C. F. JENKINS.

BOX CAPPING MACHINE.

APPLICATION FILED MAY 25, 1910.

1,067,431.

Patented July 15, 1913.

6 SHEETS—SHEET 1.

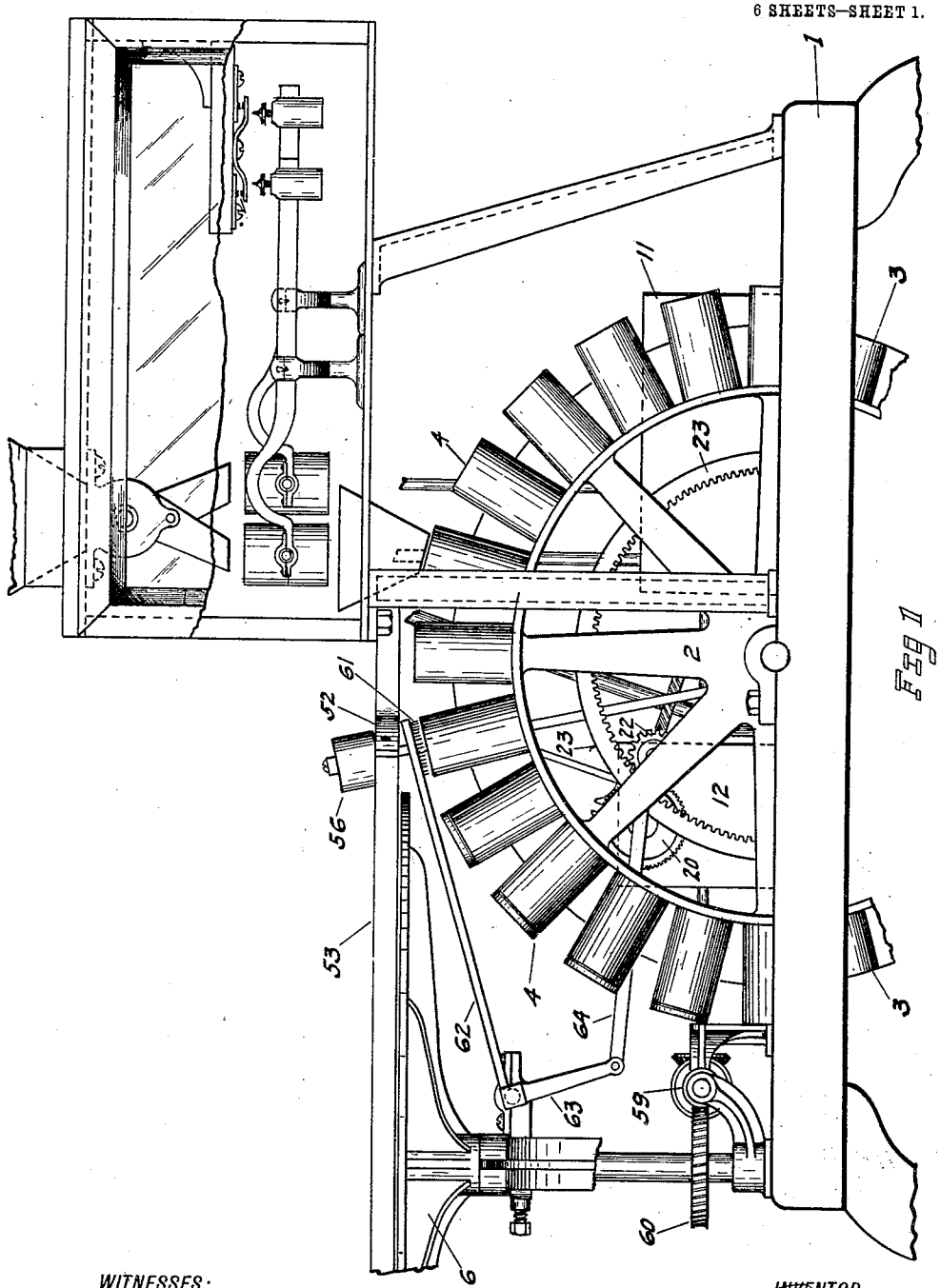


Fig 1

WITNESSES:

A. W. Jenkins

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C. Francis Jenkins

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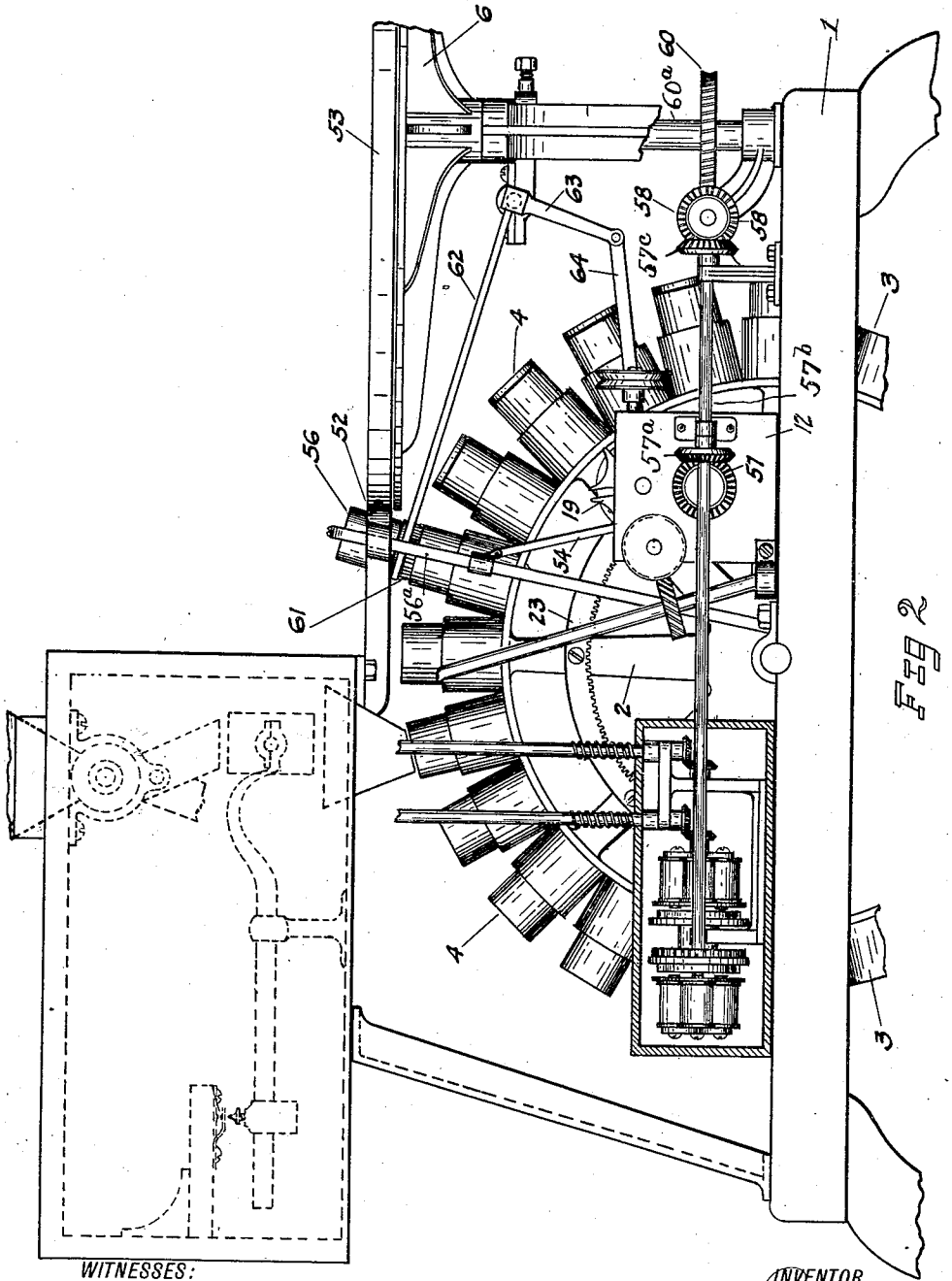


Fig 2

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6 SHEETS—SHEET 3.

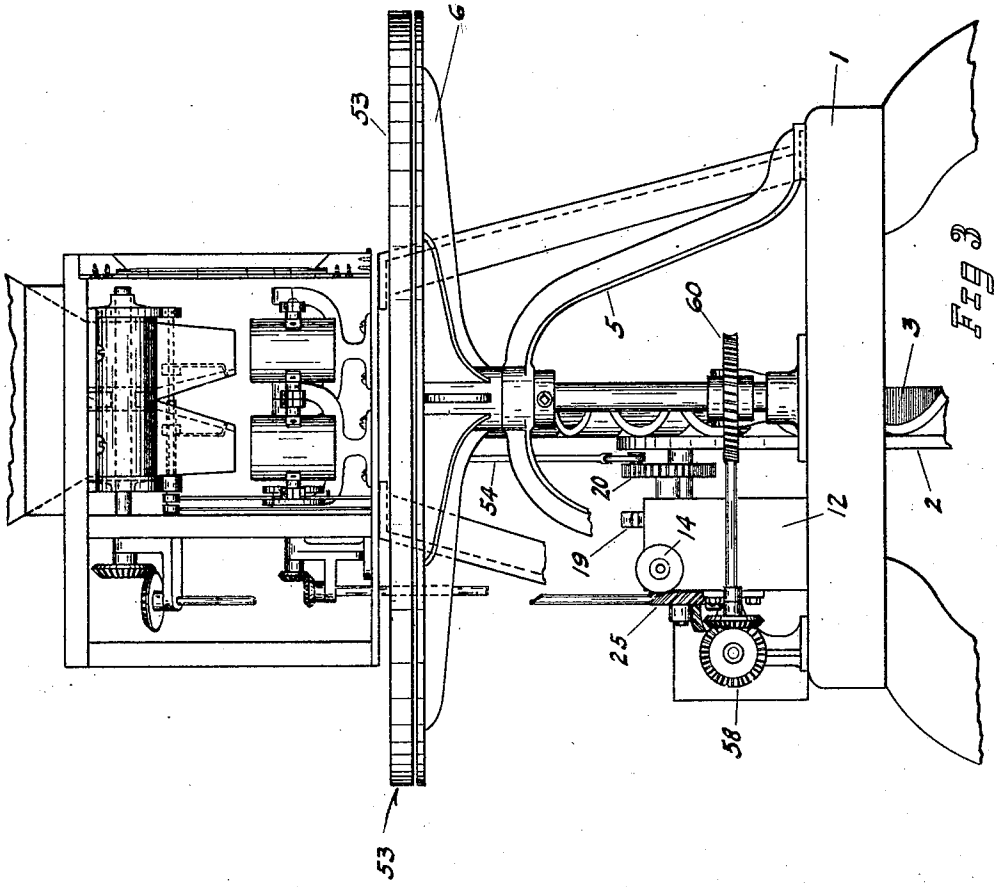


Fig 3

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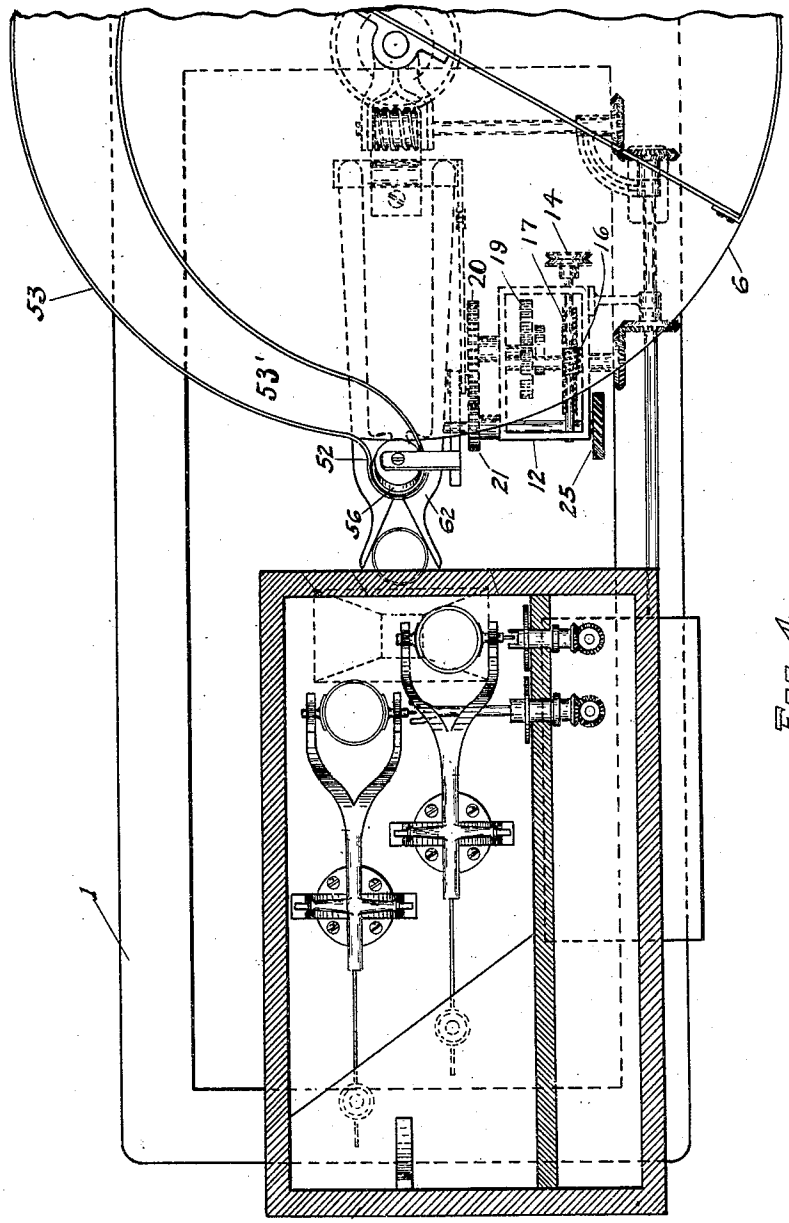


Fig 4

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6 SHEETS—SHEET 5.

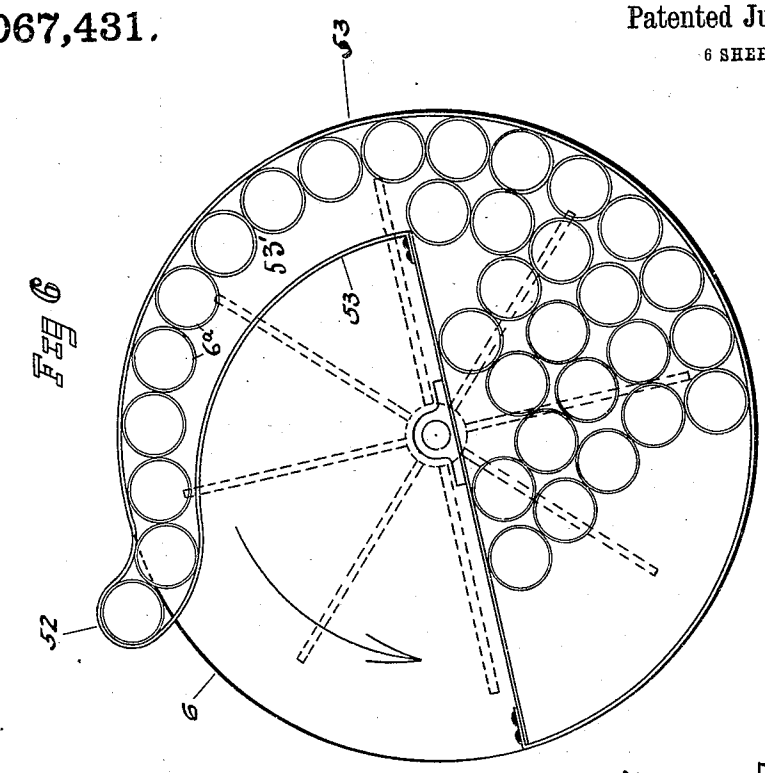


Fig 6

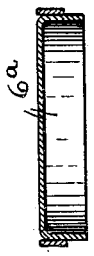


Fig 7

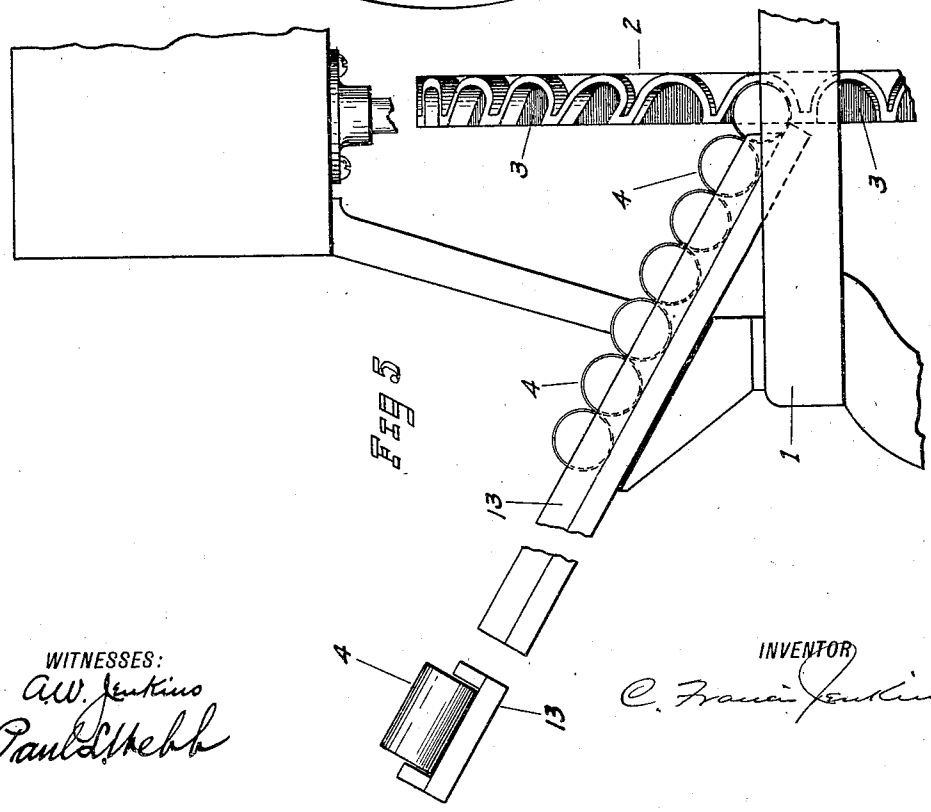


Fig 5

WITNESSES:

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6 SHEETS—SHEET 6.

Fig 11

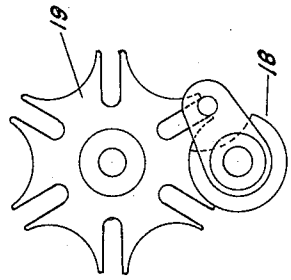


Fig 10

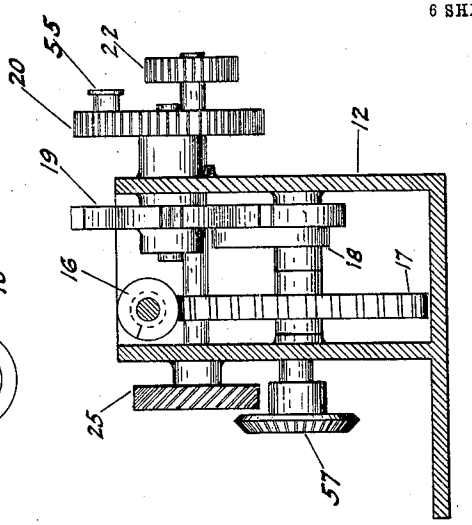


Fig 9

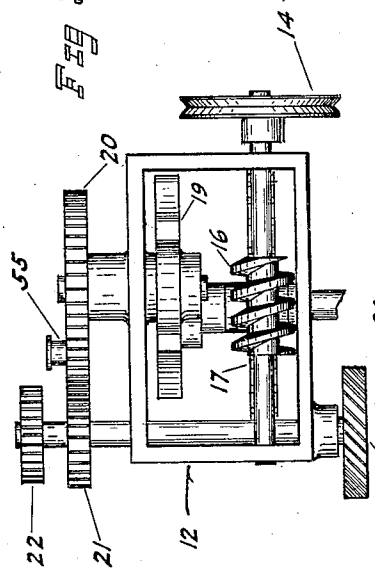
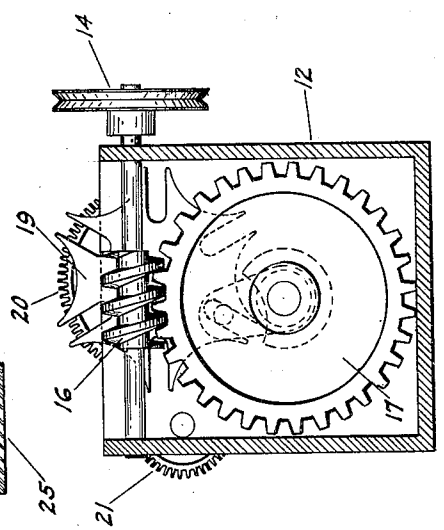


Fig 8



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES FRANCIS JENKINS, OF WASHINGTON, DISTRICT OF COLUMBIA.

BOX-CAPPING MACHINE.

1,067,431. Specification of Letters Patent. Patented July 15, 1913.

Application filed May 25, 1910. Serial No. 563,418.

To all whom it may concern:

Be it known that I, CHARLES FRANCIS JENKINS, citizen of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Box-Capping Machines, of which the following is a specification.

The invention relates to applying previously formed caps to bottles of paper or other material and the general object is to provide apparatus which is simple, automatic, and both rapid and certain in operation.

In the accompanying drawings, Figures 1, 2, 3, 4 are, respectively, front, rear, end, and plan views of a machine embodying the invention. Fig. 5 shows in side elevation a box chute and a vertical wheel for taking boxes therefrom. Fig. 6 is a plan view of a cap-feeding disk and tram or cap guide above the same. Fig. 7 shows a box cap in cross-section. Figs. 8, 9, 10 are detail views showing in side elevation, plan, and end elevation, respectively, gearing for driving other parts. Fig. 11 is a detail view of a step by step movement forming part of the structure shown in Figs. 8, 9, 10.

In these figures, 1 represents the main frame of the machine and 2 a vertical wheel mounted therein and provided peripherally with a series of closely adjacent, radial box pockets 3 which are open at their outer ends and also open laterally on one face of the wheel, as shown in Fig. 5, these pockets being of a radial depth less than the length of the boxes 4 which they are to hold temporarily. The boxes are fed sidewise, by gravity, into the pockets from an inclined chute 13, Fig. 5, fixed to the frame of the machine in position to deliver boxes to the pockets approximately in the line of the wheel's horizontal diameter.

The wheel is rotated step by step by a power pulley 14 (Fig. 3) the shaft of which is supported by a box 12 fixed to the frame 1 and bears a worm 16 (Figs. 8, 9, 10) engaging a gear 17 mounted in the box 12. The shaft of the gear last mentioned bears a mutilated disk 18 and an arm provided with a pin to engage in the radial slots of a wheel 19, the disk, arm, pin, and slotted wheel constituting a well known step by step movement which need not be further described. The shaft of the wheel 19 bears a gear 20 which drives a pinion 21 upon the shaft of which is fixed a pinion 22 engaging an internal gear 23 fixed to the wheel 2, as shown in Fig. 3; and by these devices the constantly rotating pulley 14 imparts step by step movement to the wheel 2, the steps being equal to the angular distance between succeeding pockets of the wheel.

The shaft of the worm gear 17 bears, outside the box 12, a beveled gear 57 (Figs. 2 and 10) which drives a horizontal cap-feeding disk 6 by means of a gear 57^a shaft 57^b, gear 57^c, gear 58, worm 59, (on the shaft of 58) and worm wheel 60 on a shaft 60^a supported by the frame and carrying the disk 6, which lies slightly above the plane of the tops of the boxes when they are at their highest point on the wheel 2.

Upon the disk 6, the upper face of which is plane, are placed a large number of caps 6^a, open side down, and preferably of the type shown in Fig. 7. Above the face of the disk is a non-rotary tram or cap guide 53 which limits the caps to a certain part of the disk and keeps them away from the center so that all are gently urged onward by the friction of the disk against their lower edges. All are thus crowded toward the entrance of a sort of way 53′ which two cannot enter abreast but which they enter singly one after another whenever the way is not already filled, so long as any remain upon the disk. In this passage all advance until the foremost cap of the line passes off the disk and is arrested, always in exactly the same place, by a loop 52 formed in the tram member. Movement of the caps in the passage then ceases although all are still urged forward by the disk below, but if the cap in the loop be removed, the next in line instantly takes its place. This loop 52 is located just above or in the axis of one of the upper pockets of the wheel 2 when the latter is at rest, and above the pocket, normally, is an overhanging plunger 56 carried by a sliding rod 56^a which is reciprocated at proper intervals by link 54 connected a crank pin 55 on the gear 20. Below the loop and normally just above the plane of the top of a box in the alining pocket lies a light bifurcated or double arm 62 of a bell-crank the other arm 63 of which is connected by a link 64 to the crank pin 55. Near its free end the branches of the arm 62 are curved outward to allow a box cap to pass between them and from each curved portion project light, converging wire fingers 61 which en-

gage the sides of a descending cap and are depressed slightly into the mouth of the box below, guiding the cap until it enters the box, after which the rocking of the bell-crank lifts the fingers and the plunger then fully seats the cap in the box.

Other mechanisms are shown, but as they pertain to operations to be made the subjects of separate applications and are not a part of the invention herein claimed, they are not described.

What I claim is:

1. The combination with a vertically moving, cap-inserting device, of an adjacent, frictional cap-feeding mechanism comprising a plane, rotary, horizontal disk for carrying numerous free caps side by side, and a fixed tram or guide, above the disk, provided with a peripheral passage for permitting single caps to be pushed in succession from the disk into the path of the inserting device by the friction of the disk on the free caps.

2. The combination with a constantly rotating, plane, horizontal disk adapted to support, side by side, free caps placed thereon, of a guide or tram, above the disk, localizing the free caps thereon and provided with an outwardly extending loop to receive caps from the disk and hold a single foremost cap outside the disk's margin in the path of other caps urged toward its position solely by the friction of the disk, and means for periodically pushing the foremost cap out of said loop and path.

3. The combination with a vertical wheel having outwardly open peripheral and radial pockets for boxes, of means for rotating the wheel step by step, a horizontal disk adjacent to the upper side of the wheel and adapted to support, side by side, many box caps in direct contact with its surface, means for rotating the disk, a fixed tram or guide holding the free caps within certain limits upon the disk and itself bent outward beyond the disk's margin to form a loop adapted to receive a single cap only, and in alinement with one of the pockets when said wheel is at rest, and a plunger reciprocating through said loop to force caps therefrom into bottles in said pockets.

4. The combination with an inclined chute adapted to deliver sidewise, by gravity, a series of round boxes placed therein, of a vertical wheel arranged to rotate step by step and having outwardly open lateral pockets in position to receive boxes, respectively, from the chute as the pockets pass the horizontal plane of the wheel's axis, means for holding a cap above each box as it reaches the upper side of the wheel, means for forcing each cap so held into the box below, and converging flexible fingers arranged for guiding the cap into the box while it is being advanced by the inserting means.

In testimony whereof I have affixed my signature in presence of two witnesses.

CHARLES FRANCIS JENKINS.

Witnesses:

JAMES L. CRAWFORD,

A. E. MARTIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."