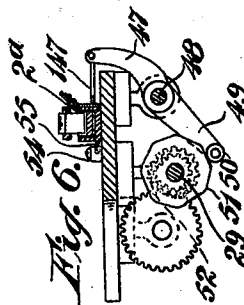
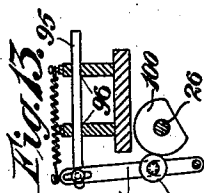
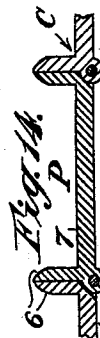
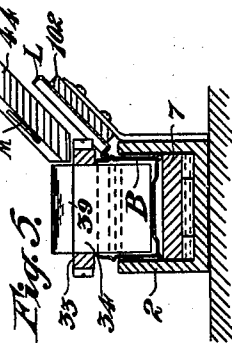
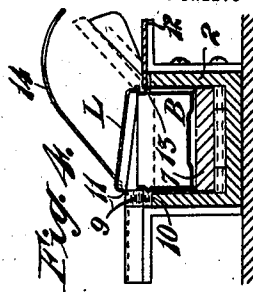
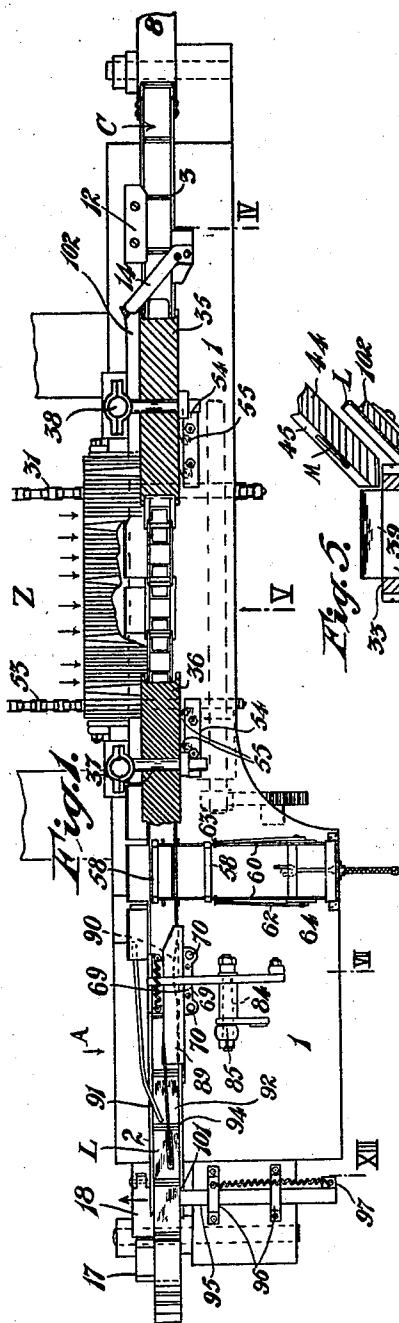


A. F. NEY.
MACHINE FOR FILLING RECTANGULAR METAL BOXES WITH VESTAS.
APPLICATION FILED AUG. 8, 1921.

1,418,451.

Patented June 6, 1922.

4 SHEETS—SHEET 1.



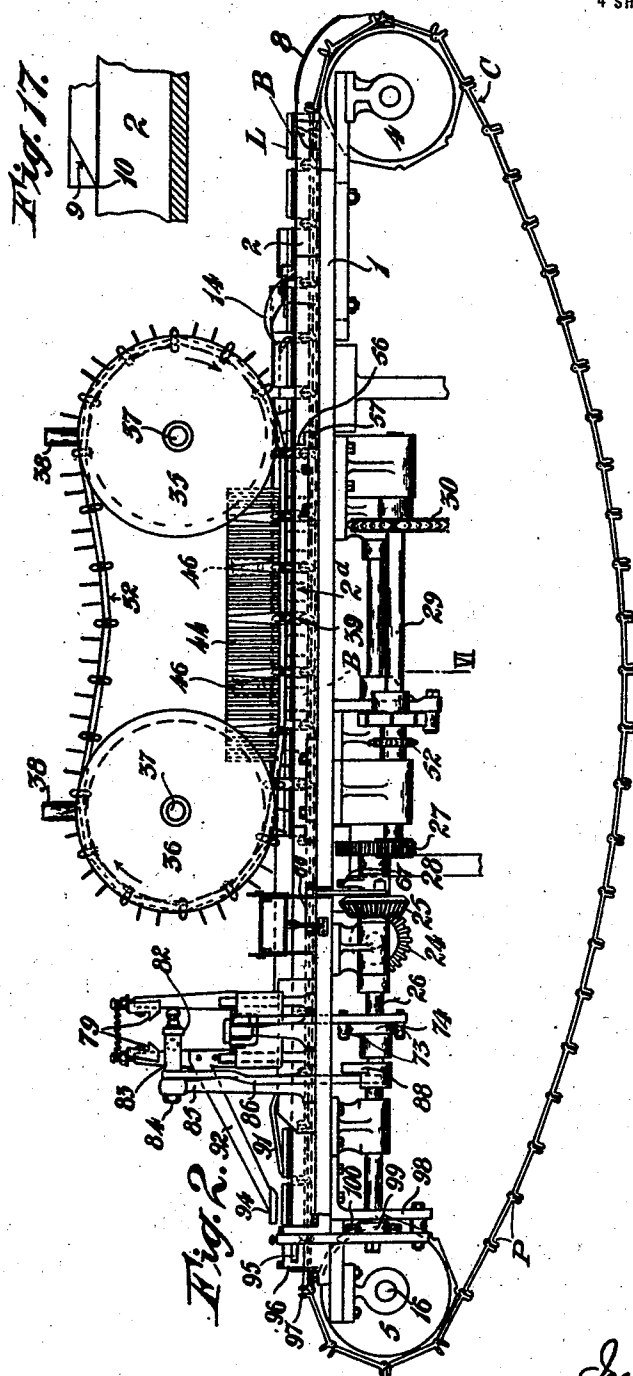
Inventor
Andrew Francis Ney.
By *Neuendorf* atty.

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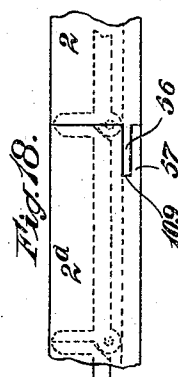
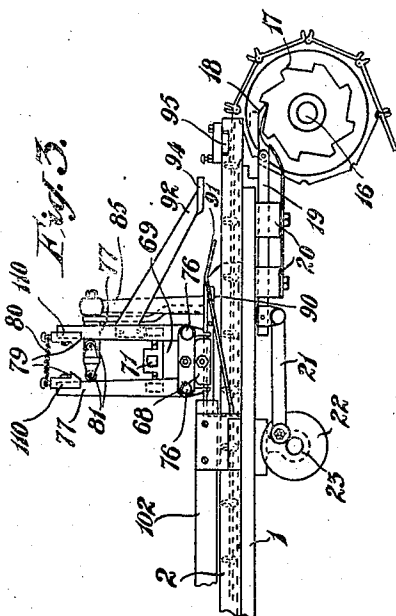
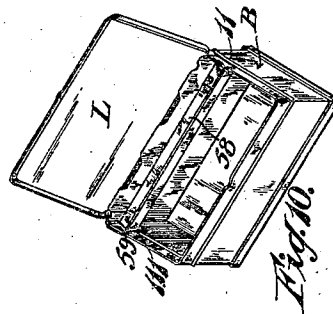
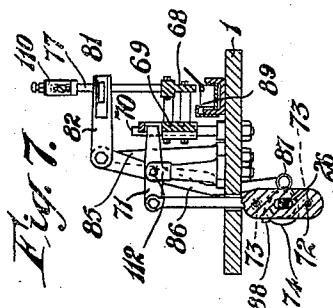
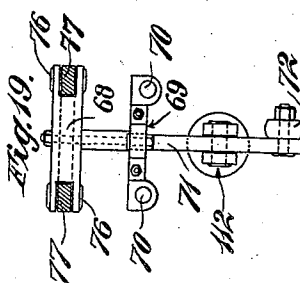
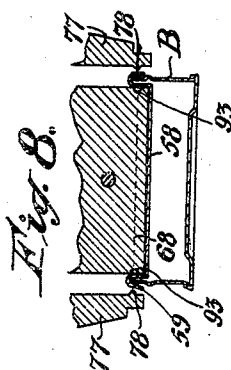
4 SHEETS—SHEET 2.



Inventor.
Andrew Francis Ney.
By *Thompson* atty.

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4 SHEETS—SHEET 3.

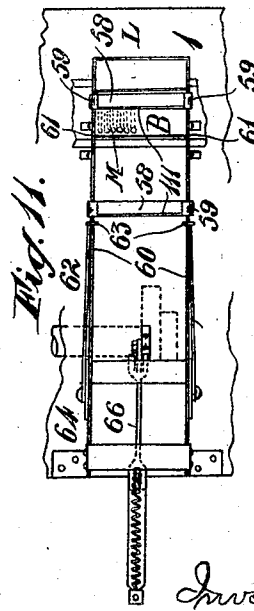
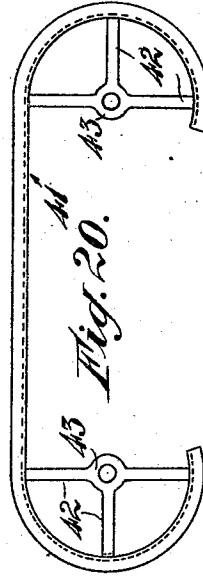


Inventor.
 Andrew Francis Ney.
 By *Henry J. Ney* atty

MACHINE FOR FILLING RECTANGULAR METAL BOXES WITH VESTAS.

Patented June 6, 1922.

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 Inventor.
 Andrew Francis Ney.
 By  Atty.

UNITED STATES PATENT OFFICE.

ANDREW FRANCIS NEY, OF EAST KEW, VICTORIA, AUSTRALIA.

MACHINE FOR FILLING RECTANGULAR METAL BOXES WITH VESTAS.

1,418,451.

Specification of Letters Patent. Patented June 6, 1922.

Application filed August 8, 1921. Serial No. 490,776.

To all whom it may concern:

Be it known that ANDREW FRANCIS NEY, a subject of The King of Great Britain, residing at "Glenelg," East Kew, in the State of Victoria, Commonwealth of Australia, hath invented new and useful Improvements in Machines for Filling Rectangular Metal Boxes with Vestas, of which the following is a specification.

Heretofore the filling with wax or wood pine vestas of rectangular metal boxes, usually fitted with hinged lids and clamping strips, has been accomplished by hand, it being first necessary to raise the lid, place the vestas in the box, and shake them into position after which a metal clamp strip for holding down the matches was fixed to the ends of the box and the lid of the latter closed. The ends of each strip was either hand sprung into recesses formed in the ends of the box or one end was similarly fitted and the other formed with a hookshaped flange which fitted over the edge of one end of the box and was pinched thereto by a manually operated device.

It will be evident therefore that the means at present adopted for filling the boxes is laborious, involving considerable hand labour and consequently expensive.

The object therefore, of this invention is to provide a machine, preferably associated with a continuous vesta making machine, by means of which the lids of the empty boxes will first be automatically raised, the boxes filled with vestas, metal clamping strips formed with hook shaped flanges at each end delivered into the boxes the flanges of the strips and the ends of the boxes pinched together and finally the lids closed and the filled boxes discharged. The boxes are carried forward during such operation by means of a carrier chain and means are provided for ensuring the vestas being laid in correct position in the boxes.

It is estimated that this machine will not only fill the boxes and pack the vestas therein more perfectly than by hand but will greatly reduce the cost of the operations.

A practical form of the invention is depicted in the accompanying drawings whereof Fig. 1 is a plan of the machine with parts in section and broken away, and Fig. 2 is a front side elevation.

Fig. 3 is a fragmentary side elevation looking in direction of arrow A in Fig. 1.

Fig. 4 an enlarged section on line IV Fig. 1.

Fig. 5 an enlarged section on line V, Fig. 1.

Fig. 6 a section on line VI Fig. 2. 60

Fig. 7 a section on line VII Fig. 1.

Fig. 8 an enlarged fragmentary detail of Fig. 3.

Fig. 9 a perspective view of the clamping strips. 65

Fig. 10 a perspective view of a box with the lid raised.

Fig. 11 an enlarged plan of the clamping strip delivery mechanism and Fig. 12 a sectional side elevation of same. 70

Fig. 13 is a section in line XIII of Fig. 1.

Fig. 14 an enlarged side elevation of the carrier chain.

Fig. 15 an enlarged plan, and

Fig. 16 a longitudinal section of the separator chain. 75

Figs. 17, 18 and 19 are details of parts not clearly shown in the other figures of drawings and Fig. 20 is an elevation of a modification hereinafter referred to. 80

The machine is mounted on a suitably supported base plate 1 provided on top with a channel shaped guideway 2 arranged parallel with the discharge end of continuously travelling chain of the match making machine carrying the vestas such machine not being illustrated but located about position 2 in Fig. 1. In said guide way travels a carrier C consisting of an endless chain or belt passing over sprocket pulleys 4, 5, and provided with pockets P formed by right angle end projections 6 projecting from the base 7 of the pockets (Fig. 14) into which are placed the boxes B with closed lids L. 85

The carrier moves intermittently and as illustrated for this purpose the shaft 16 of sprocket pulley 5 carries a ratchet wheel 17 (Fig. 13) engaged by a suitably supported dog 18 pivoted to a bar 19 slidable in guide bearings 20 and connected with a connecting rod 21 eccentrically connected with a disc 22 on a transverse shaft 23 driven by bevel gearing 24, 25 (Fig. 2). 95

The gear wheel 25 is mounted on a longitudinal shaft 26 having a spur wheel 27 gearing with a pinion 28 on the main shaft 29 provided with a sprocket 30 operated by a chain 31 in timed relationship with the match machine located at position Z. 100

In order to protect the hands of the box- 110

feed operator the end portion of the carrier C is protected by a shield 8.

Fixed to the channel guideway 2 are means (Fig. 4) to raise the lids of the boxes comprising a bevelled ramp 9 fixed to one side of the guideway and slightly projecting inwardly of same in such a position that its edge 10 as each box advances by intermittent motion of the carrier engages the underside edge 11 of the flange of the lid L thus causing the latter to gradually rise on its hinge. During this movement the side edge of a horizontal hold down plate 12 fixed to the opposite side of the channel guideway bears upon the outwardly pressed shoulder 13 usually formed on the boxes whereby the box is prevented from rising during the first upward swinging movement of the lid. The final lifting of the lid is effected by contact of the forward edge of same with a laterally and upwardly inclined arm 14 fixed at the same side of the guideway as the bevel ramp 9. The lid when raised is supported on an inclined support 102 fixed to the side of the guide way and extending the full length of same along which support the lids slide as the boxes intermittently advance.

As the boxes advance towards the match making machine from which the matches M are discharged into the boxes means are provided to prevent the matches twisting or lying at an angle in the boxes. The means comprise an overhead endless separator chain 32 (Figs. 15, 16) consisting of pivoted links to the sides 33 of which are riveted partition plates 34 which project into a box and divide it into three compartments each sufficiently narrow to prevent the matches lying at an angle.

The separator chain 32 travels horizontally just above the carrier at the position where the matches are discharged into the box and passes round idle flanged pulleys 35, 36 mounted on spindles 37 projecting from standards 38 on the base plate 1. The chain 32 is advanced intermittently by the boxes through the medium of transverse bars 39 into which are screwed the pivot screws 40 of the links which bars enter the spaces between the adjacent ends of the boxes that project above the carrier.

In lieu of the idle pulleys 35, 36 a curved flanged plate 41 (Fig. 18) may be utilized said plate being fixed by spider arms 42 and hubs 43 to the axles 37.

In order to direct the match from the match machine into the boxes an inclined plate 44 (Fig. 5) grooved to form partition 45 is fixed by brackets 46 to the guideway 2.

The portion 2^a of the guideway opposite the match delivery position is separated from the rest and adapted to be reciprocated rapidly by shaking or bumping motion, to cause the vestas to settle down compactly in the boxes. Accordingly one side of the

guideway 2^a has arms 147 affixed thereto (Fig. 6) connected to levers 47 on a rock shaft 48 having a lever 49 carrying a roller 50 engaging a many sided bumping cam 51 mounted on shaft 29, the hub of said cam 70 being provided with a sprocket 52 (Fig. 2) driven by chain 53 (Fig. 1).

On the side of the guideway 2^a opposite this gear are two blocks 54 housing springs 55 which bear against this portion of the guideway.

In order to keep the portion 2^a of the guideway down on the base the end portion 56 of the bottom of the rigid portion 2 is halved to overlap the correspondingly halved end portion 57 of the reciprocating portion 2^a and the sides of the latter are cut away as at 109 to permit its lateral movements as illustrated in Fig. 18.

The filled boxes with open lids advance to a position in front of mechanism for feeding the metal clamp strips 58 Fig. 9 which are formed at the ends with upwardly projecting flanges, the extremities being bent downwardly to form hooks 59 which are adapted to rest on the end edges of the boxes Figs. 10, 11 and 12 when the clamp strip is in the box and bear upon the stems of the vestas. One side edge of the clip is also formed with an upturned flange 111.

These strips are fed on to inclined rails 60 (Figs. 11, 12) the ends of which are downwardly curved and project over the boxes and are superposed by guides 61 at their ends.

Upon said rails are guided plungers 62 with cross heads 63 engaging the rails and adapted to push said strip off the rails into the boxes. These plungers may be connected with a lever 64 operated by a link 65 connected with a spring controlled crank lever 66 carrying a roller 166 operated by means of a cam 67 on the countershaft 26.

If however, sufficient room is provided and it is preferred the clamp strips may be deposited in the box by manual labour in which case the mechanism illustrated in Figs. 11, 12 is not required.

In advance of this mechanism (Figs. 1, 2, 3, 7, 8) is the means for pinching the flanges 39 of the clamp strips 58 to the edges of the boxes. This comprises a presser foot 68 adapted to descend on the flat portion of the strip and a pinching device (Fig. 8) adapted to pinch the hook flanges and the ends of the box together as in Fig. 10.

As illustrated the presser foot 68 is mounted on a slide block 69 consisting of two parts formed by bolts as in Fig. 19 said block being vertically slidable on standards 70 engaged by a lever 71 mounted on pivot 112 and operated by a slotted arm 72 straddling shaft 26 and provided with rollers 73 engaging a cam 74 on said shaft.

Vertical levers 77 are connected by pivots

76 to the slide block 69 said levers 77 being formed on their opposed sides about the bottom with small pins or studs 78 and provided near the top with vertically adjustable pieces 110 formed with bevelled projections 79 and connected by a spring 80. Contacting with the respective levers 77 are rollers 81 mounted on a lever arm 82 projecting from a sleeve 83 mounted on a pivot 84 projecting from a standard 85 said sleeve having a downwardly extending lever 86 carrying a roller 87 operated by a cam 88 on shaft 26.

When the presser foot descends upon a clamp strip in a box the pinching device moves with it and then cam 88 operates to raise lever arm 82 and consequently rollers 81 which engage the bevelled projections 79. This movement spreads apart the upper ends of levers 77 and causes their lower ends to move inwardly and pinch the flange hooks 59 on the clamp strips 58 against the presser foot 68, which is recessed opposite the spikes as at 93 Fig. 8, into intimate connection with the ends of the box said pins or studs 78 clinching the whole securely together.

During the pinching operation the box is held down in the carrier by means of an overhanging plate 89 fixed to the side of the guideway and a flat spring 90 fixed to the side flange of said plate is employed to press the box towards the outer side of the guideway.

It will be understood that the pinching of the clamp strip is accomplished during the momentary periods of rest of the carrier.

Fixed to the base plate is an arm 91 bent at its end at an angle across the carrier and downwardly inclined against which the lid L of the filled and completed box contacts to close said lid and projecting from one lever 77 is an arm 92 with a stamper 94 that comes down on the lid and presses it down tight on the box.

The final step is the ejection of the boxes from the carrier chain during the momentary stoppage of the carrier and this is effected by a spring controlled plunger 95 operating in guides 96 reciprocated by means of a lever 97 pivoted to a bracket 98 Fig. 2 and carrying a roller 99 operated by a cam 100 on the countershaft 26 the discharged boxes being delivered on to a chute or conveyor not illustrated. To permit the discharge a portion of one side of the guideway is cut away and the opposite side is formed with a notch 101 for the passage of the plunger.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed I declare that what I claim is:—

1. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box car-

rier, a bevelled ramp at one side of said guideway, and a laterally and upwardly inclined arm on said side extending across the carrier to raise the box lid.

2. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier, a bevelled ramp at one side of said guideway, and a laterally and upwardly inclined arm on said side extending across the carrier to raise the box lid and a hold down plate on the opposite side of said guideway.

3. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier, a bevelled ramp at one side of said guideway, a laterally and upwardly inclined arm on said side extending across the carrier to raise the box lid, a hold down plate on the opposite side of said guideway and a lid support thereon.

4. Means for filling rectangular metal boxes with vestas, comprising an intermittently operated endless carrier chain formed with pockets to receive the boxes and an overhead endless chain operated through the medium of the boxes and formed with means to partition the boxes during the filling operation.

5. Means for filling rectangular metal boxes with vestas, comprising an intermittently operated endless carrier chain containing the boxes and an overhead endless chain synchronously operated by the boxes and provided with projecting plates that enter and partition said boxes during the filling operation.

6. Means for filling rectangular metal boxes with vestas comprising an intermittently operated carrier chain formed with pockets to receive the boxes, an overhead endless chain operated through the medium of the boxes and provided with projecting partition plates that extend into the boxes and an inclined partitioned feed plate adapted to deliver vestas between said partition plates into said boxes.

7. Means for filling rectangular metal boxes with vestas, comprising a channel guideway formed in disconnected sections, means to laterally reciprocate one section, an intermittently operated endless carrier chain in said guideway formed with pockets to receive the boxes, an overhead endless chain the links of which are engaged by the boxes, projecting partition plates fixed to said links that temporarily enter the boxes, and an inclined feed plate adapted to deliver vestas between said partition plates into the boxes.

8. Means for filling rectangular metal boxes with vestas, comprising an intermittently operated endless carrier chain formed with pockets to receive the boxes, an overhead endless chain operating parallel to the carrier chain and provided at the pivots of

its links with projecting bars that engage the ends of the boxes said links provided with projecting partition plates that enter the boxes and means to feed vestas to the latter.

9. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets, means to raise the lids of the boxes, means to feed the vestas therein and an overhead endless chain provided with partition plates that enter the boxes.

10. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets means to raise the lids of the boxes and an overhead endless separator chain provided with projecting partition plates that enter the boxes while being filled.

11. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets, a bevelled ramp adapted to engage the flange of the box lid, a laterally and upwardly inclined arm extending across the carrier, a hold down plate, an inclined lid support an overhead endless chain provided with partition plates projecting therefrom.

12. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets, a bevelled ramp adapted to engage the flange of the box lid, a laterally and upwardly inclined arm extending across the carrier, a hold down plate, an inclined lid support an overhead endless chain, supporting means for said chain and partition plates projecting therefrom.

13. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets, a bevelled ramp adapted to engage the flange of the box lid a laterally and upwardly inclined arm extending across the carrier, a hold down plate, an inclined lid support, an overhead endless chain supported on freely rotatable pulleys and operated synchronously with the carrier the links of said chain provided on their sides with transversely projecting partition plates and at their ends with transverse bars which engage between adjacent ends of the boxes.

14. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets, means to raise the lids of the boxes, an overhead endless separator chain provided with partition plates that enter the boxes and a partitioned chute for delivery of vestas to the boxes.

15. In a machine for filling rectangular

metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets, means to raise the lids of the boxes, an overhead endless separator chain provided with partition plates that enter the boxes, a partitioned chute for delivery of vestas to the boxes and means to shake that portion of the guideway opposite said delivery chute.

16. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets, means to raise the lids of the boxes, an overhead endless separator chain provided with partition plates that enter the boxes, a partitioned chute for delivery of vestas to the boxes and a bumper cam operated lever operating a rock shaft carrying arms connected with that portion of the guideway opposite the delivery chute which is laterally moveable against springs.

17. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets, means to raise the lids, an overhead endless separator chain provided with projecting partitions, a vesta delivery chute, clamp strips formed at each end with hook flanges and means to pinch said flanges to the respective ends of the boxes.

18. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets means to raise the lids of the boxes, an overhead endless separator chain provided with projecting partitions, a vesta delivery chute, means to feed clamp strips formed with hook flanges at each end upon the end edges of the boxes and means to pinch said hook flanges to said edges.

19. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets, means to raise the lids of the boxes, a vesta delivery chute, means to deliver clamp strips with hook flanges at each end upon the end edges of the boxes, a presser foot vertically reciprocating above the strips and a pair of pinching levers reciprocating with said presser foot and operating against the ends of the hook flanges.

20. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets, means to raise the lids of the boxes, a vesta delivery chute, means to deliver clamp strips with hook flanges at each end upon the end edges of the boxes, a presser foot vertically reciprocating above the strips and a pair of pinching levers reciprocating with said presser foot and operating against the ends of the

hook flanges, and a hold down plate overhanging the box.

21. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets, means to raise the lids of the boxes, a vesta delivery chute, clamping strips formed at each end with hook flanges, means to deliver same to the end edges of the boxes comprising a pair of inclined rails to support the hook flanges, plungers in engagement with said rails and reciprocated by means of a spring controlled cam operated lever and means to pinch said hook flanges to the ends of the boxes.

22. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets, means to raise the lids of the boxes, a vesta delivery chute, clamping strips formed at each end with hook flanges, means to deliver same to the end edges of the boxes comprising a pair of inclined rails to support the hook flanges, plungers in engagement with said rails and reciprocated by means of a spring controlled cam operated lever, a vertically reciprocating presser foot and a pair of levers the latter operated to pinch the hook flanges to the ends of the boxes.

23. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets, means to raise the lids of the boxes, a vesta delivery chute, clamping strips formed at each end with hook flanges, means to deliver same to the end edges of the boxes comprising a pair of inclined rails to support the hook flanges, plungers in engagement with said rails and reciprocated by means of a spring controlled cam operated lever a hold down plate for the boxes, a vertically reciprocating presser foot and a pair of levers the latter operated to pinch the hook flanges to the ends of the boxes.

24. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets means to raise the lids of the boxes, an overhead endless separator chain provided with projecting partitions, a vesta delivery chute, clamping strips formed at each end with hook flanges; a pair of inclined rails to support the strips, plungers with cross heads in engagement with said rails, a cam operated spring controlled lever operating said plungers, a hold down plate for the boxes, a spring bearing against the box, a vertically reciprocating

presser foot and a pair of levers, the latter operated to pinch the hook flanges to the ends of the boxes.

25. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets means to raise the lids of the boxes, a support for the lid, means to deliver the vestas to the boxes, means to deliver clamp strips to the boxes and pinch same thereto and a lid closing means consisting of an arm extending at an angle across the guideway.

26. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets means to raise the lids of the boxes, a support for the lid, means to deliver the vestas to the boxes, means to deliver clamp strips to the boxes and pinch same thereto, an arm extending at an angle across the guideway and downwardly inclined at its end and a vertically reciprocating stamper operating to close the box lids.

27. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets, means to raise the lids of the boxes a support for the lid, means to deliver the vestas to the boxes, means to deliver clamp strips to the boxes and pinch same thereto, an arm extending at an angle across the guideway and downwardly inclined at its end, a vertically reciprocating stamper operating to close the box lids and a horizontal reciprocating box ejector operating opposite portions of the sides of the guideway formed with recesses.

28. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets means to raise the box lids, means to deliver the vestas to the boxes and prevent the vestas twisting, means to shake the boxes, means to pinch the clamp strips to the boxes, means to close the lids and means to eject the boxes.

29. In a machine for filling rectangular metal boxes with vestas, a channel guideway, an endless intermittently operated box carrier formed with pockets, means to raise the box lids, means to deliver vestas to the boxes and prevent the vestas twisting, means to shake the boxes, means to feed hook flanged clamp strips to the boxes, means to pinch the hook flanges of the strips to the end edges of the boxes, means to close the lids and means to eject the boxes.

Dated this 30th day of June, 1921.

ANDREW FRANCIS NEY.