

(No Model.)

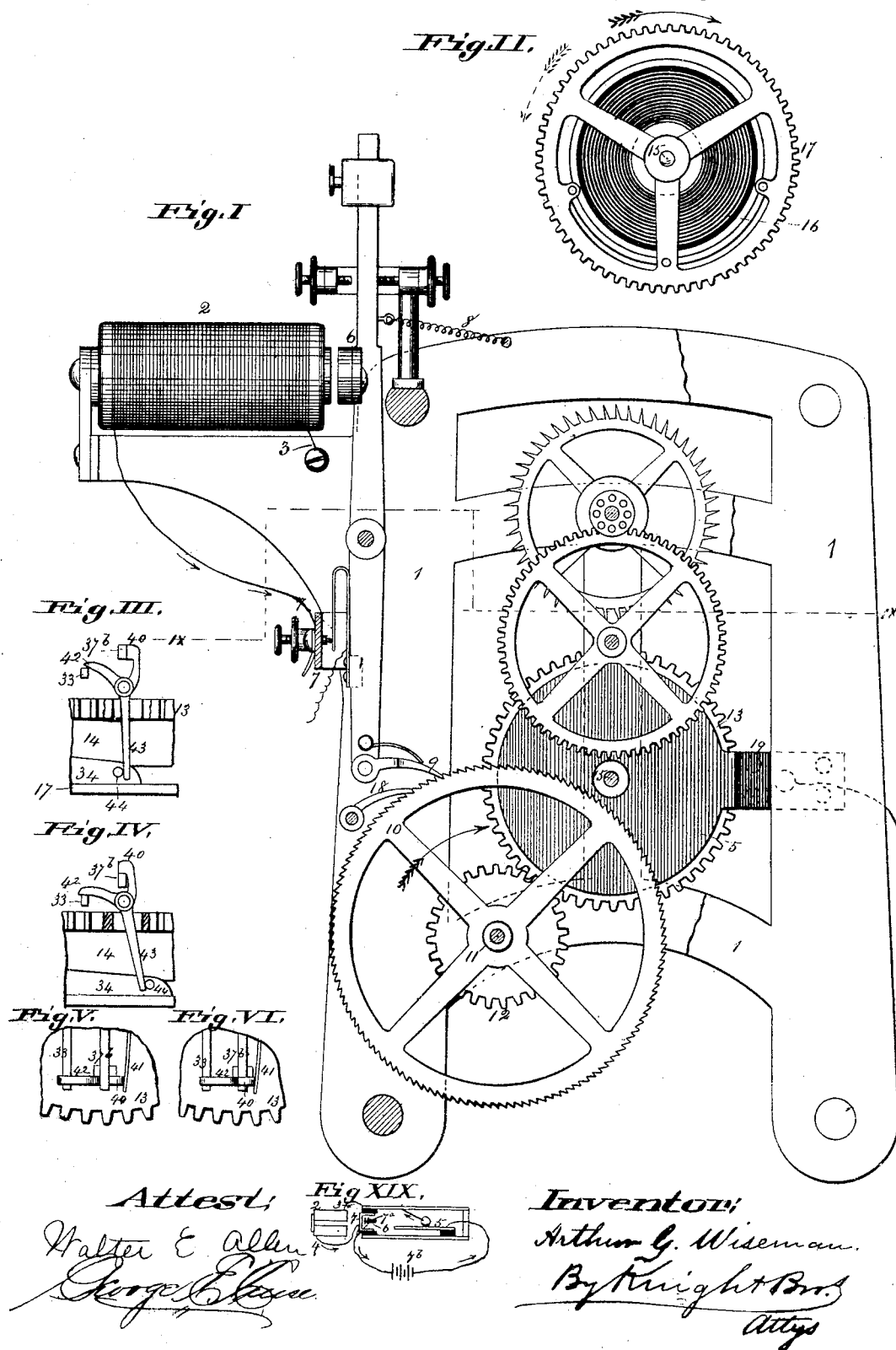
2 Sheets—Sheet 1.

A. G. WISEMAN.

ELECTRIC WINDING ATTACHMENT FOR CLOCKS.

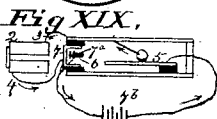
No. 502,215.

Patented July 25, 1893.



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Inventor:

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(No Model.)

2 Sheets—Sheet 2.

A. G. WISEMAN.

ELECTRIC WINDING ATTACHMENT FOR CLOCKS.

No. 502,215.

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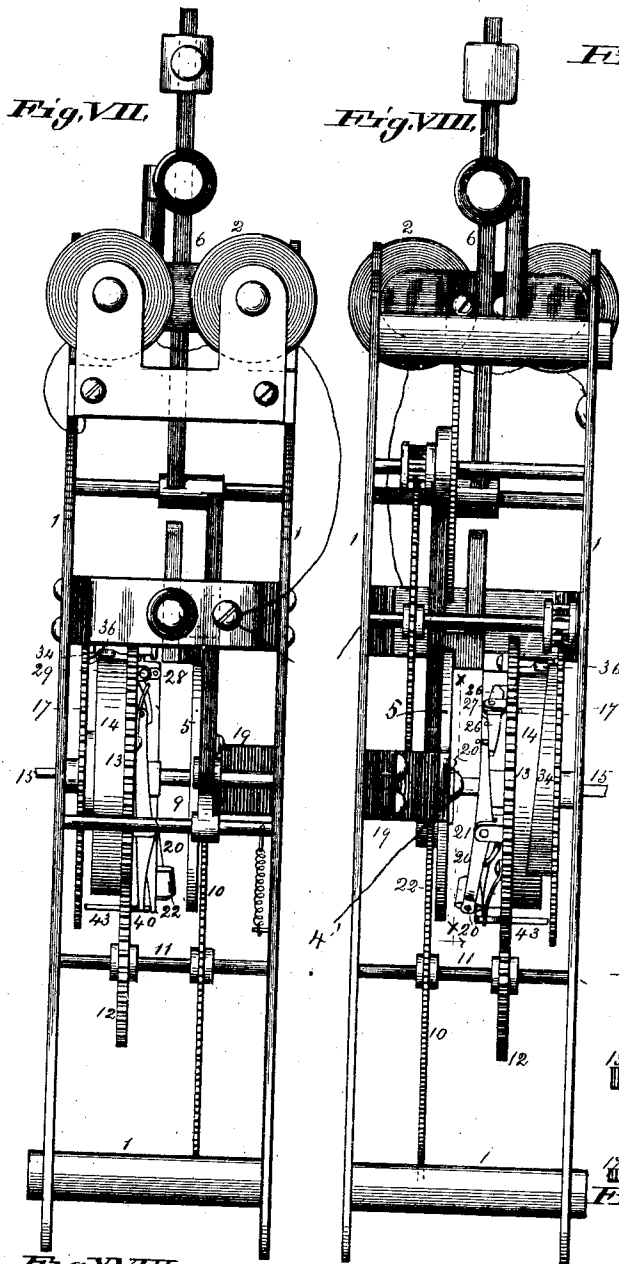


Fig. X.

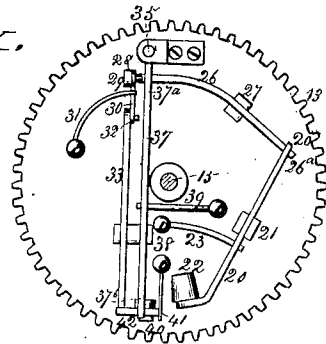


Fig. XI.

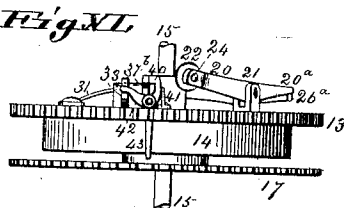


Fig. XII.

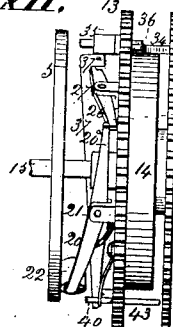


Fig. XIII.

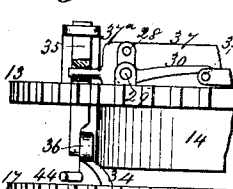


Fig. XIV.

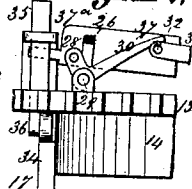


Fig. XV.

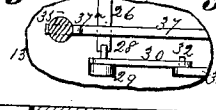


Fig. XVI.

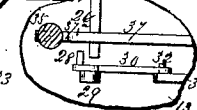


Fig. XVII.

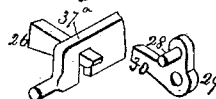


Fig. XVIII.

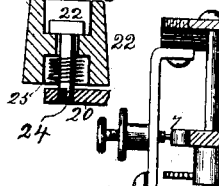
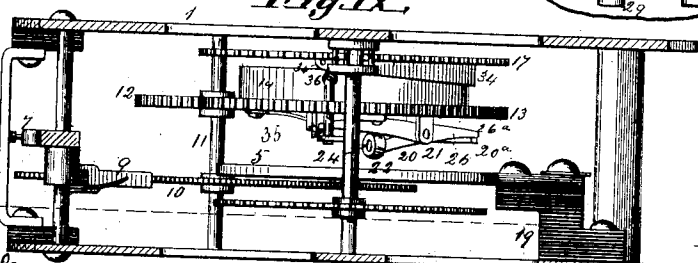


Fig. XIX.



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# UNITED STATES PATENT OFFICE.

ARTHUR G. WISEMAN, OF ST. LOUIS, MISSOURI.

## ELECTRIC WINDING ATTACHMENT FOR CLOCKS.

SPECIFICATION forming part of Letters Patent No. 502,215, dated July 25, 1893.

Application filed July 30, 1892. Serial No. 441,720. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR G. WISEMAN, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Electric Winding Attachments for Clocks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

This electric winder is connected with the minute shaft of the clock, the spring barrel being turned one revolution for each revolution of the shaft, by the means fully described hereinafter and whose novel features are set forth in the claims.

This invention is shown and described but not claimed in my application, Serial No. 450,210, filed October 28, 1892.

Figure I is a rear elevation of a clock having the electric winding attachment, part in longitudinal section at I—I, Fig. IX. Fig. II is a front view of the spring wheel which is attached to the minute hand shaft. Figs. III and IV are detail top views showing a detent catch in different positions, and Figs. V and VI are detail side views of the same. Figs. VII and VIII are elevations showing opposite sides of the clock, the clock being run with the circuit broken. Fig. IX is a transverse section at IX—IX, Fig. I. Fig. X is a rear view of the circuit breaking wheel, the shaft being in section at X—X, Fig. VIII. Fig. XI is a top view of said wheel, and Fig. XII is a side view of said wheel with the electric circuit closed. Figs. XIII and XIV are detail top views showing the circuit breaking lever in different positions, and Figs. XV and XVI are detail side views of the same. Fig. XVII is a detail perspective view. Fig. XVIII is a section of the contact roller. Fig. XIX is a diagram of the electric circuit.

The frame 1 of the clock may have any ordinary or preferred construction and the same may be said of the escapement mechanism as my invention does not apply to these parts.

2 is an electro magnet, one terminal, 3, of which is connected to the clock case and the other terminal, 4, to the conducting disk 5.

6 is the armature whose lever is adapted to break contact at 7.

8 is a retracting spring drawing the armature into its normal position when the circuit is broken.

9 is a spring pawl on the armature lever that engages a ratchet wheel 10 on a shaft 11. The shaft 11 carries a spur wheel 12 engaging the spur gearing of the circuit breaking wheel 13. To this wheel (13) is attached the main spring barrel 14. The wheel 13 and barrel 14 turn free on the minute hand shaft 15. The inner end of the main spring 16 is attached to a disk fast on the shaft 15, and the outer end of the spring is attached to the barrel 14.

17 is a wheel fast upon the shaft 15 and which is in connection with the escapement train.

18 is a click or pawl (see Fig. I) preventing the backward rotation of the ratchet wheel 10. Now it will be understood that the outer end of the main spring being fast to the barrel 14, which is in turn fast to the current breaking wheel, and the other end of the main spring fast to the minute-hand shaft 15 this latter shaft will be driven by the spring and that as this shaft turns once an hour the spring will be unwound one coil each hour, and to compensate for this unwinding the current breaking wheel and barrel 14 must be turned forward just one revolution each hour. The means for giving this movement to the barrel will now be described. The fixed disk 5 of electro conducting material is parallel with the current breaking wheel and is traversed by the shaft 15, with which it is concentric. I prefer to make the disk of aluminium because of its non-oxidizable character. It is connected to the frame by an insulating bracket 19.

20 is a lever fulcrumed upon a post 21 projecting from the circuit breaker wheel 13. The lever carries at one end a conducting wheel 22 that is adapted to run against the face of the disk 5 and thus close the electric circuit.

23 is a spring acting on the inner side of the lever 20 and adapted to push the wheel against the disk. I prefer to make the wheel of platinum to avoid oxidation. I support the wheel loosely upon its arbor 24 so that it

may accommodate itself to the surface of the disk, a spring 25 being inserted between the wheel and arbor, see Fig. XVIII.

26 is a lever fulcrumed at 27. The shorter end 26<sup>a</sup> of the lever 26 is below the end 20<sup>a</sup> of the lever 20, so that when the end 26<sup>a</sup> is thrown outward the contact wheel 22 is thrown out of contact with the disk. The lever 26 is held in the above described position by a spring catch 28 pivoted to the wheel 13 at 29 and having an arm 30 receiving the pressure of a spring 31 to hold the arm down and the spring catch in engagement with the upper side of the end 26<sup>b</sup> of the lever. In order to release the catch the arm 30 is raised by means of a pin 32 on a lever 33 and this pushes the catch 28 off the top of the lever and allows it to fly out, when the contact lever 20 swings on its fulcrum and the wheel 22 comes in contact with the disk. Normally while the clock is running the circuit is broken, while at any point determined on the electric circuit is closed while the circuit breaking wheel and spring barrel are making one revolution. It will be seen that the running of the clock is not affected because the pressure of the main-spring is maintained upon the shaft 15.

34 is an incline upon the inner side of the wheel 17 and concentric with the shaft.

35 is a rod parallel with the shaft 15 and working in bearings of the wheel 13. This rod carries an anti-friction roller 36 bearing upon the incline so that as the wheel 17 rotates the wheel 13 being at rest, the rod is gradually forced outward. The rod is connected to one end 37<sup>a</sup> of a lever 37 fulcrumed to the wheel 13 at 38.

39 is a spring drawing the end 37<sup>a</sup> of the lever inward.

40 is a catch, engaging the end 37<sup>b</sup> of the lever 37 when the other end has been carried to its outward position. The catch 40 is actuated by a spring 41 to throw it into active position. The spring catch has a finger 42 extending over one end of the lever 33 and by its pressure on that end of the lever serving to force out the other end of the lever and release the catch 28 as before explained. The catch 40 has an arm 43 that extends nearly to the wheel 17 and upon the wheel is a pin or stud 44 that engages with the arm 43 and moves the catch first forward and then backward during the process of winding.

This process will now be described:—The contact wheel 22 is out of contact with the disk 5, and the circuit-breaking wheel and the spring barrel are at rest and the shaft 15 turning at the speed of one revolution in an hour. See Figs. VII, VIII, IX, XIII. At this time the rear end 20<sup>a</sup> of the contact lever is held out by the end 26<sup>a</sup> of the lever 26 beneath it and the other end of lever 26 is held in by spring catch 28 and these parts retain this position until electric contact is to be made. As the shaft 15 rotates the incline 34 comes to the antifriction wheel 36 and the end 37<sup>a</sup> of

the lever is gradually thrown outward from the position seen in Fig. XIII to the position seen in Fig. XIV. The other end 37<sup>b</sup> of the lever is now in position to allow the catch 40 to engage over it and this it does under the influence of the spring 41. Just at this time the stud 44 of the wheel 17 strikes the projection 43 of the catch and by forcing in that end of the lever 33 throws out the other end and disengages the catch 28 from the end of the lever 26 allowing such end to fly out and allowing the contact lever 20 to move the other end 26<sup>a</sup> of the lever inward and to carry the wheel 22 into contact with the disk 5. The circuit breaking wheel with the spring barrel now rotates under the influence of the electric magnet and described connections. The revolution of the spring barrel, &c., occupies say one second. As the revolution is completed the projection 43 overtakes the stud 44 and impinging against it, is held backward so as to pull the catch 40 off the end 37<sup>b</sup> of the lever when the other end 37<sup>a</sup> of the lever descends, carrying down the end of the lever 26 and throwing out the other end 26<sup>a</sup> beneath the inner end of the contact lever and retracting the roller 22 thus breaking contact. It will be observed that the electric circuit is broken by the inward movement of the end 37<sup>a</sup> of the lever 37, the said lever acting on the levers 26 and 20 in the way described. It will be also seen that the end 37<sup>a</sup> of the lever 37 is gradually moved outward, by the incline 34, while the electric current remains broken. The catch 28 allows the above by holding down that end of the lever 26 until the revolution of the wheel 17 is completed, and until the projection 43 is engaged by the stud 44, and the catch 28 is disengaged from the lever 26. The electric circuit may be arranged in any manner that will produce the desired effect.

The diagram Fig. XIX in connection with the other figures will serve to show an effective arrangement. The terminal 3 extends to the clock case and excites the circuit breaking wheel 13 with the contact lever 20 and roller 22. The other terminal wire extends from the magnet to the insulated plate 7, then from the insulated spring 7<sup>a</sup> on the armature, to the electric cell 7<sup>b</sup> and from the cell to the contact disk 5. The vibration of the armature-lever winds the clock, when the circuit is closed.

It is believed that in all electric winders heretofore the power has been applied to a shaft running at a much higher speed than the minute hand shaft 15 as shown in my invention. This requires that the winding should be going on a great part of the time, whereas with my device from five to ten seconds in an hour is all that is needed (as has been said before). In addition to this there is greater precision because the parts come to a full rest between the periods of action. The power is acting at a better purchase because acting directly on the hand-shaft in-

stead of acting on an intermediate shaft running at a greater speed and of course having weak purchase on the hand shaft.

It is obvious that considerable force must be expended in winding up the main spring, where only ten seconds are spent each hour. Hence I have made the ratchet wheel 10 of considerable diameter and reduced the diameter of the spur wheel 12, and arranged the magnet and armature to this end.

I claim as my invention—

1. The combination, with a gear-shaft 15; wheel turning free on the shaft, a main spring with ends connected to the shaft and said wheel, a disk 5, a lever pivoted to said wheel and adapted to bear against said disk to close the circuit, and mechanism carried by said wheel to operate said lever, all substantially as, and for the purpose set forth.

2. The combination, in an electric winding attachment for clocks, of the shaft 15, the circuit breaking wheel loose on the shaft, the main spring attached by its opposite ends to the shaft and circuit breaking wheel, a cog gear on the circuit breaking wheel, an electro magnet, a ratchet pawl on the armature and a ratchet wheel actuated by the pawl and having gear connection with the circuit breaking wheel, substantially as set forth.

3. The circuit breaking wheel turning loose in the shaft 15 and connected therewith by the main spring, the circuit-breaking lever 20 with its contact roller 22, the lever 26, the catch 28, lever 33, catch 40 having a finger 42 and the wheel 17 upon the shaft 15 having a stud 44, all substantially as set forth.

4. The shaft 15, circuit breaking wheel turning loose on the shaft, main spring connected by its ends to the shaft and circuit breaking wheel respectively, a movable contact device 22 upon the wheel and the con-

tact disk 5 adapted for continuous contact with the device during the rotation of the circuit breaking wheel, substantially as set forth.

5. The shaft 15, an incline 34 and stud 44 on the shaft, a circuit-breaking wheel turning loose on the shaft, a rod 35 parallel with the shaft and having bearing in the circuit breaking wheel, the levers 37, 26 and 20 with springs 23 and 30, and the catch 40, all adapted to operate substantially as set forth.

6. The combination of the shaft 15 having incline 34 and stud 44, the circuit breaking wheel turning loose on the shaft, the main spring connected to the shaft and circuit-breaking wheel by its opposite ends respectively, the rod 35 with wheel 36, the contact lever 20 with contact roller 22, the conducting disk 5, the levers 26, 33, 37, catches 28 and 40 and an electric winding device substantially as set forth giving rotation to the circuit breaking wheel 13, substantially as set forth.

7. The described combination of the main-spring 16 and wheel 13 on the minute hand shaft 15, and the electric winder composed of the magnet 2, armature 6, pawl 9, ratchet-wheel 10 and spur wheel 12, all constructed substantially as set forth.

8. The combination, in an electric clock winder, of an armature carrying a pawl, a ratchet-wheel actuated by the pawl, an insulated spring on the armature connected with the electric cell, an insulated piece connected with the magnet and receiving the contact of the spring in one position of the armature.

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Witnesses:

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ED. S. KNIGHT.