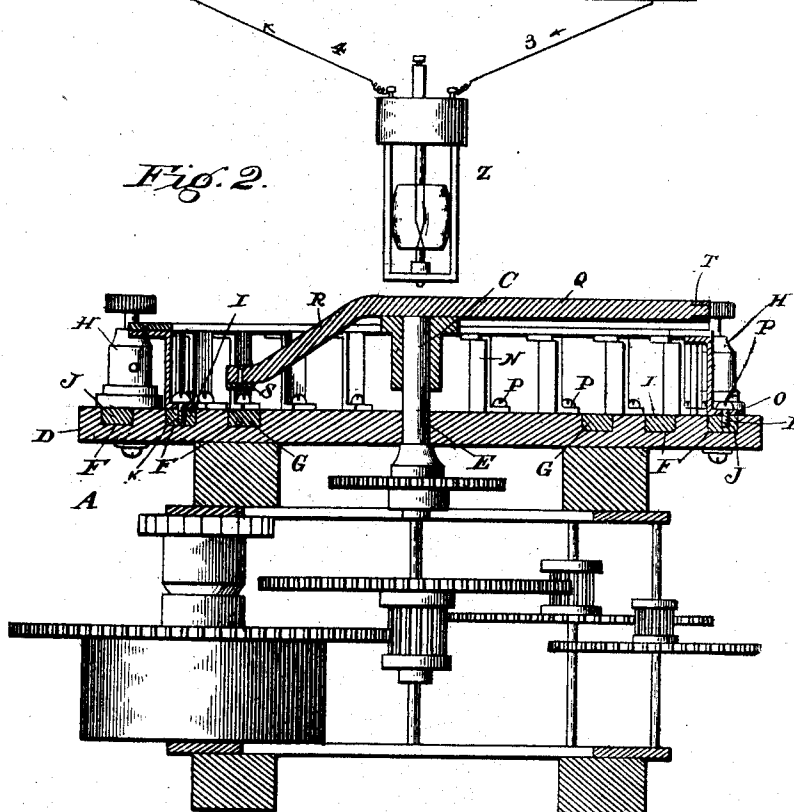
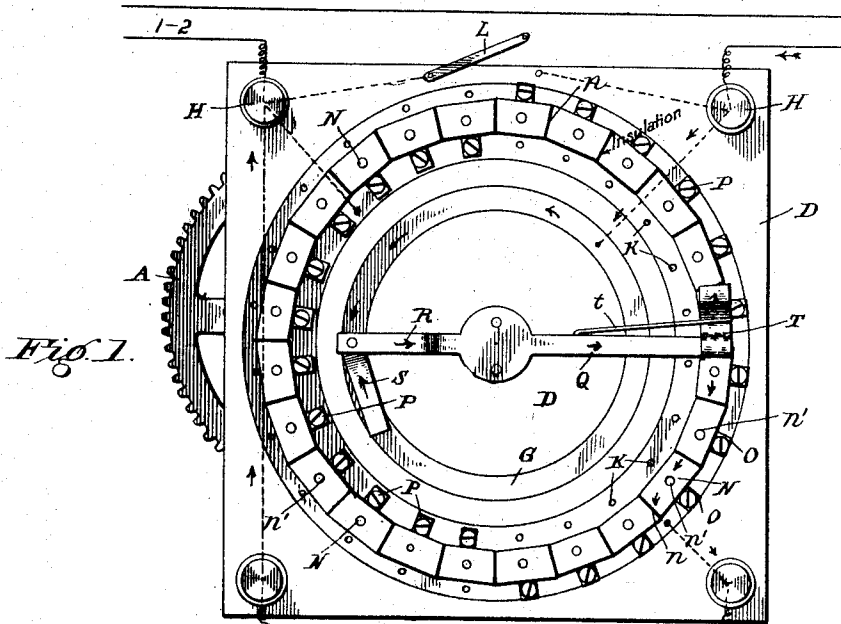


F. BELAND.
ELECTRIC TIME CUT-OUT.

No. 505,808.

Patented Oct. 3, 1893.



Inventor

Witnesses

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By his Attorneys.

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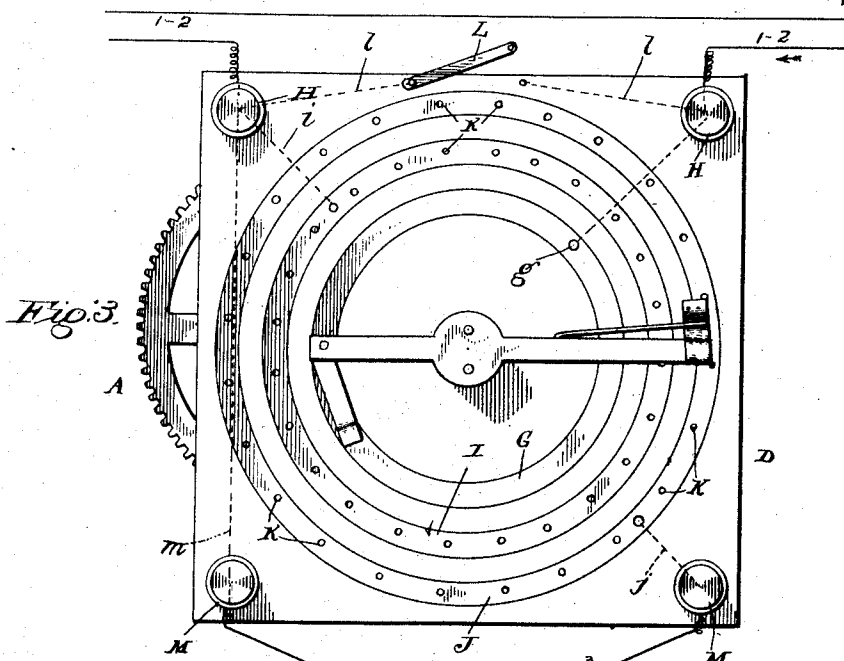


Fig. 3.

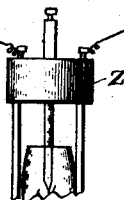


Fig. 4.

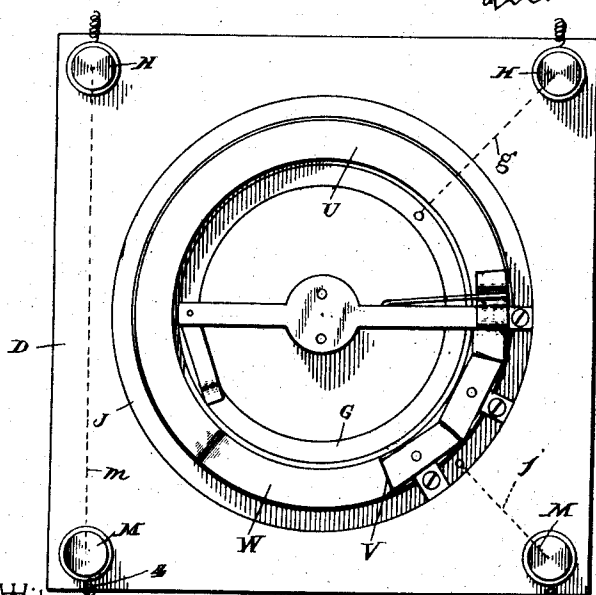
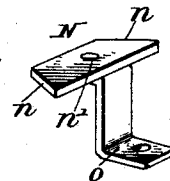
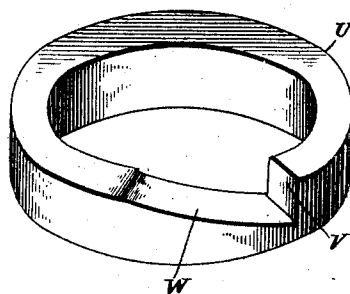


Fig. 6.



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UNITED STATES PATENT OFFICE.

FRANK BELAND, OF CAIRO, ILLINOIS.

ELECTRIC TIME CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 505,808, dated October 3, 1893.

Application filed July 8, 1893. Serial No. 479,944. (No model.)

To all whom it may concern:

Be it known that I, FRANK BELAND, a citizen of the United States, residing at Cairo, in the county of Alexander and State of Illinois, have invented a new and useful Electric Time Cut-Out, of which the following is a specification.

This invention relates to electric time cut-outs; and it has for its object to provide certain improvements in automatic cut-outs employed for holding an electric circuit open or closed any length of time, and to be used in connection with electric lighting systems, motors, &c., so that the apparatus may be brought into use and cut-out of use automatically, at stated intervals, or periods of time.

To this end the main and primary object of this invention is to simplify the construction of time cut-outs, while at the same time providing a cut-out having every adjustment necessary to provide for the proper distribution of the electric current, whether for lighting or other purposes.

With these and other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a front elevation of an electric time cut-out constructed in accordance with this invention. Fig. 2 is an enlarged transverse sectional view thereof, showing the clock mechanism and more clearly the method of connecting the contact segments with the cut-out or short circuit ring and also with the working circuit ring. Fig. 3 is a plan view of the cut-out dial showing the several rings thereof and the proper circuit connections. Fig. 4 is a detail in perspective of one of the shiftable contact segments and its attaching foot. Fig. 5 is a front elevation of the cut-out modified for multiple work. Fig. 6 is a detail in perspective of the insulator cut-out ring employed for multiple work.

Referring to the accompanying drawings, A represents a clock mechanism frame in which is mounted the ordinary clock mechanism, which, in the present invention is of that character adapted to run continuously for twenty-four hours at one winding there-

of, and so constructed that the main shaft or arbor C, thereof, will make one revolution in twenty-four hours. This is effected without any change whatever in the construction of the clock mechanism, but a twenty-four hour movement is preferable for use in connection with apparatus of this character.

Secured to one side of the frame A, is the cut-out dial D, formed of any suitable insulating material and provided with a central opening E, through which projects the outer end of the main shaft or arbor C, and said insulator dial D, is further provided in its outer face with a concentric series of circular grooves F, the inner grooves of which accommodate the continuous central charging ring G, which has a wire connection g, with one of the main circuit binding posts H, to which is adapted to be connected one terminal of the main supply circuit 1—2, and said binding post to which the wire g, is connected may for the sake of clearer understanding be called the positive or charging post through which the current enters.

Concentric with the central charging ring G, and fitted in the intermediate and outer one of the grooves F, are the intermediate cut-out or short circuit ring I, and the outer working circuit ring J, respectively, and each of the latter two rings is provided at regularly spaced intervals with the threaded openings K, and said openings are adapted to be spaced apart so as to divide the two rings into twenty-four equal spaces, each space of which will represent one hour on the dial plate, as will be more fully understood in connection with the other parts of the cut-out to be presently described. The intermediate cut-out ring I, is electrically connected by the short circuit wire i, with the other binding post H of the main supply circuit 1—2, so that when said cut-out ring and the central charging ring are in one circuit, a short circuit is completed from one post H, to the other, in order to cut out the working circuit from use, and to secure the same result for cutting the entire apparatus out of use, I may employ a cut-out switch L, arranged in the short switch circuit 1—1, the terminals of which are connected directly to the adjacent posts H. The other outer working circuit ring J, is connected by the wire j, with one of the binding posts M, of

the working circuit 3—4 in which is included a lamp Z, or motor or other apparatus adapted to be brought in use for certain periods of time. The other binding post of the working circuit is connected directly with one of the binding posts of the supply circuit by the wire *m*. Now it will be seen that when the rings G and J, are closed on one circuit the working circuit is rendered active.

Shiftable contact segments N, are adapted to be connected with either of the rings I and J, at any of their subdivided points, and said contact segments have beveled ends *n* adapted to be slightly separated from the corresponding ends of the adjacent segment, and such contiguous segments provide when the entire series of segments are in position a circular contact ring or path for the brush devices to be presently referred to, and each of said contact segments is pivoted at its center as at *n'*, to the outer angled extremity of an angled attaching foot O. The angled attaching feet O, are angled at both ends or extremities so that the inner ends can be readily shifted from one ring to the other when changing or adjusting the intervals at which the working circuit is to be brought into play, and the off-standing feet O, are removably attached to either of the rings I and J, by means of the attaching screws P, passing through the inner ends of the feet and engaging the threaded openings K, in such rings.

Secured to and insulated from the outer end of the main shaft or arbor C, of the clock mechanism is the traveling brush arm Q. The brush arm Q, has an inner inwardly disposed arm extension R, to which is attached one end of the spring collecting brush S, which makes a constant and permanent contact with the central charging ring G, while to the outer extremity of the arm Q, is pivotally attached the circuit brush T, normally held in contact with the circuit or path of slightly separated contact segments by means of the spring *t*, secured thereto and to the arm, and such circuit brush is curved gently, or of such a shape, so as to span the spaces between the segments when trailing thereover.

Now from the foregoing it is thought that the construction and operation of the herein described time cut-out will be readily apparent to those skilled in the art.

Assuming the contact segments to be arranged as illustrated in Fig. 2, twelve of such segments are attached directly to the outer working circuit ring J, while the other twelve are connected to the intermediate cut-out or short circuit ring I, so that there will be a period of twelve hours' duration in which the working circuit is active, and twelve hours when it is cut out. With this arrangement of contact segments it will be apparent that when the circuit brush T, is traveling over the segments connected to the outer ring J, the circuit is completed from the central charging ring G, through the brush arm, the ring J, the connection *j*, and the working cir-

cuit 3—4, so that such circuit is active and in use during the interval while the circuit brush is traveling over these segments connected therewith. When the circuit brush T, reaches the segments connected with the intermediate cut-out ring I, the electric current is short circuited through said intermediate ring and over the connection *i*, so that the working circuit is cut-out from use.

It will be apparent that any arrangement of the contact segments may be observed, so that the working circuit can be rendered active, automatically, at any stated time or for any duration of time according to the character of work required of the working circuit, and by reason of the pivotal connection of the contact segments with their attaching feet, the circular continuity of such segments is never broken, because in shifting the connection from one of the rings to the other, it is simply necessary to hold the segments stationary and turn the angled attaching feet from one ring to the other, it of course being understood that the openings K, of each ring are immediately adjacent to each other.

Many dispositions and arrangements of the contact segments and various modifications of the cut-out may be observed, and I will have it understood that changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention, particularly since the construction herein-described is employed especially for series work, and it is obvious that it is necessary to employ the cut-out for incandescent and general multiple work.

In order to adapt the construction herein described for multiple work, I dispense with the intermediate short circuit ring I, and the connections thereof, and substitute for said short circuit ring the removable raised cut-out ring U. The intermediate raised cut out ring U, is formed of any suitable insulation, and is sufficiently wide so that the outer track edge thereof is disposed directly under the shiftable contact segments N, attached to the outer extremities of the attaching feet O. The said raised insulator contact ring is provided with a single cut-out notch V, formed deeply therein in order to provide for the instantaneous opening of the circuit at the time desired, and is provided with an inclined side W, leading out to the outer edge of the said raised ring. In the modification just described the construction is identical with that hereinbefore described, with the exception of the substitution of the ring U, and the non-employment of a supplemental short circuit, so that the circuit is always closed through the central ring G, and the outer working circuit ring J. The attaching feet O, which carry the shiftable contact segments at their outer extremities, are adapted to be removably attached at any of the regular intervals on the outer working circuit ring J, and wher-

ever these attaching feet are attached, the segments carried thereby are disposed directly over and beyond the outer track edge thereof.

5 In the multiple construction just described, in order to have the lamps or motors cut in for any stated period it is simply necessary to attach the segments to the working circuit ring at the desired point, so that the circuit
10 brush T, will contact therewith when it reaches that point. Now it will be apparent that while the clock is running properly, and the circuit brush contacts with the contact segments at the point where they are located, the circuit is
15 closed directly through the central and outer rings over the working circuit. Now the cut-out notch V, in the cut-out ring, is adapted to be disposed immediately beyond the last segment with respect to the travel of the
20 brush arm, so that as the brush T, leaves such last segment, it immediately drops into the cut-out notch V, whereby the circuit is opened instantaneously, so as to cut out the lights or motors which are included in the working circuit, without shifting the current over a short
25 circuit as is necessary or expedient for series work as hereinbefore described. The brush T, climbs out of the notch V, over the inclined side W, of such notch, and then travels around
30 on the outer edge of the raised contact ring until it again comes in contact with the segments.

Having thus described the invention, what is claimed, and desired to be secured by Letters
35 Patent, is—

1. In an electric time cut-out, the combination with the main shaft or arbor of a clock mechanism; of a cut-out dial having a series of conductor rings, connections from certain
40 of said rings with a main supply circuit and from one ring with a working circuit included in the main supply circuit, shiftable contacts for two of said rings, and a revolving brush permanently contacting with one of the rings
45 and with said shiftable contacts, substantially as set forth.

2. In an electric time cut-out, the combination with the main shaft or arbor of a clock mechanism; of a cut-out dial having a central charging ring, and concentric cut-out
50 and working circuit rings, connections from the central charging ring with a main supply circuit, a similar connection with the cut-out ring, and a working circuit connection with the working circuit ring, shiftable contacts
55 for the cut-out and working circuit rings, and a traveling brush attached to said shaft or arbor and contacting permanently with the said charging ring and said shiftable contacts
60 substantially as set forth.

3. In an electric time cut-out the combination of a cut-out dial having shiftable contacts adapted to be included in either a main supply or working circuit, and a clock mechanism controlled brush making contact with
65 said shiftable contact and permanently in-

cluded in the main supply circuit, substantially as set forth.

4. In an electric time cut-out, the combination with the main shaft or arbor of a clock
70 mechanism; of a cut-out dial having separate sets of binding posts receiving the terminals of a main supply and a working circuit respectively, a central charging ring arranged on the dial and connected with one binding
75 post of the supply circuit, concentric cut-out and working circuit rings arranged on the dial and connected respectively with the other binding post of the supply circuit and one
80 binding post of the working circuit, shiftable contacts for the cut-out and working circuit rings, and a brush arm attached to said shaft or arbor and having separate brushes making permanent contact with the central charging ring and said shiftable contacts respectively,
85 substantially as set forth.

5. In an electric time cut out the combination of a cut-out dial having a concentric series of metallic rings one of which is included in a main supply circuit, and the other of
90 which is connected with said main supply circuit and a working circuit respectively, shiftable contact segments arranged in the same circle and having attaching feet shiftable and removably attached to the latter two
95 rings, and a clock mechanism controlled brush arm carrying separate contact brushes one of which permanently contacts with one of said metallic rings and the other of which travels over the face of said contact segments, sub-
100 stantially as set forth.

6. In an automatic electric time cut out, the combination with the main shaft or arbor of a clock mechanism; of a cut-out dial having concentric grooves, a central charging ring
105 arranged in one of the grooves and connected with one terminal of a main supply circuit, concentric cut-out and working circuit rings arranged in the other grooves of the dial and connected respectively with the other terminal
110 of the supply circuit and with a working circuit, said cut-out and working circuit rings being provided with regularly spaced threaded openings, angled attaching feet receiving
115 at one end screws adapted to engage threaded openings of the ring to removably and shiftable attach said feet thereto, off-standing contact segments pivotally attached to the outer
120 ends of said attaching feet and having beveled ends registering with each other to form a circular contact path, and a brush arm attached to said main shaft or arbor and having at one end a collector brush permanently contacting with the said charging ring and at
125 its other end a circuit brush traveling over said contact segments, substantially as set forth.

7. In an electric time cut-out, the combination with the main shaft or arbor of a clock mechanism; of a cut-out dial having a central
130 charging ring and an outer working circuit ring included in a main supply and working

circuit, removable contacts for the outer working circuit ring, an intermediate cut out ring disposed between the other rings, and a revolving brush permanently contacting with
5 the charging ring and alternately with the outer ring and said cut-out ring, substantially as set forth.

8. In an electric time cut-out, the combination of a cut-out dial having separated rings
10 included in a main supply and working circuit and one of which has removable contacts,

a cut-out ring adapted to be disposed directly under the removable contacts, and a clock mechanism controlled brush, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

FRANK BELAND.

Witnesses:

CHAS. W. FRANK,
WILL P. GREANEY.