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DEVELOPMENT OF MODERN SCHEME OF NONTRADITIONAL LIGHTING DEVICE

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Abstract

This article describes how to prevent excessive electricity consumption of lights on the floors at night and automatically turn on the lights after the end of movement, using electricity only when needed.

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It is also possible to save electricity through the project of introducing solar photoelectric systems that generate electricity in a multi-storey housing stock and utility. This is achieved by installing motion sensors on each corridor and each floor in high-rise buildings and sending electricity to energy-saving lamps. This technology prevents excessive electricity consumption of lights on floors at night. Motion sensor lights installed on each floor deliver light to the corridor for a specified period of time upon detecting movement on the floor, and automatically turn off the light after the movement ends. In this case, the entrance floor causes the use of electricity in corridors only when there is a need and limits the excess electricity consumption of the company.[1]

Figure 1. A view of the entrance-exit corridor to the floor where the motion sensor is installed.

As a result of the analysis presented in the research work, the energy-saving techniques and technologies used in multi-story residential buildings (inter-floor lighting motion sensors and energy-saving fluorescent lamps) are distinguished by the fact that they are among the most economical materials of the present time.

If a lighting system project for an object (mainly corridors and corridors) is developed using the scheme, it will show a number of advantages. That is, with its help:

- Connect and disconnect from the first switch;
- Connecting from the first switch and disconnecting from the second;
- -Connecting and disconnecting from the second switch;
- Connecting from the second switch and disconnecting from the first.

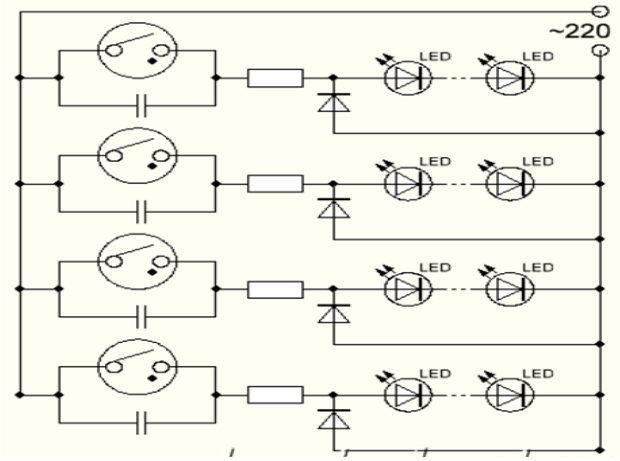

Figure 2. Disconnecting - connecting scheme

The scheme in Fig. 2 is very useful for us in situations like the one discussed above, that is, when organizing the lighting system in multi-story buildings.[2]

More precisely, a person entering the pod at night presses a button and the system is activated and the scheme operates for a certain period of time. That is, the light bulb is lit. The bulb will automatically turn off after a certain period of time. It is this "known" time that we can adjust using a variable resistor.

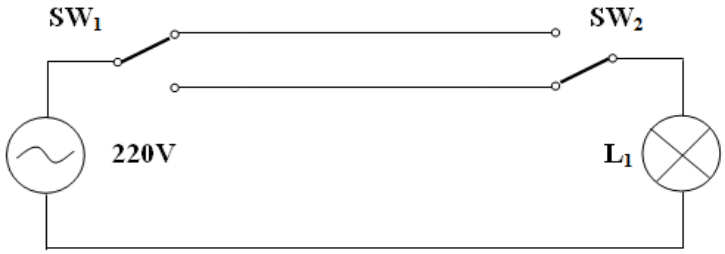

Figure 3. A simple two-way disconnect-connector circuit.

The operation of the circuit in Figure 3 (burning for a certain time) depends on the charging time of the capacitor in it. Because, as we know, current flows through the capacitor only when it is being charged.[3]

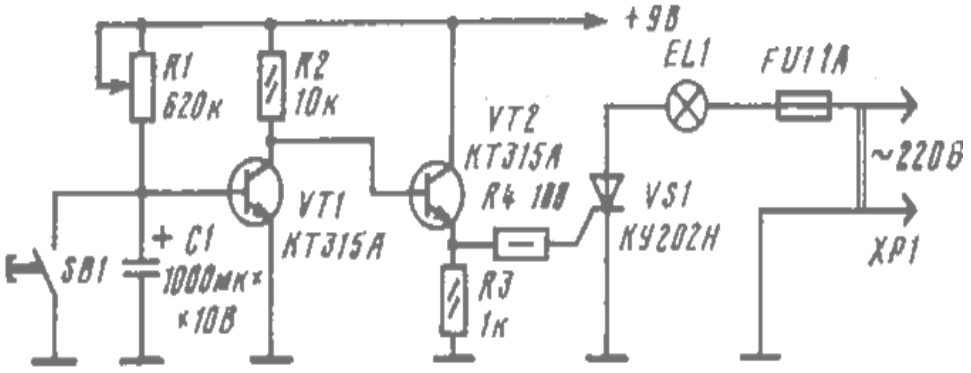

Figure 4. A circuit that ensures that the light stays on for a certain period of time

In addition, the following modern and complex scheme of automatic light control has been developed. With its help, the light can be controlled both optically and acoustically.

All resistors used in this circuit are MLT type, power 0.25 W.

Resistor Dimensions: (in Ohms)

R1 12k, R2 680k, R3 680, R4 8.2k, R5 300k, R6 430, R7 120k, R8 100k, R9

10M, R10 22k, R11 10k, R12 47k, R13 680, R14 18k, R15 6.8k, R16 2.4k, R17 47k, R18 2.2M, R19 680.

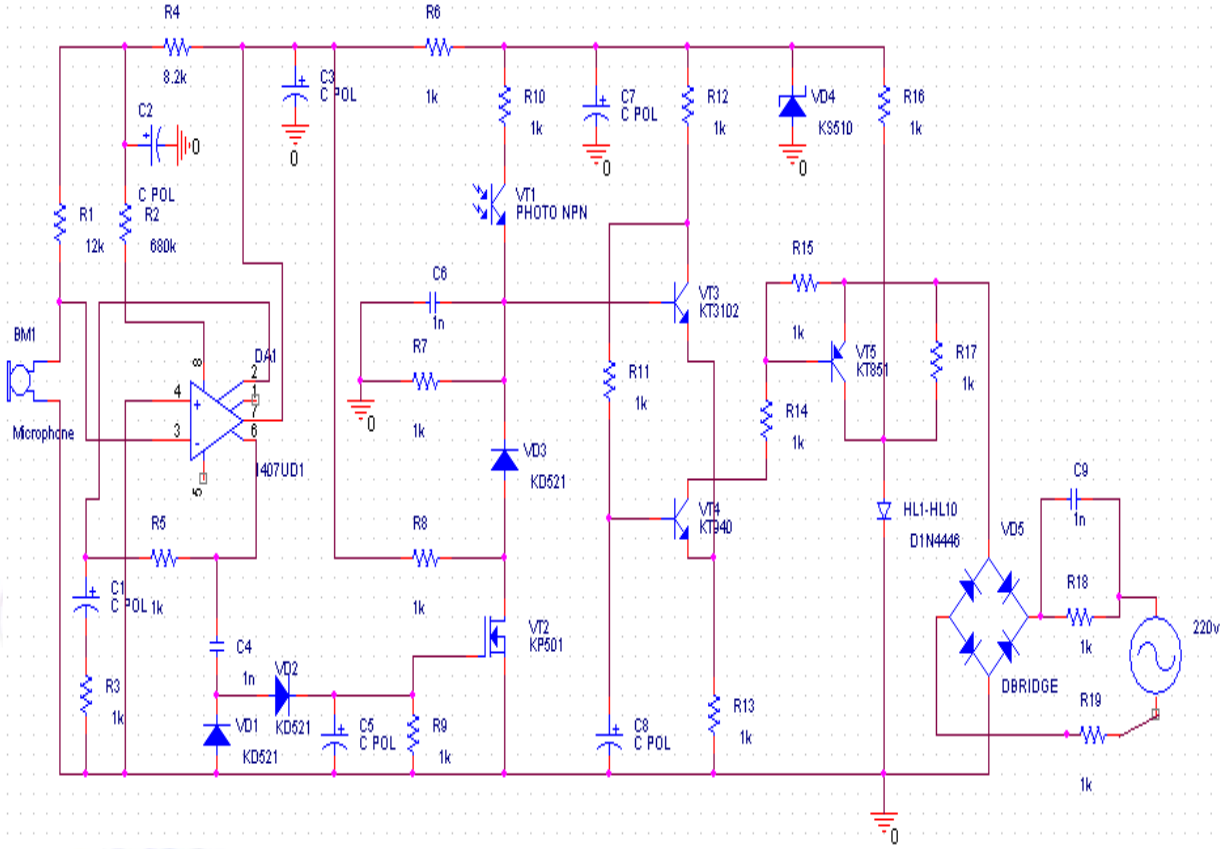

Figure 5. Automatic lighting control scheme

Capacity of capacitors (shown in farads):

C4 1mk - filmy, C6 0.22mk - KM-5, C9 0.47mk,630V

Electrolyte capacity (shown in farads):C1 2.2mk 10V, C2 100mk 10V, C3 470mk 16V, C5 47mk 20V, C7 470mk 16V, C8 1mk 6.3V

Transistors:

VT2 KP501A, VT3 KT3102B, VT4 KT940A, VT5 KT851B

Diodes:

VD1 KD521A, VD2 KD521A, VD3 KD521A

Stabilitron:

VD4 KS510A

Diode bridge:

VD5 DB106

Operational unifier:

DA1 KR1407Ud2

Phototransistor: -VT1 HPTB1-48B.[4,5]

Through the scheme, it is possible to create an automated process for lighting multi-level entrance-exit corridors. That is, there is no need to manually turn on and off the lighting system installed with this scheme. This circuit can automatically turn on when it gets dark and turn off automatically when it gets light. In this case, the photoresistor R1 in the circuit performs the main task. At the same time, the energy supply of lighting and electronic equipment was carried out through an unconventional energy source, solar cells.

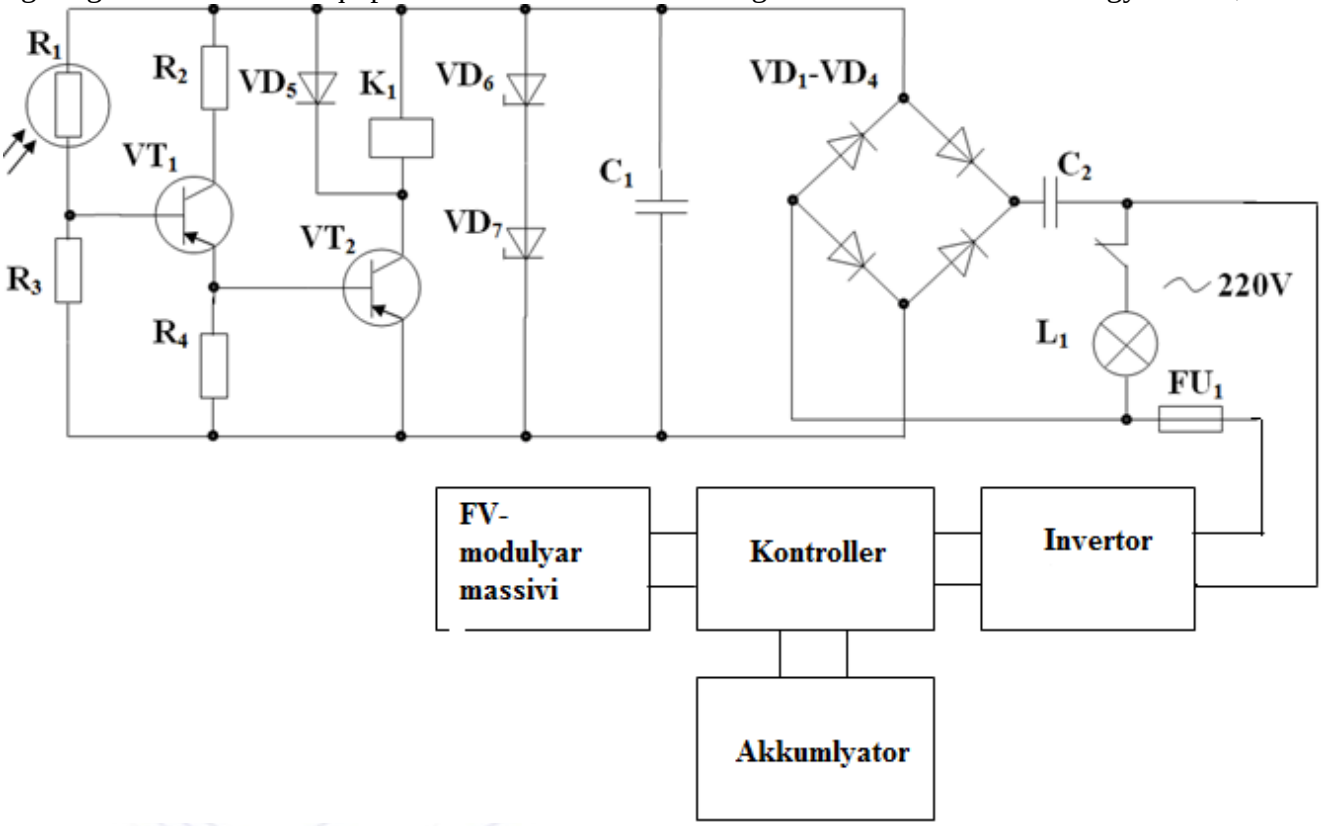

Figure 6. Light control scheme with unconventional energy source and photoresistor.

In this:

R_1 – FSK 1 type photoresistor;

R_2 – 4.7 kOm, 0.25 Vt;

R_3 – 51 kOm, 0.25 Vt;

R_4 – 1 kOm, 0.25 Vt;

VT_1, VT_2 – MP 40 A type transistor;

VD_1 –VD_5 – D 226 diodes;

VD_6 , VD_7 – D 809 stabilitrons;

S_1 – K50-6 200 mkf, 50 V;

S_2 – M5M 0,5 mkf, 500 V;

FU_1 – 1 Ampere;

K_1 – rele RES 22, RSM1 650-700 Om.[6]

Conclusion: This simple scheme can be effectively used in lighting systems of courtyards, avenues and corridors of production enterprises. Especially, this scheme is considered very convenient if it is used to

illuminate entrance-exit corridors of multi-storey buildings. In this case, it is enough to connect the combination of lights of all entrances and exits of an entire apartment building to one circuit.

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