

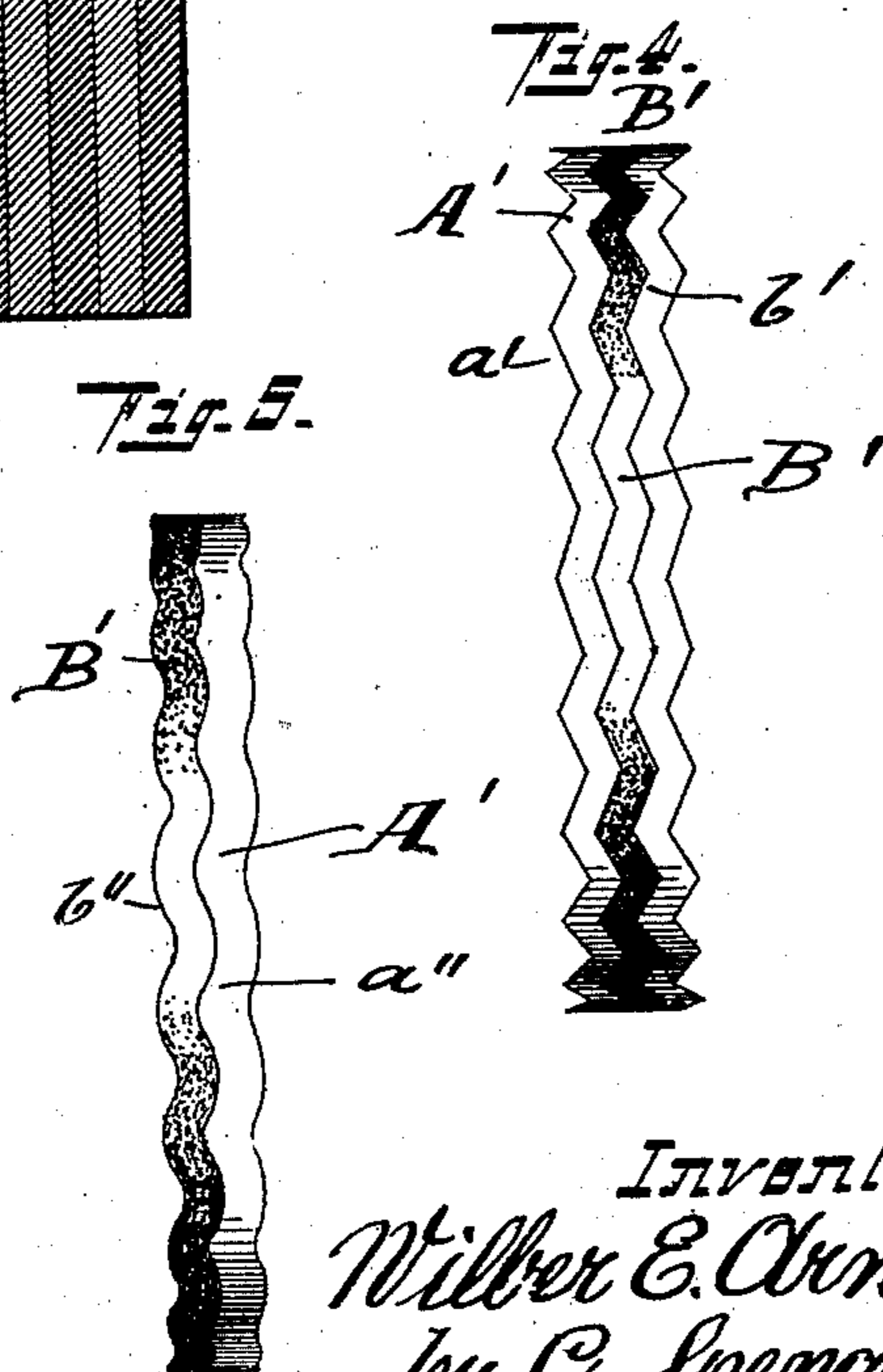
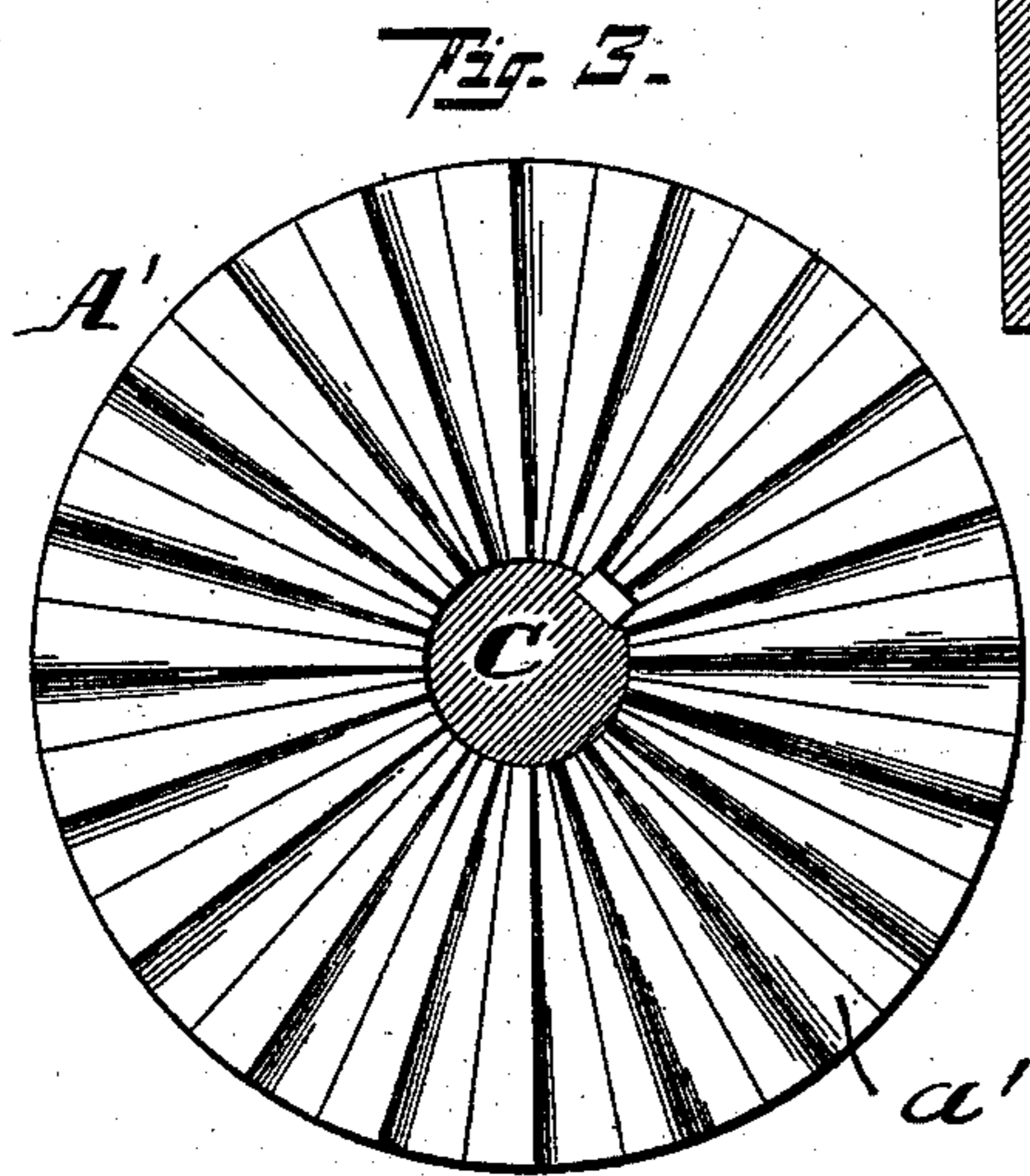
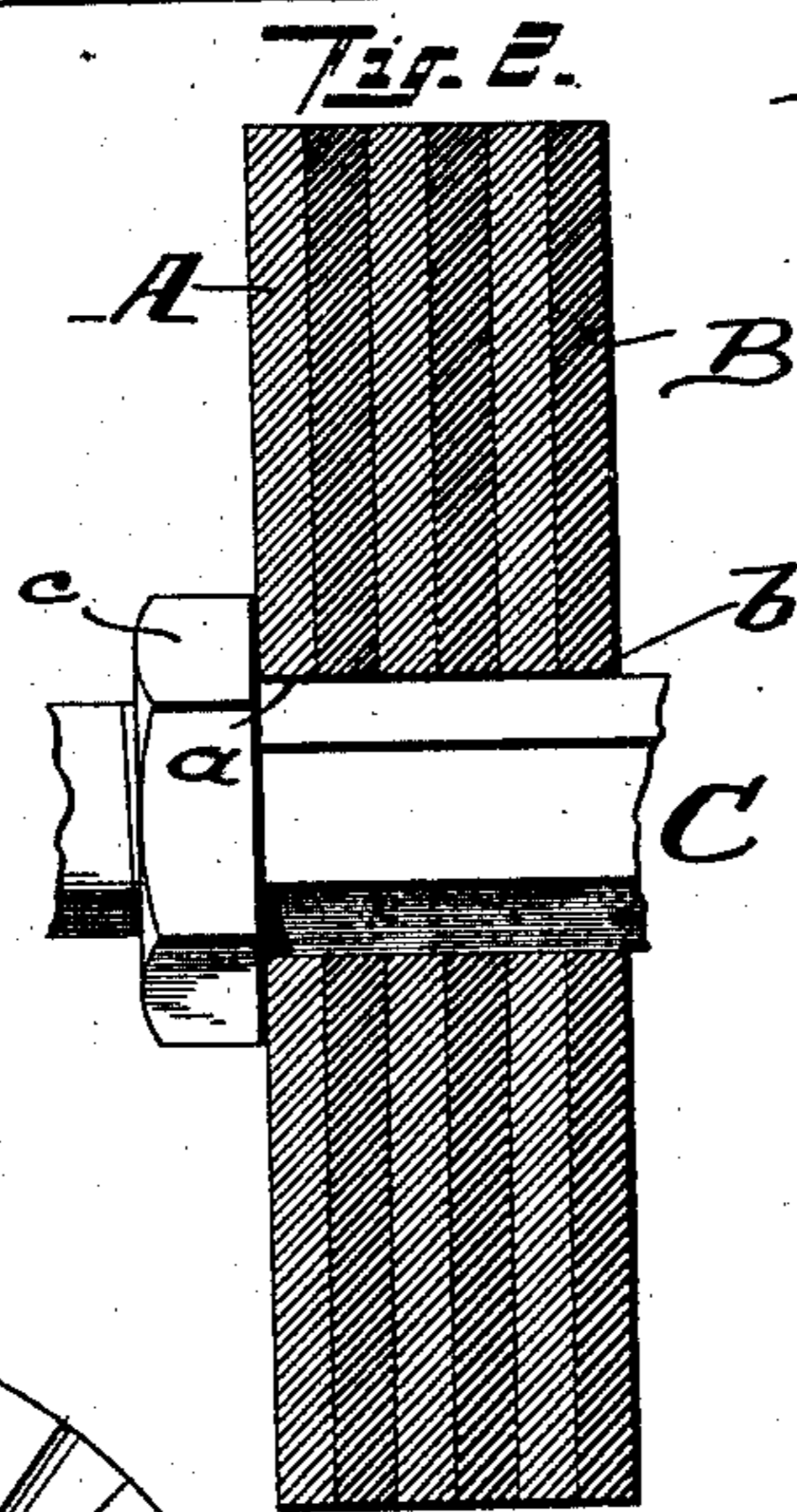
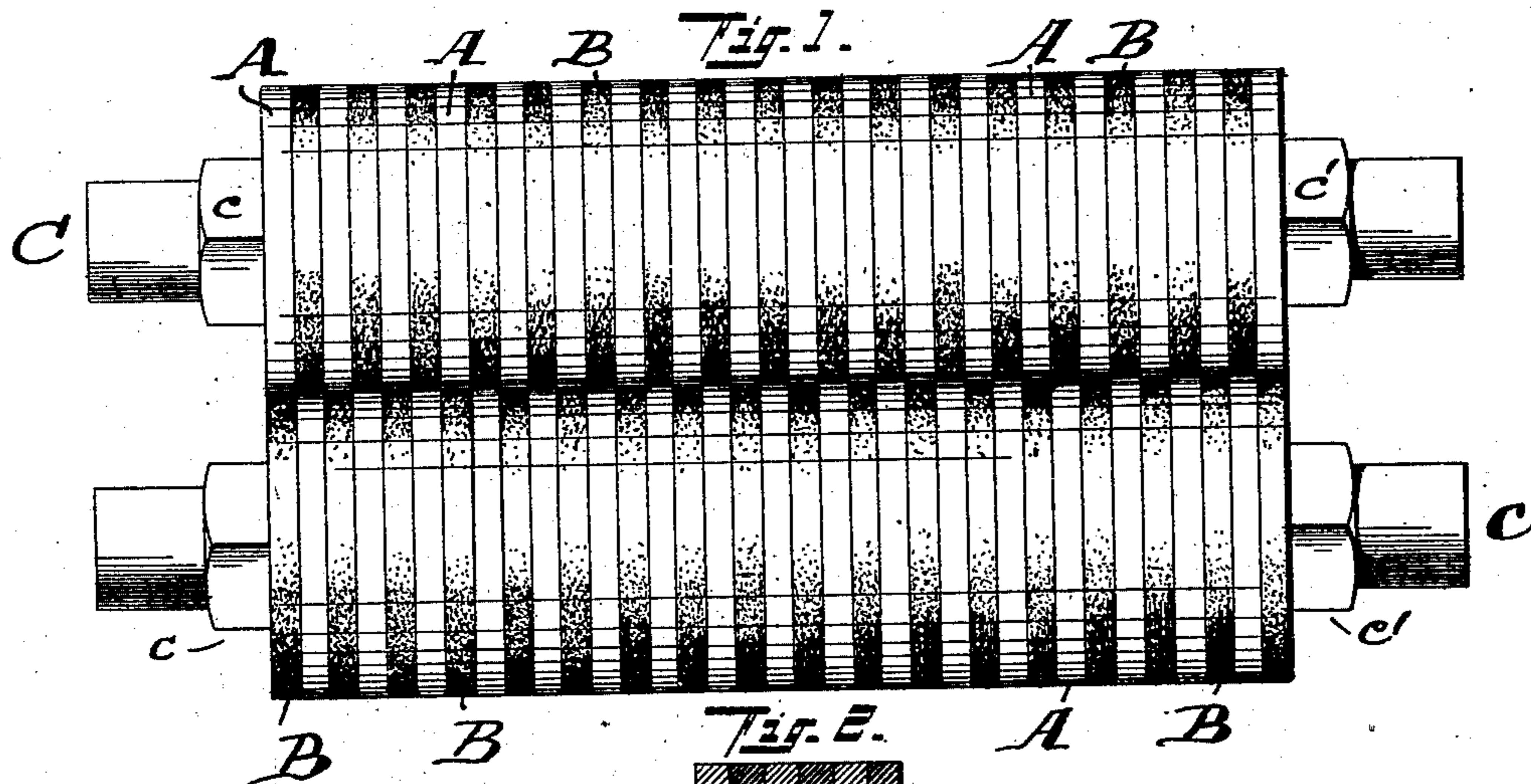
No. 679,821.

Patented Aug. 6, 1901.

W. E. ARNOLD.
COMPOSITE GRINDING ROLLS.

(Application filed Aug. 18, 1899.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

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COMPOSITE GRINDING-ROLLS.

SPECIFICATION forming part of Letters Patent No. 679,821, dated August 6, 1901.

Application filed August 18, 1899. Serial No. 727,623. (No model.)

To all whom it may concern:

Be it known that I, WILBER E. ARNOLD, a citizen of the United States, residing at Madisonville, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Composite Grinding-Rolls; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to metallic grinding-rolls of the kind which are built up in sections and of which rolls usually two operate in conjunction with each other, they being mounted for such purpose with their grinding-surfaces opposite each other, the operation being by rotation in opposite directions.

It relates more particularly to rolls used for reducing grain to flour, and the object of so building them up in sections of metal of alternate hardness is for the purpose of rendering them self-sharpening.

My invention consists of the construction as hereinafter described and claimed and as illustrated in the accompanying drawings, in which—

Figure 1 shows two grinding-rolls operating in conjunction with each other in the usual manner and arranged as contemplated by my invention. Fig. 2 is an enlarged vertical section of a number of the end disks of one of said rolls. Fig. 3 is an end view, and Fig. 4 in an edge view shows a modified form of my invention. Fig. 5 in a similar view shows another modification.

Referring to Figs. 1 and 2, letters A and B indicate the disks referred to before, and of which those represented by A are of a harder metal than those designated by B. As to one particular roll, they are all of equal diameter and have central openings or bores *a* and *b*, which are fitted to a shaft C, which may be round or polygonal, as shown in Fig. 2. The disks are mounted edgewise on their shaft in a manner that one of the harder metal alternates with one of softer metal, and they are endwise confined on such shaft by nuts *c c'*. In addition to having the disks thus alternating in one roll as to the degree of hardness of material they further alternate in position in a manner that the edge

of a soft disk in one roll operates opposite and against a hard disk on the other roll. The rolls being mounted and geared to rotate in opposite directions, their cylindrical grinding-surfaces will wear uneven—that is to say, the edge of a disk of softer material will wear down slightly in advance of the one of harder material operating against it in opposite direction, which latter, however, follows as soon as the brunt of the wear is thrown against it. The harder disks thus wearing slower compensate for the more rapid wear of the softer disks, whereby continually close and contacting grinding-surfaces are maintained between the two rolls. The larger part of the wear is thus alternately transferred from the grinding edge of the soft disks to those of the harder material, which alternate wear-down keeps the grinding-surfaces in operative condition and obviates re-dressing by hand.

As shown in Figs. 3 and 4, the hard-metal disk A' is provided with angular crimps and the soft-metal disk B' has similar crimps *b'* in order that said disks may nest the one within the other when mounted upon a shaft, so as to form a truly cylindrical roll. By thus corrugating or bending the disks from their centers out to their circumferences the grinding-surface of the roll instead of exposing the edges of the disks in parallel zones or stripes, as in Fig. 1, will show zigzag or chevron-shaped edges, as shown in Fig. 4. Therefore a vertical plane passing directly across such a roll would cut alternately through a portion of the hard and soft disk, and assuming this plane to be one of an indefinite number of grinding-surfaces of said roll it is evident the wear of such alternate surface would be reduced to a minimum.

In Fig. 5 the angular crimps are omitted and their work is accomplished by providing the disks with wave-shaped bends or rounded corrugations *a'' b''*. In each of these cases these crimps or corrugations are arranged radially.

Having described my invention, I claim as new—

1. A pair of grinding-rolls each comprising two sets of grinding-disks of which one set is of softer metal than the other, all of equal diameter and each provided with a central

bore, a shaft to which these bores are fitted and upon which the two sets of disks are mounted side by side to form grinding-rolls and in a manner that one disk of softer metal
5 alternates with one of harder metal, said disks further so arranged that one of hard metal in one roll operates against one of soft metal in the other roll and means whereby all these disks are held sidewise together to form a
10 complete roll with a continuous cylindrical grinding-surface.

2. A composite grinding-roll consisting of alternate hard and soft metallic disks, having radially-arranged corrugations or crimps and secured side by side and all mounted upon 15 a central shaft for the purpose described.

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

WILBER E. ARNOLD.

Witnesses:

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