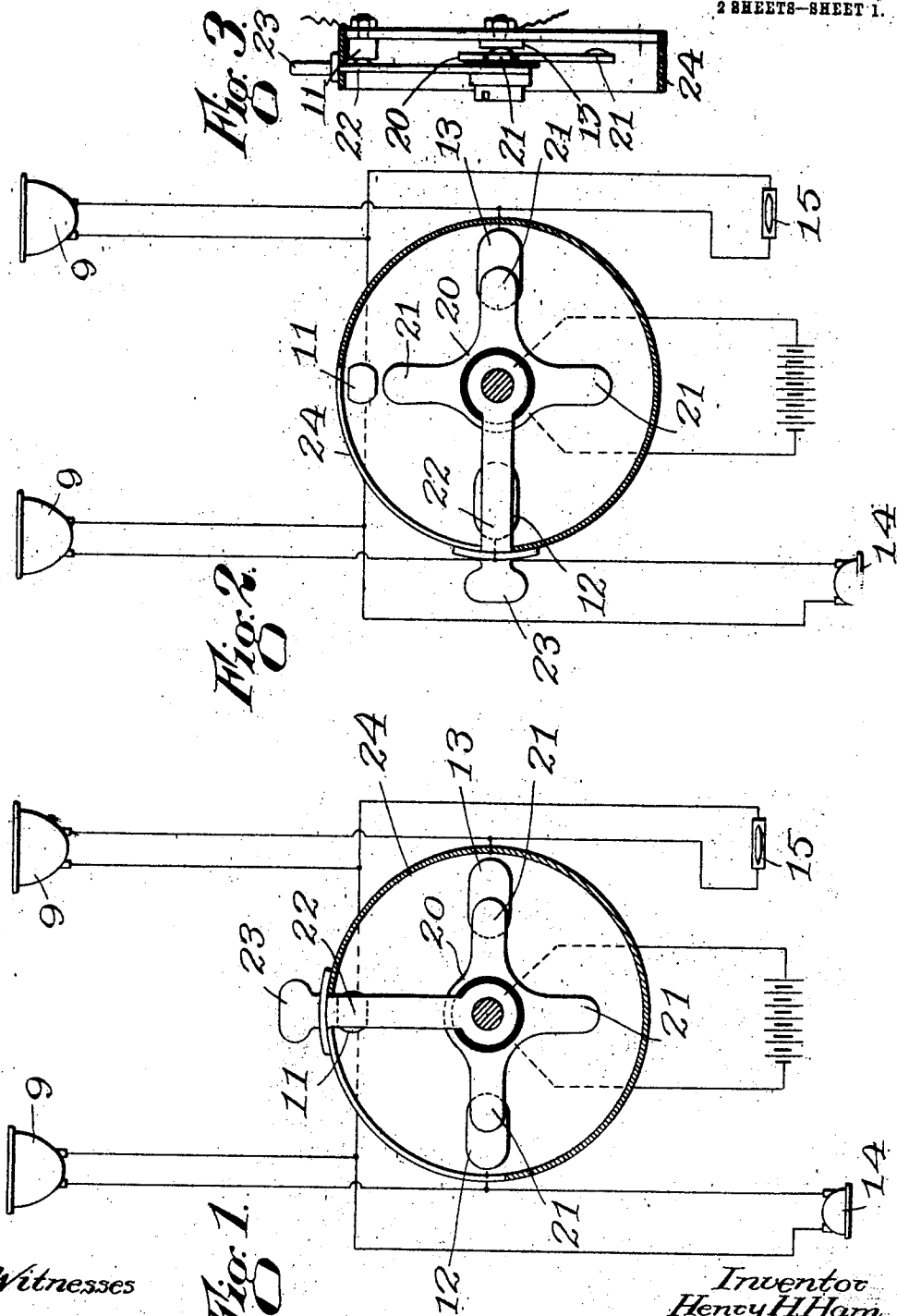


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ELECTRICAL INSTALLATION.
APPLICATION FILED MAY 1, 1913.

1,112,903.

Patented Oct. 6, 1914.

2 SHEETS—SHEET 1.



Witnesses

C. F. Wescom

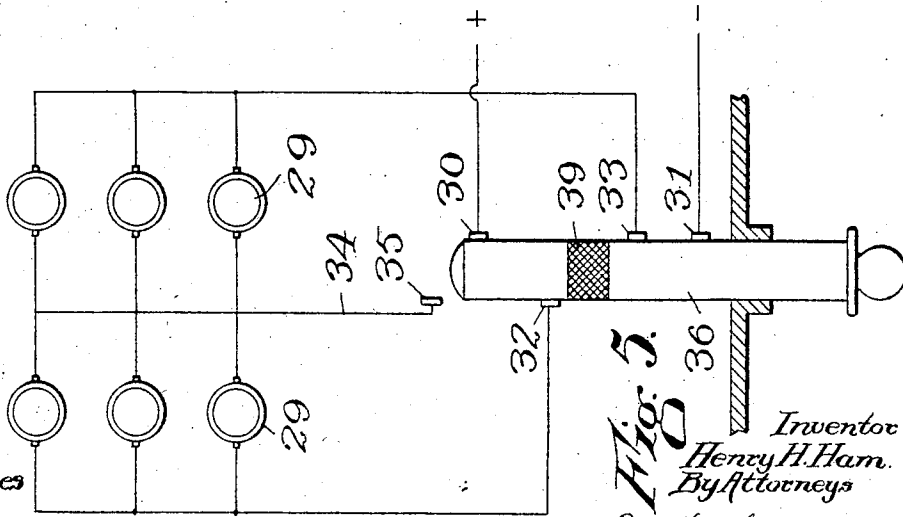
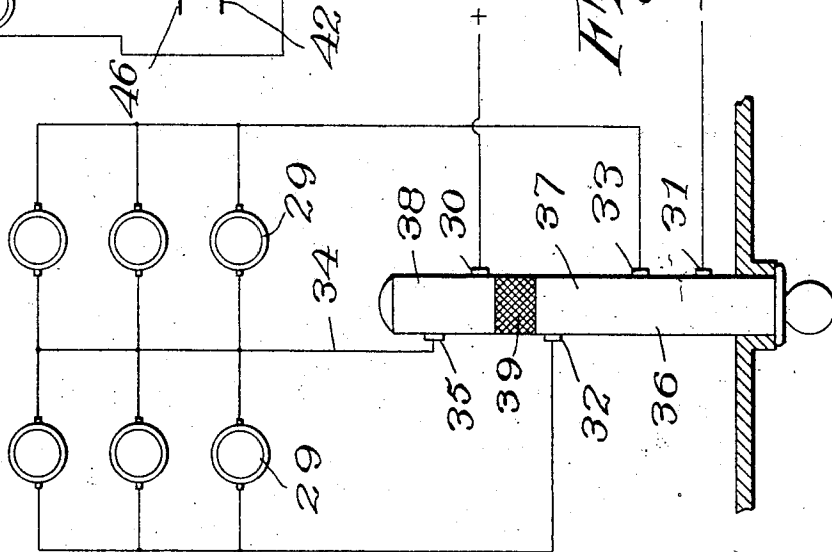
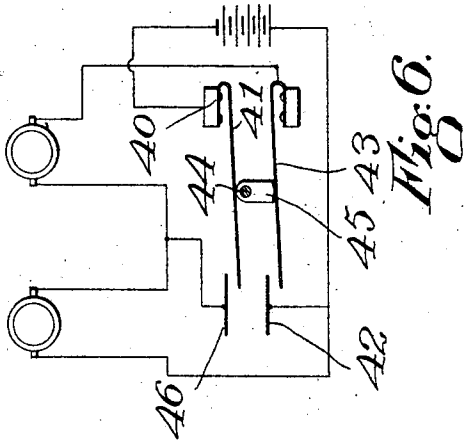
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ELECTRICAL INSTALLATION.

1,112,903.

Specification of Letters Patent.

Patented Oct. 6, 1914.

Application filed May 1, 1913. Serial No. 764,773.

To all whom it may concern:

Be it known that I, HENRY H. HAM, a citizen of the United States, residing at Shrewsbury, in the county of Worcester and State of Massachusetts, have invented a new and useful Electrical Installation, of which the following is a specification.

Ordinarily when it is desired to dim lights or to supply other electric devices with an amount of power less than the maximum, it has been the custom to throw in resistance which necessarily involves some loss of power.

The principal object of this invention is to provide for accomplishing this result by changing the connection in a simple and convenient way and without the employment of complicated mechanism, so that the lights or the like instead of using the current in parallel will receive it in series, thus using the entire current for operating the lamps or the like and yet securing the desired result. In this way it will be seen that the lamps constitute the resistance for dimming each other and that the power used therefore in the resistance is used for lighting purposes primarily, and consequently is not wasted.

The invention is capable of general use, but is designed especially for dimming the lights of automobiles and will be described herein particularly with reference to that application thereof.

A particularly important object of the invention is to provide for securing these results by means of a switch and connection of the simplest character and not involving any more expense than is involved in the simplest kind of switches.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is an end view of a switch constructed in accordance with this invention showing how this switch is applied in an ordinary automobile lamp circuit and in a position in which the lamps are connected with the battery in parallel so as to get the maximum lighting power; Fig. 2 is a similar view showing the connection of the lamps in series so as to get a minimum lighting power; Fig. 3 is a side view of the switch; Fig. 4 is a diagrammatic view showing how the invention can be applied to lamps not in multiples of four, and showing the switch in a modified form; Fig. 5 is a similar view showing another position of the switch, and

Fig. 6 is a diagrammatic view of another form of switch.

Referring first to Figs. 1, 2 and 3, the two head lights 9 are shown as connected to each other in series by a conductor having a terminal 11. The ends of this part of the circuit are individually provided with two terminals 12 and 13. I have also shown the tail light 14 and pilot light 15, the former being connected in parallel with one of the head lights, and the latter in parallel with the other so that the invention is shown in the simplest form involving lights in multiples of four. Each of the terminals, 12 and 13 therefore is connected with one terminal of one of the head lights, and one of them with one terminal of the tail light, and the other with one terminal of the pilot light. The other terminals of all four lights are connected with the terminal 11.

The switch itself has an oscillatable member 20 having three contacts 21 thereon electrically connected with each other and making an angle of 90 degrees with each other in the form shown in the drawings. Also rigidly mounted on this member 20 is another contact 22 which is insulated from the other three contacts 21 and is at right angles to two of them. This contact 22 is connected with one of the battery wires, and the three contacts 21 are connected with the other wire. A handle 23 is shown located on the casing 24 in which the switch is arranged and connected with the member 20 so as to oscillate the same about its longitudinal axis.

Now when the parts are in the position shown in Figs. 1 and 3 the insulated contact 22 is in engagement with the terminal 11 and the two opposite contacts 21 are in engagement with the terminals 12 and 13. Consequently current from the battery passes to the two contacts 21 and divides, one half going out through each of the contacts 12 and 13. Each of these currents passes through one of the lamps and then directly to the terminal 11, all the lamps thus being in parallel. From the terminal 11 the current passes back to the battery through the insulated contact 22. With the parts in this position all four lights are supplied with the maximum amount of power and burn with the maximum amount of brilliancy. When it is desired to turn the lights off, the member 20 can be turned

to an intermediate position in which none of the contacts is in engagement with any of the terminals 11, 12, or 13.

When it is desired to have the lamps burn at half power the switch is turned to the position shown in Fig. 2. In this case the central one of the arms 21 engages the terminal 13 on one side, while the insulated terminal 22 engages the other terminal 12. The one of the arms 21 which now extends toward the terminal 11 is shorter than the arm 22 and does not engage this terminal. The current therefore comes from the battery to one of the conducting contact arms 21, passes from that to the right hand terminal 13, then divides and goes through the pilot light 15 and one of the head lights 9. Then it passes in series through the other head light 9 and the tail light 14 and back to the battery through the terminal 12 and insulated arm 22.

In Figs. 4 and 5 another form of the invention is shown, and it is indicated as applied to a six lamp circuit. In this case the positive and negative wires of the line are provided with terminals 30 and 31. The lighting circuit is shown as arranged with six lights 29 in pairs, those of each pair being in series with each other and having two common terminals 32 and 33. Between each pair of lights, however, there is a common electrical connection 34 having a terminal 35. The switch in this case is a sliding plug 36 having a conducting section or contact 37, a second conducting section or contact 38, and an insulating section 39 between them. With the parts in the position shown in Fig. 4 the terminals 31, 32 and 33 are in contact with the conducting section 37, while the terminals 30 and 35 are in contact with the conducting section 38. Consequently the current will pass through the terminal 30, contact 38, terminal 35, wire 34 to all the lamps, dividing there and coming back to the conductor 37 through the terminals 32 and 33, and contact 37 and thence to the negative side of the line. In this way the lamps are in parallel and all lighted to their maximum brilliancy. In the position shown in Fig. 5 the conducting contact 38 is in contact with the two terminals 30 and 32, while the two terminals 31 and 33 are still in contact with the contact 37, the terminals 35 being out of contact altogether. Now in this case the current comes in through the terminal 30, contact 38, terminal 32 to one side of the series of lamps, and passes through each pair of lamps in series and back through the terminal 33, contact 37 and terminal 31. In this way the lamps receive only half the power and yet all the power which is used is employed for lighting purposes.

If it is desired to shut the lights off entirely the plug is moved to an intermediate

position in which the insulating section 39 covers the terminal 30. In Fig. 6 the same principles are carried out. Here the battery terminal 40 is permanently connected with a spring contact 41. The other battery terminal 42 is connected with one end of the lamp circuit, the other end of which is connected with a spring 43. A rotary shaft 44 has an eccentric 45 thereon adapted when in its two opposite positions to engage the two springs 41 and 43 and move them laterally. In the position shown it moves the spring 43 out of engagement with the contact terminal 42. In the opposite position it would move the spring 41 into engagement with a contact 46, which is connected between the two lamps. That would give a parallel connection, while in the position shown the lamps are connected in series, from the battery through 41, 44, 43, through the lamps and back to the other terminal of the battery. It will be seen, therefore, that by this method of dimming electric lights or reducing the activity of any other electric device, the reduction in the amount of power used is provided for simply by changing the circuit from parallel to series, thus using all the power for the purpose intended and not wasting any in heating up an inactive resistance, and yet the device used for accomplishing the results is of exceedingly simple character and does not materially add to the expense of installation over the ordinary switches used to switch in the resistance, and in fact is less expensive than many of these.

Although I have illustrated and described only three forms in which the invention can be carried out, I am aware of the fact that it can be carried out in many other ways without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to all the details of construction herein shown and described, but

What I do claim is:—

1. The combination with two electrical devices, of a conductor connecting them with each other in series, and a switch having two contacts insulated from each other and movable to two positions, in both of which one of said contacts is connected with one terminal of the source of power, and with one of said devices on the side thereof opposite said conductor, and the other contact of said switch is connected with the other terminal of said source of power, in one of which positions one contact is connected with the other of said devices on the side thereof opposite said conductor and in the other of which positions the last named contact is connected with said conductor at a point between said two electrical devices and otherwise insulated from the second of said devices.

2. The combination with two electrical de-

vices, of a conductor connecting them with each other in series, means for connecting one end of said conductor with a terminal of a source of power, the other end of said conductor also having a terminal, and a switch having two contacts insulated from each other and movable to two positions, in both of which one of said contacts is connected with one terminal of the source of power, and the other contact of said switch is connected with the other terminal of said source of power, and in one of which one contact is connected with said conductor at a point between said two electrical devices, said switch also being movable to a third position in which the circuit is electrically broken.

3. In an electric installation, the combination with a pair of lamps connected in series with each other, and having a terminal in the circuit between them and a terminal in the circuit beyond each lamp, of a switch having a member provided with contacts for a power circuit, and movable to a position in which each of said contacts is in contact with one of the last named terminals and out of contact with the first named terminal, and also movable to another position, in which one of its contacts, is in contact with the first named terminal and the other in electrical connection with both of the other terminals.

4. The combination with two electrical devices, of conducting means for connecting them with each other in series, and a switch having a portion thereof connected with one

terminal of a source of power in all positions of the switch, and another portion insulated therefrom and connected with the other terminal of the source of power, said switch being movable to two positions, in one of which said other portion thereof is electrically connected with said conducting means at a point between said two devices, and in the other of which it is connected with it on one side of said conducting means.

5. The combination with two electrical devices, a conductor connecting them with each other in series, means for connecting one end of said conductor with a terminal of a source of power, the other end of said conductor also having a terminal, and a switch having two contacts insulated from each other and movable to two positions, in both of which one of the last named contacts is connected with said terminal of the source of power, and in one of which the other contact of said switch is connected with the other terminal of said source of power, and in the other of which it is connected with said conductors at a point between said two electrical devices, said switch also being movable to a third position in which the circuit is electrically broken.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

HENRY H. HAM.

Witnesses:

ALBERT E. KAY,
C. FORREST WESSON.