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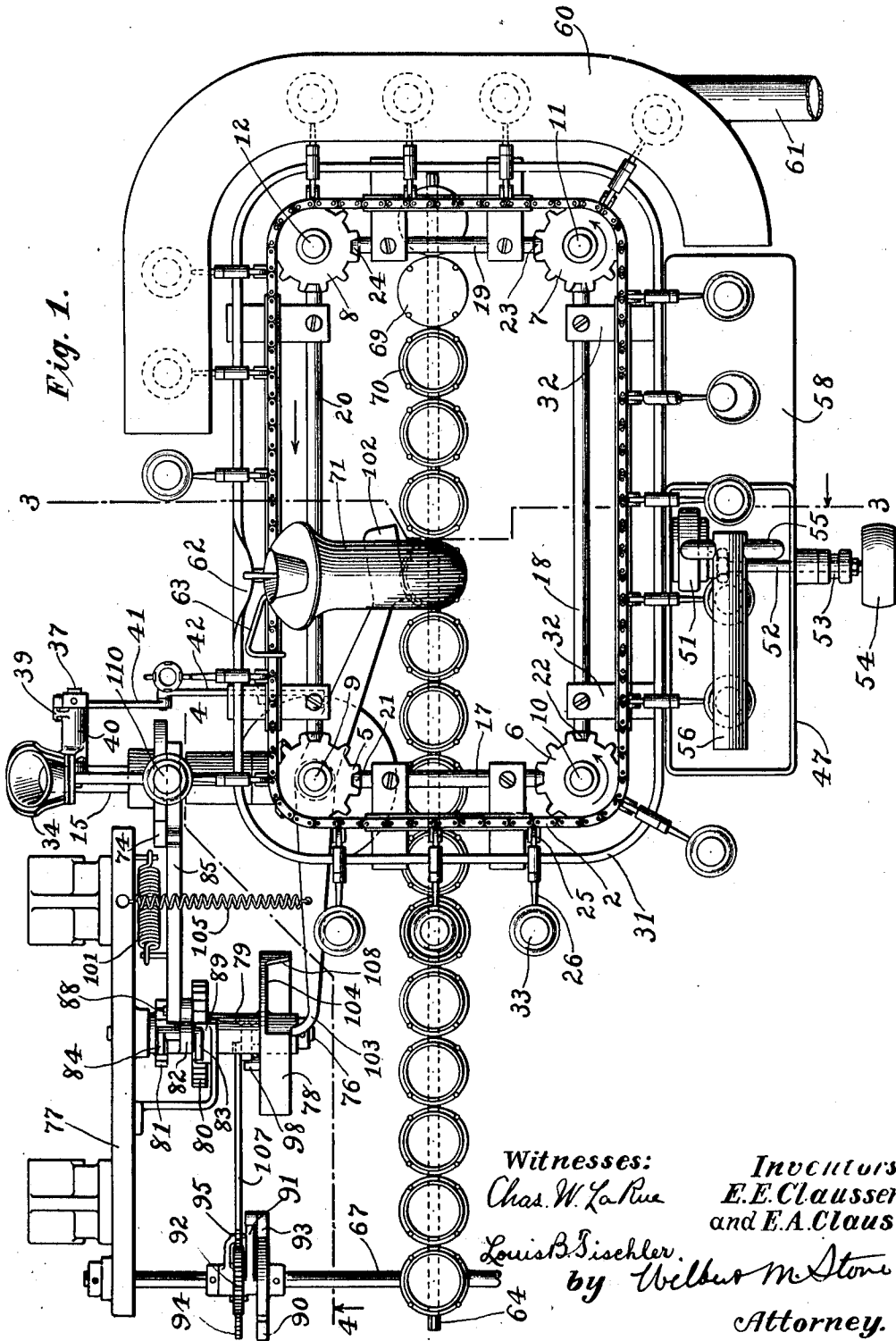
COATING MACHINE.

APPLICATION FILED DEC. 30, 1911.

1,055,320.

Patented Mar. 11, 1913.

3 SHEETS—SHEET 1.



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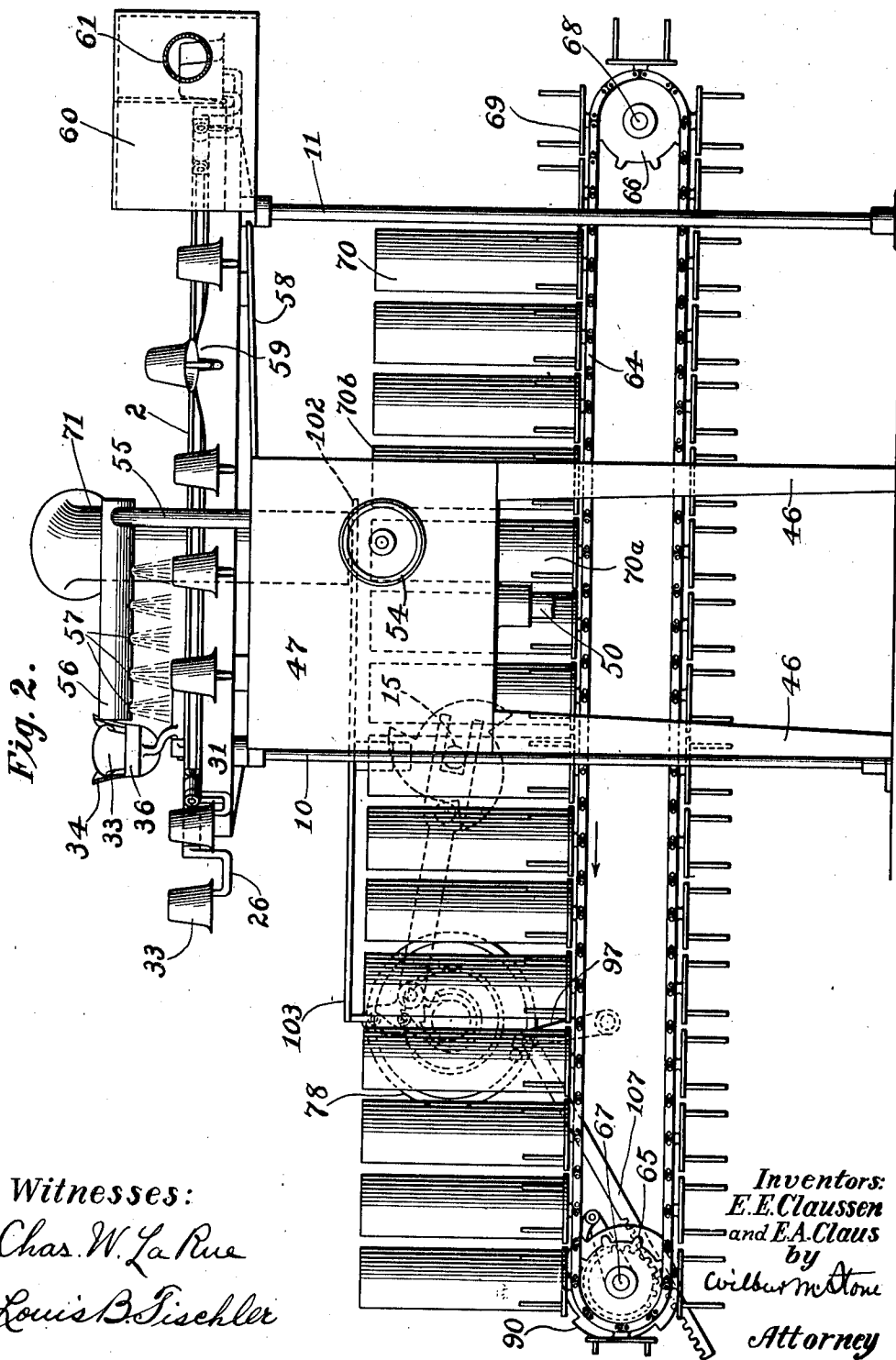
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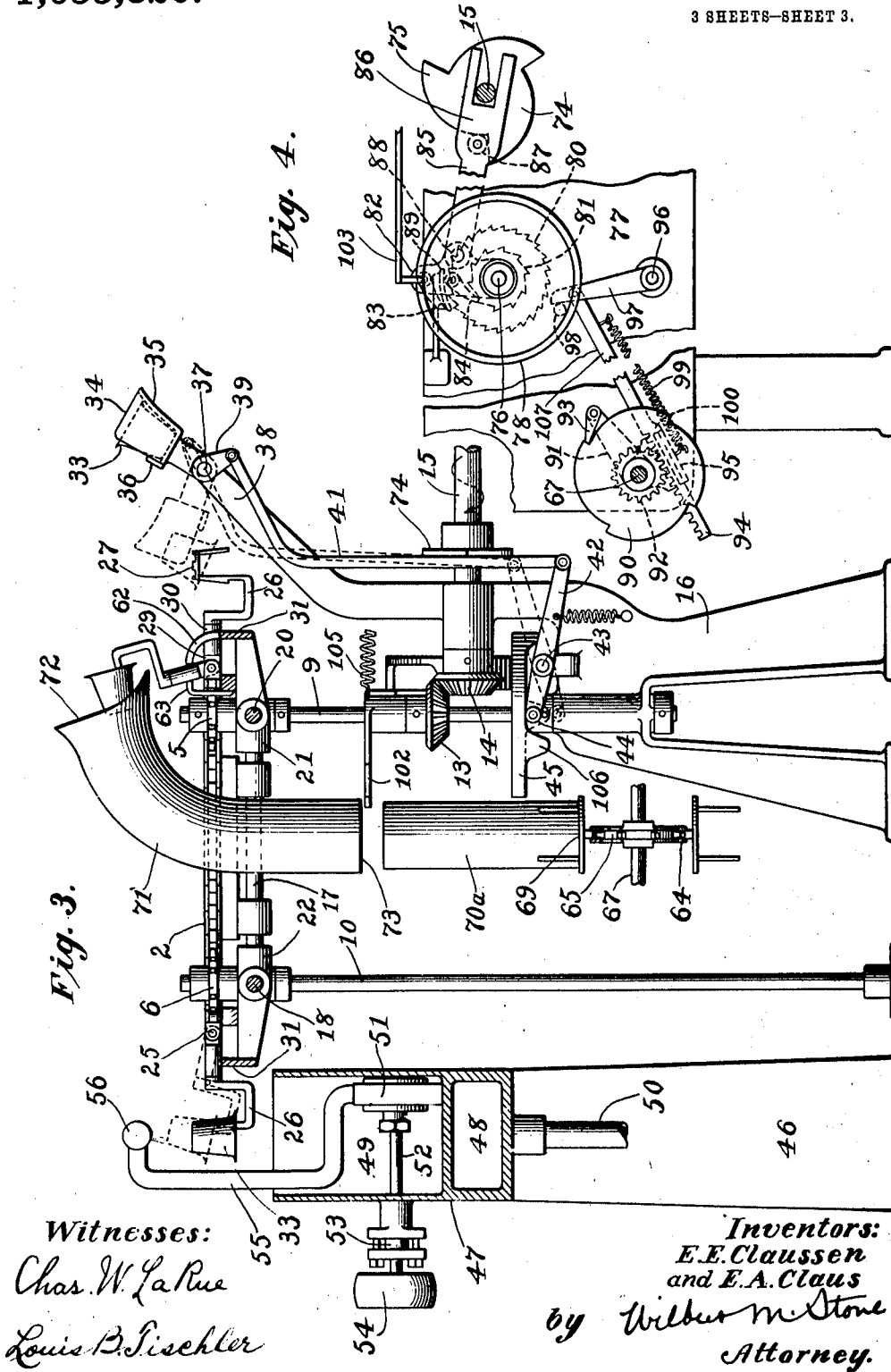


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UNITED STATES PATENT OFFICE.

EDWARD E. CLAUSSEN AND EMIL A. CLAUS, OF HARTFORD, CONNECTICUT, ASSIGNORS
TO PUBLIC SERVICE CUP COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW
YORK.

COATING-MACHINE.

1,055,320.

Specification of Letters Patent.

Patented Mar. 11, 1913.

Application filed December 30, 1911. Serial No. 668,778.

To all whom it may concern:

Be it known that we, EDWARD E. CLAUSSEN and EMIL A. CLAUS, citizens of the United States, and residents of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Coating-Machines, of which the following is a specification.

This invention relates to coating machines and particularly to machines of that class adapted for coating receptacles, such as paper cups, with waterproofing material, such as paraffin.

The object of the present improvements is to provide a machine of the class specified, substantially automatic in its operation and which rapidly and with a minimum of attention receives the articles to be coated, performs the several operations thereon, cools or dries them and packs them for commercial use.

To these ends our improvements comprise mechanisms and combinations of mechanisms illustrated in their preferred form in the drawings accompanying this specification, wherein—

Figure 1 is a general plan view thereof, Fig. 2 is a longitudinal elevation, Fig. 3 is a cross sectional elevation on line 3, 3 of Fig. 1, and Fig. 4 is a longitudinal sectional elevation of a portion of the mechanism, the section being taken on line 4, 4 of Fig. 1.

Our improved machine is planned and particularly adapted for receiving cups from some constant and uniformly timed source of supply, such for instance as a cup forming machine, for delivering said cups consecutively and bottom up to a traveling carrier, which carrier passes the cups under a shower bath of melted paraffin, after which the cups are cooled or dried and then discharged into successively presented packing receptacles, a predetermined number into each thereof.

A traveling carrier, comprising endless chain 2 mounted for movement preferably in the horizontal plane, on a plurality of sprockets as 5, 6, 7, 8, is actuated constantly in one direction. Said sprockets are mounted upon shafts as 9, 10, 11, 12, respectively. Said shafts 10, 11 and 12 are fixed shafts and serve also as corner posts for a portion of our improved machine. Sprockets 6, 7 and 8 turn freely upon the upper ends of

said shafts respectively. Shaft 9 has bevel gear 13 fixed thereto and said gear is driven by bevel gear 14 on main driving shaft 15. Shafts 9 and 15 have bearings in upright 16. Brace rods 17, 18, 19 and 20 have their ends fixed in angle brackets 21, 22, 23 and 24, as the case may be, thus forming a frame for the support of several parts of our improved machine. Said chain 2 has hinged thereon, as at 25, a plurality of cup supports as 26. Said supports are preferably S shaped, having a cup engaging portion 27 and a hinge portion 29. On the shank of said hinge portion we preferably mount a roll as 30 for engagement with rail 31. Said rail 31 is supported from rods 17, 18 and so forth by brackets as 32, 32 and the working face of said rail is parallel with the plane of chain 2, except at two points, which will be described later herein. Said rail 31 is efficient to sustain the cup supports, as 26, for conveying the cups, as 33, thereon, in bottom-upright positions, except at the two points noted above.

For delivering cups successively to successive supports, as 26, respectively, we provide the following means: Cup holder 34 has portion 35 thereof of similar contour to that of the cup to be held, but said portion has its delivery side cut away, leaving only a low front wall 36. Said holder 34 is pivoted adjacent to the path of cup supports 26, at 37 on arm 38 upstanding from upright 16, and has arm 39 projecting from hub 40 thereof. Said arm 39 is connected by link 41 with one end of lever 42 pivoted at 43 in upright 16. The other end of said lever bears roll 44 for engagement with cam 45 fixed to shaft 9. Said cam 45 has lobes 106 corresponding in number with the spacing of cup supports 26.

On that side of the machine opposite the cup delivery means just described, we have mounted upon legs 46, 46, container 47 for the coating liquor. As in some cases we contemplate the use of melted paraffin as a coating liquor we have illustrated said container or tank 47 provided with heating chamber 48 below container chamber 49, steam pipe 50 leading thereto and pipe 500 leading therefrom. Rotary pump 51 has its shaft 52 projecting through stuffing box 53 and said shaft is provided with pulley 54 on the outboard end thereof. Pipe 55 leads upwardly to discharge head 56 lo-

cated above said tank 47 and over the path of cup supports 26. Said head 56 is provided with a plurality of discharge holes 57 through the under side thereof. Drip table 58 extends from the upper portion of chamber 49 in the direction of travel of said supports 26 for catching and draining back into said chamber 49 the surplus portion of the coating liquor that runs off from the cups.

That portion of rail 31 opposite drip table 58 has its upper face at 59 raised above the adjacent portions of said rail, forming a cam for rocking on their hinges cup supports 26 as they pass thereover for tilting the cups so that the surplus coating liquor may be drained from their upturned bottoms. Just beyond said table 58, in the direction of travel of said cup supports 26, we provide a cooling or drying chamber 60 about the pathway of the cups on said supports. Said chamber is provided with inlet pipe 61 through which, when paraffin is used for coating, cold air is forced from some source of supply not shown.

Beyond the cooling or drying means, in the direction of travel of cup supports 26, is the cup discharging means comprising cam 62 in the upper face of rail 31. This cam 62 is similar to cam 59 but of greater height and is efficient to rock successively on their hinges cup supports 26 to a position beyond the vertical so that cups carried on said supports will be discharged therefrom. Opposite, cam 63 is efficient to engage said supports after they have been acted upon by cam 62 and return them to their normal path of travel on rail 31, ready to receive other cups for treatment.

For gathering and packing the coated cups discharged from cup supports 26 we provide a movable receptacle carrier comprising endless movable chain 64 preferably located lengthwise under cup support carrier 2. Said chain 64 is supported on opposite sprockets 65, 66 fixed to horizontal shafts 67, 68 respectively, and is provided with receptacle supports as 69 of some convenient pattern. The preferred receptacle comprises a tubular case 70 adapted for holding a predetermined number of cups. In the drawings, case 70^a is illustrated in receiving position on one of supports 69 of chain 64 opposite discharge cam 62. For guiding the discharged cups toward case 70^a we employ tubular chute 71 having bell-mouth 72 thereof conveniently located for receiving said cups at the point of discharge and having its lower end 73 slightly above and in registry with the mouth of said case 70^a.

For intermittently moving chain 64 to position receptacle supports 69 successively under lower end 73 of chute 71 we employ ratchet and pawl mechanism comprising ac-

tuating cam 74 fixed on main shaft 15. Said cam has a plurality of lobes 75 one for each passing cup support 26 on chain 2. Freely mounted on stud 76 outstanding from frame 77 cam 78 has fixed to hub 79 thereof a plurality of ratchets, two being shown, 80 having 25 teeth and 81 having 10 teeth. Between said ratchets and turning freely on hub 79 therebetween is pawl arm 82 carrying pawl 83 for ratchet 80 and pawl 84 for ratchet 81. Arm 85 having bifurcated end 86 in engagement with shaft 15 has roll 87 thereon for engagement with cam 74 and said arm is pivotally connected at 88 with pawl arm 82. Shoe 89 supported from frame 77 coacts with pawl 83 to hold said pawl out of engagement with ratchet 80 during a portion of the stroke of said pawl. One end of spring 101 is fixed to frame 77 and the other end to arm 85 for urging roll 87 to engagement with cam 74. On sprocket shaft 67 is fixed ratchet 90 and adjacent thereto pawl arm 91 has gear 92 fixed to the hub thereof for free oscillation on said shaft. Pawl arm 91 carries pawl 93 for engagement with ratchet 90. For oscillating gear 92 and arm 91 rack 94 is slidably supported for engagement with said gear by block 95 turning freely upon said shaft. Pivoted at 96 on frame 77 below cam 78, arm 97 reaches upwardly for engagement with pin 98 on the rear face of said cam. Extension 107 of rack 94 is pivotally connected to arm 97 near the upper end thereof. One end of spring 99 is fixed to extension 107 of rack 94 and the other end to block 95 for urging ear 100 of said rack downwardly to engagement with the heel of said block.

Pivoted freely on shaft 9 is gate 102 for holding one or more of the cups discharged from supports 26 by cam 62 in guiding means 71 during the movement of receptacle carrying chain 64. Said gate has arm 103 fixed thereto for engagement with said gate out of coaction with bottom 73 of chute 71 and spring 105, one end of which is fixed to frame 77 and the other end to arm 103, is efficient to move said gate into coaction with said bottom of chute 71 when permitted by depression 104 of cam 78.

The operation of our improved machine is as follows: Main shaft 15 being started in rotation in the direction of its arrow, Fig. 3, cup carrier chain 2 will move continuously in the direction of its arrow, Fig. 1, presenting cup supports 26 successively to receiving position 110 opposite cup delivery holder 34. Cups being supplied bottom down to said holder as needed, by hand or by mechanism not shown, lobe 106 of cam 45 through arm 42 and link 41 rocks cup holder 34 on its axis 37 from the full line position of Fig. 3 to the dotted line

position thereof, thereby tipping the cup therein against low front wall 36 and delivering it bottom up onto opposite support 26. Chain 2 continuing its uninterrupted movement about sprockets 5, 6, presently conveys the cups, on its successive supports 26, under discharge holes 57 of head 56. Chamber 49 having been previously supplied with paraffin and heated by the means described and pump 51 started in rotation, hot liquid paraffin is discharged from said holes 57 onto the cups passing thereunder. Said paraffin strikes the upturned bottom of the cup, flows down the side walls thereof, a portion lodging on the flanged rim and the surplus flowing back into chamber 49 or onto table 58 and thence back into said chamber. As said cups successively reach a position over said table 58 their respective supports engage cam 59 and are tilted upwardly to permit any surplus paraffin to flow off from the upturned bottom of the cup. See dotted position, Fig. 3. Chain 2 then passes around sprockets 7 and 8 conducting said cups into and through cooling chamber 60. Cup supports 26 then pass into engagement with cam 62 whereby said supports are tilted upwardly through more than ninety degrees, reaching their greatest throw when opposite mouth 72 of chute 71, into which the cup is delivered bottom down, Fig. 3. Said cup descends by gravity through said chute and into case 70^a thereunder. Supports 26 are then returned to their normal positions on rail 31 by engagement with cam 63.

Cases as 70 may be placed by hand on supports 69 respectively at the right hand end Fig. 2, and after receiving their predetermined supply of cups may be removed at the left hand end before chain 64 turns downwardly about sprocket 65.

The operation of the means for closing gate 102 when a predetermined number of cups have been deposited in case 70^a and for moving chain 64 for presenting a succeeding case in receiving position and then opening said gate to permit the cups accumulated in chute 71 to descend into said succeeding case is as follows: Assuming that it is desired to deliver to case 70^a as many cups as there are teeth in ratchet 80, pawl 84 of ratchet 81 is thrown backwardly out of engagement with its ratchet. Lobes 75 of cam 74 successively engage roll 87 of arm 85 to reciprocate that arm, and therefore pawl 83, once for each passing cup support 26 and therefore for each cup delivered into chute 71. The reciprocation of said arm 85 rocks pawl arm 82 about shaft 76 and causes pawl 83 to engage ratchet 80 and rotate that ratchet one tooth space at a time in anti-clockwise direction, Figs. 2 and 4. When said ratchet, and cam 78 rigid therewith, has made one complete revolution,

arm 103 moves into depression 104 of cam 78 by the pull of spring 105, causing gate 102 to close under bottom 73 of chute 71, thus cutting off the delivery of cups to the case thereunder. Directly following the closing of gate 102 pin 98 on the back of cam 78 engages arm 97, moving it to the right, Fig. 4, pulling rack 94, rotating gear 92 and pawl arm 91. This causes pawl 93 to engage and rotate ratchet 90 and sprocket 65. The upper run of chain 64 is thus moved to the left, Fig. 2, to replace filled case 70^a by the next succeeding and empty case 70^b. At the conclusion of this movement, arm 103 is engaged by inclined portion 108 of cam 78 and gate 102 is opened to permit those cups which have accumulated in chute 71 to fall into case 70^b. Thereafter cups continue to be delivered into said case until ratchet 80 and cam 78 have completed a second revolution when gate 102 is again closed and the several steps in the operation repeated. If it is desired to fill shorter cases than case 70 or if it is desired to put fewer cups into said case, corresponding in number for instance, with the number of teeth in ratchet 81, pawl 83 of ratchet 80 is thrown out of engagement and pawl 84 is thrown into engagement with ratchet 81, and the operation proceeded with as before. By this means cam 78 is given longer and correspondingly fewer incremental movements to complete one revolution.

We claim:

1. A coating machine including in combination, a traveling carrier, a plurality of cup supports mounted on said carrier, means for delivering cups successively to successive supports respectively, comprising a cup holder pivotally mounted adjacent to the path of said cup supports, means for rocking said holder on its pivot for delivering the cup onto a cup support, means for timing said cup delivery means with said carrier, a container for coating liquor, means for delivering the coating liquor from the container onto the cups, and means for discharging the cups from the cup supports.

2. A coating machine including in combination, a traveling carrier, a plurality of cup supports mounted on said carrier, a movable receptacle carrier, a plurality of receptacle supports thereon, means for intermittently moving said receptacle carrier, means for timing said receptacle carrier with said traveling carrier and means for changing said timing from one predetermined ratio to another predetermined ratio.

3. A coating machine including in combination, a traveling carrier, a plurality of cup supports mounted on said carrier, a container for coating liquor, means for delivering the coating liquor from the container onto the cups, means for discharging the cups from the cup supports, a movable re-

ceptacle carrier, a plurality of receptacle supports thereon, means for intermittently moving said receptacle carrier, means for timing said receptacle carrier with said cup discharging means, and means for changing said timing from one predetermined ratio to another predetermined ratio.

4. A coating machine including in combination, a traveling carrier, a plurality of cup supports mounted on said carrier, a container for coating liquor, means for delivering the coating liquor from the container onto the cups, means for discharging the cups from the cup supports, a movable receptacle carrier, a plurality of receptacle supports thereon, means for intermittently moving said receptacle carrier, means for timing said receptacle carrier with said cup discharging means, means for changing said timing from one predetermined ratio to another predetermined ratio, means for guiding the discharged cups toward the receptacle carrier, and means for holding one or more of the discharged cups in the guiding means during the movement of the receptacle carrier.

5. A coating machine including in combination, a traveling carrier, a plurality of cup supports mounted on said carrier, means for delivering cups to said supports, means for timing said cup delivery with said carrier, means for discharging the cups from the cup supports; a movable receptacle carrier, a plurality of receptacle supports thereon, means for intermittently moving said receptacle carrier, means for timing said receptacle carrier with said cup discharging means, a chute for guiding the discharged cups toward the receptacle carrier,

means for holding one or more of the discharged cups in the guiding means during the movement of the receptacle carrier comprising a movable gate for said chute, means for moving said gate into and out of operative position relatively to said chute, means for timing said gate with said receptacle carrier and means for changing said timing from one predetermined ratio to another predetermined ratio.

6. A coating machine including in combination, a traveling cup carrier, a movable receptacle carrier, a plurality of receptacle supports thereon, a receptacle carrier actuating shaft, a ratchet fixed thereon, means for discharging cups successively from said cup carrier into a receptacle on said receptacle carrier, means for timing said receptacle carrier with said cup carrier and for changing said timing from one predetermined ratio to another predetermined ratio including a ratchet shaft, a plurality of ratchets, varying from each other in the number of their teeth, fixed to said shaft, means operatively connected with the cup discharging means for rotating one or another of said ratchets one tooth space for each discharged cup, and means for actuating the receptacle shaft ratchet one tooth for each full revolution of the ratchet shaft.

Signed this 26th day of December, 1911, at New York, New York, before two subscribing witnesses.

EDWARD E. CLAUSSEN.
EMIL A. CLAUS.

Witnesses:

H. R. GARVIN,
LOUIS B. TISCHLER.