May 9, 1933. E. H. HAND 1,907,964

DEVICE FOR CHANGING RADIO COILS

Filed July 7, 1931 2 Sheets-Sheet 1

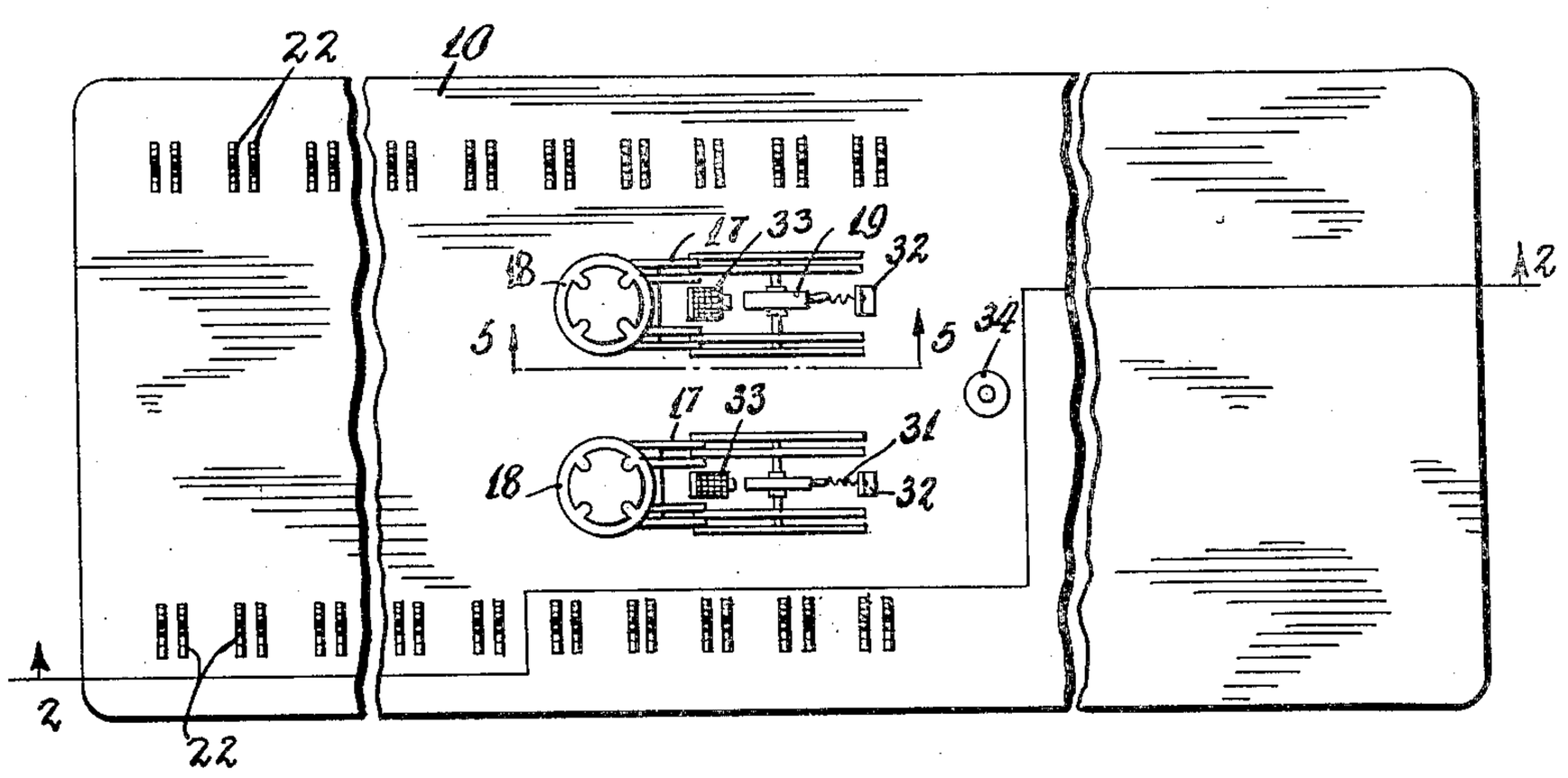

FIG 1

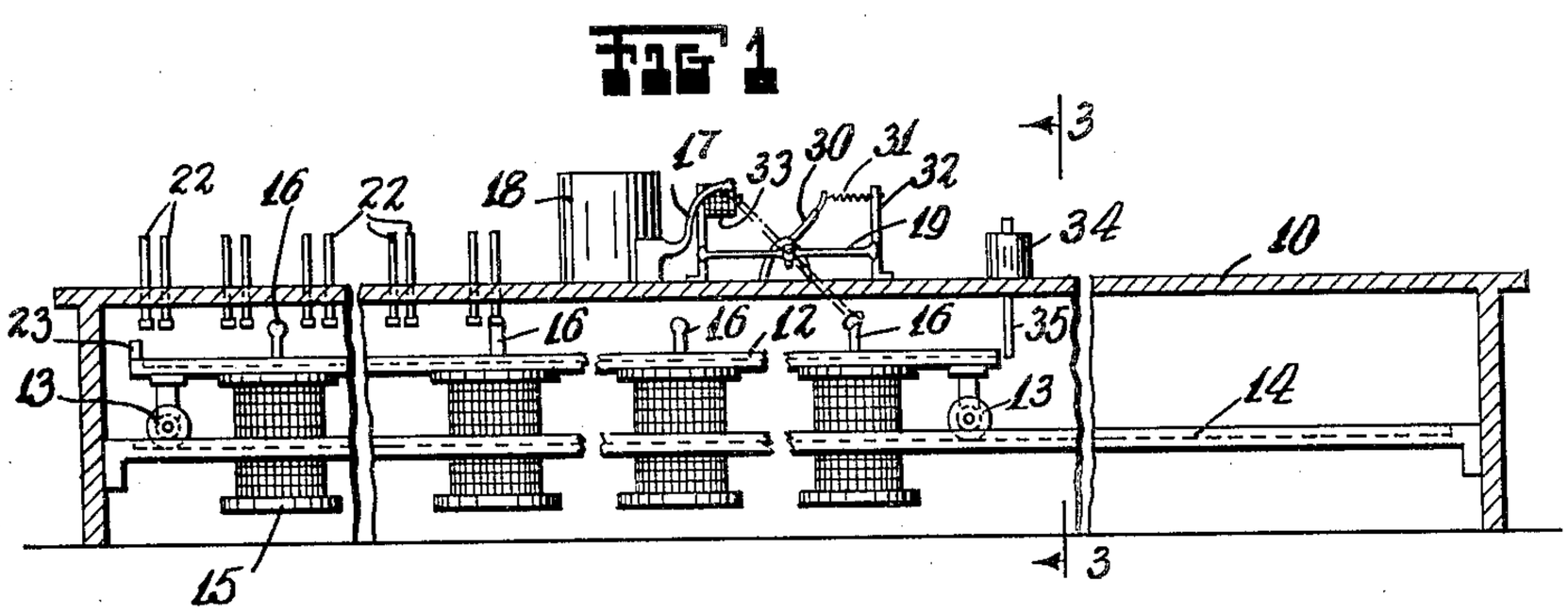

FIG 2

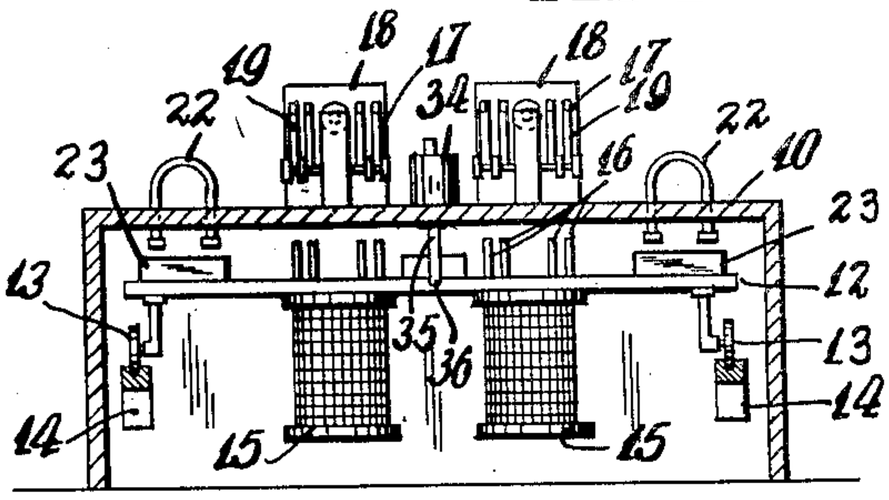

FIG 3

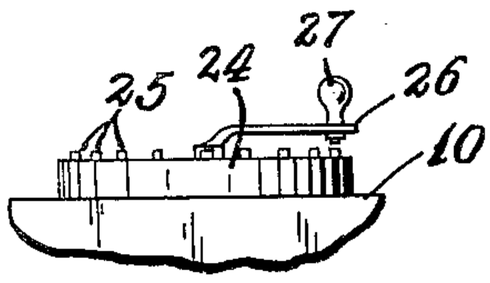

FIG 4

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DEVICE FOR CHANGING RADIO COILS

Filed July 7, 1931 2 Sheets-Sheet 2

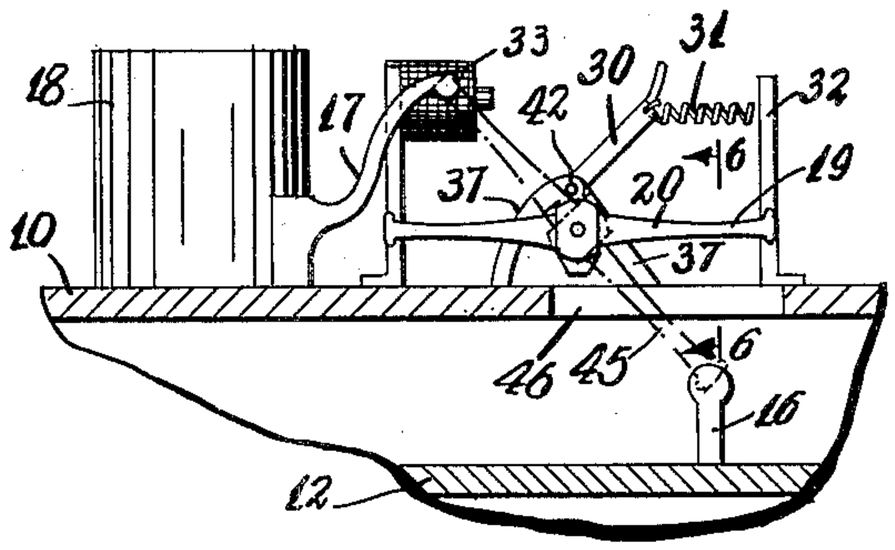

FIG 5

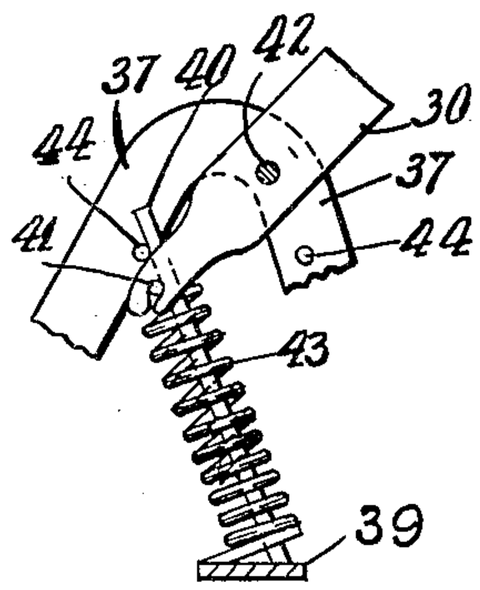

FIG 7

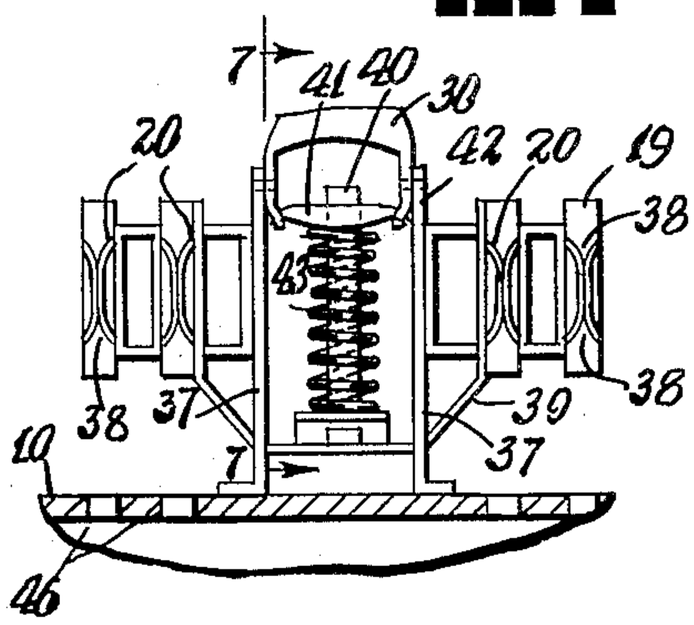

FIG 6

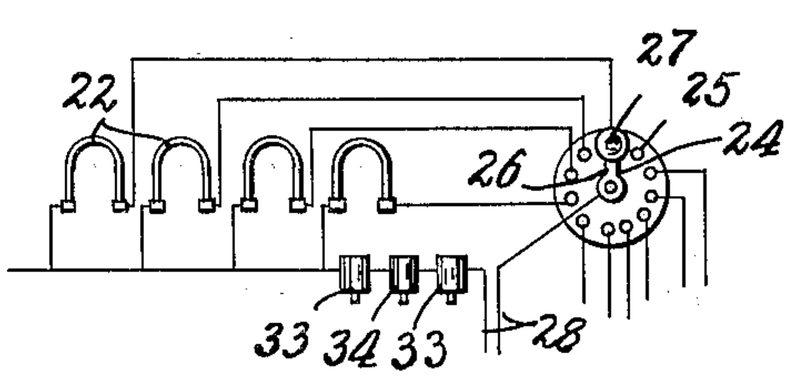

FIG 8

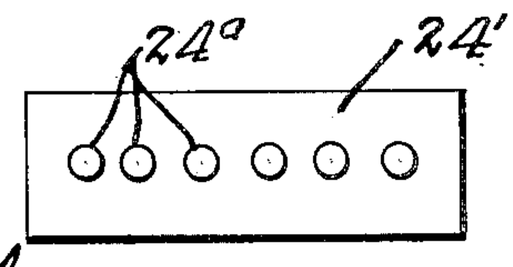

FIG 9

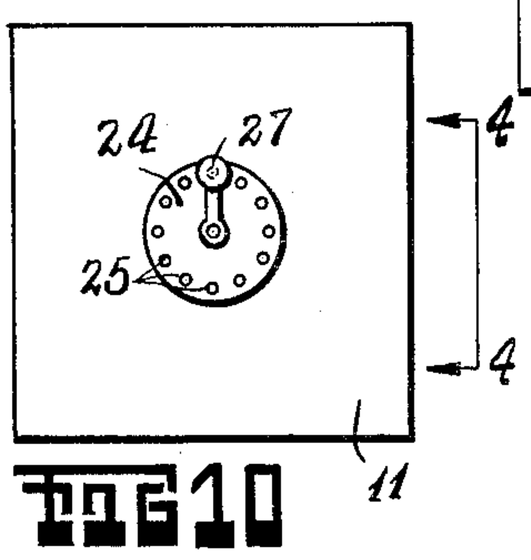

FIG 10

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Patented May 9, 1933 1,907,964

UNITED STATES PATENT OFFICE

ERLE H. HAND, OF NEW YORK, N. Y.

DEVICE FOR CHANGING RADIO COILS

Application filed July 7, 1931. Serial No. 549,192.

This invention relates to new and useful improvements in a device for changing radio coils.

The invention has for an object the construction of a device for changing radio coils which is characterized by a stationary platform supporting one or more sockets and one or more circuit switches capable of connecting with contacts of said sockets and simultaneously with contacts of different radio coils.

It is further proposed to arrange the different coils upon a movable carriage capable of moving in the plane parallel to said platform.

A still further object of this invention is the provision of blades on said switches capable of engaging with the contacts so as not to obstruct motion of the carriage.

It is another object of this invention to provide a row of electro-magnets on the platform and carriage, and to provide a control switch and circuits to move the core and consequently the carriage as determined by energizing any of the electro-magnets.

A still further object of this invention is the provision of means for automatically moving the circuit switch or switches to the off position while the carriage moves.

Another one of the objects of this invention is the provision of a latch for holding the carriage in a stationary position during the normal operation of the device.

And a still further object of this invention is the construction of a device of the class mentioned which is of simple, durable construction, desirable in use and efficient in action, and which can be manufactured and sold at a reasonable cost.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings, forming a material part of this disclosure:—

Fig. 1 is a plan view of a device constructed according to this invention.

Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is of a fragmentary elevational view of a control switch looking in the direction of the line 4—4 of Fig. 10.

Fig. 5 is a fragmentary enlarged detailed sectional view of circuit switches taken on the line 5—5 of Fig. 1.

Fig. 6 is a fragmentary sectional view taken on the line 6—6 of Fig. 5.

Fig. 7 is a sectional view taken on the line 7—7 of Fig. 6.

Fig. 8 is a schematic wiring diagram of the device.

Fig. 9 is a plan view of a control switch of modified form, used in this invention.

Fig. 10 is a plan view of a panel with the control switch mounted thereon.

The device for changing radio coils comprises a stationary platform 10. A movable carriage 12 is slidably arranged to move parallel with the top platform 10. The carriage is supported upon wheels 13 and operates in tracks 14 extended from end to end of the device. A series of different coils 15 is attached to the carriage 12 and is connected with contacts 16 on the carriage. The coils 15 are of different size and designed to properly function in different radio circuits. They are of the type usually employed in radio construction, each coil having a plurality of contacts as illustrated in Fig. 2. The coils are arranged in pairs in two parallel rows as may be understood by inspecting Fig. 3.

Groups of contacts 17 are located on the platform 10. Customary sockets 18 are mounted on the upper surface of the platform 10 and each of the sockets are provided with contacts 17. A pair of switches 19 are mounted upon the platform 10 and have blades 20 capable of connecting the contacts 16 on the carriage 12 with the contacts 17 in an "on" position. In an "off" position, the blades 20 will assume a position as indicated in Fig. 5. Each of the switches 19 are so located that in the "on" position, contact is made with one or the other of the contacts of the rows of coils 15. More particularly, the

switch 19 at the top of Fig. 1 may contact with any of the coils 15 on the right row shown in Fig. 3 and the switch 19 at the bottom of Fig. 1 may connect with any of the contacts of the coils in the left row of Fig. 3.

A means is provided for moving the carriage 12 to place any of the coils for connection with the circuit switch or switches and simultaneously move the circuit switch to the "off" position while the carriage moves. This means is in the form of electro-magnets 22 arranged in two rows, one along the front side, and the other along the rear side of the platform 10. These magnets are mounted upon the platform 10 and have their bottom ends extending in such a manner as to be capable of attracting cores 23 upon the carriage 12. A control switch 24 is mounted upon a customary front panel 11 and connects with the plurality of circuits capable of selectively energizing the magnets 22 so as to cause the carriage 12 to move to any predetermined distance and connect the desired pair of coils in circuit.

The control switch 24 consists of a plurality of stationary contacts 25 connected in series with the magnets 22 as shown in Fig. 8 and a movable contact 26 capable of closing the circuits with any of the stationary contacts. Normally, the contact 26 is slightly spaced from the contacts 25 so that the circuit is open. To close the circuit, it is necessary to depress the knob 27 on top of the contact 26. The contact 26 may be turned to any position so as to close the circuit through any of the contacts 25 and corresponding magnet 22.

The leads 28 in Fig. 8 are intended to connect with some source of current. The return lead of the circuit is provided with electro magnets 33 capable of attracting the levers 30 of the circuit switches 19. Springs 31 act between the control levers 30 and standards 32 so as to normally move the control levers in the position in which the blades 20 close the circuit through the contacts on the platform and on the carriage. Another electro-magnet 34 is also located in the return lead of the circuit 28 and controls an electro-magnetic latch which acts to normally latch the carriage 12 against moving. This electro-magnetic latch has a plunger 35 capable of engaging within any one of the line of recesses 36 formed in the upper surface of the carriage 12.

Each of the circuit switches 19 comprises a pair of spaced standards 37 pivotally supporting the blades 20. The ends of the blades are formed with female openings 38 so as to coact with the contacts 16 and 17 which are of the male type. A cradle 39 connects upon the pivot point of all of the blades 20 and extends beneath the standards 37. A stem 40 projects from the cradle 39 upwards between the standards 37 and engages into a pivotally mounted member 41 carried in the end of the lever 30. The control lever is pivotally mounted at the point 42 upon the standards. A coaxial spring 43 is arranged upon the stem 40 and normally hold the cradle 39 upon one side or the other side of its pivoted point. Stops 44 project from the inner sides of the standards 37 and limit the amplitude of possible motion of the lever 30.

In Fig. 7 the lever 30 is shown pivoted towards the right so that the cradle 39 is also towards the right. The spring 43 serves to maintain the condition of the parts. When the lever 30 is manually moved towards the left the pivotal mounted member 41 will be moved towards the right and once the lever passes the dead center, the spring 43 will urge the cradle 39 towards the left and accomplish pivoting of the switchblades. In Fig. 5 the dot and dash lines 45 indicate the pivoted position of the blades 20 in which they engage the contacts 16 and 17 simultaneously. Openings 46 are formed in the platform 10 to allow the blades 20 to extend towards and making connection with the contacts 16 on carriage 12. One of the main features is constructing parts of Fig. 5 so as to reduce to a minimum the distance between contact points 16 and 17.

The operation of the device may be traced by assuming that it becomes necessary to change the coils which are employed in a radio circuit. The knob 27 is first moved so that the contact 26 is over the correct contact 25 on the control switch 24. The knob 27 should be depressed to close the circuit. The electro-magnets 33 become energized and draw the levers 30 so as to cause the circuit switches 19 to operate whereby the blades 20 will move to their neutral positions shown in full lines in Fig. 5. The closing of the circuit also causes the energization of the electro-magnet 34 which releases the plunger 35. The cores 23 are then drawn to the electro magnet 22 which are energized by the closing of the circuit contact 26. The electro-magnets 22 are of sufficient strength to draw the cores 23 even when the distance between these parts is at a maximum.

The carriage 12 then moves along until the cores 23 are close to the electro-magnets which are energized. Then the knob 27 may be released. After the circuit is broken by the contact 26 leaving the particular contact 25, the springs 31 draw the levers 30 to cause throwing of the circuit switches 19 so that the blades 20 assume their connecting positions. The connecting positions are the ones indicated by the dot and dash lines 45 in Fig. 5. The female ends of the blades engage the male contacts 16 and 17. In the new position, different coils 15 will be connected with the sockets 18. The blades 20, on each of the circuit switches 19 serve to connect

the desired coils 15 with the proper elements in the sockets 18.

While I have shown and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:—

1. An inductance system, comprising in combination a stationary platform having a plurality of sockets attached thereto, contact members extending through said platform and in electrical relatiton with said sockets, a movable carriage having a plurality of inductance coils attached thereto, contact members attached to said carriage and in electrical relation with said inductance coils, and electro magnetic means for selectively making electrical connection between each of said inductance coils and said sockets as the carriage is reciprocated.

2. An inductance system, comprising in combination a stationary platform having a plurality of sockets attached thereto, contact members extending through said platform and in electrical relation with said sockets, a movable carriage having a plurality of inductance coils attached thereto, contact members attached to said carriage and in electrical relation with said inductance coils, and means for selectively making electrical connection between each of said inductance coils and said sockets as the carriage is reciprocated.

3. An inductance system, comprising in combination a stationary platform, a plurality of electro magnets fixed upon the platform, a movable carriage slidably mounted beneath said platform so as to move parallel to the surface of the platform, and a plurality of cores fixed upon the said carriage, said electro magnets being in electrical relation with said cores to make said cores capable of being attracted by said electro magnets adapted in such a manner so as to move the carriage to a desired position.

4. An inductance system, comprising in combination a stationary platform having a latch attached thereto, an electrical circuit for controlling said latch, a sliding carriage having a plurality of recesses adapted to engage said latch, and electro magnetic means for selectively making said latch engage each of said recesses to hold the movable carriage in position desired.

5. A device for changing radio coils, comprising a stationary platform, a movable carriage adjacent thereto, a series of different coils mounted on said carriage and connected with contacts on said carriage, contacts on said platform, a circuit switch on said platform having blades capable of connecting contacts on said platform with contacts on said carriage in an "on" position and capable of assuming an "off" position free from said contacts, and means for selectively moving said carriage to place any of the coils for connection with said switch and simultaneously move the switch to the "off" position while the carriage moves.

6. A device for changing radio coils, comprising a stationary platform, a movable carriage adjacent thereto, a plurality of coils mounted on said carriage and connected with contacts on said carriage, contacts on said platform, a circuit switch on said platform having blades capable of connecting contacts on said platform and carriage in an "on" position and capable of assuming an "off" position free from said contacts, and electro-magnetic means for selectively moving said carriage to p'ace any of the coils for connection with said switch and simultaneously move the switch to the "off" position while the carriage moves.

7. An electro magnetic device for changing radio coils, comprising a stationary platform, a movable carriage adjacent thereto, a plurality of coils mounted on said carriage and connected with contacts on said carriage, contacts on said platform, a circuit switch on said platform having blades capable of connecting contacts on said platform and carriage in an "on" position and capable of assuming an "off" position free from said contacts, and electro magnetic means for selectively moving said carriage to place any of the coils for connection with said switch and simultaneously move the switch to the "off" position while the carriage moves, rollers being mounted upon said carriage and engaging in tracks supported across the bottom of the platform to constitute support for the carriage.

8. A device for changing radio coils of the class described, comprising a stationary platform, a movable carriage adjacent thereto, a plurality of different coils mounted on said carriage and connected with contacts on said carriage, contacts on said platform, a circuit switch on said platform having blades capable of connecting contacts on said platform and carriage in an "on" position and capable of assuming an "off" position free from said contacts, and means for selectively moving said carriage to place any of the coils for connection with said switch and simultaneously move the switch to the "off" position while the carriage moves, said plurality of coils having primary and secondary windings connected with contacts located on the top of the carriage.

9. A device of the class described for changing radio coils, comprising a stationary platform, a movable carriage adjacent thereto, a plurality of different coils attached

to said carriage and connected with contacts on said carriage, contacts on said platform, a circuit switch on said platform having blades capable of connecting contacts on said platform and carriage in an "on" position and capable of assuming an "off" position free from said contacts, and means for selectively moving said carriage to place any of the coils for connection with said switch and simultaneously move the switch to the "off" position while the carriage moves, said circuit switch including a lever, which when moved in one direction causes the blades to pivot into the "on" position, and when moved in the other direction, into the "off" position.

10. A device for changing radio coils, comprising a stationary platform, a movable carriage adjacent thereto, a plurality of different coils mounted on said carriage and connected with contacts on said carriage, contacts on said platform, a circuit switch on said platform having blades capable of connecting contacts on said platform and carriage in an "on" position and capable of assuming an "off" position free from said contacts, and electric operated means for selectively moving said carriage to place any of the coils for connection with said switch and simultaneously move the switch to the "off" position while the carriage moves, comprising a plurality of electro-magnets fixed upon said platform and acting against cores attached upon said carriage.

11. A device for changing radio coils, comprising a stationary platform, a movable carriage adjacent thereto, a plurality of different coils mounted on said carriage and connected with contacts on said carriage, contacts on said platform, a circuit switch on said platform having blades capable of connecting contacts on said platform and carriage in an "on" position and capable of assuming an "off" position free from said contacts, switch operating means connected with said switch and capable of causing the plates to move to a position including a lever, and means for moving said carriage for selectively placing any of the coils for connection with said switch and simultaneously move the switch to the "off" position while the carriage moves, comprising a plurality of electro-magnets fixed upon said platform and acting against cores attached upon said carriage, and a control switch in a circuit with said electro-magnets capable of moving the lever of said switch operating means to cause the blades of the switch to move to the "off" position.

12. A device for changing radio coils, comprising a stationary platform, a movable carriage adjacent thereto, a plurality of different coils attached to said carriage and connected with contacts on said carriage, contacts on said platform, a circuit switch on said platform having blades capable of connecting contacts on said platform and carriage in an "on" position and capable of assuming an "off" position free from said contacts, switch operating means connected with said switch and capable of causing the plates to move to a position including a lever, and means for selectively moving said carriage to place any of the coils for connection with said switch and simultaneously move the switch to the "off" position while the carriage moves, comprising a plurality of electro-magnets fixed upon said platform and acting against cores attached upon said carriage, and a control switch in a circuit with said electro-magnets capable of moving the lever of said switch operating means to cause the blades of the switch to move to the "off" position, a spring being connected upon the lever of the switch to normally move the lever back to the "on" position.

13. A device for changing radio coils, comprising a stationary platform, a movable carriage adjacent thereto, a plurality of different coils mounted on said carriage and connected with contacts on said carriage, contacts on said platform, a circuit switch on said platform having blades capable of connecting contacts on said platform and carriage in an "on" position and capable of assuming an "off" position free from said contacts, switch operating means connected with said switch and capable of causing the plates to move to a position including a lever, and means for selectively moving said carriage to place any of the coils for connection with said switch and simultaneously move the switch to the "off" position while the carriage moves, comprising a plurality of electro-magnets fixed upon said platform and acting against cores attached upon said carriage, and a control switch in a circuit with said electro-magnets capable of moving the lever of said switch operating means to cause the blades of the switch to move to the "off" position, a spring being connected with the lever of the switch to normally move the key back to the "on" position, and an electro-magnetic latch being provided for holding the lever in a stationary position when the control switch is "off".

In testimony whereof I have affixed my signature.

ERLE H. HAND.