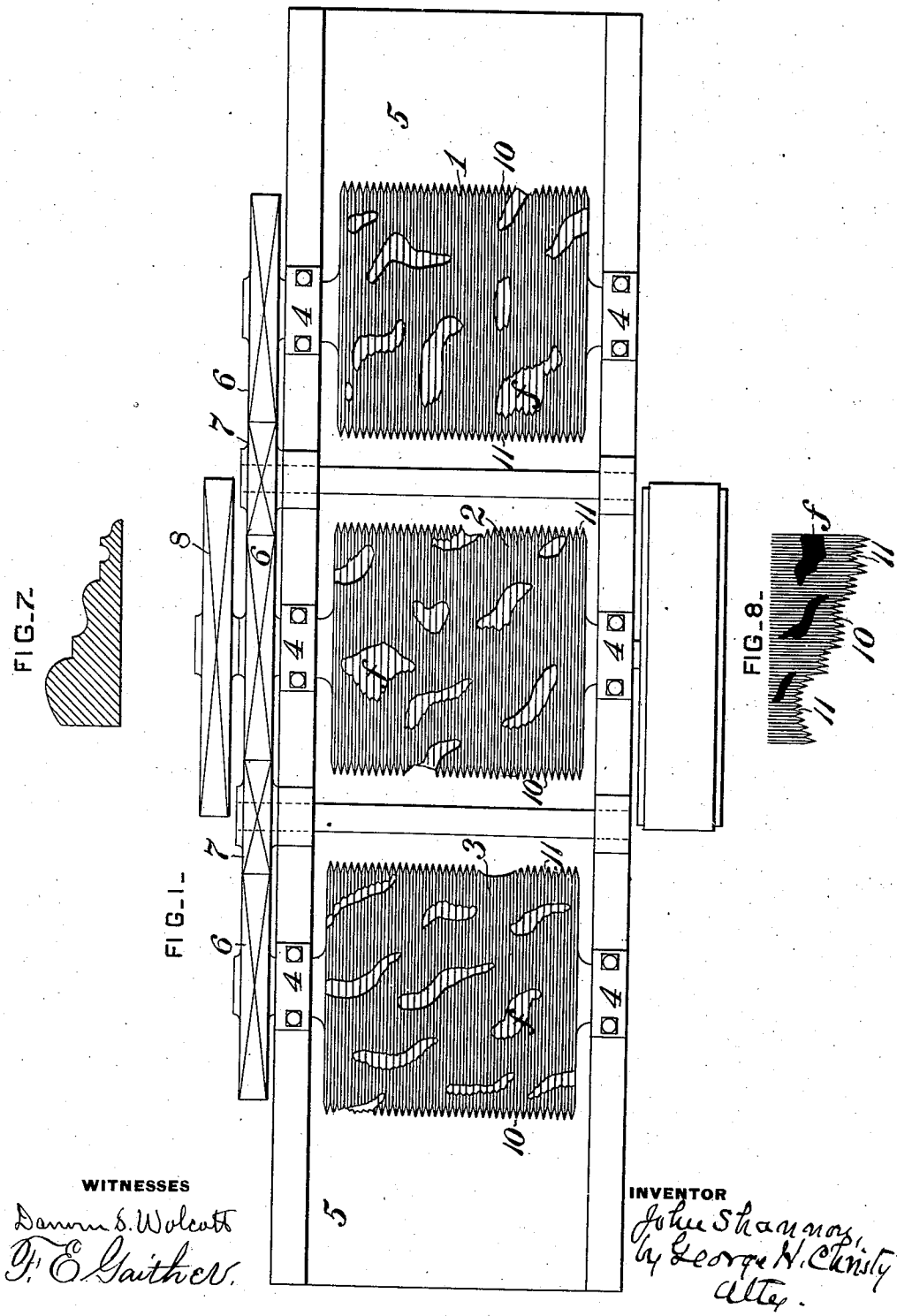
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J. SHANNON.

WOOD GRAINING MACHINE.

No. 501,668. Patented July 18, 1893.



WITNESSES

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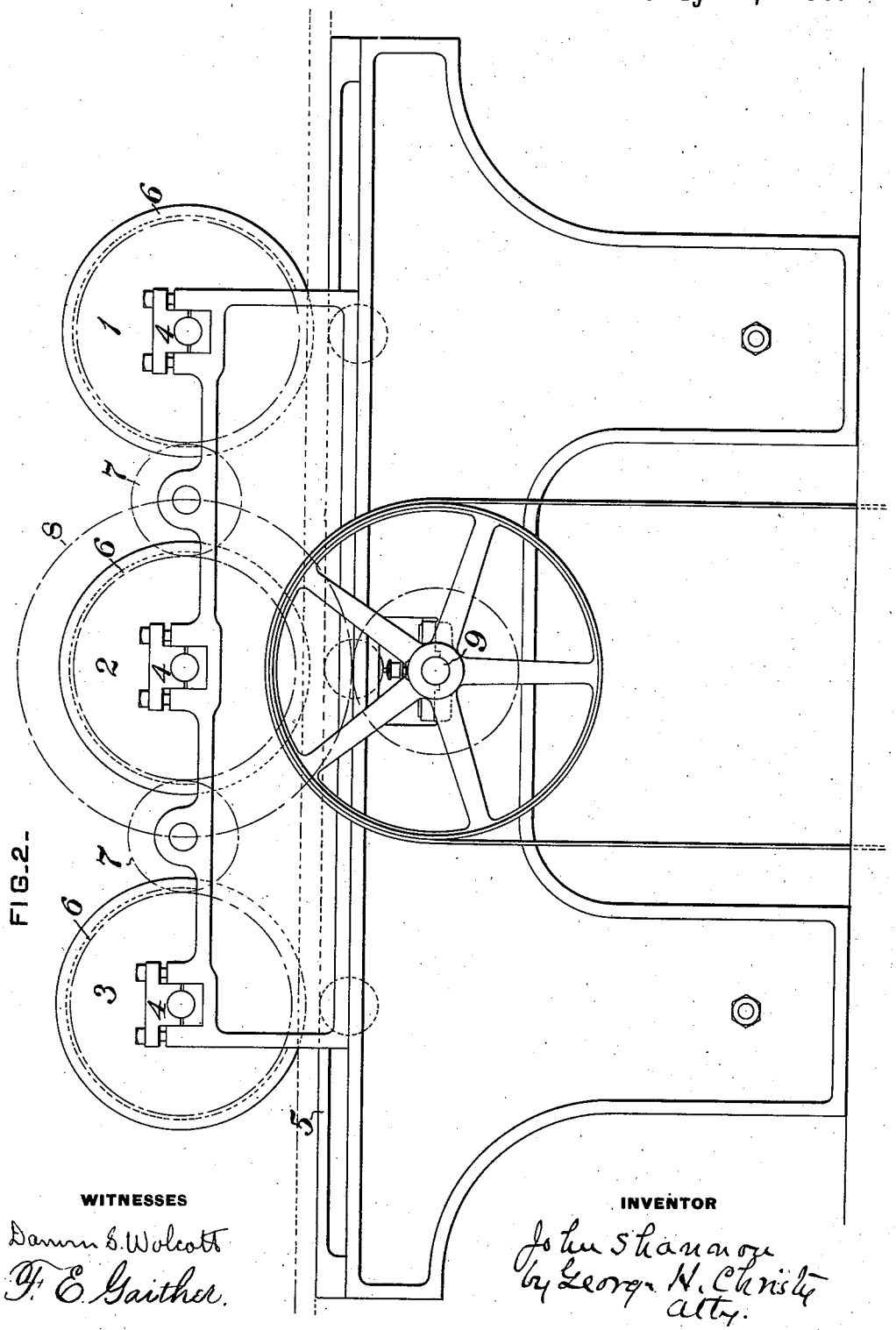


FIG. 2.

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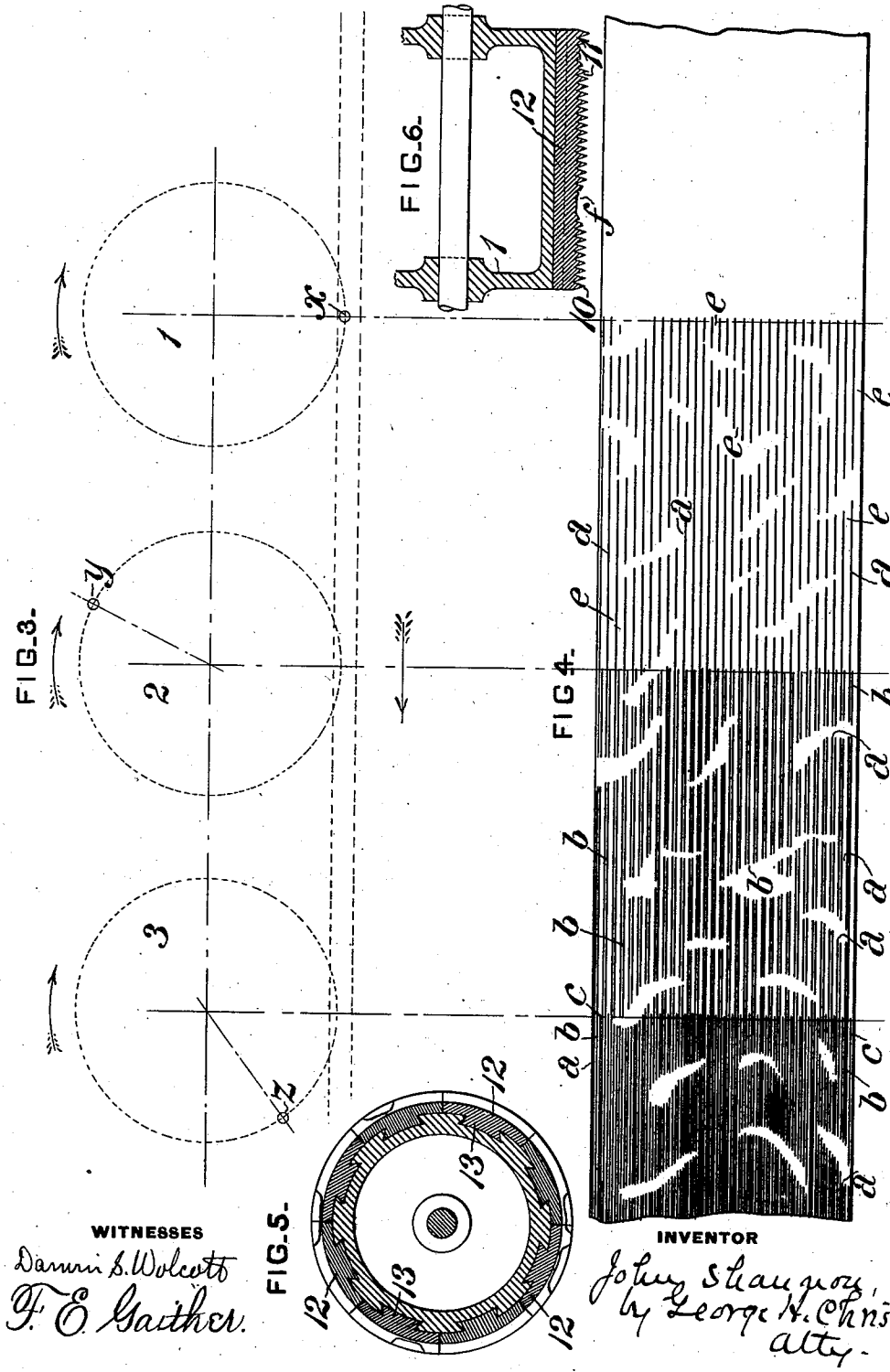
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UNITED STATES PATENT OFFICE.

JOHN SHANNON, OF PITTSBURG, PENNSYLVANIA.

WOOD-GRAINING MACHINE.

SPECIFICATION forming part of Letters Patent No. 501,668, dated July 18, 1893.

Application filed May 16, 1892. Serial No. 433,170. (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 or discovered certain new and useful Improvements in Wood-Graining Machines, of which improvements the following is a specification.

The invention described herein relates to certain improvements in graining woods in imitation of the natural grain or growth of hard close grained woods, by forming cuts or indentations beneath the surface of soft woods and then applying a suitable filler to such cut or indented surface. These cuts or indentations have been made by a roller formed of a series of cutting disks separated by a series of washers of less diameter than the cutting disks, so that the edges of the disks will project a sufficient distance into the material brought in contact therewith.

It is desirable in order to produce the best effects that the cuts or indentations for the filler should be in very close proximity to each other, separated from each other by an exceedingly thin wall of wood, and it is also desirable that the cuts or indentations should be sufficiently deep to permit of a slight planing off of the treated surfaces, without obliterating the cuts or indentations. When the cutting disks are arranged on a roller so as to produce cuts or indentations of the desired depth and proximity to each other, the walls of wood become jammed between adjacent disks and hence the action of the disks is to crush or break down the fibers of the surface of the wood rather than to form thin walls.

The object of the present invention is to produce the cuts or indentations by means of a series of two or more rollers provided with peripheral cutting edges, the cutting edges of one roller being arranged in a plane passing between the cutting edges of the other roller.

The invention claimed is hereinafter more fully described.

In the accompanying drawings forming a part of this specification, Figure 1 is a top plan view of a graining machine having my invention applied thereto. Fig. 2 is a side elevation of the same. Fig. 3 is a diagrammatic view illustrating the manner of arranging the designs on the rollers as regards the initial points thereof so that the designs on the rollers will properly overlap. Fig. 4 is a view showing the effect produced by each roller. Fig. 5 is a transverse section of a roller having the removable sections. Fig. 6 is a longitudinal section of the same. Figs. 7 and 8 are sectional views of a molding and the roller for graining the same, respectively.

In the practice of my invention, the rollers 1, 2 and 3 are mounted in suitable bearings 4 on opposite sides of the bed 5 of the machine. On the ends of the shafts of the rollers are secured gear wheels 6, which are caused to rotate in unison by the interposed pinions 7. A gear wheel 8 on one of the shafts intermeshes with a corresponding wheel on the driving shaft 9. The rollers are preferably formed of cast steel and the peripheral surfaces thereof are trued up by turning or grinding. The cutting or indenting edges 10 are then formed by cutting grooves 11 in a manner similar to that practiced in forming screw threads, except that the grooves and cutting edges do not extend spirally along the rollers. The depth to which the grooves are cut is dependent upon the depth of cut to be made in the wood and the width of the grooves is dependent upon the number of intermediate cuts or indentations, as will be hereinafter described. After the cutting edges have been formed the surfaces of the rollers are covered with wax or acid resisting material, and the design to be produced is then marked on the coated surfaces of each of the rollers. The coating is then removed from the rollers at such parts of the design marked thereon, as are to be in relief on the wood treated. The rollers are then placed in acid to eat out the exposed portions of the cutting edges as shown at *f*, Figs. 1 and 8, and the coating is then removed from the other portions of the rollers. In lieu of this method of preparing the rollers, the design may be traced on the rollers in any desired manner, and the cutting edges of the rollers at such points of the design as are to be in relief may be cut away with a chisel or in any other suitable manner.

If desired the operative faces of the rollers may be formed by a series of longitudinal sections 12, which can be removably attached to the body of the roller by means of a dovetail projection 13 on the sections fitting cor-

respondingly shaped grooves in the body of the roller, as shown in Figs. 5 and 6, or in any other suitable manner. These sections are attached to the roller, and the cutting edges and the design are formed on their outer faces in the manner hereinbefore described. The employment of the removable sections permits of easy changes of the designs to be produced without removing the rollers from the machine.

After the rollers have been prepared in the manner described, they are so mounted in their bearings in the machine, that the cuts or indentations *b* formed by the roller 2 will be intermediate of the adjacent cuts *a* formed by the roller 1 and the cuts or indentations *c* formed by roller 3 will be intermediate of the cuts *a* and *b*, as clearly shown in Fig. 4. It will be observed that the cuts or indentations *c* are not only intermediate of adjacent cuts *a* and *b*, but are also intermediate of adjacent cuts *b*, and adjacent cuts *a*.

The arrangement of the cutting edges of one roller with relation to those of the other rollers may be effected either by adjusting the rollers longitudinally in their bearings or by properly locating the cutting edges upon the rollers during the manufacture thereof.

By reference to Fig. 4, it will be seen that the walls of wood *e* formed by the cutting edges of the roller 1 are comparatively wide and consequently sufficiently strong to permit of cuts *a* being quite deep without liability of injuring such walls. As the adjacent cutting edges of the roller 2, straddle the cuts *a*, these cuts or indentations permit of the two walls of wood formed by roller 2 to close together, thus preventing a wedging in and consequent crushing down of said walls between adjacent cutting edges of the roller 2. The adjacent cutting edges of the roller 3 will straddle two cuts or indentations *a* and *b*, which will permit of a greater degree of closing in of the walls, and hence there is less liability of wedging between adjacent cutting edges, as is desirable on account of the diminished thickness and strength of such walls.

As the same design is formed on each of the rollers it is necessary that the rollers should be so rotated that the design on the successive roller or rollers shall exactly overlap the design partially formed on the board by the roller 1. To this end, the same part of the design on each roller is taken as an initial point, as indicated at *x*, *y* and *z*, in Fig. 3. These points having been established, the rollers and their driving mechanism are so adjusted that when the initial point *x* on the roller 1 is directly below the axis of said roller, the initial point *y* of roller 2 will have reached such a point in its rotation that the peripheral distance between the point of intersection of a vertical plane passing through the axis of roller 2 and the bed of the machine, and the point *y*, measuring in the direction contrary to that of the rotation of the roller, is equal to the distance between the axes of the rollers 1 and 2. The peripheral distance between the initial point *z* and the point of intersection of a vertical plane through the axis of roller 3 and the bed of the machine, measured in a direction contrary to that of the rotation of the roller is equal to the distance between the axes of the rollers 1 and 3.

By reference to Fig. 4 the clearness and sharpness with which the design is brought out by the multiplicity of cuts and indentations, is clearly shown. The number of rollers used in producing any given design depends entirely upon the character of the design, *i. e.* whether a high or low relief is desired, the number of rollers used increasing with the sharpness or height of design desired. Hence, I do not limit myself to any specified number of rollers.

While preferring to employ rollers constructed in the manner described, it is evident that rollers consisting of a series of metal disks and interposed washers may be employed.

The roller herein described is especially adapted for graining moldings, such as shown in Fig. 7, as the roller can be turned to the desired contour as shown in Fig. 8 prior to forming the peripheral cutting edges, whereas the turning of rollers consisting of a series of disks is a very difficult operation on account of the thinness of the disks, and the consequent liability of their edges being turned over.

I claim herein as my invention—

In a wood graining machine, the combination of a series of two or more rollers, all the rollers being provided with cutting edges adapted to produce the same design, said rollers being successively operative on a board or strip and so arranged with reference to each other that the cutting edges of one roller shall lie in a plane passing between the cutting edges of the other roller or rollers, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JOHN SHANNON.

Witnesses:
DARWIN S. WOLCOTT,
R. H. WHITTLESEY.