

(No Model.)

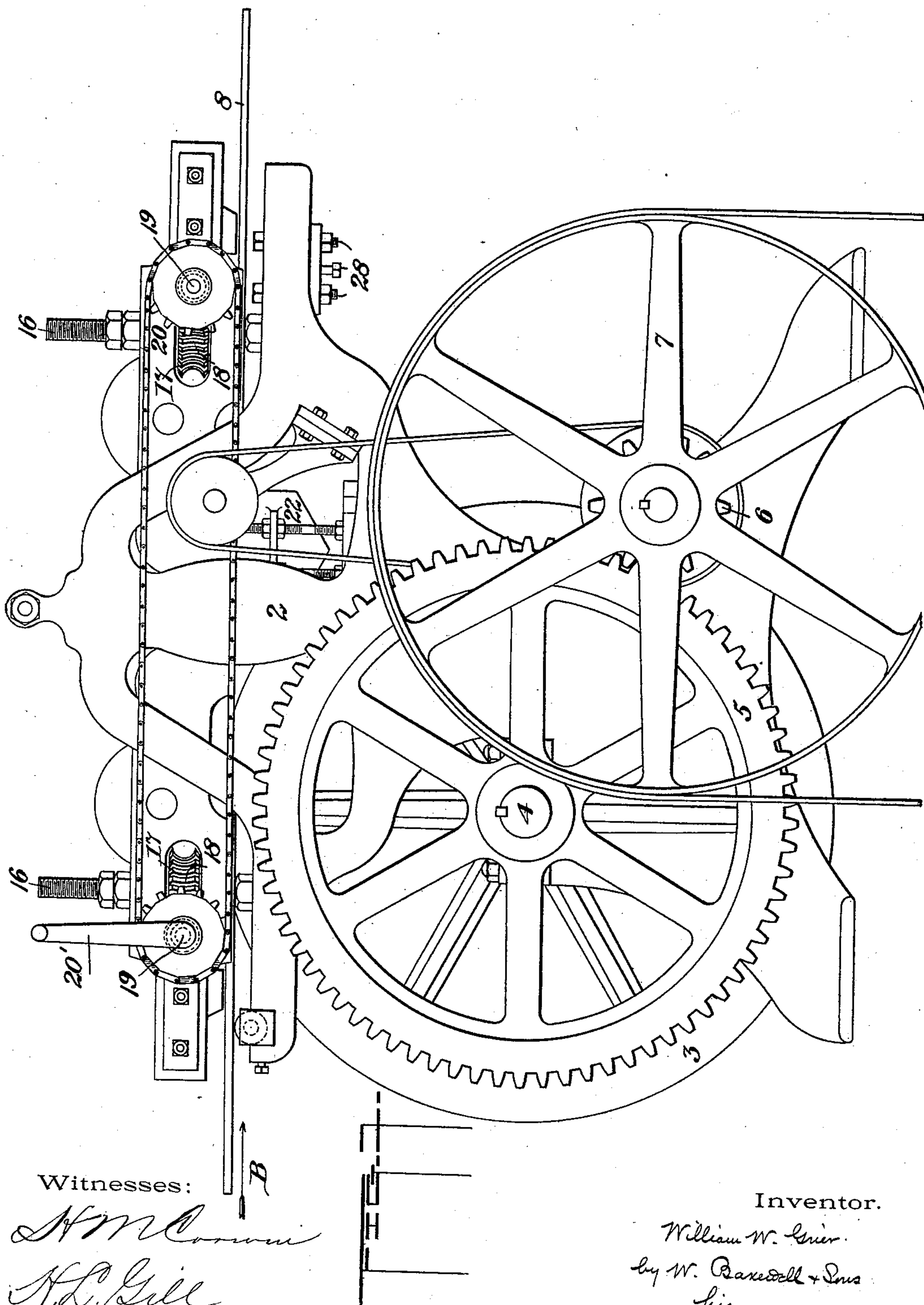
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W. W. GRIER.

WOOD INDENTING AND APPARATUS THEREFOR.

No. 540,588.

Patented June 4, 1895.



Witnesses:

W. M. Corwin
H. L. Gill

Inventor.

William W. Grier.
by W. Baxendell & Sons
his
Attorneys

(No Model.)

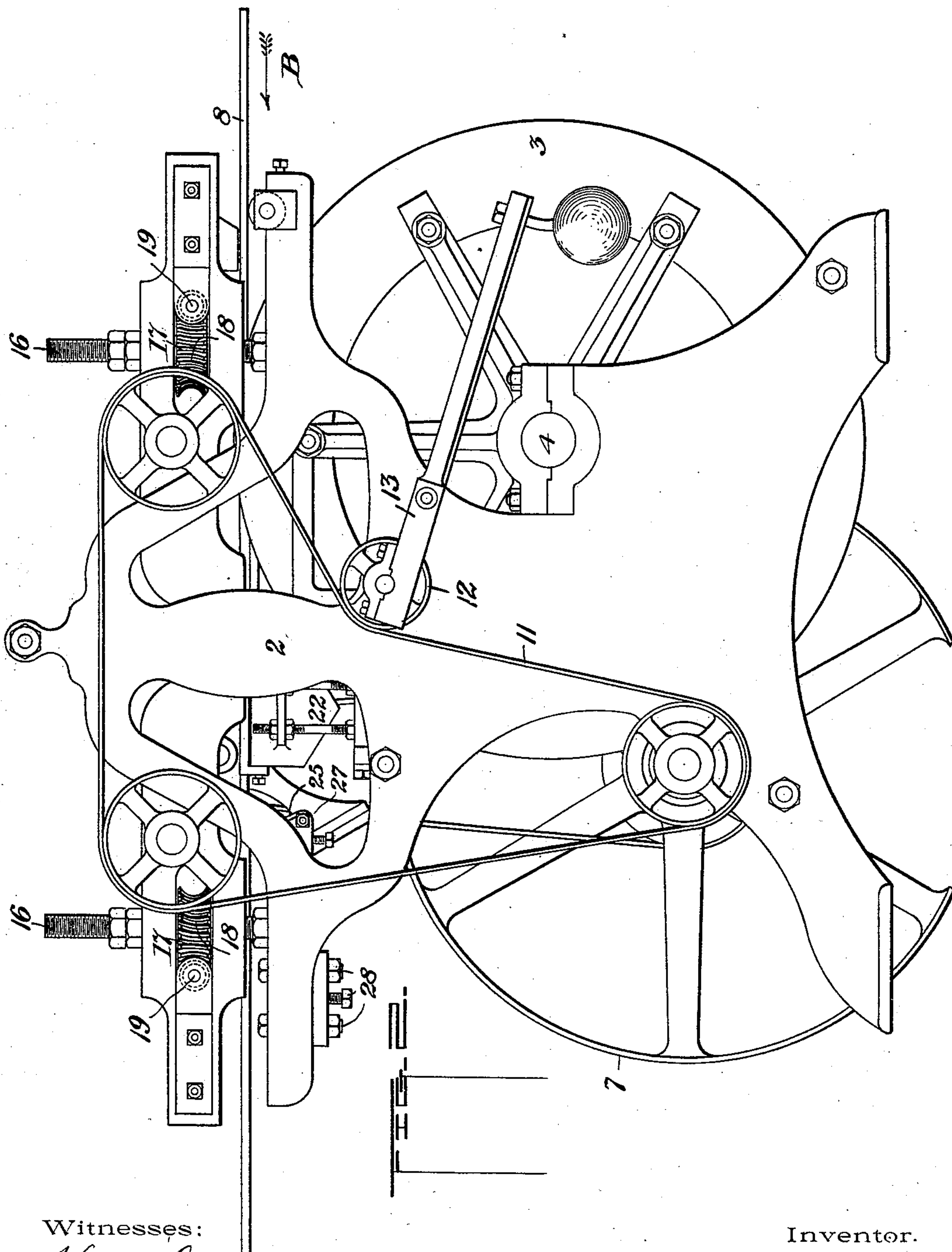
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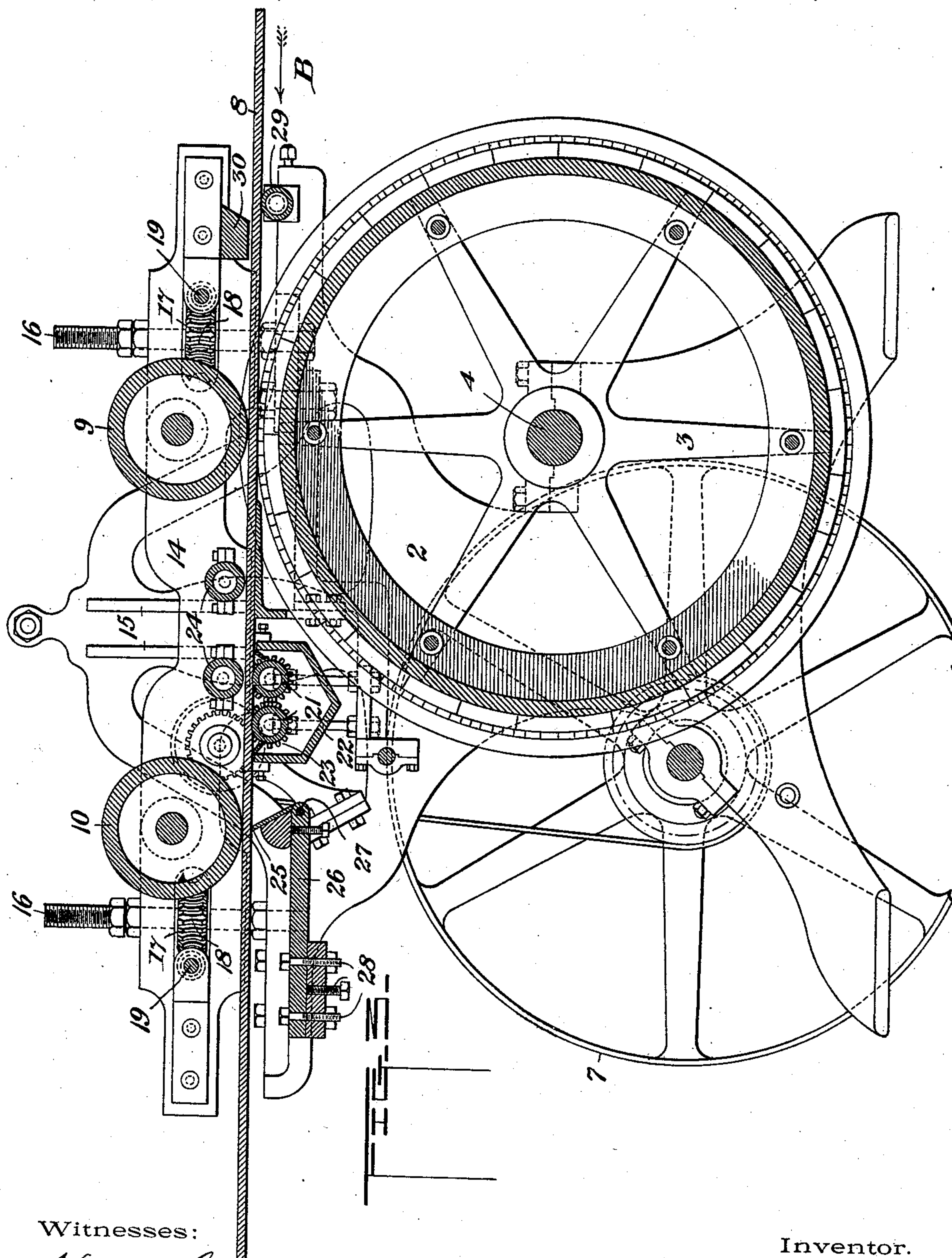
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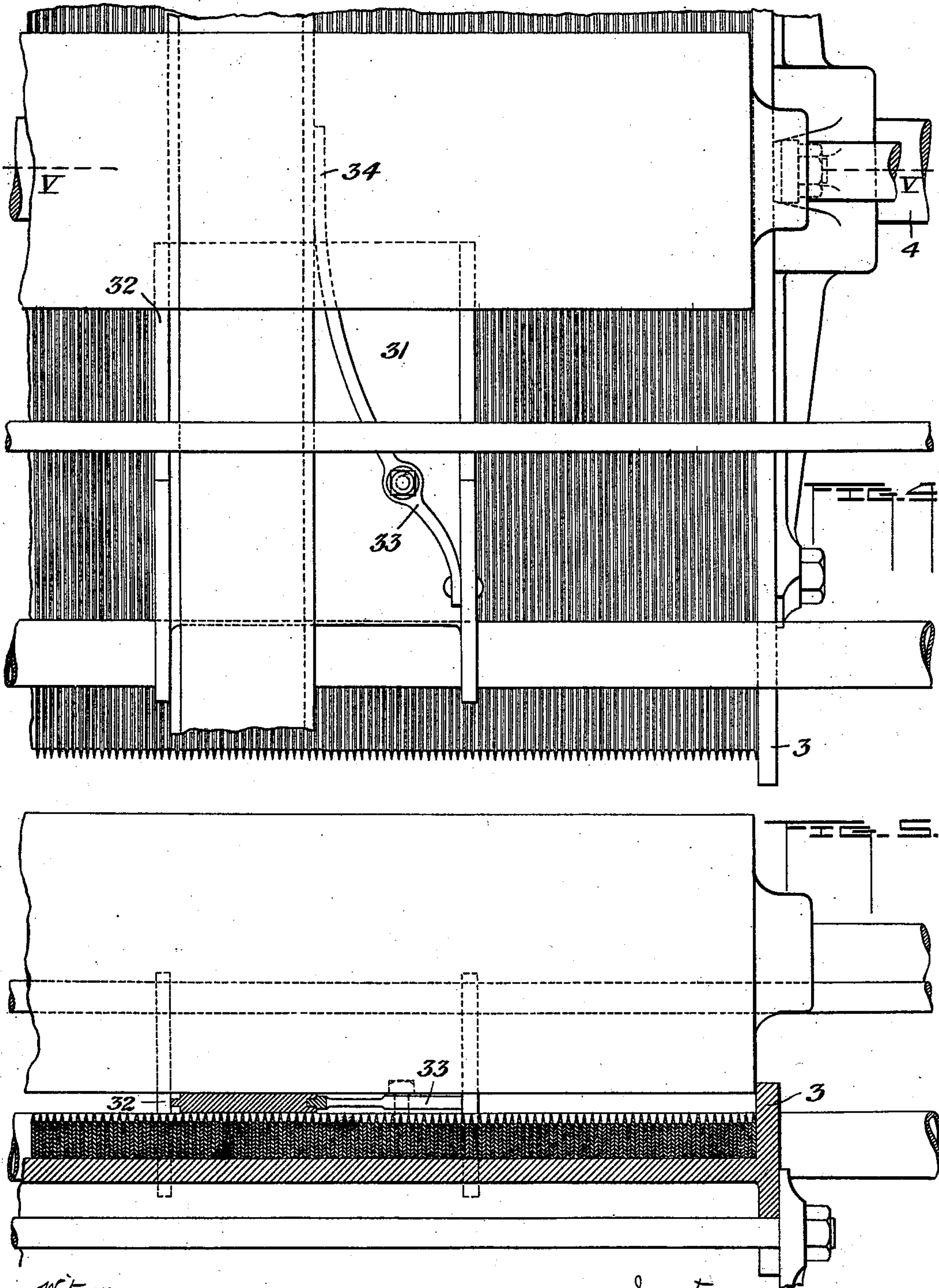
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H. L. Gill

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William W. Grier
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(No Model.)

5 Sheets—Sheet 5.

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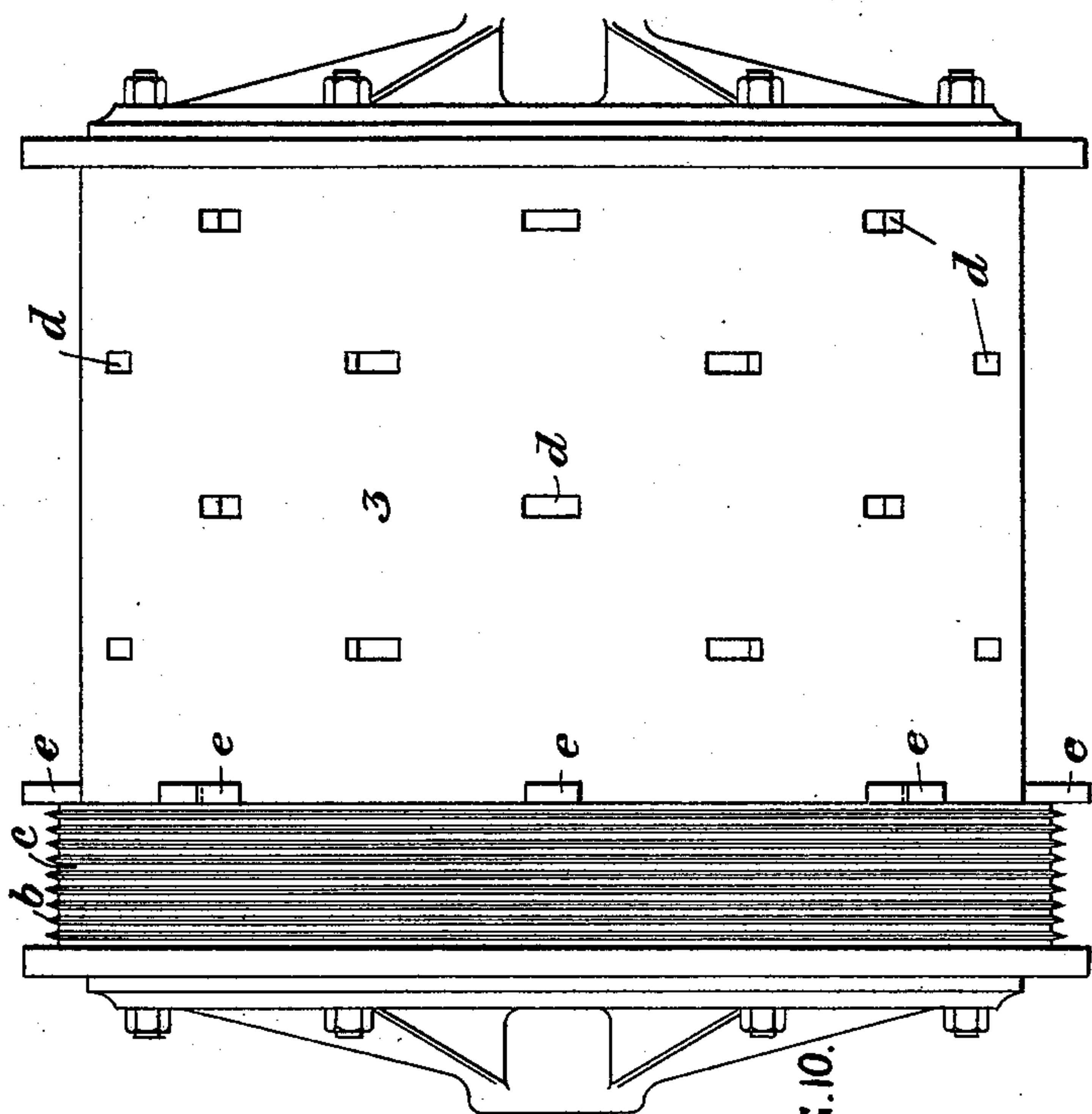


FIG. 10.

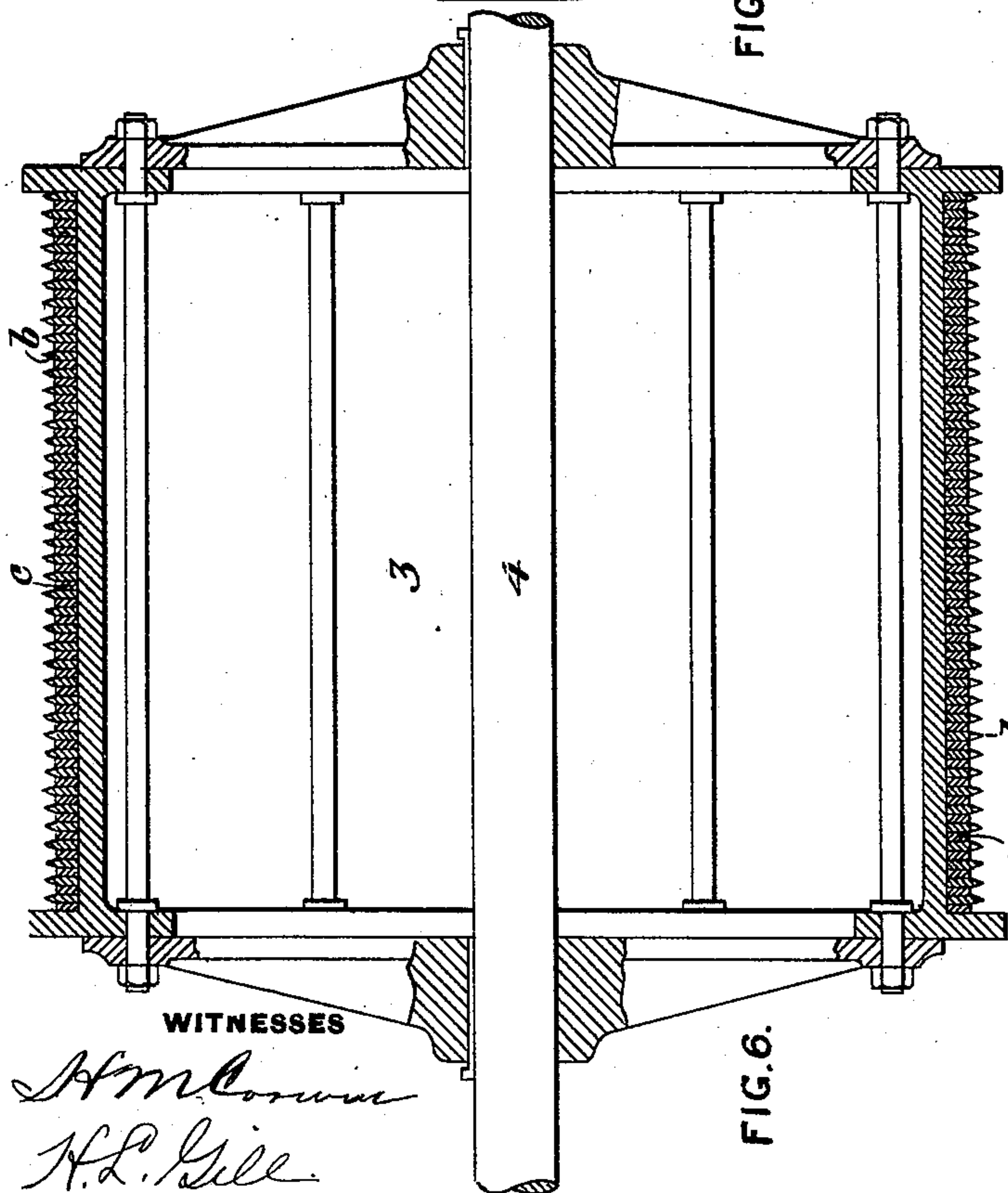


FIG. 6.

WITNESSES

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H. L. Gill

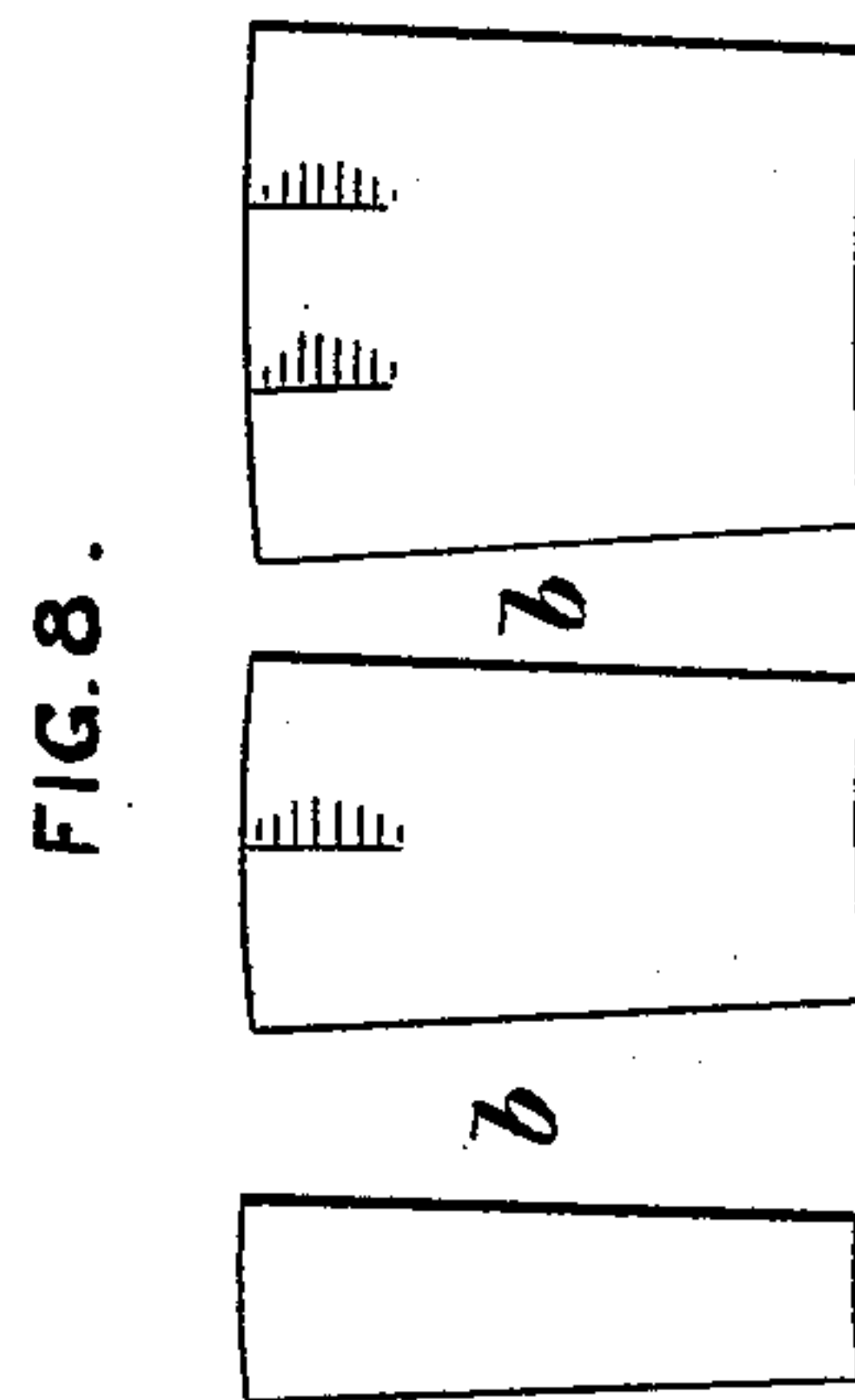


FIG. 8.

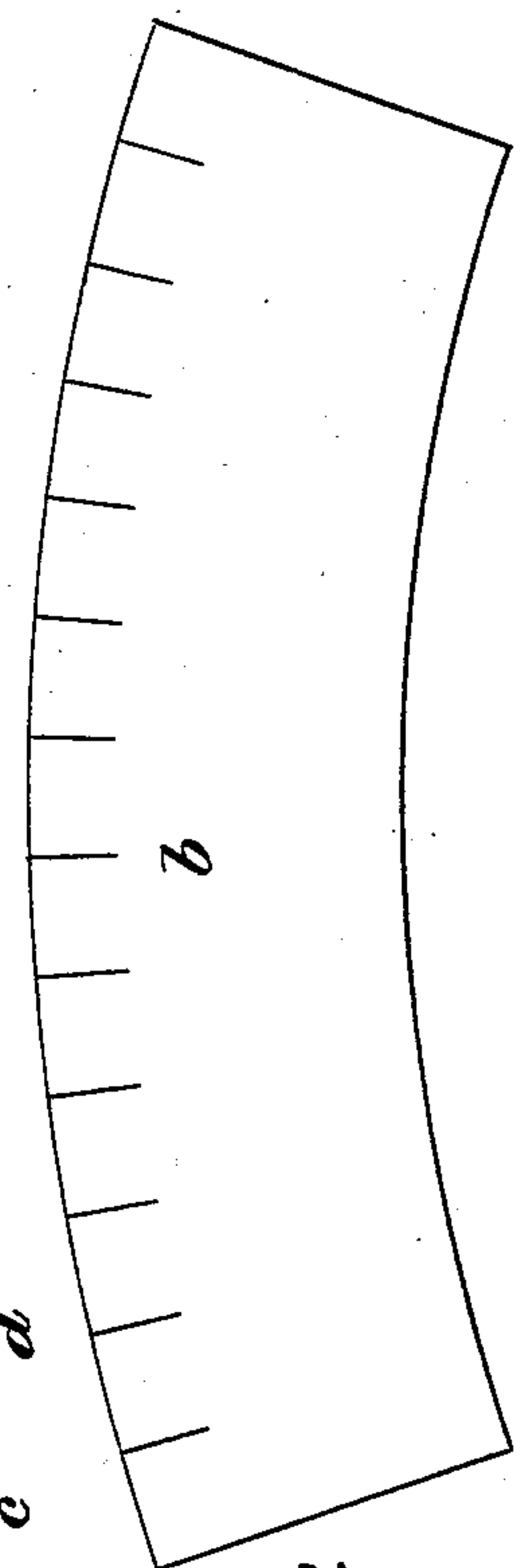


FIG. 7.

INVENTOR

William W. Grier
by his Attorneys
W. B. Russell & Son.



FIG. 9.

UNITED STATES PATENT OFFICE.

WILLIAM W. GRIER, OF HULTON, PENNSYLVANIA.

WOOD-INDENTING AND APPARATUS THEREFOR.

SPECIFICATION forming part of Letters Patent No. 540,588, dated June 4, 1895.

Application filed February 7, 1894. Renewed November 15, 1894. Serial No. 528,931. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. GRIER, of Hulton, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Wood-Indenting and Apparatus Therefor, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

10 Figures 1 and 2 are respectively side elevations of opposite sides of my improved machine. Fig. 3 is a vertical central longitudinal section thereof. Fig. 4 is a plan view, on a larger scale, of part of the machine, showing the device for preventing injury to the edge grooves of grooved boards. Fig. 5 is a vertical longitudinal section on the line V V of Fig. 4. Fig. 6 is a vertical longitudinal axial section of the indenting-roller, illustrating the manner of arranging and holding the type. Fig. 7 is a side view of a sheet-metal blank from which the types may be cut. Fig. 8 shows several of the type. Fig. 9 is an edge plan view of some of the types. Fig. 10 is a plan view of the roller with the types partially set thereon and keys holding the layers of types during the setting of the cement.

Like symbols of reference indicate like parts in each.

30 My invention relates to an improvement upon the wood-graining machine for which I have already obtained Letters Patent of the United States No. 472,260, dated April 5, 1892; and it consists in certain improvements in the general construction of the machine, and in improvements in the construction of the wood-indenting roller.

In the drawings, (Figs. 1, 2 and 3,) 2 represents the machine-frame, and 3 is the indenting-roller, having a central shaft or axis 4, journaled in suitable bearings. The specific construction of the roller will be explained in detail hereinafter. It will suffice for the present to say that its periphery is made up of a series of indenting types set in such relative position as to produce on the surface of a board indentations corresponding to the surface pattern of natural wood such as oak, &c. This roller may be fixed to a suitable gear-wheel 5, driven by a pinion 6 on the shaft of a belt-pulley 7, these devices affording means

by which the roller may be rotated to effect the work hereinafter explained.

The board 8 to be treated passes over the indenting-roller 3, and above its position are feed-rollers 9, 10, journaled in the machine-frame, and driven by a belt 11 from the main driving-shaft of the machine. This belt may pass around pulleys on the axes of both rollers and may be provided with a belt-tightening pulley 12, which being journaled on a weighted lever 13 keeps the belt taut and enables the feed-rollers to be adjusted vertically without disturbing their power connection. In order to effect such adjustment I journal these rollers in a vertically movable frame 14, set in guide-ways 15 in the machine-frame, and to move such frame vertically I provide adjusting screws 16, fitted with nuts 17. These nuts are formed with external worm-teeth 18, and are adapted to be rotated simultaneously by worms on cross-shafts 19, which may be connected by driving sprocket-gearing 20. On actuating this gearing by a hand-crank 20', or otherwise, the nuts 17 are rotated and the frame 14 moved vertically to vary the degree of pressure of the rollers 9, 10, upon the board.

In advance of the indenting-roller, and on the under side of the board, I journal a filler-spreading roller or rollers 21 included within a tank or box 22 adapted to contain liquid filler material, into which the lower portion of the roller or rollers dips. As these rollers are driven by suitable gearing and power-connections 23, they spread upon the under side of the indented board the filler which adheres to their surfaces. Presser rollers 24 may be journaled in the frame 14 and may be adapted to bear upon the upper side of the board to press it against the filler rollers.

To remove the surplus filler from the board, I use a scraper 25. This scraper is preferably fixed to a board or plate 26 pivoted to the machine-frame at a line 27, and adapted to be turned on said pivot by adjusting screws 28. By adjustment of these screws the degree of pressure of the scraper on the board may be varied, and to secure the best action of this device, the plate 26 is preferably constituted of a resilient board.

As thus constructed the operation of the

machine is in general as follows: The board to be indented is introduced into the machine in the direction of the arrow B, between the indenting roller and the feed-roller, and by the rotation of these rollers in the direction of the arrow, is carried onward, as shown. In its passage over the indenting-roller, the types impress in the surface the required indentations. Then in passing over the filler-rollers, the filler material is spread upon it and caused to enter the indentations, and finally in passing over the scraper, the filler is forced still more thoroughly into the indentations and the surplus filler removed. The degree of pressure of the feed-rollers upon the board can be regulated accurately by means of the adjusting mechanism described above.

Instead of using the machine for the purpose of successively indenting and filling the surface of the lumber to be treated, the pattern may be produced upon the wood at one operation by applying ink or coloring material to the edges of the types, and then passing the lumber under or in contact with them. In such case, the pressure of the roller upon the wood should be gaged so that the types shall not be forced deeply into the wood, for their bearing thereon may be only sufficient to produce upon the wood's surface a very slight indentation or imprint, and the edges of the types need not be so sharp as when the wood is intended to be filled by a separate operation.

In order to prevent the passage over the indenting roller of more than one board at a time, I prefer to use a device shown in Fig. 3. It comprises a board-supporting roller 29, set at the receiving end of the machine, in advance of and above which is a stop-strip 30, situate just sufficiently above the roller to permit passage of one board only. When a board is passing through the machine, the end of a second board may be placed upon the first, but will be prevented from advancing by the stop strip, but when the first board has passed, the end of the second will automatically fall upon the roller 29, and can be fed forward into the machine.

In using machines of the character above described for the purpose of indenting boards having grooved edges such as are commonly used in flooring, it has been found that the pressure of the roller is apt to split the wood at the groove. In order to prevent this I apply the devices shown in Figs. 4 and 5, which are constructed as follows:

31 is a feed-plate suitably secured to the machine-frame on the receiving side of the indenting-roller, and having a side strip 32 against which the edge of the board has a bearing.

33 is a spring arm attached to the plate 31, and having at its end a lateral tongue 34, which fits within the groove of the board at a point opposite to the middle line of the indenting roller. By thus filling this groove the

device prevents the pressure of the roller thereon from splitting the wood.

I shall now describe the indenting roller. The construction of the roller so that the indenting surface shall be composed of series of individual types *b* disposed in proper order and held by a suitable matrix upon the roller or cylinder, constitutes the most effective means for indenting wood. It is desirable of course in making such indenting rollers that the type shall be held with great firmness, and that they shall be capable of being set so as to produce a pattern simulating as accurately as possible the appearance of hard wood. I have discovered that these results may be produced by building up on the surface of a roller successive annular layers of individual types, separating these layers of type by intervening strips or ribbons *c*, preferably composed of strips of wood-veneer, paper, leather, or other material, which, when the type is being set, will absorb moisture, and will afterward shrink so as to bind the type firmly to the roller, and using cement to hold the types and strips together. The cement will unite to such absorbent material with very great tenacity. The strips are made of length greater than the types, so that when applied, each strip shall be in contact with and shall adhere laterally to several of the individual types, thus forming a common bond which holds the types against displacement. This construction enables the rollers to be built up in circular successive layers, produces a strong and very durable indenting surface, and enables its periphery to be truly cylindrical, so that in indenting it shall work with perfect accuracy.

Within the scope of my broader claims, separating strips of metal may be set between the layers of type, in which case the metal strips are preferably composed of continuous annular bands, which should be heated before their application to the roller, so that they shall shrink around the same, and the types may be held in place by lateral projections adapted to engage with recesses on said strips. Unless the types are thus set in layers, it is difficult to get them regular. The intervening strips separate laterally the indentations produced on the wood, and thus improve the pattern, and when formed of wood or other flexible material, constitute a firm bond between the adjacent layers of types.

The cementing material which I prefer to employ, as a means for holding the type in place, consists of a mixture of silicate of soda and a substance, preferably whiting, mixed therewith to give body to the cement. This cement is easy to apply, sets rapidly, and is very tenacious.

The types are composed of small plates of steel or similar metal, cut from sheets, and they are (or the majority of them are) preferably of greater height than width, for such proportion renders the types very easy to set,

and enables them to be arranged so as to simulate much more accurately the natural appearance of wood. The separate strips, when made of wood and similar material, are preferably made in short sections, each preferably from six to ten inches in length for a roller of thirty-six inches diameter.

In practice, in setting the type upon the roller, which consists of a flanged cylindrical shell as shown in Fig. 6, I place it in an upright position and then set the types and separating strips in alternate layers, setting first a separating strip layer, applying cement to its side, then laying types in a layer thereon with their lateral edges together or somewhat separated to produce proper spacing of the pattern, with the bases of the types resting against the periphery of the roller, and with their indenting edges outermost. Cement is then applied to the layer of types, a layer of separating strips is applied to the side of said layer, and so the work is continued, alternate layers of types and strips being laid and cemented together. After thus setting a number of layers, I find it desirable to press them together somewhat and to permit the cement to harden, before proceeding to set another series of layers. For this purpose, I prefer to form on the surface of the roller annular rows or series of notches *d* as shown in Fig. 10, and to stagger the relative positions of the notches in the several rows. When a number of layers of type have been set, keys or holding pieces *e* are put in the row of notches to which the layers extend so as to hold them under slight compression during the hardening of the cement, and by reason of the staggering or alternating of the position of the notches, the layers are not distorted by the pressure of the keys thereon.

When the roller is built up in the manner above described, it constitutes a strong and efficient device.

The use of the separating strips of absorbent material is especially efficient in shrinking the whole body of types upon the roller and holding them thereto with tenacity so that they afford a permanently durable setting.

For the purpose of making the indentations produced by the type somewhat irregular and thus to impart variety and grace to the pattern without destroying the general parallelism of the indentations, I prefer to slit or shear, without cutting out any of the material, the edges of the type and to twist the edges formed by these cuts so as to impart to said edges a zigzag outline, so that they shall be out of parallel with the body of the types, as shown in Fig. 9. This also facilitates the guiding of the edges so bent out.

The indenting edges of the type are of shuttle or canoe-shape, tending to points at the ends and thicker at the middle portion as shown in Fig. 9, for by such shape I secure distinctly improved appearance of the pattern produced upon the wood and facilitate their indenting action upon the wood.

I desire it to be understood that the construction of the various parts of the apparatus may be varied somewhat without departure from the invention as summarized in the following claims, since

What I claim as new, and desire to secure by Letters Patent, is—

1. In wood-indenting mechanism, an indenting surface composed of layers of individual types arranged alternately with layers of laterally interposed binding and separating strips and cementing material, said strips being of length greater than the individual types, whereby each strip will fit against and adhere to two or more of the types and will constitute a bond therefor; substantially as described.

2. In wood-indenting mechanism, an indenting roller having series of layers of types held by cementing material and alternate layers of lateral separating and binding strips of absorbent material adapted to receive moisture and to shrink around the roller; substantially as described.

3. In wood-indenting mechanism, an indenting roller having types set in layers or rings around the roller and held by cementing material and alternate layers of binding and separating strips shrunk around the roller; substantially as described.

4. In wood-indenting mechanism, an indenting roller having types set in layers or rings around the roller and held by cementing material and alternate layers of binding and separating strips composed of sections of absorbent material; substantially as described.

5. In wood-indenting mechanism, an indenting roller having a series of layers of individual types held by cementing material and alternate layers of lateral separating and binding strips said strips being of length greater than the individual types whereby each strip will fit against and adhere to two or more of the types and will constitute a bond therefor; substantially as described.

6. In wood-indenting mechanism, an indenting roller having series of layers of flat individual types of sheet metal held by cementing material and alternate layers of lateral separating and binding strips said strips being of length greater than the individual types whereby each strip will fit against and adhere to two or more of the types and will constitute a bond therefor; substantially as described.

7. The method of making indenting rollers, which consists in successively building up around the periphery of a roller alternate layers of types and separating strips said strips being of compressible and absorbent material, uniting them by cementing material, and after thus laying a part only of the indenting surface, compressing or holding together the layers during the hardening of the cementing material and then building up the remainder of the indenting surface in the same manner; substantially as described.

8. A flat sheet metal type having a shuttle-
shape indenting edge; substantially as de-
scribed.

9. In indenting mechanism, a type com-
5 posed of a metal strip having its edge slit, and
the portions formed by said slits twisted, sub-
stantially as described.

In testimony whereof I have hereunto set
my hand.

WILLIAM W. GRIER.

Witnesses:

H. M. CORWIN,
F. E. GAITHER.