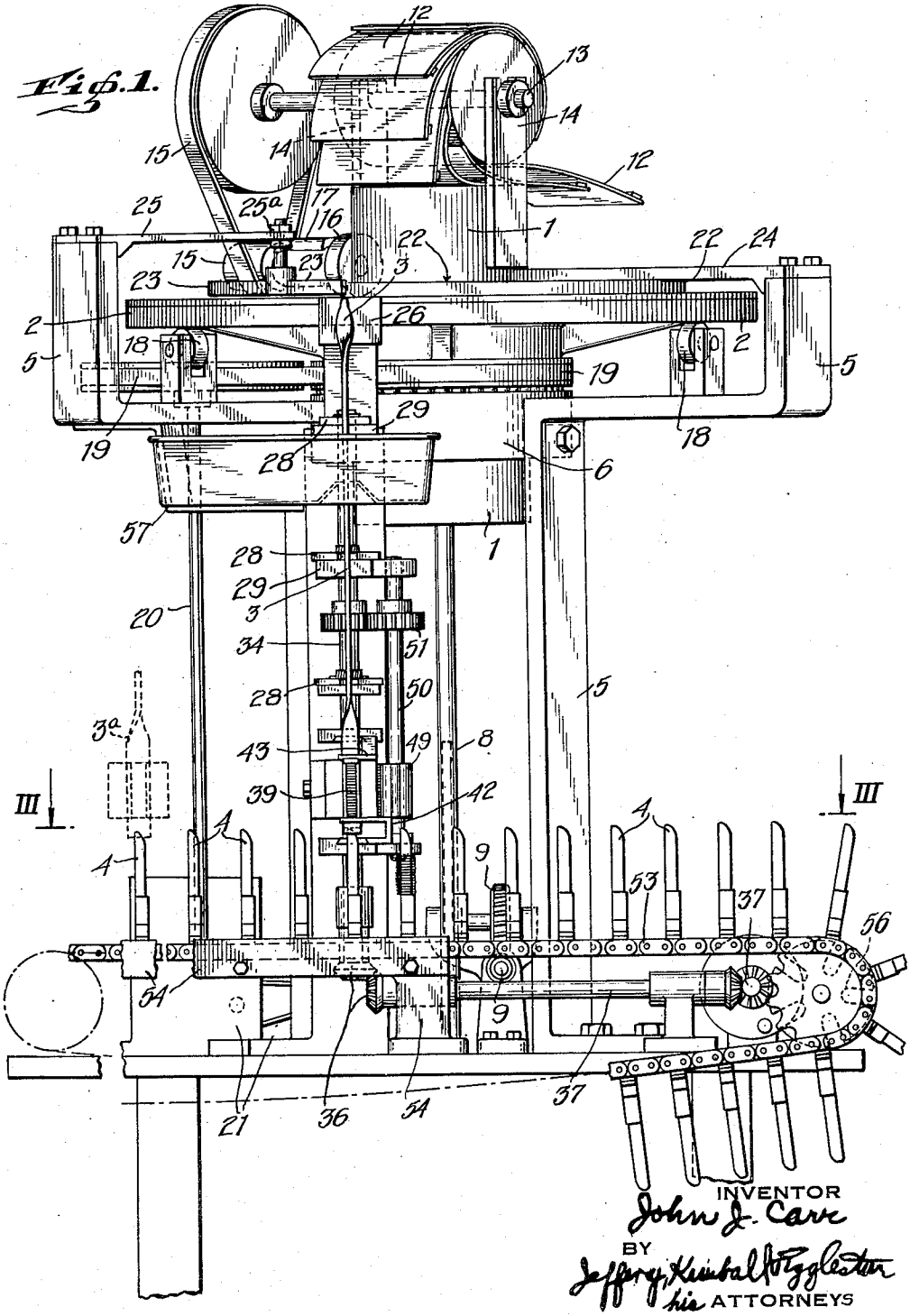
Feb. 20, 1945. J. J. CARR 2,369,660

PIN-HANDLING MACHINE

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Fig. 1.



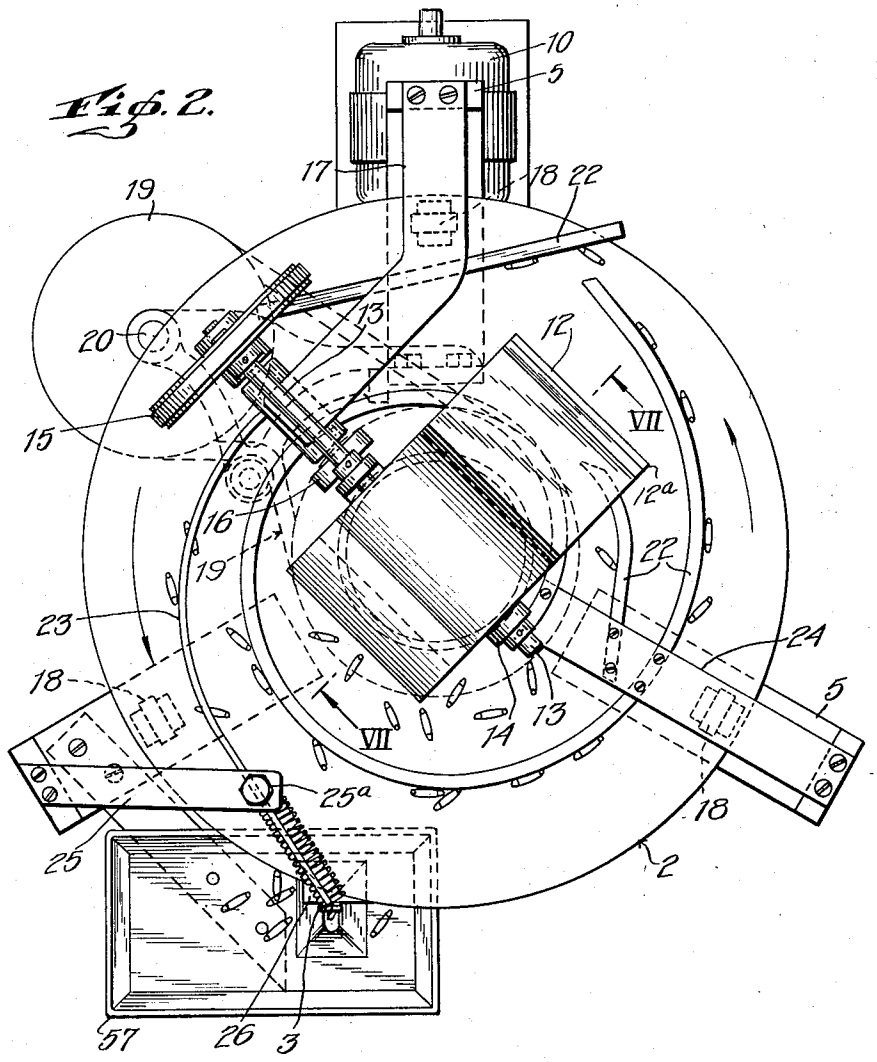
INVENTOR
John J. Carr
BY
Jeffrey, Kimball, Wyglendon
his ATTORNEYS

Feb. 20, 1945. J. J. CARR 2,369,660

PIN-HANDLING MACHINE

Filed March 18, 1943 6 Sheets-Sheet 2

Fig. 2.



INVENTOR
John J. Carr
BY
Jeffery, Kimball & Eggleston
his ATTORNEYS

Feb. 20, 1945. J. J. CARR 2,369,660

PIN-HANDLING MACHINE

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Fig. 3.

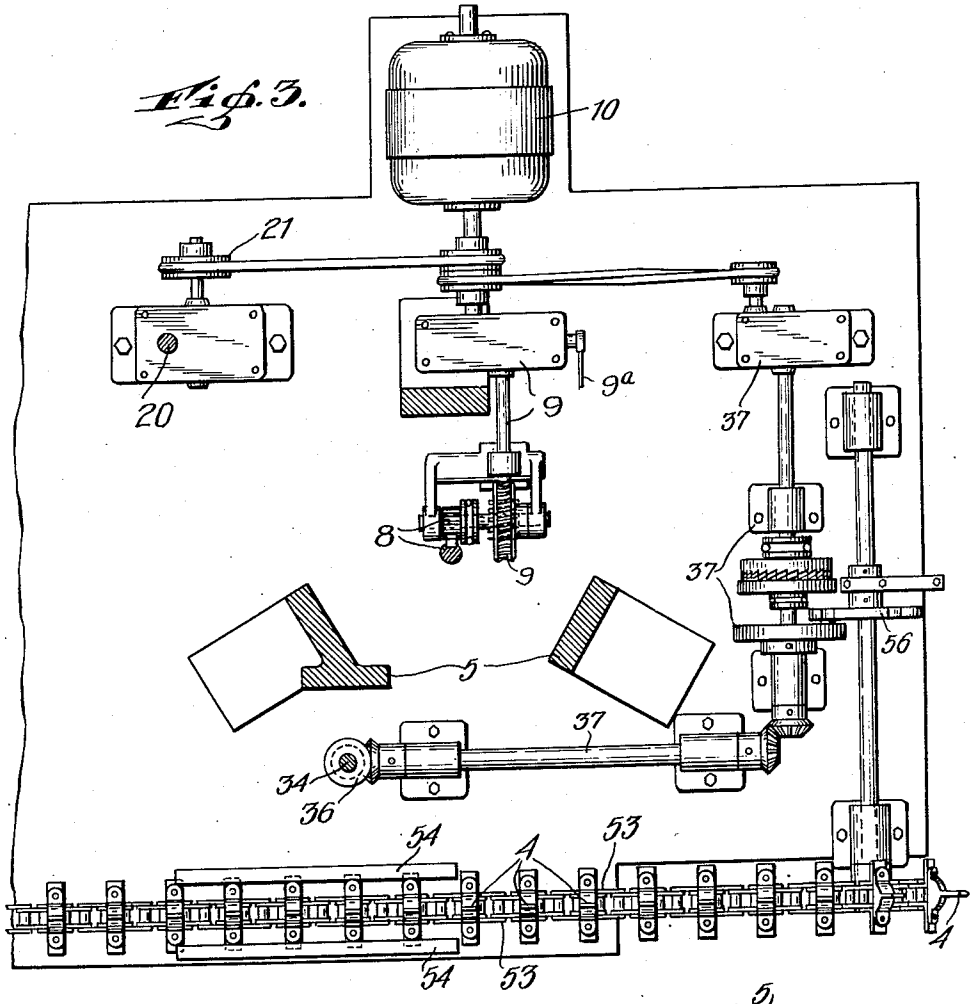
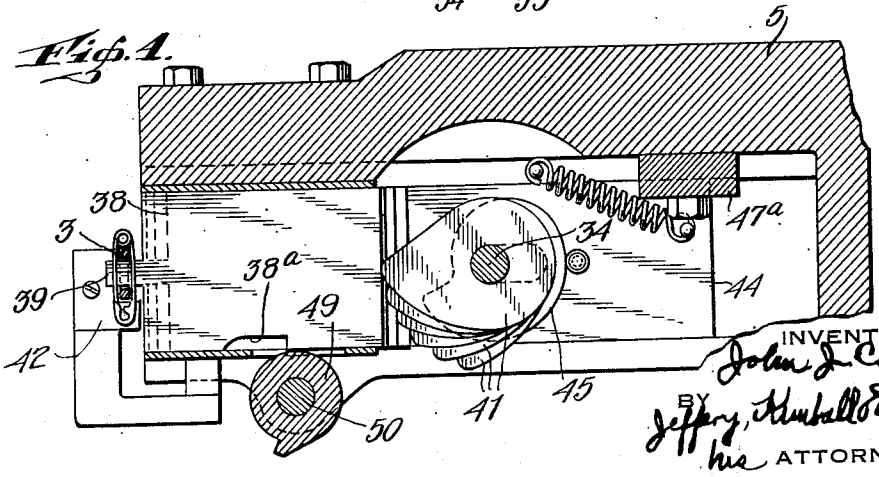


Fig. 4.



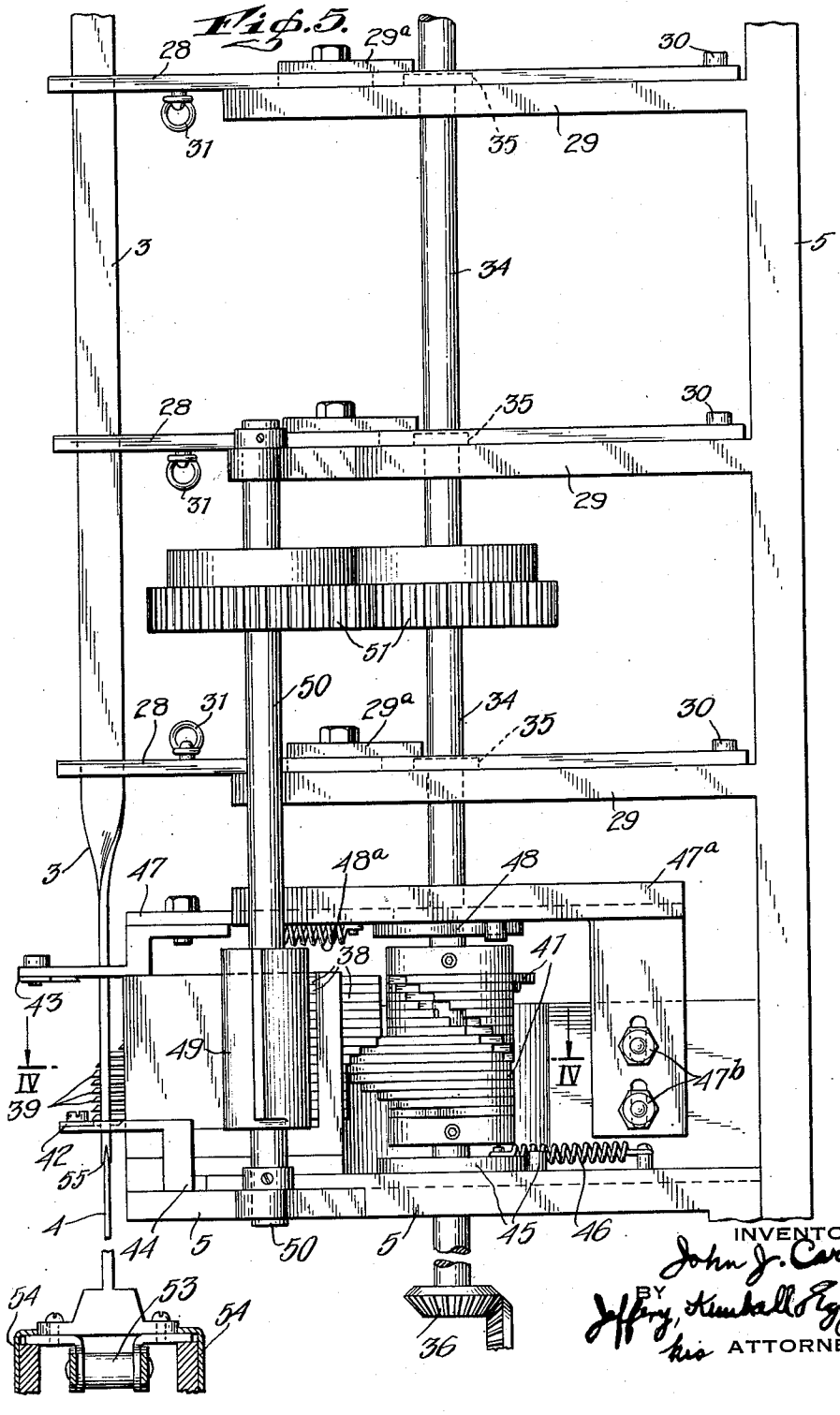
INVENTOR
Dolan J. Carr
BY
Jeffery, Kimball & Eggleston
his ATTORNEYS

Feb. 20, 1945. J. J. CARR 2,369,660

PIN-HANDLING MACHINE

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Fig. 5.



INVENTOR
John J. Carr
BY
Jeffrey, Kimball & Eggleston
his ATTORNEYS

Feb. 20, 1945. J. J. CARR 2,369,660

PIN-HANDLING MACHINE

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Fig. 6.

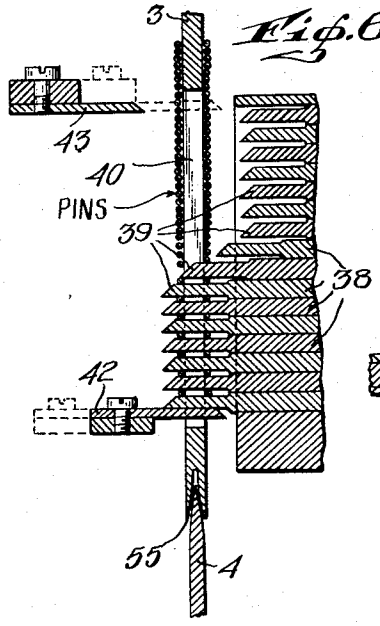


Fig. 7.

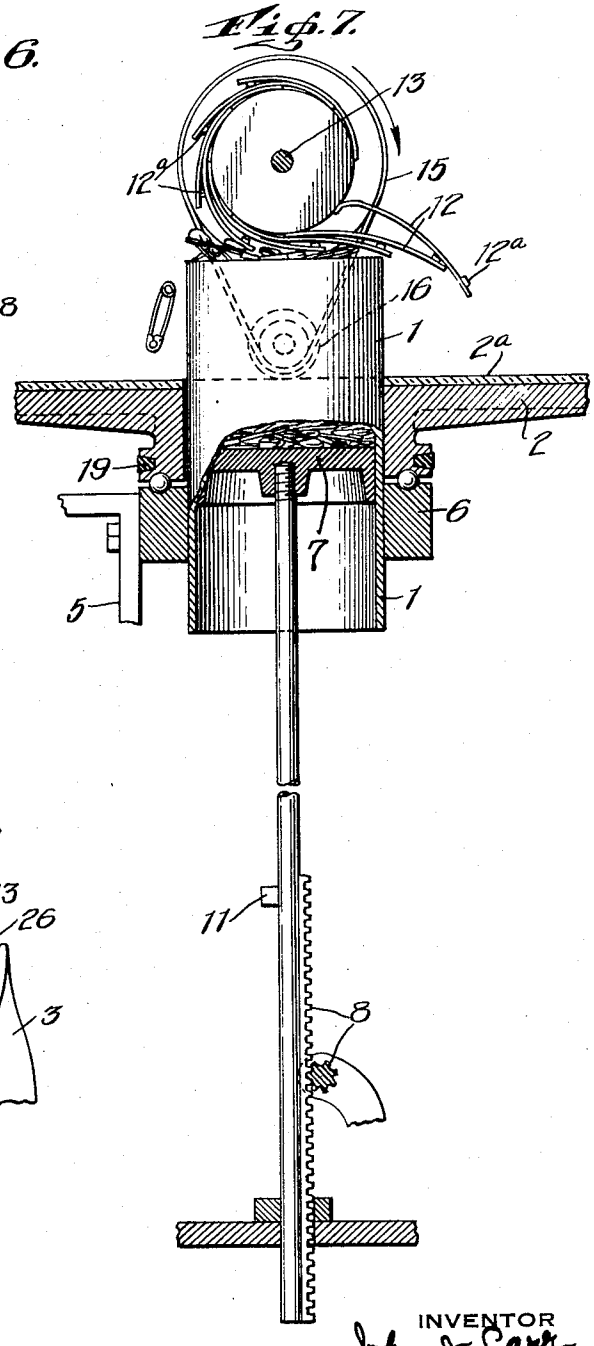
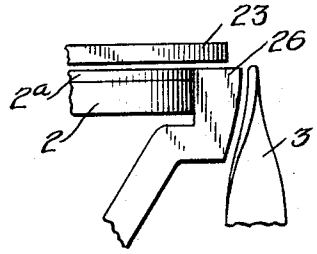


Fig. 8.



INVENTOR
John J. Carr
BY
Jeffery, Kimball & Eyston
his ATTORNEYS

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PIN-HANDLING MACHINE

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Fig. 9.

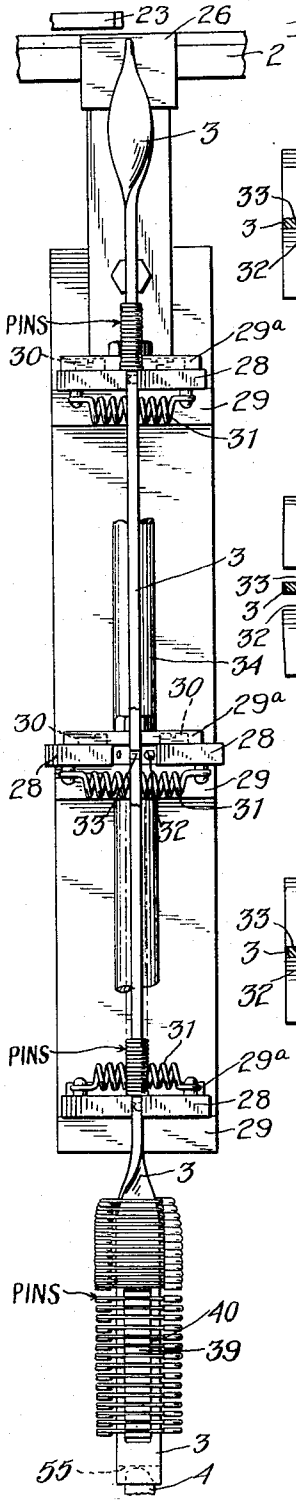


Fig. 10.

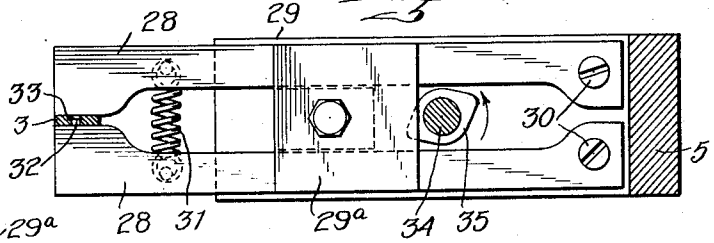


Fig. 11.

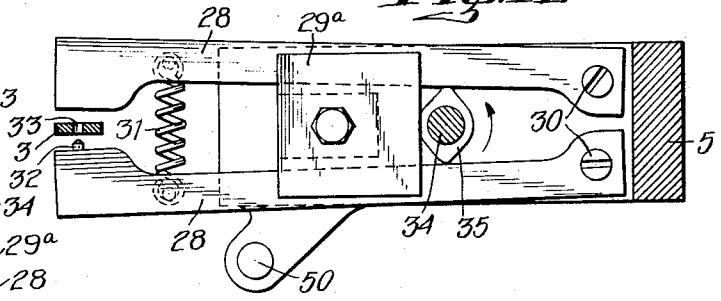


Fig. 12.

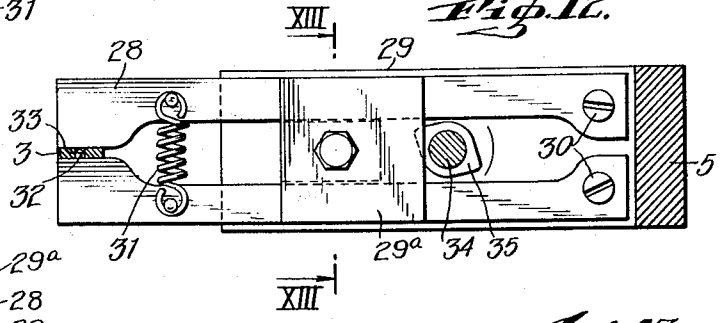
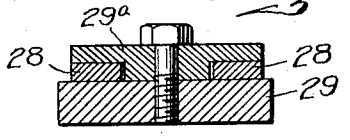


Fig. 13.



INVENTOR
John J. Carr
BY
Jeffery, Kimball & Eyster
his ATTORNEYS

Patented Feb. 20, 1945 2,369,660

UNITED STATES PATENT OFFICE

2,369,660

PIN-HANDLING MACHINE

John J. Carr, Naugatuck, Conn., assignor to The Risdon Manufacturing Company, Naugatuck, Conn., a corporation of Connecticut

Application March 18, 1943, Serial No. 479,671

34 Claims. (Cl. 163—8)

The invention is a machine for handling safety-pins and like articles, its function being to receive such articles in bulk and deliver them in regimented bunches or groups, if desired of predetermined number in each group, ready to be further manufactured, handled or packaged as the case may be. By "regimented" is meant that the delivered safety-pins, are arranged or stacked in parallel relation and with their heads or capped ends all pointed in the same direction, this being an important but not indispensable function of the machine of this invention. The invention consists in the general design and mode of operation, and specifically in the feeding means, the regimenting means and the delivery and counting means, individually and in combination with each other, all as herein explained in connection with the exemplification shown in accompanying drawings, in which:

Figure 1 is a side elevation of a safety-pin machine incorporating the features of this invention.

Figure 2 is a top plan thereof.

Figure 3 is a horizontal section on line III—III of Fig. 1.

Figure 4 is a larger scale horizontal section on line IV—IV of Fig. 5.

Figure 5 is a side elevation of the conducting, delivering and counting mechanism.

Figure 6 is a detail of it.

Figure 7 is a detail, partly in section of the hopper and the pin-delivering means.

Figure 8 is a detail of the transfer point from the regimenting means to the conductor rail.

Figure 9 is a front elevation of the conductor rail and its multiple holders or supporting means.

Figures 10, 11 and 12 are cross sections of Fig. 9, respectively above each of the rail holders, and

Figure 13 is a section on XIII—XIII of Fig. 12.

The general operation is as follows:

The bulk pins to be bunched are poured into a hopper 1 (Fig. 7), at the top of the machine and are thereafter automatically delivered from the top of the hopper so that they fall onto a revolving table 2, concentric with the hopper and on which they are regimented, and from which they are delivered over the table edge and so as to fall onto the end of a conductor rail 3, on and by which they are guided under positive control, and from the lower end of which they slide off onto a receiving device or finger 4, or one of a series of such fingers, which come successively into momentary registry with the foot of the rail for that purpose. Each finger, thus receiving a bunch of pins from the rail, carries it forward to the delivery station which in the present case, is at the right-hand side of the machine as shown in Fig. 1. At this point the groups or bunches on the fingers are dropped off or otherwise removed as best suited to the nature of the operation that is next to be performed upon them. While within the control of the conductor rail the pins may be and preferably are counted, so that each conveyor finger can thus receive and deliver an exactly uniform number of pins in each bunch, and if desired, all with their heads pointed in the same direction.

While the form of the invention herein shown has been developed to handle safety-pins in the closed-pin condition, the principles employed in its several departments can be utilized also for other articles susceptible of handling by them, whether closed or not and as will presently become apparent.

The main frame of the illustrated machine, marked 5, includes a central ring or socket structure 6, in which the hopper 1, is formed or secured as shown in Fig. 7. According to this invention, this hopper is an upright cylinder or tubular chamber, open at its top and closed at its bottom by a movable floor 7, which is in fact a piston for the cylinder. It is caused to rise in the cylindrical hopper by the slow action of a rack and pinion drive generally designated 8, the rack being on the piston rod as illustrated in Fig. 7. Its pinion is driven through a reducing gear-train collectively marked 9 (Fig. 3) from an electric motor 10, but the detail of this hopper drive is of no consequence to the invention, except to note that it includes a clutch 9a or some equivalent means of disconnecting it, (as by dropping the worm out of mesh with its worm wheel) so that the hopper floor or piston 7 can be quickly lowered when necessary, as when the hopper is to be replenished with a fresh supply of pins. On such occasion the hopper piston descends until a stop 11 on its piston rod encounters the frame or some other fixed abutment.

When the hopper has been filled with pins the action of the slowly rising piston keeps the mass of pins therein substantially flush with the brim or top of the hopper, where the top layer is subject to the action of a wiper mechanism composed in this instance of a series of flexible or fabric flaps 12, carried on a horizontal shaft 13, and which continually drag across the top of the hopper so as to wipe the pins over the hopper brim, thus causing them to fall onto the rotary table 2. These flaps have light weights 12a

on their free ends, and pass over the top of the hopper in proper correlation to the slow rise of the piston 7 so as to cause delivery to the table at a rate which conforms to the other functions of the machine, as will be understood and the action can be varied either by controlling the motion of the flaps or their number, or the value of the weights attached to them. Since the wiper mechanism will have repeated contact with some of the hopper pins it is preferred to make the flaps of soft material calculated not to abrade the lacquer coating with which they may be protected. The pin delivery thus effected is not regular but nevertheless provides a continuous supply more or less constantly falling onto the rotary table and has the advantage that it avoids tangling of the loop-shaped pins, and actually separates those which have already become tangled or interengaged with each other when deposited in the hopper.

When the wiper mechanism comprises flaps as described, it is sufficient to mount the flapper shaft 13, in open bearings, as indicated at 14 or otherwise, so that it and its flaps can be quickly lifted and removed or swung to one side, to provide access for filling the hopper, and then as quickly replaced. Any other wiper system can be similarly rendered removable. Shaft 13 is shown as driven by a belt-and-pulley drive, marked 15, from a friction wheel 16, bearing upon and driven by the top surface of the rotary table 2. This friction wheel is journalled in a rigid frame bracket 17 over-lying the rotary table, but the manner of drive is obviously a matter of machine design to be organized as preferred.

The rotary table 2, on which the pins fall, is circular in contour, concentric to the hopper 1. It is journalled on the frame ring 6 by a ball-race as indicated or otherwise, and steadied in its travel by three frame-supported bearer rollers 18, below its rim portion. It can be driven in any appropriate way, in the present case by a belt 19, from an upright shaft 20, which receives its power through suitable driving connections collectively indicated at 21 (Fig. 3) from the motor 10. In its best form the table top is surfaced with a plate of glass, or like material highly polished or very smooth, so that such rubbing action as it may have on the pins does not affect the lacquer coat on them.

This perfectly flat glass surface revolves beneath a fixed system of guiding scrolls or fences, marked 22 and 23, which are supported on appropriate frame brackets, such as 24 and 25 in positions close to, but out of actual contact with the table surface. The pins fall on the table near its center and the several fences 22 are so slanted or curved as to work them gradually outward, toward the periphery, as the table rotates.

The fences marked 22 are so close to the table surface that no part of any pin can ride under them and are therefore guided by them so as to approach the periphery. Fence 23, however, is spaced slightly further from the table surface, far enough to allow the small or hinge ends of the pins, but not the capped or head ends, to be carried under it by the table movement, and it is so placed as to be encountered by the pins approaching the edge of the table. The effect of this is to gather these pins, under the fence 23, by their heads, and all in a row as indicated in Fig. 2, with all the heads or capped ends on one side of the fence and all the small or hinge ends on the other as indicated in Fig. 2. The fence is adjustable toward and from the table top by means of the threaded stud 25a by which it is attached to its bracket 25.

By the effect of the table movement the row of pins which collects under the fence 23 advances along the latter toward and over the edge of the table and onto a stationary triangular shelf 26 (Fig 8), which is flush with the table surface and closely fitted to the circular periphery thereof but not in contact with it. This shelf is fixed on a rigid bracket on the frame 5. The pins pass freely from the table onto this shelf as they move along the guiding fence 23. Their movement over the shelf is due to the pushing action of those behind and causes them to pass successively over the edge of the shelf and fall therefrom, one after the other, onto and over the upper end of the conductor rail 3, placed close to the shelf so as to catch them. See Fig. 8.

This rail is an upright or vertical member, somewhat pointed at its upper end to facilitate catching the falling pins and its cross section throughout its length is predetermined with reference to the shape of the interior of the closed safety-pins so that as the latter slide down upon it they are held by it against any possibility of inversion or changing their parallel or head-and-tail relationship, i. e., it is a positive control for the pins moving along it. The rail is properly termed an internal conductor rail since the closed pins engage it only by their interior surfaces, but this is not to say that it may not be supplemented in particular cases by associated surfaces engaging the outsides of the pins. In its lineal aspect such rail can be either straight or curved as the machine design may require, and in the present case in hand it is straight but its flat section is twisted about its longitudinal axis to a total of 180°, so that it reverses the head-and-tail position of the pins in transit thereon. Thus the pins are delivered to receiving fingers with their heads all directed oppositely to their initial position pointing toward the delivery station. This direction of the pins is preferred for the case taken for illustration but by different rail configurations it will be apparent that the pins can be delivered in any desired position.

The pin-conducting function of the internal conductor rail is made possible, according to this invention, by supporting it on the machine frame through the collective action of a set of alternately or intermittently functioning rail-holders, at least one and preferably two of which are always engaged with the rail to hold it in prescribed position, while the other or others are opened and disengaged from the rail to permit the pins to slide past them. Three such rail-holders are shown in the present case, one for holding the rail near the top, one near the bottom and the other at about its middle, and each comprises a pair of jaws 28 resting flatwise upon a rigid horizontal frame shelf 29 and pivoted thereto at points 30. They are also held snugly on their shelves and centralized thereon by retainer caps 29a. They close by the action of their springs 31 and thereby grip the rail 3 with considerable pressure, thus collectively holding it with substantially the same fixity as if it were an integral member of the machine frame.

The opening of the jaw-holders in the proper sequence, is done by the action of a vertical cam shaft 34, common to all of them and provided with a jaw-spreading cam 35 located between the respective jaw members at each elevation. This shaft can be driven in any appropriate manner as by the miter gears 36 at its foot and a

transmission line indicated generally by 37 in Fig. 3, from the driving motor 10. The cams 35 thereon are so angularly related that they open first one and then another of the rail-holders, but always leave two of them closed on the rail, as above indicated, to maintain its rigid position.

As a precaution against even minute departure from such fixed position one or each of the holder jaws is provided with a beveled tooth or dowel 32 to register with a correctly located matching hole 33 in the rail so that any incipient rail displacement is immediately rectified by the jaw-closing action. This maintains the accuracy of the rail position continuously under all circumstances. The safety-pins descending the conductor rail thus have free passage along it with only momentary interruption as they encounter a closed holder; their descent is practically continuous. The release of pins from the lower end of the rail is controlled by delivery escapement mechanism comprising an upper escapement tooth 43 and a lower tooth 42, each appropriately actuated to block passage of pins on the rail in alternation. The vertical separation of these escape teeth can be relied on for roughly determining the quantity of pins that is delivered from the rail to the receiving device but greater uniformity, as to the number of pins in each delivery is desirable and is obtained by means of a counting mechanism located between the two teeth of the escapement mechanism.

Such counting mechanism according to this invention comprises a vertical stack of identical flat plates 38, each with a chisel pointed projection or wedge 39 formed on its front-edge and each mounted to slide horizontally and independently in a suitable housing so as to project its wedge into engagement with the pins on the rail, while the latter are retained thereon by the lower escapement. The wedges are preferably designed to pass through the pins and enter into a longitudinal slot in the rail indicated at 40 in Figs. 6 and 5. They are advanced consecutively into the rail slot, beginning at the bottom, by the action of a stack of scroll cams 41 on the same shaft 34, that actuates the rail holders.

The wedges are spaced from each other by the thickness of one safety-pin and as each is advanced and wedges its way into the stack of pins on the rail it forces those above it upwardly and as indicated in the drawings, until only the predetermined number of pins conforming to the number of wedges, remain below the upper escapement tooth 43, one pin being then located between each two adjacent wedges.

At this point the upper escapement tooth 43 moves under the pins above the top wedge 39, so as to take the support of the stack of pins on the rail above that level (see Fig. 6). While these pins are thus held from descending, all the counting wedges are withdrawn which allows the counted pins to collapse and rest on the lower escapement tooth 42. When this latter tooth is withdrawn, which occurs next, the counted pins fall as a bunch into or onto the receiving device. The number of counting teeth determines the number of pins in the bunch and by having an individual scroll cam for each counting plate the number can be changed when desired. At the same time it is within the invention to advance all the counting wedges simultaneously, making them of graded length so that the lowest engages the pins on the rail first (protruding through rail slot 40) and the others do so consecutively upwards, the successive engagement of the pins being the important factor in this system of pin-counting.

The lower escapement 42 is mounted on or as part of a slide 44, and operated in the described sequence by a cam 45 on the cam-shaft 34 against a return spring 46, and the upper escapement 43 is similarly mounted on a slide 47 operated by a cam 48 on shaft 34, also against an appropriate return spring 48a. The detail of this slide mechanism is obviously of no consequence so long as the teeth function in the desired sequence, it being noted that to accommodate different numbers of counting plates the support 47a for the upper escapement (43) is made vertically adjustable as by the use of the bolt and slot attachment 47b.

Withdrawal of the counting wedges 39 to their retracted positions is accomplished by a restoring cam 49 carried on a vertical counter-shaft 50 driven from cam-shaft 34 by the gear-couple 51. This cam is common to the stack of counting plates 38 engaging the notches 38a in the sides thereof so as to restore all of them at once at the proper point in the cycle.

The means for receiving and conducting the pins which the escapement mechanism releases from the conductor rail can be variously organized to transport them to the delivery point in any desired formation and according to the purpose of the operation next to be performed. If they are merely to be delivered in bunches, or counted bunches, any form of receiving device or receptacle may be used, but if an initial regimentation of the pins is to be preserved for example, in order to string them on a wire holder or the like, a finger-type of receiver is used as represented by the fingers 4. These are of oblong cross-section conforming to the interior of the pins so as to continue the positive control of pin position.

The machine under description has a series of such fingers, 4, carried on an endless conveyor which may be a sprocket chain 53, trained over sprocket wheels and driven step-by-step so that the fingers come successively into aligned registry with the foot of the conductor rail, each finger stopping at the rail long enough to receive a group of pins from it, released by the escapement mechanism.

The virtue of such chain of fingers is that it can serve more than one pin-arranging mechanism, or conductor rail, so that each of the fingers will receive pins, or bunches of pins, successively from each of them. Another pin-arranging mechanism, like that already described, is intended to be indicated in Fig. 1 by the dotted line representation of its conductor rail here marked 3a, and which can be understood as delivering to the same chain of fingers. There can be any desired number of such or equivalent pin-depositing mechanisms common to the one row of fingers and each can deliver a different kind or size of pin or the like, onto each finger, the larger-sizes being ordinarily delivered first and the smallest size last, or in any other gradation. For this purpose each receiving finger is shouldered as indicated and is thicker at the bottom to accommodate the larger size pins, thereby keeping them from tangling with smaller pins and insuring that the larger ones do not accidentally reverse their positions.

Where the finger conveyor passes below the conductor rail or rails it is guided by a box-type channel 54, which holds the fingers rigidly erect

for this part of the stretch for perfect alignment with the lower ends of the rails and such registry is facilitated by forming the lower end of the rail 3, with a fishtail notch 55 to receive the chisel-edge tip of the finger. (See Figs. 6 and 9.)

The chain 53 is driven step-by-step by Geneva couple 56, which appears in Figs. 1 and 3 and constitutes part of the drive connections 37, above referred to. The detail of this intermittent drive is not of consequence so long as the fingers proceed step-by-step into registry with the conductor rail or rails with a dwell period suited for the transfer of the pins and to their removal from the fingers at the delivery station.

For the protection of the conveyor from possible injury from pins falling into it, a collector pan 57 is desirably mounted under the delivery shelf 26, and around the conductor rail 3, to catch any pins that might happen to miss the pointed end of the latter in falling from the shelf.

From the description above given it should be apparent that there is no intention of limitation of this patent to the detail except as expressed in the claims following.

I claim:

1. In a pin-handling machine, the combination of a movable table and associated pin-guiding fence, means for supplying pins thereto comprising a hopper in which the pins are stored in bulk and means for causing the pins to rise in the hopper for discharge over the brim thereof onto the table and means for wiping the pins from the top of the hopper onto the table.

2. In a machine as in claim 1, means for wiping the pins from the hopper comprising flexible members which drag over the hopper brim.

3. In a machine as in claim 1, flexible flaps which drag over the top of the hopper to remove pins therefrom, and driving means for said flaps mounted for removal from normal position to provide access to the hopper.

4. A pin-bunching machine comprising a plurality of means for regimenting and delivering pins in groups of predetermined number, each said means handling pins of different size, a conveyor common to all said means, pin-receiving devices on said conveyor and means for step-by-step actuating said conveyor to advance said devices successively into registry with said delivery means so that each device receives groups of regimented pins of different sizes.

5. A machine for handling safety pins and the like comprising an internal conductor-rail held with its receiving end in a fixed position, means for depositing pins on such rail, successively functioning rail-holder jaws collectively holding the rail in said position and permitting the passage of the pins along the rail, a conveyor finger, and means for registering such finger with the discharge end of said rail and permitting the passing of the pins from the rail onto said finger.

6. A machine for handling safety pins and the like comprising an internal conductor-rail held with its receiving end in a fixed position, means for depositing pins on such rail, sequentially-functioning rail-holders collectively holding the rail in said position and permitting the passage of the pins along the rail, means for causing pins to accumulate on the rail beyond said rail-holders, a conveyer element periodically registering with the rail for receiving groups of such accumulated pins therefrom, and means for actuating said element to convey the pins to a point of delivery.

7. A machine for handling safety pins and the like comprising in combination, a plural number of internal conductor-rails held with their receiving ends in fixed positions, means for depositing pins on such rails, successively-functioning rail-holders for collectively holding the respective rails in their fixed positions and permitting the pins to pass along them, and a conveyer element successively registering with the discharge ends of said rails to receive the pins from each of them.

8. A machine for handling safety pins and the like comprising two or more internal conductor-rails held with their receiving ends in fixed positions, means for regimenting and depositing different sized pins respectively on said rails, successively-functioning rail-holders for collectively holding the respective rails in their said fixed positions and permitting the pins to pass along them, and a conveyer finger successively registering with the discharge ends of said rails and receiving groups of pins from each of them.

9. A machine as defined in claim 8 wherein said conveyer finger is cross-sectionally proportioned to hold the different sizes of received pins in different positions thereon.

10. A machine for handling safety pins and the like comprising in combination, means for converting pins from random to regular arrangement and discharging them when regularly arranged, an internal conductor-rail held with its receiving end in a position to receive the pins so discharged, successively-functioning rail-holders collectively holding the rail in said receiving position and permitting the pins to pass along it, an excess-receiving pan or the like adapted to receive pins which are not received by said rail and a conveyer element receiving and removing the pins that have entered onto the rail and passed thereon through said rail-holders.

11. A machine for handling safety pins and the like comprising in combination, means for converting pins from random to regular arrangement and discharging them when regularly arranged, an internal conductor-rail held with its receiving end in a position to receive the pins so discharged, successively-functioning rail-holders collectively holding the rail in said position and permitting the pins to pass along it, means for receiving pins that do not enter onto the rail, an escapement tooth for causing pins passing along the rail to accumulate thereon, and means for withdrawing the tooth to release the accumulated pins in groups of predetermined number, and a conveyer element receiving the released groups.

12. A machine for handling safety pins and the like comprising a table surface, means for arranging the pins on and discharging them from such surface, an internal conductor-rail held with its receiving end in position to receive the pins so discharged, said rail being adapted and organized so that the pins are kept from turning thereon, successively-functioning rail-holders collectively holding the rail in said position and permitting the passage of the pins along it, and a conveyer for removing pins from the end of said rail and conducting them to a point of delivery.

13. A machine for handling safety pins and the like comprising in combination, means for receiving the pins and discharging them with their heads pointed in a common direction, an internal conductor-rail held in position to receive the pins so discharged, successively-functioning rail-holders collectively holding the rail in said position

and permitting the pins to pass along it without change of their said directional relation, and a conveyer element receiving and removing pins from the end of the rail in the same directional relation.

14. A machine for handling safety pins and the like comprising means for regimenting the pins with their heads pointing in a common direction and for discharging them in regimented relation, an internal conductor-rail held in fixed position to receive the pins so discharged, successively-functioning rail-holder jaws collectively holding the rail in that position and permitting the pins to pass therealong, and means coacting with the rail to cause pins to accumulate thereon after passing said jaws, and means for periodically opening said means to release a pin accumulation.

15. A machine as defined in claim 14 having also means for counting the pins that have accumulated on the rail and for releasing from the rail only those pins that have been counted.

16. A machine for handling safety pins and the like comprising means for regimenting the pins with their heads all pointing in the same direction and discharging the regimented pins in that directional relation, an internal conductor rail held in position to receive the pins so discharged, cross-sectionally shaped to maintain such relation, and successively functioning rail-holders collectively holding the rail in that position and permitting the discharge of the pins along the rail.

17. A machine for handling safety pins and the like comprising a table surface, means for arranging the pins thereon in parallel relation and discharging them from such surface in that relation, an internal conductor-rail held with its receiving end in a position to receive the pins so discharged, means for receiving pins not entering onto the rail, said rail being adapted and organized to maintain the pins against turning thereon, successively-functioning rail-holder jaws collectively holding the rail in said position and permitting the passage of pins along it, means for causing the pins to accumulate after passing said jaws, and means for counting and discharging a predetermined number of pins from the accumulation.

18. A machine for handling safety pins and the like comprising a moving table surface, stationary means for arranging the pins on and guiding them off of such surface, an internal conductor-rail held with its receiving end in position to catch the pins falling from said surface, means for collecting pins not caught by the rail, successively-functioning rail-holders collectively holding the rail in said position and permitting the passage of the pins along the rail and a conveyer periodically registering with said rail for receiving pins therefrom.

19. A machine for handling safety pins and the like comprising a hopper for pins in random positions, a moving surface receiving pins from the hopper, means associated with such surface for arranging the pins with their heads pointing in a common direction, an internal conductor-rail held in a fixed position for receiving pins from such surface, and shaped to keep them from turning on the rail, successively-functioning rail-holders collectively holding the rail in said position and permitting passage of pins along the rail, and a conveyer for taking pins from the end of the rail in the same directional relation.

20. A machine for handling safety pins and the like comprising a hopper for a mass of pins, a moving table surface, a wiper element adapted for non-positively moving pins at random from the hopper to said surface, means for regimenting the pins on said surface so that their axes extend in a common direction, an internal conductor-rail held in position to receive the regimented pins, successively-functioning rail-holders collectively holding the rail in its said position and permitting the pins to pass therealong including means for accumulating pins on the rail for delivery in bunches.

21. A machine for handling safety pins and the like comprising means for regimenting the pins, comprising a moving table surface, means for dropping pins at random thereon, one or more fences coacting with such surface to guide the pins thereon into parallel relation, and located so as to guide them off of such surface in such relation and a conductor receiving the pins so discharged adapted to retain them in the same relation.

22. A machine for handling safety pins and the like comprising a moving table surface receiving pins at random, one or more fences for guiding pins thereon into parallel relation and extended to guide them off such surface in that relation, an internal conductor-rail held in fixed position to catch the pins leaving said surface, said rail being cross-sectionally shaped to keep the pins from turning thereon, and successively-functioning rail-holders collectively holding the rail in said position and permitting the pins to pass along it to the discharge end thereof.

23. A machine as defined by claim 22 wherein a stationary shelf is supported flush with said table surface, close to its edge, and between the same and the receiving end of said conductor rail.

24. A machine as defined in claim 22 wherein the table surface is rotary and a stationary shelf is supported flush with the surface thereof, close to its circular edge, and between the same and the receiving end of said conductor rail.

25. A machine as defined in claim 22 wherein a stationary pin-conducting shelf is supported flush with the table surface, close to its edge, between the same and the rail, and the guiding fence overlies such shelf to guide pins thereon toward the rail.

26. A machine for handling safety pins and the like comprising an internal conductor-rail held in a fixed position, successively-functioning rail-holders collectively holding the rail in such position so as to permit pins to pass therealong, means for converting pins from random to regular arrangement and depositing them on the receiving end of such rail, an escapement tooth coacting with the rail to accumulate pins thereon at its discharge end, means for counting the accumulated pins comprising a series of counting wedges and means for advancing these wedges between adjacent pins to establish the number of pins for discharge on the retraction of said escapement tooth.

27. A machine for handling safety pins and the like comprising an internal conductor-rail held in a fixed position, successively-functioning rail-holders collectively holding the rail in such position so as to permit pins to pass therealong, means for converting pins from random to regular arrangement and depositing them on the receiving end of such rail, a lower escapement tooth coacting with the rail to accumulate pins on its discharge end, a series of counting wedges, means for advancing these wedges successively

between adjacent pins beginning with the lowest and thereby moving the pins backwardly on the rail, and an upper escapement tooth adapted to hold back the uncounted pins when said wedges are withdrawn.

28. The combination of claim 27 in which the rail is slotted and the counting wedges advance into the slot.

29. The combination of claim 27 in which the counting wedges are in the form of a stack of plates having individual cams for progressively advancing them toward and between the pins.

30. The combination of claim 27 in which the counting wedges are in the form of a stack of plates, in which there is a cam for individually advancing each wedge, and in which there is a single means for simultaneously withdrawing all said wedges.

31. A machine for handling safety pins and the like comprising in combination, an internal conductor-rail held in a fixed position, successively-functioning rail-holders collectively holding the rail in such position so as to permit pins to pass thereon, means for depositing pins on the receiving end of such rail, and means for counting pins accumulating on the rail comprising a selected number of counting wedges, and means for advancing them respectively between adjacent pins on the rail to establish a corresponding number of pins to form a group for discharge therefrom.

32. The combination of claim 31 in which the rail is slotted where the pins accumulate on it and the wedges penetrating between the pins pass through said slot.

33. A machine for handling safety pins and the like comprising an internal conductor-rail held in a fixed position, successively functioning rail-holders collectively holding the rail fixed in such position, to permit pins to pass along it, means for depositing pins on the receiving end of such rail, means coacting with the rail to accumulate a predetermined group of pins thereon near its discharge end, a sprocket chain, a conveyer finger carried thereby into registering alignment with the discharge end of said rail, said end being notched to assist alignment of said rail with the tip of said finger.

34. A machine for handling safety pins and the like comprising in combination, a hopper for holding a mass of pins and adapted for discharging them in random fashion, a circular table mounted to rotate concentrically with said hopper, said table being surfaced with glass or like material adapted to receive the pins from said hopper, guiding fences coacting with said surface but out of contact therewith for arranging the pins in regimented relation on said surface, one of said fences being adapted to engage only the heads of the pins, and such fence extending beyond the edge of the table to discharge the pins therefrom with their heads all pointed in a common direction.

JOHN J. CARR.