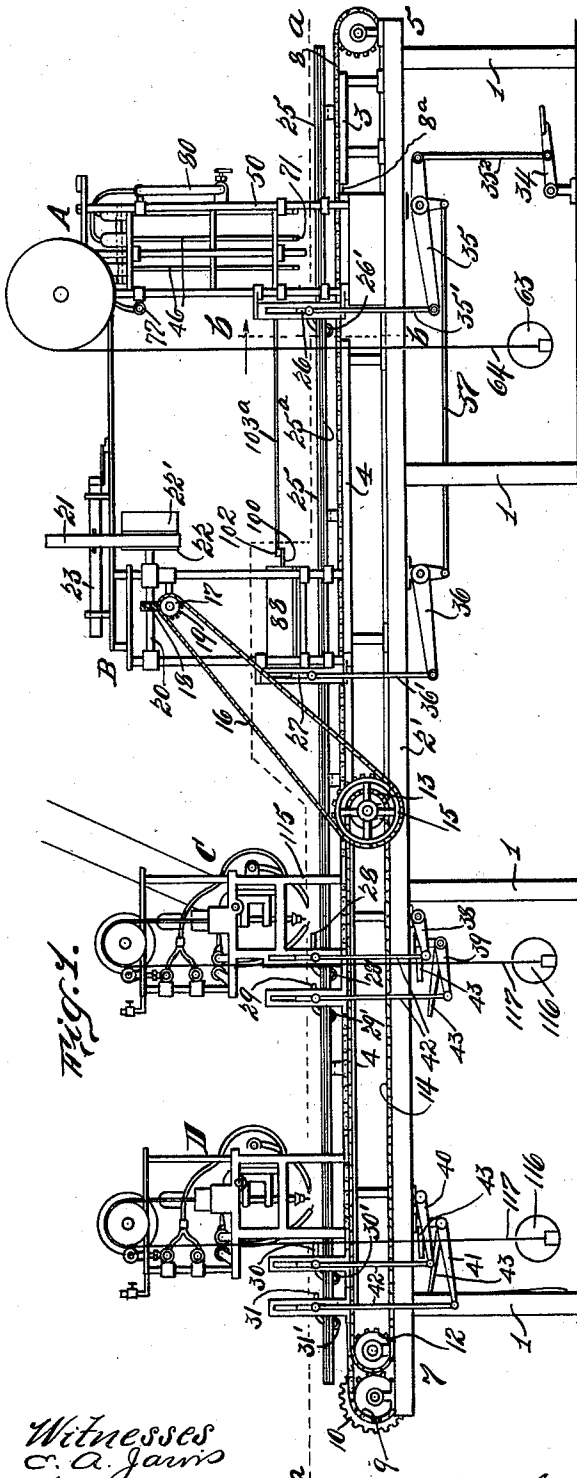


B. HAUSHEER.
CAN MANIPULATING MACHINE.
APPLICATION FILED JUNE 28, 1910.

1,030,300.

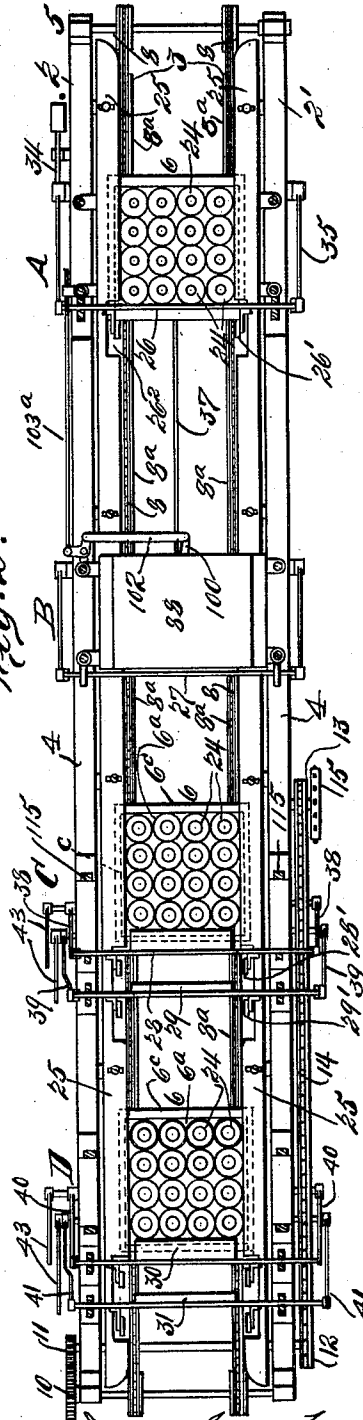
Patented June 25, 1912.

3 SHEETS-SHEET 1.



Witnesses
C. A. Jarvis
H. H. Measures.

Fig. 2.



Inventor:
Bernard Hausheer.

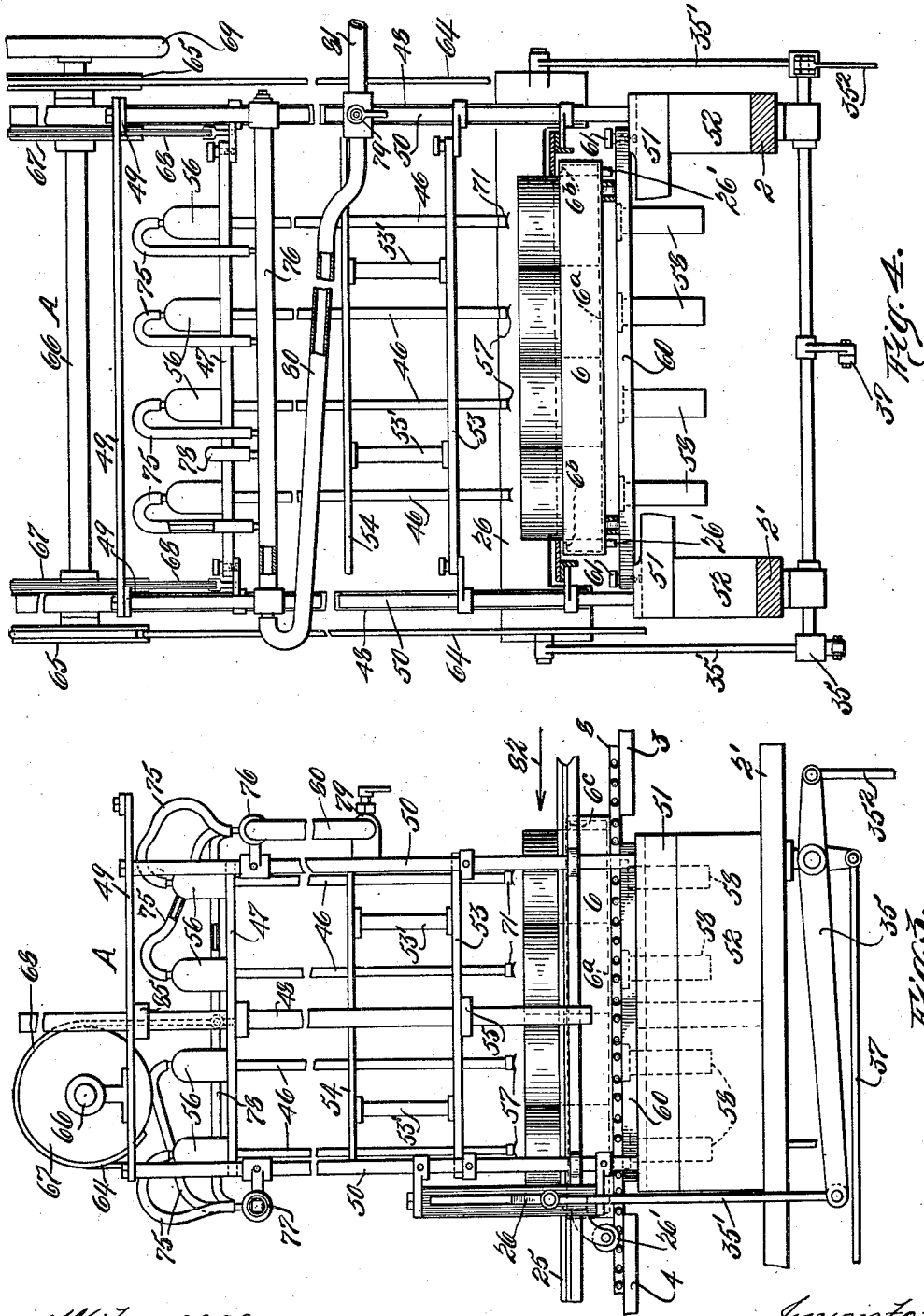
Walter D. Edmunds
attorney

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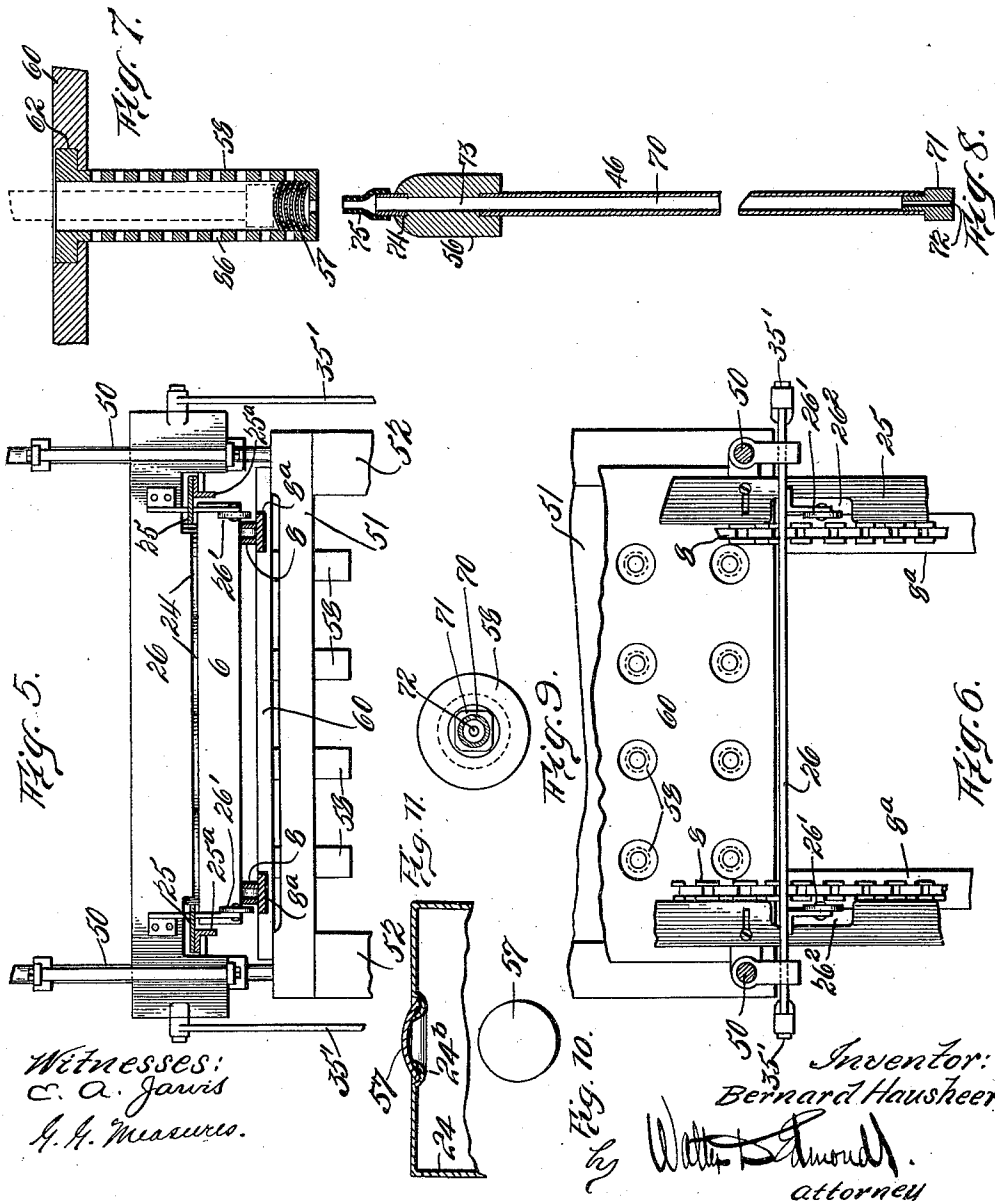
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by *Walter D. Amund*
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3 SHEETS-SHEET 3.



Witnesses:
C. A. Jarvis
H. H. Measures.

Inventor:
Bernard Hausheer
attorney

UNITED STATES PATENT OFFICE.

BERNARD HAUSHEER, OF NORWICH, NEW YORK, ASSIGNOR TO BORDEN'S CONDENSED MILK COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

CAN-MANIPULATING MACHINE.

1,030,300.

Specification of Letters Patent. Patented June 25, 1912.

Application filed June 28, 1910. Serial No. 569,270.

To all whom it may concern:

Be it known that I, BERNARD HAUSHEER, a citizen of the United States, and a resident of Norwich, in the county of Chenango and State of New York, have invented a new and useful Can-Manipulating Machine, of which the following is a specification.

My present invention relates to improvements in machines for manipulating simultaneously, and alike, pluralities, or groups, of like cans, or other cylindrical containers of merchandise such for example as condensed milk.

The objects of my invention include provision of means whereby, without handling, the said groups of containers may be fed, simultaneously when desired, through the machine, beneath a plurality of sequentially disposed, differently-functioning, groups of alike operating devices; also means whereby, by aid of said feeding means, each member of one of said groups of containers may be centered accurately with a member of one of said groups of operating devices, and different groups so centered simultaneously when desired; also means whereby said containers may, by aid of said feeding means, be held so centered during function thereon of the operating devices with which they are then centered.

Other objects of my herein claimed inventions include provision of means whereby on each member of one of such groups of containers, in this instance cylindrical cans previously charged through therein contained exceptionally small therewith concentric openings, may, simultaneously, be placed, by one of said groups of operating devices, a suitably disposed cap, and this without handling cap or can.

In those applications of my improvements which are herein described the cans manipulated are cylindrical as shown in the drawings, and are assumed to have been previously filled through a small concentric opening in each with merchandise.

I attain my said objects by the devices and combinations of devices hereinafter more particularly described and claimed, thereby economizing in time and in manual labor, and rendering possible, on industrial scales of production, much smaller openings in containers than heretofore practicable, whereby leaks are desirably diminished. For better understanding of the operation

and results, throughout the machine, of my feed-centering devices, reference is also hereinafter made to, by me invented but not herein claimed, other groups of operating devices, *i. e.*, flux applying and soldering instrumentalities, disposed sequentially to my said cap-placing group, in said machine, and coöperating in attainment of its unitary final result, *i. e.*, the capping complete of large pluralities of cans treated simultaneously without handling from start to finish.

My invention is illustrated by the accompanying drawings as described herein, together with such additional features as are essential to impart such full, clear and exact understanding of my said invention as to enable any person skilled in the art to which it appertains to make, construct and use the same to the best advantage.

Referring now to said drawings:—Figure 1 is a side elevation of principal parts of a machine containing my said invention, and showing also, diagrammatically, groups of other than cap-placing devices; Fig. 2 is a plan, partly in section, of the machine shown in Fig. 1, showing groups of cans in centered positions under some of the groups of operating devices, latter not shown, said section being taken on line *a—a* of Fig. 1; Fig. 3 is a detail, side elevation, on enlarged scale, of my group of cap-placing devices, showing a group of cans in centered position thereunder, portions only of the carrier chain and main frame being shown; Fig. 4 is an end view of the parts shown in Fig. 3, as seen in the direction indicated by arrow 82 in latter; Fig. 5 is a fragmentary, detail, sectional, end view, on enlarged scale, showing one of my roller-provided stops; the section being taken on the line *b—b* of Fig. 1; Fig. 6 is a fragmentary, top-plan, view of the parts shown in Fig. 5, showing also some of the cap-containing magazines; Fig. 7 is a vertical, central, sectional, detail-view, on a still more enlarged scale, of one of my cap-containing magazines; Fig. 8 is a vertical, central, sectional, detail-view, on enlarged scale, of one of my cap-placing spindles; Fig. 9 is an enlarged, top-plan, detail-view of one of my cap-containing magazines, showing in horizontal cross-section a lower terminal member of my said cap-placing spindle inserted in said magazine; Fig. 10 is a top plan view of one of the caps hereinafter described, enlarged; Fig. 11 is a cen-

tral section of part of a can enlarged, and of the said cap placed thereon as hereinafter described.

Similar letters refer to similar parts throughout the several views.

My machine is supported by a suitable frame, comprising legs 1, horizontal, longitudinally extending, supporting members 2, 2', and, mounted on latter, auxiliary supporting elements 3, 4 (Figs. 1 and 2). Adjacent the front, or receiving, end, 5, of the machine, as indicated in Fig. 1, are disposed a group of similarly constructed and operating, *i. e.*, hereinafter specifically described, like cap-placing devices and instrumentalities indicated by A. A convenient distance behind the latter are sequentially disposed, through the machine, groups of like fluxing instrumentalities and devices indicated by B, and groups of like soldering instrumentalities indicated by C, and D.

The machine has, extending longitudinally therethrough, a runway for the cans, bounded laterally, on each side, by parallel, lateral, alining members and below by the endless conveyer hereinafter described, coöperating with which and with other elements as hereinafter described are the movable trays or carriers 6 (Fig. 2) comprising a bottom 6^a (Figs. 4, 2), side flanges 6^b, and a transverse tail-board, or rear member, 6^c, (Figs. 2, 3) for a specific purpose hereinafter described; said carrier, as a whole, being dimensioned and adapted to carry loosely a group of similarly shaped; or like, cylindrical containers, in this instance cans, *i. e.*, the capacity of said carrier is somewhat greater than the number of cans contained as indicated in part by dotted lines at C (Fig. 2), thus admitting some movement of the cans on the bottom of said carrier relatively thereto and to each other. The said endless conveyer consists, in this instance, of the sprocket-chains 8, movably supported on underneath ways 8^a. Means are provided to impart to said conveyer continuous motion in parallelism with said runway, *i. e.* the chains 8 are driven by sprocket-wheel 9, located at delivery end 7 of the machine. Sprocket-wheel 9 is rotated by gear 10 (Figs. 1, 2), intermeshed with pinion 11, rotated by sprocket-wheel 12, rotated by another sprocket-wheel 13, through sprocket-chain 14. Wheel 13 is rotated by sprocket-wheel 15 through chain 16 and sprocket-pinion 17. Pinion 17 is rotated by spiral-gears 18, 19; 18 being carried by shaft 20 rotated by belt 21 and pulley 22. Belt 21 may be moved from pulley 22 to idler pulley 22' and vice versa by belt-shifter 23 under control of an operator stationed near cap-placing devices A. The cans, 24, constitute, in this instance, a group containing an even number, sixteen, of cylindrical cans, of like shape and dimensions, as shown in the draw-

ings (Figs. 2, 3, etc.). The top of each can comprises the usual circular therewith concentric and, at this stage, uncapped opening, the edge of which is flanged as at 24^b (Figs. 10 and 11) to receive, and seam with, the circular cap 57 (Figs. 10 and 11) to be thereto applied as hereinafter described. It will be understood that the said cans have, prior to entering the machine, been filled with merchandise, for instance condensed milk, requiring for its preservation hermetic sealing. The aforesaid can-carriers 6 loosely ride on the chains 8 constituting the endless conveyer, *i. e.*, are supported and held thereon by gravity and friction only.

Laterally bounding the can-runway are, as aforesaid, the parallel, alining, members, or rails, 25 (Figs. 2, 4), mounted upon angle-irons 25^a supported on elements 3, 4, etc., of the frame of the machine. Said lateral members are supported, and disposed, sufficiently above the conveyer chains 8 to clear the carriers 6, and sufficiently proximate to the center of said runway to contact with some of the group of cans on the bottom or floor of said carrier. Said lateral, alining, members are spaced-apart a distance equal to the sum of the diameters of an aliquot number of said even-numbered group of like cans (Figs. 2, 4). The centers of the operating devices constituting each of said groups A, B, C, D, are mutually spaced-apart a distance equal to the diameter of each of said cans, and the interspace between inner faces of said lateral members and vertical axes of said centers thereto most proximate is equal to one-half of said diameter, as witness the cap-placing devices (Figs. 3, 4). It follows that the said lateral alining members will, as the cans are carried through the runway, contact with some cans and, coacting with said conveyer, guide the group toward positions in which their centers will register with said centers of said operating devices. Transverse said runway of the machine in the path of said cans are a plurality of movable, normally closed, stops, 26, 27, 28, 29, 30 and 31, sequentially disposed, as shown, to, in turn, contact with some of said cans and, coacting with said conveyer and said lateral members, crowd said group into positions, in equal ranks, in which centers of said cans will register, in turn, with said centers of said operating devices. The said stops are kept normally closed by gravity in, and transverse, the upper part of the path of the cans in said runway, being however like the said lateral alining members 25 located sufficiently above the conveyer chains 8 to clear, at all times, the tops of carriers 6. To relieve the operator from holding up said stops until cleared by the carriers, each stop is provided with therewith connected downwardly projecting rollers 26', 28', 29', 30', 31', respectively,

which rollers are disposed to rest and rotate upon the side flanges 6^b of the carriers 6, portions of the alining members 25 being, as at 26², (Fig. 6), cut away to enable said rollers to contact with said flanges. After the stop has been held open sufficiently for the carrier to move thereunder a short distance, the stop may be released by the operator, whereupon its said rollers will rest and rotate upon said side flanges until the carrier has cleared the stop, when latter will, by gravity, be returned to normal position. It follows that said stops contact with some of the cans and co-acting with said conveyer and with said alining members tend to crowd the cans contacted, and thus more or less the entire group, into the aforesaid positions in which their centers will register with the said centers and axes of said operating devices. After the stops have, as aforesaid, contacted with some of the cans, thereby checking the onward feed, or progression, of these through the runway, the aforesaid rear member 6^c of carrier 6, disposed to contact with some of the cans, comes into play, and by so contacting therewith and coacting with said conveyer, said lateral alining members, and, in turn, with each of said stops, ultimately forces said group of cans into the aforesaid required positions in which the center of each can is in exact register with the center of one of said operating devices, whereupon said rear member so co-acting combines to hold said group in said positions until the particular stop then in coaction therewith is raised out of its said normal position in the path of the cans in said runway.

It follows that however irregularly the cans may be placed or afterward disturbed in the carriers, or on the conveyer, their progression through the machine operates to bring them in turn automatically, and inevitably, into required register with each successive group of operating devices, the cans being constantly guided laterally toward required positions by the lateral alining devices 25, intermittently crowded toward said positions by said stops, and ultimately forced thereinto, and held there, relatively to each plurality of operating devices, in turn, by said rear members 6^c of the carriers 6. On the other hand it will be observed that no group of cans can at any time pass beyond its required position beneath any of said pluralities of operating devices until released through said raising of a stop; also that one or more groups of cans may be simultaneously advanced in the runway while one or more groups are simultaneously manipulated by one or more of said pluralities of operating devices, this being possible because of the continuous motion of the endless conveyer chains 8 on which the said carriers loosely ride, the chains constantly pro-

pellling each carrier until its cans are clamped stationary between one of said stops and said carrier's said rear member 6^c, after which, and until said stop is lifted to open the path of the cans in the runway as hereinafter described, said chains will slip onward under the bottom of said carrier, the while, by their friction with latter, constantly imparting to said rear member 6^c sufficient pressure against the therewith contacting cans to hold, through co-action of said alining members and said stop, the entire group of cans in required register with the then superimposed group of operating devices during manipulations by latter and until said stop is lifted. From the foregoing it follows that the carriers 6, with their loosely contained cans, may be placed upon the constantly moving conveyer chains 8 without particular regard to position or interval and afterward disturbed in relative position while fed from one group of operating devices to the next since the elements mentioned automatically regulate the feed and position of the cans through and in the runway to suit requirements of the machine, and insure successive perfect centerings thereof at the plurality of locations required. Thus operators of such machines are relieved from manipulations other than raising and lowering said groups of operating devices and raising said stops when required. Any convenient means may be employed to so raise said stops as to open the runway for passage of the cans. In the present instance, the stop 26, adjacent the group A of cap-placing devices, and the stop 27 adjacent the group B of fluxing devices, are shown (Fig. 1) connected by suitable levers and links with treadle 34, depression of which by operator will obviously simultaneously lift both said stops, stop 26 being connected with bell crank lever 35 by link 35', stop 27 being connected with bell crank lever 36 by link 36', bell crank lever 36 being connected by link 37 with bell crank lever 35 and latter with treadle 34 by link 35². The stops 28, 29, 30 and 31 are raised by lever arms 38, 39, 40 and 41 respectively connected to their respective stops by links 42, said lever arms being in turn operated by handle-arms 43 within reach of the operator. Referring now more particularly to the capping instrumentalities (Figs. 3, 4, 5-9), these are supported normally above said runway and comprise a plurality (in this instance even-numbered, *i. e.* sixteen) of like independently vertically movable tubular pneumatic spindles 46, having downwardly presented mouths, the centers of which are equally spaced-apart a distance equal to the diameter of the cans to be manipulated thereby. It will be observed that each of said spindles comprises, viewed as a whole with its connected parts, a verti-

cally extended portion of uniform horizontal cross-section and above said portion a part, hereinafter described, of greater horizontal cross-section than said portion. A horizontally disposed vertically movable member or plate 47 is provided with perforations in which said extended portions of said spindles are slidably held, and upon which plate said parts of said spindles of greater horizontal cross-section bear, and thereby said spindles as a whole, are normally supported. Plate 47 is detachably secured at each side thereof to vertically movable rods 48, slidably supported in bars 49, carried by pedestals 50, carried by bed-plate 51, carried by blocks 52, mounted on frame members 1 and 2 (Figs. 3, 4). The said vertically extended portions of uniform horizontal cross-section of said spindles 46 also pass slidably through perforations in detachable alining plate 53 also carried by pedestals 50. 54 is, for still greater accuracy, a similar supplemental alining plate supported as shown by posts 53' resting on plate 53. To plate 53 are secured guide brackets 55, through which said rods 48 may freely slide. In this instance the said part of each said spindle which is of greater horizontal cross-section constitutes a weighted member 56, whereby said spindles are, by gravity, caused to descend with the frame 47 and also to firmly contact, with required pressure, the caps 57 as shown in Fig. 7 and hereinafter described. The capping instrumentalities comprise also, disposed below said runway, a corresponding plurality (sixteen) of vertically disposed, tubular, cap-containing, magazines 58, having upwardly presented openings, each positioned, centered, and dimensioned, to admit insertion thereinto of one of said spindles. Said magazines 58 are carried by a plate 60 (Fig. 6) in which they are removably fitted to admit of their individual removal therefrom without detaching it from the bed-plate 51 of the capping devices. For such purpose said plate 60 is secured to said bed-plate 51 by means of thumb-screws 61 (Fig. 4). As shown in Fig. 7 each magazine 58 is fitted into a socket 62, countersunk in said plate 60, the top of each magazine being slightly below the upper surface of said last mentioned plate. The location of each magazine 58 is carefully adjusted to center, in as exact alinement as possible, with the center of the thereabove corresponding spindle 46, to the end that said spindles may, when lowered, simultaneously, freely, enter into said magazines. Means are provided to so lower said spindles. Said frame 47 and spindles 46 thereby carried are normally held above said runway of the machine by weights 63, suspended from cables 64 (Fig. 4). Said cables 64 are carried on drum-pulleys 65, on rotatable shaft 66, supported

by said pedestals 50. On said shaft 66 are also drum-pulleys 67, carrying chains 68 (Fig. 4) having their lower ends connected with said frame 47. A hand-wheel 69 (Fig. 4) on shaft 66 enables the operator to rotate said shaft against weight 63, thereby relieving from latter frame 47 and its group of spindles 46, which are then forced by gravity toward and into said magazines 58. Reverse motion imparted to said hand-wheel results in said weights 63 lifting said spindles back to normal position.

Each spindle 46 consists of a tube 70 (Fig. 8) terminating in a plug 71 having a bore, or mouth, 72 of preferably small diameter. Each weighted member 56 carried by each spindle is bored as at 73 (Fig. 8) and provided with a nipple 74, to which one end of a flexible tube 75 is air-tightly secured. The tubes 75, from two ranks of said group of said spindles 46, are connected to a trunk-tube 76 (Fig. 3). The tubes 75, from the other two ranks of said spindles, are connected to an auxiliary trunk-tube 77, trunk-tubes 76, 77, being connected together by tube 78. Said trunk-tube 76 is also connected by tube 80 to one side of a valve 79 (Fig. 4), the other side of said valve being connected by tube 81 with any suitable constantly acting exhaust, not shown.

The said group A, (Fig. 1) of capping instrumentalities is operated as follows: Said frame 47, and its weighted spindles 46, are simultaneously lowered as aforesaid until said mouths of said spindles insert into their corresponding magazines 58, and are, by gravity, contacted, with required pressure, against the topmost member of a supply of like caps carried by each said magazine. Such lowering of the spindles through the runway may be seasonably accomplished immediately after one of said carriers 6 has been released, by lifting stop 26, and advanced by said endless conveyer beyond said spindles in the direction of arrow 82 in Fig. 3. Said required contact of the spindles with the caps is demonstrated by latter's arrestation of downward movement of the spindles and continued descent of frame 47, thus showing a space between frame 47 and said weighted parts 56 of said spindles. Valve 79 is then turned to open communication between the spindles 46 and said exhaust. This causes the topmost caps in the magazines to adhere to their therewith contacting spindles, whereupon the weights 63 are permitted to restore frame 47 and spindles 46 to their normal position above the runway of the machine, *i. e.* until stops 85 (Fig. 3) of said rods 48 contact with said bars 49. The plurality of spindles is thus sufficiently raised to permit another carrier 6 with its group of uncapped cans to be advanced thereunder by the endless conveyer until in its turn, contacted by said stop 26

and by rear member 6° of said carrier, it is, between the lateral alining members 25, positioned so that the center of each can, and of its contained opening, registers with the center of one of said plurality of spindles. During said positioning of the cans, the said exhaust has continued its operation, thereby retaining the caps in adherence to their respective spindles. As soon as the cans have been as aforesaid stopped and thereby positioned, frame 47 and spindles 46 are again lowered until the caps are brought in contact with the cans and preferably pressed down upon their openings,—the edge of the caps being seated in the flanged edge 24^b of said openings as shown in Fig. 11. Valve 49 is then turned to cut off the exhaust, thus releasing the caps from the spindles after which latter are again raised, as aforesaid, to normal position. Treadle 34 is then depressed thereby raising stop 26 clear of the cans, whereupon the chains 8, constituting the continuously-moving endless conveyer, cause the carrier and its now capped cans to again advance through the runway to the next group C of operating devices. The hereinbefore described capping operations may be repeated indefinitely on successive groups of cans.

It will be noted that said magazines 58 are laterally perforated as at 86 (Fig. 7) to insure free circulation of air within, and between the therein contained caps; also that the horizontal cross-section of the said plug 71, constituting the lowermost part of each spindle 46, differs in shape from the horizontal cross-section of the upwardly presented openings of the tubular cap-containing magazines 58 as shown in Fig. 9, the said horizontal cross-section of said plug of said spindle in this instance being angular, *i. e.*, square, and the said cross-section of said opening of said cap-containing magazine being circular. By said lateral perforations of the magazines and by said diversity in shape between parts is avoided suction detrimental to the adhesion of the caps to the spindles when latter are lifted out of the magazines. It will also be noted that, by reason of the construction described, independent contact, under independent pressure, is accorded to each spindle with its respective cap, and this notwithstanding that the topmost caps of respective magazines may be at different levels. By the means described it becomes possible to lower simultaneously to operative position relatively to the cans, or otherwise, a plurality of vertically-disposed like members each provided at its lower end with like operating downwardly presented instrumentalities, and, notwithstanding inequalities of level, impart required operative position under required pressure to each of said instrumentalities independently of the others. It will

be understood that the plate 60, frame 47 and alining plates 53, 54, are preferably removable in order that corresponding members may be interchanged and adapted to manipulation and treatment of groups of cans numerically different and of different diameters, to which end the said lateral alining members 25 are also transversely adjustable as indicated in Fig. 2, such obvious details of construction being, since plainly shown in the drawings, not indicated by reference characters.

It will be understood that the members of the above referred to groups of operating devices sequentially disposed in the machine to follow the treatment imparted by the cap-placing group, such being, in the present instance, group B (Fig. 1) representing a plurality of like fluxing devices adapted to simultaneously apply flux adjacent the seams of the previously applied caps, and groups C and D (Fig. 1) being pluralities of like soldering devices, are spaced-apart and positioned relatively to the cans and runway like the said cap-placing devices, it being thus equally important that, during their operation, each can be accurately centered with one of said devices, the which is accomplished by my said can-feeding and centering means the same as when the cans are under the cap-placing devices. My said combination of can feeding and centering means thus serves the requirements of the entire machine, or organized sequence of groups of differently functioning instrumentalities, and this without the cans, the caps, the flux, or the solder or the soldering irons being manually handled from start to finish, the preliminary charging of the required number of cans into the carriers being readily effected by unskilled labor without attention to positioning them, since the latter is, whenever required, accurately effected by the automatic operations of the elements of the machine as described. It will also be understood that while, in the drawings, I have shown application of my said feeding and centering devices to a certain type of cans, any other type of containers comprising a cylindrical main portion may be equally fed and manipulated in groups thereby. I do not moreover confine myself to the particular shapes, proportions, and relative locations of parts as illustrated in the drawings, these being variable, without departing from my invention, to meet special requirements of each type of containers treated.

What I claim as new and desire to secure by Letters Patent is the following, viz:—

1. In a can-manipulating machine having a runway for the cans the combination of the following elements, viz: a carrier comprising a bottom adapted to loosely carry an even numbered group of like shaped cans

of alike diameter; under said runway an endless conveyer on which said carrier loosely rides; means to impart to said conveyer continuous motion in parallelism with said runway; on each side of said runway
 5 parallel lateral alining members spaced apart a distance equal to the sum of the said diameters of an aliquot part of the number of said cans, and disposed to contact with
 10 some of said cans; transverse said runway in the path of said cans a movable normally closed stop disposed to contact with some of said cans; on said carrier a rear member disposed transversely of said runway to contact with some of said cans and, coacting
 15 with said alining members, and said stop, to force and ultimately hold said group stationary in positions in which their centers are equally spaced apart and the cans lined up in mutually contacting ranks; and
 20 means to raise said stop out of the path of said cans in said runway.

2. In a can-manipulating machine having a runway for the cans the combination of the
 25 following elements, viz: supported normally above said runway a plurality of like manipulating devices having downwardly presented operating members whose centers are equally spaced apart; a carrier comprising
 30 a bottom adapted to loosely carry a group of like-shaped cans each of diameter equal to the interspace between centers of said manipulating devices; under said runway a conveyer on which said carrier loosely
 35 rides, means to impart to said conveyer motion in parallelism with said runway toward and beyond said manipulating devices; on each side said runway parallel lateral alining members spaced and disposed to contact with some of said cans and coacting
 40 with said conveyer to guide said group toward positions in which their centers register with said centers of said manipulating devices; transverse said runway in the path
 45 of said cans a movable normally closed stop disposed to contact with some of said cans and coacting with said conveyer and said lateral members to crowd said group toward said positions; and on said carrier a rear
 50 member disposed to contact with some of said cans and, coacting with said conveyer said lateral members and said stop, to ultimately force and hold said group stationary in said positions.

55 3. In a can manipulating machine having a runway for the cans, the combination of the following elements, viz: normally held down by gravity in and transverse the path of the can in said runway a vertically movable stop having downwardly projecting
 60 rollers; a carrier adapted to loosely carry an even numbered group of like shaped cans of like diameter and comprising a bottom member having therefrom upwardly
 65 extending lateral flanges disposed as treads

for said rollers and a rear member transversely disposed to contact with some of said cans; on each side of said runway parallel lateral alining members spaced apart
 70 a distance equal to the sum of the diameters of an aliquot part of the number of said cans and disposed to contact with some of them; under said runway a conveyer on which said carrier loosely rides; means to impart to said conveyer continuous motion
 75 toward and beyond said stop; and means to raise and momentarily support said stop out of said path of said cans until said treads have advanced beneath said rollers whereby said stop is supported out of the
 80 path of said cans while said rollers bear on said treads and returned by gravity to normal position after said treads have been advanced beyond said rollers.

4. In a cam manipulating machine having
 85 a runway for the cans the combination of the following elements, viz: supported normally above said runway a plurality of independently vertically movable tubular pneumatic like spindles having downwardly
 90 presented mouths the centers of which are equally spaced-apart; below said runway a corresponding group of vertically disposed tubular cap-containing magazines having upwardly presented openings positioned,
 95 centered, and dimensioned to admit insertion thereinto of said group of spindles; means to lower said group of spindles simultaneously transverse said runway into said magazines to independently contact
 100 with and bear upon the caps therein contained; means to exhaust air from said spindles simultaneously whereby one of said caps is caused to adhere to each of said spindles; means to raise said spindles carrying said
 105 caps simultaneously above said runway; means to feed simultaneously through said runway a group of as many like cans as there are spindles each said can having a similarly located uncapped opening; means to
 110 stop said group of cans beneath said group of spindles; means to aline said cans in positions in which each of their said openings registers with one of said mouths of said spindles; and means to cut off said exhaust
 115 from said spindles whereby said caps are released to rest respectively upon said openings of said cans.

5. In a can manipulating machine having a runway for the cans the combination of
 120 the following elements, viz: supported normally above said runway an even-numbered plurality of independently vertically movable tubular pneumatic spindles having downwardly presented mouths, the centers
 125 of which are equally spaced-apart; below said runway a corresponding group of vertically disposed tubular cap-containing magazines having upwardly presented openings positioned, centered, and dimensioned
 130

to admit insertion thereinto of said group of spindles; means to lower said group of spindles simultaneously transverse said runway into said magazines to independently contact with and bear upon the caps therein contained; means to exhaust air from said spindles simultaneously whereby one of said caps is caused to adhere to each of said spindles; means to lift said spindles carrying said caps simultaneously above said runway; a carrier comprising a bottom adapted to loosely carry as many like cans as said spindles, each said can having a similarly located uncapped opening and a diameter equal to the distance between said centers of said mouths; under said runway an endless conveyer on which said carrier loosely rides; means to impart to said carrier continuous motion in parallelism with said runway; on each side of said runway parallel lateral alining members spaced apart a distance equal to the sum of the said diameters of an aliquot part of the number of said cans and disposed to contact with some of them and coacting with said conveyer guide said group toward positions in which said openings register with said mouths; transverse said runway in the path of said cans a movable normally closed stop disposed to contact with some of said cans and coacting with said conveyer and said lateral members to crowd said group toward said positions; on said carrier a rear member disposed to contact with some of said cans and, coacting with said conveyer said lateral members and said stop, to ultimately force and hold said group stationary in said positions; and means to cut off said exhaust from said spindles whereby said caps are released to rest respectively upon said openings of said cans.

6. In a can manipulating machine having a runway for the cans the combination of the following elements, viz: supported normally above said runway a vertically movable tubular pneumatic spindle having a downwardly presented mouth; below said runway a corresponding vertically disposed tubular cap-containing magazine having an upwardly presented opening positioned, centered and dimensioned to admit insertion thereinto of said spindle; means to lower said spindle transverse said runway into said magazine to contact with a cap therein contained; means to exhaust air from said spindle whereby said cap is caused to adhere thereto; means to lift said spindle carrying said cap above said runway; means to feed in said runway a can having an uncapped opening; means to stop said can in said runway beneath said spindle; means to adjust said opening to register with said mouth of said spindle and means to cut off said exhaust from said spindle whereby said cap is released to rest upon said opening.

7. In a can manipulating machine having a runway for the cans the combination of the following elements, viz: supported normally above said runway a vertically movable tubular pneumatic spindle having a downwardly presented mouth; below said runway a corresponding vertically disposed laterally-perforated tubular cap-containing magazine having an upwardly-presented opening positioned, centered and dimensioned to admit insertion thereinto of said spindle; means to lower said spindle transverse said runway into said magazine to contact with a cap therein contained; means to exhaust air from said spindle whereby said cap is caused to adhere thereto; means to lift said spindle carrying said cap above said runway; means to feed in said runway a can having an uncapped opening; means to stop said can in said runway beneath said spindle; means to adjust said opening to register with said mouth of said spindle and means to cut off said exhaust from said spindle whereby said cap is released to rest upon said opening.

8. In a can manipulating machine having a runway for the cans the combination of the following elements, viz: supported normally above said runway a vertically movable tubular pneumatic spindle having a lowermost part of given horizontal cross-section containing a downwardly presented mouth; below said runway a corresponding vertically disposed tubular cap-containing magazine having an upwardly presented opening of horizontal cross-section differing in shape from said horizontal cross-section of said lowermost part of said spindle, said opening being positioned, centered, and dimensioned to admit insertion thereinto of said lowermost part of said spindle; means to lower said lowermost part of said spindle across said runway into said magazine to contact with a cap therein contained; means to exhaust air from said spindle whereby said cap is caused to adhere to its said lowermost part; means to lift said spindle carrying said cap above said runway; means to feed in said runway a can having an uncapped opening; means to stop said can in said runway beneath said spindle; means to adjust said opening to register with said mouth of said spindle; and means to cut off said exhaust from said spindle whereby said cap is released to rest upon said opening.

9. In a can manipulating machine having a runway for the cans the combination of the following elements, viz: supported normally above said runway a vertically movable tubular pneumatic spindle having a lowermost part of angular horizontal cross-section and a downwardly presented mouth; below said runway a corresponding vertically disposed tubular cap-containing maga-

zine having an upwardly presented opening of circular horizontal cross-section, said opening being positioned, centered and dimensioned to admit insertion therein of said lowermost part of said spindle; means to lower said spindle across said runway into said magazine to contact with a cap therein contained; means to exhaust air from said spindle whereby said cap is caused to adhere to its said lowermost part; means to lift said spindle carrying said cap above said runway; means to feed in said runway a can having an uncapped opening; means to stop said can in said runway beneath said spindle; means to adjust said opening to register with said mouth of said spindle; and means to cut off said exhaust from said spindle whereby said cap is released to rest upon said opening.

10. In a can manipulating machine having a runway for the cans, the combination of the following elements, viz: supported normally above said runway a plurality of vertically disposed tubular pneumatic spindles each comprising a vertically extended portion of uniform horizontal cross-section, above said portion a part of greater horizontal cross-section than said portion, and below said portion a downwardly presented mouth; a horizontally disposed vertically movable member or plate upon which said portion of greater horizontal cross-section and thereby said spindles are normally supported and containing perforations in which said extended portions of said spindles are slidably held; below said runway a corresponding plurality of vertically disposed tubular magazines containing, loosely, like articles and each having an upwardly presented opening positioned, centered and dimensioned to admit insertion therein of one of said spindles, means to lower said plate until said spindles enter in said magazines, contact with said articles, and its aforesaid support of said spindles ceases; means to exhaust air from said spindles whereby one of said articles is caused to adhere to each of said spindles; and means to raise said plate until it again supports said spindles and returns them to their original position.

11. In a can manipulating machine having a runway for the cans, the combination of the following elements, viz: supported normally above said runway a plurality of vertically disposed tubular pneumatic spindles each comprising a vertically extended portion of uniform horizontal cross-section and each having adjacent its upper end a weighted part of greater horizontal cross-section and in its lower end a downwardly presented mouth; a horizontally disposed vertically movable member or plate, upon which said weighted parts of greater horizontal cross-section and thereby said spin-

dles are normally supported, and containing perforations in which said extended portions of said spindles are slidably held; below said runway a corresponding plurality of vertically disposed tubular magazines containing, loosely, like articles and each having an upwardly presented opening positioned, centered and dimensioned to admit insertion therein of one of said spindles; means to lower said plate until said spindles insert in said magazines, contact with said articles, and its aforesaid support of said spindles and their said weighted parts ceases; means to exhaust air from said spindles whereby one of said articles is caused to adhere to each of said spindles; means to raise said plate until it again supports said spindles and their said weighted parts and returns them to their original position.

12. In a machine having a runway the combination of the following elements, viz: a carrier comprising a bottom adapted to loosely carry a plurality of cylindrical containers of like horizontal diameter; under said runway an endless conveyer on which said carrier loosely rides; means to impart to said conveyer continuous motion in parallelism with said runway; on each side of said runway parallel alining members spaced-apart a distance equal to the sum of the diameters of a number of said containers and disposed to contact with some of them; transverse said runway in the path of the containers a stop disposed to contact therewith; on said carrier a rear-member disposed transversely of said runway to contact with the containers and, coacting with said alining members with said stop and with said conveyer, to force and ultimately hold said containers stationary in positions in which their centers are equally spaced-apart on a line parallel with said stop and rear-member.

13. In a machine having a runway the combination of the following elements, viz: supported normally above said runway a group of like operating devices having their centers equally spaced-apart and a plurality of them disposed on a line transverse said runway; a carrier comprising a bottom adapted to loosely carry a group of like containers each of diameter equal to the inter-space between said centers; under said runway a conveyer on which said carrier loosely rides; means to impart to said conveyer continuous motion in parallelism with said runway; on each side of said runway, spaced-apart a distance equal to the sum of the diameters of as many containers as are centers of operating devices on said line, parallel alining members disposed to contact with containers and coacting with said conveyer to guide them toward positions in which their centers register with centers of said operating devices; transverse said run-

way in the path of the containers a stop disposed to contact with the containers and, co-acting with said conveyer and said alining members, to crowd the containers toward
 5 said positions; and on said carrier a rear member disposed to contact with containers and, coacting with said conveyer said alining members and said stop, to force and hold the containers stationary in said positions.
 10 14. In a can manipulating machine having a runway for the cans the combination of the following elements, viz: supported normally above said runway a vertically movable pneumatic spindle having a down-
 15 wardly presented mouth; below said runway a corresponding vertically disposed cap-containing magazine having an upwardly presented opening positioned, centered, and dimensioned to admit insertion therinto of
 20 said spindle; means to lower said spindle transverse said runway into said magazine to contact with a cap therein contained; means to exhaust air from said spindle whereby said cap is caused to adhere there-
 25 to; means to lift said spindle carrying said cap above said runway; means to feed in said runway and center with said mouth of

said spindle a can having an uncapped opening; and means to cut off said exhaust from said spindle whereby said cap is released to rest upon said opening. 30

15. In a can manipulating machine having a runway for the cans the combination of the following elements, viz: normally held down by gravity, in and transverse the
 35 path of the cans in said runway, a vertically movable stop having downwardly projecting rollers; in said runway a carrier adapted to loosely carry a plurality of cans and comprising a bottom member having
 40 therefrom upwardly extending lateral flanges disposed as treads for said rollers; under said runway a conveyer on which said carrier loosely rides; means to impart to
 45 said conveyer motion toward and beyond said stop; and means to raise and momentarily support said stop out of said path of said containers until said treads have advanced to beneath said rollers.

BERNARD HAUSHEER.

Witnesses:

GEORGE A. MATHEWSON,
 JOSEPHINE J. DILWORTH.

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