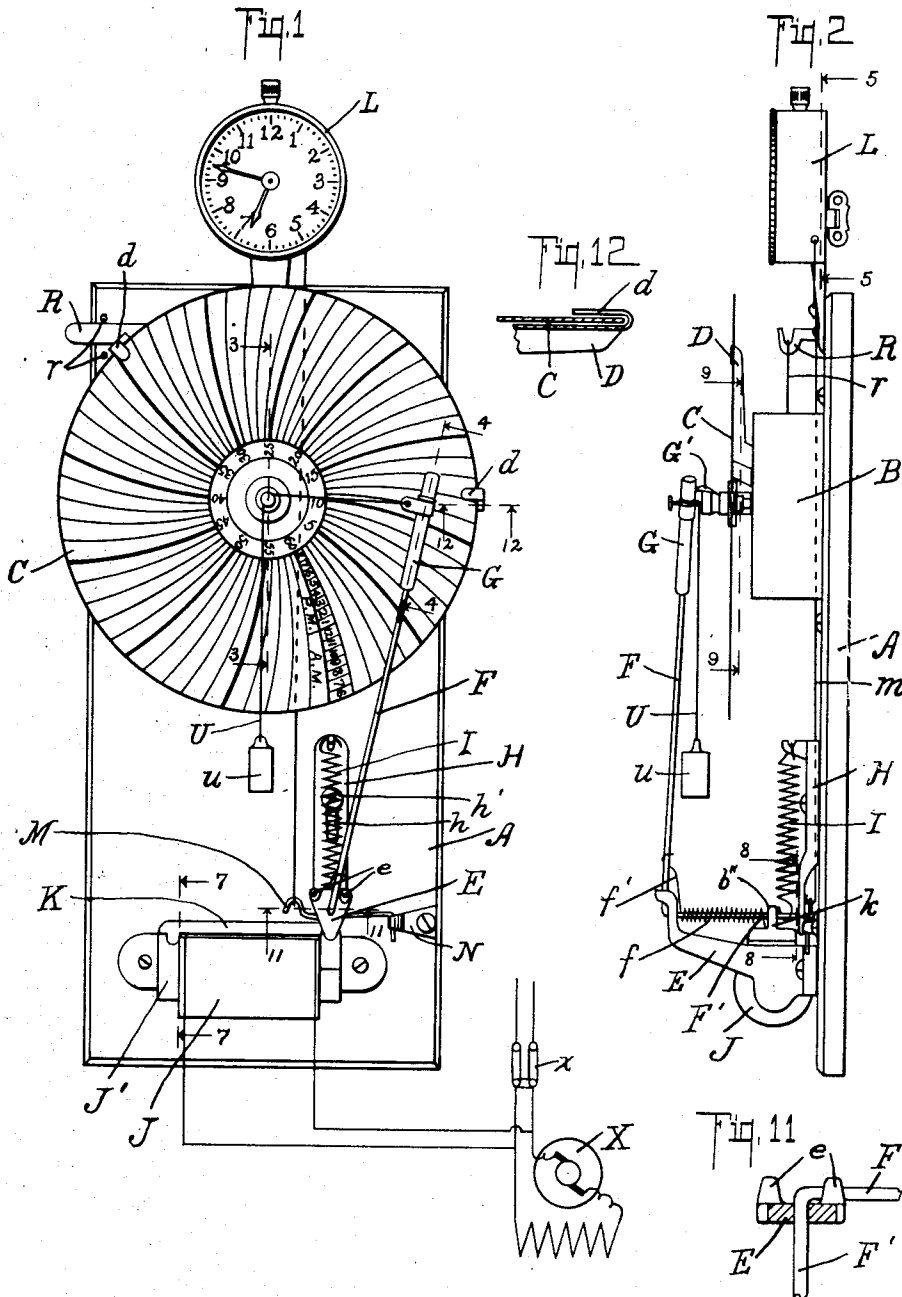


G. F. CARD.
RECORDING DEVICE.
APPLICATION FILED MAR. 4, 1908.

1,000,989.

Patented Aug. 22, 1911.

2 SHEETS—SHEET 1.



Witnesses:

Gertrude Tallman
Louella Greenfield

Inventor,

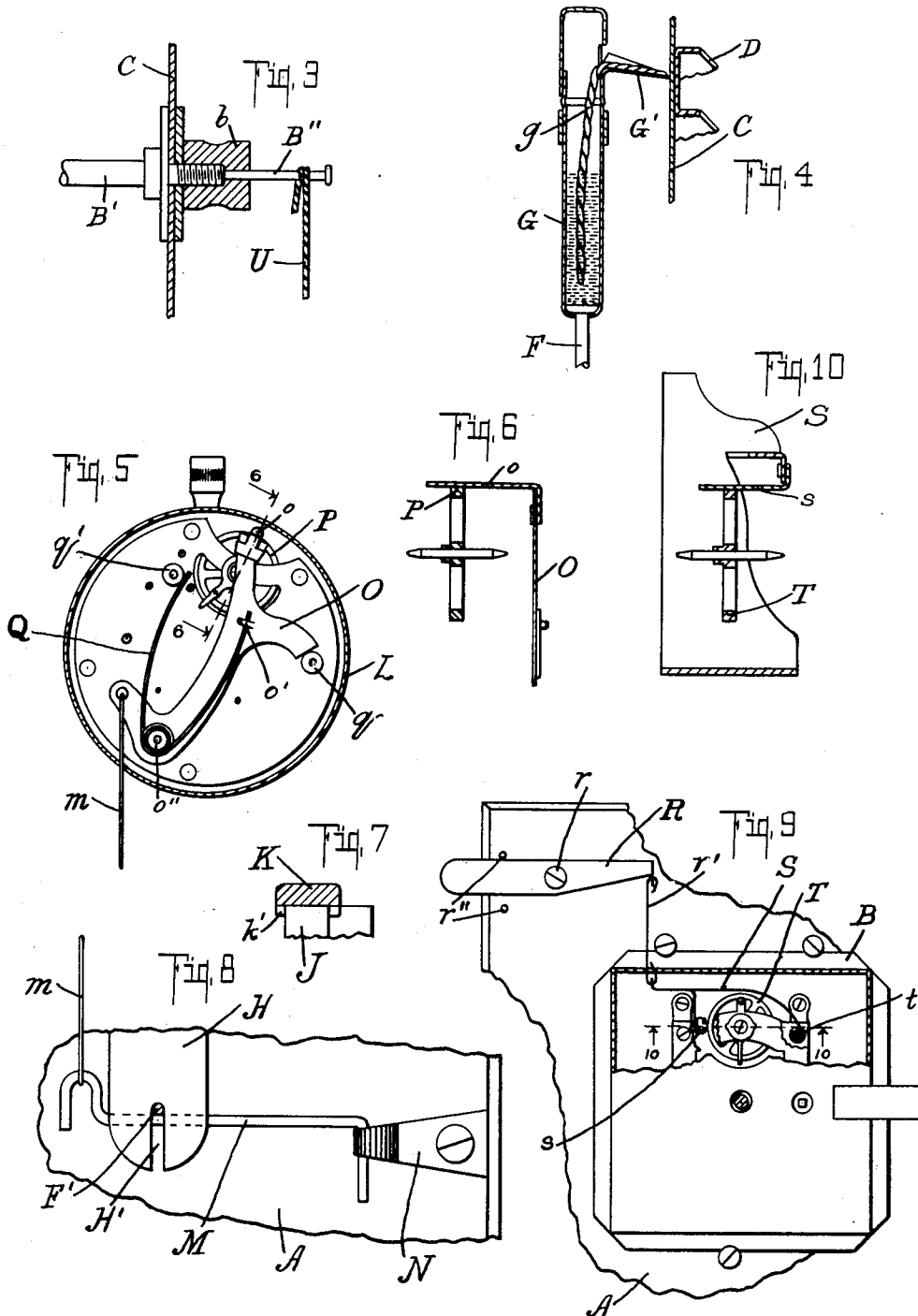
George F. Card
By *Chappell & Earl*
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UNITED STATES PATENT OFFICE.

GEORGE F. CARD, OF FORT WAYNE, INDIANA.

RECORDING DEVICE.

1,000,989.

Specification of Letters Patent.

Patented Aug. 22, 1911.

Application filed March 4, 1908. Serial No. 419,177.

To all whom it may concern:

Be it known that I, GEORGE F. CARD, a citizen of the United States, residing at Fort Wayne, Indiana, have invented certain new and useful Improvements in Recording Devices, of which the following is a specification.

This invention relates to improvements in recording devices.

10 It relates particularly to that class of registering or recording devices illustrated and described in my application for Letters Patent filed September 21, 1905, Serial Number 279,443, and is a modification and in
15 some respects an improvement upon the structure there illustrated.

The objects of this invention are: First, to provide a recording device adapted to indicate the starting and stopping of a machine,
20 the periods of its operation, and to indicate the total of the time it is in operation. Second, to provide in a recording device having a timekeeping clock, an improved stop mechanism for the clock. Third, to
25 provide a recording device embodying the above advantages, which is very simple in structure and convenient to operate, and one which is not likely to get out of repair.

Further objects, and objects relating to
30 structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

35 The invention is clearly defined and pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawings forming a part of this
40 specification, in which,—

Figure 1 is a front elevation of my improved recording device. Fig. 2 is a side elevation thereof looking from the right of Fig. 1. Fig. 3 is an enlarged detail section
45 taken on a line corresponding to line 3—3 of Fig. 1. Fig. 4 is an enlarged detail section taken on a line corresponding to line 4—4 of Fig. 1, showing structural details of the marker and its relation to the record sheet C.
50 Fig. 5 is an enlarged detail taken on a line corresponding to line 5—5 of Fig. 2, showing the arrangement of the stop or brake mechanism for the clock L. Fig. 6 is an enlarged detail section taken on a line corresponding to line 6—6 of Fig. 5. Fig. 7 is a
55 detail section taken on a line corresponding

to line 7—7 of Fig. 1, showing details of the armature and the means of supporting the same. Fig. 8 is an enlarged detail section taken on a line corresponding to line 8—8 of
60 Fig. 2. Fig. 9 is an enlarged detail section taken on line 9—9 of Fig. 2, a portion of the casing of the clock mechanism B being broken away to show the arrangement of the stop mechanism therefor. Fig. 10 is an enlarged
65 detail section on a line corresponding to line 10—10 of Fig. 9, of the stop lever S. Fig. 11 is a detail section on a line corresponding to line 11—11 of Fig. 1, showing details of the supporting arm E for the
70 marker arm F. Fig. 12 is an enlarged detail section taken on a line corresponding to line 12—12 of Fig. 1, showing details of the support for the record sheet.

In the drawings, the sectional views are
75 taken looking in the direction of the little arrows at the ends of the section lines, and similar letters of reference refer to similar parts throughout the several views.

Referring to the drawings, A represents
80 the supporting plate or frame on which the operative parts are mounted. In practice I preferably provide a casing, but as that forms no part of this invention, it is not here illustrated. Mounted upon the plate A is a
85 suitable clock mechanism B. None of the details of this clock mechanism are illustrated other than the balance wheel and the stop mechanism, which will be described later.
90

The shaft B' is driven by the clock mechanism, and it is preferred that the shaft should revolve once an hour. A record sheet, as C, is detachably secured upon the shaft B' by a suitable thumb-nut b (see Fig. 3), so
95 that the record sheet is revolved with the shaft. This record sheet C is preferably circular in form, and is ruled to form radial minute spaces, there being 60 lines upon the sheet illustrated, and it is also preferably
100 provided with radially arranged hour spaces, with hour indicating characters therefor, the sheet illustrated having hour indicating characters from 6 a. m. to 8 p. m. This record sheet is the same as that illustrated
105 in my application for patent hereinbefore referred to.

The record sheet is held in position by bracket-like arms D which are provided with finger-like projections d under which
110 the edge of the sheet is inserted. (See Figs. 1 and 12).

A bracket-like arm E projects outwardly from the frame or plate A. This bracket forms a support for the marker arm F which is pivoted thereon, the bracket being provided with a perforation through which the horizontally disposed portion F' of the marker arm is arranged. This allows the marker arm to swing or rock to and from the record sheet and also to swing laterally across the same.

To limit the lateral movement of the marker carrying arm, the bracket E is provided with outwardly projecting stops *e*. (See Figs. 1 and 11.) The marker arm is held normally out of contact with the record sheet by the spring I, which spring is supported upon the adjustable plate H. The lower end of this plate H is slotted at H' to receive the inturned end F' of the marker arm, forming a guide therefor.

The plate H is provided with a longitudinal slot *h*, and is held adjustably in position by the screw *h'* arranged therethrough. By adjusting this plate H the tension of the spring I is regulated.

On the upper end of the arm F is a receptacle G for the writing fluid. Projecting from this receptacle is a marker or pen G'. This marker is preferably trough-like in form and in it I arrange a wick *g* which depends into the writing fluid in the receptacle. When the marker arm is rocked rearwardly, the pen is thrown into contact with the record sheet, and as the record sheet is revolved by the clock mechanism, the proper record is made.

To make a continuous record I shift the arm F laterally on the record sheet. This I preferably accomplish by means of the cord U which is secured to the arm F and wrapped around the extension B'' on the shaft B' of the clock mechanism, so that as the shaft is revolved, the arm is drawn inwardly thereby. This makes the record in the form of a spiral, with breaks therein whenever the pen is out of contact with the sheet.

A weight, as *u*, is provided for applying tension to the cord U. The marker arm is held normally outward from the shaft B' by the spring *f* which is coiled about the horizontally disposed portion F' of the arm, and is provided with an extension *f'* which engages the marker arm. (See Fig. 2.)

The arm F is actuated by the armature K which is provided with a projection over which the end *f''* of the spring *f* is engaged so that the armature is held in position over the magnet. The armature is actuated by the electro-magnet J which is supported on a suitable bracket or frame mounted upon the plate A. As the armature K is connected to the arm F' it is held normally out of contact with the magnet by means of the spring I. The magnet J is provided with

an electrical connection to the machine, the operation of which it is desired to record. I have illustrated a conventional form of motor X as being the machine, the operation of which it is desired to record, and *x* indicates the switch for turning the current off and on the motor.

The hour spaces marked on the record sheet correspond to the inward movement of the arm F during each revolution of the shaft, so that the record lines properly correspond with the hour.

To keep a complete record of the time of operation of the machine during the day, I provide a clock L. This clock is provided with a stop device which is connected to the armature or to the marker arm, so that it runs only when the marker is in its recording position, thereby registering totals so that they can be determined at a glance. It will be obvious that the connections might be arranged so that the clock would register when the recorder is in its inoperative position so that the total of the inoperative periods would be had.

The stop mechanism of the clock preferably consists of a lever O, pivoted at *o''*, within the clock casing. On the free end of this lever is a laterally projecting spring shoe *o* which is adapted to engage the periphery of the balance wheel P. The lever arm is held in its engaging position by the spring Q, one end of which engages a suitable lug *o'* on the lever and the other end a post *q'*. A rest or stop *q* is provided for the lever when in its engaging position.

The lever is connected by the link *m* to the pivoted lever M. (See Figs. 1 and 2). This pivoted lever is supported by the clip N, as clearly appears in Fig. 8. The lever marker when the same is actuated, thereby forcing it downwardly, and through the link *m* lifts the lever O from engagement with the balance wheel, allowing the clock to start. The spring shoe of the lever O engages the balance wheel with a sliding movement, so that when it is withdrawn therefrom, the balance wheel is put in motion, thereby insuring the prompt starting of the clock. As soon, however, as the lever is released, it is thrown into its engaging position by the spring Q, thereby checking or stopping the clock. I also preferably provide the record sheet driving mechanism B with a stop or brake, the same preferably consisting of the pivoted lever S having a brake shoe *s* thereon, arranged to engage the periphery of the balance wheel T in substantially the same manner as that which I have described for the balance wheel P of the total registering clock.

The stop lever S is thrown into and out of its engaging position by the lever R, which is pivoted at *r* and which is connected to the

lever S by the link r'. A pair of stops r'' are provided for the lever R.

It is intended that the clock mechanism B shall be started at the beginning of each day, and I provide this mechanism for that purpose. However, it may be used or not, as desired.

In the structure I have illustrated, I have shown the magnet J connected direct to the motor, so that when the current is on the motor it will also be on the magnet. It is evident, however, that other connections might be made, the object being to electrify the magnet when the machine is started and in operation.

When my improved recording device is used in connection with a mechanically operated machine it is necessary to provide a battery or other electrical supply. As the arrangement of this will readily appear to one skilled in the art, I have not illustrated the details thereof herein.

By arranging and connecting my improved recording device to the machine the operation of which it is desired to record, when the machine is started the marker will be thrown into contact with the record sheet by means of the magnet and held there until the machine is stopped, recording the period of time of the operation of the machine and indicating all stops. It also, through the connections described, indicates by the clock L, the time of operation in hours. By this arrangement I produce a record showing the exact time of starting the machine, and also all stops, and also the full time of operation. This furnishes complete data for the computation of cost on piece work operation and wear on the machine, etc.: it also enables the determination of the merits of each operator.

Where my improved recorder is to be used in connection with mechanically operated machines,—that is, machines other than electric motors and electrically operated machines, I prefer to adapt the shifting arm or operating lever of the machine as a means for operating the switch. It will be obvious that my improved recorder is adapted for use in connection with any style of machine.

I have illustrated and described my improved recording device in detail in the form preferred by me on account of the structural simplicity and economy, and convenience in use; I am, however, aware that it may be very considerably varied in structural details without departing from my invention.

Having thus described my invention, what

I claim as new and desire to secure by Letters Patent, is—

1. The combination with the machine, the operation of which it is desired to record, of a clock mechanism; a record sheet carrier actuated thereby; an electro-magnet; an armature; a pivoted marker arm connected to said armature; a spring; whereby said marker arm is held normally out of its operative position and said armature is held normally out of contact with said electro-magnet; connections for said marker to said clock mechanism whereby the marker is shifted; an electrical connection for said electro-magnet to said machine, whereby said magnet is electrified when the machine is in operation; a time registering clock; a stop device therefor; consisting of a pivoted lever having a spring armor shoe arranged to engage the periphery of the balance wheel of the said registering clock; a spring adapted to hold said stop lever normally in its engaging position; connections from said stop lever to the marker arm, consisting of a pivotally supported lever arranged to be engaged by the horizontally-disposed portion of said marker carrying arms; and a link connecting said pivot lever to the said stop lever, for the purpose specified.

2. The combination with the machine, the operation of which it is desired to record, of a clock mechanism; a record sheet-carrying shaft driven thereby; an electro-magnet; an armature; a pivoted marker arm connected to said armature; a spring for holding said marker arm normally out of its operative position; a cord for moving said marker arm laterally wrapped about said shaft; a spring for holding said marker arm normally outward from said shaft; electrical connections for said electro-magnet to said machine, whereby said magnet is electrified when the machine is in operation; a time registering clock; and a stop device therefor actuated by the said armature, for the purpose specified.

3. The combination with the machine; an electrically controlled recorder having electrical connections with said machine; a time registering clock; and a stop device therefor having operating connections with said recorder, for the purpose specified.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

GEORGE F. CARD. [L. s.]

Witnesses:

MARTHA E. COLERICK,
PAULINE RAUH.