

(No Model.)

4 Sheets—Sheet 1.

J. W. PHILP.

MACHINE FOR CUTTING GORES IN BARREL BLANKS.

No. 424,821.

Patented Apr. 1, 1890.

Fig. 1.

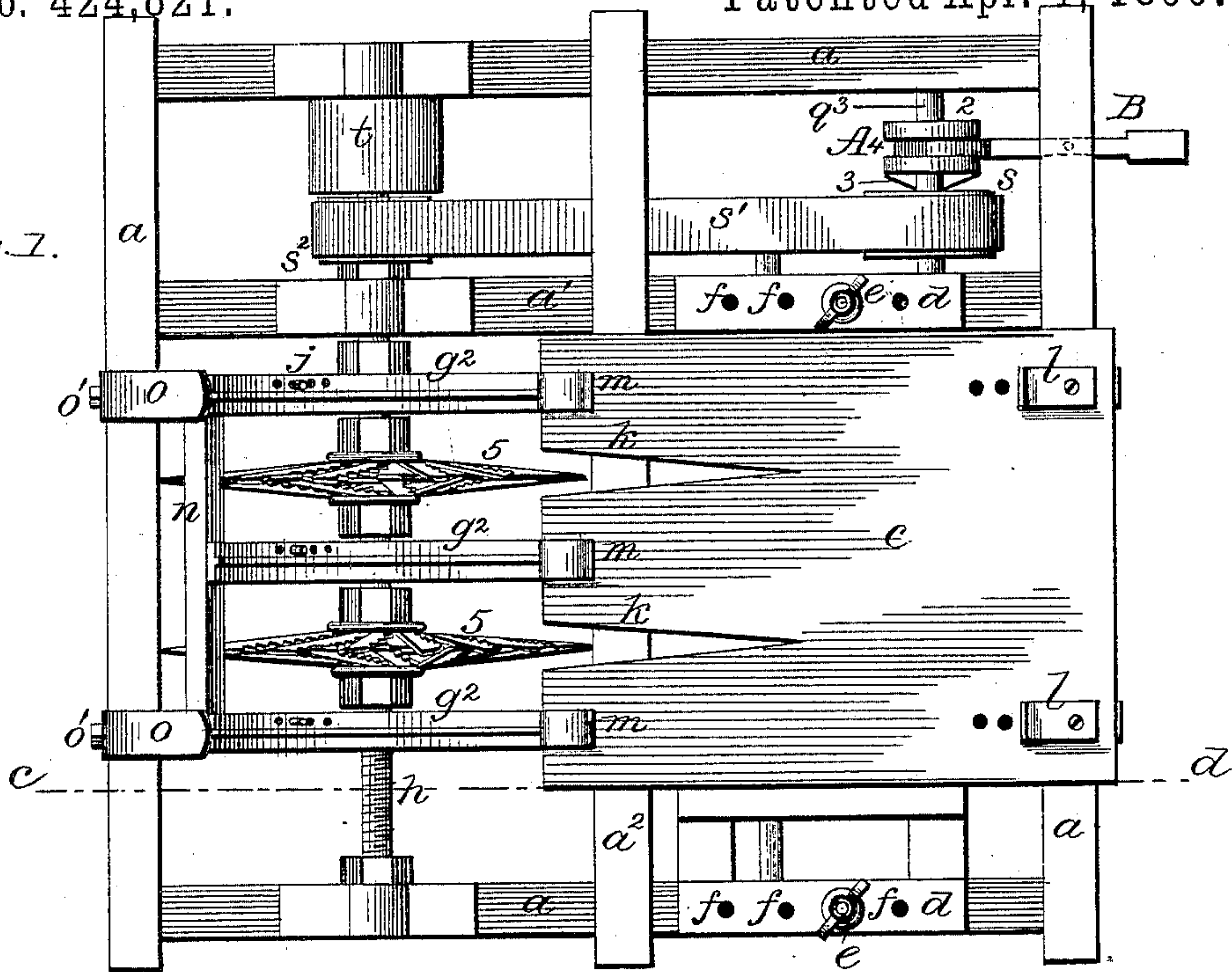
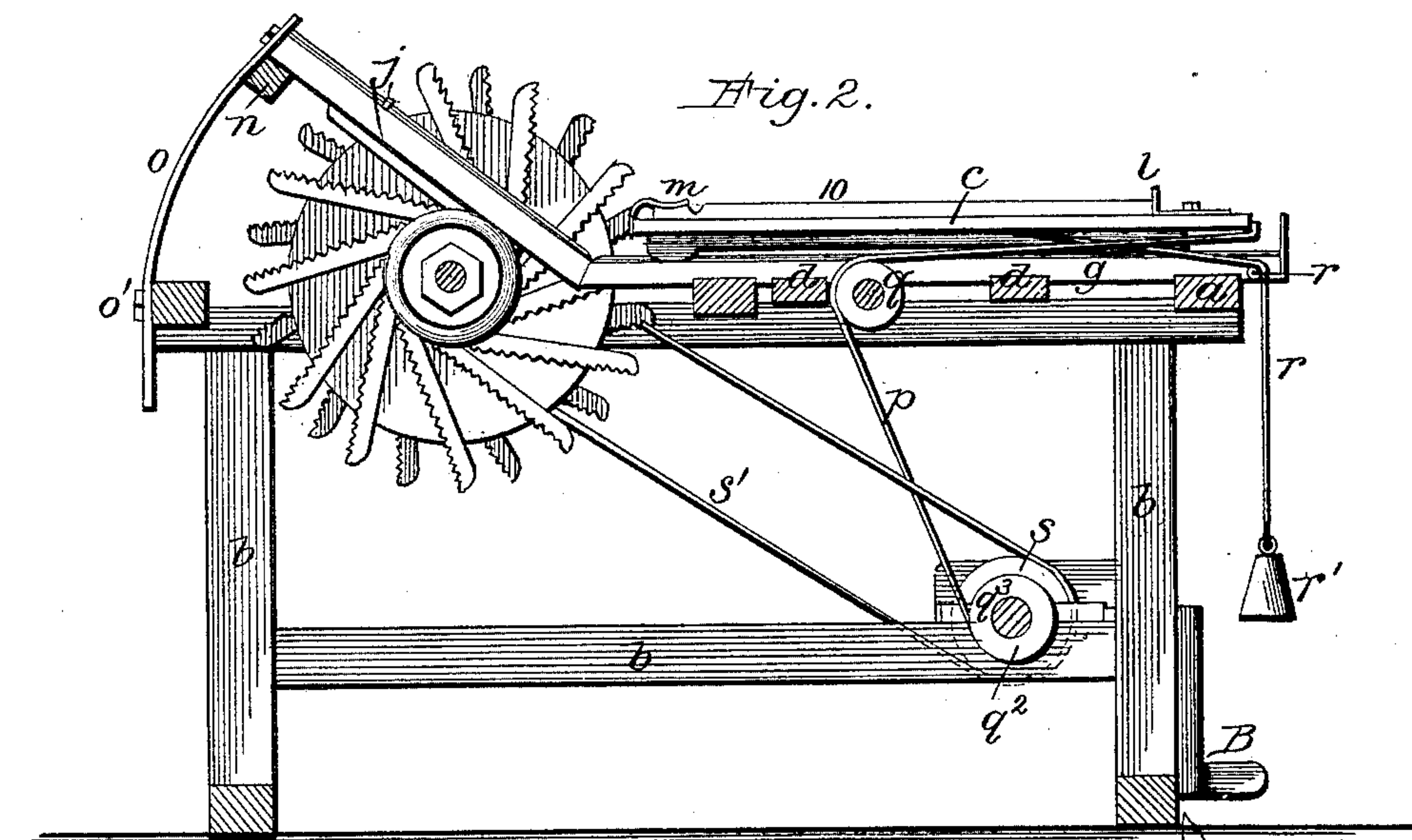


Fig. 2.



WITNESSES

Matth. H. Purphey.  
Howell Barth

INVENTOR

John W. Philp  
By Johnson & Johnson  
his Attorneys.

(No Model.)

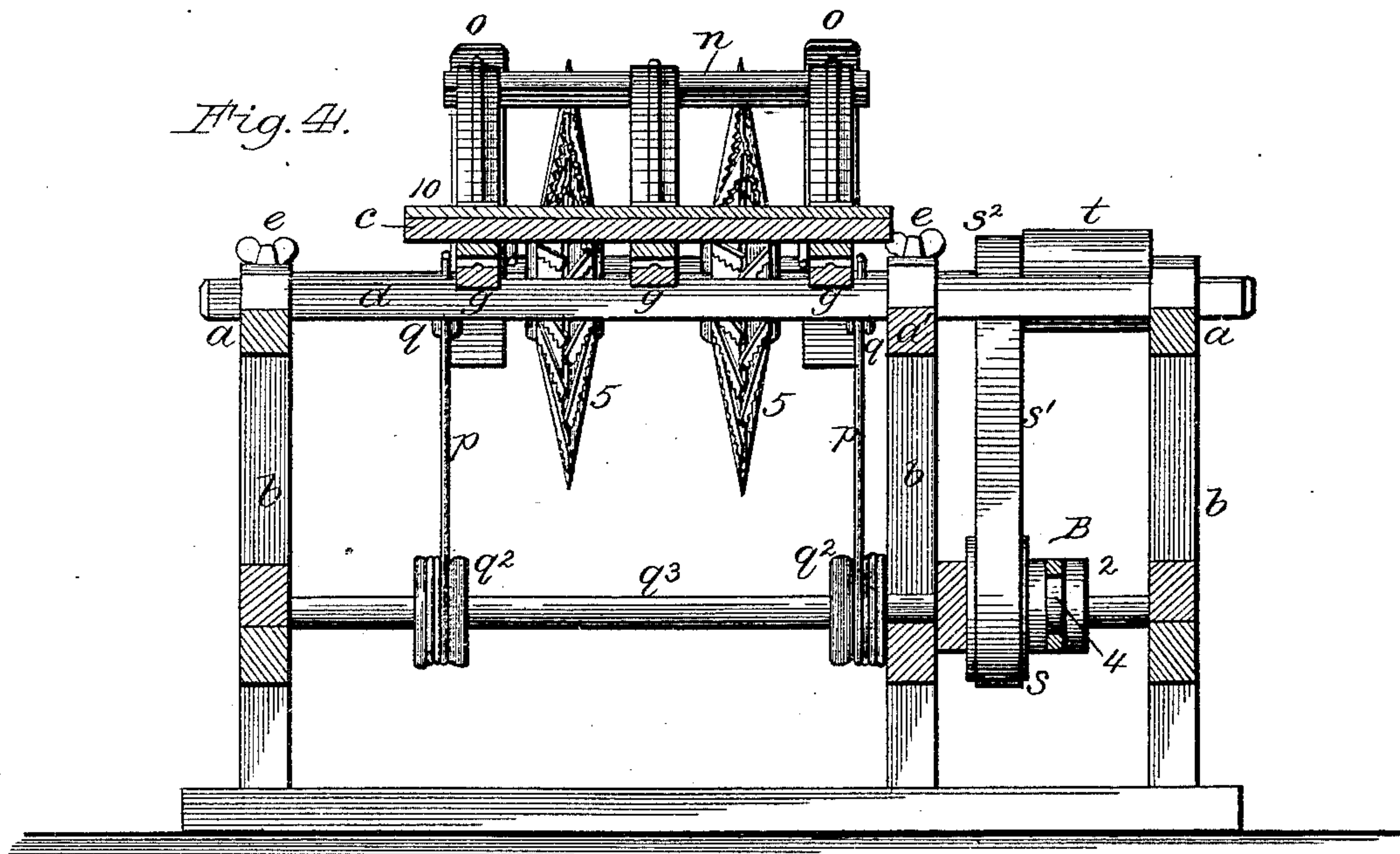
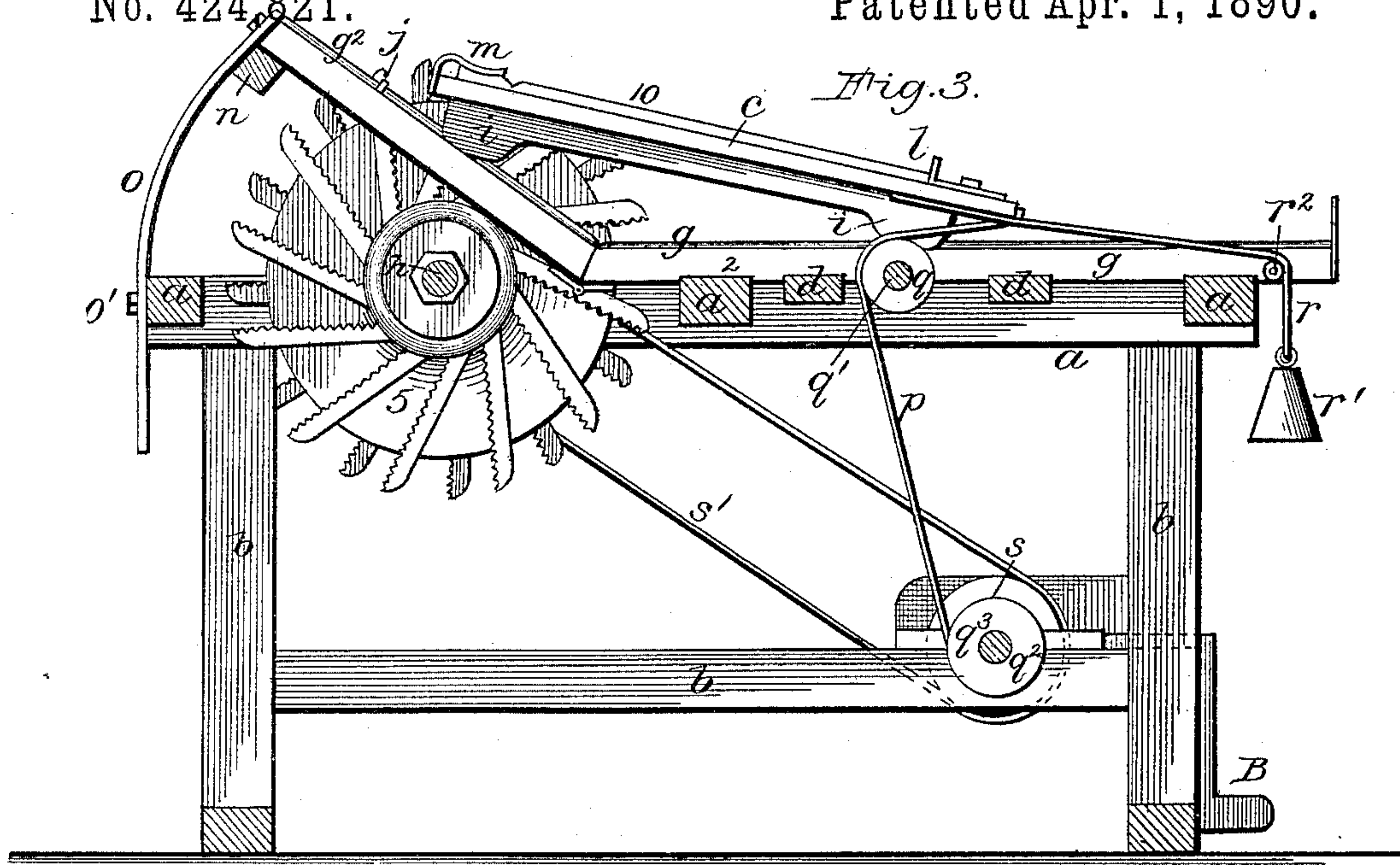
4 Sheets—Sheet 2.

J. W. PHILP.

MACHINE FOR CUTTING GORES IN BARREL BLANKS.

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WITNESSES  
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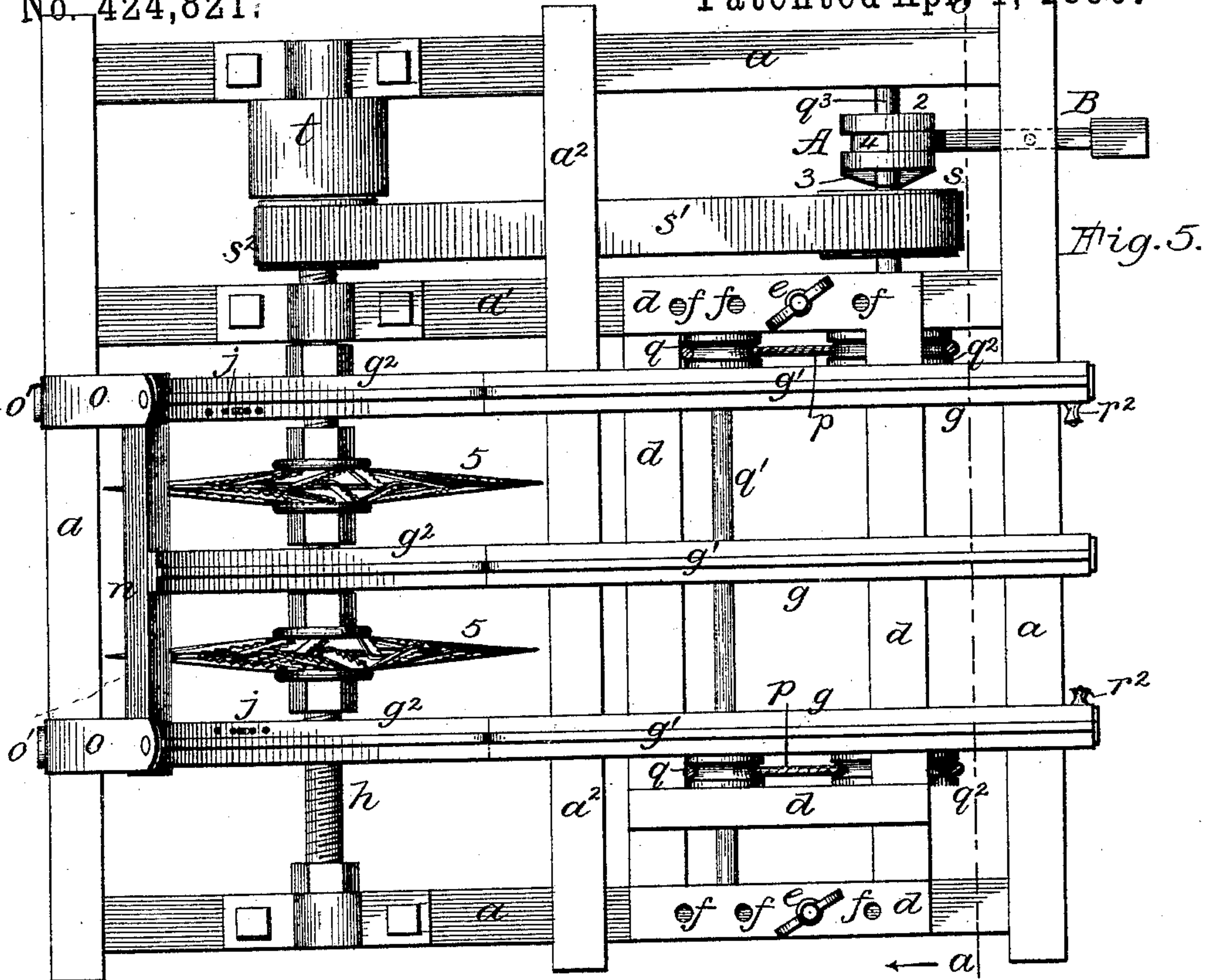


Fig. 8.

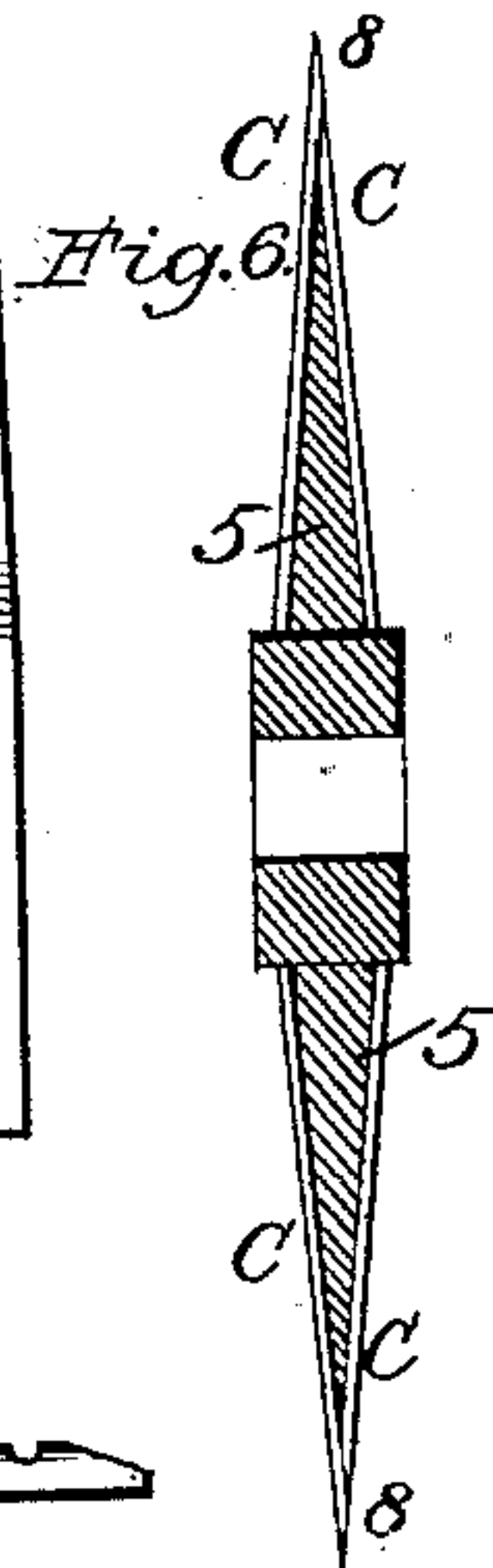
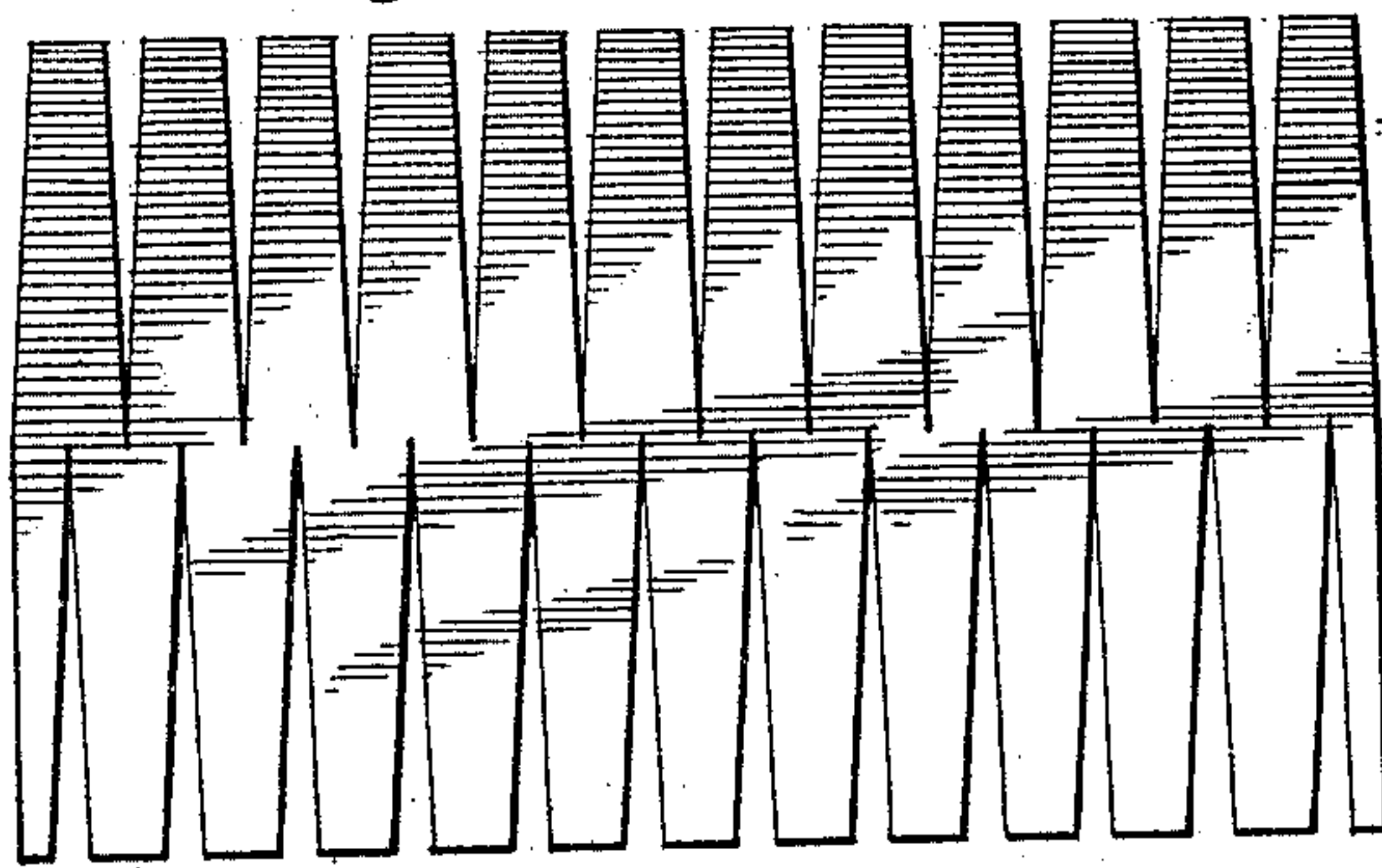


Fig. 7.

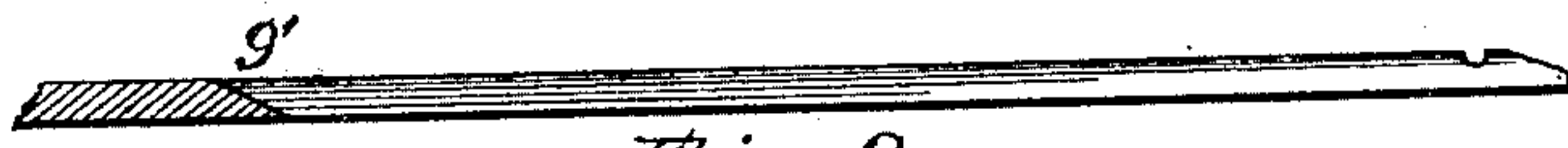


Fig. 9.

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(No Model.)

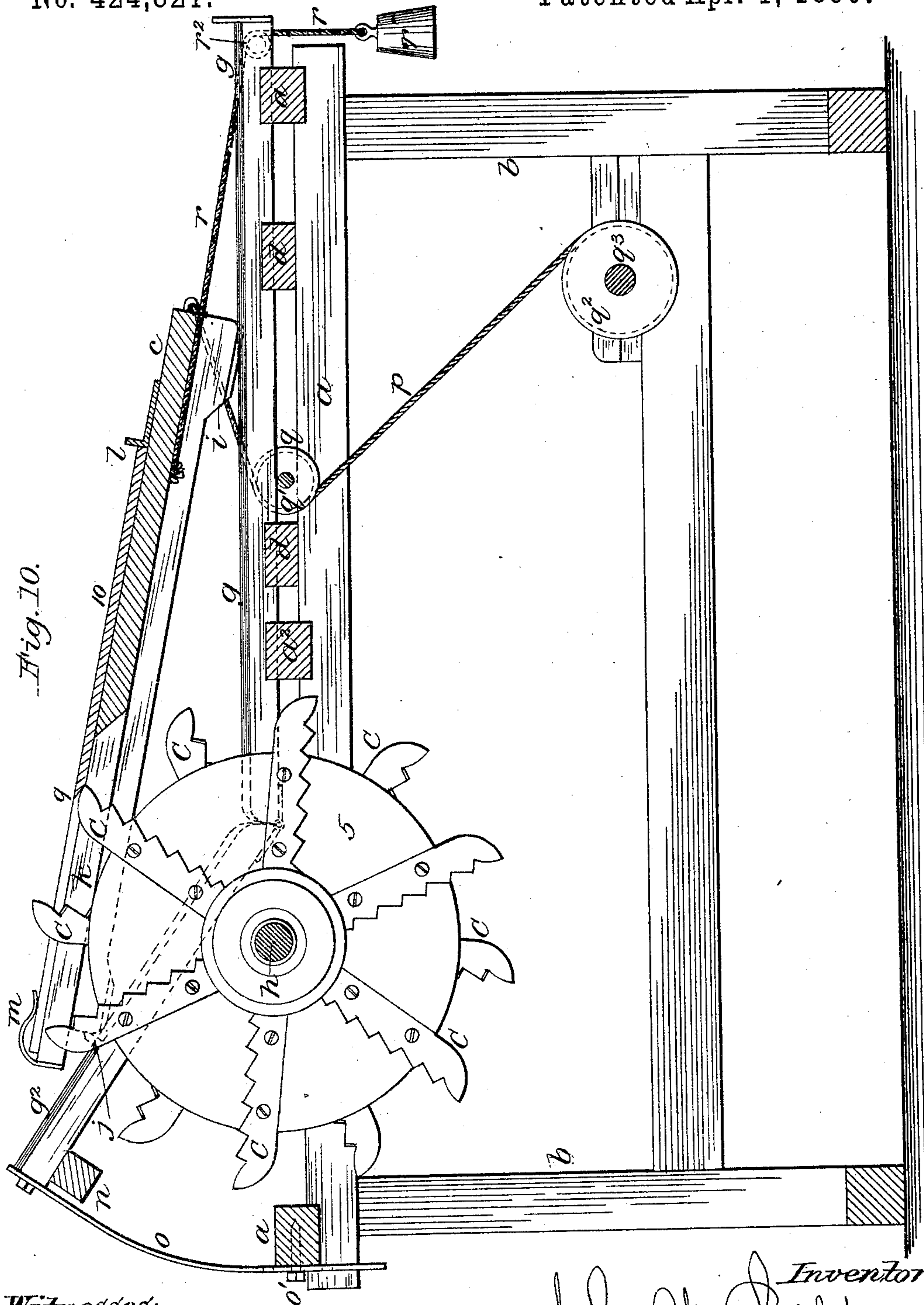
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J. W. PHILP.

MACHINE FOR CUTTING GORES IN BARREL BLANKS.

No. 424,821.

Patented Apr. 1, 1890.



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*Inventor:*

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John W. Hilp  
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His Attorneys



# UNITED STATES PATENT OFFICE.

JOHN W. PHILP, OF HUMBOLDT, TENNESSEE.

## MACHINE FOR CUTTING GORES IN BARREL-BLANKS.

SPECIFICATION forming part of Letters Patent No. 424,821, dated April 1, 1890.

Application filed June 4, 1889. Serial No. 313,036. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. PHILP, a citizen of the United States, residing at Humboldt, in the county of Gibson and State of Tennessee, have invented new and useful Improvements in Machines for Cutting Gores in Barrel-Blanks, of which the following is a specification.

My invention relates to barrel-making machines, and my improvement is particularly directed to the production of a machine for cutting gores in thin sheets or veneers of wood cut to form blanks for making barrels, and which machine consists of certain novel parts and combination of parts which will be separately pointed out in the claims concluding this specification.

The following is a description of the machine and the several devices illustrated in the accompanying drawings, which machine embraces the several features of my invention in total combination.

Referring to the drawings, Figure 1 is a top view of the machine. Fig. 2 is a vertical longitudinal section of the machine, taken on the line *c d*, of Fig. 1, showing the feed-table carrying the barrel-blank horizontally to the cutter-heads. Fig. 3 is a vertical longitudinal section of the machine, showing the feed-table carrying the barrel-blank in inclined relation to and away from the cutters to complete the cutting of the gores with beveled edges, and with a pointed under-cut at the termination of the gores. Fig. 4 is a transverse section of the machine taken on the line *a b* of Fig. 5, looking toward the rear. Fig. 5 is a top view of the machine, the feed-table being removed to show the adjustable supplemental frame which carries the track-rails. Fig. 6 is a diametrical sectional view of one of the cutter-heads. Fig. 7 is an enlarged sectional detail showing the beveling of the cutter-blade points and their meeting in the same plane to give a sharp angle to the gore at its terminus. Fig. 8 shows the gored barrel-blank, and Fig. 9 is a section taken through one of the gores of the same, particularly showing the under-cut or bevel at the terminus of the gore. Fig. 10 shows the machine in vertical section with the cutter-blades, the inclines and feed-table with the blank thereon in the position they occupy when the table is at the

limit of its forward inclined feed and the cutter-blades in position to finish the gore with the point under-cut or bevel.

A rectangular frame has its top part formed of side and cross pieces *a*, and is suitably supported by an upright frame *b*, in the top frame of which the shaft is journaled that operates the gang of the gore cutter-heads and also carries the table *c*, which feeds the blank to the cutter-heads.

Upon the longitudinal pieces *a a'* of the top frame is secured a supplemental frame *d*, which is made adjustable toward and from the cutter-heads by means of screws *e* and holes *f* in the side bars of said frame, for a purpose to be presently described.

Rails *g*, having track ribs or tongues *g'*, are firmly secured in longitudinal parallel relation to each other at suitable distances apart upon the supplemental frame *d*, and are therefore moved with the adjustment of the latter. These rails are set in mortises in the front and middle cross top rails *a a'*, which serve as guides to hold and brace said rails upon the top frame. These rails extend from the front to beyond the middle cross-piece *a'* of the top frame and have hinged sections *g'*, which are adjustably supported in upwardly-inclined relation to the horizontal supplemental adjustable frame-rails *g* and form extensions of the latter, upon which the feed-table is moved from a horizontal position to an upwardly-inclined position, as shown in Figs. 3 and 4, being supported at its front end upon the horizontal rails and at its rear end upon the inclined rail-sections, upon which it operated back and forth, as I shall hereinafter describe.

At the rear portion of the top frame and in suitable bearings thereon is journaled the shaft *h* of the cutter-heads in such relation to the adjustable inclined rail-sections as that one cutter-head will operate centrally between two of the rails and above them, as I shall more fully hereinafter state.

The feed-table is provided with grooved blocks or runners *i i* corresponding with and riding upon the track-rail tongues and adapted to slide freely over the hinge-joint of the rails. The movement of the feed-table upon the inclined rail-sections is limited by stops *j*, placed therein near their upper ends, and which are



made adjustable in holes in said rails to suit the length of the gores to be cut in the blank. The rear portion of the table is formed with gores *k*, which register with and correspond in form to the gores to be made in the barrel-blank, which is fed to the cutters upon said table. Stops *l* are adjustably secured upon the upper side of the table near its front edge, while spring clamps or clips *m* are secured at the rear edge of the table, so as to project forward, and the barrel-blank is secured upon the table between these stops and spring-clips, as shown in Figs. 2 and 3. The stops are made adjustable to suit different lengths of barrel-blanks.

The hinged extensions of the track-rails are connected together at their rear ends by a cross-bar *n*, so as to form a brace therefor, and the braced ends of these track-rail extensions are supported by bars *o*, which, being connected to the upper ends of the said extension-rails, are adjustably secured to the rear cross-piece of the table-frame by means of bolts *o'* and holes in said bars, whereby the hinged track-extensions may be adjusted at various angles to vary the bevel of the edges of the gores.

The table is fed forward by cords *p* connected to its forward edge, and passing over pulleys *q* upon a shaft *q'*, mounted in the end pieces of the supplemental frame, are connected to pulleys *q''* on a shaft *q'''*, mounted in the supporting-frame under the said supplemental frame, so that the revolving of said shaft will wind the cord upon its connected pulleys and thus move the table forward.

The feed-table is returned to its starting position (shown in Fig. 2) by means of cords *r*, secured to the table and passing over pulleys *r''*, suitably mounted at the front of the frame, having weights *r'* upon their lower ends sufficiently heavy to draw the table forward upon the track-rails at the moment the shaft *q''* is released from its driving-clutch A, which may be of any suitable construction adapted to be operated by a foot-lever B. For this purpose the clutch-shaft has a loose pulley *s*, from which a band *s'* leads to a pulley *s''* on the shaft of the cutter-heads, which is driven continuously by the drive-pulley *t*. I have shown a form of foot-lever clutch in Figs. 1 and 5 in which a half-clutch 2 turns with and slides upon the shaft *q''*, and the projections 3 upon the inner face of the half-clutch engage with recesses in the side of the loose pulleys *s*. The foot-lever B is pivoted to the supporting-frame, and its inner end is bifurcated and engages with a circumferential groove 4 in the hub of the half-clutch, so that said clutch may be thrown into or out of engagement with the loose pulley by tilting the foot-lever to one side or the other.

In a patent granted to me September 4, 1888, No. 389,006, for cutter-head for cutting gores in barrel-blanks, I have described, shown, and claimed a cutter-head having cut-

ters arranged to produce V-shaped gores in the blank and so arranged as to act at the circumference of and upon both faces of a disk of V shape in cross-section and in which the said cutters extend to the hub of the disk, so that the cutters have contact with the edges of the gores to the point of the latter; and the sides of the said cutter-head taper from the hub to nearly a feather-edge, so that the points of all the cutters of each head will meet in the same plane in a line which determines the angle of the gore being cut and terminates the gore with a sharp angle. I employ this cutter-head as a co-operating device in my present invention, and I deem it necessary to describe only so much of said cutter-head as is necessary to establish such co-operation with an organized machine having provision for feeding the barrel-blank in separate planes of movement to said cutter-heads, so as to cut all the gores at one operation having provision for beveling the edges of the gores to admit of perfect jointing of the edges of the gores in finishing the barrel, having provision for adjusting the length of the gores, having provision for adjusting the relative length and width of the gores, and having provision for operating the feeding-table in a horizontal position in relation to the cutter-heads at the commencement of the operation, and finally, operating the feeding-table in a gradually-increasing upwardly-inclined relation to said cutter-heads. The number of the cutter-heads will of course be equal to the number of the gores to be cut in the blank, and they are suitably secured upon the shaft *h*, one preferably between two table track-rails, so that the latter will give a firm support to the feed-table along its front gored edge, as shown in Fig. 1. The cutter-heads are composed each of a circular disk shaped to taper from its hub to nearly a feather-edge at its circumference, as shown in the cross-section in Fig. 6. The cutters C of steel blades are secured upon the faces of the disk at equal distances apart and alternating upon opposite sides. The outer edges of these cutter-blades project beyond the circumference of the disk and terminate in a circular line or plane concentric with the disk, the ends being inclined toward each other by the tapering sides of the disk. The cutters are secured so as to project from the faces of the disk the thickness of the blade, and their cutting-edges are formed by saw-teeth, which are sharpened with the bevel facing the disk, as shown in Figs. 6 and 7, the teeth thus cutting at their outer edges only. The cutter-blades are thickest at their cutting-edges, so that they will free themselves in passing through the wood, and the outer tooth of each blade is filed to a sharp point 8, so as to cut into a sharp angle or point and terminate the cut gore in a beveled undercut point 9, as seen in Figs. 9 and 10, the point of each blade forming an oblique chisel-edge, with its outer side facing away from the disk, so that the



points of all the cutters of each head will revolve in the same plane as a single line coincident with the middle of the thickness of the disk, as seen in Fig. 6. As the cutter-heads are revolved the sharp edges of the inwardly-beveled teeth will cut and trim the edges of the gore, while the oblique chisel-points of the blade will cut and trim the inner undercut angle of the gore to a perfect point, and thus prevent any outside surface swell or bulge at these points when the gores are closed in forming the barrel.

In putting the clutch in gear the table is moved forward by winding up the cords *p*, so as to carry the barrel-blank 10 to the cutter-heads in a horizontal plane a sufficient distance to cause the cutters to cut well into the blank, making the gores the same width as the thickness of so much of the tapering heads as will enter the gores at the limit of such horizontal movement. At this point the feed-table commences to travel upward upon the inclined tracks, and, gradually rising thereon at an increasing inclination, will cause the cutters to continue their cutting action by that portion of the cutter-heads which decreases in thickness and thus complete the cut of the gores in gradually decreasing width. The gradually-increasing inclination of the table, as it is fed up the inclines, causes the cutting-blades to have a divergent or oblique relation to the under side of the table, and gives thereby a bevel form to each edge of the gore corresponding to the tapering form of the cutter-heads, as shown in Fig. 10. It is this relation of the cutting-blade to the feed-table when the latter is moving upon the inclines which causes the points of the cutters to cut in the under side of the barrel-blank at the terminus of the gore, and thereby reduce or groove the blank on its inner side beyond the end of the gores, so that the gores may be closed with a perfectly smooth joint at the other side of the barrel, and thus permit of tight-fitting joints along the edges of the gores.

As the supplemental frame *d* and the horizontal track *g* are adjusted toward or from the cutter-heads, the latter will be caused to cut further or less into the blank before the feed-table commences to rise upon the inclines, and by adjusting the angle of the inclines more or less the cutting-blades will cut more or less from the edges of the gores. The length of the gore-cuts produced by the inclined movement of the table will be regulated by adjusting the stops *j* at or near the upper portions of the inclined tracks.

Referring to Fig. 10, it will be seen that in making the under-cut or bevel at the point of the gore, the feed-table is at the limit of its inclined forward movement, and that the points of the cutter-blades act beneath the barrel-blanks to give the under-cut. The feed-table therefore is moved forward on a horizontal plane a little above the axis of the cutter-heads for a certain distance controlled

by the adjustment of the supplemental frame, and is then caused to rise at its rear end as it advances, and in this way the cutter-head cuts horizontally into the blank so as to make the widest part of the gore, and then the blank still advancing is caused to recede upwardly and away from the cutter-head to a point where the latter ceases to cut, and in such latter movement the gore is cut to a point with its edges beveled from the outer edge of the blank to the undercut point.

I claim as my improvement—

1. In a machine for cutting gores in barrel-blanks, the combination, with a series of revolving side-cutting cutter-heads tapering in cross-section to their circumference, of track-rails having upwardly-inclined rear portions at the sides of said cutter-heads, and a feed-table having gores corresponding to said cutter-heads, which travels upon said track-rails, substantially as described, for the purpose stated.

2. In a machine for cutting gores in barrel-blanks, the combination, with a series of revolving side-cutting cutter-heads tapering in cross-section to their circumference, of horizontal track-rails having upwardly-inclined rear portions at the sides of said cutter-heads, a feed-table having gores which correspond to said cutter-heads, which has a limited travel upon said track-rails toward and from said cutter-heads, and means, substantially such as described, for adjusting said horizontal track-rails toward or from said cutter-heads, substantially as described, for the purpose stated.

3. In a machine for cutting gores in barrel-blanks, the combination, with a series of side-cutting cutter-heads tapering in cross-section to their circumference, of horizontal track-rails having upwardly-inclined rear portions at the sides of said cutter-heads, a feed-table having gores which correspond to said cutter-heads, which has a limited travel upon said track-rails toward and from said cutter-heads, means, substantially such as described, for adjusting said track-rails horizontally, and means, substantially such as described, for adjusting the inclination of said rear track portions in relation to the cutter-heads, whereby the gores may be cut of greater or less length and their edges formed with greater or less bevel.

4. In a machine for cutting gores in barrel-blanks, the combination, with a series of revolving side-cutting cutter-heads tapering in cross-section to their circumference, of horizontal track-rails, inclined track-rails at the sides of said cutter-heads, a feed-table traveling upon said tracks, and means, substantially such as described, for vertically adjusting the rear ends of said inclined track-rails in relation to the cutter-heads, for the purpose stated.

5. In a machine for cutting gores in barrel-blanks, the combination, with a feed-table supporting main frame and a series of revol-



ingside-cutting cutter-head tapering in cross-section to their circumference journaled in said frame, of a supplemental frame having longitudinal track-rails and adjustably secured to said main frame, upwardly-inclined track-rails hinged to and forming extensions of said longitudinal track-rails, adjustable supports for the rear ends of said inclined track-rail extensions, and a feed-table having gores corresponding to the cutter-heads having a limited movement upon said track-rails toward and from said cutter-heads, substantially as described.

6. In a machine for cutting gores in barrel-blanks, the combination, with a series of revolving side-cutting cutter-heads tapering in cross-section to their circumference, of horizontal track-rails extending to and lapping with said cutter-heads and having upwardly-inclined extensions at the sides of said cutter-heads, a feed-table traveling upon said track-rails, fixed and adjustable stops on said rails for limiting the movement of the table from the cutter-heads and over the latter, and means, substantially as described, for feeding and retracting the table, substantially as described.

7. In a machine for cutting barrel-blanks, the combination, with the series of revolving side-cutting cutter-heads, the main frame and suitable means for operating said cutter-heads, of the supplemental frame *d*, having holes *f* in its end pieces and securing-bolts *e*, the track-rails *g*, having the hinged upwardly-inclined extensions *g*<sup>2</sup>, provided with adjustable stops *j*, the plates *O* for adjustably supporting the rear ends of said inclined extension-rails, a feed-table traveling upon said rails, and means for operating said table, substantially as described, for the purpose specified.

8. The combination, in a machine for cutting gores in barrel-blanks, with a frame having longitudinal tracks formed with inclined rear ends, a shaft journaled in said frame and having a pulley, and a series of side-cutting cutter-heads upon said shaft, of a gored feed-

table traveling upon said tracks, cord secured to said table and passing over pulleys upon said frame and having weights at their pending ends, a shaft journaled in said frame and having drums upon it and a pulley, a belt passing around said pulley and the pulley upon the cutter-shaft, and cords or chains secured to the under side of said feed-table near the rear edge and passed around pulleys upon said frame and secured to and winding upon said drums, substantially as described.

9. The combination, in a machine for cutting gores in barrel-blanks, of the frame having the longitudinal track-rails *g*, formed with the inclined track-rails *g*<sup>2</sup>, the shaft or arbor *h*, having the pulley *t*, the side-cutting cutter-heads upon said shaft or arbor, the pulleys *r*<sup>2</sup> in the forward end of the frame, the pulleys *q* at the middle of the frame, the gored feed-table *c*, traveling upon the track-rails, the shaft *q*<sup>3</sup>, having the drums *q*<sup>2</sup>, the loose clutch-pulley *s*, the belt *s*<sup>1</sup>, passing around pulleys *s* and *s*<sup>2</sup>, the sliding half-clutch 2, the clutch foot-lever *B*, the cords *r*, passing over pulleys *r*<sup>2</sup> and having weights *r*<sup>1</sup> and secured to the feed-table, and the cords or chains *p*, secured to the feed-table, passing around pulleys *q* and secured to the drums *q*<sup>2</sup>, substantially as described.

10. The combination, in a machine for cutting gores in barrel-blanks, of a series of revolving side-cutting cutters, arranged in inclined relation upon the opposite sides of a disk or cutter-head, a feed-table having gores corresponding to said series of cutters, and track-rails formed of horizontal and inclined sections, substantially as described, for the purpose specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JNO. W. PHILP.

Witnesses:

W. I. MCFARLAND,  
M. W. JOHNSON.