July 14, 1953 F. L. WALKER, JR., ET AL 2,645,226

CODED CARD SEGREGATING MEANS

Filed Jan. 16, 1950 4 Sheets-Sheet 1

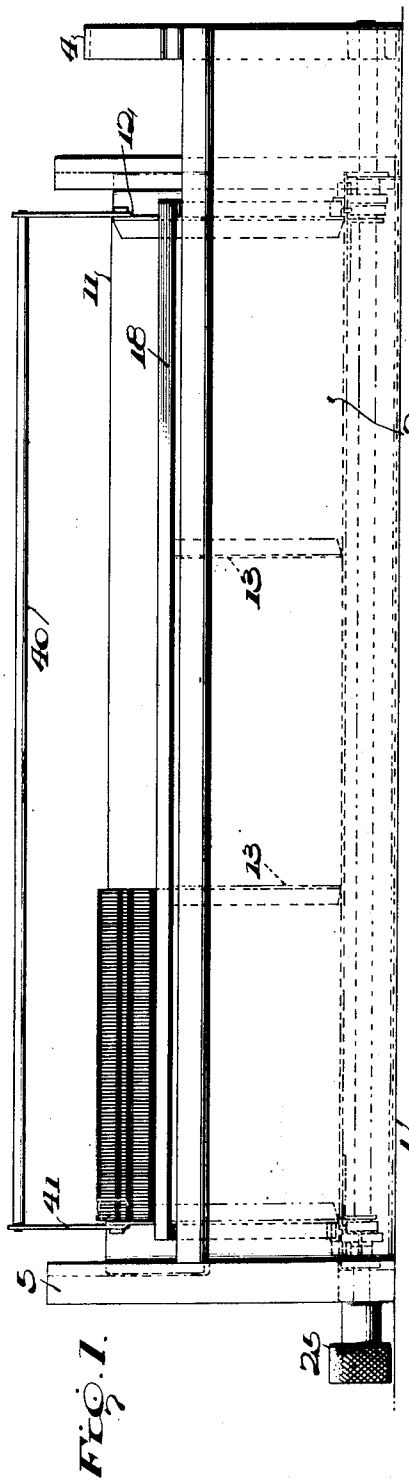


Fig. 1.

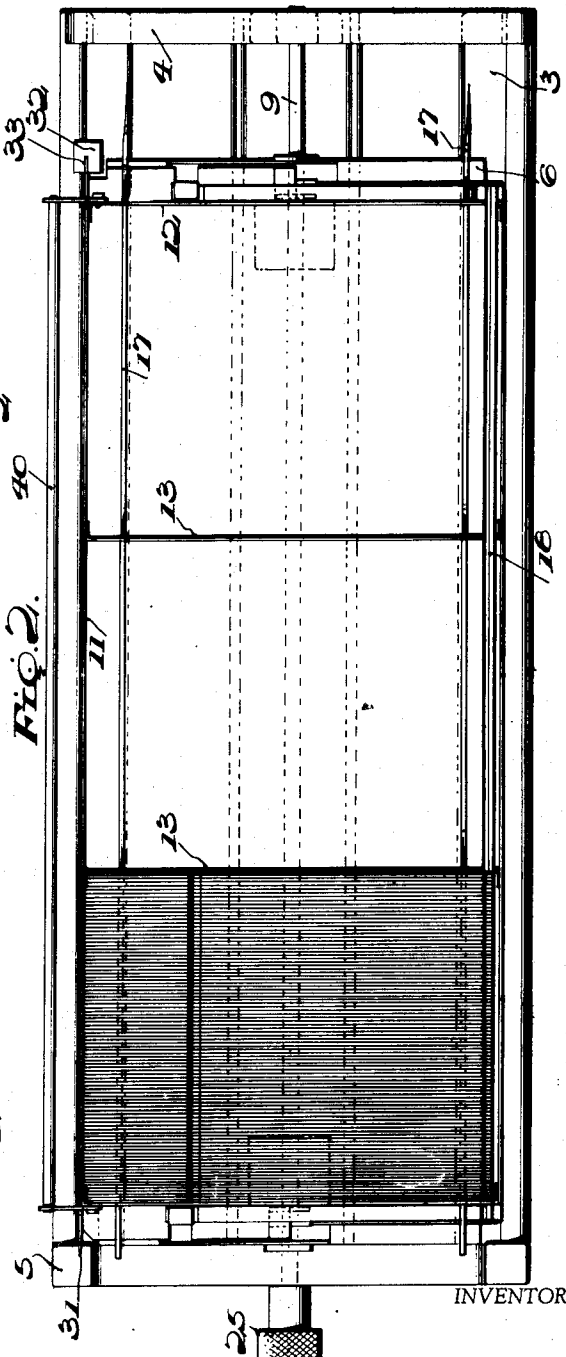


Fig. 2.

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Fig. 3.

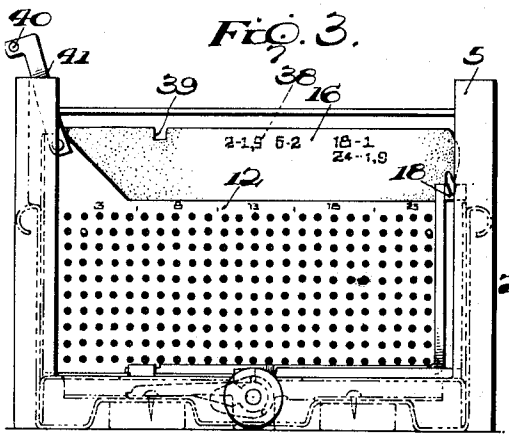


Fig. 4.

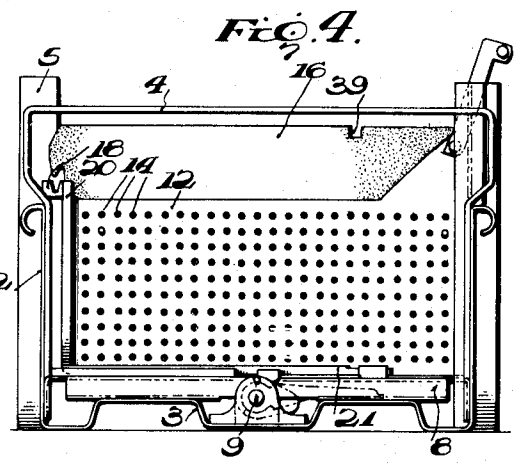


Fig. 5.

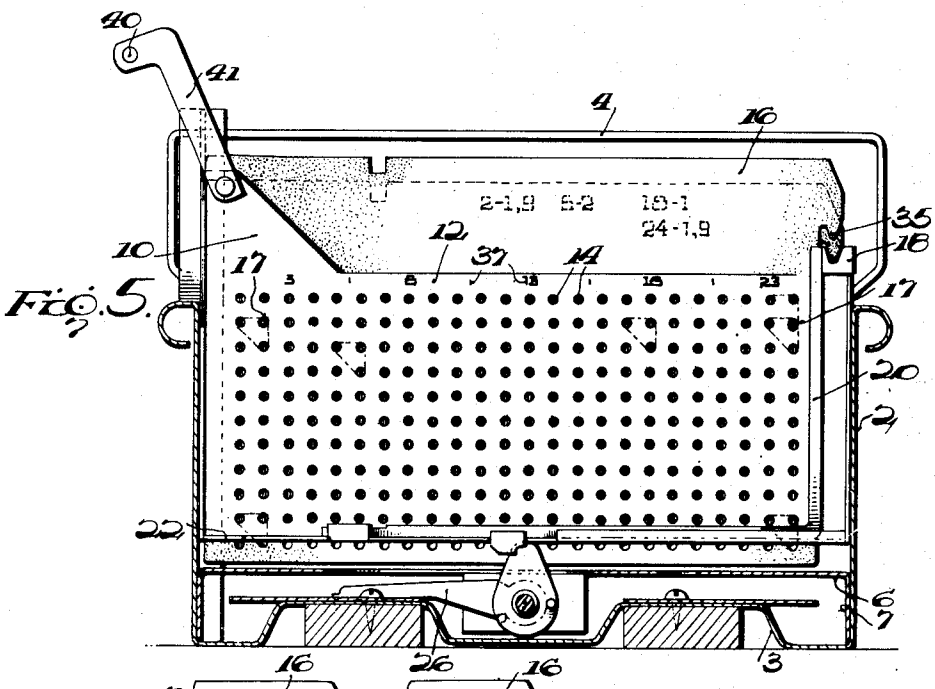


Fig. 7.

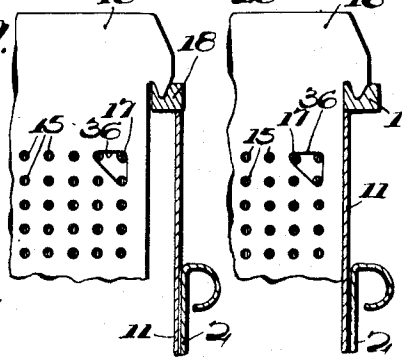


Fig. 6.

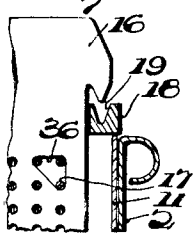


Fig. 8.

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CODED CARD SEGREGATING MEANS

Filed Jan. 16, 1950 4 Sheets-Sheet 3

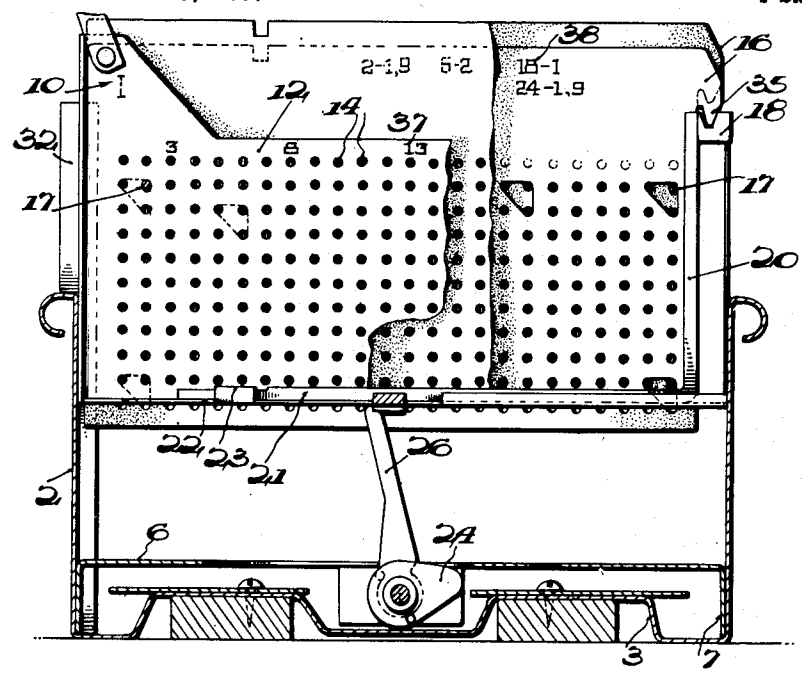


Fig. 9.

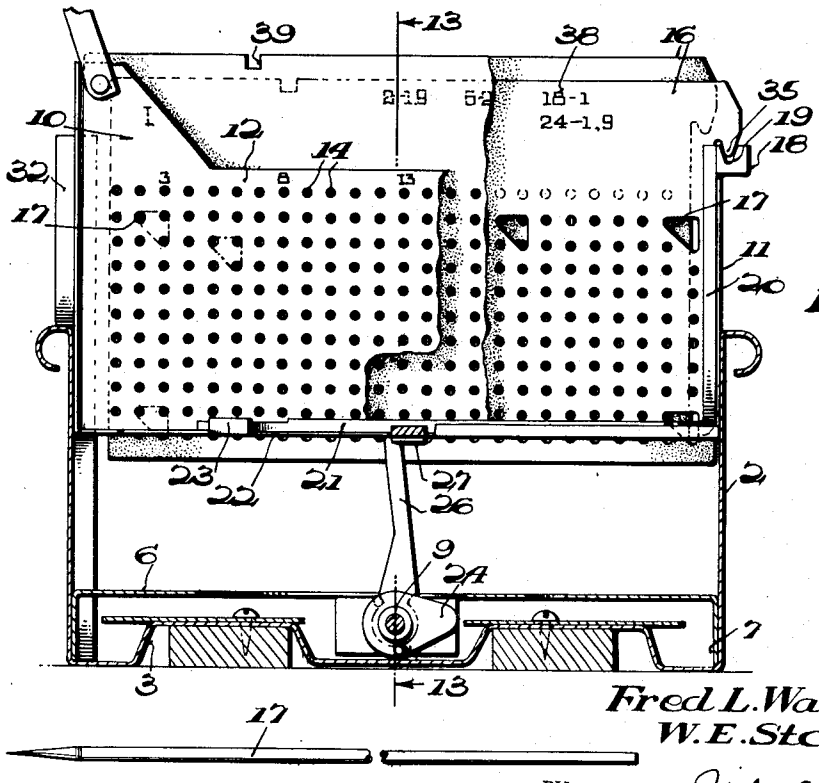


Fig. 10.

Fig. 11.

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CODED CARD SEGREGATING MEANS

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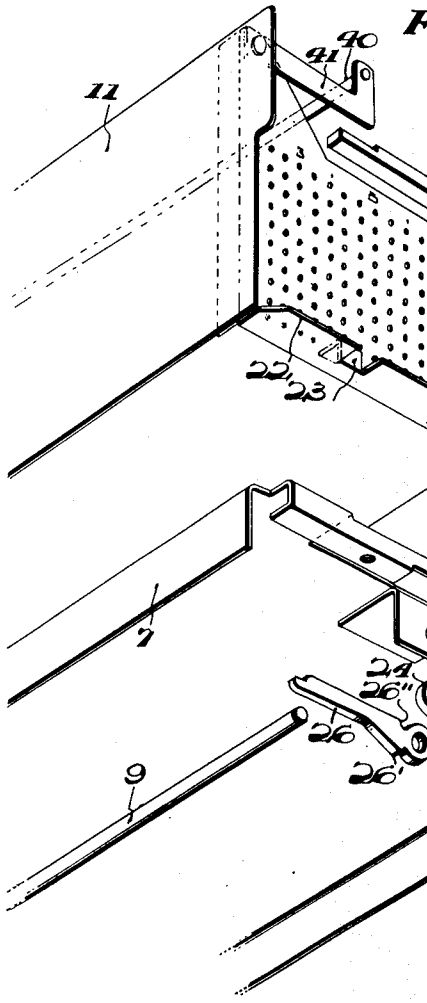


FIG. 12.

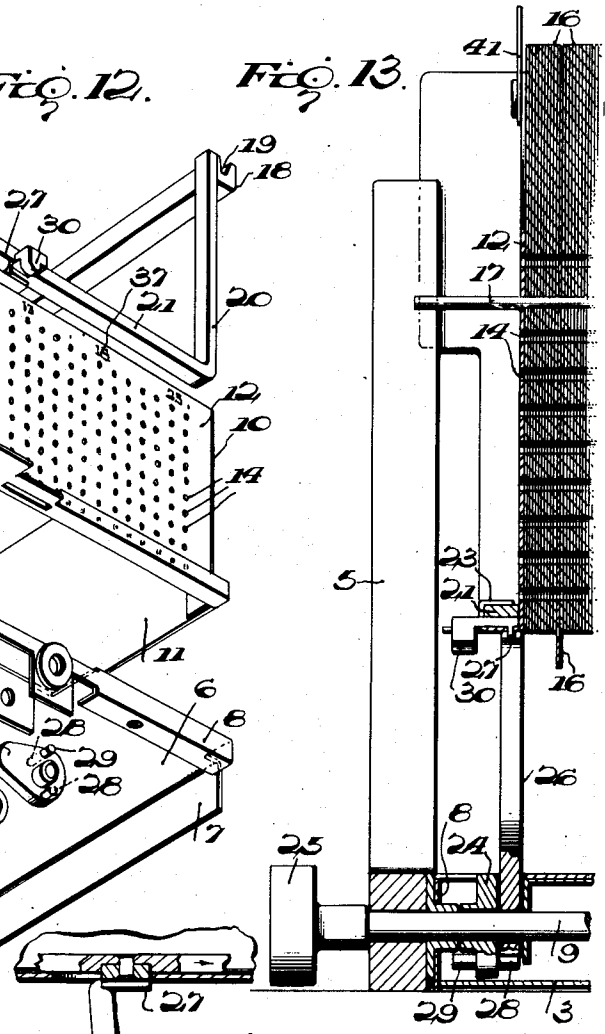


FIG. 13.

FIG. 15.

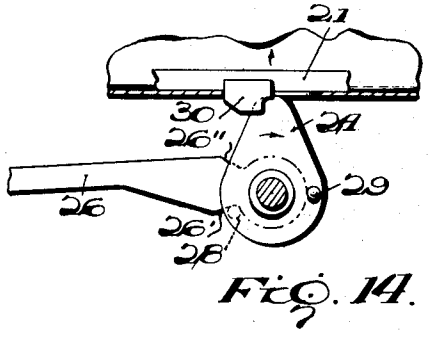


FIG. 14.

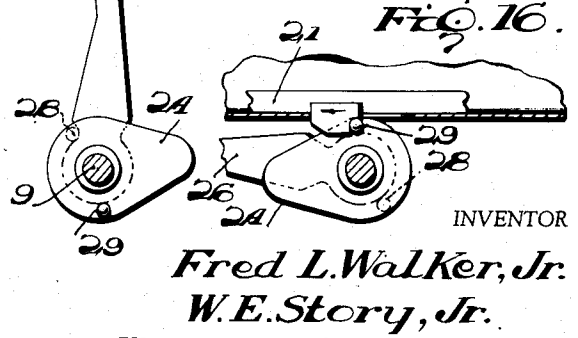


FIG. 16.

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UNITED STATES PATENT OFFICE

2,645,226

CODED CARD SEGREGATING MEANS

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Application January 16, 1950, Serial No. 138,884

15 Claims. (Cl. 129—16.1)

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This invention relates generally to the compiling of tabular and statistical data, and is particularly concerned with the sorting or segregating of cards in accordance with the data recorded thereon by means of punched slots or the like.

More specifically, it is an object of the present invention to provide a simplified method and apparatus for rapidly searching library or business card index files and segregating the cards in accordance with the desired subject or combination of subjects.

It is a further object of the invention to code the cards according to subject matter by punching the same to provide cut-out portions having more or less triangular or inverted L shapes so as to permit the cards to be raised and moved laterally in the segregating operation.

Another object of the invention resides in the provision of an apparatus for use with the coded cards so that the latter may be readily raised and moved laterally in accordance with the indicia thereon to segregate cards bearing the desired indicia from the other cards in the stack.

Another object of the invention consists in the provision of a mechanism for segregating coded cards, which is especially adapted to use in conjunction with conventional file cabinet drawers.

Other objects and advantages of the invention will be apparent from the following description when taken in connection with the accompanying drawings, in which,

Figure 1 is a side elevational view of the segregating apparatus;

Figure 2 is a plan view thereof;

Figures 3 and 4 are front elevational and rear elevational views respectively;

Figure 5 is an enlarged front elevational view of the apparatus with the U-shaped frame removed and the related parts shown in section;

Figures 6, 7 and 8 are fragmentary detailed sectional views showing the various positions of a selected card with respect to the rod or rods which extend through the master or coded slots formed therein and the selector bar;

Figures 9 and 10 are views similar to Figure 5 but showing various positions of the cards, cam operated means, selector bar, etc.;

Figure 11 is a plan view, partly broken away, of one of the rods;

Figure 12 is an exploded view of one of the cams and arms for operating the frame together with the portions of the frame, selector bar, etc.;

Figure 13 is a fragmentary sectional view taken through the front of the segregating mechanism when placed in elevated position by the elevating arm; and,

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Figures 14, 15 and 16 are detail views showing the sequential positions of the cam pins and lugs operated thereby.

As mentioned above, the invention is intended primarily for use in connection with index cards of the general type used in card index cabinets and accordingly the drawings illustrate a drawer 1 such as used in conventional cabinets of that type. This drawer or container is provided with side walls 2, bottom 3, and a rear reinforcing bracket 4 connecting the side walls 2. This drawer differs from conventional card index drawers in that it is open at the front and rear; the front end being provided with the U-shaped frame element 5. Also the bottom 3 is covered by a secondary bottom member 6 of inverted U-shaped construction and having the edges of its flanges 7 resting on the primary bottom 3 as clearly shown in Fig. 5. This secondary bottom is provided with front and rear flanges 8 which form bearing members for a shaft 9 which carries the operating cam and arm to be later described.

Mounted within the drawer or container 1 for vertical movement, is a bottomless frame 10 formed of metal or the like and comprising side walls 11, perforated end walls 12, and perforated partitions 13. This frame member is open at its top and bottom and the end walls 12 and partitions 13 are provided with uniformly spaced apertures 14 which correspond with similar perforations 15 formed in the index cards 16 with which the present apparatus is to be used. For supporting the cards 16 within the frame 10 when the latter is to be raised in the manner to be indicated hereinafter, a plurality of rods 17, depending in number upon the maximum number of code markings, is provided. These rods are threaded through the apertures in front wall 12 of the frame, the cards 16, the partitions 13 and the rear wall 12, it being understood of course that the partitions 13 are intended primarily for the purpose of maintaining the cards in vertical position when the drawer is only partly filled and for preventing the sagging of the rods under the weight of the cards.

Mounted for lateral sliding movement with respect to the frame 10 is a selector bar 18 provided with a groove 19 in its upper surface adapted to be engaged by the selected cards in a manner which will appear hereinafter. This bar 18 which is mounted on the right hand side of the frame, as viewed in Fig. 9, and which is normally in contact with the edges of the cards, is provided with downwardly extending arms 20 at its front and rear ends which terminate in lateral extensions 21 slidably positioned on the front and rear

flanges 22 of the front and rear plates 12 of the frame 10, and held in position thereon by guide members 23.

The frame 10 with its supply of cards is given an initial lifting movement by means of cams 24 which are fixed to the front and rear ends of the shaft 9 which latter may be operated by means of a knurled knob 25 or the like. Also mounted on the shaft 9 adjacent the front and rear ends are the operating arms 26 which serve to raise the frame 10 to its maximum height. The extensions 21 of the legs 20 of the selector bar 18 are provided on their undersurfaces with lugs 27 adapted to be engaged by the upper ends of the arms 26 and move the extensions 21 and selector bar 18 to the right as clearly shown in Fig. 10. The arms 26 which are loosely mounted on the ends of the shaft 9 are provided with a lost motion connection with the cams 24 by means of pins 28 which extend inwardly of the cams and engage shoulders 26' and 26'' on opposite sides of the arms to raise and lower them at the proper times. The outer faces of the cams 24 are each provided with a single pin 29 which serves to engage the right hand edge of the lugs 30 also formed on the extensions 21 and return the selector bar 18 to its original position.

In order to stabilize the frame 10 in its vertical movements the rear side of one of the legs of the U-shaped frame member 5 is provided with a guide slot 31 which receives the front edge of one of the side walls 11 of the frame. Likewise the rear portion of the container or drawer 1 is provided with a vertically extending guide bar 32 provided with a slot 33 on its inner face for slidably receiving the rear end of the adjacent side wall 11 of the frame.

The cards 16, as already mentioned, are formed with uniformly spaced apertures 15 which substantially cover the lower three quarters of the card. Also the cards to be used in the segregating apparatus are provided on one of their edges, the right hand edge in the present embodiment, with downwardly extending hooks or beaks 35. These hooks 35 may be integrally formed with the cards and serve to cooperate with the slot 19 in the upper surface of the selector bar 18 whereby the selected cards may be readily moved laterally to segregate them from the unselected cards within the container 1. In order that this two-way movement of the cards may take place, the cards may be coded by means of triangular cut out portions 36 which, as clearly shown in Figs. 5–8 inclusive, encompass two vertically adjacent apertures 15 and one or more apertures immediately at the left of the upper of the vertically adjacent apertures. It is to be understood however that the number of horizontal apertures included in a master slot will depend upon the spacing of the apertures and upon the extent of movement of the selector bar 18. It is to be noted also that any one card may be coded with the number of master cut-outs 36 necessary to record thereon the various categories of the statistical data being digested. Furthermore the master cut-outs 36 will be placed on the cards at various positions in accordance with the particular master code devised for the coding system.

In the operation of the device the rods 17 are inserted through the front wall 12 of the frame 10 in accordance with the master code, for the selection of the particular cards, and for example, the rods 17 are shown as being passed through the aperture located at the intersection of the second row of horizontal apertures 15 (Fig. 5) and the second vertical row from the left, and the second aperture in the last vertical row at the right. In order to readily ascertain the particular apertures through which the rods 17 are to be inserted, the upper edge of the front wall 12 of the frame 10 may be provided with indicia 37. Such indicia may also be applied to the vertical edge of the front wall if desired. After the rods have been inserted at the proper locations the knob 25 is rotated to cause the cams 24 to partly raise the frame 10 and the cards, through the medium of the rods 17. If there were no friction between the various cards within the frame 10 the selected cards would remain in their lowermost position due to the vertical length of the master cut-outs 36. However the cards to be selected may sometimes be raised because of friction with the unselected cards. To rectify this possible faulty operation, the arms 26 are rotated in a clockwise direction to raise the frame 10 above the high points of the cams 24 and are then rotated in a counter-clockwise direction to allow the frame to drop onto the cams. This operation is performed by the pin 28 at the left of cam 24 (Fig. 12) engaging shoulder 26' to rotate the arm 26 to a position about as shown in Figure 9 wherein the arm is at the left of the vertical, the shaft is then moved counterclockwise to remove this pin 28 from its support of the arm 26. Consequently the frame 10 will be allowed to drop onto the high point of cam 24 or thereabout, since the high point of the cam has now been brought into its upper position as the shaft 9 is rotated counterclockwise to remove pin 28 from its engagement with shoulder 26' on the arm 26. Several repetitions of this operation will insure the jarring of the selected cards downwardly until the upper walls of their cut-outs 36 engage the rods 17. In this phase of the operation the cams 24 serve as anvils in receiving the blows of the frame 10. When the cards have descended in the manner indicated, or if they initially remain below the unselected cards when the frame is raised, their hook portions 35 will enter the groove 19 in the selector bar 18. Continued movement of the arms 26 to the right cause their free ends to engage the lugs 27 on the under-surfaces of the extensions 21 so that the selector bar is moved to the right as shown in Fig. 10. This movement of course will withdraw the selected cards laterally with respect to the unselected cards, lateral movement of which is prevented by the pins, and thereafter the rods 17 are withdrawn so as to allow the unselected cards to descend to the bottom of the drawer or container 1 so that they rest upon the secondary bottom 6 of the container, while the selected cards are maintained in their elevated position by the selector bar 18. By thus segregating the cards the data 38 which appears on the unperforated upper portions of the cards may readily be observed and noted as desired.

In the event that only one piece of information is to be obtained and if this particular piece of information is coded near the left hand lower corner of the cards, it will be apparent that the opposite ends of the cards might have a tendency to rotate about the pin, and to overcome this possible difficulty each of the cards is provided on its upper edge with a notch 39 and the segregating apparatus is provided with a bar 40 adapted to be seated in the aligned notches 39 of the cards. This bar 40 is mounted on arms 41 which are pivoted at the upper left hand corner of the front and rear walls 12 of the frame

10, and thus the bar may be swung into and out of operative position with respect to the notches 39. It is to be understood of course that this accessory 39—40 need only be used for the purpose just mentioned, namely, when the coded information to be selected appears only near the left hand lower corner of the card.

After the selected cards have been segregated and the required data copied therefrom, the apparatus is returned to its initial position by turning the knob 25 and shaft 9 to the left, thereby allowing the frame or tray 10 to descend, first onto the nose of the cam 24 and then as the counter-clockwise rotation is continued, to descend further into position onto the secondary bottom 6 of the container. Further rotation of the shaft 9 to the left causes the pin 29 to engage the lug 30 and to return the selector 18 into position under the hooks 35 of the several cards in the frame 10 pushing back with it the previously selected cards. The selector is now ready for another operation.

From the foregoing description taken in connection with the accompanying drawings it will be apparent to those skilled in the art that we have devised a simplified method and apparatus by means of which coded cards may be readily selected in accordance with information coded thereon and that such operation may be performed while the container or drawer remains in the file cabinet and the cards remain within the drawer.

In accordance with the patent statutes we have described what we now believe to be the preferred method and apparatus for segregating coded cards, but inasmuch as various changes may be incorporated in the apparatus without departing from the spirit of the invention it is intended that all such variations be included within the scope of the appended claims.

What is claimed is:

1. A card for use in a segregating mechanism, said card provided with horizontal and vertical series of uniformly spaced apertures, and one or more master cut-outs formed in said card and spaced from its periphery, said master cut-out encompassing two vertically adjacent apertures and an aperture laterally adjacent the upper of the two vertically adjacent apertures.

2. A card for use in a segregating mechanism, said card provided with horizontal and vertical series of uniformly spaced apertures, and at least one master cut-out formed in said card and spaced from its periphery, said master cut-out encompassing two vertically adjacent apertures and at least one aperture immediately to the left of the upper of the two vertically adjacent apertures.

3. A card for use in a segregating mechanism, said card provided with horizontal and vertical series of uniformly spaced apertures, a hook on one edge of the card, and one or more master cut-outs formed in said card and spaced from its periphery, said master cut-out encompassing two vertically adjacent apertures and an aperture laterally adjacent the upper of the two vertically adjacent apertures.

4. A card for use in a segregating mechanism, said card provided with horizontal and vertical series of uniformly spaced apertures, one or more master cut-outs formed in said card and spaced from its periphery, said master cut-out encompassing two vertically adjacent apertures and an aperture laterally adjacent the upper of the two vertically adjacent apertures, the upper edges of the card provided with a notch.

5. Card filing apparatus comprising a container for cards, cards provided with uniformly spaced apertures and master cut-outs positioned to represent statistical data, a vertically movable bottomless, rectangular frame in the container, said frame including uniformly apertured transverse plates, rods adapted to be inserted in the apertures of said plates and through the cut-outs of certain of said cards, a shaft oscillatably mounted on the bottom of the container, means on the shaft for raising and lowering the frame, a selector bar mounted on the frame for lateral movement with respect thereto, a lug connected with the selector bar and adapted to be engaged by the raising and lowering means to move the selector bar in one direction, a pin carried by the shaft for use in moving the selector bar in the opposite direction, and means on the upper surface of the selector bar for interlockingly engaging a card.

6. Card filing apparatus comprising a container for cards, cards provided with uniformly spaced apertures and master cut-outs positioned to represent statistical data, a vertically movable bottomless, rectangular frame in the container, said frame including uniformly apertured transverse plates, rods adapted to be inserted in the apertures of said plates and through the cut-outs of certain of said cards, a shaft oscillatably mounted in the bottom of the container, a cam on the shaft for imparting a primarily lifting movement to the frame, an arm on the shaft for imparting a secondary lifting movement to the frame, a selector bar mounted on the frame for lateral movement with respect thereto, means connected with the selector bar adapted to be engaged by the arm to move the selector bar in one direction, a pin on the cam for use in moving the selector bar in the opposite direction, and means on the upper surface of the selector bar for interlockingly engaging a card.

7. Card filing apparatus comprising a container for cards, cards provided with uniformly spaced apertures and master cut-outs positioned to represent statistical data, a vertically movable bottomless, rectangular frame in the container, said frame including uniformly apertured transverse plates, rods adapted to be inserted in the apertures of said plates and through the cut-outs of certain of said cards, a shaft oscillatably mounted in the bottom of the container, arms on the opposite ends of the shaft for raising and lowering the frame, an elongated selector bar on the frame mounted for lateral movement with respect thereto, lugs connected with the opposite ends of the selector bar adapted to be engaged by said arms to move the selector bar in one direction, pins carried by the shaft for use in moving the selector bar in the opposite direction, and means on the upper surface of the selector bar for interlockingly engaging a card.

8. Card filing apparatus comprising a container for cards, cards provided with uniformly spaced apertures and master cut-outs positioned to represent statistical data, a vertically movable bottomless, rectangular frame in the container, said frame including uniformly apertured transverse plates, rods adapted to be inserted in the apertures of said plates and through the cut-outs of certain of said cards, a shaft oscillatably mounted in the bottom of the container, arms on the shaft for raising and

lowering the frame to segregate certain of the cards, an elongated selector bar extending longitudinally of the frame at one of the upper edges thereof, arms secured to the respective ends of the selector bar and extending to the bottom of the frame, lateral extensions on the lower ends of the arms slidably mounted in the bottom of the frame, lugs on the lateral extensions adapted to be engaged by the arms on the shaft for moving the selector bar in one direction, pins carried by the shaft for use in moving the selector bar in the opposite direction, and means on the selector bar for interlockingly engaging segregated cards.

9. Card filing apparatus comprising a container for cards, cards provided with uniformly spaced apertures and master cut-outs positioned to represent statistical data, a projection on an edge of each of said cards, a vertically movable bottomless, rectangular frame in the container, said frame including uniformly apertured transverse plates, rods adapted to be inserted in the apertures of said plates and through the cut-outs of certain of said cards, a shaft oscillatably mounted in the bottom of the container, an arm on the shaft for raising and lowering the frame, an elongated selector bar mounted on the frame for lateral movement with respect thereto, said selector bar provided with a longitudinal groove in its upper surface adapted to receive the projections on the cards, a lug on the selector bar adapted to be engaged by the arm to move the selector bar in one direction, and a pin carried by the shaft for use in moving the selector bar in the opposite direction.

10. In apparatus for segregating cards provided with uniformly spaced apertures and master cut-outs positioned to represent statistical data, a container for the cards, a vertically movable bottomless, rectangular frame in the container, said frame including uniformly apertured transverse plates, rods adapted to be inserted in the apertures of said plates and through the cut-outs of certain of said cards, a selector bar slidably mounted on the frame, means on the selector bar for interlocking cooperation with the cards, and rotatable means for raising and lowering the frame and for moving the selector bar laterally with respect to the frame.

11. In apparatus for segregating cards provided with uniformly spaced apertures and master cut-outs positioned to represent statistical data, a container for the cards, a vertically movable bottomless, rectangular frame in the container, said frame including uniformly apertured transverse plates, rods adapted to be inserted in the apertures of said plates and through the cut-outs of certain of said cards, a shaft oscillatably mounted on the bottom of the container, means on the shaft for raising and lowering the frame, a selector bar mounted on the frame for lateral movement with respect thereto, a lug connected with the selector bar and adapted to be engaged by the raising and lowering means to move the selector bar in one direction, a pin carried by the shaft for use in moving the selector bar in the opposite direction, and means on the upper surface of the selector bar for interlockingly engaging a card.

12. In apparatus for segregating cards provided with uniformly spaced apertures and master cut-outs positioned to represent statistical data, a container for the cards, a vertically movable bottomless, rectangular frame in the container, said frame including uniformly apertured transverse plates, rods adapted to be inserted in the apertures of said plates and through the cut-outs of certain of said cards, a shaft oscillatably mounted in the bottom of the container, a cam on the shaft for imparting a primarily lifting movement to the frame, an arm on the shaft for imparting a secondary lifting movement to the frame, a selector bar mounted on the frame for lateral movement with respect thereto, means connected with the selector bar adapted to be engaged by the arm to move the selector bar in one direction, a pin on the cam for use in moving the selector bar in the opposite direction, and means on the upper surface of the selector bar for interlockingly engaging a card.

13. In apparatus for segregating cards provided with uniformly spaced apertures and master cut-outs positioned to represent statistical data, a container for the cards, a vertically movable bottomless, rectangular frame in the container, said frame including uniformly apertured transverse plates, rods adapted to be inserted in the apertures of said plates and through the cut-outs of certain of said cards, a shaft oscillatably mounted in the bottom of the container, arms on the opposite ends of the shaft for raising and lowering the frame, an elongated selector bar on the frame mounted for lateral movement with respect thereto, lugs connected with the opposite ends of the selector bar adapted to be engaged by said arms to move the selector bar in one direction, pins carried by the shaft for use in moving the selector bar in the opposite direction, and means on the upper surface of the selector bar for interlockingly engaging a card.

14. In apparatus for segregating cards provided with uniformly spaced apertures and master cut-outs positioned to represent statistical data, a container for the cards, a vertically movable bottomless, rectangular frame in the container, said frame including uniformly apertured transverse plates, rods adapted to be inserted in the apertures of said plates and through the cut-outs of certain of said cards, a shaft oscillatably mounted in the bottom of the container, arms on the shaft for raising and lowering the frame for segregating certain of the cards, an elongated selector bar extending longitudinally of the frame at one of the upper edges thereof, arms secured to the respective ends of the selector bar and extending to the bottom of the frame, lateral extensions on the lower ends of the arms slidably mounted in the bottom of the frame, lugs on the lateral extensions adapted to be engaged by the arms on the shaft for moving the selector bar in one direction, pins carried by the shaft for use in moving the selector bar in the opposite direction, and means on the selector bar for interlockingly engaging segregated cards.

15. In apparatus for segregating cards each provided with a projection on an edge and with uniformly spaced apertures and master cut-outs positioned to represent statistical data, a container for the cards, a vertically movable bottomless, rectangular frame in the container, said frame including uniformly apertured transverse plates, rods adapted to be inserted in the apertures of said plates and through the cut-outs of certain of said cards, a shaft oscillatably mounted in the bottom of the container, an arm in the shaft for raising and lowering the frame, an elongated selector bar mounted on the frame

for lateral movement with respect thereto, said selector provided with a longitudinal groove in its upper surface adapted to receive the projections on the cards, a lug on the selector bar adapted to be engaged by the arm to move the selector bar in one direction, and a pin carried by the shaft for use in moving the selector bar in the opposite direction.

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WM. E. STORY, JR.

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