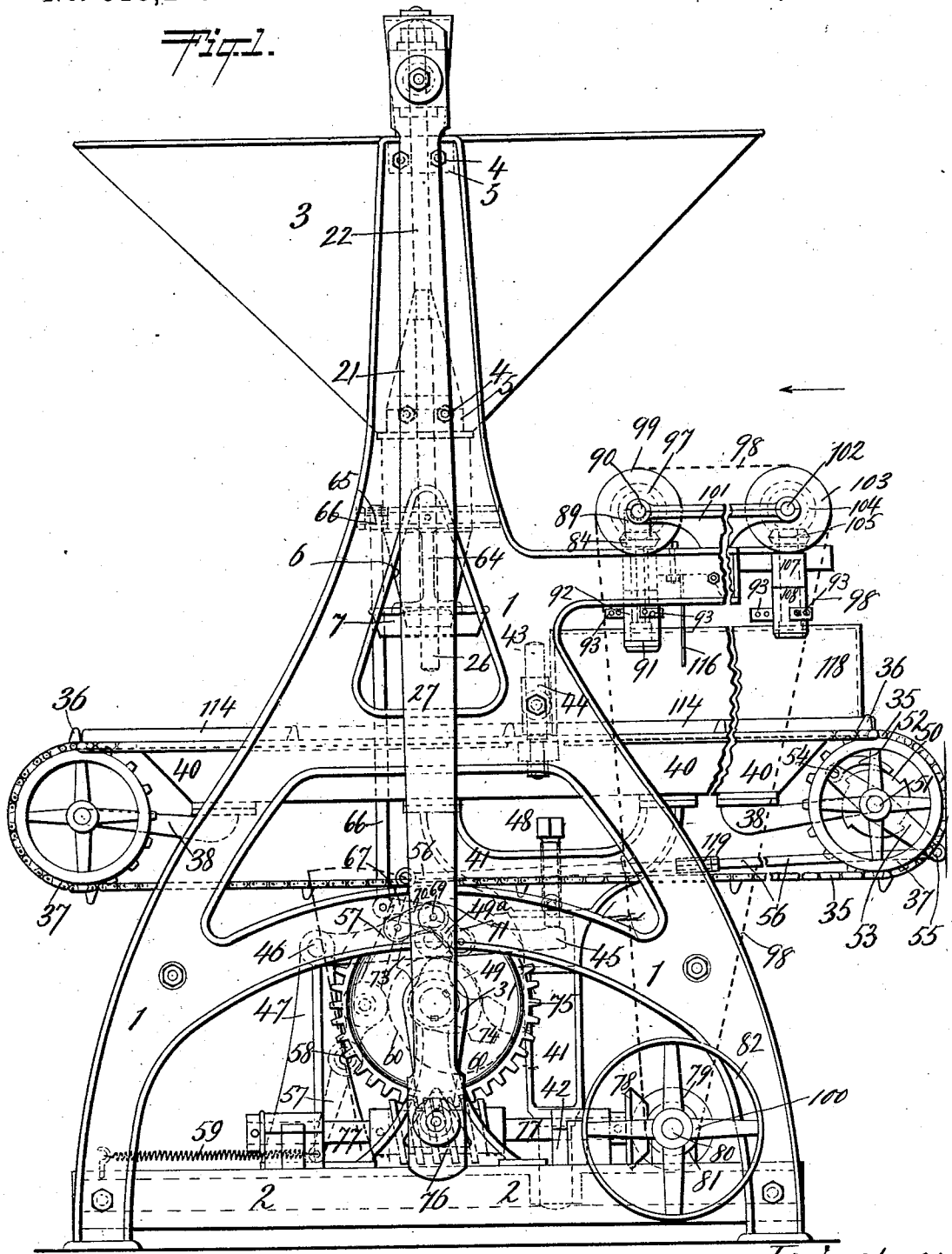
(No Model.) 6 Sheets—Sheet 1.

C. S. BUCKLIN.

CAN FILLING MACHINE.

No. 515,283. Patented Feb. 20, 1894.

Fig. 1.



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C. S. BUCKLIN.

CAN FILLING MACHINE.

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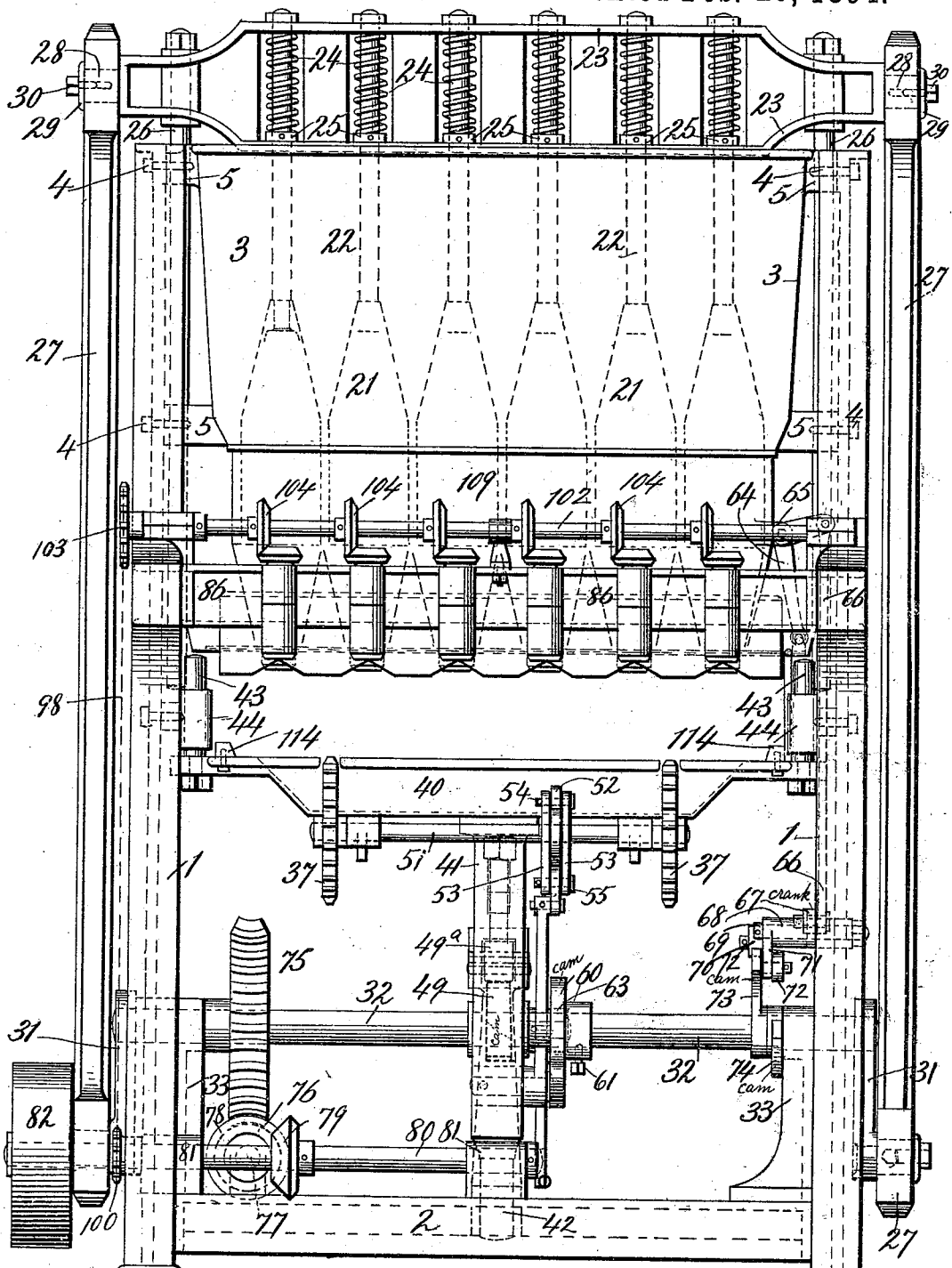

Fig. 2.

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C. S. BUCKLIN.

CAN FILLING MACHINE.

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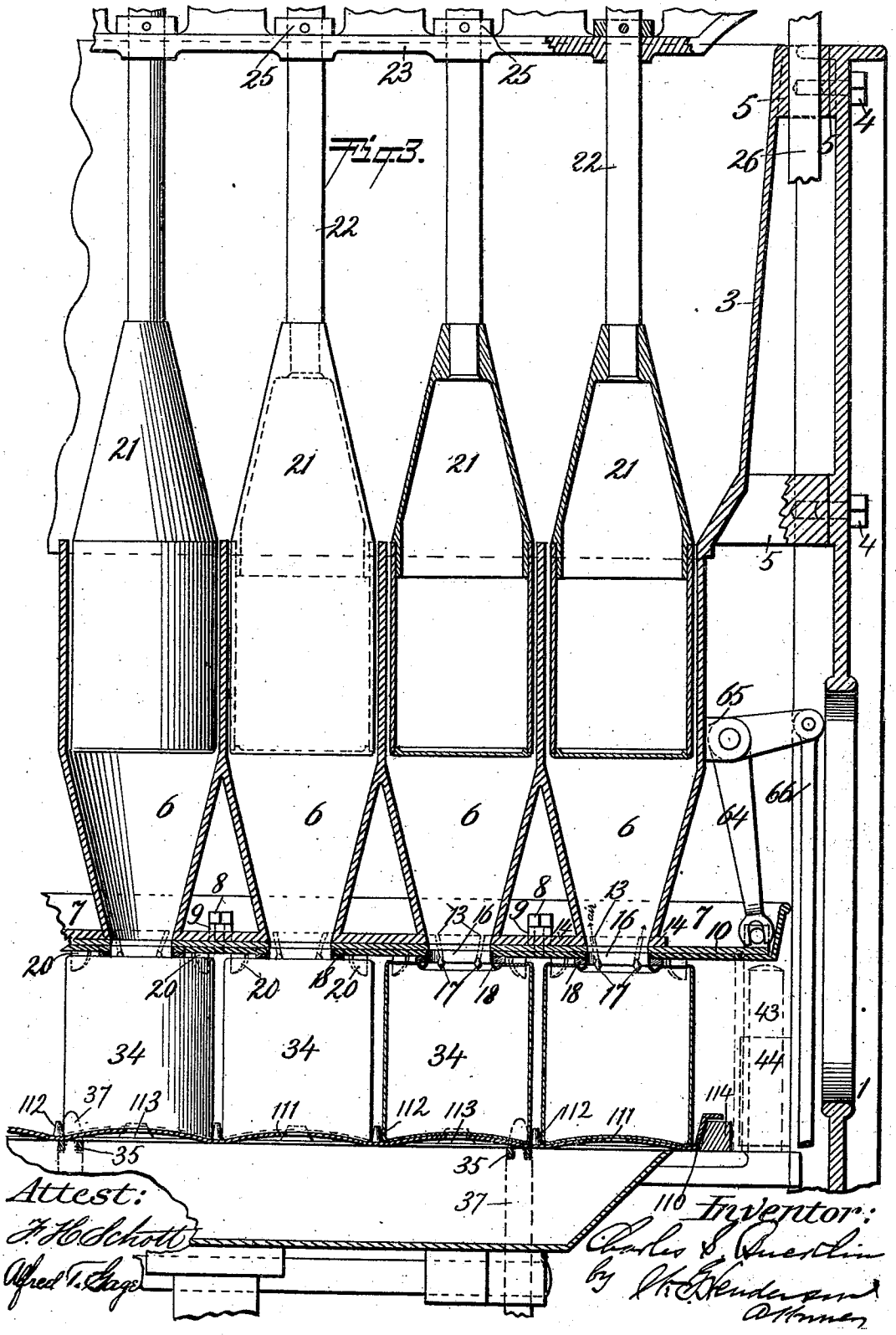

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C. S. BUCKLIN.

CAN FILLING MACHINE.

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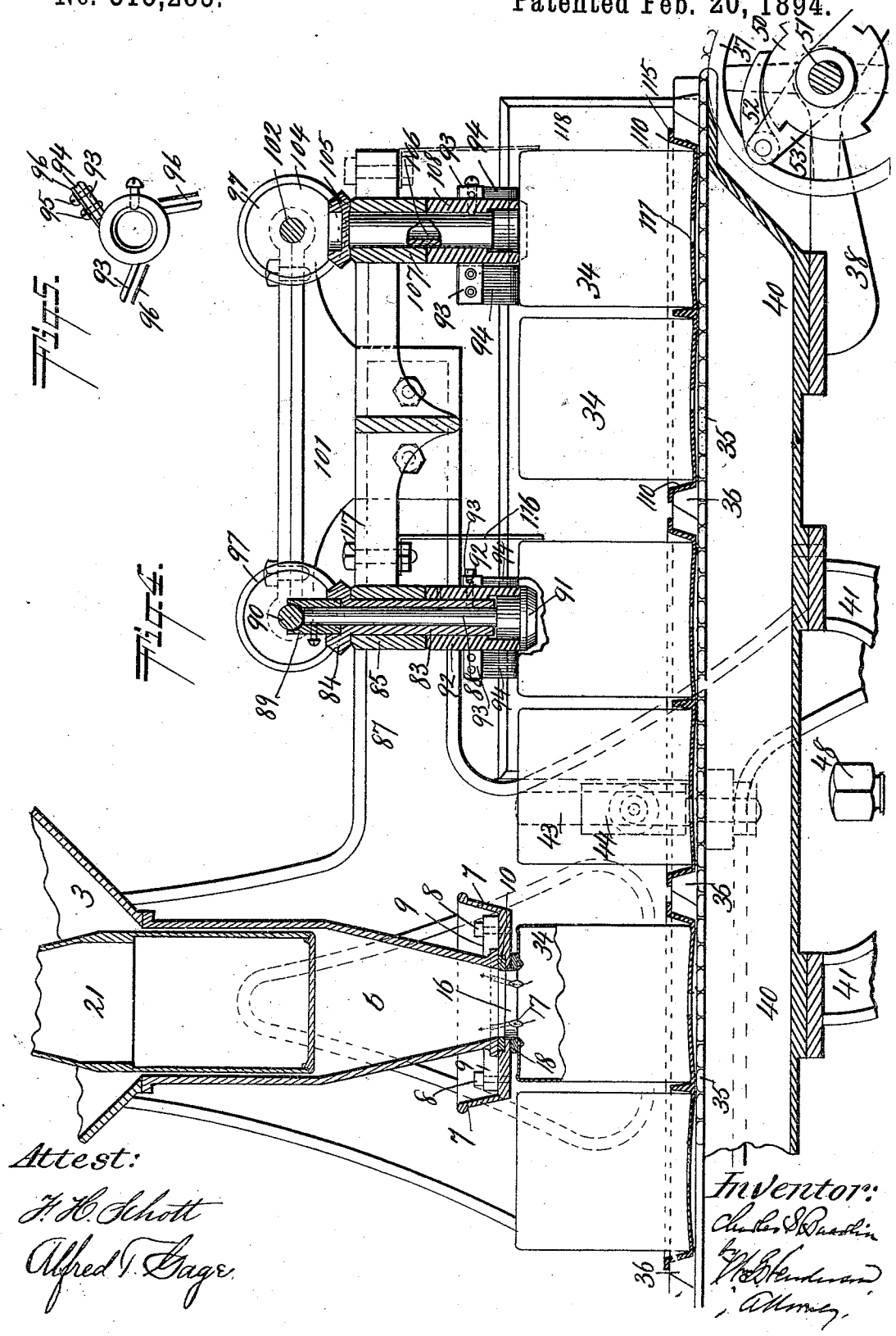

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CAN FILLING MACHINE.

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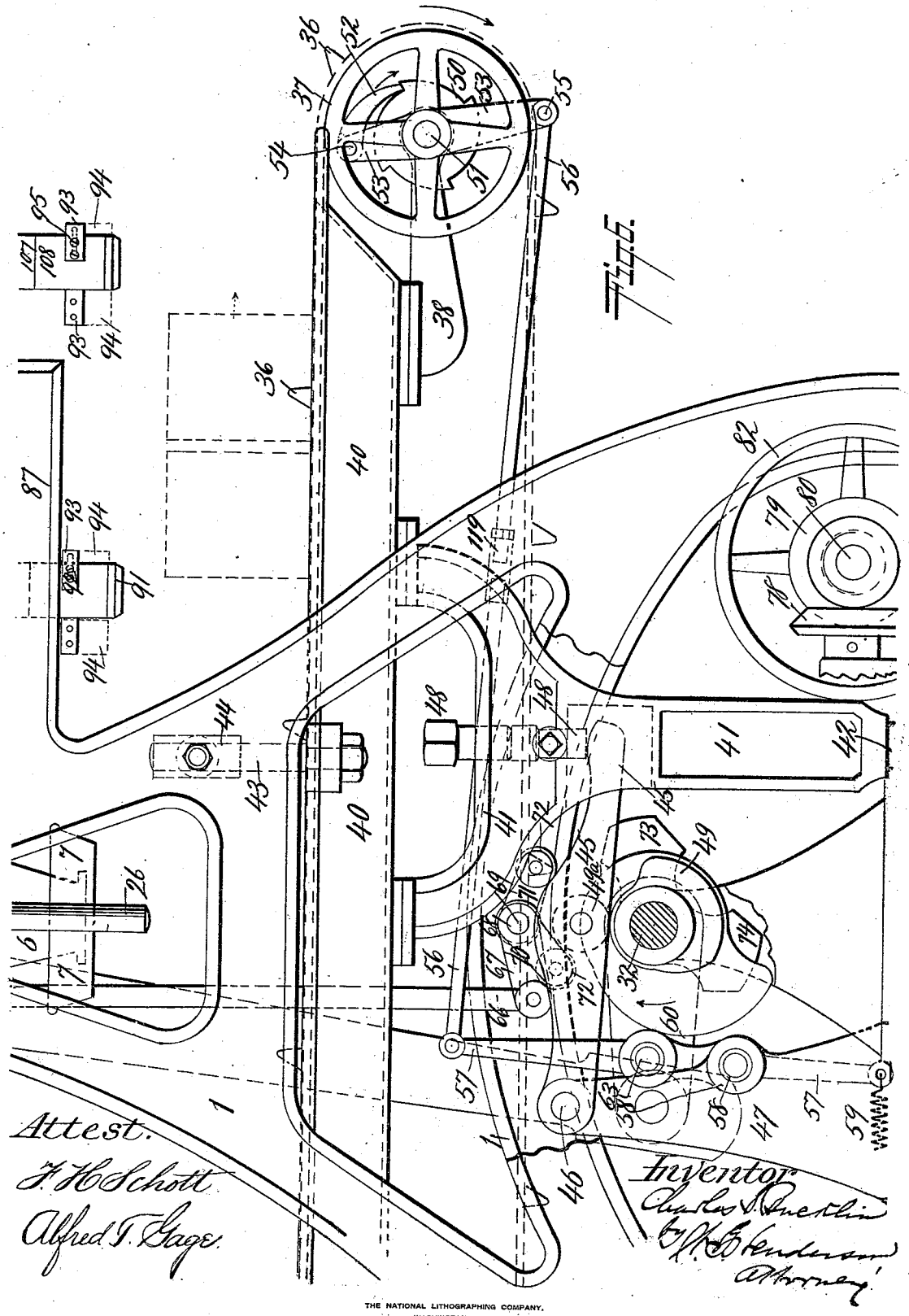

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C. S. BUCKLIN,

CAN FILLING MACHINE.

No. 515,283. Patented Feb. 20, 1894.

Fig. 7.

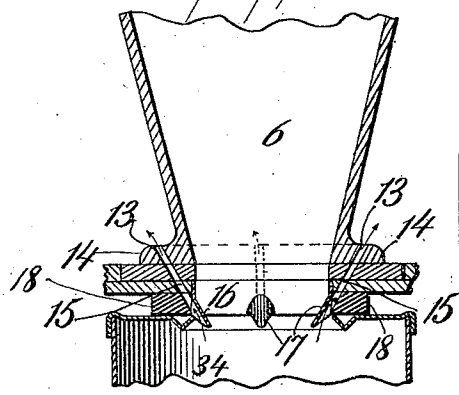


Fig. 8.

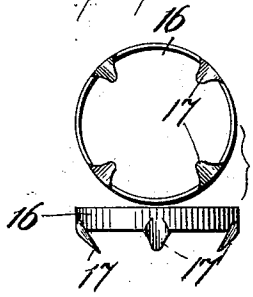


Fig. 9.

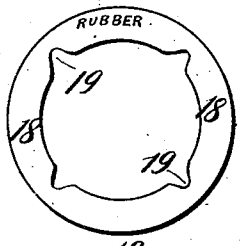


Fig. 10.

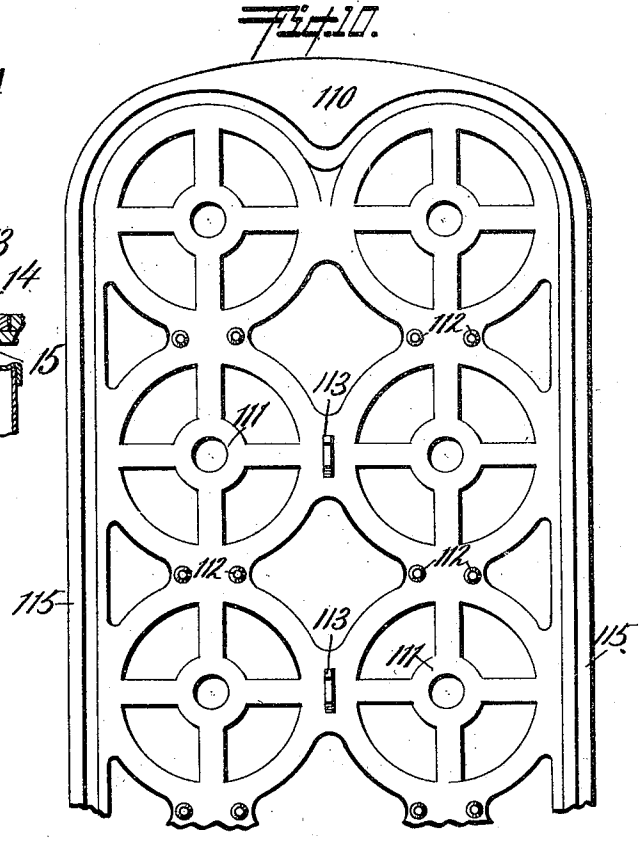


Fig. 11.

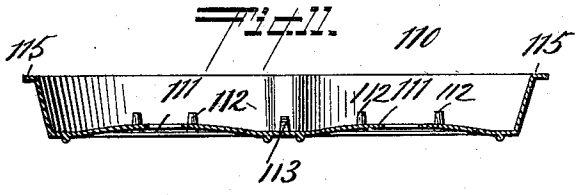


Fig. 12.

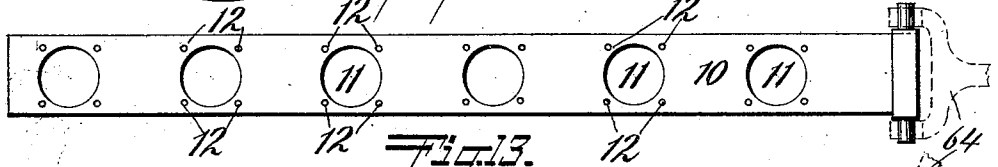
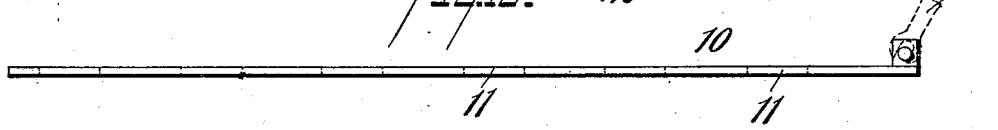


Fig. 13.



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THE NATIONAL LITHOGRAPHING COMPANY,
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UNITED STATES PATENT OFFICE.

CHARLES S. BUCKLIN, OF BALTIMORE, MARYLAND.

CAN-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 515,283, dated February 20, 1894.

Application filed March 22, 1893. Serial No. 467,189. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. BUCKLIN, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Can-Filling Machines; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in machines for filling cans with vegetables or other materials or substances for which it may be adapted, and it has for its object to provide a machine in which the filling, topping and wiping of the cans will be effected in the same machine and in succession by means automatically operated and timed in their movements to perform the several functions stated in proper order.

It has further for its object to provide improved means for venting the cans while being filled.

It has further for its object to provide for one or more of the plungers to yield in the event of one can being properly filled before another where a number of cans are being filled at the same time so that all the cans of the series may be properly filled without the undesirable results which would follow from one can being filled before the others if no provision were made for the yielding of the plunger in the can that should become first filled.

It has further for its object to provide for feeding the cans to the fillers by a step by step motion of varying strokes or steps so that the successive rows of cans in a tray will be properly fed to the fillers and allowance be made for the space between two trays in bringing a succeeding tray of cans to the fillers.

It has further for its object to provide for the filler, the topper, and a supplemental wiper in alignment with each other together with means for feeding the cans to said several devices in succession, and also in connection with such instrumentalities and separate trays for holding the cans to provide means for feeding each tray of cans to the filler, to the topper, and to the supplemental wiper by varying strokes or feeds so as to compensate for the varying spaces between the cans and each set of trays.

It has further for its object to provide for a vertical moving table sustaining and carrying in its movement the carrier which moves the cans under and then away from the filler.

It has further for its object to provide means for centering the can under the filler as it is lifted up to the filler; it has further for its object to provide a tray for holding a series of cans and constructed so as to prevent outward bulging of the bottom of the cans while being filled; and it has further for its object to improve generally the construction of the entire machine and of the several parts entering into the construction of the machine as will hereinafter more particularly appear.

To the accomplishment of the foregoing objects, the means found best adapted for the purposes will be hereinafter particularly described and the invention then sought to be clearly defined by the claims, reference being had to the accompanying drawings forming a part hereof in which—

Figure 1 is a side elevation of the machine with parts broken away. Fig. 2, is a front elevation looking in the direction of the arrow in Fig. 1. Fig. 3 is a front elevation of a portion of the machine looking in the direction of the arrow of Fig. 1, on a larger scale than Figs. 1 and 2, parts of the devices illustrated being in section. Fig. 4 is a side elevation of portions of the machine showing parts in section. Fig. 5 is a plan view of a portion of the wiper. Fig. 6 is a side view of a portion of the machine showing certain of the cans, levers and a portion of the vertically moving table with portions of other parts of the machine. Fig. 7 is a sectional view of a portion of a filler and a can showing the arrangement of the slide valve and air vent, the lip portion of the air vent being exaggerated. Fig. 8 is a side and a bottom view of the air vent ring showing the lips exaggerated. Fig. 9 is a plan view of the rubber gasket that fits around the air vent. Fig. 10 is a top plan view of a portion of the can tray. Fig. 11 is a cross section through the can tray. Fig. 12 is a plan view of the slide valve showing also air

vents therein and Fig. 13 is a side view of the same valve.

In the drawings the numeral 1 designates the side standards of the machine and 2 the base of the machine bolted to the side standards. Between the upper ends of the standards is placed the hopper 3, it being secured to the standards by bolts 4 passing through the standards and into extensions 5 projecting from the opposite sides of the hopper. From the bottom of the hopper depend the tubes or fillers 6 the lower portions of which taper, and around the discharge mouth of the fillers is placed the pan 7 which is held in place by bolts 8 which secure the pan to webs or lugs 9 projecting from the sides of the fillers. The bottom of the pan is provided with openings corresponding to the discharge mouths of the fillers, and a slide valve 10 moves in suitable grooves or a way between the bottom of the pan and the fillers as illustrated clearly in Fig. 3 of the drawings, which valve is formed with openings 11 which register with the discharge mouths of the fillers when the material is to pass into the cans, the spaces between the openings serving to close the discharge mouth of the fillers when the material is not to pass into the cans. The valve is also formed with air vents 12 which are caused to register with vents 13 in the flanges 14 of the fillers and with vents 15 in the bottom of the pan when the valve is in position to permit the passage of the material so that the cans may be vented while being filled. An annular ring 16, preferably of sheet metal, is fitted in each opening in the bottom of the pan and it is formed with downwardly extending lips 17 which are inclined inwardly and formed concave on their outside faces so that the concavity will form a portion of the air vent leading from the can through the flange 14 of the fillers. These lips constitute shields for the lower portion of the air vents so as to keep the material away from the air vents while the cans are being filled and thus provide a better venting of the cans than otherwise. The position of these lips with reference to the cans is clearly illustrated in Fig. 7 of the drawings although there shown on an exaggerated scale. A gasket 18 is fitted around a portion of the annular ring which projects below the bottom of the can and has portions cut away as illustrated at 19 in Fig. 9 so as not to interfere with the vent, the gasket permitting close contact with the top of the can during the filling operation.

In order to center the can while being brought into position under the filler and thus insure the mouth of the can being brought directly under the discharge mouth of the filler, lugs or projections 20 are formed on the under side of the bottom of the pan in such position that the upper portion of the can will strike against the lugs or projections which bearing against the sides or top edge of the can will shift or move the can laterally so as to bring its mouth directly under the mouth of the filler if from any cause it should be slightly to one side of a satisfactory register therewith in being lifted into position. There is preferably employed four of these lugs or projections arranged in the position indicated in Fig. 3 of the drawings, and the inner faces of these lugs or projections are tapered or curved so as to more satisfactorily adjust the cans to their proper positions under the fillers.

A plunger 21 is provided for each of the tubes or fillers which may be of any suitable construction, a very good construction however being illustrated in Fig. 3 where two of the plungers are shown in section. The shafts or rods 22 of these plungers pass through a cross head 23 by which they are raised and lowered in unison. These rods are free to move vertically in this cross head independently of each other so that if one can should become filled before another the plunger can yield during the period that the other can is being filled and thus avoid undue pressure of the plunger on the can first filled during the period that the other cans are filling. Each plunger is placed under an elastic or spring pressure which may be afforded by a spring coil 24 encircling the upper portion of each rod between the upper and the lower portion of the cross head, said spring bearing at its lower end against a collar 25 secured by a set screw or otherwise to the rod and at its upper end bearing against the cross head. The tension of these springs will be such that the plungers will be held sufficiently firm to discharge their functions in the filling operation under ordinary conditions but should one can be filled before the other then the spring of the plunger to that can will yield to the pressure from below so as to avoid the undue pressure before referred to while the other cans are being filled. The tension of these springs can be regulated by adjusting the collars 25 as is obvious. The cross head 23 is guided in its vertical movement by guide rods 26 bolted to opposite ends of the cross head and passing freely through guides which may be collars bolted to the inside of the upright standards 1 or which may be afforded by the extensions 5 of the hopper 3, said extensions being formed with openings for the free reciprocation of the guide rods therein. The cross head carrying the plungers is moved up and down by means of pitmen 27 through the upper ends of which will pass studs or pins 28 extending from the ends of the cross head, washers 29 and bolts 30 entering said studs or pins serving to hold the pitmen thereto. The lower ends of these pitmen are secured by corresponding washers and bolts to the crank arms 31 which derive motion from a shaft 32 to the ends of which they are connected, and thus it will appear as said cranks are turned with the shaft 32 the plungers are raised and lowered to discharge their functions. The shaft 32 has its bearings in suitable boxes supported by the standards 33.

The cans designated by the numeral 34 are brought to the fillers and after being filled carried therefrom by a carrier of suitable construction, the preferred construction being an endless carrier composed of the two sprocket chains 35 each provided with the studs 36 and sustained at opposite ends by the sprocket wheels 37 which are journaled in suitable arms 38 extending from the under side of the pan 40. This pan 40 is supported upon a suitable table which has a vertical movement so that as the cans are brought under the fillers the table can be lifted so as to bring the mouths of the cans next to the mouth of the fillers to receive the material and the table then lowered so that the cans will be taken away from the fillers and be free to be moved forward to the topping device and wiper while other cans may be brought under the fillers to be raised to the fillers in the next upward movement of the table and so in succession so long as the machine is operated. The preferred form of table is a yoke 41 on which the pan rests and to which it is secured, said yoke having a stem 42 at its lower end which will work in a suitable guide, for instance an opening formed in the base 2, in order that the yoke may be guided in its vertical movements. It will be observed that by this construction, the sprocket wheels and the endless carrier are sustained by and carried with the table which moves the cans up to and down from the fillers. The pan 40 is also sustained and carried by the table and is guided in its vertical movements by the pins or rods 43 which work in suitable collars 44 bolted to the side standards 1, which construction also tends to steady the table 41 in its vertical movements. The table is raised vertically at the proper time to bring the mouth of the cans next to the mouth of the fillers through the instrumentality of a lever 45 fulcrumed at 46 to a standard 47. This lever at its free end bears against the lower end of a stud or bolt 48 attached to the table 41 although it might bear against some other suitable part of the table. It is preferred however to employ this bolt or stud which is made adjustable so that by lengthening or shortening it the extent of the upward movement of the table may be regulated to accommodate cans of different heights or other conditions that may make it desirable to control the extent of the vertical movement of the table. The lever 45 is lifted at the proper time by means of a cam 49 suitably formed for the purpose, which cam is keyed to the shaft 32 and bears against a friction roller 49^a secured to the lever. The table is let down gradually by gravity at the proper time, the bearing face of the cam being suitably formed for that purpose.

The endless carrier for the cans is fed or moved under a step by step motion by means of a ratchet 50 secured to the shaft 51 which carries the sprocket wheels 37 at one end of the machine, and a pawl 52 made to engage the ratchet through the instrumentality of an arm 53 preferably composed of the two plates shown as journaled on the shaft 51, to the upper ends of which arm or plates the pawl will be attached by the bolt 54 while to the lower ends of the same arm or plates will be connected by means of a bolt 55 one end of a rod 56 the other end of which is connected to the upper end of a lever 57 fulcrumed at 58 to the standards 47 and having its end below said fulcrum connected with a spring 59 which will retract the lever 57 after it has been moved from its normal position by a cam 60 secured by a set screw 61 to the shaft 32 bearing against a friction roller 63 secured to the side of the lever 57. This cam 60 is formed, for instance as shown, so as to time the step by step movement of the endless carrier to move the cans under the fillers and let them stand thereunder during the period required to lift them up to the fillers and then down from the fillers and then away from beneath the fillers and so on in succession during the operation of the machine.

The cans are supported upon the endless carrier by means of trays, the construction of which will be hereinafter described. These trays are designed to contain two rows of cans and as the space between the adjacent end rows of cans in the two trays is not the same as the space between the two rows of cans in one tray it is necessary to compensate for the difference in order to bring the cans in proper position under the fillers, as well as under the topping device and the wiper hereinafter described, and to effect that result the endless carrier should be given a long and then a short stroke, the short stroke being sufficient for the space between the two rows of cans in one tray and the long stroke being for the space between the cans of adjoining trays. The preferred manner of effecting this irregular step by step movement is to form the ratchet 50 with its teeth at varying distances apart as clearly indicated in Fig. 1 of the drawings. By this construction the pawl will move from its normal position indicated in Fig. 1 of the drawings forward to the position of the nearest tooth indicated in the same figure without effecting any movement of the carrier while the pawl traverses that space and after coming in contact with that tooth it will move the ratchet the distance of the space between that tooth and the tooth next in advance of it which will give the short movement through which it traverses. This movement brings the tooth of the ratchet shown as back of the point of the pawl to the position indicated by the point of the pawl in Fig. 1 of the drawings so that when the pawl is retracted to its normal position by the spring 59 it will engage with the tooth of the ratchet brought to that position and act thereon to turn the ratchet which will be moved from that point the distance of the long space between the ratchet teeth which will make the long stroke of the carrier and so on in succession. This movement applies

to bringing the cans under the topping device and then under the supplemental wiper as well as to bringing them in the first instance under the fillers.

The slide valve 10 previously described is operated by means of a bell crank lever 64 which may be fulcrumed to an ear 65 extending from the side of the end filler, the short arm of which lever is connected by a rod 66 with an arm 67 extending from a sleeve 68 turning on a stud 69 extending from the standard 1. This collar 68 has also extending from it two arms 70 and 71 extending in opposite directions and forming a bell crank lever each of which arms has connected to its free end a friction roller 72. The two arms of this lever lie in different planes so as to bring the friction rollers in the path of travel of the two cams 73 and 74 keyed to the shaft 32 in order that said cams in their rotation may act one upon the friction roller of the arm 70 to move the slide valve 10 in one direction through the instrumentality of the arm 67, rod 66 and bell crank lever 64 which movement at the same time throws the other arm 71 so as to bring its friction roller in position to be acted on by the cam 74 which acting on the friction roller carries down the arm 67 and rod 66 so as to move the lever 64 to shift the slide valve 10 in the opposite direction, and thus in alternation the slide valve will be opened and closed for controlling the flow of the material from the fillers into the cans, said cams and levers being so formed, for instance as illustrated, as to cause the slide valve to move at the proper times for opening and closing the mouths of the fillers. The main drive shaft 32 is provided with the toothed wheel 75 which derives motion from the worm 76 on the shaft 77 which is journaled in suitable boxes at the base of the machine and is provided with a bevel gear 78 meshing with a corresponding gear 79 on the shaft 80 journaled in boxes 81 and having at its end the band wheel 82 to which motion is transmitted from the source of power. After the cans have been filled and moved down from the mouth of the fillers they are moved from beneath the fillers and to a position beneath the topping devices and when the table is next lifted, one row of the filled cans is brought up to the topping devices for the same to discharge their functions. There are provided as many toppers as there are cans, and each topper is composed of a hollow shaft 83 provided at its upper end with a bevel pinion 84 and passed through a collar or sleeve 85 supported from the bar 86 extended across the machine and sustained by extensions 87 of the standards 1. Through these hollow shafts 83 passes a shaft 88 having secured to its upper end by a set screw, a yoke or fork 89 which will fit around transverse shaft 90 so that the shaft 88 will be prevented from rotating. The lower end of the shaft 88 carries a plug 91 designed to fit inside of the mouth of the can for the topping operation.

To the lower portion of the hollow shaft 83 is attached a sleeve 92 by means of a set screw or other means so that said sleeve will rotate with the hollow shaft 83. This sleeve 92 is provided with lateral wings 93 to which strips of rubber 94 or other suitable material are secured by means of screws 95 and washers 96 or other suitable means. These strips of rubber are designed to bear against the top of the can around the opening therein so as to clean the tops of the material that may overflow or be forced out of the can, and the rubber strips therefore may be termed wipers. Rotation is given to the hollow shafts 83 by beveled wheels 97 attached to the transverse shaft 90 to which rotation is imparted by a sprocket chain 98 engaging the sprocket wheel 99 on the end of the shaft and the sprocket wheel 100 on the power shaft 80. The shaft 90 is journaled in suitable boxes at one end of the brackets 101 formed as a part of the cross bar 86. The opposite ends of the brackets 101 sustain in suitable boxes a shaft 102 which has motion transmitted to it by the sprocket chain 98 which passes from the sprocket wheel 99 of the shaft 90 to the sprocket wheel 103 on the end of the shaft 102. This shaft is provided with a series of bevel gears 104 which mesh with the bevel pinions 105 on the shaft 106 which passes through collars 107 sustained by the cross bar 86 supported from the extensions 87.

To the lower ends of the shafts 106 are secured the sleeves 108 by means of set screws, and these sleeves are provided with wings 93 and wipers 94 secured thereto in like manner as the wipers are secured to the wings of the sleeves 92 of the topping device. These supplemental wipers operate in the same manner as the wipers attached to the toppers and remove any of the material that the first set of wipers fail to remove so that the cans will be delivered from the machine practically wiped of all the material that may have been deposited on the top of the cans.

The toppers and the supplemental wipers are arranged in alignment with the fillers and at such distances therefrom and from each other that the cans will be fed first to the topping devices from the fillers and then from the topping devices to the supplemental wipers in the step by step movement hereinbefore described. This allows the cans to be expeditiously filled, then topped and afterward wiped by automatic mechanism so that the necessity of handling the cans during any of these three operations performed in successive steps is avoided. The mechanism as before stated is so timed that the varying feed of the cans applies to all three of the devices named, that is, to the filling, to the topping, and to the final wiping devices. The transverse shafts 90 and 102 may also have a bearing in the brackets 109 sustained by the cross bars in which the topping and wiping shafts are journaled.

The cans to be filled are placed in trays

which are carried by the endless carrier hereinbefore described. These trays are designated by the numeral 110, and as illustrated, are formed so as to contain two rows of cans of six rows each although they may be formed to contain a greater or smaller number of cans. They are each formed with a series of raised seats 111 arranged side by side so as to fit up into the arched bottoms with which the cans are formed so as to prevent said bottoms being bulged or forced outward while being filled. These seats are preferably opened as illustrated so as to make the tray light and economize material also to permit any overflow of the material from the can to pass through the bottom of the tray into the pan 40 across which the trays are moved by the endless carrier described. The raised seats are provided at their meeting edges with studs or pins 112 along each row of the seats, and between the rows there is provided studs 113. The pins tend to properly space the cans so that if some of the cans should be too small to fill the tray the pins will bring them to the same center as the larger cans. Guides 114 are preferably employed along the opposite sides of the top rim of the pan 40, and the ends of the trays bearing against the inner face of said guides, the trays are held better in place. The trays are carried across the pan 40 by the endless carrier described and the studs or pins 36 of said carrier bearing against the sides of the pans assist in moving the trays with a positive action, and these studs or pins also serve to prevent the trays from crowding one against the other.

In order to prevent the material that may be removed from the tops of the cans by the wipers at the topping devices and also at the auxiliary wipers from being thrown onto the cans that have just been wiped, a pendant apron 116 is suspended so as to lie between the two rows of cans to act as stated, which apron may be sustained from the extensions 87 or a support secured thereto by bolts 117 as illustrated in Figs. 1, 2 and 4 of the drawings; and upright plates 118 may be supported at opposite sides of the cans along the topping and auxiliary wiping devices as indicated in Fig. 1 of the drawings.

The position of the vertically moving table and of the cans while the latter are being filled, topped and wiped is indicated in Figs. 1, 2, 3, and 4 of the drawings, and the position of the table in its lowered position is indicated in Fig. 6 of the drawings.

The rod 56 which connects the arm 53 of the pawl 52 with the lever 57 is preferably formed in two parts connected together by a turn buckle 119 by which the length of the rod may be regulated as desired.

The construction of the several parts and their arrangement have been described in detail but it is to be understood that the invention is not confined to such details in all the particulars described as changes therein may be made without departing from the essential features of the invention, although the particular construction by which the invention has been illustrated is preferred as the same is believed to be the best form of the invention.

Having described my invention and set forth its merits, what I claim is—

1. In a can filling machine, the combination of a filler, a topper beyond the filler, a wiper beyond the topper, means for raising and lowering the cans under the filler, topper and wiper, and means for automatically feeding the cans while lowered successively from the filler to the topper and then to the wiper by an intermittent motion that permits the cans to stand at rest while being filled, topped and afterward wiped, substantially as and for the purposes described.

2. In a can filling machine, the combination of a filler, a topper beyond the filler, a wiper beyond the topper, means for raising and lowering the cans under the filler, topper and wiper, and means for feeding the cans from one of said devices to the other, while the cans are lowered, by a varying stroke movement to compensate for the varying spaces between the cans, substantially as and for the purposes described.

3. In a can filling machine, the combination of a filler, a can support sustaining the cans at varying distances apart, means for raising and lowering the cans to and from the filler, and means thrown into action periodically, while the cans are lowered, for feeding the cans to the filler by a varying movement that compensates for the varying spaces between the cans, substantially as and for the purposes described.

4. In a can filling machine, the combination with a filler, a combined topper and wiper, and an auxiliary wiper, or means for simultaneously moving the cans in proper time from the filler to the combined topper and wiper, and then to the auxiliary wiper, whereby the four operations of filling, topping and wiping and auxiliary wiping are performed simultaneously, substantially as and for the purposes described.

5. In a can filling machine, the combination of a filler, a combined topper and wiper comprising a shaft held against rotation and bearing a plug at its lower end to enter the mouth of the can, and a sleeve revoluble around said shaft and carrying the wiping device, and means for moving the cans from the filler to said combined topper and wiper, substantially as and for the purposes described.

6. In a can filling machine, the combination of a filler, a plurality of wipers arranged one beyond the other, means connecting the wipers for transmitting motion from one to the other, and means for feeding cans from the filler to the wipers in succession and holding them temporarily under each wiper, substantially as and for the purposes described.

7. In a can filling machine, the combination

of a filler, a wiper, a shield or apron located to lie between the wiped and unwiped cans, and means for bringing the shield and cans in such relation to each other that at periods the shield will be between the cans while at other times the cans may be moved past the shield, substantially as and for the purposes described.

8. In a can filling machine, the combination of a filler, a carrier for moving cans under and from under the filler, and a vertically moving table sustaining said carrier and serving to lift the cans toward and from the filler, substantially as and for the purposes described.

9. In a can filling machine, the combination of the filler, a carrier for moving the cans under and from under the filler, a pan across which said carrier travels, and a vertically moving table sustaining said pan and carrier, substantially as and for the purposes described.

10. In a can filling machine, the combination of a filler, a can carrier comprising sprocket chains and sprocket wheels, a pawl and ratchet for transmitting motion to said carrier, and a vertically moving table sustaining said sprocket chains and wheels and pawl and ratchet, substantially as and for the purposes described.

11. In a can filling machine, the combination of a filler, a vertically moving table for lifting the cans to and from the filler, a yoke upon which said table rests, a lever for raising said yoke to lift the table, and an adjustable stud or bolt adapted to be adjusted without disconnecting the parts to sustain the table at a higher or lower point as desired, to regulate the extent of movement of the table, substantially as and for the purposes described.

12. In a can filling machine, the combination of a filler, a vertically moving table to lift the cans to and from the filler, a lever to move the said table, a cam to actuate said lever at the proper time, an adjusting member to regulate the limit of movement of the table, said member being located to serve as a bearing for the free end of the lever to act on to lift the table, and means for automatically operating said cam, substantially as and for the purposes described.

13. In a can filling machine, the combination of a filler, a can carrier, a pawl and ratchet for transmitting motion to said carrier, a lever actuated by a cam to move the carrier at the proper time, means connecting said lever with the pawl and ratchet, and a vertically moving table sustaining said can carrier and moving it to and from the filler substantially as and for the purposes described.

14. In a can filling machine, the combination of a filler, a can carrier, a pawl and rotatable ratchet for transmitting motion to said carrier, said ratchet having its teeth at varying distances apart to impart a short and a long movement to the carrier, and means for actuating said pawl and ratchet substantially as and for the purposes described.

15. In a can filling machine, the combination of a filler, a valve for controlling the passage of material from said filler, a rod connected at its upper end with said valve, a sleeve provided with a crank and bell-crank lever and connected with the lower end of said rod, and the cams acting on the arms of the bell-crank lever to lift one arm to shift said valve and at the same time throw the other arm of the lever into the path of the other cam that it may act thereon to reverse the valve and at the same time throw the other arm of the lever back into the path of its actuating cam, substantially as and for the purposes described.

16. In a can filling machine, the combination of a filler, a can carrier having a step-by-step movement to move the cans under and from under the filler, a lever having a rod connecting it with a part of the can carrier mechanism to transmit power to the mechanism, a cam acting on said lever and formed to time the step by step movement of the carrier to move the can under the filler and let it stand thereunder during the time required to lift it up to the filler and then down from it and then away from beneath it, a vertically moving table for lifting the can to and from the filler, the lever 45 bearing against a part of said table, and the cam 49 formed to bear against said lever to lift it and through it the table and hold the can under the filler until filled and then permit the said lever and table to move downward, substantially as and for the purposes described.

17. In a can filling machine, the combination with the filler and an air vent for the cans, of a shield extending below the mouth of the filler into the mouth of the can adjacent to the air vent said shield being inclined inwardly to direct the material inwardly toward the middle of the mouth of the can and away from the vent as it is passing from the filler into the can, substantially as and for the purposes described.

18. In a can filling machine, the combination with the filler and an air vent for the can, of an annular ring located around the space through which the material passes from the filler to the can and formed with depending lips adjacent to the air vent to shield the vent from the material passing into the can substantially as and for the purposes described.

19. In a can filling machine, the combination with the filler having a flange at its lower end, a pan around the filler, a slide valve between the bottom of the pan and the base of the filler, the flange to the filler, bottom to the can and the slide valve having openings adapted to register with each other to form an air vent for the cans, and pendent inwardly inclined lips adjacent to said air vent made concave on their outside faces to form a por-

tion of the air vents and extended to enter the mouth of the can to shield the air vent from the material passing from the filler to the can, substantially as and for the purposes described.

20. A tray for holding a series of cans in a can filling machine, said tray having raised sides and formed with a series of raised seats side by side to enter the concave bottoms of the cans being filled, substantially as and for the purposes described.

21. A tray for holding a series of cans in a can filling machine, said tray having raised sides and formed with rows of raised seats to enter the concave bottoms of a series of cans and formed with openings in the bottom, substantially as and for the purposes described.

22. A tray for holding a series of cans in a can filling machine, said tray being formed with a series of raised seats to enter the concave bottoms of the cans and provided with division pins or studs between the series of seats substantially as and for the purposes described.

23. A tray for holding a series of cans in a can filling machine, said tray being formed with rows of raised seats to enter the concave bottom of the cans and provided with division pins or studs between the rows of seats and also between the seats of each row, substantially as and for the purposes described.

24. In a can filling machine, the combination with a hopper and a series of fillers, of a series of plungers reciprocable together and each having a yielding vertical movement independent of the others to permit one plunger to yield from pressure below in the event of one can becoming filled before another while the other plungers are discharging their function of forcing the material from the fillers into the cans substantially as and for the purposes described.

25. In a can filling machine, the combination with the hopper and series of fillers, of the series of plungers, the cross head to which the upper portions of the plungers are connected and in which they have a vertical movement, springs exerting a pressure on said plungers, and means for moving the cross head and its plungers, substantially as and for the purposes described.

26. In a machine for filling cans, the combination of the hopper and a series of fillers leading therefrom, a series of plungers for the series of fillers and under spring pressure, a cross head to which said plungers are connected, guide rods connected to the cross head and working in suitable guide ways, and means for moving the cross head, substantially as and for the purposes described.

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

CHARLES S. BUCKLIN.

Witnesses:
THOS. M. DOBBIN,
WILLIAM H. BERRY.