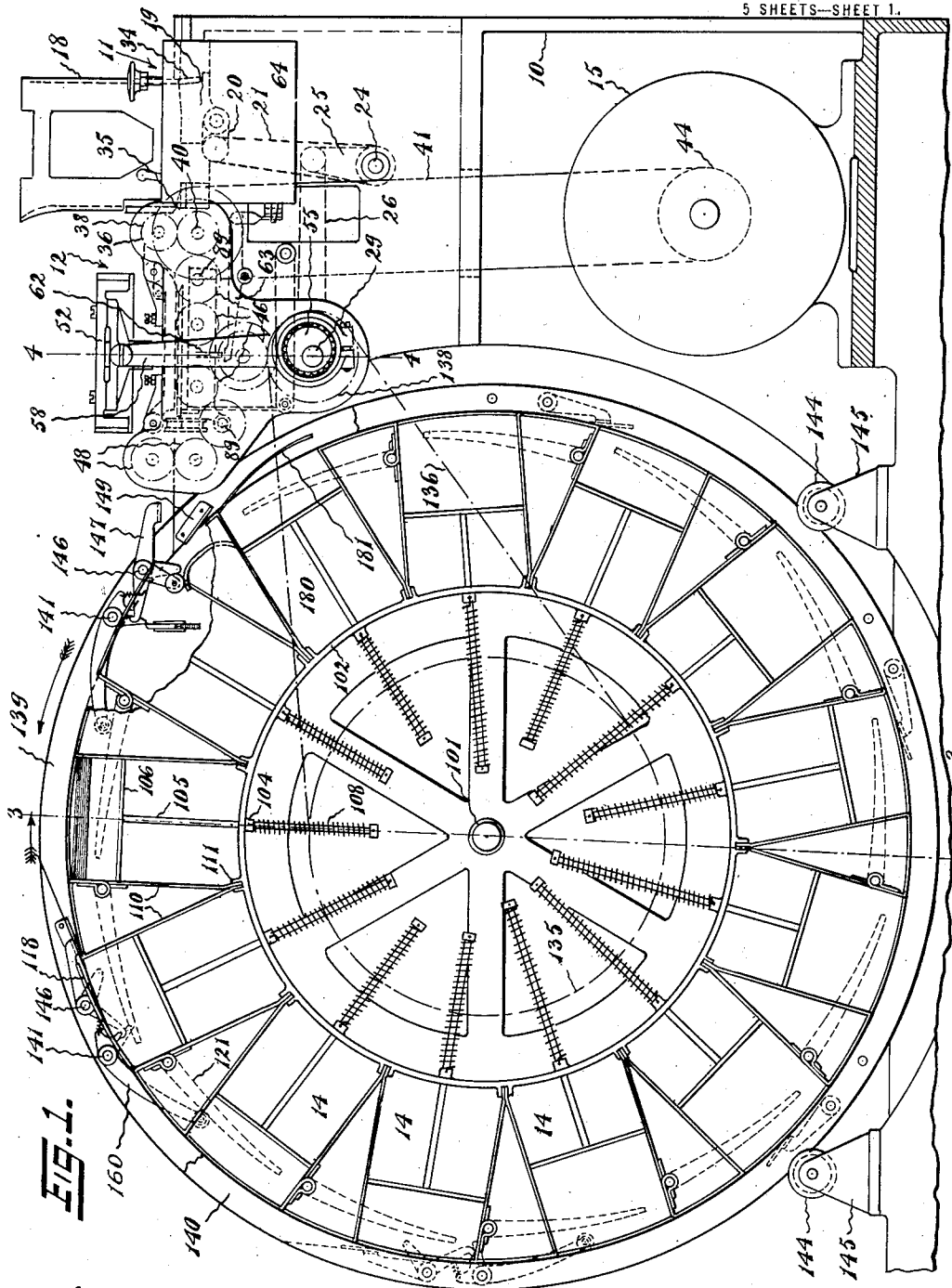


W. W. LASKER.
 ROTARY CARD SORTER.
 APPLICATION FILED AUG. 29, 1917.

1,298,971.

Patented Apr. 1, 1919.

5 SHEETS—SHEET 1.



Witnesses;
 Louis C. Badreau.
 H. D. Penney

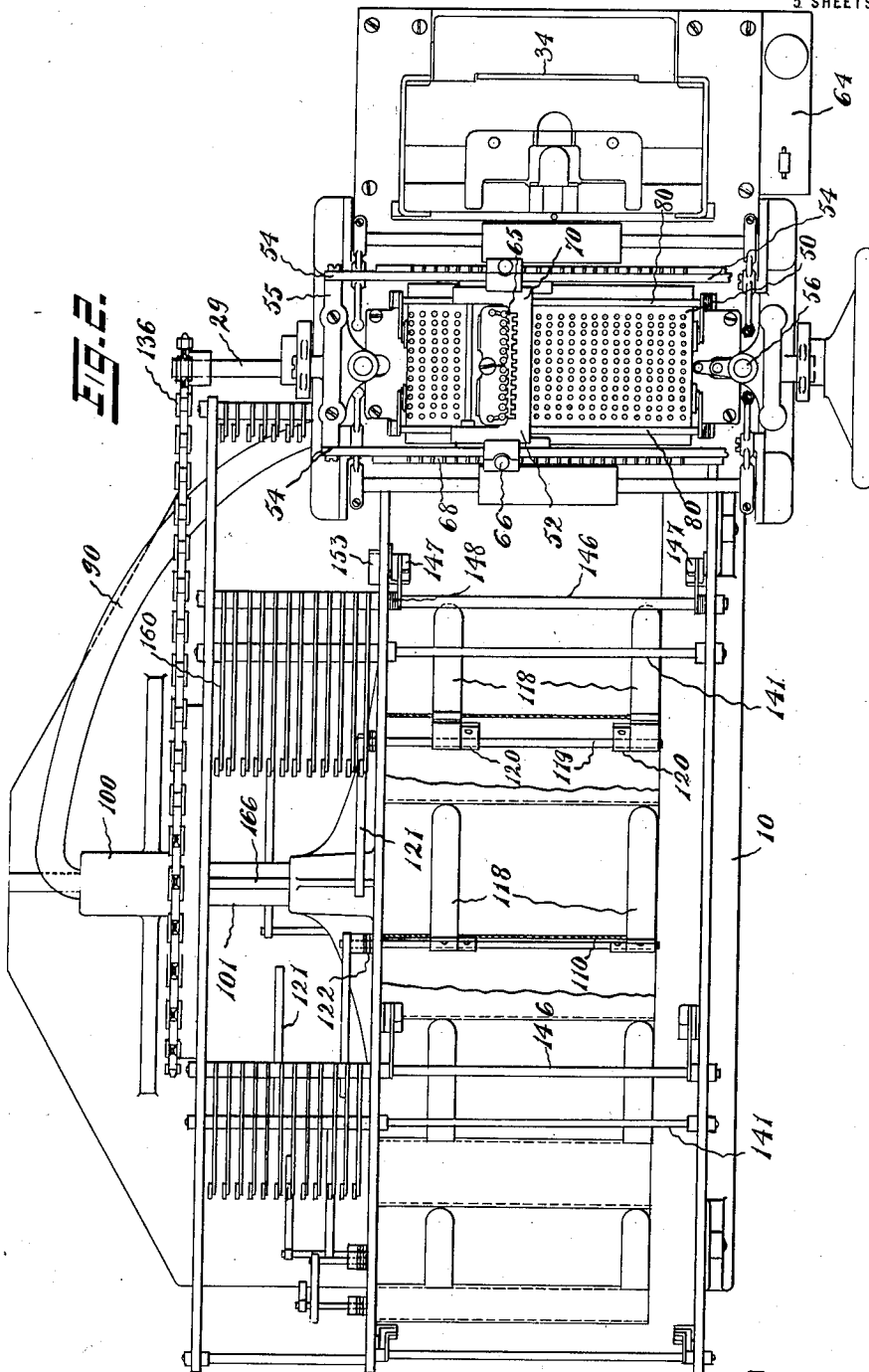
Inventor:
 William W. Lasker,
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5 SHEETS—SHEET 2.

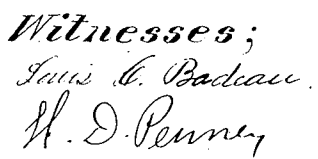


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Fig. 3.



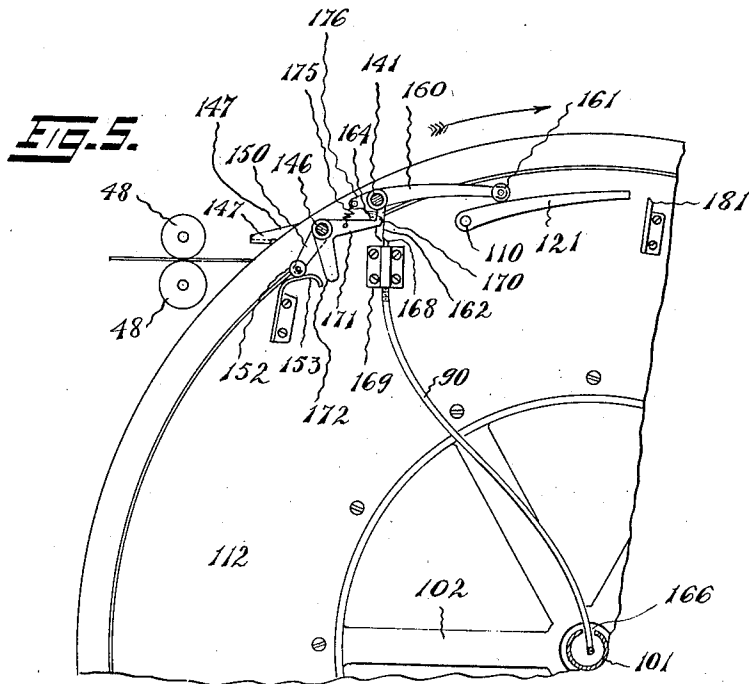
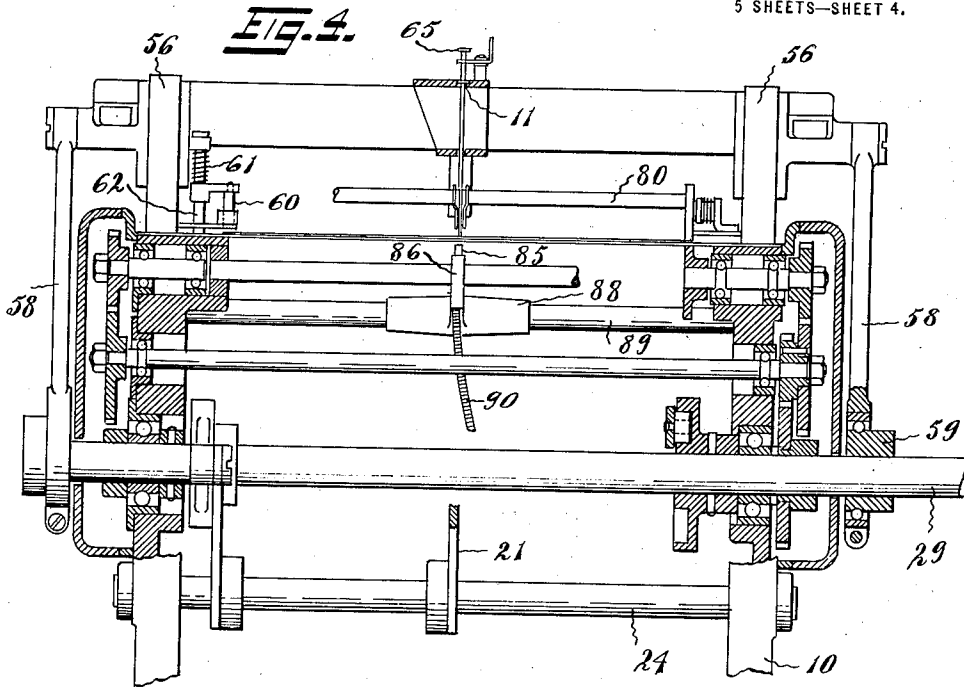
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5 SHEETS—SHEET 4.



Witnesses;
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5 SHEETS—SHEET 5.

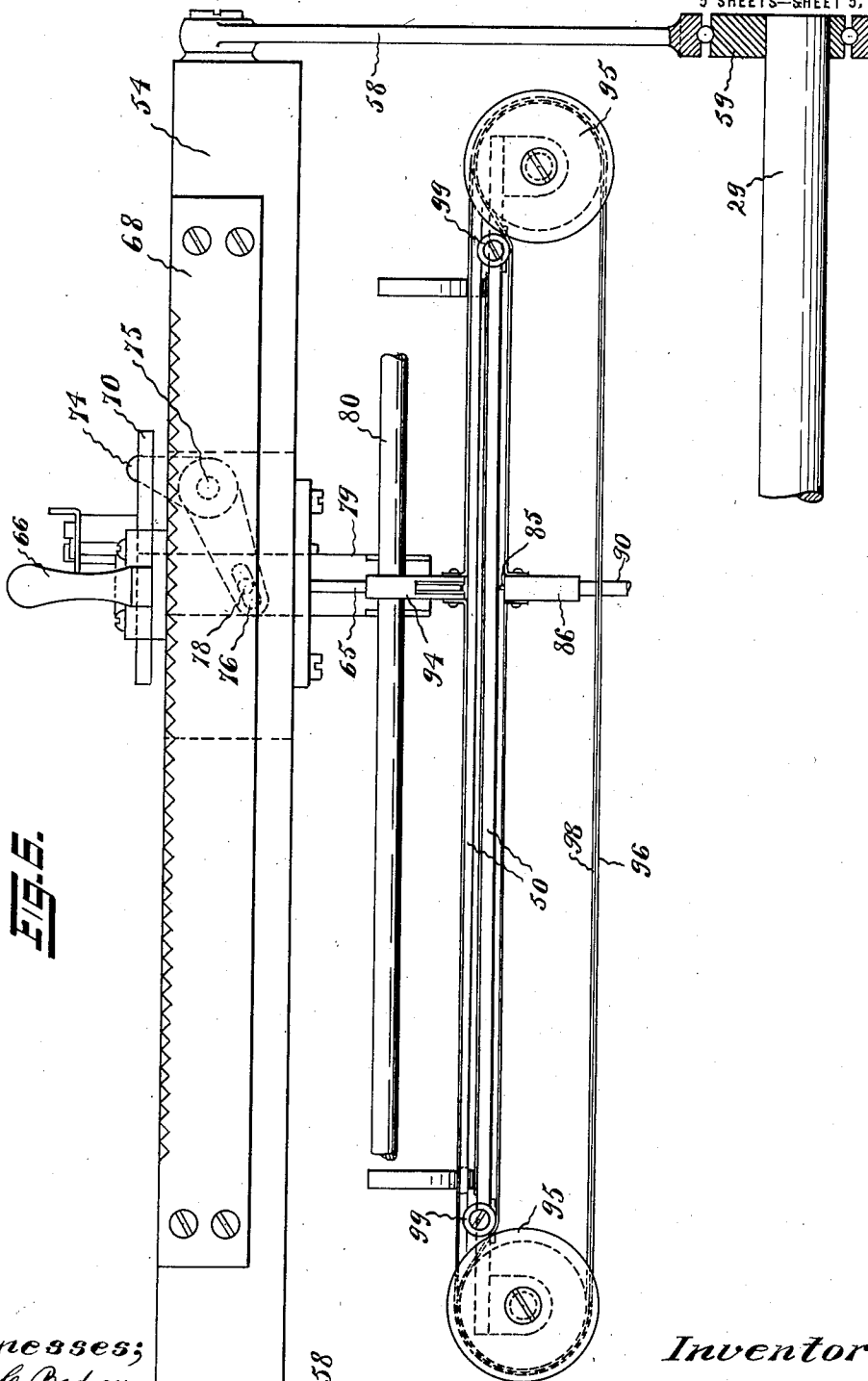


FIG. 5.

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UNITED STATES PATENT OFFICE.

WILLIAM W. LASKER, OF BROOKLYN, NEW YORK, ASSIGNOR TO POWERS ACCOUNTING MACHINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

ROTARY CARD-SORTER.

1,298,971.

Specification of Letters Patent.

Patented Apr. 1, 1919.

Application filed August 29, 1917. Serial No. 188,718.

To all whom it may concern:

Be it known that I, WILLIAM W. LASKER, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Rotary Card-Sorters, of which the following is a specification.

This invention relates to machines for sorting perforated cards such as are used in automatic calculating and adding machines. One object of the invention is to provide a machine having a conveyer adapted to receive from the analyzer, and simultaneously convey several cards to the compartments for receiving the cards and deposit each in its appropriate box without in any way interfering with or being delayed by the proper depositing of the other cards.

Another object of the invention is to provide in a card sorting machine, a suitable conveyer for conveying the cards from the analyzer to the card receiving compartments, which conveyer when in operation has continuous uniform rotary motion, thereby eliminating all power losses which might be caused by reversing or changing the direction of motion of the parts.

Another object is to provide a convenient and economical arrangement of construction for the card receiving compartments.

Another object of the invention is to provide an eccentrically operated analyzer pin box, and an eccentrically operated card feeding means, thereby eliminating the use of cams and the power losses due thereto.

Other objects are to provide efficient and economically manufactured selective means for operatively connecting the analyzer with the means for conducting the cards to their appropriate compartments, and suitable means for adjusting the analyzer and said selective means to the particular line of perforations to be analyzed.

While herein I have minutely described various details of the machine, it is understood that the invention is not limited to these, since the details of construction and combination may be greatly varied without

departing from the spirit and scope of the invention as claimed.

Figure 1 is a side elevation of the machine;

Fig. 2 is a plan of the same;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1;

Fig. 4 is an enlarged fragmental sectional view, taken approximately on the line 4—4 of Fig. 1;

Fig. 5 is a fragmental side elevation showing parts of the means for selectively operating the card conveying means; and Fig. 6 is an enlarged fragmental sectional view of the analyzer adjusting means.

On the main frame of the machine 10 are mounted the card feeding means 11, the analyzing means 12, the card receiving compartments 14, means for conveying the cards from the analyzer and selectively depositing them in the various compartments, and the motor 15 for driving various mechanisms.

The card feeding means 11 and the analyzer 12 are located on the upper part of one end of the machine, and are similar in construction to that described in the application of Jas. Powers, Serial No. 33863, filed June 14th 1915; hence they need not now be shown or described in all their details.

The upper part of the feeding means comprises a magazine hopper 18, adapted to receive a pack of the cards to be sorted, and at the lower part of the feeding means there is provided a reciprocating block 19 guided in the lower part of the feeding means and connected by means of a link 20, to a lever arm 21 mounted on the shaft 24 carried on the frame of the machine, and provided with an arm 25 connected to a link 26 having its end 28 eccentrically mounted on the eccentric-shaft 29, driven by means of suitable driving means, hereinafter mentioned from the motor 15, whereby the block 19 is reciprocated in the lower part of the magazine 18. The block 19 is provided with a feeding knife 34 whereby, when the block 19 is reciprocated, the lowermost card is fed forward through the micrometer slot 35 at the outlet side of the feeding means.

From the micrometer slot 35, the card is received between feed rollers 36 and 38, the latter mounted on the shaft 40, suitably driven by the sprocket chain 41 from the drive pulley 44 of the motor 15. From the shaft 40 suitable gears 46 convey power to the eccentric-shaft 29, and to the conveying rollers 48, which latter are adapted to withdraw the cards from the analyzer 12, and deliver them to the conveying means, as will be explained.

The cards are conveyed by the rollers 36 and 38 into the space between the perforated plates 50, suitably supported on the frame of the machine.

The pin box 52 is adjustably mounted on the side-pieces 54 (Fig. 2) carried on the end pieces 55 (Fig. 2) vertically slidably mounted on the posts 56 carried on the frame of the machine. Said box, side pieces, and end pieces are vertically reciprocated by means of links 58 having their lower ends receiving the eccentrics 59 on the eccentric shaft 29.

For times when the cards are exhausted or are improperly placed between the perforate plates 50, there is provided the usual automatic stop comprising a stop pin 60 (Fig. 4), carried by the vertically slidable rod 62 yieldably pressed downwardly by the spring 61 and adapted to be by a normally placed card, held out of contact with a switch lever 63 (Fig. 1), but adapted to be permitted, by a wrongly placed card or the absence of a card, to move downwardly to actuate the switch lever 63 to throw the electric switch 64 and cut off the source of power to the motor.

The pin box is provided with a row of pins 65 which may register with any one of the rows of perforations of the plates 50, when the box is adjusted on the side pieces 54, as explained, in which position the pin box is held by detents 66 (Figs. 2 and 6) engaging the notched bars 68 secured to the side pieces 54.

The pins 65, as explained in the before-mentioned patent application are yieldably pressed against the perforated cards, and that pin which finds a perforation, passes through the card during the downward motion of the pin-box, and is then locked against retrograde motion relative to the pin-box by means of the sliding locking-plate 70 (Figs. 2 and 6), which is moved against the row of pins and engages over an annular lug 11 (Fig. 4), of such pin as passes through a perforation, whereby such pin is locked. This sliding movement of the locking-plate is brought about by means of bell-cranks 74 fulcrumed as at 75 upon the side-pieces 54, and each provided with a slot 76 in which engages a pin 78 carried on uprights 79 slidably mounted on the rods 80

fixed to the frame of the machine. Said rods hold said uprights 79 against vertical movement, whereby the bell-crank 74 is oscillated for bringing about the reciprocation of the locking-pins.

Continued downward movement of the pin after it has been locked by the locking-plate causes the pin to bear against one of the plunger pins or plungers 85 (Fig. 6) which corresponds in number to the pins 65 and are carried in a block 86 mounted on sleeves 88 (Fig. 4) slidably mounted on shafts 89 carried by the frame of the machine.

The plungers 85 when depressed by the analyzing pins, transmit motion to the movable member of push-cables 90 for operating the selected mechanism of the card conveyor as will be explained.

It is, of course, necessary that the plungers 85 remain always in register with the analyzing pins 65, as for instance when the pin-box is moved upon the side-pieces 54 as heretofore explained. Registration is effected by means of the mechanism shown in Fig. 6 which will now be explained. The lower ends of the analyzing pins 65 slide in a pin-block 94 slidably mounted on and held against vertical movement by the rod 80. At opposite ends of the perforated plates 50, there are rotatably mounted groove pulley wheels 95, in the grooves of which are disposed a pair of superposed steel ribbons 96 and 98, the ends of the outer ribbon 96 being secured to the pin-block 94, while the ends of the inner ribbon 98 are secured to the plunger block 86. The end portions of the inner ribbon 98 are held spaced from and disposed parallelly to the end portions of the outer ribbon 96 by being passed under the small rollers 99, mounted upon the lower perforated plate 50. This holds the ribbons spaced apart a distance sufficient to permit the perforated plates 50 to be disposed therebetween. The intermediate part of said ribbons are positively secured together; and it is evident that longitudinal motion of the pin-box and consequently the block 94 upon the rod 80 will positively constrain the block 86 to move an equal amount upon the rod 89, thus always assuring that the row of plungers 85 shall always remain in register with the pins 65.

The cards are received from the rollers 48 (Fig. 1) and are carried by the conveyers and deposited in the compartments 14. The construction and the mounting of these compartments will now be described. At one side of the main frame of the machine, there is carried a standard 100 (Fig. 3) provided at its upper end with a horizontal bore in which is secured a sleeve 101 on the inner end of which is fixed a supporting drum 102, in the periphery of which are radially slid-

able follower rods 105, carrying at the outer ends followers 106 adapted to press outwardly the cards carried in said compartments. The rods and followers are yieldably moved outwardly by means of springs 108 tensioned between said blocks and lugs carried on the inner ends of the rods. The sides of the compartments are formed by means triangularly bent plates 110 (Fig. 1) having their ends brought together and secured in grooves 111 provided in the outer peripheral face of the drum 102. The inner end wall of the compartments is formed by an annular plate 112 secured by means of bolts 115 (Fig. 3) to said drum. The outer ends of the compartments are left open for the manual removal and insertion of cards.

The cards are held in the compartments against the outwardly directed pressure of the followers 106 by means of pairs of bent metal straps 118 forming deflecting gates, for the cards, and fixed upon rods 119 rotatably mounted in brackets 120 fixed to the walls 110, said rods projecting a distance through the inner wall plate 112 and carrying cam-levers 121 (Figs. 1 and 2) disposed in helical relation around the machine for a purpose that will be explained. The deflecting gates are normally held closed by means of springs 122.

Now will be described the means for conveying the card from the rollers 48 to the compartments 14.

Rotatably mounted upon bearings 130 (Fig. 3) is disposed a spider 131 carrying a ring 132 and a sprocket wheel 135 over which passes a chain 136 (Fig. 1) from a wheel 138 on the shaft 29, whereby spider is rotated with eccentric shaft one time, for instance, for six rotations of the eccentric shaft.

Rings 139 and 140 similar to the ring 132 are secured to and held in spaced relation with the latter by means of connecting rods 141 (Figs. 1 and 5) secured to all three of said rings, thereby forming a revolving frame for supporting the conveyer mechanism. This frame is supported on one side by the bearings 130 and on the other side by flange wheels 144 (Fig. 1) carried on brackets 145 supported on the base of the main frame.

Disposed around the conveyer frame there are rotatably mounted, in the rings 132, 139 and 140, a set of, for instance, 6 clamping spindles 146 each carrying a pair of clamping jaws 147 adapted to cooperate under the action of springs 148 with clamping brackets 149 carried on the rings 139 and 140. Each spindle 146 carries thereon an arm 150 (Fig. 5) having at its outer end a roller 152 adapted to engage a cam-bracket 153 carried on the wall plate 112 in such a position that, when the conveyer frame is rotated in

the direction of the arrow of Fig. 5 said roller will contact the cam-bracket and cause the spindle to rotate and the clamping jaw 147 to open just as a card is delivered from the rollers 48, at which instant the roller passes from the cam-bracket and permits the clamping jaws to close upon and grasp the card. Since in the example shown there are 6 spindles 141 and the shaft 29 rotates 6 times as fast as the conveyer frame. There will be a pair of jaws 147 in position to receive a card at each delivery of a card from the rollers 40. Of course, the specific number of clamping mechanisms may be varied if desired, in which case the relative speed of rotation of the conveyer frame and the eccentric shaft would be varied.

The cards grasped by the jaws 147 are carried past the deflector grates 118. The mechanism for causing the deflector gates to open to conduct cards into the respective compartments, will now be described.

Upon each connecting rod 141 (Figs. 2 and 5) there are fulcrumed a plurality of tripping arms 160, equal in number to the entire number of cam-levers 121, and each carrying at its free end a roller 161 adapted, when the tripping arm is depressed as will be explained to engage and trip one of the cam-levers, thereby opening outwardly the deflector gates 118, thereby causing the card to be pulled from the jaws 147, and guided by the deflected gate into the compartment.

It will be noted that each tripping arm 160 is provided with an inwardly projecting finger 162 and an onwardly projecting shoulder 164 somewhat offset from said finger.

At the instant the card is in the analyzer being analyzed, there is a set of jaws 147 and associated fingers 162 in a position somewhat behind that which they are to occupy when the card is ejected from the rollers 48. At such instant, the plungers 85 will be operated by the analyzer pins, and this movement will be communicated through the push cables 90, passing into the outer end of the sleeve 101 and out the intermediate opening 166 thereof, to the tripping pins 168 vertically slidable in the pin block 169 (Figs. 3 and 5).

The pin block 169 is placed in such a position that the tripping pin 168 which has been pushed upwardly will engage the passing finger 162 associated with the clamping jaw 147, which is to receive the card whose analysis caused the tripping. This tripping throws tripping arm 160 downwardly to tripping position and causes the finger 164 to be caught behind the hooked end 170 of a bell-crank 171 provided with a downwardly extending arm 172 and yieldably held in contact with the finger 170 by means of a spring 175 tensioned between the outer arm of said bell-crank and a projection 176 projecting

from the fulcrumed end of the tripping lever 160, whereby the tripping lever is also yieldably held in outward position. When any analyzing pin passes through a perforation and operates a tripping pin, that lever 160 which is adapted to contact the cam-lever 121 of the compartment into which such card is destined to be deposited, is the one which is tripped by the tripping pin; and the tripping pins, the analyzing pins, and the cam-levers 121 are arranged in such order that this must take place.

It will be noted that the discard or overflow compartment 180 just beneath the rollers 48 (Fig. 1) provided with a permanently open deflector 181, for deflecting into such compartment any card not deflected into other compartments, as for instance, when such card has no perforation in the column being analyzed.

The operation will be clear from the foregoing and need now only be briefly summarized as follows:—

The cards to be analyzed are arranged in the hopper 18, and the pin box is adjusted along the side pieces 154 until the analyzing pins and plunger pins register with the column to be analyzed. The machine is then started and the cards passed into the analyzer one by one and are analyzed by downward movement of the pin-box. This movement causes the outward movement of the tripping pins 168 just as the finger 162 passes, whereupon the tripping arm 160 corresponding to the card being analyzed is tripped inwardly. As the conveyer frame continues to rotate, the card is ejected from the analyzer just in time to be caught by the jaws 147 associated with such tripping arm, and the analyzer frame continues to rotate until the roller 161 of the tripped arm 160 comes into contact with the corresponding cam-lever 121, thus opening the deflector gate and conducting the card in its appropriate compartment.

After the card has been deflected into its proper compartment, continued rotation of the conveyer frame causes the inwardly projecting arm 172 (Fig. 5) to come into contact with a tripping blade 184, which causes the hooked end 170 to disengage from the shoulder 164 and permit the tripping arm 160 to resume its normal position.

Should it happen that no tripping lever 160 be set for a card, as for instance when such card has no perforation in the column being analyzed, such card will not be deposited in one of the compartments 14, but will be deflected by the permanently open deflector 181 into the overflow compartment 180.

I claim as my invention:—

1. In a card sorter, the combination of a circular series of compartments; a conveyer for conveying cards to all the compartments; means for feeding cards to said con-

veyer; card-record-controlled means carried by said conveyer and adapted to be set for controlling the discharge of the cards from the conveyer, and deflecting means controlled by the last mentioned means for deflecting the cards from the conveyer into the compartments.

2. In a card sorter, the combination of a circular series of compartments; a conveyer for carrying the cards to all of said compartments; means for feeding the cards to the conveyer; a plurality of disengaging means for said cards, one for each compartment; and means controlled by the perforations on said cards for rendering said disengaging means effective as a card reaches the compartment corresponding to its perforation.

3. In a card sorter, the combination of a plurality of stations; a conveyer for carrying the cards to all of said stations through a common path; means for feeding the cards to the conveyer; means for disengaging the cards from the conveyer; and record actuated means operating in synchronism with the conveyer for controlling the operation of said disengaging means to effect the delivery of the cards to the sorting stations corresponding thereto.

4. In a card-sorter, the combination of a circular series of compartments; a conveyer for carrying the cards to all of said compartments through a common path of movement; means for feeding the cards to the conveyer; deflecting means for disengaging the cards from the conveyer; and card actuated means operating in synchronism with the conveyer for controlling the operation of said deflecting means to effect the delivery of the cards to the sorting stations corresponding to the index-points thereon.

5. In a card-sorter for sorting record-cards having perforations thereon, the combination of a plurality of sorting stations, means comprising operating levers located in accordance with the perforations on the cards; a conveyer for said cards; and adjustable means on said conveyer actuated through the instrumentality of a card for operating the aforesaid means to discharge the cards from the conveyer into said sorting stations.

6. In a card-sorter, the combination of a circular series of sorting compartments; means comprising operating levers located in accordance with the index-point positions on the cards; a conveyer for said cards; and settable card actuated means on said conveyer actuated through the instrumentality of the card for operating levers to discharge the cards from the conveyer into said compartments.

7. In a card-sorter, the combination of a circular series of compartments; a conveyer for carrying the cards to all of said com-

partments through a common path of movement; means for feeding the cards to the conveyer; deflecting means for disengaging the cards from the conveyer; and means controlled by the perforations of the cards for rendering said deflecting means effective as a card reaches the compartment corresponding to its perforation.

8. In a card-sorter, the combination of a card analyzer; a series of compartments; a plurality of moving conveyers; means for feeding a card from the analyzer into a conveyer during the travel of the latter; a group of settable members associated with each conveyer, members of the same group moving in different paths; a deflector gate for each compartment adapted to be operated by a corresponding set settable member of each group to deflect into the compartment a card from the associated conveyer; and a plurality of setting members of which the one, corresponding to a card in the analyzer is adapted to be operated by the analyzer to set the settable member corresponding to that compartment which are to receive such card, to cause such settable member to cause the deflector gate to deflect the card into such compartment.

9. In a card-sorter, the combination of a card analyzing means; an endless series of compartments; a series of conveyers adapted to receive cards from the card analyzing means and successively to pass said compartments; means for opening each conveyer as it reaches a certain point in its travel and immediately closing it; means for feeding cards from the analyzing means into the opened conveyer; a plurality of settable means associated and traveling with the conveyer, the different settable means of each conveyer traveling in different paths; a deflector gate for each compartment and each provided with an operating cam lever disposed near the path of the settable means corresponding to such compartment and adapted to be tripped by said settable means to cause the inflector gate to deflect a card from the conveyer into the compartment; setting means adapted to be operated by the analyzing means in accordance with the card therein and adapted to set the settable means associated with the conveyer which is to receive said card; and corresponding to the cam lever associated with the compartment which is to receive said card; means for holding the set settable means in set position until it has tripped the corresponding cam lever and caused the deflector gate to deflect the card from the conveyer into the compartment; and means for causing the holding means to release the set settable means after it has caused the deflector gate to deflect the card.

10. In a card-sorter, the combination of a card analyzer; a series of compartments;

means for conveying cards from the analyzer to the compartments; deflecting means; and push cables operated by the analyzer for operating said deflecting means.

11. In a card-sorter, the combination of a card analyzer having analyzer pins; a series of compartments; a deflector gate for each compartment; plungers coöperating with the analyzer pins; settable means for selective operating the deflector gates; and push cables connected to said plungers and adapted to operate said settable means.

12. In a card-sorter, the combination of an analyzer; a series of compartments; a revolving conveyer comprising clamping jaws; means for opening said jaws when they are in position to receive cards from the analyzer; and means for deflecting cards from the jaws into the compartments.

13. In a card-sorter, the combination of an analyzer; a series of compartments; a revolving conveyer comprising clamping jaws; means for opening said jaws when they are in position to receive cards from the analyzer; settable means for deflecting cards from the jaws into said compartments; and means operated by said analyzer for setting said settable means before said jaws arrive at said position.

14. In a card-sorter, the combination of an analyzer; a series of compartments; a revolving series of conveyers adapted to receive cards from the analyzer; a plurality of settable means associated and traveling with each conveyer each provided with a shoulder; a deflected gate for each compartment and each provided with an operating cam lever disposed near the path of the settable means corresponding to such compartments and adapted to be tripped by a settable means to cause a card to be deflected into a compartment; setting means operated by an analyzer and adapted to set the settable means; a spring pressed pivoted hook adapted to engage said shoulder and hold the set settable means set until the card has been deflected into a compartment; and means for tripping said pivoted hook after the card has been deposited for causing the release of the settable means.

15. In a card-sorter, the combination of a frame; a card analyzer thereon; a standard on said frame; a sleeve carried in said standard; a drum mounted on said sleeve; a plurality of compartments mounted on the periphery of said drum; a supporting member rotatably mounted on said sleeve between said drum and said standard; an annular frame carried on said supporting means and surrounding said drum; and selective means carried on said frame for receiving cards from said analyzer and depositing them in said compartments.

16. In a card-sorter, the combination of a frame; an analyzer supported thereon; a

drum on said frame provided with longitudinally disposed peripheral grooves arranged therearound; triangularly bent pieces of sheet-metal forming compartment partitions and having their free side edges brought together and secured in said grooves; and means for conveying cards from the analyzer to the compartments.

17. In a card-sorter, the combination of a plurality of circularly disposed compartments; outwardly spring pressed, radially disposed follower rods mounted in said compartments; followers on said rods; and means for analyzing cards and forcing them into said compartments.

18. In a card-sorter, the combination of a reciprocating analyzer frame; a pair of stationary analyzer plates disposed under said frame and provided with rows of perforations; a pin box slidable on said frame and provided with a row of analyzer pins adapted to register with anyone of the rows of said perforations; a pin block receiving said pins and disposed above said plates and held against vertical movement; a plunger block slidably disposed below said plates; plunger pins in said block; means for holding said plunger pins in register with said analyzer pins.

19. In a card-sorter, the combination of a reciprocating analyzer frame; a pair of stationary analyzer plates disposed under said frame and provided with rows of perforations; a pin box slidable on said frame and provided with a row of pins adapted to register with anyone of the rows of said perforations; a pin block receiving said pins and disposed above said plates and held against vertical movement; a plunger block slidably disposed below said plates; a pair of grooved rollers at each end of said plates; pairs of superposed ribbons disposed in said grooves the ends of one ribbon of each pair being secured to said pin block, the ends of the other being secured to said plunger block; a series of compartments; means for conveying cards from said plates to said compartments; and means operated from said plungers for selectively conducting cards from the conveying means into the compartments.

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