May 8, 1923. 1,454,399

J. E. NORRIS

TRIMMER FOR BATTERY SEPARATORS.

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FIG. 1

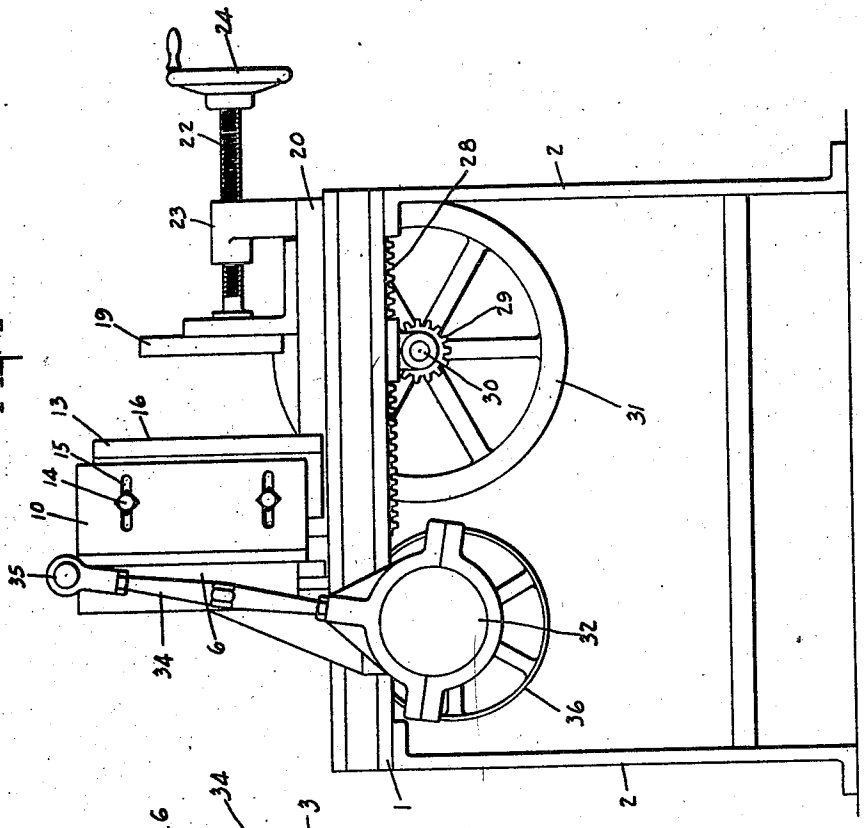
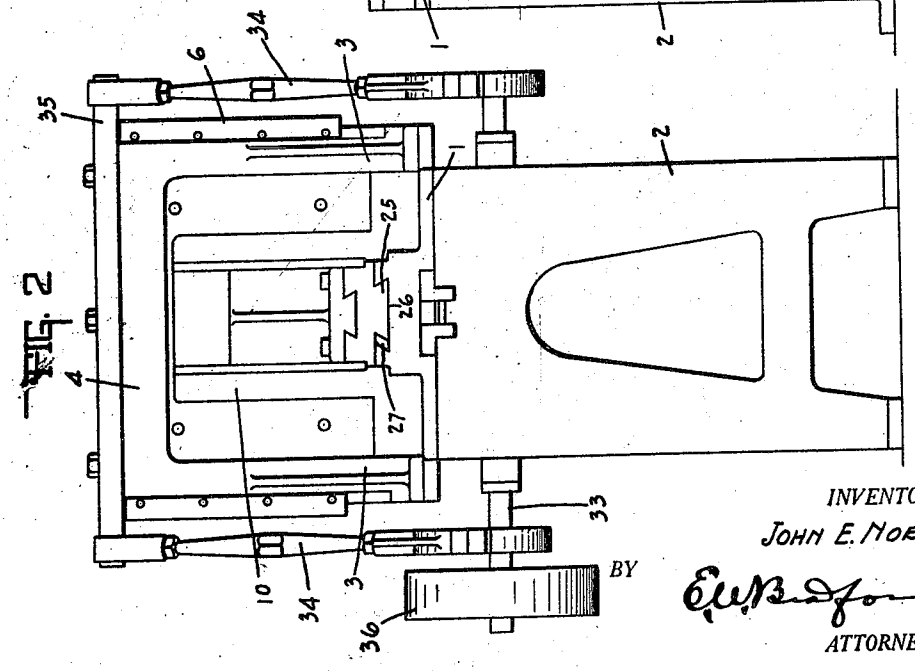



FIG. 2




INVENTOR.
JOHN E. NORRIS.
BY
ATTORNEY.

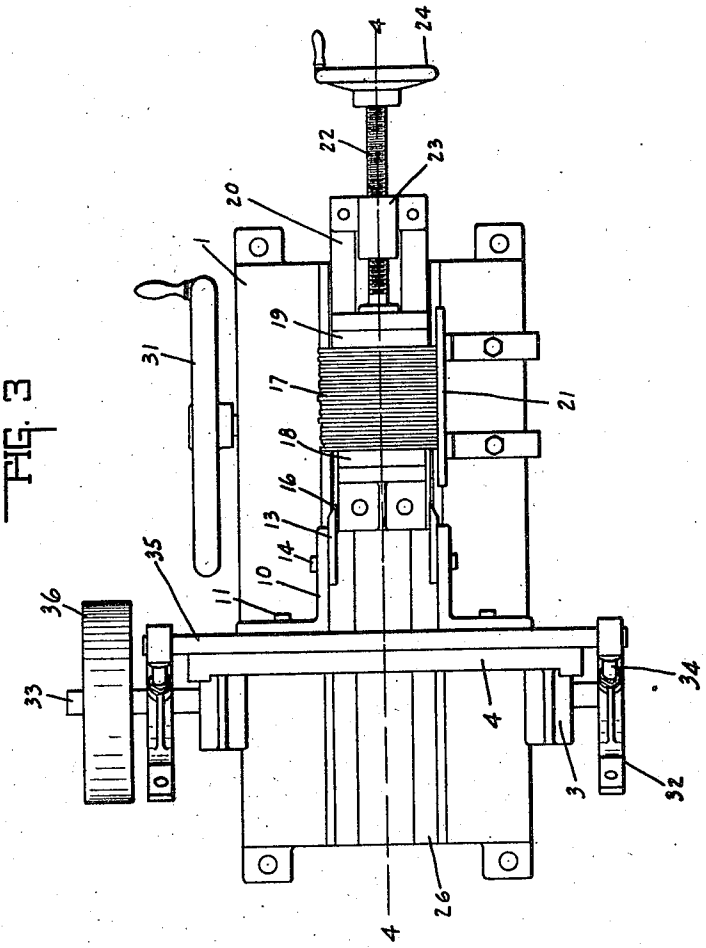
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FIG. 3




INVENTOR.
JOHN E. NORRIS.

BY

ATTORNEY.

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J. E. NORRIS

TRIMMER FOR BATTERY SEPARATORS

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FIG. 4

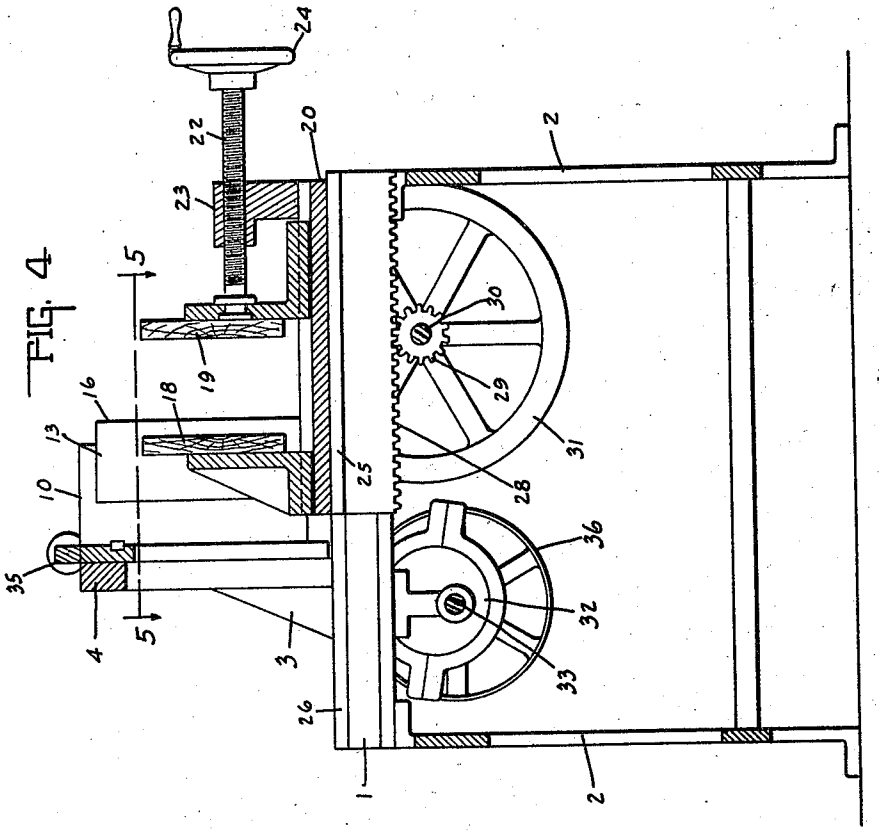
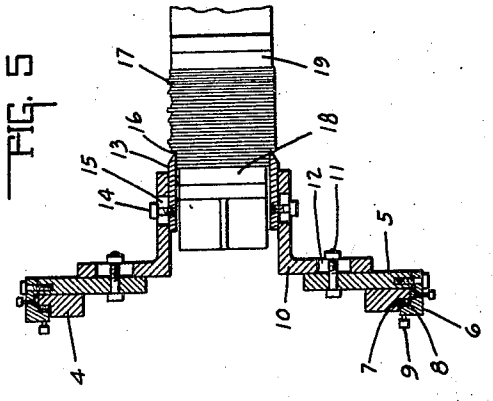



FIG. 5




INVENTOR.
JOHN E. NORRIS.

BY

ATTORNEY.

Patented May 8, 1923. 1,454,399

# UNITED STATES PATENT OFFICE.

JOHN E. NORRIS, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO INDIANAPOLIS MANUFACTURING COMPANY, OF INDIANAPOLIS, INDIANA, A CORPORATION OF INDIANA.

## TRIMMER FOR BATTERY SEPARATORS.

Application filed August 1, 1921. Serial No. 488,972.

*To all whom it may concern:*

Be it known that I, JOHN E. NORRIS, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Trimmers for Battery Separators, of which the following is a specification.

This invention relates to trimmers, and is designed primarily for trimming battery separators, and the prime feature of the invention is the provision of cutting elements, which are spaced a uniform distance apart and adapted for trimming opposed edges of a plurality of separators, for reducing the separators to uniform size.

A further feature of the invention is the provision of means for imparting a reciprocating movement to the cutting elements, so that a substantially shaving effect will be imparted to the cutting elements.

A further feature of the invention is the provision of means for holding a plurality of the separators in compact formation during the trimming operation, and a further feature of the invention is the provision of means for gradually feeding the separators towards the cutting elements.

Other objects and advantages will be hereinafter more fully set forth and pointed out in the accompanying specification.

In the accompanying drawings which are made a part of this application,

Fig. 1 is a side elevation of the trimming device.

Fig. 2 is an end elevation thereof.

Fig. 3 is a top plan view of the trimming device showing a plurality of separators in position to be trimmed.

Fig. 4 is a central vertical sectional view as seen on line 4—4, Fig. 3.

Fig. 5 is a detailed horizontal sectional view, as seen on line 5—5, Fig. 4, showing the trimming elements in operation.

Referring to the drawings in which similar reference numerals designate corresponding parts throughout the several views, 1 indicates a bed plate which is mounted at its ends upon supporting legs 2, and extending upwardly from the edges of the bed plate 1, adjacent one end thereof are standards 3, which are connected at their upper ends by a cross head 4. Slidably mounted upon the standards 3 is a frame 5, a substantially L-shaped guide member 6 being attached to the outer edges of the frame 5, which fit around parts of the standards 3 and hold the frame 5 in proper alignment with the standards, and to more securely interlock the guide members with the standards and reduce friction therebetween, each standard has a vertically extending notch 7, into which enters parts of the guide members 6, and to reduce friction between these parts and likewise take up any wear, gibs 8 are introduced between the guide members and the parts of the standards engaged thereby, adjusting screws 9 being entered through the guide members for adjusting the gibs to compensate for any wear that may occur.

Secured to the frame 5 are brackets 10, which are substantially angular-shaped in cross section, the brackets being secured to the frame 5 by means of bolts 11, the brackets 10 having elongated slots 12, through which the bolts 11 pass, so that the brackets may be adjusted laterally towards or from each other.

One arm of each bracket 10 extends at right angles to the face of the frame 5, and to the inner faces of these arms are attached cutting elements or plates 13, adjusting screws 14 being applied for mounting the cutting plates on the brackets, and the brackets are preferably provided with elongated slots 15, so that the plates may be adjusted on the brackets. The cutting elements 13 are provided with cutting edges 16, which are adapted to trim the edges of battery separators 17, which are preferably constructed of wood and are more or less frail. The necessity of trimming the separators is occasioned by uneven expansion of the separators during the process of treatment to which they are subjected, but in view of the fact that the cutting knives are positioned a uniform distance apart, and as the separators are fully expanded before they are trimmed, the separators will be of a uniform size after passing through the trimming device. Owing to the frailness of the separators it is preferable to perform the trimming operation on a number of the separators at one operation, the separators being bunched in compact formation during the trimming operation. To properly accomplish this result a pair of clamping members 18 and 19 are mounted upon a carriage 20, which carriage is in turn slidably

mounted on the bed plate 1, the clamping member 18 being fixed to the carriage 20, while clamping member 19 is movably mounted thereon.

The separators 17, after being bunched together, are positioned between the clamping members 18 and 19, an adjustable guide bar 21 being attached to the bed plate 1, for determining the position of one edge of the separators. The separators are then forced into close proximity, and are held in fixed position by operating a feed screw 22, which is threaded through a bearing 23 on the outer end of the carriage 20, the inner end of the feed screw engaging with clamping member 19, while the outer end thereof is provided with a hand wheel 24 for conveniently operating the feed screw.

The carriage 20 is preferably provided with a dovetail tongue 25, which enters a dovetail groove 26 in the bed plate 1, the carriage being held in proper alignment by means of an adjustable bar 27, said bar also serving to take up any wear on the carriage.

After the separators have been properly clamped between the clamping members 18 and 19, they are fed towards the cutting elements 13, by moving the carriage lengthwise. Although this result may be accomplished in many different ways, in this instance a toothed rack 28 is connected with the carriage 20, which rack co-operates with a gear 29, mounted upon a shaft 30, one end of the shaft having a power applying wheel 31 connected therewith, which in this instance is shown as hand operated.

In order to impart a substantially shaving action to the cutting elements as they are severing the edges of the separators, the cutting elements are reciprocated vertically through the medium of eccentrics 32, which are mounted upon a driven shaft 33, the eccentric rods 34 being connected with a cross bar 35, which is in turn connected to the upper edge of the frame 5; consequently when the shaft 33 is rotated the frame 5 and parts carried thereby will be moved back and forth in a vertical plane, thus causing the cutting plates to more readily sever the edges of the separators.

In operating the device the feed screw 22 is turned to move the clamping member 19 away from the clamping member 18, when a bunch or stack of separators is introduced between the two clamping members 18 and 19, and one edge thereof forced against the guide bar 21. The feed screw 22 is then operated in the opposite direction, thus securely clamping the bunch of separators in position on the carriage 20.

Power is then applied to the shaft 33 through the medium of a belt pulley 36, or otherwise, the rotation of the shaft 33 causing the plates 13 to reciprocate vertically. Power is then applied to the shaft 30, through the medium of the hand wheel 31, or otherwise, the gear 29 engaging with the rack 28 moving the carriage 20 and the bunch of separators thereon into engagement with the cutting edges of the plates 13, the plates readily severing the edges of the separators, and as the plates are spaced a uniform distance apart, the separators will be trimmed to a uniform size, and after the side edges of the separators have been trimmed the bunch may be given a half turn by loosening the clamping member 19, so that the opposite or end edges of the separators may be trimmed as effectively across the grain, as with the grain. It will likewise be seen that although the device is shown and described as used for trimming battery separators, it may be used for trimming various other articles.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a trimming device, means for securing together a plurality of separators, cutting elements for trimming the edges of the separators, means for advancing the separators towards the cutting elements, and means for imparting vertical movement to the cutting elements whereby the entire group of separators is brought into contact with the cutting elements at a single advancement of the separators, substantially as set forth.

2. In a trimming device, means for clamping together a plurality of separators, a pair of spaced cutting elements, means for imparting vertical reciprocating movement to the cutting elements, and means for feeding the separators horizontally towards the cutting elements.

3. In a trimming device, vertically disposed cutting elements, means for adjustably spacing the cutting elements with respect to each other, a vertically movable frame for carrying the cutting elements, means for imparting reciprocating vertical movement to said frame, clamping members for holding a plurality of elements to be trimmed in compact formation, and means for moving the elements to be trimmed into engagement with the cutting elements.

4. In a trimming device, a group of separators, means to advance the separators horizontally, a pair of oppositely spaced cutting elements, means for reciprocating the cutting elements vertically, means for adjusting the cutting elements by varying the distance therebetween and other means for adjusting the cutting elements in the direction of the movement of the separators, substantially as set forth.

5. In a trimming device, a group of separators, said separators presenting vertically opposed edges and horizontally opposed

edges, a pair of knives arranged to contact with the said vertically opposed edges of the separators, means for horizontally reciprocating the group of separators, and means for vertically reciprocating the knives, substantially as set forth.

6. In a trimming device, a group of separators, said separators presenting vertically opposed edges and horizontally opposed edges, a pair of knives arranged to contact with the said vertically opposed edges of the separators, means for horizontally reciprocating the group of separators, and means for bringing into contact with the said knives, the said horizontally opposed edges of the separators, substantially as set forth.

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana, this 27th day of July, A. D., nineteen hundred and twenty-one.

JOHN E. NORRIS. [L. S.]

Witnesses:

N. W. ROULYKE,

CAREY S. FRYE.