

No. 694,546.

Patented Mar. 4, 1902.

M. HOEFT & E. SCHULTZ.  
SELF WINDING ELECTRIC CLOCK.

(Application filed Sept. 25, 1900.)

(No Model.)

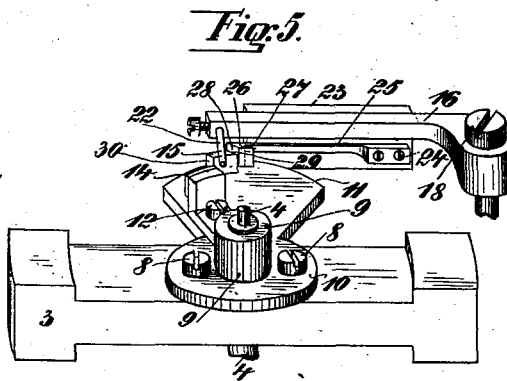
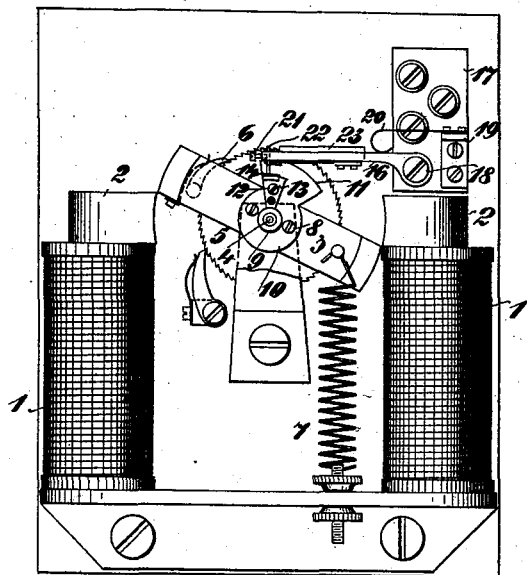


Fig. 1.

Fig. 2.

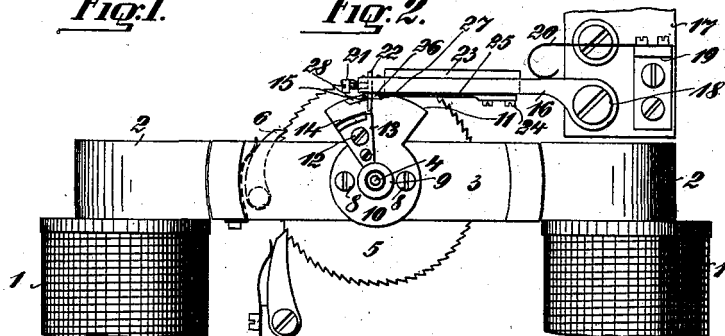


Fig. 3.

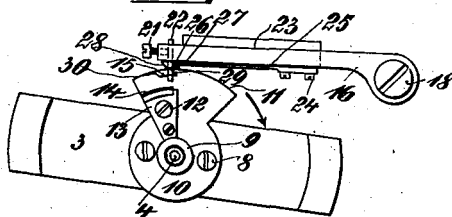
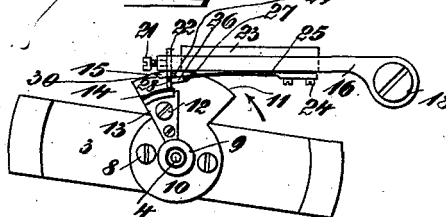


Fig. 4.



Witnesses

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# UNITED STATES PATENT OFFICE.

MAX HOEFT AND EMIL SCHULTZ, OF BERLIN, GERMANY, ASSIGNORS TO  
MAX MÖLLER, OF ALTONA, GERMANY.

## SELF-WINDING ELECTRIC CLOCK.

SPECIFICATION forming part of Letters Patent No. 694,546, dated March 4, 1902.

Application filed September 25, 1900. Serial No. 31,016. (No model.)

*To all whom it may concern:*

Be it known that we, MAX HOEFT, manufacturer, and EMIL SCHULTZ, watchmaker, of Trebbinerstrasse 12, in the city of Berlin, S. W., in the Empire of Germany, have invented certain new and useful Improvements in Circuit-Closing Devices for the Winding of Electric Clocks; and we do hereby declare that the following is a full, clear, and exact description of the same.

Our present invention relates to improvements in electric contact devices for electrical timepieces and the like; and the object of our improvements is to provide means for automatically cleaning the electrical contact-surfaces, and thus effecting with certainty the necessary closure of the circuit and to prevent sparking of the contact-surfaces.

The improved contact device is characterized by a spring which is so arranged as not to be under tension before and after, but only when the circuit is closed, and by the combination of this spring with a number of mechanical parts hereinafter described and claimed.

Referring to the accompanying drawing, illustrating this invention, Figure 1 is an elevation of the improved contact device. Fig. 2 is a perspective view of the same on a larger scale, and Figs. 3 to 5 represent details.

Between the poles 2 of the electromagnet-coils 1 is pivoted, on a spindle 4, the lever-armature 3, to which is fastened a spiral or other spring 7, which has the tendency to turn the armature in one direction, the attraction of the poles 2 when the circuit is closed being adapted to turn said armature in the opposite direction. On the armature 3 is fixed a disk or suitably-shaped piece 10, from which rises a sleeve 9 and which has a curved contact-surface 11. To this disk is secured, by screws 12 or other suitable means, a projecting angle or other shaped piece 13, having a contact-piece 14, above which there is a small pallet-like or other suitably-shaped projection 15, hereinafter referred to simply as the "pallet."

A narrow contact-lever 16 is hinged on a pin 18, secured to an insulated base-plate 17 in any suitable or usual manner, and is controlled by a spring 20, screwed to an angle-

piece 19; so that the lever 16 always tends to turn toward the spindle 4. At this end the lever 16 carries a screw 21 for securing an adjustable contact-pin 22, which is capable of being raised or lowered in a hole drilled in the lever 16. Behind the contact-pin 22 a plate of insulating material 23 is secured to the lever 16, and to its under side screws 24 attach a flat spring 25, terminating in a pallet-like or other suitably-shaped piece 26, which has two inclined faces 27 and 28, which when the clock is going engage with the inclined faces 29 30 on the pallet 15.

On the spindle 4 is fixed a ratchet-wheel 5, which when the armature is turned by the spring 7 is rotated by a pawl 6, secured to said armature, and is kept from returning when the armature returns by a pawl secured to the framework, Fig. 1.

The operation of the circuit-closing mechanism is as follows: When the armature 3 is attracted, it will assume the position shown in Fig. 2. In this position magnetism in the electromagnet 1 has ceased, and by the operation of the spring 7 the armature now slowly returns to the position shown in Fig. 1, in which the circuit is closed. In the return motion of the armature the inclined face 29, on the pallet 15 will first strike the incline 28 on the piece 26, and thus cause the contact-lever 16 to be raised. When the armature goes back further, the pallet-like piece 26 lies on the pallet 15, Fig. 3, and the contact-pin 22 cannot therefore touch the contact-plate 14. Contact between these two only takes place when the armature has been so far oscillated backward that the projecting edge of the incline 27 can pass the incline 30, when the contact-pin 22 will strike the contact-plate 14. The circuit is thus closed, and the armature 3 is again attracted. When the armature is attracted, the incline 30 of the pallet 15 presses against the incline 27, and this and the spring 25 assume the positions shown in Fig. 4, thus increasing the friction between the contact-pin and contact-plate in accordance with the strength of the spring, and the parts will be maintained in that manner until the contact-plate 14 is pulled away from the contact-pin 22, at which moment the spring 25 springs back again.

By these very simple means the contact is made and broken at (locally) different points of the contact-surfaces, and the contact of the contact-surfaces during the time the circuit is closed is very uniform and firm, (so that a deposit of dust upon the contact-surfaces will not prevent the circuit from being closed,) without, however, requiring the exercise of much force to move the contact-surfaces relatively to each other. Finally it has to be noted that the contact-pin 22 must always touch the contact-surface 14 when the lever 16 falls or moves toward the spindle 4, even if much worn. Accumulation of dust or foreign bodies cannot affect this, as when the armature goes back even any dust and the like accumulated on the curved surface 11 and the upper face of the pallet 15 will be brushed off by the leading edge of the plate 23 and the piece 26, respectively. The spring 25 only operates while the circuit is closed, and the friction produced by it does not check the going of the clock, not being therefore disadvantageous in that respect. The friction continues for a short time only, during which time it cannot well be dispensed with if the contact-surfaces are to remain clean and be protected against the sparking that would otherwise occur when closing the circuit, owing to the shaking or concussion to which such clocks are, as a rule, necessarily subject. This contact device therefore satisfies the highest requirements that can be made in such a device as to simplicity of construction and certainty of operation.

Instead of the pallet 15 a pin or the like can be used to raise and lower the pallet-like piece 26 as the disk 10 oscillates. This arrangement can, however, be reversed and a pin provided on the spring 25, working in combination with the pallet 15.

What we claim, and desire to secure by Letters Patent of the United States, is—

1. A contact device for electrical timepieces, and the like, comprising, in combination, an oscillating contact-piece; a lever fulcrumed with its free end proximate to said contact-piece; a second contact-piece, secured to the arm of said lever; a spring secured to, and insulated from, said lever; and means to depress said spring and consequently said lever, and thus increase the friction between the contact-surfaces when the circuit is closed; substantially as, and for the purpose, set forth.

2. In an electric clock a contact device for making and breaking electric circuits, comprising, in combination, a lever hinged at one end; a spring attached to said lever; and means to depress said spring and, consequently, said lever and thus to increase the friction between the contact-surfaces, when the circuit is closed; substantially as, and for the purposes, set forth.

3. In an electric clock a contact device for making and breaking electric circuits, comprising, in combination, an oscillating cam;

a contact-piece secured to said cam; an arm hinged at one end with its free end proximate to the edge of said cam; a spring secured to, and insulated from said arm; a pallet-like piece secured to said spring; a pin secured to said oscillating cam and adapted, by oscillating to raise and lower said pallet-like piece, and, consequently, indirectly, said arm; substantially as set forth.

4. In an electric clock a contact device for making and breaking an electric circuit, comprising, in combination, an oscillating cam; a contact-piece secured to said cam; a lever hinged at one end with its free end proximate to the edge of said cam; a plate of insulating material secured to said lever and adapted by bearing on the edge of said cam to limit the downward stroke; a spring secured to said insulated plate; a pallet-like piece secured to said spring; a pin secured to said oscillating cam and adapted, by oscillating, to raise and lower said pallet-like piece, and, consequently, indirectly, said lever; substantially as set forth.

5. The combination in a timepiece of: an electromagnet; a lever-armature, pivoted between, and adapted to be turned by the attraction of, the poles of said electromagnet; a spring, adapted, on breaking the circuit to turn said lever-armature contrary to the direction of the attraction of said poles; a contact-piece adapted to oscillate with said lever-armature and electrically connected with one pole of the source of electricity; an insulated lever hinged to a fixed part of the timepiece, and arranged with its end pressed toward said lever-armature; a second spring, attached to, and insulated from, said lever; a pallet-like piece secured to the end of said second spring; a second contact-piece, electrically connected with the other pole of the source of electricity, secured to said lever and adapted to bear in certain positions of said armature against the first contact-piece.

6. The combination in a timepiece of an electromagnet with two projecting pole-pieces; a lever-armature adapted to oscillate between said pole-pieces; a spring attached to said lever-armature and adapted to turn said lever-armature in the opposite direction to that effected by the electromagnets; means for adjusting the tension of said spring; a contact-piece adapted to oscillate with said lever-armature and conductively connected with one pole of the source of electricity; an insulated lever hinged to a fixed part of the timepiece and arranged with its end pressed toward said lever-armature; a second spring, attached to, and insulated from, said lever; a pallet-like piece secured to the end of said second spring; a second contact-piece, electrically connected with the other pole of the source of electricity, secured to said lever, and adapted to bear in certain positions of said armature against the first contact-piece; and a pin adapted to rotate with said lever-armature and depress said pallet-like piece and increase

the friction between said contact-surfaces, when the circuit is closed by the said contact-pieces; all substantially as set forth.

7. A contact device, for electrical timepieces and the like comprising, in combination, an oscillating contact-piece; a lever fulcrumed with its free end proximate to said contact-piece; a second contact-piece, secured to the arm of said lever; a spring attached to, and insulated from, said lever; a pallet-like piece attached to the free end of said spring; a pin adapted to oscillate with the first contact-piece and to raise and depress said pallet-like piece; substantially as, and for the purpose, set forth.

8. A contact device for electrical timepieces, and the like, comprising, in combination, an oscillating contact-piece; a lever insulated from, and fulcrumed with its free end proximate to, said contact-piece; a second contact-piece, secured to said arm; a spring attached to said lever and insulated from the first-said contact-piece; a pallet-like piece attached to the free end of said spring; a pin adapted to oscillate with the first-said contact-piece and to raise and depress said pallet-like piece; substantially as, and for the purpose, set forth.

9. A contact device for electrical timepieces,

and the like, comprising, in combination, an oscillating contact-piece; a lever insulated from, and fulcrumed with its free end proximate to, said contact-piece; a second contact-piece secured to said lever; a spring secured to, said lever and insulated from the first-said contact-piece; and means to depress said spring and consequently said lever, and thus increase the friction between the said contact-surfaces; substantially as set forth.

10. In an electric clock a contact device for making and breaking electric circuits, comprising, in combination, a lever hinged at one end; a spring attached to said lever; a contact-piece adjustably secured to said lever; and means for depressing said spring, and consequently, said lever and thus to increase the friction between the contact-surfaces, when the circuit is closed; substantially as and for the purposes, set forth.

In witness whereof we have hereunto signed our names, this 20th day of August, 1900; in the presence of two subscribing witnesses.

MAX HOEFT.  
EMIL SCHULTZ.

Witnesses:

FRANZ SCHWEYTERLEY,  
HENRY HASPER.