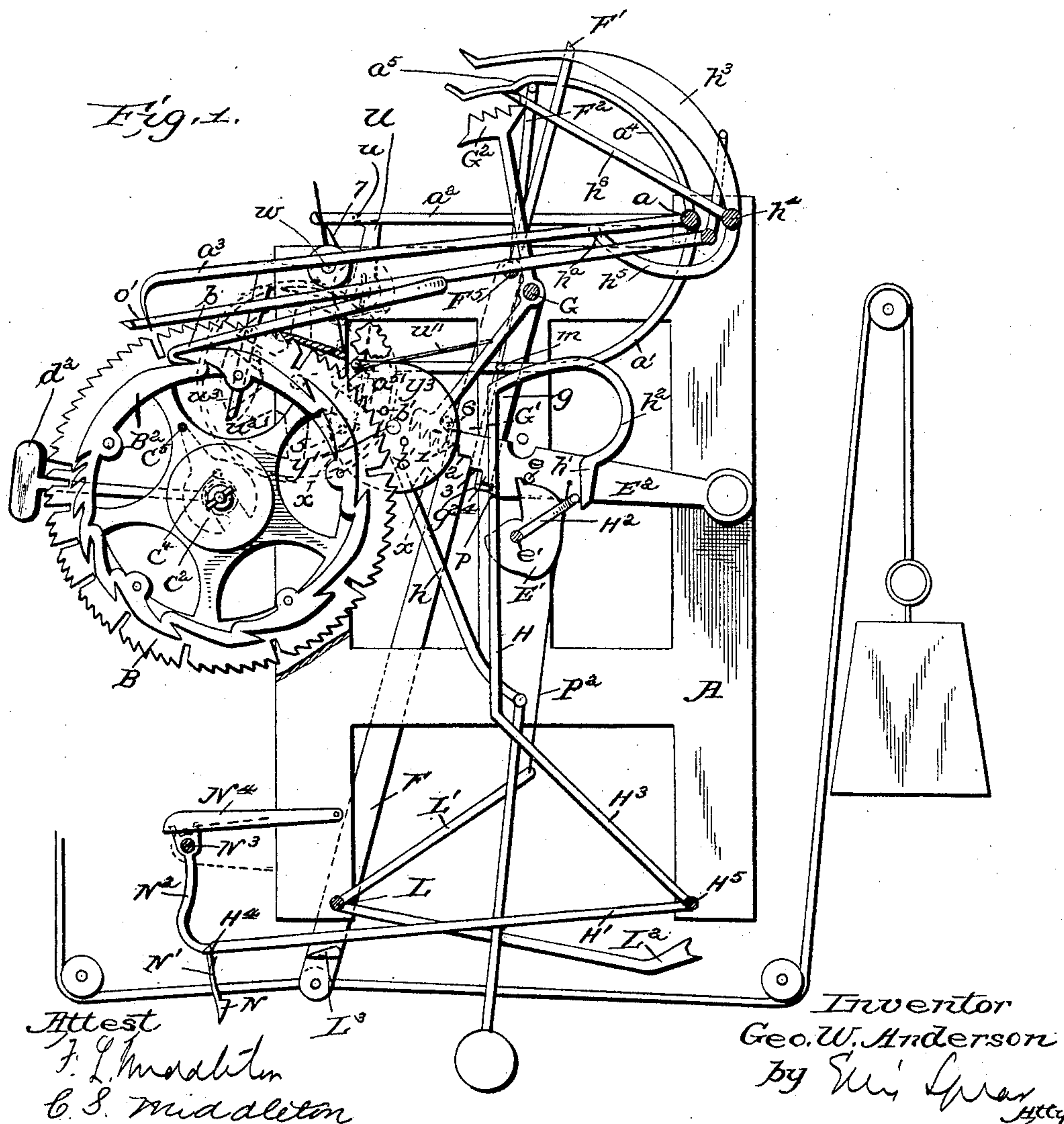
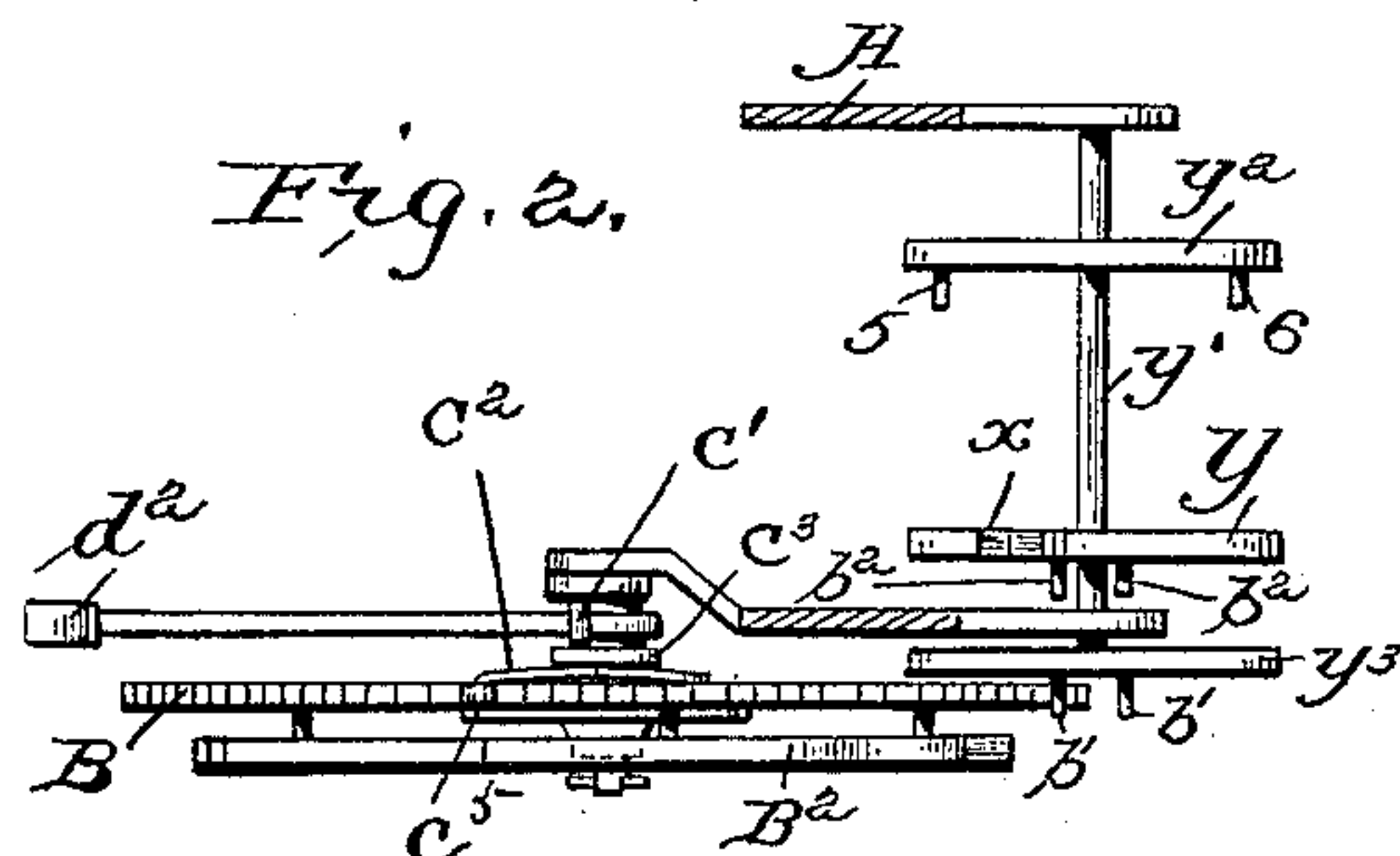


2 Sheets—Sheet 1.

No. 593,184.

Patented Nov. 9, 1897.



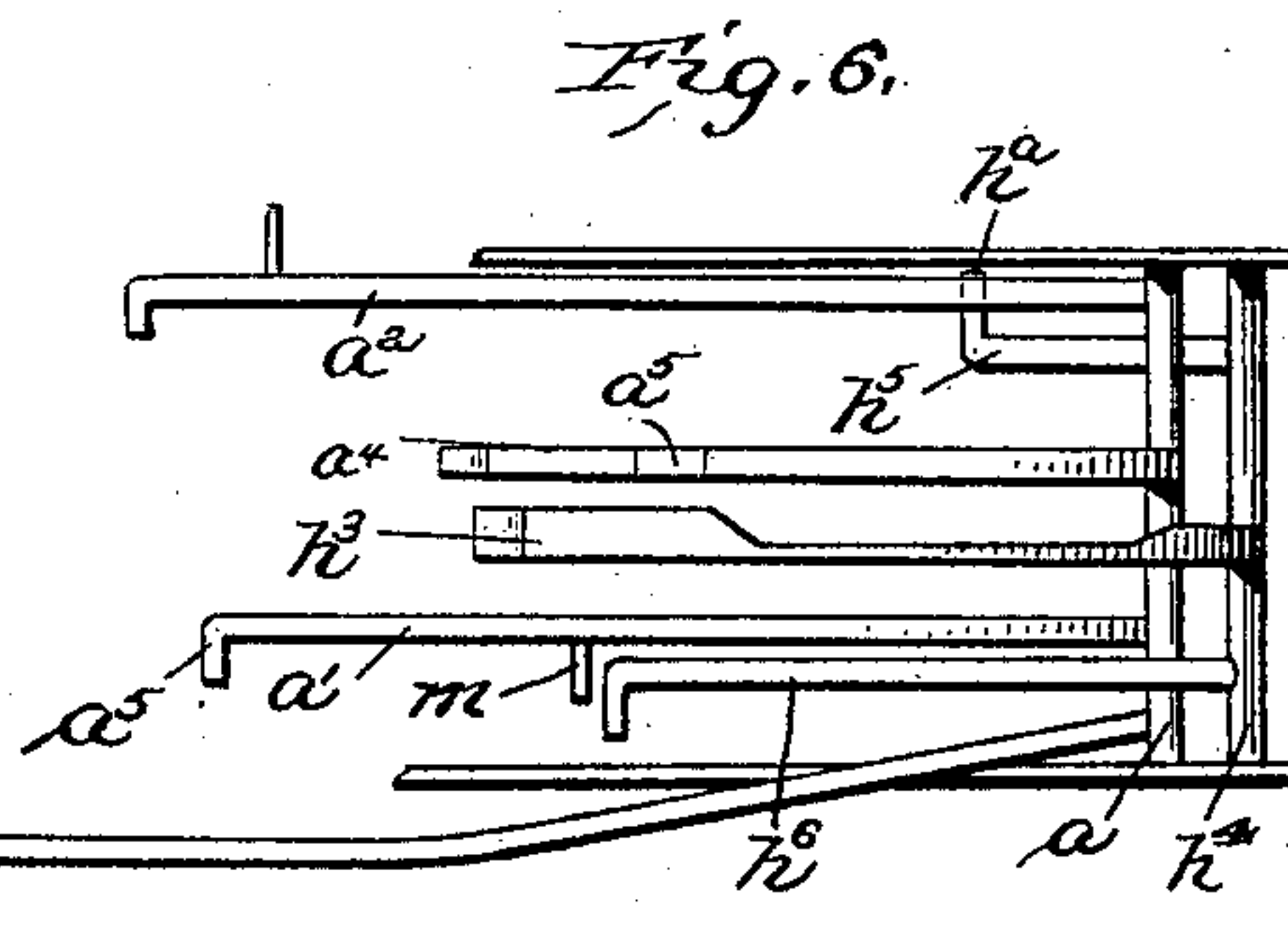
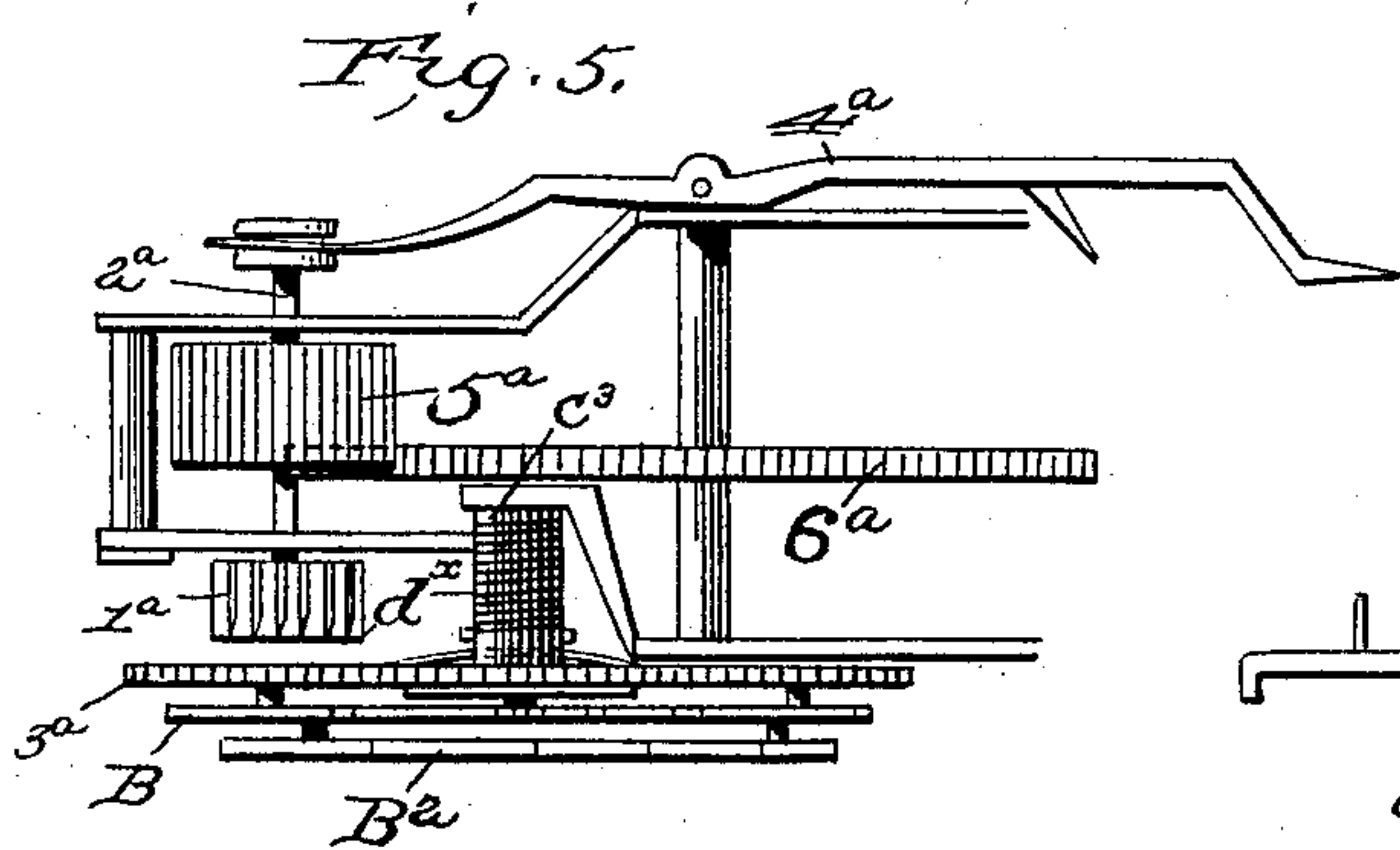
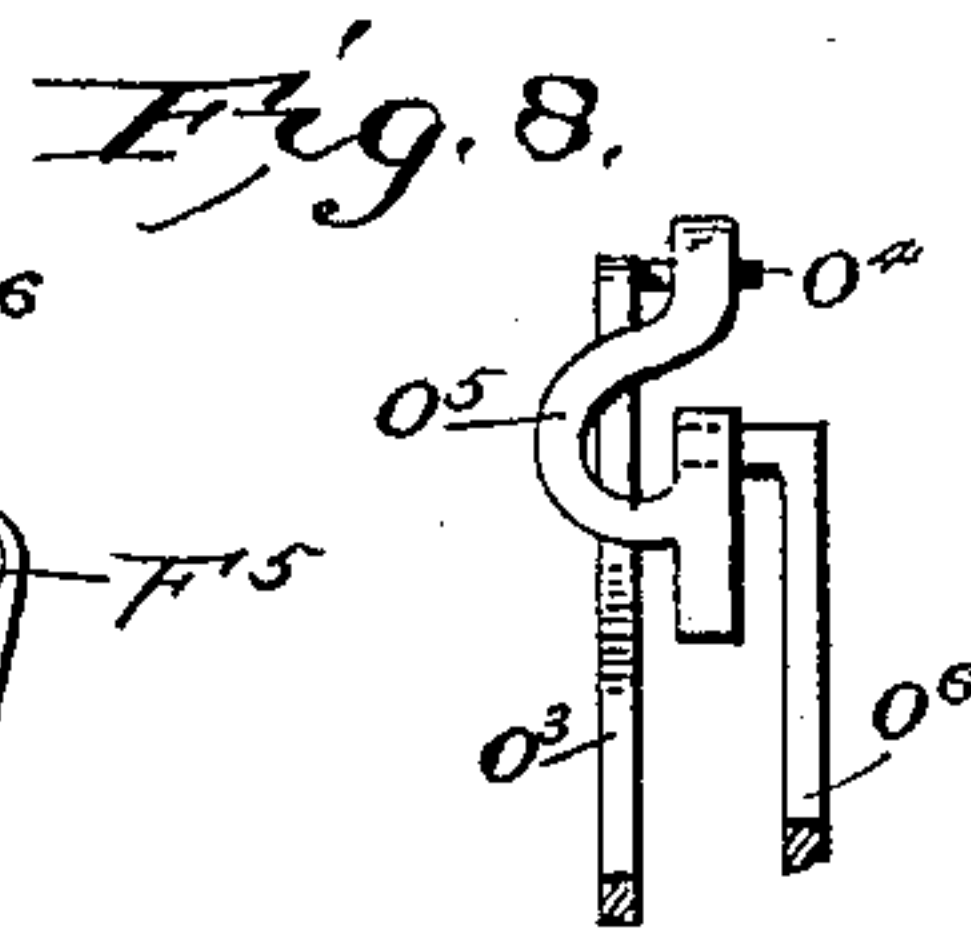
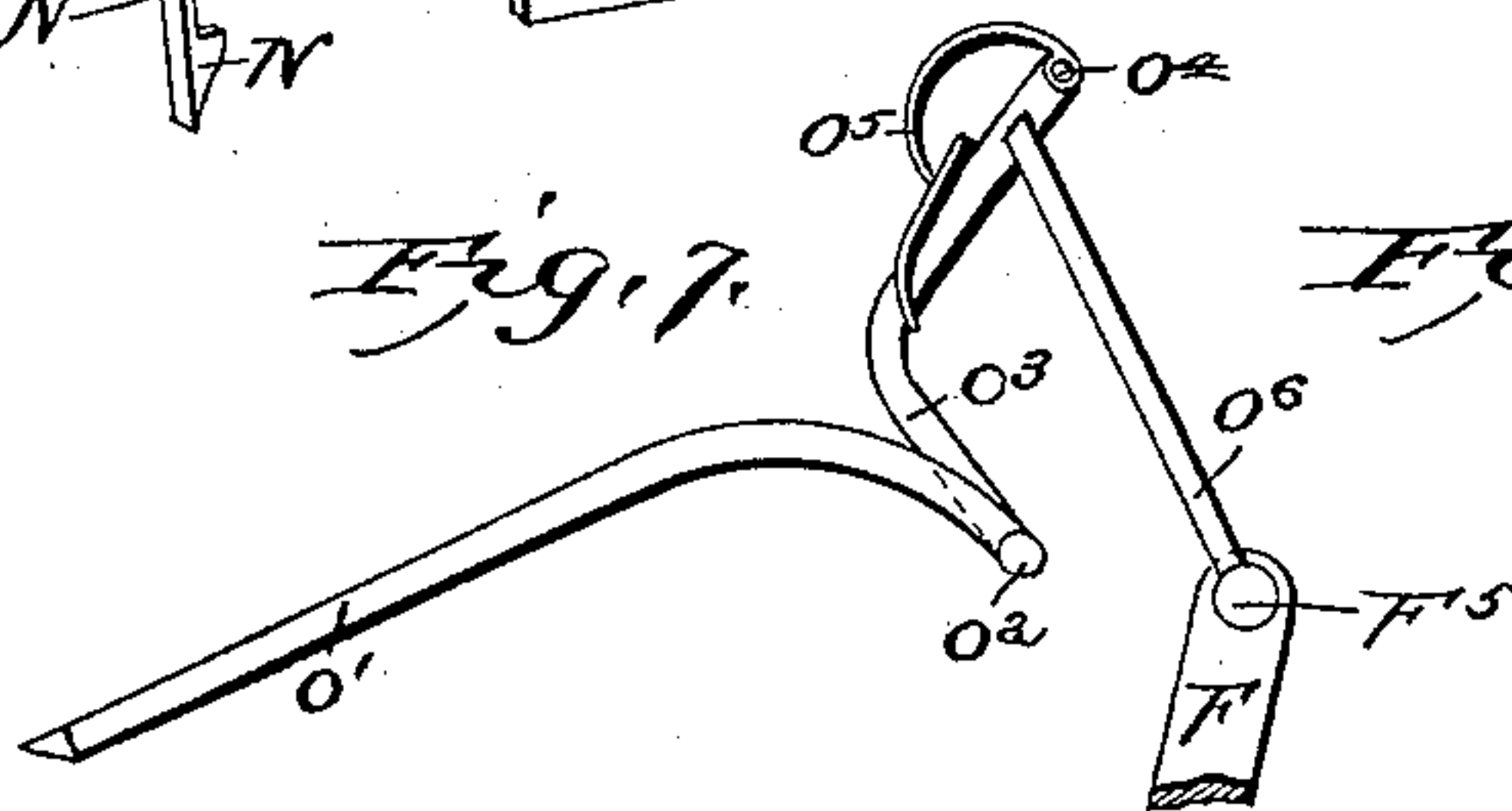
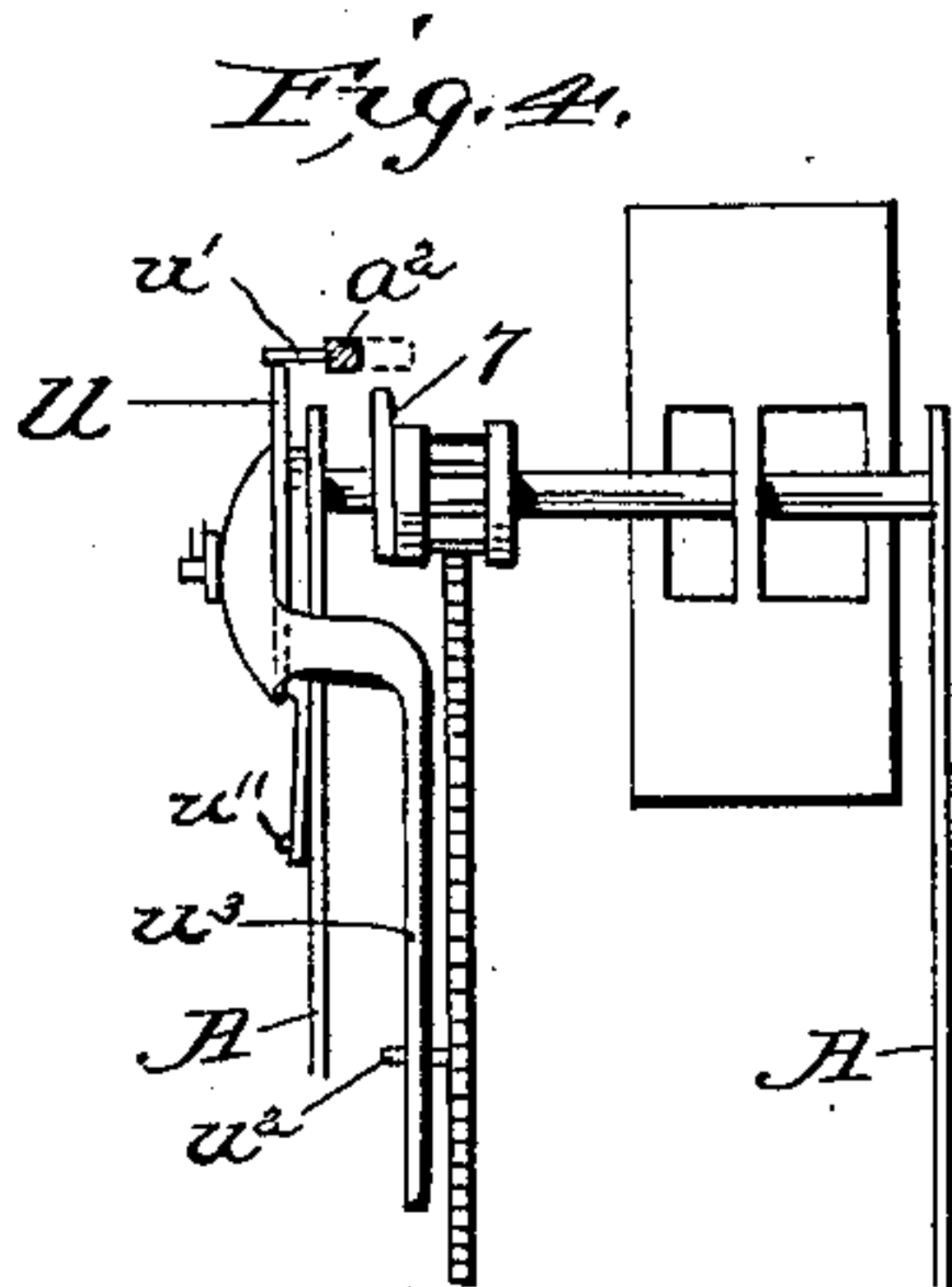
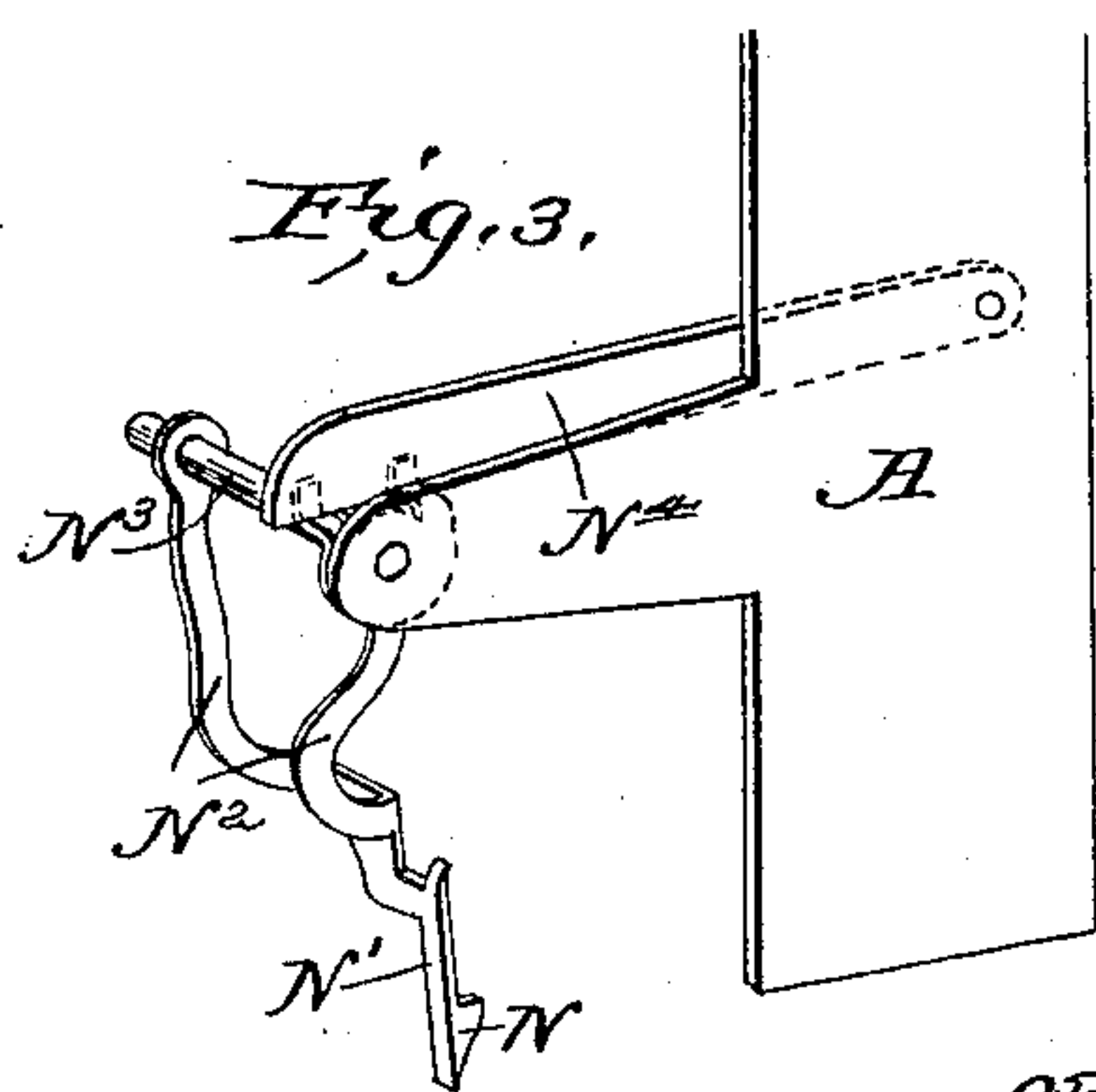
(No Model.)

2 Sheets—Sheet 2.

G. W. ANDERSON.
CLOCK REPEATING MECHANISM.

No. 593,184.

Patented Nov. 9, 1897.



Attest
F. L. Middleton
C. S. Middleton

Inventor
Geo. W. Anderson
by W. H. H. H.

UNITED STATES PATENT OFFICE.

GEORGE W. ANDERSON, OF BUFFALO, KANSAS.

CLOCK REPEATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 593,184, dated November 9, 1897.

Application filed April 6, 1895. Serial No. 544,836. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. ANDERSON, a citizen of the United States, residing at Buffalo, in the county of Wilson and State of Kansas, have invented a new and useful Repeating Strike for Clocks, of which the following is a specification.

My invention relates to improvements in striking-clocks in which the hour-strike is regulated by a count-wheel, and said strike, as well as the minute-strike, can be repeated, the object of the repeat being to apprise a person at night of the approximate time by leading a cord from the clock to the bed.

The invention includes particularly the detail mechanism for accomplishing this result, this mechanism being so arranged that the time between the fractional-hour strike and the hour-strike shall be at the option of the person causing the repeat.

The invention is illustrated by the accompanying drawings, in which—

Figure 1 is a front elevation, parts being broken away for the purpose of better illustration. Fig. 2 is a detail showing the disk-spindle, count-wheel, and their connection. Fig. 3 is a detail of the hook N. Fig. 4 is a detail of the fan-spindle-locking device. Fig. 5 is a detail in plan of a modification of the count-wheel-driving mechanism. Fig. 6 is a plan view of the shafts a and H^4 , showing the parts carried thereby in the position shown in Fig. 1. Figs. 7 and 8 are detail views of a modification.

The rear and front plates of the clock-frame are shown at A, they being of ordinary construction and the same shape, only a section of the front plate being shown in Fig. 1.

The minute-hand spindle e' is journaled in the intermediate portion of the front and back plates, this spindle carrying a snail-cam E' , which operates upon a pin e , carried by an arm E^2 , pivoted to the rear plate A. The free end of this arm E^2 is provided with a series of steps 1, 2, 3, and 4, these steps corresponding in number to the divisional time-strike—that is, if the clock is to strike the quarter-hours four steps are employed, and if it is to strike one for every five minutes twelve steps would be necessary. The spindle e' is provided with a finger H^2 , having a laterally-bent end that is adapted to bear

against the laterally-bent end h' , forming a continuation of a loop-shaped portion h^2 , that is integral with the vertical rod H, having an inclined lower portion H^3 , pivoted at H^5 . This rod has either a horizontal continuation H' , provided with a laterally-bent end H^4 , or this portion H' is independently secured to the pivot H^5 . In the normal position of the parts the end H^4 is seated upon a hook N, formed on the inside of the lower part of an inclined plate N' , this plate being formed integral with the arms N^2 , which are freely suspended from the stud N^3 , extending inwardly from an extension of the front plate of the clock-frame, this extension being shown by dotted lines in Fig. 1 and full lines in Fig. 3. An arm N^4 , also pivoted to the front plate, has its free end supported on lateral extension of the arm N^2 , above the stud N^3 , this arm holding the hook N and plate N' normally inclined inwardly.

In the rotation of the spindle e' as it nears the completion of the hour the finger H^2 pushes upon the end h' and tilts the rod H toward the right. This will lift the rod H' until the end H^4 is above and to the outside of the curved end of the plate N' , when said plate N' will spring back into normal position.

The completion of the hour will cause the finger H^2 to pass the end h' , when the arm H' will drop by gravity below the hook N, thus tilting the rod H to the left and bringing the part h^2 of said rod beneath the pin m , carried by the locking-arm a' , fixed to the shaft a . This arm will be lifted by the continued movement to the left of the rod H, and the laterally-bent end $a^{5'}$ of the arm a' will be lifted out of the recess x in the disk Y and thus free said disk. This disk is carried by and rotates with the spindle y' , which in turn is driven by the ordinary clock mechanism, which, to avoid the complication of the drawings, is not shown. This spindle y' carries three disks—Y, before mentioned, y^2 , and y^3 —which are disposed at different positions thereon, as shown in Fig. 2. The disk y^2 has projecting from the face thereof, near its outer periphery, two pins 5 6, which are diametrically arranged and are adapted to come into contact with the upper end of the arm h as the disk rotates. The arm h is intermediately pivoted to the front and rear plates A,

and from this pivotal point the upper portion of the arm extends at an inclination, the lower part thereof extending in a vertical direction and having the bell-hammer secured to its lower end. The upper part of this arm strikes against a pin p , carried by the rod II , and moves it toward the right on the first strike of the automatic hour-strike until the end II^4 of the rod II' is again seated upon the hook N , thus preventing this rod again returning to the left until operated upon by the finger II^2 . The lifting of the arm a' by the curved portion of the rod II will rock the shaft a and lift the locking-arm a^2 , extending therefrom, out of contact with the projection on the fan-spindle, and the locking-arm a^3 from engagement with the deep notches in the count-wheel B . The teeth of the count-wheel B are engaged and the wheel moved step by step by the pins $b' b''$, carried by the disk y^3 , fixed to the spindle y' , the pawl o' engaging and holding the wheel after each movement. This wheel will continue to rotate and the clock to strike until one of the recesses in the disk Y comes beneath the bent end of the arm a' , when said end will drop therein and locking-arm a^2 will fall into the path of the projection 7 on the fan-spindle, and thereby lock the same against rotation and lock said disk against further rotation, the pawl a^3 at the same instant dropping into one of the deep notches in the count-wheel. To repeat this strike, as well as to strike the quarter-hour, a lever F is fixed on the end of the shaft F^5 , which is journaled in the front and rear plates A , and from the lower end of this lever a cord is led off for operating the same. Another cord is led off in an opposite direction to the first and connected to a weight or spring for returning the lever to normal position when released. This shaft F has extending upwardly therefrom two arms or branches F' and F^2 of the lever, which extend on slightly-different lines from said shaft. On drawing the lower end of said lever to the left the arm F' will ride beneath and lift the curved arm h^3 , secured to the shaft h^4 . The central portion of this arm is flattened vertically in order that it may spring aside and allow the arm F' to return to normal position when the lever F is released. As the arm h^3 rises it will lift the short arm h^5 , which is fixed to the shaft h^4 , and the lateral extension h^a thereof will lift the locking-arm a^2 , secured to the shaft a , and free the fan-spindle w . This will also lift the arm a' and free the disk Y , and at the same time the locking-arm a^3 will be lifted and the count-wheel released. The arm a^4 is provided with an inclined offset a^5 , corresponding in position to the flattened portion of the arm h^3 , and the end of the arm F^2 will pass beneath this incline and allow the locking-arm a^3 and arms a' and a^2 to drop and lock the striking mechanism when the quarter-hour strike is completed.

The count-wheel when released for the re-

peat of the strike is turned backwardly by a weight d^2 or equivalent means, connected thereto by means of spring-washer c^2 , interposed between the sleeve c^3 , carrying said weight and said wheel, said washer being secured to the count-wheel by a bent portion c^5 , extending into a small opening in the wheel, a rigid washer carried by said sleeve c^3 bearing upon the opposite face of the wheel. This spring-washer exerts sufficient tension upon the wheel to cause the weight to be lifted by the rotation of said wheel until it reaches an almost vertical position, where it is arrested by a pin c^4 , extending from the frame and projecting into the path of the said weight, when the wheel will continue its rotation by slipping with the spring-washer between the rigid washer and said sleeve. The return movement of the wheel is regulated by a wheel B^2 , rigidly secured to the wheel B and having a series of teeth cut in its periphery corresponding in position to the deep notches in the count-wheel. A pawl b , carried by a shaft journaled between the front and back plates of the frame, is provided with a feather end which rides during the forward rotation of the count-wheel on the periphery of wheel B^2 , but on the release of said count-wheel this pawl permits it to only return to the position necessary to begin the repeat of the hour-count by engaging the teeth in the wheel B^2 .

During the quarter-hour strike the pawl o' is held out of engagement with the teeth of the count-wheel, and although this wheel is moved a step every time one of the pins b' engages therewith it will be turned back by the weight or spring d^2 an amount equal to its forward movement before the opposite pin b' comes into engagement therewith. The pawl o' may be operated upon directly by an extension of the lever F , or it may be operated through the arm h^3 , as shown in Fig. 1.

A shaft G , journaled in the plates A , has extending therefrom in opposite directions two arms, which have formed upon their ends segmental racks G' G^2 , each of which is provided with the same number of teeth, four being shown herein. This shaft G also carries an arm g , provided with a lateral extension g^2 , adapted to engage with the steps 1, 2, 3, and 4 of the arm E^2 .

The rack G' is adapted to be operated upon by the pins $b^2 b^3$, carried by the disk Y and corresponding to the pins $b' b''$, and said rack is held in position when moved by the pins $b^2 b^3$ by the pawl h^6 , carried by the shaft h^4 , which engages with the rack carried by said arm G^2 . This pawl is lifted to entirely disengage the rack when the arm h^3 is lifted. The disengaging of this rack allows the rack G' to swing to the right, this movement being regulated by the arm g coming into engagement with the steps in the arm E^2 .

The arm E^2 , as shown herein in Fig. 1, is in its highest position when the widest part of the cam E' is bearing upon the pin e , carried

thereby. The arm g will therefore engage the lowest step 4 thereon and allow the rack G' its greatest movement to the right. The rotation of the disk Y will cause the pins carried thereby to engage with the teeth of this rack and lift the same step by step, the pawl h^6 engaging with the rack G^2 and holding the same against reversed movement.

As the bell-hammer is operated twice for every complete revolution of the disk y^2 it would in this event strike four times, denoting that the time was on the last quarter. When the last tooth of the rack G' is passed by the pins carried by the disk Y , the pawl h^6 will fall into the last and deepened tooth of the rack G^2 , thus allowing the arms a' a^2 to fall and lock the striking mechanism, as the arm F' has in the meantime come beneath the reduced portion of the arm h^3 and released itself therefrom, and the branch F^2 has passed beneath the inclined offset in the arm a^4 and offer no support therefor. On releasing the lever F after the quarter-hour strike it will be returned to its normal position by the weight before mentioned. This will cause the backward movement of the arms F' F^2 . The arm F' will spring the arm h^3 to one side and will return without lifting the same. The arm F^2 will ride up the incline a^5 on the arm a^4 and lift the same, thereby lifting the arm a' and a^2 and the pawl a^3 and releasing the striking-train. After the branch F^2 passes from beneath the arm a^4 said arm will be prevented from dropping by the locking-arm a^3 until said locking-arm again reaches one of the deep notches in the count-wheel and the hour-strike is completed.

To prevent the movement of the lever F just before the hour-strike is to be operated automatically, a bell-crank lever is provided, which is pivoted to the frame at L . One arm, L' , of this lever is connected to the arm E^2 by a wire P^2 , so that it is raised and lowered by the movement of said arm. The other arm, L^2 , of the bell-crank has a widened and recessed end that is adapted to be raised when the time for the hour-strike is due to a position directly opposite to a knife-edge L^3 , projecting from the face of the lever F , near the lower end thereof.

To prevent the arm a' falling into the same recess in the disk Y , from which it is lifted on the first movement of the lever F after said lever is released at the completion of the quarter-hour strike, this being liable to occur should the means for moving said disk weaken and permit the disk to lag, and the lever F be quickly returned to position, I have provided means for holding the arm a^2 elevated, as shown in Fig. 4. This consists of a lever U , intermediately pivoted to the plate A , the head of the lever being flattened to form a seat for a pin u' , extending laterally from the end of the arm a^2 . This lever is attached to the lever F by a short link u'' and has a movement parallel therewith, so that when the le-

ver F returns the head of the lever U will come beneath the pin u' and prevent the arm a^2 from falling. To remove this support after the quarter-hour strike, a pin u^2 projects from one of the wheels of the striking-train, and this pin swings the arm u^3 , connected to the lever U , outwardly, and thereby said lever U from beneath the pin u . The fan-spindle is of an ordinary construction and carries a locking-arm 7, that comes into contact with the end of the arm a^2 when the mechanism is to be locked. Instead of the driving mechanism for the striking-train before described I may employ the construction illustrated in Fig. 5. As shown in this figure, a spur-wheel 1^a , mounted upon a shiftable spindle 2^a , engages a supplemental gear-wheel 3^a , fixed to the count-wheel B . The spur-wheel is designed to be shifted out of engagement with the said supplemental gear during the quarter-hour strike by means of a lever 4^a , pivoted to the back of the frame A . Another pinion 5^a , carried by the same shiftable spindle, is provided for rotating the gear 6^a and thereby the disk-spindle, but this latter pinion has a sufficient face of cog to prevent it ever becoming entirely disengaged from the gear 6^a .

A modification of the pawl o' and operating connections is shown in Figs. 7 and 8. Fig. 7 shows the pawls o' fixed to a spindle o^2 , journaled in the clock-frame, this spindle carrying the arm o^3 , having the stud o^4 projecting from the end thereof, to which is fixed the latch o^5 , a face view of which, clearly showing the configuration thereof, is seen in Fig. 8.

The shaft F^5 carries an arm o^6 , having a laterally-bent end that rides over the latch, raising the pawl o' as the lever F is drawn from right to left and beneath the same as the lever is released and returned to normal position.

A modification of the means for returning the count-wheel to be used in lieu of the weight d^2 is shown in Fig. 5. This consists of a spring d^x , coiled around the sleeve c^3 and secured thereto at one end, so that its normal tendency is to rotate said sleeve and count-wheel backwardly.

I claim—

1. In combination in a striking clock the bell-hammer, the count-wheel adapted to be rotated rearwardly having deep notches to regulate the hour-strike and the toothed wheel rigidly attached thereto with means for engaging the same for controlling the rearward rotation of said count-wheel, substantially as described.

2. In combination in a striking clock, the bell-hammer, the lever F and the mechanism operated thereby for actuating said hammer to strike the hours in one position of the lever and for striking the fractions of an hour in the reversed position thereof, substantially as described.

3. In combination, in a striking clock, the bell-hammer, the lever F , the mechanism operated thereby to strike the fractions of an

hour in the first movement of said lever and to strike the hour on the final movement thereof, substantially as described.

4. In combination, in a striking clock the bell-hammer, the count-wheel with means for rotating the same forwardly, the mechanism regulated thereby for striking the hour, and the means for automatically rotating said wheel rearwardly for the repeat of said hour-strike, substantially as described.

5. In combination, in a striking clock, the bell-hammer the count-wheel with means for rotating the same forwardly, and the means regulated thereby for operating said bell-hammer and the means for automatically rotating said wheel rearwardly frictionally connected therewith, substantially as described.

6. In combination in a striking clock, the bell-hammer, the count-wheel with means for rotating the same forwardly, the means regulated thereby for striking the hours, and the weight frictionally connected therewith for automatically rotating the same rearwardly, substantially as described.

7. In combination in a striking clock, the bell-hammer, the count-wheel with means for rotating the same forwardly, means regulated thereby for striking the hours, and the weight frictionally connected therewith for automatically rotating the same rearwardly, and means for limiting said rearward rotation, substantially as described.

8. In combination, in a striking clock, the bell-hammer the count-wheel with means for rotating the same forwardly, the means regulated thereby for striking the hours, and the weight frictionally connected therewith for rotating the same rearwardly, and means for limiting said rearward rotation, said means comprising a freely-pivoted pawl and a toothed wheel rigidly connected to said count-wheel, substantially as described.

9. In combination in a striking clock, the bell-hammer, the count-wheel the disk carrying means for rotating said wheel step by step during the hour-strike, means for holding said wheel at each forward step, and the means for locking said holding means out of engagement with said wheel during the quarter-strike whereby said count-wheel will be returned after each forward step.

10. In combination in a striking clock the bell-hammer, the disk carrying means for operating the same, the locking means for said disk, the pivoted rod operated through the minute-hand spindle for releasing said disk, and the means adapted to positively operate said rod for returning the same to normal position, substantially as described.

11. In combination, in a striking clock, the bell-hammer, the disk for operating the same, the arm engaging said disk to lock the same against rotation, the pin carried by said arm, the pivoted rod having a looped end, and the means for bringing said loop into engagement with said pin to raise said arm and release the said disk, substantially as described.

12. In combination, in a clock for repeating the hour and fractional-hour strike, the bell-hammer, the disk for operating the same, the count-wheel for controlling the hour-strike, the cam carried by the minute-hand spindle, the pivoted lever operated thereby the pivoted arm and the segmental racks controlled by said arm for regulating the minute-strike, substantially as described.

13. In combination, in a clock for repeating the hour and minute strike, the bell-hammer, the disk-spindle carrying means for operating said hammer, the count-wheel for regulating the hour-strike, the cam carried by the minute-hand spindle, the pivoted arm operated thereby, the oppositely-arranged segmental racks controlled by said arm and the pins carried by said disks fixed to the spindle for rotating said count-wheel and for engaging one of said racks and the means controlled by the opposite rack for stopping the minute-strike, substantially as described.

14. In combination, in a clock for repeating the hour and minute strike, the hammer, the count-wheel for regulating the hour-strike, the disk for rotating the same, the locking means therefor, the releasing means, the cam carried by the minute-spindle, the pivoted arm operated thereby, having a graduated end, the shaft G having the arms carrying segmental racks extending therefrom in opposite directions, the supplemental arm fixed to the shaft G for engaging the graduated end of said arm for positioning said racks, the pin fixed to a second disk for engaging the lower racks, and moving said racks step by step to determine the minute-strike, and the pawl for engaging the upper rack to hold said racks after each forward step, substantially as described.

15. In combination, in a clock for repeating the hour and minute strike, the bell-hammer, the count-wheel for regulating the hour-strike, the disk for rotating the same, the locking means therefor, the releasing means, the cam carried by the minute-spindle, the pivoted arm operated thereby, having a graduated end, the shaft G having the arms carrying segmental racks, extending therefrom in opposite directions, the supplemental arm fixed to the shaft G for engaging the graduated end of said arm for positioning said racks, the pins fixed to a second disk for engaging the lower racks, and moving said racks step by step to determine the minute-strike, and the pawl for engaging the upper rack to hold said racks after each forward step, and means for releasing said pawl, substantially as described.

16. In combination in a striking clock, the bell-hammer, the count-wheel, the disk for operating the same, the means for locking said disk, the pivoted rod for engaging and releasing said locking means, the means carried by the minute-spindle for holding said rod out of engagement with said locking means, and the supplemental means for hold-

ing said rod out of engagement with the locking means after the completion of the automatic hour-strike when released by the minute-hand spindle, substantially as described.

17. In combination, in a striking clock, the bell-hammer, the count-wheel, the disk for operating the same, the means for locking said disk, the pivoted rod having a horizontal extension, said rod being adapted to engage and release said locking means, the finger carried by the minute-hand spindle for holding said rod out of engagement with the locking means, and a pivoted latch for engaging said horizontal extension to hold said rod in normal position when disengaged from said finger after the automatic strike of the hour, substantially as described.

18. In combination, in a striking clock, the bell-hammer, the count-wheel, the disk for rotating the same, the means for locking said disk, the releasing-rod therefor, the finger carried by the minute-spindle for holding said rod in normal position, the horizontal extension of said rod having a laterally-bent end, and the supplemental means for holding said rod comprising a freely-pivoted latch having an inclined plate carrying a hooked end, said laterally-bent end being adapted to be lifted above said plate by said finger, and to drop down upon the outside of said plate on the release of said rod by said finger, said hooked end engaging said lateral end of the extension on the return of said rod after the hour-strike, substantially as described.

19. In combination, in a clock for repeating the hour and minute strike, the bell-hammer, the count-wheel for controlling the same, the disk for operating said wheel, the locking means therefor, the means for automatically releasing said disk, and the means for manually releasing the same, comprising a pivoted lever, the mechanism operated thereby, and the means for locking said lever on the approach of the automatic strike, substantially as described.

20. In combination, in a clock for repeating the hour and minute strike, the bell-hammer, the count-wheel, the disk for operating said hammer, and wheel, the means for locking said disk, automatic releasing means therefor, and the manual releasing means comprising a pivoted lever with mechanism operated thereby, a projection on said lever, and a pivoted bell-crank lever having the end of one of its arms recessed and means for bringing said recessed end in the path of said projection to lock said lever on the approach of the automatic strike, substantially as described.

21. In combination in a clock for repeating the hour and minute strike, the bell-hammer, the count-wheel, the disk for operating said hammer and wheel, the means for locking said disks, automatic releasing means therefor, and the manual releasing means comprising a pivoted lever with mechanism operated thereby, a projection on said lever,

and a pivoted bell-crank lever having the end of one of its arms recessed, the pivoted arm, the snail-cam for the minute-spindle for automatically controlling said arm, and the connection between said arm and the said bell-crank lever, for bringing said recessed end in the path of said projection on the operating-lever, substantially as described.

22. In combination, in a clock for repeating the strike of the hours and minutes, the bell-hammer, the count-wheel the disk for rotating the same and actuating said hammer, the locking means for said disk, the automatic releasing means, the pawl for holding said count-wheel after each forward step, the racks with means for automatically adjusting the same to regulate the minute-strike, the pivoted levers, the means for freeing and returning the count-wheel and for operating the minute-strike on the first movement of said pivoted lever, and the means for operating the hour-strike on the return movement thereof, substantially as described.

23. In combination, in a clock for repeating the strike of the hour, and minutes, the bell-hammer, the count-wheel, the disks for rotating the same and actuating said hammer, locking means therefor automatic releasing means, the pawl for holding said count-wheel against rearward rotation, the racks for regulating the minute-strike with means for automatically adjusting the same, the pivoted lever, the means for releasing the count-wheel and operating the minute-strike through the release of said disks on the first movement of said lever, means for returning the count-wheel when released, and the means for checking the same on the return, substantially as described.

24. In combination, in a clock for repeating the strike of the hour, and minutes, the bell-hammer, the count-wheel, the disks for rotating the same and actuating said hammer, locking means therefor, automatic releasing means, the pawl for holding said count-wheel against rearward rotation, the racks for regulating the minute-strike with means for automatically adjusting the same, the pivoted lever, the means for releasing the count-wheel and operating the minute-strike through the release of said disks on the first movement of said lever, means for returning the count-wheel when released, the disk carried by the same, having teeth corresponding to the deep notches therein, and the freely-pivoted pawl for engaging said teeth to check said count-wheel on its return movement, substantially as described.

25. In combination in a clock for striking the repeat of the minute and hour, the bell-hammer, the count-wheel, the disks for rotating the same and actuating said hammer, the arm engaging and locking said disks, the automatic release for said arm, the segmental racks with means for controlling the same, the pivoted lever, the shaft carrying said locking-arm, the supplemental arm carried

by said shaft, the pawl for engaging the count-wheel also carried by said shaft, and the branch of said lever, for lifting said supplemental arm to release said pawl and locking-arm, substantially as described.

26. In combination, in a clock for repeating the minute and hour strike, the bell-hammer, the count-wheel, the disks for rotating said wheel and actuating said hammer, the segmental racks with means for controlling the same, the arm engaging and locking said disks, the automatic release therefor, the fan-spindle, the pawls engaging the count-wheel, the arm engaging the fan-spindle, the pawl engaging one of said racks, the arm h^3 , the arm a^4 , the branches carried by said lever for lifting the arms h^3 , a^4 on the first movement of said lever, said arms being adapted to drop at the end of the first movement of said lever, whereby the fan-spindle the count-wheel, the racks and the disk will be locked on the completion of the minute-strike, the arm a^4 being adapted to be again raised on the return movement of said lever to raise the locking-arms of the disk and fan-spindle, substantially as described.

27. In combination, in a clock for repeating the hour and minute strike, the bell-hammer, the count-wheel, the disks for operating said wheel and hammer, the locking-arm therefor the automatic release, the shaft a carrying said arm, the fan-spindle carrying a projection, the pawl for engaging the teeth in said count-wheel, the pawl for engaging the notches therein, the segmental racks, the pawl engaging therewith, the arm a^2 for engaging the fan-spindle, the arm h^3 having a reduced part, the arm a^4 having an inclined offset corresponding therewith, the pivoted lever F , the branches extending therefrom for raising said arms h^3 , a^4 on the first movement of said levers, to release said count-wheel to permit the return of the same, disengage the pawl h^2 from the rack G^2 to per-

mit of the positioning of the rack G' and to release the disk to strike the minutes, said arm h^3 being adapted to drop by disengaging itself from the raising branch when said branch reaches the reduced portion whereby the pawls for engaging the teeth of the segmental rack and count-wheel will drop into engagement, and the arm a^4 when the raising branch therefor reaches the offset will drop to lock the fan spindle and disk on the completion of the minute-strike, said arm a^4 being adapted to be again raised on the return movement of said lever, to release the hour-striking mechanism, and the arm h^3 being adapted to be sprung aside to permit the return passage of its raising branch.

28. In combination, in a clock for repeating the hour and minute strike, the bell-hammer, the count-wheel, the disk the locking means therefor, the automatic releasing means, and means operated manually for holding said locking means out of operation and supplemental means controlling the return of said locking means when released, substantially as described.

29. In combination, in a clock for repeating the hour and minute strike, the bell-hammer, the count-wheel, the disks, the locking-arm therefor, the automatic means for lifting said arm, the arm a^2 fixed to the shaft of the locking-arm, the pivoted lever carrying means for lifting the arm a^2 for releasing the disks on the first movement of said lever, means whereby said arm will drop on the return movement of the lever a pivoted arm for supporting said arm a^2 to prevent the return of the same when released and means for removing said support, substantially as described.

GEORGE W. ANDERSON.

Witnesses:

J. S. JOHNSON,
A. G. MARSHMAN.