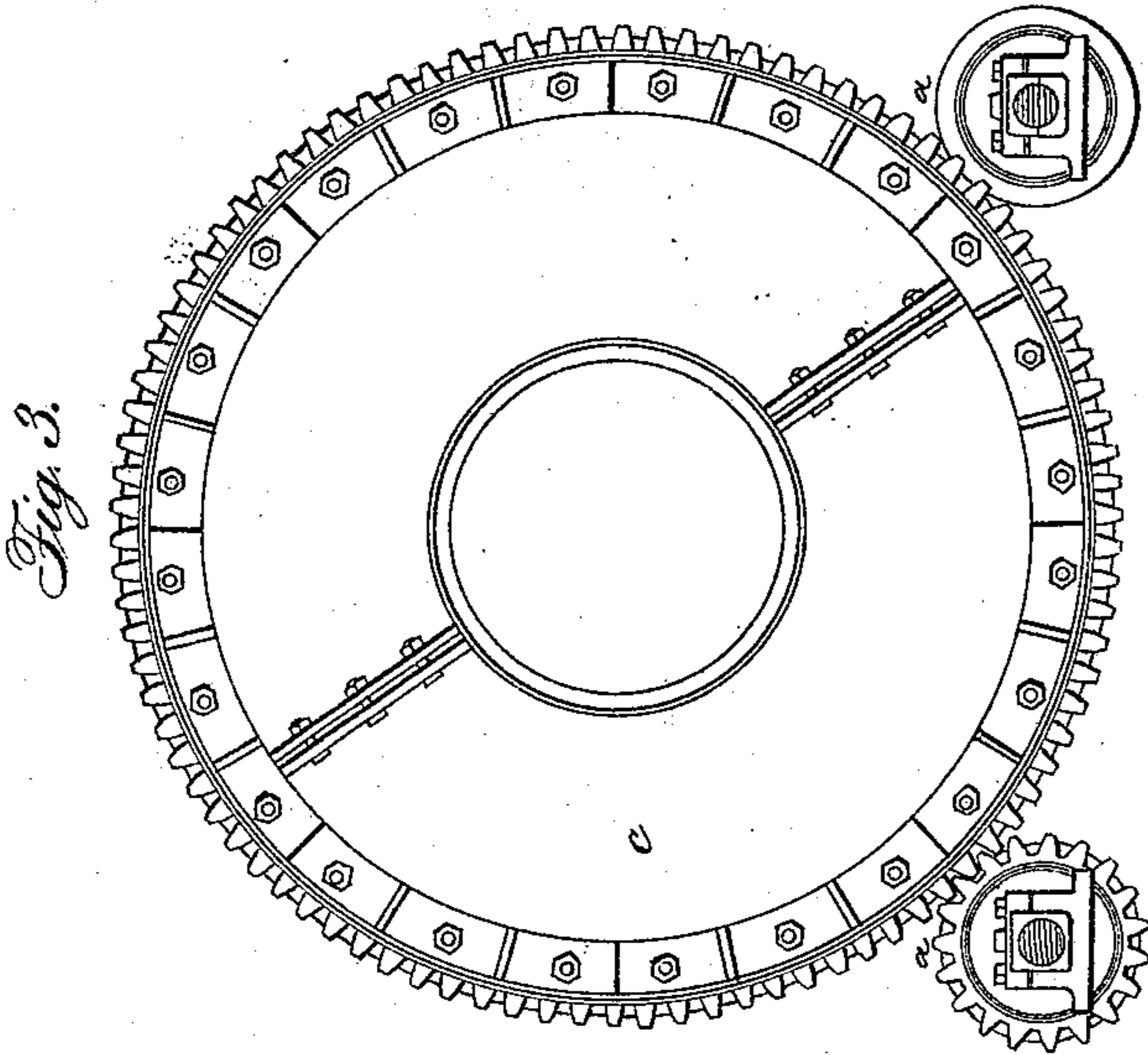


T. J. CHUBB.

Ore Mill.

No. 52,532.

Patented Feb. 13, 1866.



Witnesses:

R. T. Campbell  
Edw. Schaffer

Inventor:

Thomas J. Chubb  
by his Atty.  
Mason Fenwick Lawrence

# UNITED STATES PATENT OFFICE.

THOMAS J. CHUBB, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN QUARTZ-MILLS.

Specification forming part of Letters Patent No. 52,532, dated February 13, 1866.

*To all whom it may concern:*

Be it known that I, THOMAS J. CHUBB, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Crushing and Regrinding Machine; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is an elevation of one side of my improved machine. Fig. 2 is a diametrical section through the revolving cylinder, showing the arrangement of partitions therein. Fig. 3 is an end view of the machine. Fig. 4 shows a series of annular corrugated crushers. Fig. 5 shows the construction of the partition-plates. Fig. 6 is a perspective view of one of the corrugated crushing and grinding rings.

Similar letters of reference indicate corresponding parts in the several figures.

The object of this invention is to more perfectly and readily effect the reduction of metalliferous ores and sands to a fine powder for the purpose of exposing all the atoms or scales of the metal therein, and thus affording a more perfect separation of the metal from its matrix by the subsequent process of amalgamation.

The nature of my invention consists in the arrangement of a series of corrugated rings loosely within a movable cylinder in such manner that the mineral substances which are passed into or through said cylinder will be subjected to the grinding action of a greater amount of grinding-surface than can be brought within a given compass by any other plan, as will be hereinafter described.

Another part of my invention consists in providing for distributing the mineral substances to the grinding-surfaces of said rings, and at the same time compelling said substances to pass through a series of chambers, whether the substances be in a dry or a wet state, as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, C represents a cylinder with central openings through its heads or ends, in the form of tubes or flanges, as shown in Fig. 2. This cylinder C may be constructed of two semi-cylindrical sections, as represented in the drawings, and these suit-

ably bolted together, so that the joints will be perfectly tight. It is mounted upon four flanged rollers, *a a a a*, so that it can be easily rotated during the operation of grinding and crushing. Within said cylinder C are several chambers, C' C', which are formed by means of circular partitions B B', that are suitably secured in place, so as to rotate with the cylinder. These partitions are intended more particularly for the distribution of the substances which are to be ground or reground to the grinding-surfaces, and to this end the partitions B' have holes through their centers, and the partitions B have holes through them at or near their circumference. The partitions B B' are arranged alternately in the cylinder C, so that the substances are compelled to pass from the center to the circumference of said cylinder, and thence toward the center again several times during the passage of the substances through the cylinder.

Within each one of the chambers C' a series of corrugated rings is arranged, as shown in Fig. 4. These rings A A may be made of different thickness, the central ring being the thickest and the heaviest. The width of these rings may be uniform and slightly less in width than the chambers C', within which they are arranged. These rings A are corrugated inside and outside, so that the external corrugations of one ring will fit within the internal corrugations of another ring, thus greatly augmenting the surfaces to which the mineral substances will be exposed in passing through the cylinder C.

It will be preferable in all cases to corrugate the rings, as I have represented in Fig. 4; but I do not confine myself to this particular form of corrugated surface, as the elevations and depressions may be made more or less acute, or the surfaces of the rings may be more in the form of spurred teeth, which will answer a very good purpose for grinding and crushing mineral substances; nor do I confine myself to any definite number of such rings, for the thinner they are made the greater the number may be used one within another. Different numbers of such rings may be used in different chambers, and the central or heaviest rings may be combined with a series of very thin and light rings. The difference in the diameters of the rings of one series is such that

the rings all play loosely one within another, and as the cylinder C is rotated about its axis these rings also rotate and find their lowest point, as represented by the arrangement in Fig. 4, thus leaving spaces above said point for allowing the mineral substances to pass through as they are crushed and ground to a fine powder between said spaces.

To operate the machine, the ore or sand, if dry, is forced through the several chambers C' by means of blast or suction, while the cylinder C is revolving. If the material to be ground is wet it is floated through the several chambers by means of a current of water. In both states the material passes from one chamber to another as rapidly as it is liberated by the grinding-rings, until it is finally discharged from one end of the cylinder in a finely-disintegrated state.

Some of the advantages of my improved re-grinding-machine over other machines for a similar purpose are as follows: It has more crushing and wearing surface for the same

weight of metal, thus saving expense in transportation; it requires less expenditure of power to perform a given amount of work; it is simple in construction, easily made, and not liable to get out of order; it can be used with dry as well as wet substances, and it cannot become clogged or overcharged.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The employment of corrugated rings, arranged one within another, for the purpose of disintegrating mineral substances, substantially as described.

2. The arrangement of a series of grinding-surfaces within a chambered cylinder the chambers of which communicate with each other, substantially as described.

THOS. J. CHUBB.

Witnesses:

ANDREW J. FAUROUT,  
G. CONRAD STAUTZ.