N° 10,961 A.D. 1901

Date of Application, 28th May, 1901—Accepted, 17th Aug., 1901

COMPLETE SPECIFICATION.

Electric Striking Clock,

I, MAX MÖLLER, of Grosse Elbstrasse, 41, Altona, (Elbe), Germany, Merchant, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

If, in an electric clock, an oscillating armature drives both the going and the striking trains, and the said armature puts tension upon a spring wherein is collected the power for driving the striking train, then care must be taken that such spring or the parts rigidly connected therewith be disengaged from the armature as soon as the spring has attained sufficient tension, as, otherwise, the attraction of the armature will be impeded.

A clock attaining this result is the subject of this invention.

It is characterized by a system of rods or levers for winding up the striking train, operated by the armature, and put out of gear with a ratchet wheel or the like on the spring barrel as soon as the spring for the striking gear has been wound up to a certain predetermined degree, whilst, as soon as the tension of the spring for the striking gear diminishes, the system of rods or levers engages with the teeth of the ratchet wheel and is thus again enabled to wind up the spring to the utmost permissible tension.

A convenient form of construction of such an electric clock is shown in the accompanying drawings, in which,

Fig. 1, represents an elevation;

Fig. 2, a detached elevation of parts, with some of the parts shown in a different position;

Fig. 3, a side elevation; and

Figs. 4, plan views.

The electro-magnet, *a*, is provided with pole pieces, *b*, between which oscillates an armature, *d*, freely swinging on a spindle, *c*. After the armature has been attracted, (which is caused, from time to time, by the electro magnetic circuit being closed by a contact pin, *f*, coming into metallic contact with a contact plate, *e*,) a spring, *g*, (shown broken) becomes operative, having been put under tension whilst the armature was being attracted, the spring causing the return motion of the armature whilst losing its tension. In the return motion, the armature actuates the driving train of the clock. All these parts of the clock are of known construction and operation.

On the return motion of the armature, which, after having been attracted, has about the position shown in Fig. 1, a pin, *i*, firmly connected with the armature by an arm, *h*, will first run free, but will presently press against a latch, *l*, rotating on a screw bolt, *k*. This latch will yield, but will return to its original position, when acted upon by a spring, *m*, not long before the armature assumes the position shown in Fig. 2. In passing onward, the pin, *i*, after the latch, *l*, has slipped back, will come into contact with the nose, *n*, of a J-shaped lever, *p*, fulcrummed at *o*, and will slightly turn this lever until the parts have reached the position shown in Fig. 2. In this position, the armature, *d*, is again attracted, when it will push downward the latch, *l*, and, therefore, the lever, *p*, jointed to it. The impact is transmitted by a pawl, *q*, on the lever, *p*, to a ratchet wheel, *r*, which is rotated thereby. With the wheel, *r*, rotates

[*Price 8d.*]

a spring barrel within which is a spring, *s*, one end of which is connected in the usual manner with the spring barrel while the other end is attached to a sleeve keyed upon a spindle, *t*. When the spring, *s*, has been wound up sufficiently the spindle, *t*, will rotate as soon as the striking train is released and will actuate the same. With the spindle, *t*, rotates a train consisting of two toothed wheels t^1, *u*, one of which, *u*, is provided with a pin, *v*. A toothed wheel, *w*, capable of sliding on its spindle faces the toothed wheel, *u*, and this engages with a toothed wheel, *x*, on the barrel of spring, *s*, this wheel, *x*, having broad teeth. The toothed wheel, *w*, has a perforation, at *y*, terminating in an inclined plane A spring, *z*, carries at its end a pin with an inclined face and this spring has a tendency to push the wheel, *w*, against the wheel, *u*, the pawl, *q*, being pushed aside by said pin and thrown out of engagement with the teeth of the ratchet wheel, *r*. The wheels, *u*, and *w*, have the same number of teeth, also the two wheels t^1 & *x*, which engage with the same.

The operation of the mechanism arranged as described is as follows:—

When there is no tension on the spring, *s*, and the pawl, *q*, is alternately raised and lowered by the oscillation of the armature, *d*, the toothed wheel, *r*, with which the pawl engages will be turned in the one direction. This rotation effects the winding up of the spring, *s*, and also rotation of the cog wheel, *x*, which rotates the toothed wheel, *w*, engaging with same. When the spring, *s*, has been wound up to the given extent, the toothed wheel, *w*, has been turned so far that the hole, *y*, in the same faces the pin, *v*, in the wheel, *u*.

As already mentioned, the spring, *z*, tends always to carry the wheel, *w*, towards the wheel, *u*, and when the position just referred to is reached, this is effected. In this movement, the pin on the spring, *z*, will push aside the pawl, *q*, so that now the armature oscillates without further winding up the spring, *s*. The spring thus has a certain tension which is so chosen as to give power for about forty strokes of the hammer.

If now the striking train actually becomes operative, which is effected with unwinding of the spring, *s*, and rotation of the spindle, *t*, then the toothed gear will turn with same, one wheel of which, *u*, carries the pin, *v*. This pin slips upwards on the inclined face of the hole, *y*, pressing back the toothed wheel, *w*, and with it the spring, *z*. This again releases the pawl, *q*, which springs into engagement with the teeth of the wheel, *r*. The next oscillation of the armature will, therefore, again wind the spring, *s*. It is necessary to provide the power of the train as above stated, as, in the higher hours of the day, much work is required of the striking train, and this can only be attained by collecting the power in the spring, *s*, when the work demanded is small.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An electric striking clock in which a swinging armature drives both the going and the striking trains and characterized by a system of levers and gearing actuated by the armature and operating to wind up the spring of the striking train by rotating its barrel and automatically thrown out of engagement upon the engagement of mechanism actuated by the spring barrel, when the latter has attained a certain position, that is to say, when the spring has been wound up to a certain extent.

2. A form of electric striking clock such as referred to in Claim, 1, which is characterized by the rotation relatively to one another of two discs the distance between which will automatically diminish by collapse, in the manner usual in clock alarums, when the tension of the spring for the striking train has attained a certain strength, so that by this means the winding gear is thrown out of engagement.

3. A form of construction of the electric striking clock referred to in Claim, 1, characterized by a J-shaped lever, *p*, with a rotatable pawl, *l*, which, when the

armature goes back, is pushed aside by the same and goes back to its position of rest by spring power, and which, when the armature is attracted, transmits the impact of the same to the pawl, *q*, on the lever, *p*.

Dated this 28th day of May, 1901.

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Redhill: Printed for His Majesty's Stationery Office, by Malcomson & Co., Ltd.—1901.

A.D. 1901. May 28. N° 10,961.
MÖLLER'S Complete Specification.

(1 SHEET)

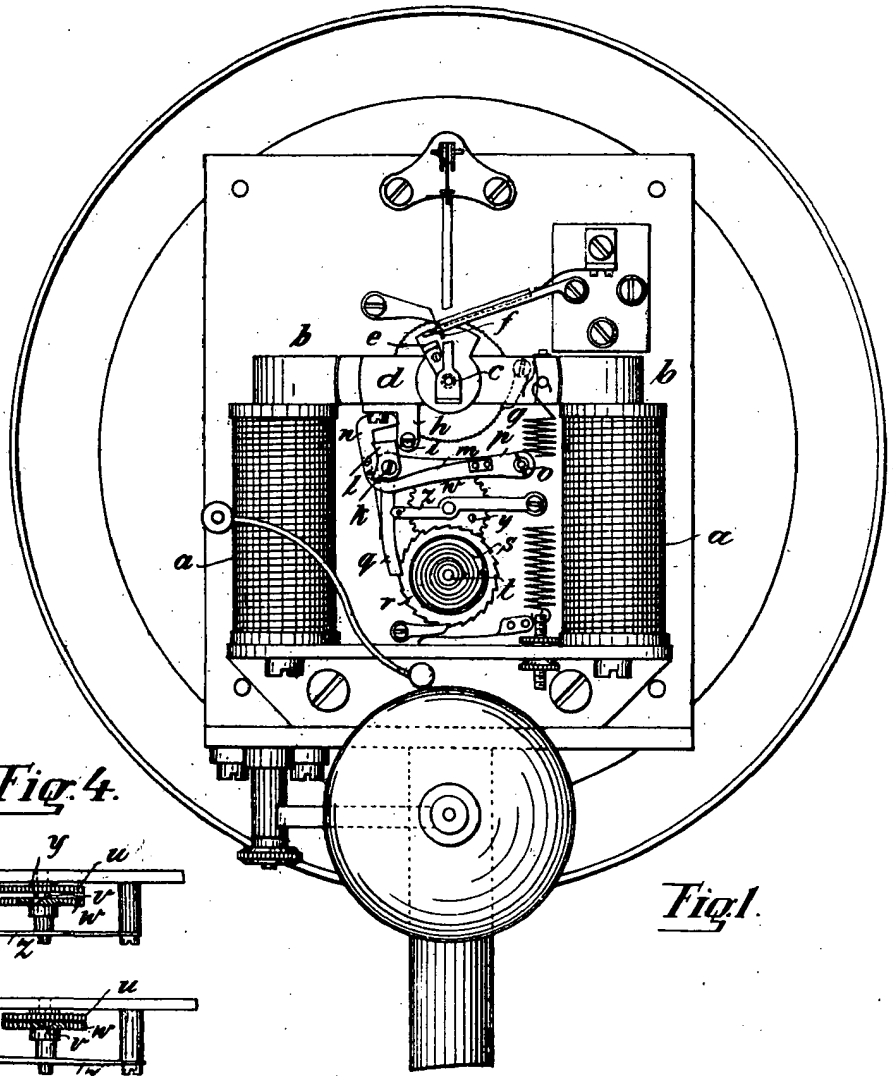


Fig. 1.

Fig. 2.

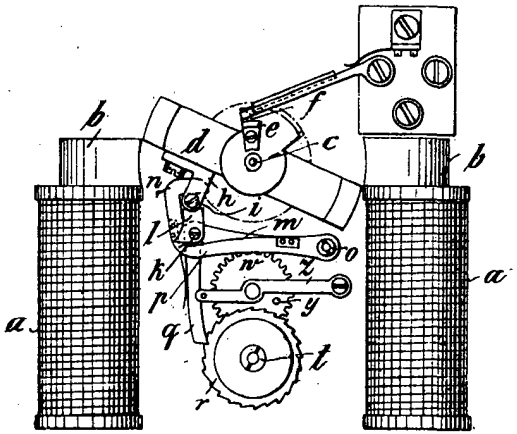


Fig. 3.

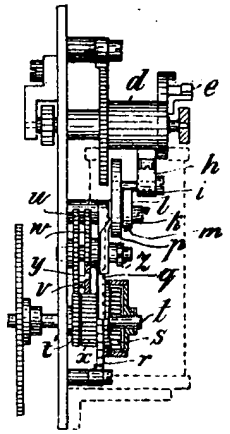
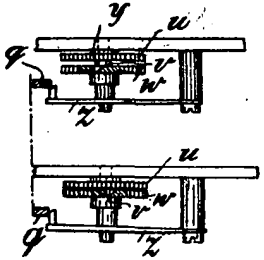


Fig. 4.



[This Drawing is a reproduction of the Original on a reduced scale]

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