



New connection on: : 05-06-2018 : 18:40:05 - Last disconnection on: : 02-06-2018 : 00:54:07

V 4.0.0.44358(LP,U,linux) (Rev:43856 2017-04-27 09:03:29 +0200#(D201802)) (RPM D201802)

Welcome to EPOQUE Rebuild under the Production Environment

[No database/cluster active] ..fi epodoc

 Database: EPODOC

[EPODOC: SS 1] mouse and control

Results in EPODOC 15.290

[SS 2] ss1 and cheek

Results in EPODOC 0

[SS 3] ss1 and head

Results in EPODOC 32

[SS 4] ss3 and move

Results in EPODOC 6

[SS 5] ..li



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PN - [GB384001](#) A 00000000

AP - GBD384001 00000000

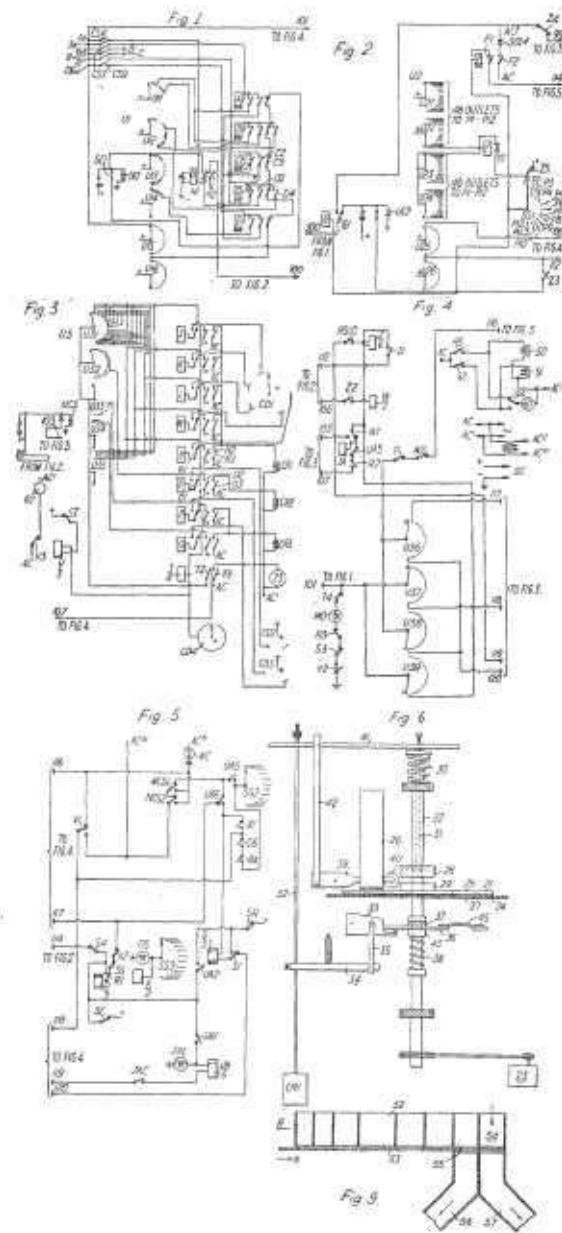
DT - *

AB - 384,001. Totalizators; display arrangements. ERICSSON TELEPHONES, Ltd., 67, Kingsway, London, and LIMB, F., Holmwood, Fellows Road, Beeston, Notting- ham. Sept. 10, 1931, No. 25356. [Class 106 (i).] To reduce the amount of display apparatus in a totalizator the number of characters displayed simultaneously is made substantially less than that required to give a complete indication of the actual or relative amounts invested on each of all the competitors in an event. For example, information regarding each of a plurality of competitors such as the totals or odds thereon may be displayed successively in the same display space, or information regarding win and place bets

may be displayed successively in the same display space. Alternatively the competitor numbers or other characters indicative thereof may be displayed in order of betting popularity. Numerous modifications are described. The indicators are preferably of the monogrammic type but may be of any other suitable kind. In the embodiment according to Fig. 1, the totals on nine competitors, both win and place, are displayed in turn on an indicator CT by means of a sequence switch SS stepped under the control of contacts X, periodically operated in any convenient manner. Consecutive odd and even contacts of banks ss6 .. ss10 are connected respectively by way of relay contacts to the wipers of the various competitor win and place registering switches. Thus lines 11 from these banks lead by way of contacts sa, ob, oc, od, oe, to wipers a (units), b (tens), c (hundreds), .., e (tens of thousands) respectively, of the win registering switch of a competitor equipment EB ; lines 12 lead to the corresponding wipers of the place registering switch of equipment EB. (Contacts sa, ob .. oe operate when their respective denominational registers first **move** off zero and serve to prevent the display of redundant zeros.) The banks a .. e are connected to the corresponding denominational elements u, t, h, th, tth of the indicator CT and are multiplied to the corresponding registering switch banks, both win and place, of all the other competitors. Associated with competitor equipments as EB or EA are plugs PB, PA the upper four contacts of which are connected to appropriate consecutive contacts in banks ss2, **ss3**, ss4 the lower three leading to registering controls RB, RA. These plugs may be inserted in any competitor jack J1, J3 .. J20, connected to ticket machines TMA, TMB, TMC and to the units, uc, and tens, tc, elements of the competitor number indicator CN. In operation, the plugs PA, PB, .. having been inserted in appropriate jacks J1 .. J20, a start key is thrown to operate a relay BS. At bs1 a relay Q is energized and interacts with drive magnet ss to step sequence switch until wiper ss2 reaches a contact marked over bs2 the relay Q being thereby short-circuited. Assuming plug PA is inserted in jack J13, switch SS will be stopped in position 1 and at bs3 circuits will be made over wipers ss6 .. ss10 by way of the competitor register EA to the totals indicator CT, and over wipers **ss3**, ss4, terminals 3, 10, the elements uc and tc will be energized to display the competitor number 13. Over bs4 and col the indicator WP will energize to display W for win. At the next actuation of contacts X, the sequence switch advances one step whereupon the earth at contacts bs3 is connected over ss6 .. ss10 to the place register of competitor numbered 13, the total thereon being now displayed at CT. The same competitor number is displayed at CN but a relay CO energized over the even (place) contacts of wiper ss5 changes the WP display to place at contacts co1. In subsequent positions of SS the totals, win and place, on the other competitors are similarly displayed. Contacts np1, np2 are operated when place betting is not allowed. Some of the contacts of bank ss2, for example one to six, are multiplied to thirteen to eighteen. The three competitors who are likely to be favourites are plugged in to these positions, their totals being thereby displayed twice as often as those of the remaining competitors. Alternatively the figures pertaining to the favourites may be displayed for longer periods by manual or automatic control of contacts X. A pool total indicator AT is provided and may be adapted to display both win and place pools under the control of further contacts of relay CO. By providing two sequence switches and CT indicators, win and place bets could be shown concurrently. In the embodiment according to Fig. 2, there are individual competitor total indicators CT1, CT2, .. and corresponding competitor number indicators CN1, CN2, ... Each competitor denominational win register wa, units, wb, tens, .. we is paralleled with the place register pa, units, pb, tens, .. pe. Normally the win totals are displayed over contacts cox1 .. cox5, and contacts wsa, wob .. woe

(correspondingly to sa, ob .. oe of Fig. 1), the place totals being displayed by periodically operating contacts X1 to operate the change over relay COB, contacts of which, as cob2, operate the COX relays of all the competitor registers. Contacts cob1 control the display of the W, win, P, place indication. In the embodiment according to Fig. 3, the competitor numbers are displayed in order of betting popularity on a vertical column of indicators CN1, CN2, CN3 .. CN24, CN25, the totals of only the first and last competitors being displayed. Associated with each indicator is a switch DS having two wipers ds1, ds2 which are manually set to indicate on tc1, (tens), and uc1, (units), the digits of the appropriate competitor number on closure of a key DK, the order of the numbers being changed as desired during betting. The first and last DS switches corresponding to indicators CN1 and CN25 have further banks ds3 .. ds7, to which are connected seriatim, the wires from competitor jacks J<1>1, J12, .., the first five wires leading to the DS switch of CN1 and the last five to the DS switch of CN25. A multipoint jack PA1, PB<1>, .., is associated with each registering switch, all of which have banks as aa1, ab1 .. ae1 multiplied to the corresponding denominational sections u1, t1, .. of indicator CTD1, and corresponding banks aa2, ab2, .. ae2, similarly multiplied to the sections u25, t25 .. of indicator CTD25. The jacks J<1>1, .. of the competitors who it is assumed will be first and last as regards betting popularity, are inserted in their respective jacks PA<1>, PB<1>, .. and the DS switches corresponding to indicators CN1 and CN25 are set to the appropriate positions and keys DK thrown, the indicators CTD1 and CTD25 then displaying the totals invested on these competitors respectively. If the number of competitors is less than the number of indicators CN1 .. CN25, the former may be given positions in the vertical column corresponding approximately with the relative totals thereon. In a modification one DS switch and indicator CN1 only may be provided, the competitor numbers being displayed successively in their order of betting popularity thereby.

PN - [GB925985](#) A 19630515
 PR - GB19580030689 19580925
 AP - GB19580030689 19580925
 DT - *
 CCI - [G07F5/24](#)
 PA - JOHN HENRY RUSSELL
 TI - Improvements in or relating to automatic vending machines
 AB - 925,985. Coin-freed vending apparatus. J. H. RUSSELL. Sept. 18, 1959 [Sept. 25, 1958], No. 30689/58. Class 27. [Also in Group XIX] A coin-freed vending machine has pulsegenerating means providing a number of pulses according to the value of a coin or coins inserted to set forward stepping switch means, a selector switch set according to the article to be purchased, article-delivery means arranged to release an article when the stepping switch means reaches the position set on the selector switch and change-control means whereby the pulses received after the set position is reached regulates the amount of change given. Coin-operated switches CS4-CS9, Fig. 1, are, with the exception of the penny switch CS4, connected to relays A-E which complete circuits for a stepping relay H so that pulses according to the coin value operate the coil UC1 of a first uniselector switch U1. For a shilling, the wiper of bank U12 is stepped round to its thirteenth contact when the relay C is de-energized and the closing of contact C3 completes a circuit between the fifth bank U16 and the self-interrupting contacts SC1 of the coil UC1 so that the uniselector switch is homed to zero position. For a two-shilling



piece, the bank U12 is first pulsed to its thirteenth contact through contacts D1, D2 of relay D and then through contacts D4, D2 until it reaches the twenty-fourth contact. Bank U11 serves for both the penny and sixpence relays and banks U13 and U14 co-operate together with relay E for half-crowns. Contacts H2 of relay H are connected through line 100 and relay contacts G1, Fig. 2, to the coil UC2 of a second uniselector U2 which therefore receives the same setting pulses as uniselector U1 but will total the value of coins inserted one after the other as it does not receive the homing pulses. Uniselector U2 has four banks totalling 96 contacts, or a price of eight shillings, the first two banks U21 and U22 counting up to 48 pennies during a first revolution and then energizing a relay Y so that the banks U23 and U24 count the next 48. Before inserting money, the customer sets a selector switch having three banks SS1, SS2, **SS3**, Figs. 2 and 5, each with contacts corresponding to the number of articles for sale and connected to an outlet on the uniselector U2 ending one penny short of the price of an article. When the wiper on switch U2 reaches the outlet corresponding to the selected article, relay G is energized and further pulses from stepping relay H are transferred from coil UC2 to coil UC3 of a third uniselector U3, Fig. 3, so that this uniselector is moved a number of times equal to one more than the excess value in pennies of the coins inserted, the first movement bringing the uniselector into

operation for counting the change required. A relay F closes the coin slots, locks the selector switch and connects a holding circuit through a switch SC, Fig. 5, which is opened once in each cycle by a cam. Uniselector U3 continues stepping until the first uniselector U1 stops and homes to zero, when the banks U37, U39, Fig. 4, are brought into circuit and a coin acceptance relay R, Fig. 5, is energized, through contact V1 of a normally-closed relay V, no-change switches NCS1, NCS2, contact UA6 of a normally-open jackpot relay UA, contact X2 of the normallyopen out-of-stock relay X and the contact S5 of the normally-open coin reject relay S. Contact R2 is closed to supply current to banks U31-U35 and through the outlets on which the wipers rest (corresponding to the amount of change required) to change-making relays J-Q, Fig. 3, which give change in the minimum number of coin combinations, excluding threepenny and two-shilling pieces. For example, if elevenpence is required in change, relay N (five pennies) and relay O (one sixpence) are energized by the wipers of banks U31 and U32 and their contacts 1-3 energize a locking circuit, coin-release solenoids CR1, CR2 and a motor relay T which energizes a change-giving motor 23 and de-energizes the banks U31- U35. The motor 23 drives a disc 21, Fig. 6, for each kind of change coin through a clutch 28, 29 which is engaged when the appropriate solenoid such as CR1 is energized. The disc has a number of holes 25 which bring

coins from a supply tube 26 to a discharge hole 27 and the number discharged depends on the arc through which the disc is rotated. A switch disc 36 is driven by a slipping clutch 37, 43 when a lock 33 is released by the solenoid linkage and when the disc reaches the fifth of a series of contact arms 45 the solenoid is de-energized and the clutch 28, 29 disengaged but the motor 23 continues to turn until the lock 33 engages a radial slot in the disc and the motor relay T is de-energized. A roller 40 linked to the solenoid rides on the disc 21 and ensures the clutch 28, 29 can only disengage when the disc has rotated through an exact multiple of the angle between adjacent holes, the roller then dropping into one of the holes. The accept relay R is energized when the first unselector U1 homes following the attainment of the price of the selected article; the contact R3, Fig. 4, then opens and extinguishes the machine-operating lamp MO, which is also extinguished while unselector U1 is operating and while relay T is energized to drive the change-giving disc. The stepping of the wiper of bank U37 on to its main arc energizes relay Z and closing of contact Z3 supplies current to the self-interrupting contacts of the coil UC2 so that the second unselector is homed. Contacts Z4 and Z5 de-energize the stepping relay H and relay Y and contact 26 energizes through the article selector switch a solenoid which releases the article. Contact Z2 energizes relay W and the self-interrupting

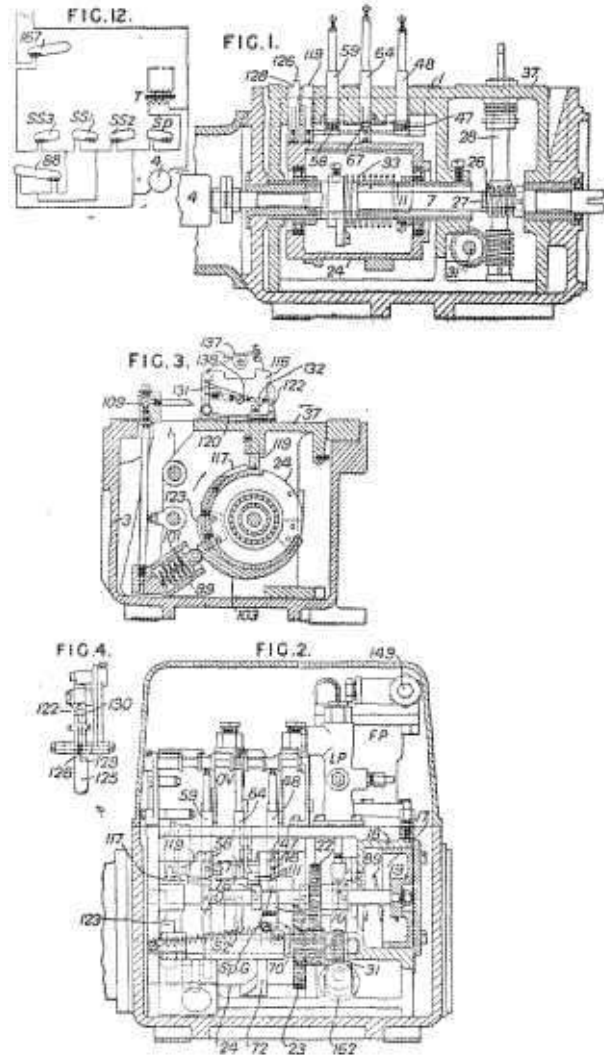
contacts of the coil UC3 of the third uniselector are energized for homing of that uniselector. Relays Z, W and Y are then de-energized. Closing of contact R5, Fig. 4, energizes the accept solenoid 50 for the inserted coins and a motor 60 for delivering the released article. The whole cycle of events having been completed, the cam switch SC, which is operated by the delivery motor 60, releases the relays R and F and de-energizes and unlocks the main selector switch SS. Relay 6 releases and lamp MO is re-illuminated. If there are only a few coins left in the sixpence or shilling coin tubes, either the switch NCS1 or NCS2 changes over and a lamp NC is illuminated to indicate that the exact money must be inserted. When the exact money is inserted, the wiper of bank U36 moves one step from its zero contact and makes a circuit through a line 117 to the coin-acceptance relay R. If more than the correct money is inserted, the wipers of banks U36 and U38 **move** on to their main arcs so that the coin-reject relay S is energized through line 120 and all the money is returned. A contact S4 is used to break the locking circuits of relays F and R as the cam switch SC is not operated unless an article is delivered. The shilling switch NCS2 may be arranged to divert pulses requiring the giving of shillings in change to cause release of the equivalent value in shillings. Additional pennies for change are contained in four tubes in a turret rotatable through quarterrevolutions by a motor 62, Fig. 3. A

normally energized relay V is de-energized by a switch ST when only a few coins are left in a tube and its contact V3 energizes the motor 62. If an article column becomes empty, a switch applies current to the appropriate contact of the selector bank **SS3** and when this column is selected by a customer, a relay X is energized to illuminate a lamp OS and, if money is inserted, to energize the reject relay S through contact X1. A contact X2 opens to de-energize relay R. To provide for free delivery of an article after a predetermined number of sales, a stepping relay JA, Fig. 4, imparts small movements to a cam which eventually opens a contact JAC and causes relay UA to be energized. Closing of contact UA6 re-routes the current which otherwise serves the relay R and directs it to the relay S to reject the money inserted, the delivery motor being energized through contacts S2 and UA4 and the article-release solenoid through contact UA5. If the customer desires return of his money before it totals the price of a selected article, he operates a switch RS10, Fig. 4, to energize relay Z and cause unselector U2 to home and reject the money by a mechanical action. According to whether the coin-reject relay S or the accept relay R is energized, a solenoid 50 or 51 is energized so that a coin reservoir 54, Fig. 9, for each denomination of coin is moved to the left and the coins fall through a hole 55 in a base 53 to a reject shoot 56 or the base is moved to the right and the coins fall to an acceptance shoot 57.

Instead of three uniselectors, two may be used if the second one is arranged to count forward beyond the preset article value as the coins are inserted and then count back again to the preset value and release corresponding change.

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- PN - [GB409392](#) A 19340503
- PR - GB19320027440 19321003
- AP - GB19320027440 19321003
- DT - *
- CCI - [F23N5/22](#)
- IDT - 24B11D5
- PA - G N HADEN & SONS LTD; PERCY HENRYHERRING
- TI - Control apparatus for liquid fuel burners
- AB - 409,392. Electrically actuated valves. HADEN & SONS, Ltd., G. N., Trowbridge, Wiltshire, and HERRING, P. H., 60, Kingsway, London. Oct. 3, 1932, No. 27440. [Class 135.] A liquid fuel burner control apparatus comprises an electric motor arranged to **move** a body carrying cams which successively open a fuel supply valve, operate a fuel ignition device, and, should ignition of the fuel be not effected or fail, open a switch in the motor circuit, whereupon the cam-carrying body is returned to its initial position. The cycle of operations is then repeated a predetermined number of times unless ignition occurs. Liquid fuel is supplied to the burner from a pump FP on a shaft 28 driven through worm-gearing 26, 27 by the shaft 7 of an electric motor 4 which also drives an air compressor. Most of the air from the compressor passes to the



burner but when the motor 4 is started some passes through a union 17 to a cylinder 18 and forces a piston 19 outwardly against the resistance of a spring 89. A pinion 22 carried by the piston 19 and driven through worm gearing from the shaft 28 is thereby caused to mesh with a toothed segment 23 on a drum 24 rotating on a bearing tube 11 surrounding the shaft 7. The drum 24 carries a number of cams operating successively tappets slidable in the upper web 37 of a frame 1 enclosing the control mechanism. A cam Sp. G first engages a roller 46 and tilts a lever 47 to raise a tappet 48 thereby opening a valve to supply gas to a nozzle adjacent the burner and closing a mercury switch Sp to energize a transformer T causing sparking at the nozzle. A cam O next engages a roller 57 on a lever 58 and lifts a tappet 59 to open a valve OV allowing liquid fuel to pass to the burner and to close a switch SS1 in the motor circuit. The fuel mixed with air from the compressor normally is ignited by the gas flame and the passage of the cam Sp.G past the roller 46 causes the gas supply and sparking to cease. Further rotation of the drum causes a cam S2 to lift a tappet 64 to open a mercury switch SS1 in the motor circuit, the tappet 64 being gripped and held in its raised position by a spring pressed plunger engaging in a groove 67. Previously to the opening of the switch SS2 a parallel circuit to the motor is completed through the left-hand contacts of a switch 88 located in the chimney stack or flue and

rocked by the heat of the flame. The drum continues to turn and as the segment 23 disengages from the pinion 22 is given a rapid partial rotation by a roller 70 on a spring-pressed stirrup 76 engaging a ramp on a block 72 fixed to the drum. The burner now operates until current is shut off from the motor either intentionally, by the opening of a switch 167 by the furnace or room temperature, or by the opening of the stack switch 88 if the flame fails. The stoppage of the motor reduces the air pressure in the cylinder 18 causing withdrawal of the pinion 22 and the movement by a collar 76<1> on the pinion shaft of the stirrup 76 to its initial position. The drum 26 is then returned to its initial position by a spring 93, its rate of movement being controlled by a cam 103 on its surface operating the spring-pressed piston 101 of a dashpot 99. Oil previously drawn from a sump in the base 3 is forced by the piston 101 past an adjustable ball valve 109 and is discharged over the web 37 so as to lubricate the tappets before returning to the sump. At the end of its return movement a cam 111 on the drum withdraws the plunger supporting the tappet 64. Should ignition of the liquid fuel not be effected the motor will stop when the switch SS2 is opened and the parts will similarly be returned to their initial position. The control apparatus will then recycle, each abortive attempt at ignition causing a ratchet arm 116 to be lifted by a ratchet pawl 122 relatively to a hold-on pawl 130 and the fourth attempt resulting

in the operation of a switch
 carrier 137 to open a switch **SS3**
 in the motor circuit, when the
 apparatus is rendered
 inoperative until manually reset.
 The rate of fuel flow to the
 burner is controlled by an
 adjustable bye-pass valve 149.

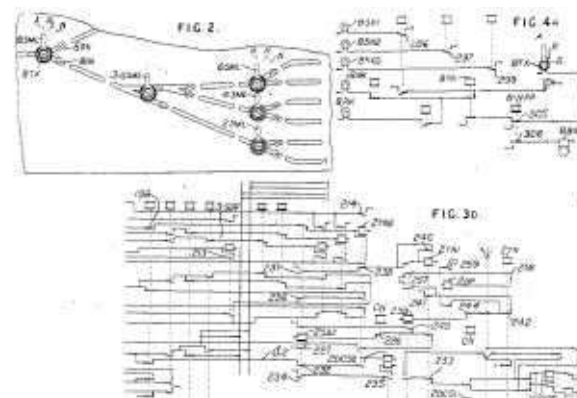
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- PN - [GB302200](#) A 19281210
- PR - GB19270021042 19270809
- AP - GB19270021042 19270809
- DT - **
- CCI - [H04Q3/0016](#)
- PA - ASS TELEPHONE & TELEGRAPH CO; JOHN WICKS
- TI - Improvements in or relating to automatic or semi-automatic telephone systems
- AB - 302,200. Associated Telephone & Telegraph Co., and Wicks, J. Aug. 9, 1927. Automatic and semi-automatic exchange systems. - In an automatic telephone system comprising a step-by-step and a revertive-control exchange, separate register-controllers are provided in the step-by-step exchange to control inter exchange communication in opposite directions. In working between the revertivecontrol exchange RCX and the step-by-step exchange SSX, Fig. 25, a subscriber X is connected by line-finders. to a first selector R1 and a register RG. and RG controls R1 to find an idle interexchange trunk to a repeater translator RT at SSX. RT includes a counting-relay set and a pair of interrupting relays which act first to send impulses to RG and the counting set until the fundamental circuit is broken and then to the counting set and the sfep-by-step selector until the former is saturated. This is repeated for each digit, the step-by-step selectors used in any interexchange call being arranged on a similar non- decimal basis to the RCX switches. The step-bystep connector is of the 200-point type with two sets of wipers, so that arrangements are made for the counting set to operate twice over when required before becoming saturated, and for a wiper-changing relay to operate. In working from step-by-step to revertive-control, each digit dialled is registered on a separate relay counting-set which is saturated in turn by revertive impulses from the RCX selectors. The counting sets, which operate as shown in Fig. 11, are comprised in a register-controller RC connected to a repeater D in SSX reached by subscriber A through line switch LS and selector SL1. The selectors R2, R3, R4 in RCX are of the 200-point type and are arranged as shown in Fig. 6, which shows the setting up of an entirely revertive-control connection. It will be seen that for varying combinations of odd and even digits, the counting sets may require to be saturated by nine, ten, or eleven impulses. A pair of relays operated in turn by consecutive impulses during each digit and then released, discriminates between odd and even digits, and controls for each digit a relay associated with its counting set to modify the circuits controlled thereby as required. An operator may be reached by dialling a special number, through a special repeater D2 at SSX and a special selector R7 at RCX. It will be seen from Fig. 6 that if the thousands digit is 0, the counting set will receive 19 impulses in all; this is provided for by releasing the counting set after the dialled impulses are received and the nine

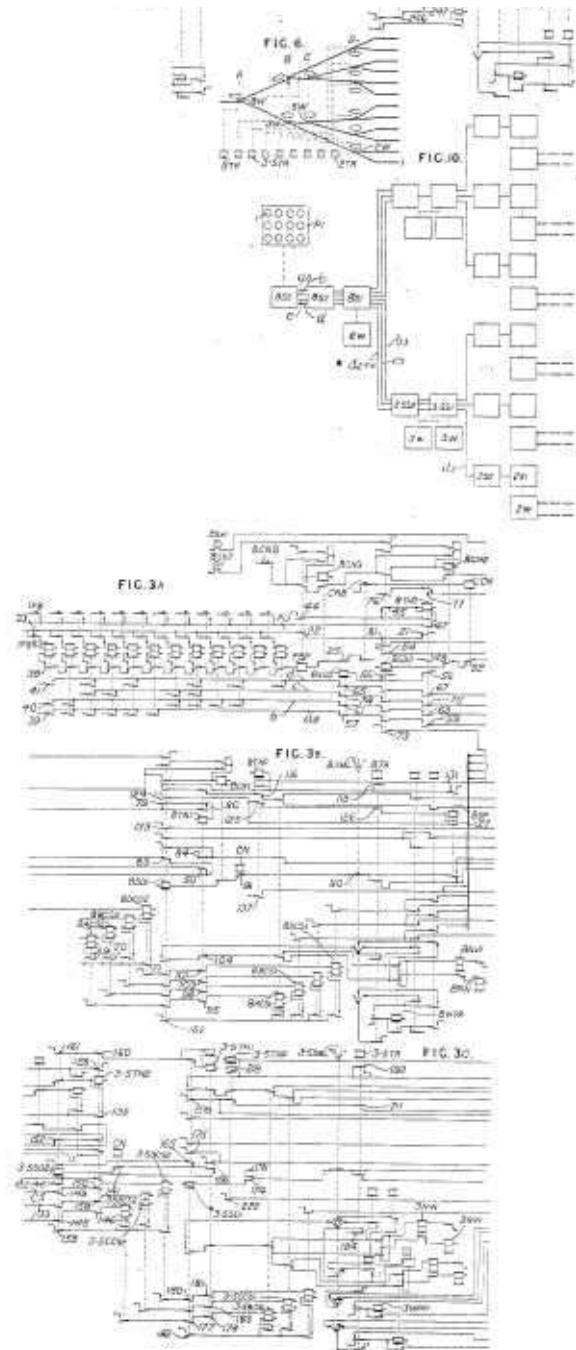
revertive impulses are then sufficient to saturate it. Operation in case of premature disconnection or delayed dialling is described and modified connections for revertive-control exchanges in which the selectors are held locally instead of from the register-controllers when dialling is delayed. Preferably the register-controllers for step-by-step to revertive-control working will be provided in common for a number of trunks, while for opposite working, they will preferably be individual to the trunks. If a revertive-control subscriber, called from the step-by-step exchange, fails to hang up, an alarm lamp will warn an operator. Inter-exchange connections with a manual exchange MX are shown on Fig. 25; this exchange is provided with keysenders and call-indicator sets arranged for working with the revertive-control exchange, so that calls between MX and SSX will be made over identical translator or register-controller apparatus with that used between RCX and SSX. In calls local to the step-by-step exchange, selectors such as SL1, SL2, SL3 are used for the first three stages, the final selection being made through one bank of a connector S4, or over a normal connector SL4, according as the hundreds digit is odd or even. Setting up connection from a step-by-step subscriber to a revertive-control subscriber 26249. Registration of digits. A subscriber at the step-by-step exchange is connected by a plunger-type line switch of the usual type controlled by a master switch to a first selector which is operated by the first digit dialled to find an idle trunk to a repeater D, Fig. 2. Line relay 162 energizes over the subscriber's loop and relay 163 then operates to energize the pull-down winding of the plunger-type switch E, Fig. 3, in series with the upper winding of relay 165 which is not operated. Magnet 204 locks up over both its windings in series and the remainder of the operation of the switch and its master are well-known. Switch E seizes a register. Figs. 3, 4, and 5, over wipers 250 - - 253, relay 209 energizing over lead 171 to earth conductor 232 and to connect a time-pulse lead to conductor 231. Relay 162, Fig. 2, repeats the next digit over conductor 199 and wiper 252 to relay 218, and relays 219, 220 are operated throughout the digit. The first impulse energizes two-step relay 211 of the thousands register 211 - - 215 over conductors 234, 242, and the register relays are so interconnected that their method of operation for various digits is as shown in Fig. 11. When relay 220 operates, relay 401 of the two-step input-control relays 401 - - 404, Fig. 5, operates its armature 419 from earth at 279, and when 220 releases at the end of the digit, a shortcircuit is removed from the lower winding of 401 which energizes fully to earth at 282 to transfer the impulsing circuit to the hundreds register relays 321 - - 325, Fig. 4, which lock up over 325, 491, 438, 232. If the hundreds digit is unduly delayed, relay 413 energizes to open 491 and present registration of the hundreds digit. At the end of the digit, when relay 220 releases, control relay 402 operates fully to transfer the impulsing circuit to the tens register 331 - - 335, and to hold the hundreds relays at 434 independent of relay 413. The tens digit is registered after which relay 403 transfers the impulsing circuit to units register 341 - - 345 and at the end of the units digit, control relay 404 energizes fully to open the impulsing circuit. Operation of revertive control switches. After the thousands digit is registered and relay 401 is energized, the incoming second selector R2, Fig. 7, is connected to the register controller over trunk 168, 169, Fig. 2, and conductors 172, 199, in a circuit through relays 503, 206, 505 and contacts of sequence switch SS2, Fig. 7, in its first position, only 503 operating. Magnet 510 then energizes from earth at 517 and SS2 advances to the second position, cutting out 503, and completing a fundamental circuit in which 206, 505 energize. Magnet 508 is now energized to rotate the trip-spindle so that interrupter 513 intermittently shorts 206. Operation of 206 forms a circuit from 257 to the thousands register, in which 211, 215 have been left energized by the six impulses, so that on the first de-energization of

206, Delay 212 fully operates. It will be seen from the impulse table, Fig. 6, that in reaching the six thousand level of R2, three reverive impulses will be sent, after which relays 211, 214, 215 of the thousands register are operated, see Fig. 11, and relay 208 then energizes over 229, lower winding of 405, 239, 283, 287, 302, 316, 240, 450, conductor 232 to earth to open the fundamental circuit. Release of 505 releases magnet 508 and completes a circuit for magnet 510 to advance SS2 to position 3. Relay 505 again operates to release 510, the brush carriage magnet 509 operates and the selected brushes rotate to an idle third selector R3, Fig. 8. Relay 405 energized partially in series with 208 and pulls up fully over 448, disconnecting earth at 450 to release the thousands register. Immediately SS2 reaches position 3, relay 205 is energized in series with retard 502 and relay 503 over N (1, 2), J (3, 2) of SS2 to hold 208 over 256, 264 until an idle selector is found while 405 prepares an alternative locking circuit for 208 over contacts of relay 402 until the hundreds digit is registered. When R3 is reached, relays 506, 702 now operate in series, the latter forming a locking circuit over K3, 2 of **SS3** and contacts 711. Relay 507 is short-circuited over the rack 512 until the brushes are properly aligned on the selected contacts when it energizes in series with the upper winding of 506 and in parallel with the lower winding thereof in the locking circuit of 702. Magnet 509 is then released and the holding magnet 511 energized. Magnet 510 also operates over C (3, 2) and A (1, 2) in turn to **move** SS2 to position 6, connecting 168, 169 to R3, and short-circuiting 205. Relay 208 is held in a circuit over 432, 449, but when the hundreds digit is registered energization of 402 releases 208, and the fundamental circuit is now extended to energize relays 206, 704. Magnet 707 now operates over 715 to step **SS3** to position 2, in which trip-spindle magnet 705 is operated. At each step of the spindle, interrupter 708 shorts 206 which sends impulses to the hundreds register 321 - - 325. From Fig. 6 it is seen that in reaching the level of R3 containing 26200, eight impulses will be sent to the register and since two have already been sent, relays 321, 322, 324, 325 will then be locked. Fig. 11, and relay 208 is again operated in series with the lower winding of relay 406 over conductors 246, 247, contacts 363, 375, 378, 374, 379, conductors 350, 232 to earth. The fundamental circuit is opened so that 206, 704 de-energize, 406 energizes fully, and **SS3** steps from position 2. On reaching position 3, relays 205, 701 energize in series, so that 208 is again independently locked by relays 205, 406. When **SS3** position 4, relay 704 operates, and in position 5 the sequence switch stops. The brush carriage magnet 706 now operates to find an idle final selector R4, Fig. 9, when relays 703, 751 energize and lock up. Test relay 703 de-energizes 704 if the brushes are correctly aligned, releasing magnet 706 and energizing holding and sequence swi

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 PN - [GB696790](#) A 19530909
 PR - USX696790 19500815
 AP - GB19510017868 19510727
 DT - *
 CCI - [B61L17/023](#)
 PA - GEN RAILWAY SIGNAL CO
 TI - Improvements in or relating to automatic switch control systems for classification yards
 AR - 696 790 Operating railway



690,790. Operating railway points. GENERAL RAILWAY SIGNAL CO. July 27, 1951. [Aug. 15, 1950] No. 17868/51. Class 104 (i). A switch control system in which the track switches in a marshalling yard are automatically positioned in accordance with the route selected by manually operable devices on a central control panel and comprising a plurality of route description storage banks of relays including a storage bank associated with each of the track switches in the track layout, circuit means which act in response to the designation of a given destination for a cut of cars by the manually operable devices to condition the storage banks associated with the first track switch in the route to such destination in accordance with the position required by that track switch and all other track switches for that route, and transfer means for each storage bank except the one for the last track switch in each group, is arranged so that the transfer means for the storage bank is rendered active by the passage of a cut of cars over the track switch associated therewith to transfer the route description then existing in the storage bank and relating to the remainder of the route to the next track switch in the route; the transfer means only being effective when the associated track switch assumes the position called for by the route description stored in the associated storage bank. In the hump marshalling yard arrangement shown in Fig. 6 the track switches are arranged at four locations A, B, C and D and



the switch 8W is located after the hump. The track switches are numbered so as to bear the number of the track to which a cut of cars will be directed if the track switch so numbered is in its reverse position and all the other track switches in the system are in their normal positions. The system is controlled from a central panel P1 Fig. 1 (not shown) located near the hump and has a number of self restoring push buttons PB, one for each track in the system, cancel push buttons 8CNB and CNB and indicator lamps 8SK1, 8SK2 and 8SK3. A control panel Fig. 2 is also provided for manual or automatic operation of the system and has switch levers SML for manually moving the various track switches to the reverse R or normal N positions or allowing the automatic A operation of the track switches. The levers SML are spring biased and when pulled upwards effect cancellation of the track switch operation. The system control apparatus, Fig. 10 has route storage units S associated with the control of the various track switches, and each unit has a bank of code storage relays CS, one for each track switch, through which a cut of cars may pass to its destination. The first three units 8S1, 8S2 and 8S3 each have four storage relays CS since this is the maximum of track switches through which a cut of cars will pass in the system shown, and they are fed by wires a8, b, c and d which govern the positions of the switches at the A, B, C and D locations respectively. General mode of operation. Assuming a

cut of cars is to be routed to track I, Figs. 6 and 10, a button 1 on panel P1 is pressed to set up a route description in the storage unit 8S3 calling for the operation of switches in locations A, B, and D and if the storage units 8S2 and 8S1 are not occupied the description is transferred through the wires a8, b, c and d to unit 8S1. Since switches in location C are not used in this instance wire c is not energized and only the wires of those switches to be moved to their normal position in the locations A, B and D will be energized. Once the route description has been stored in unit 8S1 switch 8W is energized to be moved or held in its normal position through wire a8. When a cut of cars occupies a track detector section of switch 8W the route description effecting the switches in locations B and D is transferred from the unit 8S1 to the storage unit 3-5S2 or if not already occupied, unit 3-5S1 through wires b3 and d2-4-6 and since wire b3 is energized the track switch 3W is either moved to or held in its normal position. The route description effecting the switches in location D is transferred when the cut of cars enters a track detector section of switches 3W and 5W, through wire 2d to transfer the balance of the route description from unit 3-5S1 to storage unit 2S2 or, 2S1 if not already occupied, to **move** to or hold in the normal position a track switch 2W. The route storage in unit 2S1 is cancelled when the cut of cars passes the track detector section of switch 2W. Route description. The push button 1PB Fig. 3A on

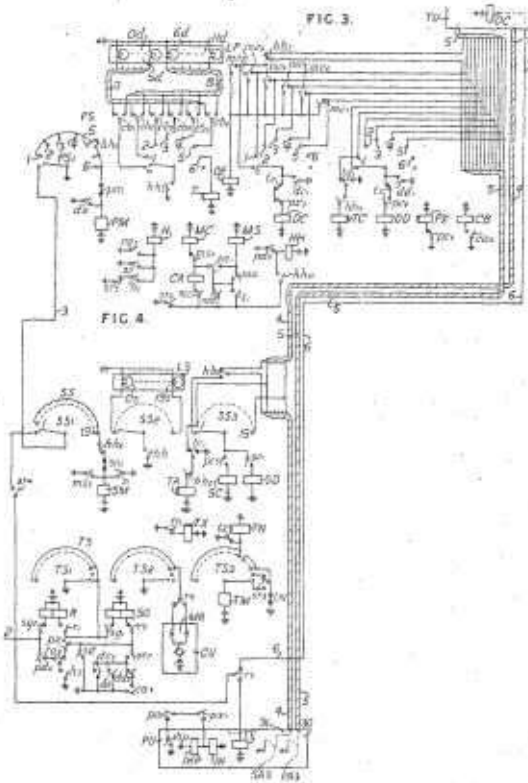
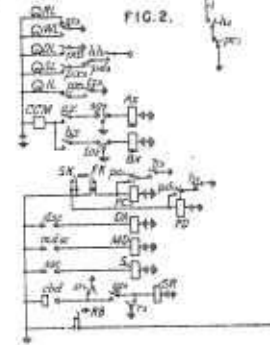
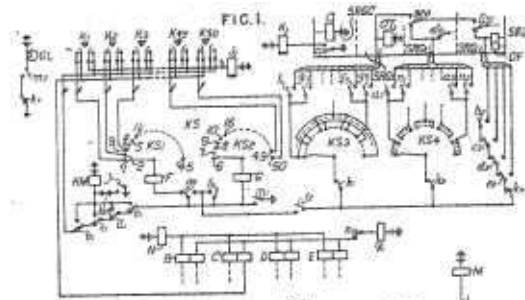
being depressed to send a cut of cars to track 1 closes a back contact 23 to pick up a repeater relay 1PBR. Relay 1PBR on picking up establishes a stick circuit through a front contact 38 and energizes a relay PBP which opens a contact 22 to de-energize a bus-bar PU thus preventing the selection of a second route acting upon the condition set up by button 1PB until the route selected is transferred to the next storage unit, and to close front contacts 39, 40, 41 to apply energy through wires a8, b and c to effect storage of the route in unit 8S3. The route description is now transferred from unit 8S3 to unit 8S2 by the closing of a front contact 44 of a relay PBP to pick up relay 8TN2 which opens a back contact 21 of the bus-bar PU and push button repeater relay PBR circuits and closes a front contact 48 to establish a circuit for a description storage relay 8SD2 associated with storage unit SS2, and a stick circuit through a front contact 47 of relay 8TN2 which ensures that the route description cannot be transferred from unit 8S3 to unit 8S2 until the push button is restored to its normal position. The relay 8SD2 on being picked up opens a back contact 45 in the pick up circuit of relay STN2 and closes a front contact 54 in a stick circuit of the relay 8SD2 subsequent to the opening of a front contact 48 of relay 8TN2. The relay 8SD3 associated with the storage unit **SS3** is normally energized through back contacts 55, and 56 of relays 8SD2 and 8TN2 and upon these relays being picked up relay 8SD3 is

released but owing to its slow drop-away characteristics it remains up long enough to allow the storage relays CS2 of the storage unit to become energized in accordance with the energy passed through wires a8, b, c, and d. The picking up of the relay 8SD2 effects the picking up of relays 8ACS2, SBCS2 and SDCS2, which are maintained up by stick circuits through front contacts 69, 70, 71 and 73, so that the route description stored in unit 8S2 is dependent upon relay 8SD2 being held up. Relay 8SD3 on being dropped disconnects the wires a8, b, c and d from the storage relays CS2 of the unit 8S2 by opening front contacts 57, 61, 74 and 65, and opens a front contact 25 in the stick circuit of the relay 1PBR and drops relay PBP which in turn drops relay 8TN2 by opening the front contact 44 assuming the push button to have been restored to its original position. When relay STN2 drops away front contacts 59, 63, 75 and 67 are opened to further isolate relays CS2 from unit 8S2 and a back contact 56 is closed to restore relay 8SD3 to its normal position so that the route description transfer from unit 8S3 to unit SS2 is now complete. Back contact 77 is closed when relay 8TN2 drops to pick up relay 8TN1 to initiate the transfer of the route description from unit 8S2 to unit SS1. Relay 8TN1 on being picked up opens a back contact 50 in the stick circuit for relay SSD2 which relay is still held through its back contact 81 until the transfer of the route description from unit SS2 to unit 8S1 is completed, and closes a

front contact 84 to pick up a description storage relay 8SD1 which relay opens a back contact 79 in the circuit to relay STN1 which is maintained up by its stick circuit through front contact 80 until relay 8SD2 drops. The relay 8SD1 on being picked up opens a back contact 83 to drop relay 8SD2 which is slow in dropping to allow the transfer of the route description from relays CS2 of unit 8S2 to unit 8S1 and thus the relays 8ACS1, 8BCS1 and 8DCS1 are picked up and so long as relay 8SD1 remains up these latter relays are held up by stick circuits through a front contact 102. On completion of the transfer of the route description from unit 8S2 to unit 8S1 relay 8SD2 drops to open front contact 73 to restore the relays CS2 of unit 8S2 to their normal position and to open a front contact 76 to drop relay 8TN1 which opens front contacts 95, 98, 103 and 101 in the pick up circuits for relays CS1 of unit 8S1 and closes a back contact 104 to energize a switch control relay 8NW or 8RW according to the position of relay 8ACS1 associated with the control of switch 8W. If the relay 8ACS1 is up relay 8NW is picked up and switch 8W is moved to its normal position and if relay 8ACS1 is down relay 8RW is picked up to **move** switch 8W to its reverse position. The entrance of a cut of cars in the detector track section of switch 8W drops a track relay STR to initiate the transfer of the route description (less that associated with switch 8W) to the storage unit 3-5S2. When relay 8TR is dropped back contacts 113 and 126 are closed

to energize relays 3-5TN2 and SDP the latter relay 8DP being held up by a stick circuit through a front contact 127 and back contacts 125 and 126 so that as long as there is storage of a route in unit 8S1 the relay remains up. The relay 3-5TN2 on being picked up closes a front contact 128 to pick up a transfer repeater relay 8TNP which is maintained up as long as the detector track section of switch 8W is occupied and as long as relay SDP is held up to close its stick circuit through the front contact 131. The relay 8TNP on being picked up opens back contacts 116 and 125 in the pick up circuits of the transfer relay 3-5TN2 and the relay 8DP but both of these relays are held by stick circuits, the stick circuit for relay 3-5TN2 being through front contact 135 and for relay 8DP as previously described

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 CCI - [G07F5/18](#) ; [G07F11/002](#)
 PA - COMM ENGINEERING PTY LTD
 TI - Improvements in coin-operated article dispensing systems
 AB - 695,867. Coin freed machines delivering selections of articles at different prices. COMMUNICATION ENGINEERING PTY., Ltd. Feb. 10, 1950 [Feb. 15, 1949], No. 3486/50. Class 27. A deposit must be inserted in a vending machine before articles for purchase may be selected. The selected articles are delivered only when further money is inserted to bring the total amount inserted up to the total price of the articles. An order is cancelled and the money inserted, less the deposit, returned when a refund button is pressed: the deposit is also returned if the total price of any articles selected does not exceed it, or if the means for collecting the deposit has been made ineffective by a control preset by the proprietor. The machine illustrated includes a dispensing system of the type in which articles are released, when selected, from their various shelves to fall on to a final delivery conveyer: the conveyer is driven to deliver the articles to the customer only after insertion of the total price and is driven in the opposite direction to return' the articles to a store for subsequent sorting and redistribution to the shelves should the customer cancel his order or not complete payment.



Selecting articles for purchase. A relay M (Fig. 1) is operated by insertion of a deposit of not less than sixpence and at m' provides an earth for operation of a key-set K1, K2 &c. which controls a digital selecting circuit SRG similar to that of Specification 659,601. The key-set provides eight groups of fifty keys, each key selecting one of four hundred articles. Each group of fifty keys is arranged in a selection frame carrying a sample of the article selected by each key, and to each of the eight groups there corresponds one winding of four relays B, C, D and E, whose contacts b2, c2, d2 and e2 are arranged to mark one of four wires leading to the section SRG1 of the selecting circuit SRG which deals with the first (most significant) digit. Each key in each group also places earth on a corresponding contact on one of two banks KS1, KS2 of a four-bank 25-outlet rotary stepping switch KS1-KS4 and all the keys are connected to a relay J which causes the stepping switch to hunt for the earthed contact. Wires to the sections SRG2 and SRG3 of the selector SRG corresponding to the second and third digits are marked by banks KS3 and KS4 of the switch KS in conjunction with contacts of relays A and N each operated in series with one winding of each of the relays B, C, D and E, and with contacts of relays F and G in series respectively with the banks KS1 and KS2. During operation of the selecting circuit SRG it is isolated by contacts k1, k2, k3 of a relay K. Contacts b1, c1, d1, e1, f6, g6, and n6 prevent a faulty signal to the selecting

circuit SRG as a result of pressing two keys simultaneously. Coin action; electric connection, multiple coin. As each penny, sixpenny or shilling piece is inserted it temporarily bridges corresponding contacts dsc, mdsc or ssc (Fig. 2) to cause a relay DA, MD or S to convey a pulse to one of the counting circuits described below.

Counting apparatus; totalling coins inserted. Coin-slit closing devices. To open the coin-slits the customer must **move** an operating lever which also closes a "start" key SK (Fig. 2) operating a relay PD which locks at pd1 and at pd5 (Fig. 3) operates a relay HH which locks at hh10 and at other contacts prepares the coin-totalling apparatus. Contact hh6 (Fig. 4) disconnects a homing circuit for a switch SS1 which subsequently steps in response to pulses on its driving magnet SM from contact sl of the shilling insertion relay S. Sixpences are counted on a scale of two circuit MC, CA, MS (Fig. 3) operated by pulses at md from the sixpence insertion relay MD. When contacts md first close relay MC operates and at mc1 prepares a holding circuit through relay CA, which is therefore operated and held when contacts md open. When the contacts md again close relay, MS is operated over (operated) change-over contacts ca1 Contacts ms2 release the relays MC and CA after contacts ms1 have locked relays MS to the earth over contacts md, and relays MS releases when contacts md again open, so restoring the system to its

original condition. Carry-over to the shillings-counting switch SS] (Fig. 4) is effected by contacts ms3 during the temporary operation of relay MS. Pennies are counted by a switch PS1-PS4 (Fig. 3) the driving magnet PM of which receives pulses from contacts da of the penny-insertion relay DA. A homing circuit normally connected to all the contacts of the first bank PS1 of this switch is disconnected from contacts 1-5 by relay contacts hh5 when the customer operates the " start" key as described above. When however six pennies have been inserted the switch steps automatically until it reaches its home contact. Carry-over to the sixpence-counting circuit is effected by contact t1 of a slow-release relay T connected to contact 6 of the second bank PS2 of the switch. Counting deposit. The first operation of CA as a result of inserting a sixpence or. six pennies, or of S as a result of inserting a shilling, closes contacts ca2 or s2 (Fig. 3) to operate relay H which locks at h1 and at h2 (Fig. 2) closes the circuit of the relay M (Fig. 1) to permit selection. Contacts h4 release relay PD (Fig. 2) and contacts h3 prepare the holding circuit of relay PC. Checking tender against price. As articles are selected their prices are totalled as described in Specification 666,442 and the total marked on wires of cables 4, 5 (Figs. 4 and 3) by rotary switches SA3, PA3. When his selection is complete the customer moves the operating lever to close the coin-slits and operate a " finish " key FK (Fig. 2)

the lever then locking in this position. The contacts FK close a circuit for relay PC which locks at pcl. Contacts pc3 (Fig. 2) release the relay M (Fig. 1) to prevent further selection and contacts pc4 (Fig. 3) release relay PX. Contacts pc2 and px 1 (Fig. 4) add a halfpenny to the total price if contacts 1hp are operated indicating an odd number of halfpence in the price. Contacts pc5 (Fig. 4), pc6 and px2 (Fig. 3) close circuits over switch bank **SS3** for comparing the amount tendered with the price marked by switches SA3, PA3 (Fig. 4) on the switch banks **SS3** (shillings), PS3 (1d. to 5d.) and PS4 (6d. to 11d.). When in response to coin insertions as described above the wipers of these banks reach the marked (earthed) contacts relays SC (Fig. 4) and DD, DC or DE (Fig. 3) are operated, the relay DE being operated if relay MC is operated as a result of insertion of an extra sixpence instead of a smaller amount in pence. The contacts scl (Fig. 4) of relay SC prepare a circuit for relay SD should an extra shilling be inserted instead of a smaller amount in pence. The contacts sc2, dd2, de, dc2 and sd and contacts ca4 (closed when an odd number of sixpenny amounts has been inserted) close a circuit for one winding of relay SG when a sufficient sum has been inserted. Relay SG locks at sgl over its second winding and switch-bank TS1. Contacts sg2 prevent operation of the refund relay R (see Returning coins below) and other contacts of the relay SG cause the coins to be discharged, the selected

articles to be delivered and the circuits to be restored to their normal condition as described below. Relay SG also operates over contacts h5, ta2, px4 and r2 if the total price is less than the deposit. Discharging coins. Collecting deposit. The inserted coins are discharged to the coin receiver when a magnet CCM (Fig. 2) is temporarily operated both by closure of contacts sg3 when the total price of the selected articles has been inserted, and (earlier to cash the deposit) by closure of contacts tc2 when the total price of the articles first exceeds the deposit. After each such operation the magnet CCM is released by contacts ax, bx of a slow-release relay AX or BX which is normally operated over the back-contacts sg3 or tc2. The relay TC (Fig. 3) is operated to cash the deposit when the second contact of bank PS4 is earthed indicating that the price registered by wiper PA3 (Fig. 4) has reached sevenpence, or when relay TA (Fig. 4) is operated to close its contact ta1 by an earth placed on the second contact of bank SS3 by movement of the wiper of bank SA3 to register a shilling. Operation of the magnet CCM releases the mechanical lock on the operating lever if this has been moved to operate key FK. If the deposit is always to be refunded the circuit for operation of magnet CCM from contact fc2 is broken by a manually operated switch (not shown). Returning coins. Should the customer wish to cancel his order he presses a button RB (Fig. 2) which is connected mechanically to return the inserted coins less the

deposit if it has already been discharged. The button RB also closes the circuit of relay R (Fig. 4) which holds at r1, disconnects the delivery relay SG at r2 and at r3 (Fig. 2) closes a circuit for operation of relay SR which effects the return of the selected articles to the store and restores the circuits. Delivering articles. Cancelling order: returning articles to store: restoring circuits. Operation of relay SG when the sum of money inserted reaches the total price of the articles selected prepares at sg4 (Fig. 2) a circuit for the relay SR. When the inserted coins are discharged they bridge contacts cbd in passing to the coin receiver so that relay SR operates and holds at sr1: relay SR may also operate over contacts r3 of the refund relay R. Contacts sr3 (Fig. 4) close a circuit over interrupter springs tm for the driving magnet TM of switch TS the wipers of which normally lie on the last contacts of the banks as shown. After the resulting initial step the magnet TM receives driving impulses over the wiper of bank TS3 in series with a relay TN forming part of a reflex circuit TN, TX generating pulses of low repetition frequency: this action provides sufficient delay to ensure