(No Model.) 4 Sheets—Sheet 1.

J. SHANNON.

WOOD GRAINING MACHINE.

No. 466,804. Patented Jan. 12, 1892.

FIG. 2.

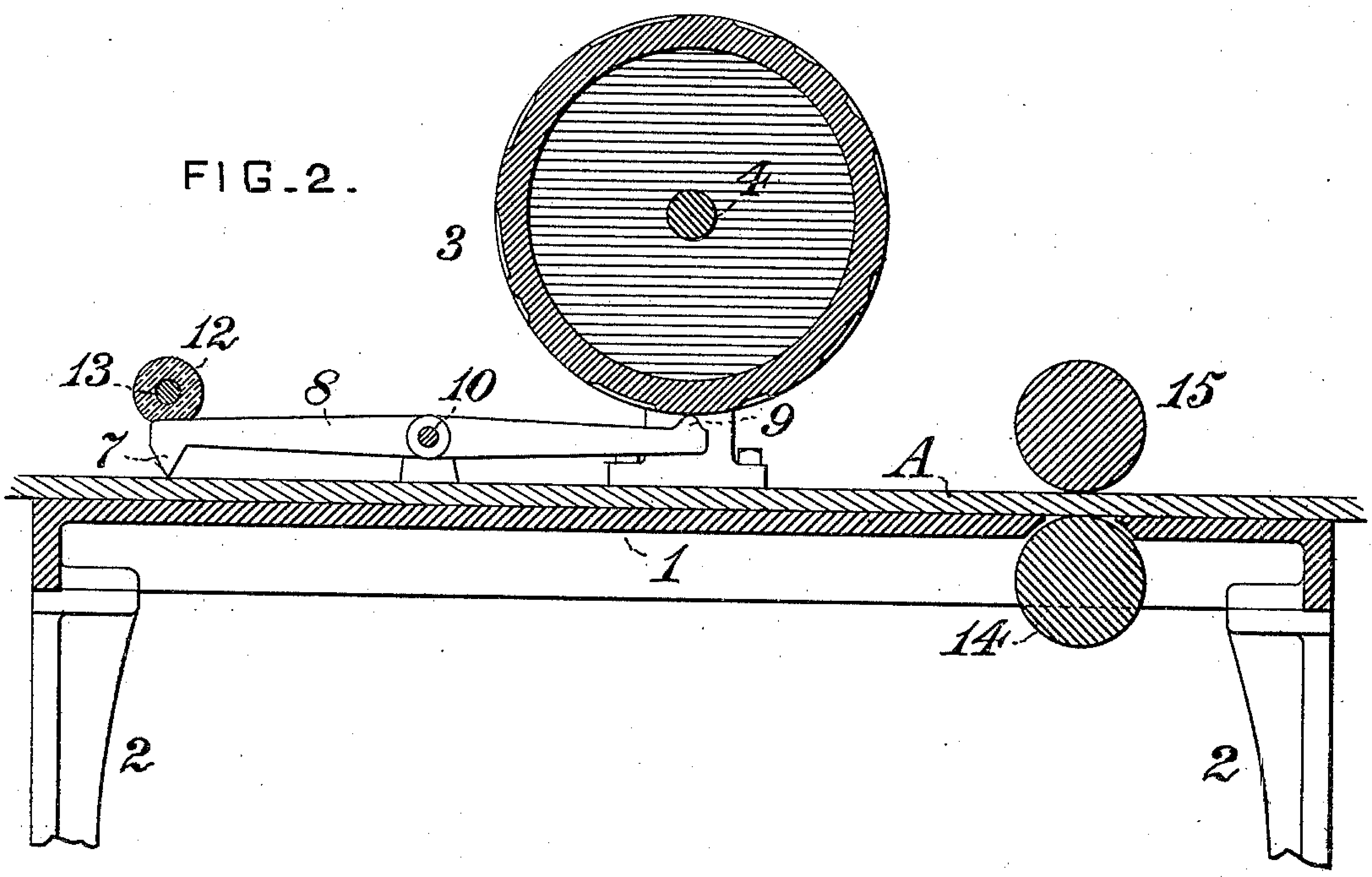
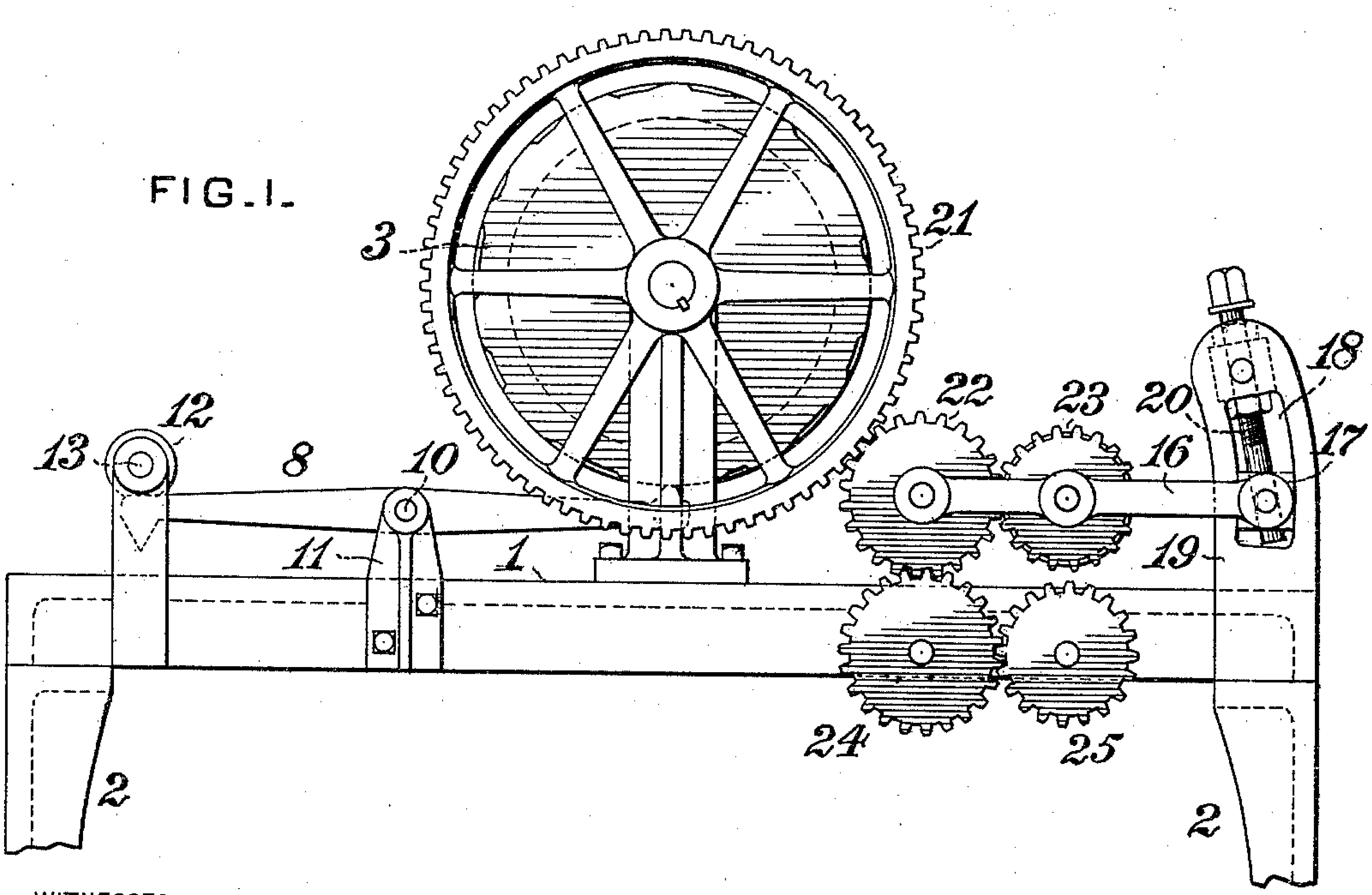


FIG. 1.



WITNESSES.

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(No Model.)

4 Sheets—Sheet 2.

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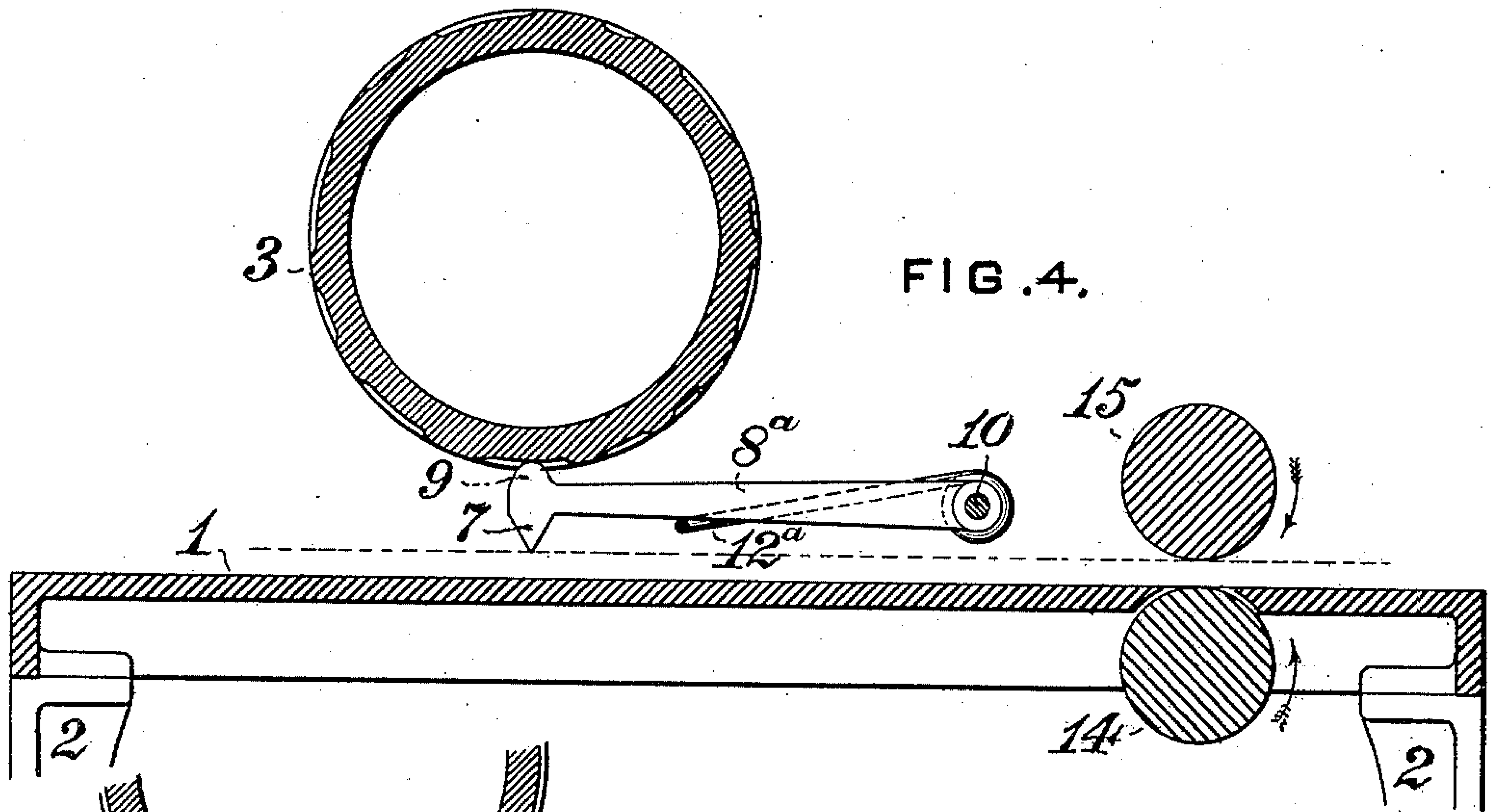

FIG.4.

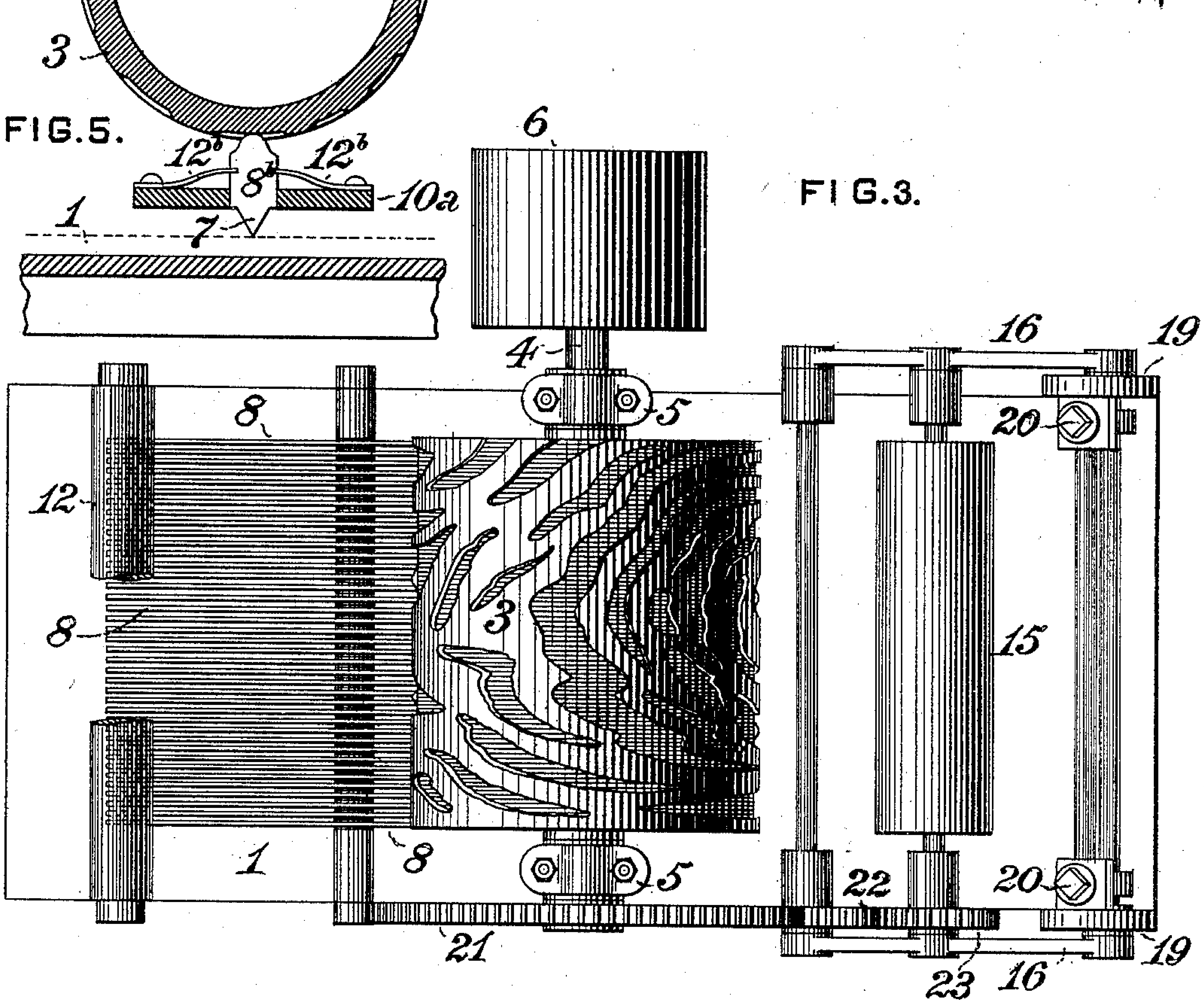

FIG.5.

FIG.3.

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WOOD GRAINING MACHINE.

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FIG. 6.

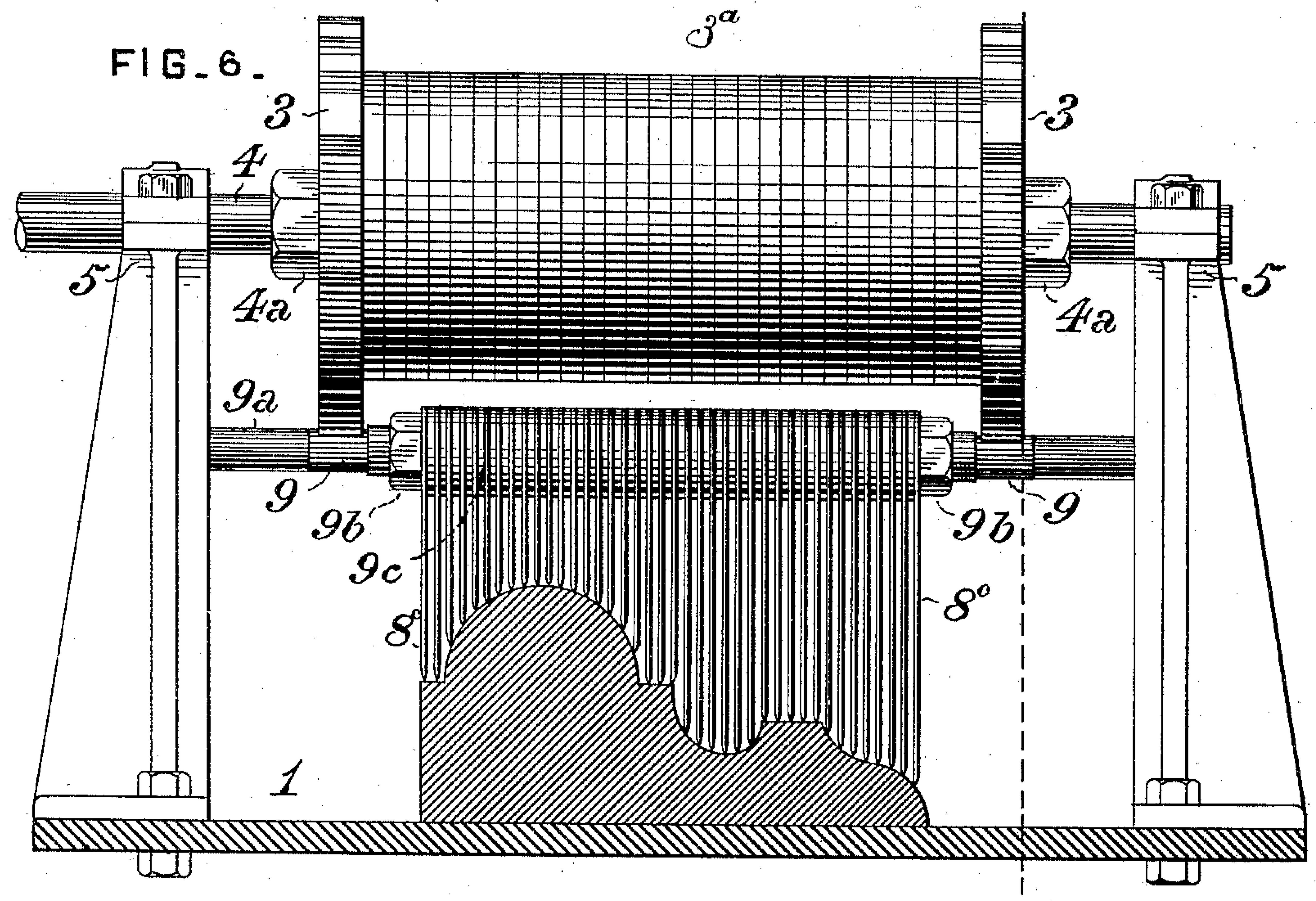

FIG. 7.

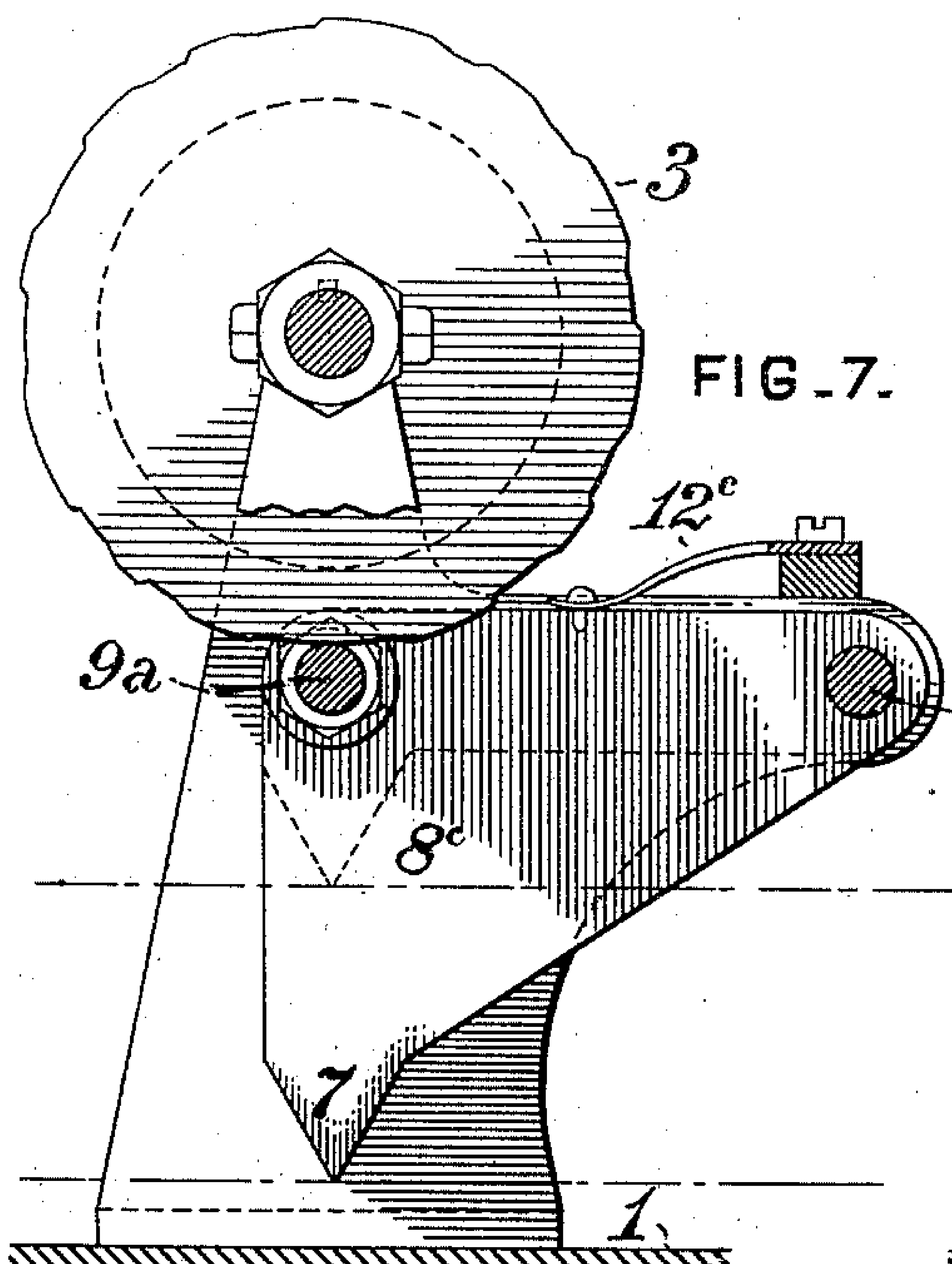

FIG. 8.

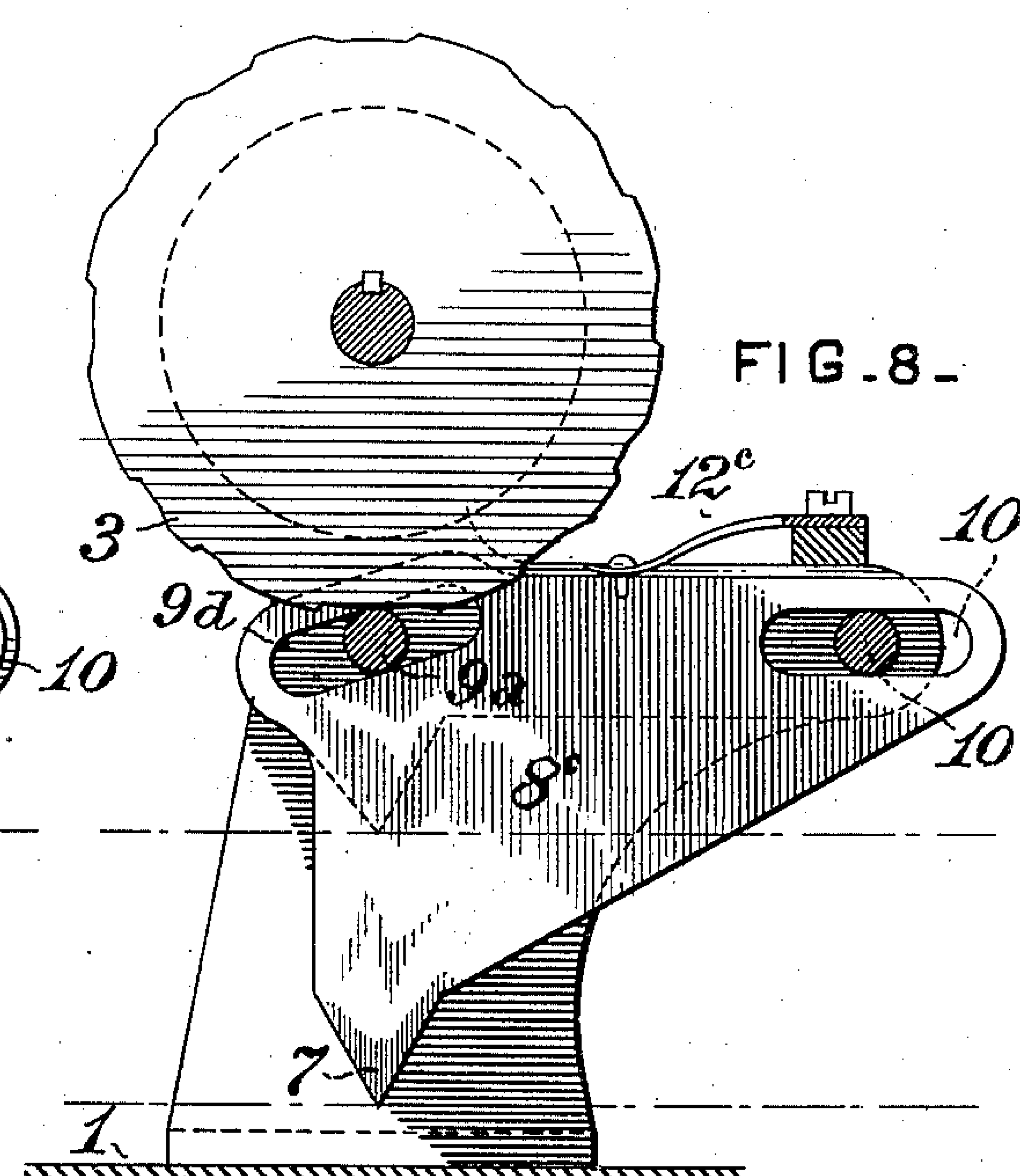

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FIG. 9.

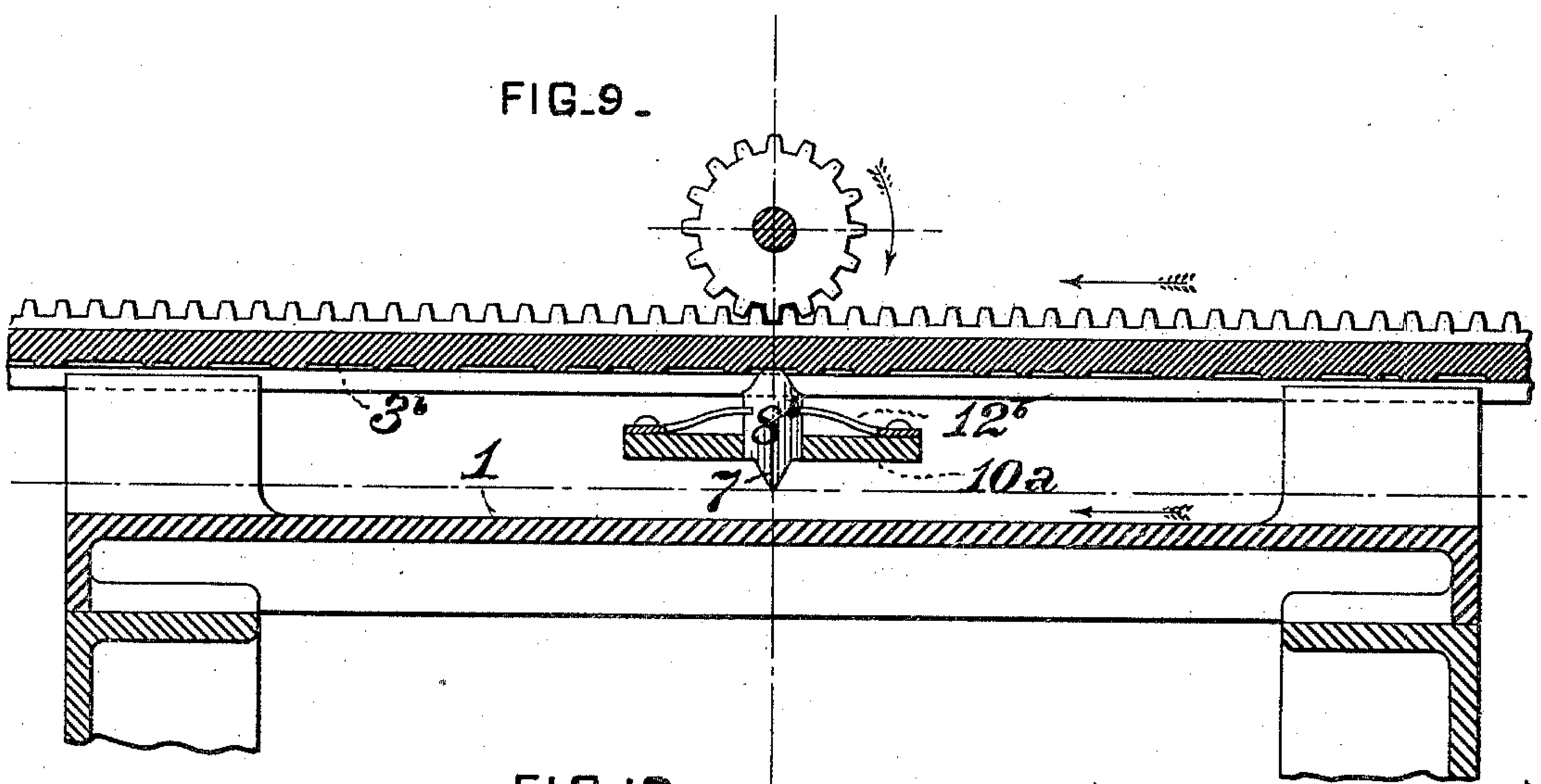
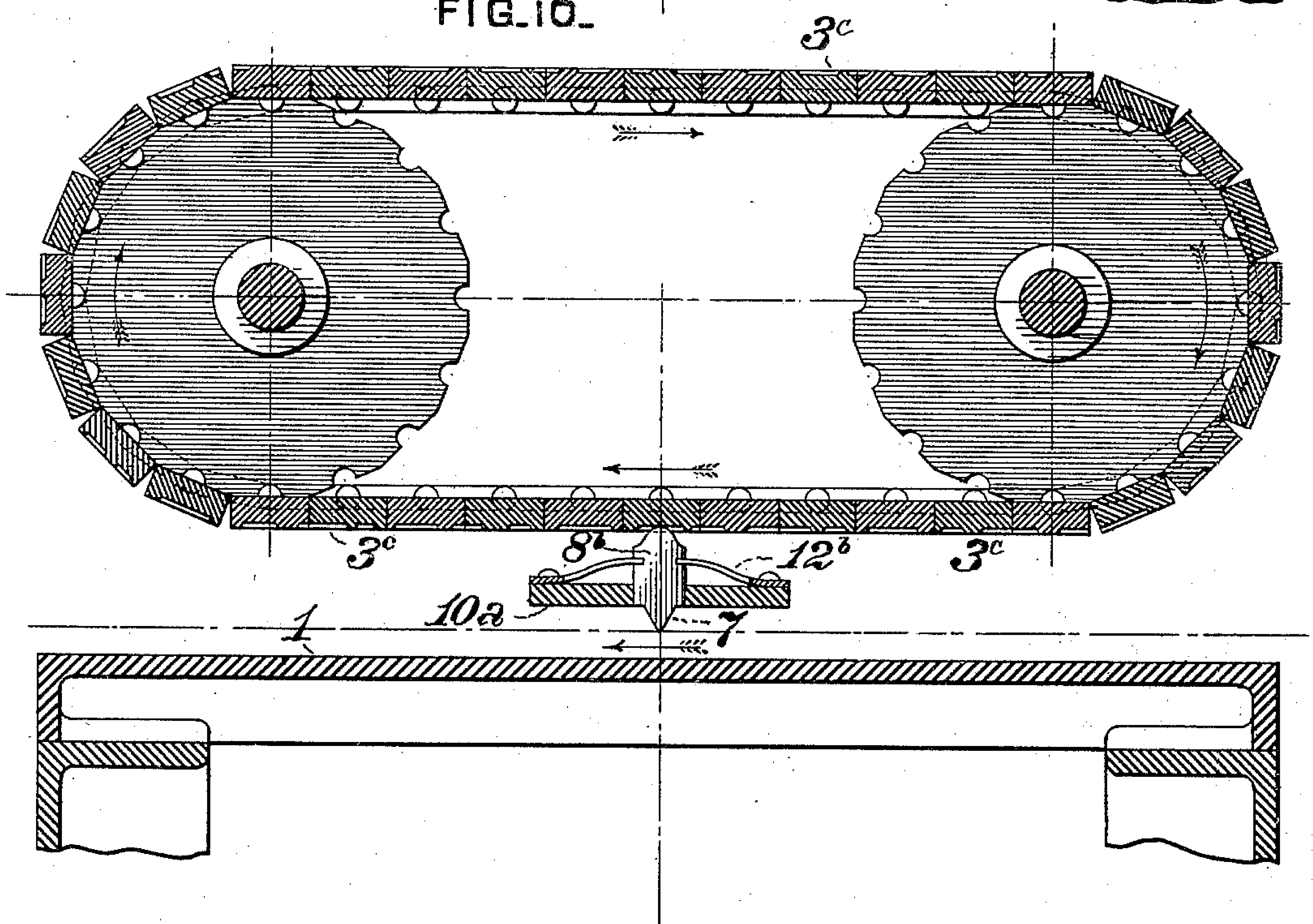


FIG. 10.



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UNITED STATES PATENT OFFICE.

JOHN SHANNON, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND PETER CASEY, OF SAME PLACE.

WOOD-GRAINING MACHINE.

SPECIFICATION forming part of Letters Patent No. 466,804, dated January 12, 1892.

Application filed November 26, 1890. Serial No. 372,653. (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 a certain new and useful Improvement in Wood-Graining Machines, of which improvement the following is a specification.

My improvement relates to the general class or type of appliances employed for producing imitations of the grain or natural growth of hard woods by scoring or incising corresponding designs on the surfaces of such softer and less expensive woods as do not naturally present them, and to which it is desired to impart their appearance for the purpose of ornamentation.

The object of my invention is to provide a device of such character which shall be of simple and inexpensive construction and which in operation will accurately and expeditiously effect the surface-graining of wood without liability to mar or deface it by bruising or breaking down its fibers.

To this end my invention, generally stated, consists in the combination of a table or rest, a design-plate having an embossed or relieved surface and fitted to move above the table, and a series of scoring-blades which are actuated to mark or incise the surface of wood supported on the table in desired and determined patterns by the movement of the design-plate.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a side view, in elevation, of a wood-graining machine embodying my invention; Fig. 2, a vertical longitudinal section through the same; Fig. 3, a plan or top view; Fig. 4, a vertical longitudinal section illustrating a modification; Fig. 5, a similar section illustrating a further modification; Fig. 6, a view partly in end elevation and partly in section of a machine adapted to the graining of moldings; Fig. 7, a vertical longitudinal section through the same; Fig. 8, a similar section showing means for adjusting the scoring-blades to different thicknesses of moldings; Fig. 9, a vertical longitudinal section illustrating a modification in which a rectilineally-moving plane-surfaced design-plate is employed, and Fig. 10 a similar section illustrating a modification in which the design-plate is in the form of a series of sections connected in an endless belt.

In the practice of my invention I provide a table or rest 1, which is ordinarily a substantial plate of metal having a truly plane upper surface and supported upon legs or standards 2. A design-plate 3, upon the surface of which a pattern or representation of the design of graining which is desired to be produced is embossed or formed in low relief in any suitable manner, is fitted to move above the table in such manner that different portions of its surface shall be caused to successively pass a determined vertical transverse plane. Such traverse of the design-plate is most desirably effected by making it of cylindrical form, so as to constitute a roll, to which rotary motion is imparted, and this preferred form is herein particularly exemplified. The cylindrical design plate or roll 3 is fixed upon a shaft 4, which may either extend entirely through it or be made in separate sections, secured to and projecting in line axially from its opposite ends. The shaft 4 is mounted in suitable bearings 5 upon the table and carries upon one of its ends a driving-pulley 6, to which rotation is imparted by a belt from a shaft driven by any suitable prime mover.

The scoring or incising of the wood whereby the desired imitation or hard wood grain is produced is effected by a series of pointed or sharp-edged scoring-blades 7, which are arranged side by side above the table 1 and are suitably supported with the capacity of intermittent vertical movement relatively thereto in position to act upon a strip of wood A traversed thereon, such movements being imparted to the scoring-blades by the embossed or relieved surface of the design-plate 3, and being dependent, as to duration and relation, upon the movement and form thereof. The movements of the scoring-blades in one direction, as either toward or from the surface of the strip of wood to be grained, are effected by the pressure of the design-plate upon their stocks or bodies 8, and are effected in the opposite direction, as either from or toward the surface of the wood, by the oppositely-acting force of a pressure device, consisting of a spring or weight, the function of which is to continuously maintain the scoring-blade stocks in working contact with the design-plate by which they are actuated.

In the construction illustrated in Figs. 1 to 3, inclusive, the stocks 8 of the scoring-blades 7 are journaled at or near the middle of their length upon a transverse shaft 10, supported in standards 11, secured to the opposite sides of the table. The scoring-blade stocks are each provided at one end with a curved bearing-face 9, which abuts against the surface of the cylindrical design-plate 3, and their opposite ends are subject to the downward pressure of a spring 12, fixed upon a transverse rod or bar 13 above and substantially in line with the points of the scoring-blades. The parts are arranged in such relation that the point of each scoring-blade will stand at or very slightly above the upper surface of the strip of wood A when the bearing-face 9 of the stock of said blade is in contact with a raised portion of the surface of the design-plate 3, the bearing-face being pressed upwardly against the same by the spring 12. It will thus be seen that when in the rotation of the design-plate a depressed portion of its surface is brought opposite the bearing-face 9 of a scoring-blade stock the bearing-face will by the downward pressure of the spring on the opposite end of the stock be forced upwardly and abut against the depressed portion of the surface of the design-plate, permitting the opposite end of the stock and the scoring-blade to be coincidently forced downwardly by the spring. The scoring-blade is held in such depressed position, in which it forms a longitudinal score or incision in the strip A, which is fed longitudinally along the table until another raised portion of the design-plate is brought in contact with the bearing-face 9, when the latter is thereby depressed, the opposite end and scoring-blade elevated, and the scoring action of the blade is intermitted until another depressed portion of the design-plate is brought opposite the bearing-face. By such movements of the scoring-blades a series of longitudinal scores or incisions in imitation of natural grain will be made by the blades in the surface of the strip A, the lengths and relative arrangement of said incisions corresponding with the pattern of the design-plate and being dependent upon and controlled by the form and movement of the design-plate and the feed of the strip to be grained. It will be seen that while the downward pressure by which the scoring-blades are forced into the wood is imparted by the spring said blades are none the less actuated by the design-plate, inasmuch as said plate, in and by its alternate presentation of depressed and of raised surfaces to the stocks, alternately permits and intermits the exertion of the pressure by which the scoring-blades are depressed to and maintained in working position.

Any suitable and preferred mechanism may be employed for effecting the longitudinal feed of the wood to be grained, or in some cases feed mechanism may be dispensed with and the strip fed by hand. In the instance shown a lower feed-roll 14 is mounted in bearings on the table 1 below a transverse slot therein, its periphery being tangential to the upper surface of the table, and an upper feed-roll 15 is journaled in bearings on arms 16, which are coupled to blocks or dies 17, fitted to slide in curved slots 18, formed in standards 19, fixed to the sides of the tables and adjustable in said slots by screws 20. A spur-gear 21, fixed on the shaft of the design-plate, engages a corresponding pinion 22, journaled in a bearing on one of the arms 16. The pinion 22 engages a corresponding pinion 23 on the shaft of the upper feed-roll 15, and also engages an idle-pinion 24, which is fixed upon a shaft journaled on the table and engages a pinion 25 on the shaft of the lower feed-roll 14. The feed-rolls are thereby rotated in opposite directions coincidently with the rotation of the design-plate, and the upper feed-roll may be raised and lowered, as desired from time to time, to accommodate different thicknesses of stuff without impairing the operative relation of the driving-gearing.

Figs. 4 and 5 show modified forms of the machine in which the same elements of the graining mechanism, as above described, are combined in the same operative relation, differing, however, in the particular that the movements of the scoring-blades in the figures last specified are reversed relatively to those in the instance first described—that is to say, the scoring-blades are moved downwardly by their stocks being brought into contact with the raised portions of the design-plate, effecting their scoring or incising action while such contact continues and are elevated by their springs when the stocks are brought into contact with the depressed portions of the design-plate.

As shown in Fig. 4, each of the scoring-blade stocks 8^a is journaled at one end on the common transverse shaft 10, and its curved bearing-face 9 is formed upon its opposite end above the scoring-blade. The springs 12^a bear against and exert pressure on the lower sides of the stocks 8. Figs. 5, 9, and 10 show structural modification, the scoring-blade stocks 8^b having a direct reciprocating movement instead of an oscillatory movement, as in the former cases. To this end they are fitted to slide vertically in a supporting and guide bar 10^a and are provided with scoring-blades 7 at their lower ends and curved bearing-faces 9 on their upper ends. The springs 12^b—two springs or two leaves being provided for each scoring-blade stock—engage notches or shoulders on the sides of the stocks and exert upward pressure, by which they are elevated to withdraw the points of the scoring-blades from the wood when and during the periods in which the depressed portions of the design-plate are brought opposite to the bearing-faces of the stocks, as before noted.

While I have herein set forth as the preferred construction a design-plate of cylindrical form, I do not desire to be understood as limiting myself to such specific form, for the reason that a plate 3^b, having the desired pattern for graining embossed or relieved upon a plane surface, different portions of which are successively brought into contact with the stocks of the scoring-blades by rectilineal movement, as shown in Fig. 9, or a series of flat embossed or relieved plates 3^c, connected in series to form an endless traversing-belt, as shown in Fig. 10, would in each case operate in combination with a series of scoring-blades similarly to the cylindrical design-plates shown and described and would act as the mechanical equivalent thereof when substituted therefor. Said plane-surface plates, either singly or connected, when combined with a series of scoring-blades, as hereinbefore set forth, I therefore consider to embody the essential principle of my invention and to be within its scope.

Figs. 6 to 8, inclusive, illustrate a modification of structure whereby the machine is adapted to operate upon moldings—that is to say, strips of wood having a surface whose contour in transverse section is made up of one or a series of connected curves with or without intermediate straight lines. In such case two cylindrical design-plates 3 are secured by nuts 4^a, upon a shaft 4, journaled in bearings 5 above the table, the distance of the design-plates apart being adjusted as desired by a series of interposed removable rings or washers 3^a. Each of the design-plates is formed with an embossed or relieved surface, so as to present irregularly disposed raised and depressed portions, adapted to alternately make contact with bearings on a shaft to which the scoring-blades are connected. A series of scoring-blade stocks 8^c is journaled upon a transverse shaft 10, each stock having a downwardly-projecting scoring-blade 7 on its free end. The vertical center lines of the several scoring-blades are located at substantially equal distances from the center of the shaft, but their downward projection therefrom—that is, the depth of the scoring-blade stocks—varies in accordance with the contour of the molding, being less or greater, as the case may be, proportionately to the elevation and depression of the different portions of its surface in transverse section. A shaft 9^a extends through the series of scoring-blade stocks, in line vertically with the points of the scoring-blades, the stocks being fixed thereto by nuts 9^b, by which they are clamped endwise thereon, rings or washers 9^c being interposed between the adjoining stocks. Cylindrical bearing-faces 9 are formed upon the shaft 9^a, said faces being caused to abut against the surfaces of the design-plates 3 by the upward pressure of a spring or springs 12^c.

In operation the scoring-blade stocks and blades are simultaneously depressed to effect the scoring or incising action of the blades, when in the rotation of the design-plates the bearing-faces 9 are brought into contact with the raised portions of their surfaces and are elevated by the spring or springs to intermit the action of the scoring-blades when the bearing-faces are brought into contact with the depressed portions of the design-plates, as in the forms shown in Figs. 4 and 5. The simultaneous elevation and depression, respectively, of a series of scoring-blade stocks of different downward projection enables the action of the blades to be exerted uniformly throughout the width of the vertically-varied contour of the molding.

As shown in Fig. 8, the scoring-blade stocks 8^c are provided with horizontal slots 10^b, to receive the shaft 10′ and angular or inclined slots 9^d, through which the shaft 9^a passes. This construction admits of adjustment to suit moldings of different thicknesses by longitudinal movement of the stocks relatively to the shafts 10 and 9^a, such movement raising or lowering the points of the scoring-blades by reason of the inclination of the slots 9^d, accordingly as the stocks are moved in one or in the other direction. The scoring-blades are clamped and held in adjusted position by the nuts 9^b.

I claim as my invention and desire to secure by Letters Patent—

1. In a wood-graining machine, the combination of a table or rest, an embossed or relieved surface design-plate fitted to move above the table, and a series of scoring-blades fixed upon stocks abutting directly and continuously against the alternately raised and depressed portions of the design-plate, movement toward and from the table being imparted to the scoring-blades in and by the movement of the design-plate and the continuous bearing thereof upon the scoring-blade stocks, substantially as set forth.

2. In a wood-graining machine, the combination of a table or rest, an embossed or relieved surface design-plate fitted to move above the table, a series of scoring-blades fixed upon stocks abutting directly and continuously against the alternately raised and depressed portions of the design-plate, movement toward and from the table being imparted to the scoring-blades in and by the movement of the design-plate and the continuous bearing thereof upon the scoring-blade stocks, and a feeding device for longitudinally traversing a strip of wood to be grained relatively to the scoring-blades, substantially as set forth.

3. In a wood-graining machine, the combination of a table or rest, an embossed or re-

lieved surface design-plate fitted to move above the table, a series of scoring-blades fixed upon stocks abutting directly and continuously against the design-plate and fitted to move toward and from the table, and a pressure device transmitting pressure to the scoring-blade stocks in direction to maintain continuous contact of said stocks with the surface of the design-plate, substantially as set forth.

4. In a wood-graining machine, the combination of a table or rest, a cylindrical design-plate having an embossed or relieved surface and journaled to rotate in bearings above the table, a series of scoring-blades fixed upon stocks which are fitted to traverse toward and from the table and to abut directly and continuously against the design-plate, and a spring bearing against the scoring-blade stocks in direction to maintain continuous contact of said stocks with the surface of the design-plate, substantially as set forth.

5. In a wood-graining machine, the combination of a table or rest, a cylindrical design-plate having an embossed or relieved surface and journaled to rotate in bearings above the table, a series of scoring-blades fixed upon stocks which are fitted to traverse toward and from the table and to abut against the design-plate, a spring bearing against the scoring-blade stocks in direction to maintain continuous contact of said stocks with the surface of the design-plate, a pair of transverse feed-rolls journaled in bearings above and below the table, respectively, and gearing through which rotation is imparted to one of the feed-roll shafts from the shaft of the design-plate, substantially as set forth.

6. In a wood-graining machine, the combination of a table or rest, a cylindrical design-plate having an embossed or relieved surface and journaled to rotate in bearings above the table, a series of scoring-blades, each fixed upon and projecting downwardly from a stock or body having a bearing-face abutting directly and continuously against the design-plate, a shaft on which said scoring-blade stocks are fitted to oscillate, and a pressure device transmitting pressure to the scoring-blade stocks in direction to maintain continuous contact of said stocks with the surface of the design-plate, substantially as set forth.

7. In a wood-graining machine, the combination of a table or rest, a cylindrical design-plate having an embossed or relieved surface and journaled to rotate in bearings above the table, a series of scoring-blades fixed upon and downwardly projecting from stocks of different vertical depths, which are fitted to traverse side by side toward and from the table and to abut against the design-plate, and a spring bearing against the scoring-blade stocks in direction to maintain continuous contact of said stocks with the surface of the design-plate, substantially as set forth.

8. In a wood-graining machine, the combination of a table or rest, a cylindrical design-plate having an embossed or relieved surface and journaled to rotate in bearings above the table, a series of scoring-blades fixed upon and downwardly projecting from stocks of different vertical depths, a shaft on which said scoring-blade stocks are fitted to oscillate, a shaft fixed to the scoring-blade stocks adjacent to their free ends and above the scoring-blades, said shaft having a cylindrical bearing-face abutting against the design-plate, and a spring exerting pressure upon the scoring-blade stocks in direction to maintain continuous contact of the bearing-face with the surface of the design-plate, substantially as set forth.

9. In a wood-graining machine, the combination of a table or rest, a cylindrical design-plate having an embossed or relieved surface and journaled to rotate in bearings above the table, a series of scoring-blades fixed upon and downwardly projecting from stocks of different vertical depths, said stocks having inclined slots above their scoring-blades and horizontal slots near their opposite ends, a shaft passing through the horizontal slots of the scoring-blades and on which they are fitted to oscillate, a shaft passing through the inclined slots of the scoring-blades, said shaft having a cylindrical face abutting against the design-plate, and a spring exerting pressure upon the scoring-blade stocks in direction to maintain continuous contact of the bearing-face with the surface of the design-plate, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JOHN SHANNON.

Witnesses:
J. SNOWDEN BELL,
W. B. CORWIN.