No. 635,241. Patented Oct. 17, 1899.

G. A. ENSIGN.

STRIP CUTTING MACHINE.

(Application filed Mar. 17, 1899.)

(No Model.) 2 Sheets—Sheet 1

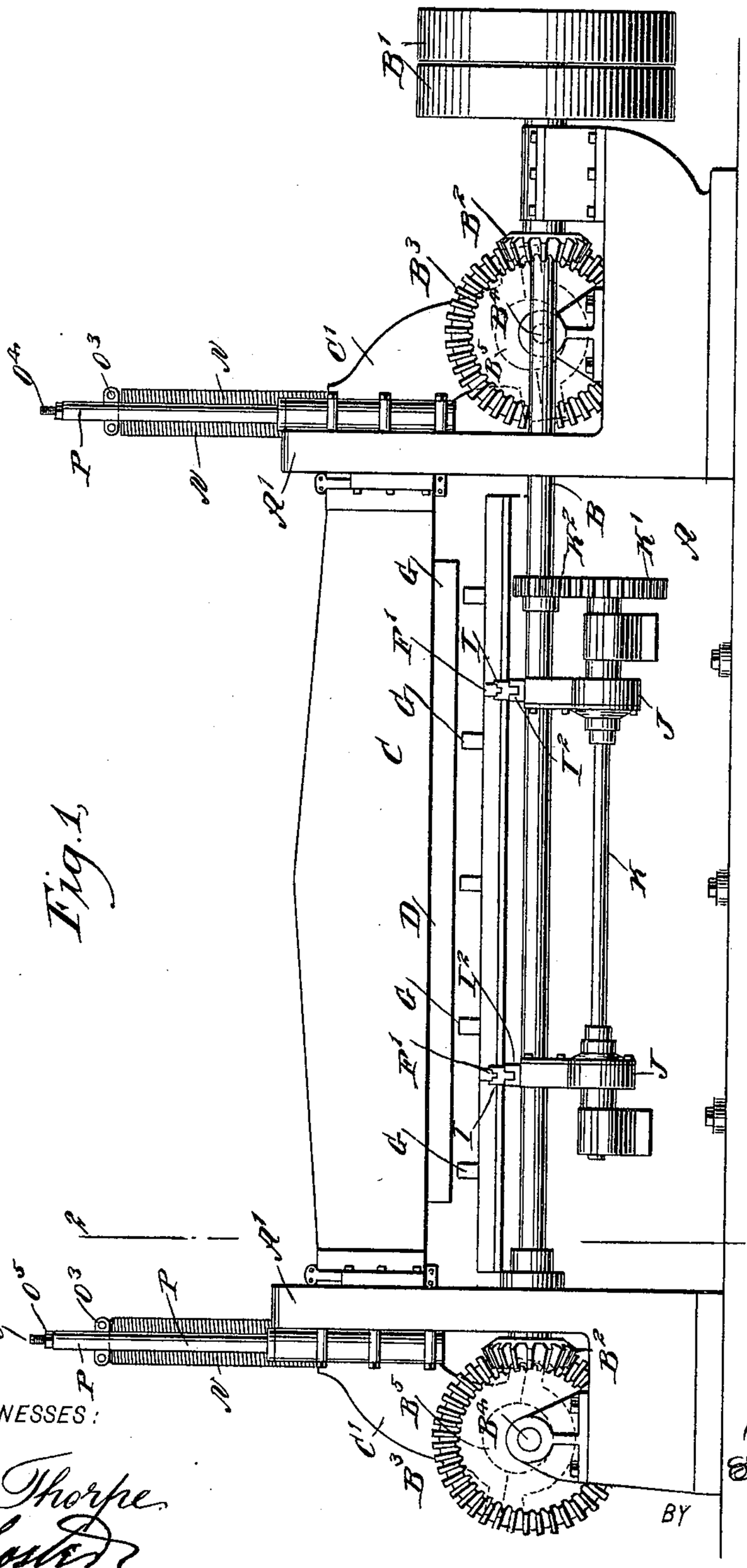

Fig. 1.

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Fig. 2.

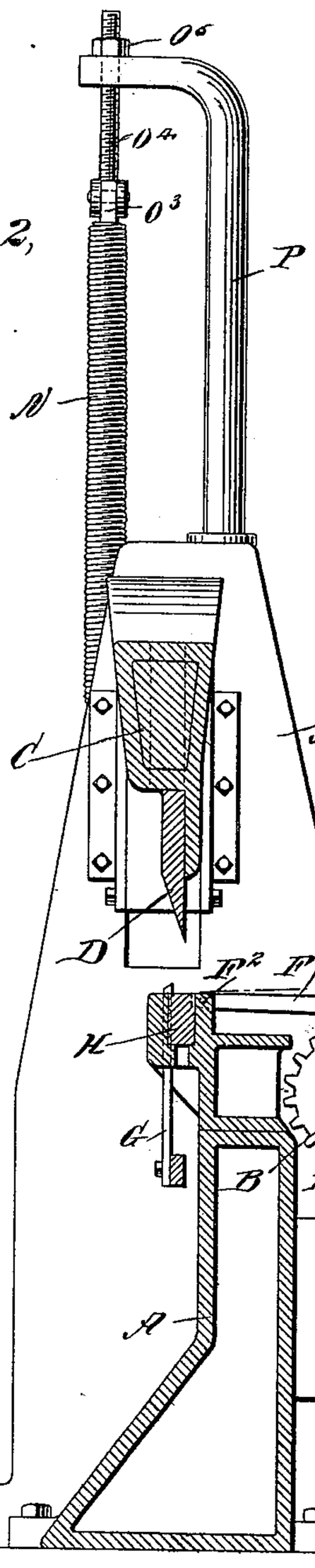


Fig. 3.

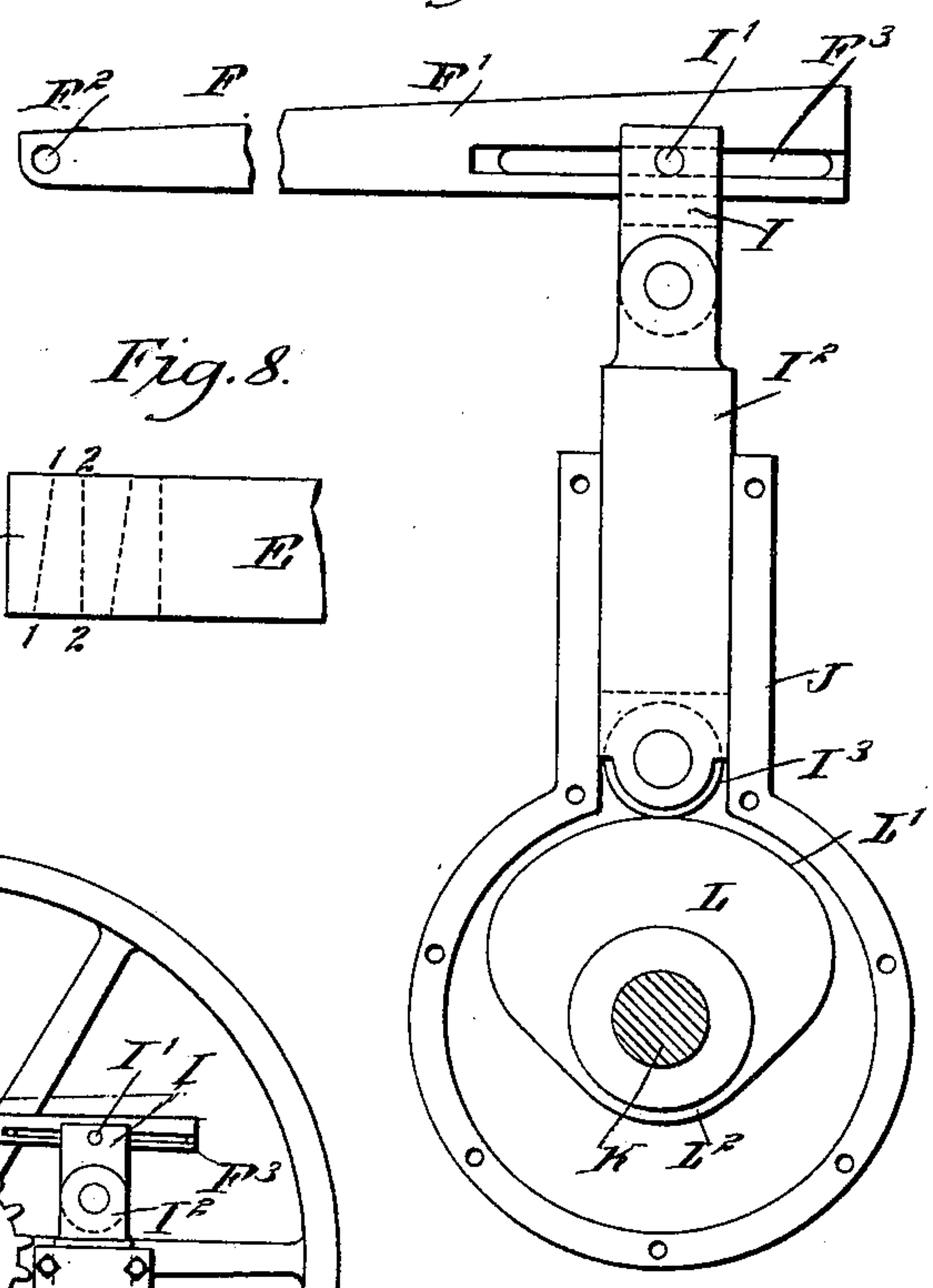


Fig. 8.

Fig. 4.

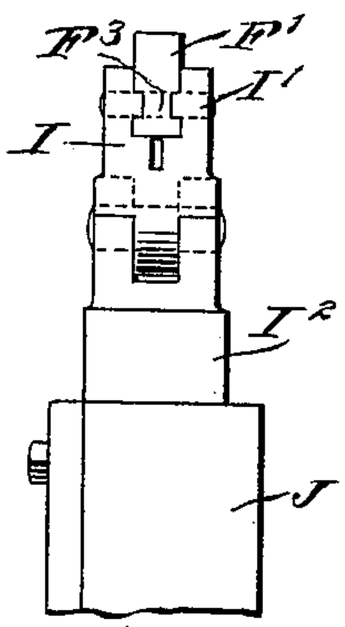


Fig. 5.

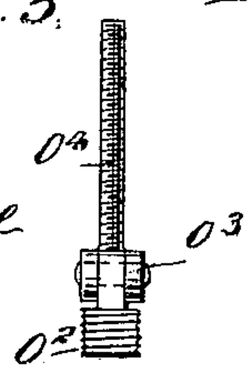


Fig. 6.

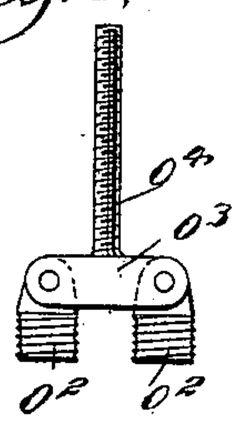
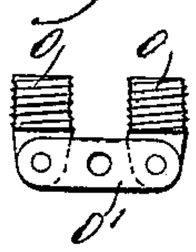


Fig. 7.



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UNITED STATES PATENT OFFICE.

GEORGE A. ENSIGN, OF DEFIANCE, OHIO, ASSIGNOR TO THE DEFIANCE MACHINE WORKS, OF SAME PLACE.

STRIP-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 635,241, dated October 17, 1899.

Application filed March 17, 1899. Serial No. 709,452. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. ENSIGN, of Defiance, in the county of Defiance and State of Ohio, have invented a new and Improved Automatic Hoop and Basket-Strip Cutting Machine, of which the following is a full, clear, and exact description.

The invention relates to woodworking machinery; and its object is to provide a new and improved automatic hoop and basket-strip cutting machine arranged to prevent backlash and to reduce the noise incident to backlash and that of the rapidly-moving heavy cutter-bar and to insure long life to the machine.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a rear elevation of the improvement. Fig. 2 is an enlarged transverse section of the same on the line 2 2 in Fig. 1. Fig. 3 is an enlarged end elevation of the table-tilting device with the casing-covering removed and the shaft in section. Fig. 4 is a rear end elevation of parts of the same. Fig. 5 is an end elevation of one of the adjusting devices for the cutter-bar spring-balance. Fig. 6 is a front view of the same. Fig. 7 is a similar view of one of the spring-balance-controlling devices, and Fig. 8 is an end view of the blank from which the hoops or strips are cut.

The improved machine is mounted on a suitably-constructed frame A, in which is journaled in suitable bearings a longitudinally-extending shaft B, carrying fixed and loose pulleys B′, connected by belt with suitable machinery for imparting a rotary motion to said shaft B. On the latter are secured beveled pinions B^2, in mesh with bevel gear-wheels B^3, secured on transversely-extending shafts B^4, journaled in suitable bearings carried by the frame A, said shafts being provided with eccentrics B^5, engaging the ends C′ of a cutter-bar C, mounted to slide vertically in suitable bearings on the standards A′ for the frame A. On the cutter-bar C is secured the usual knife or cutter D, adapted to cut the hoops or basket-strips E′ from a blank E, held on a table F and abutting with its front edge on stops G to permit the cutter or knife D to cut the hoops or strips to a uniform and desired thickness, the front of the blank E resting on a wooden block H, supported in the frame A, directly under the cutting edge of the knife, so that when the latter descends and cuts off a strip or hoop its cutting edge is not injured, as it comes in contact with wood and not with iron.

In order to form the strips or hoops with a beveled side, as indicated in dotted lines in Fig. 8, it is necessary to impart a tilting motion to the table F on which the blank rests, so that the blank stands at an angle to the vertically-reciprocating cutter D to produce the desired result, as hereinafter more fully described.

The table F is formed by two or more transversely-extending bars F′, pivotally connected at their forward ends at F^2 to the frame A, directly at the rear of the block H, the top edges of said bars F′ standing at a level with the block H during one stroke of the cutter-bar to then move into an angular position relatively to the block H and the cutter-bar during the next stroke of said cutter-bar. For this purpose (see Figs. 2 and 3) the rear ends of the bars F′ are formed in their sides with longitudinally-extending recesses F^3, engaged by bolts I′ on a link I, pivotally connected with a slide I^2, fitted to move vertically in suitable bearings in a casing J, hung loosely on a longitudinal shaft K, journaled in suitable bearings on the frame A and provided at one end with a gear-wheel K′, in mesh with a pinion K^2 on the shaft B. (See Figs. 1 and 2.) The gearing between the shafts B and K is such that the said shaft B makes four revolutions to one revolution of the shaft K, it being understood that the shaft B makes two revolutions to one revolution of the shafts B^4.

On the shaft K, within each of the casings

J, is secured a cam L, engaged at its peripheral surface by a friction-roller I^3, journaled in the lower end of the slide I^2, so that when the shaft K is rotated the cam L imparts a positive upward sliding motion to the slide I^2 to swing the corresponding table-bar F′ into an inclined position for the knife D to make a beveled cut on the blank E, as indicated at 1 in Fig. 8. The cam L is provided with two concentric portions L′ L^2, each representing one-quarter of a revolution of the cam, so that during the time the friction-roller I^3 travels on the portion L′ the table-bar is held in an upwardly-inclined position—that is, during the time the cutter-bar C makes its downward stroke. During the upward stroke the friction-roller I^3 travels on that portion of the cam between the end of the portion L′ and the beginning of the portion L^2, so that the slide I^2 now moves downward by its own weight and that of the table-bar connected with it, and when the friction-roller I^3 travels on the portion L^2 of the cam the cutter-bar makes a second descent at the time the table-bars F′ are in a horizontal position to make the straight cut 2 2. (See Fig. 8.) During the next upward stroke of the cutter-bar the friction-roller travels from the end portion L^2 to the beginning of the portion L′ to cause an upward-sliding motion of the slide I^2 to swing the table-bar back into an inclined position and tilt the blank relatively to the cutter-bar.

It is understood that after each descent of the knife D a hoop or strip is cut from the blank, and during the upward movement of the cutter-bar the stops G move downward below the top surface of the block H to allow of pushing the hoop out of the machine by the operator shifting the blank forward, the stops G immediately returning to an uppermost position to allow the forward side of the blank to abut against the stops G.

Thus it will be seen that by the arrangement described the blank on the table is alternately tilted from a level position into an inclined position during successive full strokes of the cutter-bar, the blank being at a standstill during the descent of the cutter-bar to insure a cutting of the strip from the blank of a desired cross-section.

In order to prevent backlash and to reduce the noise incident to backlash in the gearing B^2 B^3 and that of the rapidly-moving heavy cutter-bar, I provide a spring-balance for each end of the cutter-bar, the spring-balance consisting, namely, of one or more springs N for each end C′ of the cutter-bar, the lower ends of the said springs being engaged by screw-plugs O, pivotally connected with each other by a cross-bar O′, pivoted to the corresponding end C′ of the cutter-bar. Into the upper ends of the springs N screw the screw-plugs O^2, similar to the plugs O, and likewise connected with each other by a cross-bar O^3, from which extends upwardly a screw-rod O^4, passing loosely through a post P, attached to the corresponding standard A′, and a nut O^5 screws on the upper end of the screw-rod O^4 and rests on the post P. By adjusting the nuts O^5 on the two screw-rods for the pairs of springs N the tension of the latter can be readily adjusted to counterbalance the cutter-bar C.

It is evident that when the cutter-bar C moves downward it moves against the tension of the springs N to assist the return movement of the cutter-bar in such a manner that all backlash in the gearing is prevented.

By attaching the screw-plugs O O^2 to the ends of the coil-springs very long life is given to the springs, as they are not liable to break, as is so frequently the case when the ends are formed into eyes or loops attached to supports or bolts, as heretofore practiced.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A hoop or basket-strip cutting machine, comprising a supporting-frame, a reciprocating cutter, means for operating the cutter, a cutting-block on the frame below the cutter, a table pivoted to the frame adjacent to the cutting-block, a shaft geared with and operated by the cutter-operating means, cams on the shaft, casings hung loosely on the shaft and each provided with a bearing, slides in the bearings and having their lower ends resting upon the cams, and links having their lower ends pivoted to the slides and their upper ends adjustably pivoted to the table, substantially as described.

2. A hoop or basket-strip cutting machine, comprising a supporting-frame, a reciprocating cutter, means for operating the cutter, a cutting-block on the frame below the cutter, a table formed of two bars pivoted to the frame adjacent to the cutting-block and having recesses in their sides, a shaft geared with and operated by the cutter-operating means, cams on the shaft, casings hung loosely on the shaft and each provided with a bearing, slides in the bearings and having their lower ends resting upon the cams, and links having their lower ends pivoted to the slides and provided with bolts at their upper ends working in the recesses of the bars forming the table, substantially as described.

3. In a hoop or basket-strip cutting machine, the combination with the frame provided with upwardly-projecting posts, and a reciprocating cutter-bar, of a spring-balance for each end of the cutter-bar, each balance consisting of a pair of springs having plugs secured in their ends, and cross-bars to the ends of which the plugs of the springs are pivoted, one of the cross-bars being pivoted to the cutter-bar and the other adjustably secured to the posts, substantially as described.

4. In a hoop or basket-strip cutting machine, the combination with a frame provided

with upwardly-projecting posts, and a reciprocating cutter-bar, of a spring-balance for each end of the cutter-bar, each balance consisting of a pair of springs, screw-plugs screwing in the ends of the springs, and cross-bars to the ends of which the screw-plugs are pivoted, one of the cross-bars being pivoted to the cutter-bar and the other provided with a screw-rod passing through the post and having a nut thereon, substantially as described.

GEORGE A. ENSIGN.

Witnesses:
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GEO. W. DEATRICH.