

962,316.

Patented June 21, 1910.

4 SHEETS—SHEET 1.

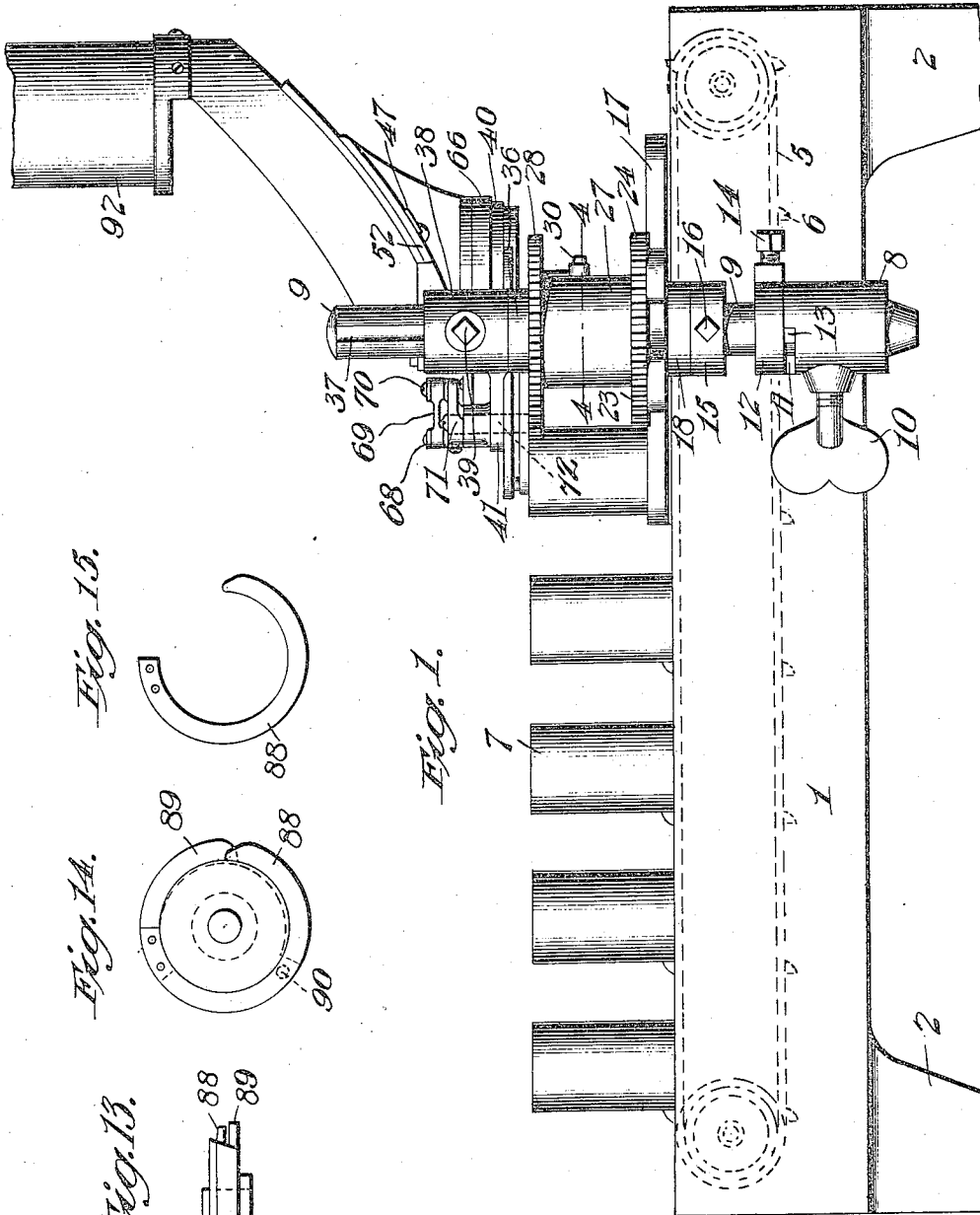


Fig. 15.

Fig. 14.

Fig. 13.

Fig. 1.

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CAN CAP DROPPER.

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4 SHEETS—SHEET 2.

Fig. 2.

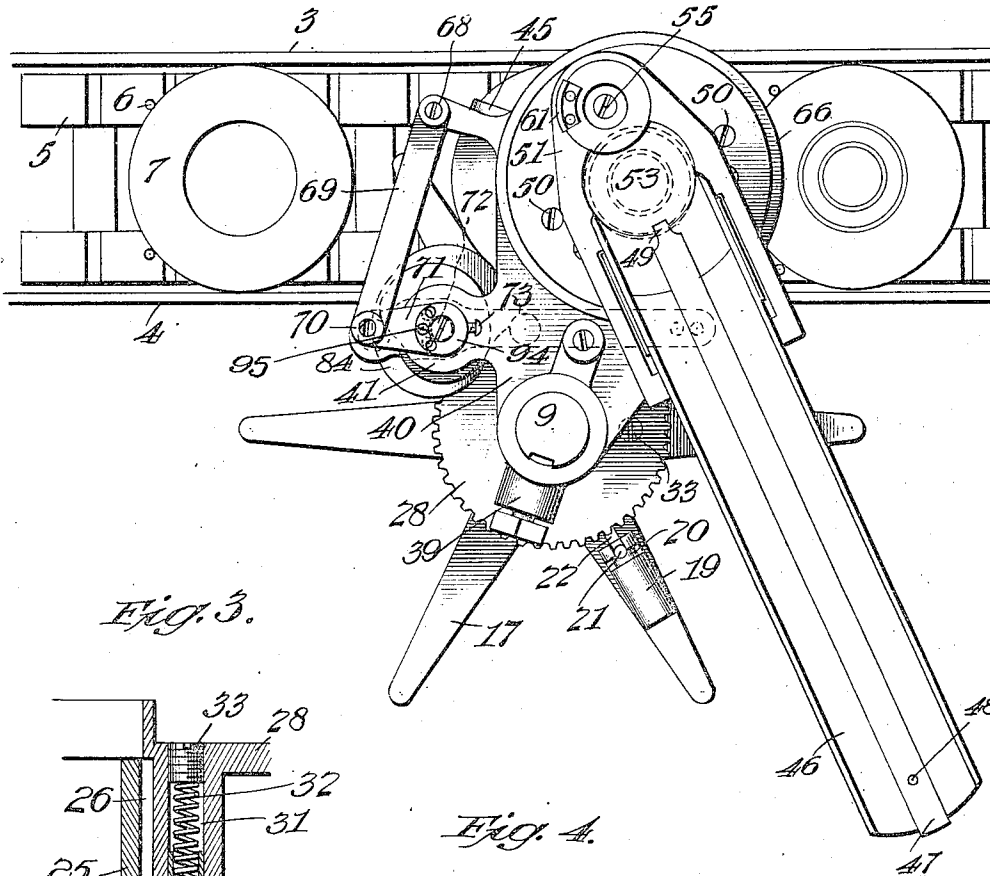


Fig. 3.

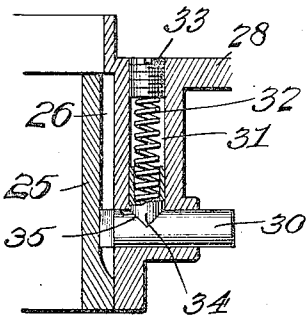


Fig. 4.

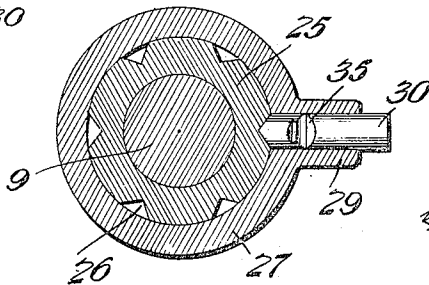
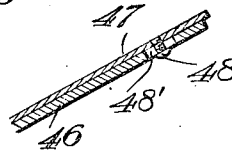


Fig. 5.



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4 SHEETS—SHEET 3.

Fig. 6.

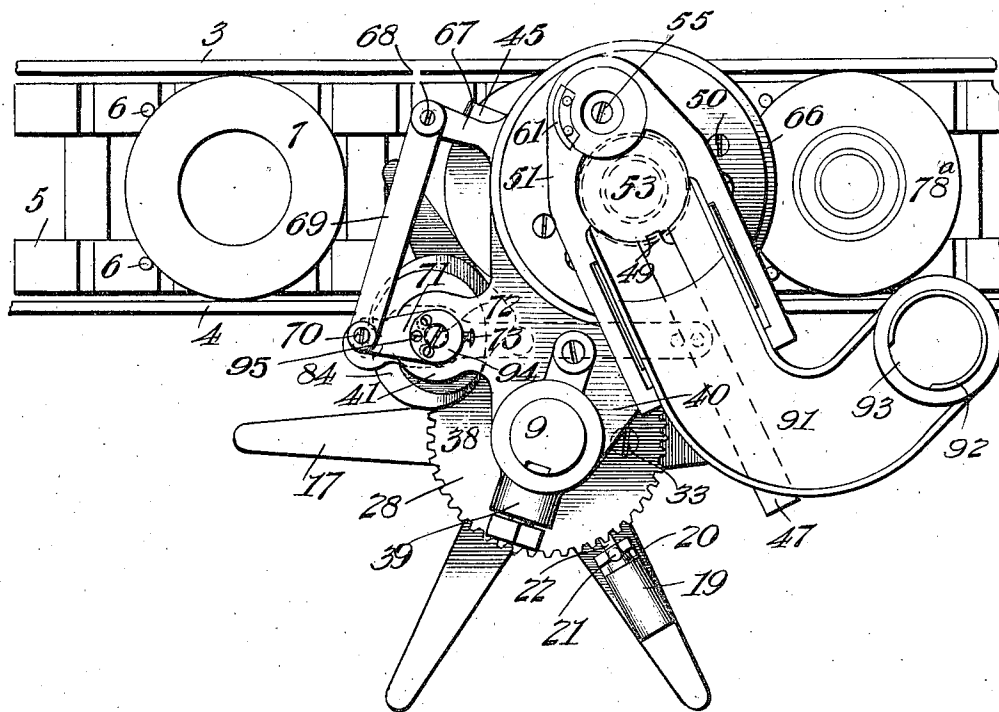
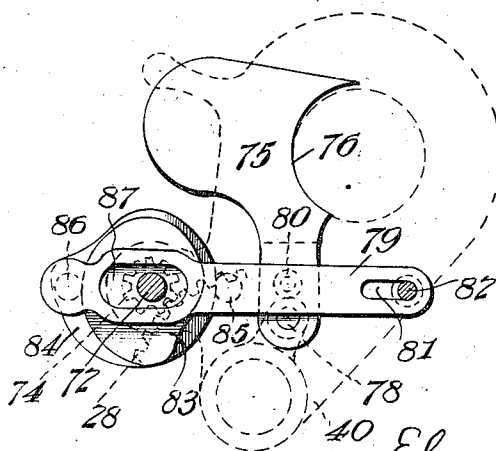


Fig. 7.



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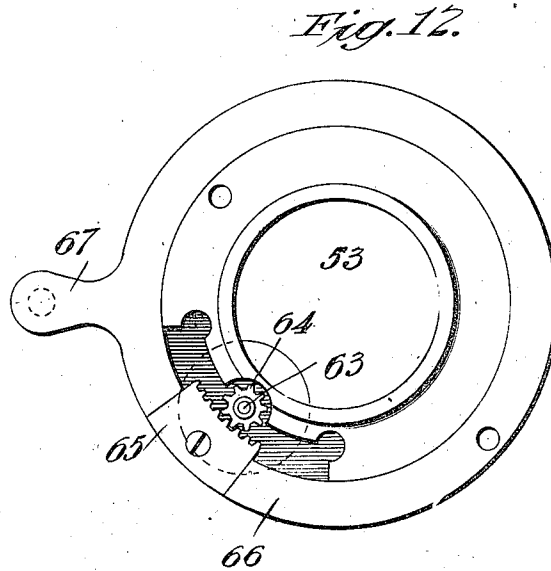
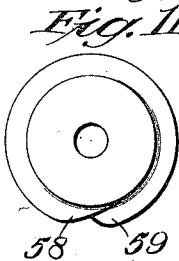
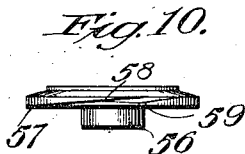
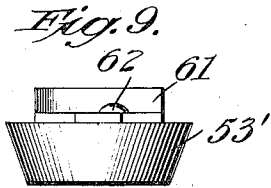
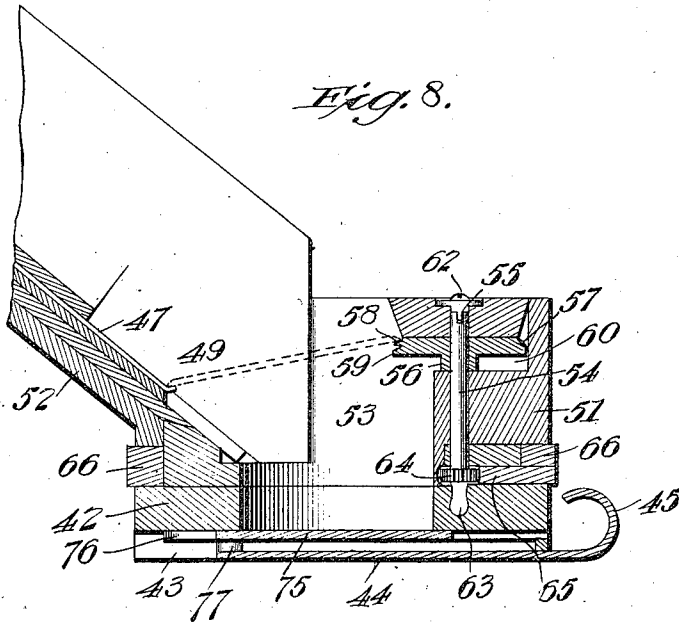
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UNITED STATES PATENT OFFICE.

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CAN-CAP DROPPER.

962,316.

Specification of Letters Patent. Patented June 21, 1910.

Application filed September 9, 1909. Serial No. 513,932.

To all whom it may concern:

Be it known that I, ELMER M. COBB, a citizen of the United States, residing at Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Can-Cap Droppers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in can cap droppers, and the object of my invention is to provide a simple and automatically-acting device, which will drop the caps exactly into the proper position on the filled cans, so that the caps may be soldered thereon without the necessity of separately handling the caps.

With this object in view, my invention consists in the construction and combinations of parts, as hereinafter described and claimed.

In the accompanying drawings—Figure 1 is a side view of my invention. Fig. 2 is a top plan view of the same, but showing a straight chute. Fig. 3 is a cross section of a part of the driving mechanism, showing the automatic releasing means. Fig. 4 is a cross section on the line 4—4 of Fig. 1. Fig. 5 is a cross section through a part of the cap chute. Fig. 6 is a top plan view of the invention as shown in Fig. 1. Fig. 7 is a top view showing the cap ejecting means. Fig. 8 is a cross section of the bottom part of the chute showing the ejecting means and the separators. Fig. 9 is a side view of the upper part of the separator. Fig. 10 is a side view showing the inclined separating partial rings. Fig. 11 is a top plan view of the part shown in Fig. 10, and Fig. 12 is a bottom plan view of the part which operates the separator. Figs. 13—15 represent a modified form of separator.

1 represents a long narrow bench, supported by legs 2. This is provided with upwardly-projecting sides 3 and 4, forming a runway for the cans, which are carried by a sprocket chain 5, having projections 6, adapted to strike against the cans 7, all these parts being of any old and well-known type. To the bottom or side of the bench 1, the cap dropper is secured by means of a projecting bracket, which is screwed onto the runway. This bracket is made right angled,

and the vertical part thereof is shown at 8 in Fig. 1, this vertical part being perforated for the passage therethrough of the rod 9, carrying a cap dropping attachment, said rod being adjustably fastened in the bracket by means of the thumb-screw 10. This bracket is cut away, as shown at 11. The rod 9 has attached to it, near its lower end, a ring 12, provided with a downwardly-projecting portion 13, which ring may be fastened to the rod 9 at any desired position by means of the set screw 14.

15 indicates another ring, which is fastened to the rod 9 by the set screw 16, which serves to support the star wheel and operating parts.

17 represents the star wheel which is provided with an enlarged hub 18 resting on the ring 15. One tooth of the star wheel is provided with an upwardly-projecting extension 19, which is perforated, and in which slides a bolt 20, provided with an operating pin 21, a spring, not shown, always tending to throw the rod toward the center of the star wheel, and the inner end of this rod is provided with a tooth 22 to engage the ratchet hereinafter described.

23 indicates the ratchet wheel, provided with teeth 24. This ratchet wheel is attached to or made integral with a hub 25, shown in Fig. 4, said hub being provided with shallow V-shaped grooves 26 extending longitudinally therealong. The hub 25 is mounted inside of a sleeve 27, the upper part of which is expanded and forms a gear wheel 28. On one side the sleeve 27 is provided with an extension, having two perforations therein, arranged at right angles to each other. In the lower part of this extension, as shown at 29, a slidable pin 30 is journaled, having its inner end pointed. This inner end is adapted to engage in one of the grooves 26. In the vertical perforation 31 is located a spring 32, confined by means of a screw 33. The lower end of this spring engages a blunt fastening point 34, which is adapted to seat in a shallow notch 35 in the upper part of the pin 30, thus forming an adjustable connection between the hub 25 and the sleeve 27.

Above the gear wheel 28 is a collar 36, which, however, is smaller than the sleeve 27. On the rod 9, which is provided at its upper part with a longitudinal groove 37, is mounted a perforated bearing 38, having a

reduced portion fitting in the collar 36 and being secured to said rod by a set screw 39, the end of which passes into the groove 37. This bearing has extending outwardly from it a plate 40, which carries the cap dropping mechanism proper, and the plate 40 has an extension 41 on which is carried the mechanism for operating the cap expelling device. The upper part of the plate 40 is substantially flat, but on its outer and lower end, it is provided with a thickened part 42, circular in its main outline, but cut away for the operation of the lever and the cap expelling device, as indicated in Fig. 8. The lower part of the extension 41 is provided with a wide cut-away portion 43, the sides of this cut-away portion being beveled to support the slide 44, having one end turned upwardly to form a handle 45, whereby the slide may be removed.

Referring to Fig. 2, 46 represents a straight chute, having curved sides, within which the caps to be fed to the machine are placed on edge. At the bottom of this chute is a narrow steel plate 47, adjustably secured in the bottom of said chute by means of a screw 48, which works in a slot 48' in said chute bottom. The lower end of the plate 47 extends below the bottom of the chute, as shown at 49, and this lower end is preferably turned upward, as indicated in Fig. 8, although this is not strictly necessary. This chute delivers into a hollow receptacle, supported on the plate 40 by means of screws 50. This receptacle has one wall thickened, as shown at 51, supporting the separating means, and on its opposite end is provided with an inclined extension 52, which supports the lower part of the chute. The receptacle is hollow, as indicated at 53, the hollowed out portion extending upwardly to correspond to the incline of the lower part of the chute.

Parts of the separator are shown separated in Figs. 9, 10 and 11, and this separator consists of an upper portion 53' inclined downwardly, and supported on a rod 54 by means of a screw 55. On this same rod is mounted a bearing 56, having an extension 57 thereon, which is circular in shape, but which has two projecting knife edged points 58 and 59, so spaced apart that the edge of a cap will just pass between them, so that as this separator is revolved it will separate the lowest cap from the row of caps in the chute and allow it to drop down through the hollow receptacle. The upper part of the thickened portion 51 is cut away, as shown at 60, for the reception of the separator, as shown in Fig. 8. To the top of the portion 53' is secured a curved guard 61, by means of a screw 62, which serves to prevent the caps in the chute from being pushed down by the weight of the caps behind, so that the lowest one will not be caught by the separa-

tor. The rod 54 is journaled in the thickened portion 51, and its lower end 63 is journaled in a bearing in the part 42, and on this rod, near its lower end, is fixed a small gear wheel 64.

The gear wheel 64 is operated by means of a curved rack 65, secured to the ring 66, with its teeth projecting inwardly (see Fig. 12), the parts being cut away to afford space for the operation of said rack and gear wheel, as indicated in Fig. 12.

Means for operating the ring 66 will next be described. This ring is provided with an extension 67 having an upwardly projecting portion 68, to which is pivoted one end of a link 69. The other end of this link is pivoted to a projection 70 on a crank arm 71, which is loosely mounted on a shaft 72, journaled in an upwardly - projecting extension of the part 41.

For the purpose of regulating the adjustment of the arm 71, to compensate for various speeds of the conveyer in the runway, I provide a disk 94, adjustably secured to the shaft 72 by a set screw 73. The disk 94 and the crank arm 71 are each provided with a series of holes, the holes in the arm being spaced farther apart than those in the disk 94. 95 represents a screw, adapted to fasten said disk and arm together, in various positions according to the speed desired.

It is obvious that the rotation of the shaft 72, by the connections already described, will vibrate the ring back and forth, whereupon the rack 65 reciprocates the pinion 64, thereby reciprocating the separator and feeding the caps, one by one, down into the central hollow portion of the main receptacle.

The shaft 72 extends down below the part 41, and on its lower end carries the gear wheel 74, which meshes with the gear wheel 28. The rotation of the star wheel causes the rotation of the gear wheel 28, thereby operating the shaft 72 and the ring 66. The shaft 72 also carries cams for operating the cap expelling mechanism, said cams being located above the gear wheel 74.

The cap expelling mechanism includes a vibrating plate 75, one edge of which is curved, as shown at 76, so that when it is drawn back, it will not interfere with the dropping of a cap. On its under-side it is provided with an expelling pin 77, and the space between the plate 75 and the slide 44 is just wide enough to receive one of the caps, which cap, as the plate 75 is reciprocated, is expelled by the pin 77, and drops onto the central portion of the can, as shown at 78, Fig. 6, the parts being so adjusted as to drop the cap exactly upon the center of the can.

The plate 75 is reciprocated by the following means. Its rear end is pivoted, as

shown at 78, to a pin passing through the plate 40, which pin serves as a pivot for the movement of the plate 75. The plate is operated by means of a lever 79, pivotally connected by a pin 80 to the plate 75. One end of the lever is slotted, as shown at 81, for the reception of the guide pin 82, which projects downwardly from the part 40. The lever is reciprocated by the following means.

10 On the shaft 72 are mounted two cams 83 and 84, of different shapes, and the lever 79 is provided with two downwardly-projecting pins or rollers 85 and 86, the outer one, 86, being the shorter, and contacting with the upper cam, and the inner pin, 85, being longer, and contacting with the lower cam. Of course, the cams are made of such a shape as not to interfere with the action of each other, and if desired, the pins 85 and 86 may have rollers mounted thereon to diminish friction. The lever 79, near its outer end, is expanded, and is provided with a long slot 87, surrounding the shaft 72.

By means of the connections described, a revolution of the gear wheel 28 will cause the reciprocation of the plate 75 in a path concentric with the axis of the rod 9, thus sweeping the cap off of the slide 44, and dropping it at exactly the right position on top of the can. The thickened part 42 of the plate 40 is slotted to permit the movement of the plate 75.

In Figs. 13, 14 and 15, a modified form of the separator is shown, the separating knives or blades 88 and 89 being mounted on the body thereof, so that they may be adjusted toward and away from each other by means of screws, such as 90.

In Fig. 2, a straight chute is shown. This form is more suitable for small caps. In Fig. 6, however, a modified form is shown, consisting of a chute 91, curved as shown in Fig. 6, and having on its outer end a tube 92, open at one side, as shown at 93, for convenience in inserting the caps.

The operation is as follows:—The apparatus being accurately adjusted by means of the various adjustments already described, and especially the ratchet wheel 23 and parts engaging therewith, and the chute being properly loaded with caps, cans are automatically delivered to the conveyer 5, which is kept in constant rotation. As each can passes under the dropper, it strikes one of the teeth of the star wheel, said wheel being located so that the bottom of the can will strike it. The star wheel is moved thereby, operating first the ring 66, to drop down one cap, which rests upon the slide 44, and then to reciprocate the plate 75, which, at the proper instant, sweeps the caps off the slide 44 exactly upon the center of the top of the can. This operation is continued indefinitely, and all that the operator has to do is to keep the chute supplied with caps. If

no cans are delivered to the conveyer, the feeding of the can caps will be stopped, inasmuch as the star wheel is operated by the cans themselves, and they are carried along by the projections 6 on the conveyer, which are so spaced as to cause the cans to properly engage the teeth of the star wheel.

I claim:—

1. The combination of a can conveyer and a cap dropper, said cap dropper including a star wheel adapted to be struck by the cans, a separator operated by said star wheel to separate the lowest cap of a row of caps, and a vibrating plate for sweeping said separated cap onto the top of a can as it passes underneath the dropper, substantially as described.

2. The combination of a can conveyer and a cap dropper secured to the frame thereof, said cap dropper including a star wheel adapted to be struck by the cans, a separator adapted to remove the lowest one of a row of caps, a vibrating plate adapted to sweep the separated cap onto the top of the can, and connections whereby the movement of said star wheel operates said separator and said plate, substantially as described.

3. The combination of a can conveyer and a cap dropper attached to the frame thereof, and including a star wheel adapted to be struck by the cans, a gear wheel operated by the movement of said star wheel, a pivotally-mounted vibrating separator for separating the lowest cap in a row, a gear wheel for operating said separator, connections between said gear wheels for vibrating said separator, consisting of a ring provided with a rack engaging said second named gear wheel, and connections whereby said first named gear wheel operates said ring, substantially as described.

4. The combination of a can conveyer and a cap dropper fastened to the frame thereof, said cap dropper including a star wheel adapted to be struck by the cans, a vibrating plate adapted to sweep a cap onto the top of a can passing underneath said cap, connections whereby the movement of said star wheel operates said plate, said connections being adjustable, substantially as described.

5. In a cap dropper, the combination of a chute adapted to receive a number of caps, a separator adapted to take off the lowest cap in said row, consisting of a vibrating body provided with overlapping sharp edges forming an interrupted screw, and means for vibrating said separator, substantially as described.

6. In a cap dropper, the combination of a chute adapted to contain a number of caps, and a separator for said caps consisting of a body portion inclined inwardly, and a separating portion provided with overlapping sharp edges forming an interrupted screw with tapering edges, and means for

vibrating said separator, substantially as described.

7. In a can cap dropper, the combination of a chute for holding a row of caps and a separator therefor, consisting of a top inclined downwardly and provided with a curved guard, a bottom portion provided with overlapping knife-edged portions forming an interrupted screw, and means for vibrating said separator, substantially as described.

8. In a can cap dropper, the combination of a chute provided with a hardened metal strip in its bottom said strip having its lower end bent, and adapted to contain a row of can caps, a hollow receptacle in which said chute is adapted to deliver, a separator within said receptacle including an inclined top and a body portion having overlapping sharp edges separated by a space, and means for vibrating said separator, substantially as described.

9. In a can cap dropper, the combination of a chute provided with a hardened metal adjustable strip in its bottom and adapted to contain a row of can caps, a hollow receptacle into which said chute is adapted to deliver, a separator within said receptacle including an inclined top and a body portion having overlapping sharp edges separated by a space, and means for vibrating said separator, substantially as described.

10. In a cap dropper, the combination of a hollow receptacle, a chute adapted to deliver caps into said receptacle, and a separator mounted in said receptacle, consisting of an inclined top, a body portion having overlapping sharp edges separated by a space from each other, means for adjusting said sharp edged portions, and means for vibrating said separator, substantially as described.

11. In a cap dropper, the combination of a chute, a hollow receptacle, a separator therein, a support on the bottom of said receptacle, a vibrating plate adapted to sweep a cap from said support, and means for vibrating said plate including a star wheel operated by the cans as they pass underneath the dropper, and connections between said star wheel and said plate for vibrating the latter, substantially as described.

12. In a cap dropper, the combination of a chute, a hollow receptacle into which said chute delivers, a separator located near the top of said receptacle, a plate extending underneath the hollow part of said receptacle, and a vibrating plate provided with a pin on its under side located above said first-named plate, substantially as described.

13. In a cap dropper, the combination of a hollow receptacle, a chute delivering thereinto, a separator mounted within said receptacle, a slide supported in the bottom of said receptacle, a vibrating plate provided with a pin on its underside, and means for

vibrating said plate, including a star wheel adapted to be struck by the cans as they pass along, and connections operated by said star wheel for vibrating said plate back and forth, substantially as described.

14. In a cap dropper, the combination of a hollow receptacle, a curved chute delivering into said receptacle, a slotted tube connected to said chute, a separator in said receptacle, a vibrating plate near the bottom of said receptacle, a star wheel operated by the cans as they pass underneath the dropper, and connections whereby the movement of said star wheel vibrates said separator and said plate, substantially as described.

15. The combination of a supporting frame, a can conveyer mounted therein, a bracket secured to said frame, a rod adjustably secured in said bracket, a bearing on said rod, a star wheel resting on said bearing and adapted to be struck by the cans as they are moved by the conveyer, a gear wheel operated by said star wheel, adjustable and yielding connections between said star wheel and said gear wheel, a chute, a separator, and a plate to sweep a cap onto each can as it passes underneath the dropper, and connections between said gear wheel and said separator and said plate for operating them, substantially as described.

16. In a cap dropper, the combination of a star wheel operated by the cans as they pass underneath said dropper, a gear wheel operated by the movement of said star wheel, a separator for removing the lowest one of a row of caps, a gear wheel connected to said separator, a ring provided with a rack engaging said gear wheel, and connections between said first-named gear wheel and said ring for operating said ring, substantially as described.

17. In a cap dropper, the combination of a supporting rod, a star wheel loosely mounted on said rod, a sleeve surrounding said rod and having a gear wheel on its lower end, adjustable connections between said sleeve and said star wheel, said sleeve being provided with recesses in its periphery, a second sleeve surrounding said first-named sleeve, and provided with a gear wheel near its upper end, a pin having a sharpened end adapted to project through said second-named sleeve into the recesses in said first-named sleeve, and a spring pressed plunger for yieldingly holding said pin in engagement with said first-named sleeve, substantially as described.

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

ELMER M. COBB.

Witnesses:

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