T. E. RAFFEL.

ROTARY CUTTING MECHANISM.

APPLICATION FILED JAN. 30, 1913.

1,068,447.

Patented July 29, 1913.

3 SHEETS—SHEET 1.

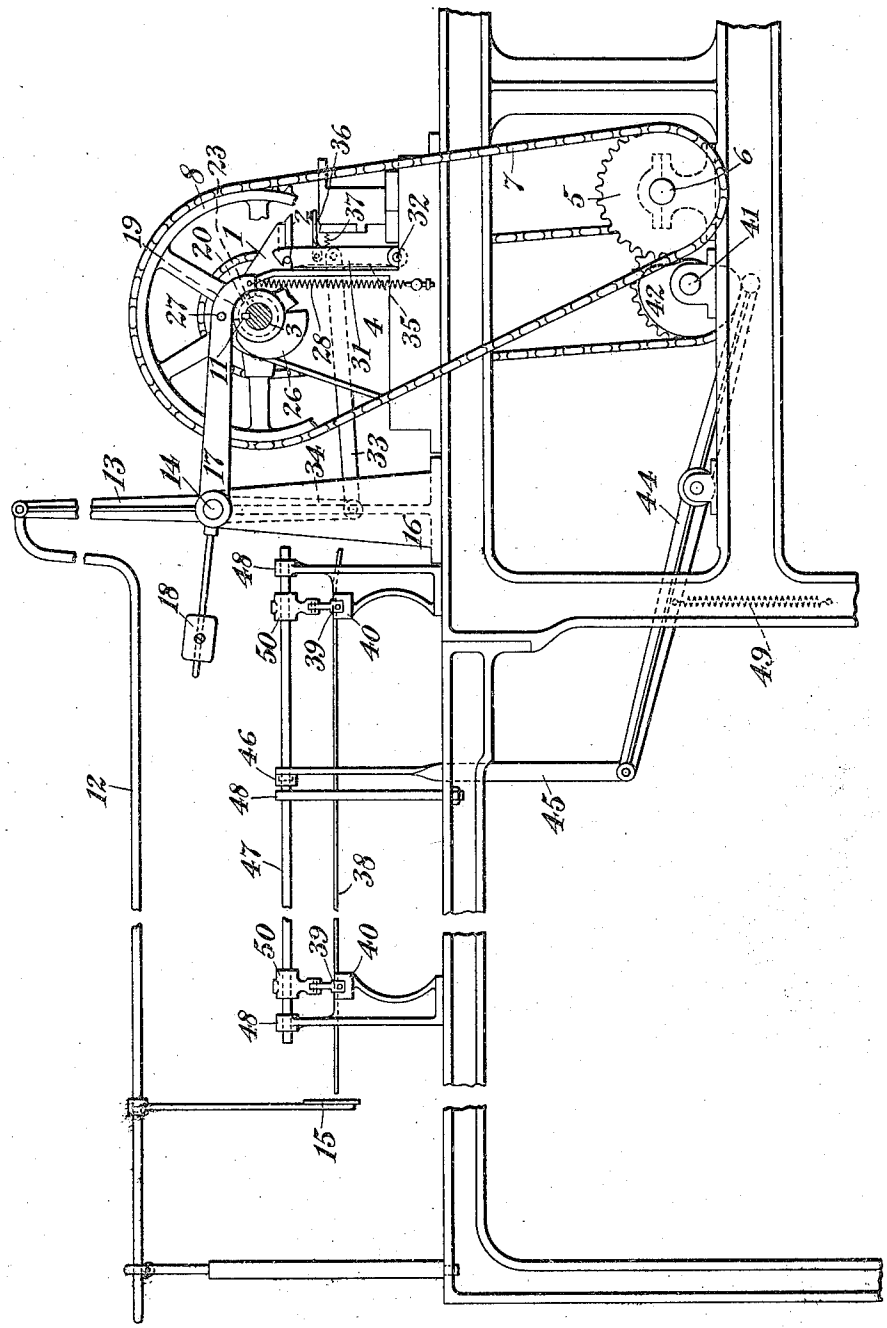



Fig. 1

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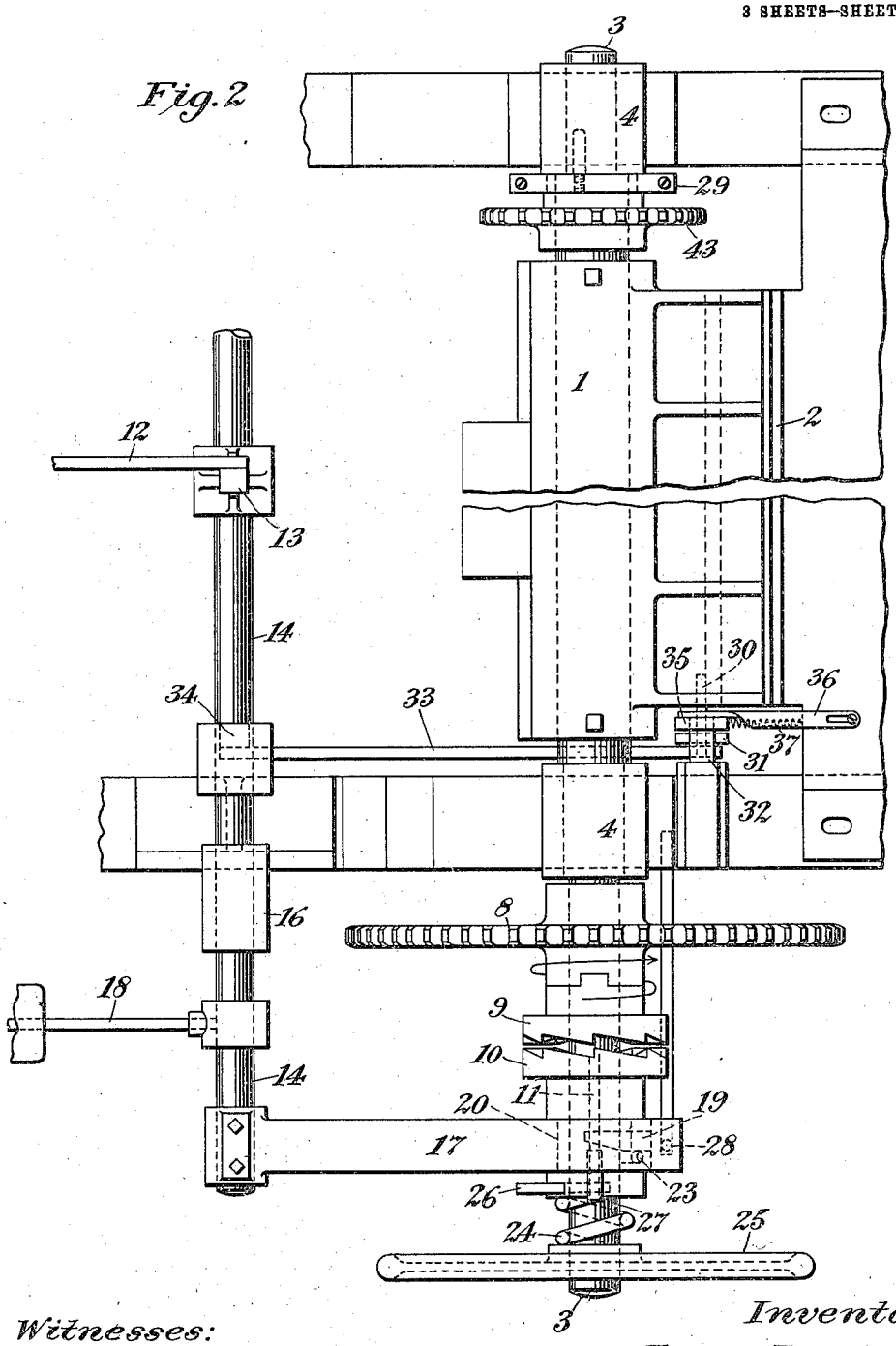
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3 SHEETS—SHEET 2.

Fig. 2




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3 SHEETS—SHEET 3.

Fig. 3

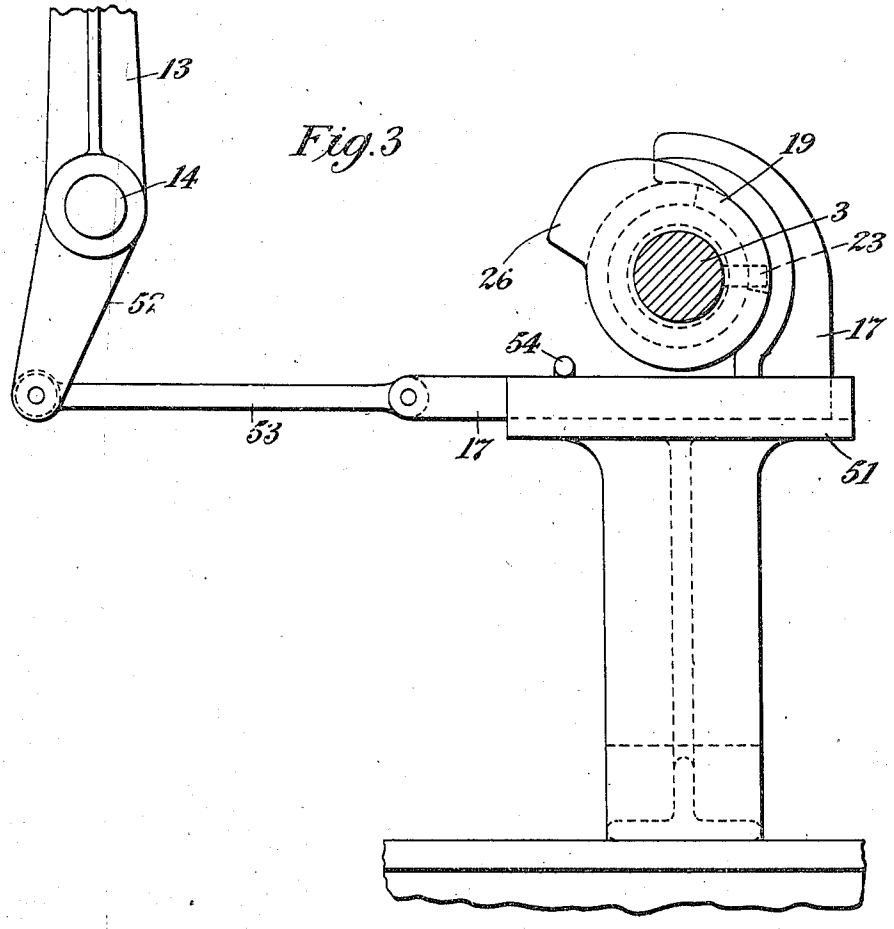
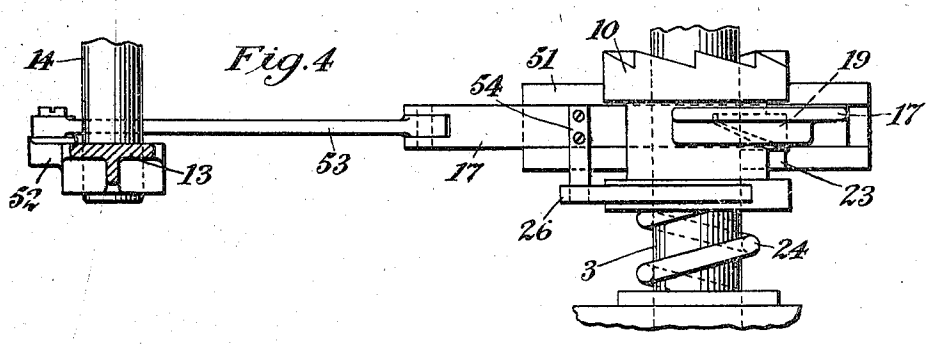



Fig. 4




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# UNITED STATES PATENT OFFICE.

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## ROTARY CUTTING MECHANISM.

1,068,447. Specification of Letters Patent. Patented July 29, 1913.

Application filed January 30, 1913. Serial No. 745,082.

*To all whom it may concern:*

Be it known that I, TOBIAS E. RAFFEL, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Rotary Cutting Mechanisms, of which the following is a full, clear, and exact specification.

My invention relates to a mechanism employing a rotary cutter which, when in operation, is adapted to cut blanks of any desired lengths from a web of paper or other material.

The principal objects of my invention are to provide novel means for controlling the rotation of the cutter, the actuation of which means is automatically governed by the movement of the web, and to provide novel means coöperating with the cutter for supporting the web while it is being cut, and then delivering the cut blanks from the machine.

In the accompanying drawings illustrating my invention, Figure 1 is a side elevation of my improved cutting machine; Fig. 2 is a plan view of the same; Fig. 3 is an elevation of a modified form of clutch controlling device, and Fig. 4 is a plan view of the same.

(1) represents a cutter bar provided with a properly counterweighted over-hanging knife (2). The bar is fixed to a normally inactive rotary shaft (3) mounted in suitable bearings (4).

A sprocket (5) carried on the power shaft (6) gives a continuous rotary motion, through the chain drive (7) to the sprocket (8) and its attached clutch member (9), both of which turn loosely on the shaft (3).

The movable clutch member (10) slides on a key or feather (11) and is normally withheld, by the dog (17), from engagement with the driving member (9). When the clutch withholding dog is released, the spring (24) will expand against the tension regulating wheel (25) and slide the member (10) into clutching position.

The operation of the clutch withholding dog is controlled by a tripping device which is actuated by the movement of the web at a predetermined point in its travel. This device comprises a trip (15) adjustably suspended from a longitudinally movable rod (12) having its forward end pivotally connected to the top of the vertical arm (13) of the rock shaft (14). The shaft (14) is mounted in suitable standards (16) and it carries a clutch withholding dog (17) and a counterweight (18). The curved free end of the dog (17) is provided with a wedge piece (19) which normally rests in the groove (20) formed in the sleeve of the clutch member (10), as seen in Fig. 1. A pin (23) projecting radially from the groove in abutment against the high part of the wedge, serves to hold the clutch member (10) out of engagement with its companion driving member. The action of the web striking the trip (15) causes the shaft (14) to rock so as to raise the clutch withholding dog (17) clear of the pin (23). When the clutch member (10) is thus freed of its restraint, the spring (24) will thrust it into clutching position so as to cause the rotation of the cutter.

To prevent the sheet from being jammed against the trip (15) and buckling, it is necessary that the trip be moved away from the web during the cutting operation. To this end I provide a cam (26) fixed to the sleeve portion of the clutch member (10) and rotatable therewith. As the cam rotates, it engages a pin (27) fixed to the dog (17) and causes the pin to ride up on the cam so as to further raise the dog, and thereby move the trip backward and away from the web. The cam (26) is designed so that it will release the pin (27) at some point near the completion of a revolution of the shaft (3) and permit the dog (17) to be drawn by the spring (28) down upon the sleeve of the clutch member (10). In this position the wedge (19) will again rest in the groove (20) and as the clutch member continues to rotate, the radially projecting pin (23) carried thereon will strike against the beveled edge of the wedge piece and ride upward and outward on it, as best seen in Fig. 2, thereby causing the clutch member to slide outward on the shaft (3) to disconnect the clutch. After the clutch is disconnected, the momentum of the shaft, which is retarded by means of an ordinary band brake (29) will cause it to complete its revolution. The cutter bar (1) is provided with a laterally projecting stud (30) which, upon the completion of a revolution of the shaft, strikes the top of the movable stop (31) and thereby arrests the motion of the shaft. The stop (31) is swingably mounted on a pivot (32) and is connected by means of the link (33) to the downwardly projecting arm (34) of the rock shaft (14). When said rock shaft is actu-

ated as herebefore described, to raise the dog (17) so as to release the clutch, it will simultaneously push the stop back from under the stud so as to free the cutter bar for rotation. A hook (35) is provided to prevent the cutter bar from turning backward while it is disconnected. Referring to Fig. 1 it will be seen that as the stud (30) travels downwardly, it will force the hook (35), which is guided by a slotted arm (36), back against the compression spring (37), which, when released, returns the hook so as to catch and hold the stud.

The cutting table upon which the web is held while being cut consists of two spaced parallel supporting rods (38) each of which is carried on a pair of arms (39) which are movable endwise in the ways (40). After a sheet has been cut from the web, the supporting rods (38) are automatically separated so as to allow the sheet to drop from the machine and then returned to their original position to support the following sheet. To effect this operation, I provide a cam shaft (41) carrying two cams (42), one at each side of the machine, which shaft is rotated by a chain driven from a sprocket (43) fixed to the cutter shaft (3). Each cam operates a pivoted lever (44) which is connected by a rod (45) to the crank (46) of the rock shaft (47) supported in bearings (48). A tension spring (49) serves to hold the lever (44) in contact with the face of the cam and as said cam rotates, the motion thereof, transmitted through the lever and its connected links, will cause the shaft (47) to rock alternately in opposite directions. As the shaft rocks, the arms (50) attached to said shaft and pivotally connected to the parts (39), will cause said parts to slide endwise in their ways (40) so as to first separate the supporting rods (38) and then return them to their original position.

In the modified construction shown in Figs. 3 and 4, the clutch withholding dog (17) is supported in the ways (51) and is arranged to slide outward to release the clutch, instead of being raised upward as in the construction shown in Figs. 1 and 2. To move the dog (17), I provide the rock shaft (14) with a crank arm (52) which is connected by means of the link (53) to the dog (17). By inspection of Fig. 3 it will be seen that as the crank (52) is moved from left to right, the dog (17) will be moved away from the shaft (3) thereby releasing the pin (23) and permitting the clutch member (10) to be thrown into clutching position. As the shaft (3) rotates, the cam (26) which is secured to and rotates with said shaft, comes into contact with the pin (54) fixed to the dog (17) and drives the dog back to its initial position so that the wedge piece (19) carried thereon will again engage the pin (23) and cause the clutch to become disconnected.

Various modifications may be made in the arrangement and construction of parts hereinbefore described without departing from the scope of my invention.

What I claim is:

1. In rotary cutting mechanisms the combination of, a rotary cutter, means for rotating the cutter, a clutch, a clutch member withholding dog, means for retracting the dog to release the clutch member, means operative upon the release of the clutch member to move it into clutching position, means for automatically disconnecting the clutch at a point near the completion of one revolution of the cutter, and means for stopping the cutter upon the completion of one revolution.

2. In rotary cutting mechanisms, the combination, a rotary cutter, means for rotating the cutter, a clutch, a clutch member withholding dog, means for retracting the dog to release the clutch said means including a trip adapted to be actuated through the medium of a moving web and disposed in the path thereof, means operative upon the release of the clutch member to move it into clutching position, means for holding the trip away from the web during the cutting operation, means for automatically disconnecting the clutch at a point near the completion of one revolution of the cutter, and means for stopping the cutter upon the completion of one revolution.

3. In rotary cutting mechanisms the combination of, a rotary cutter, means for rotating the cutter, means having a part disposed in the path of the web and adapted to be actuated by the movement thereof to automatically effect operative connection between the cutter and its rotating means, means for automatically disconnecting the cutter from the rotating means at a point near the end of one revolution thereof, and means for stopping the cutter upon the completion of said revolution.

4. In rotary cutting mechanisms, the combination of, a rotary cutter, means for rotating the cutter, a cutting table comprising two web supporting members and means for moving said supporting members away from or toward each other in a horizontal plane, substantially as described.

In testimony whereof I have hereunto subscribed my name in the presence of two witnesses.

TOBIAS E. RAFFEL.

Witnesses:
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A. COHEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."