

(No Model.)

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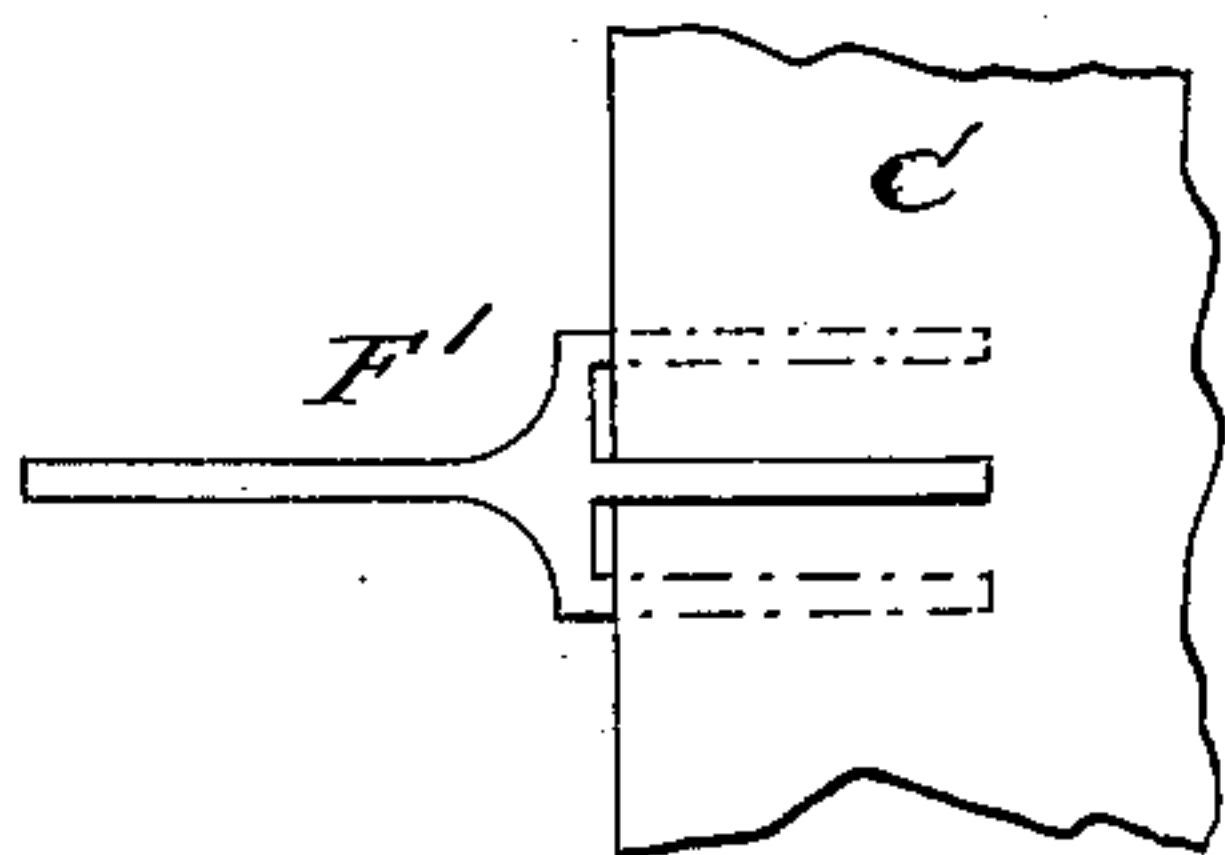
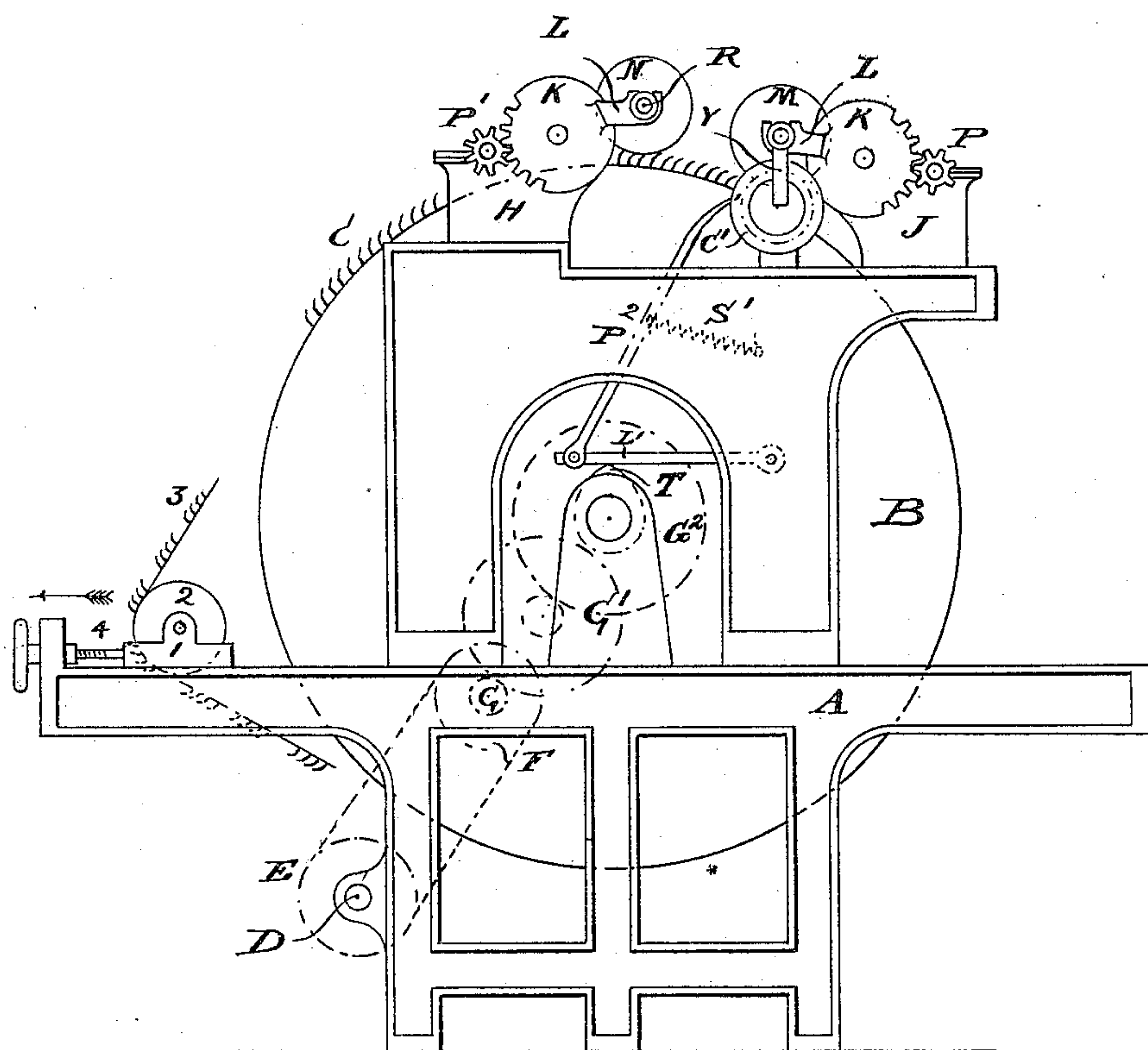
W. MIDDLETON & W. WILSON.

APPARATUS FOR GRINDING CARD TEETH FOR CARDING FIBERS.

No. 429,044.

Patented May 27, 1890.

FIG. 1.



Witnesses:

J. A. Rutherford  
Dennis Clumby

FIG. 5.

Inventors:  
William Middleton  
William Wilson  
By James L. Norris  
Attorney

(No Model.)

3 Sheets—Sheet 2.

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FIG. 2.

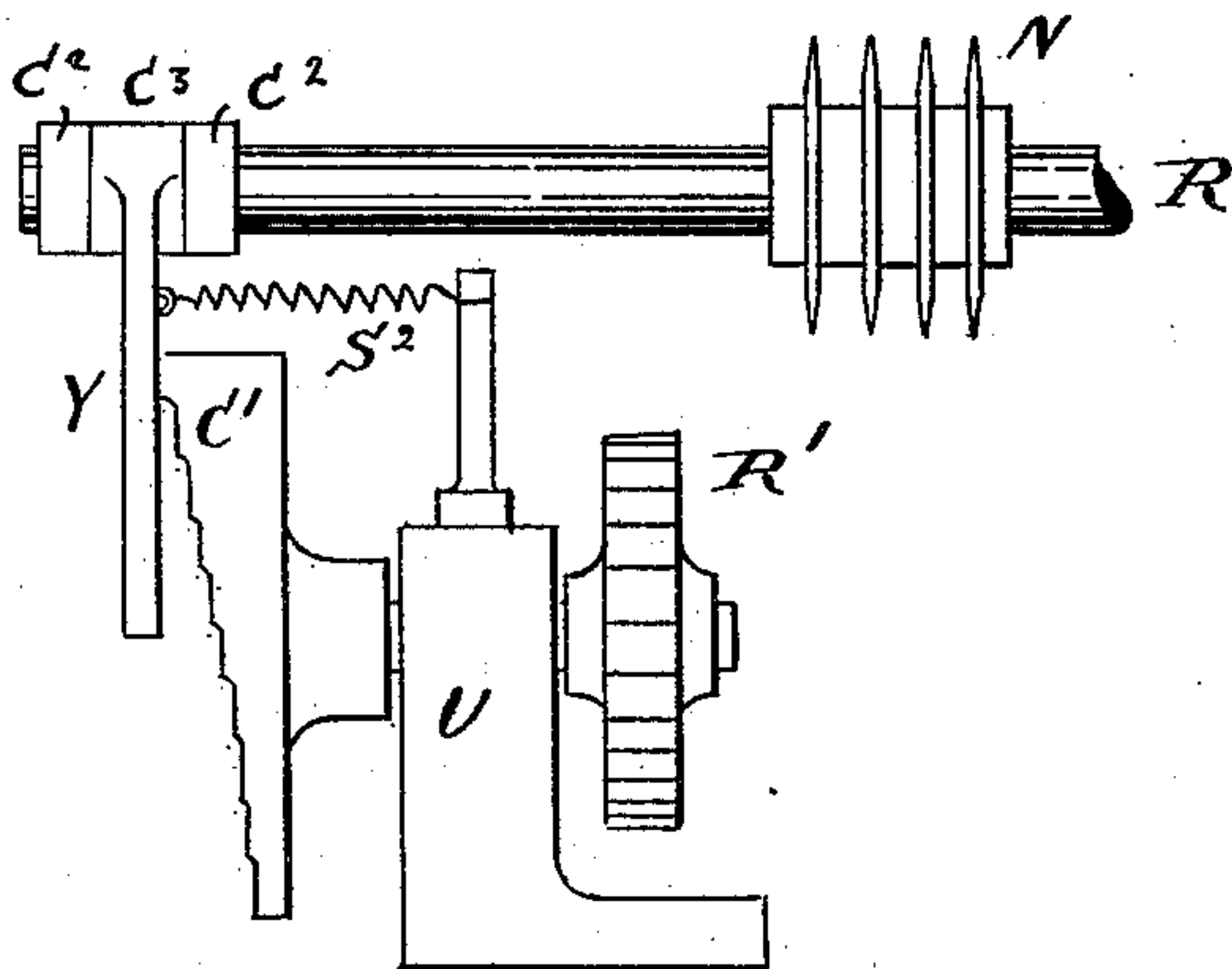
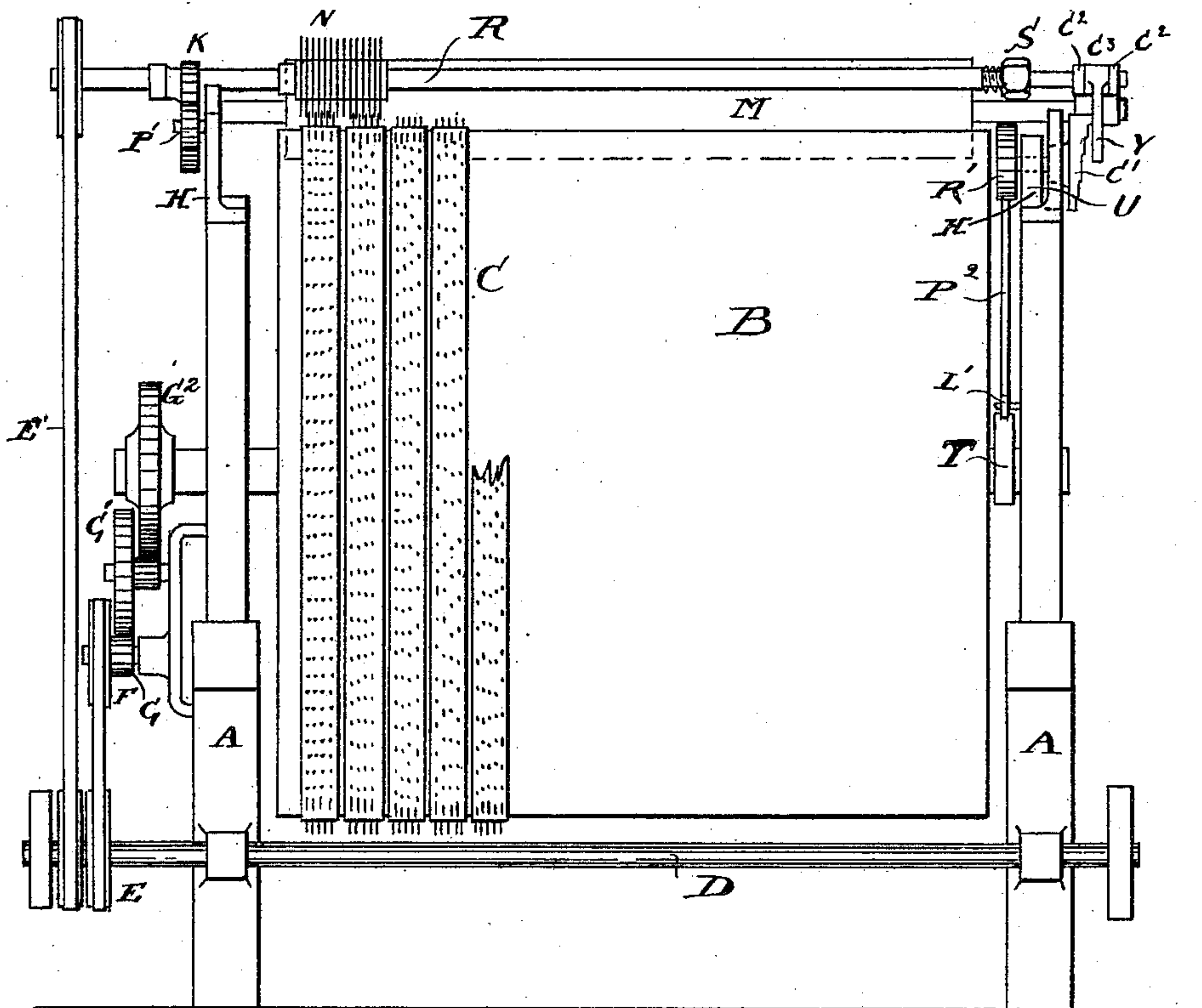


FIG. 3.

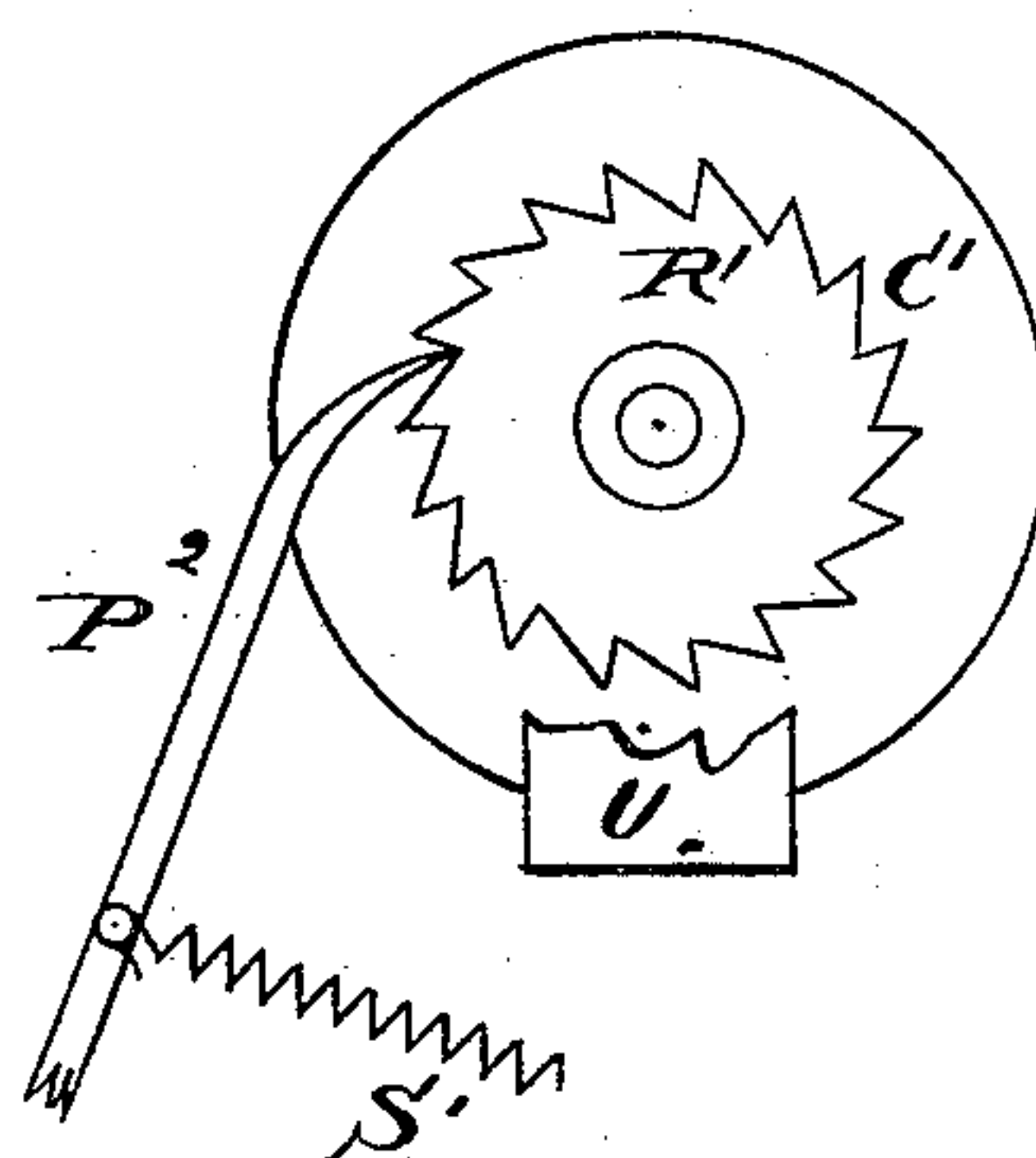


FIG. 4.

Witnesses:  
J. A. Rutherford  
Dennis Sundry.

Inventors:  
William Middleton  
William Wilson  
By James L. Norris  
Attorney

(No Model.)

3 Sheets—Sheet 3.

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APPARATUS FOR GRINDING CARD TEETH FOR CARDING FIBERS.

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Patented May 27, 1890.

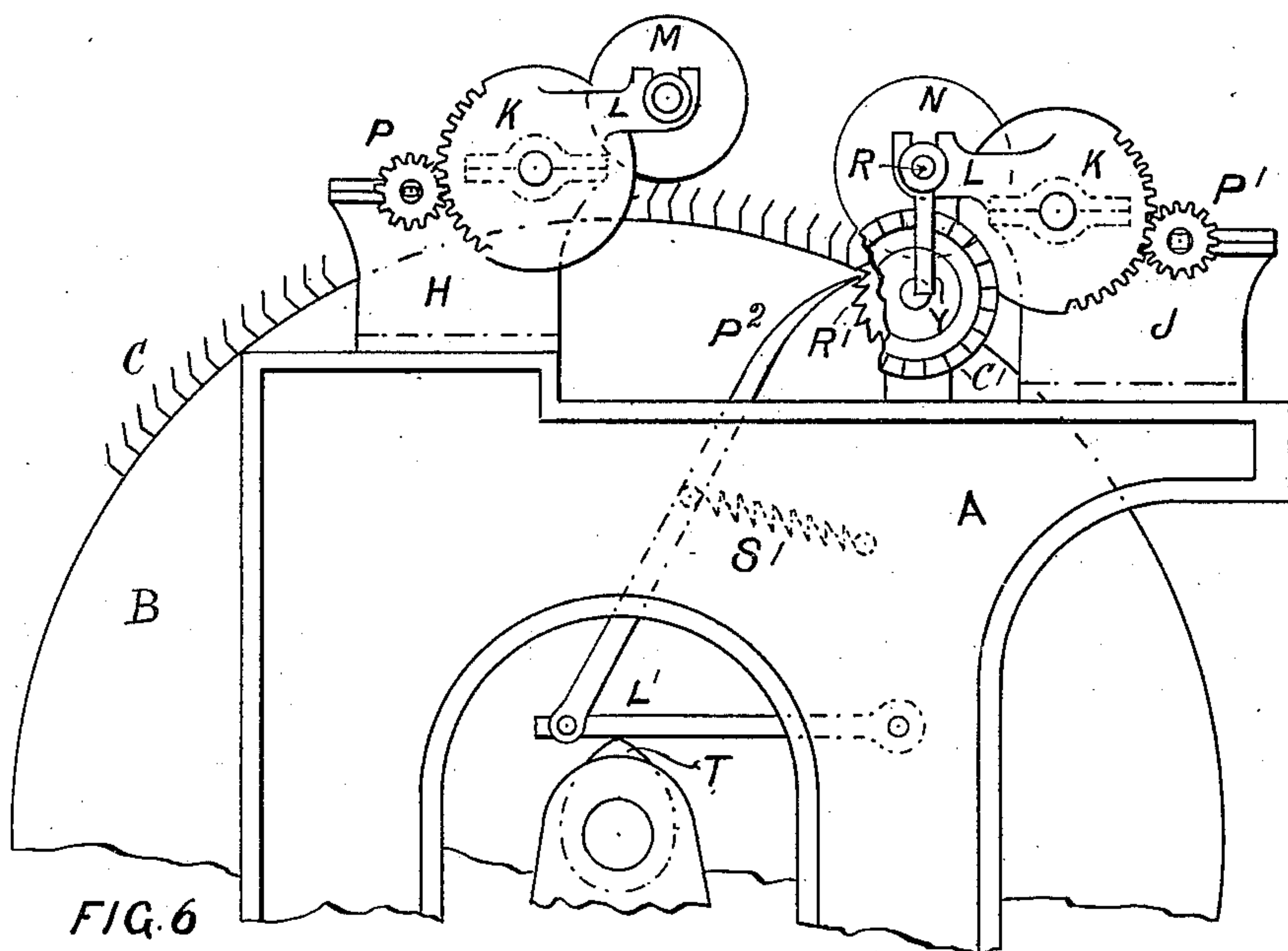


FIG. 6

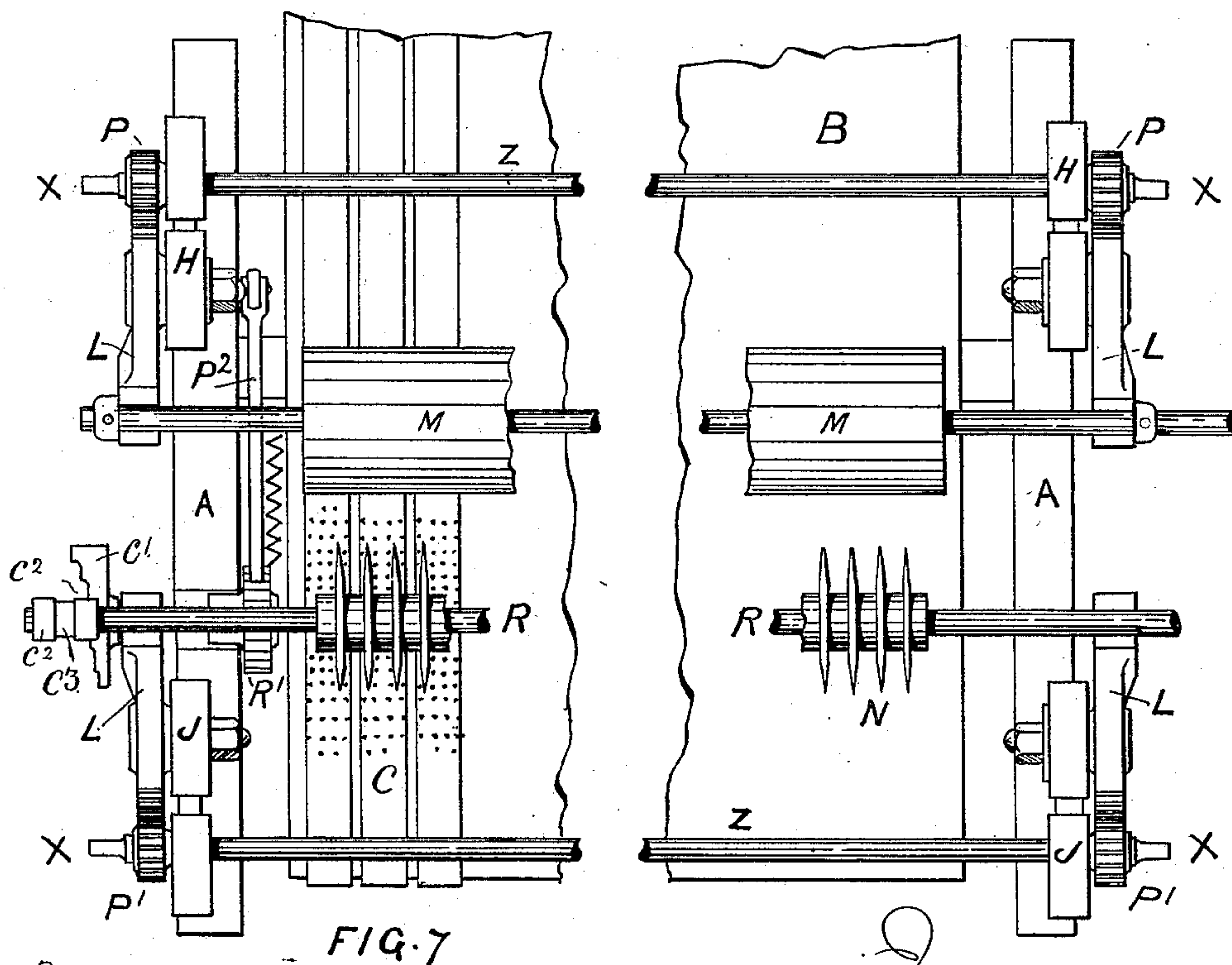


FIG. 7

Witnesses:  
J. A. Rutherford.  
Percy B. Hills.

Inventors:  
William Middleton  
William Wilson  
By James L. Norris  
Attorney



# UNITED STATES PATENT OFFICE.

WILLIAM MIDDLETON AND WILLIAM WILSON, OF LIVERSEDGE, COUNTY OF YORK, ENGLAND.

## APPARATUS FOR GRINDING CARD-TEETH FOR CARDING FIBERS.

SPECIFICATION forming part of Letters Patent No. 429,044, dated May 27, 1890.

Application filed October 10, 1889. Serial No. 326,570. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM MIDDLETON and WILLIAM WILSON, subjects of the Queen of Great Britain and Ireland, residing at  
5 Liversedge, in the county of York, England, have invented certain Improvements in Apparatus for Grinding Card-Teeth for Carding Fibers, of which the following is a specification.

10 This invention relates to certain improvements in apparatus for grinding the teeth or dents of card-clothing, and has for its object the combination of certain mechanical appliances and motions in such a manner that both  
15 the ends and sides of the teeth may be ground simultaneously, and thereby grind them to what is known as "needle-pointed cards" in a more expeditious manner; and it consists in mounting a cylinder of large diameter in  
20 a suitable frame and wrapping the card-fillet around the same and to the frame of the apparatus, fixing adjustable journals, in which rotate the shafts of the grinding-roller and grinding-disks, the peripheries of the latter  
25 being  $\Lambda$ -shaped, and in addition to rotating the shaft and disks have also a reciprocating and intermittent motion.

In the accompanying drawings, Figure 1 represents a side view of an apparatus suitable for pointing the teeth or dents of card-clothing. Fig. 2 is a plan of the same, and  
30 Figs. 3 and 4 detached details drawn to a larger scale. Fig. 5 is a detail illustrating a modified construction. Fig. 6 is a side elevation of the upper portion of the machine on an enlarged scale. Fig. 7 is an enlarged partial plan view showing the principal parts.

On the machine-frames A is mounted a cylinder B, similar to those used on carding-engines, and around the circumference of the  
40 cylinder is tightly wrapped the card-fillet C, the ends being secured to the cylinder in any convenient manner.

The cylinder B may be driven from the  
45 main shaft D of the machine by a belt passing over pulleys E and F, and gearing G G' G<sup>2</sup>, connecting pulley F with the shaft of the cylinder, thereby moving it slowly.

To the upper part of each side frame A are  
50 secured brackets H and J, each supporting on a center stud a circular toothed wheel or disk

K, on which are formed the projecting bearings L, for supporting the shafts of the grinding-roller M and grinding-disks N, the peripheries of the latter being  $\Lambda$ -shaped. The  
55 shafts of roller M and disks N are preferably driven from the main shaft by belting E' and the gearing M' N', as shown in Fig. 2, although they may be, if desired, driven from a main or separate counter-shaft in the works. 60

The grinding-roller M and disks N are by preference made of consolidated emery, similar to ordinary emery-wheels, and on the cylinder B being put in motion the journals supporting the roller M are adjusted by pinions  
65 P, so that the circumference of the said roller is in a suitable position for grinding the points of the card-teeth to sharpen and make them all of equal length.

The mechanism for operating the pinions  
70 P and P' consists of forming a square at X, Fig. 7, on the end of each shaft Z, so that on placing a box key or handle on one end of either shaft the latter and the pinion P or P' may be operated, thus moving the respective  
75 toothed wheel or disk K and the projecting bearings L toward or away from the card-teeth on the circumference of the cylinder B. The grinding-disks N are brought into contact with the card-teeth in a similar manner  
80 by pinions P'; but the extreme circumferences of the disks are below the points of the teeth, so that the taper sides of the disks N come in contact and grind the sides of the teeth, thereby bringing them to a point; and in order  
85 that all the teeth may be ground equally at the sides and brought to a point a number of disks equal to about the width of the cylinder B are placed on shaft R and secured thereon by nut S, the shaft and disks being operated  
90 for some distance first in one direction and then in the other in the following manner:

On the shaft or axle of cylinder B is secured a tappet T, which on each revolution raises one end of the lever L', supported at  
95 the opposite end by a stud-pin. To this lever is jointed a catch arm or pawl P<sup>2</sup>, the end of which is kept in contact with the ratchet-wheel R' by means of spring S'.

The ratchet-wheel R' is supported by a  
100 short shaft passing through a bracket U, secured to one of the end frames A, and on the



same shaft is secured a cam-plate C', having a circumferential rim of irregular width. On the rotating shaft R, carrying the grinding-disks N, are secured two collars C<sup>2</sup>, between  
 5 which is a collar or boss C<sup>3</sup>, free for the shaft R to revolve therein, and to which is attached an arm Y, kept in contact with the face of cam-plate C' by means of spring S<sup>2</sup>, so that  
 10 on each revolution of cylinder B the cam-plate C' is operated a certain distance, thereby causing the revolving shaft R and disks N to be moved for a time in one direction and then in the other, the teeth or dents spring-  
 15 ing sufficiently to allow the grinding-disks N, when operated, to pass from one furrow or space to the next, thus operating with uniformity on all the teeth or dents of the card and grinding them to what are termed "needle-  
 20 points." The rotating grinding-roller M acting on the ends of the teeth grinds them all to an equal length.

The apparatus is also applicable for grinding and pointing the teeth or dents of what is known as "sheet card-clothing," by adding  
 25 to the apparatus already described a carriage 1 on each side of the machine, and mounting thereon a stretching-roller 2.

The sheet card-clothing 3 is passed over the cylinder B and stretching-roller 2 and the  
 30 ends stitched together, thereby forming an endless sheet, which is tightened by the before-mentioned carriages being moved in the direction of the arrow by means of screws 4, or other well-known device, by which suffi-  
 35 cient friction is obtained between the cylinder B and clothing for the latter to rotate along with the cylinder. The catch arm or pawl P<sup>2</sup> and tappet T may be dispensed with when grinding card-clothing, and the ratchet-

wheel R' operated by attaching to the edge 40 of the card-clothing 3 a finger F', having three or more prongs formed somewhat as shown by Fig. 5, which embrace the card-clothing, one arm of the finger being so bent that it will come in contact with the teeth of 45 the ratchet-wheel R' once every revolution of the card-clothing, and thus operate the cam-plate C', so that the disks N are moved once every revolution of the card-clothing, first in one direction and then in the other, the roller 50 M and disks N acting on the card-teeth in the manner as before described.

What we claim is—

1. In a machine for grinding card-teeth, the combination, with a grinding-roller and grind- 55 ing-disks, of mechanism for operating said grinding-disks, whereby the disks are reciprocated to operate intermittently upon both sides of the card-teeth, substantially as described. 60

2. The combination of a tappet T, ratchet-wheel R', cam-plate C', arm Y, and grinding-disks N, substantially in the manner and for the purpose as hereinbefore described.

3. The combination of a cylinder B and 65 card fillet or clothing, a grinding-roller M, and grinding-disks N, with a tappet T, pawl P, ratchet-wheel R', cam-plate C, and roller-shaft R, substantially in the manner and for the purpose hereinbefore set forth. 70

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WILLIAM MIDDLETON.  
 WM. WILSON.

Witnesses:

JNO. GILL,  
 WM. PREST.