May 29, 1923.

1,457,124

F. C. RINSCHE

CARD SORTING MACHINE

Filed Jan. 5, 1917

5 Sheets-Sheet 1

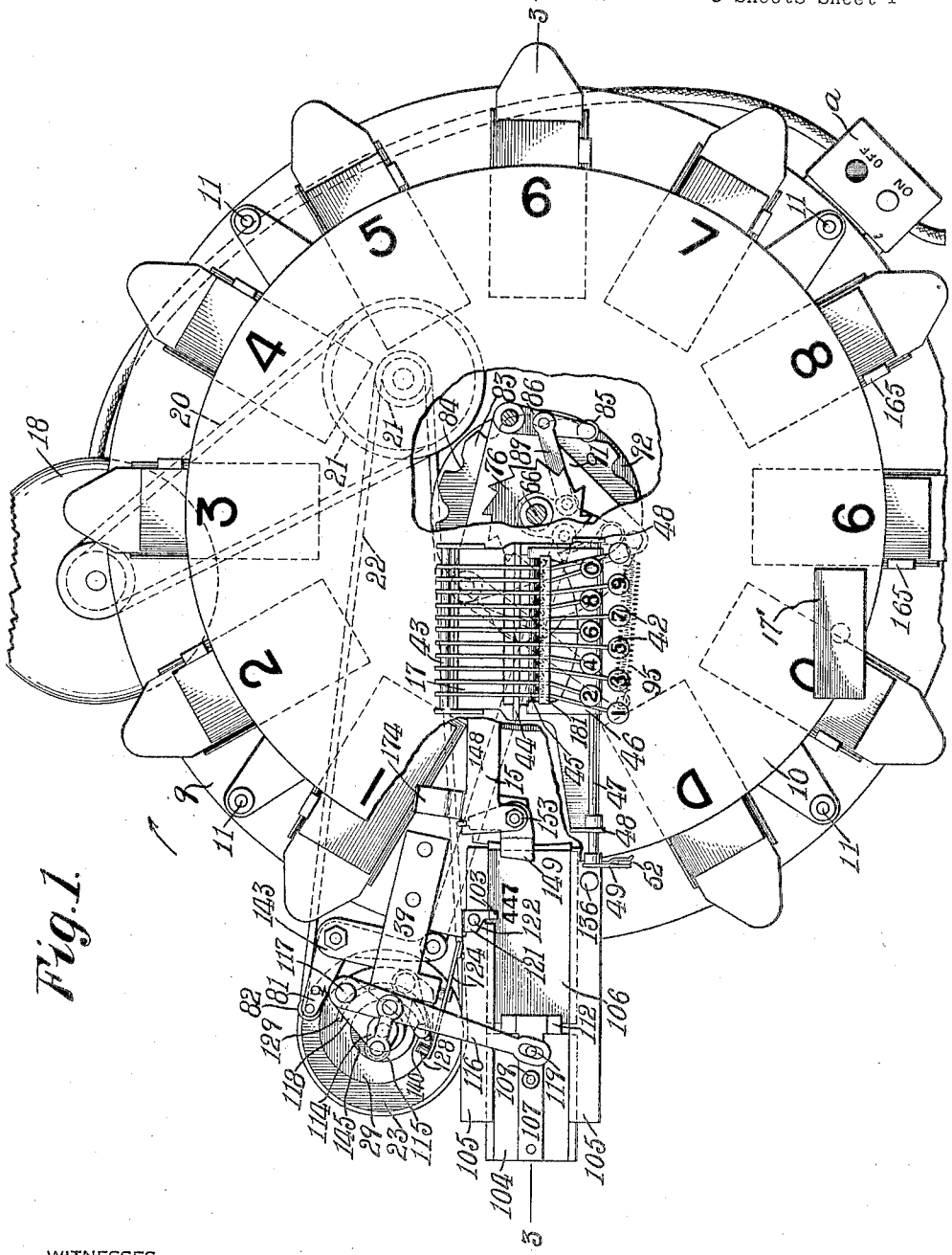


Fig. 1.

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CARD SORTING MACHINE

Filed Jan. 5, 1917

5 Sheets-Sheet 2

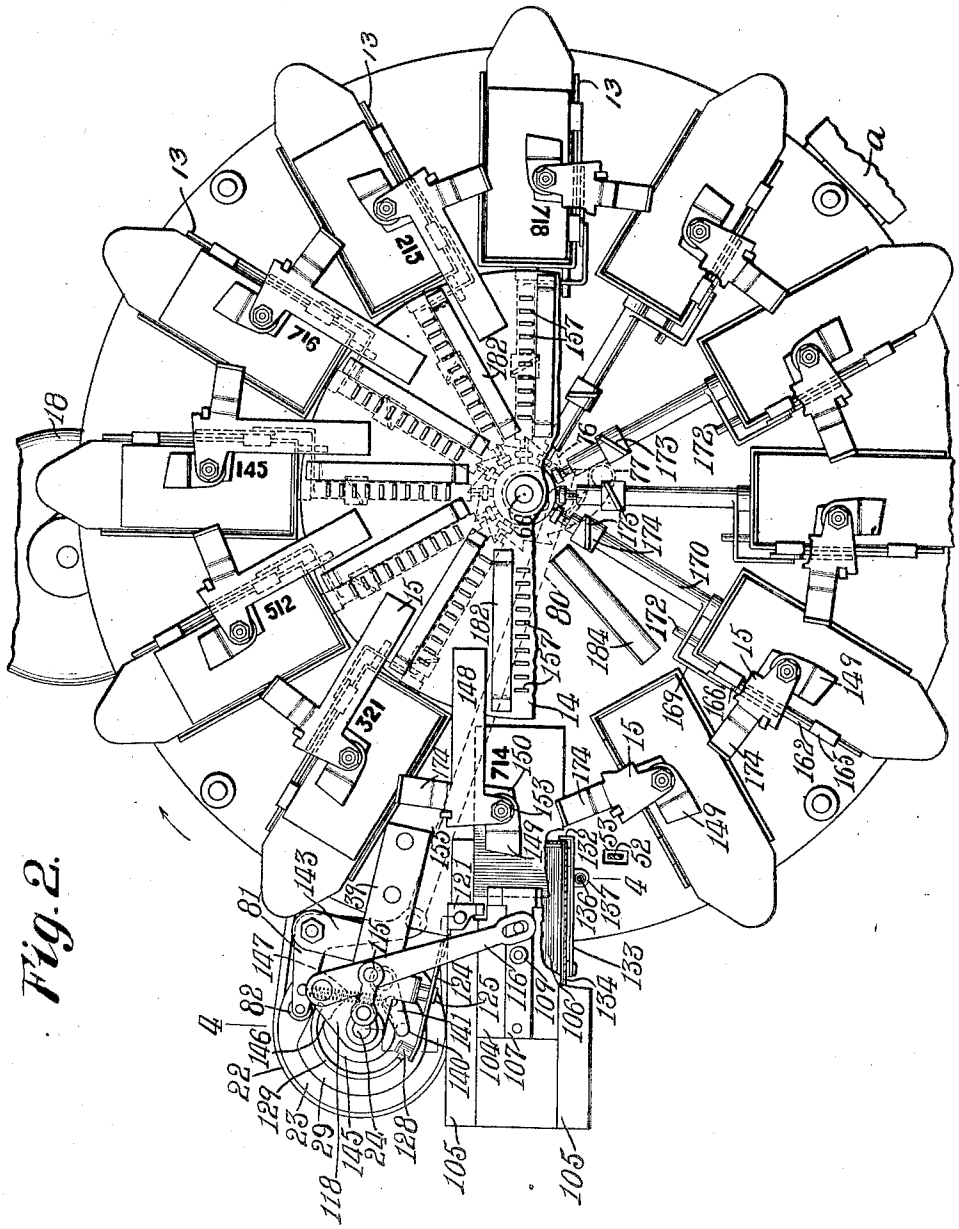


Fig. 2.

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CARD SORTING MACHINE

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Fig. 5.

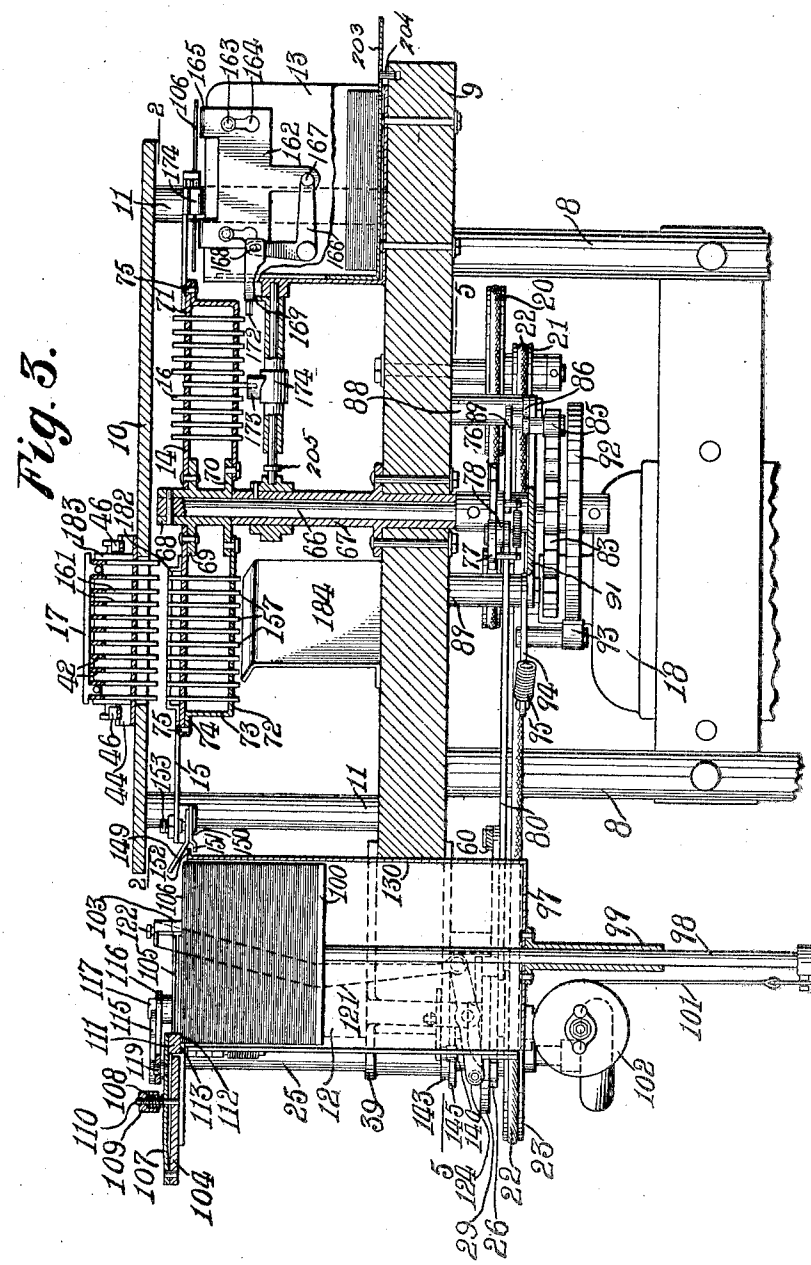
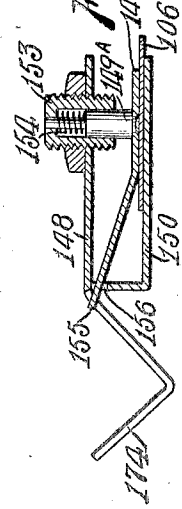


Fig. 8



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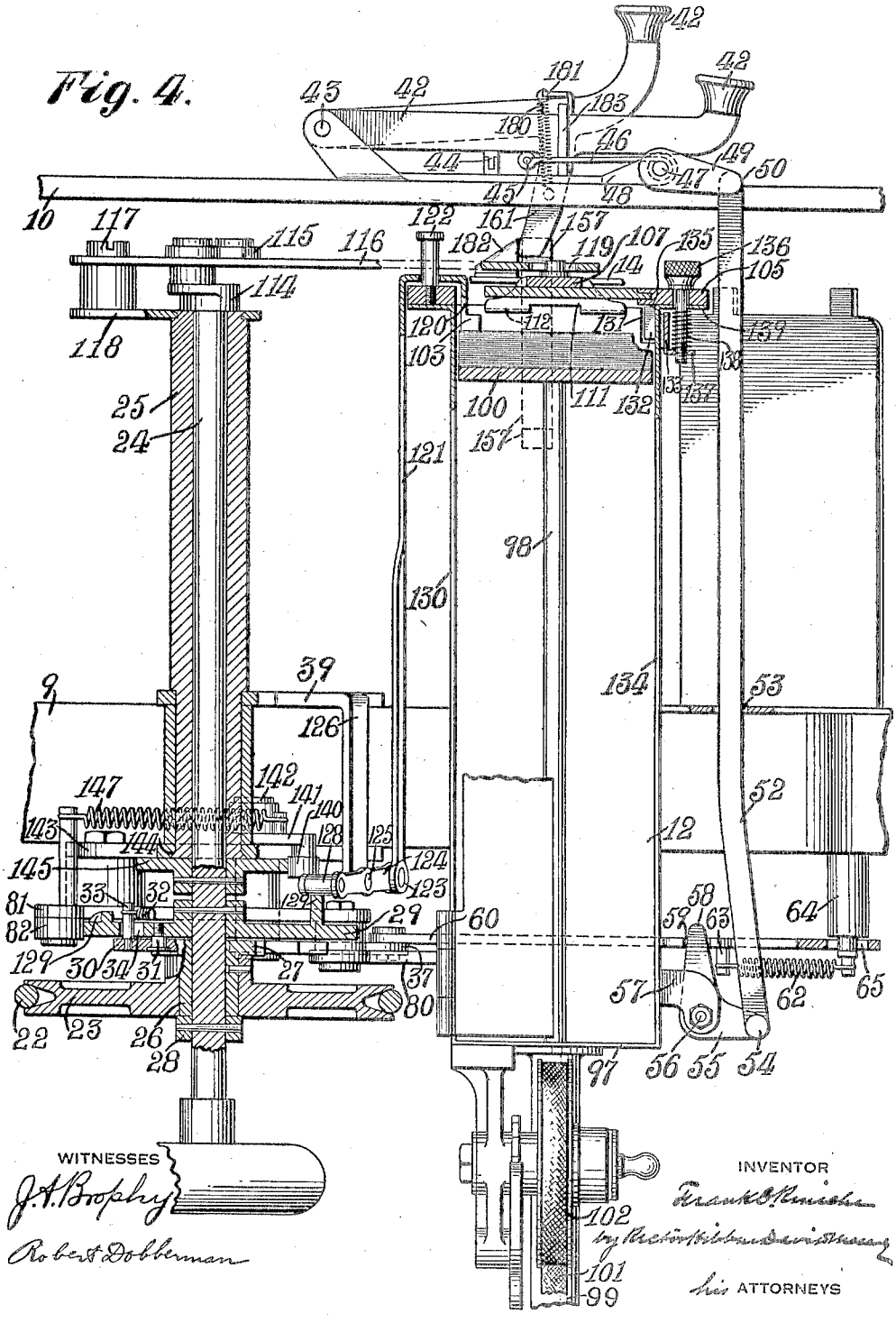
May 29, 1923. 1,457,124

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CARD SORTING MACHINE

Filed Jan. 5, 1917 5 Sheets-Sheet 4

Fig. 4.



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May 29, 1923. 1,457,124

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CARD SORTING MACHINE

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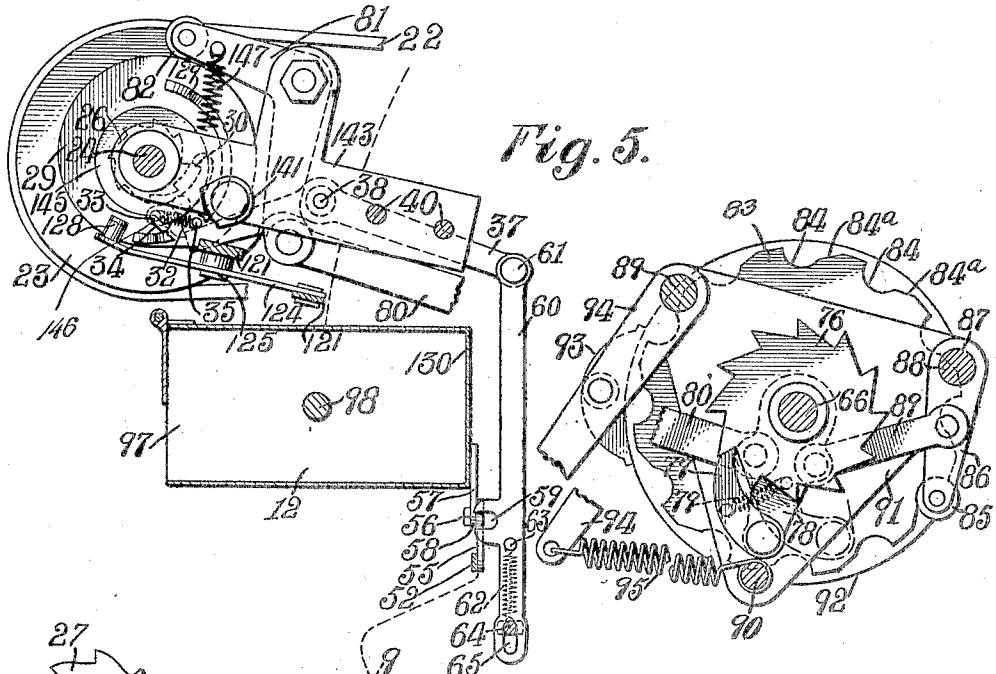


Fig. 5.

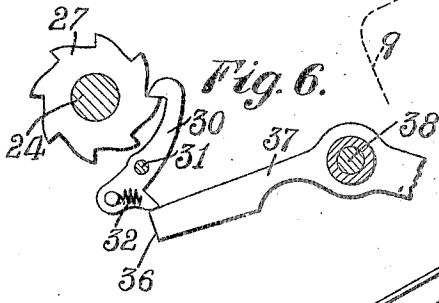


Fig. 6.

Fig. 7.

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Patented May 29, 1923. 1,457,124

UNITED STATES PATENT OFFICE.

FRANK C. RINSCHE, OF DETROIT, MICHIGAN, ASSIGNOR TO BURROUGHS ADDING MACHINE COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

CARD-SORTING MACHINE.

Application filed January 5, 1917. Serial No. 140,705.

To all whom it may concern:

Be it known that I, FRANK C. RINSCHE, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Card-Sorting Machines, of which the following is a specification.

The purpose of machines of this general character is to assort the cards of a stack or mass having different characteristics or printed matter thereon into groups according to such characteristics. Thus if the cards are numbered they may be sorted into groups or packs of similar numbers, and ordinarily for this purpose the machine is adapted to subdivide the cards into ten groups or packs with an additional pack composed of discards where necessary. Where the numbers of the cards contain a single digit, a single sorting is necessary. Where, however, the numbers of the cards contain a plurality of digits a number of sorting operations corresponding to the number of digits is necessary. Thus, if the number contains three digits the cards are first sorted into packs corresponding to the hundreds, and then each pack into sub-packs corresponding to the tens, and finally the tens' packs are sorted into packs corresponding to units. Obviously the operation can be carried out for the purpose of arranging cards in numerical order.

It is the object of my invention to provide a machine for this purpose which is compact and relatively simple, and speedy in operation. Broadly speaking my invention comprises a magazine or hopper for the unsorted cards, a circular series of receptacles for the cards corresponding in number to the groups or sub-packs into which the cards are to be divided, a rotary support carrying the series of distributors for distributing the cards to the respective receptacles with manipulative devices to set said respective distributors in such manner that they each may deposit the card received thereby from the magazine in the proper receptacle.

In the accompanying drawings and in the following specification I have shown and described a preferred embodiment of my invention. It is to be understood, however, that the specific disclosure is for the purpose of exemplification only, and that the scope of the invention is defined in the following claims in which I have endeavored to distinguish it from the prior art so far as known to me without, however, relinquishing or abandoning any portion or feature thereof.

In the drawings Fig. 1 is a plan view of the entire machine, partially broken away and in section, however, to better reveal the mechanism; Fig. 2 is a horizontal section on the line 2—2 of Fig. 3 with parts broken away; Fig. 3 is a central vertical section on the line 3—3 of Fig. 1, parts being shown in elevation; Fig. 4 is a vertical section on the broken line 4—4 of Fig. 2, parts being shown in section and other parts omitted for the sake of greater clearness of illustration; Fig. 5 is a fragmentary view in horizontal section on the line 5—5 of Fig. 3, parts being broken away and condensed; Fig. 6 a detail in horizontal section; Fig. 7 another detail of the machine in perspective; and Fig. 8 a vertical section of a further detail.

Each part is identified by the same reference character wherever it occurs throughout the several views.

The stand or frame of the machine comprises legs 8, 8, upon which is supported a main table 9, and above the latter a shelf or auxiliary table 10 is supported by legs 11, 11 (Fig. 3). The magazine for the unsorted cards is shown at 12, and the receptacles for the several groups or sub-packs of cards, of which there are eleven, including a discard receptacle, at 13, all arranged about the circumference of the circular main table 9. A revoluble distributor support 14 is mounted concentrically with respect to the table and receptacles and carries a circular series of card distributors 15, which successively receive cards from the magazine 12, as the support revolves step by step. A series of selectors designated collectively 16 appertains to each distributor, and at the time when the corresponding distributor receives its card from the magazine is set by means of key mechanism 17, mounted upon the shelf 10 to actuate mechanism associated with the proper receptacle to cause such mechanism to remove the card from the distributor, when the latter reaches said receptacle. 17′ is an arm rest for the operator.

Except for the setting of the selectors the

entire apparatus is motor-driven, though the mechanism is coupled to the motor for operation by the action of the key by which the selector is set. The motor 18 may be a rotor of any approved or suitable type, and is shown as an electric motor controlled by a switch *a*. It is connected by a belt 20 with a double speed-reducing pulley 21, which in turn is connected by a belt 22 to a pulley 23, loosely mounted upon a vertical shaft 24. (See Figs. 1 and 4.) From this shaft 24 the various mechanisms of the machine are driven but normally it is actuated only when coupled to the pulley 23 by the mechanism to be now described. It may be first mentioned, however, that said shaft is mounted in a hollow post 25 secured to the table 9, by bracket plates 39, 143.

The pulley 23 is pinned to a sleeve 26 which immediately surrounds and is journalled upon the shaft 24 and upon the upper end of said sleeve is formed a ratchet 27 (see Figs. 4 and 6) which therefore turns constantly with the pulley 23 whenever the motor is energized. The sleeve 26 and its attached pulley and ratchet are held from axial movement relative to the shaft 24 by a collar 28 pinned on said shaft and a cam disc 29 likewise pinned thereto. The cam disc and shaft are at the required times connected to the pulley and ratchet to revolve therewith by means of a pawl 30 pivoted at 31 upon the underside of the cam disc when engaging a tooth of the ratchet. A spring 32 attached at one end to a pin 33 extending loosely from said pawl through a slot 34 in the cam disc and at the other end to a pin 35 on said disc urges the pawl into engagement with the ratchet, but the latter is normally restrained from engagement by contact with the end 36 of a bell crank lever 37 which is pivoted on a stud 38 which projects downwardly from bracket 143 which is fixedly mounted upon the table to the underside of which it is bolted as at 40, see Fig. 5. The bell crank lever 37 normally stands in the path of the heel 41 of the pawl so that when the latter revolves with the cam plate it engages said lever and is withdrawn thereby from engagement with the ratchet whereby the pulley 23 is free to revolve upon the shaft 24 without operating the latter, but at each operation of the manipulative device by which the machine is set in operation said lever is withdrawn from the pawl which thereupon engages the ratchet so that the cam disc and shaft revolve therewith until the pawl is again released by coming in contact with the end of said lever.

The manipulative device 17 is mounted as stated above upon the shelf 10 and comprises a group of keys 42 corresponding in number to the card receptacles and each bearing a numeral upon the finger piece, see Fig. 1, identifying it with a particular card pocket or receptacle. The construction by which these keys cause the cards to be deposited in their respective receptacles will be later described. For the present purpose it is to be noted that the keys are pivoted at 43 upon the table and their downward movement stopped by a cushioned bar 44 upon said shelf. A bail 45 extends under all of said keys and is connected by arms 46 to a shaft 47 journalled in brackets 48 upon said shelf, so that whenever any of the keys is depressed the bail is likewise depressed and turns the shaft 47. The latter carries at one end an arm 49 which is pivoted at 50 to a link 52. Said link which depends substantially vertically through the machine is guided at 53 and is pivoted at 54 to a bell crank lever 55, see Fig. 4. The latter is pivoted at 56 to bracket 57 mounted upon the card reservoir or hopper and at its other end 58 extends into an open slot or bifurcation 59 formed upon one edge of a link 60 which is pivoted at one end 61 to the bell crank 37 which controls the above described pawl and ratchet mechanism for connecting the shaft 24 to pulley 23. (See Fig. 5.) Link 60 is normally retracted to maintain the bell crank 37 in engagement with the pawl 30 by means of a spring 62 secured at one end to a post 63 upon the link and at the other end to a post 64 projecting downwardly from the lower side of the main table and also forming a guide for the link 60 which is slotted at 65 for the purpose. It will be obvious from the above description that whenever any of the finger bars 42 is depressed the bail 45 is lowered oscillating shaft 47, raising link 52, oscillating bell crank 55, reciprocating link 60 and oscillating the bell crank lever or dog 37 to withdraw it from the pawl 30 which, on being released engages the ratchet and thus couples the shaft 24 and the pulley 23 for a complete revolution.

The rotation of the shaft 24 rotatively advances the distributor carrier a step to present a new distributor to the magazine to receive a card therefrom and to carry the other distributors each over a succeeding card receptacle or pocket. Each revolution of shaft 24 also operates upon the card feeding mechanism associated with the card magazine to feed the top card therein into the jaws of the distributor then in registry with said magazine.

In order to provide for a step by step rotation of the distributor carrier the latter is pinned to a rotary shaft 66 which is journalled in a sleeve 67 secured to the main table 9 and provided with a head 68 having flanges 69, 70, to which the upper plate 71 and the lower plate 72 are respectively attached. (Fig. 3). At its periphery plate 72 is struck up to form a cylindrical margin

73 and a flat annular flange 74 which latter is secured to the upper plate 71 by the rivets 75. The selectors 16 are mounted in said plates in a manner to be presently described. The shaft 66 upon which the carrier is mounted is provided near its lower end with a ratchet 76 having a number of teeth corresponding to the card pockets plus one, and a pawl 77 mounted on an arm 78 which is pivoted upon shaft 66 is maintained in operative relation to the ratchet by means of a spring 79 secured at its opposite ends to said pawl and arm respectively. (Fig. 5). The arm 78 is oscillated by means of a link 80 which is pivoted at one end to said arm and at the other to a bell crank lever 81, the other arm of which has a roller 82 bearing upon the edge of the snail cam 29. It follows from this construction that at each revolution of the shaft 24 and the attached cam 29 the lever 81 is rocked, the link 80 reciprocated and the arm 78 rocked to feed the ratchet and the attached distributor carrier a single step. In order to accurately position the shaft 66 and the parts carried thereby after each advance said shaft has pinned thereto a disc 83 upon the periphery of which are formed notches 84, which are arcuate in general design and at their forward edges 84^a are cut away as shown in Fig. 5, to receive a roller 85 mounted upon a rock arm 86 which is pivoted at 87 upon a post 88 and connected by a link 89 with the arm 78 mentioned above. The arcuate portions of the notches 84 accurately fit the periphery of the roller 85. The cutaway portion is engaged by the roller as the latter is drawn into a notch near the termination of the advance of the shaft and distributor carrier caused by the engagement of the pawl with the corresponding notch of the ratchet just described, to accurately position the disc and thus secure absolute registry of the distributors with the respective card receptacles and the magazine. The post 88 to which reference has been made is one of three posts 88, 89 and 90 which depend beneath the table 9 and support a triangular plate 91 which at its center is perforated to receive and brace the lower end of the shaft 66. As seen in Fig. 3, this plate is intermediate the ratchet 76 and the notched positioning disc 83.

Mounted on the end of the shaft 66 below the notched disc 83 is a friction disc 92 (see Figs. 3 and 5) which is engaged by a brake shoe 93 carried by an arm 94 pivoted on post 89. The brake shoe is urged into frictional contact with the disc 92 by a spring 95 connected to the end of arm 94, the purpose of the construction being to prevent overthrow of the shaft 66 which might take it beyond the proper corrective influence of the roller 85. By the mechanism just described I have provided for feeding the distributors step by step along the circular series of card receptacles and card magazine, avoiding overthrow of the carrier and bringing the distributor into accurate registry with the receptacles and magazine.

Each distributor comprises a pair of jaws between which a card is fed from the magazine when it arrives opposite the latter. A further description of the distributors is deferred to a later portion of the specification. The card magazine consists of a rectangular casing having a closed bottom 97 through which a stem 98 projects and is guided by a sleeve 99. The upper end of the stem 98 carries a follower 100 which supports and feeds upward the stack of cards in the magazine (see Figs. 3 and 4). To the lower end of the stem 98 is attached one end of a ribbon 101 which is wound upon an ordinary spring drum 102 whereby the follower is continually urged upward. The upward motion, however, is arrested by the contact of the upper card of the stack with the under sides of slideways or guides 105. The slide 104 reciprocates in said ways or guides 105 radially of the distributor carrier and in its inward motion pushes the top card 106 in the magazine into the jaws of the distributor 15 in registry with the magazine. As seen in Fig. 3 the slide carries a spring plate 107 secured to said slide at its outer end and yieldingly maintained in proper card engaging position by a spring 108 compressed between said plate and nut 109 upon screw pin 110. The nut provides for adjustment for varying thicknesses of cards. At its inner end spring plate 107 carries a card engaging block 111 which, as seen more particularly in Figs. 3 and 4, is rabbeted or cut away at 112 leaving a shoulder 113 of a height less than the thickness of one of the cards in connection with which the machine is to be employed. The stack of cards being firmly pressed against the under surface of the card engaging block, the latter by reason of the construction just described engages only the top card as the slide is moved inward, thus avoiding conveying more than one card at a time into the jaws of the distributor. The mechanism for reciprocating the feed slide 104 is best shown in Figs. 1 and 4. The intermittently actuated shaft 24, above described, carries upon its upper end a crank arm 114 which is connected by a link 115 to an arm 116, the latter being pivoted at 117 to a stationary bracket arm 118 mounted upon the stationary sleeve 25 surrounding the shaft. Arm 116 has a pin-and-slot connection 119 with the slide. At each revolution of the shaft 24, therefore, the arm 116 is given a complete oscillation to feed the card on top of the pack to the distributor in registry with the magazine and return it to its initial position.

When the card engaging block has deliv-

ered its card to the distributor and returned sufficiently to clear the rear edge of said card it would engage the uppermost of the remaining cards on its rearward movement and perhaps disarrange the same were not provision made to avoid such action. For this purpose a stop 103, is vertically reciprocable to force the stack of cards and the bar upon which they rest downward during the return of the slide to such an extent as to avoid engagement therewith. As seen in Figs. 3 and 4, said stop 103 is connected to or formed upon the downwardly turned end 120 of a link 121 which is guided upon pin 122 at its upper end and connected at its lower end 123 to a lever 124 which is pivoted at 125 upon a bracket 126 projecting down from plate 39, referred to above. The free end of lever 124 carries a roller 128 which at the proper time engages an arcuate cam 129 upon the upper face of the cam disc 29. The upward pressure of the pack of cards in the magazine tends to raise the link 121 and lower the free end of lever 124, but during the return of the card feeding slide above described the roller 128 on lever 124 is engaged by cam 129, and link 121 with stop 103 is lowered sufficiently to remove the cards from the possibility of contact with the card feeding slide, thus avoiding shifting the then top card either outwardly to a position in which it cannot be engaged by the shoulder 113 or angularly so that it is no longer square with or parallel to said shoulder.

Provision is also made for preventing the feed of two or more cards at a time by friction or adherence between them. For this purpose the inner wall 130 of the magazine is of a height to prevent inward movement of more than one or two extra cards and to accurately stop the card next to the top, an abutment which can be nicely adjusted to miss the top card but stop the second card is provided. With this in view one of the forward corners 131 of the magazine is cut away (see Fig. 4) and a rectangular bent end 132 of an arm 133 pivoted to the side wall 134 of the magazine (see Fig. 2) projects into said cutaway portion to intercept and prevent motion of the second card when the slide moves forward. To properly regulate the height of the upper edge 135 of the adjustable stop a set screw 136 extends through guide 105 upon the adjacent wall and is threaded into a lug 137 extending outwardly from said arm. A spring 138 is interposed between said lug and the under surface of the flange 139 on which the guide rests cooperating to secure the proper adjustment of the upper edge of the stop in an obvious manner. By the above described mechanism I have provided against the accidental or unintentional shifting of the second card in the forward movement of the slide to feed the top card or in the return movement of the slide when said card has become the top card.

The actuator shaft 24 which, as described above, gives the step by step rotation to the distributor carrier, the reciprocation to the card feeding slide and the vertical motion to the stack of cards in the magazine to escape the return movement of the feed slide is accurately positioned after each operation by means of a roller 140 upon an arm 141 which is pivoted at 142 to bracket 143, said bracket suitably secured to the end face of the table 9 and also forming at 144 a support or guide for the sleeve 25. (See Fig. 4.) Roller 140 bears upon the periphery of a snail cam 145 pinned to shaft 24, the parts being so adjusted that as the shaft comes to rest the shoulder 146 of said cam comes into registry with the roller. The latter is urged into engagement with the cam by a spring 147 attached to pins upon said arm and the bell crank 81 heretofore described, respectively, thus serving the double function of drawing both levers into contact with their respective cams. The strength of the spring and the arrangement of the parts is such that if the shaft and its attached parts does not quite reach its exact position of rest, the pressure of the roller 140 on the inclined shoulder 146 gives the slight movement to the cam and shaft necessary to bring them accurately into the correct position.

The construction of the card distributors can best be understood by reference to Figs. 2, 3, 7 and 8. As these distributors are alike a description of one of them will suffice for the group. As heretofore stated, they equal in number the card receptacles plus the card magazine and it will be recalled that by means of a ratchet and pawl construction the distributor carrier is rotated step by step to bring these distributors successively into registry with the magazine and said receptacles. Each distributor comprises a body portion or plate 148 which is secured to the carrier at its inner end and at its outer end supports a pair of jaws 149, 150 between which the card is fed whenever the distributor comes opposite the inner end of the magazine. The lower jaw 150 is rigid with and may be formed integral with the body 148 of the distributor and is depressed at 151 as shown in Fig. 3 to extend under the lip 152 of the inner wall of the magazine thus insuring that the card shall be fed above said jaw. The upper jaw 149 is secured to a plunger 149[a] within the hollow screw 153 which is secured to the main body 148 of the distributor, a spring 154 bearing on the plunger to depress said jaw 149. Towards its outer end jaw 149 is bent upwardly to make a flaring opening with the jaw 150 and it is prevented from turning relatively to the main body of the distributor by means

of a lug 155 thereon projecting through a slot 156 formed in the vertical portion of said main body. Thus the jaws of the distributor are maintained in proper relative position but permitted to open under the pressure of a card to receive and frictionally hold the same between them.

After a distributor has received a card the machine is again set in motion by the depression of one of the key levers 42 heretofore described. A depression of the lever not only starts the mechanism for giving the distributor carrier a step rotation and for feeding the following card to the next distributor in order, as heretofore described, but sets a selector mechanism, of which there is one set to each distributor, so that when the distributor reaches the receptacle corresponding to the key depressed the selector will cause the card to be deposited from the distributor into said receptacle. Each selector 16 comprises a set of vertically movable slides 157 which extend through the upper and lower plates 71, 72, to which reference has been made, and are vertically movable from an upper to a lower position therein (see Fig. 3). Fig. 7, which is on an enlarged scale, shows a fragmentary section of such a selector comprising two of the slides which are each formed with upper and lower notches 158, 159 for engagement by a spring 160 which yieldingly holds the slide in either upper or lower position accordingly as it has been moved by the mechanism provided for that purpose. The selector slides in each set are equal in number to the receptacles less one and are arranged to be brought, when the corresponding distributor is in registry with the magazine, beneath the respective keys of the keyboard, heretofore described. There is a key of said keyboard for each of said slides and each key is provided with a downwardly extending prong 161 which engages the corresponding slide when the key is depressed and drives said slide to its lower position. In addition to the keys for operating the respective slides of each set there is a key which has no corresponding slide and therefore effects an actuation of the machine without setting a selector. It is used when the card fed from the magazine is to be dropped into the discard receptacle. The setting of a particular selector key in this manner prepares it to cause the actuation of a device for stripping the card from the distributor when the latter comes over the particular receptacle corresponding to the key depressed and the selector actuated thereby. Each receptacle except that for discards which is last, is provided on the side thereof opposite the advance of the distributors with a stripping plate 162 which is vertically reciprocable upon the wall of the receptacle by means of pins 163 and slots 164 and carries fingers 165 which when the plate is in its upper position engage the advancing edge of the card 106 carried by the distributor and strip it from the latter, permitting it to fall into the receptacle beneath. The stripper plate is vertically reciprocated by a bell-crank 166 which has a pin-and-slot connection thereto at 167 and a similar connection at 168 to an angular arm 169 connected to a sleeve 170 which is reciprocable radially of the machine on a guide rod 171. The movement of sleeve 170 is limited by collar 205. The arm 169 is guided by pin 172 on the wall of the receptacle. Projecting upwardly from the sleeve 170 is an inclined cam or wedge 173 secured to said sleeve by a collar 174ª. On reference to Fig 2 it will be seen that these cams or wedges are arranged respectively at different distances from the axis of the machine and they are so spaced radially of the machine as to engage respectively the several selectors of each set. Thus, for example, if key numbered 1 (see Fig. 1) is depressed it lowers the first selector slide which is in a position to engage the cam 173 appertaining to card receptacle 1, when key numbered 2 is depressed it lowers the particular selector slide which is in a position radially of the machine to engage the cam 173 individual to pocket 2 when the bank of selectors has been revolved to that pocket, and so on. Obviously, the engagement of a selector slide with the corresponding cam 173 causes the latter to reciprocate the corresponding sleeve 170 carrying arm 169 which in turn oscillates the bell crank 166 to raise the stripper plate 162 into a position in which its fingers 165 engage the card carried by the approaching distributor 15 and strip it therefrom on the next movement of the carrier. After the selector slide has passed the cam the latter permits a return of the stripper plate under gravity to its normal position. Thus the depression of a key of the keyboard effects an operation of the actuator shaft for giving a step advance to the distributor carrier and reciprocating the card feeding slide to carry a card between the jaws of the distributor when in registry with the magazine, and also sets a selector of the bank corresponding to such distributor so that when the latter reaches the proper receptacle the stripper mechanism thereof detains the card which has been supplied thereto so that it may be dropped in the receptacle. In order that such card may not interfere with the following card in the rapid operation of the machine each distributor is provided with a forwardly projecting finger 174 which is bent as shown in Fig. 7 to ride over the receptacles and depress a card which may have been deposited by a preceding distributor out of the path of the following distributor.

After the depression of a key it is imme-

diately upon release restored to its upper position by a spring 180 connected at its respective ends to said key and a bracket 181. The keys, however, are positively restored to their upper position, in case for any reason the spring should be insufficient for this purpose, by contact of their prongs 161 with the inclined blade 182, one of which is arranged in advance of each bank of selector slides, thus obviating any danger of the engagement of a slide by a previously depressed key. The keys are guided in their movement by the comb 183.

There being but one cam 173 in the path of movement of each selector slide it is unnecessary to restore a depressed slide to its upper position until it reaches the position in registry with the magazine. Therefore, I arrange an inclined blade or cam 184 radially of the table 9 just in advance of the position of registry of the selectors with the keyboard, whereby any depressed selector slides are raised to their upper position just before the selector to which said slide belongs comes into registry with the keyboard.

The operation of the machine has been described in detail in connection with the description of the respective parts thereof but it may be briefly recapitulated as follows: The cards to be sorted are stacked in the hopper or magazine and if to be sorted by numbers the numbers must be uppermost so that they may be read by the operator. I have illustrated the machine as dealing with cards, the numbers of which have three digits, and will describe the operation of sorting such cards. The motor having been set in operation the operator observes the top card and depresses a key corresponding to the lefthand digit, which in the case of the card shown is number 4. The depression of the key sets the corresponding selector of the set which is directly beneath the key bank, and at the same time lowers the bail 44 and oscillates the shaft 47 to raise link 52, oscillate bell crank 55, reciprocate link 60 and by shifting lever 37 withdraw the end thereof from contact with the heel 41 of pawl 30. This permits the pawl to shift into engagement with one of the teeth of the ratchet 26 which is constantly rotated by the motor through belt 20, double pulley 21, belt 22 and pulley 23 as above described. If, as is ordinarily the case, the depressed key is immediately released it resumes its normal position and in any event is restored to normal by the restoring cam 183 appertaining to the following set of selector slides. Thus the pawl 30, the cam disc 29 to which it is attached, and the actuating shaft 24 are given a complete rotation which is ended by the end of the lever 37, which has in the meantime been released by the elevation of the key (by which it has been tripped) engaging the heel of said pawl and withdrawing the latter from engagement with the ratchet. The engagement of the roller 140 with shoulder 146 of cam 145 insures the accurate return of the actuating shaft and its connected parts to the initial position. The arrangement of the cams and crank arm upon the actuating shaft are such that the first effect of the revolution of the shaft is the actuation of the card delivery slide 104 through crank 114 on the shaft, link 115 and arm 116 to deliver the card number 447, which as before stated was on the top of the pack, to the jaws of the distributor. The further rotation of the actuating shaft through the engagement of its cam 29 with roller 82 upon bell crank lever 81 and link 80 rocks arm 78 about the shaft 66 and the engagement of the pawl 77 on said arm with the ratchet causes the latter and the shaft of the distributor carrier to which it is attached to rotate to carry each distributor into registry with the next succeeding card pocket or receptacle. The brake 93 prevents the overthrow of the carrier and its position is accurately adjusted by the roller 85 entering the recess with which it is in registry under the action of the arm 78 and link 89. Just prior to the return movement of the card feeding slide the stop 103 is depressed by link 121, lever 124 and cam 129 to lower the cards out of contact with said slide. The actuating shaft having returned to rest after a complete revolution the machine is in condition for the next operation. The operator inspects the next card in the magazine and depresses the corresponding key when the operation just described is repeated. When the number 4 receptacle is reached by the distributor carrying card 447, the number 4 selector appertaining to said distributor having been set, as heretofore described, wipes past the corresponding cam 173 as the distributor is rotated beyond said receptacle. The sleeve upon which said cam is mounted is drawn inward or toward the center of the carrier, by this action elevating the stripper plate 162 on said card receptacle or pocket whereby the fingers 165 on said stripper plate engage the edge of the card 447 and maintain it over the receptacle while the distributor passes on to the following receptacle. Thus the card is dropped from the distributor into the proper receptacle. Any card which has not properly fallen into the receptacle is struck by the bent finger 174 of the following distributor as the latter passes over the receptacle and forced downward to avoid its being engaged by the following card. After the depressed selector has moved past the cam for elevating the stripper plate the latter returns to its lower position and the selector slide itself is ultimately restored just prior to reaching the magazine by the cam plate 184. At each operation of the machine the new distributor

is presented to the magazine and receives its card, so that the cards are rapidly fed from the magazine and distributed to the proper pockets. After the cards have been distributed according to the lefthand digit, as above described, those from each card pocket are again returned to the magazine and distributed according to the numeral of the second digit, though in this redistribution the cards from the several pockets are kept separate for an obvious reason. Finally, each group of cards resulting from such second distribution is returned to the magazine and again distributed according to the units digits, thus completing the assortment. The discard receptacle marked D, instead of the card removing fingers operated by selector keys of the other receptacles, has stationary fingers 200 which strip the discards from the distributor.

To facilitate the removal of the cards from the several receptacles each is provided with an L-shaped card-support 203 having a dowel pin 204 engaging a hole in the table 5 to prevent accidental removal and hold it in adjusted position.

I claim:

1. In a device of the class described, a card magazine, means for feeding cards singly therefrom, a series of card receptacles, a distributer movable into registry with said card magazine and card receptacles, intermittently acting means for moving the distributer successively into registry with the magazine and respective receptacles, means operable when the distributer is at rest in registry with the magazine for delivering a card from the magazine to the distributer, a stripping device associated with each receptacle and movable into and out of position to strip a card from the distributer, mechanical means for moving each said stripper into operative position, and selective means on the distributer which may be set when the distributer receives a card adapted to operate said mechanical means to actuate the stripper.

2. In a device of the class described, a card magazine, means for feeding cards singly therefrom, a series of card receptacles, a distributer adapted to receive cards singly from the magazine, intermittently acting means for moving the distributer successively into registry with the magazine and receptacles, means operable when the distributer is at rest in registry with the magazine for delivering a card to the distributer and selector mechanism for said distributer adapted to be set at the time a card is received thereby, and means connected with the respective receptacles adapted to be operated by the selector mechanism when properly set to strip a card from the distributer.

3. In a device of the class described, a card magazine, means for feeding cards singly therefrom, a series of card receptacles, a series of distributers adapted to receive cards successively from the magazine, intermittently acting means for moving the distributers successively into registry with the magazine and receptacles, means operable when a distributer is at rest in registry with the magazine for delivering a card from the magazine to said distributer selector mechanism for each distributer adapted to be set at the time a card is received thereby, and means connected with each receptacle adapted to be operated by the selector mechanism when properly set to strip a card from a distributer when it reaches said receptacle.

4. In a device of the class described, a card magazine, means for feeding cards singly therefrom, a series of card receptacles, a distributer, intermittently acting means for moving the distributer successively into registry with the magazine and receptacles, means operable when the distributer is at rest in registry with the magazine for delivering a card to the distributer and a series of selector elements for said distributer adapted to be set selectively when a card is received by the distributer, normally inoperative means connected with each receptacle for stripping a card from the distributer, each such means being adapted and arranged to be put in operative position by a particular selector element.

5. In a device of the class described, a card magazine, means for feeding cards singly therefrom, a series of card receptacles, a series of distributers, intermittently acting means for moving the distributers successively into registry with the magazine and receptacles, means operable when a distributer is at rest in registry with the magazine for delivering a card from the magazine to said distributer, a series of selector elements for each distributer, movable therewith and adapted to be set selectively when a card is received by the corresponding distributer, normally inoperative means connected with each receptacle for stripping a card from a distributer, each such means being adapted and arranged to be put in operative position by a corresponding selector element of each series.

6. In a device of the class described, a card magazine, means for feeding cards singly therefrom, a series of card receptacles circularly arranged, a rotary carrier, a circular series of distributers on said carrier adapted to be brought successively into registry with the magazine and with the respective receptacles, a series of selector elements for each distributer arranged at successively increasing distances from the axis of the carrier, a mechanism connected with each receptacle for stripping cards from the

distributers but normally maintained in inoperative position, and a trip for each stripping mechanism, said trips being arranged at varying distances from the axis of the carrier corresponding to the respective selector elements in the series.

7. In a device of the class described, a card magazine, means for feeding cards singly therefrom, a series of card receptacles arranged in a circle, a rotary carrier, the axis of which is concentric with the receptacles, a series of distributers mounted on the carrier and adapted to be brought successively into registry with the magazine and with the respective receptacles, a series of movable selector elements for each distributer, the selector elements of each series being arranged at successively increasing distances from the axis of the carrier, a normally inoperative mechanism connected with each receptacle for stripping cards from the distributers, a cam for each mechanism adapted to set such mechanism in operative position, the cams of the respective receptacles being arranged at varying distances from the axis of the carrier corresponding to the selector elements, and adapted to be operated thereby.

8. In a device of the class described, a card magazine, means for feeding cards singly therefrom, a series of card receptacles circularly arranged, a rotary carrier the axis of which is concentric with said series of receptacles, a series of distributers carried by the carrier and adapted to be brought successively into registry with the magazine and with the respective receptacles, a series of movable selector elements for each distributer arranged at successively increasing distances from the axis of the carrier, a vertically movable stripper for each receptacle, a cam connected to each stripper and adapted to raise the same into operative position, the cams of the respective strippers being arranged at varying distances from the axis of the carrier corresponding to the selector elements, each cam being adapted to be operated by the corresponding selector element when the latter is displaced from normal position.

9. In a device of the class described, a card magazine, means for feeding cards singly therefrom, a series of card receptacles circularly arranged, a rotary carrier, the axis of which is concentric with the card receptacles, a series of distributers arranged concentrically with the carrier and adapted to be brought successively into registry with the magazine and with the respective receptacles, a series of vertically movable selectors for each distributer, means for selectively displacing one of the selectors, means for restoring a displaced selector just before it reaches the magazine, a stripper mechanism for each receptacle, a trip mechanism for placing the stripper mechanism in operative position to strip a card from a distributer, the trip mechanisms being located at varying distances from the axis of the carrier corresponding to the selector elements.

10. In a device of the class described, a card magazine, means for feeding cards singly therefrom, a series of card receptacles, a series of distributers adapted to receive cards successively from the magazine, means for moving the distributers successively into registry with the magazines and receptacles, a selector mechanism for each distributer comprising a series of reciprocable selector bars, a stripper mechanism for each receptacle, each stripper mechanism having a trip for moving the same into operative position, the respective trips being arranged in the path of movement of the respective selector bars to be operated thereby whereby when a selector bar is moved from normal position it actuates the corresponding trip, a keyboard arranged above the path of the selectors and having a series of keys corresponding to the selector bars of each set and adapted respectively to operate the latter and means operated by the depression of a key for causing a step by step advance of the distributors.

11. In a device of the class described, a card magazine, means for feeding cards singly therefrom, a series of card receptacles arranged in a circle, a rotary carrier, the axis of which is concentric with the receptacles, a series of distributers mounted on the carrier and adapted to be brought thereby successively into registry with the magazine and with the respective receptacles, a series of vertically movable selector bars for each distributer, the respective bars of each series being arranged at successively increasing distances from the axis of the carrier, a normally inoperative mechanism connected with each receptacle for stripping cards from the distributers, a trip for each mechanism adapted to set the latter in operative position when actuated, the trips of the respective receptacles being arranged at varying distances from the axis of the carrier corresponding to the selector bars and adapted to be operated thereby respectively, a bank of keys arranged above the carrier, each key having means for operating a corresponding selector bar of each set, means for giving the carrier a step by step rotation and devices operated by the depression of a key for putting such means into operation.

12. In a device of the class described, a card magazine, means for feeding cards singly therefrom, a series of card receptacles arranged in a circle, a rotary carrier, the axis of which is concentric with the receptacles, a series of distributers mounted on the carrier and adapted to be brought successively into registry with the magazine and with the respective receptacles, each of said

distributers comprising a pair of relatively movable jaws to receive and frictionally hold a card, and means connected with the respective receptacles for stripping a card from the distributer.

13. In a device of the class described, a card magazine, means for feeding cards singly therefrom, a series of card receptacles arranged in a circle, a distributer adapted to receive a card from the magazine and to be brought successively into positions above the respective receptacles and a depressing finger mounted upon said distributer and adapted to project into the card receptacles successively and to depress a card engaged thereby.

14. In a device of the class described, a distributer comprising a main plate having a lower jaw extending beneath the same, a spring-pressed jaw mounted in the plate and engaging the lower jaw, said spring plate comprising a lug 155, there being an opening in the main plate to receive said lug and prevent the spring-pressed jaw from turning and a finger connected to the distributer and extending below the lower surface thereof.

15. In a device of the class described, a magazine for receiving a stack of cards, a distributor, means for feeding the cards singly to said distributor from said magazine, a rotary carrier for said distributor, a series of card receptacles arranged about said carrier, a selector on the carrier, means for setting the selector, means operated by the last said means for giving said carrier a step by step rotation, and a card stripping device on each receptacle normally in inoperative position and arranged to be moved to operative position by the selector when correspondingly set.

16. In a device of the class described, a rotary carrier, a card distributor carried thereby, a card magazine, a series of receptacles arranged concentric with said carrier, means for feeding the cards singly from said magazine to said distributor, a series of selector bars slidingly mounted on said carrier, a card stripping device for each receptacle adapted to be made operative by a corresponding selector bar when the latter is moved from normal position, a series of keys each having means to operate a corresponding selector bar, a rotary shaft, a pulley journaled on said shaft, means for continuously rotating said pulley, a clutch for locking said pulley to said shaft, means normally holding said clutch out of engagement, connections operated by the depression of one of said set of keys for withdrawing said clutch, engaging means to permit the clutch to lock the pulley and shaft together, and means operated by the shaft for giving the carrier step by step rotation.

17. In a device of the class described, a rotary carrier, a card distributor thereon, a magazine and a series of receptacles arranged concentric with the carrier, means for feeding cards singly to said distributor, normally inoperative stripping means for each of said receptacles, a series of movable selector bars normally in inoperative position but adapted when moved to operative position to operate a corresponding one of said card stripping means, a series of keys mounted on a stationary support each having means to operate a corresponding selector bar, a normally stationary rotary shaft, a pawl and ratchet connection between said shaft and carrier for operating the latter, a pulley journaled on said shaft, means for constantly rotating said pulley, a pawl and ratchet connection between said shaft and pulley, a latch for normally maintaining the pawl out of engagement with said ratchet, a shaft oscillated by the depression of one of said keys, and connections between said shaft and said latch whereby the latter is released from the pawl upon depression of a key, and the pulley and shaft rotated together to give the carrier a step by step rotation.

18. In a device of the class described, a rotary carrier, a magazine and series of card receptacles concentrically arranged about the axis of said carrier, a card distributor on said carrier, means for feeding cards singly to said distributor from said magazine, a normally inoperative card stripper for each said receptacle, a selector adapted to be set to render a predetermined stripping mechanism operative when the distributor reaches the corresponding receptacle, a rotary normally stationary shaft, connections between said shaft and carrier whereby the latter is shogged at each rotation of the shaft and a connection between the shaft and the feeding means for the magazine to operate said means at each rotation of the shaft.

19. In a device of the class described, a rotary carrier, a magazine and series of card receptacles concentrically arranged about the axis of said carrier, a card distributor on said carrier, means for feeding cards singly to said distributor from said magazine, a normally inoperative card stripper for each said receptacle, a selector adapted to be set to render a predetermined stripping mechanism operative when the distributor reaches the corresponding receptacle, a rotary, normally stationary shaft, connections between said shaft and carrier whereby the latter is shogged at each rotation of the shaft, a connection between the shaft and the feeding means for the magazine to operate said means at each rotation of the shaft, means for depressing the cards in the magazine on each return movement of the feeding means and connections from said shaft for operating the depressing means.

20. In a device of the class described, a card magazine and a series of card recep-

tacles circularly arranged, a rotary carrier, a circular series of distributers on said carrier adapted to be brought successively into registry with the magazine and with the respective receptacles, means for giving the carrier a step-by-step rotation and permitting the distributers to rest in registry with the card magazine and the respective receptacles, means for feeding cards singly from the magazine to a distributer when in registry with said magazine, a series of selector elements for each distributer, a stationary keyboard having keys with which said elements register when the distributer is in registry with the magazine, a mechanism connected with each receptacle for stripping cards from the distributers but normally maintained in inoperative position, and a trip for each stripping mechanism, said trips being arranged to be engaged by the respective selector elements of the distributers when set for that purpose.

21. Distributing apparatus comprising a circular series of chutes, a rotatable turret movable over said chutes and provided with a plurality of receptacles, means to intermittently rotate the turret, means to feed a flat article into one of the receptacles in the turret while the turret is at rest, and manually controlled selective mechanism for discharging each of the articles from the turret at a predetermined discharge chute during the rotation of the turret.

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Witnesses:
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