(No Model.) 2 Sheets—Sheet 1.

J. H. TAYLOR.

CUTTING MACHINE.

No. 601,719. Patented Apr. 5, 1898.

Fig. 1.

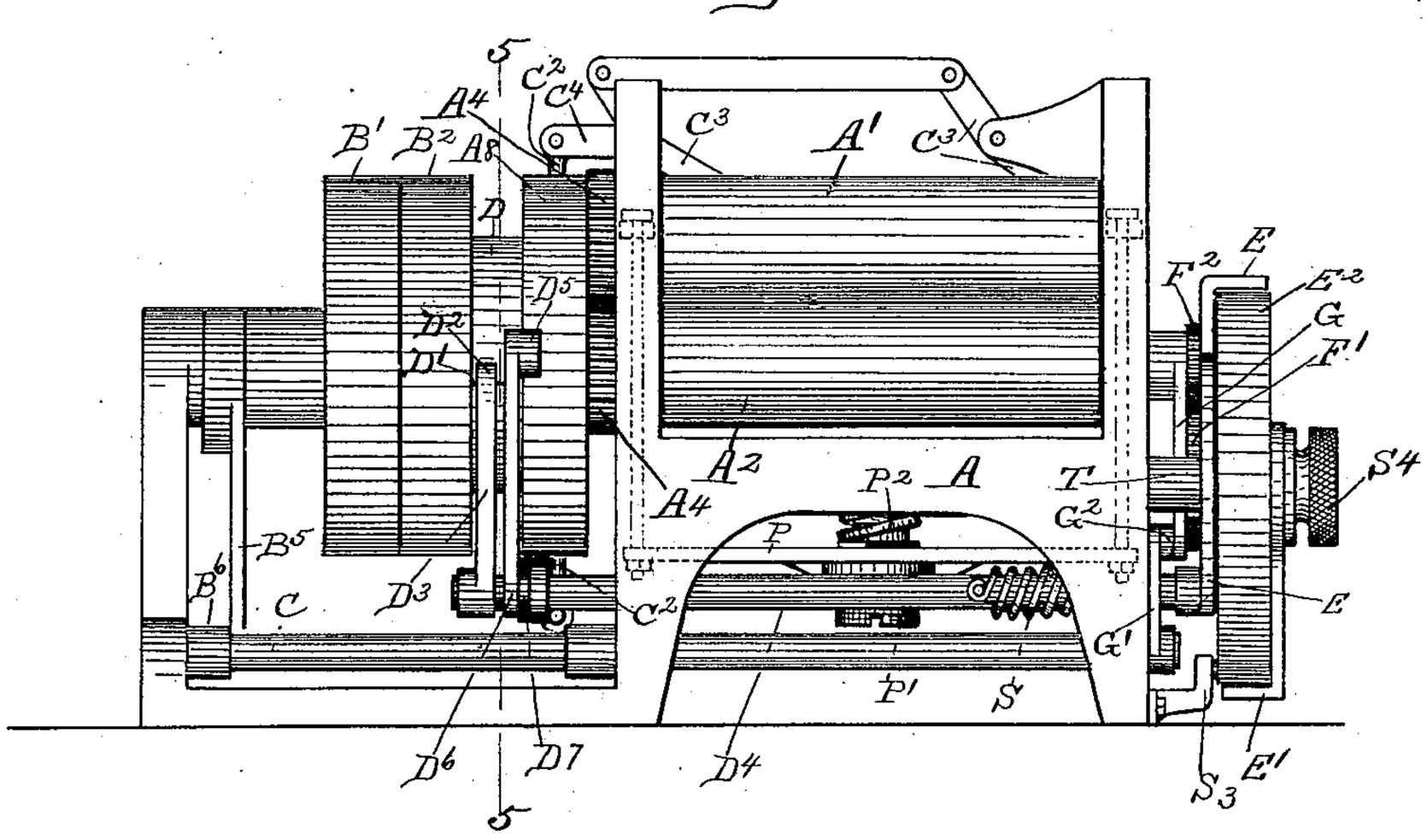
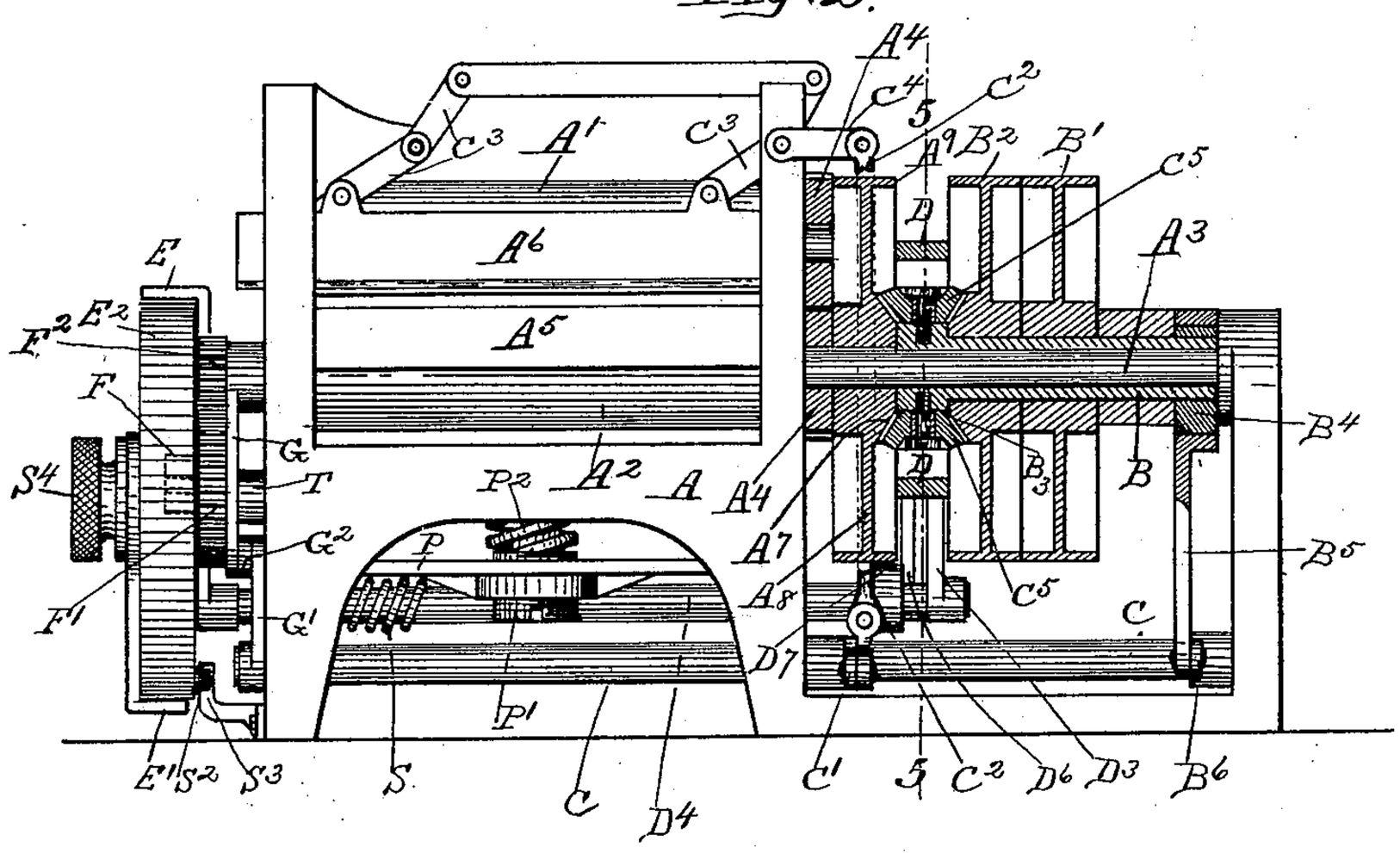


Fig. 2.



Witnesses:

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Inventor:

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

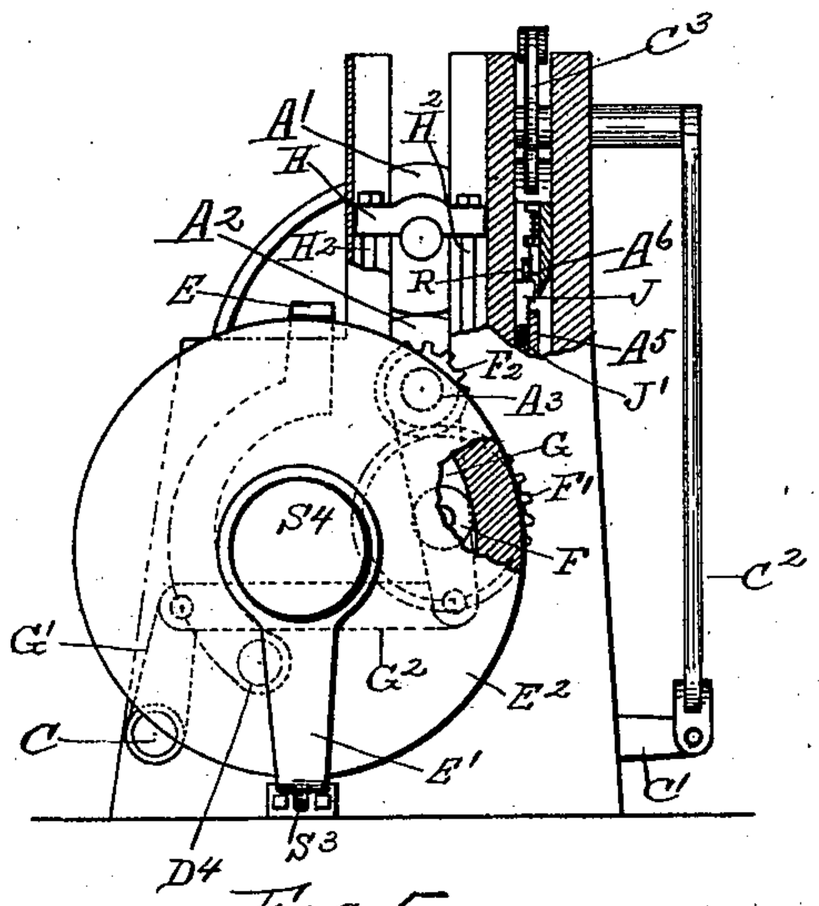


Fig. 4.

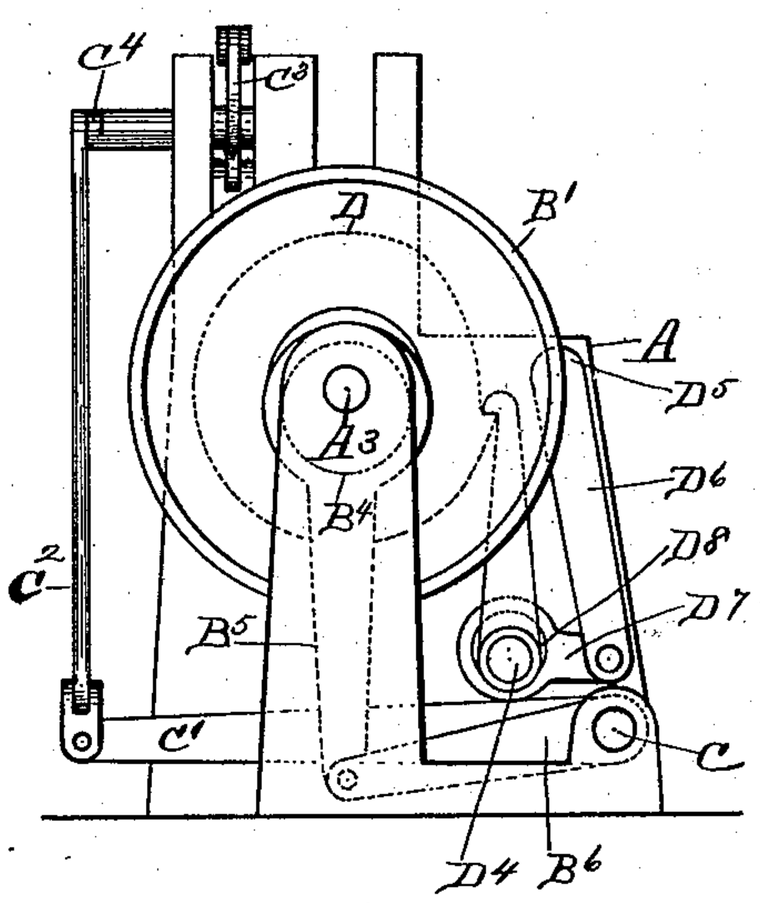


Fig. 5.

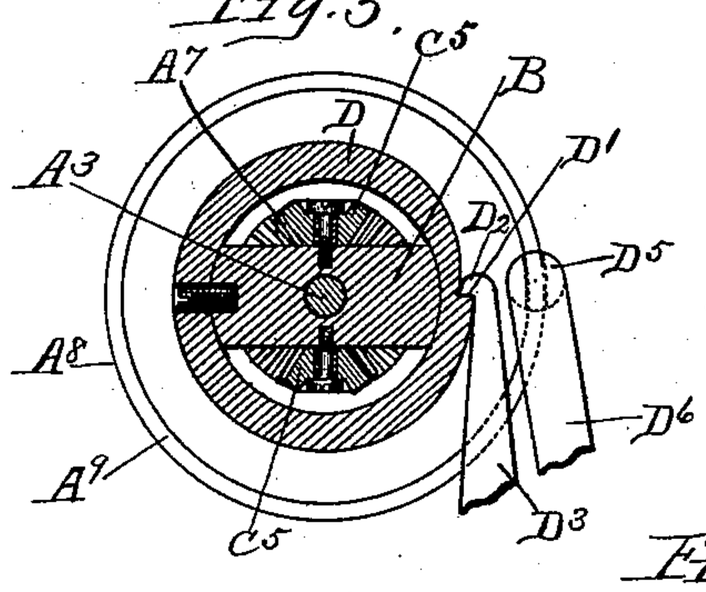


Fig. 6.

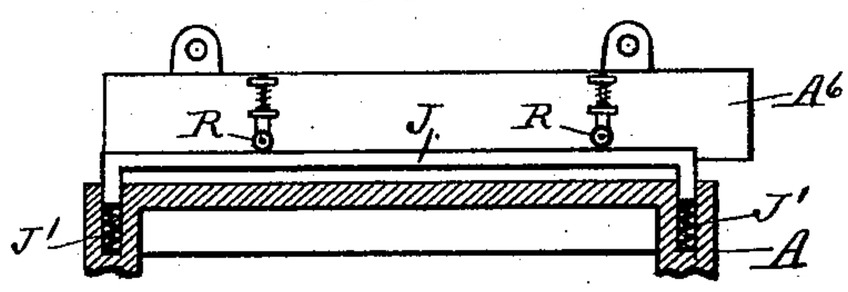


Fig. 7.

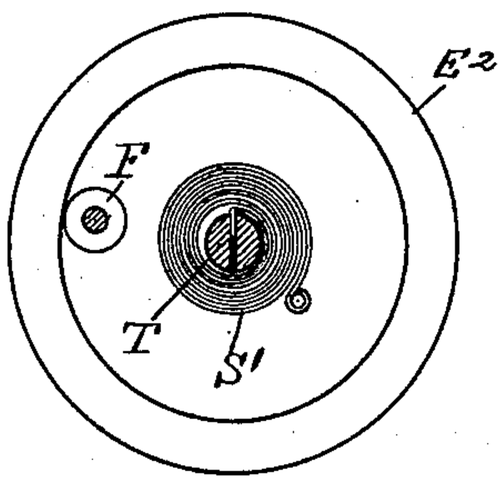


Fig. 8.

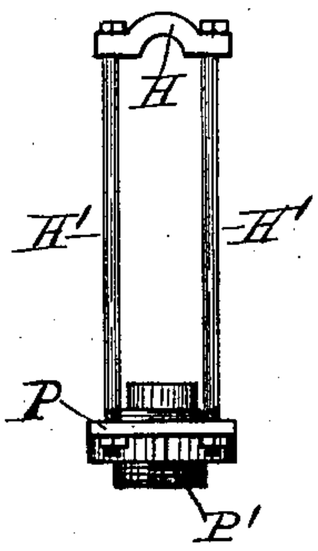
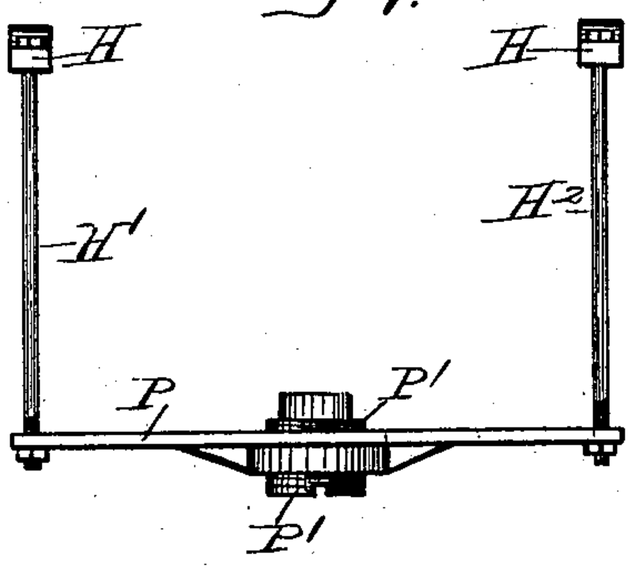


Fig. 9.



Witnesses:
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J. G. Curtis.

Inventor:
John H. Taylor
By Mosher & Curtis
Attys.

UNITED STATES PATENT OFFICE.

JOHN H. TAYLOR, OF COHOES, NEW YORK, ASSIGNOR TO J. H. WILSON & CO., OF SAME PLACE.

CUTTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 601,719, dated April 5, 1898.

Application filed July 16, 1897. Serial No. 644,771. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. TAYLOR, a citizen of the United States, residing at Cohoes, county of Albany, and State of New York, have invented certain new and useful Improvements in Cutting-Machines, of which the following is a specification.

The invention relates to such improvements; and it consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings, and the letters of reference marked thereon, which form a part of this specification.

Similar letters refer to similar parts in the several figures therein.

Figure 1 of the drawings is a view in front elevation of my improved cutting-machine. Fig. 2 is a view in rear elevation of the same, showing part of the operating mechanisms in central vertical longitudinal section. Fig. 3 is a view in elevation of the right-hand end as seen in Fig. 1. Fig. 4 is a similar view of the opposite end. Fig. 5 is a vertical cross-section taken on the broken line 5 5 in Fig. 2. Fig. 6 is a vertical cross-section of the frame of the machine, showing the presser-bar and knife in elevation. Fig. 7 is a view in elevation of the inner side of the pattern-disk. Fig. 8 is an end view of the spring-actuated bearing-frame for the upper roll. Fig. 9 is a side view of the same.

My improved cutting-machine is adapted for use in dividing a strip of fabric or other material into short lengths or pieces of predetermined size, and especially for cutting off from a long strip of paper or cloth short sections for use in reinforcing and trimming paper boxes.

The machine comprises mechanism for feeding the strip through the machine, cutting mechanism, and various operating mechanisms whereby the cutting mechanism and feeding mechanism are operated alternately, and each is maintained in an idle position while the other is operating, all as will be hereinafter more particularly described.

A is the frame of the machine, which supports in suitable bearings the feed-rolls A' and A^2, the lower roll A^2 being fixed upon the drive-shaft A^3, which operates to drive said roll, the upper roll being driven by frictional engagement with the lower roll or by means of the gear connections A^4 A^4 between said rolls.

At the rear of the machine are the fixed cutter A^5 and the movable cutter A^6, whereby the strip of material is cut as it passes through the machine.

The drive-shaft supports a sleeve B, rotary thereon, and a beveled gear A^7, fixed to the shaft. Rotary upon the sleeve are the belt-pulleys B' and B^2, the latter being the drive-pulley and being provided with the beveled gear B^3, fixed thereto.

The outer end of the sleeve B is provided with a cam or eccentric B^4, connected by pitman B^5 with an arm B^6 on the cutter-operating shaft C, which has bearings in the frame of the machine, whereby a rotary movement of the sleeve imparts rocking movements to the cutter-operating shaft, which movements are transmitted, through the arm C' on said shaft, the link C^2, and the angle-levers C^3 and C^4, to the movable cutter, causing the same to reciprocate to and from the stationary cutter.

Rotatively fixed upon the inner end of the sleeve B is a pinion C^5, which meshes with both of the beveled gears A^7 and B^3. A plurality of such pinions may be used, if desired.

By means of the construction above described the sleeve B and drive-shaft A^3 are so connected with the drive-pulley that when either said sleeve or said shaft is held in a stationary position the other will be given a rotary movement by the drive-pulley. For example, if the sleeve is held in a fixed position the pinion C^5, thus having a fixed bearing, acts merely as an intermediate gear through which the rotary movement of the drive-pulley is transmitted to the drive-shaft by means of the beveled gears A^7 and B^3, causing the shaft to rotate in the opposite direction from the pulley; also, if the shaft and gear A^7 are held in a stationary position the beveled gear A^7 serves merely as the fixed element of a planet-gear, the rotary movement imparted to the pinion by the beveled gear B^3 on the drive-pulley causing the pinion

to travel around the fixed gear A^7, and thereby imparting a rotary movement to the sleeve, which movement operates the cutter, as above described. It will thus be seen that by providing suitable break mechanisms for the shaft and sleeve and operating the same alternately I can operate the rolls and cutter alternately with a single continuously-rotating drive-pulley.

The break mechanisms comprise the cam D, fixed upon the sleeve B and provided on its periphery with a stop D′, adapted to engage a hook D^2 on the upper end of the arm D^3, fixed upon the brake-shaft D^4, which hook is adapted to be moved into or out of the path of said stop by a rocking movement of the brake-shaft; also the brake pulley or wheel A^8, fixed upon the drive-shaft in connection with the beveled gear A^7 and provided with a projecting rim A^9, which runs in and approximately fits a slot in the head D^5 of the link D^6, the lower end of the link being connected by the pitman D^7 with the cam or eccentric D^8 on the brake-shaft. The parts are so arranged that a rocking movement of the brake-shaft in one direction moves the hook D^2 out of the path of the stop D′ to release the sleeve, and at the same time, by means of the eccentric and pitman, moves the link D^6, so that the walls of its slotted head bind upon the rim of the brake-wheel A^8 and hold said wheel, with the drive-shaft and feed-rolls, in a stationary position. A rocking movement of the brake-shaft in the opposite direction throws the hook D^2 into the path of the stop D′, thereby holding the cam D, with its connected sleeve and pinion, in a stationary position, and at the same time moves the line D^6 so that the walls of its slotted head are parallel with the rim of the brake-wheel A^8, thereby releasing said wheel and the connected beveled gear A^7, drive-shaft, and rolls.

As a means for imparting a rocking movement to the brake-shaft for the purpose of operating the brakes alternately I provide the brake-shaft with an arm E, which projects into the path of a trip E′, carried by a pattern-disk E^2, rotary upon a pivotal support T, which is a stud fixed upon the frame of the machine.

The pattern-disk is rotated by means of the friction-roll F, engageable with the inner side of the disk-rim and fixed to the gear F′, which meshes with a pinion F^2 on the drive-shaft, whereby a rotary movement of said drive-shaft causes the disk to rotate until its trip by engagement with the arm E causes such a movement of the brake-shaft that the brakes are reversed, whereupon the drive-shaft ceases to rotate.

The brake-shaft is provided with an actuating-spring S, which tends to hold the hook D^2 in the path of the stop D′ or in contact with the surface of the cam D, the cam-surface being so formed as to hold the hook at a uniform distance from the center of the drive-shaft throughout an approximate rotation of the sleeve B, thereby maintaining a uniform brake-pressure upon the rim of the brake-wheel A^8.

As a means for releasing the pattern-disk and restoring the same to its initial position after it has operated the brake mechanism I provide bearings for the gear F′ and friction-roll F on the lever G, which is pivoted at one end upon the drive-shaft, and connect the other end of the lever with an arm G′ on the cutter-operating shaft by means of the link G^2 in such a manner that the cutter-operating rocking movement imparted to this shaft by means of the eccentric on the sleeve B swings the lever G and the friction-roll away from the rim of the pattern-disk, whereupon the disk is returned by means of an actuating-spring S, to its initial position, with the stop S^2 on the disk in engagement with a projection or stop S^3, fixed on the frame.

It will be seen that the movement which can be imparted to the feed-rolls before the drive-shaft brake is applied, in the manner above described, is limited by the position of the trip on the pattern-disk and that, by locating the trip in different angular positions on the disk greater or less movement can be given to the rolls between the successive operations of the brake to vary the length of the pieces cut from the strip, as desired. The trip is secured upon the disk by means of a clamping thumb-screw S^4, which can be loosened to permit adjustment of the trip.

The feed-rolls are held yieldingly in engagement with each other or with the material which is fed between them by means of a bearing-frame comprising two pairs of rods, one pair at each end of the frame of the machine, connected with a segmental bearing for the upper roll, all four of the rods being connected at their lower ends with a common cross-plate P, provided at its center with a screw P′, between which and the frame of the machine is interposed a coil-spring P^2. The tension of the spring can be regulated by means of the screw P′.

H H represent the segmental bearings, H H′ one pair of rods, and H^2 H^2 the other pair of rods.

In connection with the cutting mechanism I provide means for holding the material to be cut in a flat position upon the cutting-bed, which means comprise a presser-bar J, provided at its ends with legs adapted to fit and slide in suitable apertures in the bed, which apertures contain springs J′, adapted to support the bar in a normal elevated position, and the yielding rollers R, supported by the cutter and adapted to engage the upper side of the bar as the cutter descends and hold the bar tightly upon the material during the cutting movement.

I am aware that a planet-gear has been employed in reversing-gear constructions, and I make no claim to the same broadly; but the construction of reversing-gear shown herein is especially adapted for use in my improved

machine, and as used in combination with the pattern mechanism and eccentric cutter-actuating mechanism therein performs different functions from such prior constructions.

The novel pattern mechanism or mechanism for predetermining the length of strip passed through the rolls between two successive operations of the cutter permits me to secure a maximum product for my machine, whatever may be the length of the cut-off sections.

In machines heretofore in use, wherein pattern-cams were employed, a complete rotation of such cam was necessary for each section of material cut off, whether such section was long or short.

A strip of paper or cloth can be fed through a pair of rolls at practically unlimited speed; but the rapidity of operation of a reciprocating cutter is limited, as after each cut the knife must retreat beyond the path of the strip.

It is customary to regulate the speed of cutting-machines to the capacity of the cutter, and with the prior machines above referred to when the speed of the machine was so regulated the capacity of the machine was the same number of cuts per minute, whether the cut-off pieces were long or short.

In my improved machine with a constant uniform speed of the main driving-pulley the cutter will be reciprocated at a constant and uniform speed, as the cutter movement must be accompanied by a complete rotation of the eccentric B^4; but it will be observed that the intervals between the successive operations of the cutter are longer or shorter in proportion to the degree of rotative movement of the pattern-disk—that is, in proportion to the length of the piece of material to be cut off.

It will thus be seen that with my improved machine when the driving speed is uniform the number of cuts per minute depends upon the length of the pieces cut off and that a greater number of short pieces than of long pieces can be cut off in a given time.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a cutting-machine, the combination with the feed-rolls, of a rotary pattern-disk, means for operatively connecting the disk and rolls; a cutter; means for actuating the rolls and cutter alternately; and a trip on the pattern-disk engageable with the alternating mechanism to operate the same, substantially as described.

2. In a cutting-machine, the combination with the feed-rolls and cutter, of a drive-shaft for the feed-rolls, a drive-pulley rotary independently of said shaft, a sleeve rotary on said shaft independently of said pulley, a beveled gear fixed on said shaft, a beveled gear fixed on said pulley, a pinion rotatively fixed on said sleeve in engagement with both of said beveled gears, operating connections between said sleeve and cutter; a brake for said sleeve; a brake for said shaft; a rotary pattern-disk; roll-actuated mechanism for rotating the disk; and means actuated by the pattern-disk for applying said brakes alternately, substantially as described.

3. In a cutting-machine, the combination with the feed-rolls, the drive-shaft therefor, the cutter, and means for operating the drive-shaft and cutter alternately, of a rotary pattern-disk, intermittent gear connections between the drive-shaft and disk, a trip carried by the pattern-disk engageable with said alternating mechanism; and means for releasing the intermittent gear and restoring the disk to its initial position, substantially as described.

4. In a cutting-machine, the combination with the feed-rolls drive-shaft, and cutter, of a rotary pattern-disk, a trip carried by said disk, an intermittent gear connection between said disk and shaft, a drive-pulley rotary independently of said shaft, a sleeve rotary on said shaft independently of said pulley, a beveled gear fixed on said shaft, a beveled gear fixed on said pulley, a pinion rotatively fixed on said sleeve in engagement with both of said beveled gears, a brake for said shaft, a brake for said sleeve, a brake-shaft, connections between the brake-shaft and several brakes whereby rocking movements of said brake-shaft cause the brakes to operate alternately, an arm on the brake-shaft projecting into the path of said trip, a cutter-operating shaft, a cam connection between the cutter-operating shaft and said sleeve, a connection between the cutter-operating shaft and said intermittent gear, and a spring and stop for restoring the pattern-disk to its initial position, substantially as described.

5. The combination with a pair of feed-rolls, and means for supporting and driving said rolls, of segmental journal-bearings for one of said rolls, two pairs of rods, each pair connected at one end with one of said segmental bearings, a common cross-plate connected with the other end of both pairs of rods, a fixed support, and a spring interposed between said support and plate, substantially as described.

6. In a cutting-machine, the combination with feeding mechanism, and a fixed cutter, of an obliquely-movable cutter, a spring-supported presser-bar having a roller-track on its upper side; and a pair of yielding rollers secured to the obliquely-movable cutter and adapted to engage and roll upon said track, substantially as described.

In testimony whereof I have hereunto set my hand this 2d day of July, 1897.

JOHN H. TAYLOR.

Witnesses:
FRANK C. CURTIS,
J. H. WILSON.