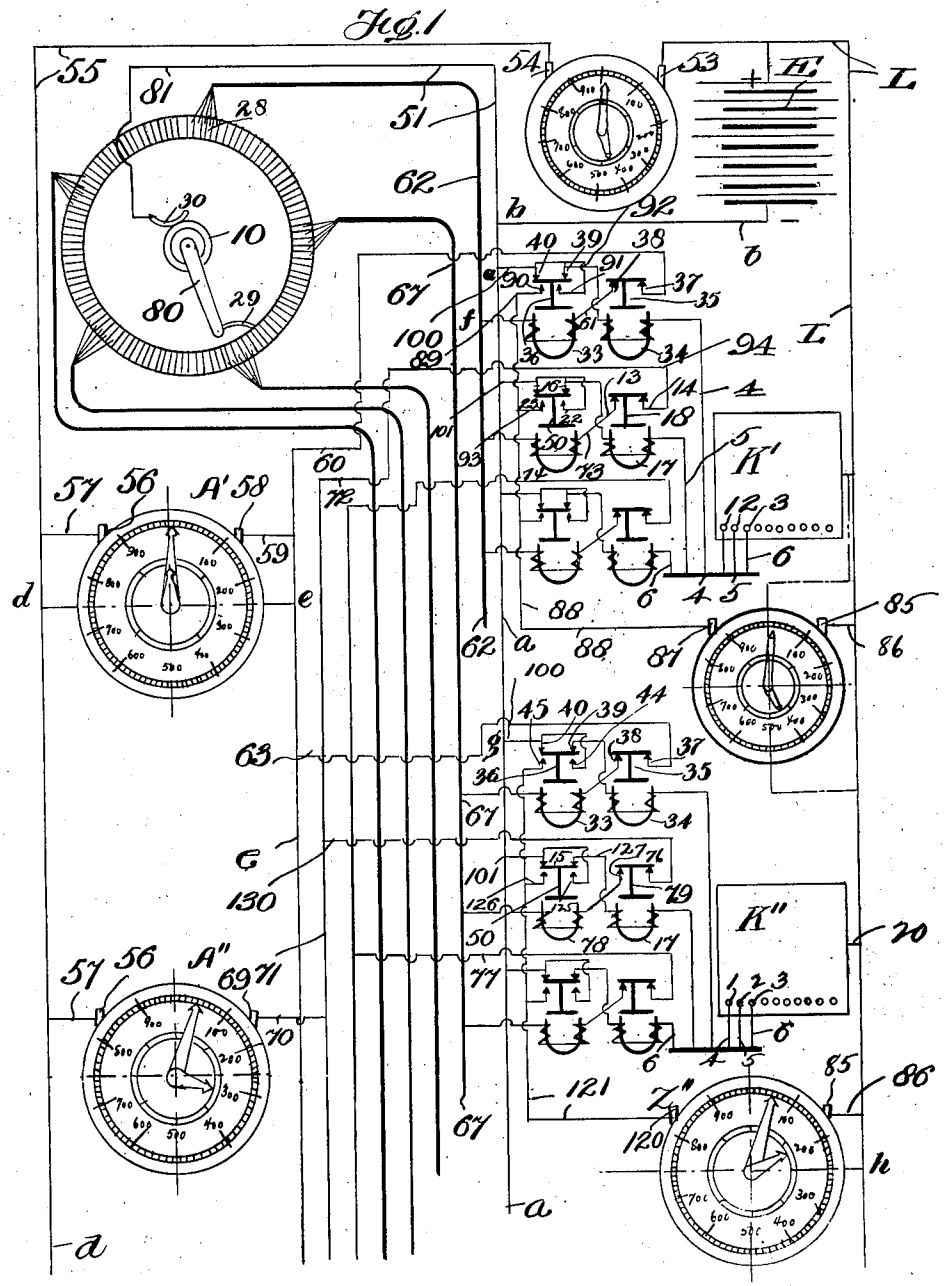
A. KIPARSKI.

AUTOMATIC TICKET REGISTERING SYSTEM.

APPLICATION FILED JULY 8, 1912.

1,101,452. Patented June 23, 1914.

FIG. 1



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UNITED STATES PATENT OFFICE.

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AUTOMATIC TICKET-REGISTERING SYSTEM.

1,101,452. Specification of Letters Patent. Patented June 23, 1914.

Application filed July 8, 1912. Serial No. 708,271.

To all whom it may concern:

Be it known that I, ALEXANDER KIPARSKI, aulic councilor, a subject of the Czar of Russia, residing at 23 Mochowaia, St. Petersburg, Russia, have invented certain new and useful Improvements in Automatic Ticket-Registering Systems, of which the following is a specification.

This invention relates to automatic ticket registering systems, and the subject-matter thereof consists in improvements over similar systems, as described in my co-pending applications, Serial No. 655,525, filed October 19, 1911, and Serial No. 768,593, the latter being a division of the former.

It is an object of the present invention to provide, in addition to the main total register and the various class registers, an accurate register for totaling the number of tickets withdrawn from each ticket box irrespective of class. It has been heretofore proposed by me to insert a register for this purpose in the ticket box circuit to be actuated upon direct withdrawal of the ticket; but, obviously, this is defective in that but a single registration will be effected upon simultaneous withdrawal of two or more tickets of different class, as the same operates to effect but a single closing of the ticket box circuit. I obviate this difficulty by controlling the ticket box total register from the class registering circuits which latter are controlled not only from the ticket box circuits, but also by mechanical means which operate to close the same in succession, irrespective of the simultaneous withdrawal of the tickets.

In the accompanying drawing forming a part of this application: the figure is a diagrammatic view disclosing two ticket boxes and a system of registering circuits therefor arranged in accordance with the invention.

Referring more particularly to the drawing K′ and K″ designate ticket boxes of the character more specifically set forth in my co-pending applications above referred to, the same being provided with a number of compartments for holding tickets of different classes as indicated by the binding posts 1, 2, 3, etc., which connect the different compartments in the ticket box, or primary circuits, the same adapted to be closed by withdrawal of the tickets through the battery E, as will be understood.

One terminal of the battery E is connected by a lead wire *c* with a conductor L and the opposite terminal by a wire *b* with a conductor *a*, the several ticket boxes K′, K″, etc., being connected in parallel across the conductors L and *a* by branches 20 leading from the former and the several compartment circuits leading from the ticket boxes to the conductor *a*, as now described.

Each compartment 1, 2, 3, etc., of each of the several ticket boxes has its respective binding post connected to a conductor 4, 5, 6, etc. Each conductor 4 contains in series an electro-magnet 34 and terminates in one contact point 39 of a pair, the other contact point 40 of which is joined by a branch wire 100 with the conductor *a*. The pair of contacts 39 and 40 are normally closed through an armature 36. Similarly each conductor 5 for the compartment 2 of each of the ticket boxes contains in series an electro-magnet 17, and terminates in one contact point 16 of a pair, the other contact point 15 of which is joined by a branch wire 101 with the conductor *a*. The pair of contacts 16 and 15 are normally closed through an armature 50. Similarly each of the remaining compartment conductors 6, etc., contains in series an electro-magnet, and terminates in one contact of a pair, the other of which is joined by a branch wire to the common conductor *a*, the pair of contacts being normally closed through an armature.

Withdrawal of a ticket from compartment 1 of one of the ticket boxes operates to close the circuit from the battery E through the lead wire *c*, conductor L, branch 20, ticket box, binding post of compartment 1, conductor 4, electro-magnet 34, contact 39, armature 36, contact 40, branch wire 100, conductor *a*, and lead wire *b* back to the battery. Similarly withdrawal of a ticket from compartment 2 of a ticket box operates to close the circuit from the battery E through the lead wire *c*, conductor L, branch 20, ticket box, binding post 2, conductor 5, electro-magnet 17, contact 16, armature 50, contact 15, branch wire 101, conductor *a*, and lead wire *b* back to the battery. Similarly withdrawal of a ticket from any of the sev-

eral remaining compartments of the ticket boxes will operate to close a circuit through the battery E containing in series an electro-magnet and a pair of normally-closed contacts, such circuits, for convenience in description and to denote point of time with reference to other circuits hereinafter established, being termed primary circuits.

The lead wire *c* is also connected by a wire 52 with one binding post 53 of a registering device 11, the opposite binding post 54 of which is connected by a common conductor 55, to which, in turn, are connected, through branches 57, the binding posts 56 of other registering devices A′, A″, etc., corresponding in number to the number of compartments of a ticket box. The opposite binding post 58 of the device A′ is joined by a branch 59 with a conductor *e*. A wire 60 leads from the conductor *e* to one contact 37 of a pair, the other contact 38 of which is connected to the trunk 62 by a wire 61, including in series an electro-magnet 33 controlling movement of the armature 36. The contacts 37 and 38 are normally open, and adapted to be closed through an armature 35 under the control of the electro-magnet 34 in the primary circuit for the compartment 1 of the ticket box K′. Similarly the conductor *e* is connected by a wire 63 to one contact 64 of a pair, the other contact 65 of which is joined to the trunk 67 by a wire 66 containing in series an electro-magnet 51, controlling movement of the armature 36. The contacts 64 and 65 are normally open, and adapted to be closed through an armature 68 under the control of the electro-magnet 34 in the primary circuit for the compartment 1 of the ticket box K″.

From the foregoing, it will be understood that the device A′ is connected in a circuit, the closing of which is under the control of the primary circuits of the compartments 1 of each of the several ticket boxes, and consequently this device acts as a register for totaling the number of tickets withdrawn from all said compartments.

The binding post 69 of the registering device A″ is connected through the branch 70 with a conductor 71, joined by a wire 72 with one contact 14 of a pair, the other contact 13 of which is connected to the trunk 62 by a wire 73 containing in series an electro-magnet 74, controlling movement of the armature 50. The contacts 13 and 14 are normally open and adapted to be closed by an armature 18 under the control of the electro-magnet 17 in the primary circuit for the compartment 2 of the ticket box K′. Similarly the conductor 71 is connected by a wire 130 to one contact 75 of a pair, the other contact 76 of which is joined to the trunk 67 by a wire 77 containing in series an electro-magnet 78, controlling movement of the armature 50. The contacts 75 and 76 are normally open and adapted to be closed by the armature 79 under the control of the electro-magnet 17 in the primary circuit for the compartment 2 of the ticket box K″. It will be understood, from the foregoing, that the device A″ is connected in a circuit, the closing of which is under the control of the primary circuits of the compartments 2 of each of the several ticket boxes, and consequently this device acts as a register for totaling the number of tickets withdrawn from all said compartments 2. Similarly a separate device is provided for registering the total number of tickets of each class as withdrawn from corresponding compartments of the several ticket boxes.

Each of the trunks 62, 67, etc., conveys the various conductors 61, 73, 66, 77, etc., to a suitable mechanical circuit closer, preferably of the type shown, wherein each of said conductors terminates in a separate segment 28, the same being insulated one from another and arranged circularly to be engaged successively by a contact 29 on a continuously rotating arm 80 in electrical connection with the collector ring 10. A brush 30 bears upon the collector ring 10 and is connected by a conductor 81 to the lead wire *b*.

It will be apparent from the foregoing that, upon withdrawal of a ticket, for example from compartment 1 of the ticket box K″, the same will operate to close the primary circuit as already described, energizing the electro-magnet 34, which attracts the armature 68 to close the normally open contacts 64 and 65, and thereby put the circuit for the registering device A′ in condition to be closed upon engagement of the brush 29 with the particular segment 28 in which the conductor 66 terminates as follows:—battery E, lead wire *c*, register 11, conductor 55, branch 57, the device A′, branch 59, conductor *e*, wire 63, contact 64, armature 68, contact 65, conductor 66, trunk 67, segment 28, rotating contact 29, arm 80, collector ring 10, brush 30, conductor 81, lead wire *b* back to the battery.

Upon withdrawal of a ticket from compartment 2 of any one of the several ticket boxes, the electromagnet 17 of the primary circuit for that compartment will be energized to put in condition for closing a similar circuit through the device A″, the actual closing of which will be effected during the interval over which the contact 29 traverses the respective segment 28. Separate circuits are similarly supplied, one for each of the primary circuits, under whose control the closing of the same is effected, and for convenience in description are hereinafter termed the secondary circuits.

It will be noted that, not only separate

compartments containing tickets of different class, but also corresponding compartments of different ticket boxes, containing tickets all of one class, are provided with separate and individual segments 28 on the mechanical circuit closer, so that, although tickets may be withdrawn from two or more compartments simultaneously, closing their respective primary circuits simultaneously, nevertheless, as the secondary circuits are closed through the contacts 28 and 29 of the mechanical circuit closer, such circuits are necessarily closed only successively as the contact 29 engages but a single segment 28 at a time. It will be apparent, therefore, that the device 11, situated as it is in the main conductor 55 common to all the secondary circuits, will accurately register each and every ticket withdrawn from all of the compartments of all of the several ticket boxes and may be called the main total register. The device A′ will accurately register the number of all of the tickets withdrawn from the compartments 1 of all the ticket boxes, while the device A″ registers the total of the tickets withdrawn from the compartments 2 of all the ticket boxes; other registering devices being provided in like manner for totaling the number of tickets withdrawn from the several other compartments. These latter devices A′, A″, etc., may be termed the class registers, as they each total the class of the tickets irrespective of the box from which they may have been withdrawn.

In order to obtain a total of the tickets withdrawn from each of the ticket boxes, it has been proposed by me to introduce a separate registering device in each of the ticket box circuits; but I find that, whereas the same registered faithfully when care was exercised to withdraw the tickets successively, accurate registration could not be accomplished for tickets simultaneously withdrawn from different compartments, as such withdrawal operates, as will be readily understood, to close but a single circuit through the ticket box which branches out over the proper compartment circuits; and therefore would traverse the winding of the registering devices but a single time effecting a single progression of the pointers.

For the purpose of assuring accurate and faithful registration for each and every ticket withdrawn, I provide for each of the ticket box devices an independent circuit connected to be closed consequent upon the closing of the secondary circuits, which, as shown above, are controlled by the primary circuits, and closed through the mechanical circuit closer only successively for each different compartment.

Z′, Z″, etc., designate registering devices, one for each of the ticket boxes, respectively, K′, K″, etc., one binding post 85 of each of which is connected by a branch wire 86 with the conductor L.

Referring more particularly to the device Z′, the opposite binding post 87 therefor has connected thereto a conductor 88, between which and the conductor *a* are arranged in parallel a plurality of pairs of contact points corresponding in number to the number of compartments in the ticket box K′. The contact points 90 and 91 are mounted in opposed relation to the contact points 40 and 39 of the primary circuit for compartment 1, so as to be closed by the armature 36 when the same is attracted by the electro-magnet 33 in the respective secondary circuit. Each of the contact points 90 and 91 are, respectively, united to the conductor 88, and through the branch 100 to the conductor *a* by means of leads 89 and 92. Similarly contact points 23 and 22 are arranged to oppose contact points 15 and 16 in the primary circuit for compartment 2 of the box K′, and are connected, respectively, to the conductor 88, and through branch 101 to conductor *a* by means of leads 93 and 94. The contact points 23 and 22 are closed by the armature 50 when the same is attracted by the closing of the secondary circuit therefor through the electro-magnet 74. In like manner, there are pairs of normally-open contact points arranged opposite the contact points of each of the primary circuits for the remaining compartments of the ticket box K′, such points being closed by armatures controlled from the respective secondary circuits.

Referring to the device Z″, the opposite binding post 120 therefor has connected thereto a conductor 121, between which and the conductor *a* are arranged in parallel a plurality of pairs of contact points corresponding in number to the number of compartments in the ticket box K″. The contact points 44 and 45 are mounted in opposed relation to the contact points 39 and 40 of the primary circuit for compartment 1 of the box K″, so as to be closed by the armature 36 when the same is attracted by the electro-magnet 51 in the respective secondary circuit. Each of the contact points 45 and 44 are, respectively, united to the conductor 121, and through the branch 100 to the conductor *a* by means of leads 122 and 123. Similarly contact points 124 and 125 are arranged to oppose contact points 15 and 16 in the primary circuit for compartment 2, and are connected, respectively, to the conductor 121, and through the branch 101 to conductor *a* by means of leads 126 and 127. The contact points 124 and 125 are closed by the armature 50 when the same is attracted by the closing of the secondary circuit through the electro-magnet 78. In like manner, there are pairs of normally-open contact points arranged opposite the contact

points of each of the primary circuits for the remaining compartment of the ticket box K″, such points being closed by armatures controlled from the respective secondary circuits.

After the secondary circuit has been closed, as above described, for example, for the compartment 1 of ticket box K′, the electro-magnet 33 being energized attracts the armature 36 interrupting the primary circuit for such compartment and closing the contacts 90 and 91 whereupon circuit is closed through the registering device Z′ as follows:—battery E, lead *c*, conductor L, branch 86, device Z′, conductor 88, lead 89, contact 90, armature 36, contact 91, lead 92, branch 100, conductor *a*, lead *b* back to the battery. Similarly, as will now be understood, a circuit is closed through the several registering devices Z′, Z″, etc., for actuating the same upon the closing of each of the secondary circuits. As such circuits are third in point of closing and depend upon the secondary circuits, the same may be called tertiary circuits.

The complete operation of my system for each withdrawal is as follows:—If we take, for example, the compartment 2 of the ticket box K″ and withdraw a ticket therefrom, such action operates to close circuit through the battery E, lead *c*, conductor L, branch 20, ticket box K″, compartment 2, conductor 5, electro-magnet 17, contact 16, armature 50, contact 15, branch 101, conductor *a*, lead *b* back to the battery. (Primary circuit). The electro-magnet 17 is thereby energized and attracts the armature 79 into engagement with the contact points 75 and 76, thus placing the secondary circuit through the registering device A″ in condition to be closed.

When the contact 29 of the circuit closer arrives at the corresponding segment 28, the following circuit is closed:—battery E, lead *c*, wire 52, main total register 11, conductor 55, branch 57, class register A″, branch 70, conductor 71, wire 130, contact point 75, armature 79, contact point 76, conductor 77, trunk 67, segment 28, contact 29, arm 80, ring 10, brush 30, wire 81, lead *b* back to the battery. (Secondary circuit). The device 11 is thus actuated to register the withdrawal of a ticket from some compartment of some box in the system, while the device A″ is actuated to register the withdrawal of a ticket as from compartment 2 of some one of the boxes. The closing of such secondary circuit energizes the electro-magnet 78 which attracts the armature 50 away from the contacts 15 and 16, thus interrupting the primary circuit, and into engagement with the contact points 124 and 125, thus closing the circuit through the device Z″ as follows:—battery E, lead *c*, conductor L, branch 86, device Z″, conductor 121, lead 126, contact 124, armature 50, contact 125, lead 127, branch 101, conductor *a*, lead *b*, back to the battery. (Tertiary circuit). Such action effects registration on the device Z″ which indicates the ticket to be withdrawn from the ticket box K″.

As has just been stated, the primary circuit is interrupted at the contact points 15 and 16 which thereupon deënergizes the electro-magnet 17, permitting the armature 79 to be retracted and thus interrupting the secondary circuit at the contact points 75 and 76. The secondary circuit being interrupted the electro-magnet 78 is deënergized permitting the armature 50 to be retracted opening the contact points 124 and 125 and closing the contacts 15 and 16, so as to place the primary circuit in condition for closing upon the withdrawal of the next successive ticket.

The tertiary circuit is broken at contacts 124 and 125 and the whole system of circuits restored automatically to the initial open position in readiness to receive the next actuation.

I have illustrated and described preferred and satisfactory constructions, but obviously changes could be made within the spirit and scope of my invention.

I claim—

1. In an apparatus of the character described, the combination of ticket boxes, normally open primary circuits adapted to be closed upon the withdrawal of tickets from the several boxes, normally open secondary circuits, registering devices in said secondary circuits, means adapted to close said secondary circuits only when said primary circuits are closed, normally open tertiary circuits adapted to be closed consequent upon the closing of said secondary circuits, and registering devices in said tertiary circuits.

2. In an apparatus of the character described, the combination of ticket boxes, normally open primary circuits adapted to be closed upon the withdrawal of tickets from the several boxes, normally open secondary circuits under the control of said primary circuits, registering devices in said secondary circuits, means for closing said secondary circuits, normally open tertiary circuits, registering devices in said tertiary circuits, and electro-magnetic means in said secondary circuits for interrupting said primary circuits and closing said tertiary circuits.

3. In an apparatus of the character described, the combination of ticket boxes, normally open primary circuits for said ticket boxes, independent means actuated by the withdrawal of tickets from the several boxes for closing the respective primary circuits, normally open secondary circuits, registering devices in said secondary circuits, mechanically-operated means for closing said secondary circuits, electro-magnetic means

in said primary circuits for controlling the closing of said secondary circuits, normally open tertiary circuits, registering devices in said tertiary circuits, and electro-magnetic means in said secondary circuits for simultaneously interrupting said primary circuits and closing said tertiary circuits.

In testimony whereof I affix my signature in presence of two witnesses.

ALEXANDER KIPARSKI.

Witnesses:
H. A. LOVIAGUNIE,
M. S. SUISARENNO.