

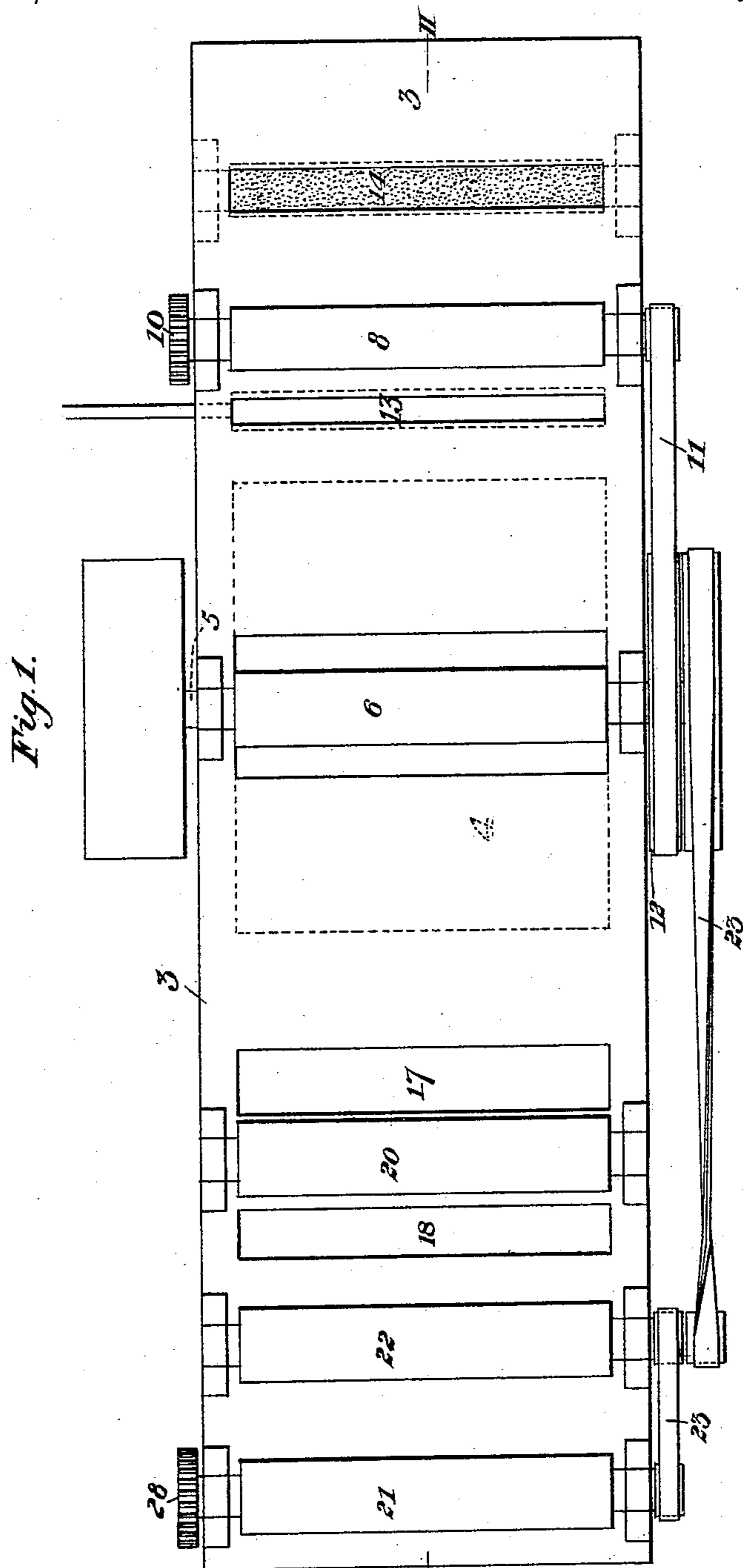
(No Model.)

3 Sheets—Sheet 1.

W. W. GRIER.
MACHINE FOR GRAINING WOOD.

No. 472,260.

Patented Apr. 5, 1892.



WITNESSES.

N. B. Crown
H. L. Gill

INVENTOR.

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

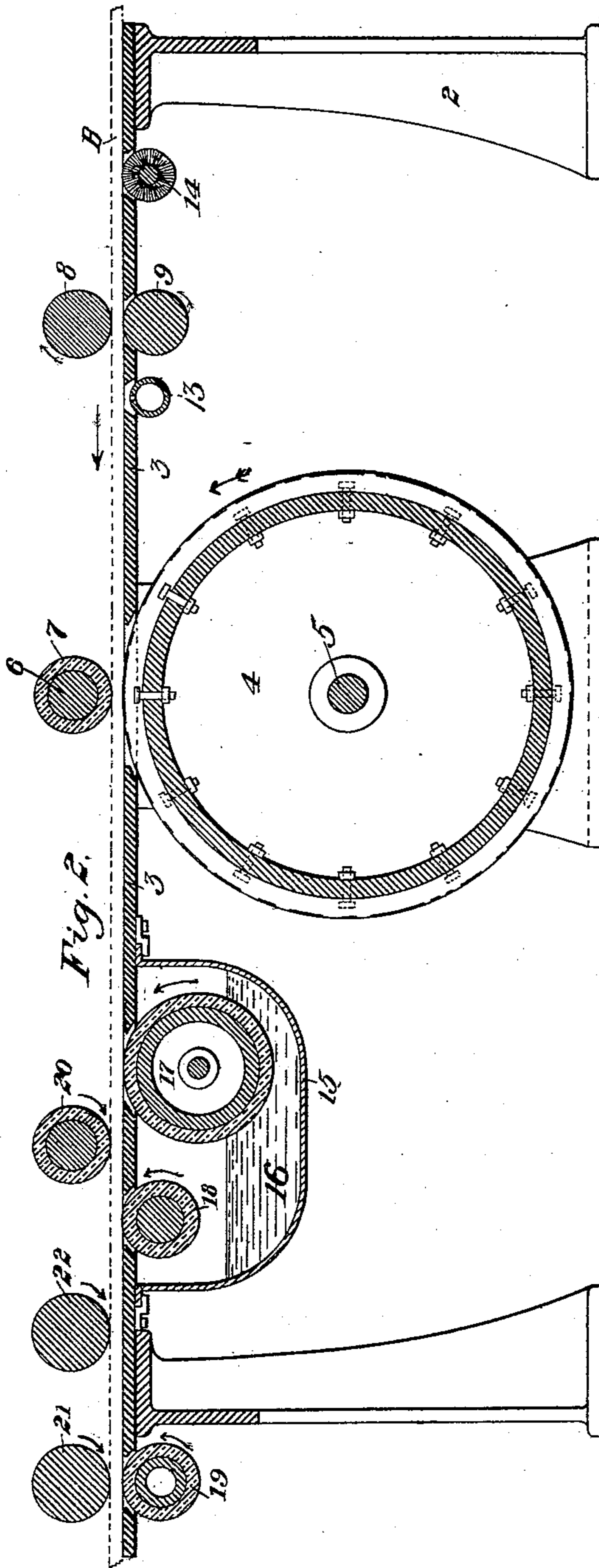
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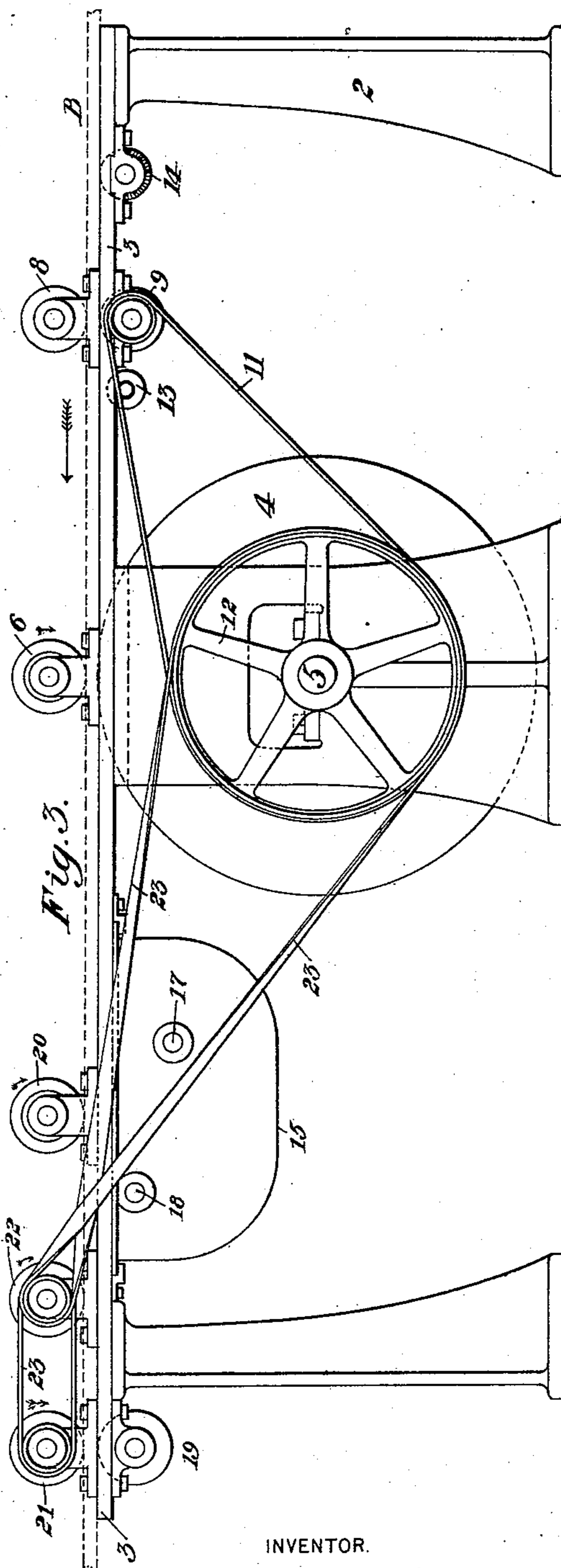
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3 Sheets—Sheet 3.

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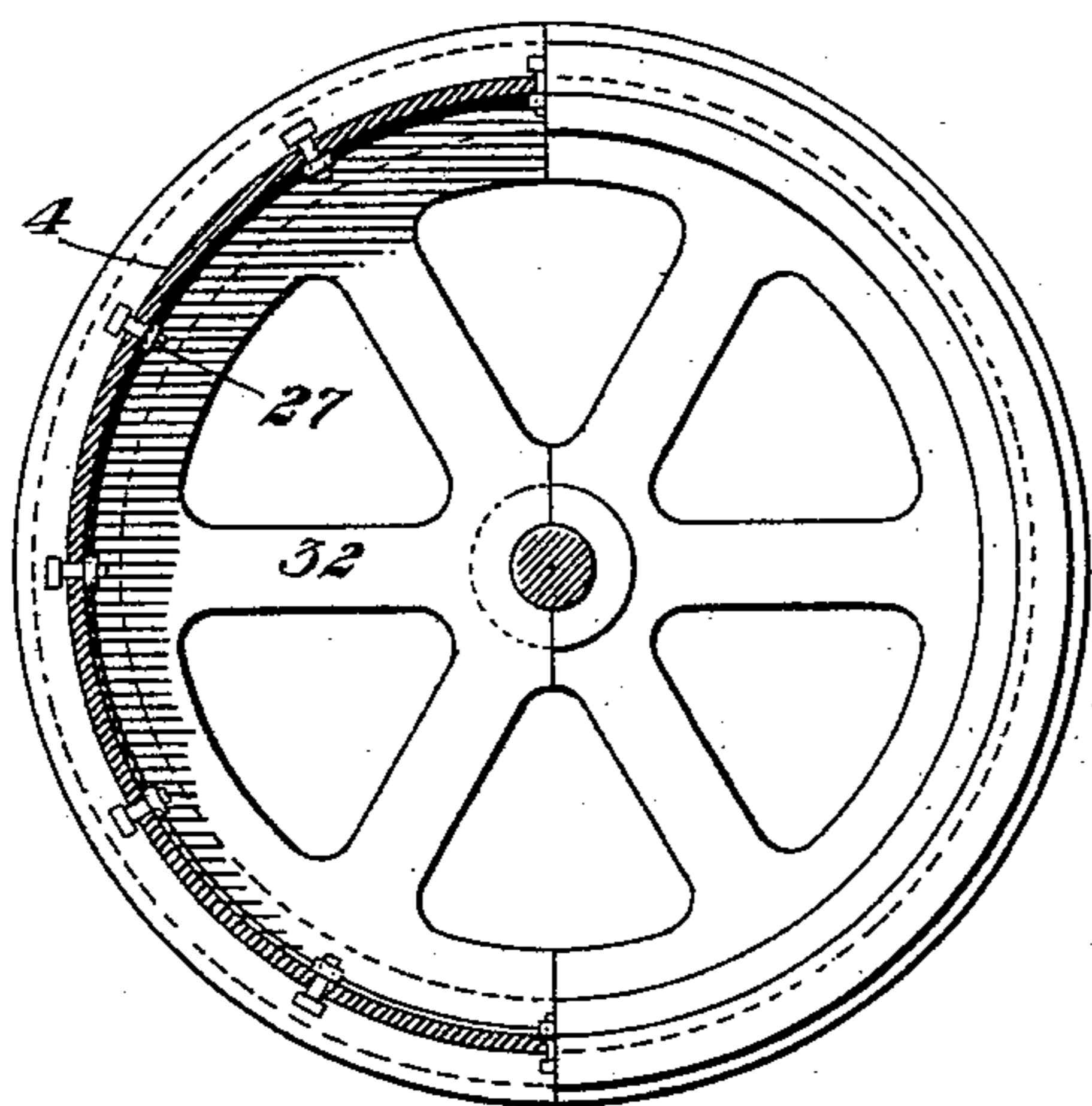


Fig. 5.

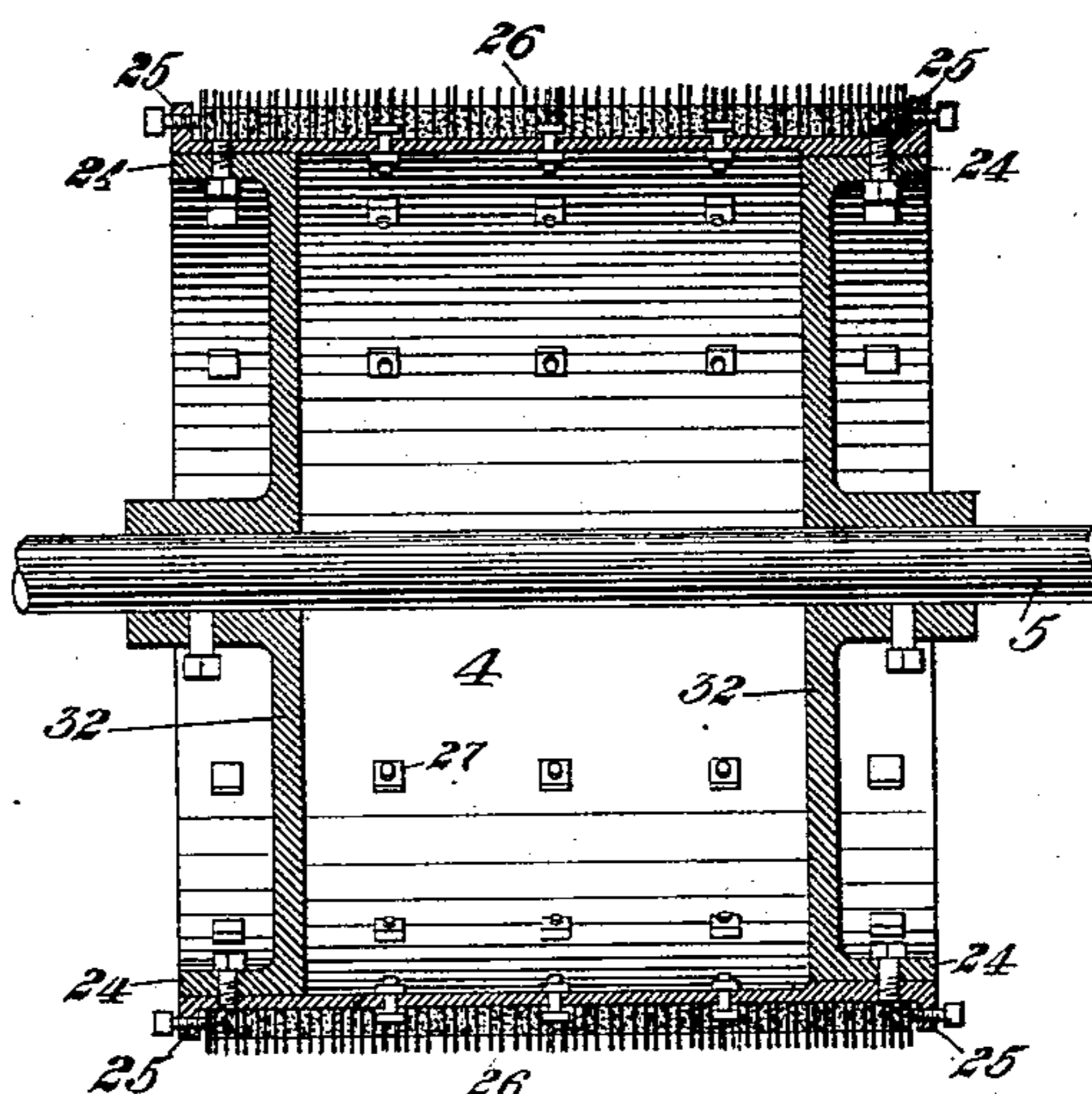


Fig. 4.

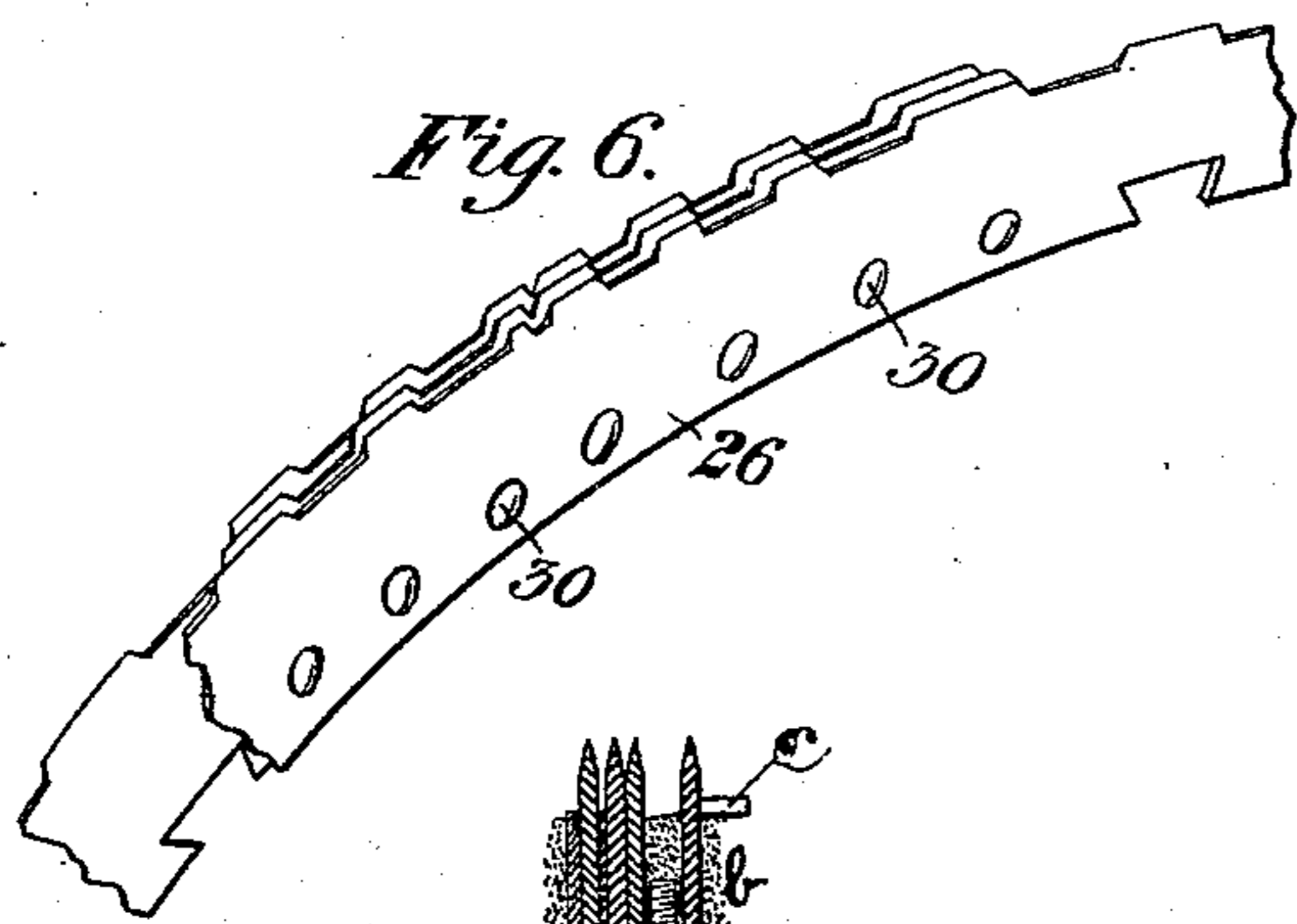


Fig. 6.

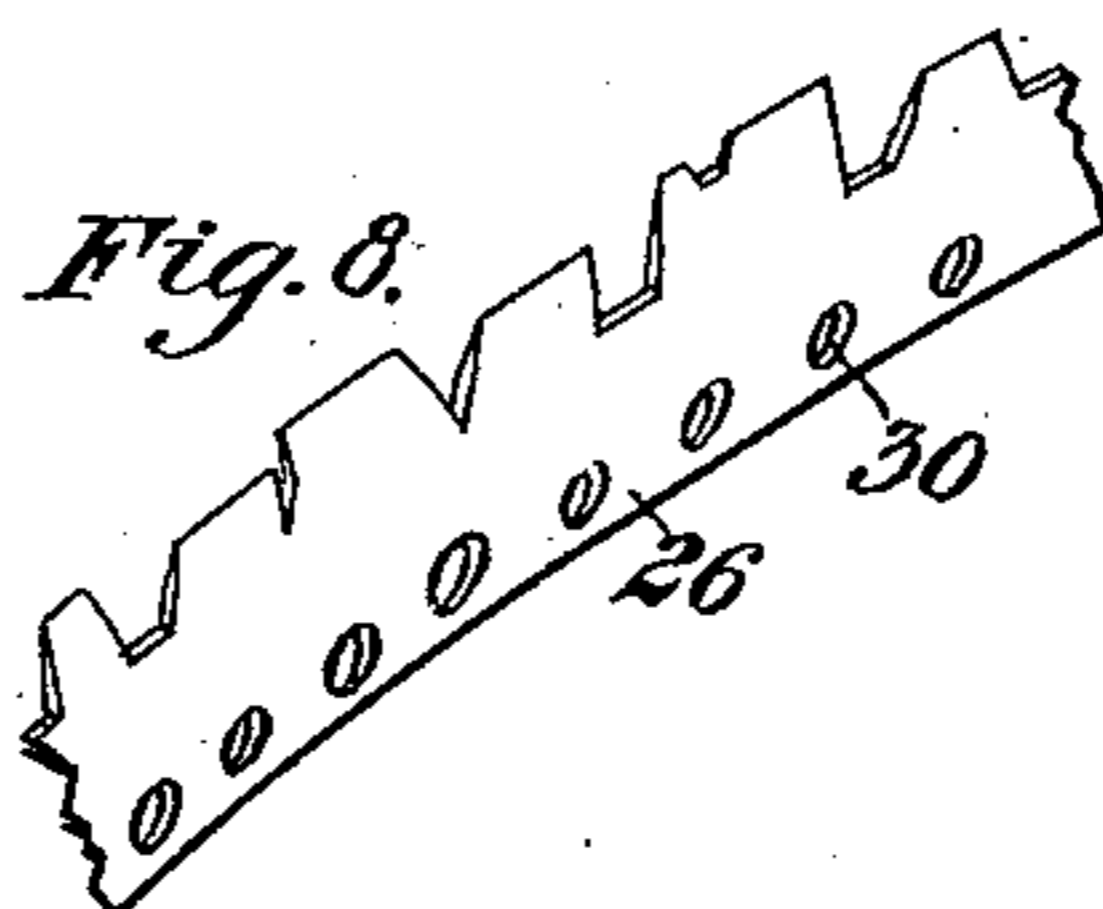


Fig. 8.

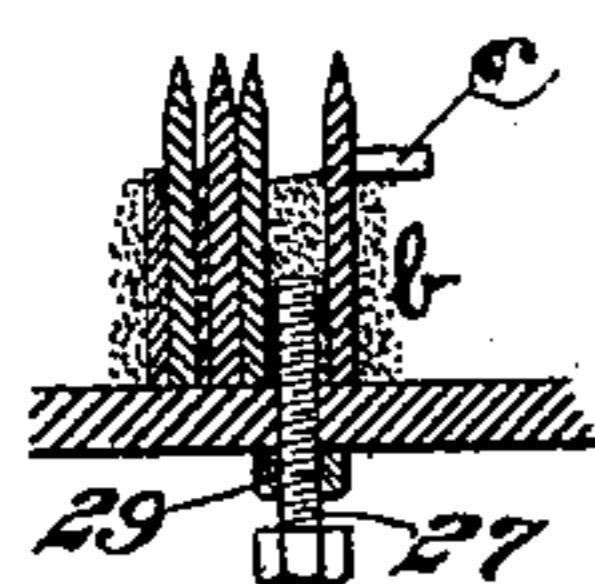


Fig. 7.

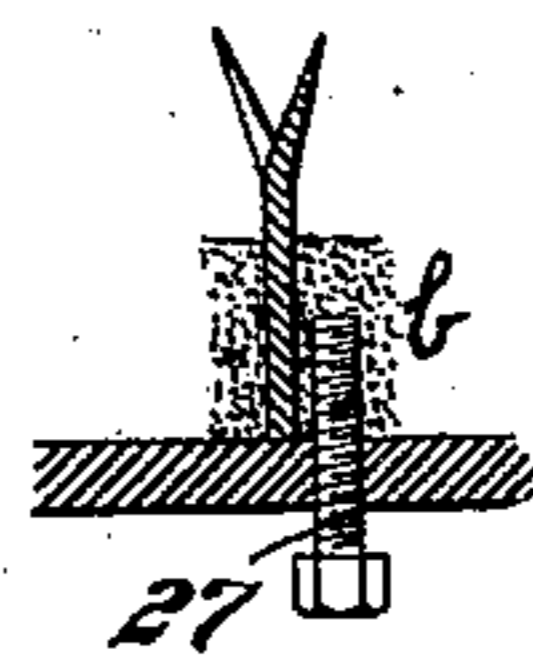


Fig. 9.

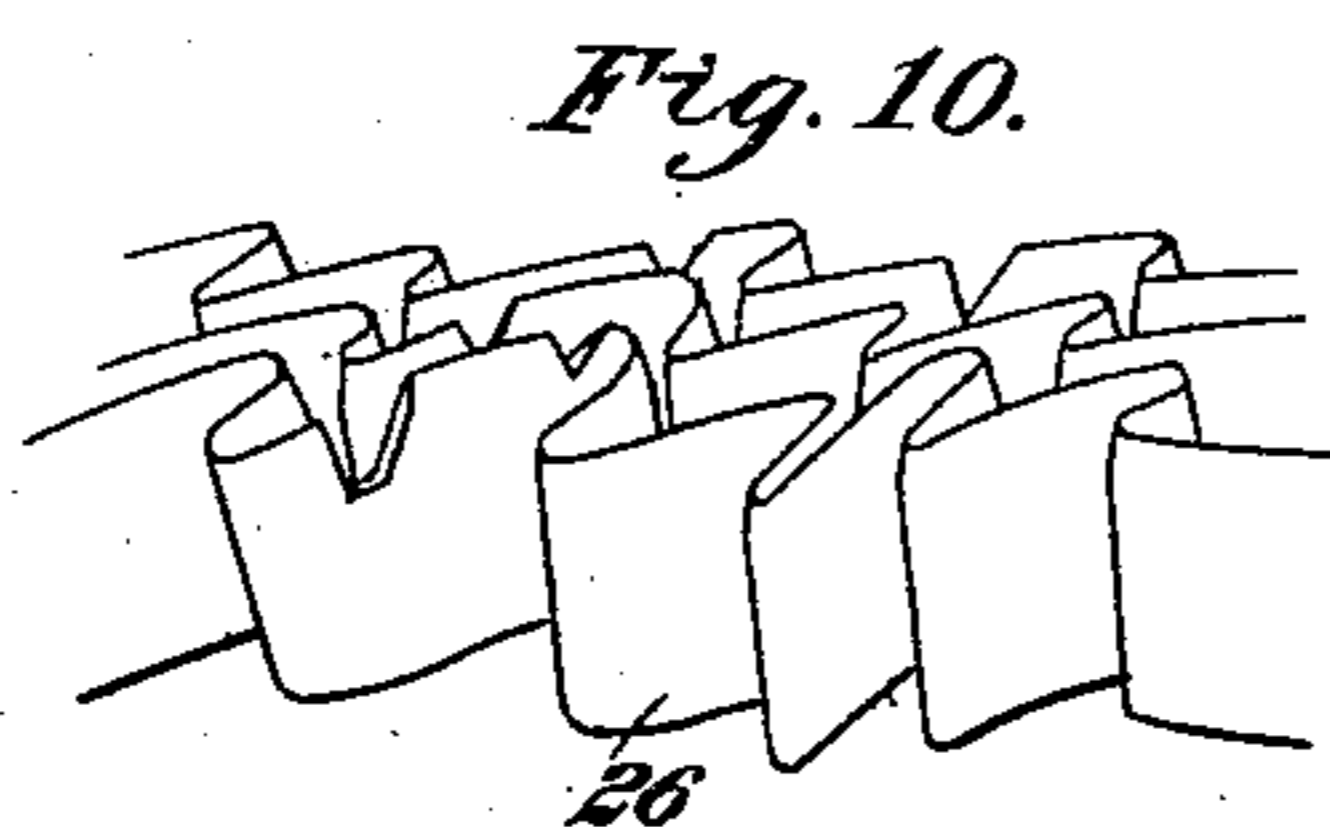


Fig. 10.

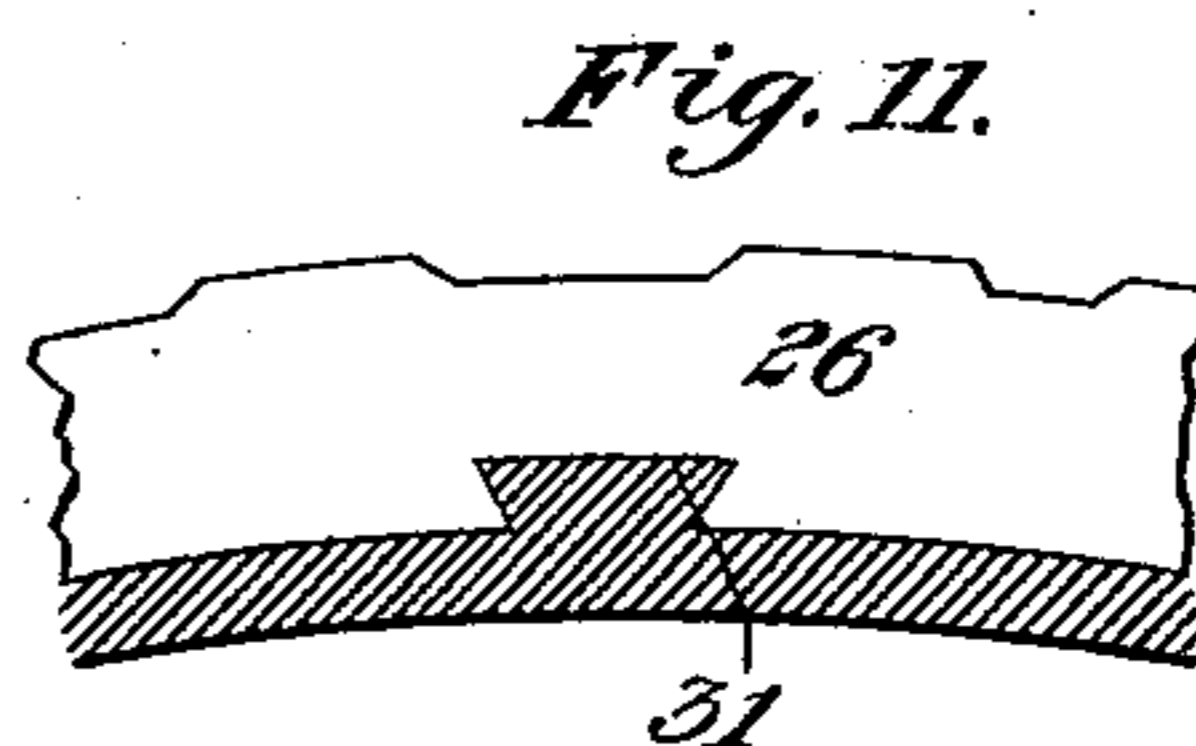


Fig. 11.

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UNITED STATES PATENT OFFICE.

WILLIAM W. GRIER, OF HULTON, PENNSYLVANIA.

MACHINE FOR GRAINING WOOD.

SPECIFICATION forming part of Letters Patent No. 472,260, dated April 5, 1892.

Application filed November 26, 1890. Serial No. 372,728. (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
5 useful Improvement in Machines for Grain-
ing Wood, &c., 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 Figure 1 shows my improved machine in
plan view. Fig. 2 is a vertical section on the
line II II of Fig. 1. Fig. 3 is a side elevation
of the machine. The figures on the third
15 sheet of the drawings are detail views illus-
trating the construction of the roller for in-
denting soft wood or other material—such as
paper-board, &c.—in imitation of the natural
grain of hard wood or other pattern. Fig. 4
20 is an axial section of the indenting-roller.
Fig. 5 is a view showing the roller partly in
end view and partly in cross-section. Fig. 6
is a perspective view showing one of the styles
of indenting-type used in my machine. Fig.
7 shows in section the types of Fig. 6 set in a
25 bed *b* of glue or other plastic material on the
shell of the indenting-roller. Fig. 8 is a per-
spective view of another variety of type, and
Fig. 9 shows it in section on the indenting-
roller. Fig. 10 is a perspective view of a
30 third variety of type, and Fig. 11 illustrates
a mode of fastening the type to the roller.

Like symbols of reference indicate like
parts in each.

The object of my invention is to provide
35 efficient means for producing on soft wood or
other material an imitation of the grain of
ornamental hard woods—such as oak, &c.—
or other surface pattern—such as a represen-
tation of leaves, figures, &c. Such imitation
40 may be made by making on the surface of
the soft wood indentations or surface cuts
disposed in such order as to imitate the hard
wood or other pattern, and after filling in
such indentations or cuts with a suitable filler
45 or paste a smooth surface is imparted to the
wood and the pattern is brought out dis-
tinctly. Machines heretofore devised for such
work have not given perfect satisfaction be-
cause of the stiffness of the patterns which
50 they produce and by reason of defects in the
operation of the mechanism. My invention,

however, provides means for obtaining beau-
tiful patterns of great variety, and the ma-
chine is of such construction that its parts
are easy to make and easy to keep in order. 55
It affords means also for filling the artificial
pores produced in making the pattern.

Referring now to the drawings Figs. 1, 2,
and 3, 2 represents the table or frame of the
machine, having a flat surface 3, on which 60
the board *B* to be indented is placed.

4 represents the indenting-roller journaled
on a shaft 5 on the under side of the ma-
chine-frame and having that portion of its
periphery directly above the shaft 5 flush 65
with or projecting slightly above the surface
of the table. This roller, preferably con-
structed as hereinafter described, has its pe-
riphery formed with a multitude of types or
projections adapted to indent the wood and 70
to produce on its surface the necessary arti-
ficial pores.

Above the roller 4 is a pressure-roller 6,
whose surface may be covered with a coating
of india-rubber or other elastic substance 7, 75
the purpose of which is to give to the board
under treatment a yielding downward press-
ure on the roller 4. At one side of this roller
there may also be rollers 8 9, connected to-
gether by gearing 10, Fig. 1, and driven by a 80
belt 11 or other power connection from the
pulley 12 on the shaft 5 of the roller 4. The
function of the rollers 8 and 9 is to feed the
board to the indenting-roller, and it is desir-
able, therefore, that they should be made to 85
rotate at the same surface speed as the latter.

For the purpose of cleaning the surface of
the board before it is acted upon by the in-
denting-roller, and thus insuring a cleaner
pattern and saving injurious wear on the 90
roller-surface, I employ a rotatory brush 14,
set so that its bristles shall be in contact with
the board and shall loosen from the board all
adhering dirt or grit, and in advance of this
brush I use a pipe 13, having a series of per- 95
forations from which jets of air or steam are
discharged on the board in order to blow off
the dirt which has been loosened by the brush.

As the rollers 8 and 9 are driven they will
feed the board *B* forward in the direction of 100
the arrow, and as the board passes over the
indenting-roller its surfaces will be impressed

with the desired indentations or artificial surface pores.

In advance of the indenting-roller is situated the mechanism for applying the filler to the board. This comprises a tank 15, secured to the under side of the table and adapted to contain a liquid or viscous filler 16. A roller 17, having its surface covered with rubber, felt, or other soft material, is journaled in the tank 15, so that its periphery shall be partly immersed in the filler and so that a portion of its periphery shall touch the surface of the board. In advance of the roller 17 is a second roller 18, the function of which is to wipe off the surplus filler from the board and another roller 19 in advance of this may be used for a like purpose and may be hollow, so that it may be heated with steam. Other scraping or wiping appliances may be used in addition to these rollers.

20 is a roller with an elastic surface, journaled above the tank 15 and adapted to bear on the upper side of the board and to force it into contact with the rollers 17 and 18.

21 and 22 are driven rollers, which bear on the board and act to draw it through the machine. They are driven by belting 23, preferably at the same surface speed as the roller 4. The roller 19 may be connected with the roller 21 by gearing 28, Fig. 1, so that it shall rotate therewith. After the surface of the board has passed the roller 4 and has been indented thereby, it passes in contact with the roller 17, which spreads the filler thereon, so as to fill the artificial pores produced by the indenting-roller. The surplus filler is wiped off by the roller 18, and the board is still further cleansed by the roller 19, so that when it passes said roller it is finished and ready to be dried and sandpapered to put it in condition for use.

The feeding of the board through the machine is performed by the rollers 8, 9, 19, 21, and 22, so that very little work, except the work of indenting, has to be performed by the roller 4, and as the feed-rollers travel at the same surface speed as the roller 4 no traction or longitudinal strain is put on the teeth of the latter, and I am therefore able to use it for a long time without the necessity of repair.

I shall now proceed to describe the manner in which the roller 4 is preferably constructed. The roller comprises a hub or frame, which is set on and fixed to the shaft 5, and a cylindrical shell, which is preferably set on the frame in such manner that it can be removed therefrom and can be handled or shipped independently of the frame. The frame may be composed of two end pieces or spiders 32, set on the shaft and having peripheral flanges 24 to which the roller-shell may be bolted, as shown. The indenting-surface is composed as follows: The roller-shell, which is cylindrical in form, has marginal flanges 25. The indenting-surface is composed of a number of types 26, having projecting

edges sufficiently sharp to penetrate and indent the wood. These types may consist of metal blocks, like printers' types, with sharpened ends or strips, or pieces of metal of various forms may be employed, according to the style or pattern desired to be produced, the sharpened edges being set transversely to the axis of the roller, so that the indentations shall be in the line of the grain of the wood operated upon. Such types are set on the surface of the shell and are retained thereon by glue, preferably fish-glue of great tenacity, the types being embedded on a surface or bed of such glue. When the glue is partially set, I confine it to the shell by inserting bolts 27 from the inner side of the shell, as shown in Fig. 7; or the bolts may be put on the shell with the bolt-heads on the outer side before putting on the glue. These bolts may be drawn up by nuts 29 after the glue has set. When the types have thus been set on the shell, white lead, varnish, or other plastic protecting material may be placed on the glue between the types, or I may use for like purpose paper-pulp, which, being wedged between the types, hardens there and serves to hold them with great security. Other plastic material capable of hardening—such as sulphur, plaster-of-paris, rubber, &c.—may also be used as the matrix in which the types are set, or the types may be set in place and held by pouring metal—such as lead—around their bases. Various forms of these types are shown in the drawings. Thus in Figs. 6 and 7 I show types constructed of strips of metal, preferably steel, having serrated edges which may extend entirely or partially around the cylindrical shell. In Figs. 8 and 9 I show a type made of a steel strip with peripheral teeth bent laterally in both directions, and in Fig. 10 I show types constituted of steel strips bent to impart curved or irregular patterns to the wood. Other forms of type—such as nail-like points, &c.—may be used either interspersed with those above named or alone. The bases of the types may conveniently be formed with perforations or indentations, which afford lodgment for the plastic material and enable it to hold the types with greater firmness. As an additional means of holding the types to the roller when the types are constituted of metal strips, I may form on the roller dovetailed projections 31, Fig. 11, and cut on the lower edges of the strips recesses of corresponding shape, which when fitted on the projections will lock the types rigidly to the roller-shell.

In making the type preparatory to setting them on the roller I may assemble together a number of separate pieces and connect them by leather or any suitable fabric, or I may build up sections of any desired size, connected by glue or otherwise, and then apply such sections to the roller.

As a useful means for holding the plastic matrix more securely on the cylinder, when strips such as shown in Figs. 6, 7, 8, and 9 are

used, I may bend lateral lips *c*, of some or all of such strips, over the plastic material, and then, as the strips are held to the cylinder by the keys 31 or by extending the strips around the cylinder and fastening them together at the ends to form encircling hoops, the lips will serve to lock the plastic bed in place. The holes 30, by affording cavities in which the plastic material may lodge, serve to accomplish the same end.

A roller made as above described will be found to be of very great use. The types are capable of such variety of arrangement that almost any patterns of hard-wood surface or other material can be reproduced on soft wood, and as the roller-shell without difficulty, can be removed and replaced by another of different pattern the work of patterning the wood is made cheap and easy.

I believe that I am the first to use for graining wood an indenting-surface composed of individual separately-formed toothed types, and I therefore intend to claim it broadly, whether the types be applied to a cylinder, as illustrated in the drawings, or set on a flat form and used with mechanism for pressing the board to be grained against the type or the type against the board.

I claim as my invention—

1. In a machine for graining wood, an indenting-roller composed of individual types having sharp edges adapted to indent the article to be grained, said types being set in a form with their edges substantially parallel and having intervals corresponding with the pattern to be produced, substantially as and for the purposes described.

2. In a machine for graining wood, an indenting-roller composed of a series of flat or plate types having cutting-edges arranged in substantially parallel lines and having intervals corresponding with the pattern to be produced, the space between the types being filled with a matrix of plastic material which maintains the relation of the types and binds the same together, substantially as and for the purposes described.

3. In a machine for graining wood, &c., an

indenting-cylinder having types disposed so as to produce on the wood a pattern, said types having sharp edges and being set in a bed of plastic material, such as glue, with their edges substantially parallel and secured to the cylinder by bolts, substantially as and for the purposes described.

4. In a machine for graining wood, an indenting-roller situate beneath the path of the article to be grained, and a filler-coating device also situate on the under side of the article and on the delivery side of the roller, substantially as and for the purposes described.

5. In a machine for graining wood, the combination, with the indenting mechanism, of a filler-containing vessel situate on the delivery side of the indenting mechanism on the under side of the article to be treated, and a roller adapted to revolve in the vessel and to bear on the article to apply filler to the latter, substantially as and for the purposes described.

6. In a machine for graining wood, &c., the combination, with the indenting mechanism, of a brush adapted to bear on the article before its indentation, and a blast-pipe, substantially as and for the purposes described.

7. In a machine for graining wood, &c., an indenting-surface composed of individual types having projections adapted to indent the wood, and a supporting roller or frame to which said types are keyed, substantially as and for the purposes described.

8. In a machine for graining wood, &c., an indenting-roller composed of types disposed so as to produce on the wood a pattern, adapted to indent the article to be grained, said types being set in a plastic matrix and held thereby and having lateral projections or indentations adapted to hold the plastic matrix, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 19th day of November, A. D. 1890.

WILLIAM W. GRIER.

Witnesses:

THOMAS W. BAKEWELL,
W. B. CORWIN.