Sept. 17, 1929. A. L. SCHULTZ 1,728,369

CONTROL MECHANISM FOR EMBOSSING MACHINES

Filed Sept. 10, 1927 4 Sheets-Sheet 1

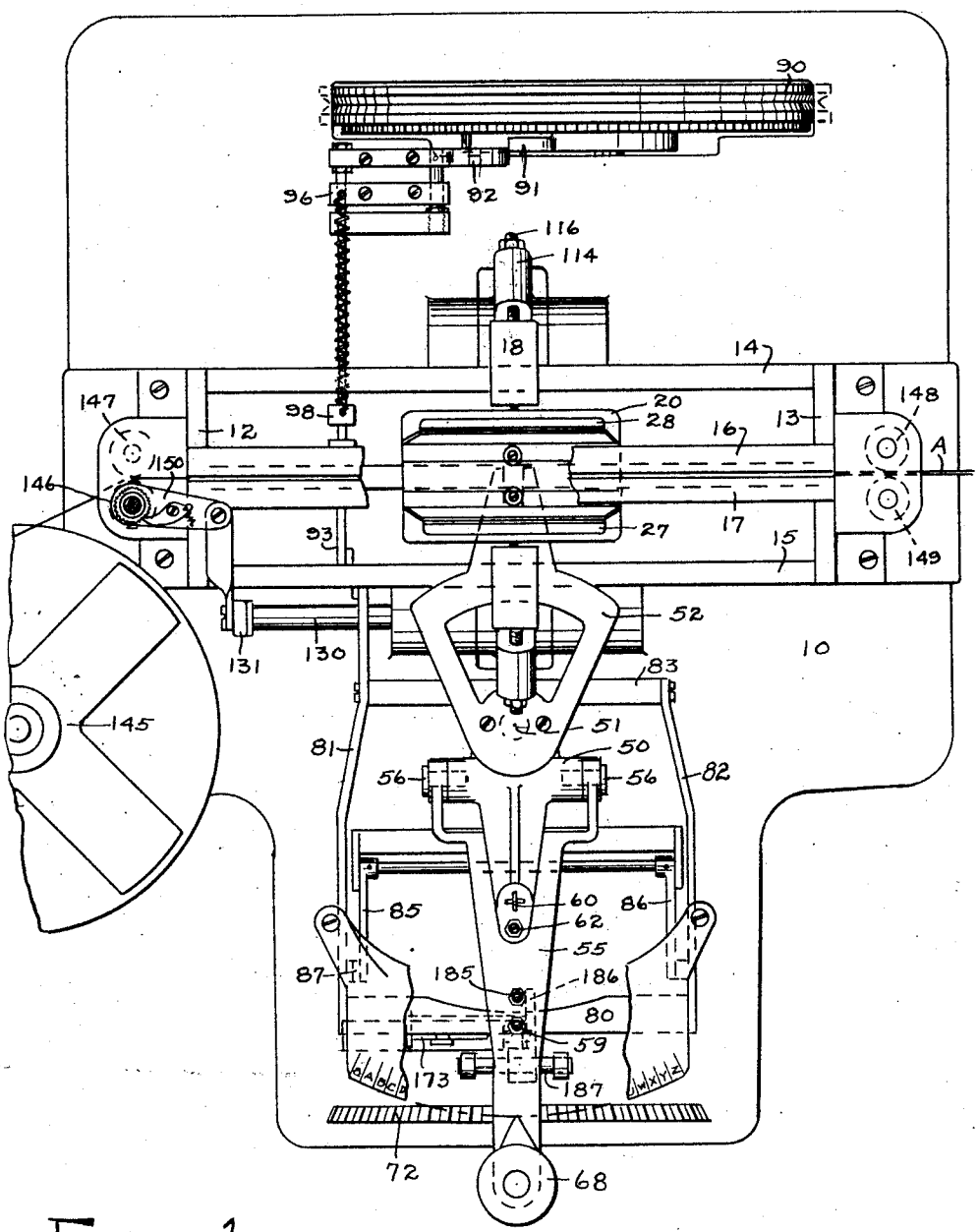


FIG.- 1

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CONTROL MECHANISM FOR EMBOSSING MACHINES

Filed Sept. 10, 1927 4 Sheets-Sheet 2

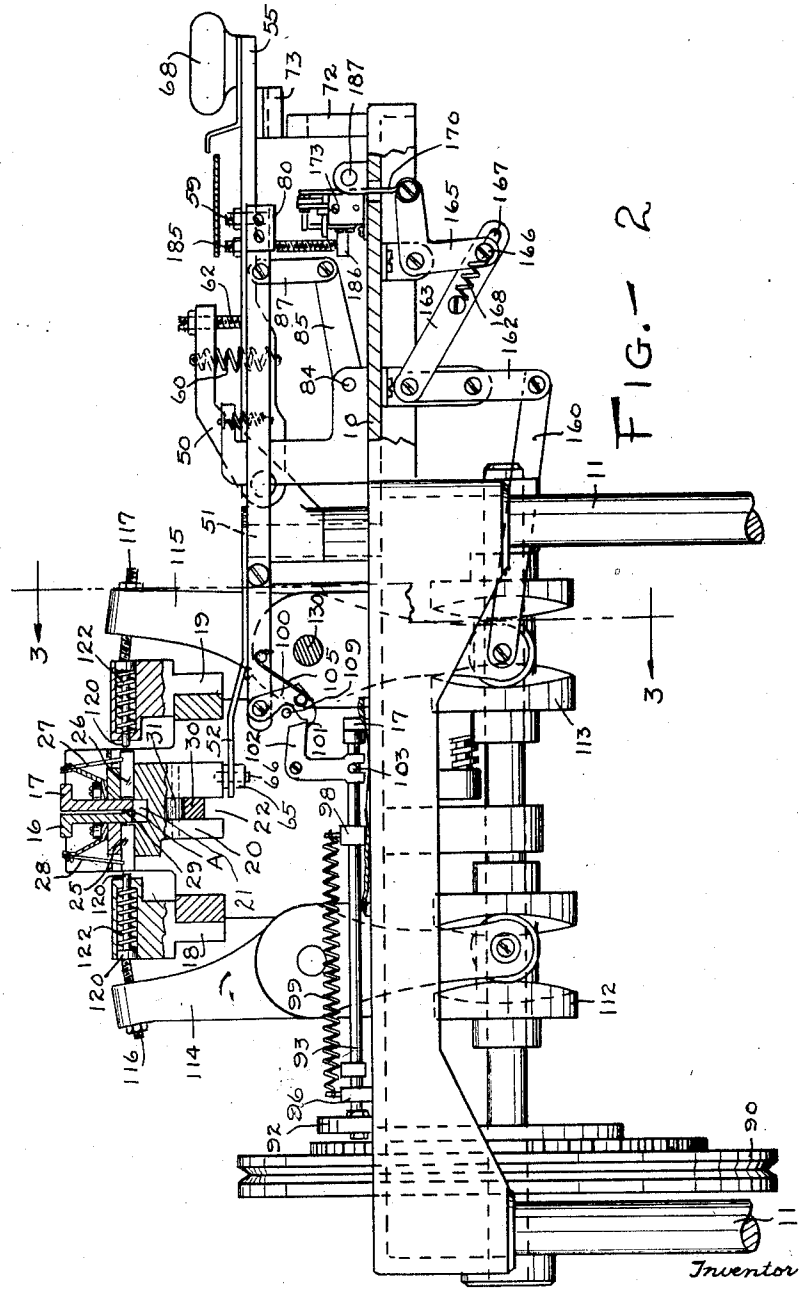


FIG. 2

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CONTROL MECHANISM FOR EMBOSSING MACHINES

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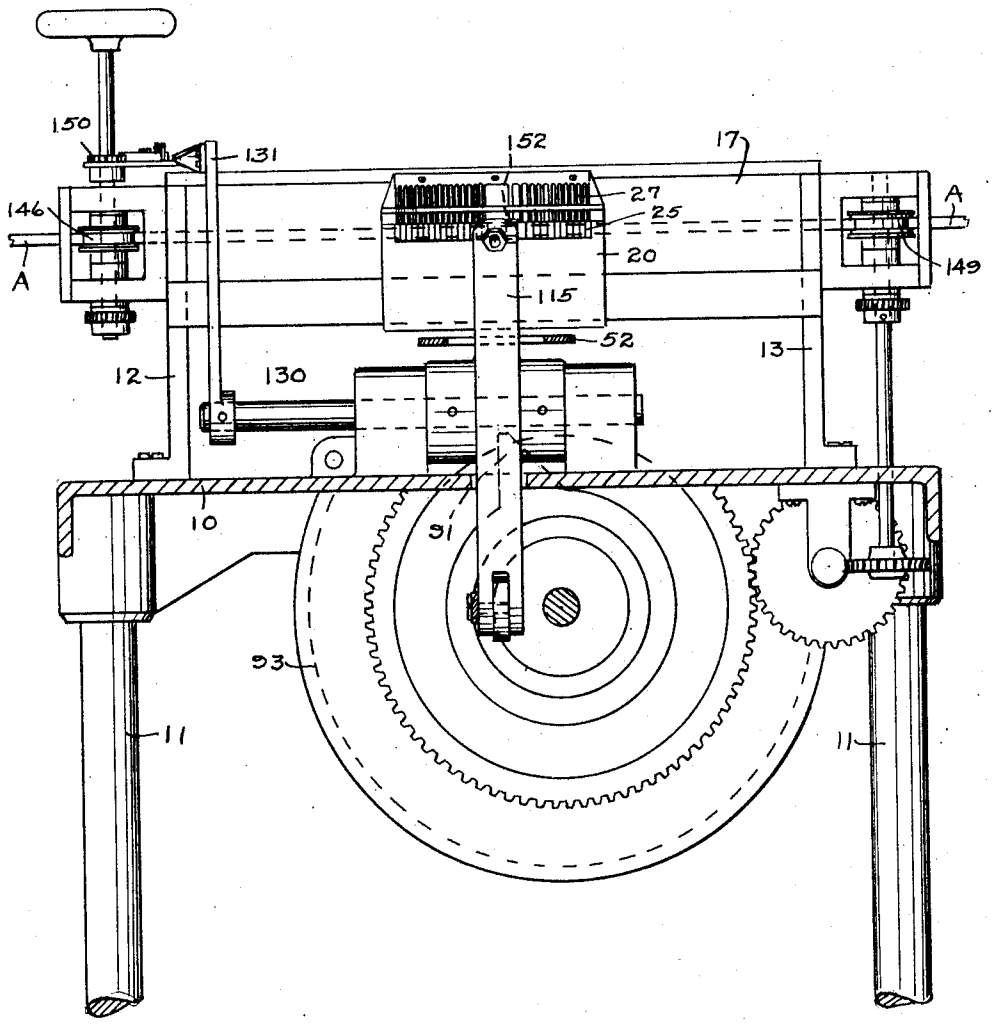


FIG.- 3

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CONTROL MECHANISM FOR EMBOSSING MACHINES

Filed Sept. 10, 1927 4 Sheets-Sheet 4

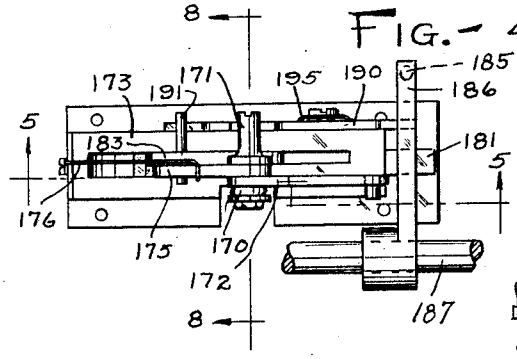


FIG.- 4

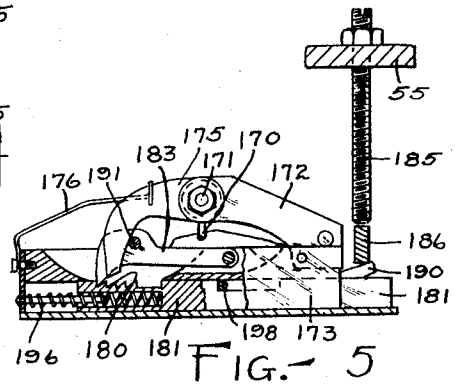


FIG.- 5

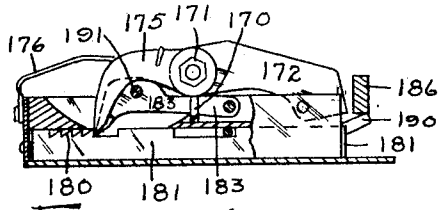


FIG.- 6

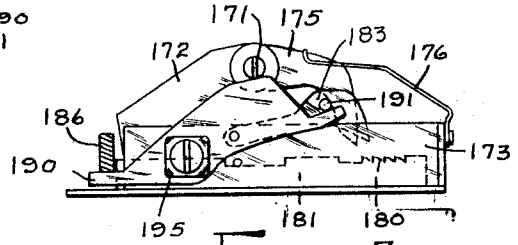


FIG.- 7

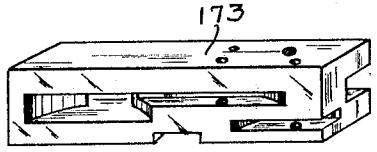


FIG.- 9

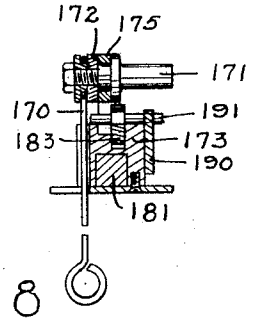


FIG.- 8

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UNITED STATES PATENT OFFICE

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CONTROL MECHANISM FOR EMBOSSING MACHINES

Application filed September 10, 1927. Serial No. 218,828.

Patent No. 1,557,754, granted October 20, 1925, to my assignee, The American Multigraph Company, as assignee of Clifton Chisholm, shows an embossing machine having a reciprocatory die head carrying male and female embossing dies, the desired characters of which are selected by positioning the die head, and are then moved together to impress an interposed ribbon of material. Following the impression the ribbon is fed the width of one die, or the same distance for a space. That patent shows also a pair of shearing dies carried by the die head, which operate to cut off the strip following the embossing of a line, which cut-off portion is then inwardly bent at its edges and delivered for mounting a form.

It has been found that unless the cut-off strip has a length at least equal to the width of several characters there is liable to be trouble in shearing it and in subsequently bending its edges and delivering it. Accordingly, the operators of the machines are instructed, that after the shearing dies have been once operated, they must not be again operated until there has been a feed of the ribbon of at least four embossed characters or spaces.

The object of my invention is to provide a very simple mechanism to insure the operator carrying out such instructions; in other words, to prevent a second actuation of the shearing dies until there have been a pre-determined number of actuations of a character die or space feed.

My invention is herein illustrated in connection with an embossing machine shown in an application No. 218,803 filed September 10th, 1927, by Clifton Chisholm, and showing a somewhat simpler form of embossing machine than that shown in the patent mentioned. However, my invention is equally applicable to either form of embossing machine, as well as to machines of very different form.

In the drawings, Fig. 1 is a plan, partly broken away, of an embossing machine, equipped with my control mechanism; Fig. 2 is a side elevation of the same partly broken away; Fig. 3 is a vertical transverse section of such machine on the offset line 3—3 on Fig. 2;—the remaining figures are details of the control mechanisms, per se, Fig. 4 being a plan; Fig. 5 a vertical section on the off-set plane 5—5 on Fig. 4; Fig. 6 a vertical section on the same plane, but in different position; Fig. 7 a side elevation looking from the opposite direction; Fig. 8 a vertical cross section on the line 8—8 on Fig. 4; and Fig. 9 a perspective of the frame of this mechanism.

I will first describe the embossing machine shown in Figs. 1, 2 and 3, so far as the same may be necessary to a complete understanding of the control mechanism.

The frame of the embossing machine shown consists primarily of a horizontal bed plate 10 mounted on suitable legs 11 and having various standards, brackets, and ears hereinafter described. Two of such frame standards 12 and 13 comprise plates rising from opposite sides of the bed plate and connected by cross bars 14, 15, 16 and 17. The bars 14 and 15 support stationary housings 18 and 19 for the embossing plungers 120 hereinafter described. The bars 16 and 17 provide a guideway for the ribbon A to be embossed.

The reciprocable die head, designated 20, comprises a block bifurcated above and below; that is to say, that in the upper surface is a groove 21 enabling the block to embrace the opposite sides of the lower portion of the bars 16 and 17, and in the under side of this die head is the groove 22 whereby the block may straddle a supporting bar 30, an interposed roller 31 being shown.

The die head carries a row of die blocks 25 having on the forward end (right hand end, Fig. 2) male dies, and a row of blocks 26 having on their rear ends corresponding female dies. The teeth of comb springs 27 and 28 carried by the die head tend to keep these blocks apart, but at the proper time of operation the plungers 120 force that pair of dies, which are centrally positioned, toward each other to emboss the interposed metal strip A. This strip in this region is channel-shaped and is guided on a rib 29 on the lower portion of the cross bar 16. Both cross bars are cut away in the central region of the

machine to allow the die blocks to be plunged toward each other.

The drawings show a manual lever for shifting the die head horizontally along its supporting bar 30 to select the dies. This lever is a compound device comprising first, a lever arm 50 on a vertical stationary pivot pin 51 rising from the frame; second, a rearward extension of this lever arm in the form of a plate 52 rigidly secured to the upper end of the hub of the arm, and loosely extending around the corresponding embossing lever 115 (hereinafter described) and its rear end slidably connected with the die head; third, a forwardly extending arm 55 pivoted to the arm 50 on horizontal pivots 56; and, fourth, a spring 60, anchored to the arms 50 and 55 and lifting the latter against an adjustable abutment screw 62, carried by the arm 50.

The compound lever just described is swung manually horizontally as a unit about the vertical pivot pin 51. The rear end of the extension 52 is bifurcated and slidably embraces a flat sided block 65 rotatively mounted on a pin 66 depending from the die head. The forward end of the arm 55 carries a hand knob 68. Accordingly when this hand knob is grasped by the operator and the lever swung in one direction from another, the die head is moved along the bar 30 to bring the desired pair of dies between the plungers 120. In the patent mentioned a similar result is accomplished by a keyboard, a pair of solenoids and linkage mechanism for moving the die head.

When the die head has been brought into the desired position by the lateral movement described, the next operation in the embodiment here shown is a downward movement of the knob, which locks the lever and die head in position and initiates the embossing operation. To effect the locking, there is provided across the machine beneath the lever arm 55 a stationary comb 72 having upwardly facing notches with beveled entrances, and on the under side of the lever 55 a beveled-edged blade 73 to coact with these notches.

I will now describe the embossing mechanism per se, which is initiated by the downward movement of the knob 68, or in the patent, automatically by reason of the die head coming to position.

Extending transversely of the machine, beneath an adjusting screw 59 on the arm 55 of the compound lever is a universal bar 80 secured to the forward ends of a pair of arms 81 and 82 pivoted in axial alignment to a bracket 83. The arms 81 and 82 are connected also by a rock shaft 84 by means of arms 85 and 86 connected by links 87 to the arms first mentioned. The arm 81 extends also rearwardly of its pivot and operates to release a single rotation clutch to cause an operation of the embossing mechanism.

The single rotation clutch may be of any approved form. It is illustrated in Fig. 1 as embodied in a main belt pulley 90. The clutch has a shoulder 91 normally engaging a slidable abutment 92 which normally holds the clutch open. When this abutment is drawn forwardly by its rod 93 to clear the shoulder 91, the clutch goes into action and makes a single rotation. At the conclusion of the rotation if the abutment has returned to position, the shoulder 91 strikes this abutment and terminates the rotation. This is a usual method of operation of single rotation clutches and it is not deemed necessary to explain it in detail, as any single rotation clutch may be employed, for instance, the clutch shown in the prior patent mentioned.

The rod 93 extends forwardly and near its forward end is guided in a bracket 97 rising from the bed plate. Secured to the rod 93 is a collar 98 forming an anchorage for the forward end of a tension spring 99, the rear end of this spring being connected to the stationary bracket 96. The spring thus tends to return the abutment 92 into position in the path of the clutch shoulder 91.

Pivotally connected to the trip lever 81, is a dog 100. This dog has a shoulder 101 normally beneath the horizontal arm of a bell crank 102 pivoted to a stationary bracket of the machine. The lower end of this bell crank is bifurcated and engages a pin 103 projecting from the rod 93. A spring 105 anchored to the lever 81 and bearing on the dog keeps the dog shoulder normally in the position shown in Fig. 2. The continued upward movement of the rear end of the arm 81 causes an inclined edge of the dog 100 to engage a stationary pin 109, and this releases the clutch rod 93 so that it returns to position.

When the clutch has been released, as above described, its operation is to give a single rotation to the cam shaft 110. On this shaft are a pair of grooved cams 112 and 113 which coact with the lower ends of a pair of levers 114 and 115. Each lever carries near its upper end an adjustable abutment pin 116 and 117 which is designed to coact with the corresponding plunger 120, heretofore referred to in the housings 18 and 19. The plungers are normally held back from the die head by springs 122 within the housings. When the die head has been positioned the selected dies are directly between the inner ends of the two plungers, and, accordingly the operation of the cams 112 and 113 rocking inwardly the upper ends of the embossing levers, cause these plungers to shove the dies 25 and 26 toward each other, thus embossing the interposed strip A.

During the second half of the rotation of the cams 112 and 113, the embossing levers are rocked in the opposite direction to their embossing movements 123 and the springs

122 withdraw the plungers, and the comb springs 27 and 28 withdraw the dies. Thereupon the operation stops, ready for a succeeding actuation.

The ribbon of material A is fed from a supply thereof, on a reel 145, along a path transversely of the machine, where it is first flanged at its edges, then embossed, cut off, the flanges bent inwardly, and the completed strip finally delivered. The ribbon passes first between a pair of rolls 146 and 147 which not only feed but flange the edges of it so that it becomes channel-shaped, whereby it is guided by the rib 29 on the cross-bar 16. The ribbon is delivered by a pair of rolls 148 and 149 which bend in the edges of the channel-shaped strip so that it is suitable for mounting over the projections of a holder.

The mechanisms for effecting the ribbon feed is substantially the same as that shown in the patent mentioned and need not here be more fully described further than to say that the roller 147 is connected by a ratchet mechanism 150 with the arm 131 on the rock shaft 130 on which the embossing lever 115 is mounted, so that on the back stroke of the embossing lever, the ribbon is fed forwardly a distance corresponding to one character. The discharging rollers 148 and 149 are continuously rotated by being suitably geared with the main pulley, and operate to bend in the flanged edges and discharge the cut-off strip whenever it is shoved into the bite of these rollers.

The shearing of the embossed portion of the strip from the following portion is effected by a pair of shearing dies 152 in the die head, controlled by the operation of the knob 68 in a particular position. That is to say, when the lateral movement of this knob has brought the dies 152 between the plungers 120, then the downward movement of the knob causes the operation already described of the embossing mechanism to effect the shearing similarly to the operation of an ordinary character die.

The mechanism so far described is not my invention, but it has been necessary to set it out somewhat fully in order that my invention may be understood, as the mechanism of my invention connects directly with both the manual lever and the embossing mechanism of the machine. My mechanism will now be described in detail.

As shown in Fig. 2, a link 160 connects the lower end of the embossing arm 115 to the lower end of an intermediately pivoted lever 162. The upper end of this lever is connected by a link 163 to the lower end of a bell crank 165. To prevent jambing the connection involves loose play in one direction, the bell crank carrying a pin 166 occupying a slot 167 in the link, and a spring 168 tending to maintain the pin at the rear end of the slot. Raising from the forward arm of the bell crank 165 is a link 170. The upper end of this link is connected to a pin 171 which is rigidly mounted in an arm 172, the other end of which is pivoted to a stationary block 173 which forms the frame of the control mechanism being described. Pivoted on the pin 171 is a pawl 175 which is pressed downwardly by a spring 176. The nose of this pawl coacts with ratchet teeth 180 on a sliding bar 181, four teeth being shown. The gain made by the pawl 175 retained by a detent pawl 183.

It results from the mechanism described that every time the embossing lever 115 is swung, the bar 181 is fed into the housing provided by the block 173 until it is substantially within it and the ratchet teeth 180 have been cleared by the pawl, as shown in Fig. 6. Mounted on the arm 55 (Figs. 1, 2 and 5) of the manual operating lever is an adjustable stud 185 which stands over a lever 186 mounted on an idle rock shaft 187. The lever 186 extends across a lever 190 pivoted to the block 173, and rests on it. The other end of the lever 190 lies beneath the pivot pin 171 and the pin 191 carried by the detent pawl 183, and projecting beneath the feed pawl 175. The lever 186 mentioned lies close to the right hand end of the housing 173 and thus stands over the block 181, or clears it, according to the position of this block.

The operation of the mechanism just described is as follows: After the metal ribbon has been fed four spaces by the four successive operations of the embossing arm 115 (either in embossing characters or simply feeding) the locking bar 181 has thereby been withdrawn from beneath the lever 186, as shown in Fig. 6. Any time thereafter the manual lever 55 may operate the shearing dies to shear off the strip, but in such operation the manual lever to position the shear dies must bring the pin 185 over the lever 186, and thus this lever must be depressed when the shearing takes effect. This depression lowers the right hand end of the lever 190, which raises the detent pawl 183 and with it the feeding pawl 175, and thus frees the bar. A spring washer 195 bearing on this lever retains it in its swung position, while the spring 196 forces the block 181 toward the right bringing it against the side of the depressed lever 186.

The depression of the lever 55, through the universal bar 80 and the mechanism heretofore described, releases the clutch and causes the embossing arms to operate the shearing dies. The first part of the active stroke of the embossing lever 115 pushes on the link 160 and by the linkage 162, 163, 165 and 170 pulls down the pin 171 and thus restores the lever 190. This raises the lever 186 free from the block 181, and the latter is then forced by the spring 196 beneath the

lever 186, the outward movement of the bar being stopped by a pin 198.

It will be seen accordingly that immediately on the return of the lever 186 following the actuation of the shearing dies the block 181 comes into the position shown in Fig. 5, and prevents any effective downward movement of the lever 186, so that subsequent action of the shearing dies is not possible until the block 181 is withdrawn.

The downward movement of the pivot pin 171 by the shearing stroke, as above described, also restores the feeding and detent pawls 175 and 183, after the lever 186 has released the block 181, so that the next actuation of embossing a character or of feeding a space when it pulls down on the pivot pin 171, operates the feeding and thereby draws the block 181 into the housing a distance of one tooth. In the embodiment shown four of such actuations, feeding the block four teeth toward the left, are required to entirely withdraw this block, and again enable the shear dies to be operated. The result is that the strip cut off must have a length at least equal to the sum of the widths of four characters, and is thus long enough to be easily handled by the bending and delivery mechanisms.

While the control mechanism is shown as coupled with the manual initiating lever, the same mechanism may be employed with the key board machine, shown in the patent referred to. In that case, the connection with the embossing lever which will be the same as shown herein, while in place of operating the lever 186 by the manual arm it would be operated simply by the shear key which initiates the shearing dies. It will also be understood that the connection to the embossing mechanism need not be directly to one of the embossing levers, so long as the connection is to a part which is operated once for each feed of the ribbon. Thus, the same control mechanism, or one employing the same principles, may be readily associated with a machine of quite different type from that illustrated.

I claim:

1. The combination of mechanism for performing two kinds of operations on a blank, mechanism actuated by the performance of one kind of operation for interposing an abutment preventing a recurrence thereof, said abutment having ratchet teeth, a pawl coacting therewith, and an operating connection between the pawl and the mechanism first mentioned, whereby a plurality of operations of the latter withdraw the abutment.

2. In a machine of the character described, the combination of means for feeding material to be acted upon one step for each cycle of usual operation, means for performing an occasional operation on said material, mechanism actuated by one instance of said occasional operation to prevent a recurrence thereof, and means whereby a plurality of successive instances of said usual operation withdraws said preventing means.

3. The combination with embossing mechanism, and shearing mechanism, of mechanism for actuating the mechanisms mentioned, and means whereby the actuation of the shearing mechanism prevents a subsequent actuation thereof until after a predetermined number of operations of the embossing mechanism.

4. The combination of embossing mechanism, mechanism for feeding a ribbon of material embossed consequent upon the operation of the embossing mechanism, mechanism for shearing said ribbon, mechanism for actuating the mechanisms mentioned, and means whereby the actuation of the shearing mechanism prevents a subsequent actuation thereof until after a predetermined number of operations of the embossing mechanism.

5. The combination, in an embossing machine, of character embossing dies, shearing dies, manually controlled means for selecting the dies required, mechanism for moving the selected dies toward each other, to emboss or shear, mechanism for feeding step by step the material acted on, mechanism for preventing a succession of operations of the shearing dies without a plurality of intermediate operations of the feeding mechanisms.

6. The combination, in an embossing machine, of a movable die head, character embossing dies, and shearing dies carried by said die head, means for controlling the position of the die head to select the die required, embossing mechanism for moving the selected dies toward each other, and mechanism for preventing a succession of operations of the shearing dies without intermediate operations of the embossing mechanism with the die head in some other position than that of shearing.

7. In an embossing machine, the conbination with embossing mechanism and shearing mechanism, of a device under the joint control of the shearing mechanism and the embossing mechanism, said control device upon one actuation of the shearing mechanism interposing an abutment against subsequent actuations thereof, and means whereby operations of the embossing mechanism gradually withdraws said abutment.

8. In an embossing machine, the combination with embossing dies, shearing dies, mechanism for actuating the same, a member necessarily moved when the shearing dies are actuated, an abutment in the path of said member, a moving pawl and a retaining pawl acting on said abutment, and a connection between the moving pawl and means operating once for each character embossed.

9. In a machine of the character described, the combination of a slidable block provided with ratchet teeth, a feeding pawl and a retaining pawl acting on said ratchet teeth,

ribbon feeding mechanism connected with the feeding pawl, whereby the block is gradually withdrawn one tooth at a time for each corresponding feed of the ribbon, and shearing mechanism for said ribbon, said block constituting an abutment against operation of the shearing mechanism until removed by the complete withdrawal of said block.

10. In an embossing machine, the combination of a die head carrying character dies and a shearing die, a plunger for operating either sort of dies, manual actuating means for positioning the die head to select a character die or the shearing die as desired, embossing mechanism for operating the plunger to cause the character dies or shearing dies to act on material, means for feeding the material consequent upon the operation of said embossing mechanism, an abutment against initiating the operation of the shearing die, said abutment being normally in idle position but thrown into active positon consequent upon one actuation of the shearing mechanism, and mechanism connected with the embossing mechanism and feeding mechanism for gradually withdrawing said abutment, whereby several successive actuations of the embossing or feeding mechanisms are necessary before a subsequent actuation of the shearing mechanism may be performed.

11. In a device of the character described, the combination of a frame, a sliding block mounted therein and having ratchet teeth, a feeding pawl and a detent pawl coacting with the ratchet teeth, a restoring lever adapted to withdraw both pawls, mechanism adapted to operate the restoring lever and release the block, said block then traveling into the path of the said mechanism and preventing a second stroke thereof, another mechanism operated by the machine, and a connection between the same and said feed pawl, whereby the latter is moved once for each cycle of the machine, several cycles being required to withdraw the block sufficiently to permit the operation of the first mentioned mechanism.

12. In a machine of the character described, the combination of an embossing mechanism, ribbon feeding mechanism, shearing mechanism, manually controlled mechanisms for operating any of said mechanisms as desired, a movable block having ratchet teeth, a feeding pawl and a detent pawl coacting with the ratchet teeth, a restoring lever adapted to withdraw both pawls, the means for initiating the shearing mechanism being adapted to operate the restroing lever and release the block, a spring for then forcing said block into the path of the said initiating means and preventing a second stroke thereof, a connection between one of the first two mechanisms mentioned and said feeding pawl, whereby the latter is moved once for each cycle of the machine to gradually withdraw the block and thus eventually permit a subsequent operation of the shearing mechanism.

13. In a machine of the class described, mechanism for performing a succession of usual operations in successive positions on a blank, mechanism for performing a manually initiated occasional operation thereon to change the physical characteristic of the blank, and mechanism governed by a predetermined number of such usual operations for preventing an occasional operation taking place prematurely.

In testimony whereof, I hereunto affix my signature.

AUGUST L. SCHULTZ.