G. H. LEWIS.

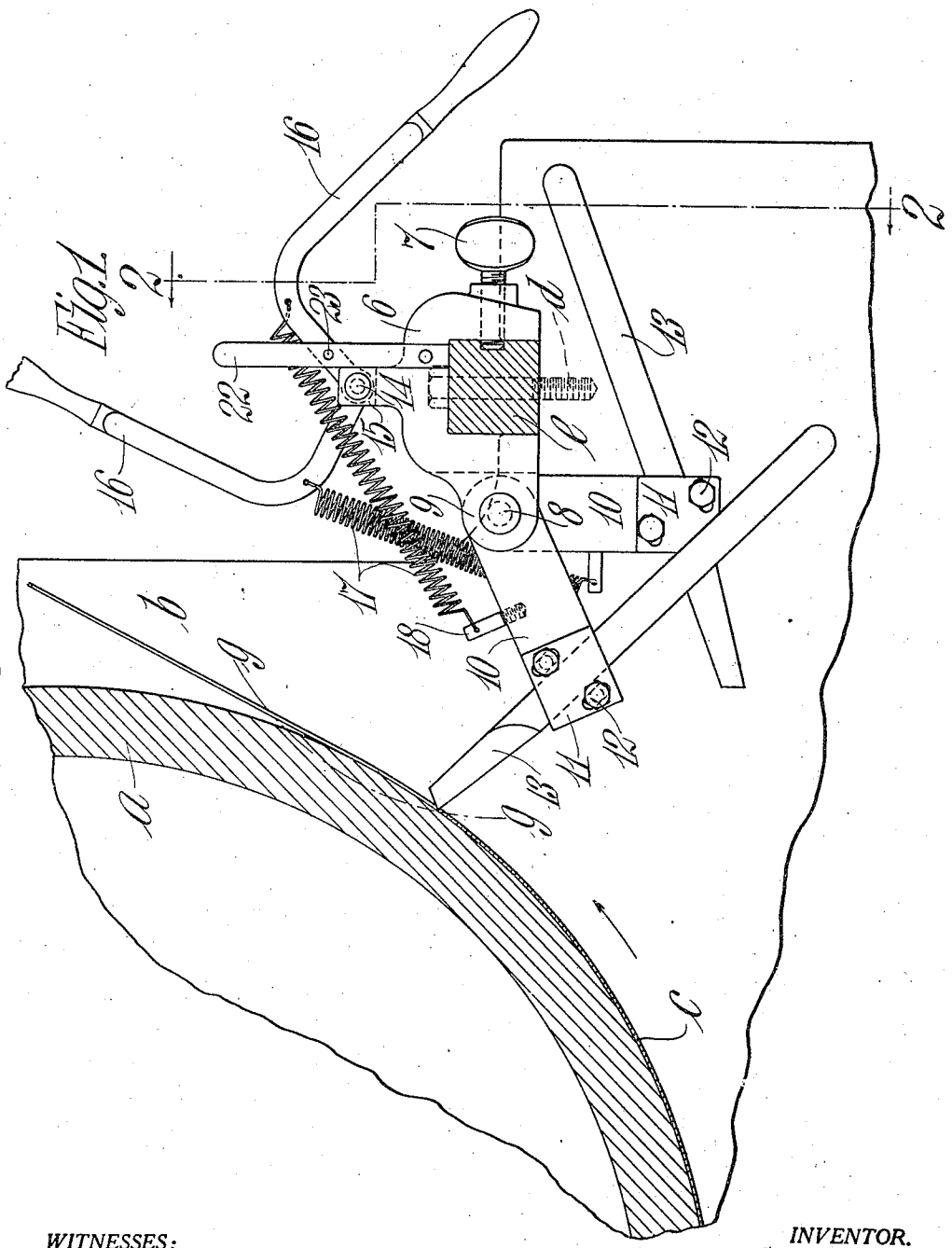
STRIP CUTTING APPARATUS.

APPLICATION FILED FEB. 27, 1917.

1,255,098.

Patented Jan. 29, 1918.

2 SHEETS—SHEET 1.



WITNESSES:

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2 SHEETS—SHEET 2.

Fig. 4.

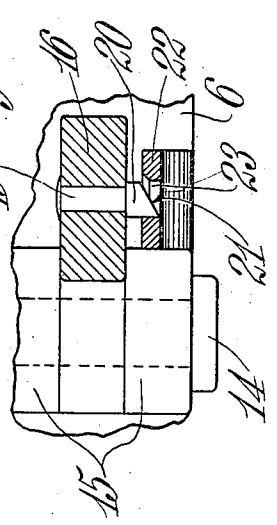
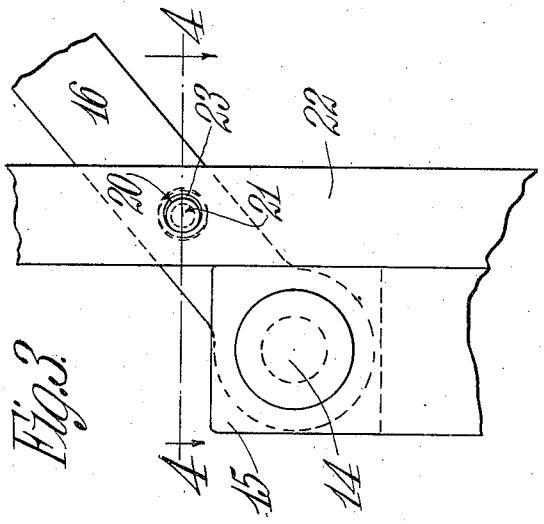


Fig. 3.



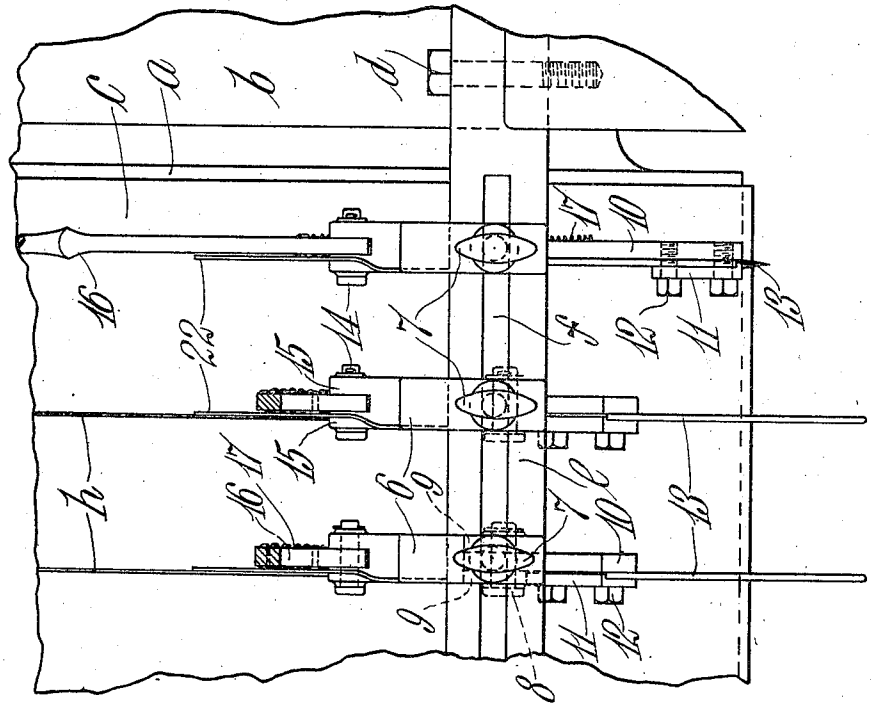


Fig. 2.

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STRIP-CUTTING APPARATUS.

1,255,098. Specification of Letters Patent. Patented Jan. 29, 1918.

Application filed February 27, 1917. Serial No. 151,359.

To all whom it may concern:

Be it known that I, GEORGE H. LEWIS, a citizen of the United States of America, residing at Chicopee Falls, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Strip-Cutting Apparatus, of which the following is a specification.

This invention relates to improved cutting devices for use with calenders. While the invention is capable of general application, it finds one preferred specific use in the tire making art, where rubber stock, rolled out by the calenders into large sheets, is to be cut during the calendering operation into a plurality of ribbon-like strips.

An object of this invention is to provide in a cutting device for a calender, improved means for rapidly and conveniently bringing the cutting knife into operative engagement with the calender roll or releasing the knife from such engagement.

Another object of the invention is to provide in a device of the class described, an improved structural arrangement, whereby the cutting knife may be brought into or removed from operative engagement with the calender roll without disturbing the adjusted relation of parts. Another object of the invention is to provide a cutting device in which the construction is characterized in that the knife is always brought against the roll with the same pressure.

Other objects and advantages will appear in the following description and will be particularly pointed out in the appended claims.

A preferred embodiment of the invention is shown for illustrative purposes in the accompanying drawings, in which—

Figure 1 is a sectional elevation showing the improved cutting knives as applied to a calender roll;

Fig. 2 is a fragmentary cross-sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged elevational view of a portion of Fig. 1; and

Fig. 4 is a sectional plan view taken on the line 4—4 of Fig. 3.

Referring to these drawings, *a* represents a calender roll of any suitable type which is to be considered as rotatably mounted in a pair of side frames *b* (one only being indicated) and suitably driven in the usual and well known manner. A sheet of rubber stock or other material, calendered on roll *a* is represented by reference *c*, and the sheet is shown as leaving roll *a* by passing upwardly from the lower peripheral portion thereof. Extending between the frames *b* in parallel relation to roll *a* and fixed to the frames in any suitable manner, such as, by bolts *d*, for example, is a bar *e*, which is adapted to support thereon a series of cutting devices now to be described.

Bar *e* is preferably of square cross sectional shape and is provided on one face with a longitudinal keyway *f*. Each cutting device has a supporting member 6, and the latter has a square slot in its under face which permits the member to be conveniently slipped upon or lifted from bar *e*. Member 6 engages three faces of bar *e*, as shown in Fig. 1, so that no devices are necessary to prevent twisting of the member relatively to the bar. This engagement is, however, a slidable one so that member 6 may be moved axially upon bar *e* as desired. For the purpose of locking member 6 to the bar, a thumb screw 7 is threaded into the member and has a part adapted to loosely fit into keyway *f*. The engagement of screw 7 with the keyway permits loosening of the screw for adjustment of member 6 without normally permitting removal of the member from bar *e*. Pivoted on a stud 8 between a pair of spaced ears 9 integrally formed with member 6 is an arm 10 and clamped to the latter by a plate 11 and bolts 12 is a cutting knife 13. Pivoted on a stud 14 between a second pair of spaced ears 15 integrally formed with member 6 is a bent lever 16. A coil spring 17 is connected at one end to the latter and at its other end is connected to a pin 18 threaded into arm 10, as shown in Fig. 1. Referring more particularly to Figs. 3 and 4, a pin 19 is riveted to lever 16 and has a cylindrical portion 20 projecting beyond the side of the lever which portion is provided with a beveled outer face 21. A flat spring 22 riveted to member 6 extends upwardly from the latter and is suitably offset, as shown in Figs. 2 and 4, to lie in the path of projection 20. Spring 22 is provided with a hole 23 which is adapted to receive the part 20 and this hole is preferably countersunk on the side adjacent lever 16, as best shown in Fig. 4.

When any one of the knives 13 is not in use, it is held by gravity away from roll *a* and the parts of the cutting device occupy

the relative positions shown by the device shown in the background of Fig. 1 or the extreme right hand device of the series as viewed in Fig. 2. When, however, a knife is to be brought into engagement with roll *a* to slit the sheet *c* thereon, lever 16 is swung in a clockwise direction and, by means of spring 17, pulls the knife 13 into engagement with the periphery of roll *a*. Continued movement of lever 16 elongates spring 17 and brings the beveled surface 21 into engagement with spring 22. The latter is forced away from lever 16 by surface 21 and, when the projection 20 comes into axial alinement with hole 23, the spring snaps back to its original position and holds the lever 16 in the position shown in Fig. 3.

The distance from the point of knife 13 to pivot 8 is made slightly greater than the shortest distance between the pivot 8 and the periphery of roll *a*, as is evidenced by the arc *g*—*g* in Fig. 1 which is struck from pivot 8 as a center and with the distance from the pivot to the point of knife 13 as a radius. Thus knife 13 is yieldingly drawn against the roll by spring 17 and, since the knife abuts roll *a* as a stop, the pressure of the knife on the roll due to spring 17 is aided by the drag of the sheet *c*. The latter, as it travels in the direction of the arrow show in Fig. 1, engages the points of knives 13 and is divided by cuts *h* (Fig. 2) into a plurality of ribbonlike strips, the width of which may be varied as desired by axial adjustments of the members 6 on bar *e*.

An important feature of the cutting device described is its arrangement for uniform knife pressure on roll *a*. Heretofore, I have used as means of forcing the cutting knives against the roll an elastic band wrapped around the knife and then stretched to and around a suitable fixed part, such as screw 7, for example. When a knife has to be rendered inoperative, the elastic band is either cut or unwrapped, allowing the knife to drop away from the roll. Aside from the inconvenience and loss of time incurred by this method, there is the further disadvantage that the pressure of the knife on the roll is left to the operator's judgment. The operator simply makes a guess at the correct tension of the elastic band and the result of such adjustment of a series of knives is apt to be characterized by a decided lack of uniformity in knife pressure so that while some knives may by chance be properly adjusted, others may have so great a pressure as to score the roll while still others have insufficient pressure so that the sheet is not cleanly cut. The described structure, however, provides a device wherein the knife may be set by a skilled operator to bear upon the roll with the correct pressure, and this adjustment, once having been made, need not be disturbed by the less skilled machine operator. The latter does not have to interfere with the adjustment of parts in order to release a knife from the calender roll, but simply pulls spring 22 outwardly to release lever 16. The latter, when again locked in position by spring 22, will bring the knife against the roll with the correct pressure.

Thus, an improved cutting device has been provided which is characterized by its provision for rapid and convenient connection and disconnection of the knives from operative engagement with the calender roll and by its arrangement for such connection and disconnection without disturbing the adjusted relation of parts and by the means for holding the knife against its work with a predetermined pressure. The invention has been described in a preferred form for illustrative purposes but the scope of the invention is defined by the appended claims rather than by the foregoing description.

What I claim is—

1. A cutting device for slitting a web of material, comprising in combination, a roll for feeding the web, a knife normally held by gravity away from the roll, normally contracted elastic means connected to said knife, means for elongating the elastic means and thereby yieldingly forcing the knife against said roll, and devices to hold the elastic means in elongated position.

2. A cutting device for slitting a web of material during a calendering operation, comprising in combination, with the calender roll, a pivotally supported knife, a pivotally supported lever, normally contracted elastic means connecting the knife and lever, the latter arranged to be moved to a predetermined position to elongate said means and thus yieldingly draw said knife against the roll and means to hold the lever in said predetermined position.

3. A cutting device for slitting a web of material, comprising in combination, a roll for feeding the web, a pivoted knife normally held by gravity away from the roll, a pivoted lever, elastic means connecting the latter and said knife, said lever arranged when moved to first draw the knife against the roll and thereafter to be moved to a further position to elongate said elastic means, whereby the knife may be yieldingly forced against the roll to slit the web, and means automatically engageable with the lever to hold it in said last-named position.

4. The combination with a calender roll, of a bar mounted adjacent thereto, a plurality of cutting devices thereon, each comprising a member axially slidable on the bar, means to clamp the member to the bar, a knife pivotally supported on the member and arranged to be held by gravity away from the roll, a lever pivoted to the member, elastic means connecting the lever and knife,

said elastic means being normally contracted, said lever arranged when swung on its pivot to draw the knife into engagement with the roll through said elastic connecting means and when swung to a further position to elongate said elastic means, and releasable devices to hold the lever in said last-named position.

5. A cutting mechanism for slitting a web of material as it is calendered, comprising in combination with the calender roll, a bar mounted adjacent thereto, a member axially slidable thereon, means to clamp the member to the bar, a knife pivotally supported from said member and arranged to drop by gravity away from the roll, a lever pivoted to said member, a normally contracted spring connecting the knife and lever, the latter arranged when swung on its pivot to draw the knife against the roll through said spring and when swung to a further position to elongate the spring, and means automatically operable when the lever reaches the last-named position to grip the lever and thus hold the spring elongated.

6. A cutting mechanism for slitting a web of material as it is calendered, comprising in combination with the calender roll, a pivotally supported knife, a pivotally supported lever, a spring connecting the knife and lever, said spring being normally contracted and arranged to be extended to force the knife against said roll when the lever is moved to a predetermined position, and means to hold the lever in said position, said means comprising, a flat spring fixed adjacent said lever and formed with a recess therein, and a projection on the lever arranged to engage in the recess when the lever is moved to said position.

7. A cutting device comprising in combination, a knife, a carrier therefor, resilient means connected to the carrier at one end, and means to move the other end of said means to a predetermined position to bring the carrier and hold the knife against the work to be cut with a constant predetermined pressure.

8. In combination, a roll for material to be cut into strips, a knife mounted adjacent the roll, means operable to move the knife to a predetermined position against the roll and a resilient device arranged to be stressed by said means and to thereafter hold the knife in said predetermined position by a constant and yielding predetermined force.

9. In combination with a roll on which material may be cut into strips, a support adjacent and parallel to the axis of the roll, a series of adjustable cutting devices on the support, each comprising a knife movable into predetermined position against the roll for cutting, operable means to move the knife to position for cutting including a spring arranged to be stressed by said means for the purpose of yieldingly holding the knife in the predetermined position by a constant predetermined force.

GEORGE H. LEWIS.