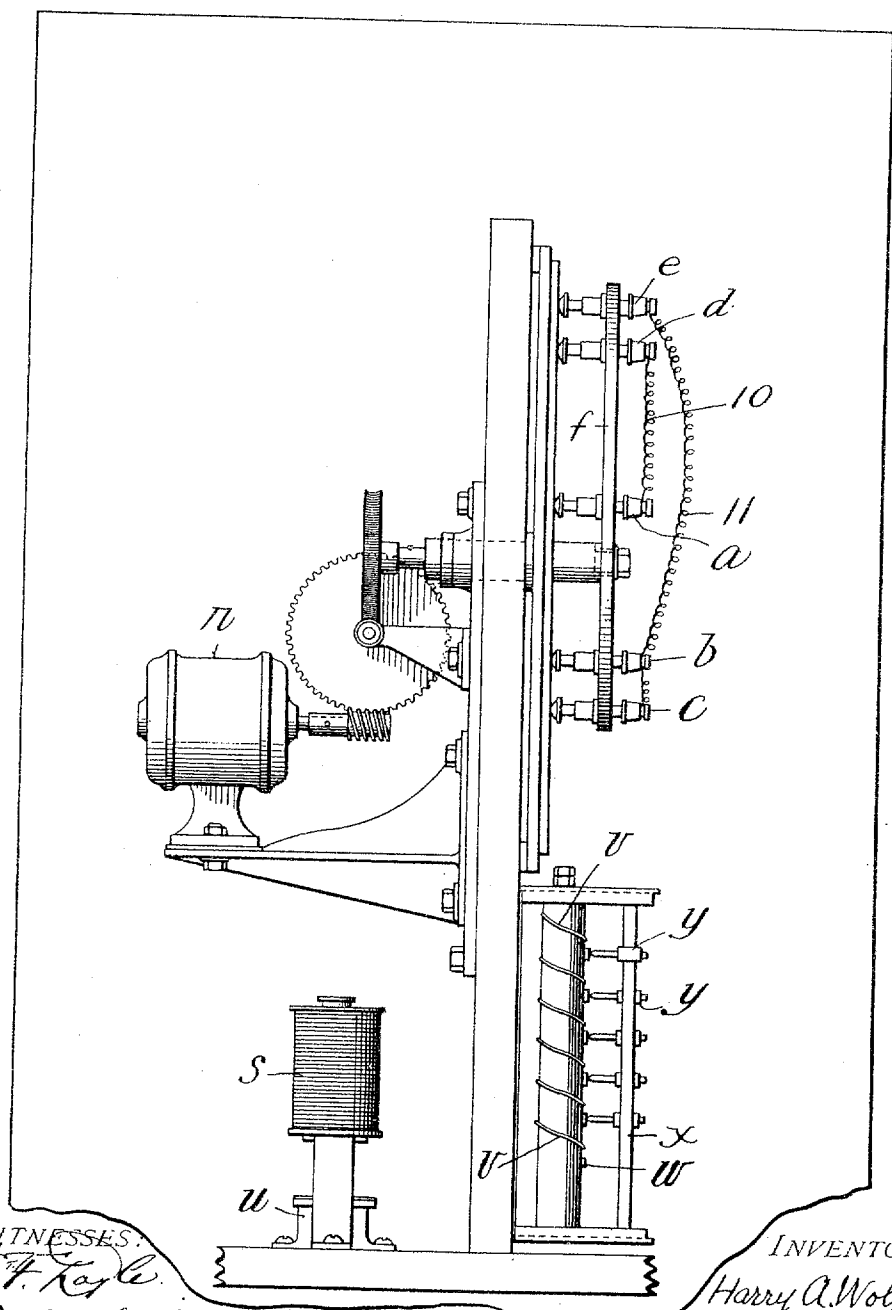


989,465.

Patented Apr. 11, 1911.
3 SHEETS--SHEET 2.



WITNESSES:
H. F. K. L.
Parker Cook

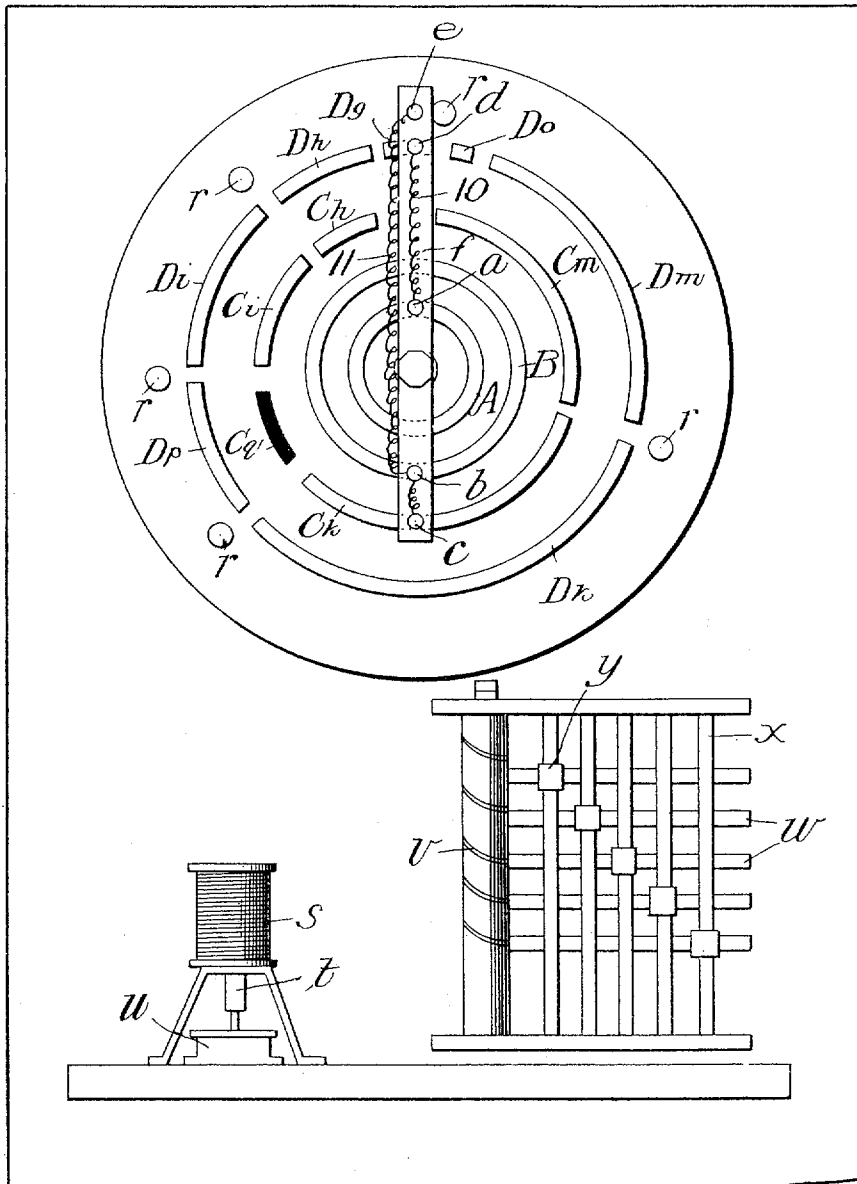
FIG. 2 BY

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3 SHEETS—SHEET 3.



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FIG. 3.

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HARRY ASHTON WOLFF, OF CHAVILLE, FRANCE.

AUTOMATIC DISTRIBUTER FOR ELECTRICITY.

989,465.

Specification of Letters Patent.

Patented Apr. 11, 1911.

Application filed December 31, 1910. Serial No. 600,309.

To all whom it may concern:

Be it known that I, HARRY ASHTON WOLFF, a citizen of the French Republic, residing at Chaville, France, have invented certain new and useful Improvements in Automatic Distributers for Electricity, of which the following is a specification.

There are already known automatic distributers for electric current comprising a certain number of concentric crowns and a switch lever which turns around the center of said crowns; this lever is driven by an electric motor in shunt on the terminals of the source of electricity. The crowns are divided into insulated segments with which the various working circuits are connected. The length of each segment is calculated in such a manner, that each of said circuits is supplied with current for a determined time. Although such automatic distributers are very convenient and useful for a great many purposes they have not been used as frequently as they ought to have been for the reason that they are difficult to regulate. The length of the segments of the concentric crowns being invariable the time during which each circuit is supplied with current, can be varied only by varying the speed at which the switch lever revolves. With this object in view a resistance is inserted in the circuit of the electric motor but this resistance has to be manipulated every time when the switch lever goes from one segment to another. Such automatic distributers are particularly designed for operating automatic machines, such as working machines the tool of which has to make several cuts, automatic photographic machines and the like. It is evident that in such machines the regulation of the distributer must be very easily effected without necessitating the changing of all the distributers. A case in which the time during which the supply of current to one of the working circuits has to be varied is presented for example where the time of exposure of a photographic apparatus has to be altered.

This invention relates to an automatic distributer which can be instantaneously regulated as it has only one resistance in the motor circuit.

The improved apparatus is characterized by having one of the concentric rings connected with the motor, instead of being continuous, divided into as many segments as the ring which serves to supply the working

circuits with current, whereby the motor circuit may be automatically modified and may be modified independently for each of the working circuits.

In the accompanying drawings the improved automatic distributer is diagrammatically shown in Figure 1 in front view and in Fig. 2 in side elevation and is shown in front elevation in Fig. 3.

The improved apparatus comprises at least five concentric rings A, B, C, D and E, of which the first two are continuous and serve for permanently connecting the rotating switch *f* with the positive terminal of the source *g* of electricity. The ring C is divided into as many segments as there are working circuits to supply with electric current. In the example shown four circuits *h*, *i*, *k*, *m* are provided and the ring C is consequently divided into four segments *C^h*, *Cⁱ*, *C^k*, *C^m*, the length of which is calculated so as to correspond to the average duration of the action of the circuits *h*, *i*, *k*, *m*. A dead segment *C^a* is disposed between the segments *Cⁱ* and *C^k*. During the time the switch lever is in contact with this dead segment none of the working circuits is supplied with current.

The ring D which serves for closing the circuit on the motor *n* consists, according to this invention, of as many segments as the ring C, four in the present case, plus two segments *D^o* and *D^a* which are designed to start and stop the revolving motion of the switch *f*, at the proper time as will be more fully hereinafter described.

The outer ring E has as many contacts *r* as there have to be provided interruptions of the working circuit. These contacts *r* serve for sending the current of the working circuits into a mercury interrupter *s*, *t*, *u* in order to avoid the production of the interruption sparks in the apparatus.

For regulating the speed of the motor *n* only one resistance *v* is required with which horizontal bars *w* are connected upon which vertical bars *x* with sliding contacts *y* are mounted.

The electric connections are as follows:— The segments of ring C are connected by the wires *3^h*, *3ⁱ*, *3^k*, *3^m* with the working circuits *h*, *i*, *k*, *m* in each of which a resistance is inserted according to the work to be done. All these circuits are connected by a common wire 4 with the movable armature *t* of an interrupter *s* which normally plunges into the

mercury of the cup *u* which is connected by the wire 5 with the negative pole of the source *g*.

The segments of the ring D with the exception of the segments D^o and D^a, that is to say five in all, as a segment D^p is arranged where the interval is situated between the segments Cⁱ and C^k of the ring C, are connected by the wires 6^h, 6ⁱ, 6^p, 6^k, 6^m each with one of the vertical bars *x* of the rheostat; the resistance *v* is connected by the wire 7 to the wire 5 and consequently to the negative pole of the source of electricity. The different sliding contacts *y* are mounted upon the vertical contact bars *x* and placed at the height which corresponds to the length of the resistance *y* to be inserted in the corresponding circuit.

The contacts *r* of the ring E are connected by a wire 8 to a common wire 9 which is connected with the wire 5, after traversing however the windings of the electromagnet of the mercury interrupter *s*.

The revolving commutator carries as many contacts as there are rings provided in the apparatus; these contacts *a*, *b*, *c*, *d*, *e* are maintained in frictional contact with the corresponding rings by springs of usual construction not necessary to be shown.

The contacts *a* and *d* are electrically connected by means of a wire 10 and the three other contacts *b*, *c*, *e* are connected the one with the others by the wire 11. The motor *n* revolves the commutator *f* by means of a convenient transmission, such for example as shown in Fig. 2.

In the wire 7 a mechanical interrupter *z* has been inserted, said wire 7 being further connected by a wire 12 with the dead segment D^a.

The interrupter *z* can be operated mechanically or electrically by the person who wants to start the apparatus. If the apparatus has to work continuously, that is to say if it has to execute periodically the same operations, and if consequently the commutator *f* has to revolve for a certain time, it is only necessary to insulate the contact D^o in which case the circuit breaker *z* remaining closed, the motor continues to be supplied except when the commutator is between the segments D^m and D^a but the motor, or better expressed, the commutator gets over this gap by inertia. If however the commutator has to revolve only once, as is the case for example with automatic machines operated by the insertion of a penny, the segment D^o has to be connected by the wire 13 with the return wire 5 and in circuit with this wire 13 an electro-magnet is inserted which serves for opening the circuit breaker *z*. Under these conditions the motor is put out of circuit as soon as the contact *d* arrives on the segment D^o; it continues to turn by inertia for the time which

is necessary to bring the contact *d* to the dead segment D^a whereupon the apparatus is stopped.

Suppose the automatic distributor has to operate an automatic photographic apparatus. In this case the interrupter *z* is operated by the coin inserted in the slot by the person who wants to be photographed. The motor is at once started by the following circuit:—

g-5-z-7-12-D^a-d-a-Λ-1-n-g.

The commutator *f* begins to turn so that the contact *d* is brought in contact with the segment D^h and the piston *c* in contact with the segment C^h. The source of electricity supplies two distinct circuits with current, of which the one is the circuit:—

g-2-B-C-C^h-3^h-h-4-t-u-5-g,

that is to say the working circuit which produces the first operation of the apparatus, for example the exposure.

The second circuit is the following:—

g-n-1-A-a-d-D^h-6^h-x-y-w-v-7-z-5-g,

that is to say the circuit which insures the operation of the motor *n* and consequently the rotation of the commutator. This circuit comprises the lower part of the resistance *v* which can be varied according to requirement by simply shifting the sliding contact *y* upon the bar *x* whereby the duration of the operation is regulated in a very simple manner.

At the moment when the contact *c* leaves the segment C^h an interrupting spark would be produced in the apparatus whereby the contacts and the segments would be quickly worn; owing however to the contact *r* with which the piston *c* is in touch, the following circuit is established:—

g-2-B-b-c-r-8-9-5-g,

so that the armature *t* is lifted out of the mercury; the interrupting spark therefore is formed at this point instead of being produced in the apparatus.

As the commutator has arrived by inertia at the following segment, the same operations begin again only it is the working circuit *i* which is supplied with current, and so on.

When the contact *d* gets on the segment D^o it produces the movement of the interrupter *z* so that the same is opened and the commutator, having turned through one complete revolution will arrive by inertia at its dead point D^a.

I claim:—

1. An automatic distributor for electric current comprising a series of concentrically arranged contact rings and a rotary switch carrying a series of contacts one for each contact ring, in combination with a motor

- for rotating the rotary switch, a source of current supply, a series of working circuits each leading from a portion of one of said contact rings and having a common return, and a series of motor circuits each leading from a portion of another of said contact rings and having a common return, and a single resistance between the motor circuits and the common return.
2. An automatic distributor for electric current comprising a series of concentrically arranged contact rings two of which are continuous and the others of which are divided into separate segments and a rotary switch carrying a series of contacts one for each contact ring, the contacts being so connected that the switch will close the circuit from each of the continuous rings to one of the segmental rings, in combination with a source of current supply, a motor for rotating the switch, a circuit leading from the source of current supply through the motor to one of the continuous contact rings, a second circuit in shunt with the motor circuit leading from the source of current supply to the other continuous contact ring, a series of working circuits leading from segments of one of the segmental contact rings, and connected to a common return, a series of motor circuits leading from the segments of another of the segmental contact rings, and having a common return, and a single resistance interposed between the series of motor circuits and the common return.
3. An automatic distributor for electric current comprising a series of concentrically arranged contact rings two of which are continuous, and the others of which are divided into separate segments, and a rotary switch carrying a series of contacts one for each contact ring, the contacts being so connected that the switch will close the circuit from each of the continuous rings to one or more of the segmental rings, in combination with a source of current supply, a motor for rotating the switch, a circuit leading from the source of current supply through the motor to one of the continuous contact rings, a second circuit in shunt with the motor circuit leading from the source of current supply to the other continuous contact ring, a series of working circuits leading from segments of one of the segmental contact rings and connected to a common return, a series of motor circuits leading from segments of a second segmental contact ring, and connected to a common return, a circuit breaker for breaking the common return of the motor circuit, an electro-magnet for releasing the circuit breaker, and a circuit leading from a segment of said second segmental contact ring through said electro-magnet.
4. An automatic distributor for electric current comprising a series of concentrically arranged contact rings two of which are continuous and the others of which are divided into separate segments, and a rotary switch carrying a series of contacts one for each contact ring the contacts being so connected that the switch will close the circuit from each of the continuous rings to one or more of the segmental rings, in combination with a source of current supply, a motor for rotating the switch, a circuit leading from the source of current supply through the motor of one of the continuous contact rings, a second circuit in shunt with the motor circuit leading from the source of current supply to the other continuous contact ring, a series of working circuits leading from segments of one of the segmental contact rings and connected with a common return, a series of motor circuits leading from segments of a second segmental contact ring, and connected to a common return, a circuit breaker for breaking the common return of the motor circuit, an electro-magnet for releasing the circuit breaker, and a circuit leading from a segment of said second segmental contact ring through said electro-magnet.
- In witness whereof I have hereunto set my hand in the presence of two witnesses.
- HARRY ASHTON WOLFF.
- Witnesses:
H. C. COXE,
ALBERT DE CARALAD.