

(No Model.)

3 Sheets—Sheet 1.

H. SILVER.
MACHINE FOR GRAINING LUMBER.

No. 601,908.

Patented Apr. 5, 1898.

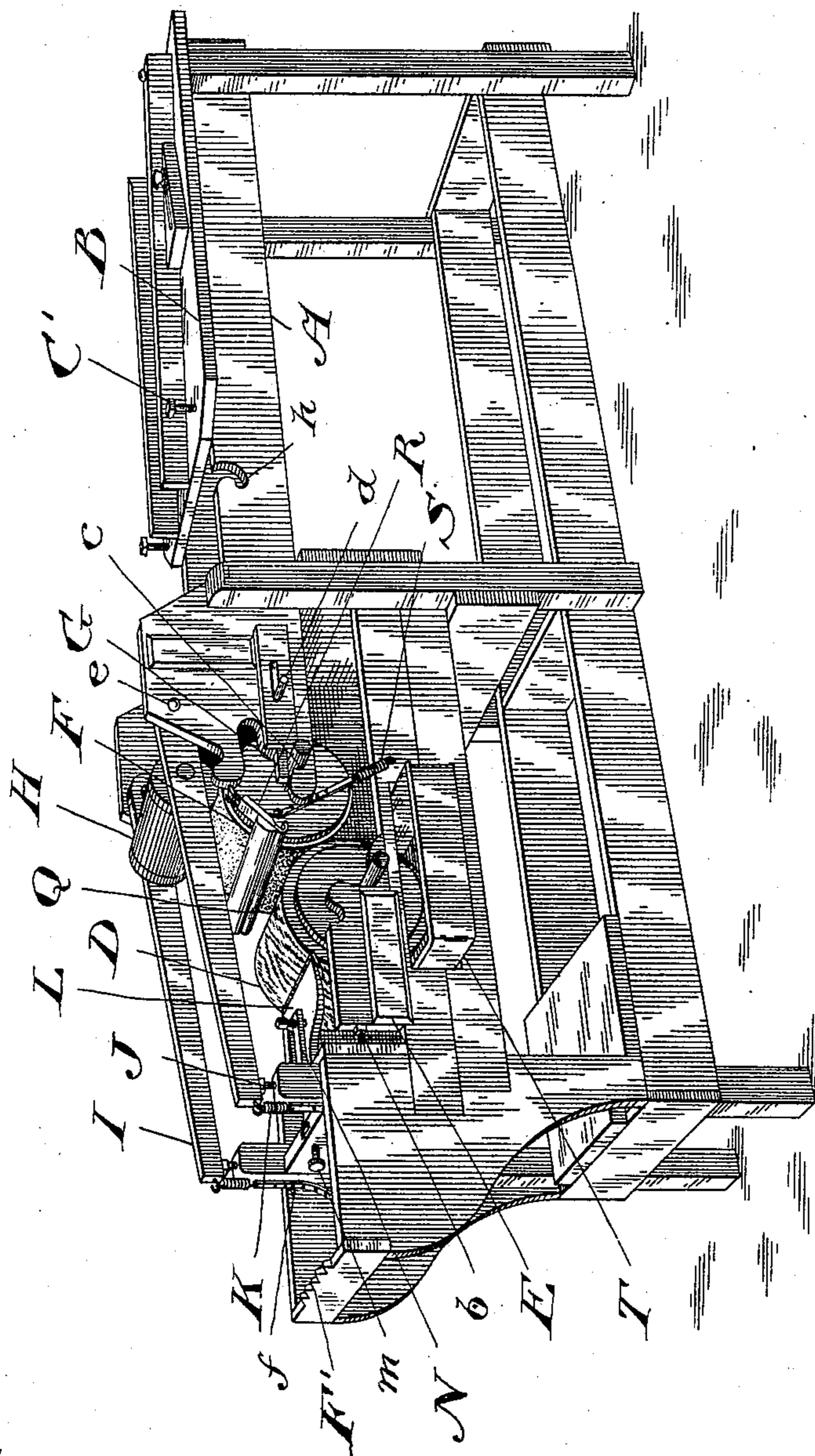


Fig. 1.

Witnesses

W. G. Merrill

Fred Clarke

Inventor

Hugh Silver

by
Richard T. Maybee
Attys

(No Model.)

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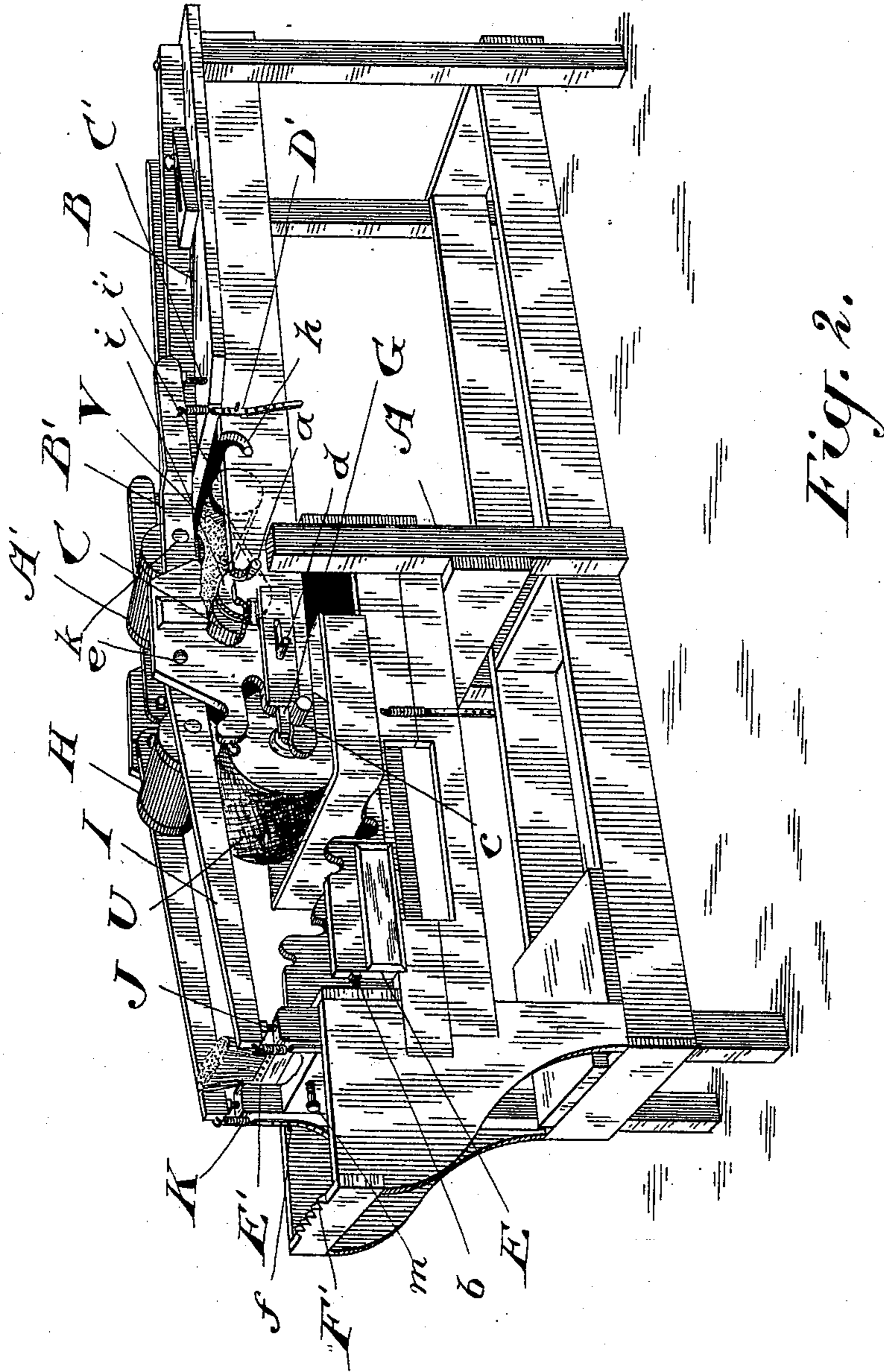


Fig. 2.

Witnesses

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(No Model.)

3 Sheets—Sheet 3.

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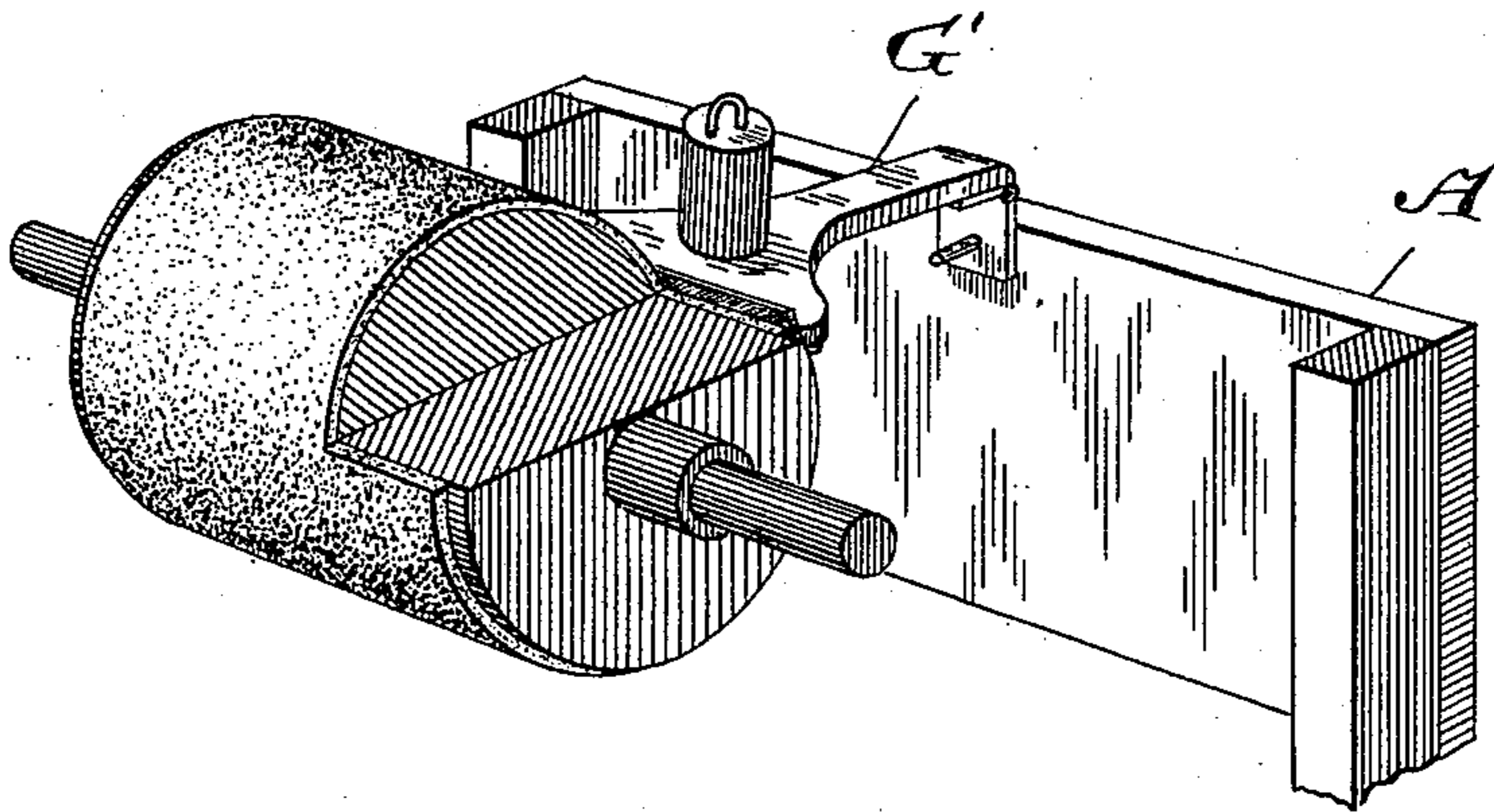


Fig. 3.

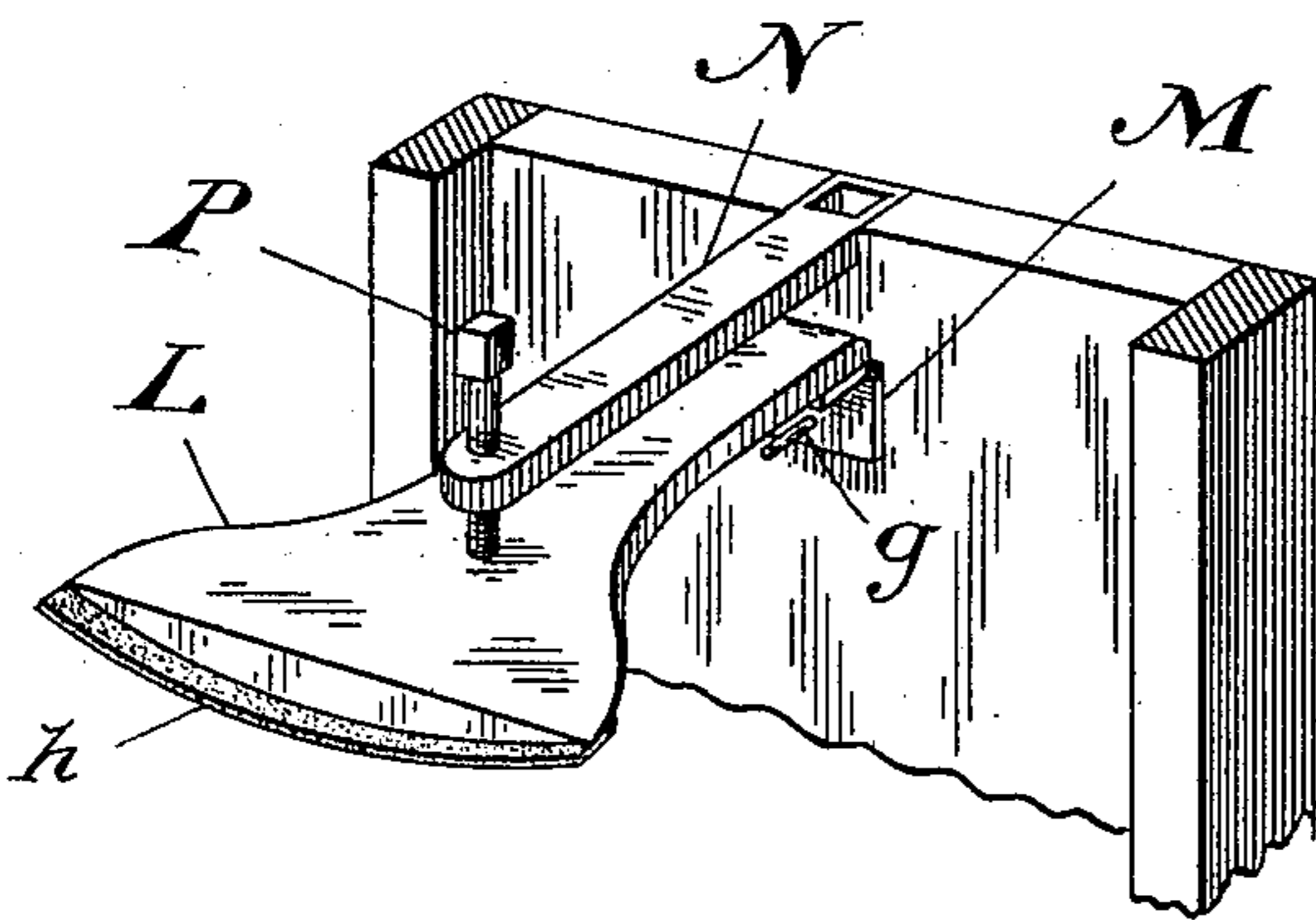
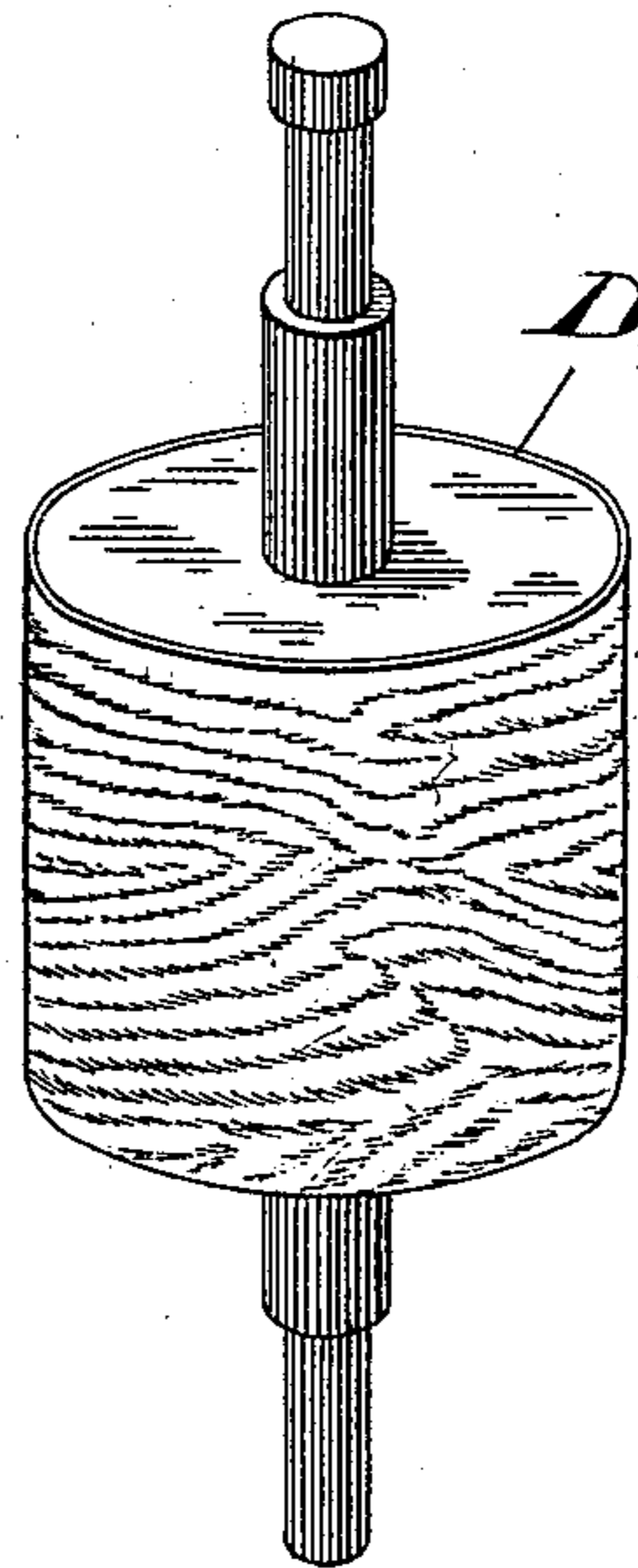


Fig. 4.

Fig. 5.

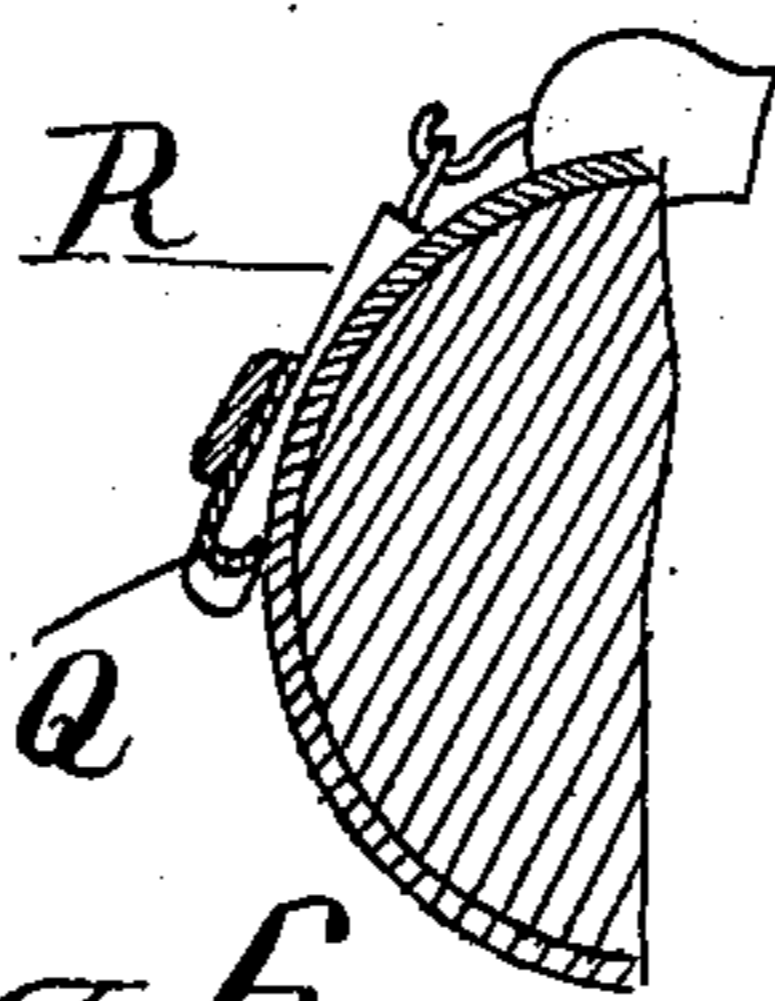


Witnesses

W. J. McMillan

Fred Clarke

Fig. 6.



Inventor

Hugh Silver

by
Richard V. Maybee
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UNITED STATES PATENT OFFICE.

HUGH SILVER, OF LINDSAY, CANADA.

MACHINE FOR GRAINING LUMBER.

SPECIFICATION forming part of Letters Patent No. 601,908, dated April 5, 1898.

Application filed March 1, 1897. Serial No. 625,662. (No model.)

To all whom it may concern:

Be it known that I, HUGH SILVER, merchant, of the town of Lindsay, in the county of Victoria and Province of Ontario, Canada, have
5 invented a certain new and Improved Machine for Graining Lumber, of which the following is a specification.

The object of my invention is to devise a machine for graining lumber which may also
10 be arranged to dust, size, and paint; and it consists, essentially, of a design-roller bearing a continuous grain pattern in intaglio and adapted to revolve in contact with a composition printing-roller, means being provided for
15 supporting the rollers, for continuously applying paint to the design-roller, and for pressing the lumber against the printing-roller, so that the grain pattern transferred from the design-roller to the latter is applied to the
20 lumber as it is passed through the machine.

My invention further consists in the details of construction which enable me to remove the graining mechanism and to substitute
25 dusting, sizing, and painting rollers, substantially as hereinafter more specifically described and then definitely claimed.

Figure 1 is a perspective view of my machine arranged for graining. Fig. 2 is a perspective view of my machine arranged for
30 sizing. Fig. 3 is a perspective view showing the scraper for the paint-roller. Fig. 4 is a perspective detail of the scraper for the design-roller. Fig. 5 is a perspective detail of the design-roller. Fig. 6 is a sectional view
35 of the scraper for the printing-roller.

In the drawings like letters of reference indicate corresponding parts in the different figures.

A is the frame of the machine, suitably
40 shaped to support the different parts.

B is the table, suitably located at the top of the frame. This table is preferably provided with adjustable guides of any suitable construction.

45 C is a guide-roller journaled in suitable bearings *a* on the frame of the machine. This guide-roller is not visible in Fig. 1, but may be seen in Fig. 2, where a portion of the framework is broken away to expose it.

50 D is a roller bearing a grain pattern in intaglio and having its spindle journaled in suitable bearing-pieces E. These bearing-

pieces, as indicated, are made to slide longitudinally upon the frame of the machine and may be moved by means of the adjusting-
55 screws *b*.

F is the printing-roller, having its spindle journaled in the bearings *c* on the frame of the machine. This printing-roller is covered with the elastic composition generally used
60 in the inking-rollers of printing-presses and normally lies in contact with the surface of the design-roller D, the adjustment of the bearing-pieces E being for the purpose of regulating this contact. 65

G are slides movable in guideways on the side of the frame of the machine for the purpose of locking the printing-roller spindle in its bearing. Each slide is provided with a
70 pin *d*, working through a slot in the frame to enable the slide to be readily moved when desired to insert or remove the printing-roller.

H is a pressure-roller located above the printing-roller and journaled in arms I, pivoted to the frame of the machine at *e*. The
75 other ends of these arms rest upon adjustable screws J on the frame of the machine, so that the arms may be raised or lowered to adapt the position of the pressure-roller to any desired thickness of lumber passing between it
80 and the printing-roller.

K are springs connected to the ends of the arms and provided with straps having a series of holes formed therein, adapted to engage with pins *f* on the frame of the machine,
85 so that any desired pressure may be applied to the arms I, and thus to the pressure-roller H.

L is a scraper adapted to bear on the design-roller D, and having a hinge M connected to its other end. (See Fig. 4.) This hinge
90 is adapted to rock upon a pin *g*, connected to the frame A, so that while the hinge allows the scraper to rise and fall the pin will permit it to rock from side to side. Any construction which would permit of this double
95 motion of the scraper would answer the purpose of my invention, which is to adapt the scraper to follow any irregularities in the surface of the design-roller or irregularities in the accuracy of its adjustment in its bearings. 100

N is an arm extending from the cross-bar O in the frame and having a set-screw P screwed through its end, so as to bear upon the scraper L. By means of this set-screw

the pressure of the scraper on the roller may be increased or decreased as desired.

It will be noticed that the front edge of the scraper (see Fig. 4) is curved in a vertical plane and has a strip of rubber *h* connected thereto. This rubber it is that comes in contact with the surface of the design-roller, and the object of making it of a curved shape is to avoid the forming of a definite dark mark across the board if the machine be allowed to remain at rest for a short time. When such is the case, an accumulation of color takes place at the scraper, which is not properly distributed when the scraper starts, but is merely slightly spread longitudinally, leaving a dark mark right across the board. By curving the edge of the scraper the color accumulates in a curved line with a tendency toward greater darkness at the center. This alone would produce a better effect than the straight dark marking; but as the machine is started again the curved surface tends to push the color sidewise across the board as well as to draw it lengthwise, and thus such a distribution of the accumulated color is effected as well, completely overcoming the disagreeable effect produced when a straight-edge scraper is used.

Q is a trough-shaped scraper, preferably inclined toward one side of the machine. This scraper is connected to arms *R*, pivoted to the frame of the machine and provided with springs *S*, connected to any suitable part of the frame of the machine, so as to hold the scraper closely in contact with the surface of the roller. Each spring is preferably made adjustable in a manner similar to the springs *K*. The surface of the design-roller *D* is preferably formed of a thin sheet of basswood or other soft material bent around the roller, with its grain following the bend of the roller. Upon this basswood a grain pattern is drawn by means of a pointed tool which will make the necessary depressions in the wood. After the grain pattern has been impressed upon it the surface is oiled and covered with a coating of shellac, and the roller is then ready for use.

T is a paint-fount resting on the frame of the machine below the design-roller, so that the surface of the latter will drop below the paint in the fount. When a board is pushed across the table of the machine over the guide-roller *C* and between the pressure and printing rollers *F* and *H*, the latter is revolved and being in contact with the design-roller causes the latter to revolve also. The surface of the design-roller is thus continuously coated with paint, which is scraped off by the scraper *L*, leaving the color only in the depressions of the grain pattern, as in an engraved plate. The grain pattern is transferred to the composition on the printing-roller and by it applied to the surface of the board passing through the machine, so that a very natural grain pattern is quickly applied thereto.

Before the lumber can be grained it is preferably sized and painted. In Fig. 2 I show the machine set up for sizing. The design and the printing rollers are removed, the place of the latter being taken by a cotton-covered roller *U*. A size-fount is also supported on the frame of the machine below the size-roller *U* to supply size to the latter.

V is a rotary brush journaled in the bearings *h*. The guide-roller and the rotary brush are provided with grooved pulleys *i i'*, connected by a cross-belt. Above the guide-roller is located a pressure-roller *A'*, journaled in arms *B*, pivoted on the frame of the machine at *k*. The other ends of these arms rest upon adjustable screws *c'* upon the frame of the machine, so as to limit the downward motion of the pressure-roller *A'*.

D' are springs similar to the springs *K* and *S* for the purpose of regulating the downward pressure of the pressure-roller. Thus as the lumber is passed between the guide-roller *C* and the pressure-roller *A'* the latter is revolved and communicates motion to the rotary brush *B*, which rapidly revolves and dusts the surface of the lumber before it reaches the sizing-roller *U*, which applies a thorough coat of size thereto.

To remove surplus size from the board, I insert a brush *E'* in a slot in the cross-bar *O* and clamp it therein at a suitable height by means of the set-screw *m*. This brush removes all surplus size, which trickles down and may be caught in any suitable receptacle below.

F' is a cross-bar of the machine, provided with a serrated upper edge, so that sized, painted, or grained boards pulled through the machine will drop thereon, and as only a few points of the support come in contact therewith no large and disfiguring mark will be made on the surface of the board. After the sized board has been dried and it is desired to paint it the rotary brush and the pressure-roller *A'* are removed from the machine and the place of the sizing-roller taken by a composition-covered roller. This roller is preferably provided with a hinged weighted scraper *G'*, connected to a cross-bar of the machine in a manner substantially identical to that of the scraper *L*. Its edge is provided with a strip of flannel which bears upon the surface of the roller, as indicated in Fig. 3. A brush similar to *E'* is also used to properly distribute the paint and remove any surplus. After the painted board has been dried it is then ready to go through the graining process, as previously described.

The method of graining lumber by producing a continuous grain pattern in intaglio upon a soft-surface wooden roller, inking and scraping it, and transferring the impression to a composition printing-roller is the most important feature of my invention. I have hitherto used composition rollers with a raised pattern thereon; but such rollers soon wear out, and it is impossible in the soft composi-

tion to get such fine and delicate effects as are frequently desirable; but by impressing the design in the soft surface of a wooden roller a great variety of effects may be produced, deep lines producing strong marks upon the grained lumber and shallow depressions correspondingly light marks, as they hold a small quantity of color. Broad shallow depressions may be also made to produce delicate shaded effects sometimes observed in natural grained lumber.

It may be possible to bend a piece of naturally-grained lumber around the roller and print from it, either with or without intensifying its grain, by artificial means; but as it then would be practically impossible to make the grain match where the ends of the strip of wood meet such a roller would have but limited value.

From the above description it will be seen that I have invented a very efficient, cheap, and convenient machine for graining lumber, which may also be arranged to previously dust, size, and paint the same.

I am aware that it is old to use a natural-grained wooden roller and a metal roller with a design formed in the surface thereof, the latter being shown in the Day patent, No. 194,997, and hence make no claim to either construction; but I regard it essential to form the roller with a thin sheet of basswood bent around it with the fiber running in the direction of the bend with a continuous grain pattern formed in the surface of the wood, so that the roller may be revolved several times, if necessary, without any break being made in the grain impression. It is important that the roller be made as above described, as a natural-grained-wood roller must be made of such a size that it can only revolve once to the length of a plank, as it is impossible to make the grain match properly at the juncture, and thus an awkward break would be the result.

I am aware that it has been proposed to produce artificial graining effects upon the surface of cheap woods by means of indenting the grain or a portion of the grain in a flat piece of soft wood and using a composition roller in combination therewith, so as to transfer the grain or design of said wood to a cheaper quality or kind of surface—such, for instance, as the method described in the United States Patent No. 416,976, of F. A. Walters—and I am also aware that it is old to use a design-roller in a graining-machine in which a thin section of wood is bent in a curved or cylindrical form, so as to encompass said cylinder, such as that shown in Auble and Hornberger's patent, No. 455,379; but I regard each of these, whether taken separately or together, as materially and essentially different from my improved device, and hence do not attempt to claim anything shown in either of said patents.

It will be noticed that in the first of the

above methods it is practically impossible to take a flat piece of grained wood and move the composition roller over it so as to have the ends of the grain meet or match in order that there will be no break when the design is transferred. It is also obviously impossible to take a piece of naturally-grained wood and bend it around the roller with the ends joining so that there will be no break in the grain. This is where the essence of my invention comes in, and it will be observed that I do not follow any method disclosed by these two patents, but on the contrary have used a kind of wood which is absolutely without grain or growth marks of its own, and after said piece of wood has been bent around the cylinder the design or grain is indented therein, and hence any skilled workman would be able to make said roller with the design or grain perfectly matched where the ends meet, and the graining could therefore be done on any desired length of board without having any break occur in the pattern of the grain or design being printed. For this purpose I have selected basswood for the reason that it has no grain or growth marks of its own, and at the same time is so soft as to be readily indented, and when a piece of this wood is bent around the roller it produces, when printed, a perfectly plain tinting, and therefore as the roller has no grain of its own any desired grain may be produced thereon, even though the grains are very elaborate—such, for instance, as French walnut, bird's-eye maple, oak, or any other fancy grains. With all the methods of which I am aware it has been impossible to copy these effects for the reason that when naturally-grained wood is used to print from the hard and almost absolutely smooth and poreless nature of portions of French walnut and bird's-eye maple prevents them from being printed from, as the knots in these woods are very hard, smooth, and poreless and show light marks when printed from, as the hard, smooth, and poreless knots do not seem capable of taking the ink properly. Basswood used by my method can be used to reproduce any design or grain whatever that can be made upon it.

What I claim as my invention is—

1. In a machine for graining lumber, a design-roller having its surface formed of a thin sheet of basswood bent around a roller with the fiber running in the direction of the bend, a continuous grain pattern being indented in the surface of the wood, whereby said roller may be rotated several times so as to make no "break" in the grain impression, in combination with a composition printing-roller adapted to revolve in contact with the said design-roller, substantially as and for the purpose specified.

2. In a machine for graining lumber, a design-roller having its surface formed of a thin sheet of basswood bent around a roller with the fiber running in the direction of the bend,

a continuous grain pattern being indented in the surface of the wood, whereby said roller may be rotated several times so as to make no "break" in the grain impression, and means
5 for continuously inking the said roller, in combination with a composition printing-roller adapted to revolve in contact with the said design-roller and a pressure-roller adapted to press the lumber against the said print-
10 ing-roller, substantially as and for the purpose specified.

3. In a machine for graining lumber, a design-roller having its surface formed of a thin sheet of basswood bent around a roller with
15 the fiber running in the direction of the bend, a continuous grain pattern being indented in the surface of the wood, whereby said roller may be rotated several times so as to make no "break" in the grain impression, a paint-
20 fount within which the said roller revolves, and a scraper adapted to remove surplus paint from the surface of the roller, in combination with a composition printing-roller adapted to revolve in contact with the said design-roller
25 and a pressure-roller adapted to press the lumber against the said printing-roller, substantially as and for the purpose specified.

4. In a machine for graining lumber, a design-roller having its surface formed of a thin
30 sheet of basswood bent around a roller with the fiber running in the direction of the bend, a continuous grain pattern being indented in the surface of the wood, whereby said roller may be rotated several times so as to make no
35 "break" in the grain impression, a paint-fount within which the said roller revolves, and a scraper adapted to remove surplus paint from the surface of the roller, in combination with a composition printing-roller adapted to
40 revolve in contact with the said design-roller; a pressure-roller adapted to press the lumber against the said printing-roller, and a scraper adapted to remove the pattern from the surface of the printing-roller at a point after it
45 has operated on the lumber and before a fresh impression is received from the design-roller, substantially as and for the purpose specified.

5. In a machine for graining lumber, a design-roller bearing a grain pattern, a paint-
50 fount within which the said roller revolves, and a scraper adapted to remove surplus paint from the surface of the roller, in combination with a composition printing-roller adapted to revolve in contact with the said design-roller; a U-shaped scraper adapted to remove
55 the pattern from the surface of the printing-roller at a point after it has operated on the lumber and before a fresh impression is received from the design-roller; a pressure-roller journaled on arms, each pivoted at one
60 end to the frame of the machine and resting at the other upon an adjustable support, and

springs adapted to hold down the said arms, substantially as and for the purposes specified. 65

6. In a machine for graining lumber, a design-roller bearing a grain pattern and carried in bearings longitudinally adjustable on the frame; a paint-fount within which the
said roller revolves, and a scraper adapted to
70 remove surplus paint from the surface of the roller, in combination with a composition printing-roller adapted to revolve in contact with the said design-roller; a U-shaped scraper adapted to remove the pattern from
75 the surface of the printing-roller at a point after it has operated on the lumber and before a fresh impression is received from the design-roller; a pressure-roller journaled on
80 arms, each pivoted at one end to the frame of the machine and resting at the other upon an adjustable support, and springs adapted to hold down the said arms, substantially as and for the purpose specified.

7. In a machine for graining lumber, a design-roller bearing a grain pattern in intaglio,
85 in combination with a flexible-supported scraper having its edge curved in a vertical plane and a strip of flexible material connected thereto, substantially as and for the
90 purpose specified.

8. A frame for a machine of the class described provided with a table B; adjustable
bearings E, for a design-roller; bearings c, for a printing, painting or sizing roller; bearings
95 a, for a guide-roller; bearings h, for a rotary brush and the cross-bar O, adapted to carry a brush, substantially as and for the purpose specified.

9. A frame for a machine of the class described, provided with a table B; adjustable
100 bearings E, for a design-roller; bearings c, for a printing, painting or sizing roller; bearings a, for a guide-roller; bearings h, for a rotary brush; the cross-bar O, adapted to carry
105 a brush, and the notched cross-bar F, substantially as and for the purpose specified.

10. A frame or machine of the class described, provided with a table B, adjustable
110 bearings E for a design-roller; bearings c for a printing, painting or sizing roller, bearings a for a guide-roller and fount-supports located below the bearings E and c, substantially as described.

11. A design-roller having its surface
115 formed of a thin sheet of basswood bent around the roller with its grain running in the direction of the bend, a continuous grain pattern being indented in the surface of the wood, substantially as and for the purpose
120 specified.

Lindsay, February 20, 1897.

HUGH SILVER.

In presence of—

R. A. BRADSHAW,
GEO. L. SILVER.