H. W. MULLER.

BLANK FEEDING MACHINE.

APPLICATION FILED MAR. 5, 1921.

1,413,181.

Patented Apr. 18, 1922.

5 SHEETS—SHEET 1.

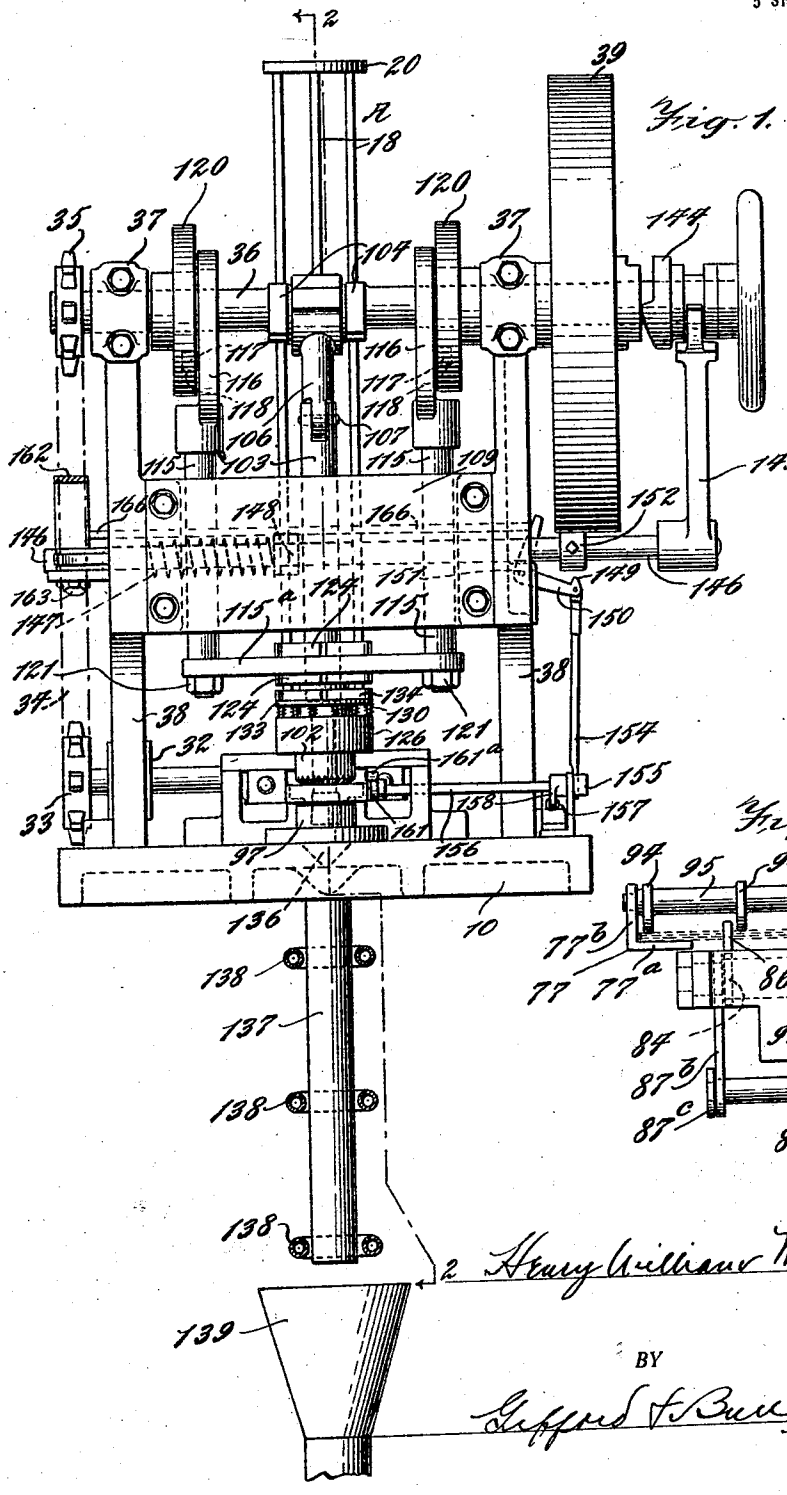


Fig. 1.

Fig. 8.

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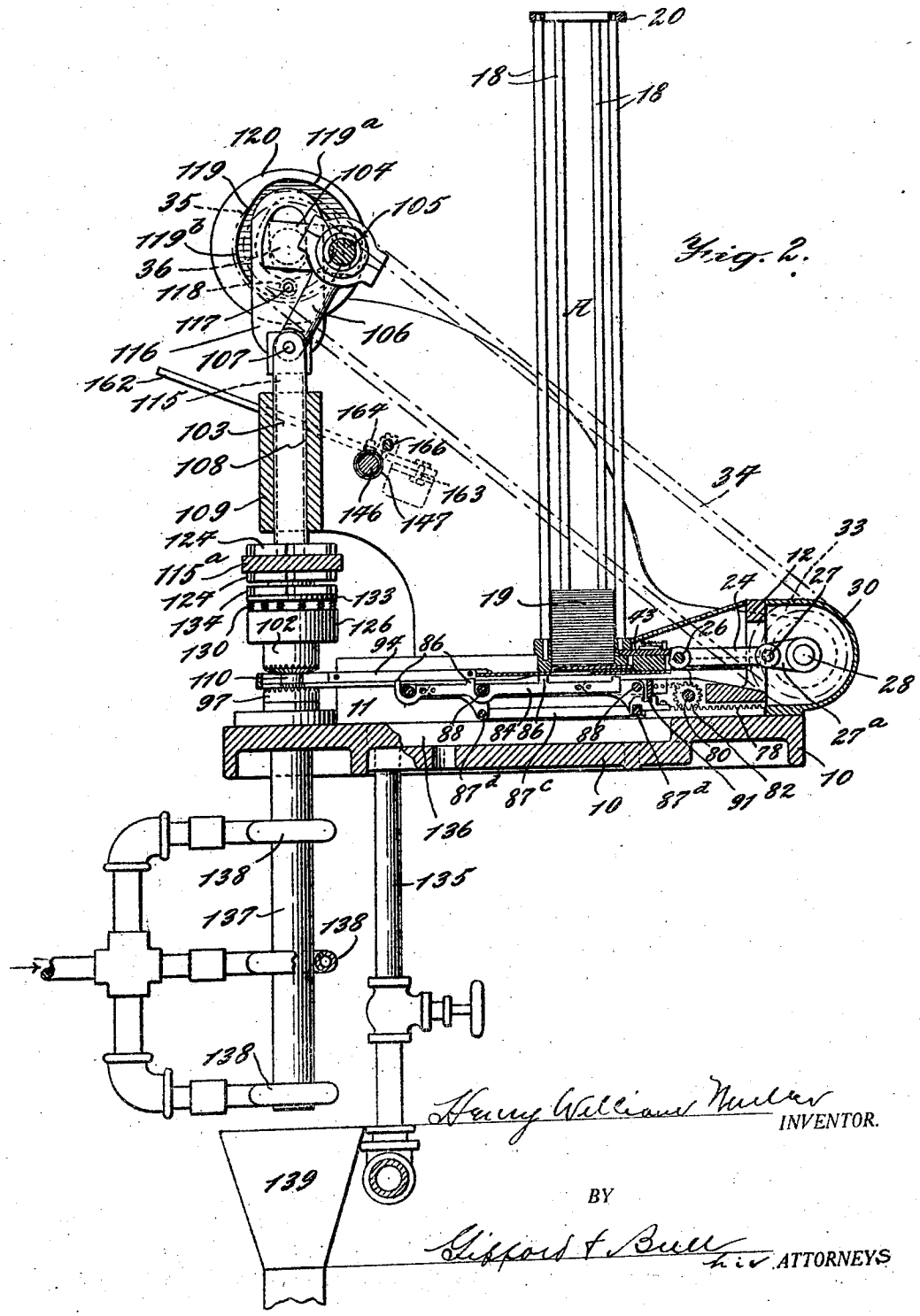


Fig. 2.

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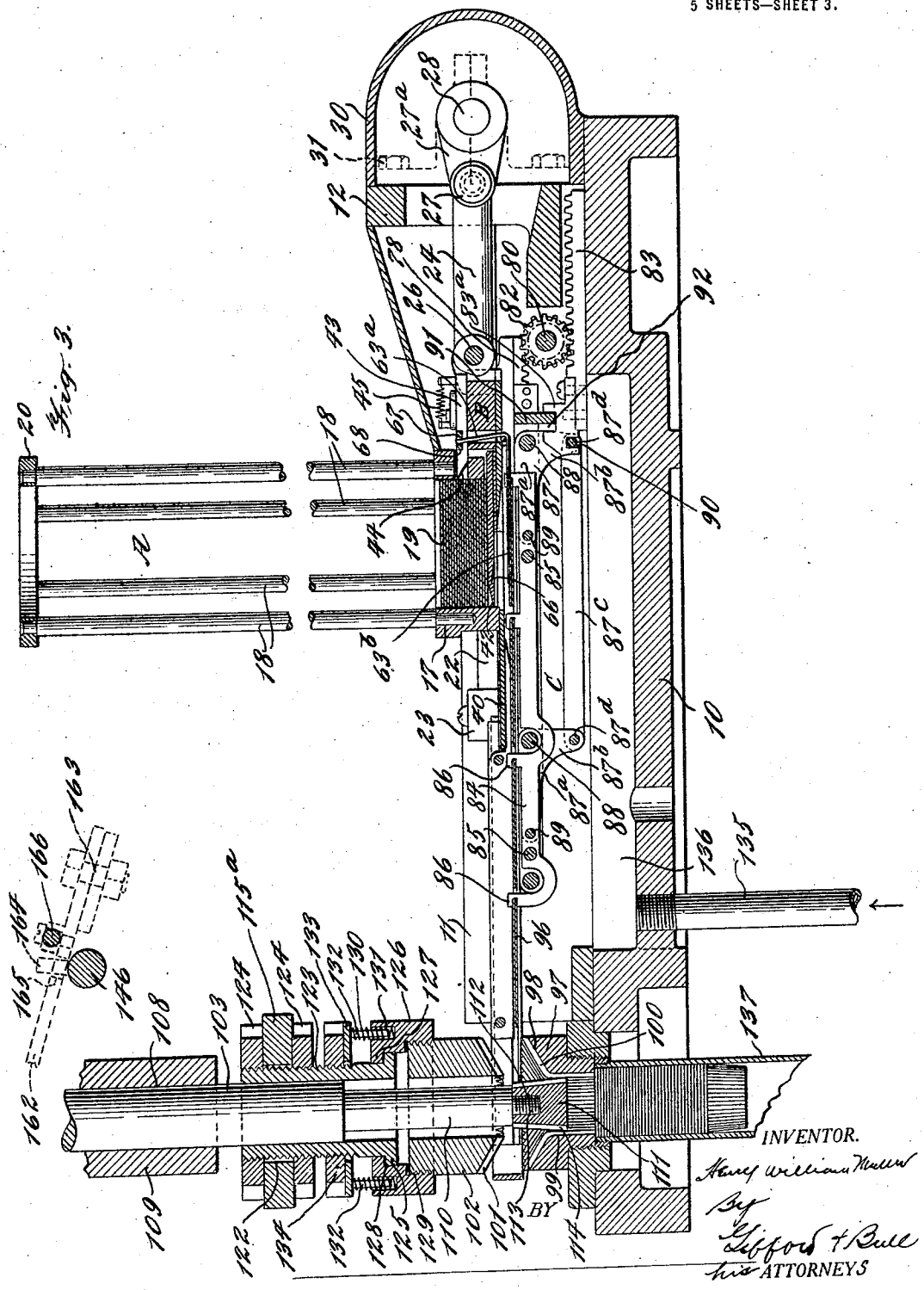
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5 SHEETS—SHEET 3.

Fig. 3.



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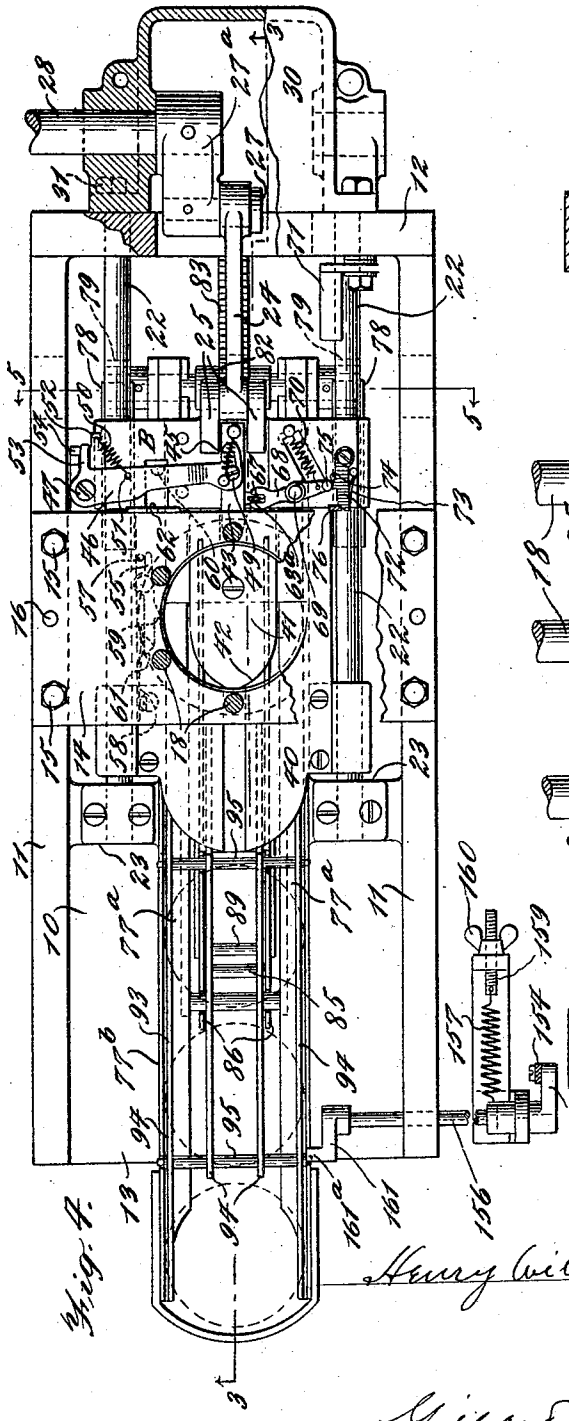


Fig. 4.

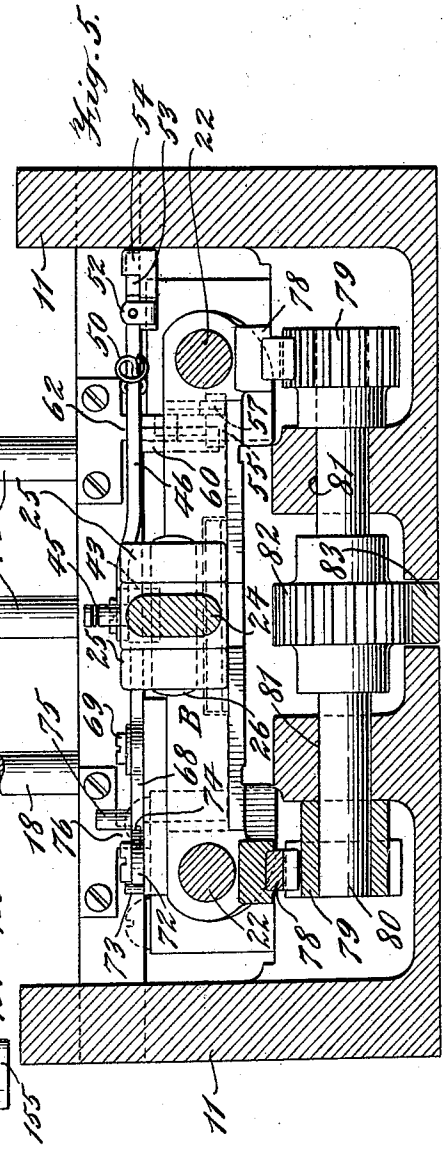


Fig. 5.

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5 SHEETS—SHEET 5.

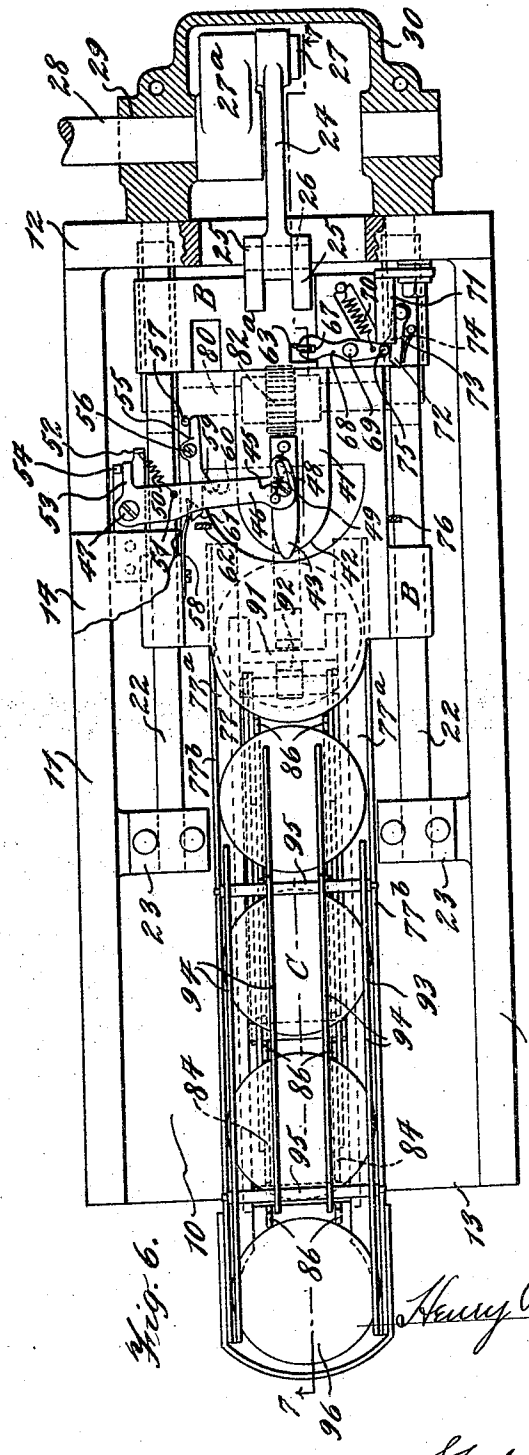


Fig. 6.

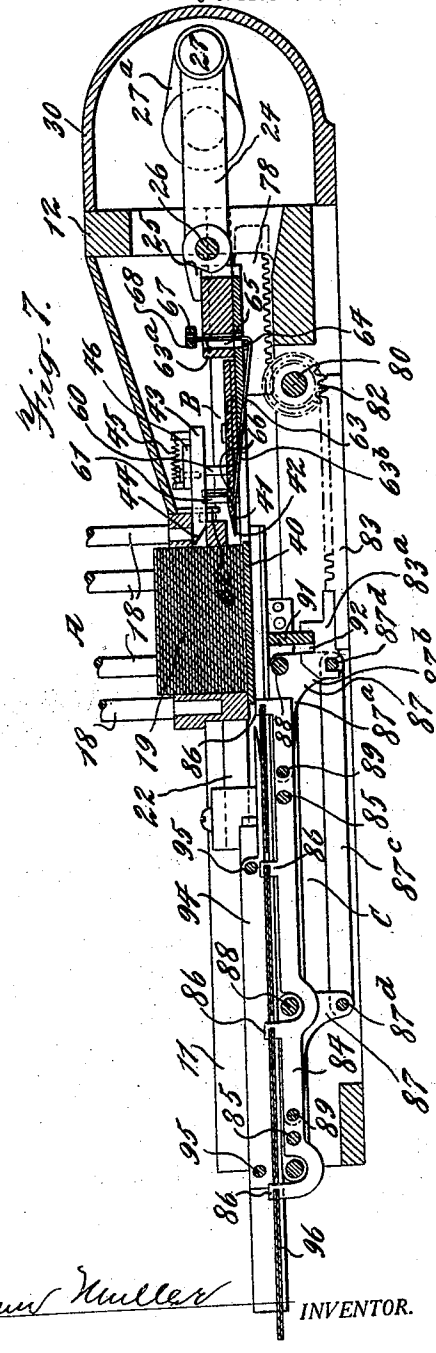


Fig. 7.

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BY

Clifford & Burch ATTORNEYS

UNITED STATES PATENT OFFICE.

HENRY WILLIAM MULLER, OF RIDGEWOOD, NEW YORK, ASSIGNOR TO MULLER PAPER GOODS CO., INC., A CORPORATION OF NEW YORK.

BLANK-FEEDING MACHINE.

1,413,181. Specification of Letters Patent. **Patented Apr. 18, 1922.**

Application filed March 5, 1921. Serial No. 449,664.

To all whom it may concern:

Be it known that I, HENRY WILLIAM MULLER, a citizen of the United States, residing at Ridgewood, in the county of Queens and State of New York, have invented certain new and useful Improvements in a Blank-Feeding Machine.

My invention more particularly relates to a machine for forming cups from paper or like material.

My invention consists in the improvements to be more fully described hereinafter, and the novelty of which will be particularly pointed out and distinctly claimed.

My invention will best be understood by reference to the accompanying drawings, in which I have illustrated the preferred embodiment of my invention, and in which—

Figure 1 is an end view of a cup-forming machine embodying my invention;

Figure 2 is a longitudinal section thereof taken along the line 2—2 of Fig. 1, and partially broken away to illustrate the construction of one of the burners for the heating device;

Figure 3 is a longitudinal section taken along the line 3—3 of Fig. 4;

Figure 4 is a plan view, partially broken away and showing the guide rods of the magazine in section;

Figure 5 is a section taken on the line 5—5 of Fig. 4 looking in the direction of the arrows;

Figure 6 is a plan view, with the magazine and its supporting blade mostly broken away to illustrate the parts beneath the same, and illustrating the carriage in a different position from that indicated in Fig. 4;

Figure 7 is a central longitudinal section taken along the line 7—7 of Fig. 6, and

Figure 8 is an end view of the conveyor.

Like reference characters indicate like parts throughout the drawings.

Referring, now, to the drawings, 10 is a bed-frame on which the machine is supported, and which may, in turn, be mounted on a table or other convenient support. The bed-frame is preferably provided with upwardly extending side flanges 11, as best shown in Fig. 5, and with an end flange 12 at one end thereof, the opposite end of the bed-frame being open, as at 13, as indicated in Fig. 4.

I have indicated, in general, at A the magazine for containing the blank discs from which crimped cups or other articles are formed. The magazine preferably comprises a base plate 14 (see Fig. 4), which may conveniently be secured to the side flanges 11 by screws 15, and may be accurately held in position by dowel-pins 16. The plate 14 is provided with a plurality of openings 17, in which are received the lower ends of upwardly extending spaced guide bars 18 concentrically arranged about a common center and forming guides for a pile of blank discs 19. I have illustrated my invention in connection with a machine for making crimped cups for use in packing candy and similar articles, for use as ice cream containers, and for other similar uses. When so used, the blanks are usually formed of plain paper discs prepared in any desirable manner, though it will, of course, be understood that the discs are not necessarily circular, as shown, or formed of paper. The tops of the bars are preferably received in openings formed in a top ring 20, which keeps the bars properly spaced.

In accordance with my invention, means are provided for separating from the pile of discs any desired number thereof, and conveying them forwardly to the stamping device. In the embodiment here shown, the means for separating a predetermined number of discs from the pile comprise a reciprocatory carriage, indicated, in general, at B, mounted to slide on two guide bars 22, one at either side of the base plate, which are supported at one end in the end flange 12 of the bed-frame and at the other in lugs 23 on the bed-frame. The carriage is reciprocated by a connecting-rod 24, one end of which is received between lugs 25 on the carriage and pivoted thereto by a pin 26. The opposite end of the connecting-rod is journalled on a crank-pin 27 on a crank-arm 27^a, which is mounted on a crank-shaft 28 having one of its bearings at 29 in one side of a casing 30, which may be bolted to the bed-frame, as at 31 (see Figs. 3 and 4), the opposite end of the shaft having its bearing in a journal-box 32, the casing serving as a housing for the crank-arm and associated parts. The crank-shaft 28 may be driven by a sprocket 33 (Fig. 1) secured thereon, through a sprocket-chain 34 engaging a sprocket-wheel 35 on the main driving shaft 36, which has its bearings at 37 in standards 38 suitably secured to the bed-

frame. The main driving shaft may be driven by a pulley 39. Mounted on the carriage B is a plate 40, which, with the carriage in the retracted position indicated in Fig. 7, is located beneath the pile of discs and forms a support therefor. Also mounted on the carriage at the rear of the plate 40 is a separating blade 41 provided with a knife-edge at its front end, as at 42, which passes between the discs when the carriage is moved forwardly to separate from the pile a predetermined number of the discs. The paper or other discs of the character here illustrated, are more or less variable in thickness, particularly at their edges, partly because of the irregular burs formed in the punching operation in forming the discs. Such variation in the thickness of the discs would result in the separating device taking from the pile a variable number of discs in the absence of any special provision for insuring a predetermined number of discs always being separated from the pile. This is objectionable, as it is obvious that the subsequent stamping operation to which the discs are subjected would produce a variable and unsatisfactory article. In accordance with my invention, means are provided for compressing the portion of the disc pile beneath the blade, and particularly the edges of the discs, a predetermined amount at the time the separating blade engages therewith. In the preferred embodiment of my invention, this means comprises a blade 43, located above the blade 41 (see Figs. 3 and 7), longitudinally slidable on stationary parts of the machine, and bevelled rearwardly and downwardly at its front end, as at 44, as indicated in Figs. 3 and 7, so that when moved forwardly into engagement with the disc pile, it will compress the discs beneath the same, and more particularly the rear edges of those discs with which the blade 41 subsequently engages. The blade 43 is moved forwardly by means which exert thereon a constant and predetermined force, in order to insure the blade being always forced into the disc pile with constant pressure. This means preferably comprises a spring 45, one end of which is connected to the blade and the other end of which is connected to an arm 46 pivoted at 47 on a stationary part of the machine and provided at its free end with an arcuate slot 48, in which is received a pin 49 extending upwardly from the blade (see Figs. 4 and 6). The arm 46 is normally retracted by a spring 50 connected to the arm, as at 51, and to a stationary part of the machine, as at 52. The arm 46 is provided with a lateral extension 53, which is brought into engagement with a stop 54 by the spring 50. Normally, therefore, the arm 46 and the associated parts are held in the position indicated in Fig. 4 by the spring 50. In order to permit the spring 45 to force the blade 43 into engagement with the disc pile, the arm 46 is rotated clockwise, as viewed in Fig. 6, about its pivot against the action of the spring 50, by means which will now be described. A lever-arm 55, pivoted at 56, is mounted on the carriage, as indicated in Fig. 6, one end of the arm being held in engagement with a stop 57 by a spring 58, also mounted on the carriage. The arm 55 is provided with a detent 59 which engages, when the carriage and the arm 55 are moved forwardly, a lug 60 formed on the under side of the arm 46, as indicated in dotted lines in Fig. 6. As soon as the carriage is moved forwardly, therefore, the detent 59 engages the lug 60 and rotates the arm 46 clockwise, as viewed in Fig. 6, thus permitting the spring 45 to force the blade 43 into engagement with the disc pile, the provision of the slot 48 in the end of the arm 46 permitting free movement of the pin 49 and of the blade. As the force exerted by the spring 45 is constant, it will always force the bevelled edge of the blade into the pile to compress the edges of the discs underneath the same a predetermined amount, the extent to which the blade 43 enters the disc pile being determined by the resistance offered by the discs. The parts are constructed and arranged so that as soon as the edges of the discs are compressed by the blade 43, the separating blade 41 engages the disc pile beneath the blade 43, and since the edges of the discs are always compressed a uniform amount, the separating blade 41 will always enter the disc pile above the same number of discs, which obviously may be one or more, and will result in a uniform number of discs being separated from the pile. Immediately after the engagement of the blade 41 with the disc pile, the compressing blade 43 is released, in order that the latter may not interfere with the subsequent movement of the blade 41 between the discs. For this purpose, the front end of the arm 55 is bevelled, as at 61 (see Fig. 6), and in the early part of the forward movement of said arm, engages a fixed stop 62, which forces the end of the arm 55 in opposition to the spring 58 out of engagement with the lug 60, thereby releasing the arm 46, which is returned to the position indicated in Fig. 6 by spring 50. The engagement of the wall at the end of the slot 48 with the pin 49 on the blade, returns the blade to the position indicated in Fig. 4. The continued movement of the carriage forces the edges of the discs separated from the pile between the blade 41 and the supporting plate 40, it being understood that both move forwardly at the same rate, thus preserving the same small space between the two, as shown in Fig. 7.

In accordance with my invention, means are provided for positively and quickly disengaging the separated discs from the blade 41, in order to overcome any tendency that may exist for the discs to adhere to the blade because of static electricity, atmospheric conditions, or other causes.

The preferred form of separating means comprises a member 63 (see Fig. 7) pivoted at 64, and constituting an elbow-lever, one arm 63^a of which extends upwardly through an opening 65 in the carriage B and the other end 63^b of which is preferably bifurcated (in a manner not shown in the drawings), the bifurcated ends normally being received in recesses 66 formed in the under side of the blade 41, so that they do not interfere with the forward movement of the blade between the discs. The upper end of the arm 63^a is received in a slot 67, as best shown in Fig. 6, formed in one end of a lever 68 pivoted on the carriage at 69. The slotted end of the lever is moved forwardly by a spring 70, one end of which is connected to the opposite end of the lever 68, the other end of the spring being attached to a stationary part. When the carriage is moved to its fully retracted position, as indicated in Fig. 6, the outer end of the lever 68 engages a fixed stop 71, which may conveniently be mounted on the inner end of one of the bolts which secures the casing 30 to the frame. The final movement of the carriage toward its retracted position rotates the lever-arm 68 in opposition to the spring 70, thereby moving the upper end of the lever-arm 63^a to the right, as viewed in Fig. 7, and moving the ends of the finger 63^b into the recesses 66 in the under side of the blade 41. The lever 68 is retained in its retracted position by an arm 72, which is moved toward the lever 68, by a spring 73. The arm 72 is provided with a detent 74 which drops in behind a pin 75 on the end of the arm 68, and thereby retains the arm in the position to which it has been moved by the rearward movement of the carriage. When the carriage is moved to its forward position, the plate 40 moves forwardly from beneath the disc pile out of the way of the separated discs, and the bevelled front end of the arm 72 engages a fixed stop 76, thereby moving the detent 74 out of engagement with the pin 75 and permitting the spring 70 to return the arm 68 to the position indicated in Fig. 4, thereby rotating the member 63 in a direction to lower the finger 63^b, and thereby quickly and effectively move the separated discs downwardly away from the blade 41.

The separated discs are received on guide plates 77, preferably in the form of angle-irons, having inwardly extending horizontal flanges 77^a and vertical flanges 77^b, additional intermediate supporting bar or bars (not shown) preferably being provided between the angle-irons, the whole forming an open-work support for the discs, along which they are moved to the stamping machine by a conveyor that will now be described. The conveyor, which I have indicated, in general, at C, is reciprocated reversely of the carriage B; that is to say, when the carriage is moving forwardly the conveyor is moving rearwardly, and vice versa. Such reverse movement is preferably secured by mechanism comprising two racks 78 mounted on the carriage B, which engage pinions 79 secured on a shaft 80 having its bearings at 81 in the base frame of the machine. On the shaft 80 is also secured an intermediate pinion 82 which engages and reciprocates a rack 83, the forward end of which is secured to the conveyor C, as best shown in Fig. 7, which conveyor, it will be understood, is guided in the frame of the machine. The conveyor comprises two arms 84, one on each side of the center line of the conveyor, connected together by pins or rods 85 and provided with a plurality of upwardly extending lugs or fingers 86, which engage the rear sides of the discs and move them forwardly to the stamping machine. With the parts in the position shown in Fig. 3, the fingers are in engagement with successive layers of discs which have been separated from the pile, and when the carriage is moved rearwardly from the position there indicated, the conveyor obviously will be moved forwardly, and the mechanism is so arranged as to move the discs forward the distance between the center lines of two successive layers of discs. In order, when the conveyor has reached its forward position, to lower the arms 84 sufficiently to bring the fingers 85 out of engagement with the discs and thus permit the arms to be moved rearwardly without disturbing the discs, bell-cranks 87 are pivoted at 88 on the conveyor, one arm 87^a of each of which is pivoted to a cross bar or pin 89 connecting the arms 84, the other arms 87^b of which extend downwardly, the front and rear arms 87^b being connected together by links 87^c, the links being connected by cross pins 87^d, one of which engages a slot 90 in a bracket on the rack-bar 82, as best shown in Fig. 3. In order to cause the initial movement of the rack-bar 83 to raise and lower the arms 84 before the conveyor is moved, a lost-motion connection is provided between the rack-bar 82 and the portion of the conveyor C on which the arms 84 are pivoted, comprising a lug or bracket 91 which extends downwardly from the upper part of the conveyor into a recess 92 of the bracket 83^a on the rack-bar 83 of greater width than the bracket 91; so that on the return movement of the rack-bar 82, the bell-cranks 87 are rocked to move the

arms 84 downwardly before the conveyor proper C is moved. Then when the rear wall of the recess 92 engages the bracket 91, the conveyor is moved bodily. On the forward movement of the rack-bar 83, the arms 84 are first raised and then the conveyor C moved forward bodily, as will be evident. A guide member 93 comprising longitudinally extending bars 94 connected by transverse bars or pins 95, as best shown in Fig. 6, is located above the path of movement of the layers of discs to retain them in position during their movement from the feeding device to the stamping machine.

The final forward movement of the conveyor C brings the last layer 96 of discs to a position above the stationary female die 97 of the stamping machine. This die is preferably formed with a conical portion 98 which merges into a cylindrical portion 99, both the conical portion and the cylindrical portion preferably being provided with corrugations 100, which are engaged by corresponding corrugations 101 formed on the male die 102. The stamping device also comprises a plunger 103 passing centrally through the movable die 102 and reciprocated up and down by a center crank comprising crank-arms 104 on the drive shaft 36 connected by a crank-pin 105, on which is journalled the upper end of a connecting-rod 106, the lower end of which is pivoted at 107 to the upper end of the plunger 103. The plunger passes through an opening 108 (see Fig. 3) formed in guide plates 109, which are bolted or otherwise secured to the standards 38, as best shown in Fig. 1. The lower portion of the plunger 103 is contracted, as at 110, and is preferably provided with a removable head 111, which may conveniently be secured to the plunger by a screw-threaded opening 112, in which is received the screw-threaded lower end 113 of the plunger proper. The head 111 is preferably provided with corrugations, as at 114, which cooperate with the corrugations formed on the cylindrical part of the female die 97. The male die is preferably reciprocated by two rods 115 (see Fig. 1) and guided by the plates 109. The upper ends of the rods 115 are provided with heads 116, which are, in turn, provided with outwardly extending pins 117, on which are mounted rollers 118, as indicated in dotted lines in Fig. 2, which engage in cam grooves 119 provided with offset portions 119^a and 119^b in discs 120 concentric with the center of the discs, and which retain the male die in its uppermost and lowermost position for an appreciable time. The lower ends of the rods 115 are connected by a plate 115^a, the plate preferably being secured to the lower ends of the rods by nuts 121. The plate 115^a is provided with a central opening 122, which preferably loosely surrounds a screw-threaded sleeve 123, as best indicated in Fig. 3. The sleeve may be adjusted vertically with reference to the plate 115^a by lock-nuts 124 located on either side thereof. The lower end of the sleeve 123 is preferably provided with a laterally extending flange 125, and means are preferably provided for furnishing a yielding connection between the male die 102 and the driving parts therefor. For this purpose, a sleeve 126 is provided, having a flange 127, which immediately surrounds the plain cylindrical part of the sleeve 123. The sleeve 126 is also provided with a cylindrical part 128 which closely surrounds the flange 125. The sleeve 123 is interiorly threaded on its lower part, as at 129, within which threaded part is received the upper threaded end of the male die 102. The sleeve 126 is normally depressed to the position indicated in Fig. 3 by a plurality of compression springs 130, the lower ends of which are received in recesses 131 in the sleeve 126, the springs surrounding stems 132 extending downwardly from a plate 133 located immediately beneath a nut 134 screw-threaded on the sleeve 123, and by adjusting the nut 134 vertically, the compression of the springs 130 may be regulated. It will, of course, be understood that the movements of the machine are so correlated that the layer 96 of discs is brought in a position above the female die 97 when the male die and the plunger are in their raised positions. The male die is first moved downwardly by the rods 115 to compress and form the paper discs, the provision of the compression springs 130 between the sleeve 126 and the nut 134 secured to the sleeve 123 insuring a predetermined pressure always being exerted on the discs, and thus tending to prevent breakage of parts and enabling the operator to secure a nice adjustment of pressure exerted on the paper discs by adjusting the nut 134. When the die 102 is brought into engagement with the die 97, the plunger 103 is forced downwardly, the plunger head 111 engaging the central portion of the discs and forcing the discs, which have now been crimped or corrugated by the dies, from between the dies and through the cylindrical portion of the die 97, where the crimping is continued, and which forms the cups into a generally cylindrical member, which, when subsequently released, will assume the desired cup form, preferably with a flat bottom and the crimped or corrugated up-standing flanges usual in cups of this character.

As the disc layers are fed forwardly from the feeding device to the stamping machine, they are preferably subjected to a steaming process, which assists in bringing them into the desired moist condition to be formed more easily in the stamping machine. For

this purpose, a steam pipe 135 (see Fig. 3) communicates with a chamber 136 formed above the bed-frame 10 and beneath the discs as they are being carried along. The formed cups in the stamping machine, as they are received from the plunger, are preferably forced downwardly through a tube 137, in which the formed cups are preferably heated by means of one or more burners 138, here shown as three in number, surrounding the pipe 137. The heating operation serves to dry the cups, which are received from the pipe in a dried and properly formed condition, and are discharged from the lower end of the pipe 137 into a suitable hopper 139, from which they are conveyed to any desired point.

In accordance with my invention, means are provided for arresting the movement of the machine in case the discs become clogged as they are being fed to the stamping device, or in case foreign matter is fed into the machine, which would interfere with the stamping operation. The machine is provided with a clutch member 144 surrounding the main shaft 36, as indicated in Fig. 1; which is slidable along the shaft to bring the clutch into and out of operative position by means of an arm 145, which is secured on a bar or shaft 146 having its bearings in the standards 38. The bar 146 is moved to the right, as viewed in Fig. 1, by a coil spring 147 surrounding the same, and located between one of the arms 38 and a collar 148 secured on the bar 146. When the bar 146 is moved to the left, as viewed in Fig. 1, to bring the clutch 144 into operative position, the bar is held in this position by a detent 149 on a bell-crank 150, which is pivoted at 151. The end of the bell-crank 150 is connected by a link 154 to an arm 155 secured on a shaft 156 which has its bearings in a stationary part of the frame, as indicated in Fig. 4. The shaft 156 is provided with an arm 158 (see Fig. 1), to which is connected a spring 157, the opposite end of which is connected to an adjustable screw-threaded member 159, which is adjustable by a nut 160, so that the tension on the spring may be regulated. The spring 157 tends to rotate the shaft in a direction to elevate the link 154 and thus bring the detent 149 into engagement with a collar 152 on the shaft 146 to hold the shaft 146 to the left, as viewed in Fig. 1. The inner end of the shaft 156 is provided with an arm 161, the end of which is preferably located, as at 161a, above the guide member 93. When the discs, for any reason, become clogged, or if foreign matter is introduced beneath the guide member 93, the latter is raised bodily and rotatates the shaft 156 through the connecting-arm 161, and thus depresses the link 154 against the action of the spring 157 and releases the detent 149 from the collar 152, and permits the spring 147 to move the shaft 146 to the right, as viewed in Fig. 1, and thus disengage the clutch and stop the machine.

The clutch member is also operable by a manually movable lever 162 (see Figs. 2 and 3), pivoted at 163 and formed with an opening 165, in which is received a pin 164 projecting from the shaft 146. A rod 166 is also connected at one end to the arm 162 and is suitably guided transversely of the machine, the opposite end of the rod 166 engaging one arm of the bell-crank 150 to move the bell-crank and thus release the shaft 146 on the initial movement of the manually-operated lever.

The operation of the machine embodying my invention will readily be understood from the foregoing description, and is as follows:

Any suitable number of discs are placed in the magazine A. When the machine is put in operation, the carriage is first moved forwardly from the position indicated in Fig. 7 and the blade 43 is forced into the disc pile to compress the discs beneath the same. Immediately thereafter the blade 41 enters the compressed discs and separates therefrom a predetermined number thereof. The forward movement of the carriage continues until the supporting plate 40 has moved to the position indicated in Fig. 3 from beneath the pile of discs, thus permitting the separated discs to move downwardly to the guide members on which they are carried. When the carriage reaches the forward position, indicated in Fig. 3, the stripper member 63 is lowered to separate the discs positively from the blade. The carriage C then engages the discs and carries them forwardly a unit distance. As the discs are being carried forward they are subjected to the action of steam and thus brought into a dampened condition. The forward movement of the discs is continued until the forward layer is brought to a position above the female die 97. The male die is then brought into engagement with the same and held in engagement therewith for an appreciable time (because of the form of the cam grooves 119 in the operating discs). While the discs are so compressed between the male and female dies, the plunger 103 is lowered and the head thereof engages the discs and forces them from between the dies and into the tube 137, where they are dried.

What I claim and desire to secure by Letters Patent of the United States is:

1. In a machine of the character described, a magazine adapted to receive a pile of discs, means entering the disc pile to a variable extent for compressing a part of the discs, and means for separating one or more of the compressed discs from the pile.

2. In a machine of the character described, a magazine adapted to receive a

pile of discs, means entering the disc pile to a variable extent for compressing to a predetermined extent a part of the discs, and means for separating one or more of the compressed discs from the pile.

3. In a machine of the character described, a magazine adapted to receive a pile of discs, a blade bevelled at its end, means for moving said blade into the disc pile to a variable extent for compressing a part of the discs, and means for separating one or more of the compressed discs from the pile.

4. In a machine of the character described, a magazine adapted to receive a pile of discs, a blade bevelled at its front end adapted to engage the disc pile, means for forcing said blade into said pile with a predetermined and uniform pressure and to a variable extent, and means for separating one or more of the compressed discs from the pile.

5. In a machine of the character described, a magazine adapted to receive a pile of discs, a blade bevelled at its front end adapted to engage the disc pile, a spring for forcing said blade into said pile, and means for separating one or more of the compressed discs from the pile.

6. In a machine of the character described, a magazine adapted to receive a pile of discs, a blade bevelled at its front end adapted to engage the disc pile, a spring for forcing said blade into said pile, means for separating one or more of the compressed discs from the pile, and means for retracting the blade in opposition to said spring.

7. In a machine of the character described, a magazine adapted to receive a pile of discs, a carriage and means for moving the same, means operable in response to the movement of the carriage for entering the disc pile to a variable extent and compressing a part of the discs, and means operable by the carriage for separating from the disc pile one or more discs.

8. In a machine of the character described, a magazine adapted to receive a pile of discs, a carriage and means for moving the same, a bevelled blade for compressing a part of the discs, a spring for forcing said blade into the disc pile, a movable carriage, means for normally restraining the movement of said blade, means operable by the movement of the carriage for releasing said restraining means, and means operable for separating from the disc pile one or more discs.

9. In a machine of the character described, a magazine adapted to receive a pile of discs, a carriage and means for moving the same, a bevelled blade for compressing a part of the discs, a spring for forcing said blade into the disc pile, a movable carriage, means for normally restraining the movement of said blade, means operable by the movement of the carriage for releasing said restraining means, and means operable by the movement of the carriage for separating from the disc pile one or more discs.

10. In a machine of the character described, a magazine adapted to receive a pile of discs, a spring-actuated member adapted to enter the pile and compress some of the discs, means for moving said member into the disc pile, a pivoted arm connected to said member, a spring for retracting said arm to hold said member normally in a retracted position, means for rotating said arm against the action of said spring, and means for separating one or more compressed discs from the pile.

11. In a machine of the character described, a magazine adapted to receive a pile of discs, a spring-actuated member adapted to enter the pile and compress some of the discs, a spring for moving said member into the disc pile, a pivoted arm connected to said member, a spring for retracting said arm to hold said member normally in a retracted position, means for rotating said arm against the action of said spring, and means for separating one or more compressed discs from the pile.

12. in a machine of the character described, a magazine adapted to receive a pile of discs, a spring-actuated member adapted to enter the pile and compress some of the discs, means for moving said member into the disc pile, a pivoted arm connected to said member, a spring for retracting said arm to hold said member normally in a retracted position, means for rotating said arm against the action of said spring, means for disconnecting said arm-rotating means from the arm whereby said arm is released, and means for separating one or more compressed discs from the pile.

13. In a machine of the character described, a magazine adapted to receive a pile of discs, a spring-actuated member adapted to enter the pile and compress some of the discs, means for moving said member into the disc pile, a pivoted arm having a lost-motion connection with said member, a spring for retracting said arm to hold said member normally in a retracted position, means for rotating said arm against the action of said spring, and means for separating one or more compressed discs from the pile.

14. In a machine of the character described, a magazine adapted to receive a pile of discs, means comprising a blade for separating from the disc pile one or more discs, a movable member associated with said blade for stripping therefrom the separated discs, and means operative on each separating movement of the blade for moving said member relatively to the blade.

15. In a machine of the character de-

scribed, a magazine adapted to receive a pile of discs, means comprising a blade for separating from the disc pile one or more discs, a movable member having fingers engageable with the lower side of the blade, and means for moving said fingers downwardly to strip the separated discs from said blade.

16. In a machine of the character described, a magazine adapted to receive a pile of discs, means comprising a blade for separating from the disc pile one or more discs, a movable member engageable with the lower side of the blade, means for moving said member into engagement with the lower side of said blade during the forward movement of said blade into the disc pile, and means for moving said member downwardly away from said blade to strip the separated discs from the pile.

17. In a machine of the character described, a magazine adapted to receive a pile of discs, means comprising a blade for separating from the disc pile one or more discs, a movable member having fingers engageable with the lower side of the blade, means for moving said fingers into engagement with the lower side of said blade during the forward movement of said blade into the disc pile, and means for moving said fingers downwardly away from said blade to strip the separated discs from the pile.

18. In a machine of the character described, a magazine adapted to receive a pile of discs, a blade for separating from the pile one or more discs, means for stripping from said blade the separated discs and comprising a member normally seated against said blade, means for moving said member away from said blade, and means for normally restraining the operation of said member-moving means.

19. In a machine of the character described, a magazine adapted to receive a pile of discs, a blade for separating from the pile one or more discs, means for stripping from said blade the separated discs and comprising a member normally seated against said blade, means for moving said member away from said blade, a detent for normally restraining the operation of said moving means, and means for releasing said detent and thereby permitting the operation of said member-moving means.

20. In a machine of the character described, a magazine adapted to receive a pile of discs, a blade for separating from the pile one or more discs, a reciprocable carriage on which said blade is mounted, means for reciprocating said carriage, means for stripping from said blade the separated discs comprising a member normally seated against said blade, means for moving said member downwardly away from said blade comprising an arm mounted on said carriage and connected to said member, means for moving the arm to lower said member, a detent mounted on said carriage normally restraining the operation of the arm-moving means, and means for releasing said detent.

21. In a machine of the character described, a magazine adapted to receive a pile of discs, a carriage and means for reciprocating the same, a blade mounted on said carriage for separating one or more discs from the pile, a movable member mounted on said carriage for stripping the separated discs from said blade, and means operable in response to the movement of said carriage for operatively moving said member relatively to the blade.

22. In a machine of the character described, a magazine adapted to receive a pile of discs, means for separating from beneath the disc pile one or more discs, and movable means for supporting and conveying the separated disc or discs undistorted from the magazine.

23. In a machine of the character described, a magazine adapted to receive a pile of discs, automatic means for separating from beneath the disc pile one or more discs, and reciprocating means for supporting and conveying from the magazine the separated discs.

24. In a machine of the character described, a magazine adapted to receive a pile of discs, reciprocable means for separating from the disc pile one or more discs, and means reciprocable reversely to the separating means for conveying the separated discs from the magazine.

25. In a machine of the character described, a magazine adapted to receive a pile of discs, a carriage, means for reciprocating the carriage, means operated by the carriage for separating from beneath the disc pile one or more discs, and means reciprocable by said carriage for conveying the separated discs from the magazine.

26. In a machine of the character described, a conveyor for moving layers of discs and comprising means for engaging the successive layers of discs at the rear thereof, said conveyor being constructed and arranged to bring said engaging means into operative engagement with said layers of discs during the forward movement of said conveyor and out of operative engagement therewith during the rearward movement of said conveyor.

27. In a machine of the character described, a reciprocable conveyor provided with fingers for engaging the successive layers of discs at the rear thereof for moving said layers of discs from the magazine, said conveyor being constructed and arranged to bring said fingers into operative engagement with said layers of discs during the

forward movement of said conveyor and out of operative engagement therewith during the rearward movement of said conveyor.

28. In a machine of the character described, a conveyor for moving layers of discs along the machine and provided with fingers for engaging the successive layers of discs at the rear thereof, means for moving said conveyor forwardly and backwardly, and means for raising and lowering said conveyor and bringing said fingers into and out of operative engagement with said layers of discs at the respective limits of movement thereof.

29. In a machine of the character described, a conveyor for moving layers of discs along the machine and comprising means for engaging the successive layers of discs at the rear thereof, means for moving said conveyor forwardly and backwardly, and means comprising bell-cranks supporting the conveyor for raising and lowering said conveyor and bringing said engaging means into and out of operative engagement with said layers of discs at the respective limits of movement thereof.

30. In a machine of the character described, a conveyor for moving layers of discs along the machine and provided with fingers for engaging the successive layers of discs at the rear thereof, means for moving said conveyor forwardly and backwardly, and means comprising bell-cranks supporting the conveyor for raising and lowering the same and bringing said fingers into and out of operative engagement with said layers of discs at the respective limits of movement of said conveyor.

31. In a machine of the character described, a conveyor for moving layers of discs along the machine and provided with fingers for engaging the successive layers of discs at the rear thereof, and means comprising bell-cranks for operating said conveyor, one set of arms of the bell-cranks supporting said conveyor and the opposite arms of which are connected to the conveyor-moving means whereby said conveyor is raised and lowered at the limits of its movement and said fingers brought into and out of operative engagement with said layers of discs.

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