

(No Model.)

3 Sheets—Sheet 1.

S. B. RICKERSON.

ROLLER MILL.

No. 278,273.

Patented May 22, 1883.

Fig. 1.

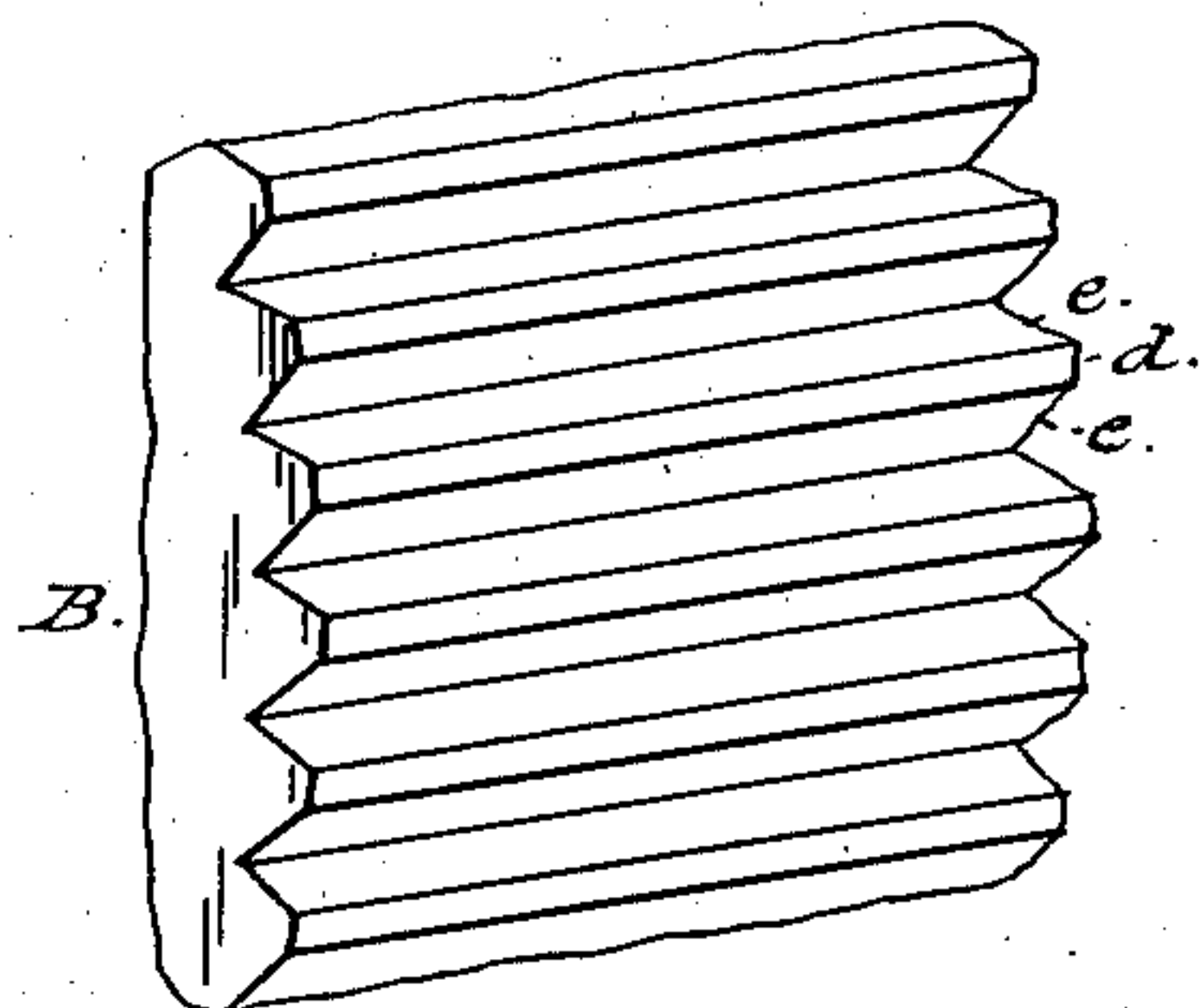


Fig. 2.

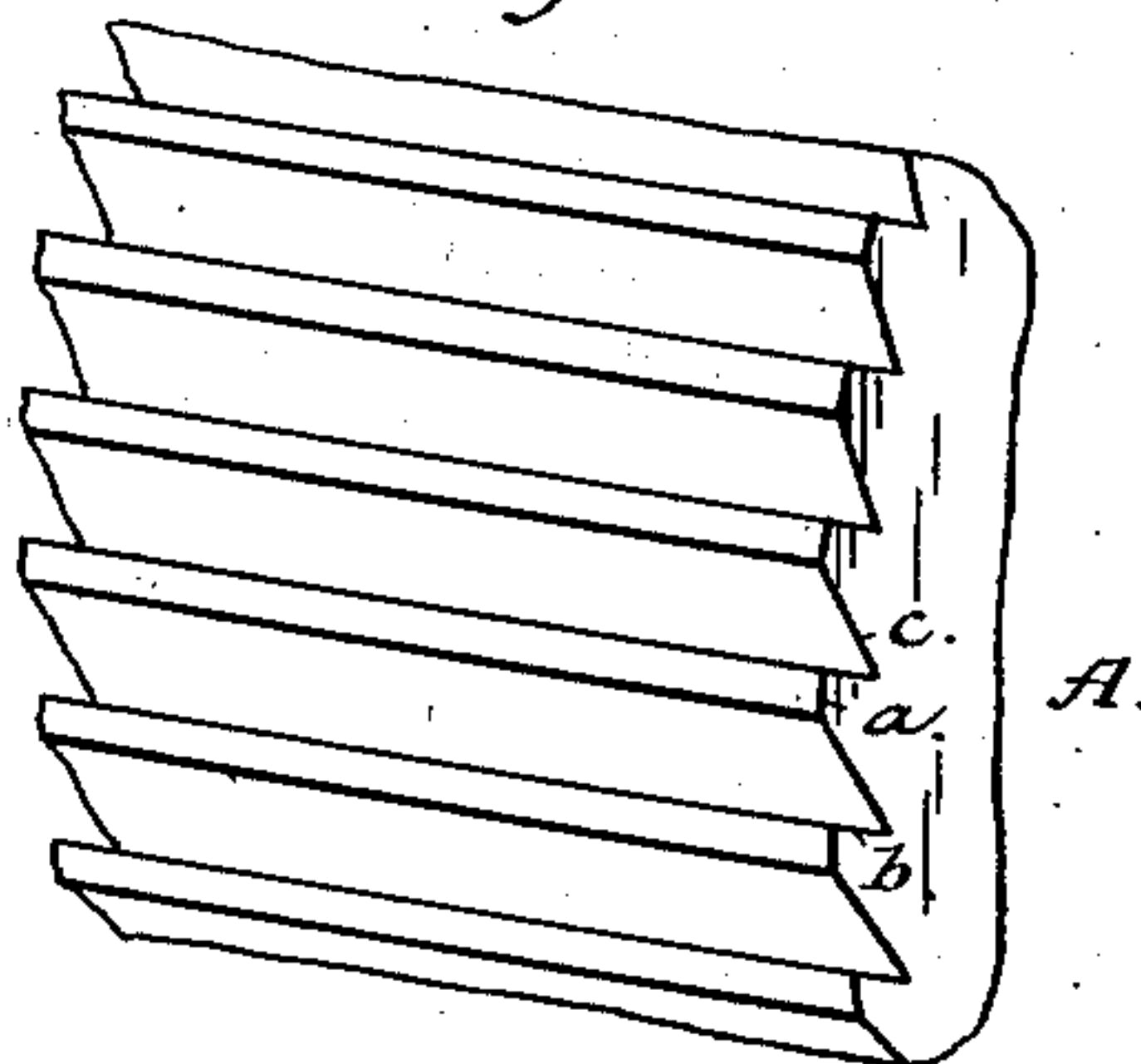


Fig. 3.

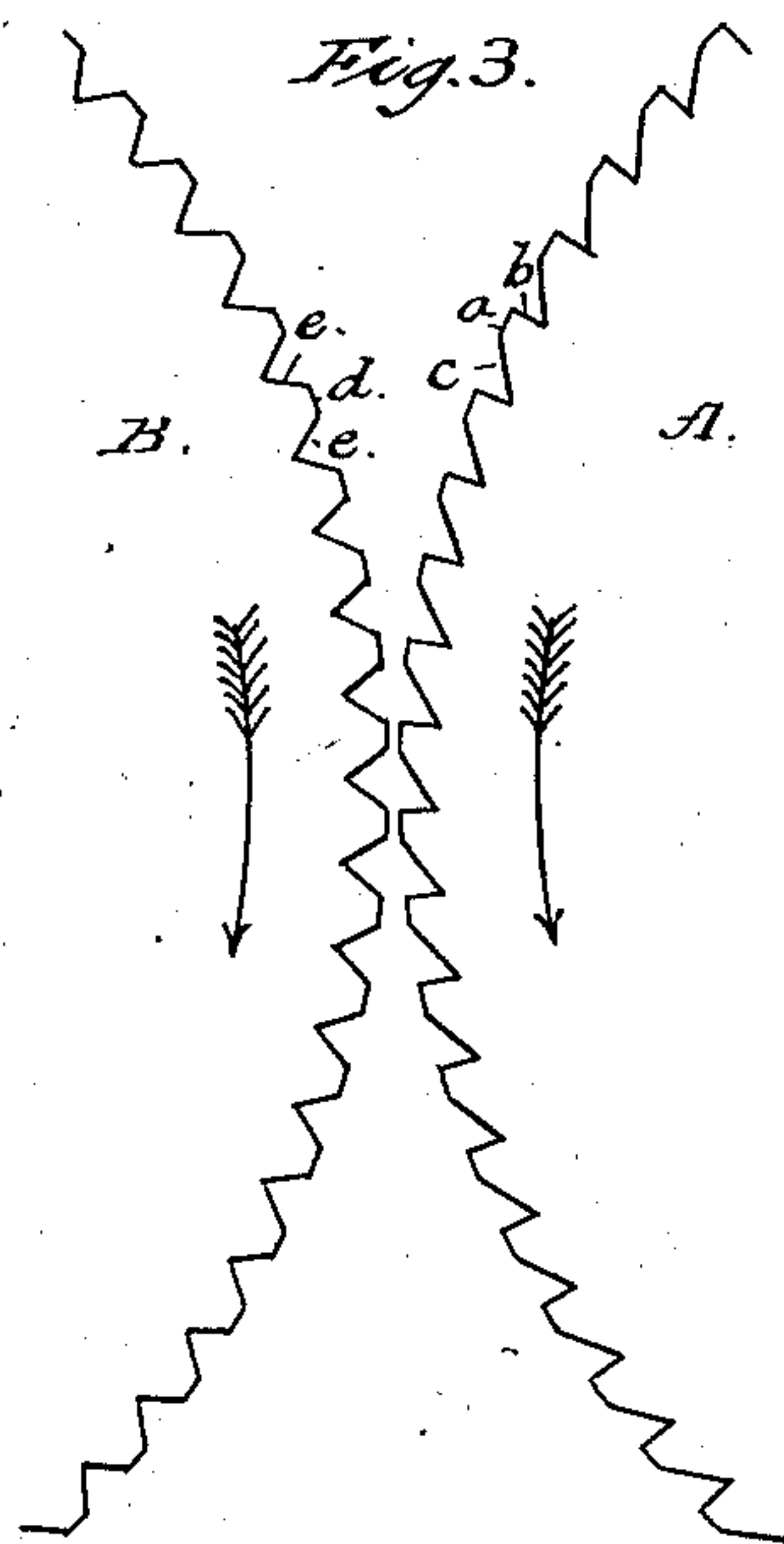
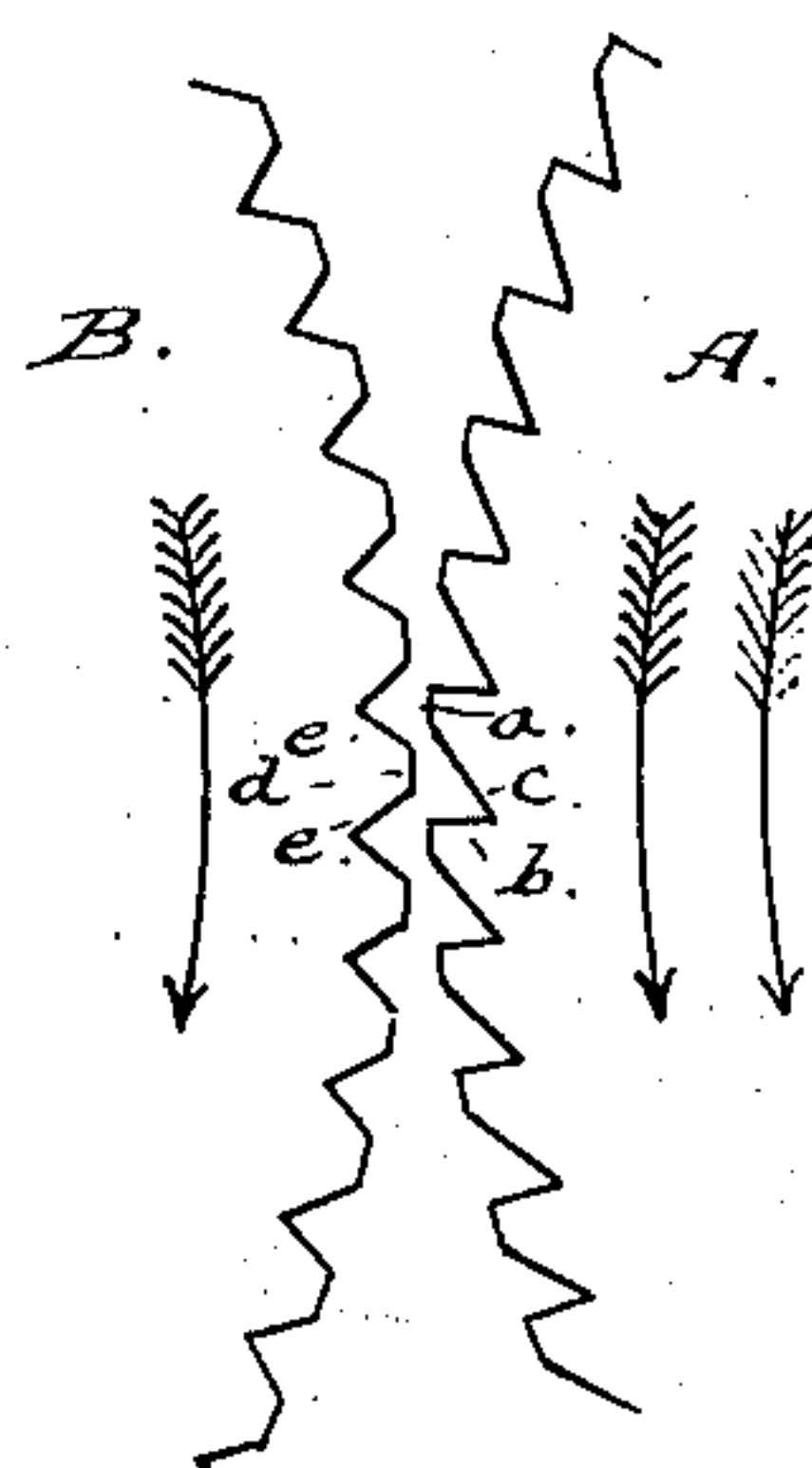


Fig. 4.



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Fig. 5.

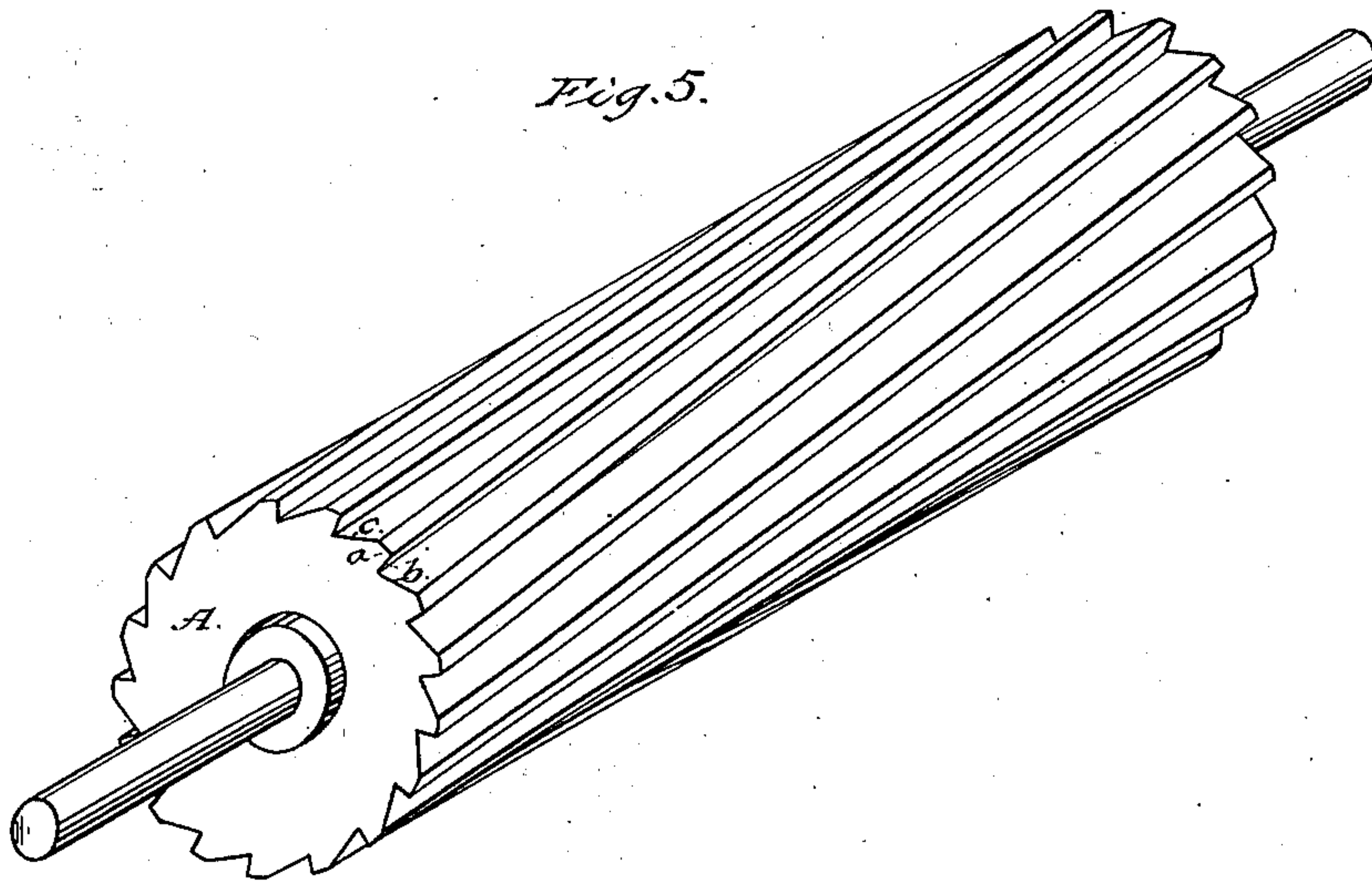
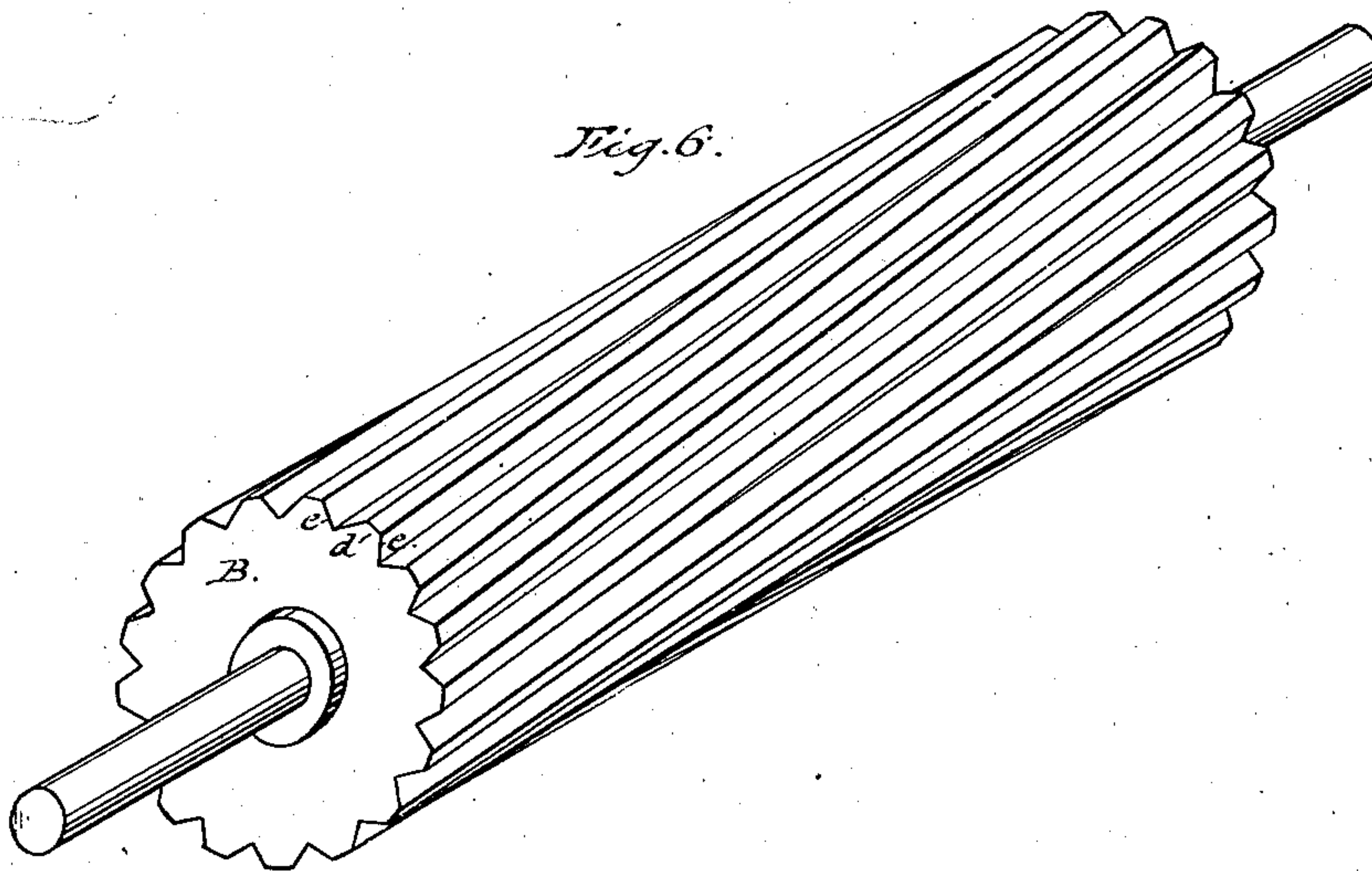


Fig. 6.



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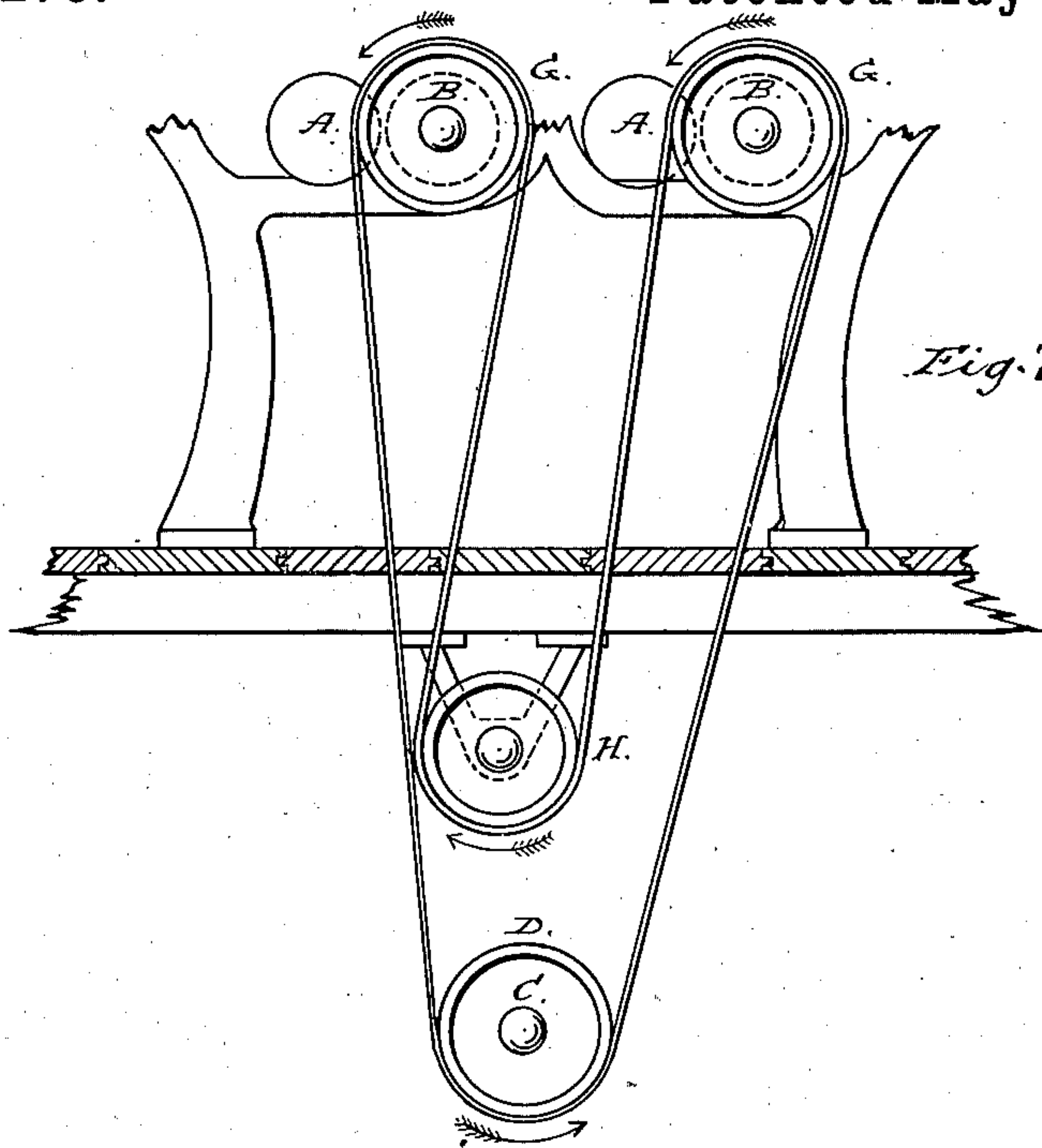


Fig. 7.

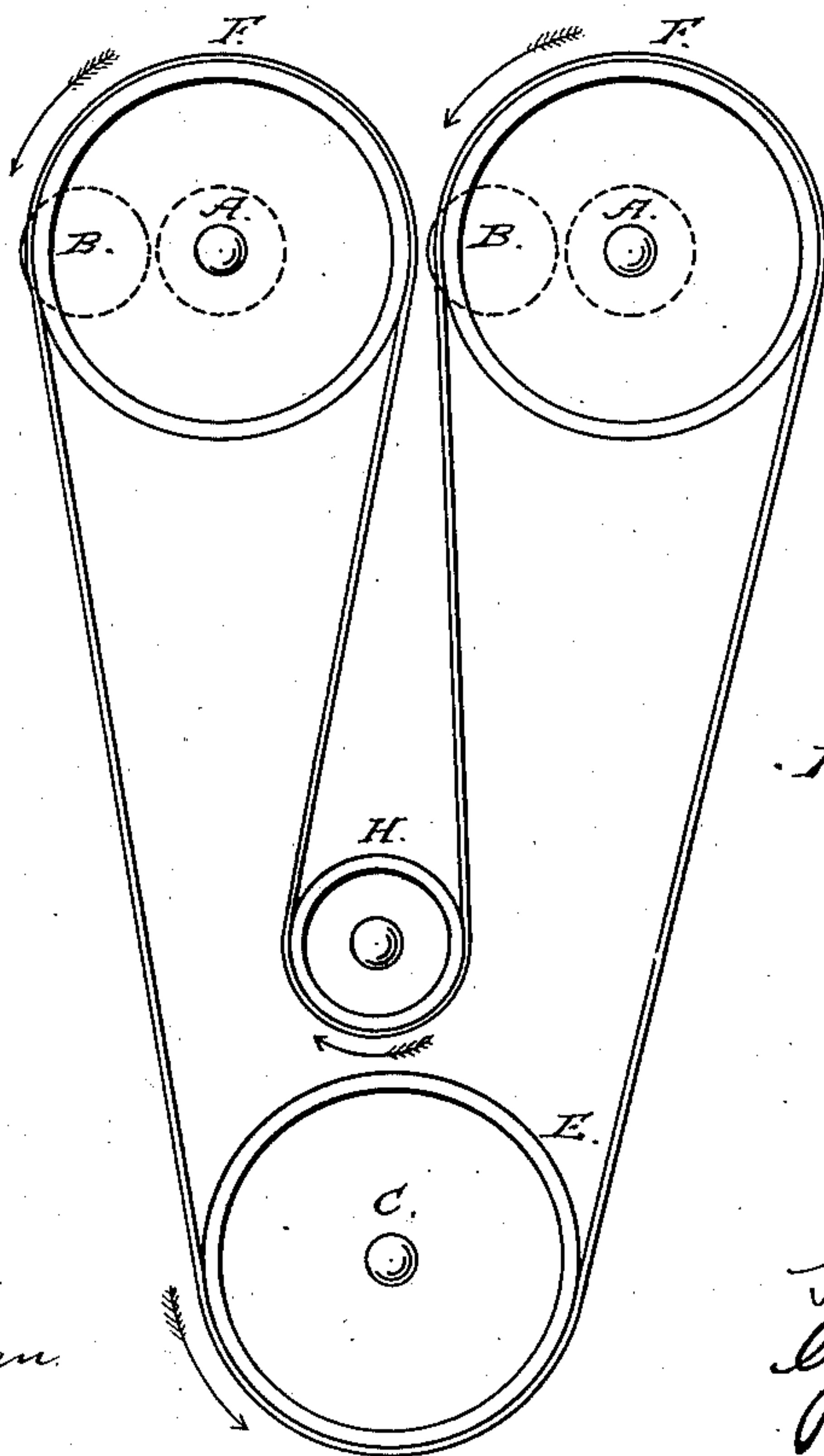


Fig. 8.

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UNITED STATES PATENT OFFICE.

SHERMAN B. RICKERSON, OF GRAND RAPIDS, MICHIGAN.

ROLLER-MILL.

SPECIFICATION forming part of Letters Patent No. 278,273, dated May 22, 1883.

Application filed March 6, 1883. (No model.)

To all whom it may concern:

Be it known that I, SHERMAN B. RICKERSON, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Roller-Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain improvements in roller-mills in which two spirally-grooved rolls or cylinders are placed side by side and turn toward each other, one roll moving at a faster speed than the other; and the objects of my invention are to prevent cutting of the grain, and to secure a uniform continuous crushing thereof while effecting the granulation of the grain, and removing the crease-dirt and germ.

My improvements consist in a special form of dress for each roll, by which these objects are perfectly accomplished.

In the accompanying drawings, which make part of this specification, Figure 1 is a section of the face of the slow-moving roll, showing the ribs and grooves constituting the dress. Fig. 2 is a similar view of the fast-moving roll. Fig. 3 is an outline view of adjacent portions of the two rolls, illustrating the relative positions of the ribs and grooves, and the form of the pockets formed by the said ribs and grooves when the rolls are moving at the same speed in the direction indicated. Fig. 4 is a similar view when the rolls are moving at different speeds, as I prefer to use them. Fig. 5 is a perspective view of the fast-moving roll. Fig. 6 is a similar view of the slow-moving roll. Fig. 7 is an end elevation of a portion of a roller-mill, showing the manner of driving the slow-speeded rollers. Fig. 8 is a view of the belting mechanism for the fast-speeded rollers on the opposite side from the view shown in Fig. 7.

Similar letters designate corresponding parts in all the figures.

The two rolls move, preferably, at different rates of speed, one roll, A, being moved at a uniformly-faster speed than the other roll, B. I prefer to have the roll A move at double the speed of the roll B, and have shown in the

drawings such proportions of the ribs and grooves of the two rolls as are suitable to this rate of speed. Each roll is provided with a peculiar form of dress. The fast roll A has a rib consisting of a plain outer face, *a*, one side, *b*, perpendicular to said face and forming a sharp cutting-edge, and an opposite straight side, *c*, inclined to said face and forming a feathered edge. The inclined side *c* runs straight until it meets the straight perpendicular side *b* of the adjacent rib, making a sharp-cornered pocket therewith. This pocket serves to receive the crushed or granulated grain and protect it from further crushing. The inclination of the side *c* to the face *a* may be at any angle desirable, that shown in the drawings being a proper one. The ribs of the slow-moving roll B are formed of a plain outer surface, *d*, and two inclined sides, *e e*. These two sides *e e* are of the same or nearly equal length, and make substantially the same angle with the face *d*, the relative lengths and angles shown in the drawings being suitable ones. The faces and grooves of the roll A should be of the same width as the faces and grooves of the roll B. The relative widths of the faces and grooves should be proportioned to the relative speeds of the two. If, as I prefer and show, the speed of roll A is double that of the roll B, the width of the grooves should be double the width of the faces of the ribs. As a result of this arrangement, it follows that no grain can pass between the rolls without being subjected to the crushing and rubbing actions of the faces of the ribs, and a uniform continuous crushing is effected. As the rolls rotate, the feathered edges of the ribs of the roll A approach the blunt cutting-edges of the ribs of the roll B, and as the falling grain is caught by said edges, neither of the edges being sharp, it is in no danger of being cut. The grain is then drawn between the faces of the adjacent ribs, is crushed and rubbed, and thereby cleansed of crease dirt and germ, and drops into the pockets of roll A below, where it is protected from further crushing, and from being ground and pulverized with the refuse matters. All the grain and refuse are caught in the pockets of the roll A, as the grooves are of such shape that they will not hold the grain, all particles falling into its grooves be-

ing shed into the pockets of the roll A, as will be clearly seen in the drawings.

For giving the required differential motion to the rolls A B the belting mechanism shown in Figs. 7 and 8 may be used. The belting mechanism shown is for driving two sets of rolls, A A, B B. On the main driving-shaft C are fixed pulleys D E of different diameters, depending on the relative speed desired. The larger pulley, E, by suitable belting, drives the pulleys F F which rotate the fast-speeded rolls A A, and the smaller pulley, D, drives the slow-speeded rolls B B through the pulleys G G and connecting belting. H H are tightening-pulleys.

What I claim as my invention is—

1. In a roller-mill, the combination of two rolls, one being provided with ribs and pockets, each rib having a plain outer surface, one straight perpendicular side, and one straight inclined side, and the other being provided with ribs and grooves, each rib having a plain outer face and two straight sides inclined at substantially the same angle, as herein set forth.

2. In a roller-mill, the combination of two rolls running at different speeds, one being provided with ribs and grooves, each rib having one plain outer face and one straight inclined face, the other being provided with ribs

and grooves, each rib having a plain outer face and two straight sides inclined at substantially the same angles, so arranged and operated that the grain shall be caught between the feathered edge of the fast-moving roll and the upper blunt edge of the slow-moving roll, substantially as and for the purpose herein specified.

3. The combination of the rolls adapted to be rotated at different speeds, the fast roll provided with a dress composed of ribs and grooves, each rib having a plain outer face, one straight perpendicular side, and one straight inclined side, and the slow roll provided with a dress composed of ribs and grooves, each rib having a plain outer face and two sides inclined at substantially the same angle, the faces and grooves of one roller being equal in width to the faces and grooves of the other roller, and the relative width of the faces and grooves being proportioned to the relative speeds of the two rolls, substantially as and for the purpose herein specified.

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

SHERMAN B. RICKERSON.

Witnesses:

J. H. BLACKWOOD,
JOHN W. SIMS.