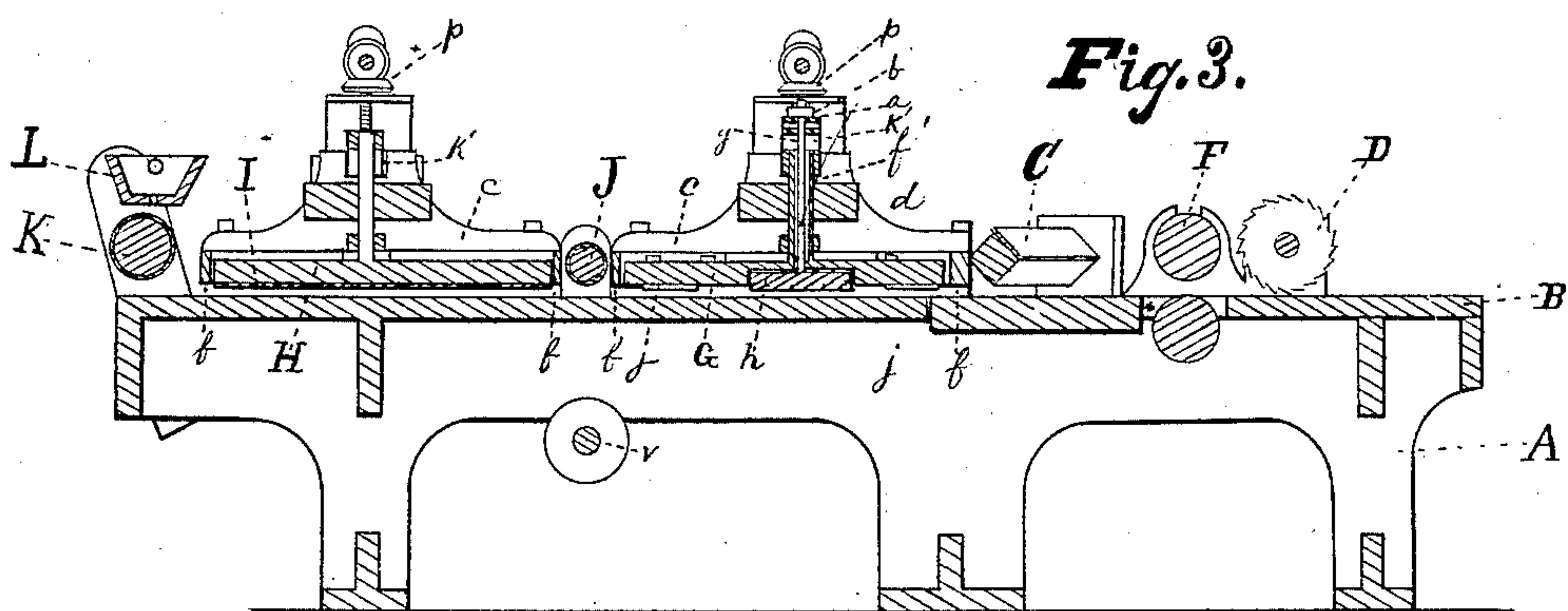
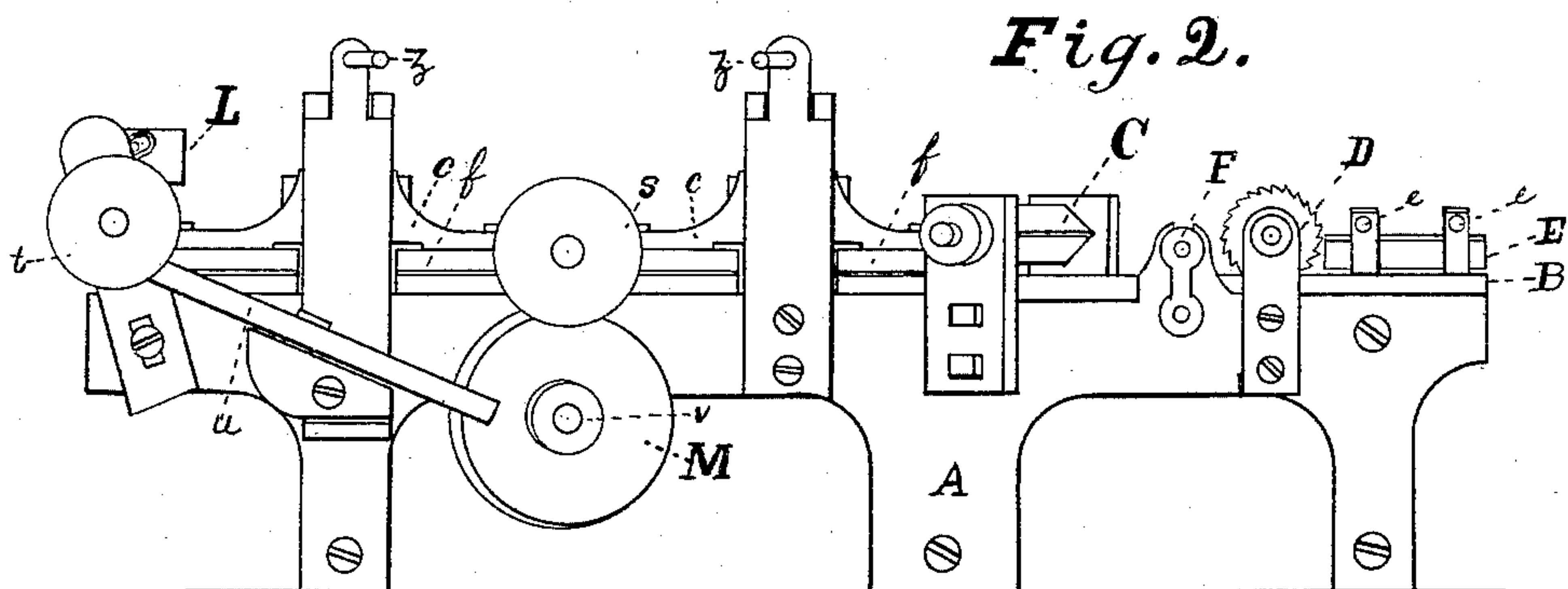
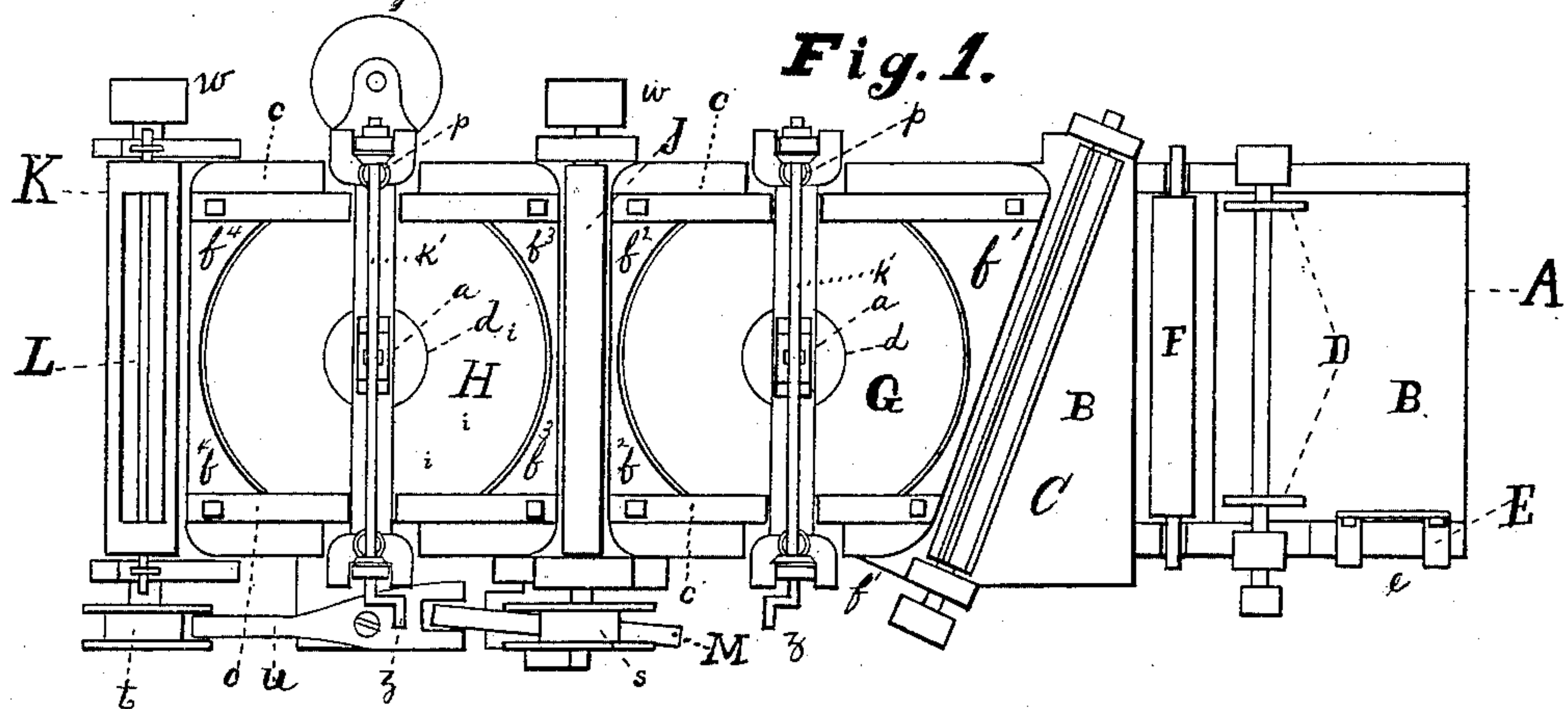


W. R. NORRIS.

MACHINE FOR PLANING AND POLISHING LUMBER.

No. 327,189.

Patented Sept. 29, 1885.



Witnesses

Am. G. Browne  
John M. Sutton

Inventor

William R. Norris

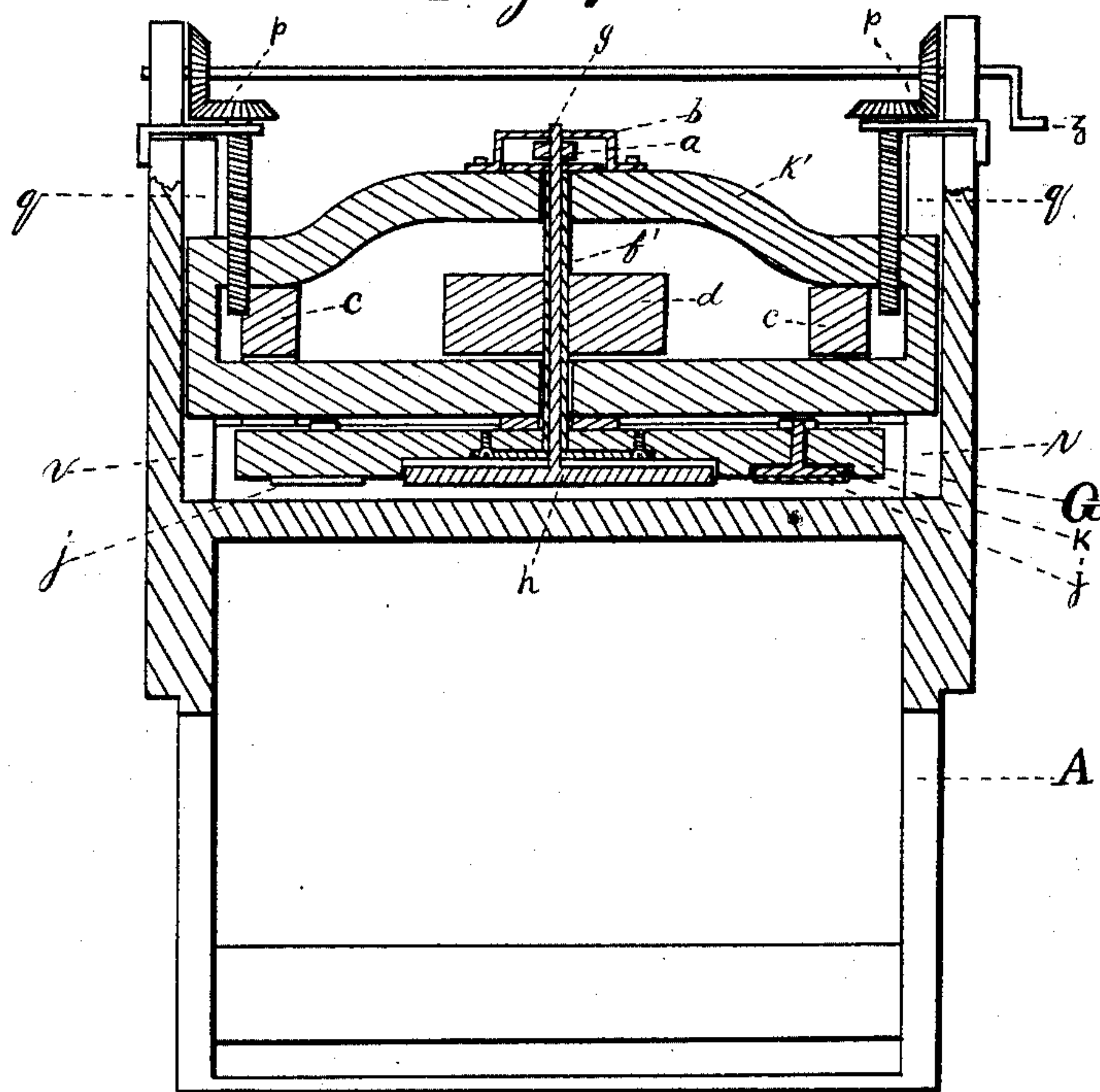
W. R. NORRIS.

MACHINE FOR PLANING AND POLISHING LUMBER.

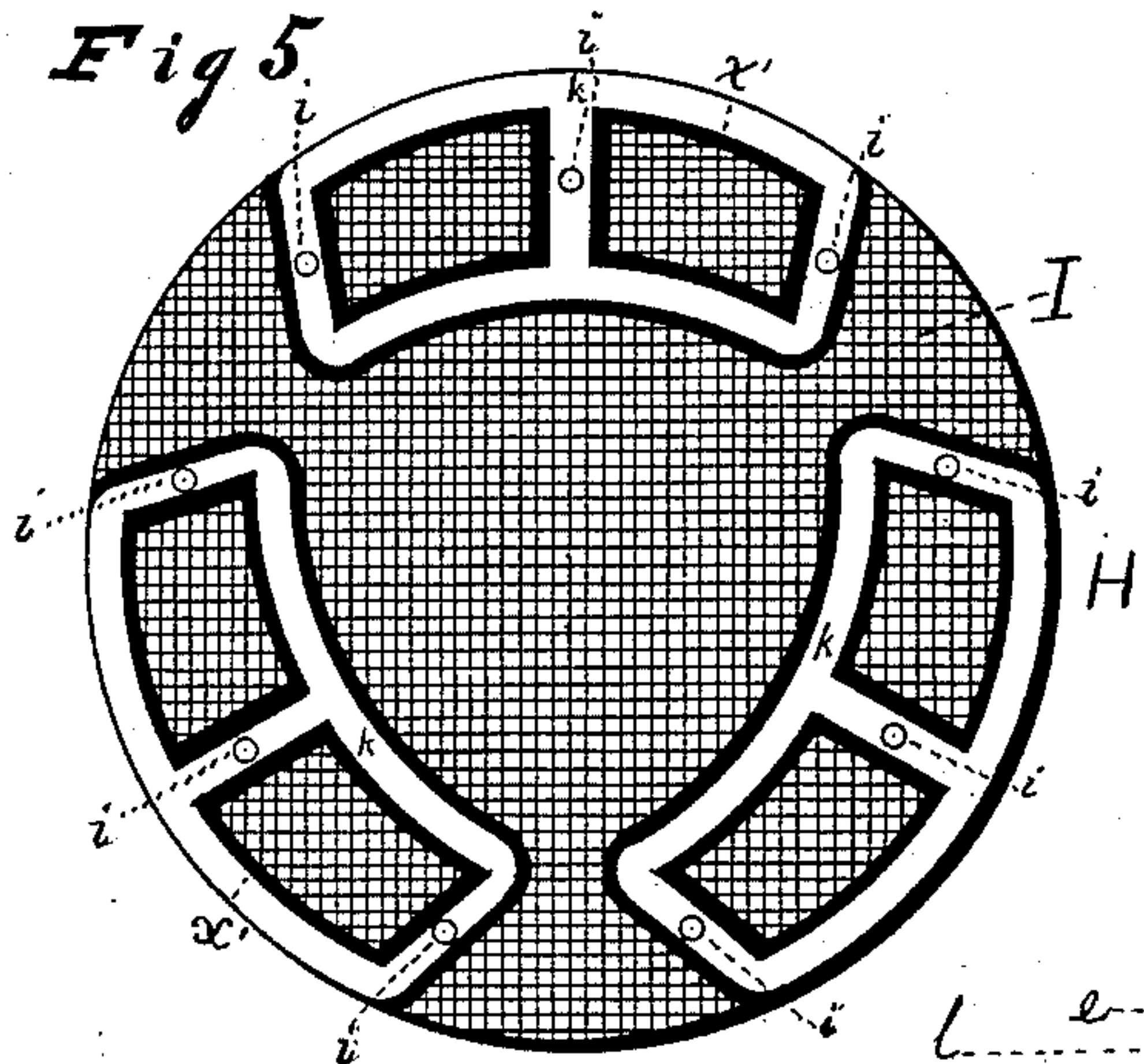
No. 327,189.

Patented Sept. 29, 1885.

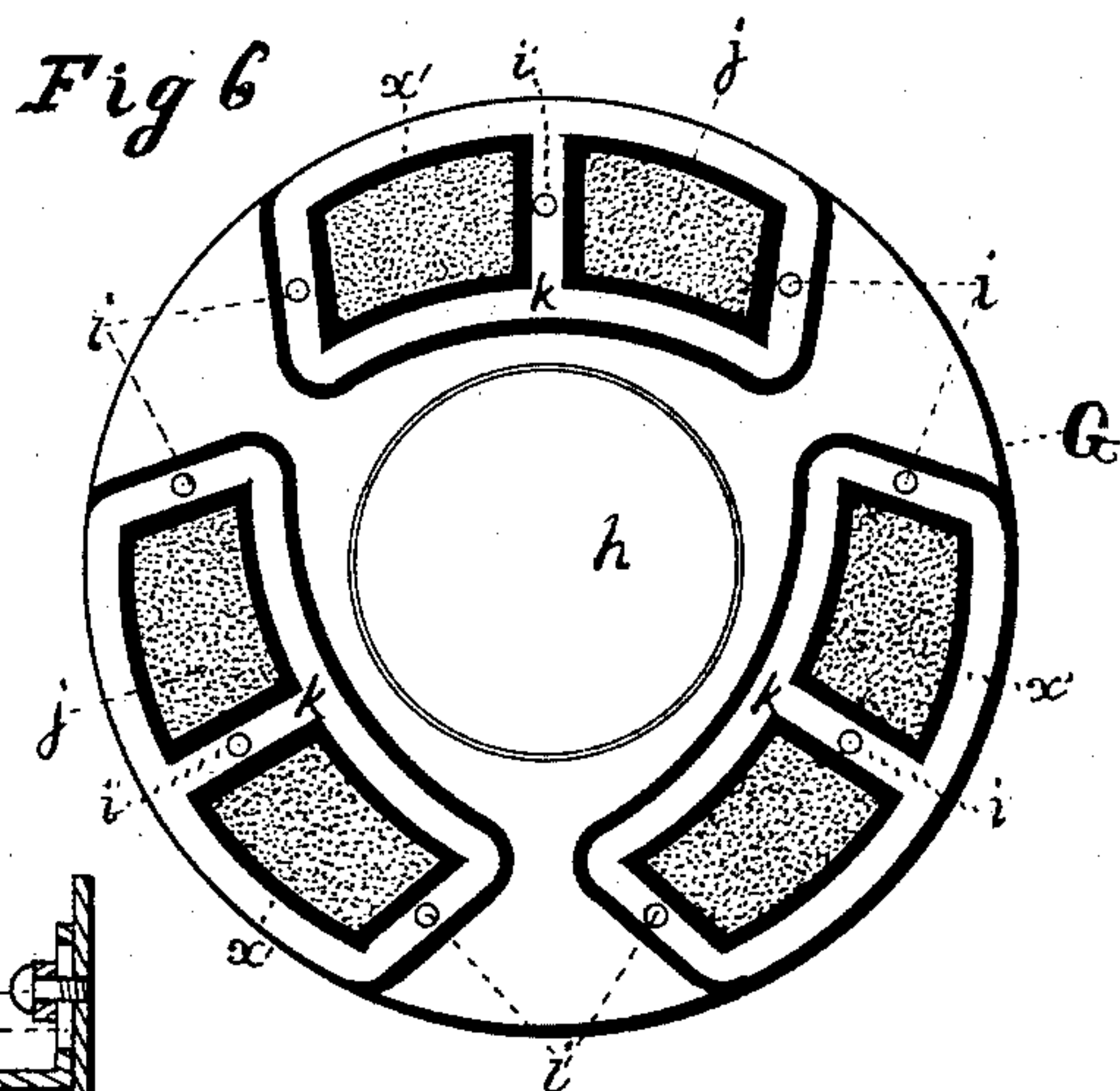
*Fig. 4.*



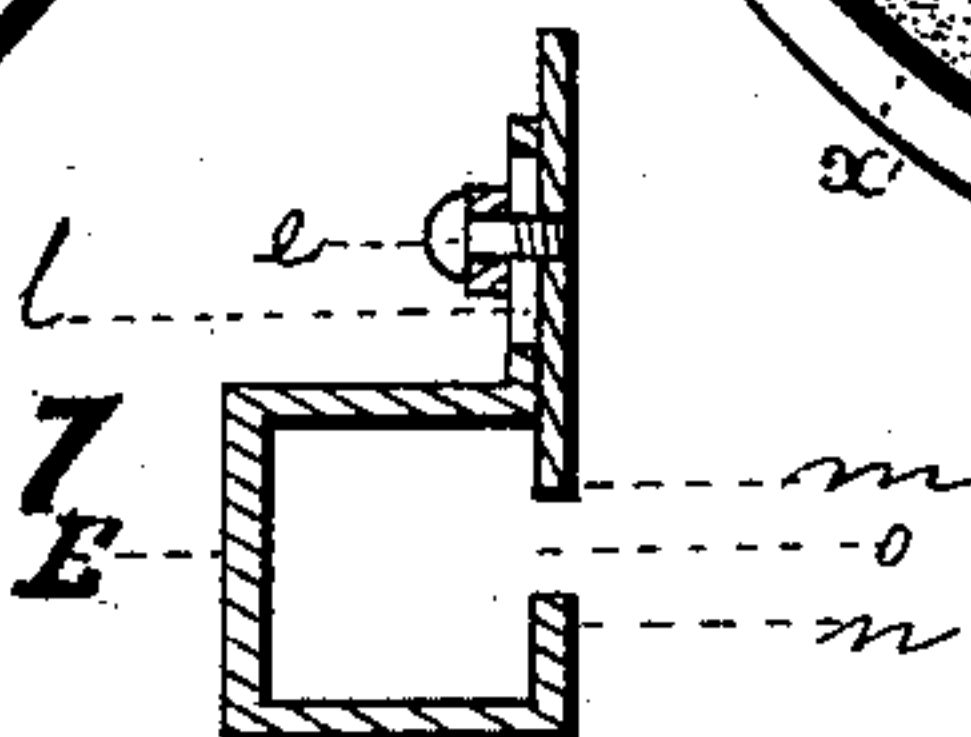
*Fig 5.*



*Fig 6.*



*Fig 7.*



Witnesses

Mr. G. Brunne  
Mr. W. Sutton

Inventor

William R. Norris



# UNITED STATES PATENT OFFICE.

WILLIAM R. NORRIS, OF FORT ANN, NEW YORK.

## MACHINE FOR PLANING AND POLISHING LUMBER.

SPECIFICATION forming part of Letters Patent No. 327,189, dated September 29, 1885.

Application filed June 28, 1879.

*To all whom it may concern:*

Be it known that I, WILLIAM R. NORRIS, a citizen of the United States, residing at Fort Ann, in the county of Washington and State of New York, have invented certain new and useful Improvements in Machines for Planing and Polishing Lumber, &c.; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to smooth-finishing lumber, in order that any change of surface in the lumber as it comes from the cutters of the planing-machine and before it passes to the finishing sandpapering apparatus may be effectually avoided, and the action of the cutters and of the sandpapering-machine be so applied as to insure a more perfect smoothness to the finished surface.

My invention comprises certain novel combinations of parts and mechanical devices whereby said process is readily and effectually carried into effect, and whereby other advantageous results in the finishing of lumber, doors, panels, cabinet-work, &c., are secured.

The machine is fully illustrated by the drawings, of which Figure 1 is a top view of the entire machine. Fig. 2 is a side elevation. Fig. 3 is a vertical longitudinal section through the middle of the machine. Fig. 4 is a vertical cross-section through the center of the sand-paper disk and its suspending and adjusting frame. Fig. 5 shows the face of the buffing-disk covered with cloth or other material ready for use, the same being held in place by the binding-frames. Fig. 6 shows the face of the sand-paper disk with its sand-paper confined in position by the binding-frames. Fig. 7 is a cross-section showing the general form and adjustable feature of the guide-rests used at the entering end of the machine.

Like letters designate corresponding parts in all the figures.

In carrying into effect the process of smooth-finishing lumber, which forms part of my said invention, I subject the lumber to the action of oblique cutters, forming part of a suitably-constructed planing-machine, as illustrated in

the accompanying drawings, the action of this cutter being to form a more smooth and uniform surface upon the lumber than can be accomplished by the use of cutters acting at right-angles to the line of travel of the lumber while being planed, and this superior smoothness being essential to a uniform action upon the plane surface of the sandpapering apparatus used in conjunction with the oblique cutter aforesaid. While one portion of the plank, board, door, panel, or other wood under treatment is still being subjected to the action of the oblique cutter the part receding from the cutter, and having the smooth plane surface aforesaid, passes underneath a rotating disk, the under or working surface of which is covered with sand-paper, and which, from the arrangement and position of the disk, is so applied to the lumber issuing from the oblique cutter that the smoothing action of the sand-paper is exerted in a direction substantially longitudinal with the grain of the wood, which avoids transverse fracture of the minute fibers lying lengthwise of the surface; and this, taken in conjunction with the absence of the ridges usually incident to the use of a merely transverse cutter, insures a much smoother finish to the material than has hitherto been obtained, this finishing being materially aided by the fact that, inasmuch as no appreciable time elapses between the action upon the material of the oblique cutters and of the longitudinal smoothing action of the sand-paper, no opportunity is afforded for the hardening of the grain of the wood, as occurs in dry weather when any appreciable amount of time is suffered to elapse between the planing and smoothing, or for any raising of the grain from moisture, as is liable to occur in a few moments where a newly-planed surface is exposed to the action of a moist atmosphere, so that by means of my said process a much more perfect and uniform smoothness is given to the finished wood than has heretofore been obtained.

In the planing of doors, which from their great length cannot well be placed under one side of the disk, the central portion of the door is necessarily subjected to the drawback of the transverse action of the sand-paper, while the larger portions of the door—the lateral parts—receive the full benefit hereinbefore specified of my said process; but, except



by making the sandpapering disk of inordinate size, I know of no remedy whereby in the smooth-finishing of doors this defect may be overcome. Nevertheless, the advantages in the manufacture of doors arising from the use of my said process are very great.

In the drawings, A represents the frame of the machine, usually made of cast-iron; B, the table or bed of the same; C, a revolving cutter-head, placed usually but not always diagonally to the feed rolls, which are shown at F.

G is a sand-paper disk made of suitable material. I prefer and generally use a cast-iron flange faced with pine wood, having a double shaft, one part within another, and a stationary central part connected rigidly with the inner part, *g*, by which it is held stationary, while the outer part is rotated by the belt and power applied to the pulley *d*, which is secured in the usual manner to the outer part, *f*, of the shaft. The stationary central part, *h*, remaining fixed, acts as a pressure-flange to hold the lumber under it down flat to the bed while it is passing through the machine. The stationary center is adjusted to and held at its proper relation to the sand-paper by the screw and nut *a* at the top of the shaft *g*.

*k k* are metal binding-frames, preferably steel, their longer parts bent on the same circle as the circumference of the disk, and of a length equal to the width of ordinary roll sand-paper, as commonly sold in the markets of this country, which is twenty-three and a half inches; or they are made one-half that length, without the middle cross-bar, so that they will be of the right size and shape for using with the ordinary sheet of ten-by-twelve sand-paper. The outside and inside long bars of these frames are bent on the same circle, so that when the frames are used as patterns by which to cut the pieces of sand-paper to be used with them the cut made for the inside of the frame will be the right shape for the outside of the next piece, thus effecting an important saving in both labor and sand-paper.

The holding or binding frames *k* are secured, when binding the paper to the disk, by studs *i*, rigidly attached to the frames, and which pass through the disk, and have nuts or other proper fastenings at the top. Channels *x'*, corresponding in shape, size, and depth with the frames, are made in the face of the disk in such manner as will permit the frames to sink into them until their outer surfaces are just flush with the face of the disk under the paper, and at the same time bind the paper tightly between the frame and body of the disk. By constructing my disks with a rigid solid face I secure a surface which does not vary with changes of worn paper for fresh paper, and am able thereby to wear the paper uniformly all over its surface and bring a maximum amount of sand-paper into contact with a given surface of lumber passing through. These results cannot be nearly so well secured

if the sand-paper is held in position by movable blocks, which must be removed every time new paper is supplied.

H is a plain solid-faced disk, having a perfectly flat surface, except that channels of the depth, size, and shape of the binding-frames *k* are made in it for receiving said frames when they are holding the buffing material, which covers the entire surface. Said disk is driven by a belt which passes around pulley *d* and which receives its motion from some pulley or drum which forms a part of the combined planing, smoothing, finishing, and polishing machine.

*k' k'* are suspending and adjusting frames which, with their adjusting-screws *q q*, serve to regulate the height of the disks and adjust them in a position parallel with the bed of the machine, or at an angle to it, if desired. Each frame is maintained in a true vertical position by the slide-rests *r*, in which they move up and down.

*f' f' f' f'* are pressure-bars surrounding the disks G and H, and which are rigidly secured to the suspending and adjusting frames *k' k'* by the arms or brackets *c*, and move up and down with the frames and maintain their proper relations with the disks.

J is a revolving sand-paper cylinder, having a longitudinal reciprocating motion imparted to it by the wobbling-pulley M on the cross-shaft *v*.

K is a revolving reciprocating cylinder, to be covered with heavy felt or other suitable material, for applying oil and filling to the surface of the lumber, after it has been planed, sandpapered, and buffed, in passing through the machine as a final finish.

L is a trough for holding waste or other proper material to be saturated with oil and filling, in contact with the cylinder K, which applies it to the moving surface under it.

M is a wobbling-pulley on the cross-shaft *v*, which imparts a reciprocating motion to both the revolving cylinders J K.

U is a lever, pivoted near its center, which transmits the reciprocating motion from the wobbling-pulley M to the cylinder K through its flanged pulley *t*.

E is a door-guide constructed in two parts, *m n*. *m* is secured to *n* by the screws *e* passing through the slot *l*, which permits the part *m* to be raised and lowered and adjusted to form a bearing for the edge of the door above the wedges, thus preventing warped doors from rising over the top of the bottom rest, *n*, and running onto the saw, in which case the door is seriously injured. The upper bearing may be of any length, and not necessarily as long as the bottom one.

D are circular saws mounted on one long arbor for cutting wedges from the edges of the doors before they reach the feed-rolls in entering the machine.

*s* is a flanged pulley on the end of the sand-paper cylinder J for receiving the reciprocating motion from the wobbling-pulley M.



W are belt-pulleys by which the cylinders J K are made to rotate.

Y are pulleys from which belts drive the disks G and H.

5 *p p* are bevel-gears on the raising-shaft *z*.  
*i* are studs which hold the disk binding-frames to the disks.

I is the buffing material on the face of the disk H.

10 *x'* are channels in the face of the disks G and H, into which the binding-frames are drawn when holding sand-paper or buffing material on the disks.

*j* is sand-paper on the disk G, ready for use.

15 The operation of trimming the edges, planing, sandpapering, buffing, and oiling the surface of doors is as follows: The door is placed flatly on the bed B, its edge bearing against the parts *m* and *n* of the guide E, the wedges  
 20 projecting beyond *m* and *n* into the space *o*. It is pushed forward by hand until it is caught by the feed-rolls, which then propel it onward. It is successively brought in contact with the wedge-cutting saws, the planing-cylinder, the  
 25 sand-paper disk, sand-paper cylinder, covered with very fine paper, the buffing-disk, and, lastly, the oiling and filling cylinder. The saws trim the wedges, the cutter-head removes any surplus thickness of wood, the  
 30 sand-paper disk, carrying coarse sand-paper, removes the planer-marks, the sand-paper cylinder, covered with fine sand-paper, removes all scratches left by the coarse paper on the preceding disk, the buffing-disk  
 35 smooths and polishes the surface, and the oiling-cylinder completes the finish. Thus, rough lumber enters the machine and leaves it with an oil-finish of very superior quality, all secured at about one-twentieth of the cost  
 40 of similar work when done by a series of machines combined with hand-work.

I am aware that sandpapering or smoothing disks arranged in vertical planes have been used in conjunction with horizontal beds  
 45 and grooving-cutters for raising and smoothing panels, as shown in Letters Patent No. 151,531, issued to Beck, Shoemaker and Weaver, June 2, 1874; but such mechanism is essentially different in structure, purpose, and  
 50 operation from my said invention.

I am also aware that sandpapering-wheels have been so arranged between pressure-rollers that stuff passed under the rollers would pass upon and in contact with the smoothing-surface, as shown in Letters Patent No. 128,975, dated July 16, 1872; but such apparatus is devoid of bed and planing mechanism, and is, consequently, essentially different from my invention in structure, purpose, and  
 60 operation.

What I claim as my invention is—

1. The combination, with the bed of a planing-machine, of a rotating disk above and extending entirely across said bed, and buffing material secured in the face of said disk near the edge thereof, substantially as and for the purpose herein set forth.

2. In combination with a planing-machine cutter-head, feeding mechanism, and bed, of the horizontal sandpapering and surfacing disk G, extending substantially across the width of said bed, for the purpose specified, sandpapering-cylinder J, as and for the purpose specified, horizontal buffing-disk H, as and for the purpose specified, and the polishing-cylinder K, as arranged and described, and for the purpose specified, said feeding mechanism being for the purpose of propelling, forcing, or drawing the lumber to be planed, smooth-finished, and polished to the successive parts, which, when combined, produce a polished surface, as described.

3. In combination with the sandpapering-disk G, the adjustable central stationary pressure-disk, *h*, with the pressure-bar *g* therewith and adjusting pressure-nut thereon, and also the upper end of said bar, as shown, provided with a polygonal end thereto, or an equivalent therefor, for fitting into a polygonal recess for the purpose of holding said pressure-disk in a stationary position while said sandpapering-disk is revolving, substantially as and for the purpose described.

4. The sandpapering disk G, provided with an adjustable frame, with pressure-bars *f' f''* connected thereto, said disk, frame, and bar extending across the bed of a planing-machine, in combination with the cutter-head C and feed-rolls F of said planing-machine, as and for the purpose set forth.

5. In combination with the sandpapering-disk G, the curved and sectional binders *k*, the outer and inner curves of which are formed or described by the same radius, as and for the purpose herein specified.

6. The combination, with the cutter-head, bed, and feed-rolls, of the adjustable horizontal disk G, extended substantially across the said bed, and the pressure-bars *f' f''*, all substantially as and for the purpose herein set forth.

7. The combination, with the cutter-head, bed, and feed-rolls, of the adjustable horizontal disk G, extended substantially across the said bed, the pressure-bars *f' f''*, and adjusting frames, all substantially as and for the purpose herein set forth.

8. In combination with the wabbling-pulley M, the flanged spool *s*, and vibrating bar *u*, for communicating simultaneously a reciprocating or endwise motion to the sandpapering-cylinder J and polishing-cylinder K.

9. In combination with a planing-machine cutter-head, feeding mechanism, and bed, a horizontal smoothing-disk extended substantially across the width of said bed, and a trimming-saw, all substantially as and for the purpose herein set forth.

WILLIAM R. NORRIS.

Witnesses:

WM. F. BROWNE,  
 AR. G. GEUR.