J. POWERS.

SPLIT PIN BOX FOR SORTING MACHINES.

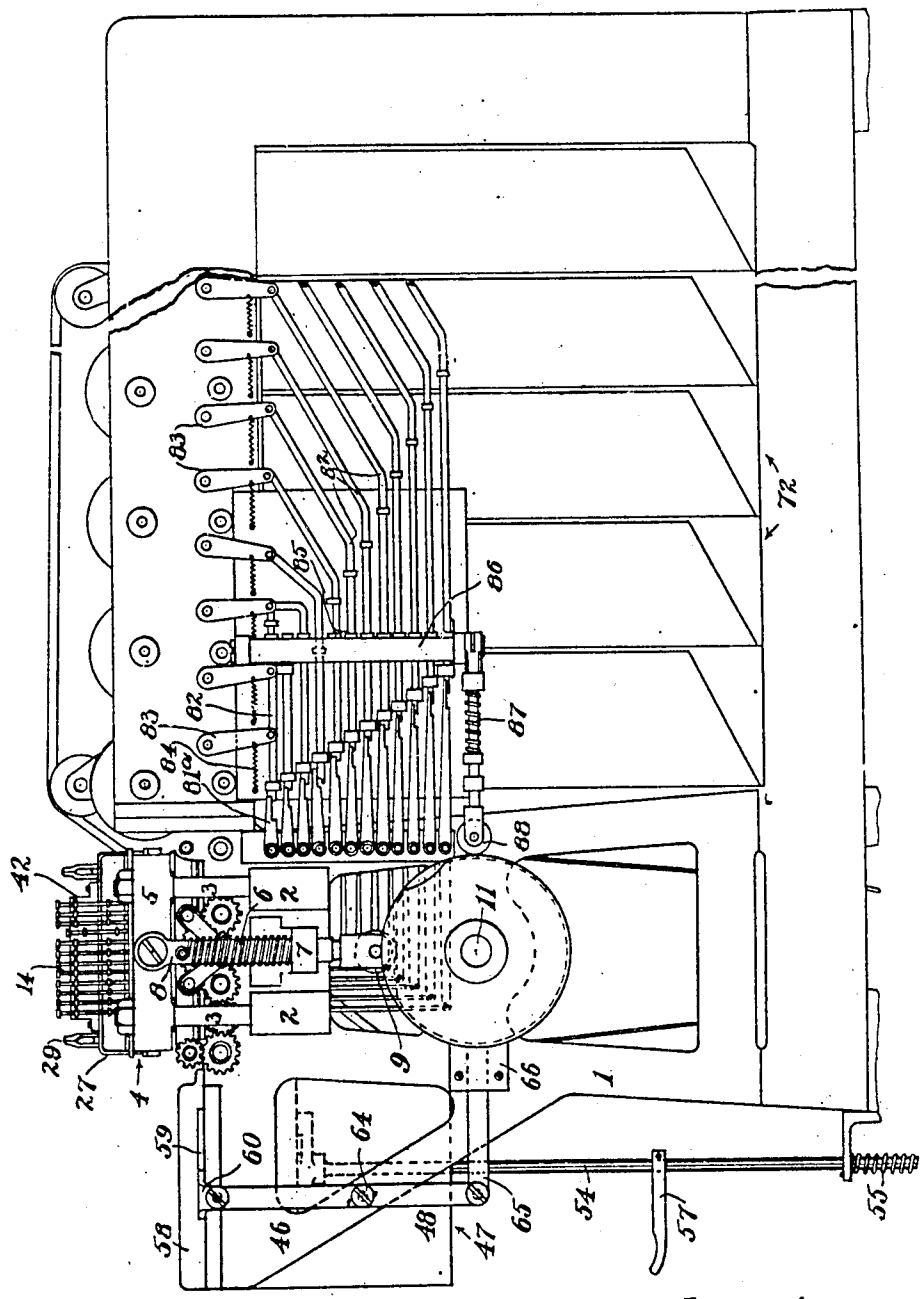
APPLICATION FILED JAN. 28, 1916.

1,236,482.

Patented Aug. 14, 1917.

5 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
Chas. E. Whiteman.
H. D. Pouney

Inventor:
James Powers.
By his Atty, F. H. Richards

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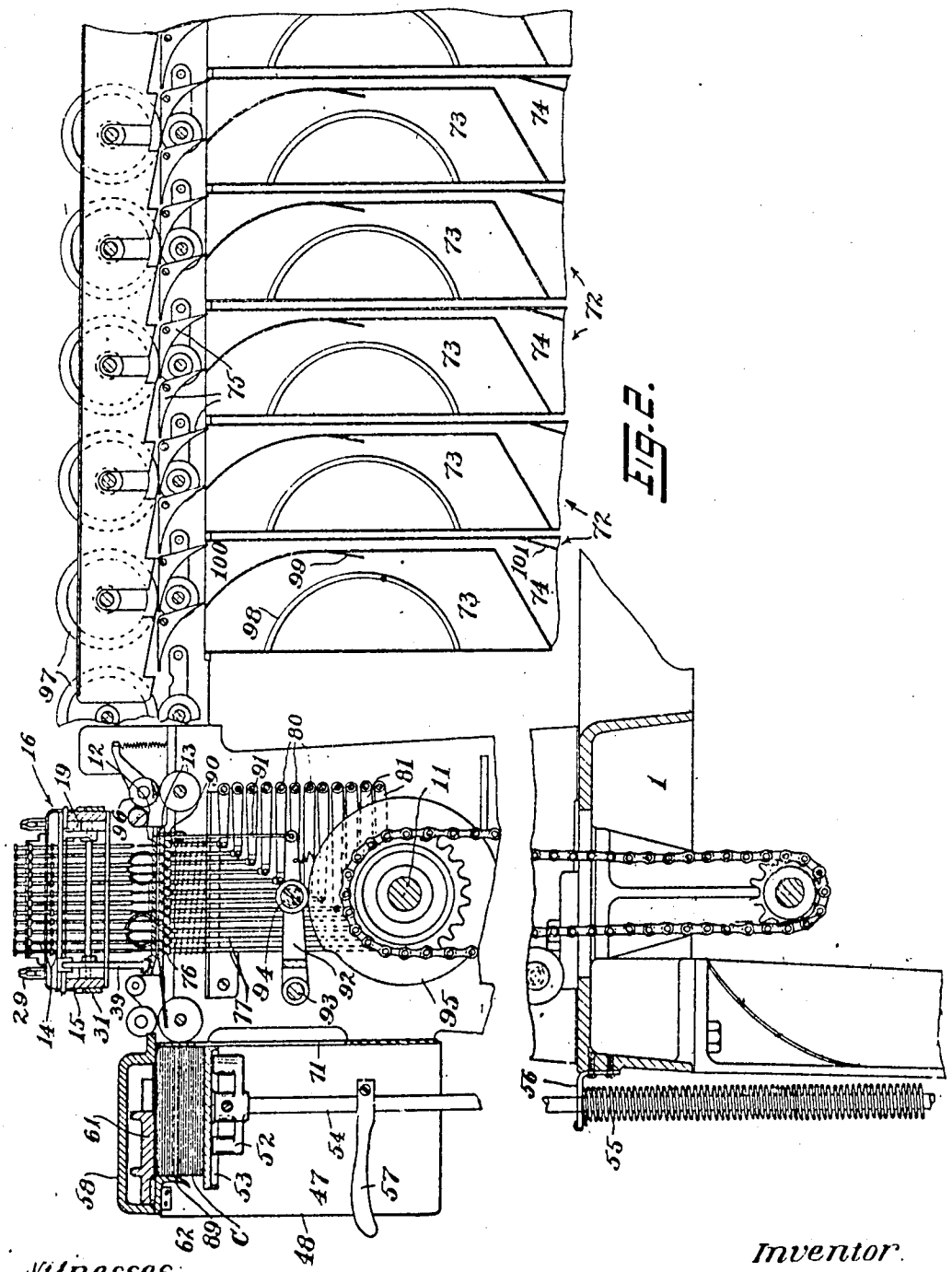


Fig. 2.

Witnesses:
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SPLIT PIN BOX FOR SORTING MACHINES.

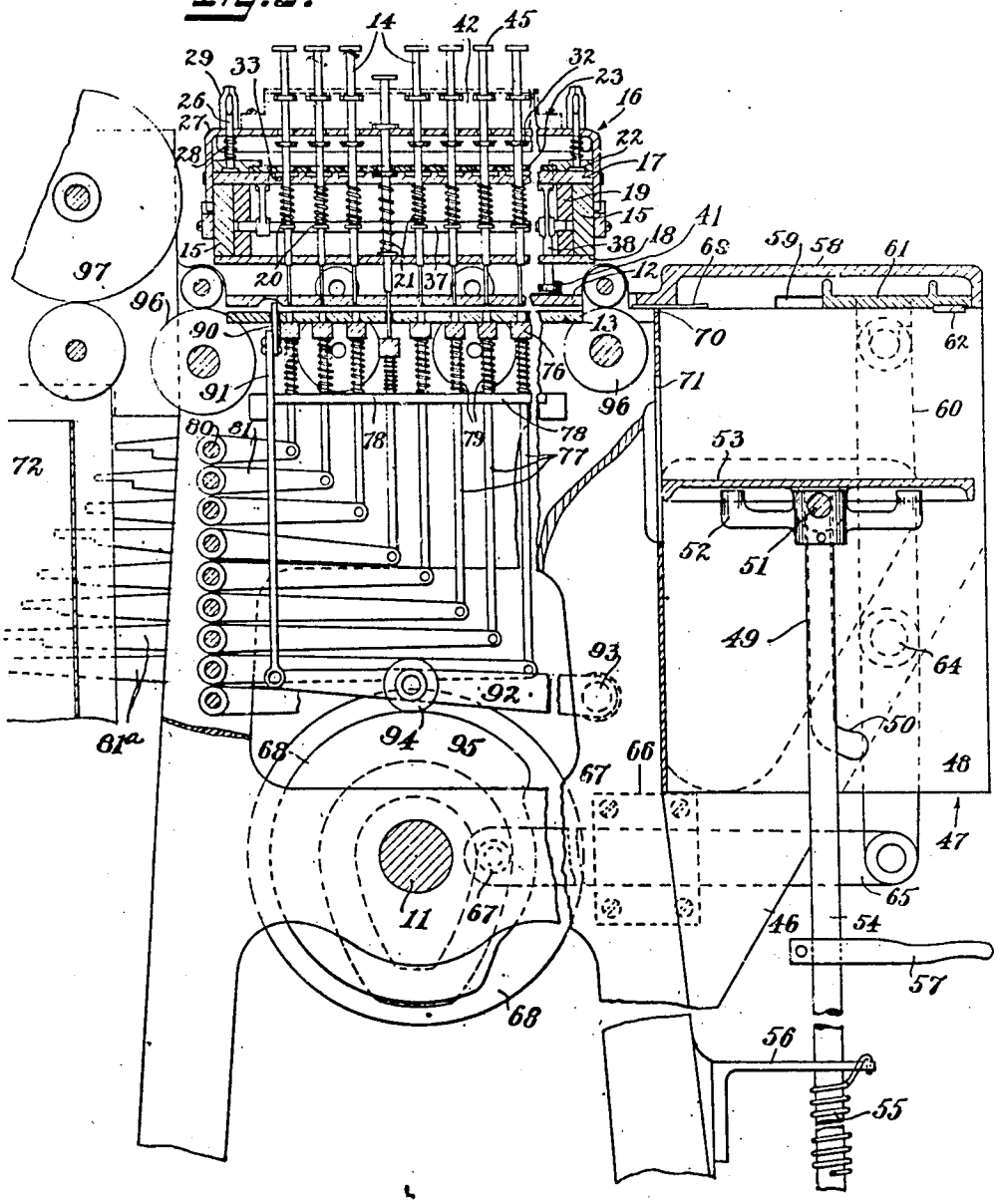
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5 SHEETS—SHEET 3.

Fig. 3.



Witnesses:

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5 SHEETS—SHEET 4.

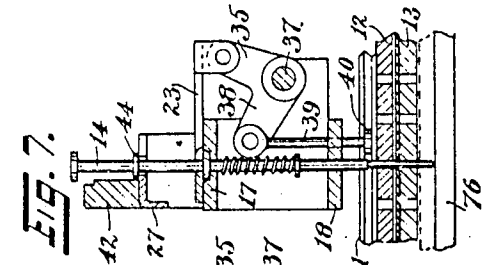


Fig. 7.

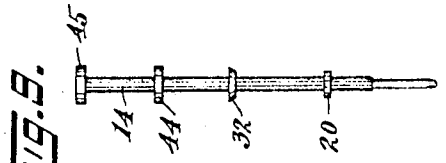


Fig. 9.

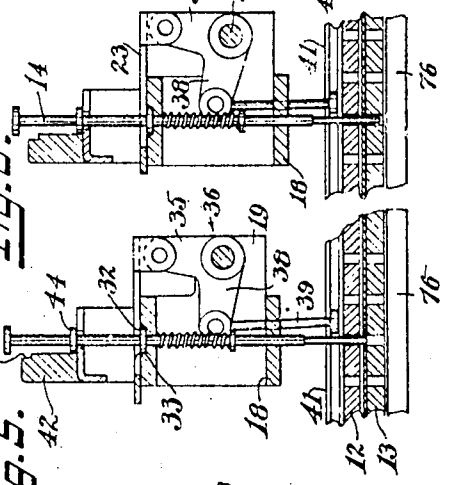


Fig. 6.

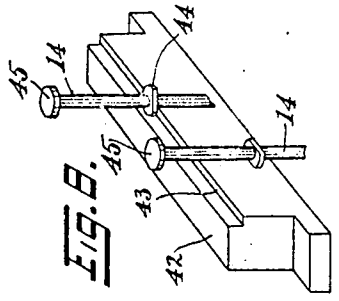


Fig. 8.

Fig. 5.

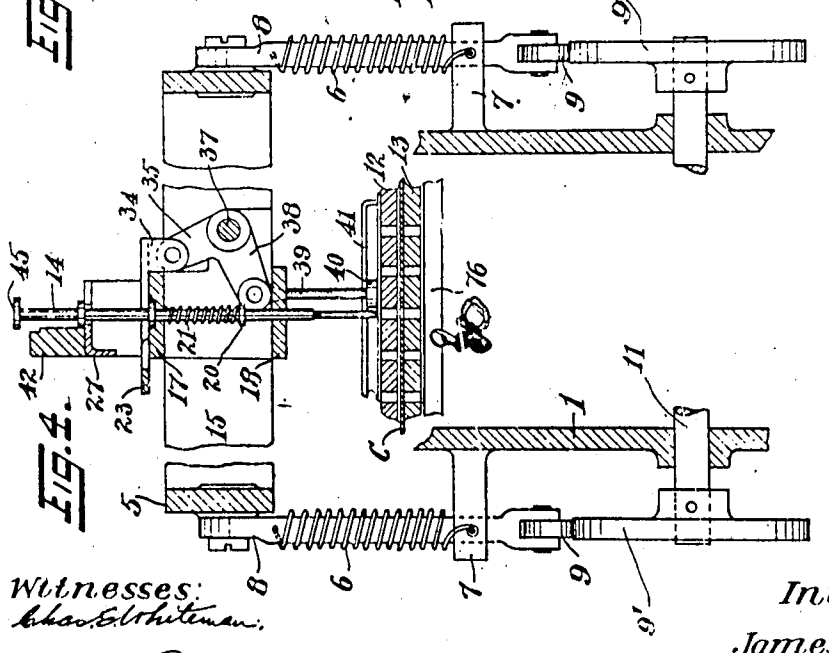


Fig. 4.

Witnesses:
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SPLIT PIN BOX FOR SORTING MACHINES.

APPLICATION FILED JAN. 28, 1916.

1,236,482.

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5 SHEETS—SHEET 5.

Fig. 12.

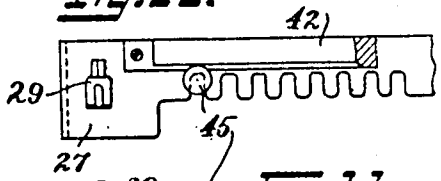


Fig. 10.

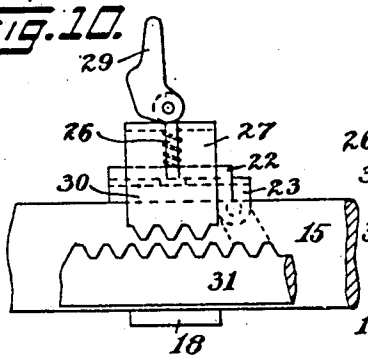


Fig. 11.

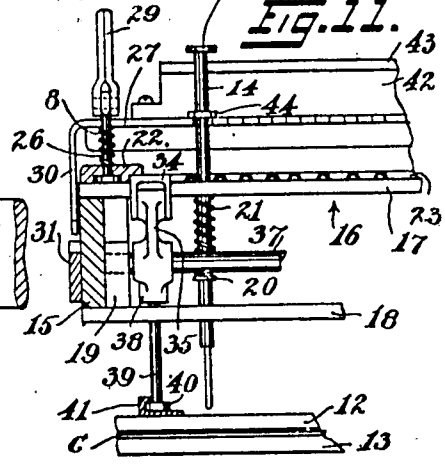


Fig. 15.

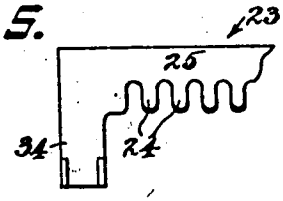


Fig. 13.

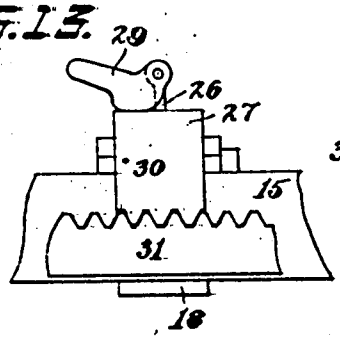
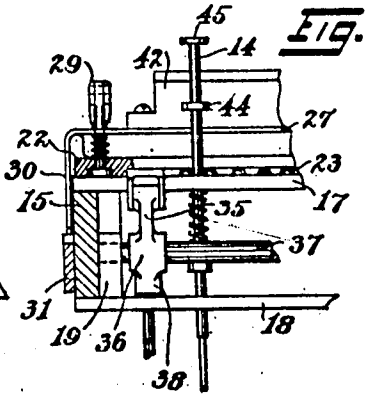


Fig. 14.



Witnesses:

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Inventor:

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UNITED STATES PATENT OFFICE.

JAMES POWERS, OF NEW YORK, N. Y., ASSIGNOR TO POWERS ACCOUNTING MACHINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

SPLIT PIN BOX FOR SORTING-MACHINES.

1,236,482. Specification of Letters Patent. Patented Aug. 14, 1917.

Application filed January 28, 1916. Serial No. 74,797.

To all whom it may concern:

Be it known that I, JAMES POWERS, a citizen of the United States, residing in New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Split Pin Boxes for Sorting-Machines, of which the following is a specification.

This invention relates to mechanically actuated and controlled apparatus or machines for coöperating with a plurality of record containing articles, such, for instance, as perforated cards, or a series of sets of perforations on a web, whereby suitable deflecting means, that are arranged in a path along which the cards are advanced after they are engaged at the controlling means, are set, so that the cards will be caused to pass into different compartments and sorted according to the different perforations in the cards.

One of the objects of the invention is to provide an improved form of feeding means for the cards, into and from the said controlling means whereby the cards will be fed into the machine so that when they are discharged from the machine they will be arranged in an order corresponding to the order of the same before having been fed into the machine.

A further object of the invention is to provide an improved form of pin-box or controlling means, that coöperates with the perforated cards in a fixed predetermined position of the cards, the pin-box being shiftable to engage different sections of the card in the said position, which will cause each of the said pin members to coöperate with the said deflector or counter in its several shifted positions, and which pin-box furthermore may be so regulated that only a certain item that is common to a number of the perforated cards may be sorted to the entire exclusion of any other items that may be common to such cards.

These and other features, capabilities and advantages of the invention will appear from the subjoined detailed description of one specific embodiment thereof illustrated in the accompanying drawings in which

Figure 1 is an elevation of the machine equipped with the present improvements.

Fig. 2 is a fragmental view being a longitudinal section of the figure shown in Fig. 1.

Fig. 3 is an enlarged fragmental view shown partly in section.

Fig. 4 is an enlarged fragmental view in section.

Figs. 5, 6 and 7 illustrate successive positions of an analyzer pin.

Fig. 8 is a perspective illustrating the means for locking an analyzer pin in idle or inoperative position.

Fig. 9 is an elevation of an analyzer pin detached.

Fig. 10 is an elevation, parts broken away, to illustrate the side of the carriage on which the analyzer pins are mounted, this view showing the carriage disengaged ready to be shifted to another position; and Fig. 11 is a fragmental sectional view of the same, in which one analyzer pin is illustrated.

Fig. 12 is a fragmental plan showing the plate by means of which the analyzer pins will be retracted after having been carried downward.

Fig. 13 is an elevation, parts being broken away, to illustrate the sides of the carriage on which the analyzer pins are mounted, this view showing the carriage engaged ready for a sorting operation; and Fig. 14 is a fragmental sectional view of the same in which one analyzer pin is illustrated.

Fig. 15 is a fragmental plan showing the plate by means of which the registering analyzer pins will be depressed.

In the embodiment illustrated, there is provided a main frame 1, having guideways 2, 2 on opposite sides in which the standards 3, 3 of the vertically movable pin-box 4 are slidably mounted. On the sides of the lateral walls 5 of the pin-box 4 rods 6 are secured which pass through guideways 7 secured on the sides of the frame 1, the rods being cushioned by springs 8, and the lower ends of which rods 6 are provided with cam rollers 9 in engagement with the cams 9′ (Fig. 4) fixed to the shaft 11 suitably journaled in the lower part of the frame 1.

Just below the pin-box 4, there are fixed in said frame 1, two plates 12, 13 provided with alined perforations so as to register with the pins 14 of the pin-box 4, the plates 12, 13 being spaced from one another a distance sufficient to permit the passage of a record card C between them. Between and to the walls 5 of the pin-box 4 there are secured two transversely disposed bars 15, 15

which serve as guideways for the transversely moving pin carriage 16.

The pin carriage 16 comprises essentially longitudinally extending plates 17, 18 connected to one another by the plates 19, the retracting plate 17 extending above the bars 15 and the plate 18 below the bars 15 and the two plates 17 and 18 each having a single row of perforations in alinement with one another in which are slidably mounted the pins 14, each having a disk member 20 disposed between the plates 17 and 18, between each of which disk members 20 and the plate 17 there is strained a spring 21 to normally exercise a downward pressure on the pins 14. Disposed on each of the ends of the upper plate 17 there is provided a securing plate 22 having a recess facing inwardly and forming a slot with the plate 17 in which two slots, the locking plate 23 is reciprocably mounted having fingers 24 along its intermediate portion 25 to engage between the several pins 14 when the pin-box 4 is depressed. Secured by each of the securing plates 22 is a stem 26 projecting up through the transverse plate 27 and having a spring 28 strained between the securing plate 22 and the plate 27 to normally maintain the plate 27 in raised position. To each of the upper protruding portions of the stems 26 there is pivoted a cam lever 29 by means of which the plate 27 may be depressed against the tension of the spring 28. The plate 27 has a downwardly extending portion 30 at each of its ends the lower end of which is serrated to engage in the serrations formed on a bar 31, one secured to each of the bars 15, by means of which engagement, the pin carriage 16 may be positioned, so that its pins 14 will register with a row of perforations in the plate 12, the pins 14 extending upwardly through the plate 27 and each having a head 32 disposed between the plate 27 and the plate 17, the plate 17 being provided with cupped-recesses 33 to receive the heads 32 of the pins 14 when the pins 14 are disposed in their extended positions, the heads 32 having conical peripheries so as to facilitate seating them in the recesses 33.

The locking plate 23 has an arm 34 at each of its ends extending in the same direction as the fingers 24, at the extreme end of each of which there is pivotally connected the arm 35 of a bell crank lever 36. The bell crank levers 36 are each fixed to a shaft 37 journaled in the bars 19, one of which levers 36 has an arm 38 extending toward the plate 23, at the extreme end of which there is pivotally connected a stem 39 having a foot 40 at its lower end, which is disposed to travel in the channel of the channel iron 41 secured to the plate 12 in which channel the foot 40 travels when the pin carriage 16 is shifted. When the pin-box 4 descends in a cycle of operation, (see Fig. 3) the bell crank 35 provided with the stem 39 will be rocked by means of the shaft 37 which rocks the other bell crank lever 36 and thereby draws the locking plate 23 so that its fingers 24 will engage between the pins 14. Thus, as shown in Fig. 3, the heads 32 of the pins 14 which do not find a perforation in the card being sorted will be disposed above the plate 23 and the head 32 of that pin which has found a perforation will be seated in its recess 33, and below the plate 23 being locked in its seat so that upon further descent of the pin-box 4, the plate 23 will exercise a positive downward movement on the extended pin 14 thereby to actuate a deflector actuator as hereinafter to be described.

Mounted on the plate 27 and adjacent to the path of movement of the pins 14 there is provided a block 42 (Fig. 8) provided with a recess 43 formed in its upper edge in position to receive the lugs 44 secured to the pins 14 when such pins are properly turned. The pins 14 are provided with such lugs 44 which are substantially heads similar to the heads 32 but having two of their opposite sides cut off so as to permit the passage of the pins 14 when they are turned so that their cut off sides are parallel to the block 42. This arrangement of the lugs 44 and the block 42 performs one of the main features of the present invention. By this means, any of the pins 14 which it may be desired not to use, may be locked in idle or inoperative position so that when the pin-box 4 descends to sort a card, and such card is only provided with data corresponding to the idle pin, there will be no sorting. Thus likewise it may be desired to sort only the cards having one particular item, in which case all of the pins will be locked in inoperative position except the pin corresponding to the item desired to be sorted and thereby no other cards will be sorted.

The pins 14 are further provided with heads 45 at their extreme upper ends by means of which the pins may be manipulated.

Another important feature of the present invention is the means for feeding the cards to the plates 12 and 13. For this purpose two brackets 46, 46 are properly secured to the frame 1 between which a magazine 47 is secured open at top and bottom and also its outer side. The side walls 48, 48 of the magazine 47 are each provided with a vertically extending slot 49 having an outwardly extending portion 50 at its lower end in which slots 49 the ends of a cross bar 51 are slidably mounted which cross bar extends through a spider 52 on which spider 52 is supported a platform 53 of substantially the same width as the

magazine 47 and having one of its edges disposed directly adjacent to the wall 71 of the magazine 47. On this platform are placed the cards which are to be fed between the plates 12 and 13. For supporting the platform, the rod 54 is provided which is fixed to the spider 52 and is normally maintained in raised position by means of the spring 55 which is fastened to the rod 54 at its lower end and to the end of a bracket 56 at its upper end, the bracket 56 being secured to the side of the frame 1. The arrangement is such that the spring 55 will maintain the uppermost card of those supported on the platform 53 in position to be fed to the plates 12 and 13. Furthermore, the spring 55 will be so tensed that, after every removal of its uppermost card, it will raise the platform 53 the required distance to position the next succeeding uppermost card into feeding position. The rod 54 is provided with a handle 57 by means of which the platform 53 may be lowered to receive a fresh supply of cards, or for purposes of repair or the like.

The magazine 47 is provided with a cover 58 which has a slot 59 in each of its side walls through which extend the arms 60 of the reciprocating plate 61 which slides in said cover 58 and is provided with a picker plate 62 on its lower surface extending into the magazine 47, in the path of movement of which picker plate 62, the uppermost card of the pack disposed on the platform 53 is located so that the picker plate 62 when moving toward the plates 12 and 13 with the reciprocating plate 61 will engage such uppermost card and feed it between the plates 12 and 13. For actuating the reciprocating plate 61, the arms 60 are fulcrumed to the brackets 46 at 64 and pivotally connected at their lower ends to the rods 65 each of which passes through a guideway 66 formed on the side of the frame 1 and is equipped with a cam roller 67 on its inner end which engages in the groove formed on a cam wheel 68 mounted on the shaft 11. To limit the uppermost card in its raised position, the stop plate 69 is secured to the cover 58 directly above the opening 70 formed at the upper end of the inner wall 71 of the magazine 47.

For sorting the cards, a plurality of receptacles 72 are provided in a row, each receptacle preferably containing two compartments 73 and 74, the compartments being of the same number as the figures in a single row of data of the perforated cards and adapted to receive cards of corresponding data respectively. For this purpose, deflectors 75 are provided one disposed at the entrance of each of said compartments, and connected by suitable mechanism with the bars 76 each disposed under one of the pins 14 so that the registration of a pin in a perforation of a card, thereby protruding through such card will engage the bar 76 disposed beneath it to actuate a deflector 75 connected with such actuated bar 76.

The bars 76 are each supported on two rods 77 one rod 77 disposed at each end of a bar 76. The rods 77 are arranged in two rows, each row of rods 77 being slidably mounted in a plate 78 secured to the inside of the frame 1, the bars 76 being normally maintained against the plate 13 and below a transverse row of perforations in such plate by means of springs 79 strained between the bars 76 and the plates 78. The rods 77 are of different length, the pair of rods 77 supporting the bar 76 nearest the receptacles 72 being the shortest, the next pair of rods 77 being longer and the remaining pairs of rods 77 each being of a greater length than its preceding pair, this being for the purpose that the pairs of rods can be connected to the shafts 80 disposed one above the other. The shafts 80 are journaled in the frame 1 adjacent to the receptacles 72 and are each connected by a pair of links 81 with a pair of rods 77, the uppermost shaft 80 being connected with the shortest pair of rods 77, the next lower shaft 80 to the next longer pair of rods 77, and the remaining shafts 80 to the remaining pairs of rods 77 in a corresponding order so that the lowest shaft 80 will be connected to the longest pair of rods 77. Each of the shafts 80 (Fig. 1) is provided on its outwardly extending end with a locking lever 81^a fixed to such rod, the end of which locking lever is stepped and in a line with the stepped end of a shifting lever 82 which is connected with a deflector 75, each of the shifting levers 82 being connected with one of the deflectors 75 by a link 83, and in the present instance, the uppermost shifting lever 82 being thus connected to the nearest deflector 75 and the next lower shifting lever 82 to the deflector 75 next to the first named deflector and the remaining shifting levers 82 to the remaining deflectors 75 in a corresponding order so that the lowermost shifting lever 82 will be connected to the farthest removed deflector 75. Each of the links 83 is connected by a spring 84 to the frame of the receptacles 72. Thus when a bar 76 is depressed by a pin 14, the bar 76 in turn will rock its locking lever 81^a out of contact with a shifting lever 82 thereby releasing such shifting lever 82 so that the spring 84 of the link 83 connected to such shifting lever 82 will be permitted to attract such link 83 and thereby rock the deflector 75 into open position. For returning the shifting lever 82 so that its deflector will rock to non-deflecting position, each lever 82 is provided with a stop 85. These stops 85 are all arranged in a single row

one above the other and in the path of movement of a bar 86 which is operatively connected to the shifting rod 87 provided at its end with a cam roller 88 in engagement with a cam mounted on the shaft 11 whereby in its order during a cycle of operation, the bar 86 will be moved to engage the stop of a released shifting bar 82 to return the deflector 75 connected thereto. In the meantime, the locking lever 81ª which had released such shifting lever 82 will be released by its bar 76 so that when the shifting lever 82 is returned to non-deflecting position, the locking lever 81ª will be in position to receive the end of such shifting lever 82 and again lock the same.

The cards C (see Fig. 2) disposed in magazine 47 are maintained snugly against the wall 71 of the magazine 47 by a spring 89 preferably secured to the cover 58. After a card is fed between the plates 12 and 13 by the picker 62, it will be stopped in proper position between such plates 12 and 13 by a stop 90 secured to the upper end of a rod 91 pivotally connected to a lever 92 which is fulcrumed at 93 to the frame 1 and has a cam roller 94 in engagement with the cam 95 mounted on the shaft 11, the cam being so timed that it will withdraw the stop after the pin-box has descended and thereby permit the card to be discharged by the rollers 96 to the rollers 97 above the receptacles 72 by which rollers 97 a card will be advanced to the deflector 75 that has been dropped into the deflecting position.

In each of the compartments 73 of the receptacles 72 there are disposed wires 98 properly looped so that when a card drops into such compartment and strikes the deflecting plate 99 it will be turned over into proper position whereas when a card drops into a compartment 74 of a receptacle 72 it will be guided in the channel 100 until it arrives at the inclined portion 101 and thereby be turned into proper position. The arrangement is such that when a card which is faced upward when being fed into the machine by the picker from the top of a pack of cards on the platform 53 by the picker plate 62, it will pass through the apparatus and drop into a compartment 73 and face downward so that when the cards are thereupon picked out of a compartment they will be in the same order when turned face upward as they were when disposed on the platform 53.

The outwardly extending portions 50 of the slots 49 are provided so that when the card supply has been exhausted, or for any other purpose, it is desired to lower the platform 53, this may be done by depressing the lever 57 and thereupon when the cross bar 51 has arrived at the outwardly extending portions 50, the outward pull on the rod 54 will draw such cross bar 51 into the outwardly extending portions 50 and thereby lock the platform 53 in depressed position until a fresh supply of cards has been introduced or until whatever other object it was intended for had been accomplished.

It is obvious that various changes and modifications may be made to the details of construction without departing from the general spirit of the invention.

I claim:

1. In a sorting machine for sorting punched cards or the like, the combination of means for holding the cards; a plurality of pins adapted to engage the card thus held so that a pin registering with a perforation in the card may pass therethrough; and means for rendering inoperative any of said pins.

2. In a sorting machine for sorting punched cards or the like, the combination of means for holding the cards; a plurality of pins adapted to engage the card thus held so that a pin registering with a perforation in the card may pass therethrough; means for rendering inoperative any of said pins; and sorting means adapted to be operatively affected by the pin passing through the perforation.

3. In a sorting machine, the combination of pins adapted to engage the cards to be sorted so that the pin registering with a perforation in the card being sorted may pass therethrough, and means for locking any of such pins in inoperative position thereby to prevent data corresponding to such locked pins from being sorted.

4. In a sorting machine, the combination, with a frame, pins adapted to engage the cards to be sorted so that the pin registering with a perforation in the card being sorted may pass therethrough, and means for locking any of such pins in inoperative position thereby to prevent data corresponding to such locked pins from being sorted.

5. In a sorting machine, the combination with a frame, a pin box movably mounted in said frame, pins slidably mounted in said pin box and adapted to engage the cards to be sorted so that the pin registering with a perforation in the card being sorted may pass therethrough, and means for locking any of such pins in inoperative position thereby to prevent data corresponding to such locked pins from being sorted.

6. In a sorting machine, the combination with a frame, a pin box frame movably mounted in said first mentioned frame, a carriage slidably mounted on said pin box frame, pins carried by said pin carriage and adapted to engage the cards to be sorted so that the pin registering with a perforation in the card being sorted may pass therethrough, and means for locking any of such pins in inoperative position thereby to prevent data corre-

sponding to such locked pins from being sorted.

7. In a sorting machine, the combination with a frame, a support in said frame for the cards to be sorted, there being perforations in said support corresponding to the figures of said card, said perforations being in rows, a pin box frame movably mounted in said first mentioned frame, a pin carriage slidably mounted in said pin box frame, a row of pins carried by said pin carriage and each provided with a lateral lug, the pin carriage being adapted to traverse said support so that the pins of said carriage may at different times register with any one of the several rows of perforations in said support, and a block on said carriage adjacent to the path of movement of said pins having a recess therein in which the lugs may be located by turning the pins thereby to lock such pins in inoperative position.

8. In a sorting machine, the combination with a frame, of a pin box frame movably mounted in said first mentioned frame, a pin carriage slidably mounted on said pin box frame, pins slidably mounted in said pin carriage and adapted to engage the cards to be sorted so that the pin registering with a perforation in the card being sorted may pass therethrough, lugs on said pins, and a block on said carriage adjacent to the path of movement of said pins having a recess therein in which the lugs may be locked by turning the pins thereby to lock such pins in inoperative position.

9. In a sorting machine, the combination with a frame, of a pin box frame movably mounted in said first mentioned frame, a pin carriage slidably mounted on said pin box frame, pins slidably mounted in said pin carriage and adapted to engage the cards to be sorted so that the pin registering with a perforation in the card being sorted may pass therethrough, lugs on said pins, a block on said carriage adjacent to the path of movement of said pins having a recess therein in which the lugs may be locked by turning the pins thereby to lock such pins in inoperative position, a retracting plate on said carriage and heads on said pins adapted to engage said retracting plate when in perforation registering position and adapted to be restored by such retracting plate after having completed an operation.

10. In a sorting machine, the combination with a frame, of a pin box frame movably mounted in said first mentioned frame, a pin carriage slidably mounted on said pin box frame, pins slidably mounted in said pin carriage and adapted to engage the cards to be sorted so that the pin registering with a perforation in the card being sorted may pass therethrough, lugs on said pins, a block on said carriage adjacent to the path of movement of said pins having a recess therein in which the lugs may be locked by turning the pins thereby to lock such pins in inoperative position, a retracting plate on said carriage, heads on said pins adapted to engage said retracting plate when in perforation registering position and adapted to be restored by such retracting plate after having completed an operation, and a locking plate reciprocably mounted on said retracting plate and adapted to engage the heads of the descended pins and lock them in descended position so that upon a further movement of the pin box such locked pins will receive a positive actuating movement.

11. In a sorting machine, the combination with a frame, of a pin box frame movably mounted in said first mentioned frame, a pin carriage slidably mounted on said pin box frame, pins slidably mounted in said pin carriage and adapted to engage the cards to be sorted so that the pin registering with a perforation in the card being sorted may pass therethrough, lugs on said pins, a block on said carriage adjacent to the path of movement of said pins having a recess therein in which the lugs may be locked by turning the pins thereby to lock such pins in inoperative position, a retracting plate on said carriage, heads on said pins adapted to engage said retracting plate when in perforation registering position and adapted to be restored by such retracting plate after having completed an operation, a locking plate reciprocably mounted on said retracting plate and adapted to engage the heads of the descended pins and lock them in descended position so that upon a further movement of the pin box such locked pins will receive a positive-actuating movement, the heads being conically shaped and the retracting plate provided with recesses to receive such heads, the recesses being cup-shaped to coöperate with the conical shape of such heads to properly guide them into position.

JAMES POWERS.

Witnesses:
GUSTAV DREWS,
FRANK FAGGIANI.