

paper feed mechanism and cutting knives will be operated in proper timed relation to the other parts of the machine.

A vertically disposed transverse plate 64 extends across the bed-plate 1 in front of the knives 49 and 50, and this bar is fixed at its ends to a pair of upright posts 65 which rise from the bed-plate 1. The bar 64 is provided on its rear face with pairs of rearwardly projecting guide fingers 66 and 67 which receive the wrapper 7 after it has passed between the knives and which guide it forwardly beneath the bar 64 and over a pair of horizontal folding plates 68 and 69. The transverse bar 64 is provided with forwardly projecting fingers 70 which engage the upper face of the wrapper, and the folder plate 69 is provided with side guiding plates or fingers 71 which engage the opposite side edges of the wrapper. The different guide fingers 47, 48, 66, 67, 70 and 71 have outturned ends to facilitate the proper guiding of the wrapper to the position shown in Fig. 3 above the folding plates 68 and 69. The upper surface of the folding plate 68 onto which the paper is first fed is above the upper face of the other folding plate 69, so that the leading edge of the wrapper will not catch on the edge of the plate 69. The driving sprocket 40 for the paper feed mechanism, is loosely mounted on the main operating shaft 41 (see Fig. 9), and is provided with a spring-actuated pawl 40' arranged to engage a notch in the shaft, so that the sprocket will be driven when the shaft is rotated in the direction indicated by the arrow. This one-way connection between the sprocket and the operating shaft permits the movement of the paper feed mechanism by hand and independently of the shaft, so that the wrapper can be readily threaded through the guides before the machine is thrown into operation. The horizontal folding plate 68 is arranged to reciprocate upon a plunger 72. This plunger (see Fig. 4) is of rectangular form and is mounted to slide upon the upper face of the bed-plate 1, the lower, side edges of the plunger being provided with projecting ribs 73 which engage guides 74 fixed upon the upper face of the bed-plate. The folder 68 has a depending lug 75 on its under side which is longitudinally perforated to engage a guide rod 76 that is fixed at its ends to the ends of the plunger 72. An arm 77 depends from one side of the plunger 72 through a slot 78 in the bed-plate and is connected by a link 79 to the upper end of an operating lever 80 (see Figs. 3, 5 and 8). An arm 81 depending from the lug 75 of the reciprocating folder plate 68, extends through the slot 78 and is connected by an adjustable link 82 to the upper end of an operating shift lever 83.

The operating lever 80 is pivotally mounted at its lower end upon the tie-bolt 6 at the right-hand end of the machine, and the lever 83 is similarly pivoted upon the central, transverse tie-bolt, as shown in Fig. 8. An eccentric rod 84 engages an eccentric 85 on the main operating shaft and is adjustably connected to the lever 80 to swing the same back and forth and thereby reciprocate the plunger 72. The lever 83 is provided with an enlarged portion midway between its ends having a cam-shaped opening 86 therein through which the main operating shaft 41 extends. A triangular-shaped cam 87 fixed to the shaft is fitted within the opening 86 and is arranged to operate upon the high points 88 of the cam slot to swing the lever 83 back and forth and thereby reciprocate the folder plate 68. The cam mechanism for operating the folder is such that the folder is shifted back and forth and held stationary for a brief interval at the opposite ends of its movement. The cam mechanism for shifting the folder, and the eccentric mechanism for reciprocating the plunger are so related that the shift of the folder is slightly in advance of that of the plunger.

A plate 89 extends across the face of the plunger 72, the ends of the plate projecting slightly beyond the side edges of the plunger, as shown in Fig. 4. A pair of horizontal pins 90 fixed to this plate extend through the inner end of the plunger and springs 91 mounted on these pins tend to hold the plate against the end of the plunger. As the plunger is shifted outwardly to the right, the projecting ends of the plate 89 engage the ends of the guides 74 and the movement of the plate is arrested, so that, upon the continued movement of the plunger, the springs 91 are compressed. This position of the plate and plunger is indicated in dotted lines in Fig. 4.

The folding plate 69 is, in the preferred form shown fixed to the under side of a transverse bar 92. This bar has depending end portions fixed to the bed-plate 1. The plate 69 and the bed-plate 1 form the top and bottom walls respectively of a horizontal guide-way or chute 93 through which the packages are forced by the plunger 72 to form the end folds, by means of suitable folders located at the sides of the guideway or chute 93. The upper face of the bed-plate 1 within the guideway or chute is preferably provided with a series of longitudinally extending ribs 94 that assist in guiding the packages in a straight line direction.

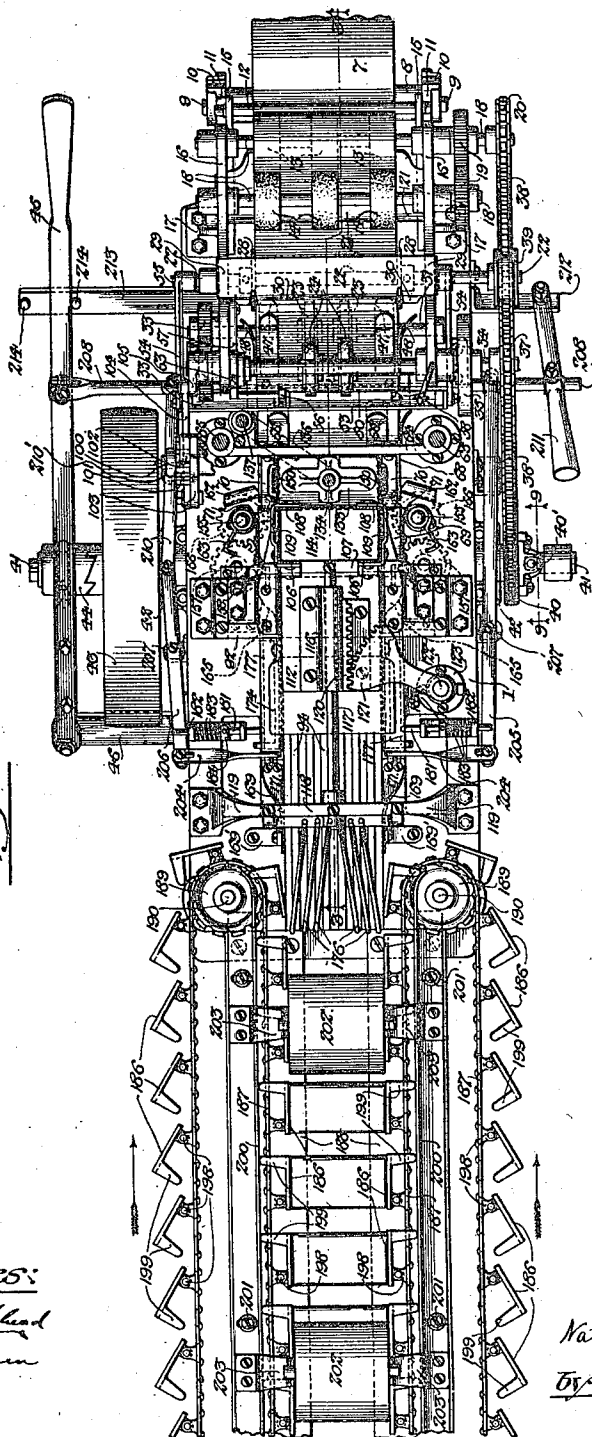
The boxes or other articles to be wrapped are fed to the machine from the right-hand end thereof through a guide or run-way comprising an elevated, horizontal portion and a downturned vertical portion. The hori-

N. B. POST.
WRAPPING MACHINE.
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9 SHEETS—SHEET 2.

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Fig. 2.



Witnesses:

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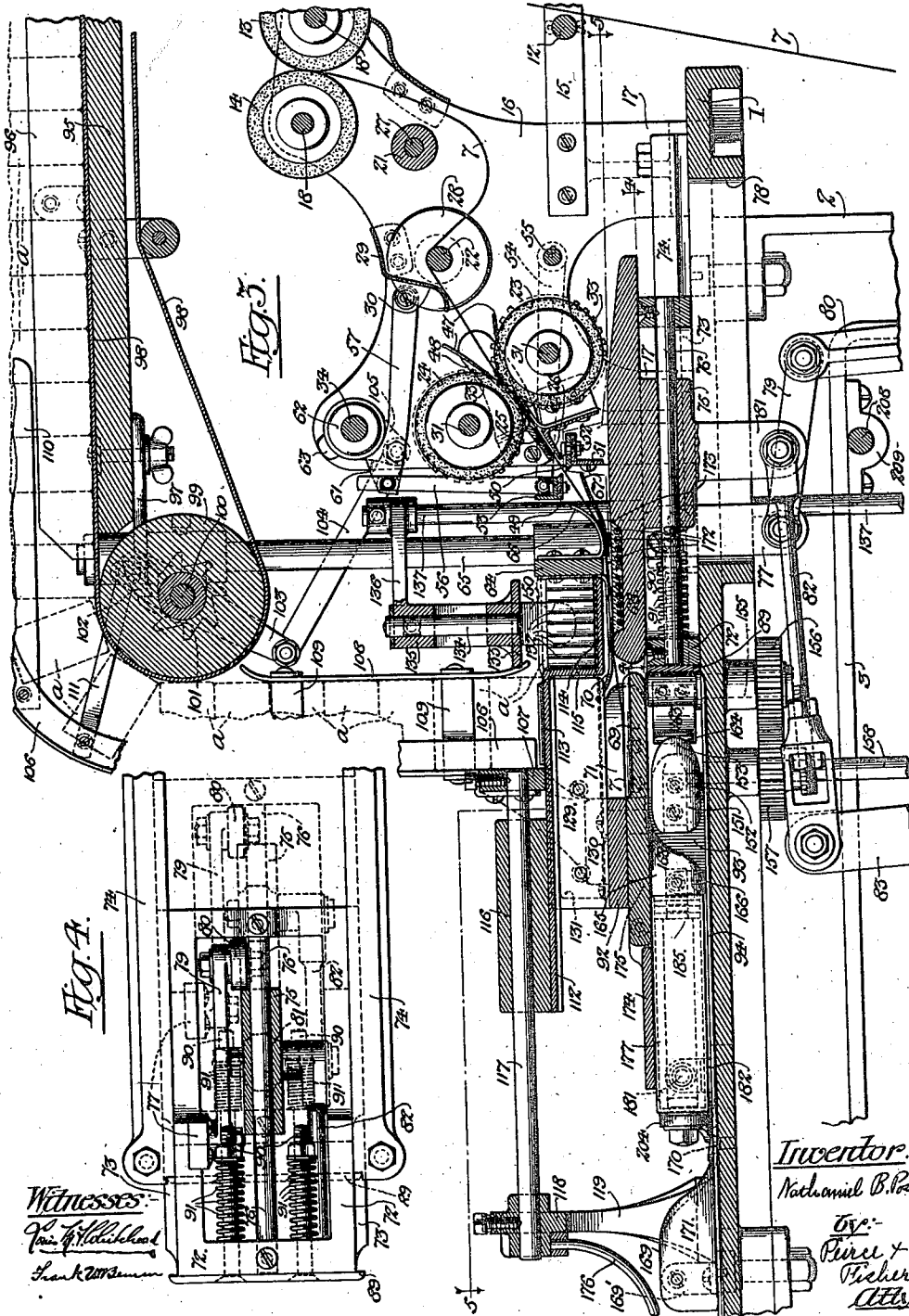
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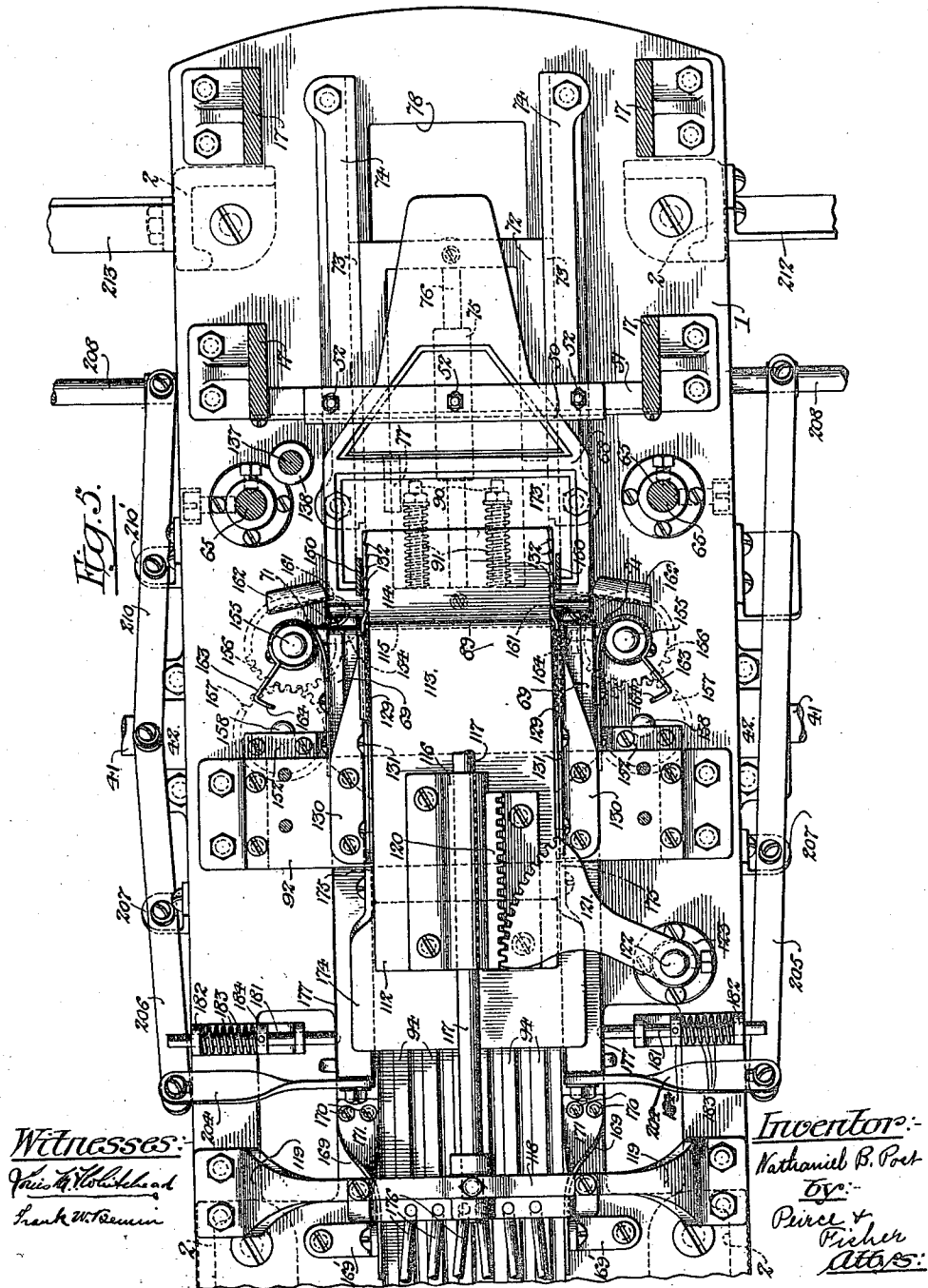
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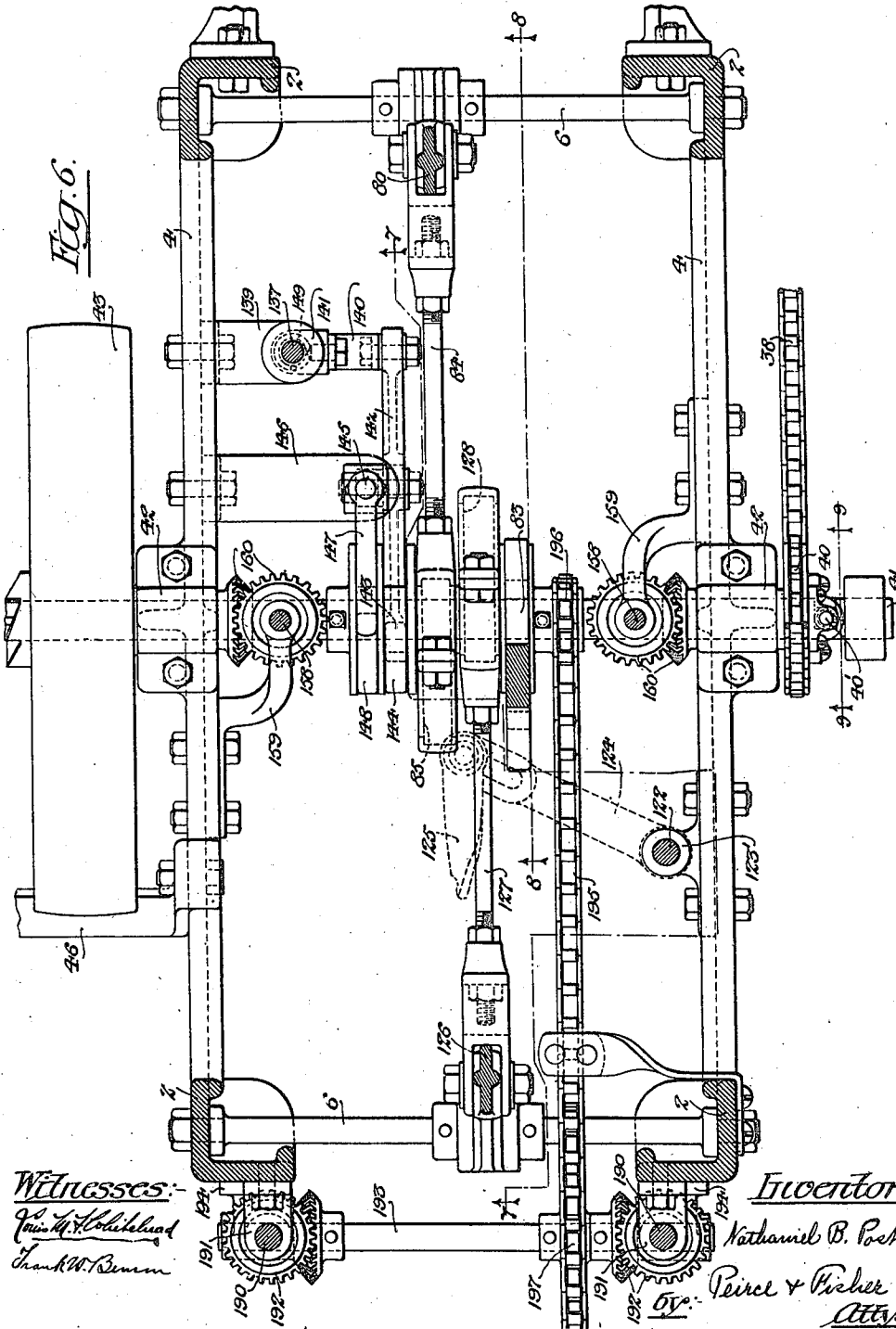
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Fig. 6.



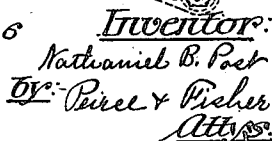
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Fig. 8.

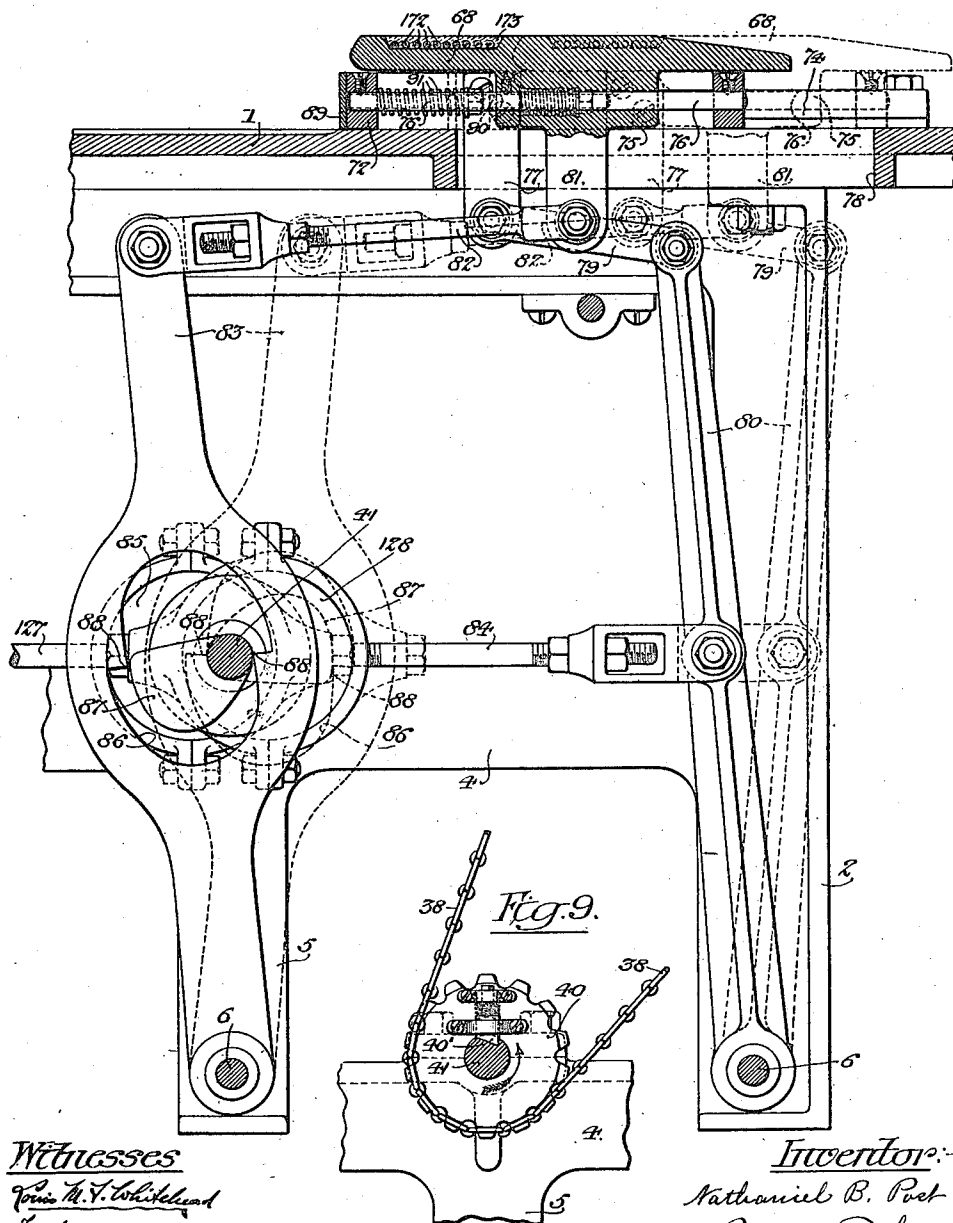
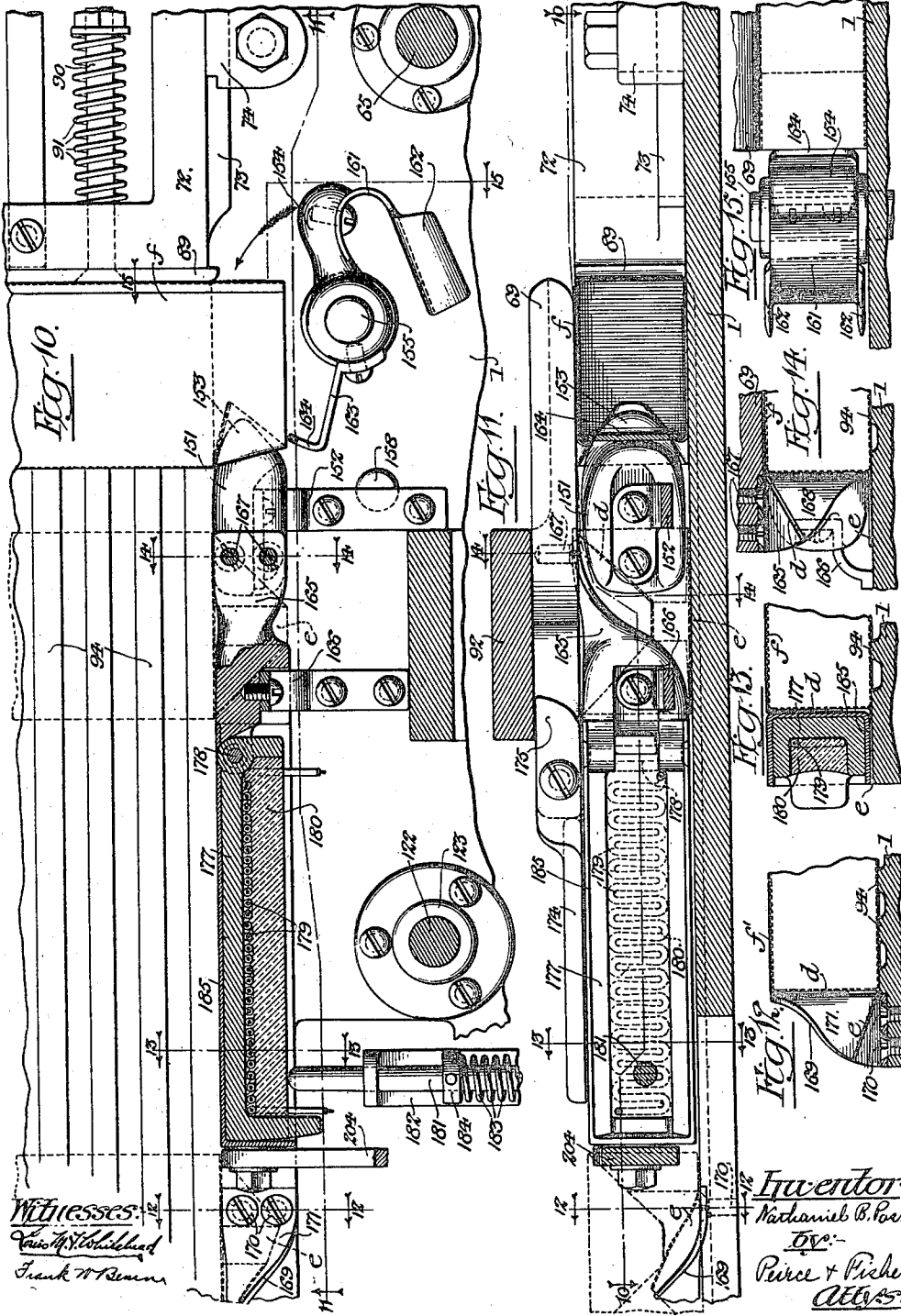


Fig. 9.

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9 SHEETS—SHEET 9.

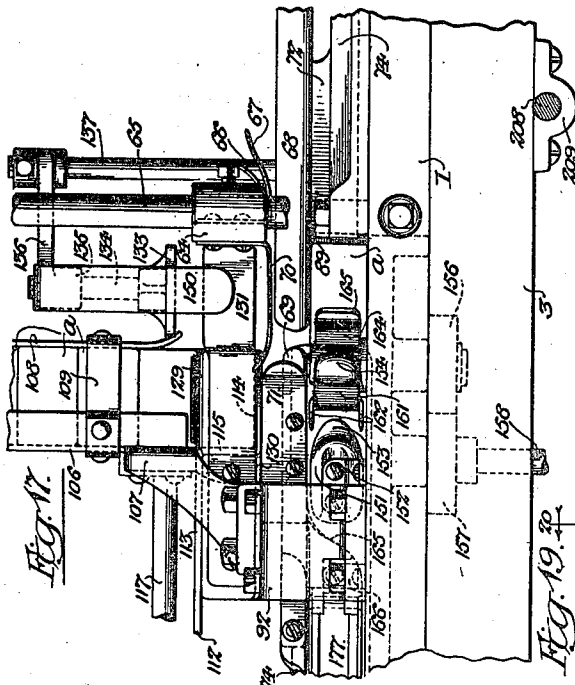
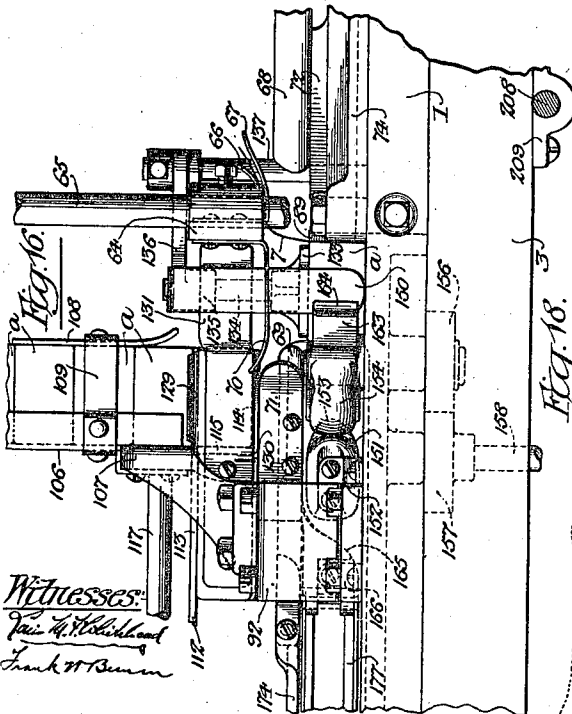


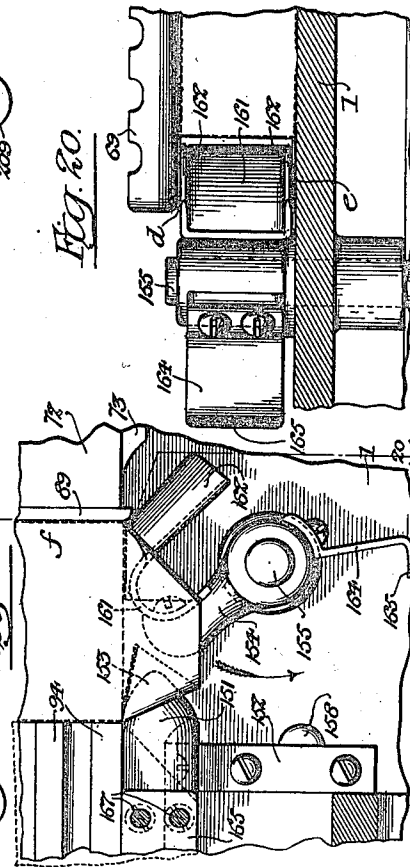
Fig. 17.



Witnesses:
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Fig. 19.

Fig. 18.



UNITED STATES PATENT OFFICE.

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WRAPPING-MACHINE.

1,195,721.

Specification of Letters Patent.

Patented Aug. 22, 1916.

Application filed February 28, 1910. Serial No. 546,552.

To all whom it may concern:

Be it known that I, NATHANIEL B. POST, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Wrapping-Machines, of which the following is a specification.

The invention relates to machines for automatically wrapping boxes or similarly shaped articles, such as cakes of soap and the like, and seeks to provide a simple, efficient and rapidly operating machine of this sort.

More particularly, the invention relates to machines for automatically forming moisture tight packages, such as set forth in the United States Letters Patent No. 881,561, Henry G. Eckstein, dated March 10, 1908. These packages are formed by inclosing the goods in an inner box or carton of stiff and comparatively rigid material, such as cardboard, infolding the box in a thin, flexible, heavily waxed wrapper and sealing the folds of the wrapper at all points in moisture tight fashion by heating the folds to melt the wax and applying pressure to the folds until the wax cools and sets.

The particular object of the present invention is to provide an automatic machine by which the thin, flexible, waxed wrappers can be applied to the inner boxes, and the folds thereof sealed at all points in moisture tight fashion by the application of heat and pressure.

The invention consists in the features of improvement hereinafter set forth, illustrated in the preferred form in the accompanying drawings and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a view in side elevation of the improved machine. Figs. 1^a and 1^b are perspective views of the box to be wrapped. Fig. 1^c is a perspective view of the wrapped box or package. Fig. 2 is a plan view with the horizontal portion of the feed chute or guideway for the boxes removed and the vertical portion thereof shown in section. Fig. 3 is a longitudinal section on an enlarged scale of a portion of the machine illustrating the folders. Fig. 4 is a detail section on the line 4—4 of Fig. 3. Fig. 5 is a plan view of the parts shown

in Fig. 3 with certain of the parts shown in section on the line 5—5 of Fig. 3. Fig. 6 is a plan view on an enlarged scale of the operating mechanism with parts shown in section on the line 6—6 of Fig. 1. Figs. 7 and 8 are views in elevation of the operating mechanism with parts shown in section on the lines 7—7 and 8—8 respectively of Fig. 6. Fig. 9 is a detail section on the line 9—9 of Figs. 2 and 6. Fig. 10 is an enlarged plan view of the folders showing the operation of forming the folds of the package and with parts shown in section on the line 10—10 of Fig. 11. Fig. 11 is an enlarged view in elevation of the folders with parts shown in section on the line 11—11 of Fig. 10. Figs. 12, 13, 14 and 15 are detail cross-sections illustrating the forming of the folds of the wrapper taken on the lines 12—12, 13—13, 14—14 of Figs. 10 and 11 and line 15—15 of Fig. 10. Figs. 16 and 17 are enlarged views in elevation of the folders of the machine with the parts shown in different positions. Figs. 18 and 19 are plan details illustrating the operation of the rotary end folder. Fig. 20 is a detail section on line 20—20 of Fig. 19.

The bed-plate 1 of the machine is mounted upon a pair of upright side frames comprising two corner standards 2 connected at their upper ends by a horizontal frame member 3 and intermediate their ends by horizontal frame members 4 from which depend the central side standards 5. The corner and center standards 2 and 5 are connected at their lower ends by transverse tie-bolts 6.

The wrapping paper 7 is wound in a roll upon a transverse support or roller 8 having pintles 9 on its ends that engage U-shaped seats 10 upon a pair of angle brackets 11 that are secured to the corner standard 2 at one end of the machine. The wrapper 7 passes from the roll upwardly between a pair of transverse guide-rods 12 over a set of feed rollers 13 and between this set of feed rollers and a companion set of feed rollers 14. The transverse guide-rods 12 extend between a pair of arms 15 that project rearwardly from two side brackets 16 mounted upon one end of the bed-plate 1 and having feet 17 that are secured to the bed-plate. The two sets of cooperating rollers 13 and 14 are of the same

size and are mounted upon a pair of transverse shafts 18 journaled at their ends in the side brackets 16. A pair of intermeshing gears 19 are fixed to the shafts 18 and one of the shafts is provided with a sprocket wheel 20 by which the feed rollers 13 and 14 are continuously driven to withdraw the wrapper from the roller 8. The feed rollers are preferably rubber covered, so as to grip the wrapper 7.

From the feed rollers 13 and 14, the wrapper passes downwardly beneath a transverse guide roller 21, over a transverse guide roller 22, thence between two sets of co-operating feed rollers 23 and 24 and then between a pair of transverse guide-plates 25 and 26. The guide roller 21 is mounted upon a transverse shaft 27 which is journaled at its ends to the side brackets 16. The roller 22 is journaled in the side brackets 16 and is provided adjacent its ends with guide flanges 28 which engage the opposite edges of the wrapper 7. A transverse guide-plate 29 is fixed to the side brackets 16 and extends transversely between the same above the guide roller 22. This plate has a depending portion 30 which extends down between the flanges 28 of the guide roller, and engages the wrapper 7 and assists in guiding it into position between the feed rollers 23 and 24. The feed rollers 23 and 24 are of the same size, are rubber covered and are mounted upon a pair of transverse shafts 31, the ends of which are journaled in the side brackets 16. These shafts are provided with a pair of intermeshing gears 33 and are intermittently driven from a transverse shaft 34 journaled in the side brackets 16 above the set of rollers 24 and provided on one end with a Geneva stop gear 35 which meshes with the Geneva stop pinion 36 on one of the shafts 31.

The shaft 34 is provided on one end with a sprocket 37 which is in line with the sprocket 20 on one of the shafts 18. A drive-chain 38 passes over the sprockets 20 and 37, below an intermediate guide wheel 39 on the end of the guide roller 22 and around a driving sprocket 40 upon one end of a drive shaft 41 of the machine. This shaft (see Fig. 6) is journaled in suitable bearings 42 upon the horizontal frame members 4 and is provided at one end (see Fig. 2) with a pulley 43 which can be driven from any suitable source of power. The pulley 43 is loose on the shaft, and is arranged to be coupled thereto by a ratchet clutch member 44 which is keyed to the shaft but is shifted longitudinally thereon by a controlling lever 45. This lever is pivoted to a bracket 46 that projects laterally from the adjacent side frame of the machine. The clutch member 44 is provided with teeth on its inner face which are arranged to engage similar teeth upon the

hub of the pulley 43. By means of the drive mechanism described, the feed rollers 13 and 14 are continuously operated to withdraw the wrapper from its web, and the set of feed rollers 23 and 24 are intermittently operated to feed the wrapper between the guide-plates 25 and 26. These guide-plates are closely adjacent and form a downwardly inclined slot or guideway for the wrapper, and are provided with rearwardly projecting, curved fingers 47 which extend on opposite sides of the feed rollers 23 and 24 and engage the upper and lower surfaces of the wrapper 7. The upper guide-plate 26 is also provided with rearwardly projecting fingers 48 which engage the side edges of the wrapper. By means of these fingers, the paper is readily guided to position between the intermittently operating feed rollers 23 and 24.

From the transverse guide-plates 25 and 26, the wrapper passes between a pair of knives or shears 49 and 50. The knife 50 is adjustably secured to a transverse angle-bar 51 by means of bolts 52 which extend through slots in the knife blade. The transverse bar 51 is fixed at its ends to the side brackets 16. The knife blade 49 is secured to an angle-bar 53 which is connected to the ends of a pair of rock-arms 54 mounted upon a transverse rock-shaft 55. This shaft is journaled in the side brackets 16 and one of the arms 54 is connected at its end by a vertically projecting link 56 to the end of an arm 57 pivoted on the inner face of one of the side brackets 16. The end of the angle bar 53 adjacent the opposite side-arm 54, is connected by a spring 58 (see Fig. 1) to a lug 59 on the upper end of the adjacent side bracket 16. This spring serves to normally hold the uppermost or movable knife blade 49 in position with the adjacent arm 54 against a stop-pin 60 on the adjacent side bracket 16. The arm 57 (see Fig. 3) is provided adjacent its end with a pointed or cam like part 61 which is arranged beneath a hub or sleeve 62 on the shaft 34 and is arranged to be engaged by a lug or projection 63 thereon once in every revolution of the shaft 34 to thereby depress the arm 57 and, through the medium of the link 56, rock the arm 54 and the upper knife blade carried thereby to sever the wrapper 7 into separate lengths in proper size to inclose a single box or like article. The cutting edges of the knife blades 49 and 50 are arranged closer together on one side than on the other, so that the wrapper 7 is severed with a shear cut. The shaft 34 is, as stated, driven from the main operating shaft 41 through the medium of the chain 38. The sprocket wheels 37 and 40 on the shaft 34 and 41 over which the chain 38 passes are of the same size, so that the shaft 34 will rotate in unison with the main drive shaft 41 and the

paper feed mechanism and cutting knives will be operated in proper timed relation to the other parts of the machine.

A vertically disposed transverse plate 64 extends across the bed-plate 1 in front of the knives 49 and 50, and this bar is fixed at its ends to a pair of upright posts 65 which rise from the bed-plate 1. The bar 64 is provided on its rear face with pairs of rearwardly projecting guide fingers 66 and 67 which receive the wrapper 7 after it has passed between the knives and which guide it forwardly beneath the bar 64 and over a pair of horizontal folding plates 68 and 69. The transverse bar 64 is provided with forwardly projecting fingers 70 which engage the upper face of the wrapper, and the folder plate 69 is provided with side guiding plates or fingers 71 which engage the opposite side edges of the wrapper. The different guide fingers 47, 48, 66, 67, 70 and 71 have outturned ends to facilitate the proper guiding of the wrapper to the position shown in Fig. 3 above the folding plates 68 and 69. The upper surface of the folding plate 68 onto which the paper is first fed is above the upper face of the other folding plate 69, so that the leading edge of the wrapper will not catch on the edge of the plate 69. The driving sprocket 40 for the paper feed mechanism, is loosely mounted on the main operating shaft 41 (see Fig. 9), and is provided with a spring-actuated pawl 40' arranged to engage a notch in the shaft, so that the sprocket will be driven when the shaft is rotated in the direction indicated by the arrow. This one-way connection between the sprocket and the operating shaft permits the movement of the paper feed mechanism by hand and independently of the shaft, so that the wrapper can be readily threaded through the guides before the machine is thrown into operation. The horizontal folding plate 68 is arranged to reciprocate upon a plunger 72. This plunger (see Fig. 4) is of rectangular form and is mounted to slide upon the upper face of the bed-plate 1, the lower, side edges of the plunger being provided with projecting ribs 73 which engage guides 74 fixed upon the upper face of the bed-plate. The folder 68 has a depending lug 75 on its under side which is longitudinally perforated to engage a guide rod 76 that is fixed at its ends to the ends of the plunger 72. An arm 77 depends from one side of the plunger 72 through a slot 78 in the bed-plate and is connected by a link 79 to the upper end of an operating lever 80 (see Figs. 3, 5 and 8). An arm 81 depending from the lug 75 of the reciprocating folder plate 68, extends through the slot 78 and is connected by an adjustable link 82 to the upper end of an operating shift lever 83.

The operating lever 80 is pivotally mounted at its lower end upon the tie-bolt 6 at the right-hand end of the machine, and the lever 83 is similarly pivoted upon the central, transverse tie-bolt, as shown in Fig. 8. An eccentric rod 84 engages an eccentric 85 on the main operating shaft and is adjustably connected to the lever 80 to swing the same back and forth and thereby reciprocate the plunger 72. The lever 83 is provided with an enlarged portion midway between its ends having a cam-shaped opening 86 therein through which the main operating shaft 41 extends. A triangular-shaped cam 87 fixed to the shaft is fitted within the opening 86 and is arranged to operate upon the high points 88 of the cam slot to swing the lever 83 back and forth and thereby reciprocate the folder plate 68. The cam mechanism for operating the folder is such that the folder is shifted back and forth and held stationary for a brief interval at the opposite ends of its movement. The cam mechanism for shifting the folder, and the eccentric mechanism for reciprocating the plunger are so related that the shift of the folder is slightly in advance of that of the plunger.

A plate 89 extends across the face of the plunger 72, the ends of the plate projecting slightly beyond the side edges of the plunger, as shown in Fig. 4. A pair of horizontal pins 90 fixed to this plate extend through the inner end of the plunger and springs 91 mounted on these pins tend to hold the plate against the end of the plunger. As the plunger is shifted outwardly to the right, the projecting ends of the plate 89 engage the ends of the guides 74 and the movement of the plate is arrested, so that, upon the continued movement of the plunger, the springs 91 are compressed. This position of the plate and plunger is indicated in dotted lines in Fig. 4.

The folding plate 69 is, in the preferred form shown fixed to the under side of a transverse bar 92. This bar has depending end portions fixed to the bed-plate 1. The plate 69 and the bed-plate 1 form the top and bottom walls respectively of a horizontal guide-way or chute 93 through which the packages are forced by the plunger 72 to form the end folds, by means of suitable folders located at the sides of the guideway or chute 93. The upper face of the bed-plate 1 within the guideway or chute is preferably provided with a series of longitudinally extending ribs 94 that assist in guiding the packages in a straight line direction.

The boxes or other articles to be wrapped are fed to the machine from the right-hand end thereof through a guide or run-way comprising an elevated, horizontal portion and a downturned vertical portion. The hori-

zontal portion of the guideway is formed by a bottom board 95 having side flanges 96 and fixed at its inner end to brackets 97 upon the upper ends of the posts 65 that rise from the bed-plate. An endless feed belt 98 passes through the horizontal portion of the guideway and over a drive roll 99 at the inner end thereof. The shaft 100 of this roll is journaled in the brackets 97 and is provided with a ratchet wheel 101 arranged to be engaged by a pawl 102 on an actuating lever 103 pivoted on the shaft. This arm is connected by a link 104 to a crank arm 105 on one end of the shaft 34 (see Fig. 3.) The vertical portion of the guideway for the packages or articles is formed of two angle bars 106 (see Figs. 1, 2 and 3) fixed at their lower ends to a transverse bar 107, the depending ends of which are mounted upon and secured to the cross-bar 92. Vertical bars 108 are connected to the angle bars 106 by horizontal pieces 109. At their upper ends, the angle bars 106 are curved over the inner end of the horizontal portion of the guideway and are provided with guide pieces 110. The upper ends of the angle bars are connected to the brackets 97 by pieces 111.

As stated, the machine is particularly designed to apply thin, flexible, waxed sealing wrappers to boxes or cartons containing the merchandise. The inner boxes, as set forth in the prior Eckstein Patent No. 881,561 above referred to, are formed from blanks of stiff paper box-board that are scored to form the corners of the box *a* (see Fig. 1^a) and cut to form the foldable end flaps *b*. The side edges of the blank are overlapped and glued together at *c* to form a lengthwise seam, and the box is preferably impregnated throughout or coated with wax to aid in rendering the package moisture proof. The merchandise is placed within the boxes *a* and the flaps *b* are folded down, as shown in Fig. 1^b. These boxes are then placed, as shown in Fig. 1, within the horizontal portion of the guideway upon the feed belt 98. The side flanges 96 engage the folded flaps *b* at the ends of the boxes and prevent them from opening. As the feed belt is advanced, the boxes fall into the vertical portion of the guideway and, at this point, the flanges of the angle bars 106 engage the flaps at the ends of the boxes and prevent them from opening.

A horizontally reciprocating carrier 112 is arranged between the lower end of the vertical portion of the feed chute or runway for the boxes and the folding plate 69. This carrier comprises a top horizontal wall 113 and a lower horizontal wall 114 which are connected by a vertical wall 115 which is opposed to or arranged in the same plane with the transverse vertical bar 64. This carrier is fixed at its outer end to a sleeve

116 mounted upon a horizontal guide-rod 117. This guide-rod is fixed at its inner end to the transverse bar 107 and, at its outer end, to a transverse bar 118 which extends between the ends of a pair of uprights 119 rising from the bed-plate 1. The sleeve 116 is provided on one side with a rack-bar 120 (see Fig. 5) which is engaged by a toothed segment 121 upon the upper end of a vertical shaft 122. This shaft is journaled in suitable bearings 123 and 123' mounted respectively upon the bed-plate 1 and upon one of the horizontal frame members 4 (see Figs. 1, 6 and 7). A crank-arm 124 fixed to the shaft 122 below the bed-plate is connected by a link 125 to the upper end of an operating lever 126. This lever is pivotally mounted, at its lower end, upon the transverse tie-bolt 6 at the left-hand end of the machine. An adjustable eccentric rod 127 engages an eccentric 128 upon the main operating shaft 41 and is adjustably connected to the operating lever 126 intermediate its ends. This mechanism serves to reciprocate the carrier 112 back and forth, once for every revolution of the main operating shaft 41. The eccentrics 85 and 128 which operate the plunger 72 and the carrier 112, are so arranged that the two parts move inwardly and outwardly together.

The carrier is arranged to reciprocate between a pair of vertical guide-plates 129 (see Fig. 5). These plates are arranged below the lower end of the vertical portion of the feed chute or guideway for the boxes and at their lower edges are provided with outturned flanges 130 secured to the upper face of the transverse bar 92. A pair of broad spring-arms 131 are fixed to the outer faces of the guide-plates 129 and the free ends of these arms extend inwardly beyond the ends of the guide-plates and are provided with a series of vertically disposed, beveled teeth 132. As the carrier 112 moves outwardly, or to the left, the lowermost box in the feed chute drops onto the lower horizontal portion of the plate 115 of the carrier. The inward movement of the carrier to the right forces this box from between the guide-plate 129 into position between the free ends of the spring-arms or jaws 130, the teeth 132 of which grip the ends of the box and prevent it from being drawn back by the carrier, when the latter is again moved outwardly, or to the left.

A vertically moving plunger 133 is arranged above and between the free ends of the spring-arms or jaws 131. This plunger is fixed to the lower end of a short, vertical rod 134 which is secured at its upper end to a head 135 on the inner end of a horizontal arm 136. The arm 136 is fixed to the upper end of a vertical rod 137. The rod 137 is longitudinally shiftable through bearings 138 and 139 carried by the bed-plate and one

of the frame members 4 (see Figs. 5 and 7). A link 140 is pivoted at its upper end to a sleeve 141, on the rod 137, and is pivoted at its lower end to the horizontal arm 142 of a shifting bell-crank. This bell-crank is pivotally mounted upon one of the central standards 5 of the machine frame below the main operating shaft 41 and its upwardly projecting or vertical arm 143 is arranged to be engaged by a nose or cam 144 fixed to the main operating shaft. The horizontal arm 142 is also connected to the lower end of a bar 145 which extends vertically therefrom through a bearing 146 on the frame member 4 and is provided at its upper end with a laterally projecting lug 147 having a curved lower edge which is arranged to be engaged by a cam 148 fixed to the main operating shaft 41.

When the plunger 92 and folder 68 are at the outer end of their movement toward the right, as shown in Fig. 16, the bell-crank 142-143 is operated by the nose or cam 144 to move the rod 137 and plunger 133 connected thereto downwardly and thereby force the box between the spring-arms or jaws 130 downwardly in front of the end plate 89 on the plunger 72 and in line with the folding chute or guideway 93. The plunger 133 is then quickly returned by a spring 149 (see Fig. 7) that is coiled about the rod 137 rests upon bearing 139 and the sleeve 141 that is fixed to the rod. If this spring fails to act, the cam 148 will engage the arm 147 and insure the proper return of the plunger 133 before the horizontally moving plunger 72 and the horizontally moving carrier 112 are again shifted inwardly, or toward each other to their innermost positions shown in Fig. 3.

In the operation of the machine, the wrapper is fed by the rolls 23 and 24 to the position shown in Fig. 3 and the box to be wrapped is moved into position to be gripped by the free ends of the spring-arms or jaws 131. The paper is then cut off by the knives 49 and 50 and the carrier 112 and horizontally shifting plunger 72 move outwardly or away from each other. The shiftable, horizontal folder 68 is also moved outwardly to the right, and when the parts are in this position, the vertically moving plunger 133 is quickly operated to force the box downwardly onto the bed-plate 1, as shown in Fig. 16. This movement of the box carries the wrapper with it down between the opposite, inner edges of the folding plates 68 and 69, so that the wrapper is folded up about the sides of the box. The vertically disposed teeth 132 on the spring-arms or jaws 131 assist in properly guiding the vertical shift of the box and the box is also prevented from getting out of proper position by a pair of guide-fingers 150 which depend from the shifting head 135 and are

arranged outside of the ends of the spring-arms or jaws 131. The vertical end-plate 89 on the plunger 72 also acts to properly position the box as it is shifted downwardly by the plunger 133, the plate 89 at this time being spring-held against the ends of the guides 74, as shown in dotted lines in Fig. 4. The guide fingers 150 also prevent the flaps *b* at the ends of the box from becoming unfolded as the box is moved from between the grip arms 131. When the box is on the horizontal plate 115 of the carrier 112 and the latter is in its outermost position, the guide-plate 129 engages the end flaps of the box and prevents them from unfolding. After the plunger 133 has returned to normal position, the side folder 68 is moved inwardly and folds the wrapper over the upper side face of the box, as shown in Fig. 17. The plunger 72 is then quickly shifted inwardly, or to the left, as shown in Fig. 3, so that the box is forced beneath the stationary side folding plate 69 and the opposite portion of the wrapper is folded over the upper side of the box, as shown at the left in Fig. 10. At the same time, the feed rolls 23 and 24 and the knives 49 and 50 are operated to feed the next wrapper into position and cut it off and the carrier 112 is again moved inwardly to move the next box over the wrapper and into position between the gripping jaws 130 and below the vertically reciprocating plunger 133. When the carrier 112, plunger 72 and movable side folding plate 68 are again moved outwardly, as shown in Fig. 16, the vertically reciprocating plunger 133 is again operated to depress the next box downwardly between the opposing edges of the folding plates 68 and 69, so that the latter, together with the plunger 72, can fold the opposite ends of the wrapper over the upper side of the box, as above described. The wrappers are thus folded about the boxes and the latter, with the wrappers thereon, are forced, one after the other, through the horizontal chute or guideway 93 between the bed-plate 1 and the stationary side folding plate 69.

The end portions of the wrappers, after they are folded around the boxes by the side folders 68 and 69, extend beyond the ends of the boxes and, as the latter are forced through the horizontal chute 93, the projecting ends of the wrappers first engage the front end folders 151. These end folders (see Figs. 3, 10 and 11) are fixed to the inner ends of arms 152 secured to the bed-plate 1 and these folders are provided with narrow, rounded ends 153 which engage the sides of the projecting ends of the wrappers and indent them to form the front end folds, as shown in Figs. 10 and 11. The opposite side end folds are formed by two arms 154 that are mounted upon the upper ends of a

pair of short vertical shafts 155 (see Fig. 5). These shafts are journaled in the bed-plate 1 and are provided on their lower ends with gears 156 which mesh with gears 157 fixed to the upper ends of a pair of shafts 158. The lower ends of the latter shaft (see Fig. 6) are journaled in a pair of brackets 159 fixed to the horizontal frame members 4 and are connected by two pairs of beveled gears 160 to the main operating shaft 41. The gearing is such that the back end folding arms 154 are rotated through one revolution for each revolution of the main operating shaft. It will be understood that one cycle of operations, to fold the wrapper about one box or article, takes place at each revolution of the main operating shaft. The ends of the arms 154 are rounded and after the folder 151 have formed the front end folds about the end edges of the box on one side, the folder arms 154 engage the end portions of the wrapper to form the opposite side end folds and fold the projecting end portions of the wrapper about the opposite side end edges of the box, as shown in Fig. 19. The rotating side end folders 154 are preferably provided with rearwardly projecting arms 161 having laterally extending upper and lower flanges 162 at their ends which are thin and therefore resilient. The stationary and rotary end folders 151 and 154 fold the projecting end portions of the wrapper, as described, about the opposite side end edges of the box or article and form the triangular upper and lower end folds *d*, and *e*. After these portions are formed, the flanges 162 on the arms 161 enter between the triangular upper and lower folds *d* and *e* and crease or iron them so that they will not become unfolded. That is to say, the upper flange 162 moves over and presses the upper triangular end fold *d* against the folder plate 69 and the lower flange moves over and presses the lower triangular fold *e* against the face of the bed-plate and creases or irons the folds at their edges.

The hubs of the arms 154 are provided at points diametrically opposite the arms with projecting arms 163 having laterally turned ends 164. As the boxes are engaged by the plunger 72 and pushed thereby from the position shown in Fig. 16 to that shown in Figs. 10 and 11, the end portions 164 of the arms 163 engage the flaps *b* on the ends of the boxes (see Fig. 18) and prevent them from becoming unfolded until the ends of the boxes are engaged by the stationary, side end folders 151.

It will be understood that the boxes are pushed, one after the other, through the folding chute 93. As they are pushed past the stationary end folders 151, the upper end folds *d* engage the stationary folders 165 which are mounted upon the inner ends of arms 166. These arms are secured to the up-

per face of the bed-plate 1 and project inwardly toward the folding chute 93. The forward edges of the folders 165 are secured to the under face of the stationary folding plate 69 by screws 167. The top end folders 165 are provided with reversely curved faces 168 that engage the projecting, triangular portions *d* of the wrappers and fold them down over the top end edges of the box, as shown in Figs. 11 and 14. The lower, projecting, triangular portions *e* of the wrapper move below the lower edges of the front end folders 165 and over the upper face of the bed-plate 1 until they reach the bottom end folders 169 that are mounted upon clips 169' secured to the bed-plate. The inner edges of these folders are recessed in the face of the bed-plate and are secured thereto by screws 170. These folders are provided with reversely curved faces 171 which turn the bottom end folds *e* of the wrapper up about the lower end edges of the box, as shown in Figs. 11 and 12, to complete the folding of the wrapper about the box or article and bring it to the form shown in 1^c.

As previously stated, the machine is not only designed to fold wrappers about boxes or articles, but is also particularly designed to fold heavily waxed wrappers about inner boxes or the like and seal the folds thereof in moisture-tight fashion at all points. When such a wrapper is employed, it will be heavily waxed, as set forth in the prior Eckstein Patent No. 881,561 above referred to, and the folders are arranged to form the folds as described, and at the same time melt, or partially melt, the wax at such points, and means are provided for holding the folds into close contact until the wax is cooled and set, so that the folds will be sealed in moisture-tight fashion at all points. For this purpose, suitable means is provided for heating the folders. To seal the side or body fold *f* of the wrapper, the movable side folder 68 is heated, preferably by means of a resistance coil 172 arranged within a recess therein and embedded in a layer of porcelain 173 or other suitable insulated material. The ends of the resistance, heating coil 172 are connected by flexible conductors to a suitable source of power, such power, for example, as the electric lighting current of the building in which the machine is used. The coil is designed to heat the folder 68 to the proper temperature to melt the wax on the wrapper when the folder is moved over the box, as shown in Fig. 17, to form the first portion of the side fold *f*. Then, when the box is pushed beneath the stationary folding plate 69 to complete the side or body fold of the wrapper, the contacting portions thereof will be sealed by the melted wax. To effect a perfect seal, it is necessary to hold the parts of the fold in close contact until the wax is

cooled and set, and this is effected by the stationary folding plate 69 as the box is pushed beneath the same. Preferably also, a horizontal pressure plate 174 is arranged at the outer end of the folding plate 69. This pressure plate is pivoted to the end of the folding plate and is provided with inwardly projecting arms 175 that extend beneath the cross-bar 92 to thereby limit the downward swing of the plate. This plate rests by gravity upon the upper faces of the boxes as they are pushed below the same and it thereby assists in cooling the wax at the side fold and holding the portions thereof into close contact until the wax has cooled and set. As an additional safeguard to the same end, the boxes are arranged to pass below a set of curved spring arms 176 that depend from the cross-bar 118, as shown in Figs. 1, 2, 3 and 5. The end folds of the wrapper are heated to melt the wax for sealing by means of two shoes 177 that are arranged between the top and bottom end folders 165 and 169, and are preferably pivoted, as shown, by vertical pivot pins 178 to the ends of the top end folders 165. These shoes are heated by resistance coils 179 arranged within recesses therein, and embedded in a layer of porcelain 180 or other suitable insulating material. These coils are connected by suitable flexible conductors to a source of power, such as the electric lighting current of the building. These shoes are arranged to be engaged at their outer ends by two horizontal pins 181 that are slidably mounted in brackets 182 on the upper face of the bed-plate 1, and springs 183 coiled about these pins extend between the outer ends of the brackets and collars 184 fixed to the pins. The pins are thus spring-pressed against the outer ends of the two shoes to hold them against the end folds of the wrapper. These shoes are arranged between the top and bottom end folders 165 and 169 as described, and slightly above the upper face of the bed-plate 1, and are provided with metal cover plates 185, the inner faces of which engage the ends of the packages and the top end fold *d* which is turned down thereon, while the bottom edges of the plate 185 on the shoes engage the inner faces of the bottom end folds *e*, as shown in Fig. 13, which at this point are not turned up against the ends of the packages. By this arrangement, the wax on the inner face of the fold *e* and the wax upon the outer faces of the other folds is melted, so that when the bottom end folds *e* are turned up against the ends of the packages by the folders 169, the melted wax will seal the end folds of the wrapper in moisture-tight fashion at all points. The shoes also by conduction heat the top end folders 165, so that these folders assist in melting the wax on the end folds of the

wrapper. It will be understood that this melting of the wax on the end folds is effected as the packages are pushed past the top end folders 165 and past the heating shoes 177.

To effect a moisture-tight seal at all points, it is necessary to press the end folds into close contact until the wax has cooled and set. For this purpose, the ends of the packages, after they are pushed past the folders, are arranged to be engaged by a set of pressing and cooling devices.

In the preferred form shown, the pressing and cooling devices comprise a set of plates or wings 186 (see Figs. 1 and 2) that are pivotally mounted upon two endless chains 187. These chains are arranged above two horizontal guide-plates or bars 188 that are fixed to and project from the left-hand end of the machine. At their inner ends the chains pass around two horizontally disposed driving sprocket wheels 189 that are fixed to the upper ends of two vertical shafts 190. These shafts are journaled at their upper ends in suitable bearings in the bed-plate 1 and at their lower ends in brackets 191 fixed to the corner standards 2 at the left-hand end of the machine (see Figs. 1 and 6). The shafts 190 are connected by pairs of beveled gears 192 to a horizontal shaft 193 that is journaled at its ends in brackets 194 upon the end standards 2 and the horizontal shaft is driven from the main operating shaft by a sprocket chain 195 which passes over sprocket wheels 196 and 197 fixed respectively to the main operating shaft and to the horizontal shaft 193.

The plates 186 are pivoted at their forward edges to lugs 198 on the chains and at their rear ends are provided with inwardly projecting lugs 199 which are arranged to engage the upwardly projecting flanges of a pair of angle-bar guides 200 that are mounted upon the bars 188 with their upwardly projecting flanges adjacent the inner sides of the chains. As the package is forced from between the bottom end folders 169, it is pushed between a pair of plates 186 on the opposite chain 187 and these plates are so positioned by the guide-bars 200 that the ends of the package will be gripped by the plates and sufficient pressure exerted thereon to hold the end folds in snug contact as the package travels with the plates outwardly over the bars 188. The angle-bar guides 200 are adjustably connected to the bottom bars 188 by means of bolts or screws 201 which extend through slots in the guide-bars. By adjusting the guides, the amount of pressure which is applied to the ends of the packages may be regulated as required. The plates on the outer sides of the chains are exposed to the air and are cooled, so that when they are

brought in contact with the package they will assist in cooling and setting the wax at the end folds thereof. The completed packages are delivered from the ends of the guide-way formed by the bars 188 and 200. In the form shown, a pair of pressure rolls 202 are mounted over the guide-way on upwardly projecting supports 203 that rise from the guide-bars 200.

When the machine is thrown out of operation, it is desirable that the heating shoes 177 be disengaged from the ends of the packages between them, since otherwise the wax thereon will be unduly melted. For this purpose, the ends of the shoes are connected by outwardly extending links 204 to arms or levers 205 and 206 pivoted to lugs 207 on the sides of the machine frame. The arm 205 is pivoted at its rear end to a cross-bar 208 extending through guide lugs 209 (see Figs. 1 and 3) and connected at one end to the controlling lever 45. The other arm 206, is connected to an intermediate arm 210 pivoted between its ends to a lug 210' on the side of the machine, and, at its end, to the bar 208. A shift lever 211 pivoted to lug 212 on the side of the machine is also pivotally connected to the bar 208. The machine can be thrown into and out of operation by either of the shift levers 45 or 211 and, at the same time, the heating shoes 177 are moved into and out of operative position. An arm 213 projecting from one side of the machine is provided with two pins 214 to engage the lever 45 and limit its throw. The links 204 have pin-and-slot or lost-motion connections with the arms 205 and 206, so that the heating shoes 177 may yield slightly as the packages are pushed between them.

As the packages to be wrapped move from the horizontal portion of the feed chute, over the roller 99, they drop into the vertical portion of the feed chute and if then out of level at all, their rear or right hand side edges will be lower than their front or left hand side edges since the right-hand sides are lower when the packages pass over the roller 99. In the present machine, the packages are pushed back or to the right from the lower end of the vertical column, so that, if the packages are out of level at all, when engaged by the movable side folder 68, the side edge first engaged thereby will be the lower, and the package will be properly engaged and will not be broken by the folder.

The rotary back end folders 154 having rounded ends will not break the wrapper if it is puckered and the wings 162 thereof crease the back end folds of the wrapper so that they will not be engaged and pushed back by the front end folders 151, as the packages are moved through the folding chute or guide-way 93. The end flaps *b* of

the packages are at all times held in place and out of the way of the folders.

The heating of the wrappers to melt the wax is effected as the folds are formed so as to melt the wax between the overlapping portions of the folds or at the contacting surfaces thereof and thereby effect a more perfect sealing of the folds. The top or movable side folder 68, presses one side edge of the wrapper down upon the package and seals it thereon, leaving the wax on the outer face of this portion of wrapper melted. Then when the other side edge is folded onto the package as the latter is pushed beneath the stationary folder 69, the fold *f* is sealed the entire length of the wrapper. It is especially difficult to effect a perfect seal at the end folds of the wrappers where there are four or more thicknesses of paper, but by melting the wax at the contacting surfaces before the folds are completed, and by holding the packages between the traveling pressure plates 186, until the wax is set, the folds are sealed moisture tight at all points. By this arrangement, the wax on the outer surface of the wrapper is left intact and is not rubbed off as the packages pass through the machine.

By supporting the roll of waxed wrapping paper at the lower rear portion of the machine, the roll can be easily placed in position and the wax dropping from the paper will not fall into the operating mechanism of the machine.

It is to be understood that the invention is not limited to the details of construction set forth except in so far as they are made the subject of particular claims, and it is obvious that portions of the invention may be taken without its adoption in entirety.

I claim as my invention:

1. In a wrapping machine, the combination with a folding chute, of two horizontal side-folders relatively movable together and apart to open and close the entrance to said chute, a feed mechanism and guides for delivering the separate wrappers successively onto the exposed outer faces of said side-folders when the latter are in closed position, the upper face of the folder onto which the paper is first fed being above that of the other folder, a feed-mechanism for delivering the articles to position above said side-folders, and a plunger for projecting the article and its wrapper between said side-folders when the latter are separated, substantially as described.

2. In a wrapping machine, the combination with a bed-plate, of a stationary side-folder above said bed-plate and forming therewith a horizontal folding chute, a side-folder movable to and from said stationary side-folder to open and close the entrance to said chute, a feed mechanism and guides for delivering the wrappers directly upon

the exposed outer faces of said side-folders when the latter are in closed position, a stationary holder for supporting an article above said movable side-folders, a feed mechanism for successively delivering the articles to said holder, a vertically movable plunger for projecting the article from said holder and moving it together with its wrapper between said side folders and onto said bed-plate, and a horizontally reciprocating plunger for pushing the same through said chute, substantially as described.

3. In a wrapping machine, the combination with a horizontal folding chute having a stationary side-folder at its upper portion, of a horizontal side-folder movable to and from said stationary side-folder to open and close the entrance to said chute, a stationary cross-bar above said movable side-folder, mechanism in rear of said cross-bar for feeding the wrappers below the same and onto the upper faces of said side-folders, a pair of stationary grip-plates for supporting an article in front of said cross-bar and above said movable side-folder, an article feed-way in front of said grip-plates, a carrier movable to and from said cross-bar for moving the articles from said feed-way to position between said grip-plates against said cross bar, a plunger for projecting the article and its wrapper from said grip-plates, between said side-folders and into line with said folding chute, and a plunger for moving the same through said chute, substantially as described.

4. In a wrapping machine, the combination with a horizontal folding chute having a stationary side-folder at its upper portion, of a horizontal side-folder movable to and from said stationary side-folder to open and close the entrance to said chute, a cross-bar above said movable side-folder, mechanism in rear of said cross-bar for feeding the wrappers below the same and over said side-folders, a pair of grip-plates for supporting an article in front of said cross-bar and above said movable side-folder, a vertical article feed-way terminating in front of said grip-plates, a carrier comprising offset horizontal plates and a connecting vertical wall arranged to alternately close the lower end of said feed chute and move the articles therefrom to said grip-plates, and vertically and horizontally movable plungers for successively projecting the articles and wrappers between said side-folders and through said chute, substantially as described.

5. In a wrapping machine, the combination with a horizontal folding chute having a stationary side-folder at its upper portion, of a horizontal side-folder movable to and from said stationary side-folder to open and close the entrance to said chute, a stationary cross-bar above said movable side-

folder, mechanism in rear of said cross-bar for feeding the wrappers below the same and onto the upper faces of said side-folders, a pair of stationary grip-plates for supporting an article in front of said cross-bar and above said movable side-folder, a vertical article feed-way terminating in front of said grip-plates, a horizontal conveyor extending over the rear end of the machine for delivering the articles to the upper end of said feed-way, a carrier movable to and from said cross-bar for moving the articles rearwardly from the lower end of said feed-way to said grip-plates, and vertically and horizontally moving plungers for successively projecting the article between said side-folders and through said chute, substantially as described.

6. In a wrapping machine, the combination with a horizontal folding chute having a stationary side-folder at its upper portion, of a horizontal side-folder movable to and from said stationary side-folder to open and close the entrance to said chute, a cross-bar above said movable side-folder, mechanism in rear of said cross-bar for feeding the wrappers below the same and over said side-folders, a pair of grip-plates for supporting an article in front of said cross-bar and above said movable side-folder, an article feed-way in front of said grip-plates, a horizontally moving carrier for moving the articles from said feed-way to said grip-plates, a vertically reciprocating plunger and a horizontally reciprocating plunger for successively projecting the article and its wrapper between said side-folders and through said folding-chute, a main drive shaft below said folding-chute, eccentrics on said shaft connected to said carrier and said horizontally reciprocating plunger, cams on said shaft and connections operated thereby for actuating said movable side-folder and said vertically reciprocating plunger, substantially as described.

7. In a wrapping machine, the combination with a folding-chute, of a pair of relatively-movable, horizontal side-folders, at the entrance of said chute, a pair of vertical grip-plates for supporting an article above said side-folders, means for feeding wrappers beneath said grip-plates, a vertical article feed-way, a horizontally reciprocating carrier for moving the articles from said feed-way to said grip-plates, and a vertically reciprocating plunger for projecting the article from said grip-plates and together with the wrapper between said side-folders, said grip-plates having vertical teeth on their faces to hold the article against return movement with said carrier and to guide its vertical shift, substantially as described.

8. In a machine for wrapping cartons having folded end-flaps, the combination

with a folding-chute, of a pair of relatively-movable, horizontal side-folders at the entrance of said chute, a pair of grip-plates over said side-folders for engaging the ends
 5 of the cartons, means for feeding wrappers over said folders and below said grip-plates, and a feed-way for the cartons having guide-plates for engaging the ends thereof, a carrier for moving the cartons from said
 10 feed-way to said grip-plates, a pair of guide-plates for engaging the ends of the cartons between which said carrier moves, and a vertically reciprocating plunger for moving the article from said grip-plates and
 15 projecting the same together with its wrapper between said side-folders, said plunger having depending arms moving outside of said grip-plates for holding the end flaps of the carton against unfolding, substantially
 20 as described.

9. In a wrapping machine, the combination with a folding chute and means for moving the articles and wrappers there-through, of a pair of rotating, back end,
 25 folding arms at the entrance of said chute, said arms having rounded ends, narrower than said chute and rearwardly extending, creasing flanges arranged to press the folders against the opposite walls of said chute,
 30 substantially as described.

10. In a wrapping machine, the combination with a folding-chute having stationary front-end and top and bottom end-folders at its sides, of a pair of rotating back-end
 35 folding arms and a movable side-folder at the entrance of said chute, a reciprocating plunger for moving the articles through said chute and means for successively operating said side folder and said rotating
 40 arms, substantially as described.

11. In a wrapping machine, the combination with a bed-plate, of a stationary side-folder above said bed-plate and forming a folding-chute therewith, stationary front-
 45 end folders and stationary top and bottom end-folders at the sides of said chute, a movable side-folder and a pair of movable back-end folders at the entrance of said chute, said latter side-folder reciprocating to and
 50 from said stationary side-folder to open and close the entrance to said chute, a feed for delivering the wrapper onto the exposed upper faces of said side-folders when in closed position, a plunger for projecting the articles and wrappers between said side-folders and onto said bed-plate when the latter are in open position, a plunger for pushing the same through said chute and means for successively operating said movable side folder, said plunger and said back end folders, substantially as described.

12. In a wrapping machine, the combination with a bed-plate, of a stationary side-folder above said bed-plate and forming a folding-chute therewith, stationary front-

end folders and stationary top and bottom end folders at the sides of said chute, said front-end folders having narrow, rounded ends for engaging the wrapper, and said top and bottom end folders having reversely curved working faces, a second side-folder reciprocating to and from said stationary side-folder to open and close the entrance to said chute, feed-mechanisms for delivering the article and its wrapper above said
 70 movable side-folder when in closed position, plungers for successively projecting the same between said side-folders and through said chute, rotary back-end folding arms at the entrance of said chute, and means for
 75 successively operating said movable side folder, said plungers and said rotary folding arms, substantially as described.

13. In a wrapping machine, the combination with a folding-chute, of a pair of folding arms having narrow ends for forming the back-end folds, and wings for subsequently creasing said folds against the opposite sides of said chute, said wings being arranged in rear of said ends and the distance between said wings being greater than the width of said ends, substantially as described.

14. In a wrapping machine, the combination with a folding-chute having stationary back-end and top and bottom end folders, and means for moving the articles through said chute, of a pair of revolving folding arms at the entrance of said chute having narrow ends for forming the back-end folds and wings for subsequently creasing said folds against the opposite sides of said chute, substantially as described.

15. In a machine for wrapping cartons having folded end flaps, the combination with a chute having folding guides at its sides for forming the front, top and bottom end folds and with means for moving the cartons through said chute, of revolving back-end folders at the entrance of said chute having feet for engaging the end flaps of the carton to prevent them from unfolding until the cartons engage said front end-folders, substantially as described.

16. In a wrapping machine, the combination with a folding-chute having side-folders at its entrance and with end folders at its side edges and with means for moving the articles through said chute, of a pair of endless conveyer chains having pressure plates movable therewith for gripping the ends of the packages as they emerge from said chute, and guides for holding said plates in engagement with the packages, substantially as described.

17. In a wrapping machine, the combination with a folding-chute having side-folders at its entrance and with end folders at its side edges, and with means for moving the articles through said chute, of a pair of end-

less conveyer chains having pressure plates movable therewith for gripping the ends of the packages as they emerge from said chute, guides over which the packages are moved
 5 by said chains and plates, and adjustable guide flanges for holding said plates in engagement with the packages, substantially as described.

18. In a machine for forming and sealing
 10 waxed paper wrappers, the combination with articles and wrapper feed mechanisms, of side and end folders for overlapping the side and end portions of the wrapper, said folders comprising heated plates arranged to
 15 directly engage the contacting surfaces of the overlapping portions of the wrapper and thereby melt the wax on the contacting surfaces of the side and end folds as said folds are formed, and means for maintaining the
 20 end folds in engagement until the wax is set, substantially as described.

19. In a machine for forming and sealing waxed wrappers, the combination of a movable side-folder for forming the initial side
 25 fold, folders for subsequently completing the side fold and for forming the end folds, and a heater for said movable side folder whereby the wax at the contacting surfaces of the side fold is melted to seal the same as the
 30 fold is completed, substantially as described.

20. In a machine for forming and sealing wax wrappers, the combination with the article and wrapper feed mechanisms, of a movable side folder, means for shifting said
 35 side folder to form the initial side fold, a heater mounted on and shiftable with said movable side folder for melting the wax on the outer surface of the initial side fold, a folder for subsequently completing the side
 40 fold, top and bottom end folders, and heaters arranged between said top and bottom end folders for heating the outer face of one end fold before the other end fold is formed, substantially as described.

45 21. In a machine for forming and sealing waxed wrappers, the combination with side-folders, front and back end folders, and top and bottom end folders and means for effecting the successive operation of said folders,
 50 of heaters interposed between said top and bottom end folders for melting the wax at the end folds, substantially as described.

22. In a machine for forming and sealing wax wrappers, the combination with the
 55 article and wrapper feed mechanisms, of side folders, front and back end folders, top and bottom end folders, mechanism for effecting the successive operation of said folders, heaters interposed between said top and bot-
 60 tom end folders for melting the wax on the outer face of one end fold before the other is formed, and means for holding said end folds in engagement until the wax is set, substantially as described.

65 23. In a machine for forming and sealing

waxed wrappers, the combination with a folding-chute, of side and back end folders at the entrance of said chute, front end folders and reversely curved top and bottom end folders successively arranged at the side edges of said chute, means for moving the articles and their wrappers through such chute and spring-pressed, heating shoes at the side edges of said chute between said top and bottom end folds and arranged to engage both the completed and incompleted portions of the end folds, substantially as described.

24. In a machine for forming and sealing waxed wrappers, the combination with a folding chute, of side and back end folders at the entrance of said chute, front end folders and reversely curved top and bottom end folders successively arranged at the side edges, means for moving the articles and their wrappers through said chute, pivoted, spring-pressed shoes intermediate with said top and bottom end-folders, and electric heaters mounted on said shoes, substantially as described.

25. In a machine for forming and sealing waxed wrappers, the combination with a horizontal folding-chute, and with means for delivering the article and its wrapper to said chute and moving the same there-through, of stationary and movable side-folders at the entrance to said chute, back and front end-folders and top and bottom end-folders successively arranged at the sides of said chute, shoes for engaging the ends of the articles and wrappers arranged intermediate said top and bottom end folders, means for heating said movable side-folder and said shoes to melt the wax at the folds of the wrapper, and pressure plates for holding the folds in contact until the wax is cooled and set, substantially as described.

26. In a machine for forming and sealing waxed wrappers, the combination with article and wrapper feed mechanisms, and side and end folders, of heating shoes for melting the wax at folds, starting and stopping mechanism for the machine, and connections between said mechanism and said shoes for moving the latter into and out of operative position, substantially as described.

27. In a machine for forming and sealing waxed wrappers, the combination with the folders and heaters for melting the wax at the folds, of a conveyer mechanism for removing the completed packages comprising traveling pressure plates arranged to engage the ends of the packages and hold the end folds in contact until the wax is cooled and set, substantially as described.

28. In a machine for forming and sealing waxed wrappers, the combination with the folders and heaters for melting the wax at the folds, of a conveyer mechanism for removing the completed packages comprising

a pair of endless traveling chains having pressure plates thereon for engaging the ends of the packages, and guides for pressing the plates against the packages, substantially as described.

29. In a machine for forming and sealing waxed wrappers, the combination of a horizontal folding chute having a stationary side-folder at its inlet end, a cooperating movable side-folder, back and front end-folders and top and bottom end-folders at the side edges of said chute, plungers for successively projecting the articles and wrappers between said side folders and

through said chute, shoes for engaging the ends of the wrappers interposed between said top and bottom folders, heaters for said movable side-folder and said shoes, a pair of endless, horizontal, conveyer-chains having plates thereon for engaging the ends of the packages as they emerge from said chute, and guide-flanges for pressing said plates against the ends of said packages, substantially as described.

NATHANIEL B. POST.

Witnesses:

OTILIE C. FREIBERG,
KATILARINE GERLACH.