

Nov. 24, 1953

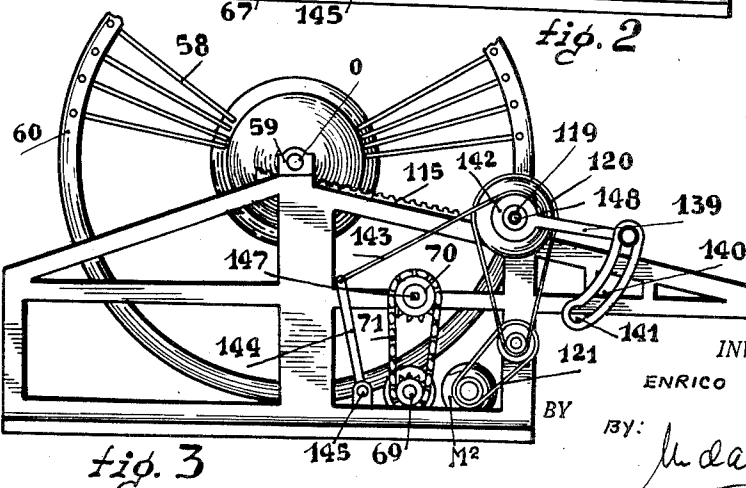
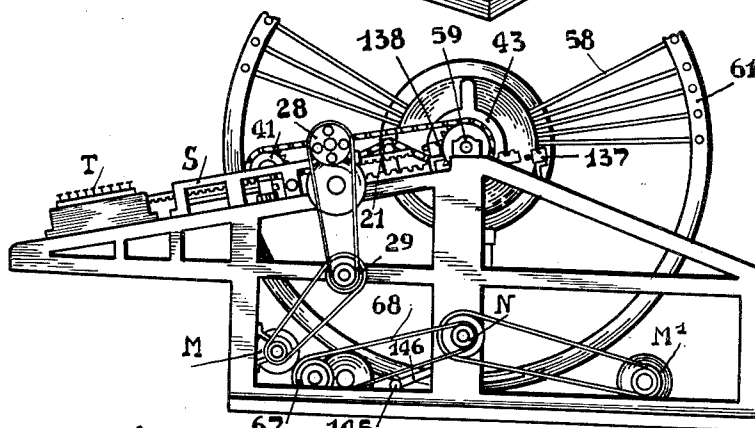
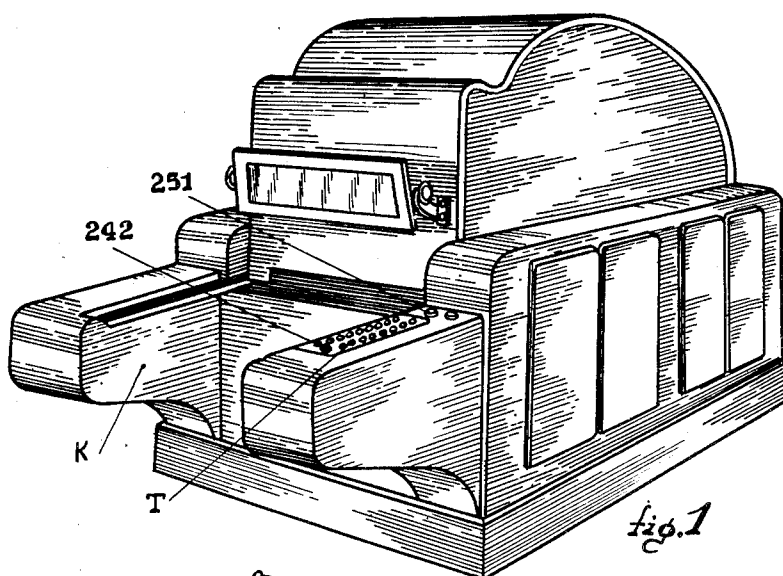
E. BERTELLO

2,660,503

SELECTIVE DELIVERY FILING CABINET

Filed July 20, 1950

7 Sheets-Sheet 1



INVENTOR.

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BY

BY:

[Signature]

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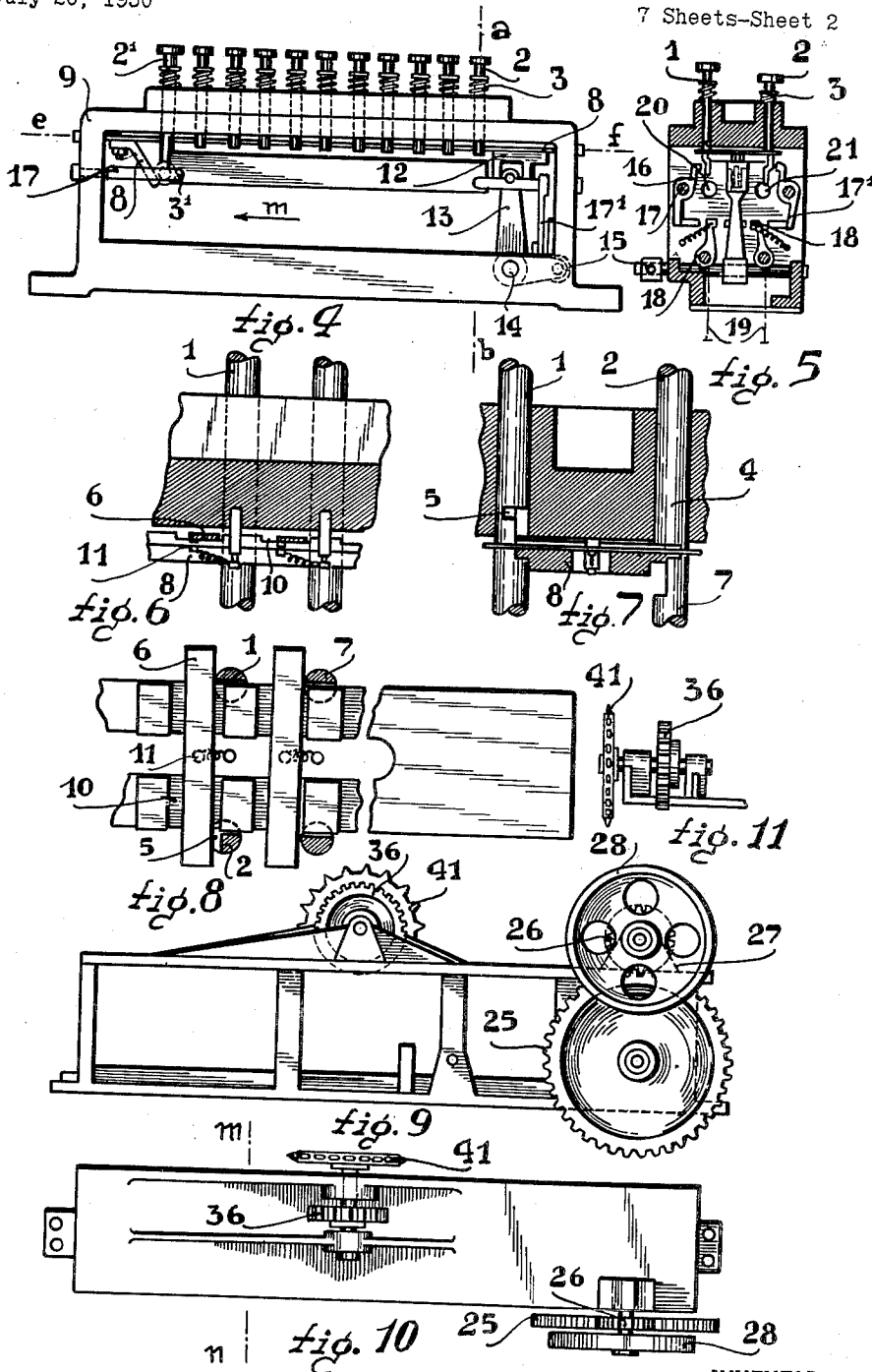
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SELECTIVE DELIVERY FILING CABINET

Filed July 20, 1950

7 Sheets-Sheet 2



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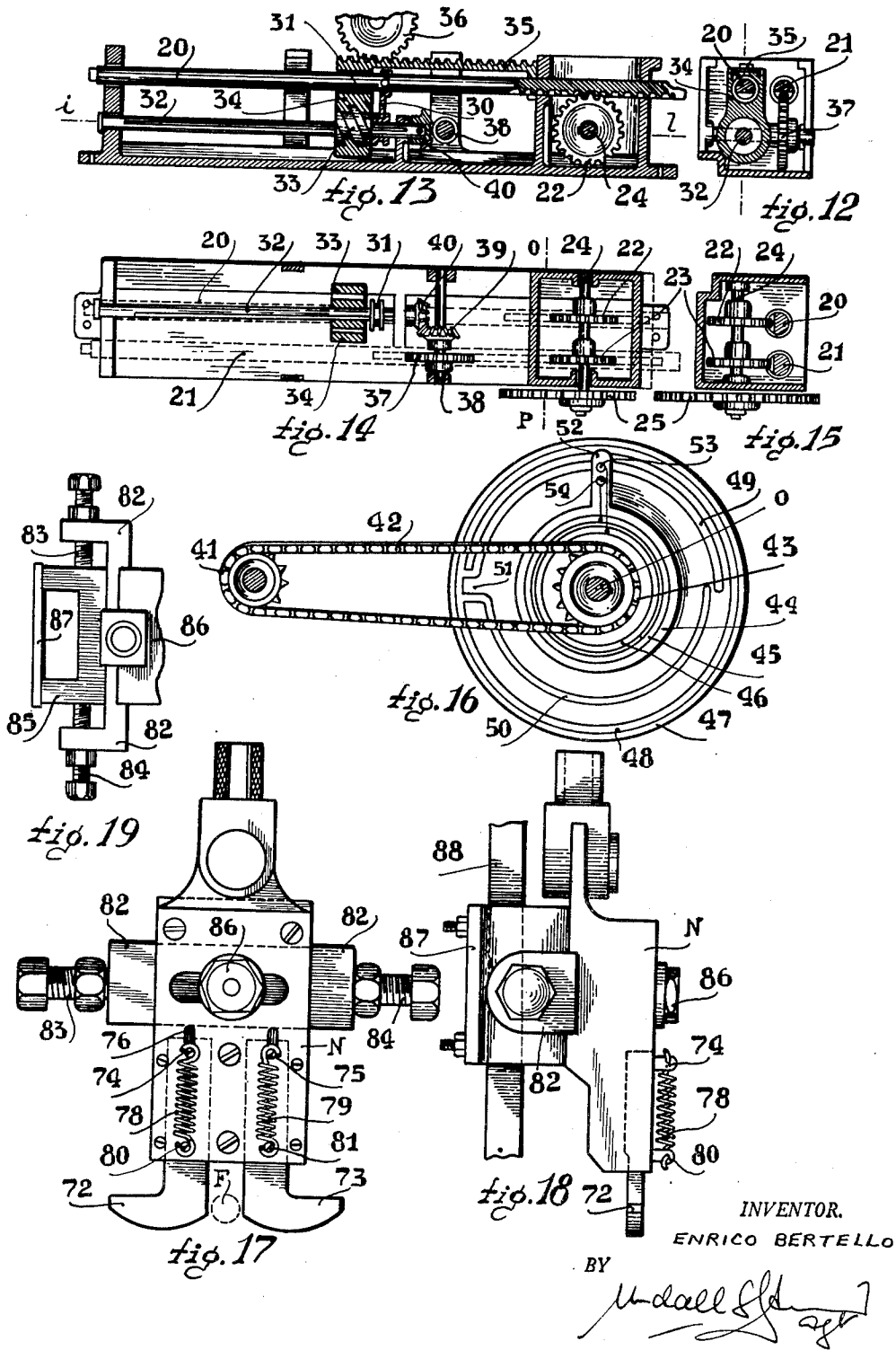
E. BERTELLO

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SELECTIVE DELIVERY FILING CABINET

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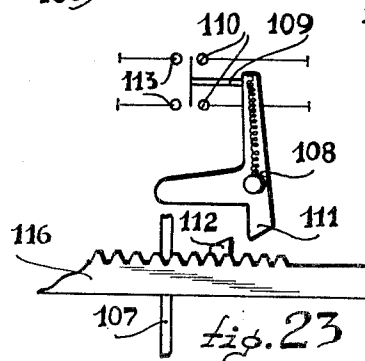
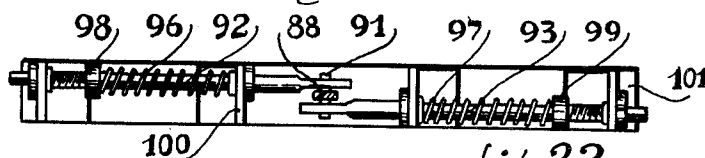
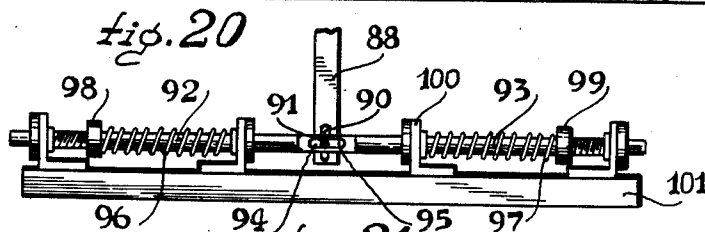
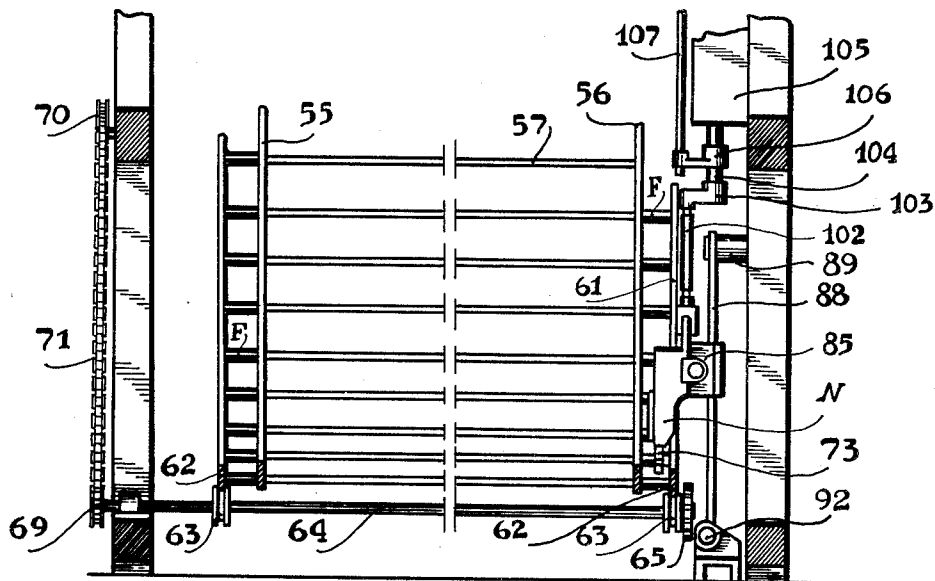
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SELECTIVE DELIVERY FILING CABINET

Filed July 20, 1950

7 Sheets-Sheet 4



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SELECTIVE DELIVERY FILING CABINET

Filed July 20, 1950

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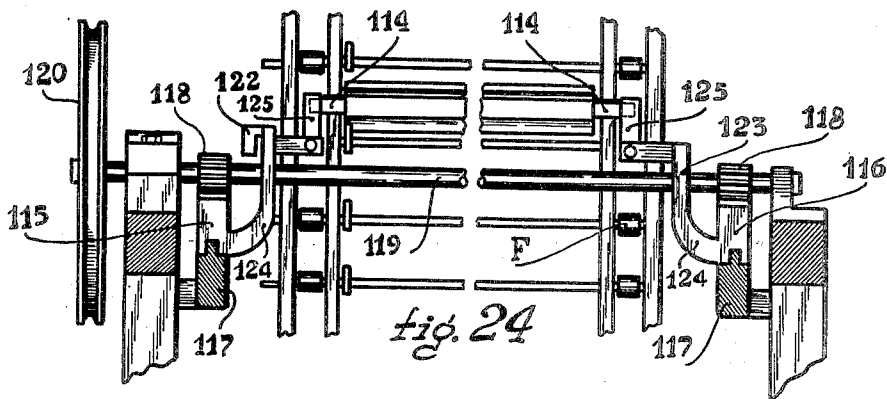


fig. 24

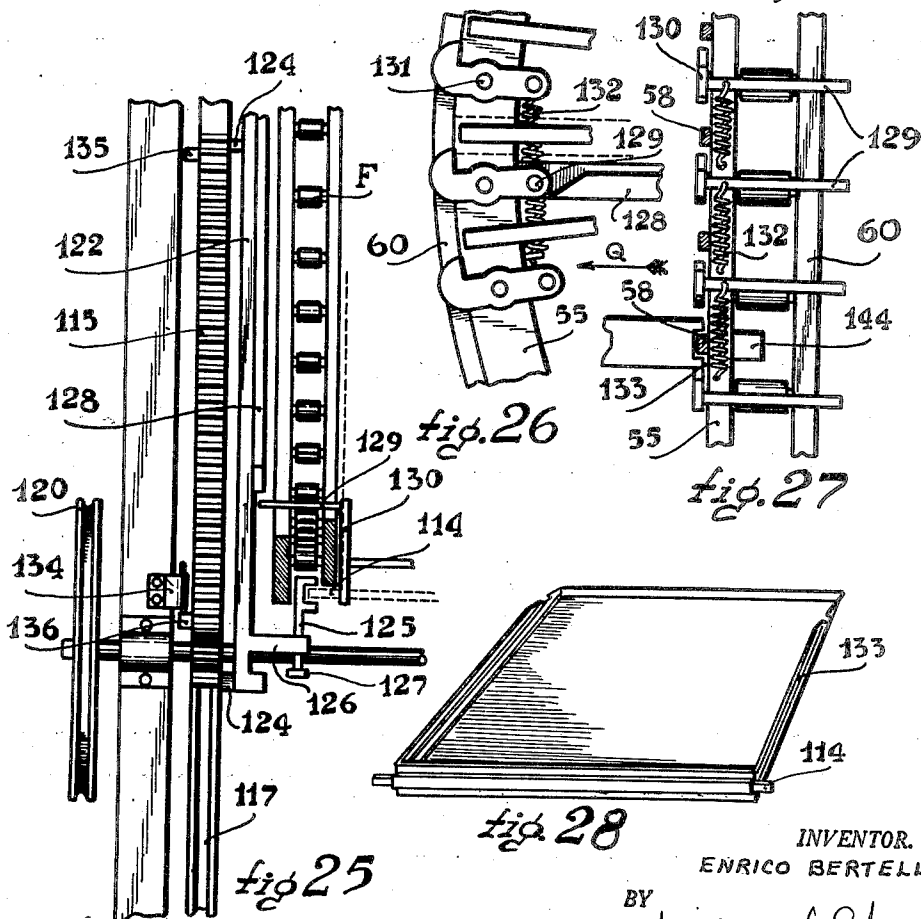


fig. 28

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SELECTIVE DELIVERY FILING CABINET

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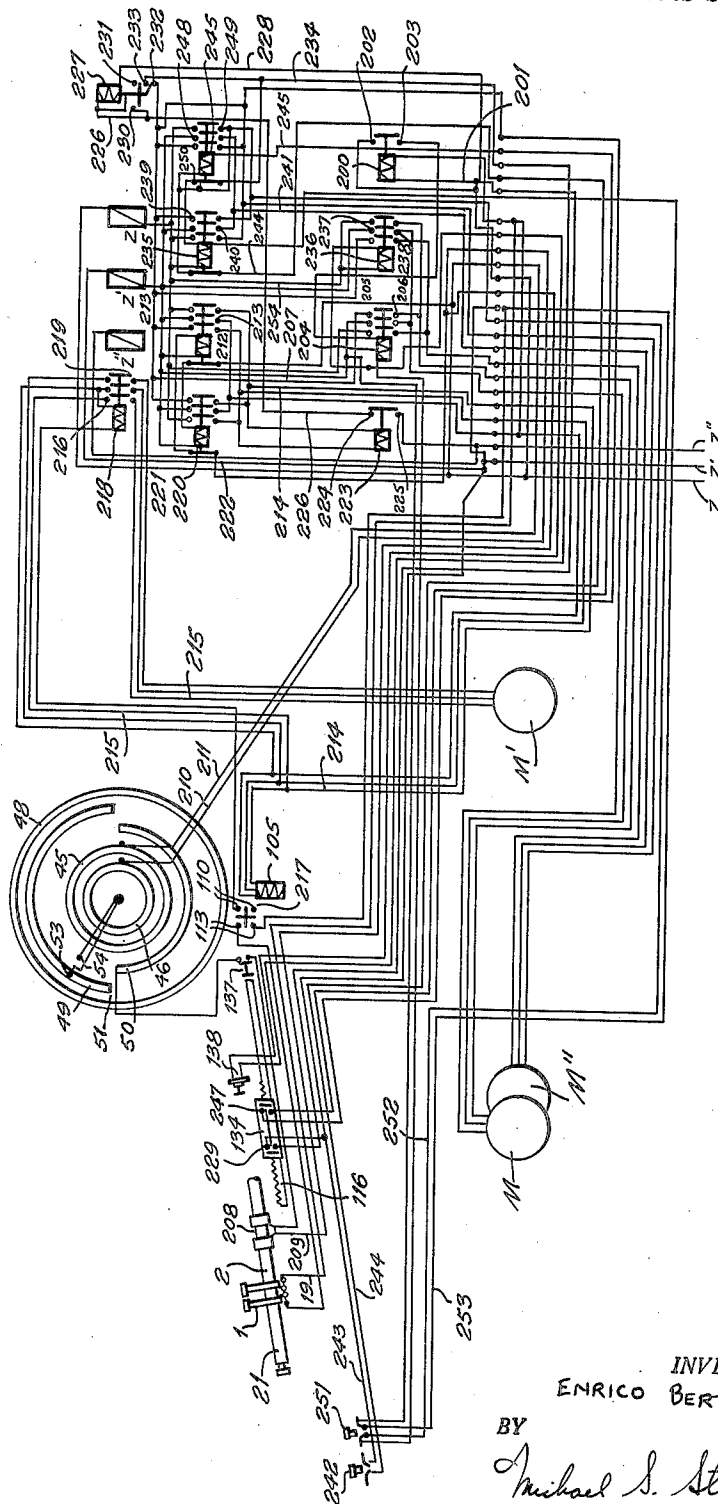


fig. 29

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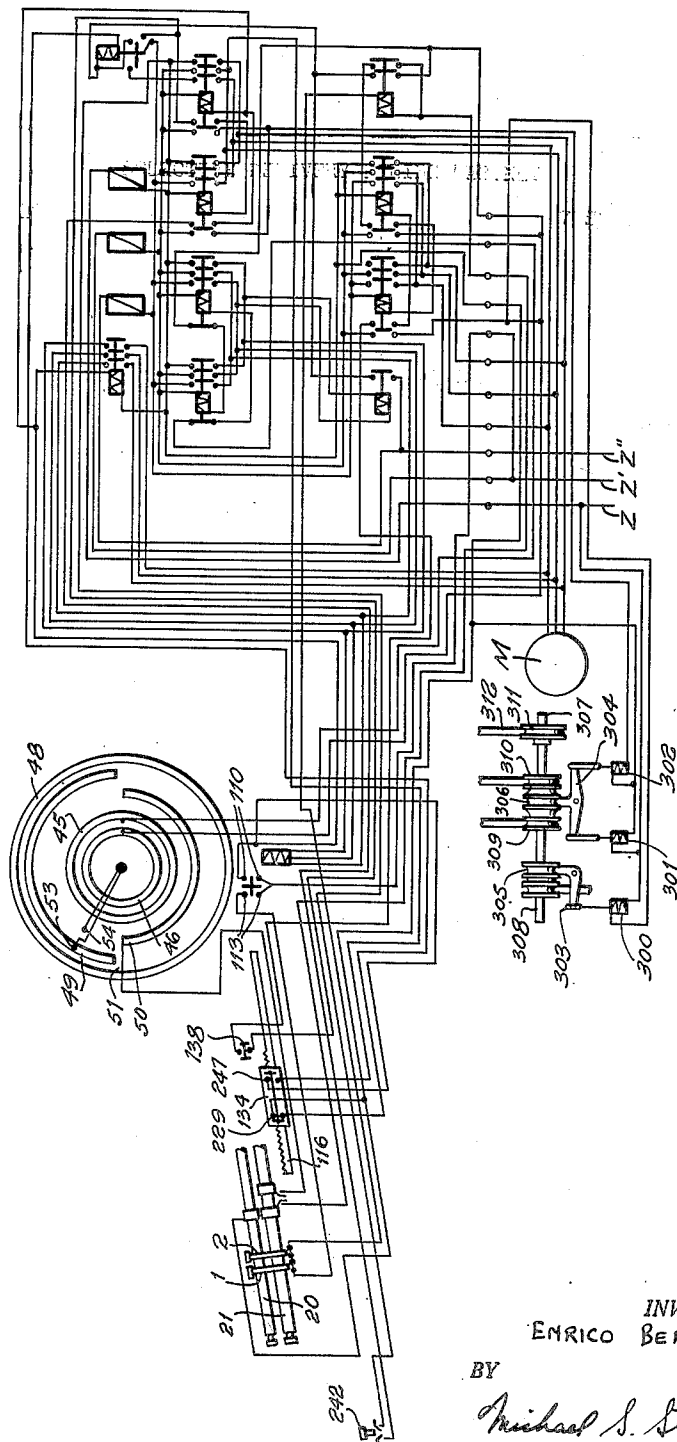
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SELECTIVE DELIVERY FILING CABINET

Filed July-20, 1950

7 Sheets-Sheet 7



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UNITED STATES PATENT OFFICE

2,660,503

SELECTIVE DELIVERY FILING CABINET

Enrico Bertello, Borgo San Dalmazzo, Italy

Application July 20, 1950, Serial No. 174,829

23 Claims. (Cl. 312-223)

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Selective delivery filing cabinets in use at the present time have certain inherent defects which may be summarised as follows: Slow movement, rotation of the drawer-carrying drum in one direction only, drawer-carrying drum not stopping at the required position, apparatus driven only by electric power, impossibility of re-opening the same drawer without causing the drum to rotate, simultaneous movements resulting sometimes in serious damage to the apparatus.

It is the primary object of the present invention to overcome the disadvantages aforesaid by the use of a combined electro-mechanical arrangement.

A selective delivery filing cabinet according to the present invention comprises a drum which is rotatable in both directions, said drum including a plurality of filing drawers and being rotatable under the action of three electric motors adapted to control synchronous or successive movements of the said drum.

The invention also includes a modification of this arrangement having one electrical motor instead of three, wherein all mechanical contrivances controlling fundamental movements of the cabinet are governed by a friction gear in association with an electro-magnet, said electro-magnet acting on said gear to produce the requisite operations. Moreover the invention comprises means adapted to cause the drawer-carrying drum to rotate in both directions, and to turn along the shortest arc of a circle in order to locate the selected drawer in the requisite position, viz., to travel along the shortest path in order to perform the required operation.

The invention also includes means for the manual operation of the apparatus in order to ensure its operation in all cases of emergency.

In order that the invention may be more readily understood, a preferred embodiment thereof, together with a modification, will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 is a perspective view of the selective delivery filing apparatus in its casing.

Figure 2 is a side elevational view of the apparatus.

Figure 3 is an elevational view of the opposite side of the apparatus.

Figure 4 is a view of the control keyboard.

Figure 5 is a cross-sectional view taken on the line *a-b* in Figure 4.

Figure 6 is a cross-sectional view taken on the line *c-d* of Figure 5.

Figure 7 is a fragmentary view of Figure 5.

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Figure 8 is a fragmentary sectional view taken along the line *e-f* in Figure 4.

Figure 9 is a view of the frame and of the gears of the selecting mechanism *S* of Figure 2.

Figure 10 is a plan view of Figure 9.

Figure 11 is a cross-sectional view taken on the line *m-n* in Figure 10.

Figure 12 is a cross-section of the selector *S*.

Figure 13 is a cross-section taken on the line *h-k* in Fig. 12.

Figure 14 is a cross-section taken on the line *i-l* in Fig. 13.

Figure 15 is a cross-section taken on the line *o-p* in Fig. 14.

Figure 16 is a view of the contact rings and corresponding gears.

Figure 17 is a front view of the drum brake shoe.

Figure 18 is a side view of Fig. 17.

Figure 19 is a fragmentary view of Figure 18.

Figure 20 is a fragmentary vertical section of the drum, its driving-mechanism, and the position of the brake.

Figure 21 is a detail of the brake oscillation absorber.

Figure 22 is a plan view of Figure 21.

Figure 23 is a view of a double switch and its mechanism.

Figure 24 is a front view of the drawer opening and closing mechanism.

Figure 25 is a fragmentary view of Fig. 24.

Figure 26 is a detail of the drawer retaining mechanism.

Figure 27 is a view taken on arrow *Q* of Figure 26.

Figure 28 is a perspective view of one drawer.

Figure 29 is a diagrammatic lay-out of the electric control system of the apparatus comprising three electric motors.

Figure 30 is a similar view of an arrangement comprising one motor only.

The apparatus being a combination of many elementary devices, each device will be described separately, after which the *modus operandi* of the whole will be summarised.

The elementary devices are:

1. The selecting mechanism.
2. The drum control mechanism comprising the drum blocking mechanism.
3. The drawer operating mechanism.
4. The manual control mechanism.

The above will be described in the stated order, and when reference will be made to the electric circuits, their operation will be described. The

apparatus is housed in a metal casing (Fig. 1) in the form of a rational cabinet, so that the operator, from operational position K can attend to any operation desired.

Selecting mechanism

The selecting mechanism comprises a keyboard T (Figures 2 and 4), two slide racks (Figures 12 and 15), and contact rings with their complementary parts (Figure 16). The keyboard T comprises two sets of keys 1 and 2 (Figs. 4 and 5) fitted with springs as shown in 3 and provided in their shanks with notches 5 (Fig. 7) to engage blocking bars in order to lock said keys in a depressed condition (Figure 8). Shanks 4 are provided with grooves 7 apt to limit the extent of the movement of the keys.

Between guides 1 slides a transversal bar 8 fitted at 9 (Figure 4) in a groove arranged in the frame of the keyboard and having notches 10 holding resilient bars 6 (Figs. 6 and 8). Transversal bar 8 is connected to a fork 12 in which moves shaft 13 pivoted co-axially at 14 to a pin 15, sliding along the same plane as the drawer (Figures 4 and 5). Bar 8 is profiled in such a way to allow cam wheel 8' (Figure 4), freely journaled on the lower end of key shank 2', to slide against it. On key 2 being operated, bar 8 slides in the direction of arrow *m* and subsequently releases resilient bars 6 which are drawn out of notches 5 to unblock the keys. The key shanks are so shaped at their lower ends that when they are depressed they engage with bars 16 fixed to spindles 17 so that actuators 17', keyed on the extreme right end of spindles 17, by striking oscillating butts 18', will close contacts 18 through which passes lead 19 of the electric circuit.

The selecting mechanism comprises two slide racks 20 and 21. The first of these moves proportionately to the tens, the second to the units of the number corresponding to the selected drawer formed on the keyboard (Figure 12). Slide rack 20 is meshed with gear 22 which is co-axial with gear 23, both these gears being frictionally mounted on shaft 24 (Figure 14) on which is keyed gear wheel 25, meshing with gear 26 (Fig. 9) keyed on shaft 27 on which is also fitted pulley 28 connected, through transmissions 29 to motor M (Figure 2).

Slide rack 20 is provided at a suitable point (Fig. 13) with a finger 30 arranged to insert itself in the groove of sleeve 31 slidable on slotted shaft 22 on which is also fitted worm gear 33 in such a way that it can slide longitudinally but it cannot turn freely. Worm gear 33 turns in a cavity 34 on rack 35 meshed with gear 36. Slide rack 21 (Fig. 14) is engaged and driven by gear 23 and drives gear 37 having a shaft 38 on which is fitted bevel gear 39 meshing with bevel gear 40 (Fig. 13) mounted on slotted shaft 32 carrying also worm gear 33. Gear 36 (Figures 11 and 13) is co-axial with gear wheel 41 which through chain 42 (Figure 16) actuates gear wheel 43 fixed to insulating disc 44 carrying conductive rings 45 and 46. Disc 44 and gear wheel 43 are freely journaled on the main shaft O of the drawer-carrying drum. On one side of the drum is keyed an insulating rim 47 on which is fitted a conducting ring 48 and which is electrically connected to half rings 49 and 50, which are concentrically arranged and have different radii. Said half rings are spaced apart by an insulating zone 51 having a position corresponding to that of drawer No. 1. Disc 44 is provided with an ex-

tension 52 on which are fitted brushes 53 and 54 arranged in positions respectively at equal distances from centre O as the two half rings 49 and 50. These brushes are electrically connected with rings 49 and 45 respectively.

Drum control mechanism

The drawer-carrying drum consists of a cylinder formed by two annular sides 55 and 56 (Figure 20) joined together by horizontal bars 57 and each fitted with radially disposed rods 58 (Figs. 2 and 3) connecting the hub to the outer periphery of the drum. The drum is keyed on a shaft O mounted on bearings 59 secured to the frame. The drum is completed by two additional rings 60 and 61 of a diameter somewhat greater than that of the two sides 55 and 56. The two rings 60 and 61 are keyed to the extensions P of horizontal bars 57, and their outer edges 62 engage grooved pulleys 63 keyed on shaft 64. On said shaft 64 which has suitable bearings, is keyed a gear wheel 65 meshed with pinion 66 (Fig. 2) keyed co-axially with pulley 67 which is connected, through transmission system 68, with motor M'. The mechanism comprises also a drum-stopping device comprising a brake block N (Fig. 17) having two jaws 72 and 73, vertically movable and fitted with pivots 74 and 75 sliding in the respective slots 76. Said pivots 74 and 75 are connected by springs 78 and 79 to pins 80 and 81 fixed to the brake block. The brake block is fitted at the rear with two ribs 82 (Fig. 19) between which move bolts 83 and 84 apt to engage U-shaped bar 85 which is connected to brake block N by a bolt 86 sliding in slot 77 closed by cover 87. Slot 77 and bolts 83 and 84 allow a perfect adjustment of the brake block.

U-shaped bar 85 is engaged by small rod 88 (Figures 18 and 20) pivoted by its upper end to pivot 89 while its opposite end, having a vertical slot 90 (Fig. 21) is fixed to pivot 91. On said pivot 91 are arranged two rods 92 and 93 slotted at 94 and 95. These rods fitted perpendicularly to the axis of the drum have compensating springs 96 and 97 adjustable by means of nuts 98 and 99. Said rods are slidable (for a length corresponding to that of slots 94 and 95) in bearings 100. The top of brake block N (Fig. 20) is connected to rod 102 which in turn is connected to electromagnet 105 by means of an articulated joint 103 and a rod 104. However on rod 104 is arranged, through arm 106, a rod 107 for the purpose of striking (Fig. 23) component 108 in order to close contacts 110 through element 109. Component 109 comprises a prolongation 111 which on being subjected to impact by butt 112 arranged on rack bar 116 of the drawer, closes contacts 113.

Drawer operating mechanism

Each drawer (Fig. 23) is provided with a prolongation 114 and comprises parallel rack bars 115 and 116 (Figure 24) sliding on guides 117 arranged on the frame. Meshing with said rack bars are pinions 118 keyed on shaft 119 which is provided at one end with a pulley 129 connected by way of transmissions 121 to motor M'' (Figure 3). Over shaft 119 are arranged profile pieces 122 and 123 fixed at 124 to said rack bars 115 and 116 respectively and therefore moving with same (Fig. 24). Profile pieces 122 and 123 are also provided with extractors 125 sliding in supports 126 and fitted with butts 127. Extractors 125 are intended to catch prolongations 114 of the drawers (Figs. 24 and 25). Profile piece 122 is provided with a butt 128 apt to strike an ex-

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tension 129 of the hooks 130 holding the drawers in their place. The hooks 130 are mounted on pivots 131 fixed on the annular side 55 of the drum (Figs. 26 and 27) and are provided with return springs 132.

The side walls 133 of the drawers (Fig. 28) are shaped to slide along rods 53 and therefore act as guides to the drawer (Fig. 27).

The frame of the apparatus is provided with a switch 134 actuated by butts 135 and 136 fixed on rack bar 115. An emergency switch is also provided (Fig. 2, ref. no. 137): whenever said safety switch 137 is not engaged by rack bar 115, and therefore the complete closing of the drawer is not ensured, the current will not be transmitted, through the opposite circuit to motor M' and the apparatus will not operate so the drum will not be able to rotate. Another emergency switch 138 (Fig. 2) is provided at the end of the return journey of the selecting slide bars in order to prevent failure of synchronisation in their operation in case of contact failures.

Manual control mechanism

This mechanism comprises a lever 139 (Fig. 3) slidable along a guide 140 having a stop notch 141. Said lever 139 is fixed to a pulley 142 freely journaled on shaft 119. Said pulley is fitted with a chain 143 connected at its opposite end to a lever 144 pivoted at 145 and co-axial with a cam 146. Said cam is apt to act on the brake block in order to disengage the drawer carrying drum. The apparatus is also provided with a gear system comprising a toothed wheel 70 actuating a wheel 69 through a gall's chain 71. The wheel 69 is keyed on a shaft 64, on which are also keyed grooved pulleys 63 operating the drum. By manually turning a handle inserted into a square socket provided in the shaft of wheel 70, it is possible to produce rotation of the drum also in case of power breakdown. The apparatus provides also a manually operated mechanism for the purpose of opening and closing the drawers, comprising a quadrangular cavity 148 (Fig. 3) arranged at the head of shaft 119 on which are keyed pinions 118 actuating racks 115 and 116. Said cavity being provided for the purpose of receiving the stem of a handle for manual operation. The casing of the apparatus is provided with a window through which the numbers inscribed on the outside face of ring 60 of the drum can be seen. The electric circuits controlling the various operations will be described hereunder together with the functioning of the apparatus, which is as follows:

Following the last operation of closing a drawer, the switch shown in Fig. 23 has closed contacts 113: by pressing down two keys of the keyboard in order to form the number of the selected drawer, the closing is effected of contacts 12 through which passes lead 19 coming, through contacts 113, from pole Z' of the local power supply. Lead 19 is connected to an electromagnet 200, to which is also connected the second line 201 from pole Z of the local supply which also feeds contact 202 of said electromagnet 200. The electromagnet thus actuated causes contacts 202 and 203 through which the current reaches electromagnet 204 which being constantly fed from pole Z' is energised and closes the group of contacts 205 and 206. These contacts are traversed by the three-pole circuit 207 which is derived from the main supply and is connected to motor M which provides the

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movements of slide racks 20 and 21: the poles of said circuit are in the following order: Z', Z'', Z. By way of the transmission system 29 (Fig. 2) motor M causes rotation of pulley 28, and subsequently of gear wheel 26, which by meshing with wheel 25 (Fig. 9), transmits movement to shaft 24 and to wheels 22 and 23, which meshing with slide racks 20 and 21 cause these to move and strike the shanks of the depressed keys. More precisely, slide rack 20 hits the shank of the key indicating the tens of the number formed on the keyboard, and slide rack 21 the shank of the key corresponding to the units of said number. For this reason the extent of the displacement of slide racks 20 and 21 is in proportion respectively to the tens and to the units of said number. At this stage, whilst motor M is still running, gear wheels 22 and 23 remain stationary being frictionally fitted on shaft 24. Slide rack 20 (tens) in the course of its movement causes the sliding on grooved shaft 32 of worm screw 33 inserted in female screw 34 fixed to rack 35 meshed with wheel 36 which in consequence will turn for an extent proportional to the number of tens. At the same time the movement of slide rack 21 (units) causes, through gear wheel 37 and bevel gear 39—40, the turning of grooved shaft 32 and therefore of worm screw 33, which in its turn causes a corresponding displacement of female screw 34 and therefore of rack 35 thereby causing wheel 36 to turn again. In this way the two displacements of rack 35 are added together on wheel 36. The ratios of bevel gear 33—40 and the thread of worm screw 33 are calculated in such a way that the extent of the movement of rack 35 relatively to slide bar 21 is equal to one tenth of the actual movement of said slide bar 21. Wheel 36 and gall's wheel 41, by turning to an extent corresponding to the number formed on the keyboard, cause, through chain 41, the turning, in proportion, of wheel 43 and therefore of disc 44, which takes a position corresponding to the selected drawer. At the same time, i. e. when the ends of the slide bars strike against the key shanks, contact 208 is closed and the current will pass through switch 137 and reach ring 40 which transmits it to the two half rings 49 and 50. At this stage it should be pointed out that, according to the position taken by disc 44, extension 52 will take such a position that only one of the brushes thereon will contact with one or with the other of half rings 49 and 50.

As indicated by the full lines in Fig. 16, brush 53 receives current from half ring 49 and transmits it to ring 46. As shown by the dotted lines, brush 54 receives current from half ring 50 and transmits it to ring 45. In other words, according to the position taken by disc 44 in relation to zone 51, one or the other of the rings 45 or 46 will be charged with current. From these rings, respectively, issue leads 211 and 210 which, through suitable electric circuits, cause the rotation in one direction or in the other of motor M' controlling the turning of the drum. More precisely, lead 210 provides the rotation of the drum in the direction of the arrow (Fig. 16) and lead 211 controls rotation in the opposite direction. Since motor M' stops when the insulated zone 51 makes contact with the two brushes 53 and 54 it should be obvious that the drum will turn always along the shortest arc of circle to bring the selected drawer in a position suitable for said drawer to be hooked by extractors 125.

As indicated by the full line in Fig. 16 the current passes through ring 46 from which cable 210 leads to an electro-magnet 212 which is connected to the mains by means of another lead. Said electro-magnet on being energized closes a second group of contacts 213 through which passes the three-pole circuit 214 in order to reach electro-magnet 105 controlling the brake. Moreover, from circuit 214 another circuit, 215, is derived: said circuit 215 is connected with a group of contacts 216. When energized, electro-magnet 105 lifts brake block N (Fig. 20), and by disengaging the extension of one of the rods 57 from jaws 72 and 73, it also disengages the drum. At the same time, small rod 107, by striking part 108, opens contacts 113, de-energizing motor M, and closing contacts 110 crossed by lead 217 derived from circuit 214 and leading to electro-magnet 218, which is connected to circuit 215 by a second lead. Electro-magnet 218 being energized, it closes the group of contacts 219 and 219 through which passes circuit 215 energising motor M' connected with poles Z, Z' and Z'' and controlling the rotation of the drum. If however disc 44 were in the position shown by the dotted lines in Fig. 16, brush 54 would receive current from half ring 50 from which, through lead 211, said current would energise electro-magnet 220. Contacts 221 and 222 being closed, the drum would be disengaged, and finally motor M' which would have been reached by phases Z'', Z' and Z, would have been energised and would have caused the drum to turn in the opposite direction.

Motor M' through transmission system 63 (Fig. 2), pulley 57 and gear wheels 65 and 66 (Fig. 20) causes rotation of shaft 64 which, by means of grooved wheel 63 drags edges 62 of the drum and therefore the drum itself. The drum, fitted with rim 47 (Fig. 16) rotates until insulated zone 51 meets brushes 53 and 54 thus insulating the rings 45 and 46 of disc 44 as well as electro-magnet 105 and motor M'. At this moment the current feeding electro-magnet 105, which when energised holds brake block N, is cut off and therefore said brake block is released, drops by gravity, and with jaws 72 and 73 grips prolongations F of bars 57 of the frame of the drum (Figs. 17 and 20). Said drum is instantaneously blocked by means of a spring arrangement 88, 92, 93 (Figs. 21 and 22) which absorbs the oscillations caused by force of inertia of the drum. By reason of the particular position taken by the contact disc and by rim 47, when the drum is blocked as above described, the selected drawer is in the position shown in figure 25 i. e. with extensions 114 inserted between the jaws of extractors 125.

When the motor M' is de-energised electro-magnet 223, which is connected to the three-pole circuit feeding said motor, is also de-energised and causes (for a relatively short time)—Figure 20—the closing of contacts 224 and 225 through which passes lead 226 coming from phase Z'' of the main supply source and leading to electro-magnet 227. Said electro-magnet is connected with a second lead originating from phase Z' of the mains and passing through contact 229 of switch 134 (closed when the drawer has been shut).

Energisation of electro-magnet 227 causes the closing of contacts 230 and 231 connected with a lead coming from pole Z'' of the main source of supply and leading to electro-magnet 227 which

therefore remains energised also when contacts 224 and 225 are open.

Energisation of electro-magnet 227 causes the closing of contacts 232 and 233 connected with lead 234 issuing from pole Z'' of the mains and leading direct to an electro-magnet 235, which is connected to a second lead from the mains leading, through switch 138, to an electro-magnet 236. The latter is connected also to a second lead coming direct from the mains.

Electro-magnet 236, being energised, closes contact groups 237 and 238 through which passes the three-pole circuit 354 on its way to motor M which it reaches with poles Z', Z and Z''.

By means of transmission system 29 (Figures 2, 9, and 14) pulley 28, gear wheels 26 and 25 and of the two wheels 22 and 23, motor M causes slide rack bars 20 and 21 to move back until they knock against switch 138, and consequently open the circuit of electro-magnet 236 which, on being de-energised, stops motor M. Slide racks 20 and 21, in other words move back to their rest position. Simultaneously with electro-magnet 236, electro-magnet 235 is also energised, and closes a group of contacts 239 and 240 forming part of a three-pole circuit 241 arriving to motor M'' with poles Z, Z', Z''.

Rotation of motor M'' causes, through transmission system 121, rotation of pulley 120 (Figure 3), of pinions 118 and therefore the sliding of rack bars 115 and 116, which drag profile pieces 122 and 123 (Figure 24). Butt 128 provided on profile member 122 strikes stem 129 of hook 130 thus causing the turning of said hook on its pivot 131 and thereby releasing the drawer.

While profile pieces 122 and 123 are still in motion, supports 126 knock against butt ends 127 of extractors 125 holding between their jaws extensions 114 of the selected drawers, so that same is dragged by the slide rack bars.

At this moment rack bar 116, by striking small lever 15 causes, through fork 12 and lever 13, the sliding of transversal bar 8: notches 19 of said bar, by acting on blocking bars 6, cause the unblocking of the keys.

In order to shut the drawer it is only necessary to press contact 242 which is connected to leads 243 and 244, the first of which is connected to pole Z' of the supply source, and the second is connected to an electro-magnet 245, connected also to a lead 246, coming from pole Z'' of the supply source and passing through contact 247 of switch 134. When electro-magnet 245 is energised it closes contacts 248 and 249 through which passes circuit 241 reaching motor M'' with poles Z', Z'' and Z, which causes motor M'' to rotate in a direction opposite to that in which it turned during the previous operation of opening the drawer. In this way motor M'' by acting contrary-wise on the above mentioned components causes the drawer to slide back until butt 132 of rack 115, by striking contact breaker 136, opens contact 247, thereby de-energising electro-magnet 245 and therefore motor M''. Therefore, when butt 132 of rack 116 (Fig. 23) knocks against extension 111 of piece 103, contacts 113 are closed and the apparatus is again ready to perform another operation.

From one of the contacts 249 of electro-magnet 245, a lead 250 is connected to said electro-magnet 245 so that by a brief pressure on button 242 the electromagnet is energised and remains so for the whole duration of the operation of closing the drawer. If it is desired to re-open the same

drawer without further rotation of the drum it is sufficient to keep button 251 depressed. Said button is connected with two leads 252 and 253, the first originating from the main supply line, and the second from electro-magnet 235 which is connected direct to said main supply by means of a second lead. Depression of button 251 causes energisation of electro-magnet 235 thus causing, through the circuits described above, energisation of motor M' and therefore the sliding out of the drawer, which will protrude in proportion to the duration of pressure on said button 251.

In case of a realization of the present invention comprising only one motor, the general outline of the electric scheme, is in a general way the same as in the three-motor realisation. Energisation of the single motor takes place, each time, in parallel with the energisation of one of the electro-magnets 300, 301 and 302 (Fig. 30) which, connected with mechanical devices 303 and 304, cause the shifting of friction members 305 and 306. These are keyed on and are shiftable on shaft 307 on which pulleys 308, 309 and 310 are freely journaled and pulley 311 (actuated by motor M through belt 312) is keyed. When shifted, said friction members transmit motion to one of the pulleys 308, 309 and 310 which control the three fundamental movements. More precisely pulley 308 controls the selecting device, pulley 309 the rotation of the drum and pulley 310 the opening and closing of the drawers.

The above movements take place in practice as described above and are based on the same electric scheme employed in the three-motors realisation.

In case of emergency the apparatus can be manually operated in the following manner: Lever 139 (Fig. 3) being pushed downwards until blocked in notch 141 causes rotation of pulley 142, which through chain 143 and lever 144 rotates shaft 145 and therefore arm 146 fixed on said shaft 145 lifts the brake block and therefore unblocks the drum. By turning the handle inserted in a square socket 147 provided in the shaft of gear's wheel 70, the rotation is caused, through chain 71 and wheel 69, of the two grooved pulleys 63, which, engaging profiled edge 62 of the drum, causes the drum to rotate. To obtain the opening of the selected drawer, a handle is inserted in socket 148 of shaft 119 and turned. Pinions 118, keyed on said shaft 119, engage the slide racks pertaining to the drawer shifting in the same manner as when the apparatus is being electrically operated.

As regards the one motor realisation on the basis of the electric scheme shown in Figure 30, said scheme remains practically the same as that of Figure 29. In this case however, energisation of the motor takes place each time in parallel with the energisation of one of electro-magnets 300—301—302, which are connected with the mechanical units 303—304 through which they cause each time the shifting of frictions 305—306. Said frictions, being keyed on shaft 307 on which pulleys 308—309—310 are freely journaled and on which is also keyed pulley 311 receiving movement from motor M by means of belt 312, transmits movement to those mechanisms which are supposed to come into action at that moment: precisely pulley 308 transmits movement to the selector device, pulley 309 to the drum and pulley 310 to the mechanism for opening and shutting the drawers, according to the direction of rotation of the motor. All these movements take place in the same manner described on the basis

of the electrical scheme for the three motor realisation.

I claim:

1. A selective delivery filing cabinet, comprising a drum rotatable in both directions, a plurality of filing drawers in said drum, keys for effecting operations of the said drum for selectively opening and closing the said drawers, the shanks of said keys having notches and grooves therein, blocking bars adapted to engage in said notches for the purpose of locking said keys in a depressed condition, a slide bar adapted to slide in said grooves for releasing said blocking bars from said notches, a fork secured to said slide bar for controlling same, and a lever movable along said fork, the latter being slidable under the action of said lever.

2. A selective delivery filing cabinet, comprising a drum rotatable in both directions, a plurality of filing drawers in said drum, each of said drawers having an identification number, keys for effecting operations of the said drum for selectively opening and closing the said drawers, transverse bars pertaining to separate sets of keys, said transverse bars being connected, by means of shaped arms, to spindles, actuators keyed on said spindles, an electric motor controlling movement of said drum, an electric supply source, a lead from said source to said motor and contacts on said lead, the lower ends of said keys being so shaped that, upon depression of the keys said lower ends strike said transverse bars thereby causing said actuators, by acting on the oscillating butts of said contacts, to close the circuit between said supply source and said motor, one of the said contacts being controlled by the set of keys pertaining to the tens of the identification number of the drawers, and the other of said contacts being controlled by the keys pertaining to the unit figures of said identification number.

3. A selective delivery filing cabinet, comprising a drum rotatable in both directions, a plurality of filing drawers in said drum, keys for effecting operation of said drum for selectively opening and closing said drawers, the shanks of said keys having notches and grooves therein, blocking bars adapted to engage in said notches for the purpose of blocking said keys in a depressed condition, a slide bar adapted to slide in said grooves for releasing said blocking bars from said notches, a release key, a profile member carried by said slide bar, and a cam wheel mounted on the shank of said release key, whereby depression of said key causes co-operation between said cam wheel and said profile member to move said slide bar to release said blocking bars from the notches in the shanks of said keys for effecting operation of the said drum.

4. A selective delivery filing cabinet, comprising a drum rotatable in both directions, a plurality of filing drawers in said drum, keys for effecting operation of said drum for selectively opening and closing said drawers, a shaft supporting said drum, an insulating rim keyed to one side of said drum, an insulating disc freely journaled on said shaft, a conductor ring and two concentric half rings of different radii on said insulating rim, said half rings being spaced apart by an insulating zone and electrically connected with said conductor ring, an extension member of the said insulating disc, radially fitted brushes on said extension member disposed respectively from the centre of said disc at distances equal to the radii of said half rings, and an electric motor for controlling rotation of said drum, said brushes

being electrically connected with said half rings and in circuit with said motor for controlling rotation of said drum in either direction dependent upon direction of rotation of said motor.

5 5. A selective delivery filing cabinet, comprising a drum rotatable in both directions, a plurality of filing drawers in said drum, each drawer having an identification number, keys for effecting operation of the said drum for selectively opening and closing said drawers, a slide rack pertaining to the tens figures of the respective drawer numbers, a slide rack pertaining to the unit figures of said drawer numbers, an electric motor controlling movement of said drum, a shaft, gear wheels frictionally mounted on said shaft and meshing respectively with said slide racks, a gear wheel mounted on said shaft, a pinion meshing with said gear wheel, and a pulley mounted co-axially with said pinion, said pulley being controlled by said motor for the purpose of actuating said slide racks.

6. A selective delivery filing cabinet, comprising a drum rotatable in both directions, a plurality of filing drawers in said drum, each of said drawers having an identification number, keys for effecting operation of said drum for selectively opening and closing the said drawers, a shaft supporting said drum, an insulating rim keyed to one side of said drum, an insulating disc freely journaled on said shaft, a conductor ring and two concentric half rings of different radii on said insulating rim, said half rings being spaced apart by an insulating zone and electrically connected with said conductor ring, an extension member on the said insulating disc, radially fitted brushes on said extension member disposed respectively from the centre of said disc at distances equal to the radii of said half rings, a slide rack pertaining to the tens figures of the respective drawer numbers, a slide rack pertaining to the units figures of said drawer numbers, an electric motor for actuating said slide racks, a gear wheel in association with said insulating disc and freely journaled together with said disc on said drum supporting shaft, a rack bar, and a gear wheel meshing with said rack bar and operable to move the said gear wheel in association with the insulating disc, the shifting movement of said rack bar being proportional to the sum of the shifting movements of the said slide racks.

7. A selective delivery filing cabinet, comprising a drum rotatable in both directions, a plurality of filing drawers in said drum, each of said drawers having an identification number, keys for effecting operation of said drum for selectively opening and closing the said drawers, a shaft supporting said drum, an insulating rim keyed on one side of said drum, an insulating disc freely journaled on said shaft, a conductor ring and two concentric half rings of different radii on said insulating rim, said half rings being spaced apart by an insulating zone and electrically connected with said conductor ring, an extension member on the said insulating disc, radially fitted brushes on said extension member disposed respectively from the centre of said disc at distances equal to the radii of the said half rings, a slide rack pertaining to the tens figures of said drawer numbers, a slide rack pertaining to the unit figures of said drawer numbers, an electric motor for actuating said slide racks, a slotted shaft, a slotted muff slidable along said slotted shaft, a finger on the slide rack pertaining to the tens figures of the drawer numbers, said finger engaging in said slotted muff, a toothed rack having

a circular groove portion, a worm gear mounted on said slotted shaft so as to slide on same and movable within said grooved portion, a spindle, a gear wheel on said spindle to transmit movement to said brushes on said insulating disc, whereby said brushes rotate in proportion to each sliding movement of said toothed rack.

8. A selective delivery filing cabinet comprising a drum rotatable in both directions, a plurality of filing drawers in said drum, each of said drawers having an identification number, keys for effecting operation of said drum for selectively opening and closing the said drawers, a shaft supporting said drum, an insulating rim keyed to one side of said drum, an insulating disc freely journaled on said shaft, a conductor ring and two concentric half rings of different radii on said insulating rim, said half rings being spaced apart by an insulating zone and electrically connected with said conductor ring, an extension member on said insulating disc, radially fitted brushes on said extension member disposed respectively from the centre of said disc at distances equal to the radii of the said half rings, a slide rack pertaining to the tens figures of the drawer numbers, a slide rack pertaining to the unit figures of said drawer numbers, an electric motor for actuating said slide racks, a slotted shaft, a slotted muff slidable along said slotted shaft, a finger on the slide rack pertaining to the tens figures of the drawer numbers, said finger engaging in said slotted muff, a toothed rack having a circular groove portion, a worm gear mounted on said slotted shaft so as to slide on same and movable within said grooved portion, and means for transmitting to said toothed rack the movements of the slide rack pertaining to the units of the drawer numbers in such a way that said toothed rack will shift in relation to said slide rack for a distance equal to one tenth of the shifting of said slide rack.

9. A selective delivery filing cabinet, comprising a drum rotatable in both directions, a plurality of filing drawers in said drum, each of said drawers having an identification number, keys for effecting operation of the said drum for selectively opening and closing said drawers, a shaft supporting said drum, an insulating rim keyed to one side of said drum, an insulating disc freely journaled on said shaft, a conductor ring and two concentric half rings of different radii on said insulating rim, said half rings being spaced apart by an insulating zone, and electrically connected with said conductor ring, an extension member on said insulating disc, radially fitted brushes on said extension member disposed respectively from the centre of said disc at distances equal to the radii of the said half rings, a slide rack pertaining to the tens figures of the drawer numbers, a slide rack pertaining to the unit figures of said drawer numbers, an electric motor for actuating said slide racks, an electric switch actuated by said slide rack pertaining to the unit figures of the drawer numbers, an electric supply source, a lead from said switch to said supply source, a second lead passing from said switch to said conductor ring whereby when said slide rack pertaining to the unit figures of the drawer numbers is moved by the depression of one of the keys, such switch is closed and current is conveyed to the said ring; and a second switch in said second lead, said second switch being arranged to pass current only when the selected drawer has resumed its

original position and is therefore completely closed.

10. A selective delivery filing cabinet, comprising a drum rotatable in both directions, a plurality of filing drawers in said drum, each of said drawers having an identification number, keys for effecting operation of the said drum for selectively opening and closing the said drawers, a shaft supporting said drum, an insulating rim keyed on one side of said drum, an insulating disc freely journaled on said shaft, a conductor ring and two concentric half rings of different radii on said insulating rim, said half rings being spaced apart by an insulating zone and electrically connected with said conductor ring, an extension member on said insulating disc, radially fitted brushes on said extension member, disposed respectively from the centre of said disc at distances equal to the radii of the said half rings, an electric motor for actuating selected drawers of the drum, an electro-magnet controlling energisation of said electric motor, a slide rack pertaining to the tens figures of said drawer numbers, a slide rack pertaining to the unit figures of said drawer numbers, an electric motor for actuating said slide racks, an electric switch actuated by said slide rack pertaining to the unit figures of the drawer numbers, an electric supply source, a lead from said switch to said supply source, a second lead passing from said switch to said conductor ring, whereby when said slide rack pertaining to the unit figures of the drawer numbers is moved by the depression of one of the keys said switch is closed and current is conveyed to the said ring; a second switch in said second lead, said second switch being arranged to pass current only when the selected drawer has resumed its original position and is therefore completely closed; and a third switch for de-energising said electric motor actuating said slide racks when said slide racks have resumed their original position and the selected drawer is therefore fully closed, said third switch being connected with said electro-magnet controlling energisation of the said drawer-actuating motor.

11. A selective delivery filing cabinet comprising a drum rotatable in both directions, a plurality of filing drawers in said drum, each of said drawers having an identification number; keys for effecting operation of said drum for selectively opening and closing the said drawers, said drum having a plurality of transverse bars pertaining to said drawers; extensions on said bars; and a brake block comprising jaws resiliently fitted thereon to receive said extensions when transverse bars pertaining to selected drawers are situated opposite said jaws.

12. A selective delivery filing cabinet comprising a drum rotatable in both directions, a plurality of filing drawers in said drum, each of said drawers having an identification number; keys for effecting operation of the said drum for selectively opening and closing said drawers; an electric motor for controlling rotation of said drum; a brake block for stopping said drum in a position for opening a selected drawer; an electro-magnet for holding said brake block in a raised position when said electro-magnet is energised; a rod connecting said brake block and said electro-magnet; contacts in circuit with said electric motor; a pivoted resilient member to operate said contacts; and a second rod connecting said first rod and said resilient member.

13. A selective delivery filing cabinet comprising a drum rotatable in both directions; a

plurality of filing drawers in said drum; each of said filing drawers having an identification number; keys for effecting operation of the said drum for selectively opening and closing said drawers; an electric motor for controlling rotation of said drum; a brake block for stopping said drum in a position for opening a selected drawer; and a shock absorbing device for absorbing the inertia of said drum, said shock-absorbing device comprising two spring controlled longitudinal rods, a U-shaped bar at the rear of said brake-block, and a stem passing between the two legs of said U-shaped bar, said stem being pivoted at its upper end about a fixed pivot, and at its lower end being connected to said spring control rods.

14. A selective delivery filing cabinet, comprising a drum rotatable in both directions, a plurality of filing drawers in said drum each of said drawers having an identification number; keys for effecting operation of said drum for selectively opening and closing said drawers; an electric motor for controlling rotation of said drum; a brake block for stopping said drum in a position for opening a selected drawer; two spring controlled longitudinal rods; a U-shaped bar at the rear of said brake block; a bolt on said U-shaped bar slidable in a transverse groove in said brake block; two lateral ribs on said brake block; two further bolts on said U-shaped bar freely playing in said ribs; and a stem passing between the two legs of the said U-shaped bar, said stem being pivoted at its upper end about a fixed pivot, and at its lower end being connected to said spring controlled rods.

15. A selective delivery filing cabinet, comprising a drum rotatable in both directions; a plurality of filing drawers, in said drum; keys for effecting operations of said drum for selectively opening and closing the said drawers, the shanks of said keys having notches and grooves; blocking bars adapted to engage in said notches for the purpose of locking said keys in a depressed condition; a slide bar adapted to slide in said grooves for releasing said blocking bars from said notches; extensions to each of said drawers; rack bars on each drawer; and slidable extractors pertaining to said rack bars, said extensions being adapted to be introduced between said extractors, which in their turn are arranged to follow the movements of said rack bars and thus to cause the opening and closing of a selected drawer.

16. A selective delivery filing cabinet, comprising a drum rotatable in both directions; a plurality of filing drawers in said drum; keys for effecting operation of said drum for selectively opening and closing the said drawers; extensions to each of said drawers; rack bars on each of said drawers; slidable extractors pertaining to said rack bars; profile pieces supporting said extractors; a hook pertaining to each drawer; and an abutment on one of said profile pieces adapted to knock against said hook for the purpose of opening the appertaining drawer.

17. A selective delivery filing cabinet, comprising a drum rotatable in both directions; a plurality of filing drawers in said drum; keys for effecting operation of the said drum for selectively opening and closing the said drawers; extensions to each of said drawers; rack bars on each said drawer; slidable extractors pertaining to said rack bars; said extensions being adapted to be introduced between said extractors which in their turn are arranged to follow the movements of the said rack bars and thus to cause the open-

ing or closing of a selected drawer; a motor adapted to rotate the said drum; a contact governing rotation of said motor in either direction; a switch adapted to operate said contact; and terminal butts on said rack bars adapted to operate said switch in either extreme position of said rack bars.

18. A selective delivery filing cabinet, comprising a drum rotatable in both directions; a plurality of filing drawers in said drum; keys for effecting operation of the said drum for selectively opening and closing the said drawers; extensions to each said drawer; rack bars on each of said drawers; slidable extractors pertaining to said rack bars; said extensions being adapted to be introduced between said extractors which in their turn are arranged to follow the movements of said rack bars and thus to cause the opening or closing of a selected drawer; contacts controlled by the said keys; an electric current source; a lead from said current source to said contacts; means for cutting off current from said lead; and a butt, pertaining to said rack bars, adapted to strike against said current cutting means upon return movement of a rack bar.

19. A selective delivery filing cabinet comprising a drum rotatable in both directions; a plurality of filing drawers in said drum, each of said drawers having an identification number; keys for effecting operation of said drum for selectively opening and closing the said drawers; an electric motor controlling movement of said drum; a brake block for stopping said drum in a position for opening a selected drawer; and means for manual release and operation of said drum, said means comprising a shaft; a cam on said shaft, said cam acting on said brake block; a lever keyed on the opposite end of said shaft; a chain connecting said lever with a pulley; a hand lever for operating said pulley; and a slotted arcuate guide for said hand lever, said guide having an arresting notch at one end, for said lever.

20. A selective delivery filing cabinet, comprising a drum rotatable in both directions; a plurality of filing drawers in said drum; each drawer having an identification number; keys for effecting operation of said drum for selectively opening and closing the said drawers; an electric motor controlling movement of said drum; a brake block for stopping said drum in a position for opening a selected drawer; and means for manual release and operation of said drum, said means comprising a shaft; a cam keyed on said shaft, said cam acting on said brake block; a lever keyed on the opposite end of said shaft; a chain connecting said lever with a pulley; a hand lever for operating said pulley; a gear wheel having at its centre a square socket in which a turning handle

can be inserted; a gall's chain linking said gear wheel with another gear wheel; a shaft on which said second gear wheel is keyed on; and two grooved wheels keyed on said shaft and meshed with the outer rims of the drum, said grooved wheels actuating said drum when driven by said second gear wheel through the gall's chain, the first gear wheel and the turning handle.

21. A selective delivery filing cabinet, comprising a drum rotatable in both directions; a plurality of filing drawers in said drum, each of said drawers having an identification number; keys for effecting operation of the said drum for selectively opening and closing the said drawers; an electric motor controlling movement of said drum; and means comprising racks effective to open and close respective drawers; a shaft; means mounted on said shaft to cooperate with said racks; and a square socket provided on said shaft for a handle for the manual operation of the opening and closing of said drawers if required.

22. A selective delivery filing cabinet, comprising a drum rotatable in both directions; a plurality of filing drawers in the said drum, each of the said drawers having an identification number; keys for effecting operation of the said drum for selectively opening and closing the said drawers; friction gears; a plurality of electromagnets pertaining to said friction gears; an electric motor acting on said friction gears to bring about the performance of all operations necessary for the selection, opening, and closing of any of the said drawers as required.

23. A selective delivery filing cabinet, comprising a drum rotatable in both directions; a plurality of filing drawers in the said drum, each of the said drawers having an identification number; keys for effecting operation of the said drum for selectively opening and closing the said drawers; friction gears; a plurality of electromagnets pertaining to said friction gears; an electric motor acting on said friction gears to bring about the performance of all operations necessary for the selection, opening and closing of any of the said drawers as required; and other electromagnets controlling said electric motor and connected with said first mentioned electromagnets whereby said electric motor is energized synchronously with the energization of any of the said other electromagnets.

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References Cited in the file of this patent

Ser. No. 317,991, Bertello (A. P. C.), published April 27, 1943.