(No Model.) 4 Sheets—Sheet 1.

A. J. HOPEWELL.

CLOCK WINDING MECHANISM.

No. 509,375. Patented Nov. 28, 1893.

Fig: 1

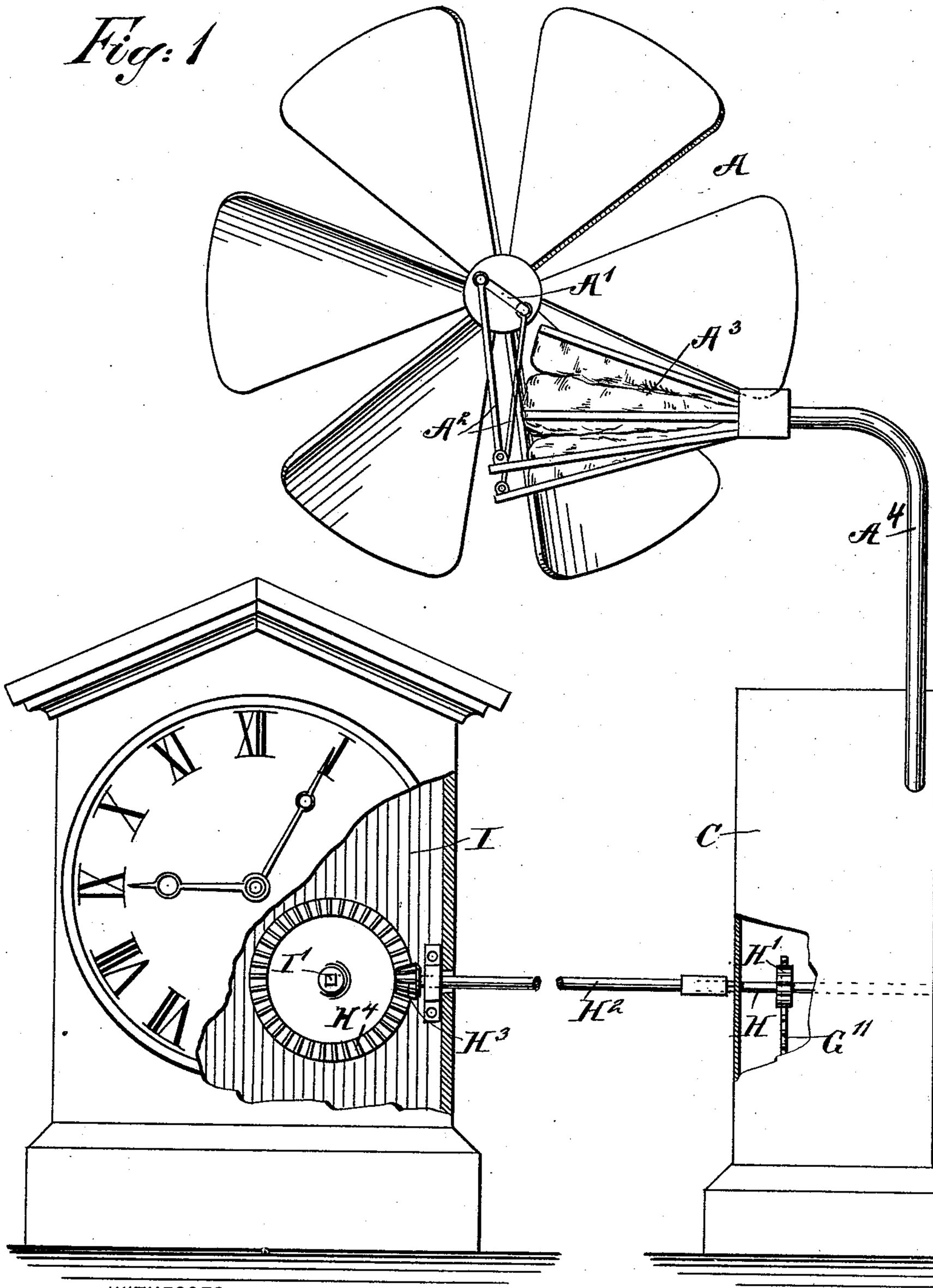

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Fig: 3.

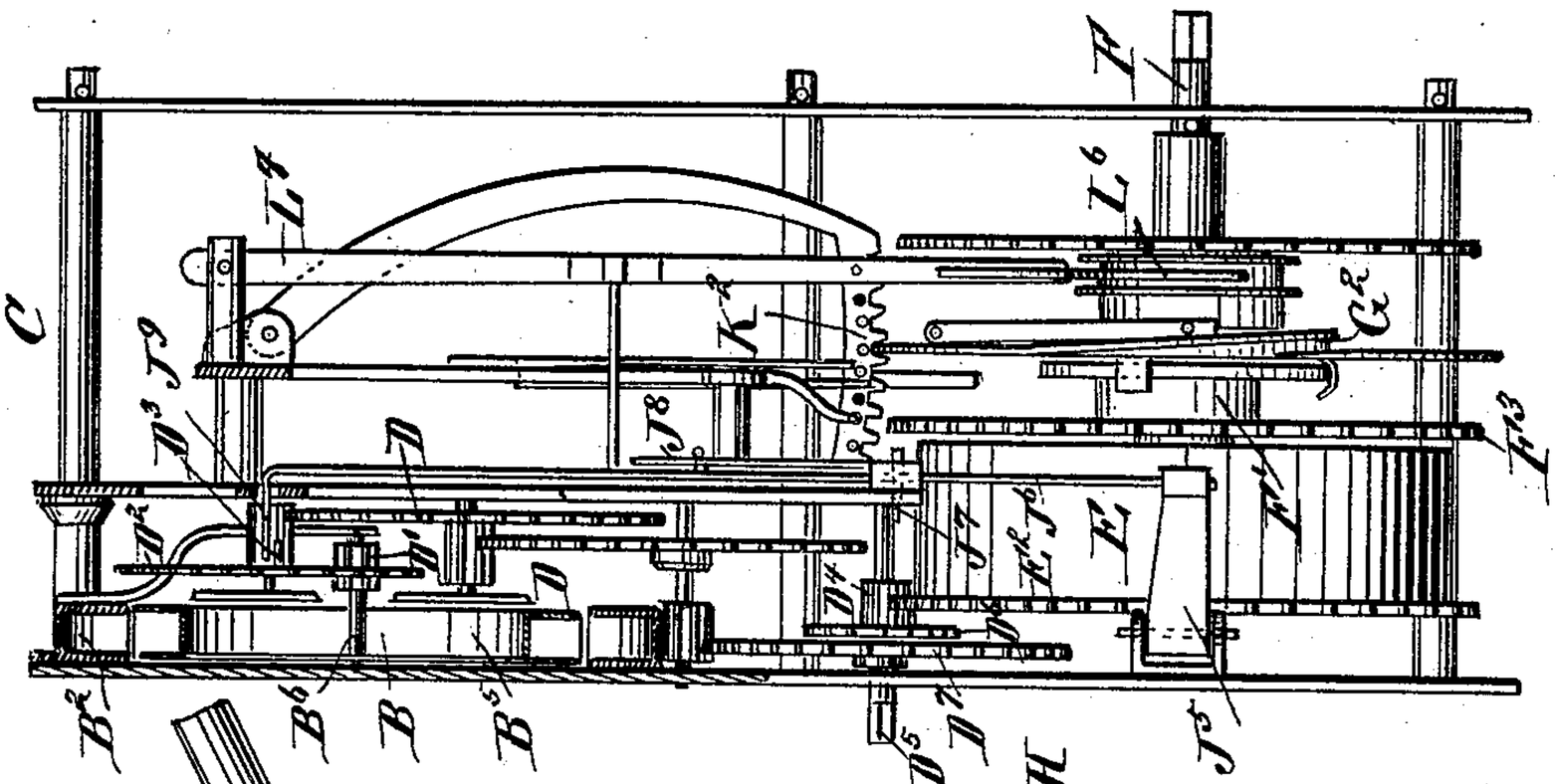


Fig: 4.

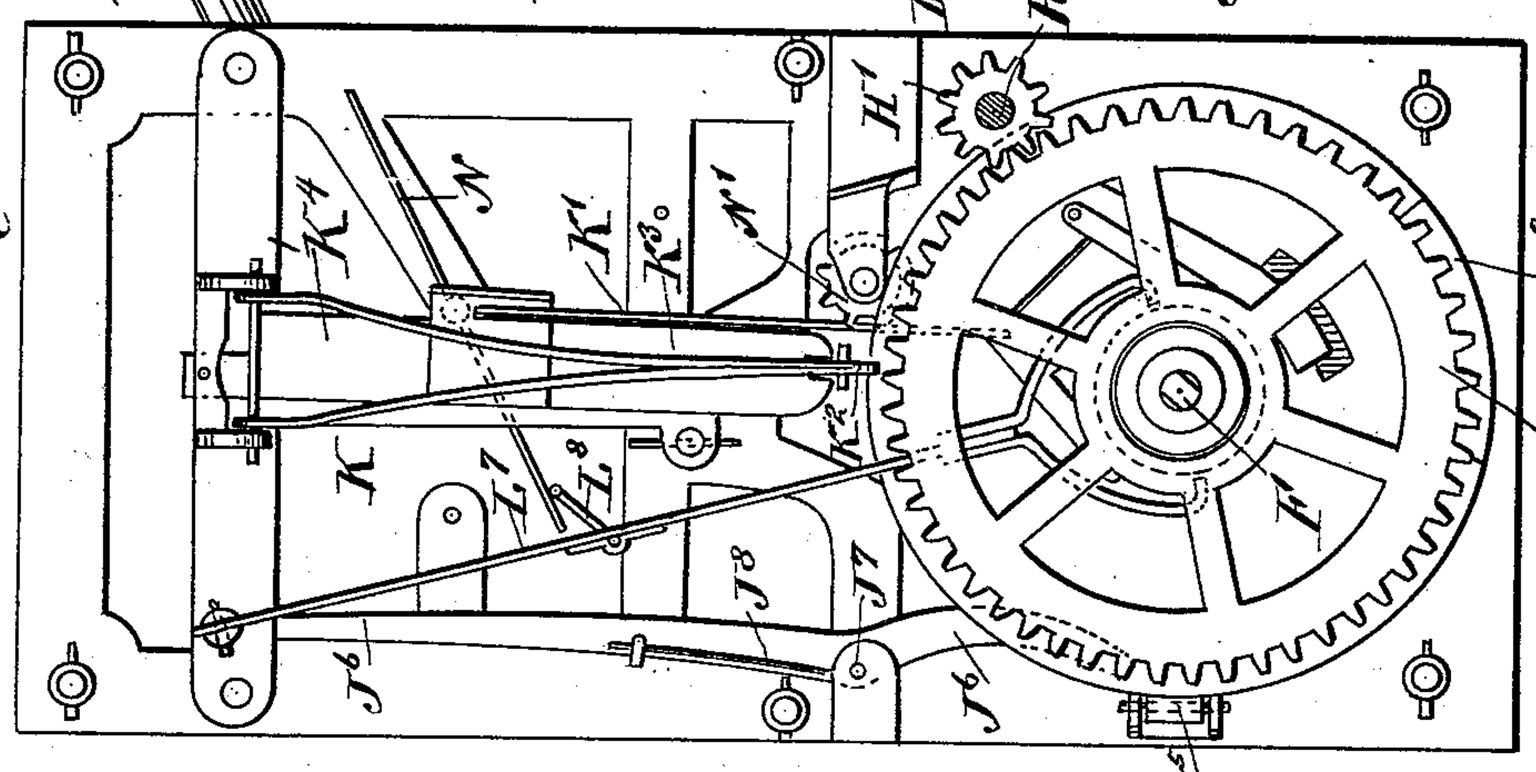
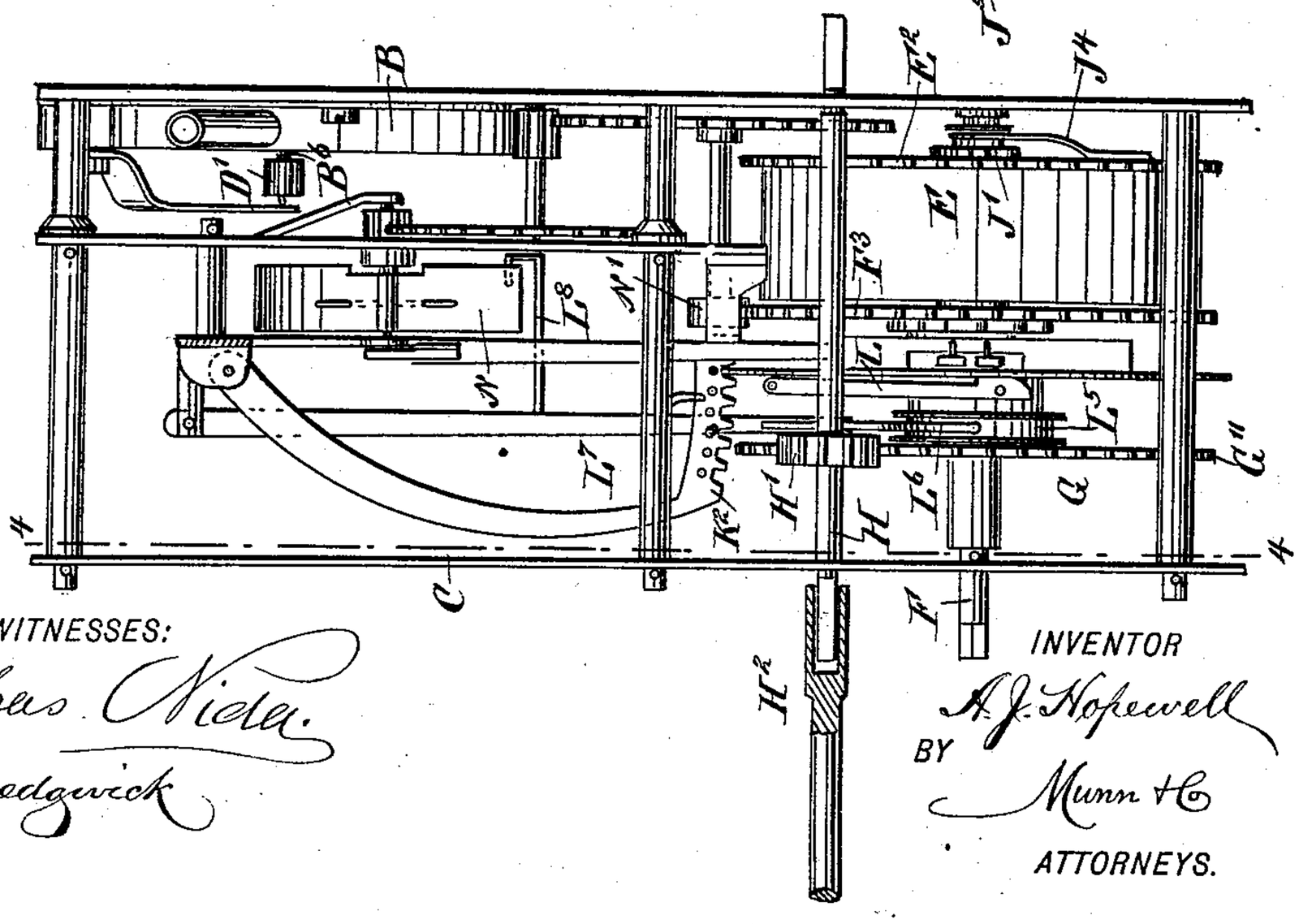


Fig: 2.



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CLOCK WINDING MECHANISM.

No. 509,375. Patented Nov. 28, 1893.

Fig: 8.

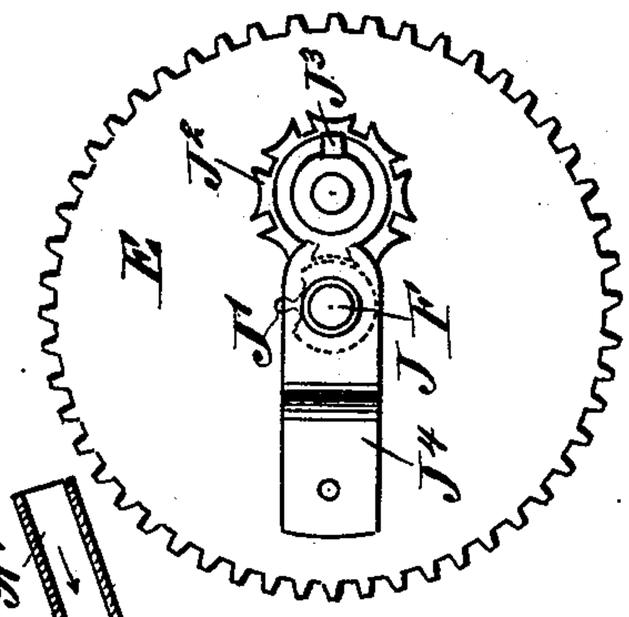


Fig: 9.

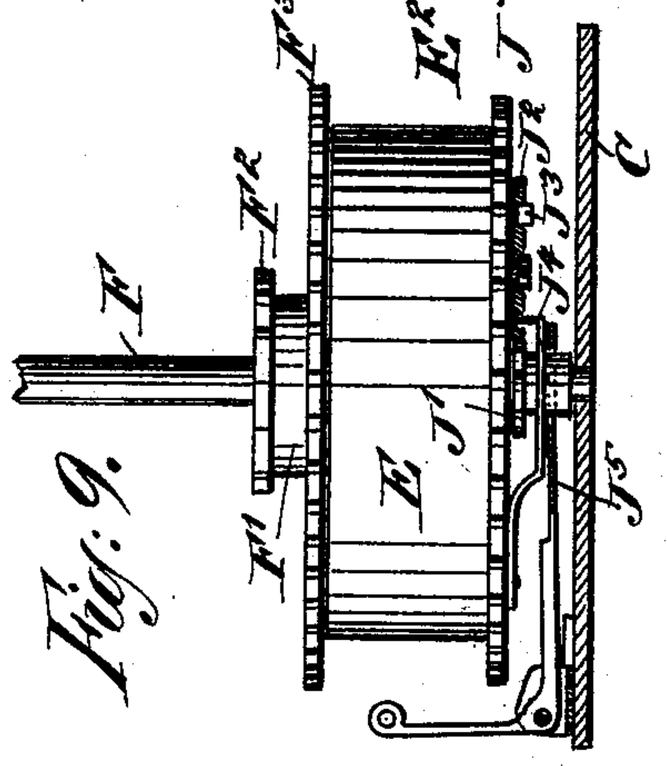


Fig: 6.

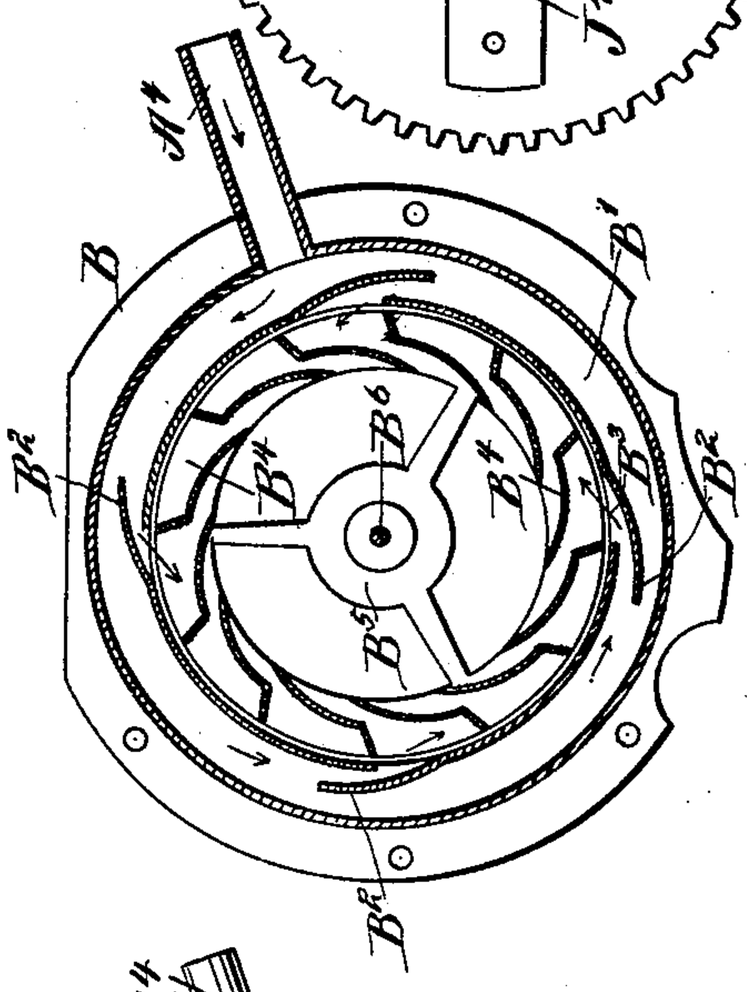


Fig: 7.

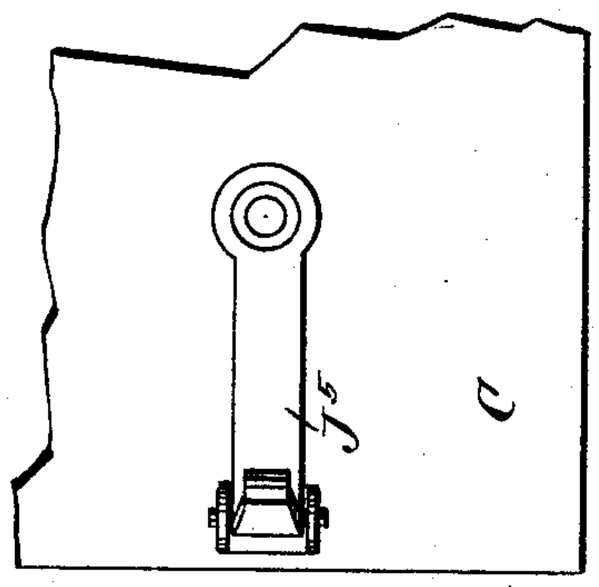
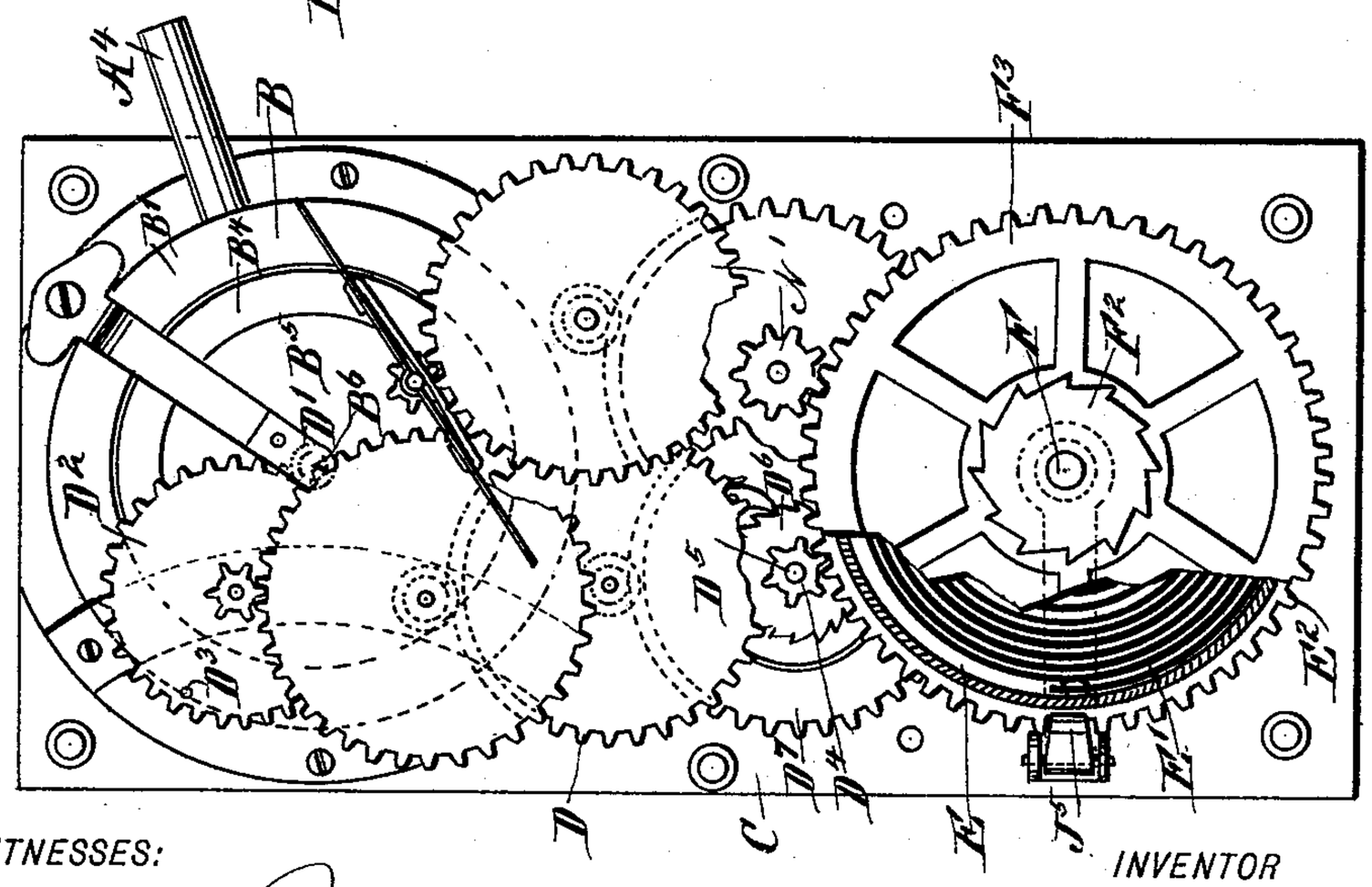


Fig: 5.



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CLOCK WINDING MECHANISM.

No. 509,375. Patented Nov. 28, 1893.

Fig: 14.

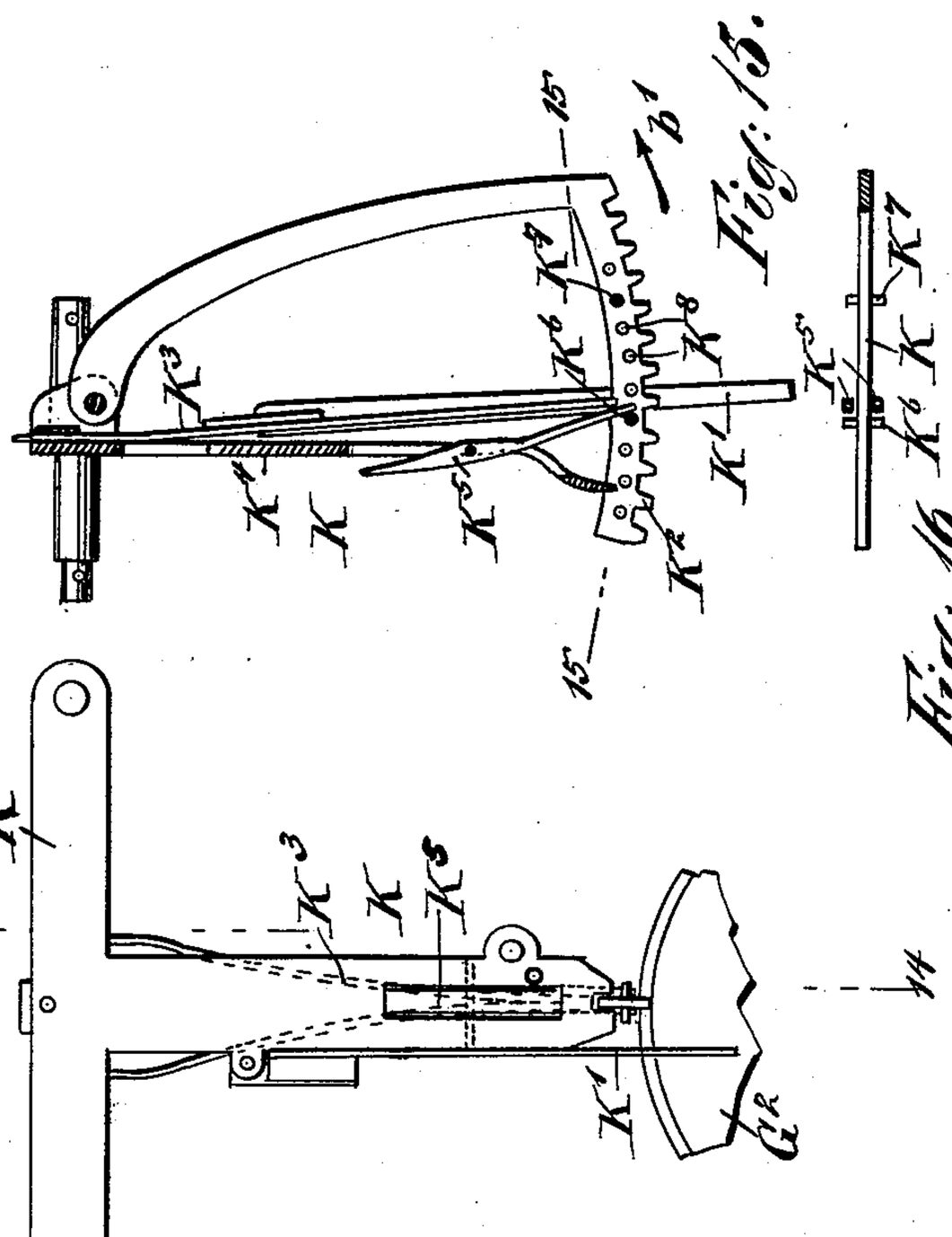


Fig: 15.

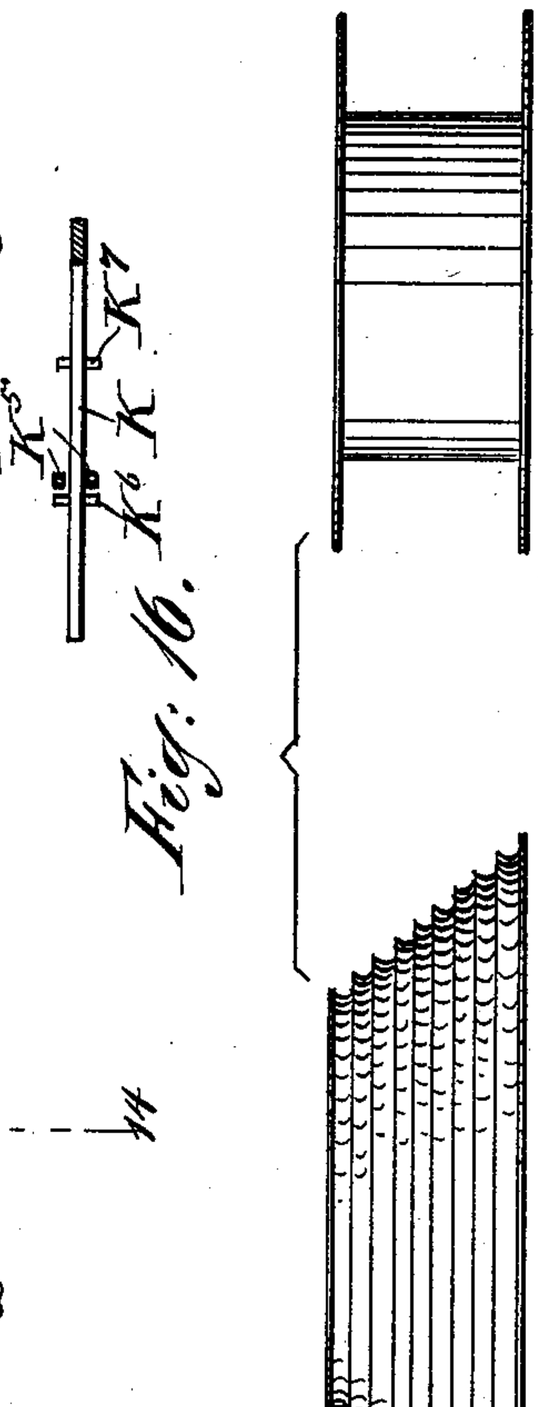


Fig: 16.

Fig: 13

Fig: 11.

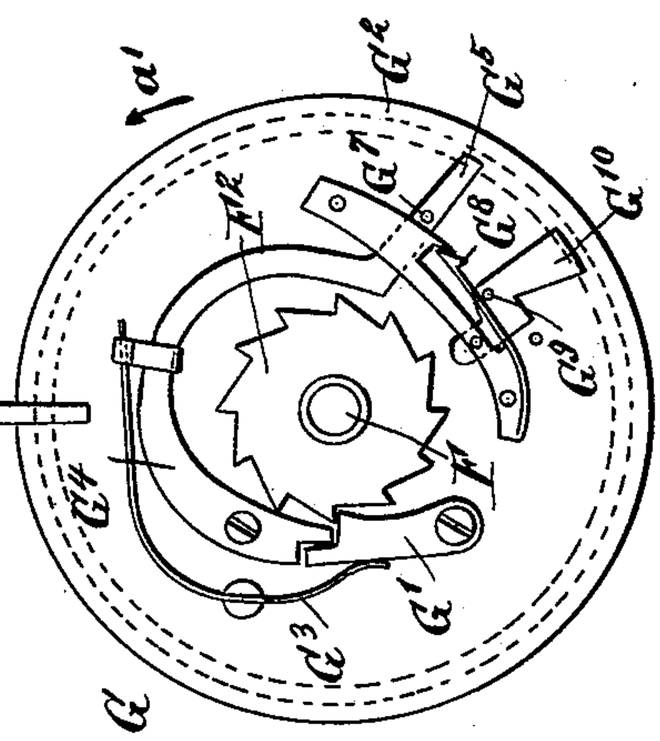


Fig: 12.

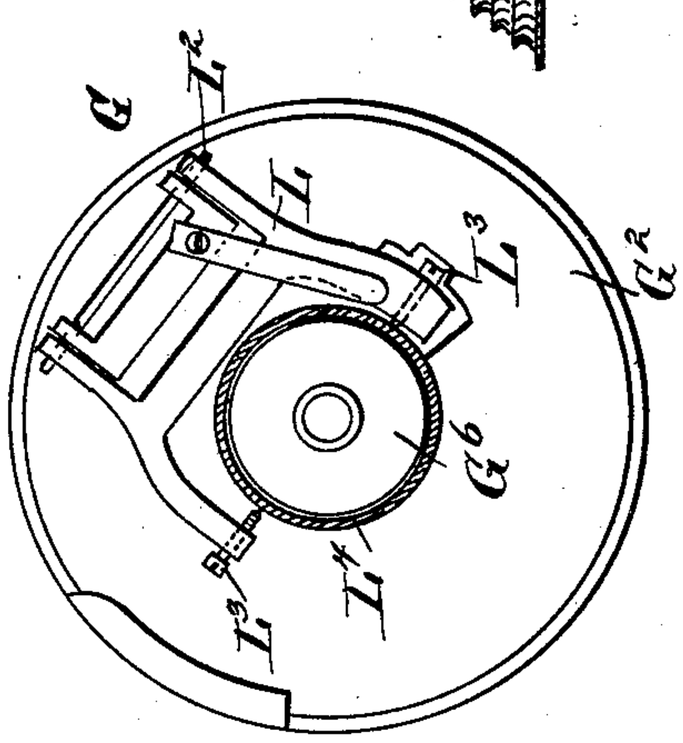
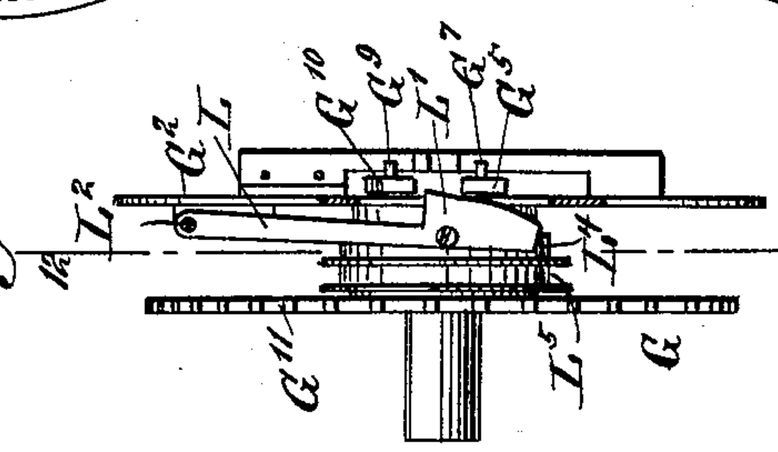


Fig: 10.



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UNITED STATES PATENT OFFICE.

ANDREW JACKSON HOPEWELL, OF EDINBURG, VIRGINIA.

CLOCK WINDING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 509,375, dated November 28, 1893.

Application filed October 14, 1892. Serial No. 448,831. (No model.)

To all whom it may concern:

Be it known that I, ANDREW JACKSON HOPEWELL, of Edinburg, in the county of Shenandoah and State of Virginia, have invented a new and Improved Clock Winding Mechanism, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved winding mechanism arranged for conveniently and automatically winding up spring or weight actuated clocks.

The invention consists of releasing and starting devices of especial construction, as hereinafter more fully described, and also of various parts and details and combinations of the same, as will be hereinafter more fully set forth and pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement as applied and with parts in section. Fig. 2 is an enlarged side elevation of the winding mechanism proper, parts being in section. Fig. 3 is a similar view of the same from the other side. Fig. 4 is a sectional face view of the same on the line 4—4 of Fig. 2. Fig. 5 is a rear face view of the same with the rear plate removed and parts in section. Fig. 6 is a sectional face view of the pneumatic wheel. Fig. 7 is a front view of a lever forming part of the stopping mechanism for the pneumatic wheel. Fig. 8 is a face view of part of the stopping mechanism for the pneumatic wheel. Fig. 9 is a plan view of the spring barrel part of the stopping device for the pneumatic wheel, and also of part of the transmitting mechanism. Fig. 10 is a side elevation of the transmitting device and part of the stopping and starting mechanisms for the same. Fig. 11 is a face view of the same. Fig. 12 is a sectional face view of the same on the line 12—12 of Fig. 10. Fig. 13 is an enlarged front view of the timing mechanism. Fig. 14 is a transverse section of the same on the line 14—14 of Fig. 13. Fig. 15 is a sectional plan view of the same on the line 15—15 of Fig. 14; and Fig. 16 is a plan view of a modified form of the transmitting mechanism.

The improved clock winding mechanism is provided with a wind wheel A, of any approved construction and located outside of the building containing the clock to be wound. The shaft of the wind wheel A carries a crank arm A′, connected by pitmen A^2 with a pair of bellows A^3 of any approved construction, so that the rotary motion of the wind wheel A actuates the said pair of bellows, which latter force a continuous blast of air into the outlet pipe A^4 of the said bellows, the said outlet pipe being connected with a pneumatic wheel B arranged in a suitable casing or frame-work C containing the especial device of the clock-winding mechanism, as hereinafter more fully described. The pneumatic wheel B is actuated by the blast of air from the bellows A^3, and is connected by a train of gear wheels D with a spring barrel E containing a spring E′, fastened at its outer end to the rim of the spring barrel, and at its inner end to the shaft F on which the spring barrel is loosely mounted, the said shaft being journaled in suitable bearings on the frame or casing C.

On the shaft F is secured a hub F′ carrying a ratchet wheel F^2 and a gear wheel F^3, of which the former is connected by an especial mechanism G with a shaft H journaled in the casing C and connected by a line of shafting H^2 with the clock I to be wound. For this purpose the line of shafting carries a bevel pinion H^3 in mesh with a bevel gear wheel H^4 secured on the winding shaft I′ of the clock I. Thus, when the shaft is rotated in one direction the spring is wound up in the clock I, and during the time the clock is running the wheel H^4 travels in an opposite direction to impart a rotary motion to the shaft H^2 in an opposite direction, for the purpose of releasing the spring barrel in the casing C, to again actuate the shaft H in a forward direction to again wind up the clock I, as hereinafter more fully described.

The pneumatic wheel B, as illustrated in Fig. 6, is provided with an annular channel B′, into which discharges the pipe A^4, the current of air traveling in the said channel in the direction of the arrows indicated in Fig. 6. Into the channel B′ extend diverging arms B^2 leading to openings B^3 formed in the inner wall of the channel, the said openings discharging into the buckets B^4 of the wheel B^5 secured on the shaft B^6. The inner ends of the buckets are open so that the current of

air, after exerting its force on the buckets B to turn the wheel, can readily escape through the inner open ends of the buckets, which lead to the open web of the wheel opening to the outside.

On the shaft B^6 is secured a pinion D', which forms part of the train of gear wheels D, the said pinion meshing into a gear wheel D^2 provided on one face with a lug D^3 adapted to be engaged by a lever J^6 forming part of the stopping mechanism J for locking the said wheel, and consequently the pneumatic wheel B at the time the spring E' in the spring barrel has been completely wound up by the action of the pneumatic wheel. This stopping mechanism J is provided with a single-toothed wheel J' secured on the shaft F on one side of the spring barrel E. See Figs. 8 and 9. The tooth of the wheel J' is adapted to engage a notched wheel J^2, mounted to turn on the rear face of the spring barrel E, so that, on further revolution of the spring barrel E the notched wheel J^2 is turned the distance of one tooth by the single-toothed wheel J' held on the shaft F which remains stationary during the winding up of the main spring E'.

On the face of the notched wheel J^2 is secured a lug J^3 adapted to engage the free end of a spring arm J^4 secured on the spring barrel E. This spring arm J^4 is adapted to impart a swinging motion to a bell-crank lever J^5 fulcrumed on the casing C and arranged horizontally, as is plainly shown in Fig. 3. The bell-crank lever J^5 is connected with the lower end of a lever J^6 fulcrumed at J^7 on a bracket on the casing C. A spring J^8 presses on the upper end of the said lever J^6, so as to hold the bell-crank lever J^5 always in contact with the spring arm J^4. On the extreme upper end of this lever J^6 is formed a transversely-extending lug or projection J^9, see Fig. 3, adapted to move into the path of the lug D^3, so as to stop further rotation of the wheel D^2 and the pneumatic wheel B. It is understood that when the projection J^3 comes in contact with the free end of the spring arm J^4, then the bell-crank lever J^5 is actuated and a swinging motion is given to the lever J^6, so that its lug or arm J^9 moves into the path of the lug D^3 to stop the gear wheels D. The rotary motion of the latter then ceases, and consequently the train of gear wheels D remains at a stand-still, and a further revolving of the spring barrel E ceases. The spring barrel E remains in this locked position until the spring E' has run down in turning the shaft F, the latter then turning the single-toothed wheel J', which actuates the notched wheel J^2, so as to move the lug J^3 from under the spring arm J^4, whereby the latter swings inward and permits the bell-crank lever J^5 and lever J^6 to return to their normal positions by the action of the spring J^8 on the said lever J^6. The lug J^9 of the said lever then moves out of the path of the lug D^3, thus unlocking the wheel D^2, the train of gear wheels D, and the pneumatic wheel B, which will now again be started up by the current of air actuating the wheel, as above described. It is understood that this takes place at the time the spring E' is unwound in the spring barrel E, the latter then being again turned to wind up the spring, as above explained. The gear wheel E^2 on the spring barrel E is in mesh with a pinion D^4 which forms part of the train of gear wheels D, the said pinion being fastened on a shaft D^5, which extends to one side of the casing and has a square end adapted to be engaged by a key for starting the spring barrel by hand when setting the device in action. The pinion D^4 is connected by a ratchet and pawl mechanism D^6 (see Fig. 5), with the gear wheel D^7, mounted loosely on the shaft D^5 and connected with the pinion of the train of gear wheels D.

The ratchet wheel F^2 secured on the shaft F, as previously mentioned, is adapted to be engaged by a pawl G' pivoted on a spiral cam wheel G^2 mounted to rotate loosely on the shaft F. A spring G^3 held on the said cam wheel presses on the pawl G' and also presses on a lever G^4, likewise fulcrumed on the said cam wheel G^2, as is plainly illustrated in Fig. 11. The lever G^4 engages the free end of the pawl G', to move the latter out of contact with the ratchet wheel F^2, or to permit the spring G^3 to return said pawl into mesh with the said ratchet wheel. The lever G^4 is provided at one end with an arm G^5 adapted to be engaged by a spring K' forming part of a timing mechanism K which serves to stop or start the winding mechanism proper, according to the time during which the clock I is running without requiring rewinding. The arm G^5 is adapted to engage a wedge-shaped lug or incline L' formed on a lever L pivoted at L^2 on the face of the cam wheel G^2 opposite the face carrying the lever G^4, as will be readily understood by reference to Figs. 10 and 12. The wedge L' extends through an opening in the web of the cam wheel G^2, so as to be engaged by the arm G^5 of the lever G^4, as above described. The lever L is held against the face of the cam wheel G^2 by a suitable spring, and the free end of the said lever carries pointed set screws L^3 engaging a sleeve L^4 mounted to slide loosely on the hub G^6 of the cam wheel G^2. This sleeve L^4 is provided with an annular groove L^5 engaged by the forked end L^6 of a lever L^7 on the arm K^4, see Figs. 2 and 4, and provided with an arm L^8 adapted to engage a fly wheel N journaled in the casing C and connected by a train of gear wheels N' with the gear wheel F^8 previously mentioned, so that the rotary motion of the latter actuates the said fly wheel N at the time the arm L^8 is disengaged from the said fly wheel and the shaft F is rotated by the action of the main spring E'.

On the arm G^5 of the lever G^4 is secured a pin G^7, adapted to engage the hook end G^8 of a spring fastened on the face of the cam wheel G^2 carrying the lever G^4, as will be readily understood by reference to Fig. 11. This hook G^8 is adapted to lock the arm G^5

in place until the said hook is disengaged from the pin G^7 by means of a pin G^9 acting on the spring of the said hook, and secured on a lever G^{10} fulcrumed on the cam wheel G^2. This lever G^{10} is arranged in line with the arm G^5, so as to be engaged by the free end of the spring K′ of the timing mechanism K at the time the cam wheel G^2 travels in an opposite direction.

It is understood that when the cam wheel G^2 travels in the direction of the arrow a', the arm G^5 is engaged by the spring K′, so that a swinging motion is imparted to the lever G^4, whereby the pawl G′ is thrown out of mesh with the ratchet wheel F^2, and at the same time the pin G^7 of the said arm G^5 is engaged with the hook G^8 to lock the said lever G^4 in place to hold the pawl G′ out of contact with the ratchet wheel F^2. When the cam wheel G^2 travels in the inverse direction of the arrow a' as hereinafter more fully described, the lever G^{10} is finally engaged by the said spring K′ and receives a swinging motion from the latter so as to press the spring carrying the hook G^8 inward, to release the pin G^7 from the hook G^8. The spring G^3, acting on the lever G^4 and the pawl G′, returns the said lever and pawl to their former normal positions, illustrated in Fig. 11; that is, the pawl G′ again engages the ratchet wheel F^2.

On the hub G^6 of the cam wheel G^2 is secured a gear wheel G^{11} in mesh with the pinion H′ secured on the shaft H connected with the clock I. The spirally arranged periphery of the cam wheel G^2 engages a toothed segment K^2, which forms part of the timing mechanism K above referred to and presently to be described. The spring arm K′ is secured on a second spring arm K^3, mounted to swing transversely, that is in an opposite direction to the arm K′. This spring arm K^3 is secured on a T-shaped arm K^4 forming part of the casing or frame C, the vertical portion of the arm carrying a tripping lever K^5 adapted to be engaged at its lower end by pins K^6 and K^7, inserted in apertures of a series of apertures K^8 formed in the segment K^2, as will be readily understood by reference to Figs. 13, 14, and 15. The segment K^2 is mounted to swing transversely, and is guided in the forked lower end of the arm K^4 and the spring arm K^3, it being understood that the lower end of the lever K^5 is preferably forked so as to be engaged by the pins K^6 and K^7 at the two forked arms on opposite sides of the segment K^2.

When the several parts are in the position shown in Fig. 14, and the segment K^2 swings in the direction of the arrow b', this being caused by the spiral periphery of the cam wheel G^2 rotating in one direction, then the pin K^6 engaging the forked end of the lever K^5, brings the lower end of the said lever in contact with the spring arm K^3, so as to move the latter outward in the direction of the arrow b', whereby the spring K′ is moved into the path of the levers G^4 and G^{10}. When the segment K^2 swings in the inverse direction of the arrow b' then the pin K^7 engages the forked lower end of the lever K^5 and imparts a swinging motion to the latter, so that the upper end of said lever K^5 finally comes in contact with the spring arm K^3 and moves the same outward in the direction of the arrow b'. Thus, it will be understood that the movement of the segment K^2 in either direction causes the spring arm K^3 to swing outward to move the arm K′ into the path of the levers G^4 and G^{10}. The apertures K^8 in the segment K^2 correspond to the number of teeth in the latter, so that one revolution of the cam wheel G^8 shifts the segment K^2 the distance between two teeth which corresponds to the distance between two apertures K^8. Now, by setting the pins K^6 and K^7 nearer together or farther apart the entire mechanism is arranged for a clock requiring frequent winding or winding at longer periods. Thus, the mechanism can be set to suit a one-day clock or an eight-day clock, or a clock having any other period of winding, it being understood that the pins K^6 and K^7 are set correspondingly closer together or farther apart.

The operation is as follows: The main spring E′ in the spring barrel E is wound up by the action of the pneumatic wheel B actuated by a blast of air from the wind-wheel A, as before explained, and when the spring is wound up the pneumatic wheel is locked by the locking mechanism J, also fully described above. When the clock I is about run down the connection of the shaft I′ with the shaft H has turned the latter so that the pinion H′ meshing in the gear wheel G^{11} has rotated the cam wheel G^2, so that the latter has shifted the segment K^2 to cause the pin K^6 to actuate the tripping lever K^5, so as to change the position of the arm K′, the latter then moving into the path of the lever G^{10}. As the latter is carried around with its cam wheel G^2, by the action of the shaft H geared with the wheel G^{11} as above described, the said lever G^{10} engages the arm K′ and is thrown forward to unlock the pin G^9 from the spring hook G^8, so that the pawl G′ is thrown in engagement with the wheel F^2. At the same time the return movement of the lever G^4 permits the lever L to swing transversely, to move the sleeve L^4 in a like direction so as to impart a swinging motion to the lever L^7 to move the arm L^8 out of the path of the fly wheel N. As the latter is now unlocked the main spring E′ will impart a rotary motion to the shaft F, the motion of which is transmitted by the ratchet wheel F^2 and the pawl G′ to the cam wheel G^2 and, as the latter carries on its hub the gear wheel G^{11}, a rotary motion is given to the pinion H′, and consequently to the shaft H connected with the winding shaft I′ of the clock I. The latter is now wound up, and during the winding the cam wheel G^2 again shifts the segment K^2 in the inverse direction of the arrow b', so that

the other pin K^7 finally acts on the tripping lever K^5, whereby the upper end of the latter throws the spring arm K^3 outward to move the spring arm K′ into the path of the arm G^5 of the lever G^4. As the cam wheel G^2 rotates in the direction of the arrow a', see Fig. 11, the said arm G^5 engages the arm K′, whereby the said lever G^4 is locked by the pin G^7 engaging the hook G^8, and at the same time the said lever throws the pawl G′ out of mesh with the ratchet wheel F^2. The movement of the arm G^5 of the lever G^4 causes an outward swinging of the lever L, as the said arm travels up the incline or wedge L′ of the arm. An outward swinging motion is thus given to the sleeve L′, whereby the position of the shifting lever L^7 is changed and its arm L′ is moved into the path of the fly wheel N, the motion of which is thus interrupted, and further winding of the clock ceases.

It will be seen that the mechanism described for winding up the clock I is wholly independent in its workings of the mechanism used for winding up the spring E′ in the main spring barrel E. It will also be seen that the force of the spring E′ after once being wound up, will be sufficient to accomplish one, two or more windings of the clock I before it will be necessary for the pneumatic wheel B to wind up the spring B. It is also understood that during the time the clock I is running the shaft H is rotated by the clock mechanism so as to rotate the cam wheel G^2, which latter, at every revolution shifts the segment K^2 the distance between two teeth until finally the respective pin K^7 comes in contact with the tripping lever K^5 for the purpose above mentioned; that is, to release the shaft F by releasing the fly wheel N as above described, to rewind the clock, the shaft H then turning in the opposite direction.

The connection of the shaft H with the shaft I′ can be made from either end of the shaft H, so that the mechanism is readily adapted to any clock whether it winds right or left handed. By the use of the connecting shaft H^2 the mechanism can be applied to wind any clock, but in certain cases and under certain circumstances it may be desirable to employ a cord to connect with the winding shaft of the clock, and in this case a grooved cone-shaped, or other form of pulley such, for instance, as is illustrated in Fig. 16, may be mounted on the hub G^6 instead of the gear wheel G^{11} the said cord extending to and winding on a flanged pulley secured on the winding shaft I′ of the clock. In this case the gear wheel G^{11}, the pinion H′, the pinion H^3, and the beveled gear wheel H^4, as well as the shaft H^2, are entirely dispensed with.

For clocks that have specially large cases, like the greater number of weight clocks, the mechanism can be fixed in position inside of the casing, and for smaller clocks the mechanism can be fixed either on the top or on one side of the casing, but generally it would be preferable to fix it underneath the clock casing and also within the base of the clock casing, or in a separate base on which the clock is set.

When desired, the power imparted to the pneumatic wheel B, can be transmitted over the train of gear wheels D and connected directly with the springs or weights of a clock so as to avoid the use of the main spring E′ in the mechanism as above described and also to curtail the other machinery. By this method a clock would not be wound at regular intervals as explained, but at any time there might be a breeze, until fully wound up, at which time the pneumatic wheel would be locked by the lever J^6 as above described. By this method of winding clocks automatically only a portion of the mechanism described would be employed, to wit: the wind wheel, bellows, the air tube to carry the air into the pneumatic wheel, the latter, and the train of gearing D,—which connects directly with the main springs or weights of the clock. The air channel of the pneumatic wheel as well as the latter and the train of gear wheels, can be fixed in a separate frame consisting of two plates and posts or pillars to support them, though generally it would be more convenient to extend and arrange the frame of the clock movement so as to receive these parts.

For striking clocks, one winding mechanism can generally be put in position so as to wind both the running and striking parts, but it will be preferable to apply a mechanism such as above described to each part, in which case it will be necessary to divide the air tube so as to form two branches, each of which actuates a separate pneumatic wheel.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A clock winding mechanism comprising a wind wheel, an air forcing device operated thereby, a pneumatic wheel having buckets or blades, a pipe leading from the air forcing device and discharging into or against said buckets or blades, and mechanism for operating the winding shaft of a clock from said pneumatic wheel, substantially as set forth.

2. A clock winding mechanism comprising a wind wheel, bellows operated by said wheel, a pneumatic wheel having buckets or blades, a casing within which the latter wheel rotates and having passages delivering thereto, a pipe leading from the bellows to said casing and mechanism for operating the winding shaft of a clock from the pneumatic wheel, substantially as set forth.

3. In a clock winding mechanism, the combination with the main spring, a shaft connected with the inner end of the said spring, mechanism for connecting said shaft with the winding shaft of a clock, and a spring barrel connected with the outer end of the said spring, and loose upon said shaft, of a single-toothed wheel secured on the said shaft, a notched

wheel mounted to turn on the face of the said spring barrel adapted to be actuated by the said toothed wheel, a projection held on the face of the said notched wheel, a spring arm adapted to be engaged by the said projection, and a bell-crank lever adapted to be moved in one direction by the said spring arm, substantially as shown and described.

4. In a clock winding mechanism, the combination with the main spring, a shaft connected with the inner end of the said spring, mechanism for connecting said shaft with the winding shaft of a clock, and a spring barrel connected with the outer end of the said spring, and loose upon said shaft of a single-toothed wheel secured on the said shaft, a notched wheel mounted to turn on the face of the said spring barrel adapted to be engaged by the said toothed wheel, a projection held on the face of the said notched wheel, a spring arm adapted to be engaged by the said projection, a bell-crank lever adapted to be moved in one direction by the said spring arm, and a spring-pressed lever connected with the said bell crank lever and adapted to lock the train of gear wheels connected with the said spring barrel, substantially as shown and described.

5. A clock winding mechanism provided with a cam wheel adapted to be rotated in either direction, a segment adapted to be engaged by the said cam wheel and provided with pins adapted to be set closely together or farther apart, and a tripping mechanism adapted to be actuated by the said pins, substantially as shown and described.

6. A clock winding mechanism provided with a cam wheel adapted to be rotated in either direction, a segment adapted to be engaged by the said cam wheel and provided with pins adapted to be set closely together or farther apart, a tripping mechanism adapted to be actuated by the said pins, and means, substantially as described, for imparting a rotary motion to the said cam wheel in one direction by the running down of the clock, as set forth.

7. A clock winding mechanism provided with a cam wheel adapted to be rotated in either direction, a segment adapted to be engaged by the said cam wheel and provided with pins adapted to be set closer together or farther apart, a tripping mechanism adapted to be actuated by the said pins, and means, substantially as described, for imparting a rotary motion to the said cam wheel by the mechanism winding up the clock, as set forth.

8. In a clock winding mechanism, the combination with a main spring shaft carrying a ratchet wheel, and mechanism for connecting said shaft with the winding shaft of a clock to wind the same and to reversely rotate the said main spring shaft from the winding shaft as the clock runs down, substantially as set forth, of a pawl adapted to engage the said ratchet wheel, a cam wheel carrying the said pawl, and a lever for throwing the said pawl into and out of mesh with the ratchet wheel, substantially as shown and described.

9. In a clock winding mechanism, the combination with a main spring shaft carrying a ratchet wheel, of a pawl adapted to engage the said ratchet wheel, a cam wheel carrying the said pawl, a lever for throwing the said pawl into and out of mesh with the ratchet wheel, and a locking device for the said lever, to hold the latter in position at the time the pawl is disengaged from the ratchet wheel, as set forth.

10. In a clock winding mechanism, the combination with a main spring shaft carrying a ratchet wheel, of a pawl adapted to engage the said ratchet wheel, a cam wheel carrying the said pawl, a lever for throwing the said pawl into and out of mesh with the ratchet wheel, a locking device for the said lever, to hold the latter in position at the time the pawl is disengaged from the ratchet wheel, and a lever for unlocking the said first named lever, substantially as shown and described.

11. In a clock winding mechanism, the combination with a main-spring shaft carrying a ratchet wheel, of a pawl adapted to engage the said ratchet wheel, a cam wheel carrying the said pawl, a lever for throwing the said pawl into and out of mesh with the ratchet wheel, and a tripping mechanism, substantially as described, and actuated by the said cam wheel to actuate the said lever to move the pawl out of contact with the ratchet wheel or into contact therewith as set forth.

12. In a clock winding mechanism, the combination with a main spring shaft carrying a gear wheel and a ratchet wheel, of a fly wheel connected by a train of gear wheels with the said shaft gear wheel, a cam wheel mounted to rotate loosely on the said shaft and carrying a pawl adapted to engage the said ratchet wheel, a tripping device for actuating the said pawl to move the latter into or out of mesh with its ratchet wheel, and a shifting device actuated in connection with the said tripping device to lock the said fly wheel as set forth.

13. In a clock winding mechanism, the combination with a segment mounted to swing in either direction, and provided with a series of apertures and pins adapted to be inserted in the said apertures, of a tripping lever adapted to be alternately engaged by the said pins, and a spring arm adapted to be engaged by either end of the said tripping lever, to be moved in either direction, substantially as shown and described.

14. In a clock winding mechanism, the combination with a wind wheel geared with the main spring shaft, of a lever for locking the said wind wheel, a sleeve engaging the said lever for shifting the latter, a lever provided with a wedge for shifting the said sleeve, and a third lever engaging the said wedge or incline to shift the said sleeve, substantially as shown and described.

15. In a clock winding mechanism, the combination with a fly wheel geared with the main spring shaft, of a lever for locking the said fly wheel, a sleeve engaging the said lever for shifting the latter, a lever provided with a wedge for shifting the said sleeve, a third lever engaging the said wedge or incline to shift the said sleeve, and a tripping mechanism, substantially as described, for actuating the said third lever, as set forth.

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Witnesses:
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