

March 11, 1924.

1,486,598

M. J. MILMOE

CARTONING MACHINE

Filed Sept. 20, 1920

11 Sheets-Sheet 1

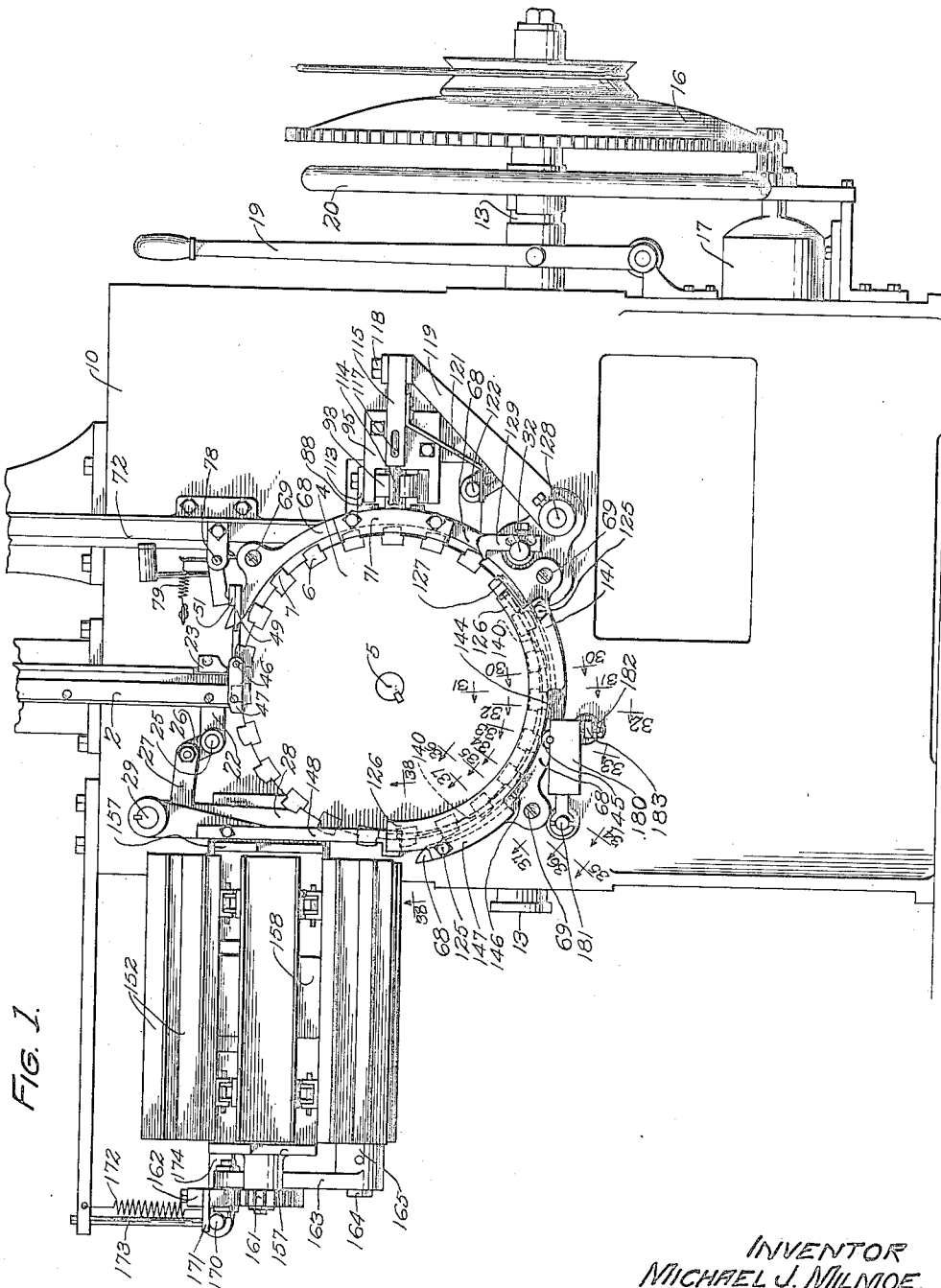


FIG. 1.

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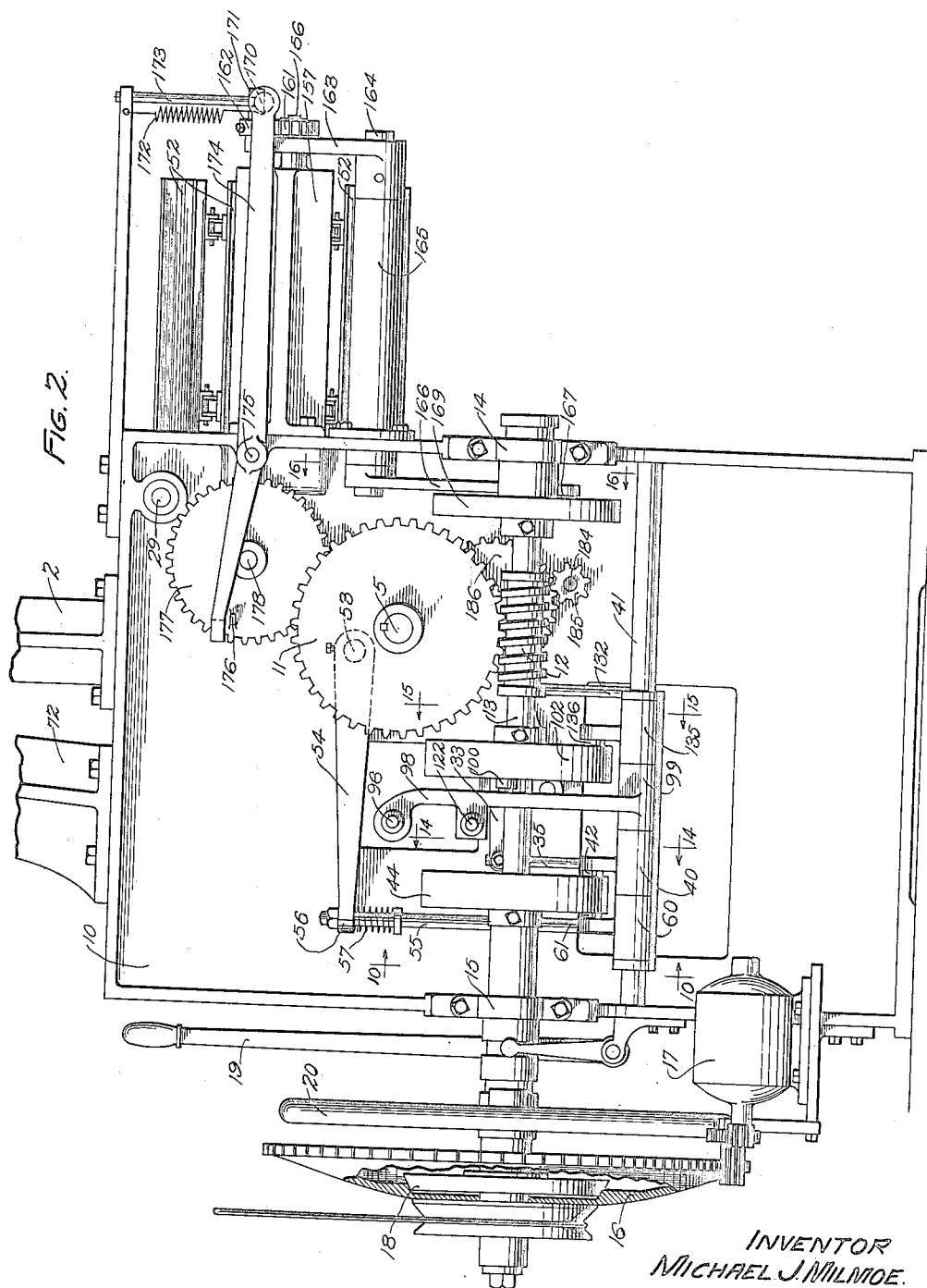


FIG. 2.

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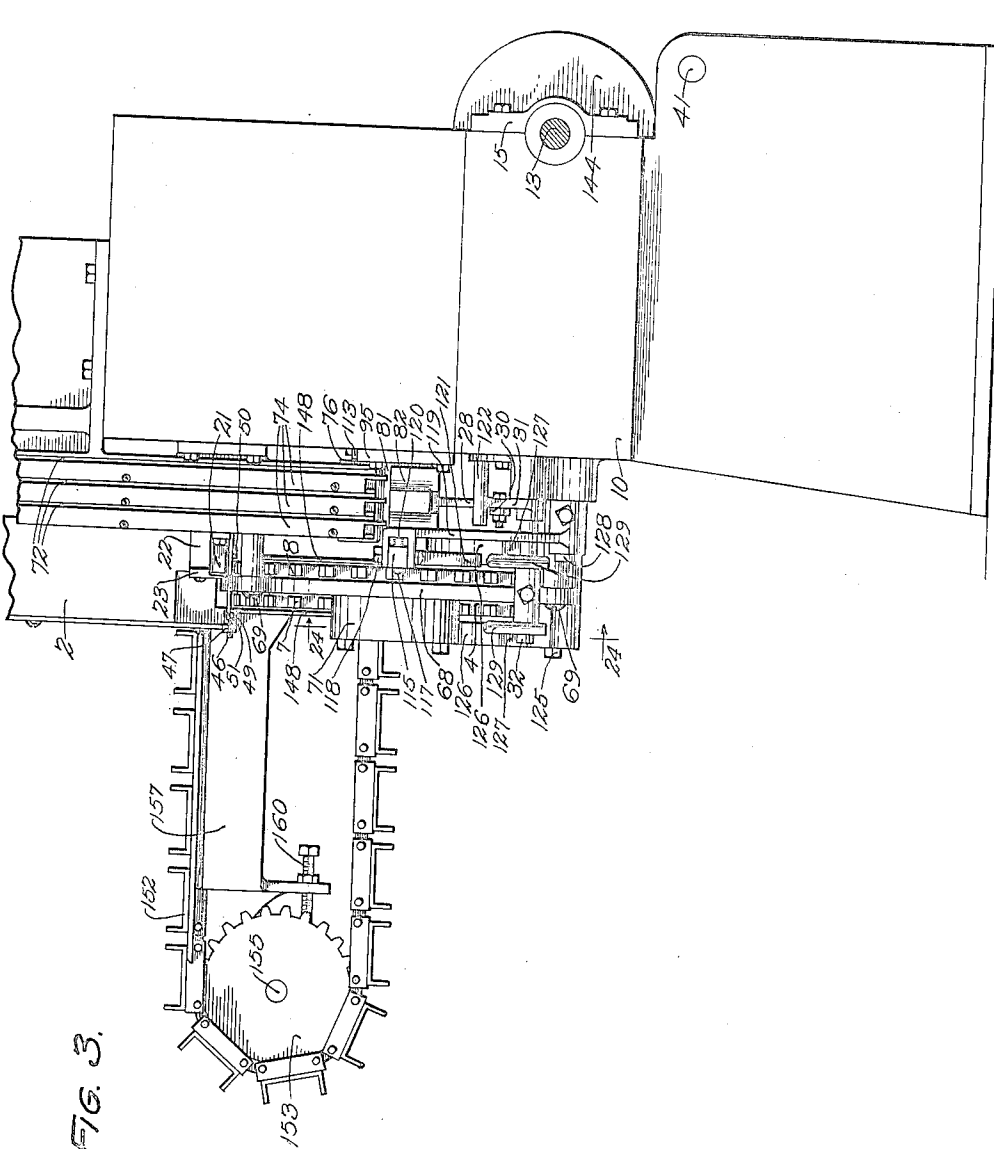
Fig. 3.

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FIG. 4.

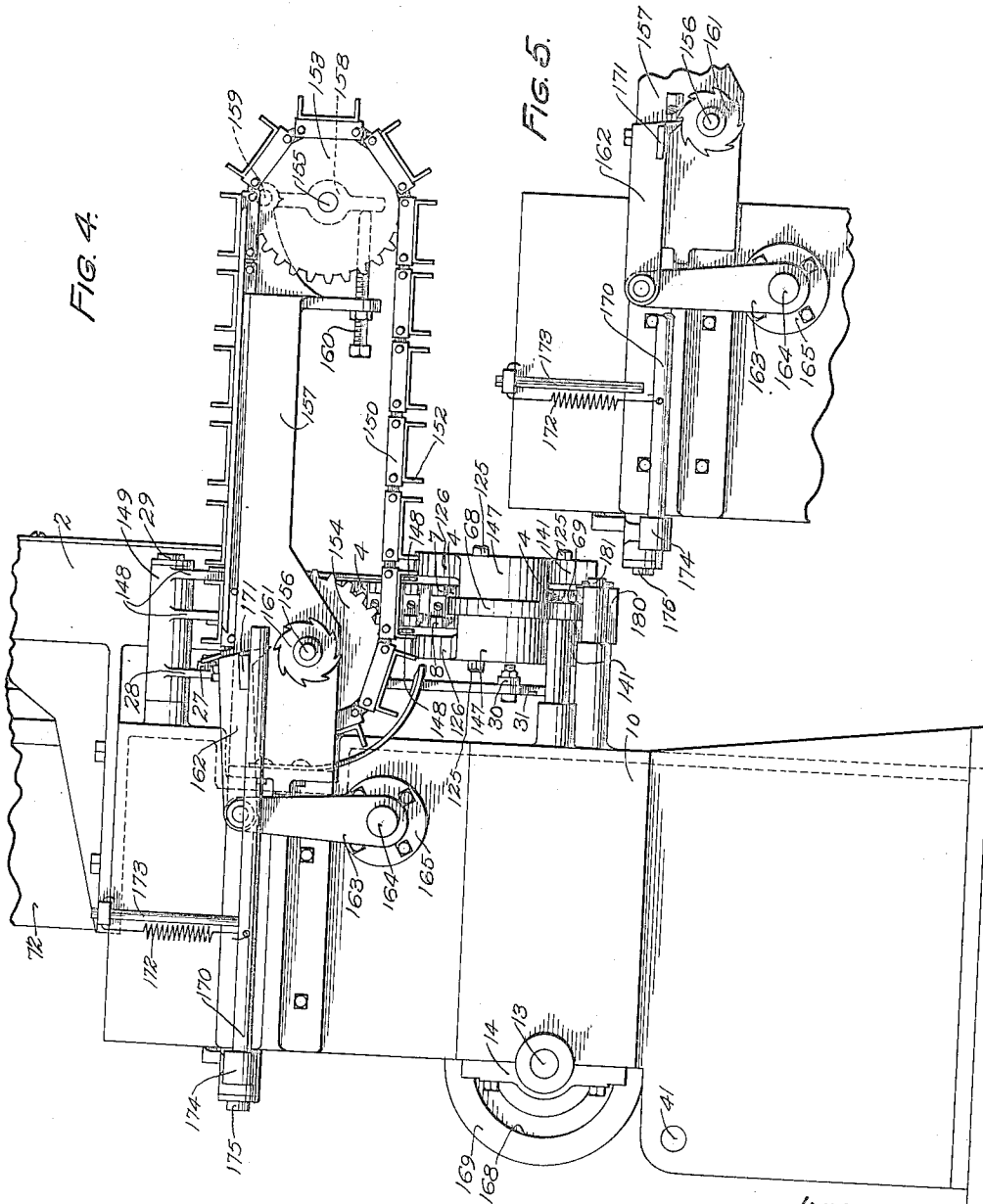
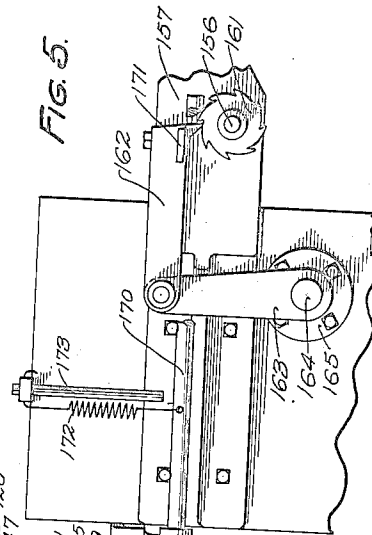


FIG. 5.



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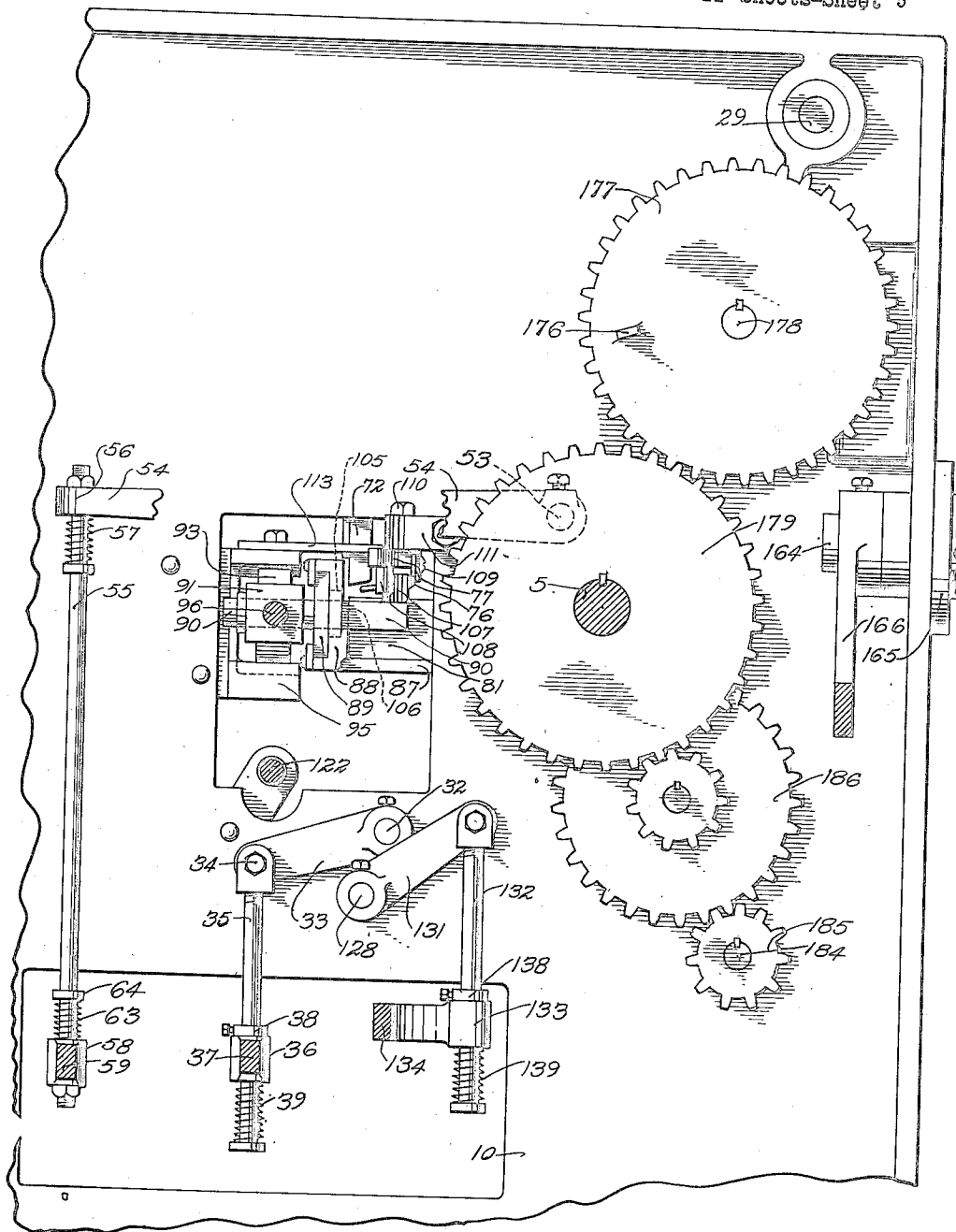


FIG. 6.

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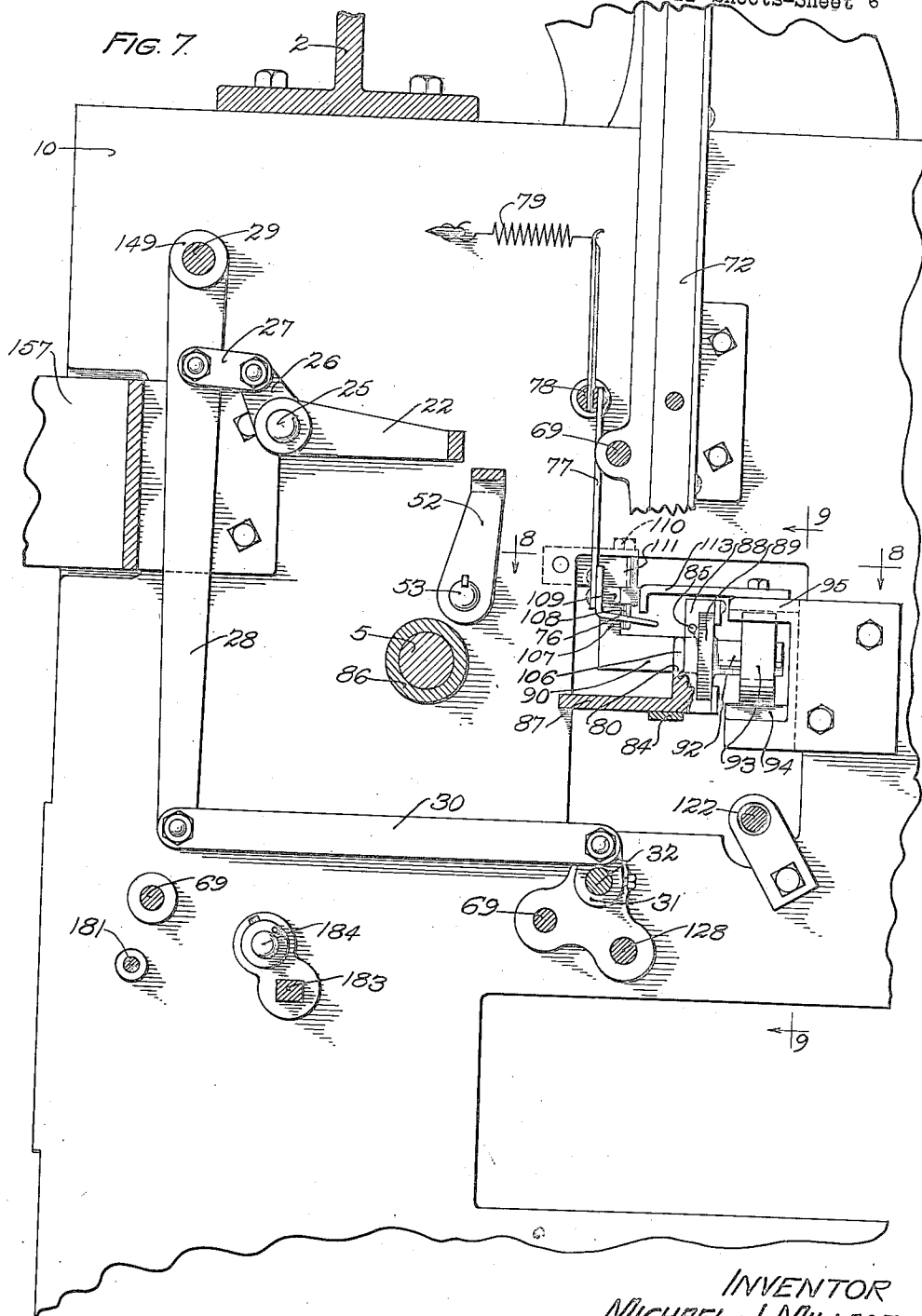
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FIG. 10

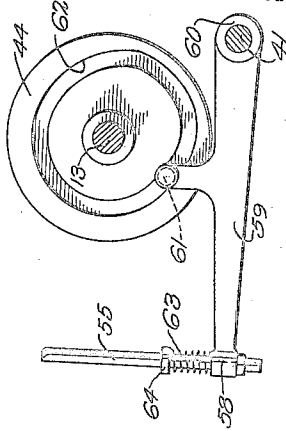


FIG. 9.

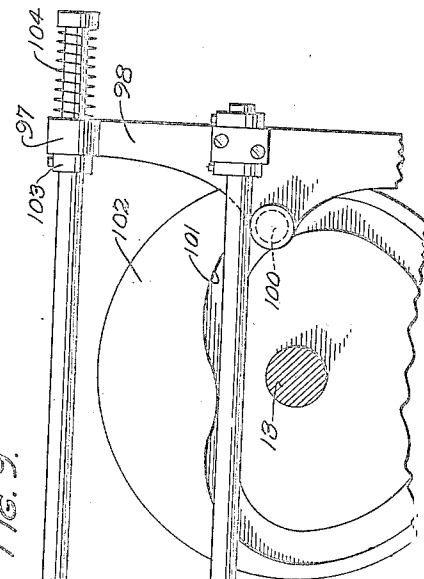


FIG. 8.

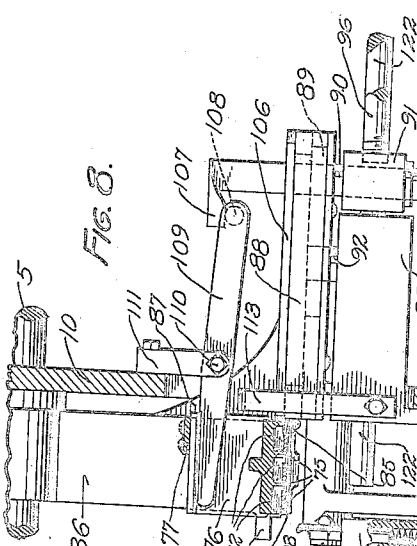


FIG. 11.

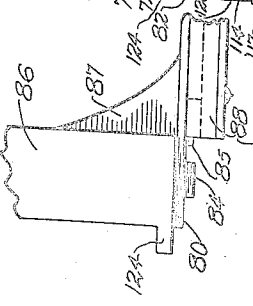


FIG. 12



FIG. 13.



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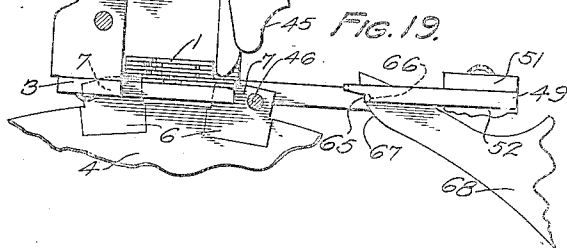
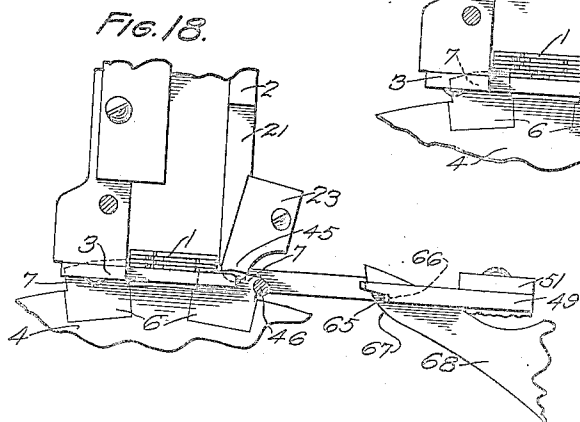
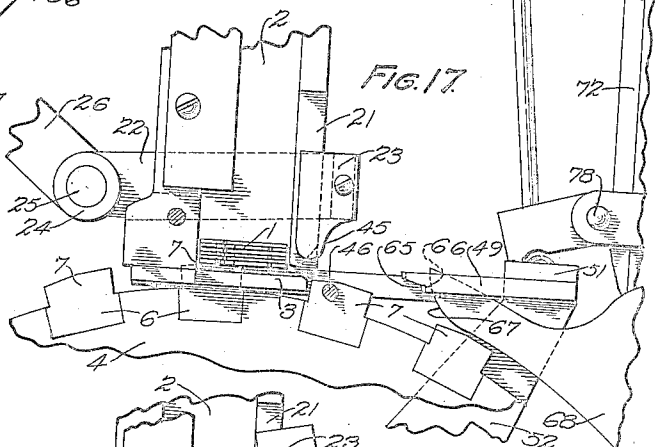
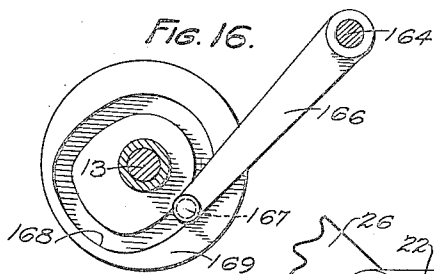
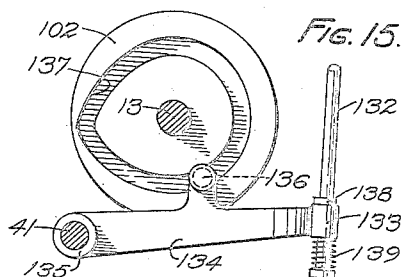
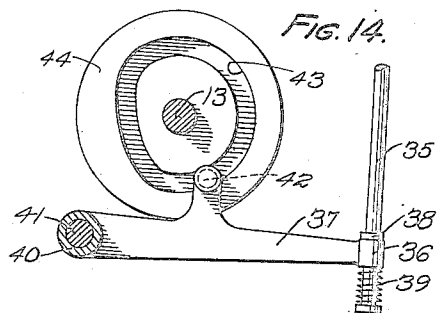
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CARTONING MACHINE

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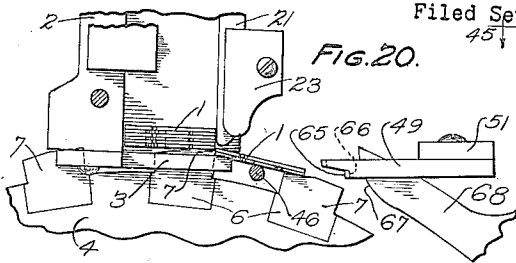


FIG. 20.

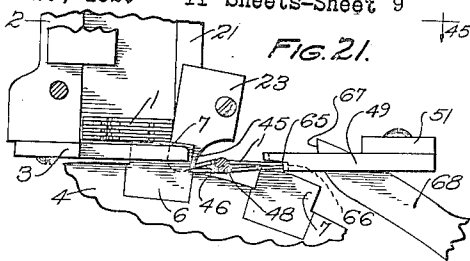


FIG. 21.

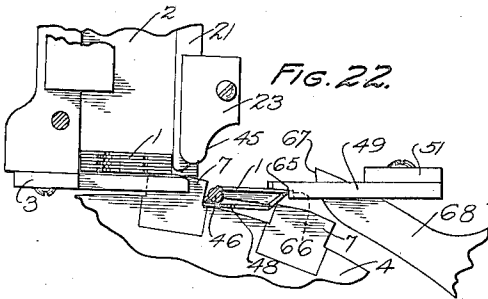


FIG. 22.

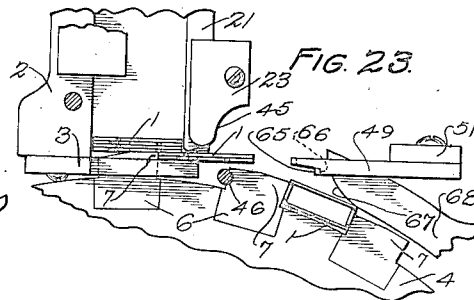


FIG. 23.

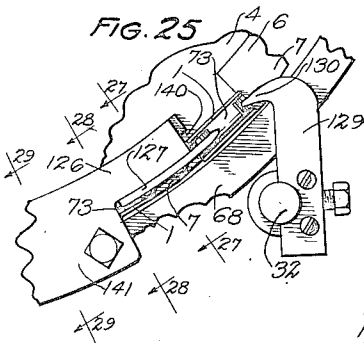


FIG. 25

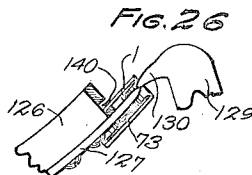


FIG. 26

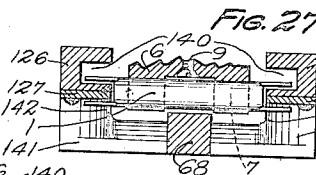


FIG. 27

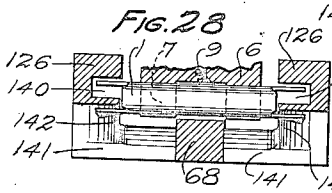


FIG. 28

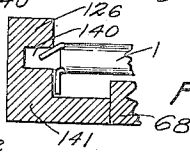


FIG. 29

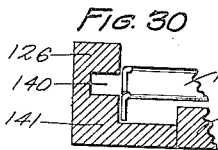


FIG. 30

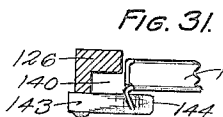


FIG. 31.

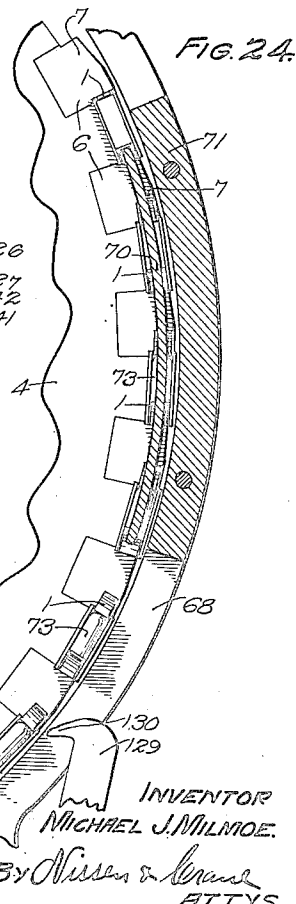


FIG. 24.

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FIG. 32.

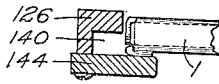


FIG. 33.

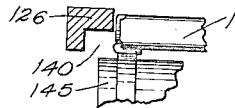


FIG. 34.

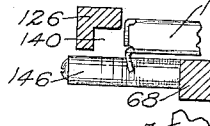


FIG. 35.

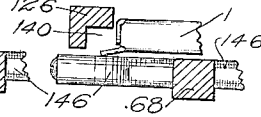


FIG. 36.

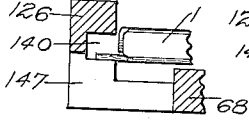


FIG. 37.

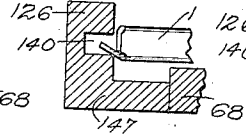


FIG. 38.

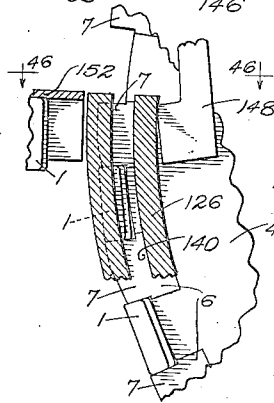
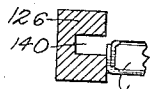


FIG. 39.

FIG. 40.

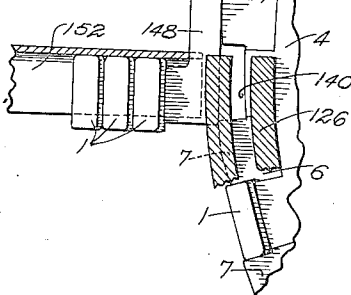


FIG. 41.

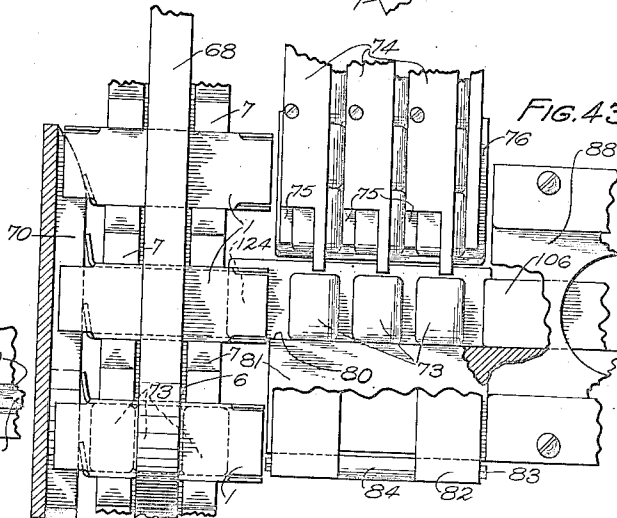
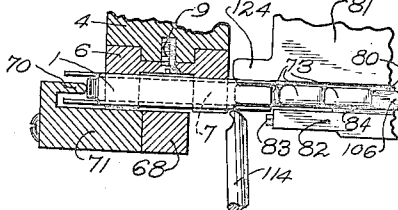


FIG. 43.

FIG. 42.

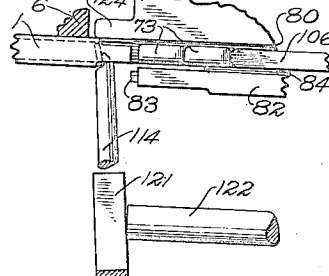
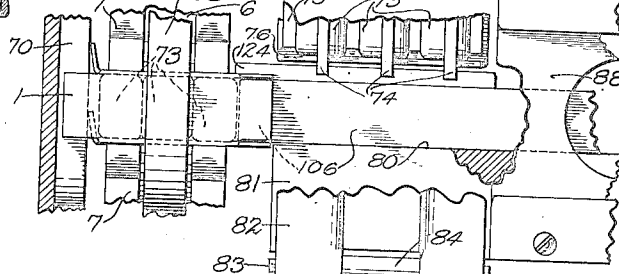


FIG. 44.



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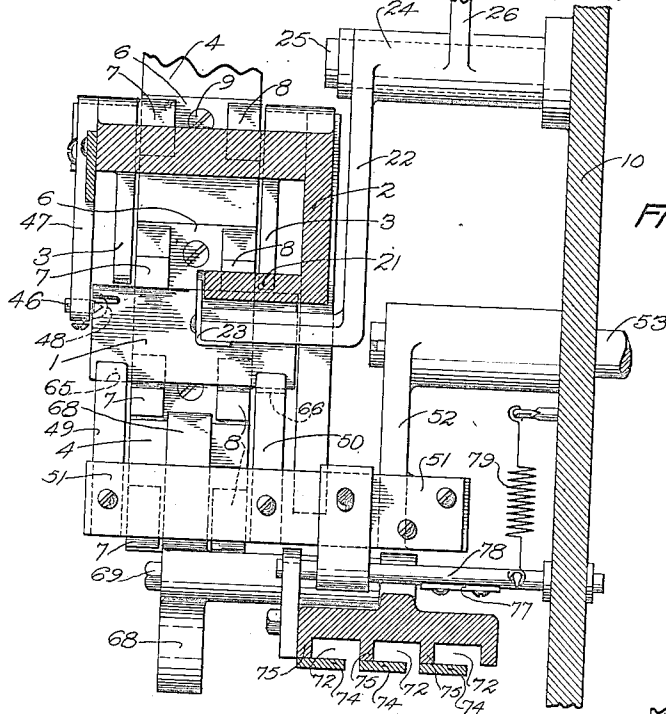


FIG. 45.

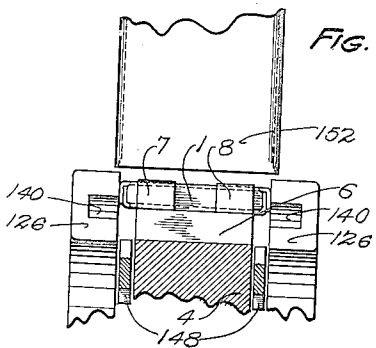


FIG. 46.

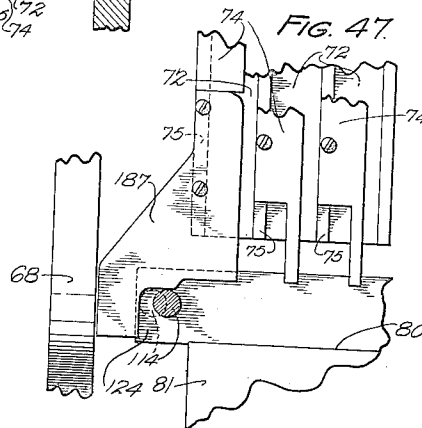


FIG. 47.

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Patented Mar. 11, 1924.

1,486,598

UNITED STATES PATENT OFFICE.

MICHAEL J. MILMOE, OF CHICAGO, ILLINOIS.

CARTONING MACHINE.

Application filed September 20, 1920. Serial No. 411,503.

To all whom it may concern:

Be it known that I, MICHAEL J. MILMOE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Cartonng Machines, of which the following is a specification.

This invention relates to machines for opening collapsed cartons, filling, closing and sealing the cartons, and for detecting any cartons not properly filled, and has for its object the provision of mechanism of the class named which shall be of improved construction and operation.

The invention is exemplified in the combination and arrangement of parts shown in the accompanying drawings and described in the following specification, and it is more particularly pointed out in the appended claims.

In the drawings—

Fig. 1 is a front elevation of a cartonng machine embodying one form of the present invention;

Fig. 2 is a rear view of the same machine;

Fig. 3 is an elevation looking from the left in Figs. 1 and 2, with parts omitted;

Fig. 4 is an elevation looking from the right in Figs. 1 and 2;

Fig. 5 is an enlarged detail of some of the parts shown in Fig. 4;

Fig. 6 is a fragmentary elevational section looking in the same direction as in Fig. 2, but with parts omitted to show other parts not illustrated in Fig. 2;

Fig. 7 is a fragmentary elevational section taken in the rear of some of the parts shown in Fig. 1;

Fig. 8 is a horizontal section substantially on line 8—8 of Fig. 7;

Fig. 9 is a vertical section substantially on line 9—9 of Fig. 7;

Fig. 10 is a fragmentary vertical section substantially on line 10—10 of Fig. 2;

Fig. 11 is a fragmentary plan of a portion of a movable guide shown in Fig. 8;

Figs. 12 and 13 are elevational views of the guide shown in Fig. 11;

Fig. 14 is a fragmentary vertical section on line 14—14 of Fig. 2;

Fig. 15 is a fragmentary vertical section on line 15—15 of Fig. 2;

Fig. 16 is a fragmentary vertical section on line 16—16 of Fig. 2;

Fig. 17 is a fragmentary elevation of the carton opening mechanism;

Figs. 18, 19, 20, 21, 22 and 23 illustrate various positions of the mechanism shown in Fig. 17 during an opening operation;

Fig. 24 is a fragmentary vertical section substantially on line 24—24 of Fig. 3;

Figs. 25 and 26 illustrate different positions of a portion of the mechanism shown in Fig. 24;

Fig. 27 is a section on line 27—27 of Fig. 25;

Fig. 28 is a section on line 28—28 of Fig. 25;

Fig. 29 is a section on line 29—29 of Fig. 25;

Fig. 30 is a section on line 30—30 of Fig. 1;

Fig. 31 is a section on line 31—31 of Fig. 1;

Fig. 32 is a section on line 32—32 of Fig. 1;

Fig. 33 is a section on line 33—33 of Fig. 1;

Fig. 34 is a section on line 34—34 of Fig. 1;

Fig. 35 is a section on line 35—35 of Fig. 1;

Fig. 36 is a section on line 36—36 of Fig. 1;

Fig. 37 is a section on line 37—37 of Fig. 1;

Fig. 38 is a section on line 38—38 of Fig. 1;

Fig. 39 is a fragmentary vertical section showing one position of the device for discharging cartons from the closing mechanism;

Fig. 40 shows a second position of the same device;

Fig. 41 is a fragmentary vertical section showing the mechanism for detecting shortage;

Fig. 42 shows the same mechanism in a different position;

Fig. 43 is a fragmentary elevation, with parts in section, showing the filling mechanism;

Fig. 44 is a view similar to Fig. 43 showing the parts in a different position;

Fig. 45 is a top plan view of the mechanism shown in Fig. 21;

Fig. 46 is a section on line 46—46 of Fig. 39; and

Fig. 47 is a view of slightly modified form of the construction shown in Fig. 43.

In the embodiment of the invention shown in the drawings, the mechanism is adapted

to open a carton from its flat folded position, insert a number of articles in the carton, ascertain if there is any shortage of the articles supplied to the carton, close and seal the carton, and collect the cartons in a receiver where they are held until they can be conveniently removed. It will be readily understood, however, that the invention is applicable to various forms of machines other than that illustrated by way of example.

A form of carton for which the illustrative embodiment of the machine is adapted is shown at 1 in Figs. 41 and 43 and comprises a rectangular tubular body portion having closing flaps extending from the four walls of the carton at each end thereof. The cartons are supplied to the machine from a magazine 2 in which they are stacked one upon the other in collapsed form, as illustrated in Fig. 20. The lower end of the magazine 2 is closed by spaced strips 3 on which opposite ends of the lowermost carton rest. A carrier disc or wheel 4, as shown in Fig. 1, is secured to the end of a shaft 5 in a position to locate the periphery thereof directly between the supporting strips 3 beneath the lower end of the magazine 2. A plurality of carrier blocks 6 are inserted in circumferentially spaced notches in the periphery of the wheel 4, and each block 6 is provided with transversely spaced teeth 7 and 8. The blocks 6 are held in place in the periphery of the wheel 4 by screws 9. The shaft 5 is journaled in a suitable frame member 10 and carries a worm wheel 11 at the end thereof opposite the carrier wheel 4, as shown in Fig. 2. The worm wheel 11 meshes with a worm 12 on a shaft 13 journaled at 14 and 15 on the frame 10. A spur gear 16 is loosely mounted on the end of the shaft 13 and is driven by a motor 17. A clutch 18 operated by a lever 19 is provided for securing the spur gear 16 to the shaft 13 for driving the shaft. A hand wheel 20 is also secured to the shaft 13 so that the shaft may be turned by hand for shifting the parts of the machine when desired.

As shown in Fig. 17, the front wall 21 of the magazine 2 terminates slightly above the upper face of the supporting strips 3 leaving a slot of sufficient thickness to permit of the discharge of a single carton from the magazine. The teeth 7 and 8 on the blocks 6 are of sufficient length to project slightly above the upper face of the strips 3 as they are moved between the strips by the rotation of the wheel 4. As the front face of the teeth 7 and 8 approach the rear face of the magazine the upper portions of the teeth will engage the rear edge of the lowermost carton, as shown in Fig. 18, and further rotation of the wheel will cause the teeth to carry the carton forwardly with the wheel 4 and thus move the carton from the

magazine through the slot beneath the lower edge of the wall 21. As shown in Figs. 18 and 19, the rear portions of the teeth 7 and 8 are beveled and the teeth are sufficiently close together to permit the forward edge of a carton to rest upon the beveled upper face of one set of teeth while it is being moved forwardly by the next succeeding teeth. The position of the carton as it moves away from the magazine is illustrated in Fig. 20 and as soon as the rear edge of the carton moves off of the supporting strips 3 that edge will tend to drop into the notch between the teeth, while the front edge continues to rest upon the beveled upper face of the preceding pair of teeth. This position of the carton is illustrated in Fig. 21. To insure movement of the rear edge of the carton into the notch between the teeth an arm 22, Fig. 45, is provided having a plate 23 secured to the end thereof. The plate 23 is centrally positioned relative to the front of the magazine 2 and lies adjacent the outer edge of the front wall 21 which wall extends approximately only half-way across the front of the magazine. The arm 22 is secured to a sleeve 24 on a stud shaft 25 carried by the frame 10, as shown in Fig. 45. A second arm 26 is secured to the sleeve 24 and is connected by a link 27 to an arm 28 pivotally mounted at 29 on the frame 10, as shown in Fig. 7. The arm 28 is connected by a link 30 to an arm 31 secured to a shaft 32 journaled for oscillation on the frame 10. The shaft 32 carries at its opposite end an arm 33, as shown in Fig. 6, the end of the arm 33 being pivotally connected at 34 to an upright rod 35. The upright rod 35 passes loosely through a sleeve 36 on the end of an arm 37 and is provided with an adjustable collar 38 and a spring 39 so that upward movement of the collar 36 produces a positive oscillation of the shaft 32 in one direction, while downward movement of the sleeve 36 produces a yielding movement of the shaft 32 in the opposite direction. The end of the arm 37 opposite the sleeve 36 is provided with a bearing 40 pivotally mounted on a shaft 41 supported by the frame 10, as shown in Figs. 2 and 14. A cam roller 42 is secured to the arm 37 and operates in a groove 43 in a cam wheel 44 secured to the shaft 13. Rotation of the cam 44 periodically imparts a resilient downward movement to the plate 23 through the chain of mechanism described, so that the plate 23 is brought into the position shown in Fig. 21, causing the curved face 45 thereof to engage the carton 1 and positively force it into the notch between the teeth 7 and 8. As the plate 23 is moved into the position shown in Fig. 21 its rear edge will engage the front edges of the cartons in the magazine 2, thus readjusting the cartons in the magazine previous to the

movement of the next carton by the succeeding pair of teeth.

During the movement of the carton into the notch between the teeth 7 and 8 by means of the plate 23, the opening of the carton is begun at one end thereof through the action of a pin 46 carried on the end of a plate 47 secured to the outer side of the magazine 2 at the lower end thereof, as shown in Fig. 1. The plate 47 is removed in Figs. 17 to 23 to permit better view of the other parts. As shown in Fig. 45, the inner end of the pin 46 is sharpened and projects below the edge of the outer end flaps of the cartons 1 as the cartons are being moved into the notches between the teeth 7 and 8.

As shown in broken lines in Fig. 45, the lowermost end flap of the carton 1 is provided with a cut-away portion or notch 48 so that as the carton moves downwardly the pin 46 passes through the notch in the lowermost flap and engages the lower face of the upper flap. As the carton is pressed downwardly at its central portion this will tend to open the flap at one end, while the opposite end remains closed. The beginning of the opening operation by the pin 46 is shown in Fig. 21.

To continue the opening process a pair of fingers 49 and 50 are provided which are supported by a bar 51 carried on an arm 52. The arm 52 is secured to a shaft 53, as shown in Fig. 45, which shaft is provided at its opposite end with an arm 54, shown in Fig. 2. A rod 55 extends loosely through a sleeve 56 on the end of the arm 54 and is provided with a spring 57 for imparting resilient upward movement to the arm 54. The lower end of the rod 55, as shown in Fig. 10, passes through a sleeve 58 in an arm 59. The opposite end of the arm 59 is provided with a bearing 60 journaled on the shaft 41. A cam roller 61 is carried by the arm 59 and engages a groove 62 in the face of the cam wheel 44 opposite the groove 43. A spring 63 is interposed between the sleeve 58 and a collar 64 adjustably mounted on the rod 55. Rotation of the cam 44 imparts resilient movement to the fingers 49 and 50 to the left in Fig. 20, and positive return movement in the opposite direction. The fingers 49 and 50 are shown in their extended position to the left in Fig. 21 in which position they come into engagement with the front edge of the carton just as its rear edge has been seated in the notch between the teeth 7 and 8. It will be seen from Fig. 45 that the finger 50 is slightly shorter than the finger 49 so that the contact shoulder 65 on the finger 49 engages the edge of the carton slightly in advance of the engagement with the corresponding shoulder 66 on the finger 50. The return movement of the fingers 49 and 50 is somewhat slower than the forward movement of the

carton under the pressure of the teeth 7 and 8 so that the combined movement of the wheel 4 and the fingers 49 and 50 gradually close up the space between the contact shoulders of the fingers and the rear edge of the teeth 7 and 8 upon which the front edge of the carton rests. This movement will bring the parts into the position shown in Fig. 22 causing the carton to be compressed between the teeth 7 and 8 on the wheel 4 and the contact shoulders of the fingers 49 and 50. This compression of the carton will continue the opening operation, which opening will progress from one end of the carton to the other, as shown in Fig. 22, for the reason that the greater length of the finger 49 will compress the outer end of the carton in advance of the inner end thereof. This method of operation greatly facilitates the opening of the carton. It is not only easier to start the opening at one end and continue the movement lengthwise to the other end of the carton, but this method of operation prevents buckling of both sides of the carton in the same direction, and also permits the curve in the carton wall formed by the opening pressure, to travel continuously from one end of the wall to the other. If opening were started simultaneously at both ends of the carton it would frequently happen that when both ends of the upper wall started to bend in an upward direction the central portion of the upper wall will bend downwardly so that when the two opening movements meet one another at the center of the carton there is a transverse buckling in the upper wall of the carton, tending to break the wall and prevent completion of the opening operation. When the opening is started at one end, however, the spreading of the walls away from one another, instead of bending of both walls in the same direction, is secured, and the opening proceeds in a progressive way which runs smoothly from one end to the other until the carton is brought into its correct rectangular formation. After the carton has been substantially opened by compression between the fingers 49 and 50 and the teeth 7 and 8 the forward edge of the carton is brought into engagement with the curved front face 67 of a guide rib 68 which extends around a portion of the periphery of the wheel 4 concentric therewith. The curved face 67 of the rib 68 completes the seating of the open carton in the space between the teeth on the periphery of the wheel 4 and the carton continues to move with the wheel with its outer face in contact with the inner edge of the rib 68.

After the cartons have been opened and seated in the periphery of the wheel 4 they are carried approximately a quarter of a revolution into the filling position. The cartons fit sufficiently closely between the

teeth in the periphery of the wheel to be frictionally held, but they are positively retained in place by the concentric retaining rib 68 which is supported on the frame 10 by screws 69, as shown in Figs. 1 and 3. The filling operation occurs while the cartons are passing a position substantially on a level with the axis of the wheel 4. While the cartons are passing the filling position they are held against endwise movement by a flange 70 carried by a block 71 which is secured to the retaining rib 68, as shown in Figs. 24, 41 and 43. This flange extends between the side flaps of the cartons and engages the edge flaps and bends them over, as shown best in Fig. 43, so that the lowermost flap of each carton forms a stop for limiting the movement of material fed into the carton.

The material with which the cartons are filled is supplied from a series of runways or chutes 72 secured to the frame 10 and extending vertically, as shown in Figs. 1 and 3. The upper ends of the runways 72 may be connected with a supply hopper from which the material is supplied to the runways. The mechanism in the embodiment illustrated is arranged for handling confections in the form of lozenges or briquets, but it will be apparent to those skilled in the art that the mechanism may be adapted to a large variety of materials. The briquets are designated in the drawings by the numeral 73 and are held in place in the runways 72 by thin sheets or strips 74 secured to partitions 75 which separate the runways. For supporting the briquets in the runways 72 a blade or plate 76 is carried by an arm 77 which is secured to a stud 78 pivotally mounted on the frame 10, as shown in Fig. 7. A spring 79 presses the blade 76 into position beneath the columns of briquets in the runways 72. The blade 77 is periodically swung rearwardly against the tension of the spring 79, by mechanism to be described, a sufficient amount to permit one briquet to drop from each of the slideways 72 onto a ledge 80, Figs. 13 and 43, formed on the front face of a filler head 81. The briquets thus deposited on the ledge 80 are held in place by a door 82 hinged at 83 to a bracket 84 secured to the lower face of the head 81. A latch 85 is provided for normally retaining the door 82 in closed position, the purpose of the door being to permit access to the ledge 80 when occasion requires.

The filler head 81 is carried on an arm 86 pivotally mounted on the shaft 5, as shown in Fig. 8, between the frame 10 and the wheel 4. A web 87 extends from the edge of the arm 86 through an opening in the frame 10 and supports a guide track 88 in rigid relation with the filler head 81. A slide block 89 is mounted to travel in the guide track 88 and is connected by a bar 90

with a head 91, as shown in Figs. 6 and 8. The slide block 89 carries a stud shaft 92 on which a cam roller 93 is journaled to travel in a cam groove 94 formed in a block 95 secured to the frame 10. A rod 96 is connected with the head 91 and has its opposite end extending through a sleeve 97 carried by an upright 98, as shown in Figs. 2 and 9. The upright 98 is provided with a sleeve 99 at its lower end pivotally mounted on the shaft 41 and carries a cam roller 100 which operates in a groove 101 formed in the face of a cam wheel 102 secured to the shaft 13. The position of the rod 96 on the sleeve 97 is controlled by an adjustable collar 103 and a spring 104. The bar 90 extends through a slot 105 in the guideway 88 and a plunger 106 is secured thereto in position to slide along the ledge 80 when the head 91 is reciprocated by the rotation of the cam 102. The cam groove 94 is so shaped that when the rod 96 is moved to the left, as viewed in Fig. 9, the roller 93 will move downwardly carrying with it the guide track 88 and the filler head 81 which is rigidly connected therewith by the web 87. At the same time that the filler head 81 is moved downwardly it will, of course, be constrained to rotate about the shaft 5 which is the axis of the carrier wheel 4, and the parts are so timed that the downward movement of the filler head will impart the same velocity thereto as that of the wheel 4. The filler head begins its downward movement each time that a carton is brought into position with the inner face of its front wall in alignment with the ledge 80, as shown in Fig. 43, and the parts will remain in this relation during the forward movement of the rod 96 and plunger 106. During the time that the filler head rotates in unison with the carrier wheel 4 and the cartons thereon, the plunger 106 will be moved by the cam 102 and the rod 96 to carry the briquets 73 which have been deposited upon the ledge 80 into the open end of the carton. The position of the plunger 106 at the beginning of its filling movement is shown in Fig. 43, and its position at the close of the filling movement is shown in Fig. 44. As the plunger 106 is retracted the filler head will be again moved upwardly into position to receive the next set of briquets deposited on the ledge 80 from the slideways 72. The gate 76 for controlling the deposit of the briquets upon the ledge 80 is operated by a cam 107 formed on the extended portion of the bar 90. The cam 107 engages a roller 108 carried by the end of a lever 109 pivoted at 110 on a block 111 carried by the frame 10. The end of the lever 109 opposite the cam roller 108 lies against the upwardly bent portion of the blade or gate 76 so that at the time that the rod 96 reaches its rearmost position the cam 107 will move the lever 109 to withdraw

the gate 76 and permit a new set of briquets to be deposited upon the ledge 80. The cam 107 operates against the tension of the spring 79 which normally holds the gate 76 closed with the arm 109 against a stop 113 which limits the movement of the gate 76 under the influence of the spring 79. At the time that the gate 76 is opened by the cam 107 the filler head with the ledge 80 thereon will be in its uppermost position.

It may sometimes happen that the supply of briquets in one or more of the slideways 72 has become exhausted, or the slideway may be obstructed, or for some other reason a complete set of briquets may not be deposited upon the ledge 80. When this occurs the particular carton will, of course, be only partially filled and in order to prevent partially filled cartons from being sent to the trade it is desirable to provide a means for detecting the shortage. For this purpose a finger 114 is slidably supported in a block 115 and resiliently pressed outwardly by a spring 116 in the rear of the finger and a stop 117 is provided for limiting the outward movement of the finger 114. The block 115, as shown in Figs. 1 and 8, is pivotally mounted on a bolt 118 carried by spaced flanges on the upper end of an arm 119. A spring 120 resiliently presses the block 115 toward the supporting frame 10. A downwardly extending bracket 121 is secured to the block 115 and lies in the path of a plunger rod 122, Fig. 7. The plunger rod 122 is connected to the upright 98 and is provided with a spring 123 normally pressing it away from the bracket 121. When the upright 98 is moved to operate the plunger 106 it will simultaneously move the rod 122 to engage the bracket 121 and shift the finger 114 from the position shown in Fig. 8 to the position shown in Fig. 42. Prior to the engagement of the rod 122 with the bracket 121 the arm 119 will be rotated in a counterclockwise direction, as viewed in Fig. 1, to bring the end of the finger 114 into contact with the end flap of the carton which is being filled, as shown in Fig. 41. This contact occurs at the time that the first briquet 73 is entering the carton, provided a full set of briquets is present on the ledge 80. If such is the case the contact finger 114 will be checked by the end flap of the carton which bears against the foremost briquet and the spring 116 will be compressed as the block 115 is moved by the arm 119. An ear 124 on the filler head 81 forms a backing for the briquet 73 to prevent its being forced out of alinement by the action of the finger 114. If it should occur at any time that less than the requisite number of briquets are present for filling the carton finger 114 will reach the position shown in Fig. 41 before any briquet has begun to enter the carton. When the finger 114 is brought into contact with the end flap under these conditions there will be no briquet in place to back up the end flap and instead of compressing the spring 116 the movement of the block 115 will force the end flap into closed position, as shown in Fig. 42. At the same time the rod 122 will engage the bracket 121 and swing the end of the finger 114 to the left, as viewed in Fig. 42, so that the end flap will be tucked into the carton. If there are no briquets at all present on the ledge 80 the end flap will remain thus closed. If there be one or more briquets present it will be forced into the carton and will carry with it the end flap which has been partially closed so that in every case where there is an insufficient number of briquets to fill the carton one of the flaps will be turned in while the carton is in filling position. This is the flap which in ordinary operation would be glued and sealed shut at a later time so as to hold the other end flaps. When this flap is closed at the time of filling it will be out of position for proper gluing so that after the carton has been discharged from the machine the other flaps instead of being properly closed and sealed will remain open so that the partially filled carton can be easily detected and separated from those that are properly filled.

During the filling operation the cartons are held against endwise movement by the flange 70 and the bent flap which is held closed by the flange forms a stop for limiting the movement of the briquets into the carton. After the filling operation is completed the cartons are moved beyond the flange 70 so that the flaps at both ends of the cartons are free. Secured to the guide rib 68 by screws 125 in position to engage the ends of the cartons after they have passed beyond the block 71 is a pair of guides 126, there being one guide arranged adjacent each lateral face of the wheel 4 near the periphery thereof. Since both guides are alike a description of one will suffice for both. Secured to the end of the guide 126 which first engages the cartons as they are moved by the wheel 4 is a plate 127 which engages the foremost edge flap, as shown in Figs. 24 and 25, and again folds it in against the material within the carton. Secured to the shaft 32 located near the position of the plate 127 is a rocker finger 129 having a nose 130 which is swung about the center of the shaft 32 to engage the rear face of the rearmost edge flap of the carton and bend it forwardly against the contents of the carton, as shown in Fig. 25. As the wheel carries the carton into contact with the inner edge of the plate 127 the finger 129 continues to move so that the edge flap is held closed until its forward edge passes behind the plate 127. In this way both edge flaps are closed as the carton passes into engage-

ment with the guide 126. The shaft 32 is oscillated by cam 44 as previously described.

The arm 119 is carried on a shaft 128 which is oscillated by an arm 131 secured to the end of the shaft opposite the arm 119, as shown in Fig. 6. The end of the arm 131 is pivotally connected to a rod 132 which passes through a sleeve 133 carried on an arm 134, see also Fig. 15. The arm 134 is provided with a bearing sleeve 135 journaled on the shaft 41 and a cam roller 136 is connected to the arm 134 in position to engage a cam groove 137 in a lateral face of the cam 102 secured to the shaft 13. The rod 132 is held in place in the sleeve 133 by an adjustable collar 138 and a spring 139. Rotation of the cam 102 will rock the shaft 128 through the mechanism described for operating the arm 119 and the test finger 114 in the manner previously described.

The guide 126 is provided with a groove 140, which, as shown in Fig. 1, is slightly eccentric relative to the wheel 4. When the carton first engages the guide 126 the upper side flap will pass within the groove 140, as shown in Fig. 27, and the lower side flap will extend below the plate 127. Adjacent the rear of the plate 127 the guide 126 is provided with a downwardly extending projection 141 which has the forward edge 142 thereof beveled inwardly toward the wheel 4, as shown in Fig. 28, so that when the lowermost side flap engages the edge 142 it will be bent downwardly into the position shown in Fig. 29. At the same time the eccentric position of the groove 140 will cause the edge of the groove to engage the upper side flap and gradually turn it over until the flaps are brought into the position shown in Fig. 30. After the carton passes the projection 141 the lower side flap engages a plate 143 having its forward edge 144 beveled so that the lower flap is bent backwardly against the outer face of the side wall of the carton, as shown in Fig. 32. At this position the curvature of the groove 140 has brought the outer edge of the groove into alignment with the outer face of the guide 126 so that the groove has its outer side open, except for the portion closed by the plate 144. As the lower side flap passes out of contact with the plate 143 it is brought into engagement with a glue roll 145, as shown in Fig. 33, where it is coated with adhesive material. The glued flap next engages a plate 146 the front edge of which is beveled and engages the flap on the side toward the guide rib 68, as shown in Fig. 34, and swings the flap outwardly into the position shown in Fig. 35, so that the flap is again in position to enter the groove 140 in the manner illustrated in Fig. 36. The guide 126 is provided with a second projection 147 which forms the lower edge of the groove 140 beyond the plate 146. The con-

tinued movement of the wheel 4 and the eccentricity of the groove 140 causes the end of the carton to again cross the groove after it has passed the plate 146 so that the lower edge of the groove bends the lower side flap inwardly against the outer face of the upper side flap, as shown in Figs. 37 and 38, and since the inner face of the lower side flap is now covered with adhesive material the lower flap is sealed in place and holds the two edge flaps and the upper side flap in closed position, thus completing the closing of the carton. The flaps at both ends of the carton are closed in the same way and since it is the lower flap of the inner end of the carton which is tucked into the carton in case of shortage it will be apparent that in such case the lower flap will not be in position to receive the adhesive material when it passes the glue roll and consequently there will be nothing to hold the other flaps of the inner end of the carton closed and the carton will remain open at one end so that the attendant may readily detect and remove any carton which is not properly filled. After the end flaps have been closed the cartons are brought into discharge position at a point substantially on a level with the axis of the wheel 4. The guide rib 68 terminates below the discharge position leaving the cartons free to move outwardly in a radial direction away from the carrier wheel 4. The cartons are removed from between the teeth of the wheel by a pair of discharge arms 148, as shown in Figs. 1, 4, 39 and 46. The discharge arms 148 are carried by a sleeve 149 on the shaft 29 which is the same sleeve that carries the arm 28 and the discharge arms are actuated by the oscillation of the shaft 29, previously described. The cartons are received from the carrier wheel 4 by a collector chain 150 having a series of pockets 152 formed of sheet metal channels secured to the links of the chain 150. The walls of the pockets 152 are so spaced that they bear against the ends of the cartons with sufficient pressure to hold the cartons frictionally in the pockets, and the pockets are sufficiently deep to permit the cartons to move in unison with the carrier wheel during discharge of the cartons from the wheel to the pockets. The receiving pockets are successively brought into alignment with the discharge position of the wheel 4 and remain stationary in this position a sufficient length of time to receive the number of cartons that a particular pocket will hold. When one pocket has been filled the chain is moved to bring the next succeeding pocket into receiving position. The cartons are fed to the pockets while they are situated on the lower run of the receiving chain and remain in the pockets until they are carried to the upper run of the chain. This permits of sufficient time for the ad-

hesive material to set before it becomes necessary to remove the cartons and it also allows a very considerable capacity in the receiving mechanism so that it is unnecessary for the attendant to remove the cartons at any particular time, but may do so at his convenience.

The chains 150 are carried by sprocket wheels 153 and 154 mounted on shafts 155 and 156, respectively. The shaft 156 is journaled in brackets 157 supported by the frame 10 and the shaft 155 is journaled in a bearing member 158 pivotally supported at 159 on the brackets 157. A screw 160 bears against the bearing member 158 for regulating the tension in the chain 150. The shaft 156 and the chain 150 are driven by a ratchet wheel 161 operated by a pawl 162 pivotally mounted at the end of an oscillating arm 163, as shown in Fig. 2. The arm 163 is secured to a shaft 164 journaled in a bearing 165 supported by the frame 10 and a downwardly extending arm 166 is secured to the inner end of the shaft 164 and carries a cam roller 167 for engaging a groove 168 in a cam wheel 169 secured to the shaft 13, as shown in Fig. 16. The pawl 162 is actuated by the mechanism described, once for each operation of the discharge arms 148 and the parts are so timed that the movement imparted to the chain 150 by the pawl 162 takes place immediately after the discharge operation of the arms 148 so that the chain is moved at a time when the discharge arms are not operating to insert a carton into the receiving pockets. Since each pocket has a capacity for a number of cartons it is not desirable to shift the chain each time a carton is discharged and for this reason the pawl 162 is held out of operative position by a control rod 170 which periodically permits the pawl to engage the ratchet wheel 161. The rod 170 engages a lug 171 on the pawl 162 and a spring 172 normally holds the rod in its upper position to support the pawl 162 out of engagement with the ratchet wheel 161. A stop 173 is provided for limiting the upward movement of the rod 170. The rod 170 is carried on the end of an arm 174 which is pivoted at 175 on the frame 10. The opposite end of the arm 174 extends into the path of a lug 176 on a spur gear 177 journaled at 178 on the frame 10 and arranged to mesh with a gear 179 secured to the shaft 5, as shown in Fig. 6. Each time the lug 176 engages the arm 174 the control rod 170 will be moved downwardly for a sufficient length of time to permit the pawl 162 to rotate the ratchet wheel 161 an amount corresponding to one notch thereon and thus shift the receiver chain 150 a sufficient amount to bring the next succeeding channel 152 into alignment with the discharge position of the wheel 4. The parts

are so timed that the movement of the chain 150 will take place after a sufficient number of cartons have been inserted in a receiving channel 152 to substantially fill the channel. The number of cartons inserted in each channel is determined by the ratio of the gears 177 and 179. By providing a series of channels which are periodically moved into receiving position a collector of large capacity is provided in compact space. Moreover, each channel may be of comparatively short length so that at no time is it necessary for the discharge arms to slide a very large number of cartons along the channel against the frictional resistance of the channel walls against the ends of the cartons as would be necessary if one continuous channel were used for collecting the cartons. The position of the collector chain brings the collected cartons into compact space near the position normally occupied by the attendant so that the cartons are much more readily removed from the collector than would be the case if a single continuous receiving trough were used.

The glue roll 145 is carried in a glue box 180 pivotally mounted at 181 on the frame 10 and adjustably held by a screw 182 threaded in a lug 183. The glue roll is provided with a detachable connection with a shaft 184 journaled in the frame 10, the end of the shaft with which the glue roll is detachably connected being shown in Fig. 7. The shaft 184 is provided with a sprocket wheel 185 meshing with a gear wheel 186 driven by the gear 179, as shown in Fig. 6.

The guide strips 74 for the slideways 72 may be cut away at their lower ends, as shown in Fig. 43, to permit inspection of the channel at the point of discharge, and also to allow access to the channels whenever necessary. It may be found desirable to provide a plate 187 to form a retainer for the briquets as they move into the carton, as shown in Fig. 47. The briquets may be fed from a hopper to the slideways 72 by any suitable mechanism, one form of mechanism being shown in my previous application, Serial No. 154,966, filed March 17, 1919. It will be seen that the operation of the machine is entirely automatic and continuous and that there is no stop in the movement of the carton carrier during the filling operation, but that the filling takes place while the carrier continues at its normal speed. The cartons are supplied in collapsed form and are automatically opened by the machine and filled with the proper number of confections, after which they are automatically closed and sealed and discharged into a collector having a sufficient capacity for holding a large number of sealed cartons. Not only is the operation au-

automatic and continuous, but the parts are designed for rapid operation so that a machine built according to the embodiment shown in the drawings will fill and seal approximately one hundred cartons per minute.

I claim:—

1. In a cartoning machine, a magazine for containing collapsed cartons, a circular carrier having teeth thereon forming peripheral pockets, means for continuously rotating said carrier to cause the teeth thereon to extract cartons, one at a time, from said magazine and deposit said cartons in said pockets, and means cooperating with said teeth for opening and seating said cartons in said pockets.

2. In a cartoning machine, a continuously moving carrier having pockets therein, means for opening and seating cartons in said pockets during the movement of said carrier, and means for filling said cartons while said carrier maintains its continuous movement.

3. In a cartoning machine, a circular carrier having peripheral pockets therein, means for opening and seating cartons in said pockets, means for filling said cartons, means for closing said cartons, and means for continuously rotating said carrier during said opening, filling and closing operations.

4. In a cartoning machine, a circular carrier having peripheral pockets therein, means for opening and seating cartons in said pockets, means for filling said cartons, means for closing and sealing said cartons, means for discharging said cartons from said carrier, and means for continuously rotating said carrier during said opening, filling, closing, sealing and discharging operations.

5. In a cartoning machine, a magazine for containing collapsed cartons, a circular carrier having teeth thereon forming peripheral pockets, means for continuously rotating said carrier to cause said teeth to extract cartons, one at a time, from said magazine, means cooperating with said teeth for opening and seating said cartons in said pockets so that said cartons will travel continuously with said carrier during a portion of a rotation thereof, means for filling said cartons during continuous movement of said carrier, means for closing and sealing said cartons during said continuous movement, and means for discharging said cartons from said carrier during said continuous movement.

6. In a cartoning machine, a circular carrier having pockets therein, a magazine for containing collapsed cartons located in one position adjacent said carrier for supplying cartons to said pockets, means for opening and seating said cartons in said pockets, filling mechanism located adjacent said car-

rier at a second position relative thereto, a carton closing mechanism located adjacent said carrier at a third position relative thereto, and means for continuously moving said carrier to successively present said cartons to said filling and closing mechanisms.

7. In a cartoning machine, a circular carrier having teeth thereon forming peripheral pockets, a magazine located at one position for supplying cartons to said carrier, means for opening and seating said cartons in said pockets, carton filling mechanism located adjacent the periphery of said carrier at a second position relative thereto, carton closing mechanism located adjacent said carrier at a third position relative thereto, means for discharging cartons from said carrier at a fourth position relative to said carrier, means for continuously rotating said carrier to transfer cartons from said magazine and successively present said cartons to said filling, closing and discharging mechanisms, and means for operating said filling, closing and discharging mechanisms during the continuous rotation of said carrier.

8. In combination, a magazine for holding a plurality of collapsed cartons, a carton carrier for extracting cartons from said magazine, and means for opening said cartons to adapt them for transportation by said carrier.

9. In combination, a magazine for holding a plurality of collapsed cartons, a carrier for extracting cartons from said magazine, said carrier having pockets therein, and means for opening said cartons and seating them in said pockets.

10. In combination, means for supporting a plurality of cartons in stacked formation, a carrier having pockets therein, means for moving said carrier adjacent said stack to cause the edges of said pockets to engage said cartons and extract said cartons from said stack, and means for opening and seating said cartons in said pockets.

11. In combination, means for supporting a plurality of collapsed cartons in stacked formation, a circular carrier having peripheral pockets therein, and means for moving the periphery of said carrier adjacent said cartons to cause the edges of said pockets to engage said cartons and extract said cartons, one at a time, from said stack.

12. In combination, a magazine for holding a plurality of collapsed cartons, a circular carrier having peripheral pockets therein arranged with the periphery thereof adjacent the lower end of said magazine, means for rotating said carrier to cause the edges of said pockets to engage the edges of said cartons and extract said cartons, one at a time, from said magazine, and means for opening and seating said cartons in said pockets.

13. In combination, a magazine for holding a plurality of collapsed cartons, spaced members for supporting said cartons in said magazine, a circular carrier having teeth thereon forming peripheral pockets, means for rotating said carrier to cause said teeth to pass between said supports and engage the edges of said cartons to extract said cartons, one at a time, from said magazine, and means for opening and seating said cartons in said pockets.

14. In combination, a magazine for holding a plurality of collapsed cartons having an opening therein to permit said cartons to be removed, one at a time, from said magazine, a carrier having pockets therein for extracting said cartons from said magazine, and a device movable past the opening in said magazine for seating the edge of a carton extracted from said magazine in a corner of a pocket in said carrier and for readjusting the remaining cartons in said magazine.

15. In combination, a magazine for holding a plurality of collapsed cartons, a circular carrier having teeth forming peripheral pockets therein, means for rotating said carrier to cause said teeth to engage the edges of said cartons and extract said cartons, one at a time, from said magazine, a movable member arranged adjacent said magazine, and means for shifting said member to cause one face thereof to engage a carton extracted from said magazine and seat said carton in a pocket in said carrier and to cause another face of said member to engage the edges of cartons remaining in said magazine to rearrange said cartons.

16. In combination, a magazine for holding a plurality of collapsed cartons, a carrier having teeth thereon forming pockets, means for moving said carrier adjacent said magazine to cause said teeth to engage said cartons and extract said cartons, one at a time, from said magazine, and means for compressing said cartons substantially in the direction of the planes thereof to open said cartons in said pockets.

17. In combination, a magazine for holding a plurality of collapsed cartons, a carrier having teeth thereon forming pockets, means for moving said carrier adjacent said magazine to cause the front edges of said teeth to engage the rear edges of said cartons and extract said cartons, one at a time, from said magazine, and an abutment member for engaging the front edges of said cartons to cause said cartons to be compressed between said member and said teeth to open said cartons in said pockets.

18. In combination, a magazine for holding a plurality of collapsed cartons, a carrier having teeth forming pockets thereon, means for moving said carrier to cause the front face of a tooth thereon to engage

the rear edge of a carton and extract said carton from said magazine, means for moving the edge of said carton into the corner of a pocket adjacent said tooth, and means for engaging the opposite edge of said carton and compressing said carton against said tooth to open said carton in said pocket.

19. In combination, a magazine for holding a plurality of collapsed cartons, a carrier having teeth thereon forming pockets, means for moving said carrier to cause the front face of a tooth to engage the rear edge of a carton and extract said carton from said magazine, means for moving the rear edge of the extracted carton into the rear corner of the pocket in front of said tooth while the front edge of said carton rests upon the rear edge of the next preceding tooth, and means for engaging the front edge of said carton to compress said carton against the rear corner of said pocket to open said carton and seat said carton in said pocket.

20. In combination, a carrier having a pocket therein, means for positioning a collapsed carton in said pocket with one edge thereof extending into one corner of said pocket while the opposite edge thereof rests upon the upper face of the opposite wall of said pocket, an abutment member for engaging the last-mentioned edge and means for relatively moving said pocket and abutment while said carton is so positioned for compressing said carton in the direction of the plane thereof to open said carton and to seat said carton in said pocket.

21. In combination, a carrier having teeth thereon forming pockets, means for positioning a collapsed carton on said carrier with the rear edge thereof in a corner of one of said pockets while the front edge thereof rests upon the upper face of the tooth in front of said pocket, an abutment member for engaging the front edge of said carton, means for moving said carrier toward said abutment member to cause said carton to be compressed, and means for moving said abutment member in the direction of movement of said carrier, but at a less rate of speed than said carrier.

22. In combination, a support for a collapsed carton, and opening means for said carton arranged to begin opening operation at one edge thereof in advance of the other while opening at the said other edge of said carton is resisted.

23. In combination, means for opening a collapsed carton, mechanism for operating said opening means to cause said opening means to separate the walls of said carton at one edge thereof prior to the separation of said walls at the opposite edge thereof and means for resisting opening of said walls at said opposite edge during the first part of said opening operation.

24. In combination, means for opening

a collapsed carton arranged to separate the walls of said carton at one edge thereof in advance of the other, and mechanism for operating said opening means to cause the separation of said walls to progress continuously from one edge to the other of said carton, said opening means including a device for holding a wall against opening movement at one part thereof while another part is being opened.

25. In combination, a pair of abutment members for engaging opposite edges of a folded carton, and means for moving said members toward one another to compress said carton to cause the walls thereof to separate said abutment members being arranged to compress said carton adjacent one edge thereof in advance of the compression adjacent the opposite edge to cause the walls of said carton to separate progressively from one edge to the other thereof.

26. In combination, a pair of abutment members for compressing a collapsed carton to open said carton, and means for actuating said abutment members to cause the walls of said carton to separate in a progressive movement from one edge to the other thereof.

27. Mechanism for opening a collapsed carton having the walls thereof connected along two opposite edges and disconnected along the other two edges, said mechanism comprising abutment members for engaging the connected edges of said walls, and means for actuating said abutment members to compress said carton adjacent one of the edges along which the walls are disconnected prior to compression adjacent the opposite edge of said carton.

28. Mechanism for opening a collapsed carton composed of walls connected to form a tubular member having open ends, said mechanism comprising means for compressing said carton adjacent one end thereof prior to compression adjacent the opposite end thereof to cause said carton to begin opening adjacent said first-mentioned end in advance of the opening of the carton adjacent said opposite end.

29. Mechanism for opening a collapsed carton having the walls thereof arranged to form a tubular member with open ends, said mechanism comprising a pair of abutment members for engaging one edge of said carton to compress said carton to cause the walls to separate from one another, one of said abutment members being arranged to engage the edge of said carton in advance of the other abutment member.

30. In combination a carrier having means thereon for engaging one edge of a collapsed carton, a pair of abutment members arranged to engage the opposite edge of said carton to compress said carton against said engaging means to open said carton,

one of said abutment members being arranged to engage the edge of said carton in advance of the other member to cause the opening of said carton to progress from one end of said carton to the other end thereof.

31. In combination, a carrier having a pocket therein, means for positioning a collapsed carton on said carrier with one edge thereof seated in one corner of said pocket, a pair of abutment members for engaging the opposite edge of said carton, and means for moving said carrier toward said abutment members to cause said carton to be opened and seated in said pocket, one of said abutment members being arranged in advance of the other so that said carton will be compressed adjacent one end thereof prior to compression adjacent the opposite end so that the opening of said carton will progress from one end to the other thereof.

32. Mechanism for opening a collapsed carton having walls arranged to form a tubular member with open ends, said mechanism comprising means for engaging one of said walls adjacent one end of said carton and separating said wall from the other prior to the separation of said walls at the opposite end of said carton, and means for resisting separation of said walls at a position removed from said first mentioned end during the beginning of said separating action.

33. Mechanism for opening a collapsed carton having the walls thereof arranged to form a tubular member with open ends, said mechanism comprising means for engaging the inner face of one of said walls adjacent one end of said carton, and means for moving said carton in a direction transverse to the plane of said wall to cause the walls of said carton to be separated adjacent said end prior to the separation of said walls at the opposite end of said carton.

34. Mechanism for opening a collapsed carton having the walls arranged to form a tubular member with open ends, one of said walls having a notch therein at one end of said carton, said mechanism comprising a contact member, and means for engaging said carton at a point spaced from said contact member for moving said carton relative to said contact member so that said contact member passes through said opening into engagement with the inner face of the other wall of said carton so that said walls are separated from one another adjacent one end of said carton in advance of the separation of said walls adjacent the opposite end of said carton.

35. Mechanism for opening a collapsed carton having the walls arranged to form a tubular member with open ends, said mechanism comprising a contact member arranged to engage the inner face of one of said walls adjacent one end of said carton,

and means for engaging said carton intermediate the ends thereof for moving said carton transversely to the plane of the walls thereof so that said walls will be separated by said engaging means adjacent one end of said carton prior to the separation of said walls at the opposite end of said carton.

36. Mechanism for opening a collapsed carton comprising means for partially separating the walls of said carton adjacent one end thereof in advance of the separation of said walls adjacent the opposite end of said carton, and means for externally engaging said carton at opposite points thereon for compressing said carton to continue the opening thereof.

37. Mechanism for opening a collapsed carton having walls to form a tubular member with open ends, said mechanism comprising a device for partially separating said walls adjacent one end of said carton, and means for progressively compressing said carton to continue the opening operation, said compressing operation beginning adjacent the end of said carton partially opened by said device.

38. In combination, a carrier having pockets therein, means for moving a collapsed carton onto said carrier, a device for engaging a wall of said carton as it is moved onto said carrier to partially open said carton adjacent one end thereof, and an abutment member for engaging an edge of said carton to compress said carton as it is moved by said carrier to progressively open said carton from one end thereof to the other.

39. In combination, a carrier having teeth thereon forming pockets, means for moving a collapsed carton onto said carrier and for seating the rear edge of said carton in a corner of one of said pockets, means for engaging said carton to partially separate the walls thereof adjacent one end of said carton, and an abutment member for engaging the front edge of said carton to cause the separation of said walls to progress from the partially separated ends thereof to the opposite end of said carton.

40. In combination, a carrier having teeth thereon forming pockets, means for moving a collapsed carton onto said carrier and for seating the rear edge of said carton in a corner of one of said pockets, a device for engaging a wall of said carton adjacent one end thereof and for retarding said wall during the movement of said carton into a pocket to partially separate said wall from the other wall of said carton at one end of said carton, an abutment member for engaging the front edge of said carton adjacent the partially open end thereof for compressing said carton against the rear wall of said pocket to continue the opening of said carton at the end partially opened, and a

second abutment member for engaging the front edge of said carton adjacent the opposite end thereof subsequent to the beginning of the opening movement at the first-mentioned end of said carton.

41. In combination, a magazine for containing a plurality of collapsed cartons having an opening to permit removal of said cartons therefrom, a circular carrier having teeth forming peripheral pockets thereon, means for rotating said carrier to cause said teeth to extract said cartons from said magazine, one at a time, a device arranged to move past the opening in said magazine to force the rear edge of a carton extracted from said magazine into the rear corner of a pocket in said carrier and to readjust the remaining cartons in said magazine, a stop for engaging the inner face of one of the walls of said cartons at one end thereof for separating said walls during the movement of said carton into said pocket, a pair of abutment members differently spaced from the front edge of said carton for successively engaging said edge to cause said carton to open progressively from one end to the other thereof, means for shifting said abutment members to bring them into contact with said edge and for returning said abutment members in the direction in which said carton is moved by said carrier but at a less speed than the movement of said carrier, and means cooperating with said abutment members to disengage said carton from said members after said carton has been opened and to seat said carton in said pocket.

42. In a cartoning machine, a carrier having a plurality of carton holders for transporting cartons to be filled, means for inserting material into cartons on said carrier, and means for moving a single insert means in unison successively with different holders having cartons therein during the filling operations.

43. In combination, a carrier having a carton holder for transferring a carton, means for inserting material into said carton while said carton is moved by said carrier, and mechanism for maintaining said inserting means in registry with said holder and carton while said material is being inserted in said carton and subsequently discontinuing the registration of said inserting means with said carton and holder.

44. In combination, a carrier having holders thereon for transporting cartons, filling mechanism arranged adjacent the path of said carrier and having a guide thereon arranged to register with the open end of a carton in each consecutive holder on said carrier during a portion of the movement of said carton, means for actuating said carrier to bring different holders with cartons therein successively into registration with

said guide, and means for moving material along said guide into said cartons.

45. In combination, a rotary carrier for holding cartons, means for inserting material into cartons held by said carrier, and mechanism for rotating said inserting means in unison with said carrier and about the axis thereof for a partial rotation of said carrier during the insertion of material into a carton and for subsequently discontinuing said registration.

46. In combination, a circular carrier having peripheral pockets therein, means for positioning cartons in said pockets with one end thereof open, a support for material to be inserted into said cartons having a guide thereon arranged to register with each consecutive pocket in said carrier and the open ends of said cartons, means for maintaining said guide in registry with a pocket and its carton during a portion only of the movement of said carton in said pocket, and means for moving material along said guide into said carton while said guide is in registry therewith.

47. In combination, a rotary carrier for holding cartons to be filled, and a filling device pivoted to rotate about the axis of said carrier in unison therewith during a portion of the movement of said carrier.

48. In combination, a rotary carrier having means thereon for supporting cartons to be filled, a filling device pivoted to oscillate about the axis of said carrier, means for moving said filling device in one direction in unison with said carrier and for operating said filling device to insert material into a carton on said carrier during said movement, and means to return said filling device into position to begin a subsequent movement in unison with said carrier for performing a subsequent filling operation.

49. In combination, a continuously moving carrier having consecutively arranged means thereon for supporting cartons to be filled, a filler head having a guide thereon arranged to register consecutively with a carton in each supporting means on said carrier, means for moving said head in unison with said carrier, during a portion only of the movement of said carrier, and a plunger for moving material along said guide into a carton in registry therewith during the movement of said head and carrier in unison with one another.

50. In a cartoning machine, a filler head, a plunger for discharging material from said head, means operating simultaneously with said plunger for shifting the position of said filler head during a discharging operation, a movable carrier having means thereon for receiving said material, and means for returning said filler head after each discharging operation by a reverse

movement thereof independently of said carrier.

51. In combination, a filler head, a carrier having movable means thereon for receiving material from said head, a device for discharging material from said head, means operating in unison with said discharging device for moving said head in unison with said receiving means during the discharge of material from said head but permitting movement of said carrier relative to said head subsequent to a discharging operation, and means for reversing the movement of said head after each discharging operation to said carrier.

52. In combination, a filler head having a guide thereon, means for depositing material on said guide, a plurality of movable devices for receiving material from said head, a plunger for discharging material from said guide, means operating simultaneously with said plunger for successively shifting said guide in unison with said receiving devices to maintain said guide in registry with different receiving devices during successive discharging movements of said plunger, means for returning said guide into receiving position after each successive receiving device is filled.

53. In combination, a rotary carrier for supporting cartons, a filler head pivoted to swing about the axis of said carrier, a guide on said filler head arranged to register with a carton on said carrier, means for depositing material on said guide, a plunger for discharging material from said guide, and cam mechanism operating simultaneously with said plunger for moving said filler head about its pivot in unison with said carrier to maintain said guide in registry with a carton on said carrier during a discharging operation of said plunger so that the material on said guide will be directed into said carton while said carrier is continuously moving.

54. Carton filling mechanism comprising a runway for supplying material, a filler head for receiving material from said runway, a gate for controlling the discharge of material from said runway, a carrier for presenting cartons to said carton filling mechanism to receive material therefrom, a device for discharging material from said filler head to the cartons on said carrier, and means for operating said gate in timed relation with the movements of said filler head, means for moving said filler head away from receiving position.

55. In combination, a runway for supplying material to be inserted in a carton, a guide for receiving material from said runway, a gate for controlling the discharge of said material from said runway to said guide, a carrier for moving cartons into po-

sition to receive material from said guide, means for moving said guide away from receiving position, a plunger for discharging material from said guide into said cartons, and means for operating said guide, plunger and gate in timed relation to one another.

56. In combination, a runway for supplying material to be inserted into cartons, a guide for receiving material from said runway, a gate for controlling the discharge of said material from said runway to said guide, a carrier for moving cartons into registry with said guide, a plunger for discharging material from said guide to a carton on said carrier, means for operating said plunger and gate in timed relation with one another, and means for shifting said guide during the operation of said plunger to maintain said guide in registry with a carton on said carrier.

57. In combination, mechanism for inserting material into a carton, and means for pressing against a yielding face of said carton to ascertain the presence or absence of material therein.

58. In combination, means for inserting material into a carton, and a yielding contact member arranged to engage a face of said carton to ascertain the presence or absence of material therein.

59. In combination, mechanism for inserting material into a carton having end flaps, and a device arranged to close one of said flaps in case said carton is not properly filled.

60. In combination, means for inserting material into a carton having end flaps, means for sealing said flaps, and shortage detecting mechanism arranged to prevent sealing of said flaps when a carton is not properly filled.

61. In combination, means for inserting material into a carton having a closing flap, means for securing said flap in closed position, and means for displacing said flap to prevent operation of said securing means thereon in case of shortage of material inserted in said cartons.

62. In combination, means for inserting material in a carton having a plurality of end flaps, means for sealing said flaps in closed position, and a device for displacing one of said flaps in case of shortage of material inserted in said carton to prevent sealing of said flaps.

63. In combination, means for inserting material in a carton having end flaps, means for securing said flaps in closed position, and a device for displacing one of said flaps in case of shortage of material inserted in said carton to prevent operation of said securing means on said flaps.

64. In combination, mechanism for inserting material in a carton having closing flaps, means for closing said flaps, and a

shortage detector arranged to prematurely close one of said flaps in case of shortage of material inserted in said carton.

65. In combination, means for inserting material in a carton having a closing flap, means for applying adhesive material to said flap and sealing said flap in closed position, and a shortage detector for displacing said flap in case of shortage of material inserted in said carton to prevent the application of adhesive material to said flap.

66. In combination, mechanism for inserting a series of articles into a carton, and a detector arranged to engage said carton, at the period in the filling operation for the movement of the first article of said series into said carton, to ascertain if the series of articles for filling said carton is complete.

67. In combination, means for supporting a series of articles in position to enter a carton, means for engaging the article of said series farthest removed from said carton for moving said articles into said carton, and a detector arranged to engage said carton at the time in the filling operation when the foremost article of said series is adjacent the point of engagement of said detector when the series of articles for filling said carton is complete.

68. In combination, means for supporting a carton having one end thereof open, means for pushing a series of articles through said open end into said carton, and a yielding detector arranged to engage said carton adjacent the open end thereof at a time in the filling operation when the movement of said detector will be resisted by one of said articles if the series of articles is complete but such that if the series of articles is incomplete said detector will distort a portion of said carton.

69. In combination, means for inserting a relatively unyielding article into a carton, and yielding means for compressing the walls of said carton to detect the presence or absence of such article.

70. In combination, mechanism for inserting relatively unyielding material into a carton, an abutment member for supporting a wall of said carton, and a yielding detector for engaging an opposite wall of said carton for pressing said wall inwardly in case of the absence of material between said walls, said wall being held against compression however in case of the presence of an article between said walls at the time of the operation of said detector.

71. In combination, a support for a carton having a closing flap, means for inserting relatively unyielding material past said flap into said carton, a contact member, and means for yieldingly moving said contact member against said flap during a filling operation so that said flap will be forced inwardly in case of the absence of filling ma-

terial adjacent said flap during the operation of said contact member.

72. In combination, means for supporting a carton having a closing flap, means for inserting material past said flap into said carton, a contact finger, means for yieldingly moving said contact finger into engagement with said flap during a filling operation so that said finger will press said flap inwardly in case of the absence of material adjacent said flap but will be held against movement of said flap in case of the presence of such material, and means for shifting said finger laterally to fix said flap in closed position in case said flap is moved inwardly by said finger.

73. In combination, a carrier for cartons having a closing flap, a guide comprising a unitary member arranged adjacent the path of said carrier and having a groove therein extending only partially there-through for receiving said flap, said guide being arranged to diverge slightly from the direction of the path of said carrier so that said carton moves transversely of said groove during the movement of said carrier to close said flap.

74. In combination, a circular carrier having means for supporting a carton with a closing flap thereon, and a guide comprising a unitary member arranged adjacent the path of a carton on said carrier, said guide having a groove therein for receiving said flap and having a curvature slightly eccentric to the path of the cartons on said carrier, said groove extending only partially through said guide so that said guide remains intact.

75. In combination, a circular carrier for supporting cartons having closing flaps, and a unitary guide arranged adjacent the path of movement of cartons on said carrier, said guide having a groove therein arranged eccentrically relative to the path of the cartons on said carrier so that a carton will be shifted transversely of said groove during its movement adjacent said guide, said groove extending only partially through said guide so that said guide remains intact.

76. In combination, a circular carrier for supporting cartons having closing flaps, means for rotating said carrier, a unitary guide arranged adjacent the path of movement of the cartons on said carrier, said guide having a groove therein curved eccentrically relative to the path of the cartons on said carrier so that a carton on said carrier will be successively moved in opposite directions transversely of said groove during the movement of said carton adjacent said guide, said groove extending only partially through said guide so that said guide remains intact.

77. In combination, a circular carrier for supporting cartons having oppositely ar-

anged closing flaps, a unitary guide positioned adjacent the path of movement of cartons on said carrier and having a groove therein arranged eccentrically relative to the path of movement of cartons on said carrier so that said cartons will be successively shifted in opposite directions relative to said groove, and means for successively directing said flaps into said groove so that one of said flaps will be closed during the transverse movement of said carton in one direction relative to said groove and the other of said flaps will be closed during the transverse movement of said carton in the opposite direction relative to said groove, said groove extending only partially through said guide so that said guide remains intact.

78. In combination, a carrier for a carton having closing flaps at opposite ends thereof, means for folding said closing flaps against an outer face of said carton, and means for applying adhesive material to said flaps while in this position.

79. In combination, a carrier having a closing flap, means arranged adjacent the path of said carrier for bending said flap outwardly against an outer face of said carton, and means adjacent the path of said carrier for applying adhesive material to said flap while in this position.

80. In combination, a carrier for a carton having closing flaps thereon at opposite ends thereof, means for bending said flaps backwardly against a common outer surface of said carton, and a glue roll for simultaneously engaging the surfaces of said flaps while in this position to apply adhesive material thereto.

81. In combination, a carrier for a carton having a closing flap thereon, means for bending said flap backwardly against the outer surface of said carton to turn the inner face of said flap outwardly, means for applying adhesive material to said face, and means for subsequently closing said flap to bring the face thereof having adhesive material thereon into contact with said carton for sealing said flap.

82. In a cartoning machine, a rotary carrier having peripheral pockets therein for holding cartons while they are being filled, means for discharging cartons in a radial direction from said wheel during rotation of said wheel, and a receiver for said cartons arranged to permit movement of a carton therein in the direction of movement of the portion of said wheel from which said carton is discharged while said carton is entering said receiver.

83. In combination, a rotary carrier having peripheral pockets therein for holding cartons during a filling operation, a pair of arms arranged adjacent opposite lateral faces of said wheel and movable radially relative to said wheel for discharging filled

cartons therefrom, and a channel-shaped device for receiving cartons as they are discharged from said wheel, said device being arranged to permit movement of said cartons toward the closed side of said channel and in the direction of movement of the portion of said wheel from which said cartons are discharged during the movement of said cartons from said wheel into said device.

84. The combination with a cartoning machine having means for sealing cartons with adhesive material, of a collector provided with a plurality of units each having capacity for receiving a plurality of cartons from said machine and for holding said cartons in closed position to permit said adhesive material to set, said units being arranged to successively receive cartons from said machine.

85. The combination with a cartoning machine having means thereon for sealing a carton with adhesive material, of a collector for receiving cartons from said machine, said collector comprising a plurality of receiving units each having means thereon for holding a plurality of cartons in closed position to permit said adhesive material to set, and means for shifting said collector to bring different units thereon into receiving position.

86. The combination with a cartoning machine, of a collector having a plurality of channels for receiving cartons having closure flaps thereon from said machine each channel having capacity for receiving a plurality of cartons, means for discharging cartons from said machine into said channels while said channels are in inverted position the cartons being retained in said channel by frictional contact with said closure flaps, and means for reversing the position of said channels to present the cartons for removal from said channels.

87. The combination with a cartoning machine, of a belt having outwardly directed channels thereon for receiving cartons from said machine, means for discharging cartons into said channels while carried by the lower run of said belt, and means for shifting said belt for bringing the channels having cartons therein onto the upper run of said belt to facilitate removal of said cartons from said channels at the convenience of the operator.

88. The combination with a cartoning machine, of a collector for receiving cartons therefrom, said collector comprising a belt having a plurality of outwardly directed channels thereon for receiving cartons, means for periodically discharging cartons

from said machine into said channels, a ratchet for shifting said belt, a pawl for operating said ratchet, means for moving said pawl once for each operation of said discharging means, and control mechanism for retaining said pawl out of operative relation with said ratchet, said control mechanism being arranged to automatically bring said pawl into operative position during one out of a series of movements thereof.

89. The combination with a cartoning machine, of a collector having a plurality of units for receiving cartons from said machine, ratchet mechanism for shifting said collector to bring said units successively into receiving position, means for retaining said shifting mechanism in inoperative position, and mechanism for automatically and periodically moving said shifting mechanism into operative position for shifting said collector.

90. In a cartoning machine a traveling carrier and mechanism for opening and depositing a carton in said carrier, inserting material in said carton and closing said carton, all during the movement of said carrier.

91. In a cartoning machine a rotary carrier having pockets therein, and mechanism for opening and seating cartons in said pockets, inserting material in said cartons and closing said cartons, all during continuous rotation of said carrier.

92. In a cartoning machine a circular carrier having pockets therein, means for opening and seating cartons in said pockets during rotation of said carrier, means for inserting material in said cartons while said carrier is rotating and means for closing said cartons during rotation of said carrier.

93. In combination a circular carrier, means for continuously rotating said carrier and mechanism for opening cartons and depositing them in said carrier, filling said cartons, closing said cartons and ejecting said cartons from said carrier, all during the continuous rotation of said carrier.

94. In combination, means for filling a carton, means for closing said carton, and means for modifying the closing of said carton in case of incomplete filling of said carton.

95. In combination, means for filling a carton having closing flaps, means for closing said flaps, and means for displacing one of said flaps from its normal closing position in case of incomplete filling of said carton.

In testimony whereof I have signed my name to this specification on this 4th day of September, A. D. 1920.

MICHAEL J. MILMOE.