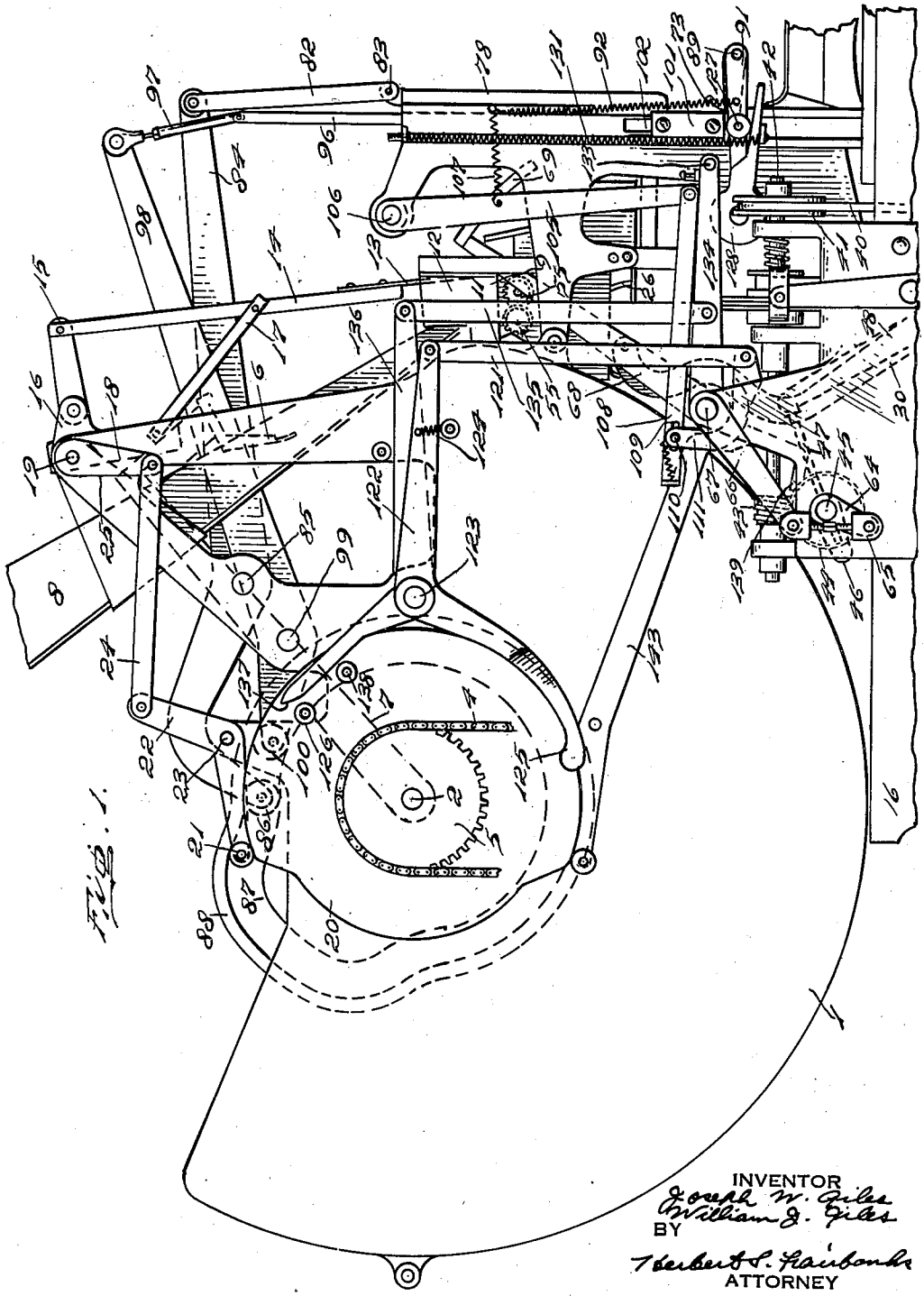
May 27, 1941. J. W. GILES ET AL 2,243,699

APPARATUS FOR MAKING A BUNCH

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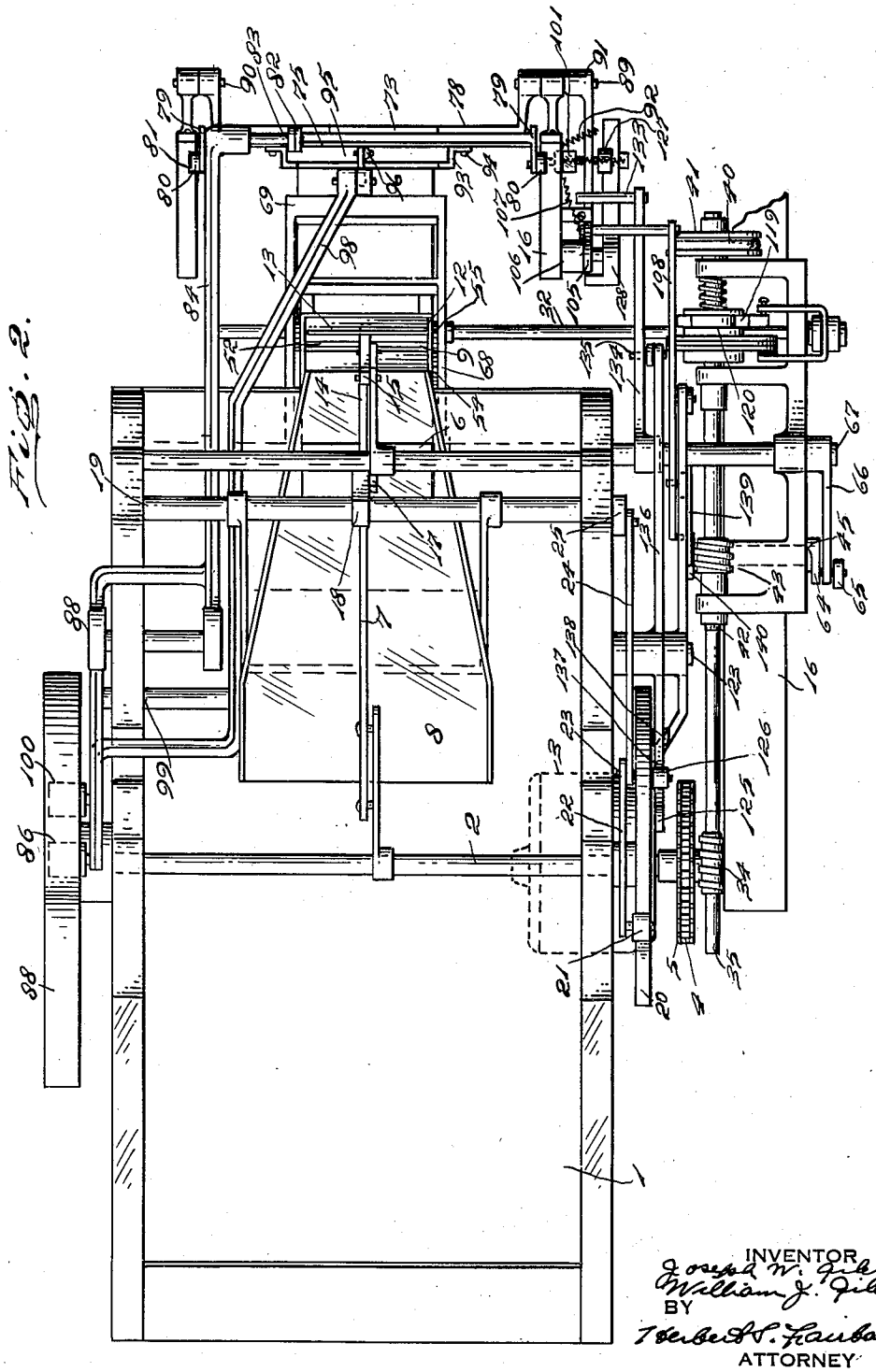
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APPARATUS FOR MAKING A BUNCH

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Fig. 2.



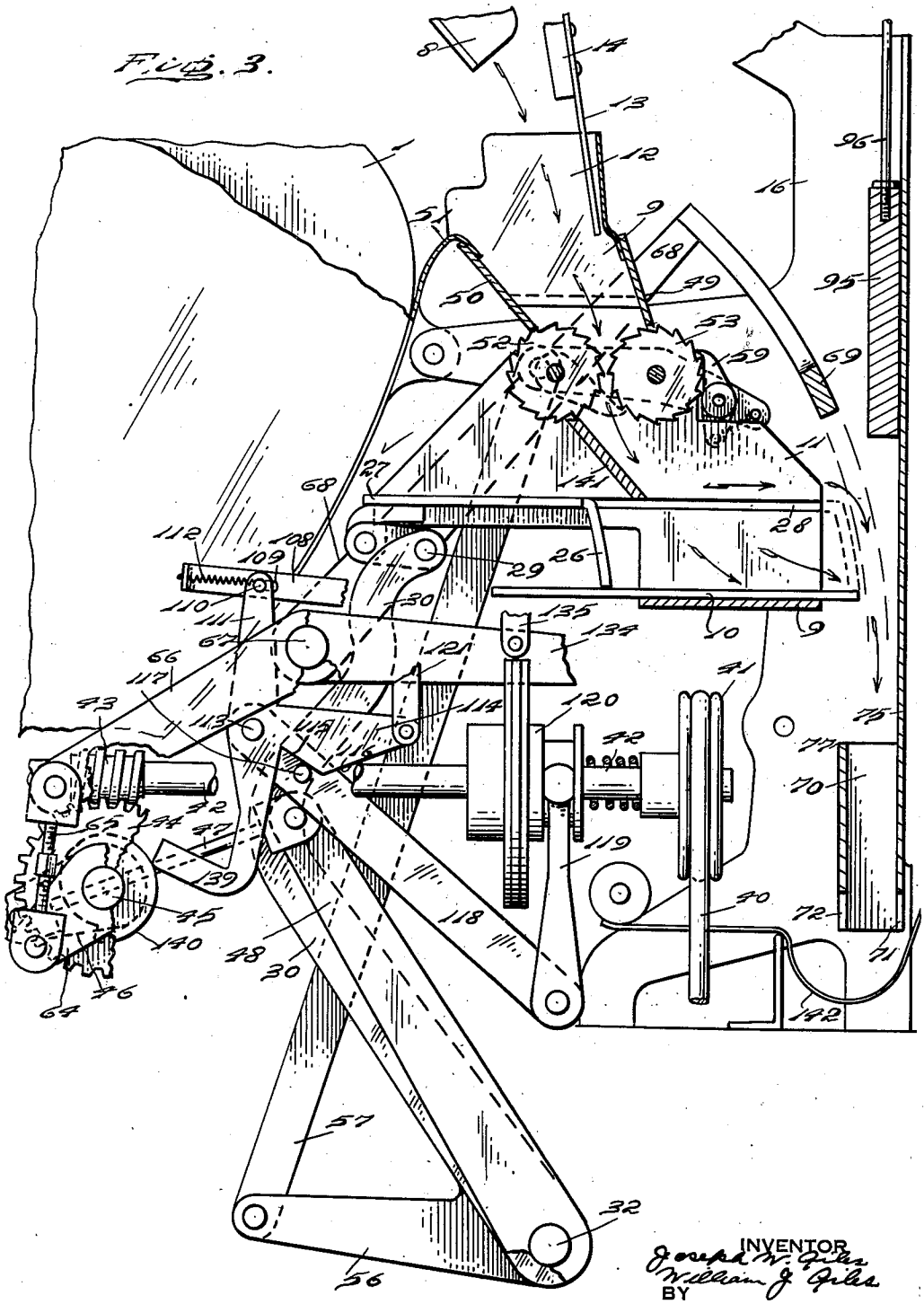
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Fig. 3.



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FIG. 4.

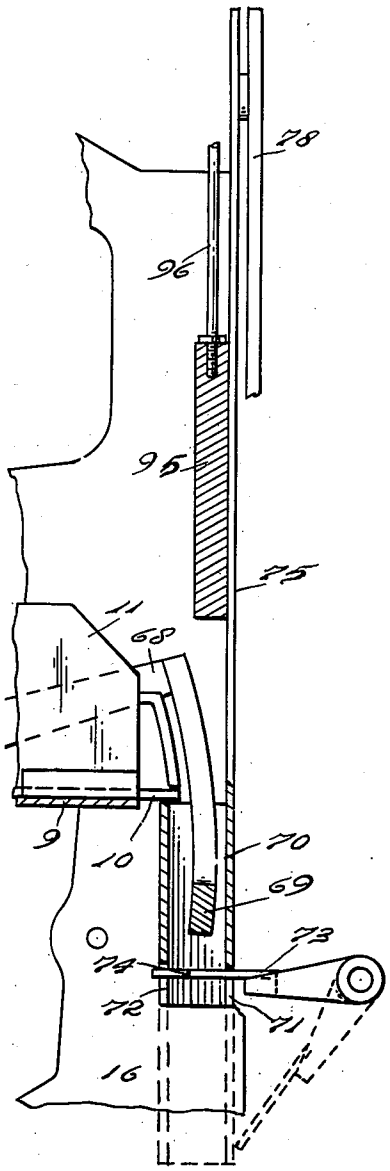


FIG. 5.

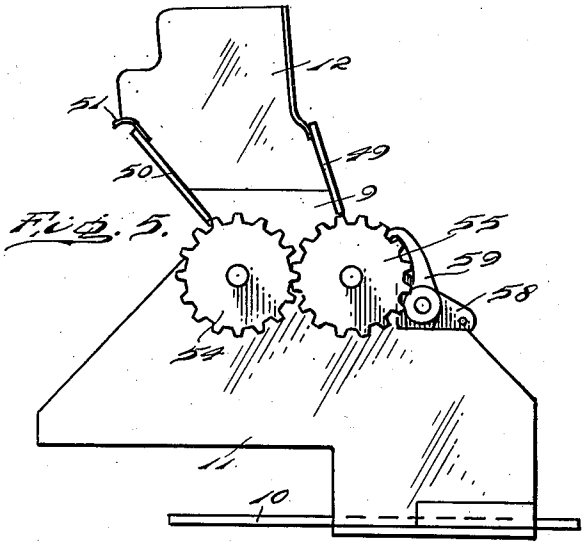


FIG. 6.

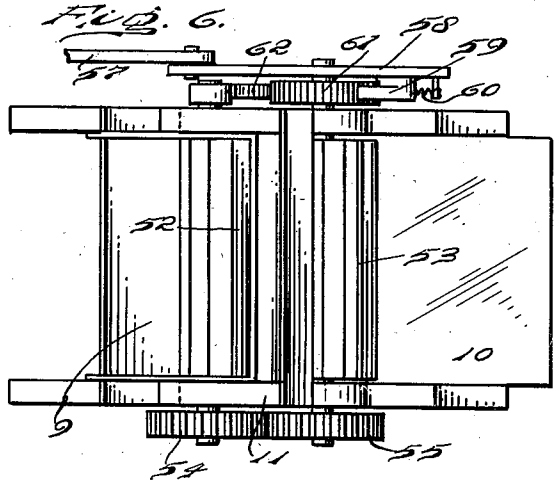
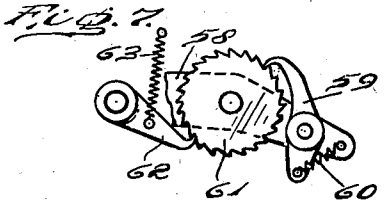


FIG. 7.



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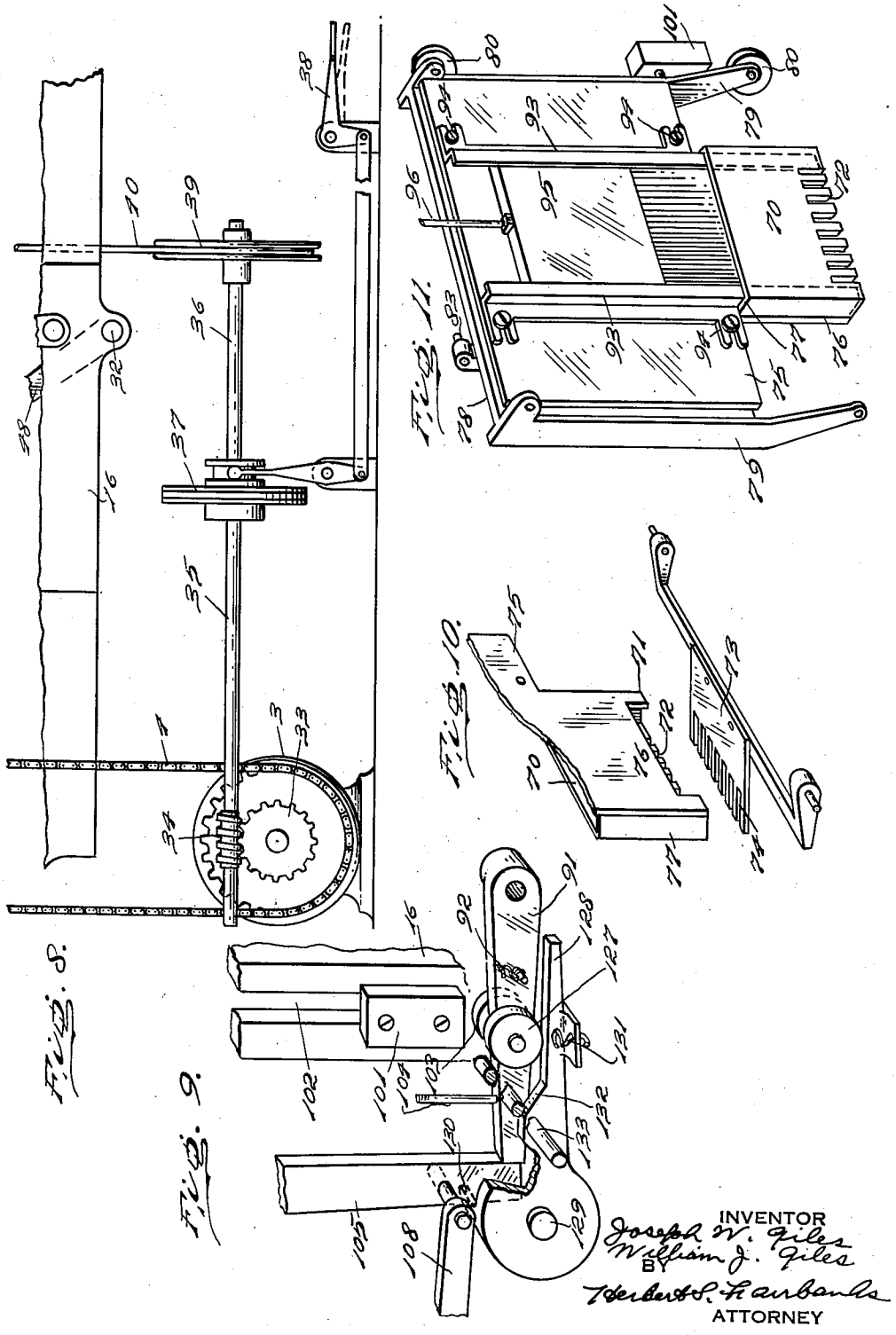


Fig. 8.

Fig. 9.

Fig. 10.

Fig. 11.

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APPARATUS FOR MAKING A BUNCH

Joseph W. Giles and William J. Giles, Philadelphia, Pa., assignors, by mesne assignments, to Jersey Cigar Machines, Inc., Belleville, N. J., a corporation of New Jersey

Application September 13, 1938, Serial No. 229,658

12 Claims. (Cl. 131—21)

The object of this invention is to devise apparatus for making a bunch charge which will mechanically produce a bunch charge having greatly improved characteristics.

When a bunch charge is formed by hand in the making of the best grades of cigars, the operator attempts to lay the tobacco straight along the longitudinal axis of the mass and builds it up in this manner in layers until the proper size of bunch charge is attained.

Our present invention enables one to obtain a greater degree of accuracy and excellence than it is possible to do by hand, since the uncertainty of the human element is eliminated.

In carrying out this invention, a loose batch of tobacco of greater quantity than required for a bunch is removed from the hopper, as in our prior Patent No. 2,118,505, May 24, 1938, and falls down a chute, separating and loosening the tobacco and discharging it into a charge receiver, having grooved feed rollers. Any excess tobacco is removed from the mass in such a manner as to still further loosen and separate the parts of the bunch.

The feed rollers have only a short feed so that a small amount of tobacco at a time is pulled down from the charge in the charge receiver. The charge is now subjected to straightening operations and this can be accomplished due to the small amounts of tobacco being fed at a time from the charge receiver.

When the pusher is returning, the tobacco is falling on the top plate of the pusher. This has a tendency to straighten the tobacco and move it against a baffle plate above the pusher and acts to straighten the tobacco.

As the pusher moves forwardly, any pieces of tobacco positioned diagonally will be straightened by the pusher pressing against a corner or end of a strip of tobacco. As the pusher moves forwardly, the tobacco is moved against a discharge plunger slide giving the tobacco a further tendency to straighten out. The tobacco is now in a sizing box leading to the bunching apron, and is pushed down into such box by a sizing plunger which has a further tendency to straighten the tobacco.

The charge is supported in the sizing box on a sizing member resiliently held in position, so that, as soon as the proper amount of the charge is on the sizing member, the latter will trip, arresting the feed of any more tobacco. The sizing box and plunger slide moves downwardly and the charge is discharged into the rolling apron which applies the binder in any conventional manner.

In so far as we are aware, we are the first in the art to make a bunch charge in this manner with the tobacco in a loose, spongy form, with the portions of tobacco extending longitudinally along the longitudinal axis with an absence of twisted and compacted pieces of tobacco, so that the cigar when finished will have an easy draft and be free smoking from the tip to the butt.

We eliminate the necessity of using the conventional cut-off knife, which at times, particularly when the knives are dull, passes through the tobacco, and drags the stems or veins without cutting them from the mass of tobacco and disarranges the entire bunch.

With the above and other objects in view as will hereinafter clearly appear, our invention comprehends a novel apparatus for making a cigar bunch.

It further comprehends novel means for intermittently and positively feeding small portions of tobacco to build up a bunch of small overlapping layers; novel means to effect the straightening of the particles of tobacco to cause them to extend in a loose condition along the longitudinal axis of the bunch without being twisted or compacted; novel pusher means; novel plunger means and a novel construction and arrangement of two timed crank mechanisms which control all of the feeding and sizing mechanism.

It further comprehends novel feeding means in the form of grooved rollers having means to intermittently actuate them.

Other novel features of construction and advantage will hereinafter be clearly set forth in the detailed description and the appended claims.

For the purpose of illustrating the invention, we have shown in the accompanying drawings a preferred embodiment of it, which, in practice, will give satisfactory and reliable results. It is, however, to be understood that this embodiment is typical only and the various instrumentalities of which my invention consists can be variously arranged and organized, and the invention is not limited to the exact arrangement and organization of these instrumentalities as herein set forth.

Figure 1 is a side elevation of a machine for making bunches and by the use of which our novel method may be carried out in practice.

Figure 2 is a top plan view of the machine.

Figure 3 a side elevation, on an enlarged scale, and partly in section, of the crank motion and its co-acting members.

Figure 4 is a fragmentary section of the sizing mechanism.

Figure 5 is a side elevation partly in section, of the sizing box and certain of its adjuncts.

Figure 6 is a top plan view of Figure 5.

Figure 7 is a detailed view of driving means for the feed rolls.

Figure 8 is a side elevation of driving mechanism employed.

Figure 9 is a perspective detail showing more particularly clutch controlling means.

Figure 10 is a detail of the sizing box and tension bar.

Figure 11 is a perspective view, viewed from the rear of the sizing box and certain of its adjuncts.

Similar numerals indicate corresponding parts.

Referring to the drawings:

In our prior patent for Tobacco feeding apparatus, No. 2,118,505, we have described and broadly claimed a novel construction for removing a mass of tobacco from a hopper and delivering it to a chute, and since this same feed is employed in our present invention, we have illustrated and described such construction in only sufficient detail for the understanding of those skilled in this art.

The tobacco container 1 of the machine has a shaft 2 journalled in it and driven in any desired manner, for example, by a motor 3, driving a sprocket chain 4, passing around a sprocket wheel 5, on the shaft 2. The container is open at the top to receive the tobacco which is removed from the container by a scoop 6 on an arm 7 fixed to the shaft 2. The tobacco is discharged from the scoop, as the shaft 2 revolves, into a chute 8.

The foregoing construction is the same as that of our prior patent aforesaid.

The tobacco receiver

The chute discharges the tobacco to a tobacco receiver 9, see more particularly Figure 3. The bottom of the receiver 9 has a plate 10 and sides 11 are secured to the receiver which has an upwardly extending side plate 12 which forms a throat leading to the chamber of the receiver. The upper end of the receiver and its rear end are open.

A leveling member 13 is disposed between the side plates 12 and is in the form of a plate having its lower marginal portion preferably irregular or serrated. The member 13 is for moving excess tobacco back into the hopper and is fixed to a lever 14, fulcrumed at 15 to a portion of the frame 16. A link 17 is pivoted at one end to the lever 14 and at its opposite end to a rock arm 18 fixed to a rock shaft 19 journalled in the machine frame 16, see Figs. 1 and 2.

The shaft 19 is rocked by a cam 20 fixed to the shaft 2, it being seen that such cam, see Fig. 1, cooperates with a roller 21 on a lever 22 fulcrumed at 23 and connected by a link 24 with an arm 25 fixed to the rock shaft 19.

Tobacco aligning mechanism

The tobacco is moved from the tobacco receiver 9 by a pusher 26 in the form of a flat plate deflected downwardly at its forward end. The pusher 26 has lugs 27 extending into slots 28 in the sides of the tobacco receiver. The pusher 26 has a rod 29 on which links 30 are loosely mounted, said links being fixed to a rock shaft 32 journalled in the frame and controlled by a novel crank mechanism which will now be described.

The motor 3, see more particularly Figure 8, has a worm gear 33 which meshes with a worm 34 on a shaft 35 connected with a shaft 36 by a clutch 37. The clutch is controlled in a conventional manner by a foot treadle 38 operatively connected with the clutch to actuate it.

The shaft 36 has a pulley 39 fixed to it and around such pulley passes a belt 40 which also passes around a pulley 41 on a shaft 42 journalled in the machine frame 16, see Figures 1 and 2. The shaft 42 has a worm 43 which meshes with a gear 44 on a crank shaft 45 journalled in the machine frame. The crank shaft 45 is driven at a higher speed than the drive of the shaft 2. The shaft 45 has a crank arm 46 connected by a longitudinally adjustable link 47 with one end of an arm 48, the other end of the arm 48 being fixed to the rock shaft 32 to rock it and thereby reciprocate the pusher 26, see more particularly Figure 3.

The U shaped plate 12 cooperates with a front plate 49 and a rear plate 50 to form a tobacco receiver, and the juxtaposed wall of the tobacco container or hopper 1 is deflected as at 51 to overhang the plate 50. The bottom of the tobacco receiver is closed by serrated feed rolls 52 and 53, see Figure 3, suitably journalled in the side plates 11 of the tobacco receiver 9, see Figure 6. The shafts of the feed rolls 52 and 53 are intergeared by the gears 54 and 55, see Figure 6. The feed rolls 52 and 53 are intermittently driven from the crank shaft 45. The shaft 32, see Figure 3, has a rock arm 56 fixed to it, and to the free end of the rock arm 56 is pivoted one end of a link 57 pivoted at its opposite end to a lever 58 fulcrumed on the shaft of the feed roll 53, see Figures 6 and 7. A driving pawl 59 pivoted on the lever 58 has a spring 60 which tends to move the hooked end of the pawl towards a ratchet 61 fixed to the shaft of the feed roll 53, see Figures 6 and 7. 62 is a stop pawl having a spring 63 tending to move it towards the ratchet 60. It will thus be clear that the feed rolls at the bottom of the tobacco receiver are intermittently actuated by the crank 45.

The crank shaft 45 has a crank arm 64, see Figure 3, which is connected by a longitudinally adjustable connection 65 with a link 66 fixed to a rock shaft 67 to which is fixed an arm 68 having at its forward end a depending sizing plunger 69, which sizes the tobacco delivered by the pusher 26 to a reciprocatory sizing box 70 since it presses on the tobacco in the box and when the charge is sufficient it presses the tobacco against a sizing plate hereinafter described.

The tobacco sizing mechanism

The sizing box 70 has rectangular side walls, is open at the top and bottom and has the front wall at its lower end cut away as at 71 and the rear wall at its lower end slotted as at 72, in order to receive a rockable tension bar or plate 73 which at its free end is slotted as at 74, so that the bottom of the sizing box will be closed during the sizing operation, see Figure 4. The front wall of the sizing box is formed by a rectangular plate 75, see Figure 11, which has a depending extension 76 forming the front of the sizing box, see Figure 11. The rear wall of the sizing box is formed by a U shaped plate 77 which has the slots 72. The plate 75 is secured to a casting 78 having side flanges 79 which carry rollers 80, see Figure 11, which travel in guide slots 81 in the main frame, see Figure 2.

The sizing box is reciprocated by means of a

link 82 pivotally connected at its lower end at 83 to the casting 78 and at its upper end to a lever 84, see Figure 1, fulcrumed at 85 and having a roller 86 which rides in a cam groove 87 of a cam 88 fixed to the shaft 2. The tension bar 73 is offset and fixed to a rock shaft 89, at one end, see Figure 2, and at its opposite end is pivotally mounted on a rod 90 carried by the machine frame. The rock shaft 89 has an arm 91 to which is connected one end of a spring 92 the opposite end of which is connected with a fixed portion of the frame, so that the tendency of such spring is to retain the tension bar in its raised position as shown in Figure 4.

Discharging mechanism for the sizing box

The sizing box 70, see Figure 11, has guides 93 secured to its plate 75 by fastening devices 94. These guides receive the ejecting plunger 95 having a rod 96 connected by a longitudinally adjustable link 97 with a lever 98 fulcrumed at 99 and having a roller 100 which rides in the cam groove 87, see Figure 1.

Automatic clutch control

One of the side flanges 79 of the sizing box mechanism has a block 101 secured to it in spaced relationship, see Figure 11, and this block 101 is slidable in a slot 102 in the machine frame, see Figures 9 and 1.

The block 101 travels in the path of a roller 103 on the rock arm 91 fixed to the shaft 89 and its spring 92 connected with it and a fixed point tends to retain such rock arm in its raised position against an adjustable stop 104, see Figures 1 and 9. The rock arm 91 acts as a stop and release for a link 105 pivoted at its upper end at 106 to the machine frame and having a spring 107 tending to move it towards the rock arm 91. The lower end of the link 105 is pivoted to one end of a bar 108 having a slot 109 into which a pin 110, carried by a lever 111, extends. A spring 112 tends to rock the lever 111 on its fulcrum 113, see Fig. 3. The lever 111 has a lateral extension 114 having reversely inclined walls 115 and 116 which cooperate with a pin 117 on a lever 118 having a clutch arm 119 to actuate the clutch 120 on the shaft 42, see Figure 3. The lever 118 and clutch arm 119 have a common pivot, see Fig. 3. The arm 114 is connected by a link 121, see Figures 1 and 3, with a lever 122 fulcrumed at 123 and having a spring 124 tending to retain its cam shaped end 125 in the path of a roller 126 carried by the cam 20.

The rock arm 91, see Figure 9, has a roller 127 which contacts a rock arm 128 pivotally supported at 129 and having a cut out forming a shoulder 130 so that when the arm 91 is rocked downwardly the shoulder 130 will move the lower end of the link 105 above such arm 91. A spring 131 tends to retain the rock arm 128 in raised position as seen in Figure 9. The rock arm 128 has a cam face 132 with which a pin 133 cooperates, see Figure 2. This pin 133 is at the end of a lever 134 fulcrumed at 67 and having a link 135 connected with a lever 136 fulcrumed at 123 and having a cam 137 in the path of travel of a roller 138 on the cam 20.

The lever 111, see Figure 3, has an outwardly deflected end 139 which is in the path of travel of a cam 140 on the crank shaft 45, see Figure 3.

The operation will now be apparent to those skilled in this art, and is as follows:

The tobacco is placed in the tobacco container 1 and the motor 3 is started, thereby revolving the shaft 2 and the arm 7 causing the scoop 6 to remove tobacco from the tobacco container and discharge it into the chute 8 as set forth in my prior patent.

The tobacco discharges from the chute 8 into the tobacco receiver 9. The parts are so timed that the cam 20, see Figure 1, now rocks the lever 22, thereby link 24, arm 25, arm 18, link 17, and thereby lever 14 to move the scraper 13 rearwardly and return excess tobacco to the tobacco retainer 1. The tobacco is now in the tobacco receiver 9 ready to be intermittently fed in small quantities to the aligning mechanism by the feed rolls 52 and 53.

The motor 3 through worm gear 33, see Figure 8, drives worm shaft 35, clutch 37, shaft 36, pulley 39 and belt 40 to drive pulley 41 and shaft 42, see Figures 1, 2 and 8. The shaft 42 is intergeared with crank shaft 45 to drive it, see also Figure 3. Crank arm 46, through adjustable connection 47, see Figure 3, rocks arm 48 to rock shaft 32 and thereby rock arm 56 to raise and lower link 57 and thereby reciprocate lever 58 and by the pawl and ratchet mechanism, see Figures 5, 6 and 7, to intermittently turn feed roll 53 and thereby feed roll 52 intergeared with the feed roll 53. The feed rolls are serrated so that as they revolve they withdraw small quantities of tobacco from the tobacco receiver 9. The tobacco being discharged strikes an inclined baffle 141 which tends to align the particles of tobacco and is received on the top plate of the pusher 26 which at this time is in its forward position. The pusher 26 now moves rearwardly and the particles of tobacco are further aligned by engaging the baffle 141. The tobacco now falls on to the plate 10 and is ready to be moved forwardly by the pusher 26.

The forward movement of the pusher further aligns the particles of tobacco due to the small quantity of tobacco fed at a time and its contact with the pusher, the plate 10, and the wall of the sizing box.

As the shaft 32 rocks, as before explained, the lever 30, see Figure 3, is rocked on its fulcrum, thereby moving a layer of tobacco into the sizing box 70 above the tension bar 73.

A layer of tobacco is fed into the sizing box, the sizing plunger 69 moves downwardly to press each layer downwardly towards the tension plate 73. The size of the bunch charge produced by repeated accumulations of tobacco is determined by the height of the plunger 69 above the tension plate. The height of the plunger 69 can be adjusted by adjusting the link 65. When sufficient tobacco is in the sizing box to complete a bunch charge, plunger 69 presses the bunch charge against the tension plate to size it and to move the tension plate downwardly. The layers of tobacco accumulate until the mass is of such size that the plunger 69 presses the accumulated mass of tobacco against the tension plate to move said plate downwardly.

The crank arm 64 through the adjustable link 65 rocks the link 66, rock shaft 67, arm 68 and the sizing plunger 69. During this sizing operation of the sizing plunger 69, the parts are in the position seen in Figure 4.

The rock arm 91 is fixed to shaft 89 on which one end of the tension plate is mounted so that when the tension plate 73 rocks downwardly, under pressure of the plunger the rock arm 91 rocks downwardly, thereby permitting link 105 to move in due to spring 107 to release the clutch 120. The operation is such that crank 64 causes the return of plunger 69 to raised position be-

fore cam 140 goes into operation to disengage the clutch. The cam 140 is so timed that the plunger 69 is now in its raised position and does not interfere with the movement of the stop plunger 95. When link 105 moves in, it rocks lever 111 through link 108, thereby moving the deflected end 139 into the path of the cam 140, which causes the lever 111 to raise arm 118 to move clutch arm 119 to disengage the clutch.

The sized tobacco is now ready to be discharged into the pocket of the rolling apron 142, seen in Figure 3.

The plunger 95 now descends and the sizing box moves downwardly and the tension member 73 is moved out of the way by the downward movement of the sizing box to permit the bunch charge to be wrapped to drop into the pocket of the rolling apron.

Roller 86 riding in cam groove 87 of cam 88 rocks lever 84 to actuate link 82 to move the sizing box downwardly. Roller 100 in cam groove 87 causes lever 98 to rock to move downwardly link 97, rod 96 and plunger 95.

The rolling apron is actuated by a lever 143 in the manner well known in this art and forms no part of our present invention.

When the rock arm 91 rocks downwardly, due to the plunger 69 pressing the tobacco against the tension plate, the link 105 draws bar 108 forwardly, turning lever 111, see Figure 3, in a direction to bring the end 139 into the path of the cam 140 with the lever resting on the stop pin 117. When lever 111 is turned by the cam 140, arms 118 and 119 are moved to actuate the clutch, the clutch collar of which is spring pressed. The releasing of the clutch stops the crank shaft 45 which is out of operation during the period in which plunger 95 is moving the bunch into the pocket of the rolling apron. When the sizing box 7 is in its downward position the block 101 holds the rock arm 91 in its downward position, thereby holding the tension plate out of the path of the plunger 95.

As the shaft 2 revolves and thereby the cam 20, the roller 126 rocks lever 122, raising link 121, see Figures 1 and 3, thereby rocking lever 111 to draw bar 108 rearwardly, drawing 139 out of the path of cam 140, permitting spring 42 to cause reengagement of the clutch, and link 105 assumes the position seen in Figure 9.

As cam 20 revolves, roller 138 rocks lever 136 to move downwardly link 135 to rock downwardly lever 134 causing pin 133, see Figure 2, to rock arm 91 downwardly and also rock arm 128 so that link 105 is moved inwardly to retain rock arm 91 in its downward position the amount of tobacco in the sizing box being sized before the machine makes a complete revolution. Near the end of such revolution as the cam 20 revolves arm 91 is returned to its starting position. Block 101 moves upwardly allowing arm 91 to assume its raised position due to the action of spring 92.

This acts as a safety device, so that the feeding and sizing operation are interrupted during the discharge of a completed bunch from the sizing box.

Having thus described our invention, what we claim is new and desire to secure by Letters Patent is:

1. In a bunch charge forming apparatus, a receiver, means to feed tobacco thereto, serrated feed rollers at the bottom of said receiver, means to intermittently drive said feed rollers to feed small quantities of tobacco in layers one above the other to build up a mass to form the bunch charge, and means to align the pieces of tobacco along the longitudinal axis of the mass as it is built up into bunch charge formation.

2. In a bunch forming apparatus, a receiver, means to feed tobacco thereto, serrated feed rollers at the bottom of said receiver, a tobacco support on which the tobacco is fed by said rollers, a pusher movable along said support, a reciprocating sizing box to which the tobacco is fed by said pusher, a plunger movable in said sizing box to size the tobacco therein, and actuating means for said rollers, pusher, and plunger.

3. In a bunch forming apparatus, a hopper, a chute, a scoop to transfer tobacco from said hopper to said chute, a tobacco receiver into which said chute discharges, means to remove excess tobacco from said chute, serrated feed rollers at the bottom of said receiver, a tobacco support on which tobacco is intermittently fed, a pusher movable along said support, a reciprocatory sizing box receiving tobacco from the pusher, a plunger to size said tobacco in the sizing box, and means to actuate said scoop, intermittently drive said feed rollers, and to actuate said pusher, sizing box and plunger.

4. In a bunch forming apparatus, a hopper, a chute, a scoop to transfer tobacco from said hopper to said chute, a tobacco receiver into which said chute discharges, means to remove excess tobacco from said chute, serrated feed rollers at the bottom of said receiver, a tobacco support on which tobacco is intermittently fed, a pusher movable along said support, a reciprocatory sizing box receiving tobacco from the pusher, a tension bar beneath said sizing box, a plunger to size said tobacco in the sizing box, and means to actuate said scoop, intermittently drive said feed rollers, and to actuate said pusher, sizing box, tension bar and plunger.

5. In a bunch forming apparatus, a receiver, means to feed tobacco thereto, serrated feed rollers at the bottom of said receiver, a pusher having a top plate on which the tobacco is fed by said feed rollers during the rearward movement of the pusher, a baffle tending to straighten the tobacco as the pusher moves rearwardly, a sizing box receiving tobacco from said pusher, a plunger to size tobacco in the sizing box, and actuating means for said rollers, pusher, and plunger.

6. In a bunch charge forming apparatus, a sizing box, means to feed tobacco in thin layers to the sizing box to build up a mass conforming to the size of the bunch charge to be made, a tension member at the bottom of said box, a sizing member to size the mass in said sizing box, actuating means for the sizing member, and means controlled by said tension member to stop the feeding means and the actuating means for the sizing member when a bunch charge has been sized.

7. In a bunch forming apparatus, a tobacco receiver open at its bottom, serrated feed rolls at the bottom of said receiver, means to feed tobacco into said receiver, means to remove excess tobacco from the receiver to form a measured charge, a sizing box to which quantities of the charge are intermittently fed, means including a reciprocatory sizing plunger pressing against each small quantity of tobacco fed to the sizing box to size the tobacco in said sizing box, and means to discharge the sized tobacco from the sizing box.

8. In a bunch forming apparatus, a reciprocatory sizing box, means to intermittently feed

aligned tobacco in small quantities into said box to build up a mass of a desired size, means including a reciprocatory sizing plunger pressing against each small quantity of tobacco in the box prior to the feed of another small quantity of tobacco into the box to size the tobacco in said sizing box, and means to actuate said box.

9. In a bunch forming apparatus, a reciprocatory sizing box, means to build up in said box aligned quantities of tobacco in layers, one above the other, a reciprocatory sizing plunger pressing against each quantity of tobacco prior to the addition of the next small quantity to size tobacco in said sizing box, an ejecting plunger for said sizing box and actuating means for said box and plungers.

10. In a bunch forming machine, a sizing box, means to intermittently feed tobacco in small quantities thereto, means including a reciprocatory plunger to size each quantity of tobacco received in the sizing box, means to automatically discharge the tobacco when a quantity for a complete bunch charge has been sized, and a sizing plate and trip lever to automatically stop the feeding and sizing means during the discharge of a completed bunch charge.

11. In a bunch charge forming apparatus, a sizing box, means to intermittently feed tobacco in small quantities less than a bunch charge to the sizing box, a sizing plunger, and means to actuate said sizing plunger to size each small quantity of tobacco after it has been fed to the sizing box and prior to the feed of the next small quantity.

12. In a bunch charge forming apparatus, a sizing box having an outlet, means to intermittently feed tobacco in small quantities less than a bunch charge to said sizing box to accumulate therein in superimposed layers until a complete bunch charge has been built up, means including a sizing plunger to press each layer, as it is fed, towards said outlet and prior to the feed of the next layer, and means to eject a complete bunch charge from said sizing box.

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