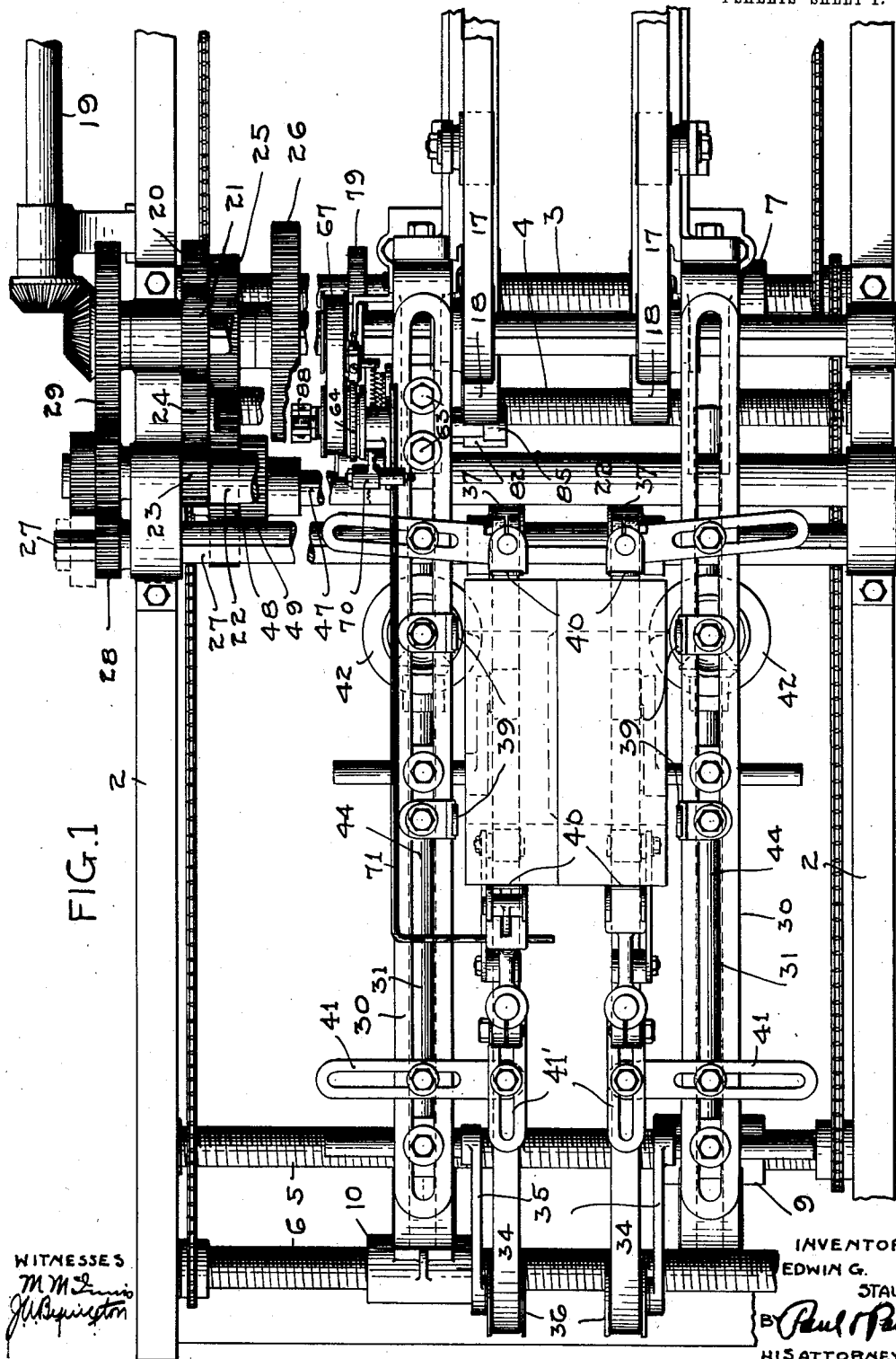


E. G. STAUDE.
 STACKING AND COUNTING MECHANISM FOR FLEXIBLE BOX BLANKS.
 APPLICATION FILED NOV. 7, 1908.

961,263.

Patented June 14, 1910.

4 SHEETS—SHEET 1.



WITNESSES
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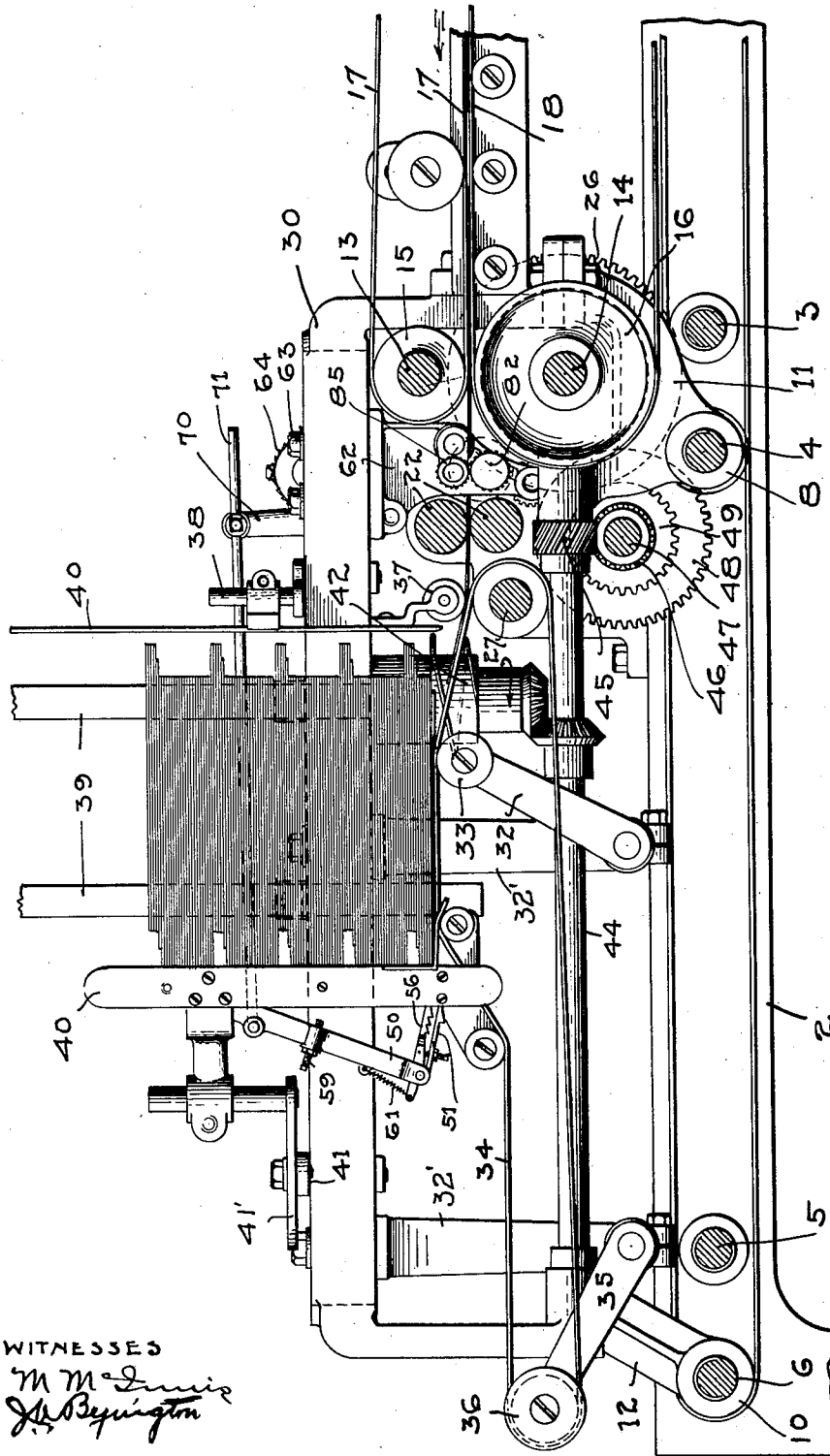


FIG. 2

WITNESSES

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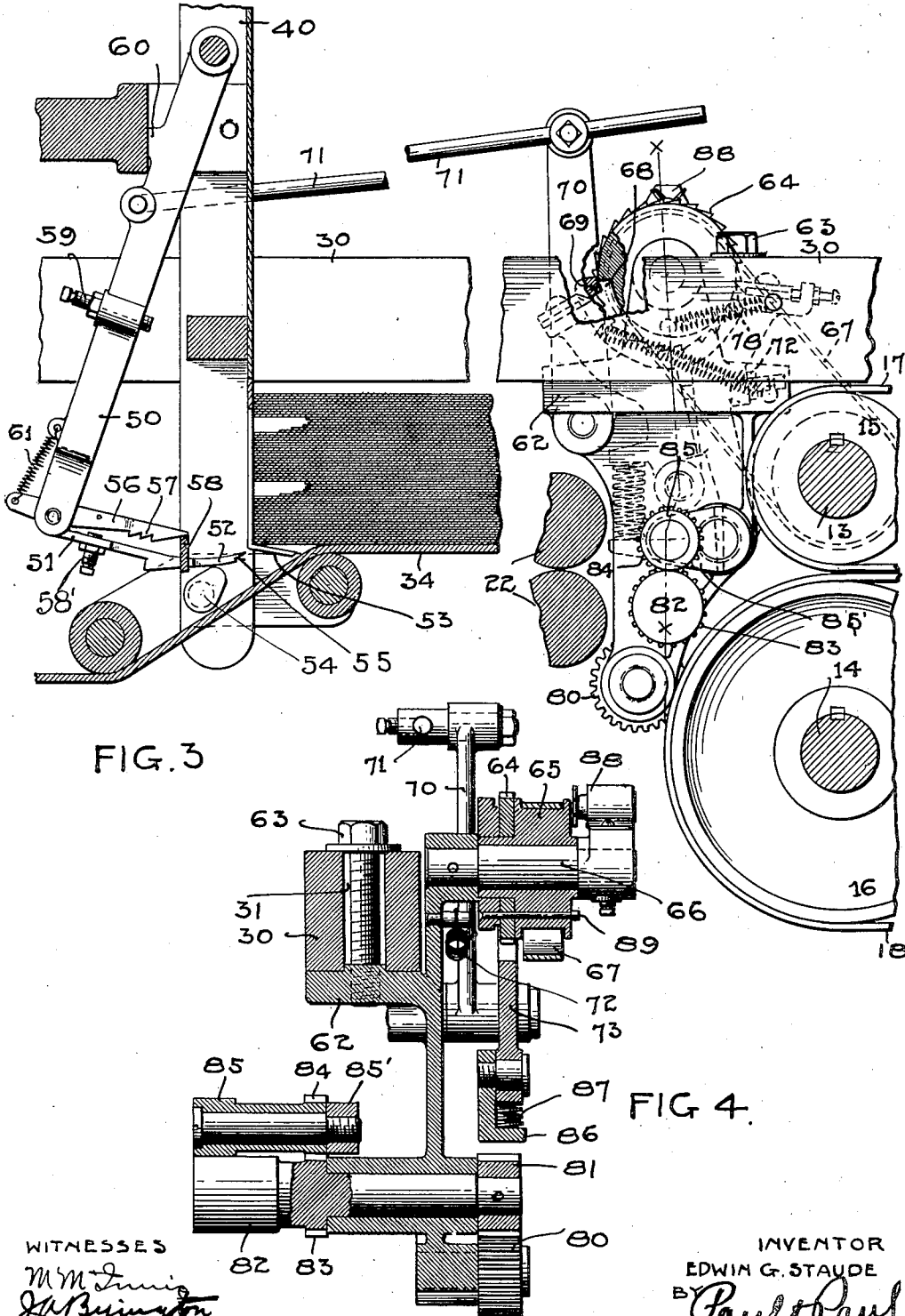


FIG. 3

FIG. 4.

WITNESSES

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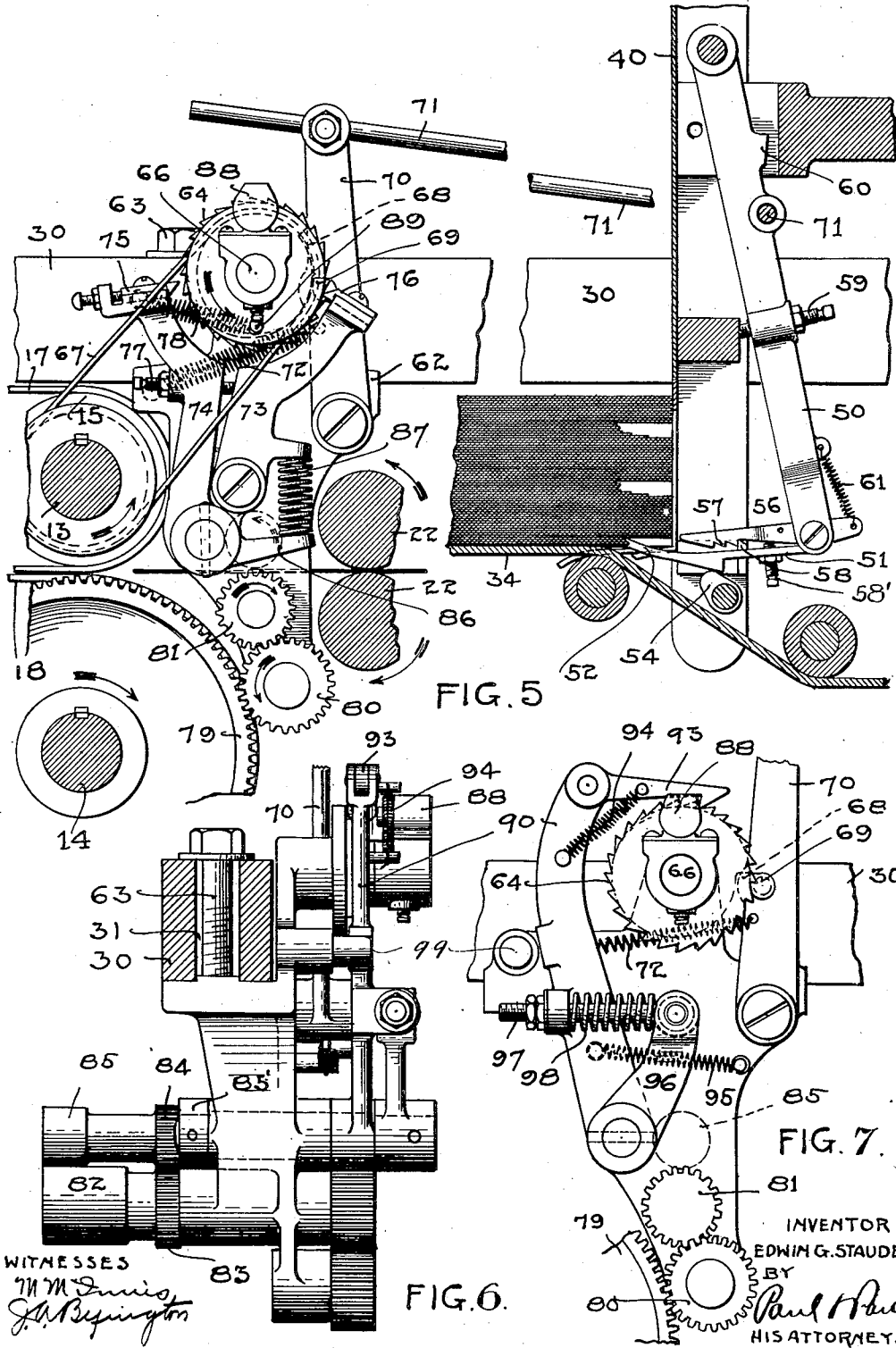
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4 SHEETS—SHEET 4.



UNITED STATES PATENT OFFICE.

EDWIN G. STAUDE, OF MINNEAPOLIS, MINNESOTA.

STACKING AND COUNTING MECHANISM FOR FLEXIBLE BOX-BLANKS.

961,263.

Specification of Letters Patent. Patented June 14, 1910.

Application filed November 7, 1908. Serial No. 461,478.

To all whom it may concern:

Be it known that I, EDWIN G. STAUDE, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in Stacking and Counting Mechanisms for Flexible Box-Blanks, of which the following is a specification.

The object of my invention, is to provide a stacking and counting mechanism, that will be positive and durable in its action, capable of operation at a high speed and readily adapted for handling box blanks of different sizes.

A further object is to provide a counting mechanism by means of which the pile of blanks will be off-set at intervals to enable the operator to determine at a glance, the number of cartons in the pile.

Other objects of the invention will appear from the following detailed description.

The invention consists generally in improved means for receiving the folded cartons or blanks from the feed belts and stacking them in a pile one above another.

Further the invention consists in improved mechanism whereby an accurate count of the cartons may be obtained.

Further the invention consists in means whereby the apparatus is adapted for packing and counting large or small cartons.

Further the invention consists in various constructions and combinations, all as hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings forming part of this specification, Figure 1, is a plan view of the stacking and counting mechanism of a box machine embodying my invention, Fig. 2, is a longitudinal vertical sectional view of the same, Fig. 3, is a sectional view illustrating the arrangement of the counter mechanism, a portion of the machine being broken away, Fig. 4, is a sectional view on line X—X of Fig. 3, Fig. 5, is a view similar to Fig. 3 taken from the opposite side of the machine, Figs. 6 and 7 are detailed views illustrating a modified form of ratchet mechanism.

In the drawing, 2 represents a frame wherein transverse screws 3, 4, 5 and 6 are mounted, having squared ends to receive a crank for turning them and changing the width of the operating mechanism of the machine. Upon these screws, hubs 7, 8 9

and 10 are mounted carrying brackets 11 and 12 which support the mechanism of the machine and which permit the machine to be readily adapted for box blanks of different width.

13 and 14 are feed belt shafts having key ways therein and provided with wheels 15 and 16 on which feed belts 17 and 18 are mounted. These belts bring the folded blanks from the folding mechanism which I have not thought necessary to illustrate in this application. The lower feed belt shaft 14 is geared to a drive shaft 19 and drives the upper feed belt shaft 13 through gears 20 and 21. Creasing rolls 22 are arranged to receive the blanks from the feed belts, the upper roll having a driving gear 23 meshing with a similar gear on the lower roll which in turn is driven through idler 24 from gear 20 on shaft 14. A stacker belt shaft 27 has a gear 28 driven from a gear 29 on the shaft 14 through an intermediate idle gear, the gear 28 being removable to allow a gear of different size to be substituted therefor, as indicated by dotted lines in Fig. 1. The stacker frames 30 are mounted on the brackets 11 and 12 and transversely adjustable therewith and provided with longitudinal slots 31 in which brackets 32' supporting arms 32 and 35 are slidable. Wheels 33 are mounted on the arms 32 and engage the stacker belts and the adjustment of said arms allows the effective working surface of the spirals to be varied and permit a proper inclination to the receiving portion of the stacker belts. The arms 35 are provided with idler wheels 36 and serve as belt tighteners for the stacker belts 34. With this mechanism, I am able to adjust the height of the working surface of the belts, according to the position of the spirals and vary the inclination of the receiving portions of the belts to compensate for the different sizes of blanks. The cartons are held down by presser wheels 37 which are adjustable vertically and horizontally upon brackets 38. These wheels are mounted on the walls of the blank receptacle and insure the continuous movement of the blanks and their delivery to the packing spirals. The receptacle in which the blanks are stacked, has side and end walls 39 and 40 adjustably supported by means of slotted brackets 41 and 41' on the frames 30.

This adjustment permits movement of the walls horizontally or vertically to adapt them for blanks of different sizes.

On each side of the stacker belts, I provide upright spirals 42 adjustable in the slotted frame 30 to permit their position to be changed according to the adjustment of the stacker walls and size of carton. The lower ends of the spirals are geared to horizontal shafts 44 having gears 45 which mesh with worms 46 on a transverse shaft 47. Gears 48 and 49 are splined on the shaft 47 and are adapted to engage respectively the gears 25 and 26 on the shaft 14. I am thus able to vary the speed of the mechanism.

To enable the operator to determine the number of blanks in the stack easily and quickly, I provide means for indenting the pile on one side. This means consists of a pivoted bar 50 provided with an arm 51 at its lower end having a forward end 52 that is adapted to slip in between tongues 53 at one end of the receptacle in the path of the incoming blanks, and at the point where the stacker belts are inclined downwardly and leave the receptacle. The vertical adjustment of the end 52 is regulated by a cam 54. The end of the arm 51 has a notch 55 to receive the forward ends of the blanks and when a sufficient number of them has entered the receptacle, the arm 51 will be pushed up to trip a locking arm 56 that is pivotally supported on the bar 50 and has teeth 57 to engage a stop 58. The locking arm prevents the heavy cartons from pushing the arm 51 out of the receptacle and may be omitted in handling small cartons. The tripping of the arm 56 is regulated by an adjusting screw 58' and the stroke of the bar 50 is determined by a screw 59 and a lug 60 which contacts with a portion of the machine frame. The arm 56 is normally held in contact with its stop by a spring 61. For the purpose of moving the bar 50 toward the stack and adjusting arm 51 in position to cause the indenting of the blanks, I provide a frame 62 secured on the machine frame by a screw 63 and provided with a ratchet wheel 64 that is mounted on the hub of a pulley 65 carried by a shaft 66. A belt 67 connects the pulley 65 with a roller on the upper feed belt shaft 13 and slips when the ratchet is temporarily locked. The ratchet wheel has a recess 68 to receive a lug 69 on a pivoted arm 70 which is adjustably connected by means of a rod 71 with the bar 50 and is normally held toward the ratchet by a spring 72.

To insure a step by step movement of the ratchet, I provide an escapement mechanism consisting of levers 73 and 74 pivoted on the machine frame and provided with adjustable blocks 75 and 76 having beveled ends to engage the ratchet teeth, the blocks alternately engaging the teeth and allowing only

a step by step movement of the ratchet. An adjusting screw 77 regulates the distance between the escapement levers and a spring 78 is provided to draw the lever 74 toward the ratchet teeth. The escapement levers are operated from a gear 79 on the lower feed belt shaft, meshing with an idle gear 80 which in turn drives a gear 81 on the shaft of a roll 82. A gear 83 is mounted on said shaft and meshes with a gear 84 on a roll 85. The roll 85 is fastened to a rocker arm 85' carried by a hub on the lower end of the escapement lever 74 and the passage of a blank between the rolls 82 and 85 will rock said hub and cause the oscillation of the lever 74 and its disengagement from the ratchet wheel. The escapement lever 74 is also provided with an arm 86 between which and the escapement lever 73, a spring 87 is provided, said spring normally tending to force the lever 73 into engagement with the ratchet teeth as the lever 74 is disengaged therefrom and in case two or more blanks should pass between the rollers 82 and 85 and force them apart an unusual distance, the spring 87 will be compressed sufficiently to compensate for the separation of the rollers without danger of damage to the escapement levers. A registering device 88 is mounted on the shaft 66 and actuated by a pin 89.

In Figs. 6 and 7, I have illustrated a modified construction which consists in providing an escapement lever 90. A dog 93 is mounted on the lever 90 and held in engagement with the ratchet teeth by a spring 94. A spring 95 draws the lever 90 toward the ratchet wheel and an arm 96 is carried by the escapement lever 90 and oscillated to move the escapement lever through the gears and rollers described with reference to Fig. 5. A threaded stud 97 and a spring 98 provide an adjustable yielding connection between the escapement lever 90 and arm 96. A stop 99 is provided in the path of the lever 90 for limiting its movement away from the ratchet, continued movement of the arm 96, being obtained through compression of the spring 98.

In the operation of the machine, the walls of the receptacle, the stacking spirals and the stacker belts are adjusted for handling blanks of the size the machine is working upon and as the blanks are delivered from between the feed belts, their folded edges will be squeezed together by the creasing rolls and guided upwardly by the stacker belts into the receptacle, an upward movement being imparted to them by the revolving spirals. The counting mechanism will project into the receptacle and engage the ends of the blanks arresting movement of some of them and causing the pile to be indented. As the blanks continue to enter the receptacle and slide in under the end of the

counter arm, it will gradually be raised and trip the locking device which holds the counter arm against premature movement. When the counter arm has been forced out of the receptacle, the blanks will be fed the full distance therein, until a number corresponding to the teeth of the ratchet wheel has entered the receptacle. At that time, the ratchet wheel having made a revolution and the lug 69 having dropped into the recess of the ratchet, the counter arm will be moved to a position within the receptacle in the path of the incoming blanks. A series of the blanks will then be retarded, causing their rear ends to overhang the stack, the position of the lower blank of the projecting series indicating to the operator the number of blanks in the stack. The operation is repeated until the receptacle is full when the blanks are removed and the receptacle allowed to fill again. The provision for regulating the speed of the different parts of the mechanism, varying the inclination of the stacker belts, the location of the spirals and the walls of the receptacle, allows me to readily adapt the machine for blanks of different sizes and material of varying weight.

The rolls connected with the counter mechanism, it will be noted, are arranged on one side of the machine and engage one edge only of the blanks and are readily removable with the ratchet mechanism from the machine for the purpose of adjustment or repairs.

I claim as my invention:

1. The combination, with a feeding means, of creasing rollers, a carton receptacle, stacking means having a moving surface and operating transversely in said receptacle, revolving packers, said stacking means and said packers being relatively adjustable, substantially as described.

2. The combination with a carton receptacle, of means for feeding cartons thereto, an arm arranged to move into the path of said cartons, means in the path of said arm for temporarily locking it, the pressure of the cartons against said arm operating the same at a predetermined time to trip said locking means.

3. The combination with a carton receptacle, and means for feeding cartons thereto, of an arm having a notched forward end arranged to move into the path of the carton, means in the path of said arm for temporarily locking it, the forward ends of the cartons entering said notched end and the entrance of succeeding cartons raising said notched end to trip said locking means, for the purpose specified.

4. The combination, with a carton receptacle and means for delivering the cartons thereto, of a carton arresting arm, a locking device comprising a toothed bar and means for engaging said bar to lock said arm in the

path of the cartons and said arm being actuated and having means to engage and trip said bar when a predetermined number of cartons have been arrested.

5. The combination with a carton receptacle and mechanism for delivering cartons thereto, of a carton arresting arm adapted to enter said receptacle, a bar supporting said arm, mechanism actuated by the passage of the cartons toward said receptacle for controlling the movement of said bar, and means adjustably connecting said bar with said mechanism whereby the stroke of said bar may be regulated.

6. The combination, with a carton receptacle, and mechanism for delivering the cartons thereto, of a carton arresting means, a ratchet wheel having escapement levers, rollers provided in connection with said escapement levers and between which rollers the cartons are fed, means for driving said ratchet wheel and mechanism controlled by the movement of said ratchet wheel for regulating the movement of said arresting means.

7. The combination with a carton receptacle and means for feeding the cartons thereto, of means for checking the movement of one or more cartons in said receptacle, a ratchet mechanism in connection with said feeding means and controlling the movement of said checking means, said ratchet mechanism including escapement levers and rollers connected therewith between which the blanks are fed and one of said rollers being yieldingly supported to permit it to accommodate itself to the passage of two or more blanks between the rollers at the same time.

8. In a machine of the class described, means for feeding the blanks, a blank receptacle in which the blanks are fed one beneath another, means for insetting the pile of cartons, said means including an arm projecting into said receptacle, a ratchet mechanism connected therewith, and rolls connected with said ratchet mechanism and between which rolls the blanks are fed.

9. In a machine of the class described, a blank receptacle adapted to receive the blanks one upon another therein, means for checking the movement of said cartons into said receptacle, a ratchet mechanism controlling the movement of said checking means, rollers connected with said ratchet mechanism between which the blanks are fed, substantially as described.

10. In a machine of the class described, a receptacle adapted to receive the blanks one upon another, means projecting into said receptacle and actuated by the contact of the blanks therewith, a ratchet mechanism connected with said projecting means, rollers between which the blanks are fed, means operatively connecting said rollers with said ratchet mechanism, said rollers being adapted to engage one edge only of the blanks.

11. In a machine of the class described, a counter mechanism including a ratchet and escapement levers therefor, rolls connected with said escapement levers and between
5 which rolls the blanks are fed.

12. In a machine of the class described, means for feeding the blanks, rollers between which the blanks are moved, a ratchet mechanism having a step by step movement operatively connected with said rollers, an oscillating arm actuated by said ratchet mechanism, a carton receptacle adapted to receive the cartons when placed one above another therein, means projecting into said receptacle
10 and into the path of said cartons to retard the entrance of one or more cartons therein, said retarding means being tripped by pressure of the blanks when a predetermined number has entered the receptacle, and
15 means operatively connecting said retarding means with said oscillating arm.

13. In a machine of the class described, means for feeding the blanks, rollers where-
25 to the blanks are delivered, said rollers engaging the blanks at one end only, a carton receptacle in which the blanks are packed, one against another, a ratchet mechanism operatively connected with said rollers and
30 movable with a step by step movement, and a blank retarding means connected with said ratchet mechanism and rendered inoperative at predetermined points by pressure of the blanks, substantially as described.

14. The combination, with means for feeding the blanks of a carton receptacle, means projecting therein and adapted to engage and retard the blanks, means for temporarily locking said retarding means, and said retarding means being tripped at pre-
35 determined intervals by the pressure of the blanks to allow them to complete their movement into said receptacle.

15. The combination, with a carton receptacle and means for feeding the blanks
45 therein, of a carton retarding means adapted to hold back one or more of the cartons, means for locking said retarding means, said means being adapted to be tripped by pressure of the blanks to allow a series of blanks
50 to enter completely into said receptacle, and means for timing the period of the tripping operation.

16. The combination, with means for feeding the blanks, of a carton receptacle adapted
55 to receive the blanks one beneath another, creasing rollers located between said feeding means and said carton receptacle, a carton stacking means having a moving surface within said receptacle and extending from

the receiving side thereof to the opposite 60 side, and means for adjusting said stacking means to adapt it for cartons of different sizes.

17. The combination, with means for feeding the blanks of a carton receptacle adapted
65 to receive the blanks fed therein one beneath another, a carton inseting device and means for temporarily locking it in its operative position, the pressure of the blanks tripping said locking means at predeter-
70 mined intervals, substantially as described.

18. The combination, with means for feeding the blanks of a carton receptacle, an inseting device operating to retard one or
75 more of the blanks at predetermined intervals, a locking device for said inseting device, and a ratchet mechanism operatively connected with said locking device and adapted to be actuated by the passage of a
80 blank.

19. The combination, with means for feeding the blanks of a carton receptacle, an inseting means and a locking device therefor, adapted to be tripped by the pressure of the
85 blanks, a ratchet mechanism connected with said inseting device and a roll connected with said ratchet mechanism and located in the path of the blanks.

20. The combination, with a carton receptacle and means for feeding the blanks
90 therein, of an inseting device adapted to be projected into the carton receptacle to arrest movement of the cartons therein, a ratchet mechanism, means operatively connecting said ratchet mechanism and said inseting
95 device to positively move the latter into the path of the cartons, means actuated by a moving carton for operating said ratchet mechanism, and a locking device adapted to positively hold said inseting de-
100 vice in its operating position.

21. The combination, with a carton receptacle and means for feeding the cartons thereto, of means for checking the movement
105 of one or more cartons in said receptacle, a ratchet mechanism controlling the movement of said checking means, said ratchet mechanism including a ratchet wheel and escapement levers therefor, means for driving said
110 ratchet wheel and means connected with said escapement levers and in the path of the cartons to be actuated thereby.

In witness whereof, I have hereunto set my hand this 2nd day of November 1908.

EDWIN G. STAUDE.

Witnesses:

J. A. BYINGTON,
C. G. HANSON.