

July 10, 1945.

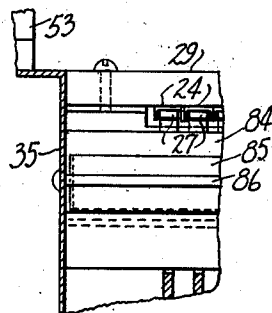
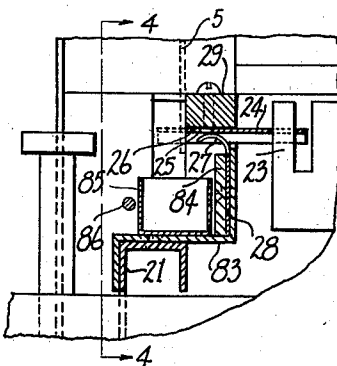
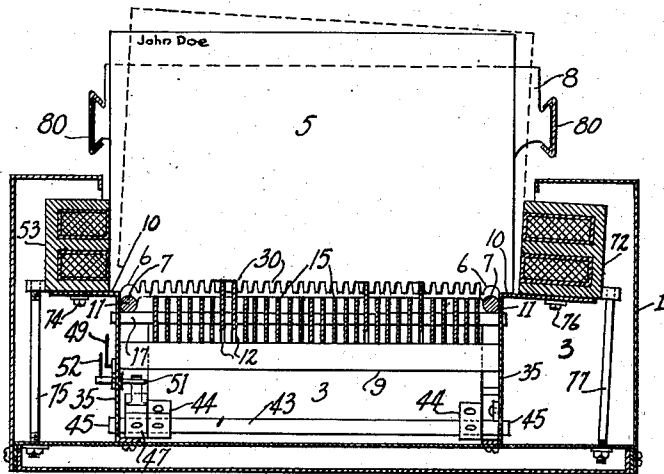
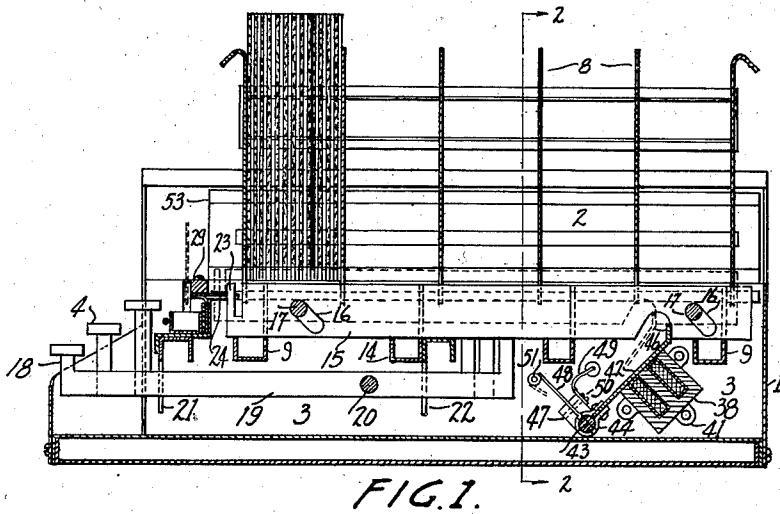
J. W. WHITSON

2,379,943

CARD RECORD APPARATUS

Filed Feb. 22, 1943

3 Sheets-Sheet 1



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CARD RECORD APPARATUS

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3 Sheets-Sheet 2

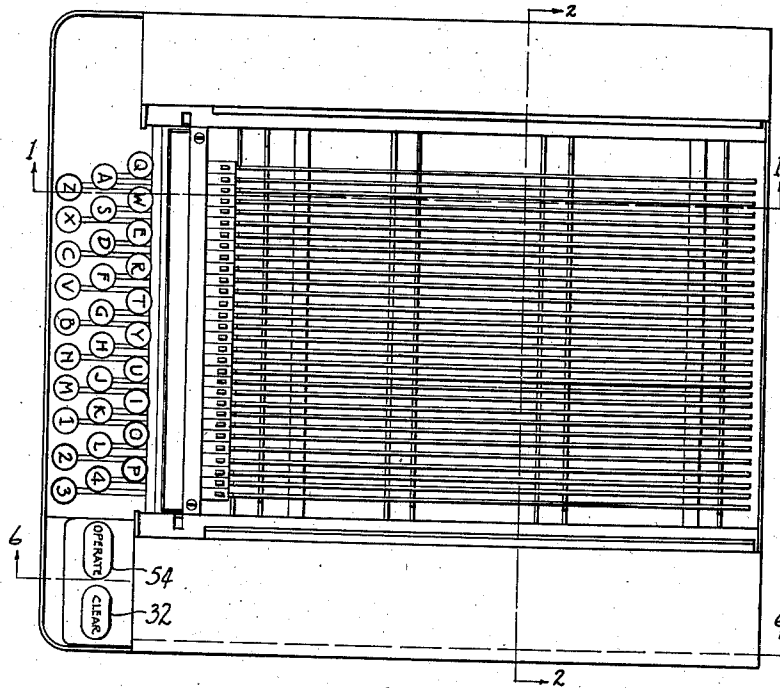


FIG. 5.

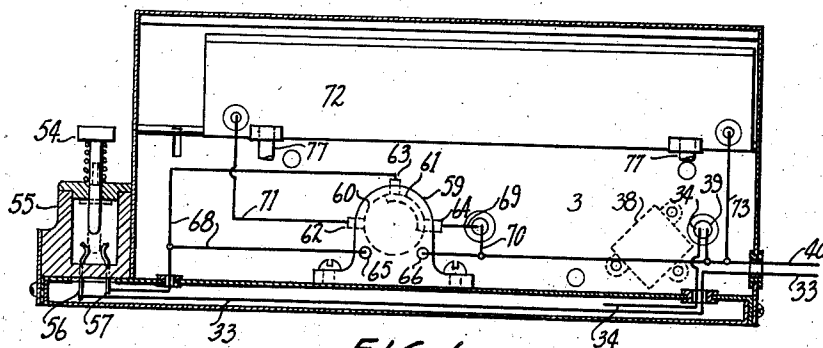


FIG. 6.

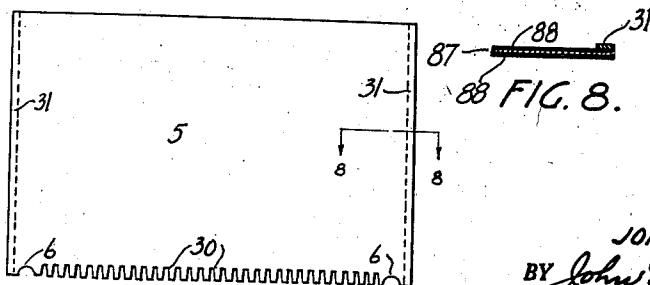


FIG. 7.

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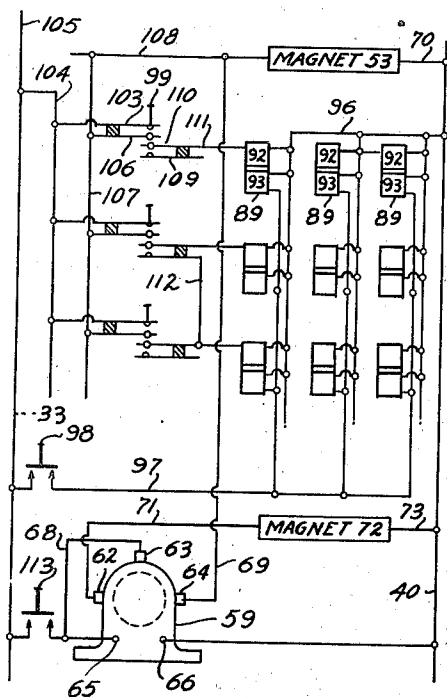
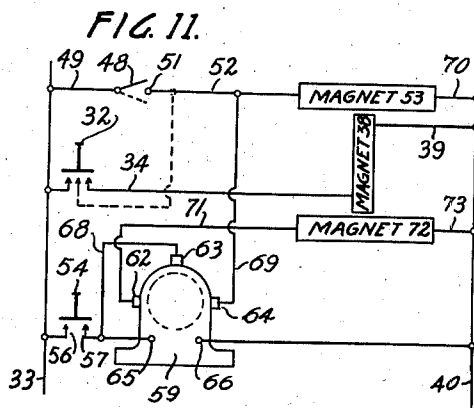
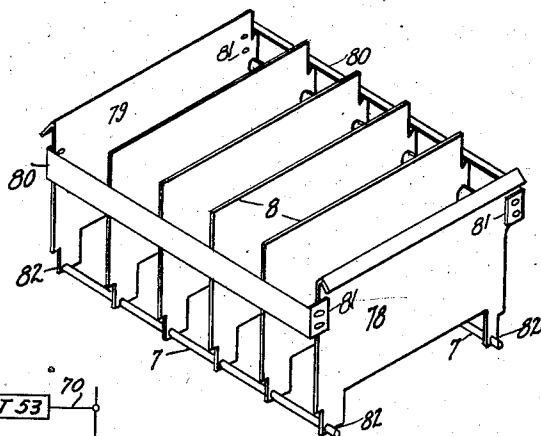
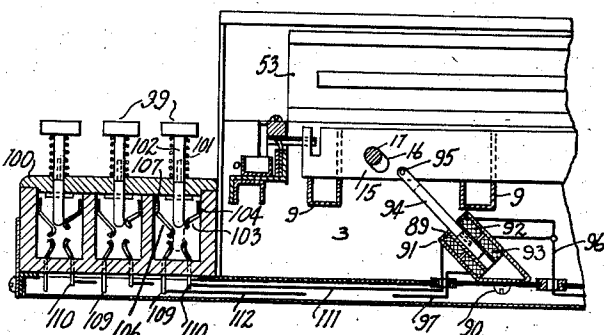
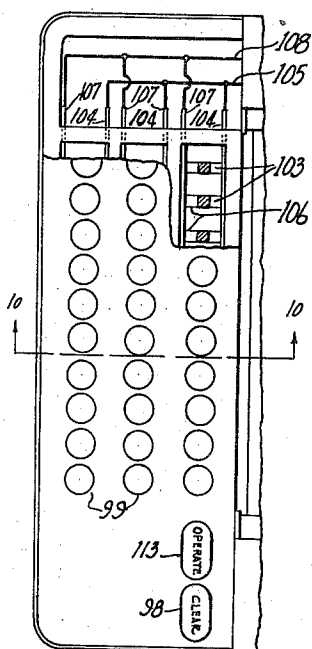
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CARD RECORD APPARATUS

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,379,943

CARD RECORD APPARATUS

John W. Whitson, New York, N. Y.

Application February 22, 1943, Serial No. 476,725

21 Claims. (Cl. 129—16.1)

This invention relates to improvements in the card record apparatus shown in the United States Patents 2,002,807 and 2,002,808 issued to me on May 28, 1935, and Patent 1,846,779 issued to me on Feb. 23, 1932.

One of the objects of the invention is to provide means, automatic in operation, for subjecting the cards to the influence of intermittent magnetic attraction so as to more readily move the selected cards.

Another object of the invention is to provide means, automatic in operation, for aligning the cards in relation to the selecting elements of the apparatus.

Another object of the invention is to provide electrically operable means for restoring the selecting elements to their normal position.

Another object of the invention is to provide electrically operable means for moving one or more of the selecting elements by the depression of a single key.

Another object of the invention is to provide an improved type of card carrier.

Another object of the invention is to provide for a card whose selecting elements will register more closely with the selecting elements of the apparatus.

With the above mentioned and other objects in view, the invention consists in the novel construction and combination of parts hereinafter described, illustrated in the accompanying drawings, and set forth in the claims hereto appended, it being understood that various changes in the form, proportion, size and details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying three sheets of drawings:

Fig. 1 is a longitudinal cross-section taken on line 1—1 of Fig. 5.

Fig. 2 is a lateral cross-section taken on line 2—2 of Figs. 1 and 5.

Fig. 3 is an enlarged cross-section view of the cutting-device.

Fig. 4 is a partial cross-section view taken on line 4—4 of Fig. 3.

Fig. 5 is a plan view.

Fig. 6 is a longitudinal cross-section taken on line 6—6 of Fig. 5.

Fig. 7 is a front elevation view of a card.

Fig. 8 is an enlarged sectional view taken on line 8—8 of Fig. 7.

Fig. 9 is a partial plan view of an electric type of keyboard.

Fig. 10 is a longitudinal cross-section taken on

line 10—10 of Fig. 9 and including some of the details shown in the front portion of Fig. 1.

Fig. 11 is a perspective view of a card carrier.

Fig. 12 is a wiring diagram of the electrical circuits shown and described in Figs. 1, 2, 5 and 6.

Fig. 13 is a wiring diagram of the electrical circuits shown and described in Figs. 9 and 10. To avoid repetition of similar parts only the first three of a row of switches 99 are indicated and only the first three of each group of solenoids 89 are indicated.

In detail the construction illustrated in the drawings comprises a casing 1, made up of a card compartment 2, a mechanism compartment 3 and a keyboard 4. Cards 5 are provided with recesses 6 on the bottom edges thereof and adjacent to each of the opposite sides thereof to be received on the carrier bars 7 of a card carrier. The carrier bars 7 of the tray or card carrier are adapted to engage the recesses 6 when removing the cards from the card compartment or installing the cards therein. The card-supporting bars 7 are provided with a plurality of card spacing elements 8 adjustable throughout the length thereof whereby a number of cards are confined between each pair of spacers. The bar 7 and the elements 8 form part of the card carrier. A plurality of holders 9 are arranged laterally across the casing 1 between the front and rear ends thereof, the upper edges of said holders lying in a common plane slightly below the line of the bottom surface of card compartment 2.

The casing 1 is provided with supporting frames 35 each of which has a shoulder on its top edge at respectively opposite sides thereof which form the bottom supporting surfaces, of the said compartment 2. When the cards are in the compartment the bottom edges thereof at the opposite corners rest on the upper face of shoulders 10 and the carrier bars 7 of the tray drop below the plane of said shoulders 10 into recesses provided in the bottom of the compartment on opposite sides thereof between the shoulders 10. The holders 9 are provided with crosswise recesses 11 therein adjacent to each of the opposite ends thereof and disposed next to the opposite sides of the casing into which the longitudinally extended bars 7 of the card carrier are adapted to rest when said card carrier is placed within the card compartment 2. The card carrier shown in Fig. 11 supports all of the cards that are confined within the card compartment and said carrier may be removed at will to permit various groups of cards supported in similar carriers to be removed to and from the compartment at will.

The holders 9 are provided with a series of elongated slots 12 cut down from an edge thereof and extending across the length of said cross members. The corresponding slots 12 of all of the holders 9 are in alignment with each other. The lower edge of each of the holders 9 is turned into a U section so that the edge 14 is bent upwardly to lie on a plane substantially flush with the bottom of slots 12.

A selector bar 15 is confined in each of the slots 12 in each of the holders 9, each of said selector bars extending from a point rearward of the rear-most holder 9 to a point forward of the fore-most holder 9. The upper edge of each of the selector bars 15 lies substantially flush with the upper edges of the holders 9. Each of the bars 15 has inclined slots 16 formed therein through which rods 17 extend, said rods being attached at their opposite ends to opposite sides of the inside supporting frames 35.

A plurality of finger keys 18 comprising the keyboard 4 are mounted on levers 19 which in turn are rotatively journaled on a cross bar 20. Each of the key levers 19 engages one of the selector bars 15 beyond the fulcrum bar 20. Thus when anyone of the finger keys 18 is depressed the opposite end of the key lever is moved upwardly caused a corresponding upward and forward movement of the related selector bar 15 within the limits of movement prescribed by the inclined slots 16 and the cross rods 17. Each lever 19 on the opposite sides of the pivotal axis 20 is confined in the respective guide members 21 and 22 which are substantially the same as holders 9 in the inverted position, to eliminate lateral play of said levers during movement thereof.

The forward end of each selector bar 15 is provided with an arm 23 thereon to which one end of a cutter 24 is vertically and slidably and detachably secured. Each cutter member 24 consists of an inverted U shaped element having one end attached to the selector bar as described, and the opposite end of said cutter provided with an opening 25 through the face thereof, one edge 26 of said opening being cut at an angle to provide a shearing or cutting edge. The cutters 24 lie alongside of each other across the width of casing 1. The bottom face of each of the cutters rests on a spring finger 27, while the upper face of the cutters is confined below the bottom side of shear bar 29. The spring fingers 27 engage the interior of their respective cutters 24 and tend to force the upper side of said cutters upwardly against the bottom side of the shear bar 29. The described method of mounting the cutters permits of a slack or "loose play" fit of said parts and the spring fingers 27 serve to hold each of the cutters in proper operating position. The spring tension of the finger on the cutters also supplies the necessary friction to maintain each selector bar in its elevated position. When the cutters are inoperative the outer ends thereof lie flush with the outer face of the shear bar 29. When any one of the finger keys is depressed, in addition to raising a corresponding selector bar 15, the movement of the selector bar causes the cutter attached thereto to be projected forwardly of the shear bar 29 into the cutting position, as shown in Figs. 1 and 3.

The cards 5 are provided with a plurality of spaced lugs or abutments 30 along the bottom edge thereof, the spaces between the plurality of lugs corresponding to the number of selector bars 15. Each of the lugs or the space between

any pair of lugs may represent or be designated by any letters of the alphabet, or by numbers, or by any other emblems or indicia to suit the particular conditions of work of the card. The lugs or spaces on the bottom of the card are related to the finger keys on the machine whereby each key on the keyboard when depressed will always move its selector bar into a space on the bottom of the card corresponding with that key. The card 5 as shown in Fig. 7 has magnetically attractable strips 31 cemented to a surface thereof at the opposite vertical edges. The cards must be responsive to magnetic attraction.

To this point the specification has followed that of Patent 2,002,808 as to parts numbers and description because the parts are similar.

In order to prepare the card shown in Fig. 7 so that it may be selected from a group of cards confined in the card compartment, the operator first depresses certain keys on the keyboard corresponding to the name or title or other key data which will distinguish that particular card from other cards. The keys thus depressed will cause corresponding cutter members to be projected beyond the face of shear bar 29 into position shown in Figs. 1 and 3. With the cutters in this position the card would have the lugs 30 on the bottom thereof dropped down into openings 25 of the cutters. The operator would then press switch 32.

Switch 32 is similar in design and operation to switch 54 shown in Fig. 6, main power lead 33 is connected to one of its contacts and wire 34 connects its other contact to one end of the coil of electro-magnet 38, the other end of the electro-magnet coil is connected to main power lead 40 by wire 39. Electro-magnet 38 is mounted in the mechanism compartment 3 and is fastened at each end to side frames 35 as at 41. Plate 42 is fastened on rod 43 as at 44. Rod 43 extends between frames 35 and is journaled therein as at 45, one end of plate 42 contacts a notch in each of the selector bars 15 as at 46 so that upon the raising of any of the selector bars plate 42 will move with the selector bar and be raised from the face of electro-magnet 38, to a position as indicated in dotted lines. When electro-magnet 38 is energized by closing switch 32, plate 42 will be attracted by and move toward the electro-magnet thus moving with it any of the raised selector bars to their downmost position, this action will cause all of the cutters to be returned simultaneously to the concealed position which action of the cutters causes the lugs on the bottom edge of the cards to be cut therefrom.

Fastened to rod 43 and rotating therewith is fiber piece 47, fastened into piece 47 is flexible contact 48, flexible main power lead 49 extends through frame 35 and is fastened to piece 47 by screw 50 which also contacts flexible contact 48. Fastened into and insulated from frame 35 is fixed contact 51, wire 52 connects contact 51 with one end of the coil of electro-magnet 53. Whenever rod 43 is rotated through the movement of plate 42, into its upmost and downmost positions, flexible contact 48 will make and break contact with fixed contact 51, thus momentarily energizing electro-magnet 53 and attracting cards 5 in card compartment 2 toward the magnet and aligning the cards over the selector bars 15. Connected into the circuit of switch 32 may be a lead wire from one end of the coil of electro-magnet 53 so that the closing of the circuit energizing electro-magnet 38 will also close a circuit energizing electro-magnet 53. In this case switch 32

would be a three point make switch as shown in dotted lines, Fig. 12.

The depression of any of the keys 18 of the keyboard 4 will cause an upward movement of that key's associated selector bar 15, thus moving plate 42 to its upmost position, when plate 42 is moving to its upmost position contact 48, 51 is momentarily made causing electro-magnet 53 to become momentarily energized, attracting all of the cards in the card compartment toward the magnet and into alignment and registration with the selector bars 15. The cards in the card compartment will likewise be momentarily attracted to magnet 53 when plate 42 is moving to its downmost position as magnet 53 will be momentarily energized when contact 48, 51 is being momentarily made. The actions of the keys 18, selector bars 15 and the plate 42 have been described in their action and relationship to each other in the previous description of the cutter action for removal of the lugs 30 from the cards. Patent 2,002,808 provides no means for doing this, the cards being moved manually as stated on page 2, column 2, lines 53 to 55 inclusive. Patent 2,002,807 while showing a means for aligning the cards, the means is not operable on movement of the selector bars or a means for restoring the selector bars to their normal position.

The card 5 from which certain of the lugs have been cut or removed would then be placed in the card carrier in card compartment 2 as shown in Fig. 2. The operator would then depress the keys corresponding to the cut out portions left on the cards as a result of the removal of the lugs. The keys when depressed will move their selector bars upwardly into the cut out spaces between the lugs on said card. The selector bars would also assume a position in the spaces between the lugs on all other cards, in the card compartment, which either have or do not have cutout portions thereon. Obviously cards that do not have lugs cut from the bottom edge thereof could not have any lateral movement inasmuch as the width of the selector bar fits the space between any pair of lugs. However, on those cards where one or more lugs have been removed to provide a space between lugs greater than the width or thickness of the selector bar, then such cards can move laterally relative to the selector bars extended between the lug spaces thereon. After the desired number of keys have been depressed and the selector bars engaged with the aforesaid selector spaces on the bottom of the cards the operator would depress switch 54, shown in Figs. 5 and 6.

Switch 54 is mounted in plastic casing 55 in such a manner that it normally remains in its upmost or open position being held so by a compression spring similar to spring 101 in Fig. 10, the lower portion of switch 54 is made of electrically conductive material and depression of the switch closes the gap between contacts 56 and 57. Connected to contact 56 is main power lead 33. An electric motor 59 is mounted in mechanism compartment 3. In the casing of motor 59 is commutator 60 having a contact segment 61, both shown in dotted lines, also mounted in the motor casing are brushes 62, 63 and 64, these brushes bear against the commutator and make and break contact with contact segment 61 as it is revolved under them by the motor. Commutator 60 may be gear driven from the motor at any desired speed. Motor 59 has terminals 65 and 66 for connecting it to its source of power. Terminal 66 is connected to main power lead 40

and terminal 65 is connected by wire 68 to switch contact 57. Wire 68 is also connected to brush 63. Brush 64 is connected by wire 69 to one end of the coil of electro-magnet 53, the other end of the coil being connected by wire 70 to power lead 40. Brush 62 is connected by wire 71 to one end of the coil of electro-magnet 72, the other end of the coil being connected by wire 73 to power lead 40.

When switch 54 is pressed closing the gap between contacts 56 and 57, motor 59 will start operating, revolving commutator 60 under brushes 62, 63 and 64, as contact segment 61 passes under the brushes electro-magnets 53 and 72 will be alternately energized. When the contact segment 61 is in contact with brushes 62 and 63 electro-magnet 72 will be energized, when the contact segment is in contact with brushes 63 and 64 electro-magnet 53 will be energized. Electro-magnet 72 is of greater power than electro-magnet 53. Operation of switch 54 will cause electro-magnets 53 and 72 to alternately attract the cards, en masse, toward them. Magnet 72 being of greater power will move the card or cards not held by the raised selector bars to the position shown in dotted lines in Fig. 2, and away from the influence of electro-magnet 53. The card may then be removed from the apparatus by the operator.

Switch 32 would then be pressed causing magnet 38 to become energized, attracting plate 42 to the magnet and moving the raised selector bars 15 to their downmost position, thus preparing the device for another card selection. When switches 32 or 54 are depressed to their closed positions they remain in this position only so long as pressure is maintained on them, when pressure is released they are returned to their normal or open position by the action of the compression springs that surround their stems.

When either of the electro-magnets 53 or 72 is energized the magnetic fields created will cause the magnetic strips 31, on the cards, to become polarized alike causing the cards to be repelled from each other, this and the en masse intermittent attraction of the cards causing an agitating of the mass of cards tending to loosen them from frictional contact with each other. Electro-magnets 53 and 72 may be energized with either direct or alternating current. When energized with alternating current the effect of direct current may be simulated by regulating the speed of commutator 60 so as to control the length of time segment 61 is in contact with brushes 62, 63 and 64 and thus determine the number of cycles of alternating current that will pass into the magnet circuits. The patents previously issued to me do not show means for energizing their magnets at predetermined intervals. It is optional to use electro-magnet 53 in conjunction with electro-magnet 72.

If wire 69 is not connected to brush 64 then only magnet 72 would be intermittently energized. If wire 71 is disconnected from brush 62 and connected to wire 68 then only magnet 53 would be intermittently energized. If only the card moving magnet is used, as in Patent 2,002,808, then magnet 53 and its connections would not be included and only magnet 72 would be intermittently energized.

When the cards are in the compartment in position to be attracted to the electro-magnets the opposite edges of the cards are supported on the shoulders 10 in the bottom of the card compartment and hence are free to move laterally with

a minimum of resistance. After the selected cards have been attracted to electro-magnet 72 the operator would withdraw the selected cards from the cards in the card compartment. Switch 32 would then be operated to return the raised selected bars 15 to position in readiness for repeating the selecting operation and such return movement of the selector bars causes the keys 18 to be raised to their operation position.

Electro-magnet 53 rests on one of the shoulders 10 and is adjustably fastened thereto by cap screws 74, studs 75 adjustably hold electro-magnet 53 to the bottom of mechanism compartment 3. Electro-magnet 72 rests on the other of the shoulders 10 and is adjustably fastened thereto by cap screws 76, studs 77 adjustably hold electro-magnet 72 to the bottom of mechanism compartment 3 and the angle of inclination of the face of electro-magnet 72 relative to the card edges may be varied by means of studs 77.

The card carrier shown in Figs. 2 and 11 has front and back plates 78 and 79 with formed side rails 80 fastened to them as at 81 and carrier rods 7 fastened into them at their bottom corners as at 82. Card spacing elements 8 are mounted in side rails 80 and on carrier bars 7 so as to be adjustable through the length of the card carrier. Side rails 80 are spaced from the edges of the cards so as to allow for the free movement of the cards between the rails and in the card compartment. This card carrier differs from the one shown in Patent 2,002,808 in that it has side rails 80 which act as a top support for the card spacing elements 8 keeping them and the cards between them in a positive vertical position which is not the case with the card spacing elements 8 of Patent 2,002,808.

Figs. 3 and 4 show enlarged views of the cutter device for removing the lugs from the cards. The spring fingers 27 are formed on an edge of piece 28 which extends between the frames 35, also extending between frames 35 is support frame 83 which is mounted on member 21. Piece 84 extends between the frames 35 and is fastened through piece 28 to support frame 83, holding piece 28 with its spring fingers 27 in operable relationship to their cutters 24. The cutters will move forward, as indicated in dotted lines, when their selector bars 15 move to their raised positions, as is the case in Patent 2,002,808 and the card lugs 30 will be dropped into the extended cutters. The cutter mounting shown in Patent 2,002,808 provides that the lower portion of the lugs 30 bear against the support frame for spring fingers 27, this causes the lugs 30 when sheared from the cards to be drawn into the cutters plugging the space under the cutters and causing the spring fingers 27 to become bent. This invention provides means for leaving a space directly under the cutters so that upon completion of the shearing action the lugs 30 can drop from the cutters into removable tray 85 which is held in place by rod 86 extending between the frames 35 and fastened therein.

Figs. 7 and 8 show a card different in construction from the cards shown in the previously mentioned patents. When the cards are made of a single piece of commercial card stock as are those shown in Patents 2,002,807 and 2,002,808 they will vary in width with each change in atmospheric humidity so that it is seldom that the spaces between the lugs 30 are in register with the selector bars 15. This invention provides a card 5 having a center core 87 cemented between two writing surfaces 88 having flexible

magnetically attractable strips 31 cemented to one of the writing surfaces adjacent the length of the opposite vertical edges thereof, thus making the card magnetically attractable and keeping the cards uniformly spaced from each other and standing vertical in the card carrier and in the card compartment. The center core is made of a material that will not be affected by varying changes in atmospheric humidity and tends to keep the spaces between the lugs 30 in substantially exact registration with the selector bars 15. This is essential because the distance from the selector bar adjacent to electro-magnet 53 to the magnet 53 must remain fixed. The writing surfaces 88 are of a material that will receive printing and record matter.

Figs. 9 and 10 show electrical means for raising the selector bars into and out of card obstructing position. The selector bars 15 are the same as previously described and function in the same manner. Under each selector bar is a solenoid 89 fastened to the bottom of the mechanism compartment 3 as at 90. Solenoid 89 has a casing 91 containing coils 92 and 93 and a movable core 94. The lower portion of the core is made of iron and the upper portion is made of a non-magnetic material. Core 94 is forked at its upper end passing either side of the selector bar 15 and fastened thereto by pin 95. When coil 92 is energized the core 94 will move upward pushing up selector bar 15 to its raised position, when coil 93 is energized core 94 will move downward carrying selector bar 15 to its downmost position. Wire 96 connects one end of each of the coils 92 and 93 to the main power supply. Wire 97 connects one end of coil 93 to switch 98 which is similar in design and operation to switch 32, shown in Fig. 5. When switch 98 is operated all of the coils 93 of all of the solenoids will be energized thus moving any of the raised selector bars 15 to their downmost position.

Mounted on the front of the apparatus are switch keys 99 in plastic casing 100. Each switch key 99 remains in a normally up position being maintained so by spring 101 which surrounds stem 102. The upper end of stem 102 is made of electrically non-conductive material and the lower end is made of electrically conductive material. In contact with stem 102 is finger 103 which is formed on an edge of bar 104, there being a finger 103 for each of the switch keys 99 in each row of keys. Connected to the end of each bar 104 is main power lead 105. Slightly below and out of contact with stem 102 is contact finger 106 which is formed on an edge of bar 107, there being a finger 106 for each of the switch keys 99 in each row of keys. Connected to the end of each bar 107 is wire 108 which is also connected to one end of the coil of magnet 53, so that upon any of the switch stems 102 making contact with its contact finger 106 electro-magnet 53 will be energized and draw the cards in the card compartment to it aligning them over the selector bars 15. At the bottom of the casing 100 are contacts 109 and 110, when a switch key 99 is fully depressed its stem 102 will make contact with them. Connected to contact 110 is wire 111 connecting on the other end to one end of the coil 92 of solenoid 89. The depression of a switch key 99 will cause its coil 92 to become energized and thus move its core 94 to its upmost position raising its related selector bar 15. There is a switch key 99 for each solenoid and a solenoid 89 for each selector bar 15. Only one solenoid is shown in Fig. 10, so as not to confuse the draw-

ing. The solenoids may be spaced in staggered relationship throughout the mechanism compartment 3. Contact 109 is used when it is desired to operate more than one solenoid from one switch key, in this case wire 112 would connect with coil 92 of another solenoid or group of solenoids. Switch 113 is the same as switch 54 and operates electro-magnets 53 and 72 in the manner already described for switch 54.

The key switches 99 form a keyboard that may have identifying characteristics on the keys as shown in Fig. 5, and the key switches 99 in combination with the solenoids 89 perform the same functions for card selecting purposes as do the key levers 19 of Fig. 1, except that the keys 99 do not remain depressed when operated, when pressure is removed from them they return to their normally up position through the action of springs 101. Switches 98 and 113 perform functions similar to switches 32 and 54 controlling electro-magnets 53 and 72 for card selecting purposes.

Having thus described this invention what I claim and desire to secure by Letters Patent is:

1. In a card record apparatus having a card compartment, a row of magnetically responsive cards in the compartment, selectively operable means to lock cards against movement, magnets arranged along opposite sides of the row of cards, one of said magnets being in close proximity to the row of cards to cause the row of cards to be attracted to it and to register with the card locking means and the other of said magnets being set at a distance from the row of said cards to cause any unlocked card or cards to be attracted to it and move out of alignment with the row of locked cards; means alternately energizing the magnets at automatically spaced intervals.

2. In a card record apparatus in which magnetically attractive cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a card aligning magnet common to all of the cards aligns the cards in lug registering relationship with the selector members and a card moving magnet common to all of the cards moves cards not locked out of alignment with locked cards: the combination of alternately operating contacts closing and opening the electrical circuits of the said magnets at timed intervals.

3. In a card record apparatus in which magnetically attractive cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a card aligning magnet common to all of the cards aligns the cards in lug registering relationship with the selector members and a card moving magnet common to all of the cards moves cards not locked out of alignment with locked cards: the combination of means for alternately energizing and de-energizing the said magnets at timed intervals.

4. In a card record apparatus in which magnetically attractive cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a card aligning magnet common to all of the cards aligns the cards in lug registering relationship with the selector members and a card moving magnet common to

all of the cards moves cards not locked out of alignment with locked cards: the combination of means for alternately energizing and de-energizing the said magnets at timed intervals and means operating the first named means at timed intervals.

5. In a card record apparatus in which magnetically attractive cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a card aligning magnet common to all of the cards aligns the cards in lug registering relationship with the selector members and a card moving magnet common to all of the cards moves cards not locked out of alignment with locked cards: the combination of means for alternately energizing and de-energizing the said magnets at timed intervals, means operating the first named means at timed intervals and means closing and opening an electrical circuit common to the first and second named means.

6. In a card record apparatus in which magnetically attractive cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a card aligning magnet common to all of the cards aligns the cards in lug registering relationship with the selector members and a card moving magnet common to all of the cards moves cards not locked out of alignment with locked cards: the combination of contacts closing and opening the electrical circuit of the card aligning magnet at timed intervals.

7. In a card record apparatus in which magnetically attractive cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a card aligning magnet common to all of the cards aligns the cards in lug registering relationship with the selector members and a card moving magnet common to all of the cards moves cards not locked out of alignment with locked cards: the combination of means for energizing and de-energizing the card aligning magnet at timed intervals.

8. In a card record apparatus in which magnetically attractive cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a card aligning magnet common to all of the cards aligns the cards in lug registering relationship with the selector members and a card moving magnet common to all of the cards moves cards not locked out of alignment with locked cards: the combination of means for energizing and de-energizing the card aligning magnet at timed intervals and means operating the first named means.

9. In a card record apparatus in which magnetically attractive cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a card aligning magnet common to all of the cards aligns the cards in lug registering relationship with the selector members and a card moving magnet common to all of the cards moves cards not locked out of alignment with locked cards: the combination of means for energizing and de-energizing the card aligning magnet at timed intervals, and means

closing and opening an electrical circuit common to the first named means and the card moving magnet.

10. In a card record apparatus in which magnetically attractive cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a card moving magnet common to all of the cards moves cards not locked out of alignment with locked cards: the combination of contacts and contact actuating means closing and opening the electrical circuit of said magnet at timed intervals.

11. In a card record apparatus in which magnetically attractive cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a card moving magnet common to all of the cards moves cards not locked out of alignment with locked cards: the combination of means energizing and de-energizing the said magnet at timed intervals.

12. In a card record apparatus in which magnetically attractive cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a card moving magnet common to all of the cards moves cards not locked out of alignment with locked cards: the combination of means for energizing and de-energizing the said magnet at timed intervals and means operating the first named means.

13. In a card record apparatus in which magnetically attractive cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a card aligning magnet common to all of the cards aligns the cards in lug registering relationship with the selector members and a card moving magnet common to all of the cards moves cards not locked out of alignment with locked cards and a common member to all of the selector members moves selector members out of card locking relationship: the combination of a magnet moving said common member, and contacts closing and opening the electrical circuits of the said magnet and the card aligning magnet substantially in unison.

14. In a card record apparatus in which magnetically attractive cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a card aligning magnet common to all of the cards aligns the cards in lug registering relationship with the selector members and a card moving magnet common to all of the cards moves cards not locked out of alignment with locked cards: the combination of means energizing and de-energizing the card aligning magnet and means associated with the selector members operating the first named means.

15. In a card record apparatus in which magnetically attractive cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a card aligning magnet common to all of the cards aligns the cards in lug registering relationship with the selector

members and a card moving magnet common to all of the cards moves cards not locked out of alignment with locked cards: the combination of electrically operable means moving selector members into and out of card locking relationship, selectively operable means controlling electrical circuits energizing the first named means and means associated with the second named means controlling electrical circuits energizing the card aligning magnet.

16. In a card record apparatus in which selectively operable cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a force common to all of the cards aligns the cards in lug registering relationship with the selector member and a force common to all of the cards moves cards not locked out of alignment with locked cards and the said forces are other than the force of gravity: the combination of means for alternately applying said forces to the cards at timed intervals.

17. In a card record apparatus in which selectively operable cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a force common to all of the cards aligns the cards in lug registering relationship with the selector members and a force common to all of the cards moves cards not locked out of alignment with locked cards and the said forces are other than the force of gravity: the combination of means for alternately applying said forces to the cards at timed intervals and means operating the first named means.

18. In a card record apparatus in which selectively operable cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a force common to all of the cards aligns the cards in lug registering relationship with the selector members and a force common to all of the cards moves cards not locked out of alignment with locked cards and the said forces are other than the force of gravity: the combination of means applying the first named force to the cards at timed intervals.

19. In a card record apparatus in which selectively operable cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a force common to all of the cards aligns the cards in lug registering relationship with the selector members and a force common to all of the cards moves cards not locked out of alignment with locked cards and the said forces are other than the force of gravity: the combination of means applying the first named force to the cards at timed intervals and means operating the first named means.

20. In a card record apparatus in which selectively operable cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a force common to all of the cards moves cards not locked out of alignment with locked cards and the said force is other than the force of gravity: the combination

of means applying the said force to the cards at timed intervals.

21. In a card record apparatus in which selectively operable cards having lugs formed in an edge thereof are selectively locked against movement by engaging the lugs on the cards with selectively settable selector members common to all of the cards and a force common to all of the

cards moves cards not locked out of alignment with locked cards and the said force is other than the force of gravity: the combination of means applying the said force to the cards at timed intervals and means operating the first named means.

JOHN W. WHITSON.