PUBLISHED
APRIL 27, 1943.
BY A. P. C.

E. BERTELLO

RECORD FILING CABINET OR THE LIKE ETC

Filed Feb. 8, 1940

Serial No.
317,991

3 Sheets—Sheet 1

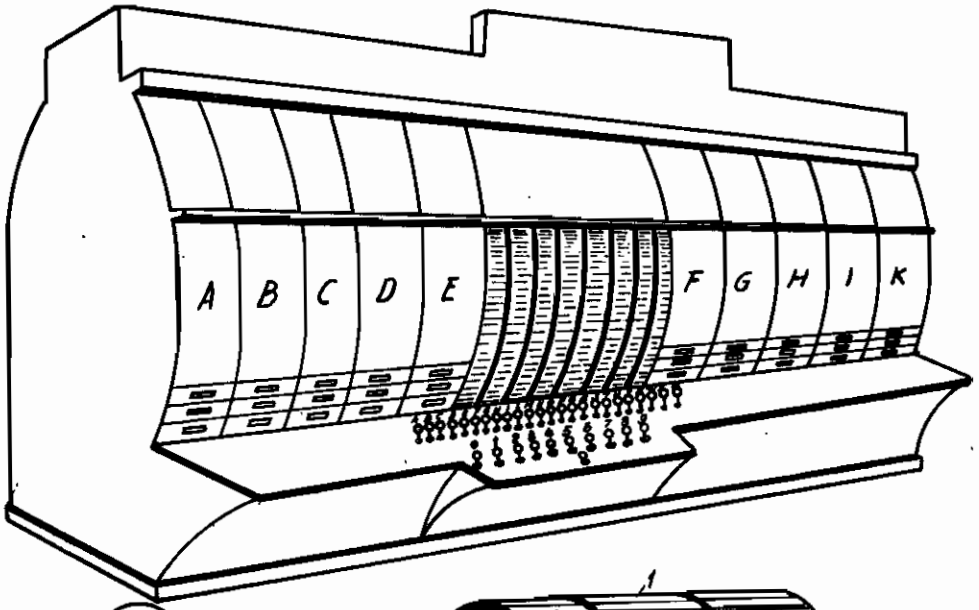


Fig. 1

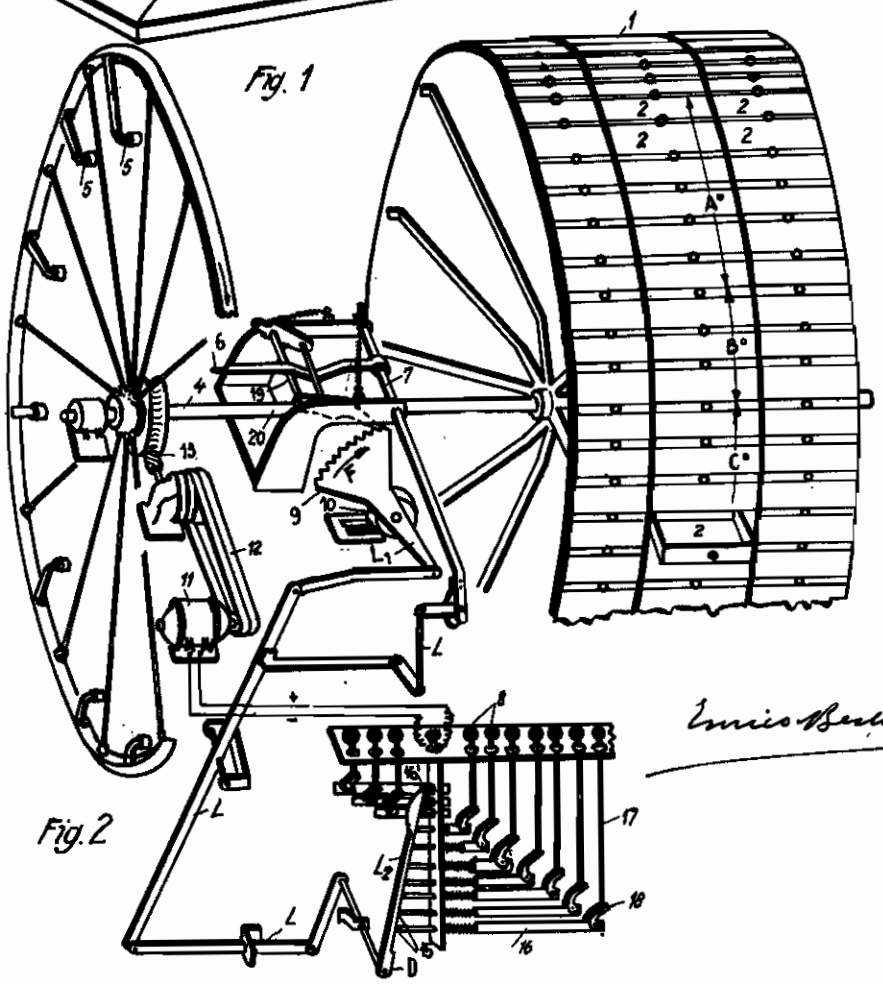


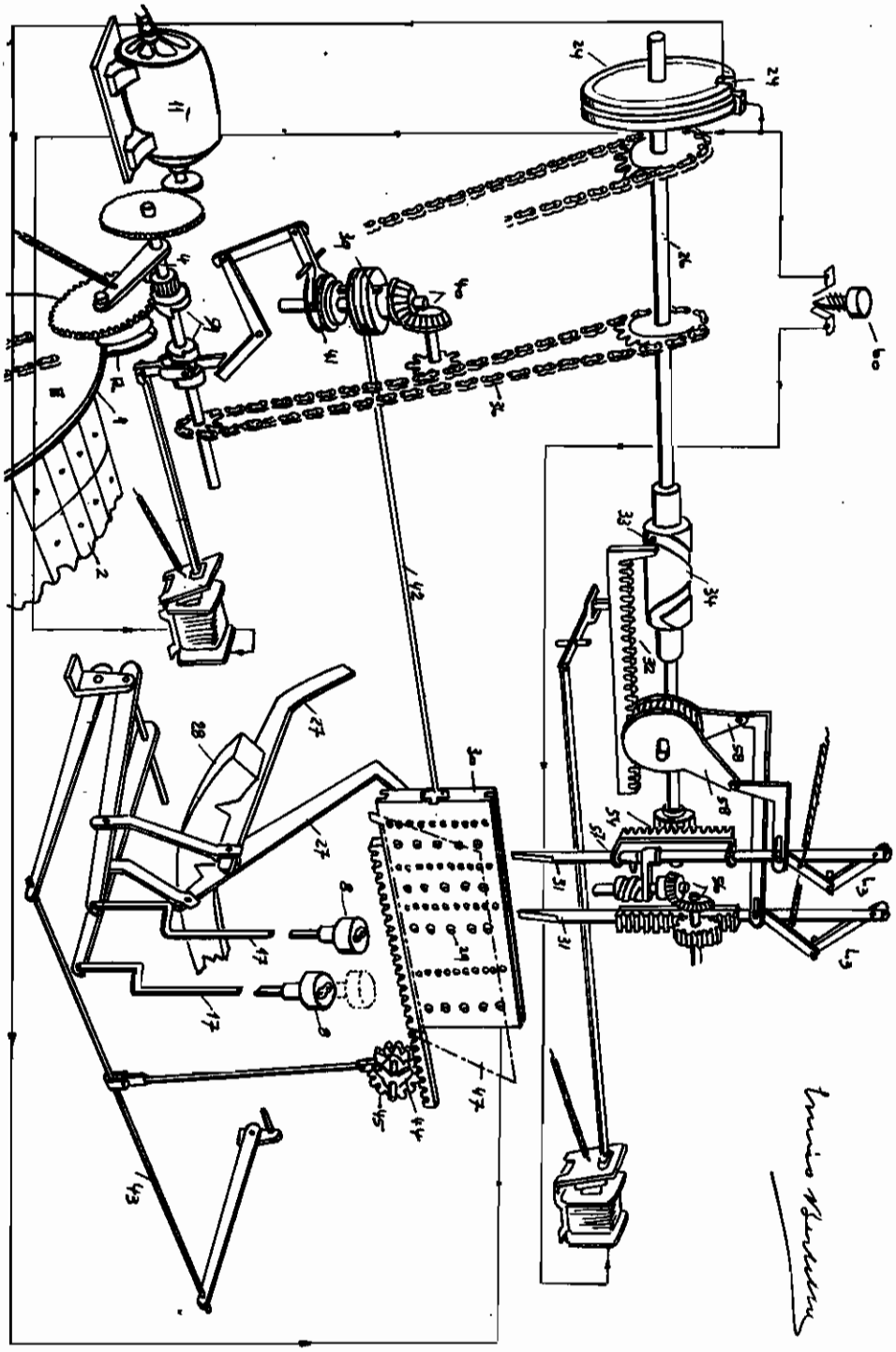
Fig. 2

Enrico Bertello

PUBLISHED
APRIL 27, 1943.
BY A. P. C.

E. BERTELLO
RECORD FILING CABINET OR THE LIKE ETC
Filed Feb. 8, 1940

Serial No.
317,991
3 Sheets-Sheet 2



PUBLISHED APRIL 27, 1943.

E. BERTELLO

RECORD FILING CABINET OR THE LIKE ETC

BY A. P. C.

Filed Feb. 8, 1940

Serial No. 317,991

3 Sheets-Sheet 3

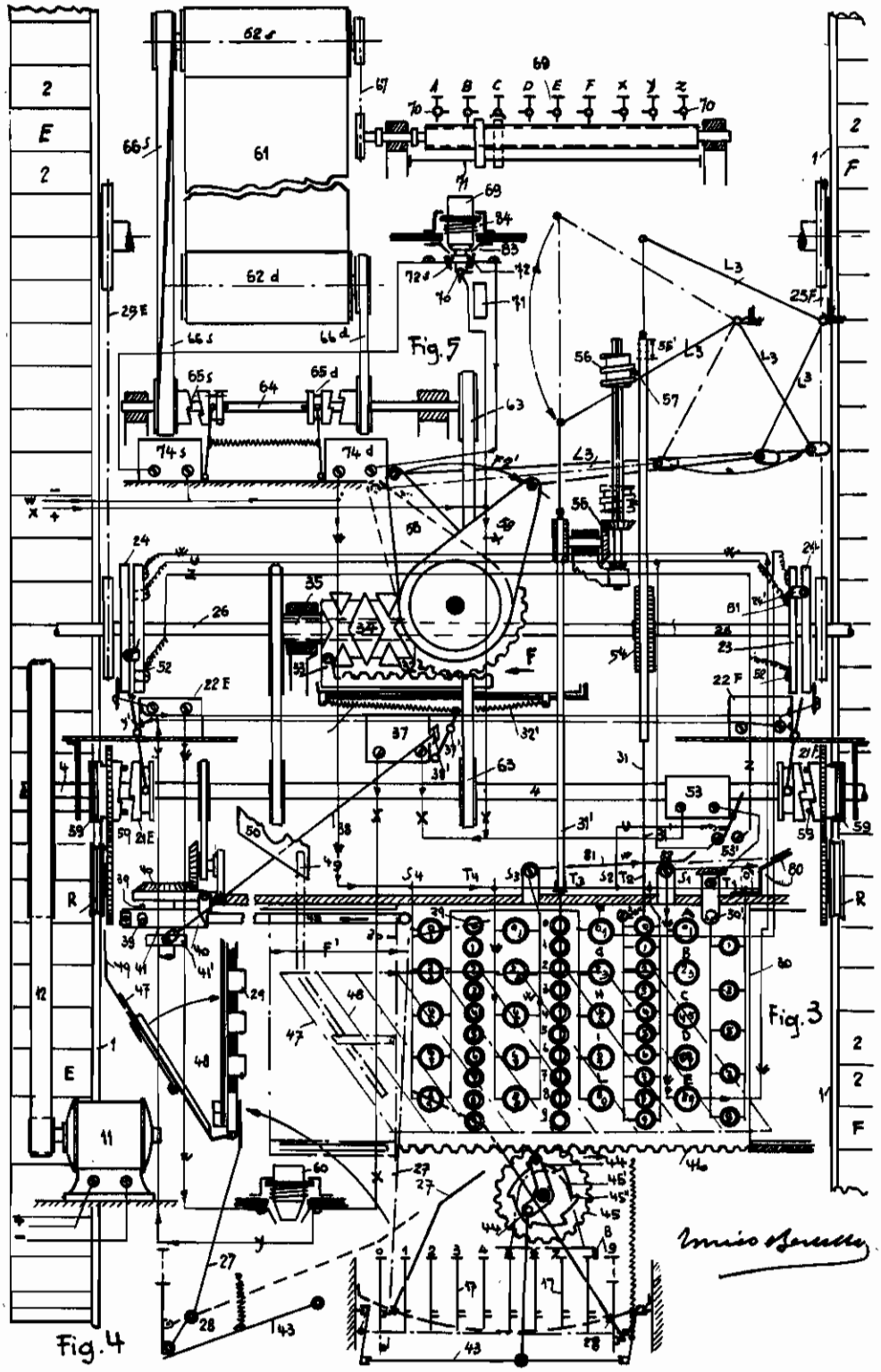


Fig. 4

Fig. 5

Fig. 3

Published Apr. 27, 1943

Serial No. 317,991

ALIEN PROPERTY CUSTODIAN

RECORD FILING CABINET OR THE LIKE ETC.

Enrico Bertello, Borgo S. Dalmazzo (Cuneo), Italy; vested in the Alien Property Custodian

Application filed February 8, 1940

This invention relates to a large record filing cabinet or the like, operable by electro-mechanical movement for the purpose of bringing to light or turning up the records placed therein in a very rapid and practical manner.

The invention consists essentially of one or more drums, functioning as file drawers and adapted to turn under the action of electrical forces produced indirectly by the striking of keys on a keyboard, each of which keys is directly or indirectly connected to a particular sector of the drum (in the case of only a single drum) or to one of the individual drums, when a plurality of drums are employed.

Two methods of carrying out the invention are here envisaged, one a simple construction and the other more detailed.

According to the first method of carrying out the invention, the apparatus consists of a single large drum having drawers therein and adapted to rotate through an arc of predetermined size in accordance with the duration of closing of ordinary electrical contacts which contacts are closed for a definite and varying period by each of the keys of the keyboard, and through the intermediary of mechanical devices, such that, in order to turn up a particular record, it is necessary first to ascertain in which sector of the drum it is located, and then to cause the rotation of the drum so that the sector or the record required is presented to the searcher who must finally carry out a small operation of selection in the sector according to the second method of carrying out the invention, which represents essentially a considerable improvement of the first method; the rotation of the drum, which, however, is in this case, replaced by a plurality of independent drums, is effected according to the number of the record desired to be turned up by the operation of separate electric circuits adapted to set in rotation through a suitable arc of a circle only one particular drum, that is to say, the drum pertaining to the record to be turned up, such that, in order to find a previously designated record, it is only necessary for the searcher to set up on the keyboard the corresponding number in order that the drum in question, and only that drum, shall rotate so that the required record is brought into position.

In accordance with the second method of carrying out the invention, the apparatus includes also a "rubric" ot column, having a continuous automatic band, unlimited in its contents, continuous in the sense that it is capable of movement of translation in two directions; automatic in the sense that it functions automatically by the mere pressure of a key and finally unlimited in the sense that it can be increased and lengthened, as desired, by the addition or insertion of any quantity of band as may be necessary.

In order that the invention may be fully understood, I shall now describe three embodiments thereof by way of example by reference to the accompanying drawings, in which:—

Fig. 1 is an external view of a cabinet embodying the invention.

Fig. 2 is a diagrammatic view of the operating mechanism for carrying out the first embodiment.

Fig. 3 is a general section showing the mechanism for carrying out the second embodiment.

Fig. 4 is a section on the line *a*—*b* of Fig. 1.

Fig. 5 is a general section of the automatic

Fig. 6 is a general section according to the third embodiment, and

Fig. 7 is a section on the line *a*—*b* of Fig. 6.

Referring first to the first embodiment, particularly to Fig. 2, 1 denotes the drum consisting of the cylindrical spokes *a*, *b*, c carrying small boxes or files. The cylinder is rigidly connected to the wheel 3 furnished with spokes corresponding in number to the number of the elements *a*, *b*, *c*; between each pair of the spokes 5 is located an abutment or projection adapted to strike against the movable abutment 6 fixed to a cross bar 7 itself connected, through the medium of a system of levers L, to the keyboard. The keyboard 8, through the said lever system L, and the complementary system L_1, controls the toothed sector 9 adapted to actuate the electrical contact 10 exciting the motor 11 so as, through the medium of the transmission 12, to cause the rotary movement of the gearing 13 and consequently the rotation of the wheel 3 and the shaft 4. The toothed sector 9 which is actuated by the lever systems L_1 and L by the keys 8, can be displaced proportionately to the angle A by the rods 15 of the sliders or selectors 16 actuated by rods 17 connected by angle strips 18. The arrangement may, however, be disposed around a vertical axis or one inclined to any desired extent, on a horizontal plane, or according to a gyroscopic method.

The above described arrangement functions in the following manner:

Assuming that each key is arranged such that, on the one hand it corresponds to a predetermined projection or abutment of the driving wheel for the purpose of producing a rotation in proportion to the duration of the electrical contact and, on the other hand, corresponds to a predetermined sector of the drum (thus, for ex-

ample, the key T is connected or related with S on the one hand, and on the other hand with when it is desired, for example, to turn up a record in the sector C, the key T, corresponding to the abutment S and the sector C, is pressed down such that the slider 16 moves the rod 15 to the desired extent so as, by means of the lever system L, to move the cross bar 7 radially of the drum so that the oscillating arm 6 strikes the projection S pertaining to the key T owing to the rotation of the wheel 3 effected by the motor 11 which simultaneously with the displacement of the bar 7 has been set in motion by the contact 10 itself closed by the simple operation of pressing down the key T.

At the moment when the projection S strikes against the arm C, the oscillating frame 19 of which the pawl 20 forms part, will, owing to the lowering thereof, produced by the impact, becomes freed from the toothed sector 9 which will thereupon return to its original position of rest together with the systems of levers L_1 and L and the apparatus will be again ready for a second operation. It will be understood, of course, that some of the mechanical devices may be eliminated and various constructional modifications introduced.

Referring now to the second embodiment, Figs. 3 and 4, the electric mechanism acting in dependence on the record (or, rather, the number of the record) which it is desired to turn up consists of a board or panel of selective contacts adapted to be actuated by levers connected to the keys of the keyboard in such a manner as to form the number corresponding to the record by energising particular electric contacts as well as the abutments against which bear the strikers adapted to determine (by reason of the position necessitated by the abutments and owing to their construction as racks acting on an axis carrying a contact disc) the relative position of the said contact disc which being furnished with interruptions causing, through the medium of an electro-magnet the braking of the axis which takes the movement of the driving shaft constantly in movement, and consequently the rotation of the drum in question by the amount of an arc corresponding to the position taken by the contact disc, and in the second place corresponding to the number set up on the selection panel with respect to the abutments activated thereby. Obviously, the apparatus outlined above calls for secondary devices necessary for its automatic functioning, such as the slide device for carrying the panel in a suitable position for undergoing the effect of the levers acting on it, the device for returning the parts to their state of rest, the braking arrangement for the principal axis, and the electric circuits connecting the electro-magnets to the contact discs.

The column having an automatic band consists of an electro-mechanical device connected to a keyboard corresponding to the letters of the alphabet by which the contacts controlling two electro-magnets are actuated, the electro-magnets, in their turn controlling two couplings adapted to cause the rotation of one of the drums on which is wound the band of the column for carrying it into the section of the letter desired.

In describing the apparatus having two hundred drawers per drum, an electric motor 11 (Fig. 3) connected to the main circuit actuates through the medium of the transmission 12 the shaft 4 provided with clutches 21 carrying the drums 1 themselves carrying drawers 2.

Each clutch 21 is also controlled by an electro-magnet 22 electrically coupled to the contact disc 23 coaxial with the disc 24 synchronised by means of the chain 25 with the corresponding drum. The keys 8 are moreover connected to levers 27 which are profiled and articulated at 28 and adapted to press on the pushers 29 movably located on the slide 30 in a vertical series of five elements (series S) and of ten elements (series T) of which each movable element serves respectively to form the number of the drum and the number of the particular drawer carried by this drum. The pushers of the series S are also coupled electrically through the medium of circuits to the corresponding contact disc 23 the rotation of which is limited or determined by the vertical rack-like sliders 31 and 31^1, the position of which is, in its turn, determined through the lever system L3 by the movable pushers of the series T and is effected by the gearing and the rack 32 actuated by the pawl 33 slidable in the double helix 34 bored on the countershaft 35 which, itself, takes its continuous movement from the guiding shaft 4 by means of the transmission 36.

An electro-magnet 37 is, moreover, provided for effecting the double role of controlling the displacement of the rack 32 adapted to allow vertical displacement of the slides 31 and 31^1 as well as to return, to its initial position, the slide 38 by means of the lever 38 and the clutch 39 adapted to enter one of the holes 40 so as to cause the rotation of the pulley 41 and consequently the winding of the flexible band 42.

The slide 30, moreover, comprises a mechanism of translation in the direction of the arrow F^1 coupled to the movement of the keys 8 and constituted by an oscillating spring rod 43 acting through the intermediary of the lever system 44 such that a pawl on the toothed wheel 45 engages with the rack 48 on which the slide is mounted to cause it to advance one step according to the interior profile 45^1 of the wheel 45 at each operation of a key, the state of rest of the system being assured by the position of the pawl 44^1 on the projection profile 45^{11}.

In order to return the pushers of the series S and T to their initial position, the carriage 30 is, moreover, provided with a hinged flap having members 48 adapted to abut the pushers, this flap being actuated automatically by the projection 49 sliding flexibly on the inclined plane 50.

In the case under consideration in which the drums carry 200 drawers the apparatus includes a particular arrangement according to which the contact disc 23 is provided with two interruptions in which are inserted two contacts 51 and 52 which receive their current from a commutator on the electro-magnet 53 according to whether it is a question of the drawers comprised in the first or in the second hundred of each drum.

Referring to the sliders 31 and 31^1 it must be noted that being coupled in their movements, the first 31, functions with respect to the tens (constituting the number to be formed) and the second, 31^1, functions with respect to the units in such a manner that 31 acts on the axis 26 of the contact disc 23 through the intermediary of the pinion 54 actuated by the rack 55 which is slidably mounted to permit of an additional translation 55^1 caused by the slider 31^1 through the system of translation 56 to which the rack 55 is coupled by the pivot 57 so as to produce a flexible connection between the two sliders. Moreover, the movements of the said sliders are regulated by the device 32 through the friction

system 58 which controls these movements through the medium of the lever system L3. The drums 1 also include a brake device 59 for the purpose of reducing their rotation at the moment of the de-clutching or disengagement of their shaft. The arrangement includes, moreover, a general push button interrupter 60.

The automatic column device, which has for its purpose to permit the turning up or finding of the number of a record in the sense of causing the column to slide at a remarkable speed and to stop it at the correct moment, consists of the band wound on the drums 62*s* and 62*d*, which take their movement from the main shaft 4 through the medium of the transmission 63 coupled to the shaft 64 on which are located the clutches 65*s* and 65*d* adapted to drop in the one direction or the other, the one or the other drum 62*s* or 62*d* by means of the transmission bands 66*s* and 66*d*. The device is, moreover, coupled by a chain transmission 67 to the endless screw or worm 68 of the keyboard 68 which carries as many keys 69 as there are letters of the alphabet. Below each key is mounted an oscillating angular stop 70 adapted to be turned by the nut 71 for the purpose of exciting the right or left contact 72*d* or 72*s* of the push button 69 which by means of suitable circuits excites the electro-magnets 74*s* and 74*d* adapted to control the clutches 65*s* and 65*d*, so as to cause the rotation in the desired sense.

In considering the case of an apparatus formed of 10 drums (A, B, C, D, E, F, &c.) which are independent and each carry two hundred drawers, the functioning of the apparatus is as follows:

Assuming the apparatus to be set in motion, the shaft 4 rotates freely, the clutches 21 being disengaged, as is shown in the drawings, and further assuming that it is desired to turn up the record classified under No. 834, that is to say, under a number contained in the first hundred drawers of the fifth drum (E), at this moment the carriage 30 is displaced completely to the left, the key corresponding to the number 9 is pressed so that the lever 27 connected to the key 8 strikes the corresponding pusher of the series S of the hundreds or selector of the drum so as to displace it forwardly with respect to the rear plane of the carriage so as to close the selector circuit through the medium of the electro-magnet 22E; at this moment the key under the action of the spring rod 43 will cause, through the medium of the mechanism 44, 45, 46, the carriage to be displaced one step to the right. Then the key 3 of the tens is now pressed so that the lever 27 of the key 3 pushes the corresponding pushers of the series S2 and T2, the first of which (the pusher of the series S2) in this case does not act, whilst the second (pusher of the series T2) determines and selects the ten; immediately on the release of the key 3 the carriage, under the action of the spring rod 42, will be displaced to the right through another stage so that at the instance of pressing the key 4 (of the units) the pushers of the series S3 and T3 will be found in the position suitable for being acted on by the lever of the pertaining key as in the preceding operation. At this instant the number 834 corresponding to the record to be turned up, will have been set up on the carriage of the pushers and likewise the contacts pertaining to the selection of the drum, the particular sector of the drum or the drawer will be found to have been completed through the circuit W which at the moment of the closing of the interrupter 80 (electrically connected to the circuit X of the mains) causes the electro-magnet 37 to be excited, as well as the particular electro-magnet of the drum 22E in question, so as to force the pawl 33 in the pathway 34 which, in its turn, causes the displacement in the direction of the arrow F, of the rack 32 and causing the movement of the friction arms 59 in the direction of the arrow F^{11}, which arm, through the medium of the lever system L3, cause, in their turn, the descent of the slides 31 and 31^1 until they abut against the displaced pushers of the carriage (indicated by the numeral 30 in the drawing) which, in their turn, cause the rotation of the shaft 26 determining also the relative position of the contact disc 23, it being noted that the slider 31 causes directly the rotation of the shaft 26, whilst the action of the slider 31^1 (of the units) is effected through the additional movement produced by the system 56.

Simultaneously, the circuit of the electro-magnet 22E is closed, thereby causing the engagement of the pertaining clutch 21E and by means of the pivot 59^1 disengages the brake and engages the whole friction transmission system R for the movement of the drum. Now, since the electro-magnet 22E remains closed when the pusher of the interrupter 60 reassumes its position by reason of the circuit Y and the contacts Y^1 connected to the bar of the electro-magnet, the drum E starts to rotate, transmitting its movement by means of the transmission 26E to the disc 24 until the contact 24^1 which returns with slight friction on the contact disc 23 arrives on the interruption or break 52 which, in this case, is not energised, and the electro-magnet 22E is de-energised and consequently disengages the clutch 21, disengages the pushers 59^1 and the friction brake acts to stop the drum at the exact point required.

At the same time, the electro-magnet 37 is de-magnetised and the spring 32 disengaged; the pawl 33 is caused to engage in the return path of the helix 34 thereby causing the whole apparatus to return into a state of rest, including the sliders 31 and 31^1 whilst, by reason of the play of the pawl 36^1 which abuts the pusher 37^1, the lever 36 forces the member 41 to push the pusher 39 into the hole 40, thereby causing the rotation of the pulley 41 which winding up the band 42 draws the carriage 30 into its initial position where the pin 39 which is provided with a secondary pin 39^1 slides on the inclined plane 40^1 thereby causing the disengagement of the pin 39 from the hole 40 so that all the members have resumed their initial position.

Assuming now that it is desired to turn up the record classified under the number 934, that is to say, a number of the second hundreds carried by the same drum E as previously used, the lever of the key D will strike the pusher E of the series S1 as previously, as well as the pusher 9 of the series T, which being electrically coupled to the electro-magnet 53 causes the energizing of the latter through the contact 53^1 which, through the circuit Z, feeds the current to the contact 52 and insulating the contact 51 (which in the preceding operation was given current by the circuit U) such that the drum turns beyond 52 so as to present the drawers beyond the first hundred, that is to say, whilst, in the first case, the drum rotates up to the limit of the interruption or brake 52 (which was not given current) in the case now under consideration, the drum rotates beyond the brake 52, that is to say, up to the limit of the interruption 51 which is not given

current. The remaining operations and movements are the same as above described.

Where it is required to turn up a record classified by a number of four digits, for example 1758, and assuming knowledge of the essential operation of pressing the keys one after the other, the mechanism functions in the following manner:

In this case the carriage has to carry out an additional step (four instead of three) that is to say it occupies a position such that the contact 30^{11}, in its turn, occupies the position of the contacts 30^{1} so that the pushers of the series T1 no longer function electrically, since it results through the corresponding pushers of the series T2 and, at the same time, by reason of the inclined plane 88, the rod 81 is moved by the contact 82 to insulate all the pushers of the series S, whilst the pushers of the series S2 cause, through the series S4, the closing of the circuit of the drums beyond the fifth, that is to say, the drums carrying records classified under a number above the first thousand. Obviously the position of all the series of pushers is displaced through one step so that the pushers of the series T3 determine the tens and those of the series T4 the units (the hundreds being determined by the contact disc 23); all the other movements and operations are carried out as described above.

According to the third embodiment, the apparatus acts in accordance with the index number of the record to be turned up and not by forming the number on the keyboard, but by picking out the number on the dials located concentrically to the knob or button, each of which corresponds to one of the drums of which the apparatus is comprised in such a manner that each drum constitutes a simple apparatus, and each dial carries as many numbers as there are drawers in each drum.

To this end the apparatus according to the third embodiment consists essentially of an indefinite series of drums carrying drawers, each of which is electrically and mechanically connected to a knob or button fixedly connected to a pointer turning on the dial and mounted on the same axis of the contact disc, such that by turning the knob with respect to the number arranged on the dial, the contact disc is compelled to take up a definite position, similarly as occurred in the previously described embodiment by causing a rotation of the drum in question.

In accordance with this embodiment, the drum 1 carrying the drawers carries a transmission 25 for synchronisation of the disc 26 freely mounted on the shaft 27 of the knob 85 on which is also fixed the contact disc 23 on which frictionally rolls the contact 24^{1}.

The said shaft or spindle 87 also has fixed thereon the pointer 86 turning around the dial 88 on which are progressively inscribed the numbers of the drawers of the drum.

The above described arrangement functions in the following manner:

If it is desired, for example, to turn up the record classified by the number 47, the pointer 86 is moved to this number on the corresponding dial and automatically the contact disc is caused to rotate up to the point where the interruption or break 51 comes into the corresponding position, such that the circuit W is closed through the medium of the contact 24^{1} of the synchronized disc 24 which causes through the electromagnet 22 the engagement of the clutch 21 and, by reason of this, the rotation of the drum until the contact 24^{1} becomes positioned in communication with the interruption or break 51 which, by breaking the circuit, causes the contrary action, that is to say, the opening of the circuit W, the disengagement of 21 and consequently, through the medium of the automatic brake 59, the arrest of the drum. If it is desired to turn up a record in another cylinder, it is necessary to have resource to the corresponding knob, and so on, each dial carrying the progressive numbers of the records contained in the drums.

With regard to the above method of operation, it will be appreciated that this latter embodiment provides the possibility of turning any number of drums at one time, whilst the previous embodiments envisage only the rotation of a single drum at the one time.

The column or "rubric" operates in the following manner:

Since the band carries in alphabetical order the name of the record and the number of the drawer in which the record is housed, and assuming that it is desired to turn up the number of a record, the initial of the name of which is the letter B, the column being at this moment located on a letter arranged to the right of the said letter B on the keyboard, the key B is pressed, thereby causing the closing of the contact 72*d* of the corresponding circuit, which exciting the pertaining electro-magnet 74*d*, causes the engagement of the pertaining clutch 65*d*, thereby causing the drum 62*d* to draw the band in the sense desired until, by reason of the synchronous displacement of the nut 71, the latter strikes against the end of the interrupter, which will thus be disengaged from the grippers 83 and, by means of a spring 84, will reassume its initial position. It must, however, be noted that, during its movement, the nut 71 alters the orientation of the angular contacts 70 of all the keys encountered over its path, which operation will be effected in the reverse manner in the subsequent operation, and thus in succession such that the contacts 70 are always left placed according to the direction of operation.

Obviously, the apparatus hereinbefore described is susceptible of various constructional modifications without departing from the spirit of the invention.

ENRICO BERTELLO.