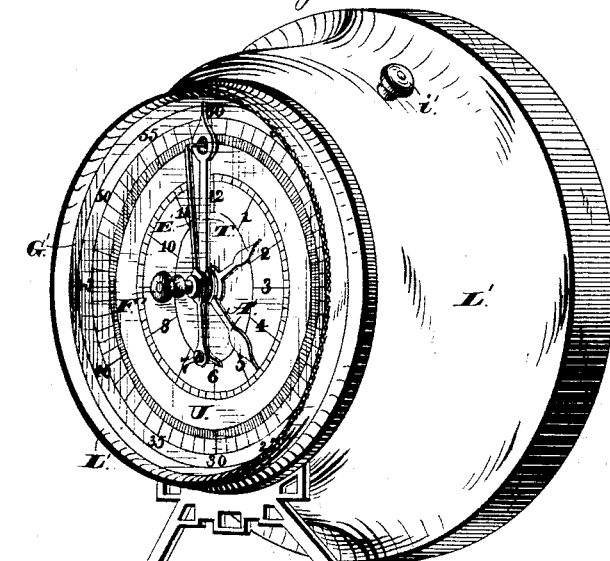


J. KARR.  
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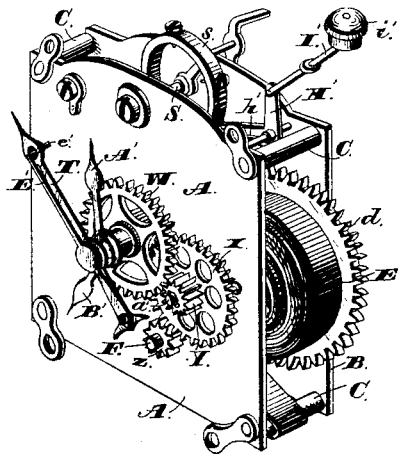
No. 263,184.

Patented Aug. 22, 1882.

*Fig. 1.*



*Fig. 2.*



*Witnesses.*

*Jas. E. Hutchinson.*  
*Henry C. Hazard.*

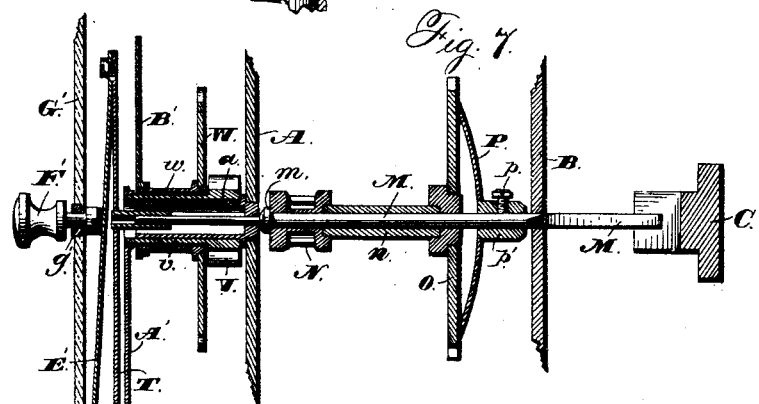
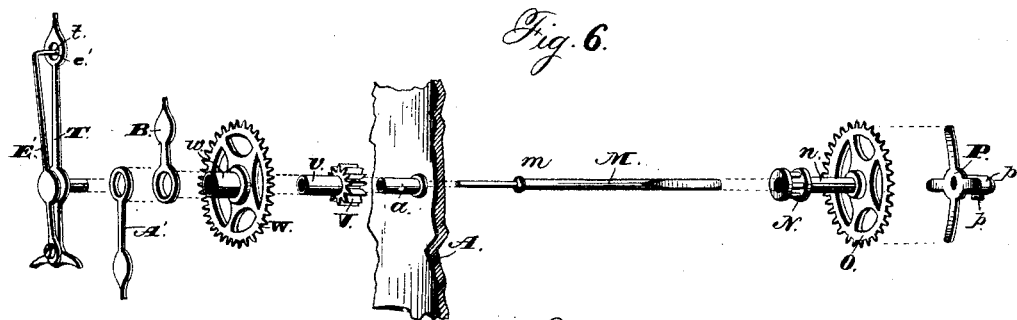
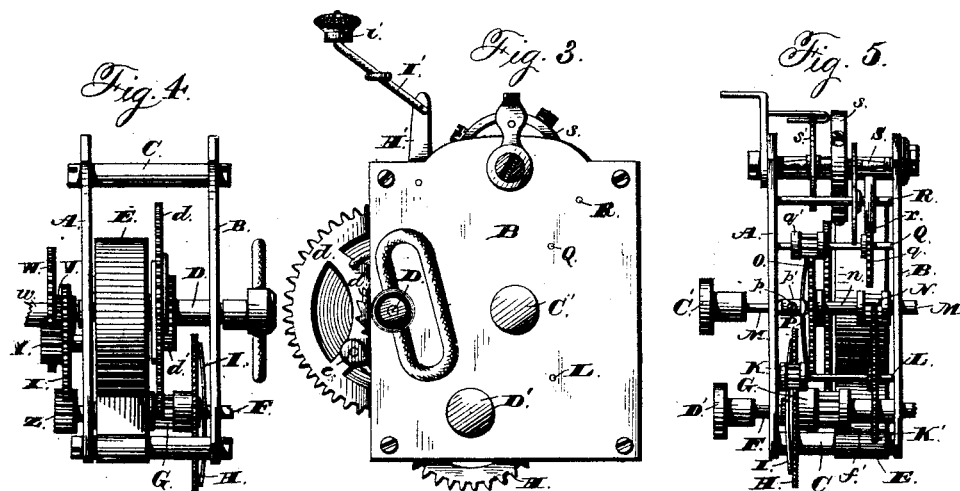
*Inventor.*

*J. Karr, by*  
*Geo. S. Prindle, his Atty*

J. KARR.  
CHRONOGRAPH.

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Witnessed.

Jas. C. Hutchinson.  
Henry C. Hazard.

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Geo. S. Prindle, his Atty

(Model.)

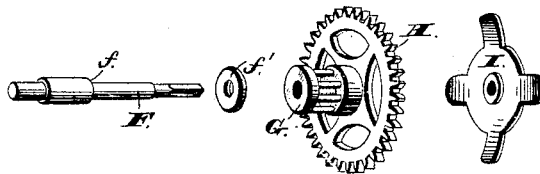
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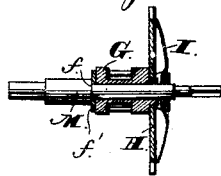
No. 263,184.

Patented Aug. 22, 1882.

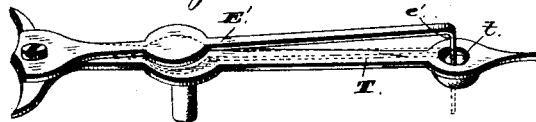
*Fig. 8.*



*Fig. 9.*



*Fig. 10.*



*Witnesses.*

*Jas. E. Hutchinson.*  
*Henry C. Hazard.*

*Inventor.*

*J. Karr.*  
*Geo. S. Findle, his atty*

# UNITED STATES PATENT OFFICE.

JACOB KARR, OF WASHINGTON, DISTRICT OF COLUMBIA.

## CHRONOGRAPH.

SPECIFICATION forming part of Letters Patent No. 263,184, dated August 22, 1882.

Application filed May 13, 1882. (Model.)

*To all whom it may concern:*

Be it known that I, JACOB KARR, of Washington, in the District of Columbia, have invented certain new and useful Improvements in Time Mechanism; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view of the clock as in use. Fig. 2 is a like view from the front of the movement separated from its case. Fig. 3 is an elevation of the rear side of the same. Figs. 4 and 5 are elevations of said movement from opposite sides. Fig. 6 is a perspective view of the parts of the center arbor separated from each other. Fig. 7 is a central longitudinal section of the same united and in position. Fig. 8 is a perspective view of the old minute-arbor and its attachments separated from each other. Fig. 9 is a central longitudinal section of the same united; and Fig. 10 is a perspective view of the recording or marking hand, the full lines showing the normal position of parts and the dotted lines their positions when moved into contact with the dial.

Letters of like name and kind refer to like parts in each of the figures.

The design of my invention is to furnish, in a simple, inexpensive, and convenient form, means whereby, in addition to the time usually indicated by a clock, seconds and fractions of the same may be indicated, and, if desired, recorded; and to this end it consists principally in the arrangement of the operative parts of the train, whereby a sweep seconds-hand is driven by a centrally-located arbor, substantially as and for the purpose hereinafter set forth.

It consists, further, in the means employed for operating the minutes and hours hands and for enabling the same to be moved independently, substantially as and for the purpose hereinafter specified.

It consists, further, in the means employed for arresting the motion of the balance-wheel, substantially as and for the purpose hereinafter shown.

In the annexed drawings, A represents the front plate, and B the back plate, of the movement, connected together at their corners and

held in relative parallel positions by means of posts C in the usual manner.

Journaled at one side of the frame thus constructed is the main arbor D, upon which is journaled the main wheel *d*, and to which is connected the inner end of a mainspring, E, the outer end of said spring being attached to or upon one of the posts C. Said main wheel is connected with said arbor when the latter is moved in one direction by the usual pawl, *e*, and ratchet *d'*, while when said arbor is rotated in an opposite direction said wheel is not moved.

Journaled below the arbor D and nearer the transverse center of the frame is a second arbor, F, upon which is journaled a pinion, G, and wheel H, which parts are rigidly connected together, and are held in frictional contact with said arbor by means of a four-armed spring, I, that is placed in rear of said wheel, and is caused to bear against the same and to hold the front end of said pinion against a shoulder, *f*, that is formed upon said arbor. A collar, *f'*, secured to and made adjustable upon the latter in rear of said spring, holds the same in place and regulates the degree of its pressure upon said wheel, the arrangement being such as to permit said arbor to be rotated within said wheel and pinion when desired, while sufficiently rigid for ordinary train purposes.

The pinion G meshes with and receives motion from the wheel *d*, while the wheel H meshes with and imparts motion to a pinion, K, that is attached to and revolves with an arbor, L, journaled slightly above and toward the opposite side of the frame.

Journaled at the center of the frame, at the point heretofore occupied by the second or minutes arbor F, is an arbor, M, which, as seen in Figs. 6 and 7, is straight from its rear end to the inner face of the front plate, A, at which point is provided a collar, *m*, and from thence to its outer end, which projects beyond said plate and the dial, is somewhat reduced in size.

Journaled upon the arbor M is a pinion, N, and wheel O, which are united by means of an interposed sleeve, *n*, so as to move together. The front end of said pinion bears against the collar *m*, and is held in position thereon by means of a four-armed spring-plate, P, which

is secured upon said arbor in rear of said wheel, and has the ends of its arms in engagement with the rear face of the latter. A set-screw, *p*, passing radially inward through a hub, *p'*, attached to said spring-plate, or through a correspondingly-shaped collar placed in rear of the same, locks said parts in position and permits any desired degree of pressure upon said wheel to be obtained.

10 The pinion N meshes with and receives motion from a wheel, K', which is secured upon the arbor L, which motion is communicated to the arbor M and causes the latter to revolve.

The arbor M, thus combined with the wheel O and pinion N, may be freely rotated within the latter for the purpose of setting the seconds-hand carried thereon, while for the ordinary purposes of a time-train said parts are connected with all necessary rigidity.

20 Above the wheel O is pivoted an arbor, Q, which carries an escape-wheel, *q*, and a pinion, *q'*, which engages with said wheel, a pallet-arbor, R, having pallets *r*, and a balance-arbor, S, provided with a balance-wheel, *s*, and hair-spring *s'*, all in the usual manner.

25 The front end of the arbor M receives a sweep seconds-hand, T, which has such length as to cause its end to pass over the outer part of the dial U, at which point said dial is provided with sixty divisions representing a like number of seconds, and each of such divisions is subdivided into four equal parts, each of which represents one-fourth of a second, when, as the train is timed to quarter-second beats, it will be seen that at each beat said seconds-hand will move forward one-fourth of a second, and if properly adjusted its end will rest over one of the subdivisions, thus enabling an observer to note with as great ease and accuracy the time indicated as though an independent quarter-seconds-hand of usual construction were employed.

30 Surrounding the projecting front end of the seconds-arbor M is a hub or sleeve, *a*, which is secured to and projects forward from the plate A, and furnishes a bearing for and upon which is journaled a pinion, V, that is provided with a projecting hub, *v*, and has the size and number of teeth of the dial-pinion heretofore placed upon the minutes-arbor.

35 Upon the hub *v* is journaled a wheel, W, which has a hub, *w*, that extends nearly to the end of said hub *v*, said wheel and hub being in all respects the same as the dial-wheel usually employed for carrying an hours-hand.

40 The pinion V and wheel W are connected by means of the usual intermediate wheel, X, and pinion Y, which are rigidly fastened together, and are journaled upon a stud, *a'*, that projects outward from the plate A, while all of said dial-wheels and pinions are driven by means of a pinion, Z, which is secured upon the projecting end of the second arbor F, and meshes with said intermediate wheel X.

45 The projecting end of the hub *v* receives a minutes-hand, A', and the hub *w* an hours-hand, B', for which hands the central portion of the

dial U, inside of the portion containing divisions for the seconds-hand, is provided with the usual divisions for indicating hours and 70 minutes.

The seconds-hand T is set by rotating its arbor M within its wheel and pinion O and N, for which purpose a button, C', is secured upon the rear projecting end of said arbor, and being connected with the train only by friction, 75 no interference with the movements of said train is caused by such change.

In consequence of the friction-connection between the second or minutes arbor F and the 80 train, said arbor may be freely rotated by means of a button, D', attached to its rear projecting end, so as to set the minutes and hours hands A' and B', respectively, without stoppage of or interference with the movements of the train, 85 the dial-wheels being only connected with the latter through said arbor.

The construction shown enables a sweep seconds-hand capable of indicating quarter-seconds to be attached to a clock of usual construction without increasing the size of the 90 time-train or adding materially to its cost.

In order that the time indicated by the seconds-hand may be recorded, if desired, the following-described mechanism is added to the 95 clock, viz: Secured at one end to or upon the outer face, at the short end of the seconds-hand T, is a marker, E', that is constructed from spring metal in the form shown in Fig. 10, and at its free end is provided with an arm, *e'*, that 100 passes rearward through an opening, *t*, which is formed in said hand near its point.

The normal position of the marker E' is, as seen in Figs. 7 and 10, with its outer end standing away from the dial U, and by a rearward 105 pressure upon its center its point *e'* may be caused to impinge upon said dial, or upon a recording-surface placed thereon, so that it is only necessary that said point be made sufficiently sharp to puncture or indent such surface, or that it be provided with ink or other 110 like means for making a mark upon the same, in order that an accurate record may be secured of the position of the seconds-hand at the instant such contact is produced. 115

The manipulation of the marker E' is effected by means of a stud, F', which is loosely journaled within a corresponding opening, *g'*, at the center of the glass front G' of the clock, and is capable without displacement of a certain amount of longitudinal motion therein. 120 The inner end of said stud is in contact with the outer face of said marker, and it is only necessary that a slight inward blow be given to the former to cause the point of the latter to impinge upon the recording-surface and make the record. The outward spring of said marker causes it, when released, to instantly move away from the dial, so that the mark produced will be sharp and clear, and being in 125 close proximity to the quarter-seconds marks, no difficulty will be found in determining the exact fraction of a second when the record was made. 130

It is designed that paper disks corresponding to the outer portion of the dial U be provided for attachment to the latter, and that each, when once used with the marker E', shall be removed and shall form a record of the time.

In order that the movement of the train may be instantly arrested, if desired, I journal a bell-crank, H', within the upper portion of the movement, and provide one end with a spring-arm, h', which, by a slight movement of said crank, may be caused to engage lightly with the side of the balance-wheel s and instantly arrest the motion of the same.

The stop described is operated by means of a rod, I', that is pivoted at one end to one arm of the crank H', and from thence passes outward through the casing L', and has upon its outer end a button, i'. If, now, said rod be pulled outward, the motion of the balance-wheel will be instantly arrested, while by an inward movement of said rod said balance-wheel will be released and will instantly resume its vibrations.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

1. A clock-movement having a single time-train in which the minutes-arbor is located at one side of the center of the train, and an arbor which carries a sweep seconds-hand capable

of adjustment independent of the train and adapted to mark quarter-seconds, which arbor is located at such center in the place heretofore occupied by said minutes-arbor, substantially as and for the purpose set forth.

2. As a means for operating the minutes and hours hands, the hub or sleeve a, secured to and projecting from the plate A, the hollow pinion V, provided with a projecting hub, v, the wheel W, having the hub w, the intermediate wheel, X, and pinion Y, and the pinion Z, secured upon and rotating with the second arbor F, which arbor is connected with the train by spring friction, said parts being combined substantially as and for the purpose specified.

3. As a means for arresting motion of the balance-wheel s, the bell-crank H', journaled between the plates A and B, operated by the rod I' and button i', and provided with the spring-arm h', which by the movements of said crank may be caused to engage with or removed from the side of said balance-wheel, substantially as and for the purpose shown.

In testimony that I claim the foregoing I have hereunto set my hand this 13th day of May, 1882.

JACOB KARR.

Witnesses:

GEO. S. PRINDLE,  
J. T. COLDWELL.