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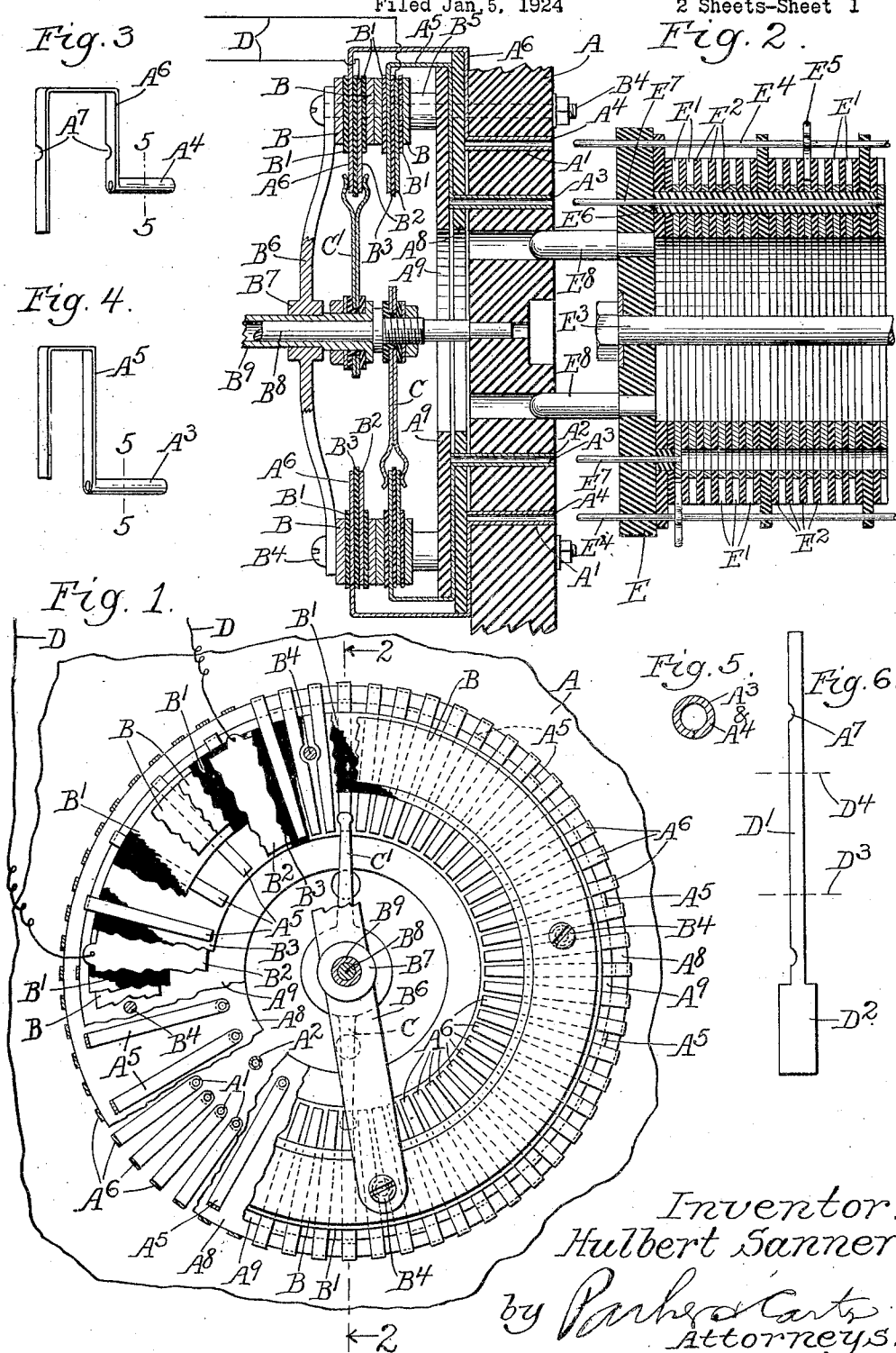
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H. SANNER

DISTRIBUTING SWITCH

Filed Jan. 5, 1924

2 Sheets-Sheet 1



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Fig. 7.

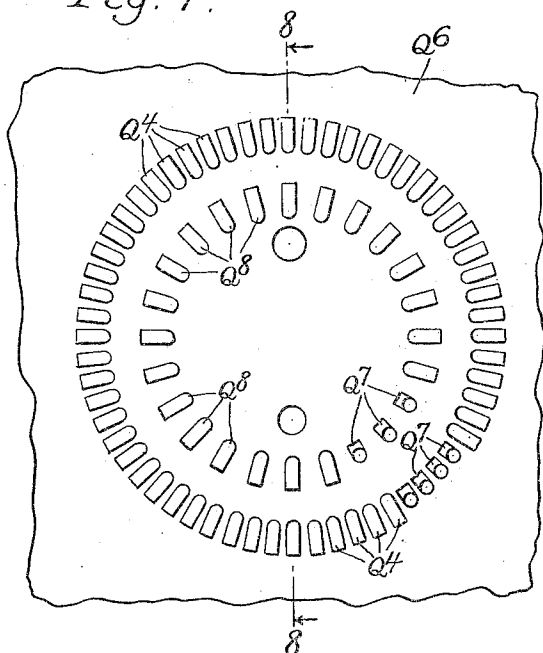


Fig. 8.

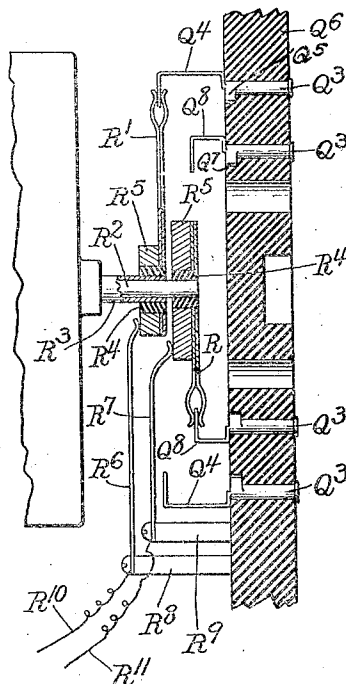


Fig. 9.

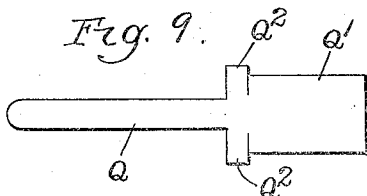


Fig. 10.

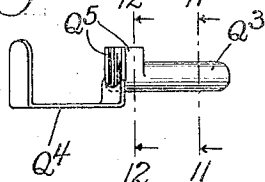


Fig. 11.

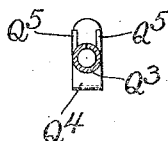
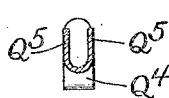


Fig. 12.



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UNITED STATES PATENT OFFICE.

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DISTRIBUTING SWITCH.

Application filed January 5, 1924. Serial No. 684,577.

My invention relates to improvements in distributing switches and circuit selectors and has for one object to provide a new and improved form of distributing switch and circuit selectors associated therewith whereby a switch operated by clockwork, electric or otherwise may be used to close selected circuits through a selector device. Another object of my invention is to provide a new and improved form of switch and selector mechanism which will be light, compact and easily manufactured. Another object is to associate a switch and a selector in a compact, easily assembled but conveniently separable unit. Other objects will appear from time to time in the specification and claims.

My invention is illustrated more or less diagrammatically in the accompanying drawings, wherein—

Figure 1 is a plan view with parts removed and parts in section;

Figure 2 is a section along the line 2—2 of Figure 1;

Figures 3 and 4 are perspective views of contact fingers;

Figure 5 is a section along the line 5—5 of Figures 3 and 4;

Figure 6 is a blank from which the contact fingers are formed;

Figure 7 is a plan view of a modified form with parts removed;

Figure 8 is a section along the line 8—8 of Figure 7 with the contact arms in position;

Figure 9 is a blank on an enlarged scale from which the contact fingers shown in Figures 7 and 8 are formed;

Figure 10 is a perspective view of one of the contact fingers;

Figure 11 is a section along the line 11—11 of Figure 10;

Figure 12 is a section along the line 12—12 of Figure 10.

Like parts are indicated by like characters throughout the drawings and specification.

A is an insulating supporting panel. It is provided with a series of concentric spaced perforations A^1 , A^2 . These perforations contain the cylindrical tubular shanks A^3 , A^4 of U-shaped contact bars A^5 , A^6 some of which are notched at two points on their sides at A^7 . All the shanks for these contact bars are of the same diameter but the shanks A^3 are longer than the shanks A^4 , the dis-

tance between the two arms of the U is greater in the contact bars A^6 than in A^5 . A^8 is an annular insulating plate which overlies the lower arm of the U of each of the bars A^6 . This plate is apertured in line with the perforations A^2 so that the shanks A^3 may pass through. A^9 is a second insulating plate which overlies the under arm of the U, A^5 . These contact bars or fingers are all of them arranged radially out of contact with one another and the two banks are insulated and held in place by the two annular insulating discs.

B, B are annular supporting rings arranged above and below the banks of contact fingers. They are insulated from the contact fingers by insulating rings B^1 and there is associated with each contact finger a contact ring B^2 insulated from it by an insulating ring B^3 . This entire assembly is held together by bolts B^4 which pass through the notches between adjacent pairs of contact fingers A^6 . A sleeve B^5 carries the tension on the bolt and holds the parts together as a unit. B^6 is a spider mounted on these bolts and having a central operating hub B^7 . B^8 is a clock shaft rotatable in the base A at one end and extending out through the hub B^7 . This clock shaft carries rotatable thereon a sleeve B^9 , which sleeve rotates in the bearing B^7 .

C is a bifurcated spring contact finger mounted on the shaft B^8 and insulated therefrom. The width of the contact finger is substantially equal to the width of any one of the terminals or contact bars and as this finger rotates with the shaft B^8 , it maintains constant contact with the contact ring B^2 and the contact fingers A^5 and closes a circuit between them. C^1 is a similar bifurcated contact finger mounted on the sleeve B^9 which operates in the same way, the idea being that the shaft B^8 and the sleeve B^9 will be given an hour and minute motion. The upper bank will represent the minutes and there will be sixty fingers in that bank, the lower bank will represent hours, there being twenty-four in that, but the hour and minute arrangement might be reversed or a decimal system or any other system might be used.

The contact ring B^2 has associated with it a conductor D which leads to any suitable electric circuit not here shown. The con-

tact fingers A⁶ are made from the blank D¹, the lower enlarged portion D² being rolled to form the shank A⁴, the long other portion being bent along the lines D³, D⁴ to the shape indicated in Figure 3. The contact fingers A⁵ shown in Figure 4 are made in the same manner from similar blanks but of different proportions.

Associated with this device is a selector which comprises an end plate E, alternate conductor plates E¹ and insulator plates E², a central holding bar E³ and a series of peripherally arranged conductor bars E⁴. The conductor plates E¹ are peripherally notched, there being a bar E⁴ in line with each notch in each plate, the notches being arranged in line so that the spring contact fingers E⁵ may be positioned along the bar E⁴ and thrust it into the notch in any one of the insulating plates. Insulating tubes E⁶ pass through perforations in the plates and contain conductors E⁷, there being one conductor for each plate and such conductor terminating at the plate and being altogether out of contact with the others. The result of this arrangement is that there are conductors E⁷ and E⁴ arranged in concentric rings projecting beyond the plate. When the projection is positioned by the bar E⁴ and by the unequally spaced concentric pins E⁸ arranged to insure proper angular relation, each of the conductors E⁴ and E⁷ engages one of the shanks A³, A⁴ to close a circuit between a plate and two of the pairs of conductor fingers subject to the sleeve closure made by the spring finger. The wires D may lead to a bell ringing apparatus or anything of that kind and it is possible to select the time at which the bell will ring by positioning the spring finger E⁵. The bifurcated contact switches will go round and round but nothing will happen until such time as the two fingers engage the two contact fingers associated in a circuit which had been selected by the spring on the conductor E⁴ when a circuit will be closed and a bell will ring or other signal will operate.

In the modified form shown in Figures 7 to 12 inclusive, the contact fingers are made from blanks having a narrow end finger forming portion Q, a wider tube forming portion Q¹, and laterally extending wing portions Q², bent to form the tube Q³, finger Q⁴, and U-shaped member Q⁵. These contact fingers are located in two concentric groups of holes in the supporting plate Q⁶, the U-shaped portion Q⁵ engaging slots Q⁷ so that the fingers are always radially positioned. The fingers of the inner group Q⁸ are shorter than the fingers Q⁴. These fingers are adapted to be engaged by split spring contact arms R, R¹ mounted respectively on the timing shaft R² and sleeve R³ and insulated from it by insulating sleeves R⁴.

Contact slip rings R⁵ are associated with each of these fingers and adapted to be engaged by wipers R⁶ and R⁷ on the binding posts R⁸, R⁹ and associated with conductors R¹⁰, R¹¹ whereby the circuits may be closed. The relation between the selector elements and the fingers is the same in this case as in the preferred form.

It will be evident that while I have shown in my drawings an operative device, still many changes might be made in the size, shape and disposition of parts without departing materially from the spirit of my invention and I wish, therefore, that my showing be taken as in a sense diagrammatic.

I claim:

1. A contact finger comprising a flat U-shaped body and an integral hollow sleeve perpendicular to one arm of the U.

2. A contact bank comprising a plurality of U-shaped contact fingers, flat supporting plates arranged on opposed sides of the contact arm of the U, means for holding the plate in position and for holding the contact fingers and the plates as a unit in position.

3. A contact bank comprising a plurality of U-shaped contact fingers, flat supporting plates arranged on opposed sides of the contact fingers of the U, means for holding the plate in position and for holding the contact fingers and the plates as a unit in position, and a plurality of separate short contact fingers, one associated with but insulated from each of the U-shaped fingers.

4. An electric distributor comprising an annularly arranged group of contact fingers, a contact ring insulated from and arranged adjacent said fingers and a wiper adapted to travel along the contact fingers and selectively close a circuit between one finger of the group and the ring, the fingers being U-shaped and having each a hollow cylindrical shank associated with the arm of the U which is not adapted to be engaged by the wiper.

5. An electric distributor comprising an annularly arranged group of contact fingers, a contact ring insulated from and arranged adjacent said fingers and a wiper adapted to travel along the contact fingers and selectively close a circuit between one finger of the group and the ring, the fingers being U-shaped and having each a hollow cylindrical shank associated with the arm of the U which is not adapted to be engaged by the wiper, conductors adapted to removably engage each one of the shanks and a conductor in permanent engagement with the contact ring.

6. An electric distributor comprising an annularly arranged group of contact fingers, an insulated supporting base for the group, there being a hollow tubular conductor shank associated with each finger of the group and a wiper adapted to engage successively fin-

gers at a point removed from the shank, a selective conductor adapted to be removably engaged with the shank.

7. A contact bank comprising an insulated base, a plurality of groups of contact fingers, tubular shanks associated one with each finger penetrating the supporting base, insulating plates adapted to hold the shanks and fingers in position with the fingers themselves radially disposed about a common center on the base, the insulating plates separating the fingers in two separate insulated concentric groups.

8. A circuit selecting device comprising in combination a selecting switch system including wipers and contact fingers, a manually adjusted selecting system adapted to be removably arranged with the switch system and means associated with the manually adjusted system for selecting individual circuits for operation.

9. The combination with a circuit selecting device comprising a plurality of insulated plates arranged side by side, a plurality of separate conductor bars arranged adjacent the peripheries of said bars and means interposed between the bar and the plate to close a circuit between them, of a switch assembly comprising a plurality of contact fingers, there being an electric connection between one contact finger and each bar and plate and wipers adapted to be moved across the fingers to close circuits to the bars and plates.

10. The combination with a circuit selecting device comprising a plurality of insulated plates arranged side by side, a plurality of separate conductor bars and means interposed between the bar and the plate to close a circuit between them, of a switch assembly comprising a plurality of contact fingers, there being an electric connection between one contact finger and each bar and plate and wipers adapted to be moved across the fingers to close circuits to the bars and plates, the circuit selecting device being removably associated with the switch assembly.

11. The combination with a circuit selecting device comprising a plurality of insulated plates arranged side by side, a plurality of separate conductor bars and means interposed between the bar and the plate to

close a circuit between them, of a switch assembly comprising a plurality of contact fingers, there being an electric connection between one contact finger and each bar and plate and wipers adapted to be moved across the fingers to close circuits to the bars and plates, the circuit selecting device being removably associated with the switch assembly, the switch fingers having hollow tubular shanks adapted to be yieldingly engaged by the conductor bars and there being conductor pins projecting one from each plate to engage other such tubular shanks.

12. A contact finger comprising a tubular shank open at both ends only, integral therewith a U-shaped extension having two arms tangential to the shank, a flat supporting strip projecting upwardly beyond the U in line with one side of the shank and a contact end integral with and bent at right angles to the supporting element.

13. In an electric distributor, an apertured supporting base, there being slots in the face thereof in line with the apertures, contact fingers having tubular shanks adapted to penetrate the apertures in the base and extensions adapted to engage the grooves in the base.

14. In an electric distributor, an apertured supporting base, there being slots in the face thereof in line with the apertures, contact fingers having tubular shanks adapted to penetrate the apertures in the base and extensions adapted to engage the grooves in the base, and contact fingers extending upwardly from the shanks and bent at right angles to the axis thereof.

15. An electric distributor comprising an annularly arranged group of contact fingers, an insulated plate engaging them, a continuous conductor ring on the opposed side of the plate immediately adjacent the fingers having substantially the same inside diameter as the inside diameter of the group of fingers, a wiper adapted to travel along the fingers and ring, comprising a bifurcated member, one fork of which is in constant engagement with the ring, the other fork, of which is in engagement with the fingers.

Signed at Chicago, county of Cook and State of Illinois, this 20th day of December 1923.

HULBERT SANNER.