

C. CASEY.
ARTICLE PACKAGING MACHINE.
APPLICATION FILED OCT. 21, 1913.

1,108,696.

Patented Aug. 25, 1914.

5 SHEETS—SHEET 1.

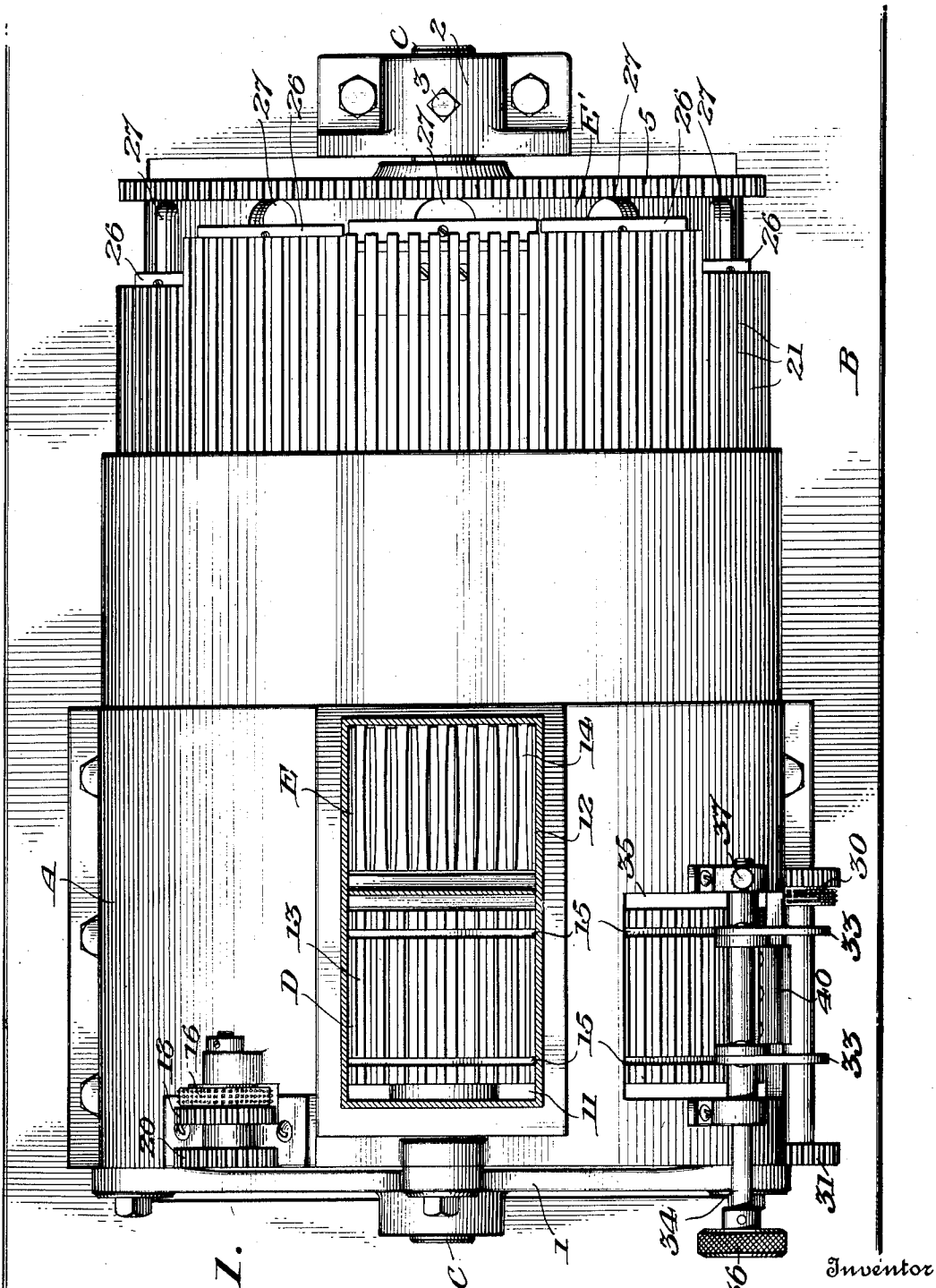


Fig. 1.

Witnesses:
Lloyd W. Patch
Alice Hammond

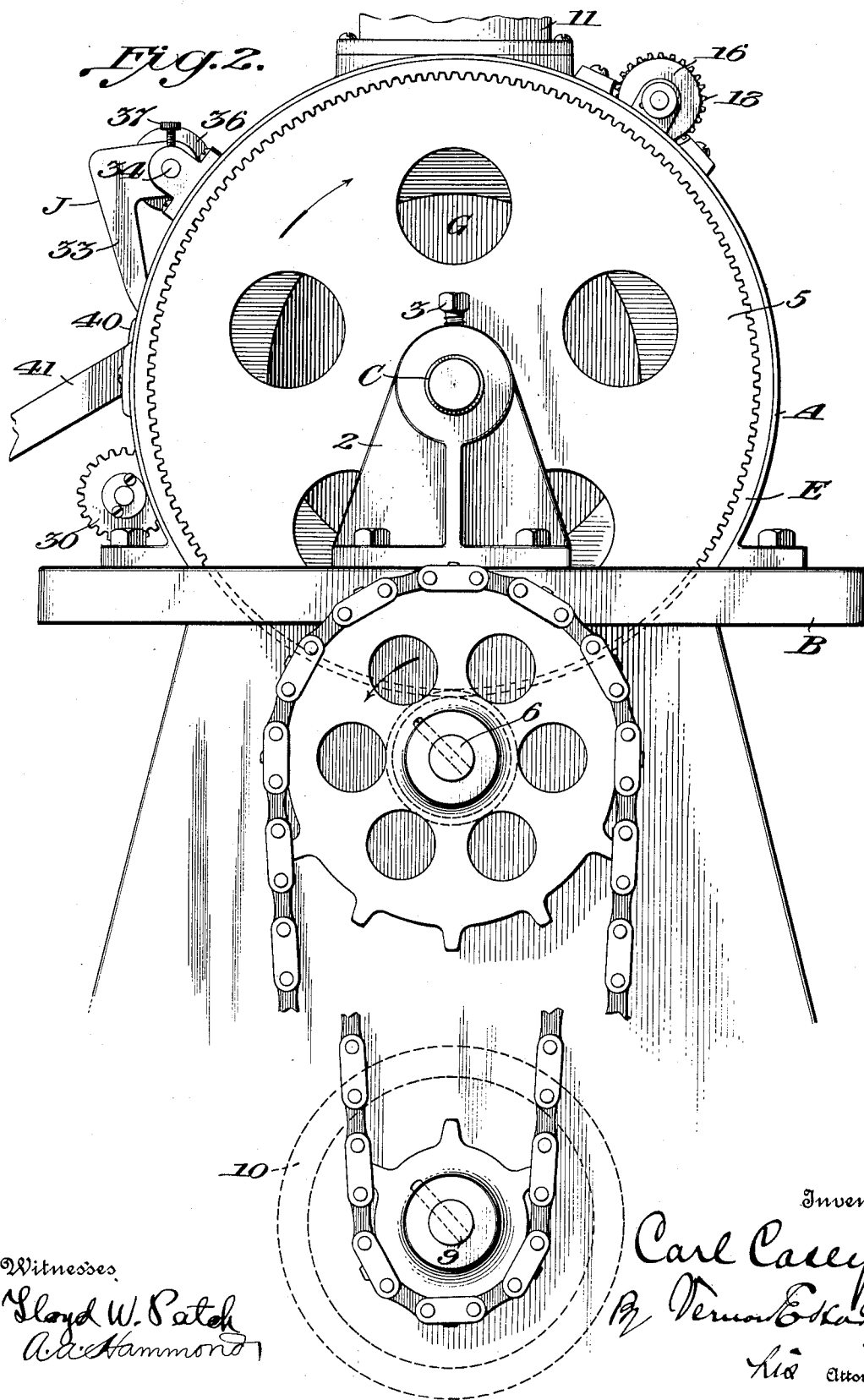
Carl Casey
By Vernon E. Hotz
his Attorney

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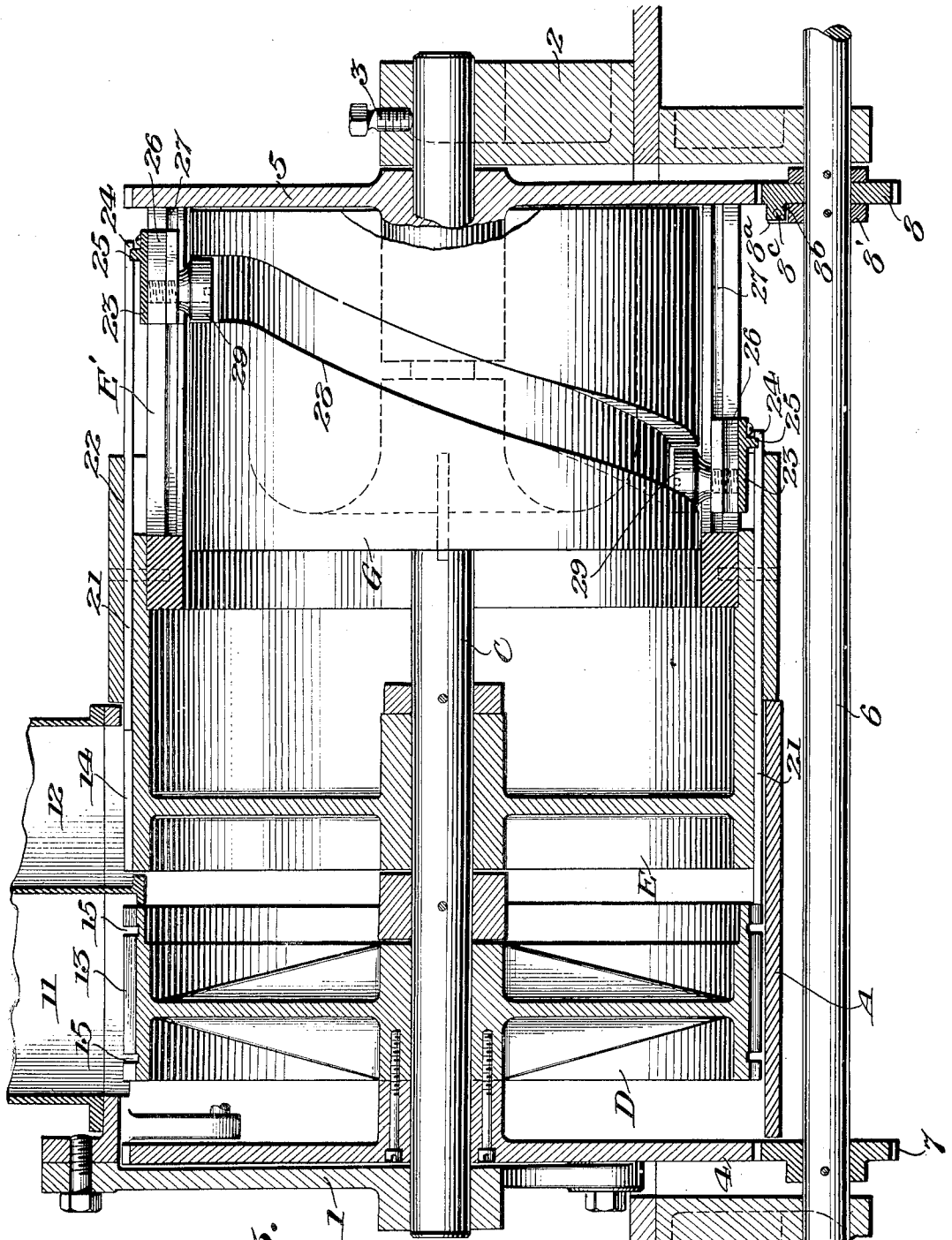


Fig. 3.

Witnesses
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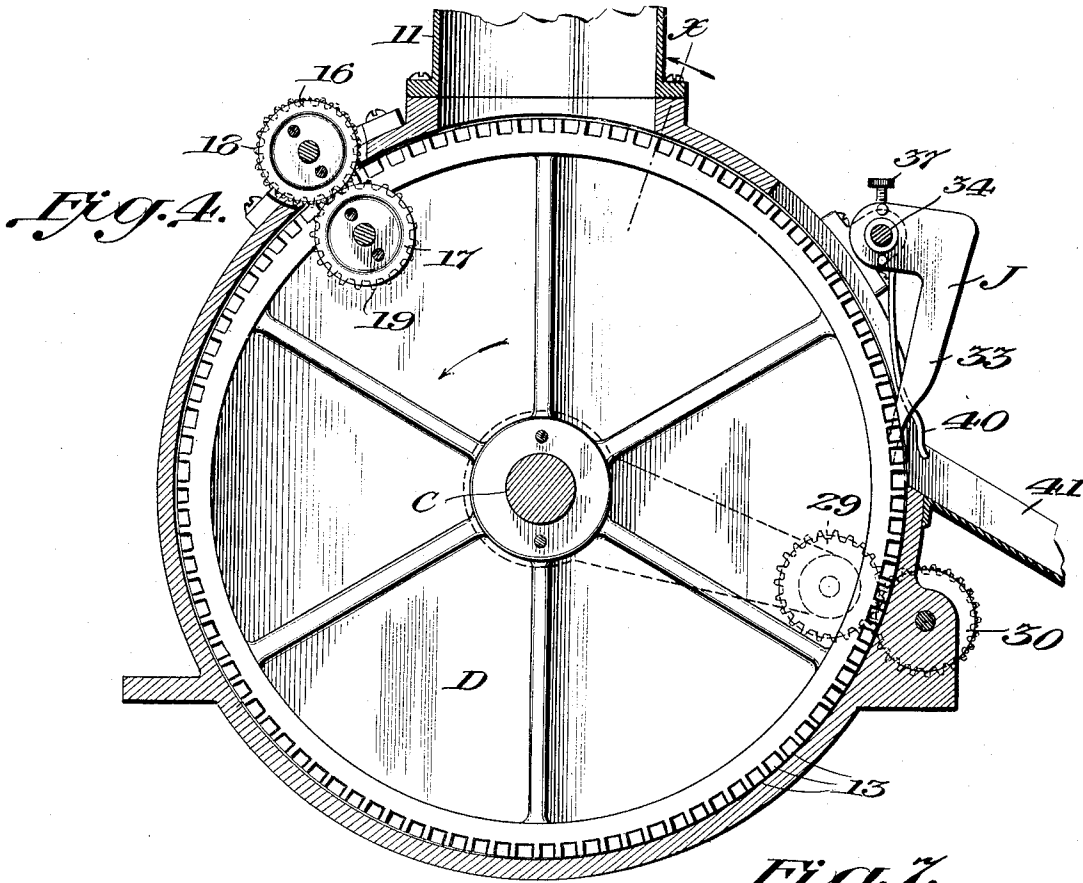
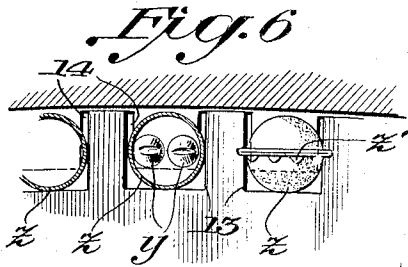
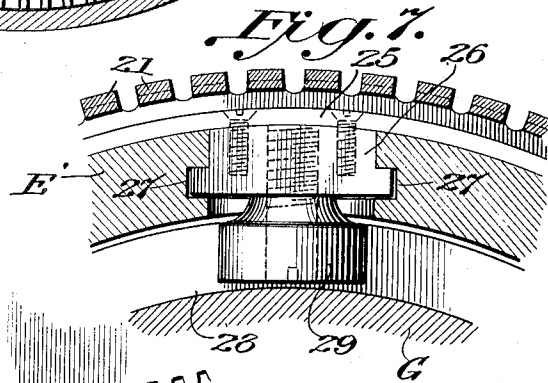
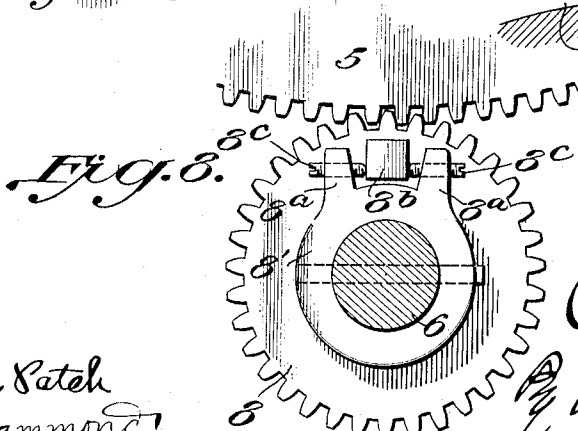
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5 SHEETS-SHEET 4.



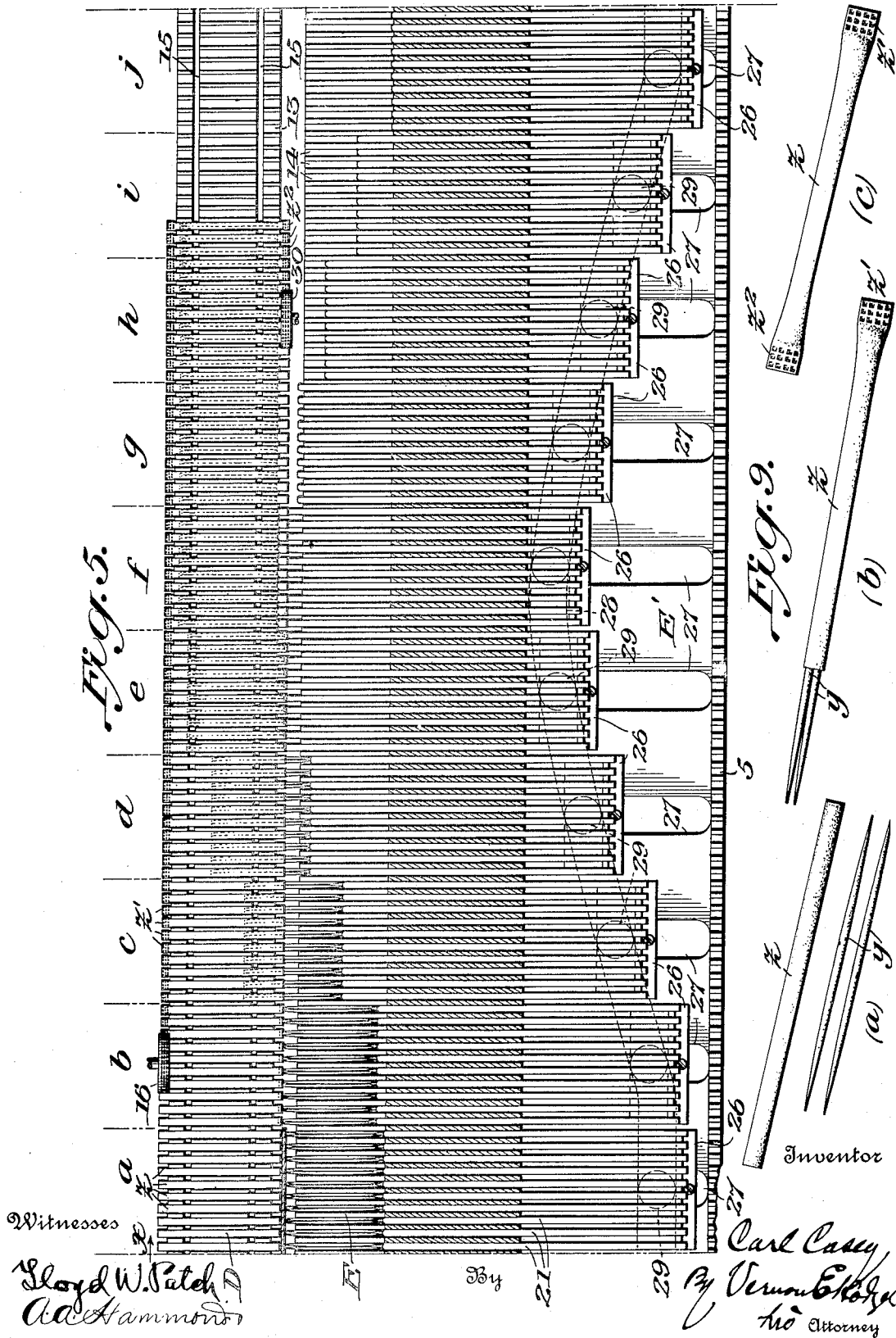
Witnesses
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1,108,696.

Patented Aug. 25, 1914.

5 SHEETS—SHEET 5.



UNITED STATES PATENT OFFICE.

CARL CASEY, OF WASHINGTON, DISTRICT OF COLUMBIA.

ARTICLE-PACKAGING MACHINE.

1,108,696.

Specification of Letters Patent.

Patented Aug. 25, 1914.

Application filed October 21, 1913. Serial No. 796,481.

To all whom it may concern:

Be it known that I, CARL CASEY, a citizen of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Article-Packaging Machines, of which the following is a specification.

My invention relates to an improvement in article-packaging machines, and the object is to provide a machine which can be used in wrapping or packing tooth picks, and other similar articles, either separately for individual use, or several in a container.

A further object of this invention is to provide a machine in which the packages may be placed in one hopper, the articles to be packaged in another, and the machine so constructed that the package and the articles to be contained are simultaneously removed from their respective hoppers, and plungers for placing the articles in the packages, after which the plungers are withdrawn, and that part of the package through which the articles are inserted is closed.

A still further object is to provide drums for receiving and removing the packages and articles from their hoppers, which drums are mounted to be rotated, and one of which carries the plungers, all of said parts so arranged that the operation of receiving the packages and placing the articles therein, and sealing or closing the package or container, is continuous.

Yet another object is to so construct the machines that the packages in tube form may be used, they being removed from the hopper, one end closed, the article placed in the package through the remaining open end and that end closed.

The invention consists of still other novel features of construction and combinations of parts which will be hereinafter more fully described and pointed out in the claims.

In the accompanying drawings: Figure 1 is a view in top plan of the machine; Fig. 2 is a view in end elevation; Fig. 3 is a longitudinal vertical sectional view through the machine; Fig. 4 is a transverse sectional view adjacent the package-receiving drum to better illustrate the position of the closing rolls; Fig. 5 is a diagrammatic development of the machine with the casing removed; Fig. 6 is an enlarged fragmentary sectional view to better illustrate the relation between the slots of the package drum and the slots of the article drum; Fig. 7 is a

fragmentary sectional view to show the means for moving the plungers; Fig. 8 is a fragmentary detailed view to disclose the manner of alining the package drum and the article drum; and Fig. 9 is a view showing the package and the articles to be packaged (a), one step of the packaging operation (b), and the completed package (c).

The casing A is provided and is supported on a suitable standard or base B. This casing A is cylindrical in form, and the shaft C is held in bearings 1 and 2 to extend through the longitudinal center thereof.

The casing A is intended to be stationary, and the shaft C is also stationary, it being held by a set screw 3 carried in one of the bearings. A package drum D is mounted upon the shaft within the casing, and near one end thereof. An article drum E is mounted on the shaft beyond the drum D to have a part thereof within the casing A. The drums D and E are preferably mounted on the shaft to be rotatable independently, one of the other, although they might, with certain changes in the structure, be connected to rotate together. A gear wheel 4 is rigidly connected with the drum D on its outer end, and a gear wheel 5 of the same diameter and having a like number of teeth is connected with the outer end of the drum E. It is the intention that the drums D and E shall be rotated at the same speed on the shaft C, and to accomplish this, the power shaft 6 is provided with gears 7 and 8, which mesh with the gears 4 and 5 respectively. This power shaft 6 may be driven as shown in Fig. 2 by a chain and sprocket, which transmit motion from the power shaft 9, driven by a belt passing around the pulley 10, mounted thereon or in any other suitable manner. A hopper 11 is provided around an opening formed through the casing adjacent the drum D on its upper part, and a similar hopper 12 is provided adjacent that part of the drum E which extends within the casing. Drums D and E are provided on their outer surfaces with a plurality of slots 13 and 14, which extend in a line parallel to the axes of rotation of the drums. The hoppers are made of a width to cover a certain definite proportion of the slots in the drums, when the drums are at rest. Say, for instance, as in the present disclosure, drums are provided with one hundred slots, the hopper is of sufficient width to cover perhaps ten slots, or one-tenth of the circum-

ference of the drum. The drum D is made somewhat shorter at each side than the length of the tube or package, and is provided near each end with peripheral grooves 15, 15 which extend into the drum to a depth preferably greater than the depth of the slots 13.

It is preferable that the package which would be received in the slots 13 of the package drum D be treated as units, and that the filling and closing operations be performed in certain units. For instance, referring to Fig. 5, which is a development in the direction of the arrow X on Fig. 4, there would be ten units or groups to be treated. These will be designated *a*, *b*, *c*, *d*, *e*, *f*, *g*, *h*, *i*, and *j*. As the shaft 6 is rotated, motion is transmitted to the gears 4 and 5, which in turn cause the package drum D and the article drum E to be rotated around the shaft C. As each slot 13 comes within the opening from the hopper 11, a package falls into place, and as the slots 14 of the article drum E come beneath the hopper 12, the articles fall into place therein.

In the present instance, the machine is shown as designed for placing tooth picks in a wrapper or packages for individual use, and the picks *y*, as shown in Fig. 9 (*a*) are the wooden picks tapered at each end, and the package is a tube, preferably circular in cross section, which may be either spirally wrapped or straight wrapped. These tubes or packages *z* are of sufficient size to receive two of the tooth picks, and the slots 14 of the drum E of such dimensions that they will accommodate two picks. As shown in Fig. 9, the tube *z* is somewhat longer than the picks *y*, and the drum D is of a length somewhat greater than the picks, although of less length than the tubes *z*, and is shown positioned that the tubes or packages overhang at each end. It is preferable that the tubes be closed at one end before the picks are inserted therein, and that after the insertion of the picks to the desired distance, the end through which they are inserted be closed. Crimping rolls 16 and 17 are provided at a point beyond the extent of the opening of the hopper 11, and preferably at a point about the center of the second unit or the unit *b*. These rolls are mounted to be stationary on the casing E, and are caused to be revolved during the operation of the machine by gears 18 and 19, which intermesh, and a gear wheel 20, which meshes with the large gear 4. After the one end of the tube has been crimped or pinched to close it, the picks can be inserted through the opposite end and, as a means of removing the picks from the slots 14 and placing them in the packages, I have provided plungers 21, 21, which fit in guideways 22 formed in the article drum E and sliding in the slots 14.

The outermost portion E' of the drum E

is tubular in form, and is of somewhat less diameter than the main portion. Since the packages are treated in units, it is more convenient and preferable that the plungers 21 be also operated in groups or units. To accomplish this, frames 23, 23 are provided, which are of sufficient extent to cover one-tenth of the circumference around which the plungers are placed. These frames are provided with rods 24 and notches 25 are formed in the plungers 21 to fit over these rods, so that as the frames are moved, the plungers fitted thereto will be moved as a unit. Guides 26 are secured to the frames 23, and slide in guideways 27 formed near the center of each unit through the wall of the member E'. A cam G is secured on the shaft C within the member E' and has a cam groove 28 formed around the periphery thereof. Friction rolls 29, 29 are secured to the guides 26 carried by each of the frames 23, and these friction rolls work in the groove 28, thus as the drum E is rotated through the medium of gear wheel 5 and its driving means, the groups of plungers are caused to be reciprocated in and out. After the one end of the tube has been closed, the plungers 21 are caused to be moved forward, and the picks are removed from the slots 14, and are placed in the packages at a point adjacent the periphery of the drum D, that is to say, the plungers 21 move as shown in the group *f* in Fig. 5 to such a point that the picks are forced entirely within the tube, and the projecting end adjacent the article drum is left free to be crimped. As shown in Fig. 5, the plungers have, during their passage through the tenths of the circumference, indicated by the groups *d* to *e*, been moved inwardly, due to the forward pitch of the cam groove 28. In the group *f*, the plungers have reached their extreme inner position, and the picks are in the proper place. At this point, the cam groove 28 has its pitch reversed, and the plungers are caused to be withdrawn through the position indicated at *g*, *h*, *i*, until they reach the position at *j*, where the grooves 14 are entirely unobstructed and ready to receive the picks or other articles to be placed in the packages or tubes.

Since at the point indicated by *a* the slots 13 are to receive a new complement of tubes, these slots, by the time they reach the point *j*, must be free of the packages containing the picks, also the end through which the picks were inserted must have been closed before the packages are removed from the machine. A second set of crimping rolls 29 and 30 are provided at such a point that the plungers 21 have been withdrawn from the ends of the tube *z*, and in this instance, are shown positioned at about the center of a group *h*. These crimping rolls are also operated continuously with the rotation of the drums, and are geared through a wheel

31 with the gear 4. The drums D and E have now passed through the greater part of one revolution. The packages and picks were inserted as in Fig. 9 (a), and as in Fig. 9 (b) the end of the package *z* was crimped at *z* between the crimping rolls 16 and 17. The picks *y* were placed in the tube by the forward movement of the plungers 21, and by the passage of the tube between the crimping rolls 29 and 30, the end through which the picks were inserted has been crimped, as at *z*², Fig. 9 (c). We now have the wrapped picks ready for delivery from the machine. As a means of removing the packages from the machine, a removing guide J is provided beyond the crimping rolls 29 and 30. This guide comprises two fingers 33, 33 which are connected on a shaft 34 supported in bearings secured to the casing A adjacent an opening 35 formed therethrough, and by turning this shaft 34, through the medium of hand wheel 36, the fingers may be brought against the bottoms of the peripheral grooves 15, 15 and by setting thumb screw 37 to hold the shaft 34 in the position to which it is turned, the fingers are caused to engage with the lower sides of the packages and raise the packages from their position in the slots 13. A guide plate 40 is secured to the shaft 34 between the fingers 33, 33, and prevents too great upward movement of the packages, and also guides them into a delivering trough 41, which is secured on the side of the machine adjacent the opening 38.

As shown in Fig. 6, the slots 14 of the drum E are made of such dimensions as to width and depth that the picks will be guided properly into the tubes *z*, and as shown in Fig. 1, the sides of the slots 14 are made somewhat concave to insure proper entrance into the tube.

That the drums D and E may always rotate in the proper relation, that is, that the slots 13 and 14 may always be in axial alinement, I have provided an adjustment for the gear 8. This adjustment comprises a collar 8' secured on the shaft 6, and provided at its upper part with lugs 8^a, 8^a. These lugs 8^a embrace a lug 8^b, carried by the gear 8 and adjusting screws 8^c are provided through the lugs 8^a, so that the gear 8 may be shifted.

From the foregoing it will be seen that I have provided a machine in which the packages and the articles to be packaged are removed automatically from the hoppers, and by plungers, the articles placed in the package, after which that part through which the articles are inserted into the package is closed, and the package inclosing the articles then removed from the machine, all of the parts so arranged that the operation is continuous and automatic.

It will be seen that some provision might

be made whereby a plurality of hoppers 11 and 12 could be made to be filled with tubes, and then when the supply in one hopper becomes low, the other or filled hopper can be inserted in place, and the operation of the machine will be continuous. Also, some provision might be made to place the completed packages in a carton or other suitable receptacle, and still other changes might be made without departing from the spirit and scope of my invention, and hence I do not wish to be limited to the exact construction herein set forth, but:—

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An article-packaging machine comprising traveling means to receive and hold the containers, traveling means to receive the articles to be packaged, means to simultaneously insert the articles into a plurality of the containers, and means to dissimultaneously close the ends of the containers.

2. An article-packaging machine comprising two rotary drums having grooves which travel in continuous alinement with each other, the grooves in one drum to receive the containers, and the grooves in the other drum the articles to be packaged, and means to force the articles to be packaged from the grooves in one drum into the containers in alinement therewith in the other drum.

3. An article-packaging machine comprising two traveling members having recesses which travel in continuous alinement with each other to receive respectively the container and the article to be packaged, means for forcing the articles to be packaged endwise into the containers, and means for closing the containers.

4. An article-packaging machine comprising two traveling members having recesses which travel in continuous alinement with each other to receive respectively the container and the article to be packaged, means for forcing the articles to be packaged endwise into the containers, means for closing one end of the containers prior to the insertion of the articles therein, and independent means for closing the open end of the containers after the insertion of the articles therein.

5. An article-packaging machine comprising hoppers for feeding the packages in the form of completed tubes and the articles to be packaged to the machine, means to receive and hold the tubes, means to receive the articles to be packaged in each tube, a plunger to place the articles in the tube, means for closing the tube, and means for operating said plunger and tube-closing means.

6. An article-packaging machine comprising a hopper in which the packages in the form of completed tubes are contained, a

hopper to contain the articles to be packaged, means to remove a tube from the package hopper, means to remove the proper number of articles from the article hopper, a plunger to place the articles in the tube, means for closing the tube, and means for operating all of said parts at the proper interval.

7. An article-packaging machine comprising a hopper in which the packages in the form of completed tubes are contained, a hopper to contain the articles to be packaged, means for successively removing the tubes from the hopper, means to simultaneously remove the articles to be contained in each tube, plungers to place the articles in the tubes, means to close the tube, and means for driving all of said parts so that the operation of the machine will be continuous.

8. An article-packaging machine comprising a container to receive the packages, a container to receive the articles to be packaged, a drum provided with a plurality of apertures to receive and remove the packages from the package container, a drum to remove the articles from the article container, plungers to place the articles in the packages, and means to close the packages.

9. An article-packaging machine comprising a hopper in which the packages are contained, a hopper to contain the articles to be packaged, a drum provided with a plurality of apertures to receive and remove the packages successively from the package hopper, a drum to remove the articles to be contained in each package simultaneously with the removal of the package, plungers to place the articles in the package, means to close the package, and means for causing the parts to be continuously operated.

10. An article-packaging machine comprising a hopper in which the packages are contained, a hopper to contain the articles to be packaged, a drum provided with a plurality of slots to receive and remove the packages successively from the package hopper, a drum to receive and remove the articles to be contained in each package simultaneously with the removal of that package, plungers acting in conjunction with said second drum to place the articles in the packages, means for closing the package in that part through which the articles are inserted and means for moving the parts to cause the several steps to be successively and continuously carried on.

11. An article-packaging machine comprising a hopper in which the packages are contained, a hopper to contain the articles to be packaged, a drum provided with a plurality of slots to receive and remove the packages from the package container, a second drum to remove the articles from the article container, plungers to place the articles in the packages, means for closing the

packages, and means for removing the closed packages from the machine.

12. An article-packaging machine comprising a hopper in which the packages are contained, a hopper to contain the articles to be packaged, a drum provided with a plurality of slots to receive and remove the packages successively from the package hopper, a drum provided with slots to receive and remove the articles to be contained in each package simultaneously with the removal of that package, plungers fitted in the slots of said second drum, a cam for causing the plungers to be moved through the slots to place the articles in the packages, and means for closing the package.

13. An article-packaging machine comprising a hopper in which the packages are contained, a hopper to contain the articles to be packaged, a drum rotatably mounted in said machine and provided with a plurality of slots to receive and remove the packages successively from the package hopper, a second drum mounted to revolve at the same speed as said first drum provided with slots to receive the articles to be contained in each package simultaneously with the removal of that package, plungers mounted to slide in the slots of said second drum, and a cam mounted to be stationary on the machine by which the plungers are guided to place the articles in the packages.

14. An article-packaging machine comprising a hopper in which the packages are contained, a hopper to contain the articles to be packaged, a drum rotatably mounted in said machine and provided with a plurality of slots to receive and remove the packages successively from the package hopper, a second drum mounted to revolve at the same speed as said first drum provided with slots to receive the articles to be contained in each package simultaneously with the removal of that package, plungers mounted to slide in the slots of said second drum, a cam mounted to be stationary on the machine by which the plungers are guided to place the articles in the packages, and means for closing the package after the articles have been placed therein.

15. An article-packaging machine comprising a hopper in which the packages are contained, a hopper to contain the articles to be packaged, a drum rotatably mounted and provided with a plurality of slots to receive and remove the packages successively from the package hopper, a second drum mounted to turn with said first drum and provided with slots to receive the articles to be contained in each package simultaneously with the removal of that package, said slots adapted to be treated in groups, a group of plungers mounted to slide in each of said groups of slots of said second drum to remove the articles from said slot

and place them in the packages, a cam mounted to be stationary and to cause the groups of plungers to be reciprocated, and means for causing the drums to be revolved.

5 16. An article-packaging machine comprising a hopper in which the packages are contained, a hopper to contain the articles to be packaged, a drum rotatably mounted and provided with a plurality of slots to receive
10 and remove the packages successively from the package hopper, a second drum mounted to turn with said first drum and provided with slots to receive the articles to be contained in each package simultaneously with the removal of that package, said slots adapted
15 to be treated in groups, a group of plungers mounted to slide in each of said groups of slots of said second drum to remove the articles from said slot and place them in the packages, a cam mounted to be stationary
20 and to cause the groups of plungers to be reciprocated, means for causing the drums to be revolved, means for closing the packages, and means whereby they are removed
25 from the machine.

17. An article-packaging machine adapted for packaging articles in tubes, comprising means for feeding the tubes and the articles to the machine, means to receive
30 and hold the tube, means to receive the article to be packaged, a plunger to place the article in the tube, and crimping rolls for closing the tube.

18. An article-packaging machine, comprising a hopper in which the packages in the form of completed tubes are contained, a
35 hopper to contain the articles to be packaged, means to remove a tube from the package hopper, means to close one end thereof, means to remove the proper number of articles from the article hopper, a plunger to place the articles in the tube, and means for closing that end of the tube through which
40 the articles are inserted.

19. An article-packaging machine, comprising a hopper in which the packages in the form of completed tubes are contained, a hopper to contain the articles to be packaged, means to remove a tube from the package hopper, means to close one end
50 thereof, means to remove the proper number of articles from the article hopper, a plunger to place the articles in the tube, means for closing that end of the tube through which the articles are inserted, and means
55 for removing the closed tube from the machine.

20. An article-packaging machine comprising a hopper in which the packages are contained, a hopper to contain the articles to be packaged, a drum provided with a plurality of slots to receive and remove the packages successively from the package hopper, means to close one end of the package,
60 a drum to receive the articles to be con-

tained in each package, plungers to place the articles in the package, means to close the opening in the package through which the articles are inserted, and means for causing the parts to be continuously operated.

21. An article-packaging machine, comprising a hopper in which the packages are contained, a hopper to contain the articles to be packaged, a drum provided with a plurality of slots to receive and remove the packages successively from the package hopper, a drum to receive and remove the articles to be contained in each package simultaneously with the removal of that package, crimping rolls to close one end of said package, plungers acting in conjunction with said second drum to place the articles in the packages, crimping rolls for closing the package in that part through which
85 the articles are inserted, and means for moving the parts to cause the several steps to be successively and continuously carried on.

22. An article-packaging machine, adapted to inclose the articles in tubular packages comprising a hopper in which the packages are contained, a hopper to contain the articles to be packaged, a drum provided with a plurality of slots to receive and remove
95 the packages successively from the package hopper, a drum to receive and remove the articles to be contained in each package, simultaneously with the removal of that package, crimping rolls placed to close one end of said packages, plungers adapted to slide in the slots of said second drum to place the articles in the packages, a cam positioned to cause the plungers to be reciprocated, means for closing the package in
105 that part through which the articles are inserted, means for removing the filled and closed packages, from the drum, and means for causing all of said parts to be successively and continuously operated.

23. An article-packaging machine comprising rigid means to receive and hold the containers by friction, means to receive the articles to be packaged, both of said means having coincident axes, means for inserting
115 the articles into the containers, and means to close the containers.

24. An article-packaging machine comprising means to receive and hold the containers, means to receive the articles to be packaged, both of said means having coincident axes, means for inserting the articles into the containers, and means to close the two ends of the containers dissimultaneously.

25. An article-packaging machine, comprising means to receive and hold the containers, means to receive the articles to be packaged, both of said means having coincident axes, means for inserting the articles into the containers, and rotating means to
130

close the two ends of the containers simultaneously.

26. An article-packaging machine, comprising plungers and two traveling members having superficial grooves which travel in alinement with each other, the grooves in one constructed and adapted to receive containers, and the grooves in the other the articles to enter the containers, said plun-

gers being in position to force the articles to be packaged from their grooves into the containers.

In testimony whereof I affix my signature, in the presence of two witnesses.

CARL CASEY.

Witnesses:

J. D. YOAKLEY,
VERNON E. HODGES.