W. T. GELTZ.

TIME RECORDER.

APPLICATION FILED APR. 17, 1913. RENEWED APR. 7, 1916.

1,187,900. Patented June 20, 1916.

2 SHEETS—SHEET 1.

Fig. 1.

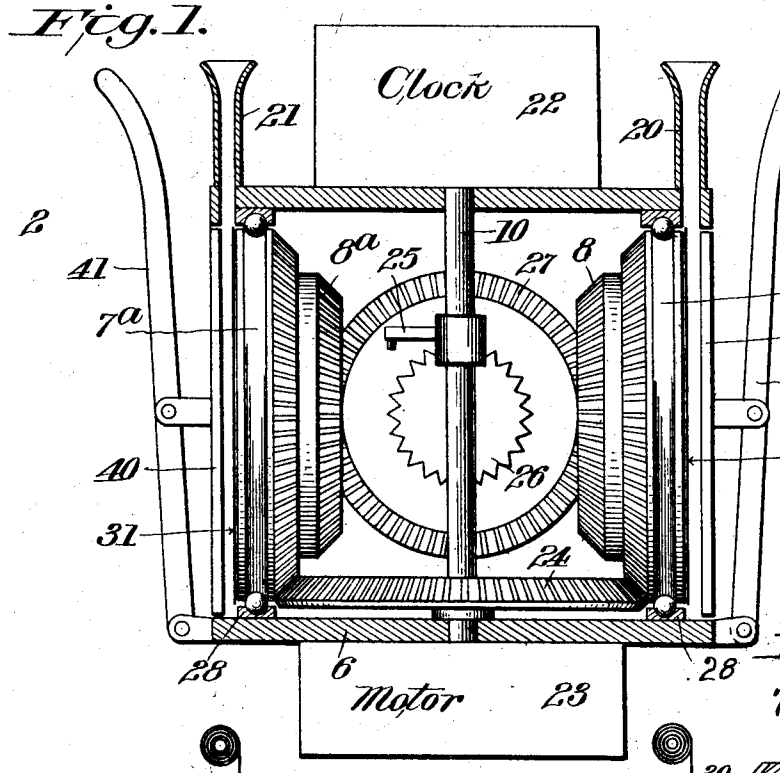


Fig. 3.

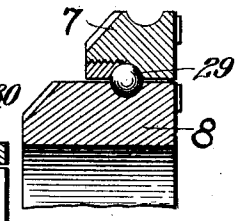
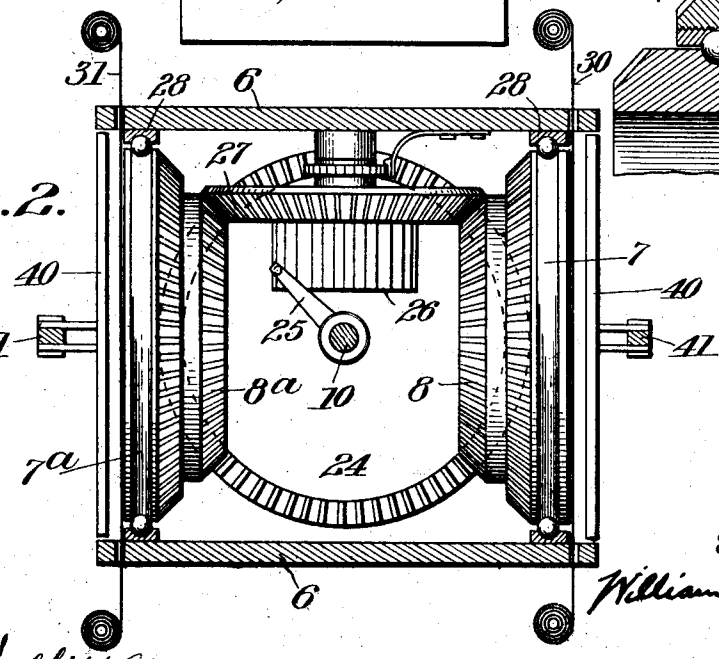


Fig. 2.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 4.

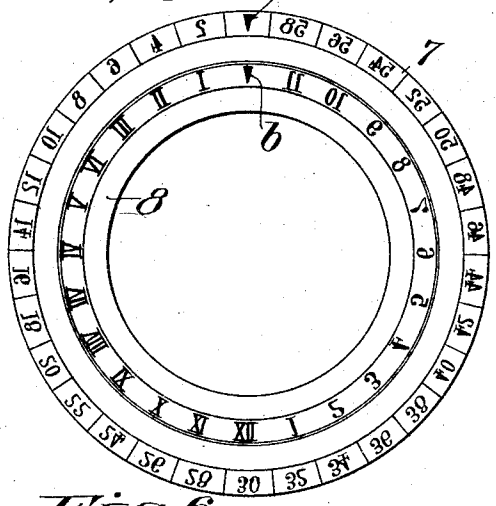


Fig. 5.

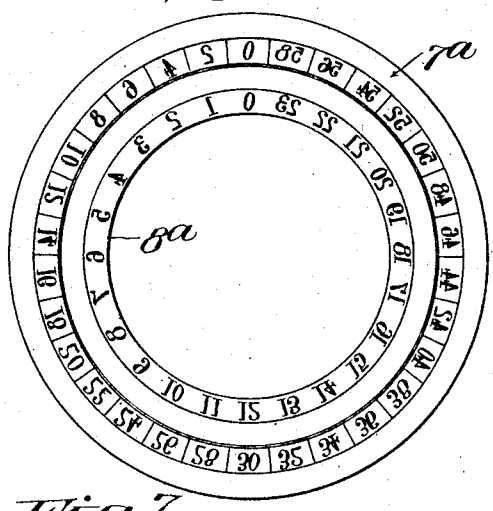


Fig. 6.

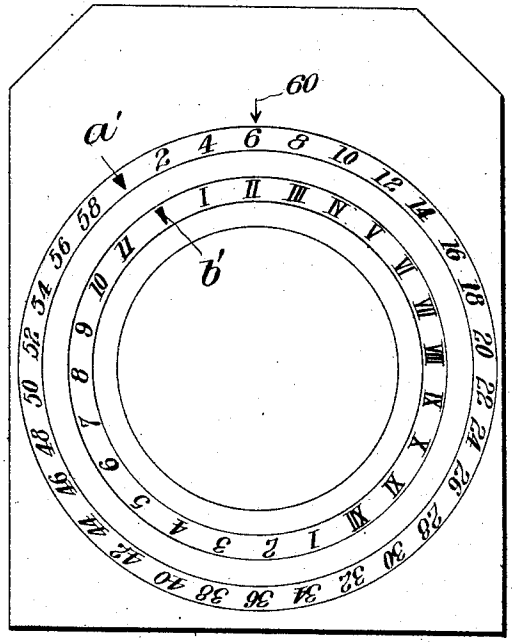
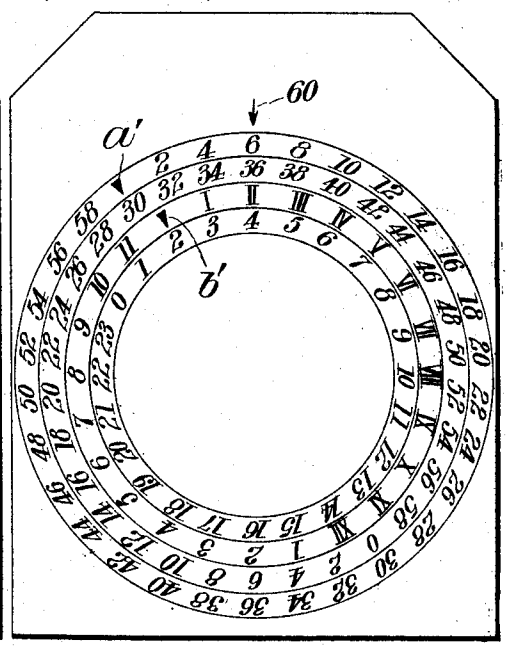


Fig. 7.



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TIME-RECORDER.

1,187,900. Specification of Letters Patent. Patented June 20, 1916.

Application filed April 17, 1913, Serial No. 761,749. Renewed April 7, 1916. Serial No. 89,723.

To all whom it may concern:

Be it known that I, WILLIAM T. GELTZ, citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Time-Recorders, of which the following is a specification.

This invention relates to time recorders, and particularly to recorders adapted for the use of workmen and watchmen. As applied to a workman's time recorder it includes improved mechanism for marking, on an individual record card, times of starting and stopping a piece of work, as well as the elapsed time in performing the work. As applied to a watchmen's time recorder it may be used for marking time on a record card or the like.

In the embodiment shown and illustrated two sets of marking wheels are employed, each set consisting of two wheels containing hour and minute marks respectively, and one set is used to mark the starting time on the record card and the other set is used to mark the stopping time on the record card, in such position that the elapsed time is plainly indicated.

The sets of annular wheels are controlled by a clock mechanism so as to advance or turn at intervals, say of an hour or minute respectively, although the time intervals may be varied if desired. To receive the starting mark, the card is inserted in a holder beside the start time wheels and to receive the stopping time the card is inserted in a holder beside the stop time wheels, and the complete record is printed on the card in concentric circles, with indexes indicating the starting, stopping and elapsed times.

One embodiment of the invention is illustrated in the accompanying drawings in which—

Figure 1 is a side elevation of the machine, partly in section. Fig. 2 is a section on the line 2—2 of Fig. 1. Fig. 3 is a section through the start wheels, on the line 3—3 of Fig. 2. Fig. 4 is a face view of the start wheels. Fig. 5 is a face view of the stop wheels. Fig. 6 is a plan of a record card having start marks thereon. Fig. 7 is a plan of the same card having the start, stop and elapsed time marks thereon.

Referring specifically to the drawings, 6 indicates the casing of the machine which incloses the time wheels. This has a holder 20 at one end for the time card to receive the start impression and a holder 21 at the other end for the card to receive the stop impression. 22 indicates, diagrammatically a clock mechanism which is provided with an escapement controlling the movement of the driving shaft 10, which is driven by a motor 23, of any suitable type, such as a spring motor. I prefer to drive the shaft by a motor, and control its movement by an escapement, although the shaft may be driven by a clock mechanism. In either case the shaft will be made to move once each minute, say. The shaft carries a bevel gear 24 which meshes with and drives the start minute wheel 7 and the stop minute wheel 7^a, located beside the respective holders, and these wheels turn step by step, at each minute. The shaft also carries an arm 25 which engages, once each hour, the teeth of a star wheel 26 which carries a bevel gear 27 which meshes with the start and stop hour wheels 8 and 8^a respectively, so that these wheels are moved step by step, once an hour.

The minute wheels 7 and 7^a rotate on bearings 28 in the casing, and the hour wheels 8 and 8^a rotate in bearings 29 in the respective minute wheels 7 and 7^a, the bearings being preferably of the ball type, the balls running in suitable raceways in the wheels and the casing. The wheels are annular, and the faces of the wheels of each set are in the same plane. The faces of the minute wheels have minutes marked thereon, as shown in Figs. 4 and 5. These may be in the form of raised type, every other minute being indicated by numbers from 2 to 58, with the intervening minutes indicated by division lines and the start minute wheel 7 has an index *a* at the 0 point. The face of the start hour wheel 8 has the hours marked thereon, conveniently in Roman numerals from I to XII to indicate A. M. and in Arabic numerals from 1 to 11 to indicate P. M., with an index *b* at the 0 or midnight point. The hour stop wheel 8^a is marked on its face indicating hours from 0 to 23.

It will be noticed that the marks on the start wheels 7 and 8 are arranged at the outer periphery of the face of the wheels, so that when a print is made on the record card, as shown on Fig. 6, the numbers will

be printed in two concentric circles spaced apart, and the numbers on the stop wheels 7^a and 8^a are arranged at the inner periphery of the wheels so that when the stop record is printed the marks appear in two concentric circles alternating with the circles of the start wheels, as shown on the stop record illustrated in Fig. 7. Any suitable inking and impression means may be used.

I have illustrated in inking ribbon 30 in front of the start wheels and an inking ribbon 31 in front of the stop wheels, and these ribbons may be of different colors for convenience of reading, and the card is pressed against the ribbon by means of a plunger 40 operated by a lever 41. This simple form of impression device is for the purpose of illustration merely and may be varied in many ways.

In operation, the workman first inserts his card in the holder 20 and operates the plunger to receive the start impression on his card, and at the end of the job inserts the card in the holder 21 to receive the stop impression on the card. Both sets of wheels are driven step by step as above described, the minute wheels 7 and 7^a making one revolution per hour and the hour wheels 8 and 8^a making one revolution every twenty four hours. Each card preferably has an index 60 located at the middle perpendicular line to point to the standard time, in hours and minutes, at which the impression was taken. Thus the start record shown on the card in Fig. 6 indicates that the record was made by the wheels 7 and 8 at two hours and six minutes. Assuming that the job required two hours and thirty minutes, the wheel 7^a and 8^a will by that time have turned to bring the minute mark "36" and the hour mark "4" at the middle vertical line, and when the workman then inserts the card in the holder 21, and receives the impression of the wheel 7^a and 8^a the minute mark "36" will be located in the circle just inside of the marks given by the wheel 7, and the hour mark "4" will be located just inside of the mark given by the hour wheel 8, with the standard hours and minutes of starting and stopping all in line with the index 60. During this time the wheel 7^a will have turned such a distance that the mark "30" printed by that wheel will be in line with the mark a' printed by the index a at the start, and the wheel 8^a will have turned such a distance that the impression given by the numeral "2" thereon, will be in line with the impression b' given by the index b on the wheel 8 at the start, and the elapsed time is read from these indexes, that is, two hours and thirty minutes. The wheels of both the start and the stop sets are similarly moved and thus always indicate the same standard time, but the start record includes also the index impressions a' and b', and since these remain on the card, subsequent stop records will by reference to those indexes always show the elapsed time, since the period corresponds to the extent of movement of the stop wheels, in hours and minutes during that time.

In the embodiment shown the hour marks are shown on the inner circles and the minute marks on the outer circles, but this may be reversed if desired. Also the two card holders are shown at opposite ends of the machine, but by appropriate changes in the gearing and structure they may be located side by side, as a matter of convenience.

The invention is not limited to the embodiment shown, but the construction may be modified in various ways within the scope thereof.

What I claim as new is:

1. In a time recorder, the combination of a clock controlled movable marking member provided with time divisions, and an index, another clock-controlled synchronously-movable marking member provided with corresponding time divisions, means to mark a card or the like with the time divisions and index of the first-mentioned member, and means to subsequently mark the card with the time divisions of the second mentioned member in a position relative to the index corresponding to the elapsed time.

2. In a time recorder, the combination of two sets of clock-controlled hour and minute wheels driven synchronously, the respective wheels of each set having hour and minute marking faces arranged in concentric circles, means to mark a record card or the like with the faces on one set of wheels, to make a start record, and means to mark the card with the faces on the other set of wheels, in concentric position, to make a stop record.

3. In a time recorder, the combination of two sets of clock-controlled hour and minute wheels driven synchronously, one set for starting time and the other set for stopping time, the hour and minute wheels of each set having time-division marking faces arranged in concentric circles of different radii, and each of the wheels of the starting time set also having an index on the face, means to mark a record card or the like with the faces on the starting time wheels, and means to mark the card with the faces on the stopping time wheels, in concentric position, the index marks coöperating with the marks of the stopping time wheels to indicate elapsed time.

4. In a time recorder, the combination of two sets of clock-controlled hour and minute wheels, one set for starting time and the other set for stopping time, the hour wheels of both sets being driven at the same speed and time and the minute wheels of both sets being driven at the same speed and time, said wheels all having time-division marking

faces in circles of different radii, and each of the wheels of the starting time set also having an index on the face, means to mark a record card or the like with the faces on the starting time wheels, and means to mark the card with the faces on the stopping time wheels, in concentric position, the index marks coöperating with the marks of the stopping time wheels to indicate elapsed time.

In testimony whereof, I do affix my signature in presence of two witnesses.

WILLIAM T. GELTZ.

Witnesses:
C. W. FOWLER,
GEO. E. TEW.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."