

(No Model.)

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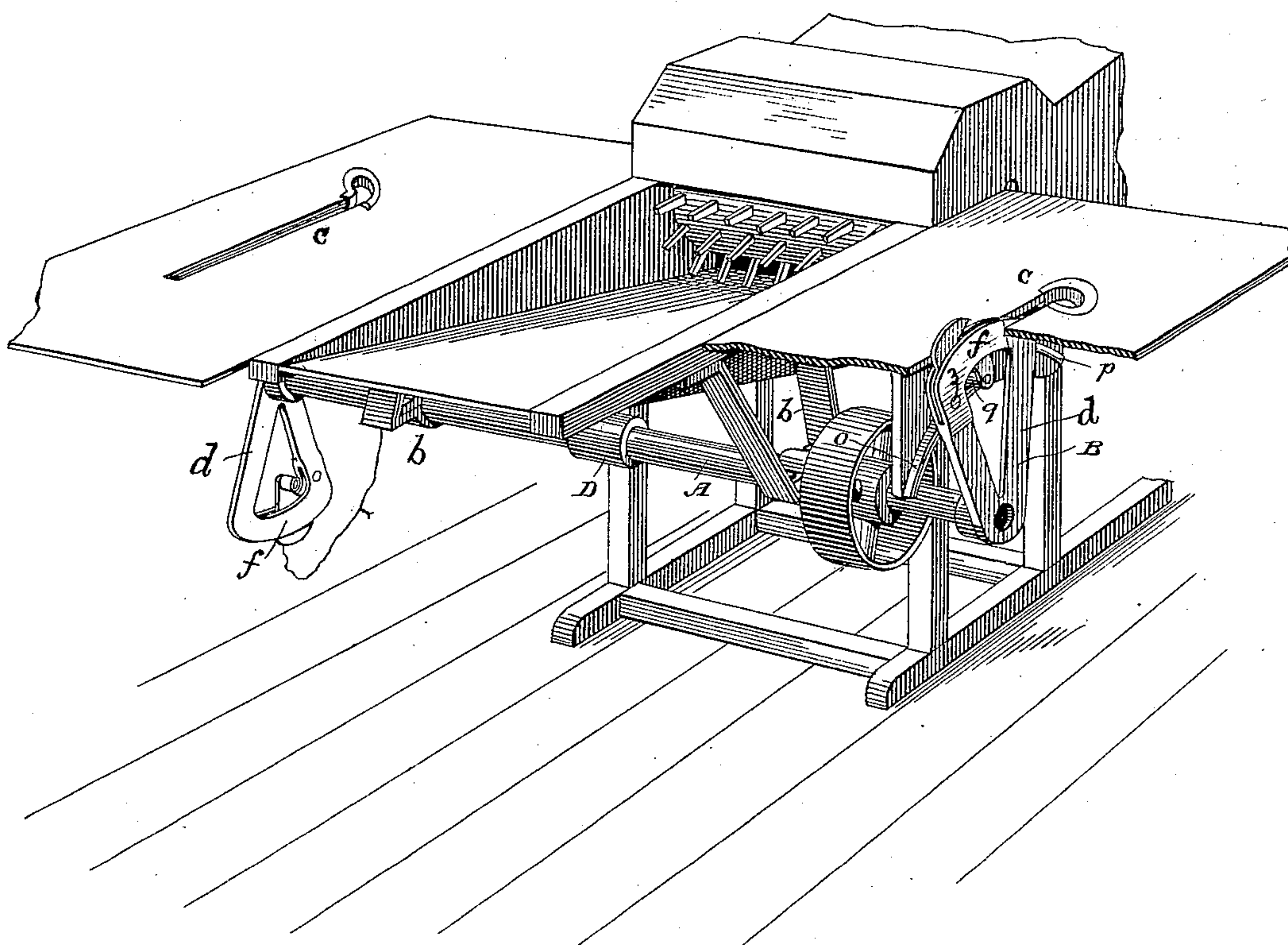
W. GRAY.

### Apparatus for Cutting and Removing Bands.

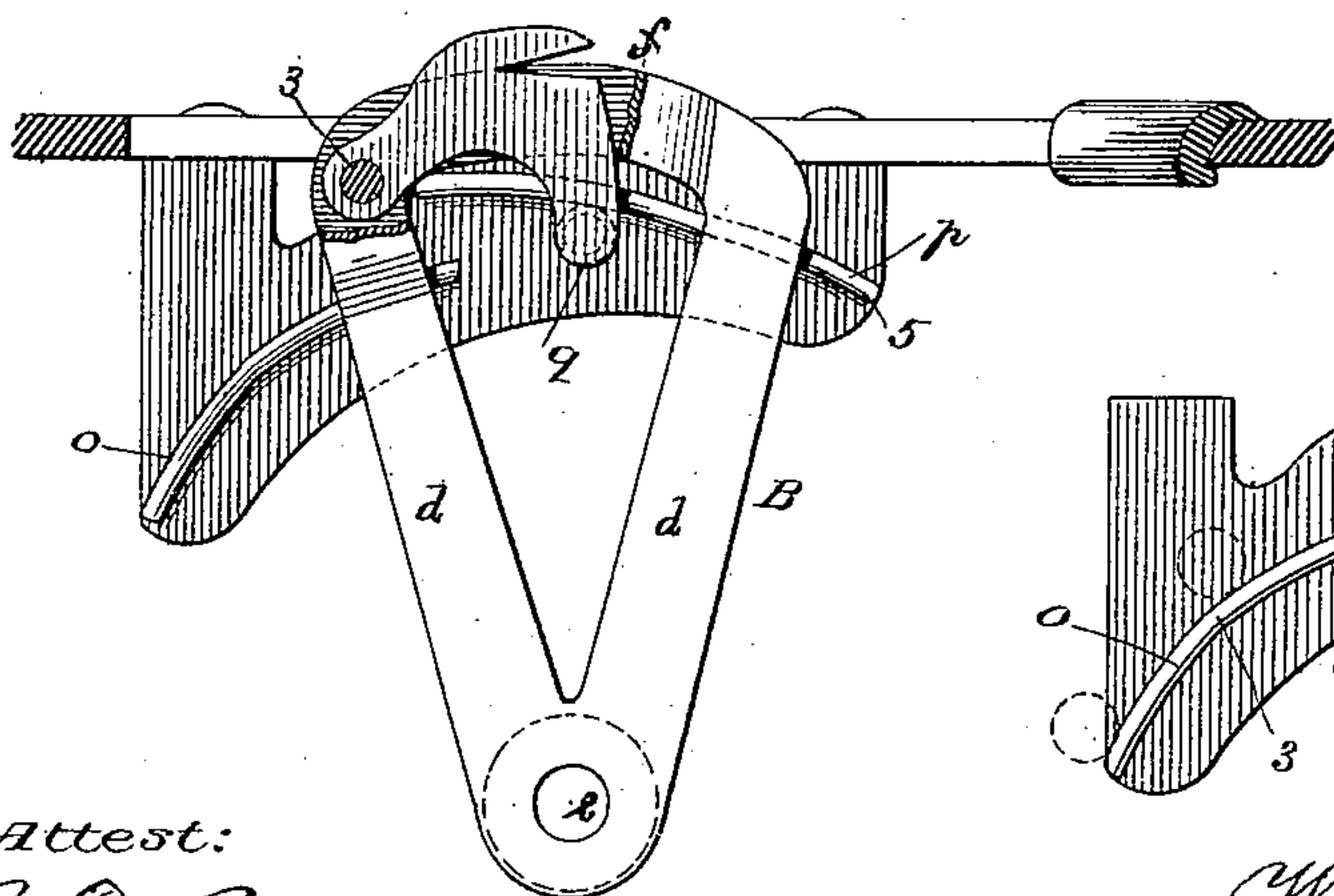
**No. 234,561.**

**Patented Nov. 16, 1880.**

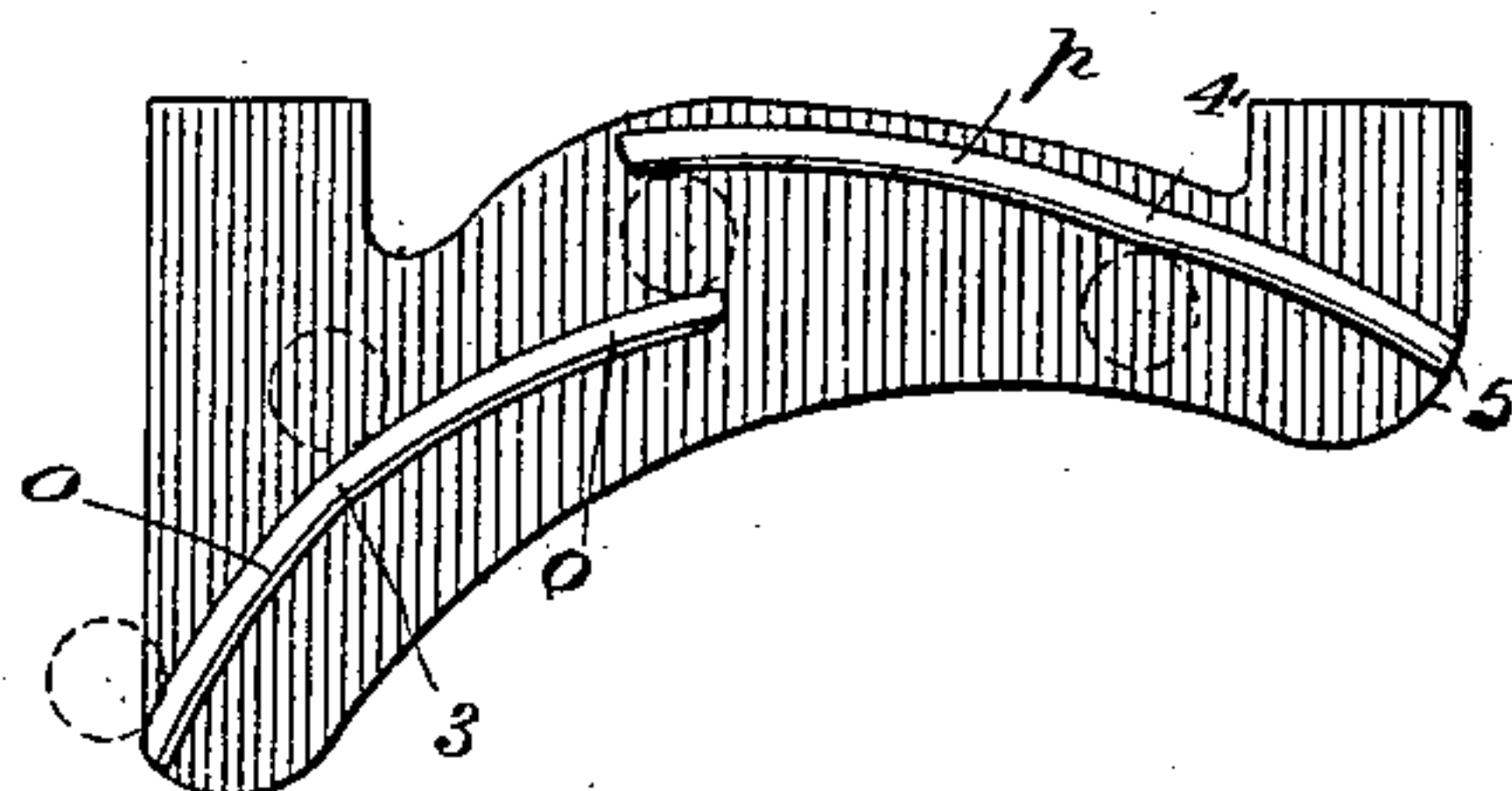
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



*Attest:*

R. F. Barnes

Marcellus

*Inventor:*

William Gray

by E. E. Spear  
Attorney

(No Model.)

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Apparatus for Cutting and Removing Bands.  
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Fig. 7.

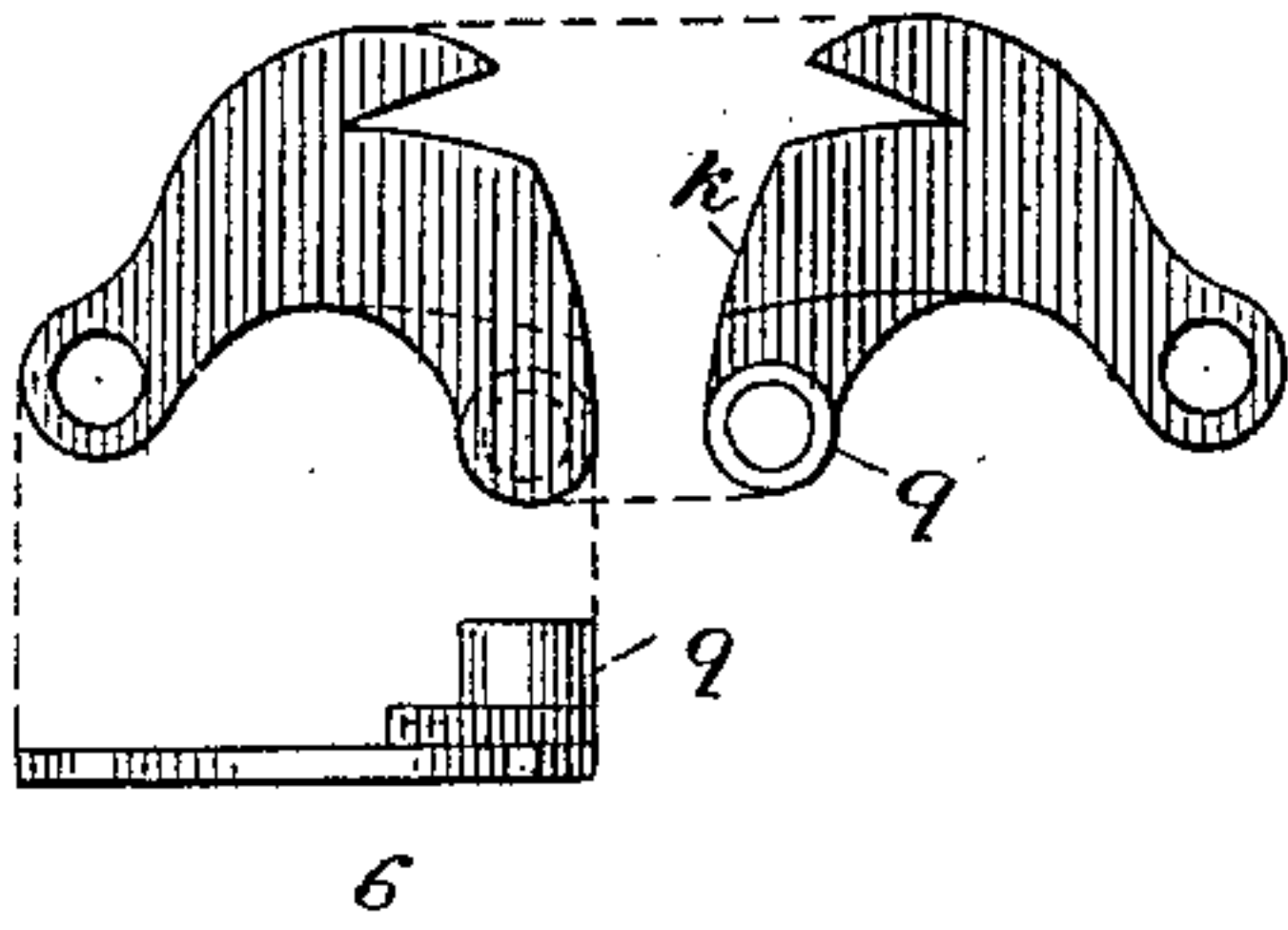


Fig. 8.

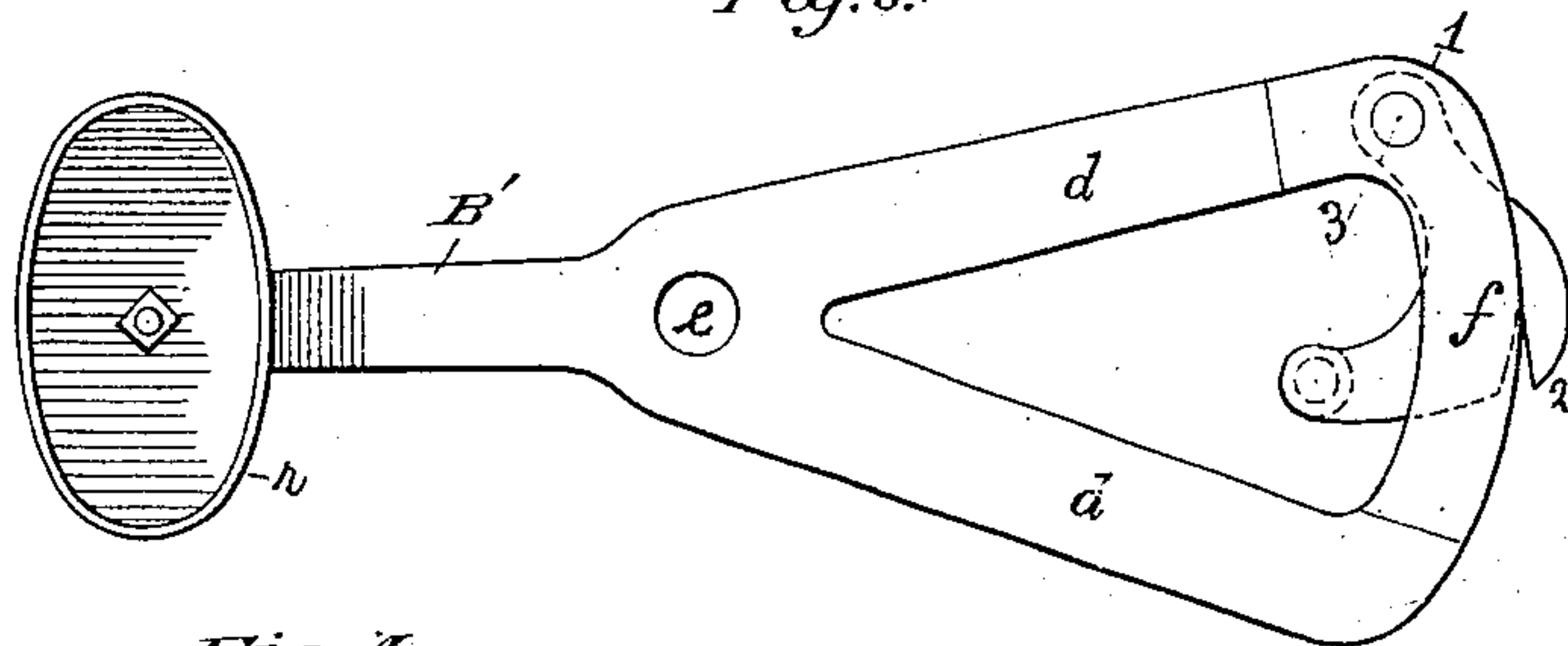


Fig. 4.

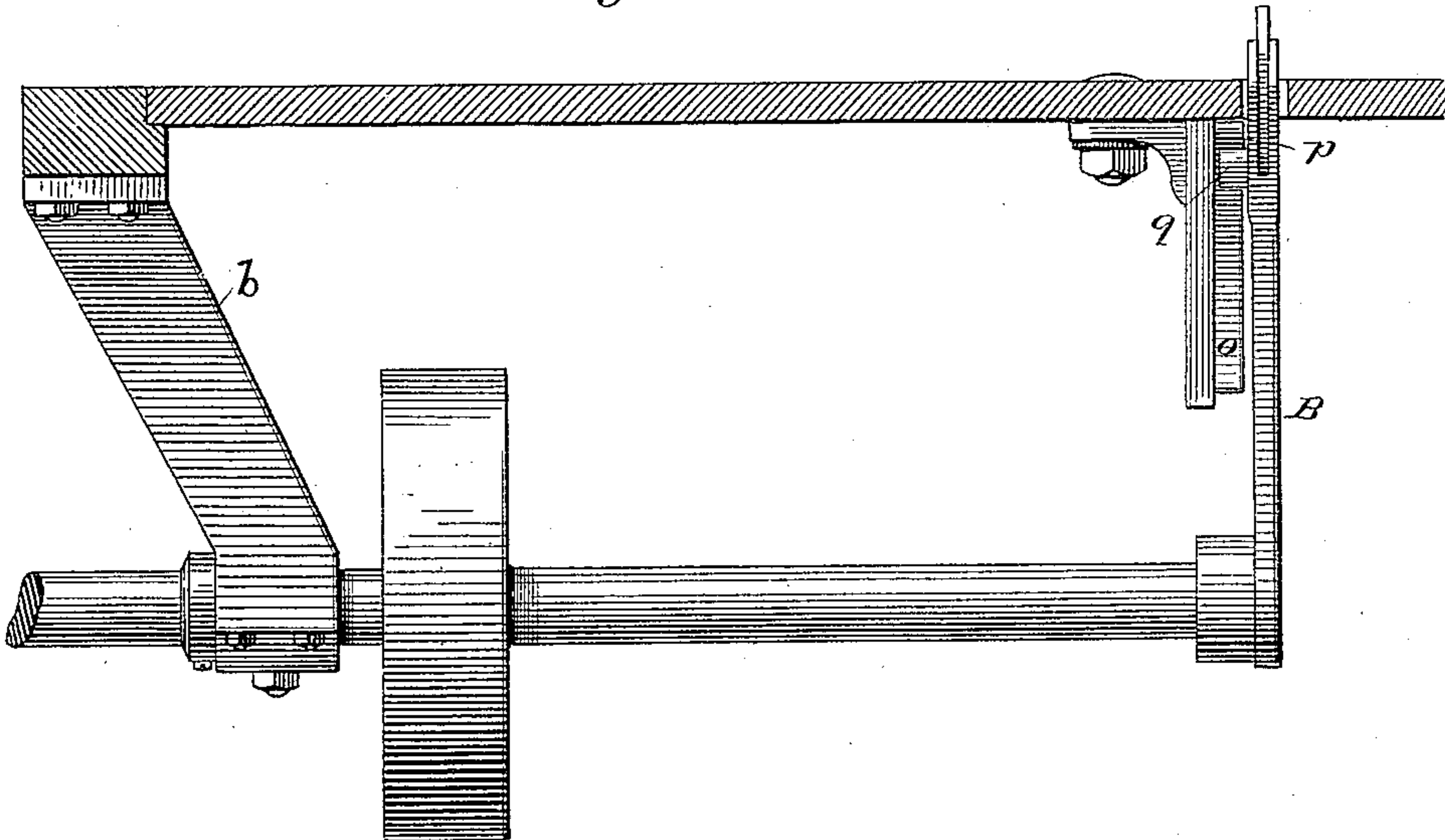


Fig. 5.

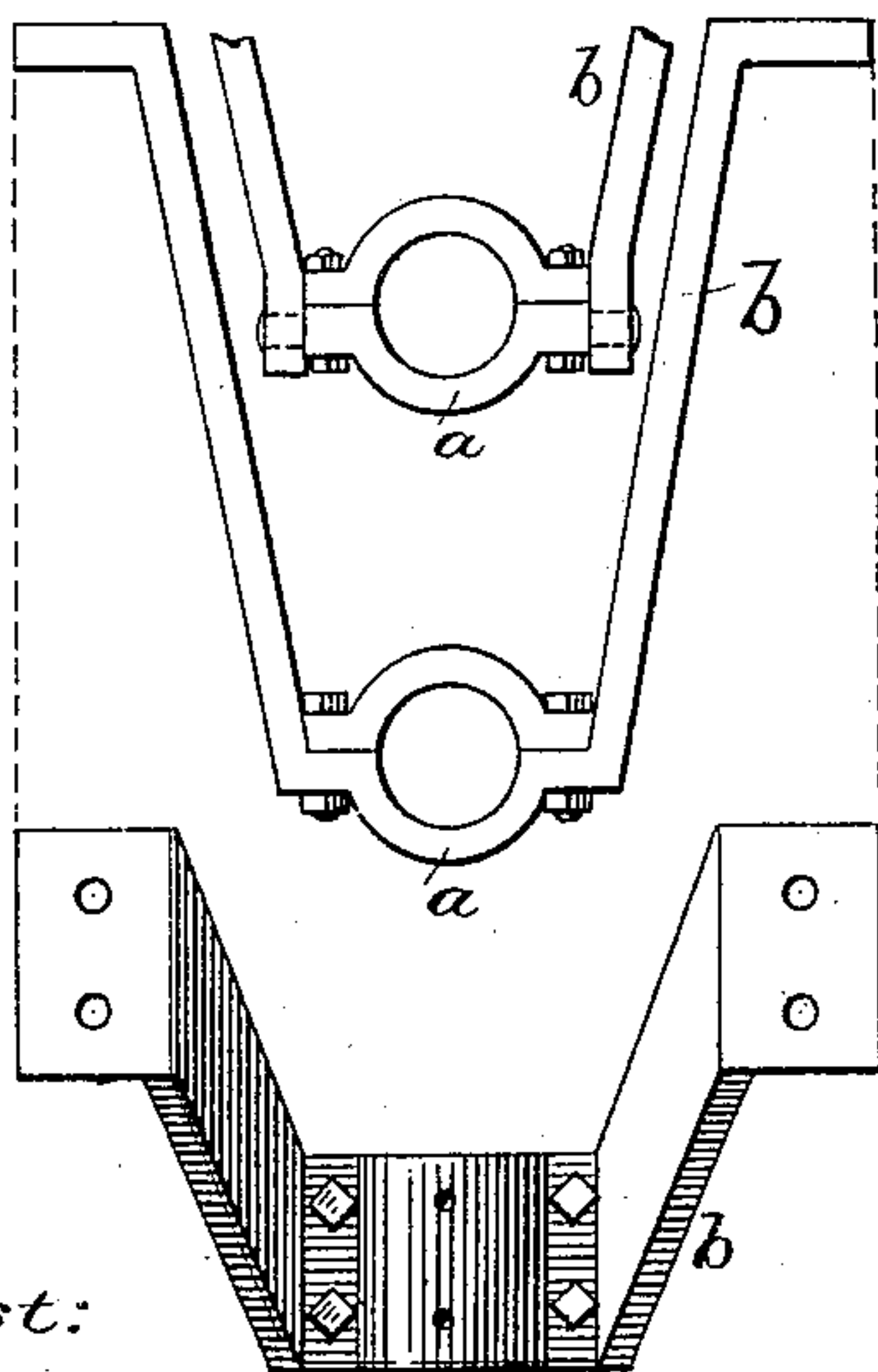
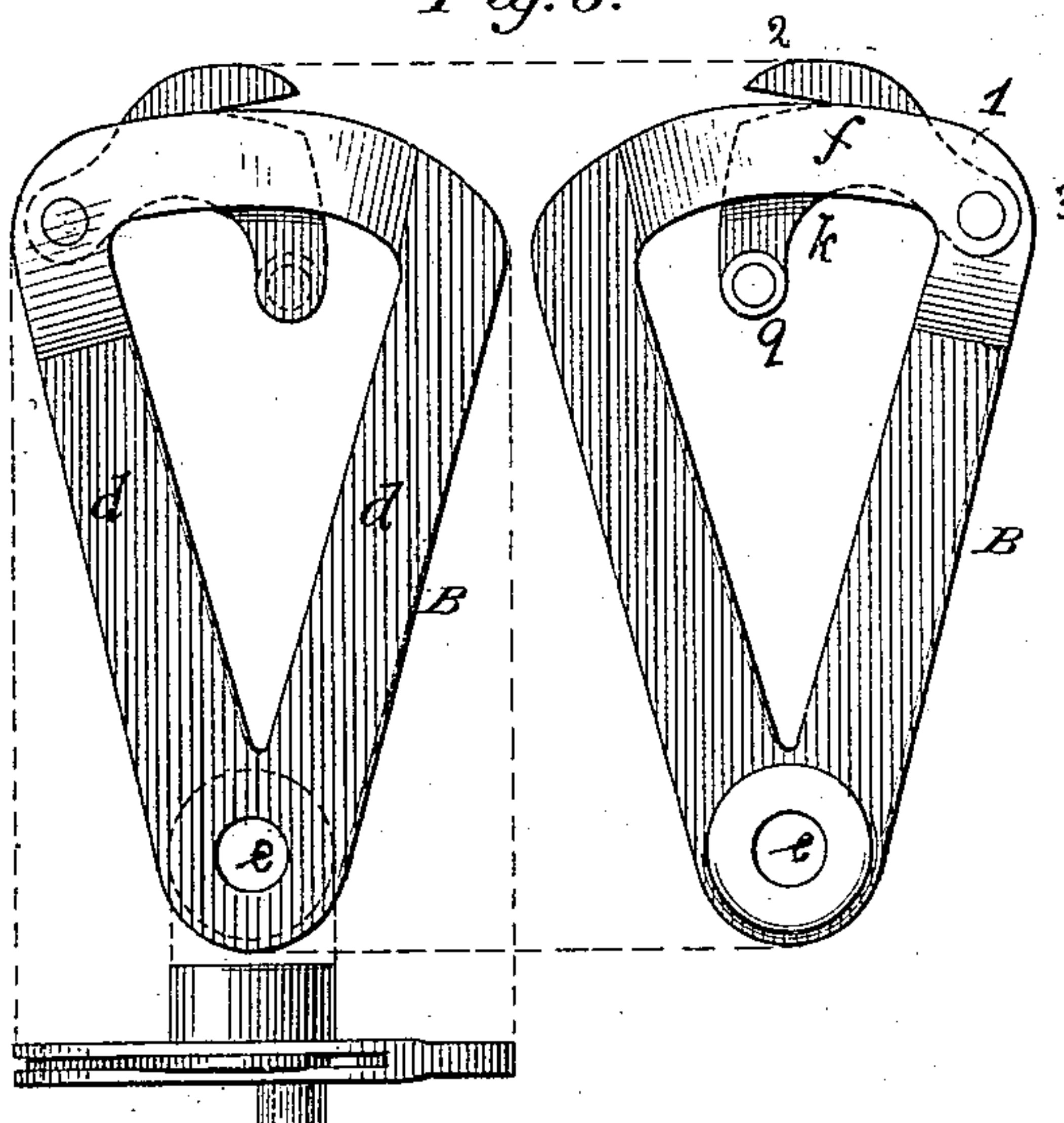


Fig. 6.



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Attorney



# UNITED STATES PATENT OFFICE.

WILLIAM GRAY, OF BEARDSTOWN, ILLINOIS.

## APPARATUS FOR CUTTING AND REMOVING BANDS.

SPECIFICATION forming part of Letters Patent No. 234,561, dated November 16, 1880.

Application filed August 11, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM GRAY, of Beardstown, in the county of Cass and State of Illinois, have invented a new and useful  
5 Improvement in Apparatus for Cutting and Removing Bands; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to band-cutters to be  
10 used in connection with thrashing-machines.

The object of the invention is, first, to cut and remove the band by the same operation of the machinery; and, secondly, to simplify the construction of the machine and increase its  
15 efficiency and certainty of action.

Heretofore band-cutters of various forms have been devised, in connection with thrashing-machines, for simply cutting the bands, leaving the bands to go with the straw. The  
20 disadvantage of this, when wire bands are used, is well known. To remove the bands other devices have been suggested acting independently of the cutters, and therefore necessarily adding to the complication of the machine.

My invention consists of a combined band cutting and removing device in one instrument, and in certain details of construction, all as  
25 hereinafter set forth.

In the drawings, Figure 1 represents a perspective view of a revolving cutting and gripping mechanism, in which form I have preferably embodied my invention. Fig. 2 represents a side elevation, partly in section, of carrying-arm and cutter. Fig. 3 shows the guideways.  
30 Fig. 4 is a section of the table lengthwise of the shaft. Figs. 5, 6, and 7 show details. Fig. 8 shows a device for preventing entangling of the band. Fig. 9 represents the hinged hanger.

The cutting and gripping mechanism is carried upon a shaft, D, mounted beneath the  
40 table a sufficient distance below the slope of the throat. This shaft is mounted in bearings *a a* upon the hanger *b b* fixed to the feed or side tables. The table on which the bundle rests to be cut is fixed to the side of the feed-table and is slotted in the direction of the movement of the band-cutter and removing device. This band cutting and removing device is carried in the arm B, which is fixed upon the shaft  
50 A in line with the slot *c* in the table, and ordinarily about twenty-one inches from the edge

of the feed-table—a distance sufficient to give room for the bundle after its band had been cut and it awaits the movement of the feeder. The arm B is of the shape shown clearly in  
55 Fig. 1. It consists of bars *d d*, which diverge from the eye *e*, by which they are held upon the shaft. Their outer extremities connect with a curved slotted bar, *f*, in which the knife is pivoted. The slot is a vertical longitudinal  
60 one through the bar *f*, and is adapted to receive the mechanism which cuts and holds the wire. The curve of the outer and upper edge of bar *f* is of peculiar shape. From the rear (marked 1) to near the center of the bar *f*, at a point  
65 marked 2, just in front of the cutter, this bar is curved on a radius struck from the center of the shaft A. From this point, just before the cutter, the curve inclines on a shorter radius to the front end, which must not under any  
70 circumstances rise above the surface of the table.

The object of the carriers is that the outer edge of the bar may act as a cam or lifter to strike against the band, lift the bundle, and  
75 cause it to slide up till the band meets the cutter. This insures the action of the cutter upon the band.

The cutter is of a shape shown clearly in Figs. 2, 6, and 7. It consists of a blade, *g*,  
80 clearer *h*, and an arm, *k*, by means of which it is moved. The cutter is pivoted in the slot at the rear end by a bolt or screw, 3, and should have sufficient motion downward to allow the cutting-edge of the blade to pass  
85 the cutting-edge of the slot and quite into said slot. Further, it should be permitted to rise far enough to bring the clearer flush with the upper edge of the bar *f*. The blade and clearer are preferably of one solid piece, and  
90 the opening between them is an acute angle, and sufficient to allow the forward end of the blade to rise high enough to catch the band without lifting out the clearer.

It should be observed that the blade fits  
95 closely to the edge of the slot in which it moves on one side, preferably on that next to the feed-table, so as to shear against said edge. On the other side it is slightly beveled off to leave a narrow space between the blade and  
100 side of the slot sufficient, when the blade is down, to bind the wire or other material of



the band and hold it until the blade is lifted. The clearer is made to fit snugly in the slot, and when it rises it obviously follows the blade and lifts out any wire or other material left thereby. The motion of the cutter, it will be understood, is rotary, and is from rear to front through the slot. The operator stands behind the table, opposite the slot therein through which the cutter moves, and holds the bundle directly over the slot, the band being across the slot. The revolution of the shaft A carries the arm B, and with it the cutter, through the said slot. Before the blade rises through the slot in the table it opens from the slot in the bar *f*. As it rises above the table it catches the band. In its further movement it is closed into its slot in the bar *f*, and coming down past the cutting-edge thereof shears the band, but lets go of that end on the shearing side. The other end of the band, however, is carried down by the blade, and binds between the blade and the inner surface of the slot in bar *f*. This holds one end of the band and carries it down through the slot in the table, and does not drop it until the knife begins to open on the other side. The band is therefore drawn quite away from the straw, carried down through the slot in the table, and dropped underneath. It will be observed that as the blade and clearer are in one piece, and therefore move together, as the blade opens it releases the end of the wire; but as the clearer rises in the slot it pushes out the end of the band and prevents it from sticking in the slot under any circumstances. It is thus certain to be dropped before the cutter comes around again to the slot, and there is no danger of entangling.

In order to protect the edge of the table from wear by the bands as they are drawn forcibly down through, their edges should be bound with iron, the front end being round and beveled toward the hole.

The proper motion, such as has been described, is imparted to the knife by means of camways *o p*, fixed below the slot on a curved plate, past the face of which the knife-carrying arm passes. These operate in connection with a stud, *q*, on the end of the arm *k*. The first camway, *o*, is the lower at the rear end, and arranged so that the stud *q* will, however much depressed, strike on the upper side of it, as shown in Fig. 3, and all of the way *o* is not on a curve concentric with that of the path of the cutter, but rises about one-third of the length of the way to a point, 3, so as to lift the stud, and thereby to open the blade sufficiently to catch the band. The remainder of the camway *o* is on the same curve as the path of the cutter, and therefore leaves it open during that part of its movement. The way *o* extends only far enough, as shown in Fig. 2, to thus lift the blade and hold it open sufficiently long to catch the band. It there terminates and the way *p* begins. This second way curves downward to a point, 4, so as to

draw down the stud and close the blade within its slot for the purpose of severing the band. From the point 4 the curve of the camway *p* is concentric with the path of the cutter, and tends to hold the blade closed during the time while the parts are in such position that the band might draw upon the blade and pull it open. However, after the cutter has passed the point 5, the pull of the band will cease to be in such direction as to have any tendency to pull open the blade, and the camway *p* may terminate.

As to the position of the camway *p* in relation to the slot in the table, it should be understood that the stud *q* must pass under it, even if the blade is raised to its highest point, Fig. 3. The rear end of the way *p* should be in such position as to begin to draw down the blade as soon as it has left the way *o*.

A shoulder, 6, on the arm *k*, prevents the blade from being drawn out beyond a certain distance. The stud *q* on the arm *k* may be provided with a friction-roller for the purpose of relieving the friction upon the camways.

The shaft should be made to revolve with rapidity sufficient to insure the catching of the band, even if the bundle be passing over the slot. This is easily attained, and it will ordinarily be sufficient if the shaft has a rate of from one hundred to two hundred revolutions per minute; but if duplicate arms be used a less number will be sufficient.

The device shown in Fig. 8 includes an extension of the arm B, which extension is marked B'. On the end of B' is a plate, preferably of the form shown, provided with the rim or flange *r*, wide enough to catch the band when it is drawn down by the revolution of the carrier, and extend it sufficiently to prevent any possibility of entangling. This device may be necessary where long bands are used.

My apparatus is so simple and occupies so little space that one may be set without inconvenience on each side of the feed-table and the cut bundles be passed to the feeders on both sides. This is necessary with large thrashers. The shaft A for this purpose may be extended across and the carrier-arm set upon each end of it in the same manner as heretofore described. In this construction it will be necessary to divide the shaft A in the middle and connect it by a sleeve or similar couplings, and also to hinge the hangers, as shown, so that in moving the thrasher the shaft may be uncoupled and swing up out of the way for passing through gates and the like.

The pulley on the shaft A may be set in any convenient position for connection with a belt from a pulley on the cylinder-shaft of the thrasher.

This apparatus is specially designed to cut wire bands, but it may obviously be used to cut and remove bands of twine or any other material, except straw or bulky bands. In case the machine be required to cut straw bands the arm may be removed and one car-



rying a simple blade may be substituted therefor.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A combined rotary band cutting and removing device, consisting of a cutter and cutter-carrier, said cutter being adapted to cut and seize the band and to remove it by the motion imparted by the carrier, substantially as described.

2. A band-cutter consisting of a carrying-arm adapted to move through an open space in the table, and a knife pivoted in said arm, and combined with mechanism whereby it is caused to open as it rises above the table and close as it descends, substantially as and for the purpose described.

3. In a band cutting and removing device, the combination of the arm slotted to receive the blade, the blade pivoted therein and adapted to open and close, as explained, and a clearer moving with said blade, substantially as described.

4. The combination of the slotted carrier, the pivoted blade, and the clearer, said blade being formed to leave a space between itself and the side of the slot opposite the cutting-edge, whereby the band is cut and held until removed by the clearer, substantially as described.

5. The combination of the pivoted cutting and clearing device, the slotted arm, and the camways, operating in connection with arm *k*, substantially as described.

6. The combination of the shaft A, the arm B, the pivoted cutting and clearing device, the arm *k*, and the camways, the parts operating in the described connection with the table, substantially as set forth.

7. The combination of the arm B, carrying band cutting and removing devices, and the second arm, B', provided with a flange, *r*, substantially as and for the purpose described.

8. In combination with the feed-table of a thrashing-machine, a band cutting and removing device, arranged on each side thereof, a shaft, A, divided at the center and provided with a coupling and hinged hangers, whereby said shaft may be uncoupled and swing up out of the way, substantially as described.

9. A combined rotary band cutter and remover adapted to operate in connection with a table for receiving the bundles, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM GRAY.

Witnesses:

L. W. SEELY,

F. L. MIDDLETON.