April 30, 1929. D. S. KNIZNIK 1,710,879

AUTOMATIC AUTOMOBILE LIGHTING DEVICE

Original Filed Oct. 30, 1924 2 Sheets-Sheet 1

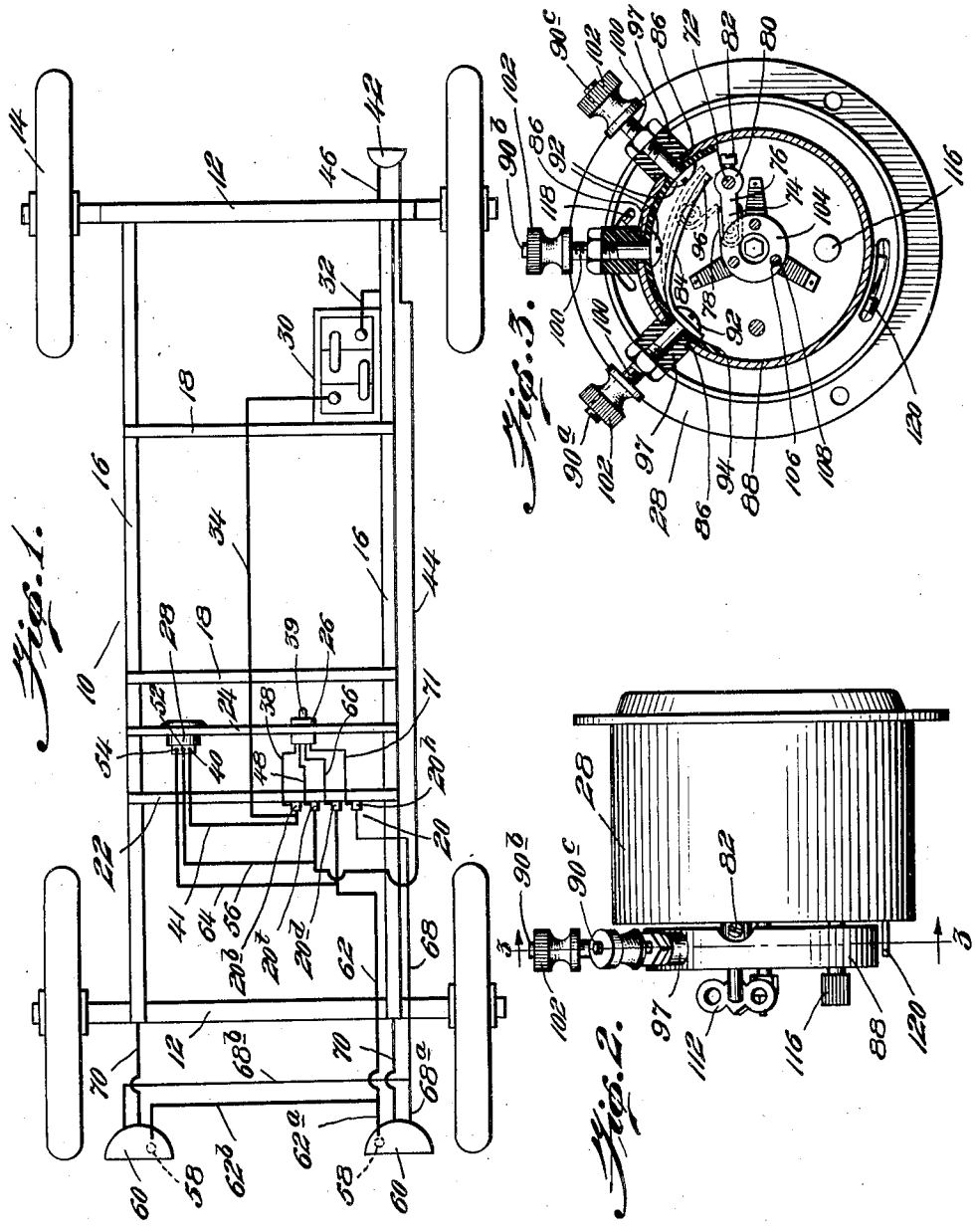


Fig. 1.

Fig. 3.

Fig. 2.

Inventor
David S. Kniznik
By Thomas A. Jenckes Jr.
Attorney

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Fig. 4.

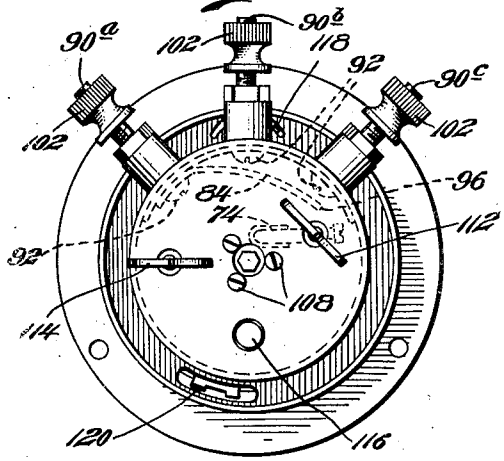


Fig. 5.

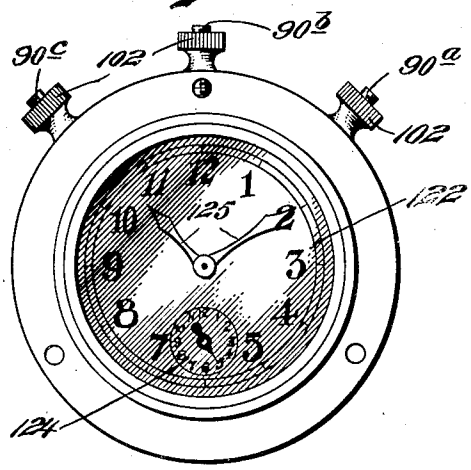


Fig. 6.

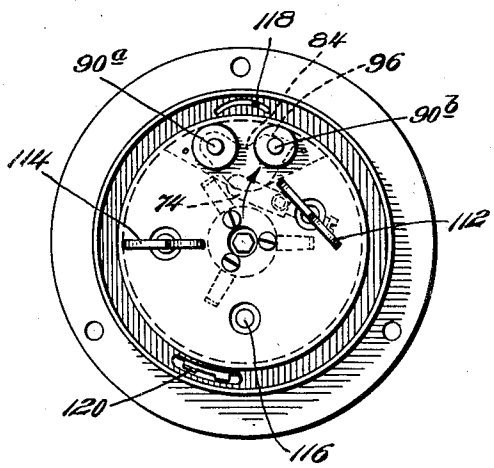


Fig. 7.

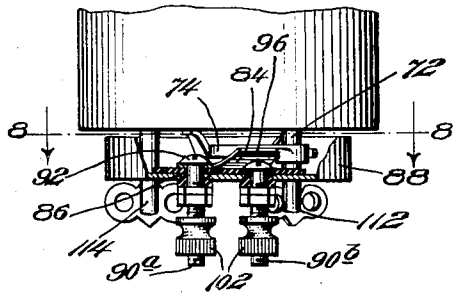
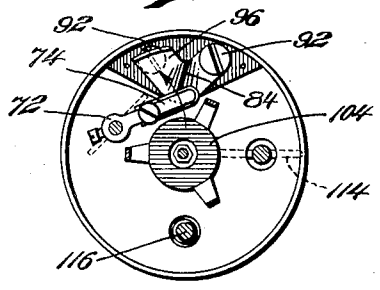


Fig. 8.



Inventor
David S. Kniznik
By Thomas A. Jenckes Jr.
Attorney

Patented Apr. 30, 1929. 1,710,879

UNITED STATES PATENT OFFICE.

DAVID S. KNIZNIK, OF PROVIDENCE, RHODE ISLAND.

AUTOMATIC AUTOMOBILE LIGHTING DEVICE.

Original application filed October 30, 1924, Serial No. 746,834. Divided and this application filed January 20, 1928. Serial No. 248,150.

My invention relates to automobiles and comprises the combination therewith of means to light the lighting system thereof at predetermined times.

I am aware that others have patented various time controlled devices for lighting the lights of an automobile but so far as I am aware these devices have contained such a multiplicity of working parts, have not been properly insulated or for various other reasons have been so impracticable that none is on the market today. So far as I am aware I am the first to provide a practical device of this description containing as few working parts. The desirability of such a device is obvious, for it provides means whereby one may set the device so that the lights will be properly turned on at predetermined times as specified by statute in most States.

To this end I take the present lighting system of an automobile just as it stands. I take a standard alarm clock just as it stands. By adding eight small pieces which may be readily purchased anywhere, I provide so far as I am aware the first simple and practical device for this purpose. I bore three holes in the gong of an alarm clock, I insert three binding posts in these holes in a manner to insulate them from the gong and from each other I mount a leaf spring on one binding post having an end projecting over the other two binding posts, I mount a cam on the alarm winding arbor, with three pieces of wire I connect these three binding posts to the desired portions of the lighting system of the automobile preferably to the binding posts located on the usual panel, namely one to the battery binding post, another to the tail and the other to the dimmer binding posts, I preferably cut off the alarm hammer and the device is completed.

It is obvious that my device functions perfectly independently of and in addition to the usual hand switch of an automobile for lighting the lights.

By embodying the usual desirable features of an alarm clock into my device, by mere setting of the usual on and off alarm setting lug I provide a device which may be made to operate or not as desired.

While my device is designed and adapted to be used in combination with the lighting system of an automobile, so far as I am aware I also provide one of the simplest time controlled devices for completing an electric circuit invented and one which of its own inherent simplicity, seems to present patentable novelty over all other previous devices for this purpose, the switch per se being claimed in my application Serial Number 746,834, filed October 30, 1924 from which this application is a division.

These and such other objects of my invention as may hereinafter appear will be best understood from a description of the embodiments shown in the accompanying drawings.

In the drawings, Fig. 1 is a skeleton plan view showing the frame of an automobile and the various component parts of the lighting system thereof.

Fig. 2 is a side elevation of an alarm clock with my invention attached.

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

Fig. 4 is a rear elevation of an alarm clock with my invention attached showing the spring and cam thereof in dotted lines.

Fig. 5 is a front elevation of an alarm clock with my invention attached.

Fig. 6 is a rear elevation of a modified form of my invention employing for purposes of illustration only two binding posts attached to an alarm clock.

Fig. 7 is a plan view of the modified form of my invention shown in Fig. 6 showing parts of the mechanism thereof in section.

Fig. 8 is a view taken along line 8—8 of Fig. 7.

In the drawings, wherein like characters of reference indicate like parts throughout, 10 generally indicates the frame of an automobile, containing the usual front and rear axles 12 having the wheels 14 attached thereto as usual, the side bars 16 and cross bars 18.

In the skeleton view shown in Fig. 1 I show a circuit normally employed on a standard type of automobile. The binding posts 20 are preferably suitably mounted on the front edge of the board 22 which separates the driver's feet from the engine. For purposes of clarity I have designated these binding posts as 20^h, 20^d, 20^t and 20^b referring respectively to the respective binding posts 20^h as the one to receive the head light wire, 20^d to receive the dim light wire, 20^t to receive the tail light wire, and 20^b to receive the battery wire. Mounted on the usual panel 24 in the front of the driver's seat is the usual

switch 26 for turning the head and dimmer lights on and off respectively and my improved time controlled mechanism or alarm clock 28. The usual storage battery 30 is suitably mounted on the frame 10. Said battery has one terminal thereof suitably grounded to the frame 10 by the wire 32 and the other terminal thereof suitably connected by the wire 34 to the binding post 20^b. The binding post 20^b is connected to the battery terminal of the switch 26 by means of the wire 38 and it is also connected to the binding post 40 of my improved alarm clock 28 by means of the wire 41. The tail light binding post 20^t is suitably connected to the tail light 42 by the wire 44, which tail light is suitably grounded to the frame 10 by the wire 46. The switch 26 is provided with the usual contacts. The wire 48 connects the binding post 20^t with its respective contact on the switch 26. The tail light binding post 20^t is also connected to the binding post 52 of my alarm clock 28 by the wire 56. The dim light binding post 20^d is suitably connected to the dim lamps 58 in the head lights 60 by the wire 62, the wire 62 being split in portions 62^a and 62^b to lead to each light. The dim light binding post, 20^d is connected by the wire 64 to the alarm clock binding post 54.

The wire 66 connects the dim light binding post 20^d to its respective contact on the switch 26. It is obvious that the tail light circuit is connected to the binding post 52 of the alarm clock 28 and the dim light circuit is connected to the binding post 54 of the alarm clock 28, and that both the dim light binding post 20^d and tail light binding post 20^t are connected to the switch 26 to function simultaneously. The head light binding post 20^h is suitably connected to the head lights 60 by means of the wire 68 which is conveniently split into the wires 68^a and 68^b to connect each head light 60, each head light being suitably grounded both for the dim lights and the head lights to the frame 10 by the wires 70. The head light binding post 20^h is connected to its respective contact in the switch 26 by the wire 71. The operation of the manually controlled switch 26 is well known. When the lights are off the swinging lever 39 of the switch, normally rests on a dead contact of said switch. As the lever 39 is turned it will contact with the proper live contacts to alternately light the dim and tail lights simultaneously or the head and tail lights simultaneously. I have worked out the circuits in such detail that the simple functioning of my invention may be more easily explained.

As explained, the wire 41 connects the usual battery binding post 20^b with the battery binding post 40 on the time controlled mechanism 28, the wire 64 connects the dim light binding post 20^d with the dim light binding post 54 of my alarm clock mechanism and the wire 56 connects the tail light binding post 20^t with the tail light binding post 52 of my alarm clock mechanism. It is obvious that when a circuit is completed in my time controlled mechanism 28, that independently of said manually controlled switch 26 the battery 30 will be connected to said dim lights and tail light thereby lighting them at predetermined times, as will be explained. Though I have shown and described separate connections for the dim lights 58 and tail light 42, my time controlled mechanism 28 may be connected to the dim lights 58 alone, tail light 42 alone, head lights 60 or to any other desired lights on the lighting system without interfering in any way and independently of the already existing manually controlled switch 26 and that to attach my mechanism to the already existing lighting system of an automobile it is only necessary to connect the three wires 64, 41 and 56.

As explained, my invention includes a spring make and break connection in an electric circuit and means to complete said circuit actuated by a shaft revoluble at predetermined time controlled settings, such as an ordinary alarm clock having such a shaft, as the alarm winding arbor 72 as shown. On the alarm winding arbor 72 of the alarm clock 28 I mount the cam 74. Said cam 74 in my preferred embodiment preferably comprises the arm 76 having a covering 78 of phenol condensation product composition or other suitable insulating material wrapped around it and the collar 80 to enclose the alarm winding arbor 72. The set screw 82 is provided to tightly secure said collar 80 to said alarm winding arbor 72. The preferred form of make and break connection I employ includes the conductor spring 84 preferably mounted on said clock 28 adjacent to said cam 74. In my preferred embodiment, I cut the holes 86 radially of the periphery of the usual gong 88 of the alarm clock 28 and in said holes I mount the binding posts 90^a, 90^b and 90^c said binding posts preferably having the screw heads 92 retained within the gong 88 to provide electrically exposed portions within said gong 88. Said electrically exposed portions 92 are preferably insulated from said gong 88 by the phenol condensation product composition insulating strip 94. The spring 84 may be mounted on the base of the binding post 90^a within said gong 88 between the screw head 92 and phenol condensation product composition strip 94, the end 96 thereof projecting over the electrically exposed portions 92 of the binding posts 90^b and 90^c. The additional phenol condensation product composition insulating collar 97 insulates the binding posts 90^a, 90^b and 90^c from the exterior surface of said gong 88 and from said clock 28. The binding posts 90^a, 90^b and 90^c are provided with the threaded portions

100 projecting radially outwardly from said gong 88 provided with the usual thumb nuts 102 for connecting the wires thereto.

The gong 88 may be mounted on the alarm 28 in any suitable fashion. In the preferred type of alarm clock shown it is mounted on the tripod 104, suitably attached to the rear of said clock 28, which contains three screw holes 106 to receive the screws 108 (Fig. 4) to attach the gong thereto. When the gong is attached, both the alarm winding handle 112 and the time winding handle 114 may be attached as usual. The usual alarm setting stem 116, the usual fast and slow setting lug 118, and the usual on and off alarm setting lug 120 are employed. As explained the alarm hammer (not shown) is preferably cut off and the alarm on and off lug 120 permits as usual revolution of the alarm winding arbor 72 at the time controlled settings, when desired. Fig. 5 shows a front elevation of the clock showing the face 122 which is provided with the usual alarm setting dial 124, and hands 125.

The operation of my invention is obvious from the above description. The binding post 90^a forms the battery terminal 40 of the alarm clock 28, the binding post 90^b preferably the tail light terminal 52 and the binding post 90^c the dim light terminal 54 thereof. Assuming that the clock is suitably connected to the circuit as indicated above, it is obvious that when the lug 120 is moved to the on position, and when the clock 28 has run to the predetermined setting of the alarm winding dial 124, that by suitable internal mechanism (not shown) the alarm arbor 72 will start to revolve. As the alarm arbor revolves it carries with it the cam 74 and presses down the arm 76 thereof on the conductor spring 84 until the end 96 thereof contacts with the electrically exposed screw heads 92 of the binding posts 90^b and 90^c and is kept in contact therewith by the tension of the alarm winding spring (not shown), when, if the circuit has been suitably connected as hitherto explained, a complete electric circuit will be formed to light the dim lights 58 and tail light 42. To turn off the lights, the on and off lug 120 is turned to the off position, and the alarm winding arbor 72 is turned sufficiently to raise the arm 76 of the cam 74 away from the spring 84. The end 96 thereof will resiliently spring away from the electrically exposed portions 92 of the binding posts 90^b and 90^c, thereby breaking the circuit and shutting off the lights. So long as the on and off lug 120 is in off position, my time controlled make and break connection to light the lights will not function. When it is desired to set the clock to light the lights at a predetermined time, the alarm key being already turned to function again by the prior operation of breaking the circuit, the alarm setting dial 124 is adjusted to the desired setting and the on and off lug 120 turned to the on position, and at the predetermined time the alarm winding arbor 72 will again revolve to light the lights, as explained.

In Figs. 6–8 I have shown a modified form of my invention claimed in application Serial No. 746,834 aforesaid where the cam 74 instead of pressing the end 96 of the spring 84 radially outwardly against the electrically exposed portions 92 of the binding posts 90^b and 90^c presses it laterally rearwardly against the exposed portion 92 of the one binding post 90^b, said binding posts 90^a and 90^b being practically identical in construction to these already shown in the prior embodiment and being mounted in holes 86 cut axially of the gong 88 and extending rearwardly of the clock thereby improving the clock's front appearance, the parts of the alarm clock being similarly insulated.

In this embodiment, the wire 56 from the tail light binding post 20^c, and the wire 64 from the dim light binding post 20^d are connected to the same binding post 90^b, thereby eliminating the use of the binding post 90^c. The disadvantage of this construction, however, is, that when the manually controlled switch 26 is turned to light the head lights 60, the tail light 42 will also light, and as the tail light circuit is now connected to the dim light circuit, the wires 56 and 64 being connected together and to the binding post 54 whenever the head lights 60 are lighted the dim lights 58 will be lighted too, through the medium of the tail light circuit. It is for this reason that I have provided the extra binding post 90^c on the alarm clock 28 in addition to the binding post 90^b, to keep the tail and dim light circuits independent of each other, but permitting both circuits to be simultaneously energized when the spring 84 is depressed by the cam 72 at the desired predetermined time to contact the electrically exposed portions 92 of both binding posts 90^b and 90^c. The embodiment shown in Figs. 6–8 as it only employs two binding posts is not within the scope of the present application, but is shown for the purpose of more clearly illustrating the principle of the invention involved in this application and to illustrate modified forms of springs and binding posts which may be employed.

Though I have preferably mounted the spring 84 and binding posts 90^a, 90^b and 90^c on the alarm gong 88 it is obvious that they may be mounted adjacent to the cam 74 on any suitable member such as a bakelite shell especially constructed for said clock to replace the gong.

Though I have shown the cam 74 provided with the insulated covering 78, it is obvious that if desired the entire cam 74 may be constructed of insulating material.

Though I have shown the alarm clock of my invention attached to the instrument

board of the automobile, it is obvious that it may be attached to the steering post or any other convenient portion of the automobile. I employ the word "dim light" to include the usual dim lights, parking lights or any other lights other than the tail light that may be employed on an automobile of lesser intensity than the headlights.

It is understood that my invention is not limited to the specific embodiments shown and that various deviations may be made therefrom without departing from the spirit and scope of the appended claims.

What I claim is:

1. In an automobile having a lighting system containing a manually controlled switch having a movable setting member and terminals mounted thereon so that the movable setting member on proper contact therewith may light the head and tail lights simultaneously independently of the dim lights and terminals mounted thereon so that the movable setting member may on proper contact therewith light the dim and tail lights simultaneously independent of the head lights, a time controlled switch for lighting the dim and tail lights at predetermined time controlled settings comprising three terminals, one connected to the battery through the battery terminal of the manually controlled switch, having one end of a make and break connection permanently attached thereto, another connected to the dim lights through the dim light terminal of the manually controlled switch and the other independently connected to the tail light through the tail light terminal of the manually controlled switch and a shaft revolvable at predetermined time controlled settings having means mounted thereon and revolvable therewith to depend said make and break connection to simultaneously contact said independent tail and dim light terminals to light the dim and tail lights at predetermined time controlled settings whereby the movable member of said manually controlled switch may be moved to light the head and tail lights without simultaneously lighting the dim lights.

2. In an automobile having the usual lighting system containing the usual manually controlled switch therefor having contact means connected to the dim and tail lights, contact means connected to the head and tail lights and a manually movable contact member adapted to independently contact said contact means to alternatively light the head and tail lights, or dim and tail lights, a time controlled switch for lighting the dim and tail lights simultaneously having two fixed contacts each connected independently in parallel to the tail light and dim lights respectively to prevent a short circuit through the tail light circuit to cause the dim lights to light on manipulation of the manually controlled switch to light the head lights, a movable contact member connected to the power electric terminal and means to move said movable contact member at predetermined time controlled settings to simultaneously contact said fixed dim and tail light contacts to light the dim and tail lights.

3. In an automobile lighting circuit having a manually controlled switch therefor having contact means in the manually controlled switch connected to the head and tail light circuits and contact means in the manually controlled switch connected to the dim and tail light circuits and a time controlled switch therefor connected thereto, two separate contacts, in the time controlled switch each connected in parallel to the dim and tail lights respectively and each adapted to be simultaneously closed in the operation thereof to simultaneously light the dim and tail lights to cause a complete separation between the head and dim light circuits to prevent manipulation of the manually controlled switch to light the head and tail lights from also lighting the dim lights by a short circuit through the tail light circuit.

In testimony whereof I affix my signature.

DAVID S. KNIZNIK.