F. A. JABERG.

CLOCK.

APPLICATION FILED MAR. 4, 1912.

1,050,542.

Patented Jan. 14, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

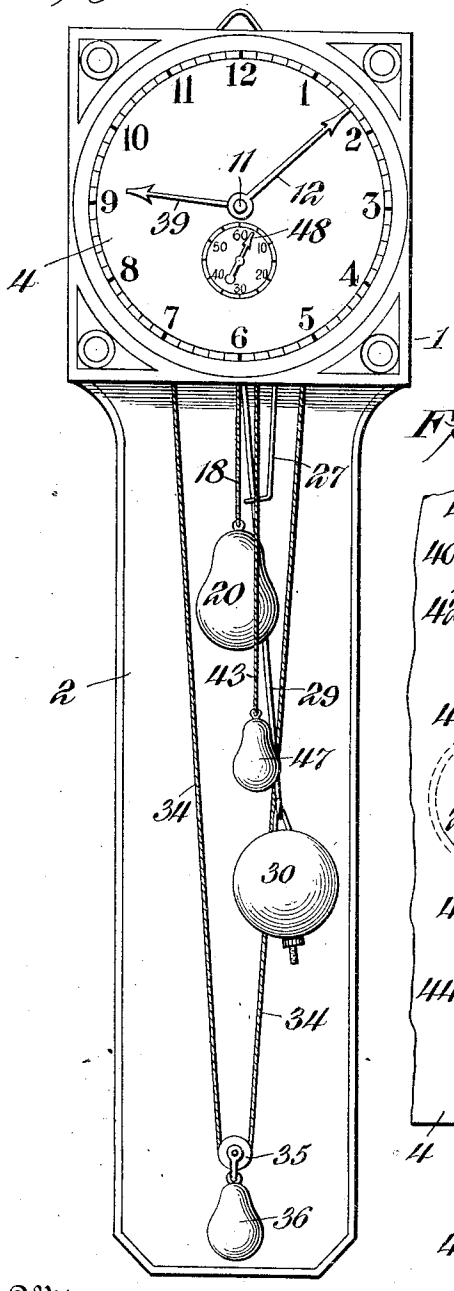


Fig. 4.

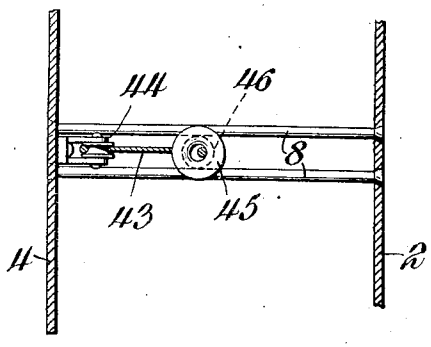


Fig. 5.

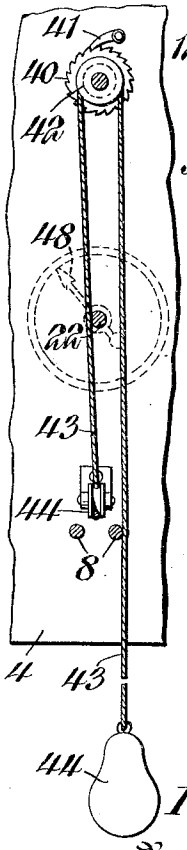


Fig. 6.

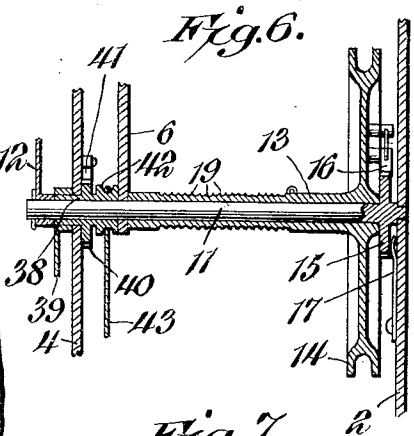
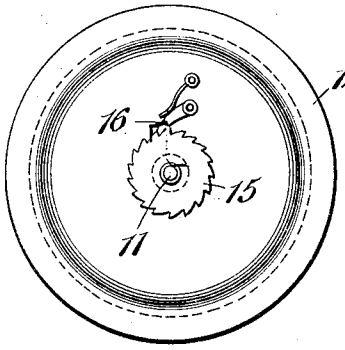


Fig. 7.



Witnesses

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2 SHEETS-SHEET 2.

Fig. 2.

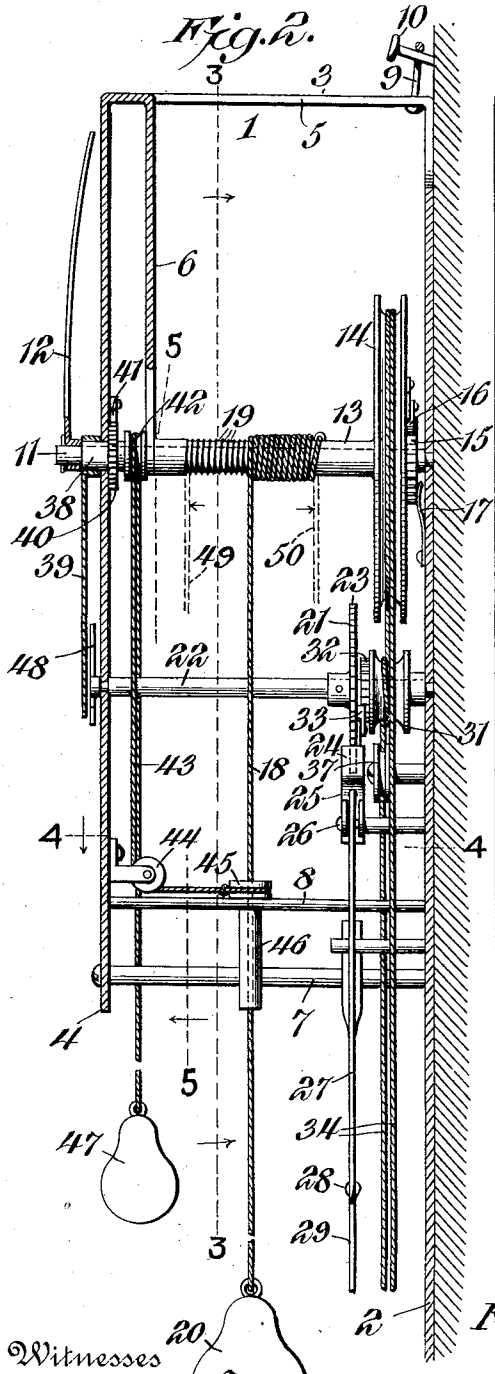
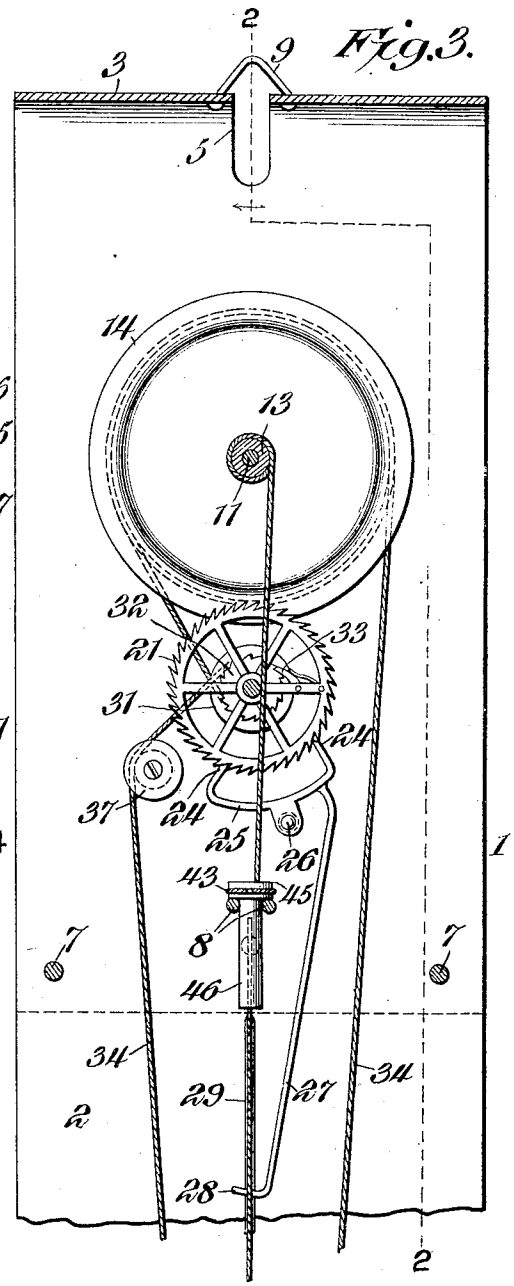


Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANK A. JABERG, OF NEW PHILADELPHIA, OHIO, ASSIGNOR OF ONE-HALF TO HENRY F. ERDENKAUF, OF NEW PHILADELPHIA, OHIO.

CLOCK.

1,050,542. Specification of Letters Patent. Patented Jan. 14, 1913.

Application filed March 4, 1912. Serial No. 681,380.

To all whom it may concern:

Be it known that I, FRANK A. JABERG, a citizen of the United States, residing at New Philadelphia, in the county of Tuscarawas and State of Ohio, have invented a new and useful Clock, of which the following is a specification.

This invention relates to clocks, and has for its object the provision of a clock unique in its structural arrangement, which shall be susceptible of manufacture at a very low cost adapting it to be given away as an advertising feature, or sold at a nominal price as a leader, and which shall, at the same time, be attractive and novel in appearance and withal a durable and fairly accurate time keeper.

Having these objects in view the invention resides in the structural details and arrangement of parts tending to cheapness of manufacture and unique appearance and combined to produce an efficient time-piece.

The invention as thus outlined and as particularly set out in the claims appended hereto will now be described in detail having reference to the accompanying drawings, wherein—

Figure 1 is a front elevation of the preferred embodiment of the invention. Fig. 2 is a vertical section on the line 2—2 of Fig. 3. Fig. 3 is a vertical transverse section on the line 3—3 of Fig. 2. Fig. 4 is a horizontal section on the line 4—4 of Fig. 2 with certain parts omitted. Fig. 5 is a section on the line 5—5 of Fig. 2. Fig. 6 is a central vertical section through the motor shaft and pulley. Fig. 7 is a rear end view of the motor pulley.

Referring to the drawings, the clock case 1 may be of any ordinary form, but for purposes of simplicity and cheapness I preferably make the same of an elongated sheet of metal of which the lower portion forms the depending rear plate 2 of the clock, the sheet being bent forwardly to form the top plate 3 and downwardly to form the front plate 4. The top of the case is cut away centrally at 5 and bent downwardly to form a support 6 for the center arbor of the clock. The front and rear faces of the clock are connected together and spaced apart by the posts 7. Two supplemental posts 8 lie closely adjacent each other in parallel relation and serve as ways, as will be hereinafter more fully explained. The clock case thus described is one which can be made at a minimum cost and which possesses great rigidity. The case is adapted to be suspended on the wall by any suitable form of hanger, as 9 engaging the nail 10.

The train of the clock comprises a center arbor 11 upon which is mounted a minute hand 12 in the ordinary manner, the arbor being journaled at the front and at the rear in the front and rear plates of the case. Upon this center arbor is rotatably mounted a power shaft or drum 13 having fixed thereto the drive pulley 14 which is coupled to the center arbor by means of a ratchet wheel 15 fixed to said arbor and a spring detent or pawl 16, by means of which the drive pulley is free to turn independently of the center arbor in a retrograde direction while being locked thereto in a forward direction. A spring 17 mounted upon the rear plate 2 of the case bears frictionally against the rear face of the ratchet wheel 15.

A motor cord 18 is wound spirally around the drum 13, spiral grooves 19 being advantageously formed on said drum in order to insure the uniform spacing of the spirals thereon. This motor cord 18 has attached to its free end a motor weight 20 by which a driving tendency is imparted to the motor shaft or drum and to the drive pulley carried thereby.

The clock as shown is provided with the usual anchor escapement comprising the escapement wheel 21 fixed on the escapement shaft 22 and having its teeth 23 engaged by the pallets 24 of the anchor 25 pivoted upon the anchor post 26 and with the escapement arm 27 engaging at 28 the pendulum rod 29, from which is suspended the pendulum ball 30.

Loosely mounted on the escapement shaft at the rear of the escapement wheel is an escapement pulley 31 carrying upon its forward face a ratchet 32 coöperating with a spring pawl or detent 33 to couple the escapement pulley and escapement wheel together in the forward movement of the train and permitting of relative retrograde movement.

The winding cord 34 traverses the drive pulley 14 and the escapement pulley 31 in such manner as to frictionally engage both pulleys and serves to transmit the driving power from the motor shaft or drum to the escapement. This winding cord is advantageously passed twice around each of these pulleys in order to insure against slippage, as shown in Figs. 2 and 3. This winding cord is preferably endless and supports in its lower bight the pulley 35 carrying the weight 36. It also advantageously traverses an idler 37 which serves to position the reaches of the cord so as to avoid interference with the other cords and to obtain a symmetrical disposition thereof.

The cannon pinion 38 carrying the hour hand 39 has fixed thereon a ratchet 40 with which engages a gravity pawl 41 mounted on the front plate 4 of the case thereby to prevent retrograde movement of said pinion. The cannon pulley 42 is also fixed to the cannon pinion and has a diameter which preferably corresponds to the diameter of the motor shaft or drum 13. This cannon pulley is traversed frictionally by a transmission cord 43, one end of which also traverses the idler 44 and is secured to a flanged collar 45 which is threaded upon the motor cord 18 and rides upon the posts 8 with its tubular flange 46 depending between said posts as a guide. Upon the free end of the transmission cord is a weight 47 which serves to take up slack and maintain said cord taut at all times.

It will be observed that the rotary movement of the motor shaft or drum corresponds to the movement of the minute hand 12 and that the rotation of the escapement shaft 22 corresponds to the movement of the second hand 48 which is fixed thereon. The motor shaft, the drive pulley, the escapement pulley and the escapement are so relatively proportioned that the weight 20 will cause the motor cord 18 to unwind one spiral and rotate the motor shaft one turn in one hour and the escapement shaft to turn once each minute, so that the minute hand and the second hand are caused to properly indicate the minutes and seconds. The winding of the motor cord upon the drum is so arranged that the relative axial displacement of each successive spiral corresponds substantially to one-twelfth the circumference of the cannon pulley, and the lateral movement of the unwinding motor cord is transmitted by the transmission cord 43 to the cannon pulley 42 and converted into rotary movement of the same resulting in the rotation of the hour hand once in twelve hours.

The clock is wound by pulling downward upon the winding cord below the idler pulley 37, whereby the drive pulley 14 and the escapement pulley 31 are given a retrograde movement independent of the center arbor and escapement shaft upon which they are mounted, the motor cord 18 being progressively wound upon the motor shaft or drum until it reaches the position shown in dotted lines at 49. Upon releasing of the winding cord the spring pawls 16 and 32 will drop into place coupling the drive pulley to the center arbor and the escapement pulley to the escapement shaft. The tendency of the motor cord to unwind will cause a clockwise rotation of the motor shaft controlled by the escapement, and at the same time a progressive lateral movement of the motor cord will result from the wound position at 49 toward the unwound position indicated at 50. The motor cord in its progressive movement laterally carries with it the flanged collar 45 and thereby imparts clockwise rotation to the cannon pinion and the hour hand as stated. The weight 47 is so calculated as to permit the collar 45 to follow the lateral movement of the cord 18 in the unwinding direction and in the winding direction to take up the slack as the collar moves to the left, the engagement of the cord 43 over the cannon pulley 42 being frictional only and allowing of slippage when the clock is being wound.

The construction as set forth dispenses entirely with intermediate gear wheels and reduces to a minimum the wearing parts and those liable to get out of order. The transmission is direct and such as to conduce to a high degree of accuracy, associated with a low initial cost and ease of renewal and repair, while the clock has a distinctive and attractive appearance.

What is claimed is:—

1. In a clock, a train comprising a motor shaft, a drive pulley fixed to the shaft, a center arbor to which the drive pulley is coupled, an escapement, a pulley coupled to the escapement, a cannon pinion, a pulley mounted on the cannon pinion, a motor cord wound on the motor shaft, a winding cord traversing the drive pulley and escapement pulley, a transmission cord connected to the motor cord and traversing the cannon pulley, and hour, minute, and second hands mounted on the cannon pulley, the center arbor and the escapement shaft, respectively.

2. In a clock, a train comprising a motor shaft, a center arbor on which the motor shaft is mounted, a drive pulley fixed to the shaft and coupled to the center arbor to permit of relative movement in one direction, an escapement, a pulley coupled to the escapement to permit of relative movement in one direction, a cannon pinion on the center arbor, a pulley mounted on the cannon pinion, a motor cord wound on the motor shaft, a driving cord traversing the drive pulley and escapement pulley in frictional engagement therewith, a transmission cord connect-

ed to the motor cord and traversing the cannon pulley, means applied to the cords to maintain them under tension, and hour and minute hands mounted on the cannon pinion and the center arbor, respectively.

3. In a clock, a train comprising a motor shaft, a center arbor on which the motor shaft is mounted, a drive pulley fixed to the shaft and coupled to the center arbor to permit of relative movement in one direction, an escapement, a pulley coupled to the escapement to permit of relative movement in one direction, a cannon pinion, a pulley mounted on the cannon pinion, a motor cord wound on the motor shaft, a winding cord traversing the drive pulley and escapement pulley in frictional engagement therewith, a transmission cord connected to the motor cord and traversing the cannon pulley, weights applied to the cords to maintain them under tension, means tending respectively to prevent retrograde movement of the cannon pinion and the center arbor, and hour, minute and second hands mounted on the cannon pinion, the center arbor and escapement shaft, respectively.

4. In a clock, a train comprising a motor shaft, a center arbor on which the motor shaft is mounted, a drive pulley fixed to the shaft and coupled to the center arbor to permit of relative movement in one direction, an escapement, a pulley coupled to the escapement to permit of relative movement in one direction, a cannon pinion, a pulley mounted on the cannon pinion, a motor cord spirally wound on the motor shaft, a winding cord traversing the drive pulley and escapement pulley, a collar threaded on the motor cord, a transmission cord connected to the collar and traversing the cannon pulley to transmit the lateral movement of the unwinding motor cord to the cannon pulley, weights applied to the cords to maintain them under tension, and hour and minute hands mounted on the cannon pinion and the center arbor, respectively.

5. In a clock, a train comprising a motor shaft, a center arbor on which the motor shaft is mounted, a drive pulley fixed to the shaft and coupled to the center arbor to permit of relative movement in one direction, an escapement, a pulley coupled to the escapement to permit of relative movement in one direction, a cannon pinion, a pulley mounted on the cannon pinion, a motor cord spirally wound on the motor shaft, a winding cord traversing the drive pulley and escapement pulley, a collar threaded on the motor cord, a transmission cord connected to the collar and traversing the cannon pulley to transmit the lateral movement of the unwinding motor cord to the cannon pulley, weights applied to the cords to maintain them under tension, and hour and minute hands mounted on the cannon pinion and the center arbor, respectively, the motor cord having a diameter substantially one-twelfth the diameter of the cannon pulley.

6. In a clock, a train comprising a motor shaft, a center arbor on which the motor shaft is mounted, a drive pulley fixed to the shaft and coupled to the center arbor to permit of relative movement in one direction, an escapement, a pulley coupled to the escapement to permit of relative movement in one direction, a cannon pinion, a pulley mounted on the cannon pinion, a motor cord spirally wound on the motor shaft, a winding cord traversing the drive pulley and escapement pulley, a collar threaded on the motor cord, a transmission cord connected to the collar and traversing the cannon pulley to transmit the lateral movement of the unwinding motor cord to the cannon pulley, weights applied to the cords to maintain them under tension, and hour, minute and second hands mounted on the cannon pinion, the center arbor and the escapement shaft, respectively, the shafts, the pulleys and the escapement being so proportioned that the escapement shaft will rotate once per minute and the drive shaft once per hour, and the motor cord being so spirally wound on the motor shaft that the relative axial displacement of each successive spiral corresponds substantially to one-twelfth the circumference of the cannon pulley.

7. In a clock, a train comprising a motor shaft, a center arbor on which the motor shaft is mounted, a drive pulley fixed to the shaft, a ratchet and pawl coupling between the drive pulley and the arbor to permit of relative retrograde movement, an escapement having an escapement wheel and a shaft, a pulley mounted on the escapement shaft, a ratchet and pawl coupling between the escapement pulley and the escape wheel to permit of relative retrograde movement, a cannon pinion, a pulley mounted on the cannon pinion, a motor cord mounted on the motor shaft, a winding cord traversing the drive pulley and escapement pulley in frictional engagement therewith, a rider mounted on the pendent portion of the motor cord, a transmission cord attached at one end to the rider and traversing the cannon pulley, weights suspended by the cords to maintain the same taut, and hour, minute and second hands mounted on the cannon pinion, the center arbor and the escapement shaft, respectively.

8. In a clock, a train comprising a motor shaft, a center arbor on which the motor shaft is mounted, a drive pulley fixed to the shaft, a ratchet and a pawl coupling between the drive pulley and center arbor, an escapement having an escapement wheel and shaft, an escapement pulley mounted on the escapement shaft, a ratchet and pulley connection between the escapement pulley

and escapement wheel, a cannon pinion, a cannon pulley carried by the cannon pinion, a motor cord wound on the motor shaft, a winding cord traversing the drive pulley and escapement pulley and in frictional engagement therewith, a rider threaded upon the pendent portion of the motor cord, a transmission cord attached to said rider and traversing the cannon pulley, weights attached to the cords to maintain the same taut, hour, minute and second hands mounted on the cannon pinion, the center arbor and escapement shaft, respectively, and means tending respectively to prevent retrograde movement of the cannon pinion and of the center arbor.

9. In a clock, a train comprising a motor shaft, a center arbor on which the motor shaft is mounted, a drive pulley fixed to the shaft, a ratchet and a pawl coupling between the drive pulley and center arbor, an escapement having an escapement wheel and a shaft, an escapement pulley mounted on the escapement shaft, a ratchet and pawl connection between the escapement pulley and escapement wheel, a cannon pulley carried by the cannon pinion, a motor cord wound on the motor shaft, a winding cord traversing the drive pulley and escapement pulley and in frictional engagement therewith, a rider threaded upon the pendent portion of the motor cord, a transmission cord attached to said rider and traversing the cannon pulley, weights attached to the cord to maintain the same taut, hour, minute and second hands mounted on the cannon pinion, the center arbor and escapement shaft, respectively, a spring mounted upon the clock case and bearing frictionally against the ratchet to prevent retrograde movement of the center arbor, and a ratchet and pawl connection between the cannon pinion and the clock case to prevent retrograde movement of the cannon pinion.

10. In a clock, the combination with a center arbor, a cannon pinion and an escapement, of a motor shaft, a pulley fixed to the shaft and coupled to the center arbor, a driving connection between the motor shaft and the escapement, a motor cord spirally wound on the motor shaft, and means to transmit and convert the lateral movement of the unwinding motor cord into a rotary movement of the cannon pinion.

11. In a clock, the combination with a center arbor, a cannon pinion, and an escapement, of a motor shaft, a drive pulley fixed to the shaft and coupled to the center arbor to permit of relative movement in one direction, a pulley coupled to the escapement, a pulley carried by the cannon pinion, a motor cord spirally wound on the motor shaft, a winding cord traversing the drive pulley and escapement pulley, hour and minute hands mounted on the cannon pinion and center arbor, respectively, and means to transmit and convert the lateral movement of the unwinding motor cord into a rotary movement of the cannon pulley.

12. In a clock, the combination with a center arbor, a cannon pinion, an escapement, and hour, minute and second hands mounted on the cannon pinion, the center arbor and escapement shaft, respectively, of a motor shaft mounted on the center arbor, a pulley carried by the motor shaft and coupled to the center arbor to permit of relative retrograde movement, a driving connection between the motor shaft and the escapement, a motor cord wound spirally on the motor shaft, a motor weight suspended by said cord, and means to transmit and convert the lateral movement of the unwinding motor cord into a rotary movement of the cannon pinion comprising a pulley on the cannon pinion, a collar threaded on the pendant motor cord, and a transmission cord attached to the rider and traversing the cannon pulley.

13. In a clock, the combination with a center arbor, a cannon pinion, and an escapement, of a motor shaft, a drive pulley fixed to the shaft and coupled to the center arbor to permit of relative movement in one direction, a pulley coupled to the escapement, a pulley carried by the cannon pinion, a motor cord spirally wound on the motor shaft, a winding cord traversing the drive pulley and escapement pulley, hour and minute hands mounted on the cannon pinion and center arbor, respectively, and means to transmit and convert the lateral movement of the unwinding motor cord into a rotary movement of the cannon pulley and comprising parallel spaced posts connecting the front and rear plates of the clock case, a flanged collar threaded on the pendent motor cord and riding upon and guided between the spaced posts, and a transmission cord attached to the collar and traversing the cannon pulley.

14. In a clock, the combination with a center arbor, a cannon pinion, an escapement, and hour, minute and second hands mounted on the cannon pinion, the center arbor and escapement shaft, respectively, of a motor shaft mounted on the center arbor, a pulley carried by the motor shaft and coupled to the center arbor to permit of relative retrograde movement, a driving connection between the motor shaft and the escapement, a motor cord wound spirally on the motor shaft, a motor weight suspended by said cord, and means to transmit and convert the lateral movement of the unwinding motor cord into a rotary movement of the cannon pinion comprising a pulley on the cannon pinion having a circumference substantially twelve times the width of each

spiral measured axially of the motor shaft, a flanged collar threaded on the pendent motor cord, a laterally extending track for said collar, a transmission cord attached to the collar and traversing the cannon pulley, and a weight suspended by the free end of said transmission cord.

15. In a clock, a winding drum or shaft, a cord thereon, a weight for actuating the cord, a minute hand actuated by the unwinding of the cord from the drum by the action of the weight, an hour hand, and means for actuating the hour hand having connection with the cord for driving the minute hand and actuated by the progressive movement of the cord lengthwise of the winding drum for causing the active movement of the hour hand.

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

FRANK A. JABERG.

Witnesses:
ELNORA HIMES,
JOHN A. HIMES.