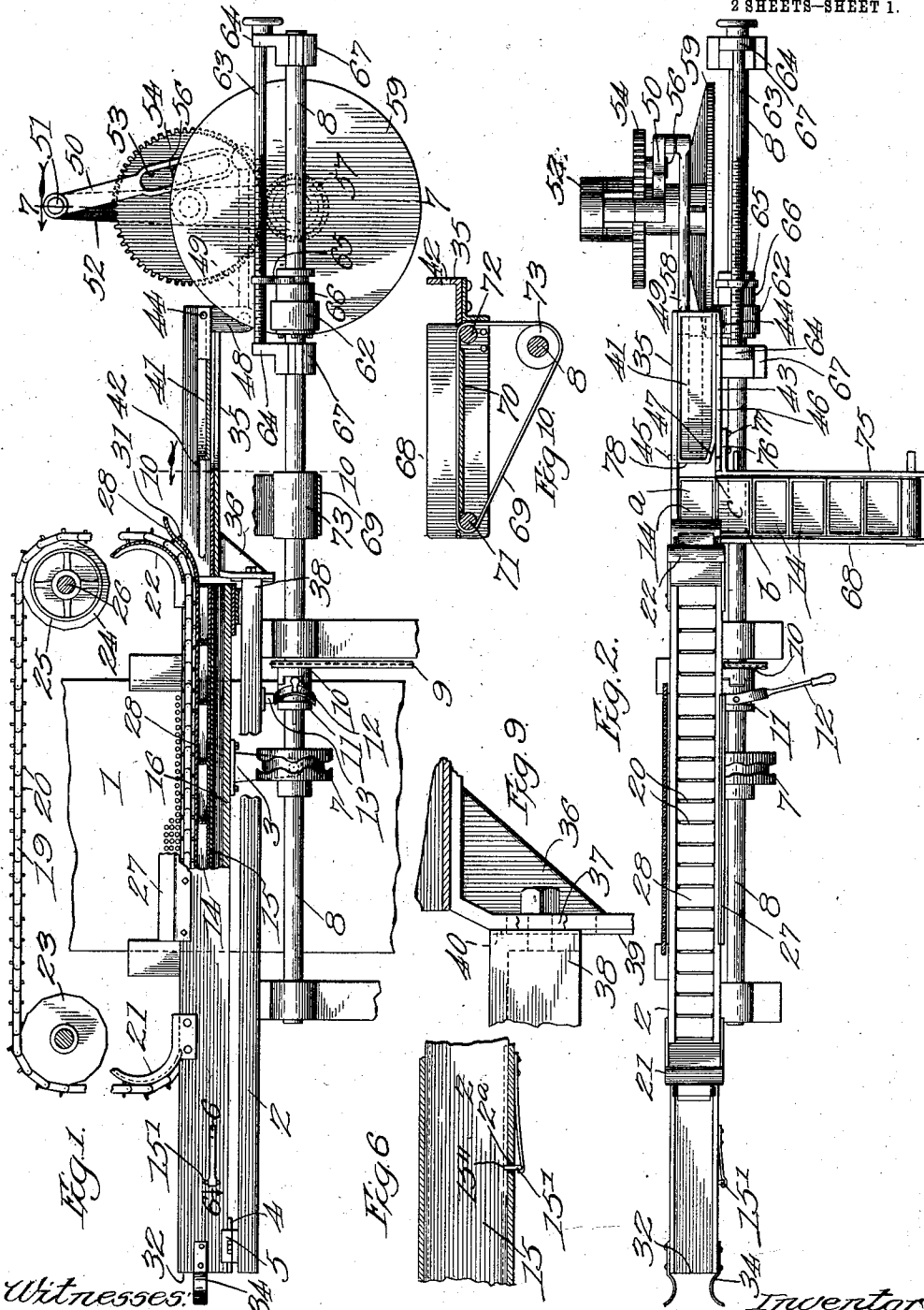


B. G. VAUGHAN.
MATCH BOX FILLING MACHINE.
APPLICATION FILED NOV. 30, 1908.

1,010,823.

Patented Dec. 5, 1911.

2 SHEETS-SHEET 1.



Witnesses:
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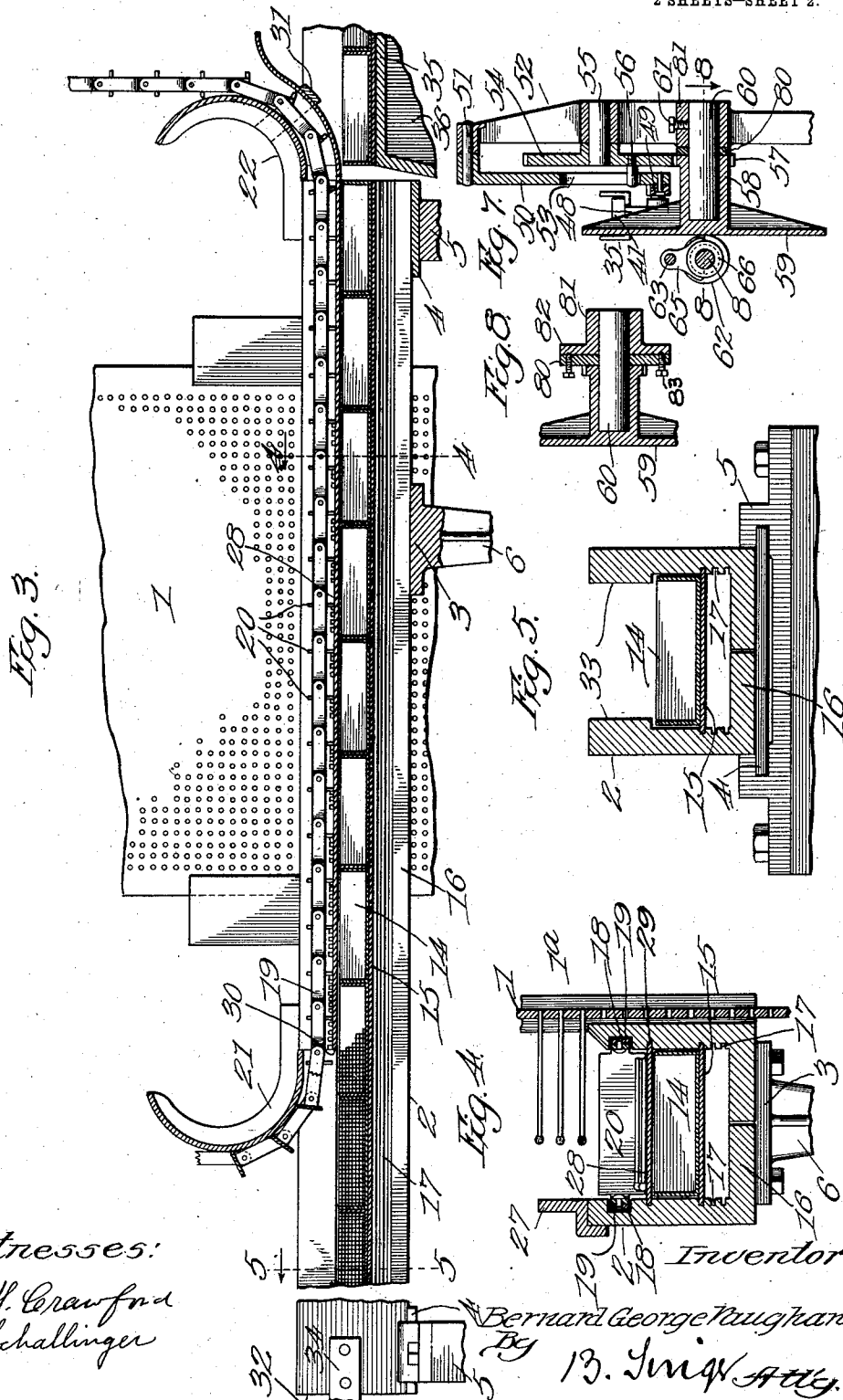
Inventor:
Bernard George Vaughan
By B. Singer Atty.

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C. M. Crawford
C. Schallinger

Inventor:
Bernard George Vaughan
By B. L. Smith, Atty.

UNITED STATES PATENT OFFICE.

BERNARD GEORGE VAUGHAN, OF JOLIET, ILLINOIS, ASSIGNOR TO NATIONAL MATCH COMPANY, OF JOLIET, ILLINOIS, A CORPORATION OF ILLINOIS.

MATCH-BOX-FILLING MACHINE.

1,010,823.

Specification of Letters Patent.

Patented Dec. 5, 1911.

Application filed November 30, 1908. Serial No. 465,107.

To all whom it may concern:

Be it known that I, BERNARD GEORGE VAUGHAN, a citizen of the United States of America, residing at Joliet, in the county of Will, State of Illinois, United States of America, have invented new and useful Improvements in Match-Box-Filling Machines, of which the following is a full, clear, and exact description.

This invention relates to machines for filling boxes with matches, tooth-picks or articles of a similar shape, and particularly to machines which are adapted to be arranged adjacent a match-making machine so as to automatically box the matches as they are discharged from the match-making machine.

The main object of the invention is to provide a match-box-filling machine which will successfully box the output of a high-speed match-making machine.

Another object is to provide a match-box-filling machine that comprises means for engaging the matches that are discharged from the match-making machine and simultaneously feeding the matches to boxes and arranging them in an orderly manner so that they will lie approximately parallel to each other when they are introduced into the boxes.

Another object is to provide a match-box-filling machine which is so designed that match-boxes of different sizes can be used therein by simply adjusting certain parts of the machine and without replacing or substituting different-sized parts, as was necessary with the match-box-filling machines heretofore in use.

Another object is to provide a machine of this character wherein the matches are delivered to the machine at one point and deposited in the boxes at a point, relatively remote, from the point at which the matches are delivered to the machine.

A further object consists in the provision of means for advancing the empty boxes to a receiving or filling position, which means is capable of adjustment so as to vary the speed of advancing movement imparted to the boxes, and thus regulate the filling thereof, without changing the speed of the match delivering means of the match-making machine.

In this connection a further improvement

consists in an improved guide constructed and arranged to receive empty boxes of different sizes so that the machine can be used to fill different sized boxes without changing the speed of the match delivery means and without changing the delivery means itself.

Other features will be more fully described in connection with the accompanying drawings and will be more particularly pointed out and ascertained in and by the appended claims.

In the drawings;—Figure 1 is a front view of a box filling machine embodying the main features of my invention, with parts broken away to show the internal construction in section. Fig. 2 is a plan view of the machine shown in Fig. 1. Fig. 3 is a front view partly in section and partly in elevation showing the parts on an enlarged scale. Fig. 4 is a sectional view on line 4—4 of Fig. 3. Fig. 5 is a sectional view on line 5—5 of Fig. 3. Fig. 6 is a sectional view on line 6—6 of Fig. 1. Fig. 7 is a sectional view on line 7—7 of Fig. 1. Fig. 8 is a sectional view on line 8—8 of Fig. 7. Fig. 9 is a detail fragmentary elevation, partly in section, of one of the guides shown in Fig. 1. Fig. 10 is a sectional view on line 10—10 of Fig. 1.

Like characters of reference designate similar parts throughout the different figures of the drawings.

I have herein illustrated the preferred form of my invention in combination with a match-making machine that is provided with an intermittently moving match-carrier or chain 1, but I wish it to be understood that my improved box-filling machine is not limited to use with a match-making machine of this type, or, in fact, to use with match-making machines, for it could be used for filling boxes with various other kinds of articles.

I have not illustrated the mechanism for moving the match-carrier 1 of the match-making machine and the means for ejecting the matches from said carrier into the box-filling machine, but it will, of course, be understood that suitable means is provided for ejecting the matches from the carrier 1 at certain periods in the cycle of operations of the carrier.

My improved box-filling machine com-

prises an approximately trough-shaped member 2 that forms a guideway for the boxes to be filled and which also receives the matches as they are discharged from the carrier 1 of the match-making machine, said trough being preferably formed from two substantially L-shaped members or pieces of angle-iron arranged with their horizontal legs extending inwardly toward each other. Said members may be connected by a part 3, at a point between their ends, and at their end portions said members are rigidly secured to bearing members or slides 4. Said slides 4 are shown mounted in supports 5, in a manner to permit of longitudinal agitation of the trough 2. The part 3, which unites the angle shaped members forming the trough, may be provided with an extension 6 carrying a roller adapted to be acted upon by an internal cam 7, as the means for imparting the desired longitudinal agitating movement to the trough 2. The agitating cam 7 is mounted upon the main operating shaft 8 which may be driven in any suitable manner, as by a chain 9 and sprocket 10, adapted to be thrown into and out of operative relation with the shaft 8 by a clutch 11. The clutch 11 may be operated by a lever 12 hung from a pendant support 13.

The trough 2 conveniently forms a guide or runway for the match boxes 14 and the walls of said trough are so proportioned as to receive the match boxes longitudinally so that their ends walls will be engaged in abutting relation, as clearly shown in Fig. 3. A bottom wall 15 is provided for supporting the match boxes and in the present embodiment of the invention said wall constitutes a false bottom for the trough 2, the bottom wall thereof being indicated at 16. The usual or medium sizes of match boxes are generally uniform in width but vary in length and depth and in order to equip a machine so that it can be used for boxes of different depth the supporting wall 15 is designed to be adjustable in the trough 2, and in the present embodiment, the trough 2 is provided with a plurality of pairs of superposed grooves 17 for receiving the supporting wall 15. If shallow boxes are to be filled, the supporting wall 15 is inserted into the uppermost groove 17 and if medium or deep boxes are to be filled the wall 15 is inserted in the intermediate or lower groove. Usually the wall 15 will be frictionally held in place but if desired a locking device may be provided which may consist of a spring actuated key 15', of a height equal to the height of the grooves 17 in one wall of the trough, and adapted to be projected by the spring through a slot 2' into engagement with a recess 15'' formed in the wall 15, as clearly shown in Fig. 6. The means for feeding the boxes to the trough 2 and also for ad-

vancing the same therein is so constructed and designed as to be utilized with any length of box, as will hereinafter more fully appear. The walls of the trough 2 are grooved at 18 to form the lower lap of a delivery chain 19 which is provided with transversely disposed link blades 20, between which the matches are received when they are discharged from the match-carrier 1 of the match-making machine. As shown, guides 21 and 22 are provided to engage the lower lap of the chain 19 and cause it to pass horizontally through a portion of the trough 2. Said guides 21 and 22 are preferably rigidly secured to the trough 2 so as to partake of the agitation imparted thereto and cause a corresponding longitudinal agitation of that portion of the chain 19 running through the trough. The chain extends upwardly and downwardly from and to the guides 21 and 22, respectively, over sprocket wheels 23 and 24, and the same are located a sufficient distance above the guides 21 and 22 so as to permit of the desired vibration of the lower lap of the chain. The chain 19 is driven from a source of power, independent of the shaft 8, and the power may be applied for this purpose to a wheel 25 mounted upon the shaft 26 of the sprocket wheel 24. The chain 19 travels abreast of the match carrier 1 and when the matches are ejected from said carrier they fall between the blades 20 of the chain 19. As shown in Fig. 4, a guard 27 is mounted upon the trough 2 to prevent the ejected matches from being thrust over the outer wall of the trough.

One of the principal objects of this invention is to deliver the matches to the boxes at a point, relatively remote, from the point at which the matches are discharged from the match carrier 1 so that the matches can be arranged in an orderly manner before they are deposited in the boxes, and in the embodiment of my invention herein shown an approximately horizontally disposed plate 28 is provided for receiving the matches when they are discharged from the match-making machine. This plate 28 is removably mounted in grooves 29 formed in the walls of the trough 2 and acts as a partition to divide the trough into a match guideway and a box guideway, said partition extending throughout a considerable length of the trough 2 and terminating at 30, which will hereinafter be termed the delivery point. The other end of the partition may extend beyond the trough 2 and upwardly above the same so as to be anchored to a support 31, secured to the guide 22. It will be seen that the partition forms an upper wall, between which and the bottom wall 15, the empty boxes may be advanced in the trough 2 and that the partition also forms a support for that portion of the chain 18 traveling

between the guides 21 and 22 so that when the matches are ejected from the match carrier 1 they will fall between the blades 20 and will be advanced thereby, upon the partition 28, to the delivery point 30 where they will be discharged into the empty boxes.

It will be clear from the foregoing that the machine may be used for any of the ordinary sized boxes without changing the chain 19, and without altering the position of the partition 28, which feature is of great practical value. From the delivery point 30 to the delivery end 32 of the trough 2 the walls of the latter are constructed to overhang the side walls of the boxes 14 as indicated at 33 (Fig. 5) so that when the matches are delivered from the end of the partition 28 they will be prevented from engaging the upper margins of the box walls. The overhanging portions 33 are preferably spaced apart a distance approximately equal to the internal width of the boxes.

In order to retard the progress of the empty boxes through the trough 2 and maintain them in close end to end relation, means, preferably in the form of springs 34, are provided for engaging the boxes when the same are being discharged from the delivery end 32 of the trough.

Means is provided for advancing the boxes in the trough 2 and said means is so designed and constructed as to permit of varying the rate of such advancing movement so as to regulate the filling of the boxes, wholly by the feeding means therefor, and without requiring any change in the speed of the delivery chain 19 or match carrier 1.

As shown, a feeder trough 35 is provided, and is disposed in alinement with the trough 2 and is spaced apart therefrom a distance sufficient to permit of the desired agitating movement of the trough 2, and afford alined passage by means of which the boxes may be advanced from the trough 35 to the trough 2. The trough 35 is normally stationary but in constructions where the trough 2 is provided with an adjustable bottom wall, the trough 35 will be adjustably mounted so that its bottom wall will always be in horizontal alinement with the wall 15, in whatever position the latter is adjusted.

As clearly shown in Fig. 9, the trough 35 is provided with a bracket 36, which may be slotted at 37, and bolted to a frame member 38, the slot in the bracket affording the requisite latitude of adjustment equal to the range of adjustment of the wall 15.

In order to insure vertical alinement of the troughs 2 and 35, the bracket 36 may be ribbed at 39 to engage a correspondingly formed groove 40 in the frame member 38. The upwardly inclined or rounded end of the partition 28 will serve to prevent the

boxes from engaging the end of the same and clogging the machine and the space between the troughs 2 and 35 will be relatively limited so as not to interfere with a free advancing progress of the boxes from one trough to the other.

A reciprocating plunger or feeder 41 is mounted in the trough 35 and the latter is suitably slotted, at 42 and 43, to receive pins or lugs 44 and 45 respectively, so as to maintain the plunger or feeder 41 in proper working position in the trough 35. The slot 42 and lug 45 are located somewhat in advance of the slot 43 and lug 44, so as to permit of the provision of an opening in the wall 46 through which the boxes may be fed, as will hereinafter more fully appear. In the present construction the boxes are fed into the trough 35 laterally thereof and in order to prevent engagement of the feeder 41 with an adjacent box the forward end of the feeder is preferably chamfered as indicated at 47. The feeder 41 is provided with a pendant arm 48 connected by a link 49, with an arm 50, pivotally mounted at 51, the arm 50 being slotted at 53. The pivot of the arm 50 is secured to a frame member 52. A gear wheel 54 is mounted on a shaft 55, having bearings in the frame member 52 and is provided with a pin 56 which engages the slot 53, formed in the arm 50, and operates the latter. By reason of the fact that the arm 50 is pivoted at 51 it will be obvious that as the pin 56 travels through the lower arc of its circuit it will be farther removed from the pivot 51 than it will be when it is traveling through the upper arc of its circuit, therefore, the arm 50 will impart to the feeder 41 a relatively slow feeding movement and a relatively rapid retracting movement, or with reference to the construction shown, the movement of the feeder toward the trough 2 will be relatively slow while the reverse movement will be relatively rapid. The gear 54 is driven by a gear 57, formed integral with a sleeve 58, provided with a friction disk 59. The sleeve 58 is mounted upon a stud shaft 60, which may be secured by a set screw 61, in the frame member 52. The friction disk 59 is driven by means of a friction roller 62, non-rotatively and slidably mounted upon the main driving shaft 8.

In order to increase or reduce the speed of the feeder 41 means are provided for adjusting the friction roller 62, abreast of the disk 59, and, as shown, said means consists of a threaded adjusting rod 63 mounted in fixed bearings 64 and a bifurcated arm 65 having threaded engagement with the rod 63 and engaging a grooved hub 66 of the friction roller 62. It will be obvious that as the rod 63 is rotated to move the roller 62 toward or away from the center of the disk 59 the speed of the latter will be corre-

spondingly altered. The bearings 64 may be conveniently formed on stationary bearings 67 of the shaft 8.

A take-up device is provided for taking up the play between the friction wheel 62 and the disk 59 resulting from wear or other causes, and as shown said take-up device is of the following construction:—A collar 80 is mounted on the shaft 60 and is disposed between the gear wheel 57 and the bearing 81. The bearing 81 is provided with laterally extending lugs 82, and set screws 83, having threaded connection with the collar 80, are adapted to be adjusted to displace the collar 80 to the left of Fig. 8 so as to force the disk 59 into engagement with the friction roller 62. As shown, a supply trough 68 is provided for feeding the boxes into the trough 35, and said trough 68 is preferably disposed at right angles to the trough 35 and is proportioned to receive the boxes in a transverse position with respect to the longitudinal axis of the trough 68. In other words, the boxes 14 will be fed sidewise through the trough 68 into the trough 35 and thereafter will be fed lengthwise through the troughs 35 and 2. A convenient means of feeding the boxes into the trough 35 may consist of an endless belt 69 passing through the bottom wall 70 of the trough 68 and over rollers 71 and 72. The belt may be driven by means of a pulley 73 secured to the shaft 8. The pulley 73 is so proportioned as to cause the belt 69 to travel at a rate of speed sufficient to feed the boxes forwardly in the trough 68 more rapidly than they can be received in the trough 35 so that when one of the boxes has been fed into the trough 35, as indicated at *a*, the next adjacent box *b* will be advanced into engagement with the box *a* and the remaining boxes in the trough 58 will be advanced toward the box *b*. All that is required of the operator is to continually fill the trough 68 in order to provide for uniformly supplying the boxes to the trough 35. The trough 68 is secured to the trough 35 so that it will always be in horizontal alinement therewith in any position or adjustment to which trough 35 may be secured. Any of the usual depth of boxes can be accommodated by the troughs 68 and 35 but if a box of greater length, than the box shown, is to be filled one of the walls of the trough 68 may be made adjustable. As shown, the wall 75 is secured to the wall 43, of the trough 35, by an angular extension 76 and bolts 77, by means of which the wall 75 may be adjusted laterally in parallel relation with the opposite wall of the trough 68. The shafts of the rollers 71 and 72 will be lengthened to permit of a limited adjustment of the wall 75.

The parts are desirably so disposed that the feeder 41 in its retracted position, will be withdrawn a sufficient distance rear-

wardly in the trough 35 to provide for a relatively considerable space between the forward end 78 of the feeder 41 and the box *a*, as clearly shown in Fig. 2. It will be seen that the forward end 78 of the feeder 41 is somewhat narrower than the width of a box, and the width of the trough 35, so that there will be no danger of the feeder engaging the corner *c* of the box *b* during the forward movement of the feeder. Furthermore, the feeder 41 is of a sufficient length to maintain engagement with the box *b* substantially throughout its length and rearward strokes so as to prevent the box *b* from entering the trough 35 until the forward end 78 of the feeder has been retracted beyond the wall 75. The speed of the belt 69 will be such that it will feed the boxes for the trough 35 and always maintain the foremost box *b* in engagement with the entered box *a* or the feeder 41, irrespective of the speed of the latter.

By means of the slow feeding and quick return movement of the feeder 41, I am able to reduce the periods of rest of the boxes advancing in the trough 2 to a minimum and at the same time it is possible to advance the boxes by a relatively slow gentle movement so as to entirely avoid any danger of crushing or collapsing the same.

While I have herein shown the supply trough 68 arranged at the righthand end of the trough 2 I wish it to be understood that my invention is not limited to this exact construction.

By the arrangement shown, a single driving shaft 8 serves to impart the required agitation of the trough 2 and chain, to operate the belt 69 to feed the boxes into the trough 35, and to operate the feeder 41. By feeding the matches to the chain 19 and partition 28, at one point, and delivering the matches at a point remote from the feeding point, the matches are thoroughly agitated and straightened before they arrive at the end of the partition 28 where they fall into the boxes. Therefore I entirely avoid the delivery of matches to the boxes in angular positions or positions other than a transverse position with respect to the longitudinal axes of the boxes. It will be further noted that the distance through which the matches fall, after being ejected from the chain 1 of the match-making machine, is divided by the partition 28 so that the space through which the matches drop from the chain 1 to the partition 28, and from the partition 28 to the boxes, is approximately half of the total distance of fall and this effectively prevents the matches from getting out of place. The distance of the fall at the feeding point is relatively slight and the agitation imparted to the trough 2, and partition and chain, serve to effectively straighten the matches so that when they are

delivered to the boxes they will lie transversely thereof.

I claim:—

1. A match-box-filling machine, comprising a relatively long horizontally disposed match-receiving plate arranged adjacent the match-carrier of a match-making machine and provided at one end with a delivery portion, means for agitating said plate longitudinally in the horizontal plane in which it lies, means for discharging matches from the match-carrier of the match-making machine onto said plate, means for advancing match-boxes into receiving position with respect to the delivery end portion of said plate so that the matches can pass from said plate directly into the match-boxes, and means for feeding the matches longitudinally of said plate to the delivery end portion thereof and simultaneously arranging the matches in a certain relation to each other.

2. A match box filling machine comprising in combination, a match receiving plate provided with a delivery end portion, means delivering the matches to said plate, means for advancing the boxes to receiving positions with respect to the delivery end portion of said plate, means for engaging and advancing the matches in a row along said plate toward and over the delivery end thereof into said boxes, and mechanism for agitating said advancing means, plate and boxes.

3. A match box filling machine comprising in combination, a match receiving plate having a delivery end portion, means for delivering the matches to said plate, means for advancing the boxes beneath said plate into a receiving position with respect to the delivery end portion of said plate and including mechanism whereby the advancing speed of the boxes may be varied, and independently operated means for engaging and assembling the matches on said plate in a row and advancing the matches toward and over said delivery end portion.

4. A match box filling machine comprising in combination, a match receiving plate provided with a delivery end portion, means for delivering the matches to said plate, independently operated means for advancing the boxes into a receiving position with respect to the delivery end portion of said plate and including mechanism for changing the speed of advancing movement of said boxes, and independently operated means for engaging and assembling the matches on said plate in a row and advancing them along the same toward and over the delivery end into said boxes.

5. A match box filling machine comprising in combination, a match receiving plate provided with a delivery end portion, means for agitating said plate, means for deliver-

ing the matches to said plate at a point remote from said end portion, means for advancing the boxes beneath said plate and abreast of said delivery end portion, and means for advancing and assembling the matches in a row along said plate and delivering the same over the end portion thereof into said boxes.

6. A match box filling machine comprising in combination, a horizontally disposed match receiving plate provided with a delivery end, means for vibrating said plate longitudinally, means for delivering the matches to said plate at a point remote from said delivery end, means for advancing the boxes beneath said plate and abreast of said delivery end, and means engaging the matches and advancing the same in a row along said plate toward said delivery end.

7. A match box filling machine comprising in combination, a trough provided with an adjustable false bottom providing a guide for the boxes, means for advancing the boxes through said guide, and means for delivering the matches to said boxes.

8. A match box filling machine comprising in combination, a main trough provided with an adjustable false bottom providing a guide for the boxes, a feeder trough containing means for advancing the boxes, means for adjusting said feeder trough with respect to said main trough, means for advancing the boxes to said main trough, and means for feeding the matches to said boxes.

9. A match box filling machine comprising in combination, a main trough provided with an adjustable false bottom, a feeder trough, a supply trough secured to said feeder trough and including means for delivering the boxes to said feeder trough, means for adjusting the feeder trough with respect to said main trough, means for advancing the matches through said feeder and main troughs, and means for delivering the matches to said boxes.

10. A match box filling machine comprising in combination, a main trough provided with an adjustable false bottom and forming a guide for the boxes, means for agitating said trough, an adjustably mounted feeder trough disposed in aligned relation with respect to said main trough, means for advancing the boxes through said feeder and main troughs, and means for delivering the matches to said boxes.

11. A match box filling machine comprising in combination, a main trough provided with an adjustable false bottom forming a guide for the boxes, means for agitating said trough, an adjustably mounted feeder trough disposed in aligned relation with respect to said trough, a supply trough delivering to said feeder trough and secured thereto, means for advancing the boxes in

said supply trough to said feeder trough, and means for advancing the boxes in said feeder and main troughs.

12. A match box filling machine comprising in combination, a main trough provided with an adjustable false bottom and a partition between which the boxes are received, means for delivering the matches to said partition, means for delivering the matches from said partition to said boxes, means for agitating the main trough, partition and match delivery means, a feeder trough adjustably mounted, a supply trough communicating with said feeder trough and secured thereto, means delivering the boxes from said supply trough to said feeder trough, and means for intermittently advancing the boxes in said feeder and main troughs.

13. A match box filling machine comprising in combination, a main trough provided with chain guides, a train traveling through said trough, a partition in said trough provided with a delivery end and supporting said chain between said guides, means for delivering the matches to said partition at a point remote from said delivery end, means advancing the boxes beneath said partition and abreast of said delivery end, and means for agitating said trough.

14. A match box filling machine comprising in combination, a main trough having an adjustable bottom for accommodating boxes of different depths, a feeder trough arranged to discharge to said main trough, means for adjusting the feeder trough in accordance with the adjustment of the bottom of said main trough, a supply trough carried by and arranged to discharge into said feeder trough, a reciprocating feeder advancing the boxes through said feeder and main troughs, and means for varying the speed of said feeder for boxes of different depth.

15. A match box filling machine comprising in combination, a feeder trough, a reciprocating plunger thereon having a forward box engaging portion reduced in size with respect to the boxes to be fed, and a supply trough delivering to said feeder trough at one side thereof and slightly in advance of the forward end of said plunger when the same is in a retracted position.

16. A match box filling machine comprising in combination, a rigid plate for receiving the matches, means for vibrating said plate, mechanism for advancing the boxes into a receiving position with respect to said plate, means for varying the speed of said mechanism, and means driven at a uniform speed for advancing the matches in a row along and delivering the matches from said plate to said boxes.

17. A match box filling machine comprising in combination, a main trough for the

boxes provided with a rigid match receiving partition covering the boxes throughout a portion of their travel through said trough, means delivering the matches to said partition, means for advancing the boxes beneath said partition, means for advancing the matches in a row along and delivering the matches from said partition to said boxes, said trough having means preventing engagement of the ends of the matches with the margins of the boxes at the point of delivery of the notches from said partition.

18. A match box filling machine comprising in combination, a main trough provided with a delivery end, a match receiving partition covering a plurality of boxes through a portion of their travel through said trough, and means advancing the matches in a row along and delivering the matches from said partition into said boxes, said trough having walls overhanging the lateral walls of said boxes from the end of said partition to the end of said trough.

19. A match box filling machine comprising in combination, a main trough for the boxes, means for advancing the boxes in said trough, means for delivering the matches to said boxes, a false bottom adjustably mounted in said trough, and means for locking said false bottom in said trough.

20. A match box filling machine comprising in combination, a main trough, means for advancing the boxes in said trough, means for feeding the matches to said boxes, the walls of said trough being provided with grooves, a false bottom for said trough adapted to be secured at different heights therein in the grooves, and a locking member for locking said false bottom in said grooves.

21. A match box filling machine comprising in combination, a trough forming a runway for the boxes, means advancing the boxes in said trough, mechanism for changing the speed of said means for boxes of different sizes, means delivering the matches to said trough, a plate above said boxes for receiving the matches from said delivery means and preventing direct delivery to said boxes, and means driven at a constant speed for straightening the matches on said plate and advancing and assembling the same in a row along said plate into said boxes.

22. A match box filling machine comprising in combination, a trough forming a runway for the boxes, means acting solely on the rear wall of the rearmost box for advancing all of the boxes through and out of said trough, mechanism for changing the speed of said means for boxes of different sizes, means delivering the matches to said trough, a plate above said boxes for receiving the matches and preventing direct

delivery to said boxes, and means driven at a constant speed for straightening the matches on said plate and advancing in a row along the same thereover into said boxes.

23. A match box filling machine comprising in combination, a main trough having an adjustable bottom for accommodating boxes of different depth, a feeder trough arranged to discharge to said main trough, means for adjusting the feeder trough in accordance with the height of the bottom of said main trough, a supply trough carried by and arranged to deliver to said feeder trough, and means for advancing the boxes through said feeder and main trough.

24. A match box filling machine comprising in combination, a main trough having a match receiving partition and an adjustable bottom therebelow between which and said partition the boxes are received and advanced, a feeder trough arranged to discharge to said main trough, means for adjusting the feeder trough in accordance with the adjustment of the bottom of the main trough, a supply trough carried by and arranged to discharge into said feeder trough, means for advancing the boxes through said feeder and main troughs, and means for varying the speed of said advancing means for boxes of different depth.

25. A match box filling machine comprising in combination, a vertically movable match carrier, a horizontally disposed trough arranged abreast of said carrier and in receiving relation thereto and forming a runway for the boxes, a horizontal partition in said trough for receiving the matches from said carrier, means for advancing the boxes in said trough beneath said partition and abreast of one end thereof, and a chain engaging the partition for straightening and advancing the matches in a row along said partition and over said end and into said boxes.

26. In a match-box-filling machine, a member arranged in an approximately horizontal plane and adapted to receive loose matches as they are discharged from the match-carrier of a match-making machine, means for causing empty match-boxes to travel past one end of said member and in close proximity thereto, and means separate and distinct from said member for assembling the matches thereon and arranging them in approximately parallel relation to each other and simultaneously feeding them longitudinally of said member and discharging them directly into said empty match-boxes.

27. In a match-box-filling machine, a longitudinally vibrating member arranged in an approximately horizontal plane and adapted to receive loose matches as they are

discharged from the match-carrier of a match-making machine, means for causing empty match-boxes to travel past one end of said member and in close proximity thereto, and means for assembling the matches on said member and arranging them in approximately parallel relation to each other and simultaneously feeding them longitudinally of said member and discharging them directly into said empty match-boxes.

28. In a match-box-filling machine, an approximately flat member arranged in a horizontal plane and adapted to receive loose matches as they are discharged from the match-carrier of a match-making machine, means for causing empty match-boxes to travel past one end of said member and in close proximity thereto, and means that engages the matches on said member and assembles and arranges them in approximately parallel relation to each other and simultaneously feeds them longitudinally of said member and discharges them directly into said empty match-boxes.

29. In a match-box-filling machine, an approximately flat member arranged in a horizontal plane and adapted to receive loose matches as they are discharged from the match-carrier of a match-making machine, means for causing empty match-boxes to travel past one end of said member and in close proximity thereto, a movable means coöperating with the matches on said member for assembling and arranging them in approximately parallel relation to each other and simultaneously feeding them longitudinally of said member and discharging them directly into said empty match-boxes, and means for preventing matches from escaping from said member while they are being assembled and fed over same.

30. In a match-box-filling machine, an approximately trough-shaped member arranged to receive loose matches as they are discharged from the match-carrier of a match-making machine, means for feeding empty match-boxes past one end of said trough and close enough thereto to permit the matches to fall directly from said trough into said boxes, and a movable means arranged adjacent said trough which tends to assemble the matches in said trough in a certain relation to each other and simultaneously feed said matches through the trough and discharge them directly into the match-boxes.

31. In a match-box-filling machine, an approximately trough-shaped member arranged to receive loose matches as they are discharged from the match-carrier of a match-making machine, means for feeding empty match-boxes past one end of said trough and close enough thereto to permit the matches to fall directly from said

trough into said boxes, means which tends to assemble the matches in said trough in a certain relation to each other and simultaneously feed said matches through the trough and discharge them directly into the match-boxes, and means for agitating said trough-shaped member longitudinally while the matches are being fed through same.

32. In a match-box-filling machine, a horizontally disposed match-splint-supporting member, means for engaging a mass of loose matches on said supporting member and simultaneously arranging them in a certain relation to each other and feeding them toward a discharge point on said member, means for causing match-boxes to travel in a lower horizontal plane past said discharge point so as to receive said matches, and means for vibrating the matches while they are being assembled and fed toward said discharge point and also vibrating the match-boxes after they have been filled.

33. In a match-box-filling machine, a substantially trough-shaped member for receiving matches from a source of supply, means for engaging the matches in said member and feeding them through same while maintaining them segregated into groups, and means for causing a line of boxes to travel in the direction in which the matches are fed over said trough-shaped member and to pass adjacent the end of said member for receiving the matches which are discharged from said member.

34. In a match-box-filling machine, a substantially trough-shaped member for receiving matches from a source of supply, means for engaging the matches in said member and feeding them through same while maintaining them segregated into groups, means for causing a line of boxes to travel under the end of said trough-shaped member and in the direction in which the matches are fed over same for receiving the matches which are discharged from said member, and means for enabling the speed at which said boxes travel to be varied.

35. In a match-box-filling machine, a comparatively long and narrow guideway through which match-boxes are fed, a partition arranged in part of said guideway for covering or protecting the match-boxes, said partition being adapted to receive matches from a source of supply, and means for engaging and feeding the matches longitudinally of said partition and segregating them into groups so as to discharge the matches into said boxes.

36. In a match-box-filling machine, a comparatively long and narrow guideway

through which match-boxes are fed, a partition arranged in part of said guideway for covering or protecting the match-boxes, said partition being adapted to receive matches from a source of supply, means for engaging and feeding the matches longitudinally of said partition and assembling them together so as to discharge the matches in an ordinary manner into said boxes, and means for agitating said partition.

37. In a match-box-filling machine, a comparatively long and narrow guideway through which match-boxes are fed, a partition arranged in part of said guideway for covering or protecting the match-boxes which travel through same, said partition being adapted to receive matches from a source of supply, means for engaging the matches on said partition and feeding them longitudinally thereof so as to discharge them into said boxes, and a vertically adjustable supporting surface in said guideway on which the boxes rest.

38. In a match-box-filling machine, a match-receiving trough for receiving a mass of loose matches from a source of supply, a feeding member traveling longitudinally through said trough and provided with devices that engage the matches in said trough and feed them toward one end of said trough while maintaining them in segregated groups, and means for moving match-boxes into position for receiving the matches which are discharged from said trough.

39. In a match-box-filling machine, a comparatively long and narrow box guideway provided with a vertically adjustable supporting surface on which the boxes rest, means for feeding boxes through said guideway, and means for segregating a mass of loose matches into groups and delivering matches to said boxes.

40. A match-box-filling apparatus, comprising a vertically movable match-carrier, an approximately horizontally disposed trough-shaped member arranged to receive matches from said carrier and provided with a longitudinally extending partition on which the matches fall in a loose mass from said carrier, means for feeding boxes through said trough-shaped member under the partition therein and past one end of said partition, and means for feeding the matches longitudinally of said partition so as to discharge them into said boxes.

BERNARD GEORGE VAUGHAN.

Witnesses:

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