

June 24, 1930.

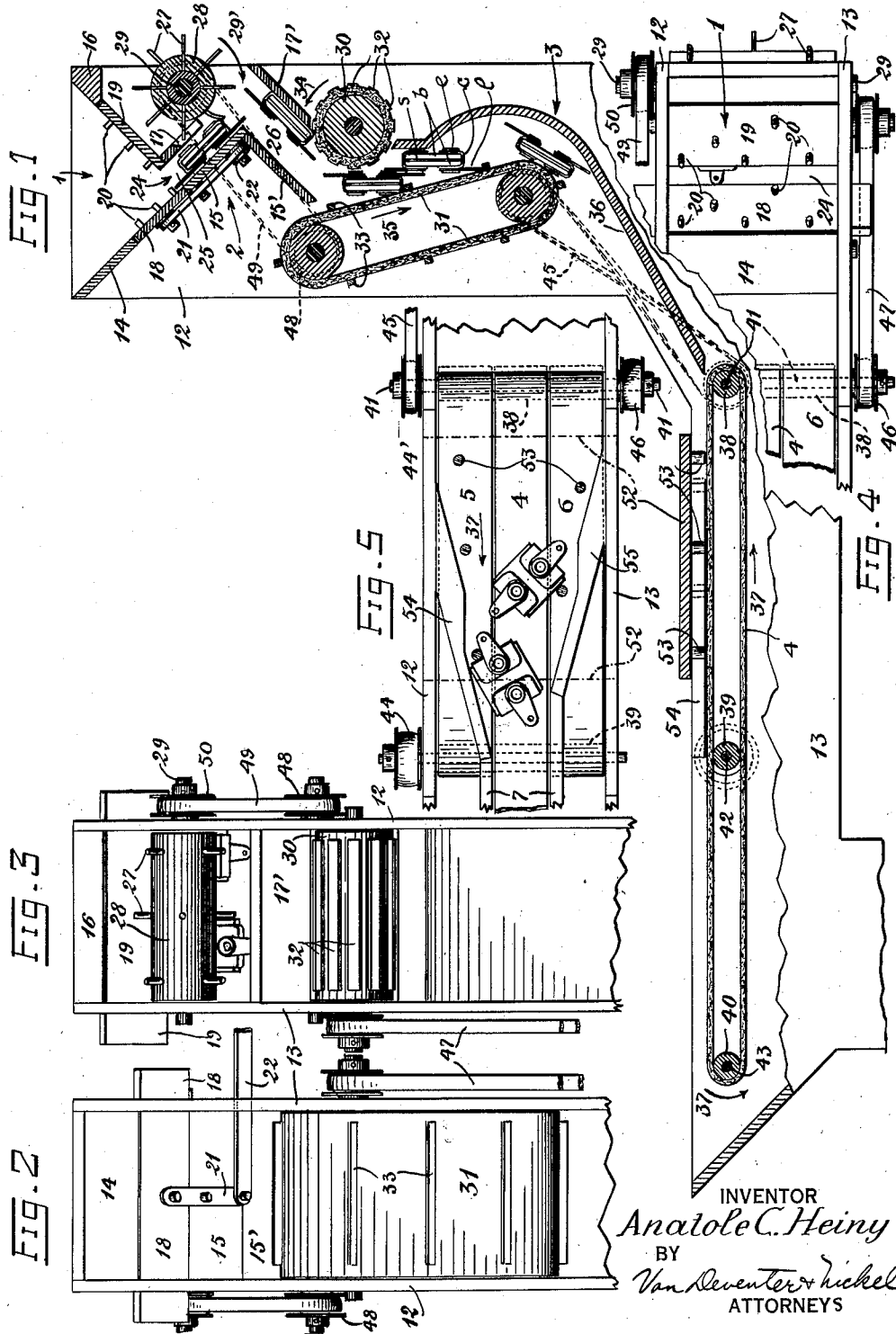
A. C. HEINY

1,768,449

FEEDING APPARATUS FOR CONDENSERS

Filed Oct. 1, 1925

3 Sheets-Sheet 1



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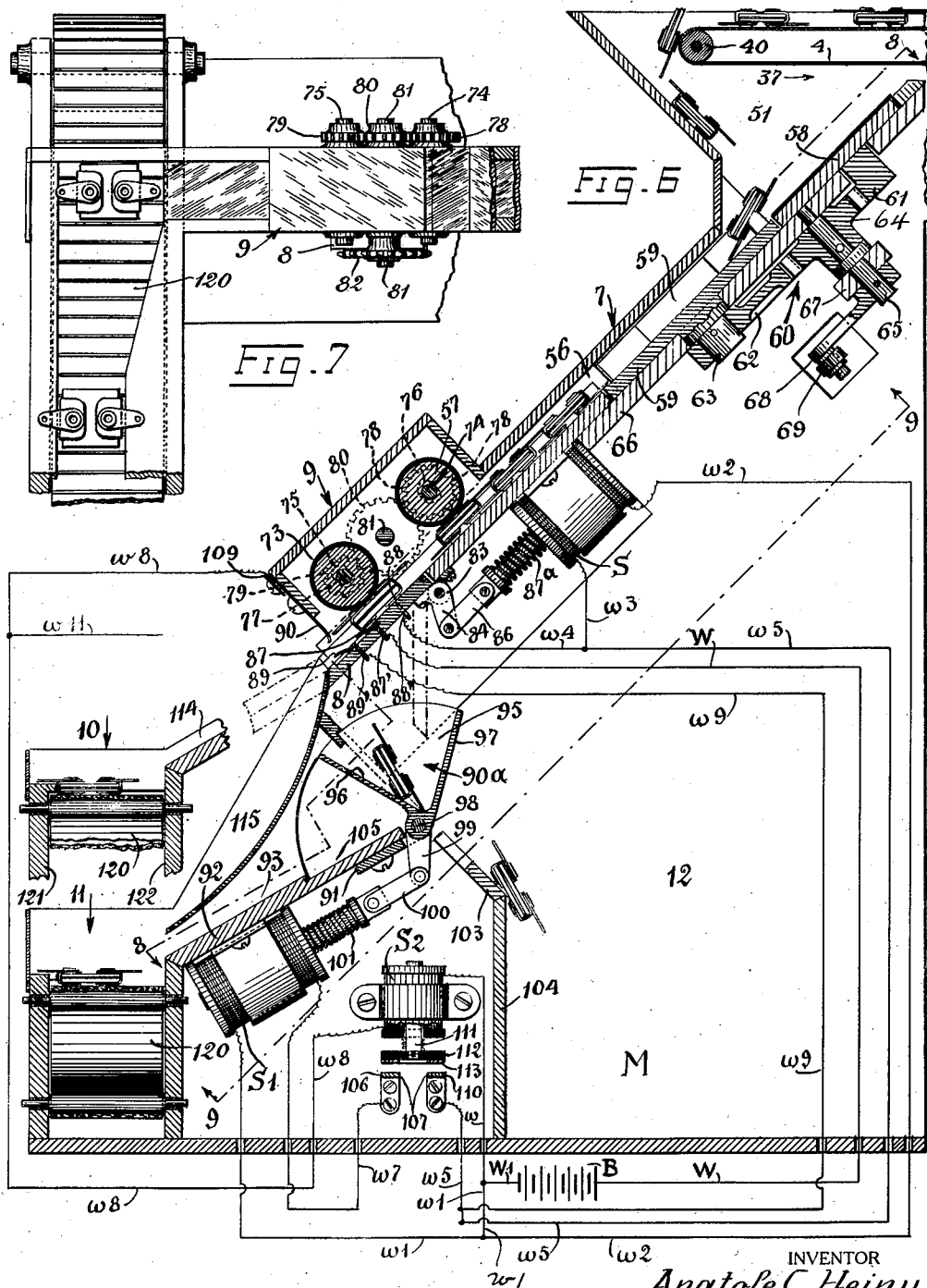
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FEEDING APPARATUS FOR CONDENSERS

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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

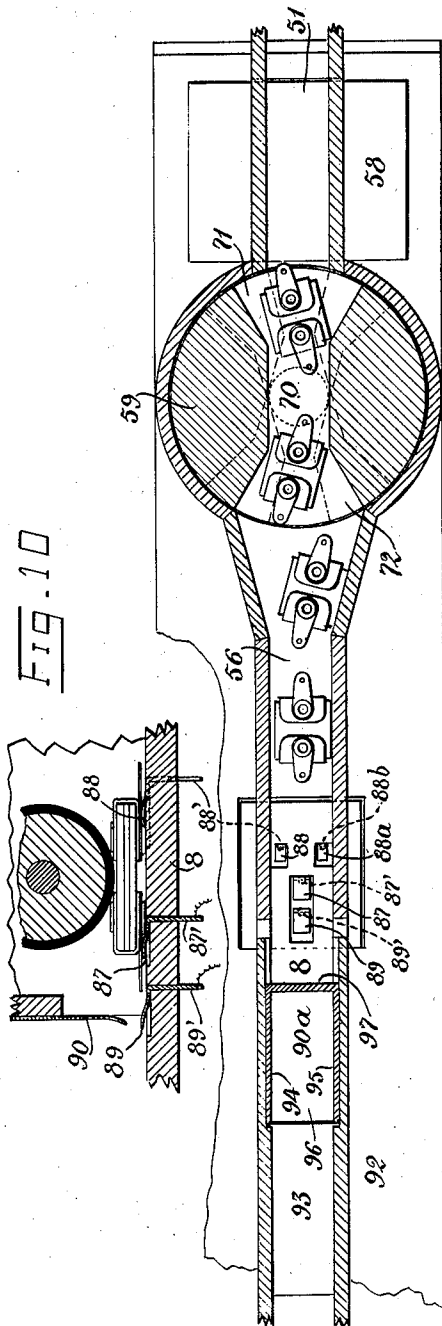
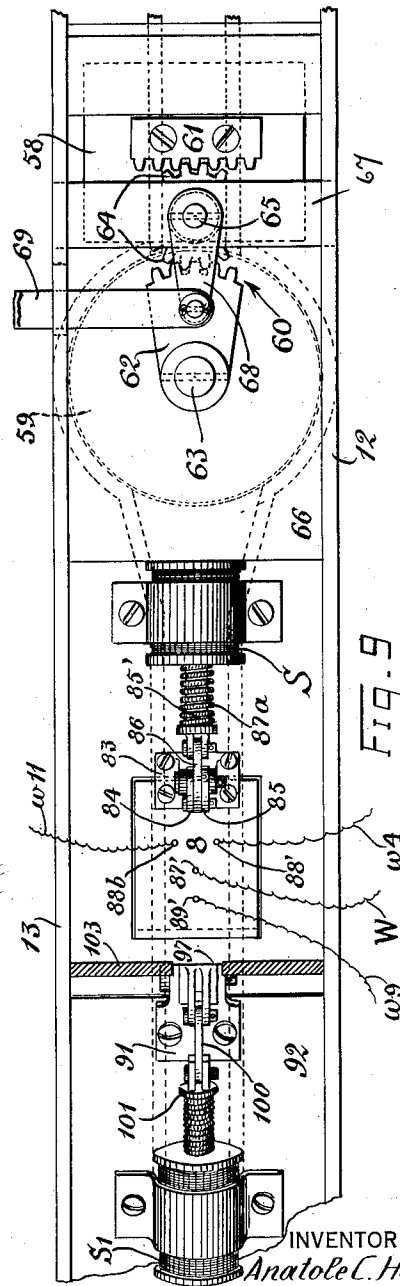


FIG. 10



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FEEDING APPARATUS FOR CONDENSERS

Application filed October 1, 1925. Serial No. 59,882.

This invention relates to mechanism for feeding condensers; and has for one of its objects to feed finished condensers of constant capacity automatically under the stamps of one or more stamping machines, from a common trough or hopper into which the condensers are thrown in large numbers at a time, to stamp upon them their various identification marks such as, type, number, capacity, etc.

Another object of the invention is to provide apparatus for supplying such condensers to such stamping machines one by one at a rate equal to the speed of the stamping machines.

And still another object is to construct such apparatus so as to separate or remove any defective condensers, so that only good condensers be fed into the stamping machines.

Further objects and advantages of this invention will become apparent in the course of this description taken with the accompanying drawings in which

Figure 1 is a vertical mid-sectional view of a hopper into which the condensers are dropped, and of the discharge way from the hopper to lead the condensers to the segregator of the apparatus;

Figure 2 is a partial front end view of same;

Figure 3 is a partial rear end view of same;

Figure 4 is a partial top plan view of same;

Figure 5 is a partial top plan view of the transferring conveyor connecting the hopper to the segregator;

Figure 6 is a vertical mid-sectional view of the segregator, and a transverse vertical sectional view of the delivery conveyors which carry the condensers to the stamping machines;

Figure 7 is a partial top plan view of same;

Figure 8 is a section on line 8—8 of Figure 6, looking downward;

Figure 9 is a section on line 9—9 of Figure 6 looking upward;

Figure 10 is a partial mid-sectional view

of the lower feed roller and the trap-door at the bottom of the segregator.

Referring to Figures 1 and 6, the apparatus is comprised of a hopper 1 at top; a discharge way 2; a chute 3; a transferring conveyor comprising the carrier belts 4, 5 and 6; a segregator 7 which terminates at the bottom in a trap-door 8 directly located under the selector feed-box 9 from which the condensers are guided according to their position of right side up or right side down in the segregator 7 to either one or the other of the delivery means or conveyors 10 and 11, running to the stamping machines, or when defective, into the magazine M, as will be explained later.

All these various parts and devices of the whole apparatus are located between two supports 12 and 13. The hopper 1 at the top is formed by four inclined transverse boards 14, 15, 16 and 17, and two sliding shaker boards 18 and 19, see Figures 1, 2, 3 and 4. The boards 18 and 19 which pass through the two supports 12 and 13 are provided on their upper faces with a number of short protruding studs or pegs 20, the object of which is to displace and to move-to-and-fro the heap of condensers as these are thrown upon them with each to-and-fro motion of boards 18 and 19. This motion may be imparted the shaker boards by any well known mechanical means, such as, for example by a rocker arm 21 and a bar 22 (see Figures 1 and 2) which can be attached to any convenient source of power, not necessary to be shown in this specification.

At the bottom of the hopper there is a discharge way 2 including the rectangular outlet opening 24 of a length equal to the distance between the two supports 12 and 13 and of a width slightly larger than the thickness of the thickest condensers to be stamped. As the condensers in the hopper 1 are shaken by the pegs 20, they pass into the opening 24 and into a small channel 25 formed by boards 15 and 17 along which they slide towards another small channel 26 set at right angles to channel 25 and formed by two boards 15' and 17', also fixed

edly set between the supports 12 and 13. But the condensers are not free to fall from hopper 1 into channel 25. They are hindered in their fall by means of flexible pins 27 set fixedly in a rotating drum 28 supported by a shaft 29 passing through the supports 12 and 13, the drum rotating as per arrow 29'. The pins are so arranged on the drum that each condenser on arriving at the bottom of channel 25 is bound to come into contact with one or another of the pins; but the pins are not stiff enough to force the condensers back. They are, however, stiff enough to hold the condensers momentarily stationary, yet flexible enough to bend while passing over the condensers. Then as soon as these pins have passed over a condenser, the latter is then free to fall into channel 26.

Directly below the channel 26 are located a corrugated leather or semi-soft rubber covered drum 30 and a conveyor belt 31 having respectively corrugations 32 and cleats 33. The drum and conveyor move respectively as per arrows 34 and 35 and with equal speed in order to maintain an interval between and prevent jamming of the condensers within the chute. Thus, as illustrated, the condensers are caused to follow one another, one by one; and one by one they fall into the chute 3 to slide along the bottom 36 thereof upon one of the belts 4, 5 and 6, which travel as per arrows 37, and are driven, belts 5 and 6 by rollers 38 and 39, and belt 4 by rollers 38 and 40. Rollers 38, 39 and 40 are respectively and fixedly mounted on shafts 41, 42 and 43 supported by the supports 12 and 13. The shaft 42 is the main operating shaft for all the above mentioned devices. It receives its driving power by means of a pulley 44 from a source of power not shown. Through the roller 39 and the two belts 5 and 6 it drives the roller 38, which actuates the belt 4, and through the shaft 41 of roller 38, and pulley 44', fixedly mounted on one end of shaft 41, and belt 45 it also drives the belt 31; and through pulley 46, also fixedly mounted on the other end of shaft 41, and belt 47 the drum 30 is revolved. Drum 28 is rotated by a pulley 48, set on the upper shaft of the belt 31, and a belt 49 and a pulley 50 fixedly set on the shaft 29 of the drum 28.

When the condensers fall upon the belts 4, 5 and 6, they will at first lie in various positions. Some of them will fall straight on the belt 4, i. e. with their lengths along or nearly along the length of the belt, and thus will be carried directly by the belt into mouth 51 at the top of the segregator 7 (Figure 6). Other condensers which may have fallen on belts 5 or 6, or belts 4 and 5, or belts 4 and 6, must be pushed entirely over upon the belt 4 to be carried to the segrega-

tor 7. To this end there is set transversely over belts 4, 5 and 6 a board 52 resting on the supports 12 and 13. This board has on its underside a number of pins or stops 53 which extend downwardly to near the upper surface of the belts 5 and 6, but there are no pins over the belt 4. As will be seen in Figure 5, showing the contour of the board 52 in dotted lines, any condenser that does not lie straight along the belt 4 as explained, is bound to come into contact with one or another of the pins 53. By doing so, it is swung around by the pin and pushed entirely over upon the belt 4, which will then carry it along without further hindrance from any other pins 53 if it has been swung to bring its length into line with the length of the belt 4; but if it has not been so swung, it will then come into contact with one or the other side of a gorge passage formed by two guides 54 and 55 set diagonally across belts 5 and 6 respectively, and attached to the supports 12 and 13 respectively, adjacent the upper end of the segregator 7. The guides 54 and 55 extend also downwardly over belts 5 and 6 but without coming into contact with them. The board 52, pins 53 and guides 54 and 55 thus constitute an alining device for the condensers.

In construction, the condensers may be of the type shown in the patent to William Dubilier, No. 1,497,095, granted June 10th, 1924, for example. They are shown as comprising two cover plates of insulation *b*, enclosing a stack *s* of thin sheets or plates of metal, the stacks and the cover plates *b* being held together by clips *c* at the ends, these clips gripping the two cover plates *b* and stack *s* between them, and held in place by eyelet rivets *e*. The sheets or plates of metal in the stack *s* are all insulated from each other and parts are connected to one of the clips *c*; while the remaining sheets of metal are connected with the clip at the other end of the condenser; the sheets or plates of metal thus being divided into two groups insulated from each other. Connected to each clip *c* is a conductor fastening lug *l*.

It will be noticed in Figures 1 and 6 that some condensers have been shown with their conductor fastening lugs *l* on their under side and some at their upper side. This latter position is the correct one for condensers to be carried under the stamps of the stamping machines. Consequently all those condensers which have fallen with their lugs *l* on the underside must be turned over before they arrive at the conveyors which carry them to the stamping machine. This turning over operation of the condensers with their lugs *l* down will be explained further on.

When the condensers fall into the segregator mouth 51 they drop immediately into

the body of the segregator or channel 56, along which they slide until they reach a soft rubber covered roller 57 by which they are gripped and made to advance only at reduced speed. This retardation is of course calculated so that the advance of the condensers towards the stamping machines is correlated with their travel from the hopper 1 into the channel 26, the chute 3 and the mouth 51. However, there is always a possibility for some condensers to issue from the hopper 1 either slightly faster or slower than the peripheral speed of roller 57 will send them towards the stamping machines. If they arrive slower then there will be no harm done, but if they come faster or in a greater number than the roller can move in a given time, they will gradually fill up channel 56 and may even pile up on top of one another in the mouth 51. It is not probable that such an eventuality will ever happen if the speed of roller 57 is well timed with the average drop of the condensers from the hopper, but as the operation depends, so to say, on too many unknown factors resulting from the pell-mell throwing of the condensers into the hopper, provision must be made so that when any clogging of condensers takes place in the mouth 51, to prevent the lowest condenser from sliding into the channel 56, such a condition must immediately be corrected. Hence there is located directly at the throat of the mouth 51 a shaker 58 and between the throat and the upper end of channel 56 a disc 59, both of which are inter-connected by means of a device 60 including gear teeth which makes them oscillate in unison and always in opposite directions to relieve momentary congestion in the mouth 51.

The device 60 is composed of a rack 61 fixedly attached to the under face of the shaker 58, a gear segment 62 fixedly mounted on the pivot pin 63 of the shaker-disc 59, a pinion 64 fixedly mounted on a shaft 65 supported by a part of the bottom 66 of the channel 56 and a smaller fixed transverse support 67, a crank-arm 68 fixedly mounted on the lower end of shaft 65, and a crank-bar 69 attached by one end to crank-arm 68 and by the other to any kind of a reciprocating device which need not be shown but which is designed to operate as required by the other parts of the apparatus. The shaker-disc 59 has in its upper surface a channel 70 which flares out at both ends as at 71 and 72, the ends being of such width that by neither of the disc's oscillations to-and-fro can the channel move out of line or registry with the mouth 56, which is itself expanded or flared at its top to a width equal to the ends of the channel or groove 70. By this arrangement the condensers dropping from the mouth 51 slide unhindered through said channel 70 into channel

56, and yet, even if piling up, one behind the other, cannot become wedged side by side in the channel, and thus be prevented from freely sliding down the channel 56 towards the roller 57. Channel 56 terminates into the selector-feed box 9 of the same width as the channel. This box contains the controlling member or roller 57, also the similar member or roller 73. Both have a semi-soft cover, such as soft leather, canvas, rubber, etc. These rollers are fixedly mounted on shafts 74 and 75 passing through oblong holes 76 and 77 cut in the sides of the box to permit the rollers to rise or fall as the different thickness of the condensers may require. On one end of those shafts are respectively mounted gears 78 and 79 meshing with and controlled by a gear 80 mounted on a shaft 81 which also passes through both sides of box 9 and which has at its other end a sprocket wheel 82, or other driving device, connected to a source of power also not shown and which too may, or may not be the same as that operating the other parts of the apparatus. Gear 79 is slightly smaller than gear 78; roller 73 has therefore a slightly greater peripheral speed than roller 57, so that no condenser that may pass from under roller 57 shall do so while the trap-door 8 is in open position, for a reason which will presently be explained. The parts 58 and 59 are set so as to be flush with the bottom of the channel 56.

Trap-door 8, (Figures 6, 7, 8, 9 and 10) is set directly below roller 73 and is in prolongation of the floor of channel 56, on which it is fastened by a hinge 83 having two integral arms 84 and 85, (Figures 6 and 9). Below the floor of the flue or channel 56 is fixedly mounted a solenoid S, the plunger of which is joined by a link 86 to the arms 84 and 85 of hinge 83. A strong spring 87^a around the plunger of solenoid S holds the trap-door 8 in closed position whenever solenoid S is not operated. Trap-door 8 is provided on its upper surface with four contact springs 87, 88, 88^a and 89, which have their electrical connections or binding posts at the under side of the door at respectively, 87', 88', 88^b and 89'. Centrally on the front end board of controller box 9 is fixedly set a feather spring contact 90 which extends downwardly in the line of passage of every condenser passing with lungs turned up.

Below the lower end of trap door 8 is located a trap-pocket 90^a swinging on a bracket hinge 91 fixedly attached to the under side of the floor 92 of a receptacle 93. Trap-pocket 90^a has two sides 94 and 95, the inner surfaces of which are flush and in line with the inner surfaces of receptacle 93, the width of which is equal to that of channel 56 and mouth 51 and in direct line also with their side-walls as well as with

those of guideway 7, (Figure 5). The front and rear walls 96 and 97 of the pocket 90^a with the side-walls 94 and 95 complete the trap-pocket, which has for object to turn every condenser which falls into it to a right-side-up position, and then pass it down the receptacle 93 to the delivery conveyor 11, as will be explained later.

This trap-pocket 90^a, hinged at 98 to bracket-hinge 91, has an integral arm 99 extending downwardly, and joined by a link 100 to the plunger 101 of a solenoid S¹, fixedly mounted on the underside of the receptacle 93. The outer or rear surface of wall 97, when the pocket 90^a is closed, is flush or even with the rear 103 of the receptacle 93, which lies at an angle of about forty-five degrees with a partition or wall 104, placed a slight distance below the lower end of trap door 8. This wall forms the magazine M for defective condensers at the bottom of the apparatus and serves at the same time as bottom brace for the support 12 and 13. When trap-pocket 90^a is closed its lower front wall 96 lies in a recess 105 cut in the upper surface of the bottom 92 of the receptacle 93, the bottom 92 being flush with the upper or inner surface of this wall 96.

The electrical connections of these various devices are as follows. One side of a source of power or battery B is connected by a wire W to the binding post 87'. The other side of battery B branches off from a wire W¹ by branches *w*, *w*¹ and *w*² respectively to one side of a switch actuating solenoid S², one side of the solenoid S' actuating the trap-pocket 90^a, and one side of the solenoid S actuating the trap-door 8. The other side of solenoid S has a wire *w*³ which branches off by a wire *w*⁴ to binding post 88', and by a wire *w*⁵ to a binding post 110 of switch 107. The other side of solenoid S¹ is connected by a wire *w*⁷ to the other binding post 106 of switch 107, which, when closed, connects solenoid S¹ by a wire *w*⁹ branching from wire *w*⁵ to binding post 89'. The other side of the switch actuating solenoid S² is connected by a wire *w*⁸ to the binding post 109 of the spring 90 and by a wire *w*¹¹ branching from wire *w*⁸ to binding post 88^b of spring contact 88^a.

At the bottom of plunger 111 of solenoid S² is fixedly attached a disc 112 of insulating material on the underside of which is affixed a metal bridge piece 113 which, when solenoid S² is not actuated, closes the electric circuit through binding posts 106 and 110. The operation of these various electrical devices is as follows.

When a condenser arrives under roller 73 in the position as shown in Figure 6, that is, with its lugs *l* on the upper side, the forward lug strikes the spring 90 before the underside of the condenser clip on which the lug

is riveted comes into contact with spring 89. Therefore as soon as the clip comes into contact with spring 87 an electric circuit is established through wire W, spring 87, the forward clip and lug of the condenser, spring 90, wire *w*⁸, solenoid S² and back to battery B by wire *w*. Solenoid S² is thus actuated and switch 107 is thus opened before the clip of the condenser on which the forward lug *l* is riveted has come into contact with spring 89, and thus trap door 8 is forced to stay closed because the circuit from spring 89 to solenoid S is open at switch 107 and thus the condenser is pushed forward upon either slideway 114 or 115 as will be explained further on. But if now a condenser comes with its lugs *l* on the under side, the lug will first come into contact with spring 87 and thus establish the following electrical circuit. From battery B along wire W to post 87', spring 87, lug of condenser to spring 89 and binding post 89', wire *w*⁹ to binding post 110, bridge 113 to post 106 (solenoid S² being then inoperative), along wire *w*⁷ to solenoid S¹ and then by wires *w*¹ and W¹ back to battery B; at the same time also by branch wires *w*⁵ and *w*³ to solenoid S and then back to battery B by wire *w*², *w*¹ and W¹. Both solenoids S and S¹ are thus energized at the same time and both trap-door 8 and trap-pocket 90^a are swung open and the condenser is made to fall as shown into pocket 90^a. Then the electrical circuits will be broken, the solenoids deenergized, and trap-door 8 and trap-pocket 90^a are swung back to their former positions, the latter passing the turned over condenser into the receptacle 93 to be discharged upon the conveyor 11 to be delivered to the stamping machine.

If now comes a defective condenser, i. e., a condenser which is short-circuited interiorly and thus will let an electric circuit to be established between both end clips, then the following electric circuit will be established. When such a condenser arrives under roller 73, either in the right or the wrong position, the under-sides of the clips come into contact with springs 87, 88 and 88^a before the front lug *l*, if on the underside, is able to come into contact with spring 89, (and if the lug is on the upper side and comes into contact with spring 90 so much the better), and thus there will be established the following circuit. From battery B along wire W to binding post 87' and spring 87, through from front clip to rear clip, from rear clip to spring 88 and binding post 88', along wires *w*⁴ and *w*³ to solenoid S and return to battery by wires *w*², *w*¹ and W¹; also at the same time from rear clip to spring 88^a and binding post 88^b, along wire *w*¹¹ which connects binding post 88^b to wire *w*⁸ (wire *w*¹¹ is only partially shown in Figure 6), along wire *w*⁸ to solenoid S² and return to battery by wires *w* and W¹, thus

energizing solenoid S² and opening switch 107 which will prevent trap pocket 90^a from being opened at the same time with trap door 8. Thus defective condensers will slide over the rear 103 of the receptacle 93 and the back face of trap-pocket 90^a into magazine M.

One of the objects of this invention, as said above, is to automatically feed finished condensers to one or more stamping machines. In Figure 6 there is actually shown a method of feeding condensers to two such stamping machines by means of two separate delivery conveyors 10 and 11. These conveyors in reality need not be located, as shown in the drawings, one above the other. They can, in fact, be placed on the same plane parallel one to the other with the necessary distance between them, each having then, of course, its chute 93 and slideway 114 respectively, as shown. Conveyor 10 would, of course, receive then only all the condensers which enter channel 56 with their lugs on the upper side, and conveyor 11 would receive all the condensers which enter the flue 56 with their lugs on the underside. All the probabilities are that both conveyors would receive an equal number of condensers. There are, however, contingencies when one or the other of the stamping machines would become inoperative. Supposing the stamping machine fed by conveyor 10 become inoperative, then all the condensers to be stamped would be shifted over on conveyor 11, and for this purpose slideway 114 would be replaced by a chute more or less in the form of chute 115. If, on the other hand, the stamping machine fed by conveyor 11 should become inoperative, then receptacle 93 can be replaced by a longer one passing over the conveyor 11 to conveyor 10 and curved to bring its mouth to the side of that of slideway 114.

Neither of conveyors 10 and 11 needs any special description, both being of the conventional type and made of a continuous corrugated and flexible belt 120 operated by the ordinary means of rollers mounted on shafts supported by the vertical supports 121 and 122.

This invention may of course be utilized for feeding manufactured articles, other than condensers, which require to be arranged in correct position for stamping or other finishing operations.

Having described my invention, what I believe to be new and desire to secure and protect by Letters Patent of the United States is:—

1. Feeding mechanism comprising parts enclosing a channel having a mouth, a shaker having a trough therein with flaring ends adjacent said mouth, and parts for rotating the shaker, to control the passage of articles into said trough and through said channel.

2. Feeding mechanism comprising parts enclosing a channel having a mouth, a shaker having a trough therein with flaring ends adjacent said mouth, and parts for rotating the shaker, to control the passage of articles into said trough and through said channel, together with a second shaker connected to act in unison with the first named shaker.

3. Feeding mechanism comprising parts forming a channel, a trap-door at the discharge end of said channel, electrical contacts carried by said door, electric circuits connected to the contacts, and electrical appliances in said circuits to cause the trap door to open when required, together with a trap-pocket below the trap-door, and electric circuits and electric appliances therein to cause said pocket to receive inverted articles delivered thereto from said channel and turn them over to right position.

4. Feeding mechanism comprising parts forming a channel, a slideway in line with the channel, a receptacle below the slideway, a trap-door in the bottom of the channel in advance of the slideway to enable the channel to discharge into the receptacle, electrical appliances and circuits for opening the trap-door when an inverted article passing through the channel arrives at said trap-door, and delivery conveyors adjacent the slideway and the receptacle, together with a movable trap pocket below the trap-door, and additional appliances and circuits to open the trap-pocket and control admission to said receptacle of articles dropping out of said channel when the trap-door opens.

Signed at New York, in the county of New York and State of New York, this 29th day of December, A. D. 1924.

ANATOLE C. HEINY.