

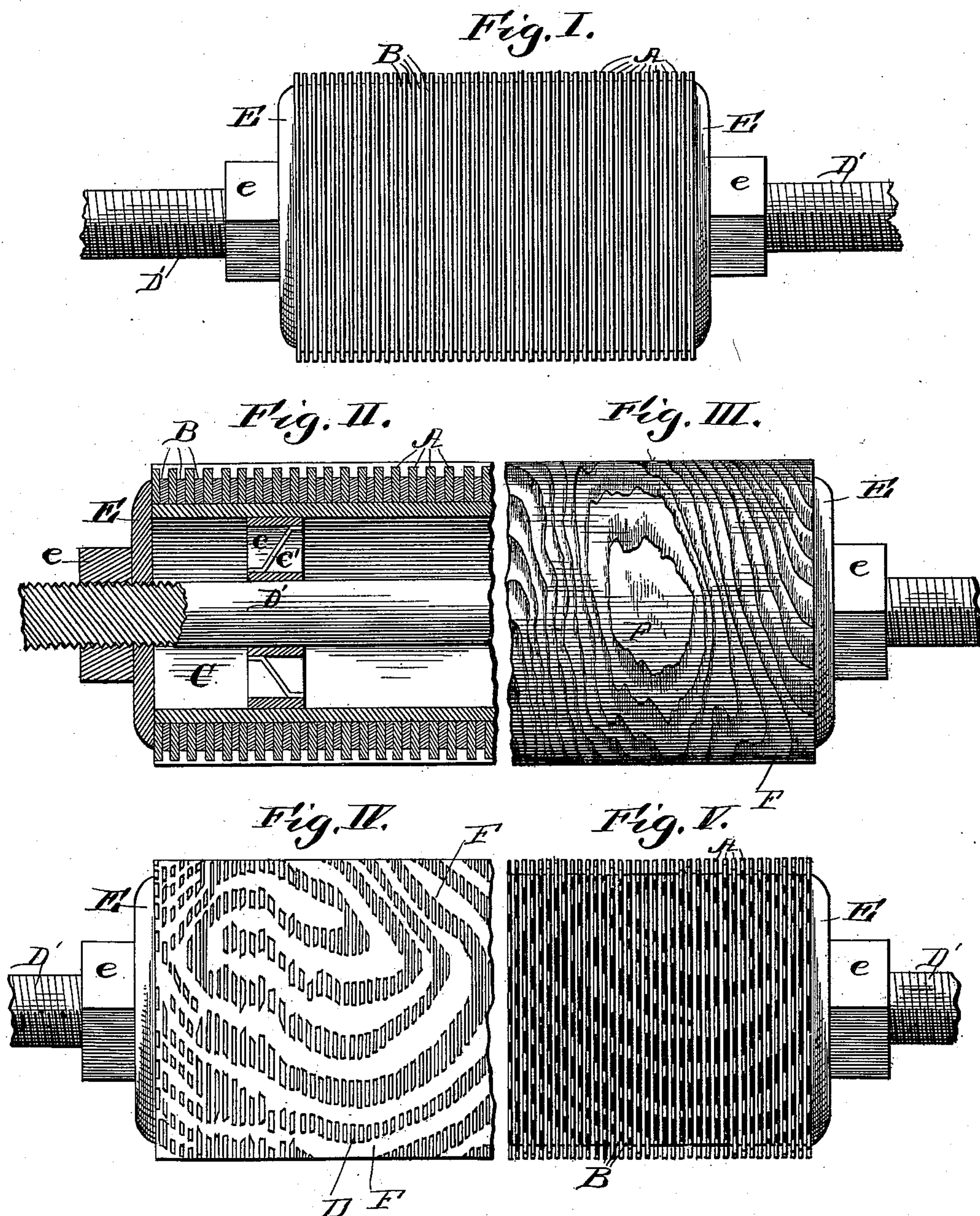
(No Model.)

2 Sheets—Sheet 1.

J. SHANNON.
ROLLER FOR GRAINING WOOD.

No. 466,377.

Patented Jan. 5, 1892.



Witnesses:
J. B. McGirr
W. A. Perukord

Inventor:
John Shannon
By his Attorneys
Edoorn Bros.

(No Model.)

2 Sheets—Sheet 2.

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Fig. VI.

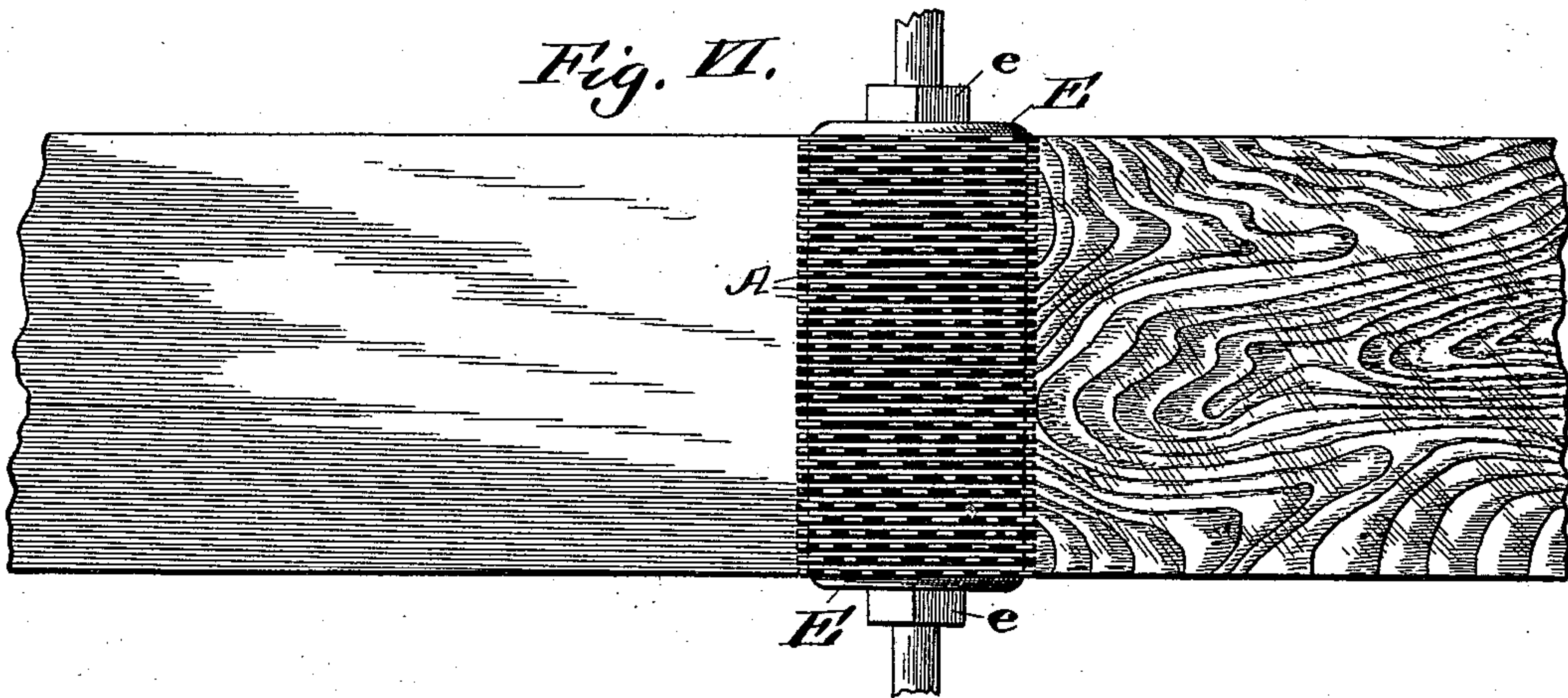


Fig. VII.

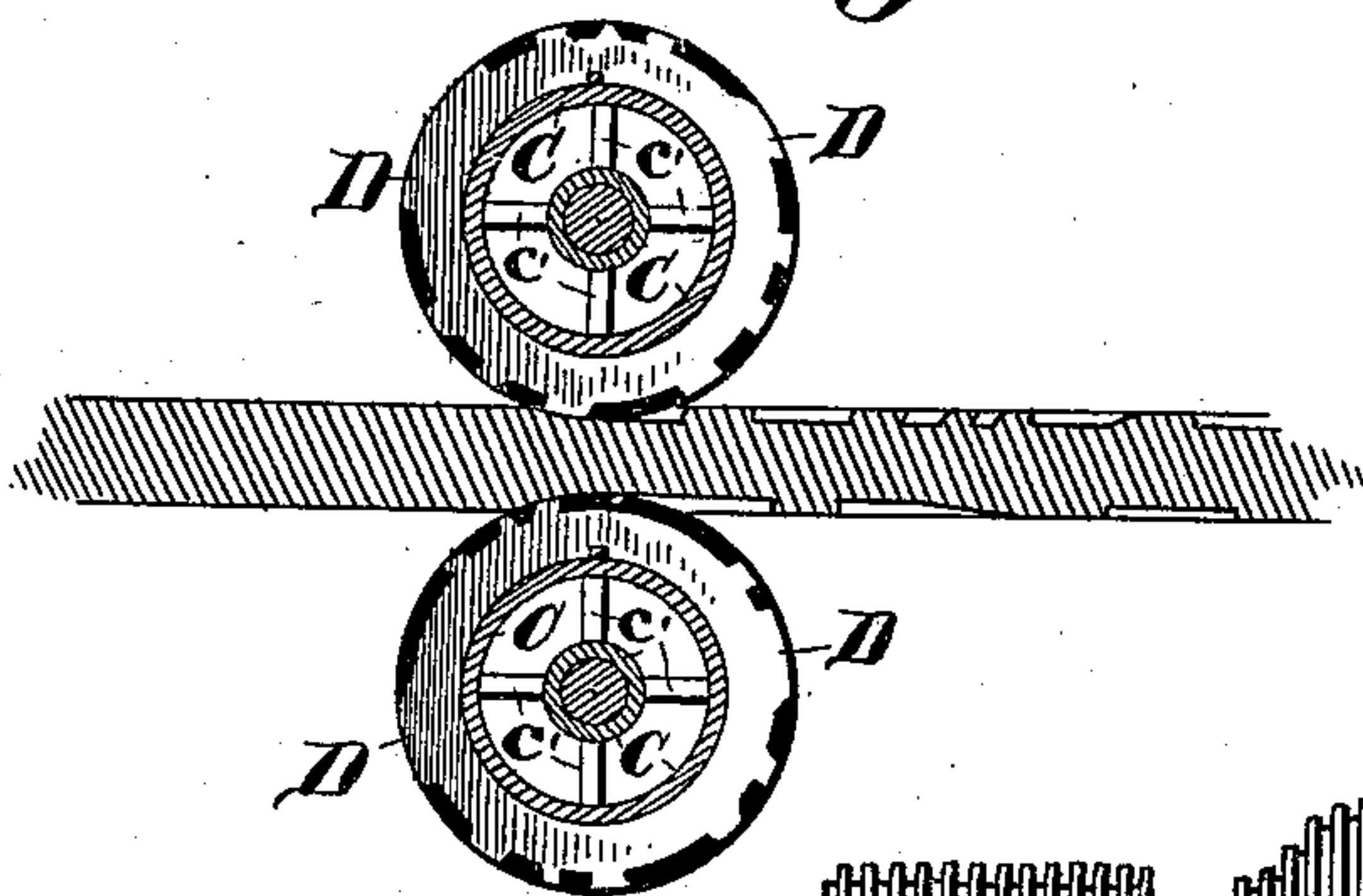


Fig. VIII.

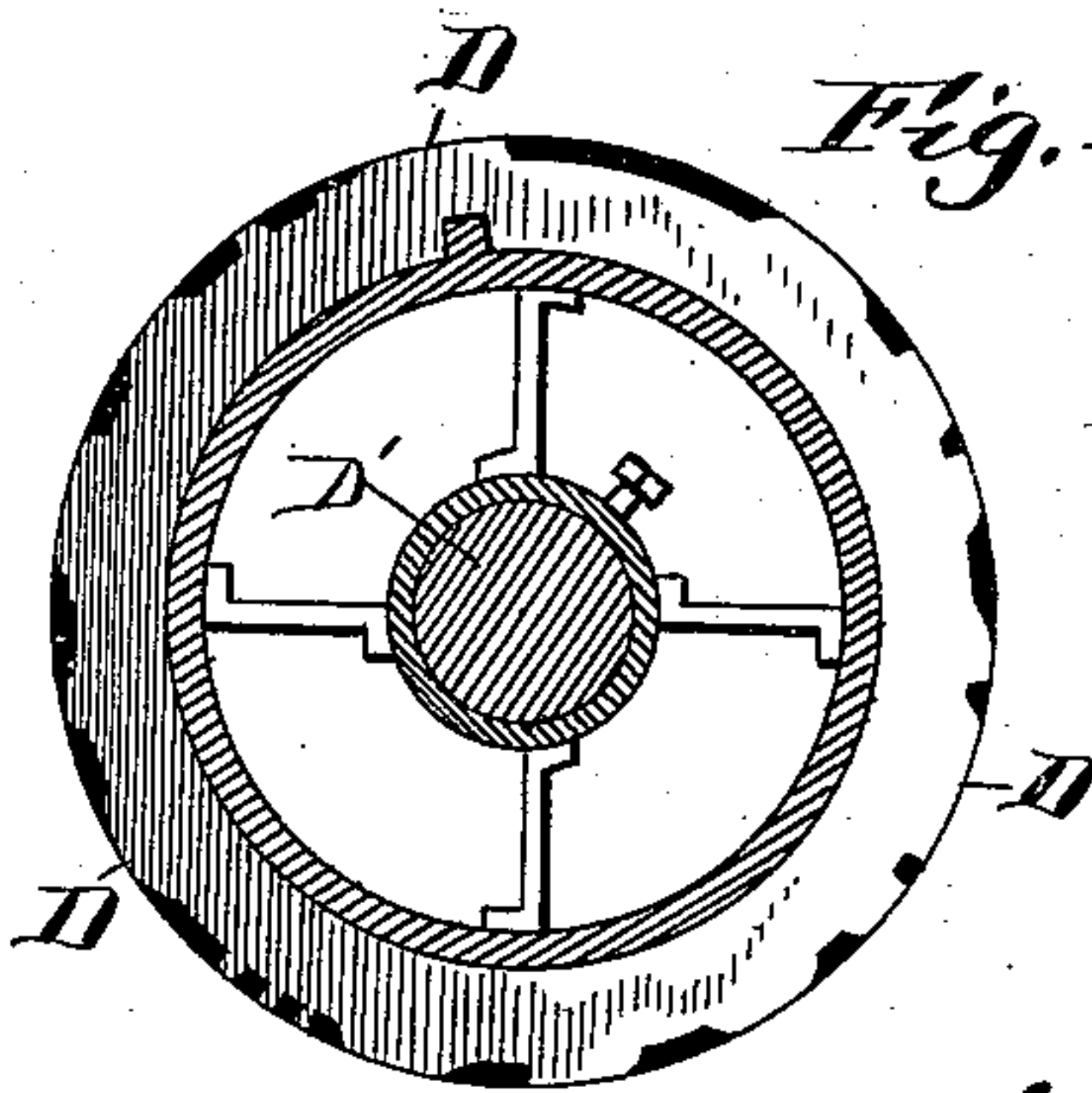


Fig. IX.

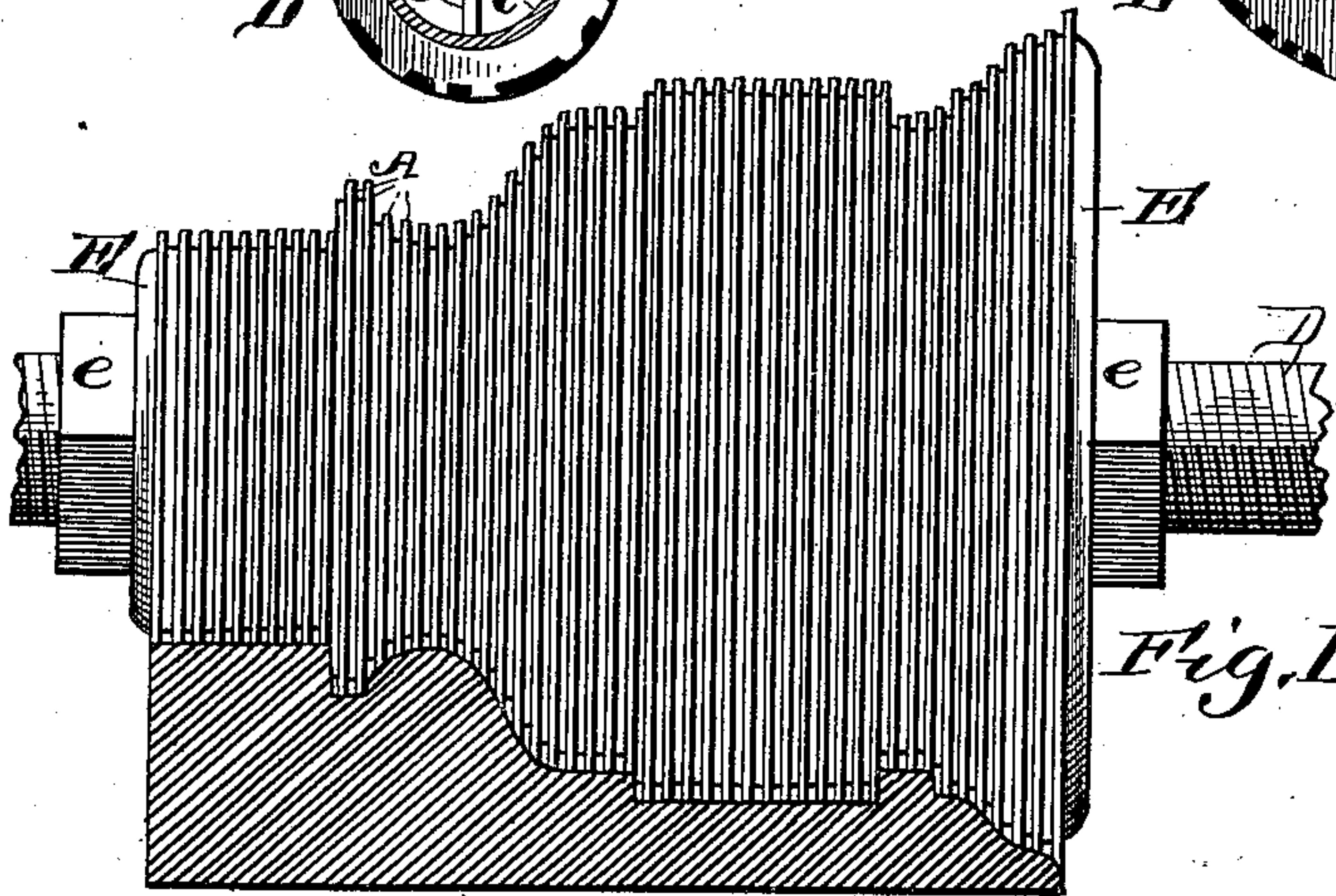
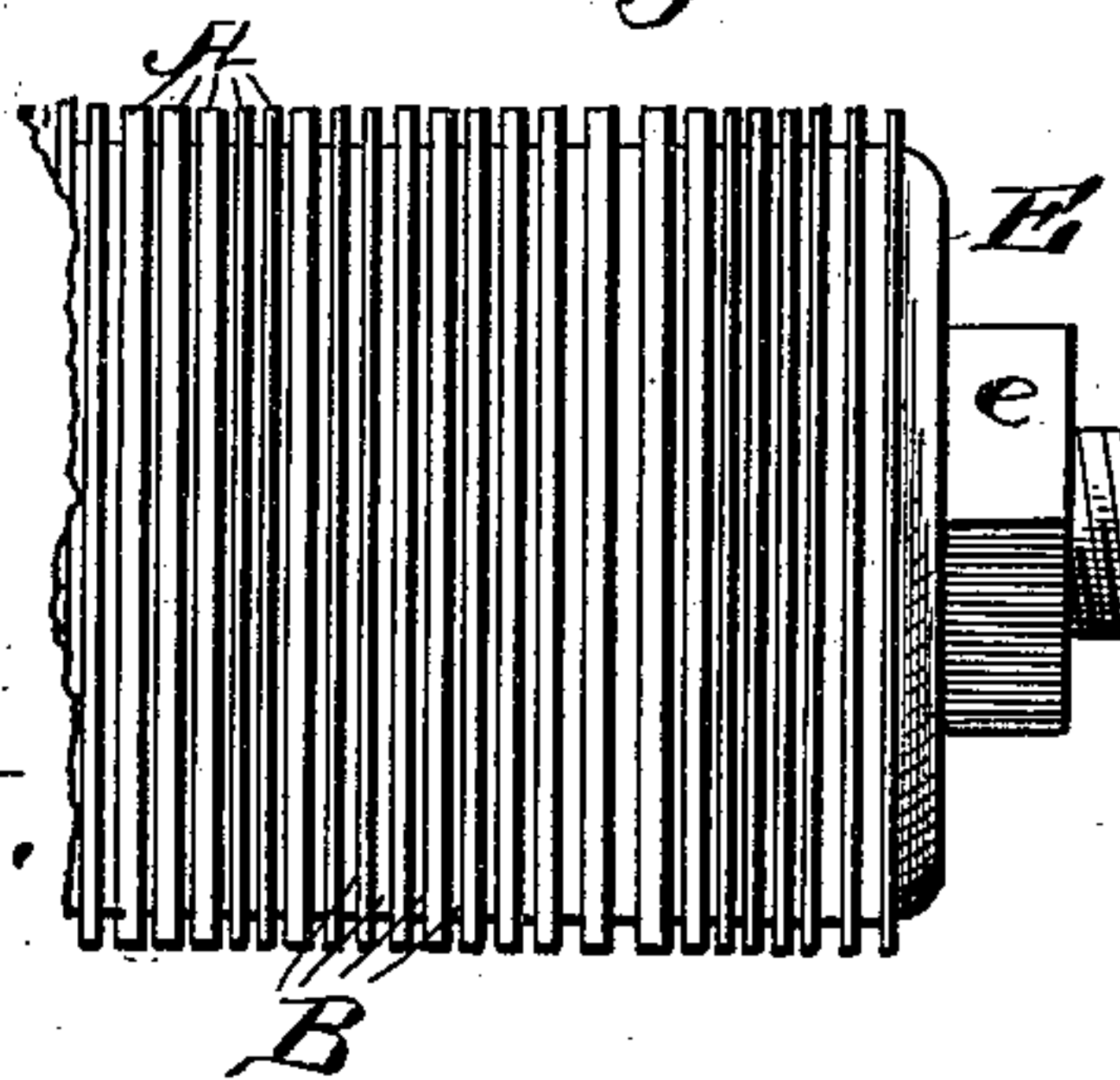


Fig. X.



Witnesses:

J. B. McGirr.
H. J. Peruchos

Inventor:

John Shannon
By his Attorneys,
Edson Bros.

UNITED STATES PATENT OFFICE.

JOHN SHANNON, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO HIMSELF
AND PETER CASEY, OF SAME PLACE, AND WILLIAM W. GRIER, OF
HULTON, PENNSYLVANIA.

ROLLER FOR GRAINING WOOD.

SPECIFICATION forming part of Letters Patent No. 466,377, dated January 5, 1892.

Application filed May 6, 1890. Renewed April 8, 1891. Again renewed October 30, 1891. Serial No. 410,308. (No model.)

To all whom it may concern:

Be it known that I, JOHN SHANNON, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Rollers for Graining Wood; 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 a roller for graining wood in close imitation of the natural growth or grain of a hard wood; and its object is to produce an improved roller of simple and durable construction having its surface formed with bits or cutters arranged in close imitation of the natural growth of a wood and adapted to indent or depress the fibers of the wood in the line of the grain thereof practically without lateral compression of the fibers of the wood, so as to have indentations, which are open to receive the filler.

In a prior application filed by me on the 1st day of February, 1890, Serial No. 388,913, I have described and claimed the method of graining soft woods in imitation of hard woods, which consists in forming depressions or indentations in the line of the grain of the wood and in imitation of the natural growth or grain of a hard wood, then filling said indentations or depressions with a filler of suitable color, and finally finishing the surface of the board; but the present application is confined to the roller or die for forming such indentations or depressions in the surface of the soft-wood board.

The present invention relates to a method of constructing a roller, in order to provide a roller having a multiplicity of small peculiarly shaped and arranged bits, which form the closely-disposed depressions or indentations in the wood. The roller is first built up on a drum or shaft of the cutter-disks and washers, so as to leave intermediate annular spaces between the edges of the disks and washers, and the entire surface of the roller-cylinder is then covered with a composition, preferably adhesive beeswax, or any other suitable composition may be used, which is impervious to the action of acids. This composition fills the annular spaces between the

disks and washers, as well as covering the edges of the disks, to the thickness of an eighth or fourth of an inch, more or less, as required. On the surface of the cylinder which is thus covered I apply the design representing the graining it is desired to imitate or copy. This design is obtained from the natural hard wood by first coating the surface of the wood with an adhesive substance—as, for instance, ink or paint—then placing a sheet of paper on the coated surface to transfer the design to the sheet of paper, and finally applying the transfer-paper while the ink is moist to the surface of the composition on the cylinder, the design being transferred to the composition from the sheet by rubbing the latter by hand or by mechanical appliances. I now proceed to remove the composition along the spaces between the dark or shade lines in the graining and at such portions of the roller at which the edges of the disk are located, which can be accomplished by hand-tools, and the whole roller or cylinder is immersed in a bath of strong acid—for instance, nitric acid. The acid consumes and removes the metal along the parts exposed by removal of the composition; but the parts concealed by the composition are not affected by the bath, because they are protected by the composition.

To enable others to understand my invention, I have illustrated the same in the accompanying drawings, in which—

Figure I is a view in side elevation of a cylinder or roller built up in accordance with my invention. Fig. II is a longitudinal sectional view through the cylinder or roller after the composition has been applied thereto. Fig. III is a side elevation of the cylinder or roller coated with the composition and having the design applied to the composition. Fig. IV is a side elevation of the cylinder after the composition has been removed from the spaces between the shade or dark lines in the grain or growth of the natural wood. Fig. V represents the cylinder in side elevation after it has been immersed in the acid bath and the composition removed from the surface thereof. Fig. VI is a plan of a roller or cylinder and a board passing below the same and having its surface indented or depressed as contemplated by my invention. Fig. VII is an

end view of a pair of coacting cylinders or rollers for ornamenting both surfaces of a board. Fig. VIII is a transverse sectional view through the cylinder. Fig. IX is a side elevation of a cylinder adapted for ornamenting irregular surfaces of molding, &c. Fig. X is an elevation from one side of a cylinder having disks and washers of varying thicknesses.

Like letters of reference denote corresponding parts in all the figures of the drawings.

In carrying my invention into practice I first build up the cylinder or roller of the cutter-disks A and the washers B, which are interposed between the cutter-disks, and the disks and washers are arranged on a cylindrical shell C, which has a central tubular bearing c, said bearing being united to the cylinder by arms c' and clamped or keyed to a driving-shaft D'. The cutter-disks A are each made of a very thin piece of hard metal, preferably of steel, and said cutter-disks are of uniform diameter, while the washers C, which are interposed between the cutter-disks, are also made of thin pieces of metal; but the diameter of the washers is less than the diameter of the cutter-disks, so that the edge or periphery of each washer lies within the edges or periphery of two adjacent cutter-disks, thus leaving a narrow annular space between the cutter-disks and the washers.

As heretofore stated, it is desirable that the fibers of the piece of soft wood shall be depressed in the line of the grain of the soft wood without compressing the fibers of the wood at right angles to the line of the depressions or indentations to leave the indentations or depressions open to receive a filler; and in order to secure a better imitation of the natural growth or grain of the wood that the indentations or depressions shall be so close together as to blend or unite together to the view and to follow the general line or contour of the natural shade or dark lines in the growth or grain of the wood to be imitated.

In the construction of a roller or die which shall attain the ends above set forth many difficulties have presented themselves; but by my present invention I have succeeded in producing a roller or die which successfully produces open depressions in close imitation of the natural growth or grain of a hard wood and adapted to receive a filler of suitable color. Each cutter-disk is made of very thin but hard steel and with thin narrow bits or cutters D, which cutters are of suitable length and very narrow to produce a depression in the wood in the line of the grain, but without appreciably crowding or forcing the fibers of the wood laterally, whereby the depressions are left open to receive the filling, and a series of such depressions or indentations can be arranged very closely together without crowding the fibers of the wood at right angles to the line of the depression of the wood fibers. The thin disks are arranged very closely together, the lateral separation of the disks determining the spacing of the depressions

with lateral relation to each other. I have found that as many as thirty-five or forty disks and washers can be arranged on the shaft within the space of an inch, but the number of disks and the lateral spacing of the same varies with the coarseness or fineness of the grain of the hard wood to be imitated. I do not wish, therefore, to confine myself to any particular number or arrangement of the cutter-disks or to the arrangement or disposition of the bits on the disks, as the same can be varied within said limits without departing from the principle of my invention or sacrificing the advantages thereof.

The thin narrow flat-faced bits on the disks vary in length, and toward the ends they may be tapered or reduced in width to make tapering depressions or indentations. The depth of the indentations or depressions may be uniform, so as to receive and retain the filling; but I prefer to make the depressions taper in depth or gradually decrease toward the ends of the depression, in order that the indentations shall gradually fade away or blend with the surface of the board in order to secure a better imitation and effect.

The bits on the series of disks vary in relation to each other around the cylinder or roller to form depressions or indentations according to the dark or shade lines in the natural growth or grain of the hard wood to be imitated, and the variety of this arrangement of the bits on the disks is very great.

The disks and washers are fitted snugly on the drum or cylinder, and they are clamped in place tightly on said drum by the heads E and the nuts e, said nuts being screwed on the threaded portions of the shaft. By having the washers between the disks of less diameter than the diameter of the disks themselves I am enabled to properly space the disks apart and to regulate the degree of penetration of the bits into the soft board.

In Fig. VII I have represented the pair of coacting rollers acting on the soft-wood board, the bits entering the wood to the depth permitted by the washers on the cylinder or roller. I may employ two rollers (an upper and lower roller) to indent the board on both sides thereof, as shown by Fig. VII; but it is evident that one smooth-faced roller may be substituted for one of the composite rollers without departing from my invention.

In the plan view, Fig. VI, I have illustrated a soft-wood board passing between the rollers and having its surface indented or depressed by the bits on the roller in close imitation of the natural growth or grain of a hard wood. This being the form or construction of the roller which it is desired to produce, I will now proceed to describe the method by which the surface of the roller or cylinder is formed with the bits D, arranged in close imitation of the grain of the wood. After the disks and washers are placed and built upon the drum a composition F is placed over the entire surface of the disks and wash-

ers and it fills the annular spaces between the edges of the washers and disks, as well as completely covering or inclosing the disks to the depth of one-fourth of an inch or one-eighth of an inch, as desired, as indicated in Fig. II. The composition is preferably of beeswax, which is applied in a melted condition, and the surface is trued by suitable mechanical appliances. A transfer-sheet (not shown) is now prepared by coating the surface of a piece of natural wood with ink or other suitable substance and transferring the design or configuration of the grain of the wood to a sheet of paper, cloth, or other suitable material. This transfer-sheet is now placed on the surface of the composition on the cylinder while the ink thereon is moist, and the design or copy transferred from the sheet to the wax surface by rubbing on the back of the sheet.

I now proceed to remove that part of the composition or beeswax between the shade or dark lines of the grain in the copy or imitation on the wax surface of the cylinder, which can be readily accomplished by hand-tools. The composition removed from the cylinder exposes the edges of the disks and leaves the remaining edges of the disks concealed and protected by the composition, the design or imitation being followed very closely and accurately.

Fig. IV shows the cylinder after the composition has been removed. I now immerse the entire cylinder in a bath of acid, preferably nitric acid, as it is very strong. The cylinder is allowed to remain in the bath of acid for a period sufficient for the acid to eat out and remove the exposed portion of the disks, and the cylinder is then removed and the composition remaining thereon carefully removed, the cylinder thus presenting the appearance shown by Fig. V. The disks and washers may be uniform in thickness, as indicated by Figs. I, II, and V; but this is not essential, as the thickness of the disks and washers can be varied according to the nature of the growth or grain in the wood to be copied, Fig. X showing the cylinder made of disks and washers of varying thicknesses. Again, the disks and washers may be of different diameters and arranged to accommodate the roller to irregular surfaces, such as form moldings, &c. In this form of the roller the disks and washers at one end of the cylinder may be of less diameter than those at the opposite end of the roller or otherwise variably disposed to accommodate the roller to the regular or irregular surface which the roller is adapted to ornament in accordance with my present invention, the roller being treated

or prepared in the manner hereinbefore described. The individual flat-faced bits on the cylinder correspond to the form or shape of the depression or indentation in the board. Thus the bit may be uniform in width and depth, if desired; but I prefer to taper the bit both in width and depth, in order to make an indentation which tapers in depth and width, so as to gradually fade out or blend with the surface of the board at one end. (See Fig. VII.)

Various changes in the form and proportion of parts and details of construction and arrangement can be made without departing from the spirit or sacrificing the advantages of my invention, and I would therefore have it understood that I hold myself at liberty to make such modifications as fall within the scope of my invention.

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

1. The method of making wood-graining rollers or cylinders, which consists in building up the cylinder with disks and washers of different diameters, coating the surface of the cylinder with an acid-proof composition which fills the spaces between the disks and washers, then removing the composition in certain lines, according to the desired design, to expose portions of the cylinder, subjecting that portion of the cylinder from which the composition has been removed to the action of acid, and finally removing the composition from the whole surface of the cylinder, substantially as described, for the purpose set forth.

2. The method of making wood-graining rollers or cylinders, which consists in building up the cylinder with disks and washers of different diameters, coating the surface of the cylinder with an acid-proof composition to fill the spaces between the disks and washers and completely inclose the edges of the disks, removing the composition in the spaces between the shade or dark lines, according to the desired design of the grain or growth, to expose a portion of the disks, immersing the part of the cylinder containing the design in a bath of acid, and finally removing the composition from the entire surface of the cylinder, for the purpose described, substantially as set forth.

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

JOHN SHANNON.

Witnesses:

JOS. FORREST,

ARTHUR L. BRYANT.