M. L. TWOMLEY & G. S. WRIGHT.

MACHINE FOR CUTTING CORRUGATED PAPER BOARD.

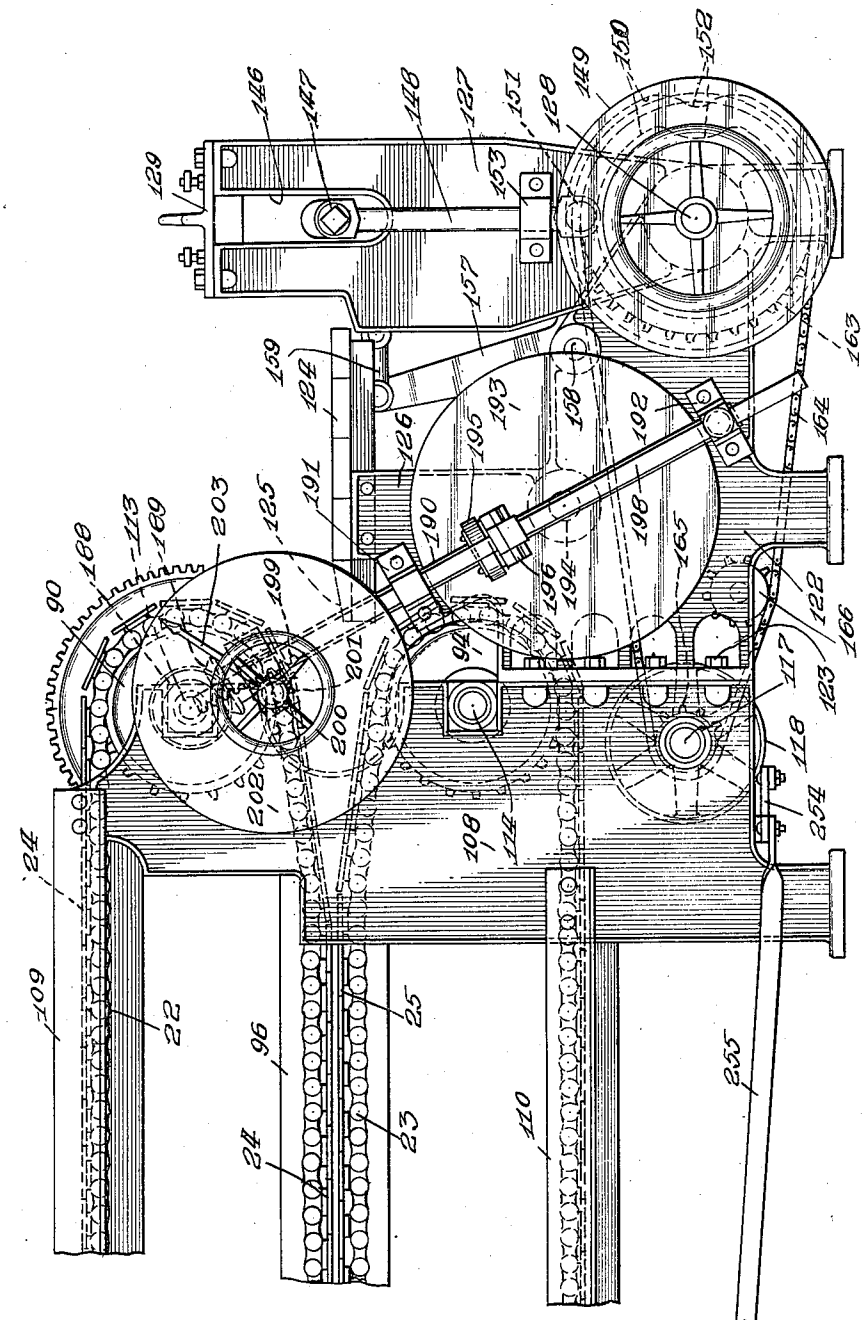
APPLICATION FILED DEC. 19, 1914.

1,281,231.

Patented Oct. 8, 1918.

6 SHEETS—SHEET 1.

Fig. 1.



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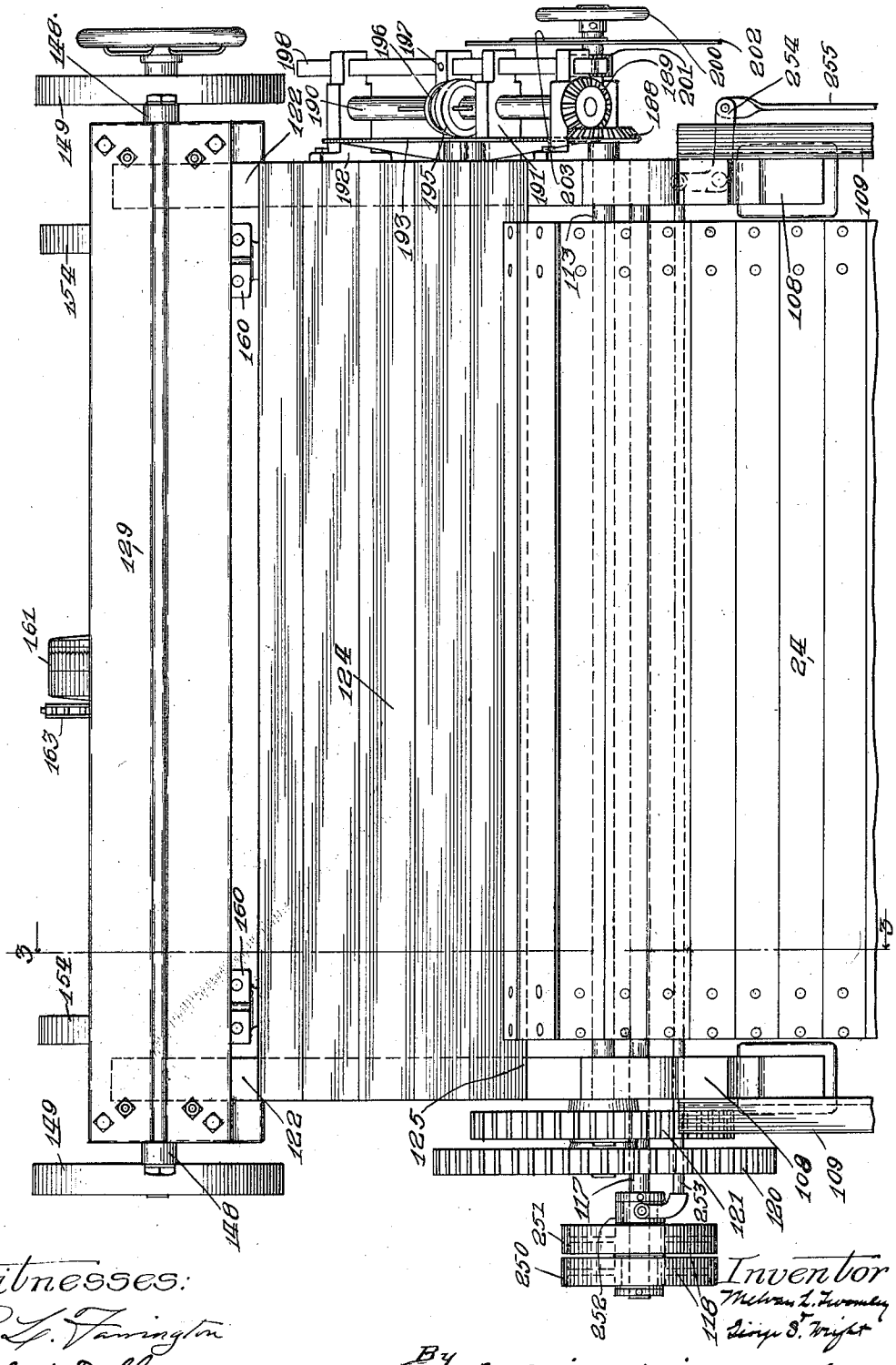


Fig. 2.

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6 SHEETS—SHEET 3.

Fig. 8.

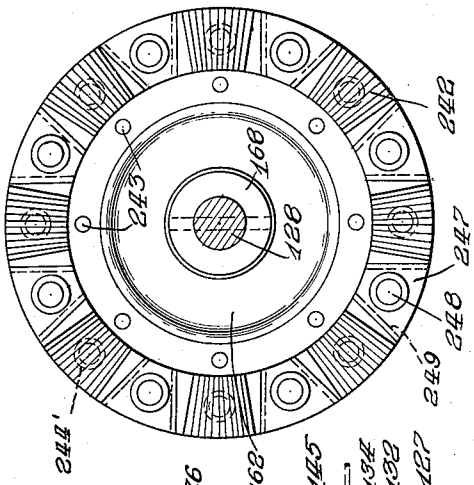


Fig. 9.

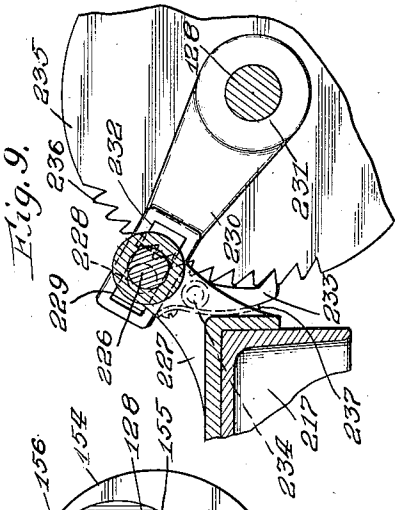
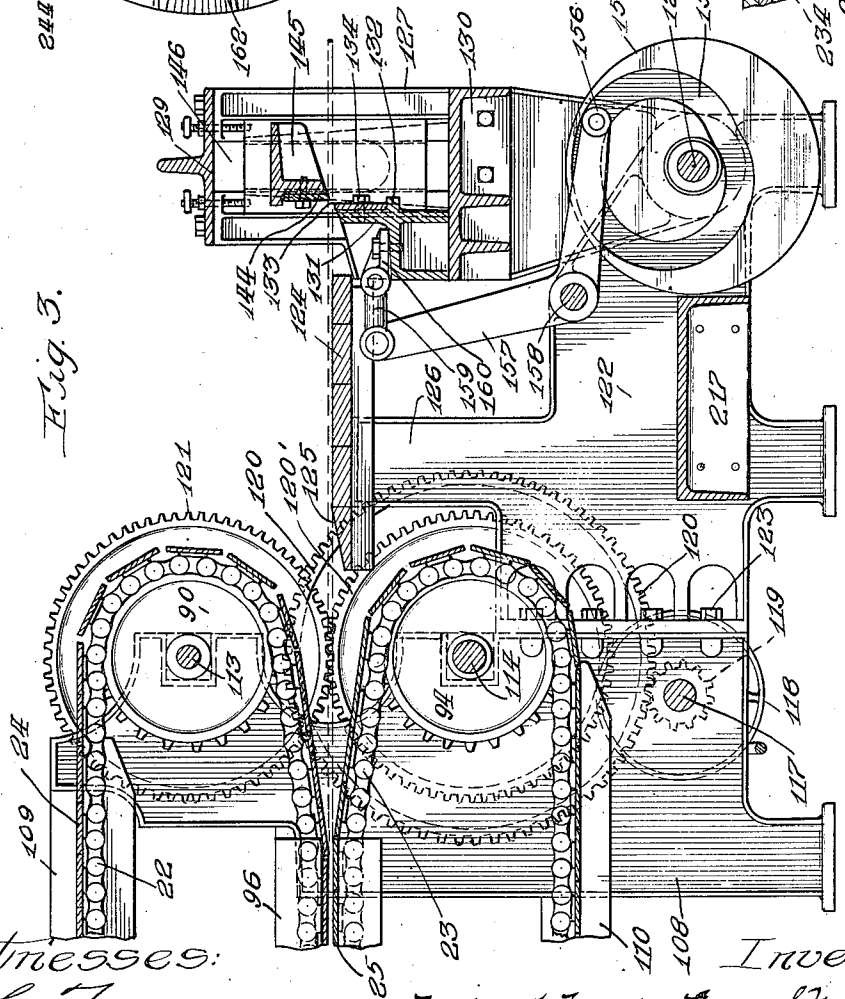


Fig. 3.



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6 SHEETS—SHEET 4.

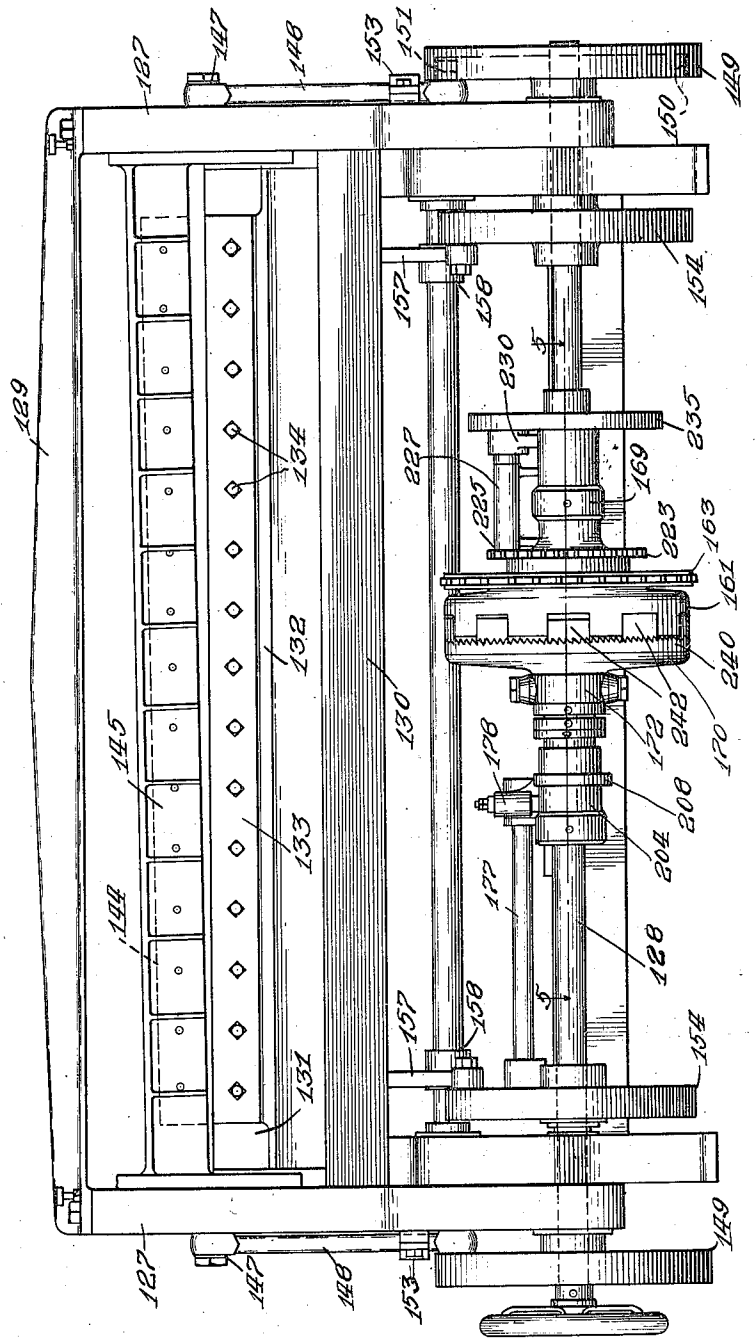


Fig. 4.

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MACHINE FOR CUTTING CORRUGATED PAPER BOARD.

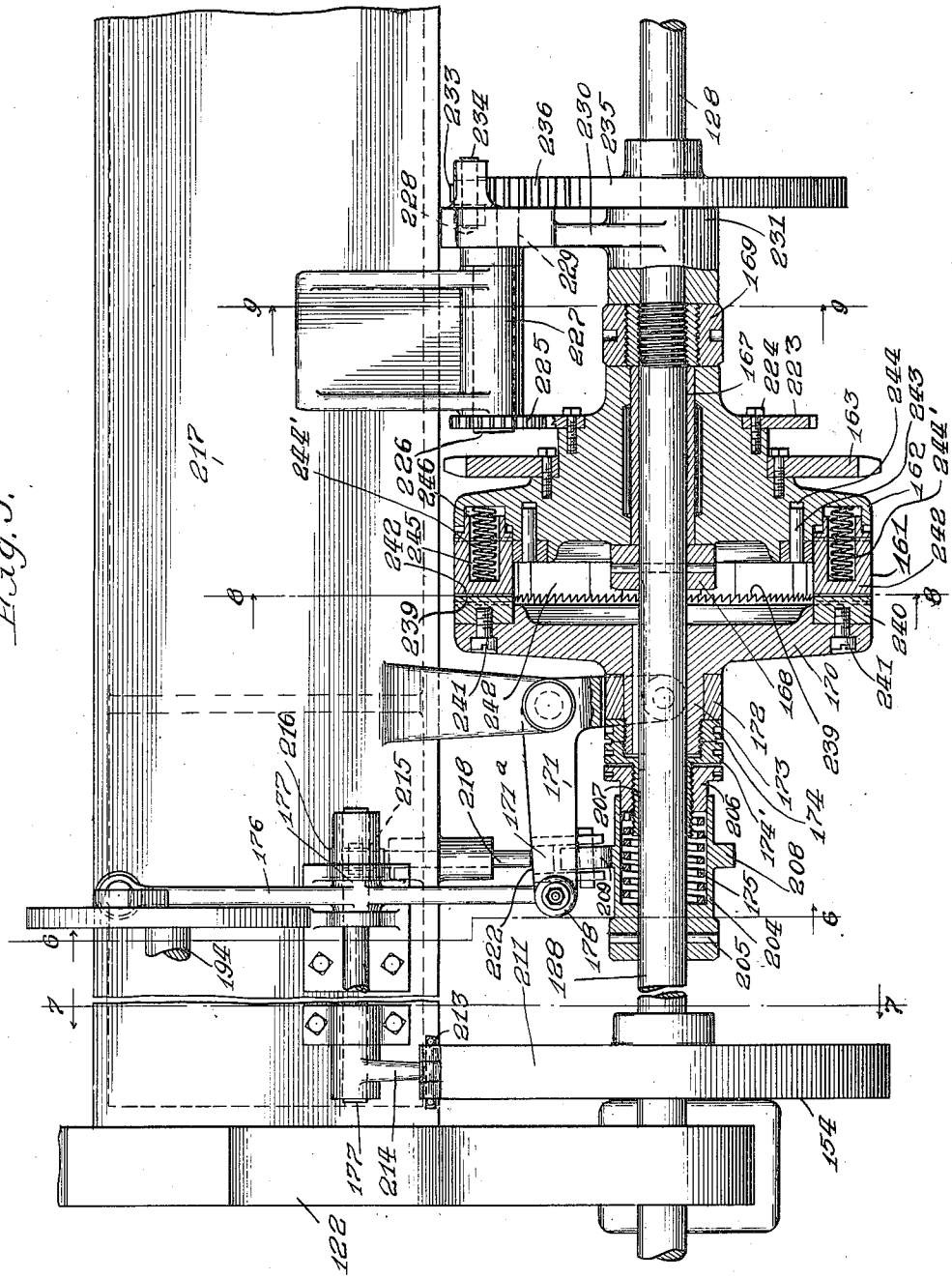
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1,281,231.

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6 SHEETS—SHEET 5.

Fig. 5.



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MACHINE FOR CUTTING CORRUGATED PAPER BOARD.

APPLICATION FILED DEC. 19, 1914.

1,281,231.

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6 SHEETS—SHEET 6.

Fig. 6.

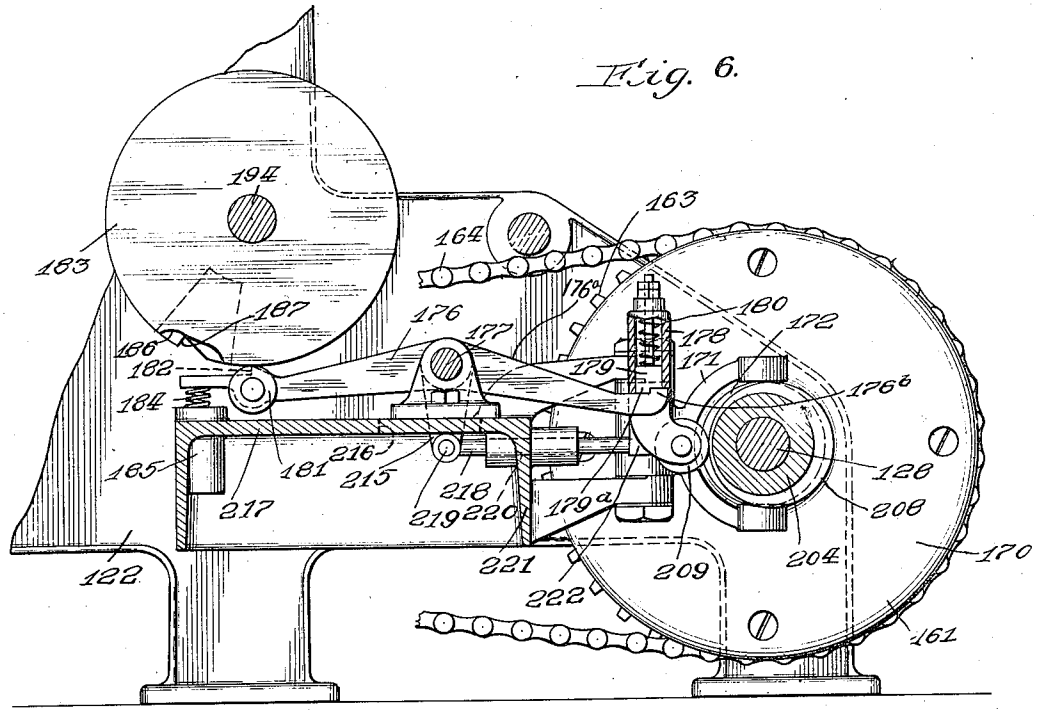
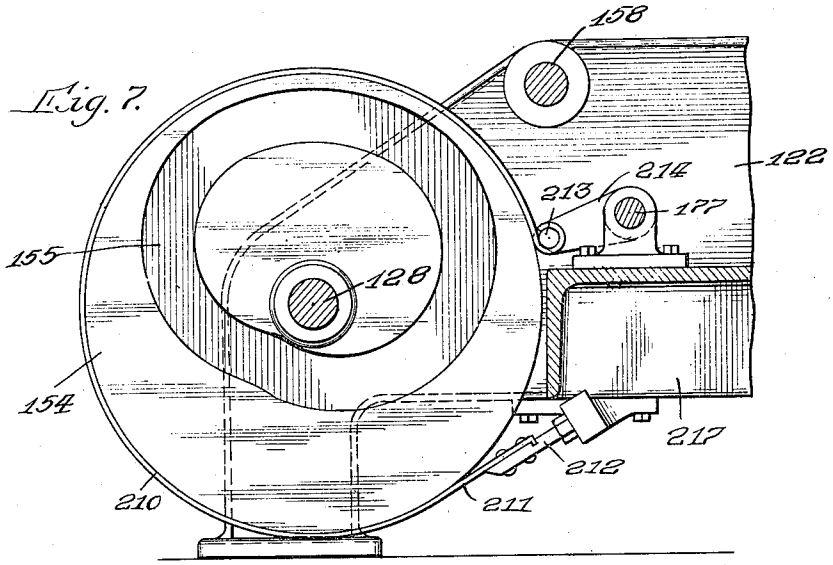


Fig. 7.



Witnesses:

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Att'ys.

UNITED STATES PATENT OFFICE.

MELVAN L. TWOMLEY, OF CHICAGO, ILLINOIS, AND GEORGE S. WRIGHT, OF ANDERSON, INDIANA, ASSIGNORS, BY MESNE ASSIGNMENTS, TO SEFTON MANUFACTURING CORPORATION, OF CHICAGO, ILLINOIS, A CORPORATION OF NEW YORK.

MACHINE FOR CUTTING CORRUGATED PAPER-BOARD.

1,281,231. Specification of Letters Patent. **Patented Oct. 8, 1918.**

Application filed December 19, 1914. Serial No. 878,101.

To all whom it may concern:

Be it known that we, MELVAN L. TWOMLEY and GEORGE S. WRIGHT, citizens of the United States, residing at Chicago, county of Cook, and State of Illinois, and Anderson, county of Madison, and State of Indiana, respectively, have invented certain new and useful Improvements in Machines for Cutting Corrugated Paper-Board and the like, of which the following is a specification.

The mechanism is particularly adapted to cutting corrugated paper board into any desired equal lengths and is shown in connection with a machine for forming that material, though it is also adapted for severing lengths of other materials. Corrugated board, as is well known, consists of three plies of heavy paper or cardboard, an intermediate ply which is corrugated and a pair of lining or facing plies or sheets which are secured by cement of some suitable kind to the crowns of the corrugations upon opposite sides of the intermediate sheet. Corrugated board so formed possesses considerable rigidity and when made in flat sheets can be bent or warped only very slightly without destroying the strength of the material or actually crushing it. In order to cut the strip of continuous corrugated board as it is fed from the forming machine without injury it is therefore necessary to provide a cutting machine which will not warp or bend the board seriously. It is further necessary or desirable that the cellular character of the board be not destroyed at the cut ends by crushing the material between the knives. It is the purpose of our invention to provide a machine of this character which will neither bend nor crush the board but will receive it as it comes from the forming machine and accurately sever it into any desired lengths without injuring it in the slightest degree.

In the accompanying drawing we have shown our invention as applied to a forming machine of the nature covered by said earlier application. It is to be understood, however, as previously explained that the invention is not confined to machines operating in this relation nor is it confined to the specific mechanism shown and described herein, the detailed disclosure being for the purpose of exemplification; the scope of the invention, however, is defined in the following claims in which we have endeavored to distinguish it from the prior art so far as known to us without, however, relinquishing or abandoning any portion thereof.

Referring now to the drawings, Figure 1 is a side elevation of the rear or exit end of a paper-forming machine with our invention applied thereto; Fig. 2 is a plan view of the same; Fig. 3 is a longitudinal vertical section upon the line 3—3 of Fig. 2; Fig. 4 is a rear end elevation of the machine; Fig. 5 a horizontal section of a part of the machine upon line 5—5 of Fig. 4; Fig. 6 a vertical longitudinal section upon the offset line 6—6 of Fig. 5; Fig. 7 a vertical longitudinal section upon the line 7—7 of Fig. 5; Fig. 8 a vertical longitudinal section of a part of the machine on the line 8—8 of Fig. 5; and Fig. 9 is a partial vertical longitudinal section upon the line 9—9 of Fig. 5.

The arrows on the lines of section on Fig. 5 show the direction in which the several views are taken and the same character of reference is applied to each part throughout the drawings and specification.

The side plates 108 which are or may be of cast metal support the rear ends of the longitudinal members 109, 96 and 110 which support lagging belts comprising the lags or slats 24, 25 and the endless chains 22, 23 on which said lags are carried. It will be understood that there are two endless chains for each lagging belt and said chains are supported at their rear ends by the sprockets 90, 94 which are carried by shafts 113, 114 mounted in housings formed upon the side plates 108. This or similar lagging is commonly employed in corrugated board making machines as seen, for example, in patent to Ferres, 746,807 granted December 15, 1903, and need not be further described.

The power shaft 117 is likewise journaled in said castings and provided with a belt pulley 118 of ordinary character for driving the same. The power shaft is further provided with a gear wheel 119 meshing with the gear 120 upon the shaft 114 which carries gear 120′ and the sprockets for the lower lagging belt and a gear 121 upon the shaft carrying the sprockets for the upper lagging belt engages gear 120′ and is of the same diameter therewith. (See Fig. 3.) Thus the rotation of the power shaft drives the lagging belts but at a considerably reduced speed.

The side plates 122 for supporting the cutting or shearing mechanism are bolted at 123 to side plates 108. A table 124 with an inclined forward edge 125 is located in a position to receive the board as it comes from the lagging belts and is suitably supported upon upward extensions 126 of the side frames. (See Fig. 3.) The cutting mechanism proper is located just beyond this table. As the board is fed continuously, and it is practically impossible to perform the entire cutting operation instantaneously, it is necessary in order to avoid buckling the board that the shearing mechanism accompany or move at an equal speed with the board while the knives are in contact with the latter. For this purpose the entire shearing mechanism is mounted in a frame comprising a pair of side or cheek pieces 127 which are pivoted upon a shaft 128 which also has other offices to perform and is located at the lower rear end of the machine. The cheek pieces 127 are connected at their upper ends by a ribbed top plate 129 which is bolted to flanges upon said cheek pieces and the latter are also connected intermediate their ends by a shelf or brace 130. Between these cheek pieces is mounted a flanged knife support 131 which is formed on its rear face with a ledge or rib 132, and to which the cutting blade proper 133 is fastened by bolts 134. The upper or movable knife comprises the usual blade 144 which is secured to a casting 145 the ends of which slide in ways formed in the cheek pieces. (See Fig. 3.) The cheek pieces are formed with ways or slots 146 extending downward from their upper edges through which extend wrist pins 147 for connection to the links 148 by which the knife is operated. The links 148 are reciprocated by cams upon the shaft 128 above mentioned which also carries cams by which the pivoted knife structure is oscillated to cause the knives to travel with the board. The cams 149 for reciprocating the knives are mounted upon the ends of shaft 128 and consist of disks keyed thereon having internal channels 150 (see Fig. 1) which receive antifriction rollers 151 mounted upon the ends of the respective links 148. As shown in Fig. 1 the cam groove is concentric except for the limited portion 152 which is sharply inturned toward the center of the cam to give a short reciprocation to the knife. The links are prevented from other than a reciprocating movement by guides 153. The cams 154 for oscillating the knife structure as a whole are located immediately within the side frames 122 (see Fig. 5) and are formed with cam grooves 155 (see Fig. 3) which receive respectively rollers 156 upon bell cranks 157 pivoted to the side frames at 158. The upper arms of said bell cranks are connected by links 159 to brackets 160 bolted to the stationary knife support (see Fig. 3) so that the shearing mechanism is given an oscillation with each complete rotation of shaft 128.

Normally shaft 128 is at rest but it is provided with a clutch 161 one member of which is keyed to it and the other member loose on said shaft and constantly driven from the main drive shaft. For this purpose the constantly-driven member 162 has secured thereto a sprocket 163 (see Fig. 5) which is driven by a chain 164 passing around the same and around a sprocket 165 upon the drive shaft. An idler 166 is employed to maintain the chain in position. The driving member of the clutch is journaled at 167 upon shaft 128 (see Fig. 5) and prevented from longitudinal movement thereon by a pinned collar 168 and a screw collar 169. The driven clutch member 170 is keyed upon the shaft and reciprocated into and out of engagement with the driving clutch member by a bell crank lever 171 connected to a collar 172 journaled upon a reduced neck 173 on said driven clutch member and held in position thereon by nuts 174, 174'.

As heretofore stated the shaft 128 is normally at rest and only rotated when a length of the board is to be cut off. The clutch shifter by which the shaft is set in motion is controlled in its operation by adjustable means driven by the operating mechanism of the machine which may be so set as to cause to be cut off any lengths of material desired. For this purpose the bell crank 171 is normally restrained against the influence of spring 175 by which the clutch is thrown into engagement and to which reference will be made later by a latch 176 pivoted at 177 upon the frame. As seen in Fig. 6 the long arm 171^a of the bell crank is formed with a housing 178 for containing a follower 179 and a spring 180 by which the follower is depressed into contact with the shouldered end catch 176^b of the latch 176. The downward movement of the follower 179 is limited, however, so that a relatively slight downward movement of the latch releases it therefrom. The other end of the latch carries a roller 181 and catch shoulder 182 and is normally pressed into contact with a revoluble disk 183 by a spring 184 mounted in housing 185 in the frame of the machine. The disk 183 is provided with a depression 186 which receives the roller upon the latch and a notch 187 for the catch 182 so that when the depression and notch come opposite the roll and catch the spring 184 throws the corresponding end of the latch upward and arm 176^a downward and releases the bell crank 171 and as above stated the bell crank then permits the driven clutch member to be shifted under the influence of spring 175.

The rotation of the controlling disk 183

is accomplished in the following manner: The shaft 113 upon which the rear sprockets for the upper lagging belt are mounted is provided with a beveled pinion 188 which meshes with and drives a similar pinion 189 upon an inclined shaft 190 which is mounted in suitable bearings 191—192 attached to one of the end frames of the machine and outside the latter. The inclined shaft is parallel to the face of a friction disk 193 which is rigidly mounted upon the same shaft 194 to which the controller disk 183 is secured. A friction roller 195 is keyed to shaft 190 and adjustable longitudinally thereof toward and from the center of the friction disk so that by adjusting the roller with respect to the friction disk the speed of the latter may be adjusted. The friction roller is engaged by a collar 196 which is pinned at 197 to a shifting rod 198, the upper end of which is formed with teeth 199 constituting a rack.

A hand-wheel 200 is journaled upon the side frame of the machine adjacent the rack and carries a pinion 201 in mesh with the latter so that by turning the hand-wheel the rack and shifting rod may be reciprocated to adjust the friction roller toward and from the center of the friction disk. For convenience in setting the speed of the friction disk a dial 202 is mounted concentric with the hand-wheel and the latter carries a hand 203 which moves over the dial. Obviously by rotating the hand-wheel the friction roller may be set to give any desired speed to the friction disk which in turn rotates the controller disk and through the latch controls the frequency of operation of the clutch shifter above described.

The spring 175 by which the driven member of the clutch is pressed into engagement with driving member (see Fig. 5) is inclosed within a housing sleeve 204 which is pinned at 205 to the shaft and the pressure of the spring may be adjusted by a sleeve 206 threaded upon an extension 207 of nut 174'. In order to unship the clutch after each operation of the shears the housing 204 is formed on its exterior with a cam 208 which coöperates with a roller 209 journaled upon the end 171^a of the bell crank lever, the cam being so formed and arranged as to thrust the arm 171^a outward on the completion of the operation of the shears. When the bell crank is first released by the depression of the latch 176 and the clutch moves into engagement the follower 179 moves to the right, (as seen in Fig. 6) so that its extended end 179^a is above the raised or shouldered portion 176^b of the latch. As soon, however, as the roller 181 on latch 176 is depressed by the further revolution of the controller disk 183 the follower 179 is driven upward in its housing against the spring 180. With the parts in this position when the bell crank is actuated by the cam 208 as above described the follower slides over the raised face 176^b of the latch to the left (as seen in Fig. 6) until the projecting end thereof drops behind the shoulder on the latch which thereupon retains the bell crank against the pressure of spring 175 until the latch is again released by the controller disk. After the release of the driven clutch member and the shaft 128 to which it is keyed these parts continue to revolve under their inertia and unless provision were made to the contrary would come to rest at different points from time to time depending upon frictional and other conditions. It is essential, however, in order that the same length of board may be cut off at each operation of the shears that these parts be brought to rest at a predetermined point from which the succeeding operation of the device may begin. For this purpose a friction strap 211 coöperates with the periphery of cam 154. This strap is secured at 212 to a fixed part of the machine and its other end is connected at 213 to an arm 214 mounted upon a rotary bolt 177, (see Figs. 5, 6 and 7,) which has been heretofore referred to as the pivot of the latch 176 and upon which the latter is loosely mounted. The arm 214 is normally substantially horizontal and the bolt 177 carries a second arm 215 which is rigid therewith and depends through an opening 216 in the cross plate 217 forming a part of the framework of the machine. A push rod 218 is pivoted to said arm at 219 and is guided in an opening 220 in web 221 depending from said cross plate, and extends into the path of a depending portion 222 of the bell crank lever arm. It follows from this construction that when the bell crank lever is shifted by the cam 208 engaging the roller 209 thereon, the push rod 218 is also shifted and in a direction to lower the horizontal arm 214 and so bring the friction strap 211 into engagement with the disk 154 to stop the rotation of the shaft 128. Thus the shaft is not permitted to revolve under its inertia until the friction of the bearings brings it to rest but it is quickly stopped by the brake just described. Obviously, however, this mechanism is not sufficient to insure the shaft coming to rest in the same identical position each time though it may be depended on to stop said shaft within a comparatively limited arc. In order, therefore, that the succeeding movement of the shaft shall begin at a perfectly definite point we provide additional mechanism for feeding it forward to such point. For this purpose the driving member of the clutch 162 carries a gear 223 which is bolted to the outer face thereof at 224 and engages a pinion 225, the shaft 226 of which is journaled in the bracket 227 carried by the plate 217 above mentioned. The other end of the shaft 226 carries a pin or stud 228 (see Figs. 4, 5

and 9) eccentrically mounted with relation thereto and journaled in a slide block 229. An arm 230 is pivoted or journaled at 231 upon the shaft 128 and at its free end is formed with a guide slot 232 in which the slide block 229 above mentioned is free to reciprocate. Obviously, the continuous rotation of the pinion 225 by gear 223 through the eccentric pin-and-slot connection with the arm 230 just described oscillates the latter about its pivotal point. By suitably choosing the eccentricity of the stud 228 the extent of this oscillation can be determined. A pawl 233 is pivoted at 234 upon said arm and engages a ratchet wheel 235 which is rigidly mounted upon the shaft 128. The teeth 236 upon said ratchet do not however extend entirely around the periphery thereof as is usually the case in ratchet wheels but only for a very limited arc thereof which corresponds to or includes the entire arc within which the shaft may be stopped by the brake band above described. It will now be seen that when the clutch is unshipped and the shaft 128 left free it will be brought to rest or substantially so by the brake band above described or at least its inertia will be overcome thereby when the toothed portion of the ratchet is opposite said pawl. But though its tendency is to stop within the arc above described the pawl 233 operated by the connections just described acting on the ratchet teeth feeds the shaft around against the frictional resistance of the brake strap until the end of the series of teeth is reached when the pawl will simply oscillate back and forth without further movement of the shaft. Any suitable spring may be employed in connection with the pawl and we have shown an ordinary spring 237 secured to the arm and bearing upon the pawl.

In order that the engagement between the driven and driving parts of the clutch may be positive and yet the lost motion in the same be reduced to a minimum we employ a clutch of the following description: The driven member 170 thereof is provided upon its engaging face with a toothed annulus 239 secured in a rabbet 240 by screws 241 (see Fig. 5). The driving clutch member 162 is provided with a series of toothed sections 242 upon its engaging face, the teeth whereof are adapted to engage the teeth upon the driven section of the clutch. Each of these toothed sections is mounted for movement parallel to the axis of the shaft, that is to say, toward and from the toothed annulus upon the driven clutch member and is guided in such movement by one or more guide pins 243 extending into bores 244 in the body of the driving clutch member, and each said toothed section is urged in the direction of the opposing toothed annulus by a spring 241 housed in cavities 245—246 in the toothed sections and the body of the driving clutch member respectively. Such movement of the toothed sections under the influence of their respective springs is limited, however, by intermediate blocks 247 which are bolted to the body of the clutch member at 248 and undercut at 249 and overlie the edges of the adjacent toothed sections which are correspondingly rabbeted for this purpose. The teeth upon each such section correspond identically in size and distance between the edges thereof with the teeth upon the opposed annulus and diagonally opposite toothed sections are so formed and placed that when one of them is in driving engagement with the teeth of the annulus or in other words with the radial faces of its teeth in engagement with the radial faces of the teeth of the annulus, the other section of the pair is similarly engaged. Obviously, the toothed sections might be so arranged that all the teeth thereon throughout the periphery of the driving member of the clutch would be simultaneously in engagement with the teeth of the driven clutch member. In that event, however, whenever the engaging faces were brought together unless it chanced that the axial faces of the teeth were in position to engage each other there would be a certain lost motion before the engagement took place which might amount to the full width or arcuate dimension of a tooth. Obviously, though by the mechanism previously described the shaft were stopped at each operation in identically the same position, such lost motion between the members of the clutch would result in unequal lengths of board being cut. In order to reduce the lost motion in the clutch to a minimum the toothed sections are arranged in pairs, the members of each pair being diametrically opposite each other and the teeth of each pair being arranged to simultaneously engage the teeth upon the driven annulus; but the teeth upon each successive pair of sections are slightly advanced or set back as the case may be with reference to the preceding pair of sections so that when the teeth of one pair of sections are in driving engagement the other pairs will be spaced apart to the extent of a fraction of the length of a tooth. In other words, the space between the last tooth of one section and the first tooth of the succeeding section is not a multiple of the length of a single tooth but a fraction thereof. Preferably the advance or set back between successive pair of sections is such as to equally divide the arcuate length of the tooth between the several pairs of sections, on the clutch member. Thus, if, as in the example shown in Fig. 8, there are four pairs of toothed sections, each successive section is advanced or set back with relation to the preceding pair of

sections a distance equal to one-quarter of a tooth. It follows that the lost motion between the clutch members can never exceed one-quarter of the arcuate length of a tooth. When the clutch members come together the pairs of sections whose teeth are most nearly in position for driving engagement interlock to the full depth of the radial faces of the teeth. The radial faces of the teeth of the other sections are not in engagement nor can the teeth thereof enter to the full depth for this reason. Therefore the springs heretofore described are provided to permit the sections which are not in the driving position to retreat sufficiently to allow the driving sections full penetration.

The continuous strip of board as formed is fed by the lagging to the shearing machine which has previously been set by the hand-wheel 200 heretofore described to cause operations of the movable shear blade at suitable intervals to give the desired length of board. The latter moves continuously through the shears and between the blades thereof until the control disk 183 releases the latch 176. The latter then releases the bell crank 171 permitting the clutch to be shipped by the spring 175. By reason of the construction heretofore described the members of the clutch engage positively and without material lost motion whereupon the shaft 128 is revolved and the cams thereon cause the movable blade of the shears to be reciprocated to sever the board and to feed the shearing means forward along with the board *pari passu* so that the sheet of material is not buckled. Any suitable provision may be made for carrying away and stacking the product of this apparatus.

The power or drive shaft 117 is provided with a clutch 252 of any usual or approved design, which latter may be operated by a rod 253 which in turn is controlled by a bell crank 254 and a hand-rod 255 extending to the front of the machine.

It will be seen that the above described cutting device, by reason of its shear action severs the cardboard without crushing the same, and because the shears moves along with the corrugated board, and at the same speed, there is no buckling of the latter which would result in injury thereto. By means of the adjustable friction driving connection for the shears the machine may be set to cut any length of board desired.

We claim:

1. In a machine of the class described, continuously operating strip-feeding means, a means for severing the material as it is formed into uniform lengths, power means for driving the strip-feeding means and shears, connections between the power means and shears comprising a normally open clutch, means for closing the clutch; trip means for normally maintaining the clutch open and permitting it to be closed at predetermined intervals and a rotary disk adjustably driven from the strip feeding means controlling said trip.

2. In a machine of the class described, continuously operating strip-feeding means, a means for severing the material as it is formed into uniform lengths, power means for driving the strip-feeding means and shears, connections between the power means and shears comprising a normally open clutch, means for closing the clutch, timing means constantly driven by the power means, and a latch controlled thereby for normally maintaining the clutch open but periodically permitting it to close.

3. In a machine of the class described, continuously operating means for feeding a continuous strip of material, means for severing the strip into predetermined lengths comprising a shears, driving means common to the strip-feeding means and the shears, connections between the driving means and the shears comprising a normally open clutch, a clutch shifter, a timing mechanism driven from the driving means, and a latch controlled by said timing means to normally oppose the clutch shifter but permit it to operate at predetermined intervals.

4. In a machine of the class described, continuously operating means for feeding a continuous strip of material, means for severing the strip into predetermined lengths comprising a shears, driving means common to the strip-feeding means and the shears, connections between the driving means and the shears comprising a normally open clutch, a clutch shifter, a timing mechanism driven from the driving means, means for adjusting the speed of the timing mechanism, and a latch controlled by said timing means to normally oppose the clutch shifter but permit it to operate at predetermined intervals.

5. In a machine of the class described, continuously operating means for feeding a continuous strip of material, means for severing the strip into predetermined lengths comprising a shears, driving means common to the strip-feeding means and shears, connections from the driving means to the shears comprising a normally open clutch, a clutch shifter, a latch normally maintaining the clutch in open position, and a controller disk driven from the driving means and normally maintaining the latch in operative position but designed to release the same at regular intervals.

6. In a machine of the class described, continuously operating means for feeding a continuous strip of material, means for severing the strip into predetermined lengths comprising a shears, driving means common to the strip-feeding means and shears,

connections from the driving means to the shears comprising a normally open clutch, a clutch shifter, a latch normally maintaining the clutch in open position, and a controller disk driven from the driving means and bearing upon the latch to normally maintain it in operative position but notched to permit the latch to move to inoperative position at predetermined intervals.

7. In a machine of the class described, continuously operating means for feeding a continuous strip of material, means for severing the strip into predetermined lengths comprising a shears, driving means common to the strip-feeding means and shears, connections from the driving means to the shears comprising a normally open clutch, means for closing the clutch, a latch normally retaining the clutch in open position, a controller disk continuously driven from the driving means, and operating connections between said disk and driving means comprising means for varying the relative speed of the driving means and disk.

8. In a machine of the class described, continuously operating means for feeding a continuous strip of material, means for severing the strip into predetermined lengths comprising a shears, driving means common to the strip-feeding means and shears, connections from the driving means to the shears comprising a normally open clutch, means for shifting the clutch to closed position, a latch normally maintaining the clutch in open position, a controller disk normally maintaining the latch in operative position but permitting it to retreat therefrom at regular intervals, means for driving the controller from the driving means, comprising a friction disk and a friction roller, the latter being adjustable toward and from the center of the friction disk, and means for adjusting the roller.

9. In a machine of the class described, continuously operating means for feeding a continuous strip of material, means for severing the strip into predetermined lengths comprising a shears, driving means common to the strip-feeding means and shears, connections from the driving means to the shears comprising a normally open clutch, means for shifting the clutch to closed position, a latch normally maintaining the clutch in open position, a controller disk normally maintaining the latch in operative position but permitting it to retreat therefrom at regular intervals, means for driving the controller from the driving means, comprising a friction disk, a shaft parallel to the plane of the friction disk and geared to the driving means, a friction roller keyed to the shaft and adjustable toward and from the center of the disk, and means to adjust said roller.

10. In a machine of the class described, continuously operating means for feeding a continuous strip of material, means for severing the strip into predetermined lengths comprising a shears, driving means common to the strip-feeding means and shears, connections from the driving means to the shears comprising a normally open clutch, means for shifting the clutch to closed position, a latch normally maintaining the clutch in open position, a controller disk normally maintaining the latch in operative position but permitting it to retreat therefrom at regular intervals, means for driving the controller from the driving means, comprising a friction disk, a shaft parallel to the plane of the friction disk and geared to the driving means, a friction roller keyed to the shaft and adjustable toward and from the center of the disk, means to adjust said roller consisting of a rack parallel to said shaft and adjustable longitudinally thereof and connected to the roller, and a hand-wheel having a gear meshing with the rack.

11. In a machine of the class described, continuously operating means for feeding a continuous strip of material, means for severing the strip into predetermined lengths comprising a shears, driving means common to the strip-feeding means and shears, connections from the driving means to the shears comprising a normally open clutch, means for shifting the clutch to closed position, a latch normally maintaining the clutch in open position, a controller disk normally maintaining the latch in operative position but permitting it to retreat therefrom at regular intervals, means for driving the controller from the driving means, comprising a friction disk, a shaft parallel to the plane of the friction disk and geared to the driving means, a friction roller keyed to the shaft and adjustable toward and from the center of the disk, means to adjust said roller consisting of a rack parallel to said shaft and adjustable longitudinally thereof and connected to the roller, a hand wheel having a gear meshing with the rack, a dial, and a pointer for indicating the adjustment of the rack.

12. In a machine of the class described and in combination with means for continuously feeding a continuous strip of material, shears for severing the material into predetermined lengths, comprising a transverse shaft, an oscillatory frame mounted on the shaft, a stationary and a reciprocating knife mounted on the frame, a pair of cam disks mounted on and driven by the shaft for reciprocating the movable shear blade and a cam disk also mounted upon and driven by said shaft, and connections therefrom for oscillating the frame.

13. In a machine of the class described and in combination with means for continu-

ously feeding a continuous strip, an oscillating shears comprising a frame mounted for oscillation in the direction of movement of the strip, a stationary and a reciprocating knife mounted thereon, means for reciprocating the knife comprising a shaft, cams mounted on the shaft, and links connecting the movable knife blade and cams, a cam for oscillating the frame, and a lever driven by said cam and connected to the frame.

14. In a machine of the class described, and in combination with means for continuously feeding a continuous strip of material, a movable shears normally inoperative, continuously operating driving means, means for connecting the shears at intervals to the driving means, comprising a clutch, a shaft upon which the clutch is mounted and which is connected to the shears for operating the same, said clutch comprising a driving and a driven member, the latter adjustable longitudinally of the shaft, spring means for pressing the driven member of the clutch into operative connection with the driving member, a lever for controlling the shiftable member of such clutch connected thereto, a latch for normally maintaining the lever in a position with the clutch open, a controller normally maintaining the latch in a position to hold the clutch open but shaped to permit the clutch to close at intervals, and connections for driving the controller from the driving means.

15. In a machine of the class described, and in combination with means for continuously feeding a continuous strip of material, a movable shears normally inoperative, continuously operating driving means, means for connecting the shears at intervals to the driving means, comprising a clutch, a shaft upon which the clutch is mounted and which is connected to the shears for operating the same, said clutch comprising a driving and a driven member, the latter adjustable longitudinally of the shaft, spring means for pressing the driven member of the clutch into operative connection with the driving member, a bell crank lever connected to the shiftable member of the clutch, a latch normally restraining the lever to hold the shiftable clutch member in open position, a controller continuously driven from the driving mechanism normally maintaining the latch in open position, releasing it at intervals, and a cam mounted upon the shaft and engaging the lever for restoring the latter and the clutch to open position.

16. In a machine of the class described, means for continuously feeding a continuous strip of material, a shears for severing the strip into sections of equal length, driving means, a connection between the shears and the driving means comprising a normally open clutch having a driving member and a driven member, the latter of which is movable toward and from the driving member, means for shifting the driven member into and out of engagement with the driving member, and means for giving the driven member of the clutch a supplemental movement, after each operation of the shears to bring it accurately to the proper position for the next operation.

17. In a machine of the class deserибed, means for continuously feeding a continuous strip of material, a shears for severing the strip into sections of equal length, driving means, a connection between the shears and the driving means comprising a normally open clutch having a driving member and a driven member, the latter of which is movable toward and from the driving member, means for shifting the driven member into and out of engagement with the driving member, pawl and ratchet means for accurately positioning the driven member of the clutch after each operation of the shears.

18. In a machine of the class described, means for continuously feeding a continuous strip of material, a shears for severing the strip into sections of equal length, driving means, a connection between the shears and the driving means comprising a normally open clutch having a driven member and a driving member, the former of which is movable toward and from the driving member, means for shifting the driven member into and out of engagement with the driving member, means for accurately positioning the driven member of the clutch after each operation of the shears, comprising a friction brake, and means for operating the same when the clutch is thrown into open position.

19. In a machine of the class described, means for continuously feeding a continuous strip of material, a shears for severing the strip into sections of equal length, driving means, a connection between the shears and the driving means comprising a normally open clutch having a driving member and a driven member, the latter of which is movable toward and from the driving member, means for shifting the driven member into and out of engagement with the driving member, means for accurately positioning the shiftable member of the clutch after each operation of the shears comprising a friction drum connected thereto, a band coöperating with the drum, and means for simultaneously withdrawing the shiftable member of the clutch for engagement with the driving member, and applying the band to the drum.

20. In a machine of the class described, and in combination with the means for continuously feeding a continuous strip of material, means for shearing said strip at predetermined intervals, comprising a shears, continuously operated driving means, means for intermittently connecting the driving

means to the shears comprising a shaft connected to the shears for operating the same, a clutch mounted on the shaft comprising a driving and a driven member, the latter adjustable longitudinally of the shaft, a spring tending to force the driven member of the clutch into contact with the driving member, a lever normally maintaining the driven member out of contact with the driving member, a latch for normally maintaining the lever with the clutch in open position, a controller for normally maintaining the latch in operative position but permitting it periodically to retreat therefrom, a cam on the shaft adapted to engage the lever to restore it to open position against the pressure of the spring, a brake drum mounted on the shaft, a brake band engaging the drum, and means operated by the cam which operates the lever for at the same time operating the brake band to cause it to engage the disk.

21. In a machine of the class described, and in combination with the means for continuously feeding a continuous strip of material, means for shearing said strip at predetermined intervals comprising a shears, continuously operated driving means, means for intermittently connecting the driving means to the shears comprising a shaft connected to the shears for operating the same, a clutch mounted on the shaft comprising a driving and a driven member, the latter adjustable longitudinally of the shaft, a spring tending to force the driven member of the clutch into contact with the driving member, a lever normally maintaining the driven member out of contact with the driving member, a latch for normally maintaining the lever with the clutch in open position, a controller for normally maintaining the latch in operative position but permitting it periodically to retreat therefrom, a cam on the shaft adapted to engage the lever to restore it to open position against the pressure of the spring, a brake drum mounted on the shaft, a brake band engaging the drum, a rotary bolt having an arm attached to the brake band, a second arm, a reciprocating bolt connected to said second arm and extending into the path of the lever whereby operation of the lever in opening the clutch will operate the brake band to cause it to engage the drum.

22. In a machine of the class described and in combination with means for continuously feeding a continuous strip of material, a shears for severing the material into predetermined lengths, means for operating the shears comprising a continuously driven shaft and connections therefrom to the shears, comprising a rotary shaft, a clutch mounted thereon consisting of a driving member and a driven member movable upon the shaft toward and from the driving member, means for causing the driven member to engage the driving member at predetermined intervals and to be released therefrom, means for restoring the shaft and driven member of the clutch to a definite postion comprising a ratchet wheel mounted on the shaft and having a discontinuous series of teeth, a ratchet for engaging such teeth, a pawl engaging the ratchet, and means operated from the driving member of the clutch for continuously operating said pawl.

23. In a machine of th class described, means for continuously feeding a continuous strip of material, a shears for severing the strip into predetermined equal lengths, a driving means, a connection between the driving means comprising a shaft, a clutch mounted on the shaft consisting of a driving and a driven member, the latter adjustable toward and from the driving member, means for arresting the shaft and driven member when released from the driving member within a definite arc, and means for restoring the shaft and driven clutch member to a predetermined position when released from the driving clutch member.

24. In a machine of the class described, means for continuously feeding a continuous strip of material, a shears for severing the strip into predetermined equal lengths, a driving means, a connection between the driving means comprising a shaft, a clutch mounted on the shaft consisting of a driving and a driven member, the latter adjustable toward and from the driving member, means for arresting the shaft and driven member when released from the driving member within a definite arc, means for restoring the shaft and driven clutch member to a predetermined position when released from the driving clutch member, comprising a discontinuous ratchet on the shaft, and a pawl driven by the driving member of the clutch coöperating with the ratchet.

25. In a machine of the class described, and in combination with a continuously operating means for feeding a continuous strip of material, a shears for severing the strip of material, a driving means for the shears, normally inoperative connections between the driving means and shears comprising a shaft, a clutch mounted on the shaft consisting of a driving and driven member, a brake for arresting the movement of the driven member and shaft when released from the driving member, a ratchet disk having a discontinuous series of teeth on the periphery thereof, a pawl engaging said teeth to feed the shaft to a predetermined position, a gear mounted on the driving member of the clutch, a pinion driven by

said gear and mounted upon a shaft, a pivoted pawl arm, connections from the last said shaft for driving the pawl arm, and a pawl carried by the pawl arm engaging the ratchet disk.

26. In a machine of the class described, a shears for severing the product into desired lengths, power means for operating the shears, a clutch intermediate said power means and shears and comprising a driving and a driven member, means for stopping the driven member after it is freed from the driving member short of a predetermined position and supplemental means for slowly feeding the driven clutch member forward into said predetermined position.

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