J. A. STOCK.

BOX ASSEMBLING MACHINE.

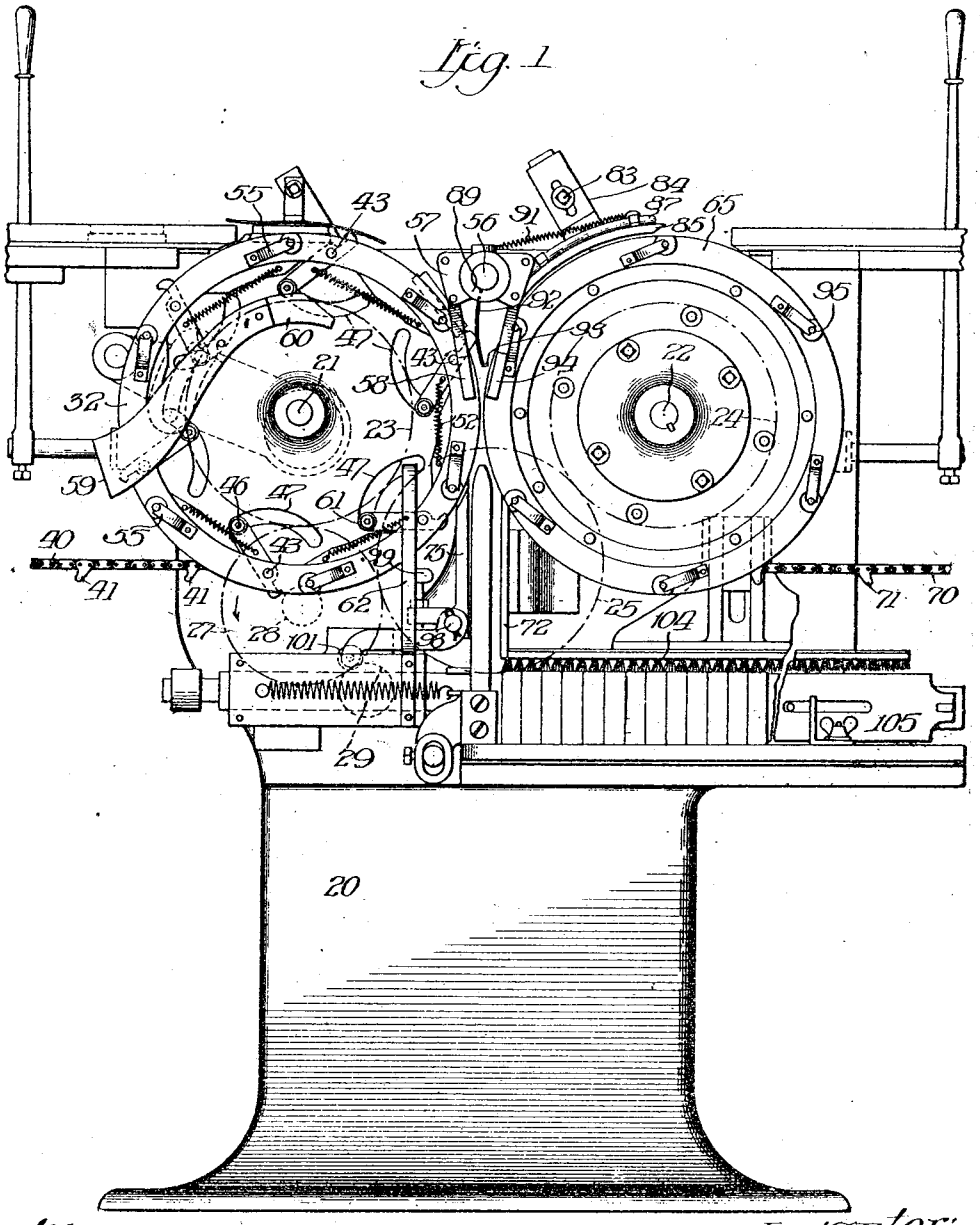
APPLICATION FILED JULY 2, 1914.

1,141,502.

Patented June 1, 1915.

7 SHEETS—SHEET 1.

Fig. 1



Witnesses:

F. C. Davison

Eugene L. Diedrich

Inventor:

Julius A. Stock

By Walter M. Fuller

Atty.

J. A. STOCK.

BOX ASSEMBLING MACHINE.

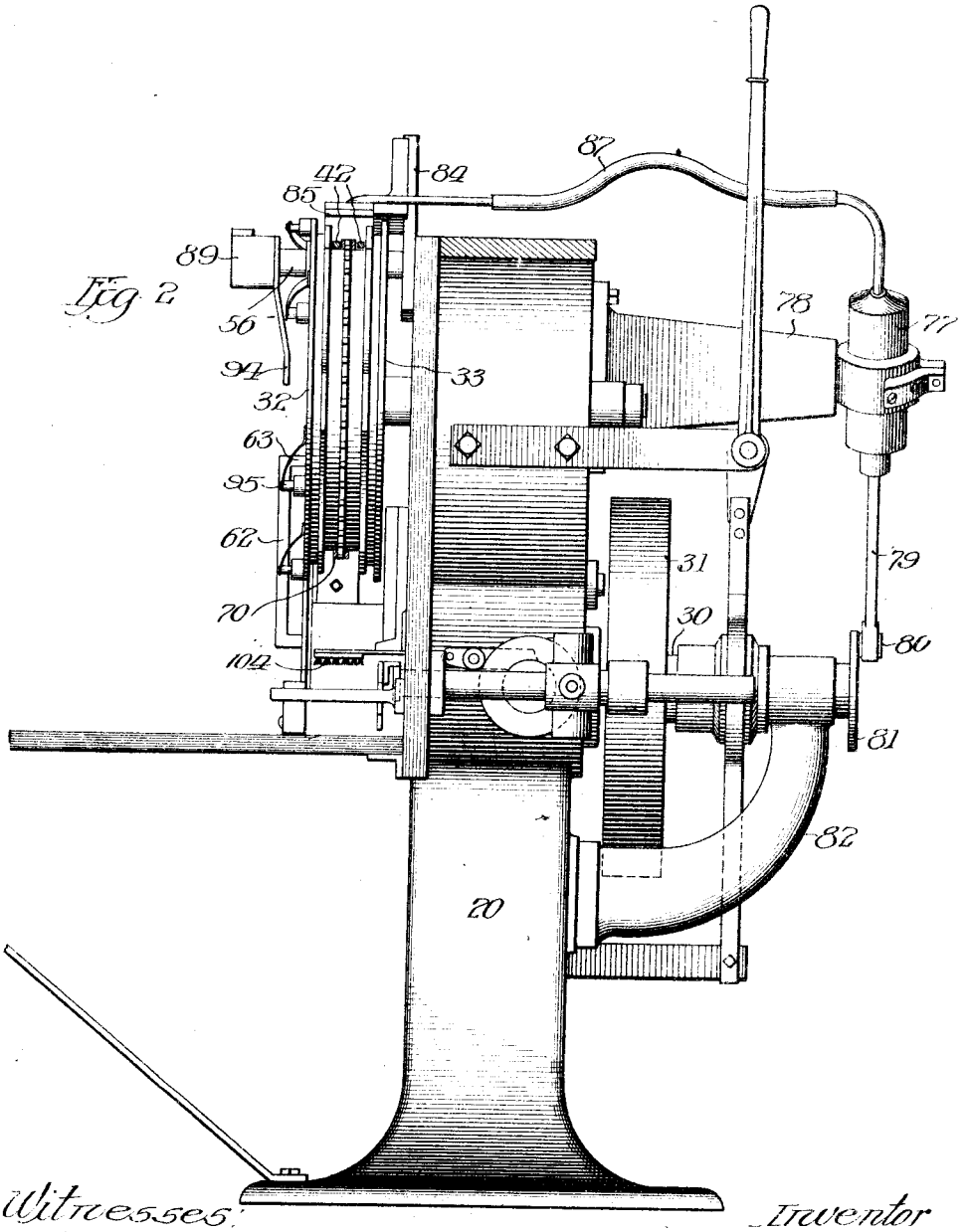
APPLICATION FILED JULY 2, 1914.

1,141,502.

Patented June 1, 1915.

7 SHEETS—SHEET 2.

Fig 2



Witnesses:

Geo. C. Larson

Eugene L. Hildenbrand

Inventor

Julius A. Stock

By Walter M. Fuller

Atty.

J. A. STOCK.

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7 SHEETS—SHEET 3.

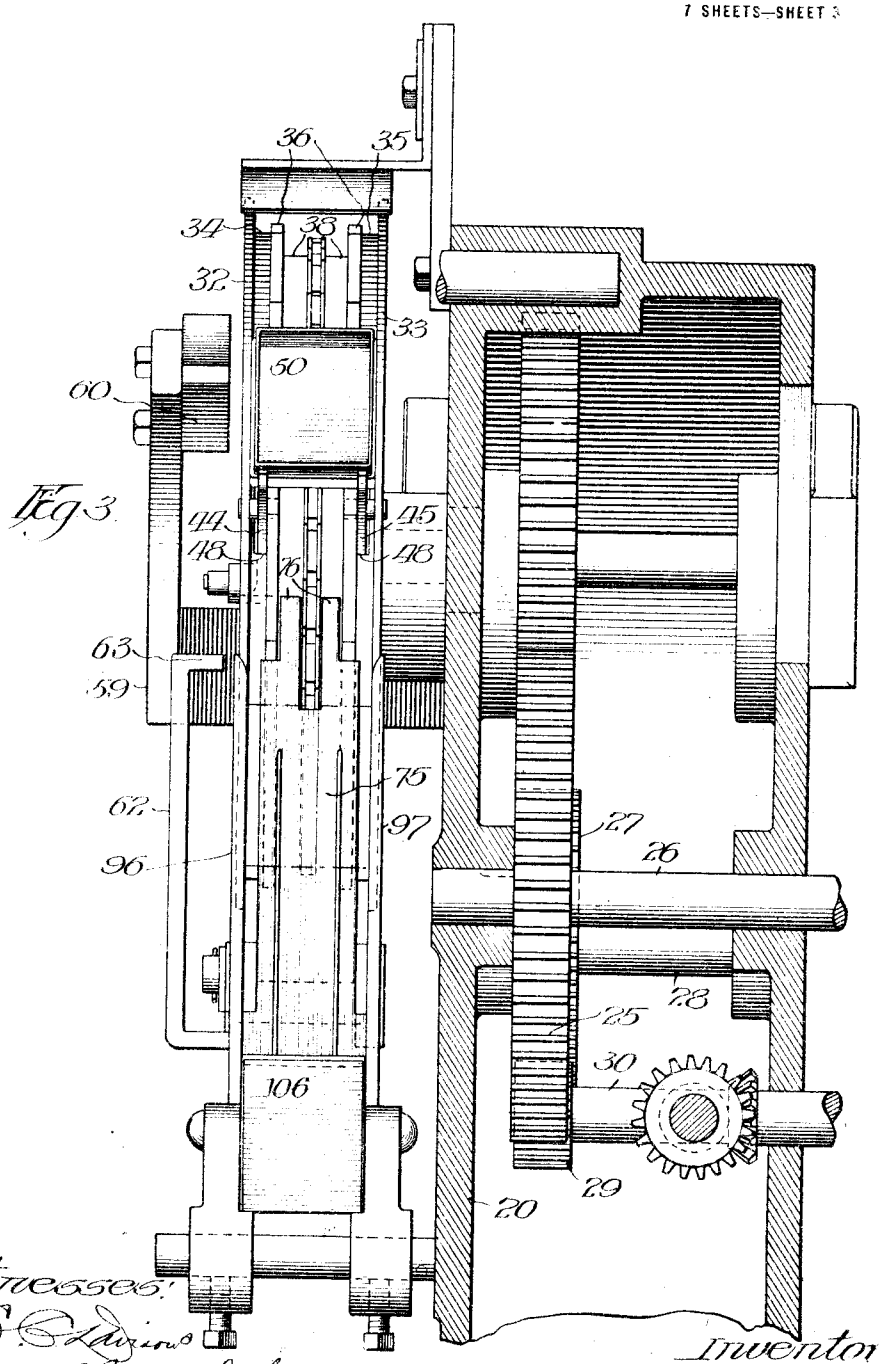


Fig 3.

Witnesses:
Ed. C. Davison
Eugene L. Niederhofer.

Inventor
Julius A. Stock
By Walter M. Fuller
Atty.

J. A. STOCK.

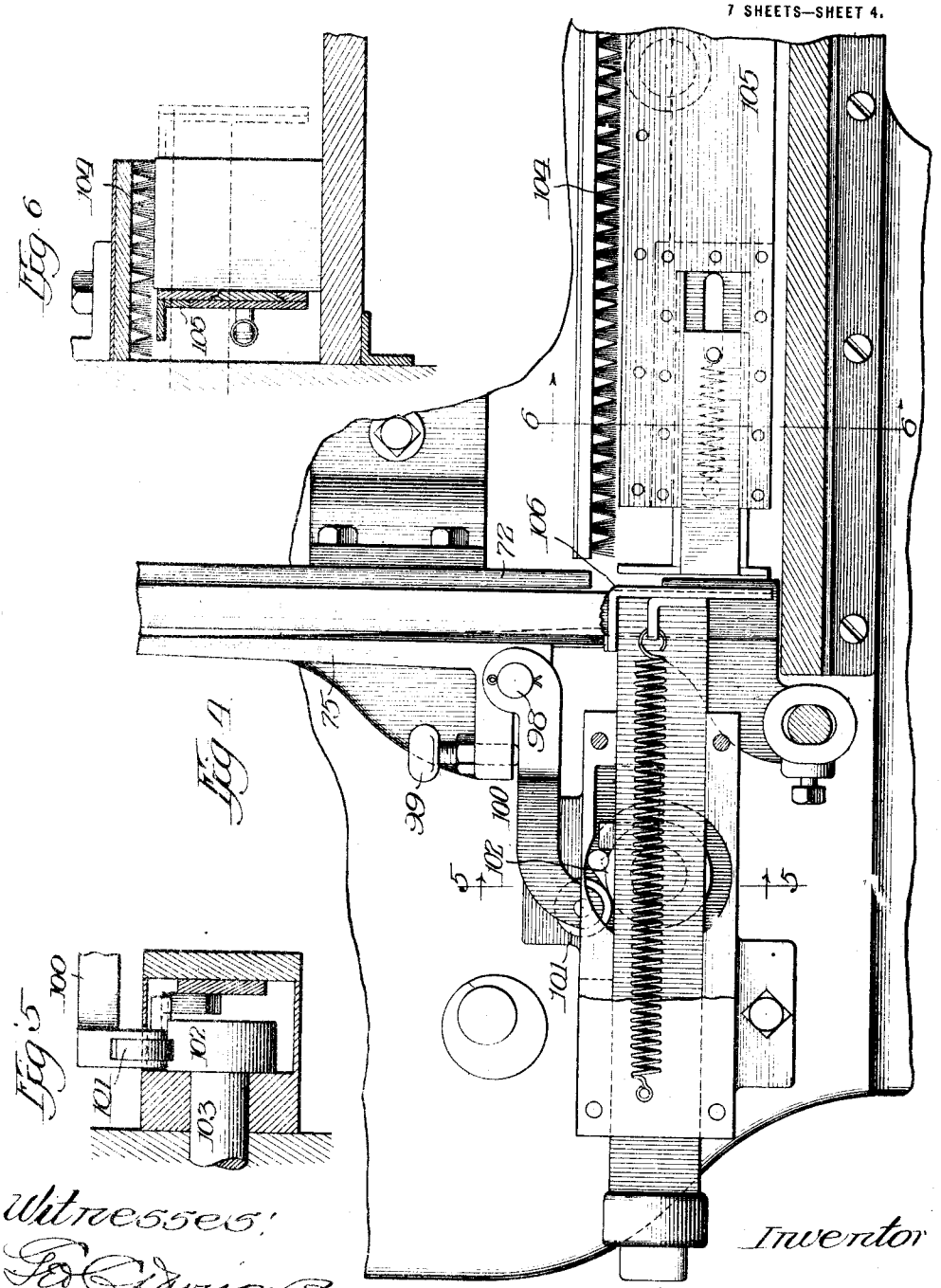
BOX ASSEMBLING MACHINE.

APPLICATION FILED JULY 2, 1914.

1,141,502.

Patented June 1, 1915.

7 SHEETS—SHEET 4.



Witnesses:

Ed. C. Davies

Eugene L. Heidenhofer

Inventor

Julius A. Stock

By Walter M. Fuller Atty.

J. A. STOCK.

BOX ASSEMBLING MACHINE.

APPLICATION FILED JULY 2, 1914.

1,141,502.

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7 SHEETS—SHEET 5.

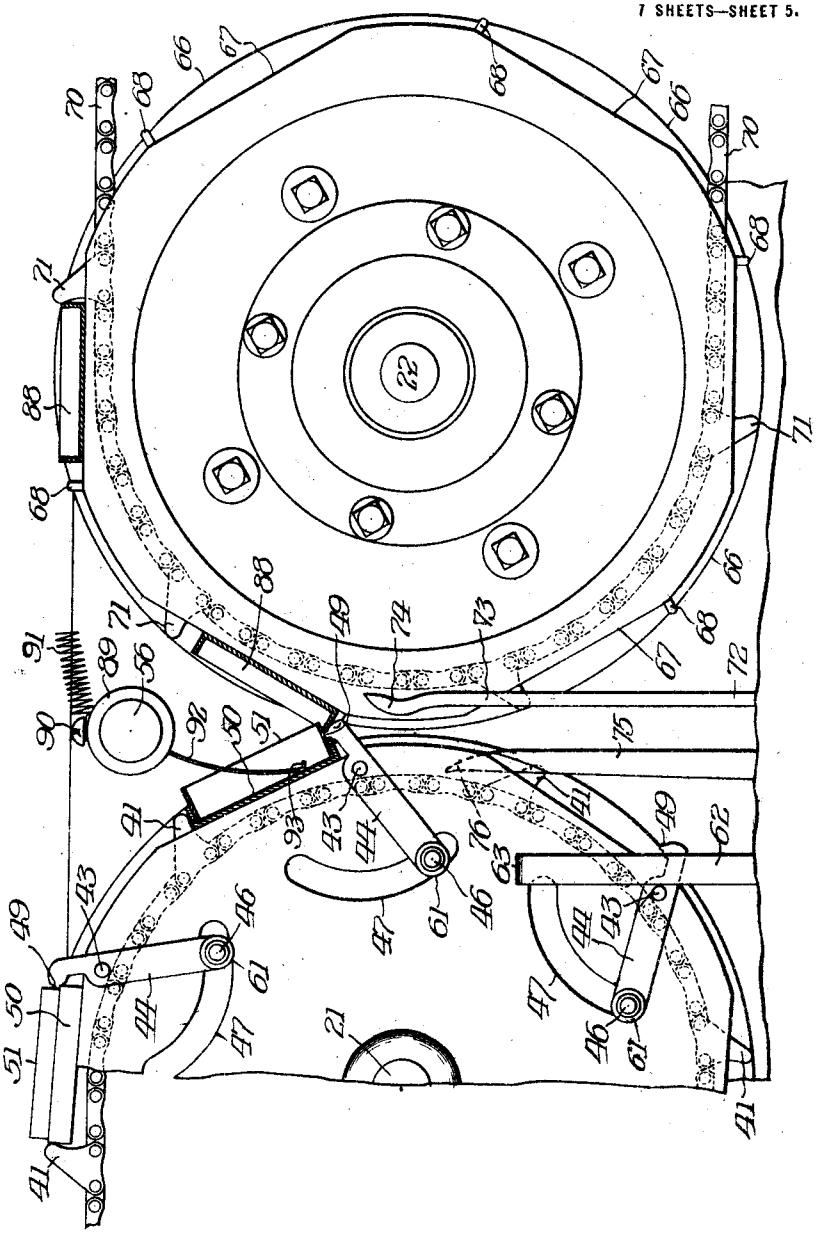


Fig. 7

Witnesses.

Geo. T. Larson

Eugene L. Wiedenhoefer.

Inventor:

Julius A. Stock

By Walter M. Fuller

Atty.

J. A. STOCK.

BOX ASSEMBLING MACHINE.

APPLICATION FILED JULY 2, 1914.

1,141,502.

Patented June 1, 1915.

7 SHEETS—SHEET 6.

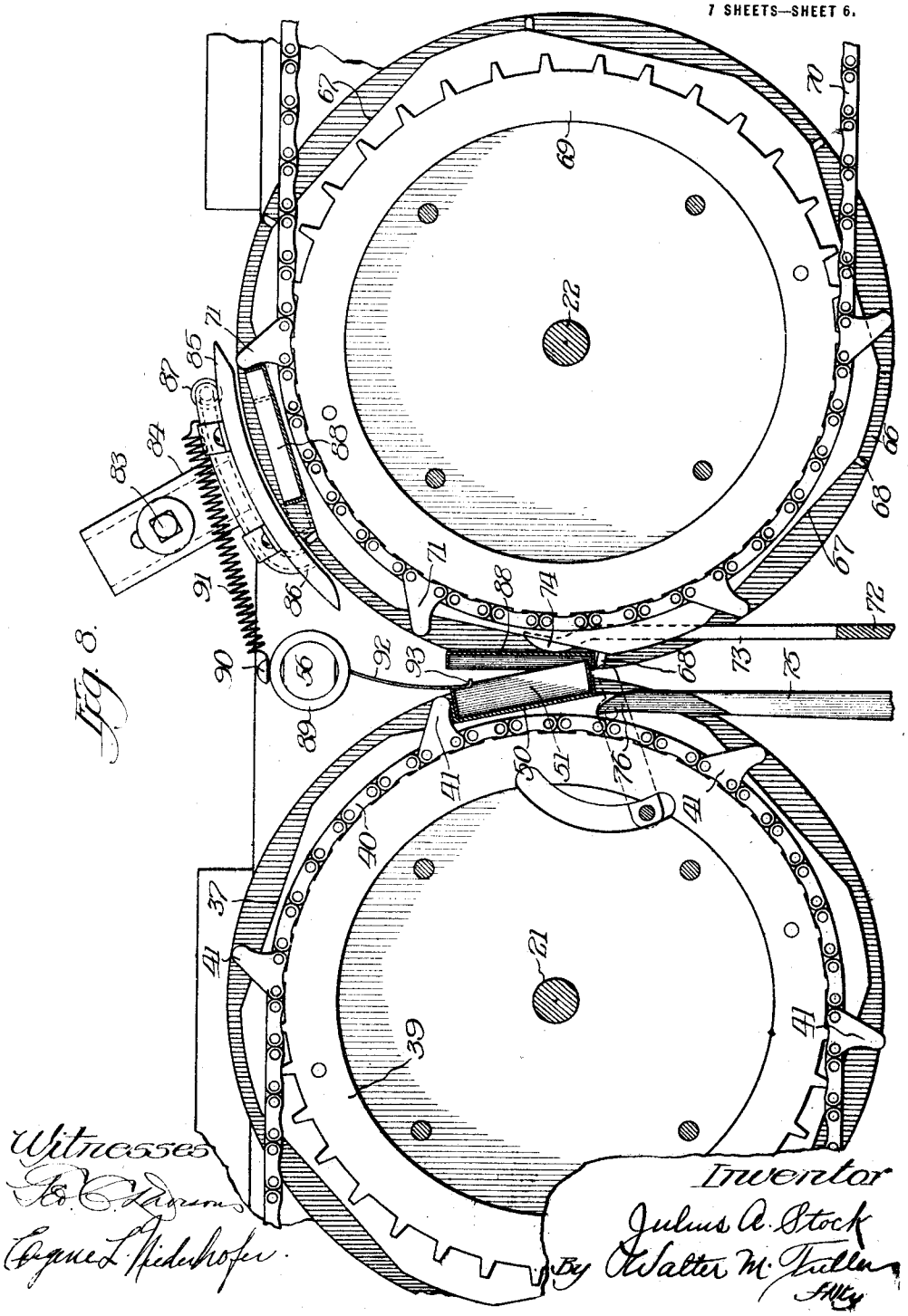


Fig. 8.

Witnesses
Geo. C. Higgins
Eugene L. Niederhofer.

Inventor
Julius A. Stock
By Walter M. Fuller
Atty

J. A. STOCK.

BOX ASSEMBLING MACHINE.

APPLICATION FILED JULY 2, 1914.

1,141,502.

Patented June 1, 1915.

7 SHEETS—SHEET 7.

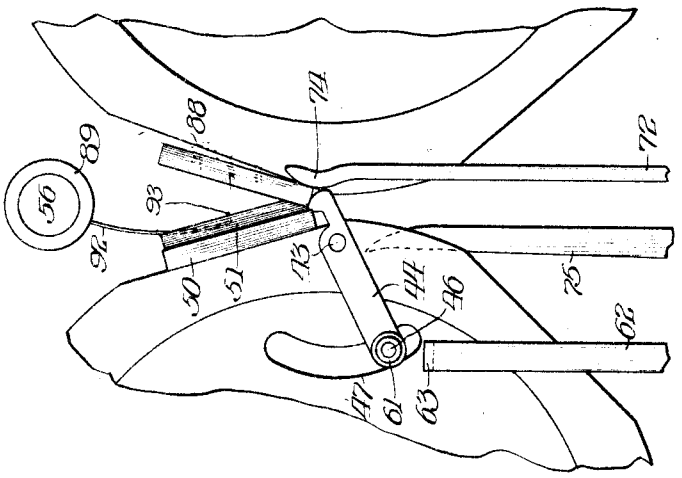


Fig. 9

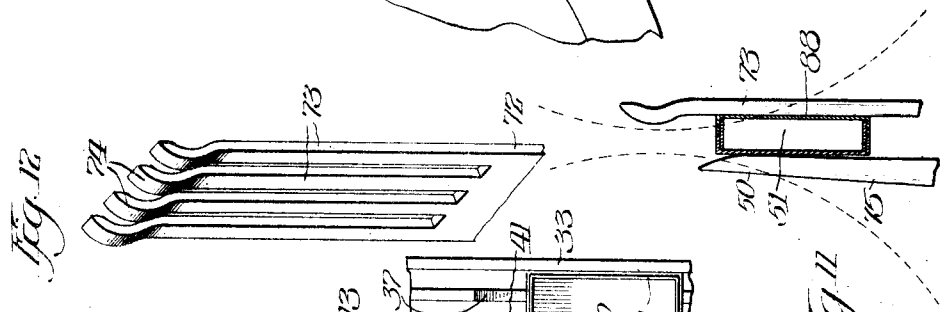


Fig. 12

Fig. 11

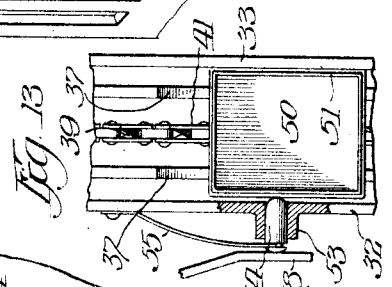


Fig. 13

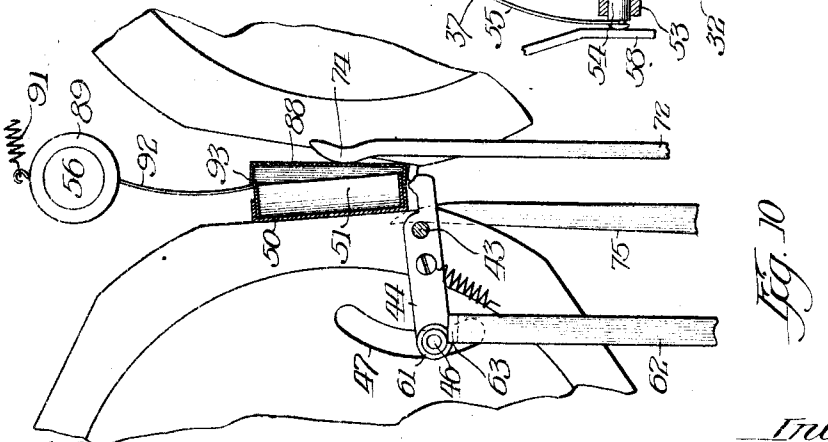


Fig. 10

Witnesses

Fred C. Lagerson

Eugene L. Fiedenhofer

Inventor:

Julius A. Stock

By Walter M. Fuller

Atty.

UNITED STATES PATENT OFFICE.

JULIUS A. STOCK, OF CHICAGO, ILLINOIS, ASSIGNOR TO W. C. RITCHIE & COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

BOX-ASSEMBLING MACHINE.

1,141,502. Specification of Letters Patent. Patented June 1, 1915.

Application filed July 2, 1914. Serial No. 848,530.

To all whom it may concern:

Be it known that I, JULIUS A. STOCK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Box-Assembling Machines, of which the following is a specification.

The salient feature of the present invention is the assembling of box-covers on box-bodies by means operating at high speed, thereby performing such function with rapidity and despatch.

The improved machine incorporating this invention, although not limited to such use, is especially applicable for placing covers telescopically on necked or collared pasteboard boxes of rectangular shape, such for example, as are ordinarily used for cigarettes.

In the preferred embodiment of the invention, the boxes and covers are fed in series toward one another in opposite directions by suitable means, each cover being brought into register with one of the boxes and applied thereto by first fitting one end of the cover over the neck, but not pressing the same home on the box, then turning the cover down over the box so that its sides fit over those of the neck, and then spreading slightly or guiding the opposite end of the cover, and while in this condition, closing it over the corresponding end of the neck, subsequently pressing the cover full down on the box so as to completely inclose the neck and bear against the edges of the box-walls proper. That is to say, the manner of applying the cover to the box by this mechanism is slightly analogous to the method of fitting a low shoe on the foot by means of a shoe-horn.

One particular feature of advantage in a machine of this character resides in the fact that the covers are applied to the boxes during the uninterrupted travel of both elements, whereby the assembling is brought about at an economical high speed of operation of the machine.

A preferred embodiment of this invention in a machine is illustrated in the accompanying drawings forming a part of this specification, a detailed description of the structural elements of such machine and their functions being given below.

In these drawings: Figure 1 is a fragmentary elevation of the machine; Fig. 2 is an end elevation of the same; Fig. 3 is a substantially central vertical cross-section on an enlarged scale; Fig. 4 is a fragmentary elevation of the lower portion of the mechanism on an enlarged scale; Fig. 5 is a cross-section on line 5—5 of Fig. 4; Fig. 6 is a cross-section on line 6—6 of Fig. 4; Fig. 7 is an enlarged view of the portion of the mechanism where the box-elements are brought together for assembling; Fig. 8 is a similar section illustrating the partial closing of the cover on the box; Fig. 9 illustrates the positions of the box elements prior to that which they assume illustrated in Fig. 8. Fig. 10 the next step in the closing operation after that shown in Fig. 8; Fig. 11 shows the box completely closed; Fig. 12 illustrates in perspective a series of curved fingers which rock the box-cover in the closing operation, and Fig. 13 is a fragmentary detail illustrating the means for bringing the box-elements sidewise into exact register.

This machine comprises a hollow-base or standard 20 on which the greater portion of the mechanism is mounted. Projecting forwardly from the upper part of this standard and rotatable in suitable bearings therein are two shafts 21 and 22 equipped with driving-gears 23 and 24 respectively, shaft 21, (by means of mechanism not necessary to describe), being adjustable to a slight degree toward and from the shaft 22. Carried by and grouped around these two shafts are the principal parts of the machine performing the box-closing operation, that is, the assembling of the box elements. The teeth of gear 24 are in mesh with an intermediate gear 25 mounted on a shaft 26 revoluble in bearings in the standard, (Fig. 3). Gear 27 on shaft 28, (Figs. 1 and 3), rotatable in bearings of the standard, is in mesh with the teeth of gears 23 and 25 and also in mesh with the driving-pinion 29 on shaft 30 which at the rear of the machine, as shown in Fig. 2, is supplied with a drive-pulley 31 which may be belted up to any suitable source of power, such as an electric-motor. Obviously then, the rotation of pulley 31 and shaft 30 is transmitted through the train of gears so as to rotate the shafts 21 and 22 in opposite directions, the former clockwise, and the latter counter-clockwise. Shaft 21 has fastened thereto and revoluble therewith, a

pair of spaced disks 32 and 33, (Figs. 2 and 3), each having an inwardly-extended flange or circular rib 34 and 35 respectively, to the inner faces of which are fastened the pair of disks 36 circular in general conformation, but also provided with a plurality of flat faces 37, those of the two disks being in angular register. Centrally between these disks 36, and which may be held in position by circular-flanges 38 on the disks, is a sprocket-wheel 39 in coöperative relation with a sprocket-chain 40 provided at intervals with outstanding lugs or fingers 41, 41, adapted when they pass around the shaft 21 to be in register with the flat faces 37, as shown for example in Fig. 8. This sprocket-chain, some distance away from the standard 20, passes around another sprocket-wheel, (not illustrated), as is customary. Chain 40 passes between a pair of supporting-strips or bars 42, 42, (Fig. 2), on which the necked, rectangular cigarette-boxes are adapted to slide, being pushed along by the upwardly-projecting lugs 41 until they reach the composite-wheel, made up with the various parts described, on the shaft 21, and then each box rests upon two of the surfaces 37, its rear-edge bearing against its coöperating stop 41 on the chain. This operation is perhaps best illustrated in Fig. 7.

For each pair of the flat surfaces 37 I pivot on each of the disks 32 and 33 at 43 the arms 44 and 45 (Figs. 3 and 7), these arms at one end being cross-connected together by the shaft 46 accommodated in curved slots 47 of the two disks. These arms 44 and 45 are pivoted on the inner faces of the disks 32 and 33 and extend through suitable openings 48, (Fig. 3), in the flanges or parts 34 and 35. At their outer ends each of these arms or fingers has a tooth 49 adapted to engage the cigarette-box 50 resting on the surfaces 37, 37, by bearing against the outer face of the box-neck 51 just above the wall proper of the box, as shown in Fig. 7. When in this position this pair of teeth 49 holds the box back against the lug 41 on the chain, that is, they prevent the box from sliding forwardly or downwardly and also limit the extent of application of the cover to the box until they are withdrawn. In order that they may perform this function, each pair of these arms 44 and 45 is supplied with a coil-contractile-spring 52, (Fig. 1), fastened to the arm 44 and also to the disk, the contractile action of the spring swinging the arms on their pivots 43 and holding them in the position illustrated in Fig. 7.

The disk 32 opposite each of the pair of flat surfaces 37 is equipped with a boss 53 (Fig. 13) slidingly receiving a pin 54 connected to a leaf-spring 55 tending to retract the pin, that is, slide it outwardly, and in order to position each of the boxes sidewise just prior to its reception of its cover, I mount on the machine-frame an outwardly-projecting stud-shaft 56, the outer-end of which has a plate 57 fastened thereto, to which is secured a bent-arm 58, (Figs. 1 and 13). As the boxes and pins 54 come into register with the end-portion of the bar 58, the latter pushes the pins in, as shown in Fig. 13, and forces the boxes over against the disk 33, in this way properly positioning and gaging them for the reception of their respective covers.

In order to actuate the pairs of arms 44 and 45 I mount on the machine-frame a bent-support 59 carrying on its inner-face a cam-block 60 with which rollers 61 on the protruding-ends of the shafts 46 are adapted to coöperate. That is to say, as the rollers ride on the surface of this cam, as illustrated in Fig. 1, the arms 44 and 45 will swing on their pivots so that their box-engaging-ends will be moved away from the corresponding lug 41 of the chain, permitting the free and ready transfer of the boxes from their stationary supporting-bars 42, 42, to the flat-surfaced rotary-disks 36. As soon, however, as the rollers pass off of the end of the cam-block 60 the arms 44 and 45 swing on their pivots under the action of their springs 52 so that the teeth 49 engage the box-neck or collar just above the edge of the box-wall and hold the box against the traveling-stop 41. After the box has received its cover, as explained hereinafter, it is necessary to retract the protruding-ends of the arms 44, 45, and their teeth or fingers 49 to permit the discharge of the box, and this is accomplished readily and easily by means of a stationary-bar 62 having an inwardly-bent end 63, (Fig. 3). When one of the rollers 61 strikes the stop 63 during the rotation of the shaft 21 and the parts carried thereby the roller will be temporarily held against movement and the turning of the disk 32 will cause the arms 44 and 45 to swing on their pivots out of the way of the box, the shaft 46 traveling in the slots 47. As soon, however, as the roller leaves the stop 63 from which it passes after a momentary detention the arms 44 and 45 swing back to normal position under the influence of their springs, as will be readily understood.

The mechanism mounted on and rotatable with the shaft 22 is much like that on the companion shaft 21, the shaft 22 and its parts being provided for the conveying and application of the box-cover. This structure comprises the inner and outer disks 65 and 66 respectively, the flat-surfaced disks 67, the forward-end of each flat surface of which is provided with a stop or gage-pin 68, and the central sprocket-wheel 69, the parts being all clamped or fastened together

in any suitable or approved manner. A sprocket-chain 70 with spaced-lugs 71 cooperates with the wheel 69 and another sprocket-wheel (not illustrated), spaced away from the shaft 22 some distance. As in the previous instance, the lugs 71 convey the box-covers on suitable stationary-supports until they arrive and become positioned on the flat surfaces of the disks 67 and as they rotate downwardly they slide into contact with the stop-pins 68, as illustrated in dotted lines in Fig. 8. As is illustrated in the various figures, and in perspective in Fig. 12, the appliance is equipped with a member 72 suitably supported in position so that its four upstanding-fingers 73 with bowed or bent-ends 74 are spaced between the disks 65 and 66, the disks 67, and the sprocket-wheel 69, so that their bent-ends are in the position illustrated in Fig. 8. The companion box-conveying structure is provided with a stripping-device 75 suitably supported in any approved manner and having a pair of upwardly-extended curved tongues 76 spaced between sprocket-chain 40 and the adjacent box-element supporting-disks 36 so that in their downward travel the boxes are compelled to leave the rotary mechanism and travel downwardly between the member 75 and the fingers 73 of the opposite member 72, (see Fig. 11).

In order to make certain that the box-covers will travel forwardly against the gage or stop-pins 68 and away from the chain-lugs 71, I provide an air-blast to assist gravity in such movement of the boxes. This mechanism comprises an oscillatory air-pump 77, (Fig. 2), mounted on a bracket 78 secured to the rear of the main-frame, the piston of the pump being connected by a rod 79 with a crank-pin 80 on a disk 81 secured to the outer end of shaft 30 beyond a bearing 82 b ed to the main-frame and assisting in the support of the shaft. Also mounted on the top of the machine and adjustable by means of a bolt 83 a bracket 84 is provided carrying a curved-plate 85 extending over the path of travel of the box-covers. This plate is equipped with a nozzle 86 connected by suitable piping 87 with the air-pump 77. The operation of this part of the mechanism is as follows: When the box-cover 88 reaches the position substantially as indicated in Fig. 8, if it fails to slide forwardly against its stop-pins 68 under the action of gravity it will be subjected to a blast of air, which, playing upon the interior of the cover, pushes it forwardly into position, the operation of the air-pump being so timed as to deliver these air-blasts in proper timed relation to the travel and position of the box-covers.

On the stud-shaft 56 a collar 89 is loosely mounted and has attached thereto by means of a screw 90, one end of a coil-contractile spring 91, the other end being fastened to any suitable stationary part of the machine, as for instance, the bracket 84 or plate 85. Collar 89 carries a depending, thin, flexible, metal-spring 92 with a hook-end 93 adapted as explained hereinafter, to assist in the application of the covers to the boxes, fitting between the boxes and covers and expanding or stretching the latter slightly, or guiding them to facilitate their application.

The stationary-plate 57 described above and mounted on the shaft 56, has fastened thereto a depending bar 94 corresponding in construction and function to the bar 58 and coöperating with the spring-pressed guiding or gaging-pins 95, in construction and purpose like the pins 54 of the companion mechanism.

The assembled boxes and covers upon leaving the conveying mechanism, as has been explained, pass down between the parts 75 and 73 and are prevented from lateral displacement by a pair of oppositely-disposed upstanding-bars 96 and 97 (Fig. 3), and if desired, the member 75 instead of being rigidly supported may be rockingly mounted on a shaft 98, (Fig. 4), and equipped with an adjusting-screw 99 bearing against a bifurcated arm 100 hung on the shaft 98 and carrying at one end a roller 101 coöperating with a cam 102 on a rotating-shaft 103.

The discharge-mechanism for the assembled box-bodies and covers forms no part of the present invention and needs no description except the statement that the horizontal passage has a retarding-brush 104, a reciprocatory delivery-plate 105, and a coöperating plunger 106. This mechanism is described and claimed in my co-pending application, Serial No. 779,486.

Operation: The operation of this improved mechanism is substantially as follows: The cigarette or other box-bodies 50 are advanced to the assembling-portion of the mechanism by means of the sprocket-chain 40 and its spaced abutments or shoulders 41. When these boxes reach the central portion of the machine, each bears on a pair of flat surfaces 37 of the rotary member with which the sprocket-chain co-acts. When each box-body reaches the upper-portion of the rotary-mechanism mounted on shaft 21, its corresponding positioning and cover-limiting arms 44, 45, are retracted against the action of their spring 52, as illustrated in Fig. 1, by the engagement of their roller 61 with the stationary-cam 60. As the box-body advances, however, and the shaft 21 turns, the roller 61 rides off of the end of the cam 60, permitting the arms 44, 45, to respond to the contractile action of the spring 52 and turn on their pivots 43 so as to engage the box-neck just above the edge of the box-rim, as illustrated, for ex-

ample in Fig. 7, thereby holding the box in proper position against its abutment 41, preventing it from falling forwardly as it passes downwardly around the axis of shaft 21. Just before it reaches the position for the application of its cover, the arm 58, by engagement with the corresponding spring-pin 54, positively pushes the box over against the guide 33 into proper position for registration with the companion cover. During such advance of each necked or collared box-body, its companion cover is being advanced toward the body by the sprocket-chain 70 and the corresponding abutment or lug 71 carried thereby, it being understood that the bodies and covers are both advanced continuously in series so that the machine may operate with a high degree of efficiency and at relatively high speed. As the box cover begins to turn down as it travels around the shaft 22, it either falls forwardly by gravity into contact with the stop or gage-pins 68, or else it is pushed into contact with such pins by the blast of air which is periodically emitted from the nozzle 86. As it continues its forward downward travel, its spring-pressed pin 54 is pushed inwardly by the stationary-bar 94 so that the cover is brought sidewise into proper register with the companion box.

As each box and its cover approach each other and travel downwardly around their respective shafts 21 and 22, they reach the positions indicated in Fig. 7, that is, the lower end of the cover is brought into register with and fitted over one end of the neck, being prevented from being completely applied at this end by the presence of the limiting fingers or lugs 49, which determine the extent of the telescopic application of the cover to the box. It should be noted that the spring-finger 92 projects inside of the box, as illustrated in this figure.

As the partially assembled box and cover proceed downwardly, the fingers or lugs 49 remain in the same position, because they are carried by the rotary member mounted on the shaft 21, and as the parts move downwardly, the cover 88 strikes the convex ends 74 of the bar 73, which cause it to rock or turn over on to the box-neck in substantially the manner illustrated in Figs. 7 and 8, and, since one end of the cover had been previously applied over one end of the neck, no difficulty is experienced in applying the cover over the sides of the neck, as it is turned down as described. When the roller 61 strikes the stationary abutment 63, the arms 44 are rapidly rotated on their fulcrums 43, removing the fingers or lugs 49 from between the cover and box, the parts being illustrated in Fig. 8 in the positions they assume just previous to such retraction of the fingers and in Fig. 10, the position which they take just after such retraction. This, of course, permits the complete telescoping of one end of the cover over the advance end of the box, and during the further downward movement of the parts the hook 93 of the resilient arm 92 engages the end-wall of the cover and extends it slightly to facilitate its application over the end-wall of the neck, as illustrated in Fig. 10.

As the assembled box and cover pass downwardly between the guides or arms 73 and 75, and 96 and 97, the cover is pushed fully home on the box so that as the latter emerges from the lower end of this passage the box-elements are completely assembled. If necessary or desirable, the bar 75 may be given a slight rocking movement by means of the cam 102 acting on the roller 101, as will be readily understood, but this is frequently not necessary.

As the shaft 21 and the parts carried thereby continue their rotation, the roller 61 passes off of the abutment 63, permitting the arms 44, 45, to respond to the action of their spring 52, and as the roller 61 travels upwardly it again engages the fixed-cam 60, rocking the arms 44, 45, for the reception between them and one of the abutments 41 on the chain 40, of another box 50.

It might be noted that the spring 91 acting on the arm 92 aids in retracting the arm from engagement with the end-wall of the cover as soon as the hook 93 has extended the cover sufficiently to permit its ready application over the end-wall of the neck.

It should be clear from this description and illustration that the box-bodies are fed forwardly in a continuous series and that the box covers are advanced toward them in the opposite direction in a continuous series and in such timed relation that the covers will register with the individual boxes and be applied thereto over the collars or necks in the manner indicated and that the assembled boxes and covers will be delivered from the lower part of the machine in a continuous series and discharged from the machine by mechanism unnecessary here to detail.

Of course, many minor mechanical changes may be made in the mechanism shown and described in detail herein without departing from the substance of this invention and without sacrificing any of its material benefits.

I claim:

1. In a machine of the character described, the combination of an endless-conveyer for box-bodies, and an adjacent opposed companion endless conveyer for box-covers having marginal flanges, said conveyers being adapted to bring said bodies and covers individually into register with

and apply them to one another with the cover-flanges telescopically fitted over the box-bodies, substantially as described.

2. In a machine of the character described, the combination of an endless-conveyer adapted to transport box-bodies, and an adjacent companion endless conveyer adapted to transport box-covers having marginal flanges and during their conveyance to bring them individually into register with and apply them to the box-bodies during their travel with the cover-flanges telescopically fitted over the box-bodies, substantially as described.

3. In a machine of the character described, the combination of an endless-conveyer adapted to continuously transport box-bodies with substantially straight sides, and an adjacent companion opposed endless-conveyer adapted to continuously transport box-covers of substantially the same shape as the box-bodies and having marginal flanges and during the travel of the bodies and covers to bring them individually into register with and apply them to the box-bodies with the cover-flanges telescopically fitted over the box-bodies, substantially as described.

4. In a machine of the character described, the combination of means to temporarily limit the extent of telescoping of a box-cover over a box-body, and means to apply the cover to the body during the action of said limiting-means and complete the placing of the cover fully on the box after the temporary action of such limiting-means ceases, substantially as described.

5. In a machine of the character described, the combination of means to temporarily limit the extent of telescoping of a box-cover over a box-body, and means to apply the cover over the body at one end and turn the cover down over the body during the action of said limiting-means and complete the placing of the cover fully on the box after the temporary action of said limiting-means ceases, substantially as described.

6. In a machine of the character described, the combination of means to convey box-bodies, adjacent companion means to convey box-covers and bring them individually into register with and apply them to the box-bodies during the travel of both bodies and covers, and means to temporarily limit the extent of telescoping of each box-cover over its box-body, said cover-applying means applying each cover to its box during the action of said limiting-means and completing the placing of the cover fully on the box after the temporary action of such limiting-means ceases, substantially as described.

7. In a machine of the character described, the combination of means to convey box-bodies, companion means to convey box-covers and bring them individually into register with and apply them to the box-bodies during the travel of the bodies and covers, and means to temporarily limit the extent of telescoping of each box-cover over its box-body, said cover-applying means applying each cover to its box at one end and turning the cover down over the body during the action of said limiting-means and completing the placing of the cover fully on the box after the temporary action of such limiting-means ceases, substantially as described.

8. In a machine of the character described, the combination of a conveyer for a necked-box body having an abutment against which the body is adapted to bear, means to hold the body in position against the abutment and temporarily limit the extent of application of a box cover over the box-body neck, means to apply a box cover over the box-neck, and means to retract said limiting-means after the cover has been partially applied to the box permitting the completion of its application, substantially as described.

9. In a machine of the character described, the combination of a conveyer for a necked-box-body having an abutment against which the body is adapted to bear, a spring-pressed pivoted arm adapted to engage the box and hold it in position against the abutment and temporarily limit the extent of application of a box-cover over the box-body neck, means to apply a box-cover over said neck, and means to rock said arm to render said limiting-means inoperative after the cover has been partially applied to the box, permitting the completion of such application by said applying-means, substantially as described.

10. In a machine of the character described, the combination of a conveyer sprocket-chain equipped with spaced abutments, a rotary support about which said sprocket-chain travels, a plurality of means on said support adapted to engage necked box-bodies and hold them in position against said abutments and temporarily limit the extent of application of box-covers over the box-body necks, means to fit box covers over said necks, and means to retract said limiting-means after each cover has been partially applied to its box permitting the completion of the application of such cover to the box, substantially as described.

11. In a machine of the character described, the combination of a conveyer sprocket-chain for necked box-bodies and having a plurality of spaced abutments, a rotary support with which said sprocket-chain coöperates, a plurality of spring-pressed hinged arms mounted on said support, each adapted to engage one of the

boxes and hold it in position against its abutment and temporarily limit the extent of application of a box-cover over the box-body neck, means to fit box-covers over said box-necks, and means to retract said spring-pressed arms in succession after the corresponding covers have been partially applied to their boxes, permitting the completion of such application, substantially as described.

12. In a machine of the character described, the combination of a conveyer for a necked box-body having an abutment, means to engage the box and hold it in position against the abutment and temporarily limit the extent of application of a box-cover over the box-body neck, means to apply a box-cover over said box-neck, means to move said box-holding and limiting means away from the abutment for the reception of the box-body, and means to retract said holding and limiting means after the cover has been partially applied to the box, permitting the completion of its application, substantially as described.

13. In a machine of the character described, the combination of a conveyer for box-elements having conveying abutments, a rotary member with which said conveyer coöperates, stops or gages on said rotary member adapted to position the individual box-elements, means to cause the box-elements to leave the conveyer abutments and engage said stops or gages, and a conveyer for companion box-elements in juxtaposition to those of the first conveyer, whereby the elements of each conveyer are assembled individually with those of the companion conveyer, substantially as described.

14. In a machine of the character described, the combination of a conveyer for box-elements with conveying abutments, and a vertically-arranged rotary member with which said conveyer coöperates and equipped with stops or gages, whereby as said box-elements pass around said rotary member they drop away from the conveying-abutments and are positioned by the engaging of their front walls with said stops or gages, substantially as described.

15. In a machine of the character described, the combination of a conveyer for box-elements with conveying abutments, a vertically-arranged rotary-member with which said conveyer coöperates and equipped with stops or gages, whereby the box-elements may drop away from the abutments and engage the stops or gages, and a conveyer for companion box elements in juxtaposition to those of the first conveyer, whereby the elements of each conveyer are assembled individually with those of the companion conveyer, substantially as described.

16. In a machine of the character described, the combination of a conveyer for box-elements, a conveyer for companion box-elements in juxtaposition to those of the first conveyer, whereby the elements of each conveyer are assembled individually with those of the companion conveyer, and means adapted to be engaged by the elements of one of said conveyers during their travel which causes their tipping to facilitate their application to the other box elements, substantially as described.

17. In a machine of the character described, the combination of a conveyer for box-bodies, an adjacent conveyer for box-covers, and means adapted to be engaged by said covers to cause their tipping, whereby to facilitate their application to the box-bodies, substantially as described.

18. In a machine of the character described, the combination of a conveyer for box-bodies, a conveyer for box-covers, and one or more stationary bars adapted to be engaged by the box-covers to cause their tipping to facilitate their application to the box-bodies, substantially as described.

19. In a machine of the character described, the combination of a conveyer for necked box-bodies, a companion conveyer for box-covers, means to tip the box-covers to facilitate their application to the boxes, and means to temporarily limit the extent of application of the covers to the bodies, substantially as described.

20. In a machine of the character described, the combination of a conveyer for necked box-bodies, a companion conveyer for box-covers, means to limit the extent of telescoping of the covers over the box-body necks, means to cause said covers to tip or turn over the box-bodies during the action of said limiting-means, and means to subsequently render such limiting-means inoperative to permit the complete application of the covers to the boxes, substantially as described.

21. In a machine of the character described, the combination of a conveyer for box-bodies, an adjacent companion conveyer for box-covers, such conveyer being positioned to apply the covers individually to the box-bodies, and means adapted to project between the partially assembled box and cover and acting to facilitate the final closing of the cover over the box, substantially as described.

22. In a machine of the character described, the combination of a conveyer for box-bodies, a companion adjacent conveyer for box-covers, whereby the covers are adapted to be applied to the boxes during the travel of the boxes and covers, and a member with a hook-end adapted to project between each box and cover during their partial assembling, the hook-end of said member being adapted to extend a wall of the cover to facilitate final closing of the cover on the box, substantially as described.

23. In a machine of the character described, the combination of a conveyer for box-bodies, an adjacent companion conveyer for box-covers, said conveyers being positioned so that the covers are individually applied to the boxes, and a substantially stationary-means adapted to engage a wall of each cover to extend the same to facilitate the final closing of each cover on its box, substantially as described.

24. In a machine of the character described, the combination of a conveyer for box-bodies, an adjacent companion conveyer for box-covers, said conveyers being positioned so that the covers are brought into register with the box-bodies, and applied thereto, and a spring-retracted arm with a hook-end adapted to project between each box and cover during their assembling, the hook end extending a wall of each cover to facilitate the final closing of the cover on the box, substantially as described.

25. In a machine of the character described, the combination of a conveyer for box-bodies, an adjacent companion conveyer for box-covers, the two conveyers being so positioned that the covers are applied individually to the boxes, means to temporarily limit the extent of application of each cover to its box, means to turn each cover down over its box during the travel of the box and cover, means to temporarily extend the end wall of the cover to be applied last to the box to facilitate the final closing of the cover on the box, and means to retract said cover-applying limiting-means, substantially as described.

26. In a machine of the character described, the combination of a traveling conveyer for box elements, a gage, spring-retracted means to move the box elements over against the gage during their travel, and means to intermittently operate said moving means, substantially as described.

27. In a machine of the character described, the combination of a conveyer, a rotary-member with which said conveyer coöperates and equipped with a gage and a spring-pressed pin, and means to actuate said pin to press a box-element over against said gage to secure its proper register, substantially as described.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JULIUS A. STOCK.

Witnesses:
T. S. TREDWELL,
LOUISE M. INGRAM.