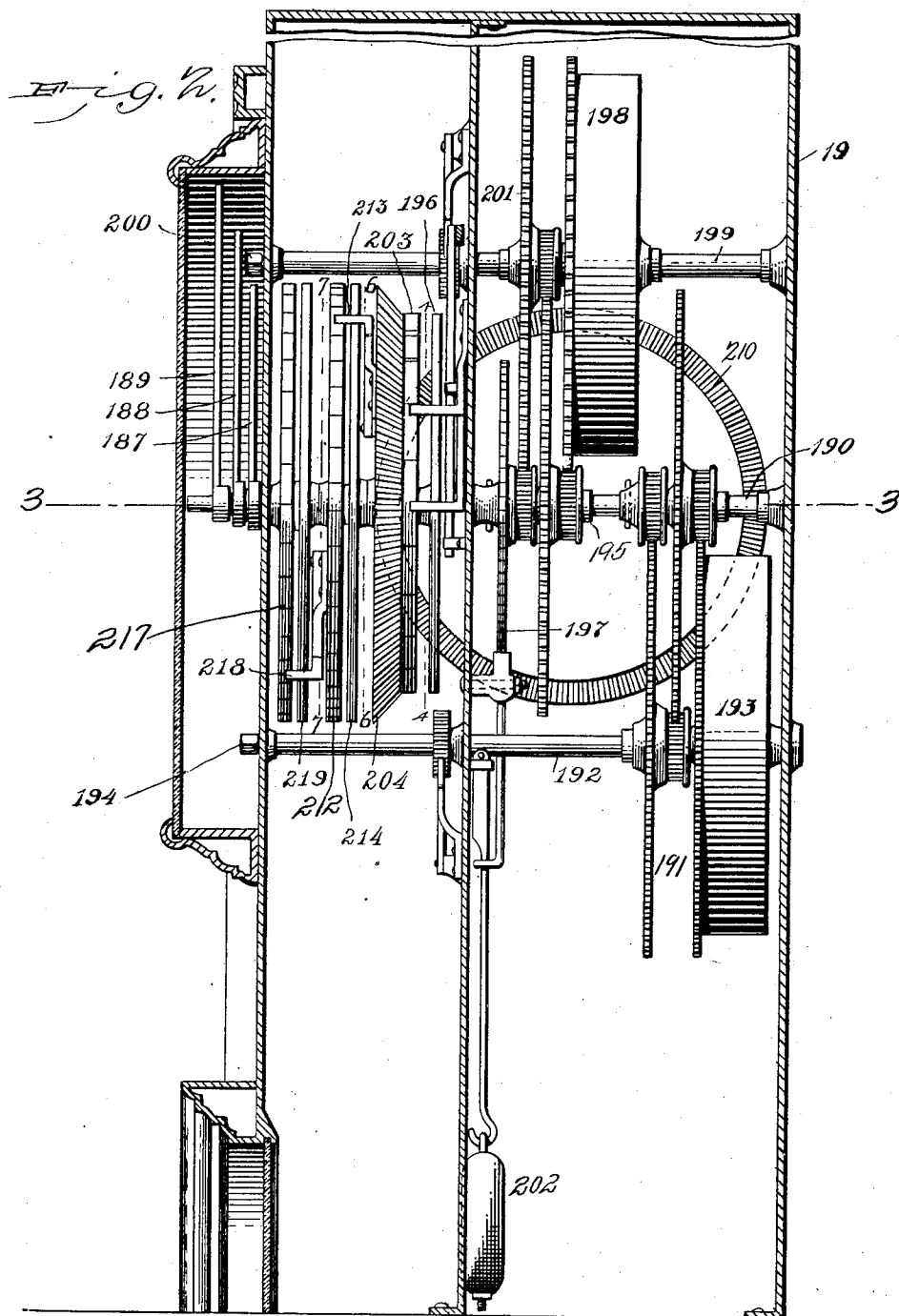


J. L. ROBERTS.
TIME REGISTER.

APPLICATION FILED AUG. 22, 1902.

NO MODEL.

4 SHEETS—SHEET 2.



Witnesses
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John E. Parker

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4 SHEETS—SHEET 3.

Fig. 3.

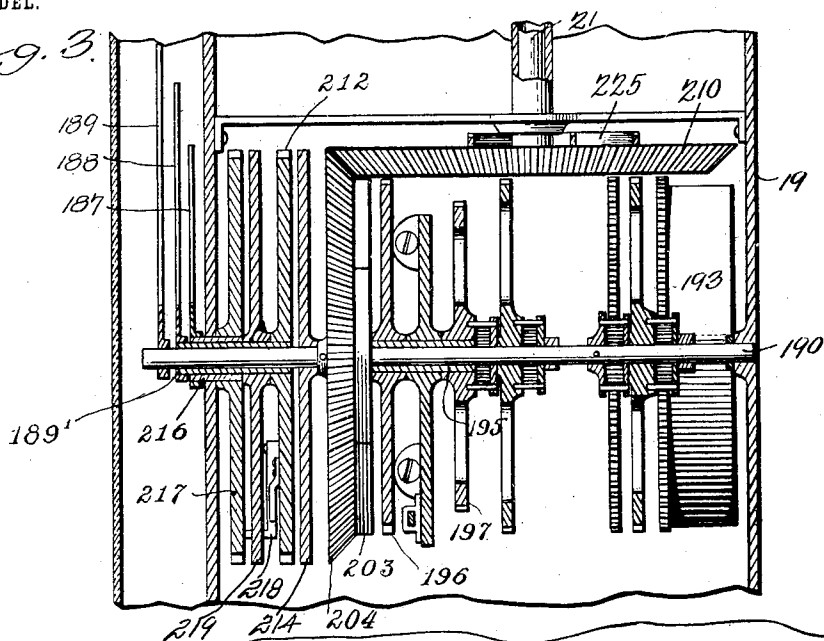
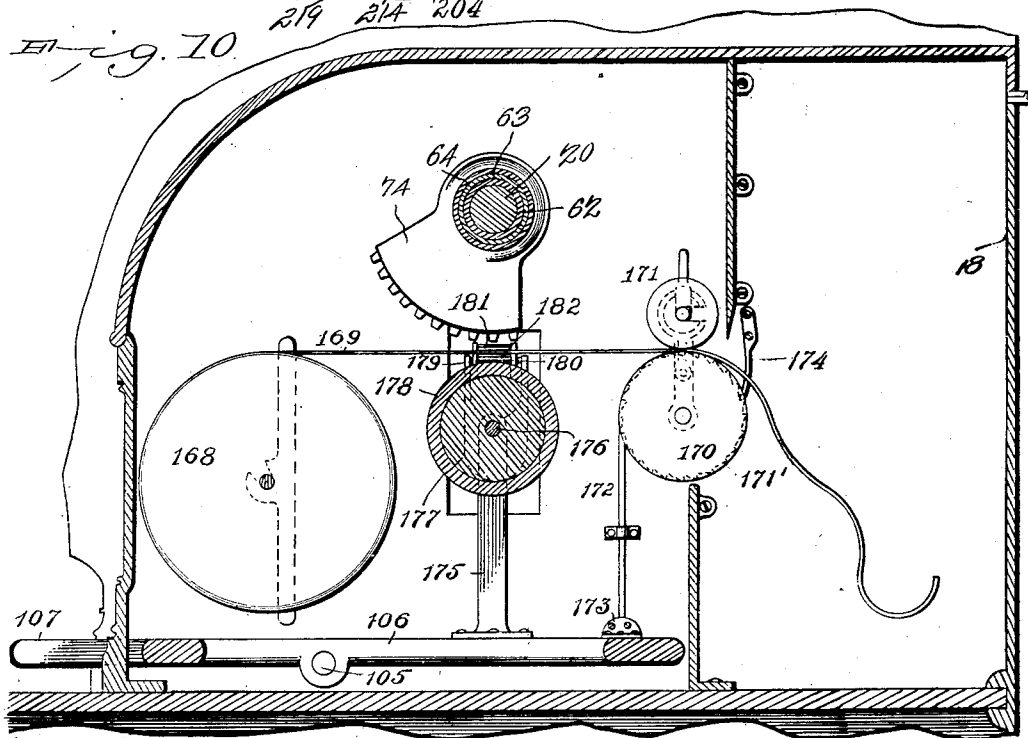


Fig. 10.



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4 SHEETS—SHEET 4.

Fig. 6.

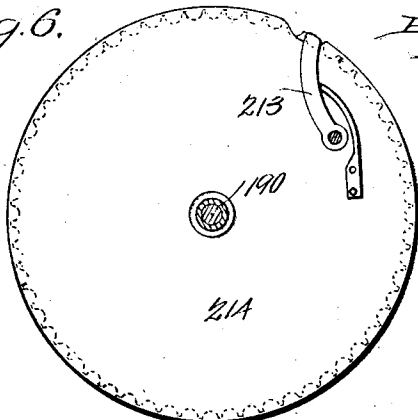


Fig. 7.

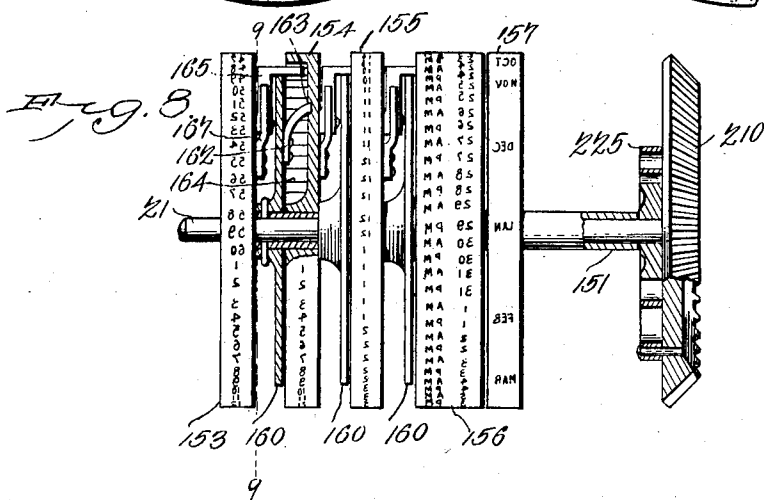
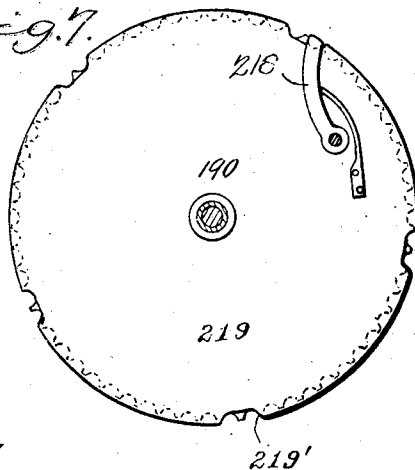
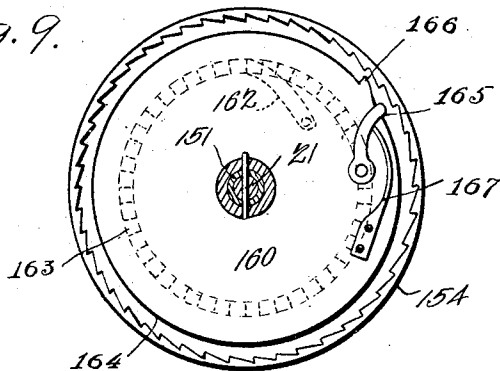


Fig. 9.



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UNITED STATES PATENT OFFICE.

JOHN L. ROBERTS, OF ST. LOUIS, MISSOURI.

TIME-REGISTER.

SPECIFICATION forming part of Letters Patent No. 739,224, dated September 15, 1903.

Application filed August 22, 1902. Serial No. 120,665. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. ROBERTS, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented a new and useful Time-Register, of which the following is a specification.

The invention relates to certain improvements in time registering or recording mechanisms, and has for its principal object to provide a device for use in connection with a cash-register to accurately record the time at which each sale is made, the time being printed on a record-strip at a point opposite the amount of money registered.

A further object of the invention is to provide a mechanism in which the recording device will not interfere with the clockwork mechanism by which the recording-disks or other imprinting devices are actuated.

A still further object of the invention is to provide a mechanism capable of recording the month, date, hour, minute, and second at which the registering mechanism is actuated and to so construct the recording mechanism that the initial movement imparted by the clockwork to the seconds-disk will be transferred in sequence through the remaining disks.

A still further object of the invention is to provide a form of clockwork mechanism in which a plurality of actuating devices are employed, one serving to drive the clockwork proper and a second for driving the recording mechanism, and the movement of one of said actuating devices being controlled by the other.

A still further object of the invention is to so construct and arrange the gearing connections of the mechanism as to permit of the ready adjustment of the timing mechanism when necessary.

A still further object is to provide an improved construction and arrangement of type-disks for recording the time and for the proper transfer of the movement of one disk to a succeeding disk.

With these and other objects in view the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of a portion of the recording mechanism of a cash-register, illustrating the application thereto of a time-register constructed in accordance with my invention. Fig. 2 is a transverse sectional elevation of the same on the line 2 2 of Fig. 1. Fig. 3 is a sectional plan view of the mechanism on the line 3 3 of Fig. 2. Fig. 4 is a sectional elevation of a portion of the mechanism on the line 4 4 of Fig. 2. Fig. 5 is a detail sectional view on the line 5 5 of Fig. 1. Figs. 6 and 7 are transverse sectional elevations of details of the mechanism on the lines 6 6 and 7 7, respectively, of Fig. 2. Fig. 8 is an enlarged detail of the recording-disks, the disks being partly broken away in order to more clearly illustrate the construction. Fig. 9 is a transverse sectional elevation of the recording-disks on the line 9 9 of Fig. 8. Fig. 10 is a transverse sectional elevation of the device on the line 10 10 of Fig. 1.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The device forming the subject of the present invention while of especial value for use in recording the registering operations of a cash-register may also be employed as a workman's or a watchman's time-recorder or for any other purpose where it is desired to keep a printed record of the time of transactions of any character.

In Fig. 1 of the drawings, 20 represents a fixed axis on which are a number of concentrically-arranged tubular shafts 62, 63, 64, and 65, all of which extend to the finger-key-operating mechanism of a cash-registering device which may be of any ordinary character or of the type illustrated in Letters Patent granted to me on November 11, 1902, No. 713,243. The several shafts are provided with segments 72, 73, 74, and 75, bearing type which may be moved by the shafts to an imprinting position immediately above the vertically-movable platen, these segments serving to make a printed record on a continuous strip of paper or on a suitable ticket of the amount of cash received, together with the number or initial of the salesman or the corresponding designating-mark of a workman or watchman whose time is to be recorded. In the end of the

axis 20 is a bearing-opening for the reception of the revoluble shaft 21, which receives motion from the clockwork mechanism in the manner hereinafter described. Near one end of the shaft at a point adjacent to the type-segments is secured a type-disk 153, bearing on its periphery type for the imprinting of numerals from "1" to "60," inclusive. This disk records the seconds of time and receives an intermittent rotative movement to the extent of a plurality of seconds at each operation. For all practical purposes it is found that a one-twelfth rotative movement of the wheel, covering a period of five seconds, is sufficient. The step-by-step movement of the seconds-wheel may in some cases occur at the end of each second; but this is likely to interfere with the imprinting operation, as the disk may be moving during the time a record is being printed and cannot be relied upon for ordinary purposes.

On the shaft 21 is a stationary tube 151, supported by brackets 152 within a suitable inclosing casing, and on the tube are loosely mounted a series of printing-disks 154, 155, 156, and 157, the latter disk being held on the tube by a friction-spring and being adjustable to imprinting position by hand. This disk is provided with properly-spaced abbreviations of the names of the various months arranged in consecutive order. The disks 154, 155, and 156 have on their peripheries the necessary type for imprinting the minutes, hours, and days, respectively, and between each two disks is a stationary disk 160, rigidly secured to the tube 151 and provided with a spring-pawl 162, adapted to engage in notches 163 in the disks for the purpose of holding the imprinting-disks in any position to which they may be adjusted. Each disk has an annular flange at its periphery, and in the flange are cut internal ratchet-teeth 164, adapted to be engaged by a spring-pawl 165, projecting from the face of a preceding recording-disk. The disk 154 is provided with numerals from "1" to "60," inclusive, to record the minute at which the mechanism is moved to imprinting position, and is provided with a corresponding number of ratchet-teeth 164. The stationary disk 160, between the disks 153 and 154, is provided with a peripherally-disposed cam 166 of a length somewhat less than the length of a single tooth of the internal ratchet, and as the pawl 165 is rotated and is held by its spring 167 in contact with the periphery of the disk 160 said cam serves to raise the pawl until its projecting end engages one of the ratchet-teeth and turns the disks 154 to the extent of a single tooth, the pawl reassuming its initial position in contact with the circular portion of the disk after passing beyond the cam. The hour-disk 155 is rotated twice during each twenty-four hours; but if the numerals from "1" to "12" thereon were spaced at equidistant intervals on the periphery of the disk an imprinting-type would not be retained

in printing position during a greater portion of the time, owing to the fact that the minute-disk only receives a turning movement for one-sixtieth of a revolution at each operation and can only impart a similar movement to the hour-disk. The hour-disk is provided with sixty teeth and is rotated one-twelfth part of a revolution at each complete rotation of the minute-disk. The periphery of the hour-disk is provided with sixty numerals, one for each tooth of the internal ratchet, and so arranged that each of the numerals from "1" to "12" appears five times, a fresh type-numeral being moved to imprinting position at the end of each twelve minutes and the stationary disk between the disks 154 and 155 being provided with five pawl-operating cams arranged at equidistant intervals for this purpose. The initial movement of the hour-wheel should be properly timed, so that the final movement from one hour to the next may occur at the proper moment. This construction may be modified so that the complete movement of the hour-wheel from one hour to the next will take place within a period of five minutes, or between the fifty-fifth and sixtieth teeth of the disk, the pawl-adjusting cam of the stationary disk being made of sufficient length to keep the pawl of the minute-disk in operative engagement with the internal ratchet of the hour-disk through a period equal to five teeth or five consecutive minutes of time. The disk 156 is provided with numerals representing the days of the month, each of the dates occurring twice on being followed, respectively, by the abbreviations "A. M." and "P. M." In order that the dates of the longest months may be imprinted, the periphery of the disk has sixty-two divisions and the internal ratchet-teeth are sixty-two in number, one tooth being engaged by the operating-pawl carried by the hour-wheel at the end of each twelve hours in order that said disk 156 may be moved to proper position to imprint the date and the morning or afternoon hours. The month-disk 157 may be actuated from the disk 156, if necessary; but as this disk will need constant adjustment, owing to the varying lengths of the months, it has been thought best to merely secure the disk in position by a friction-spring, so that it may be adjusted by a cam at the end of each month. One complete rotative movement of the seconds-wheel 153 will transmit to the minute-wheel 154 an angular movement to the extent of one space or division, and a complete revolution of the minute-wheel will transmit to the hour-disk 155 a movement equal to five spaces or divisions. This movement is transmitted from disk to disk, the various types on said disks representing the month, date, hour, minute, and second being always below and in vertical line with the axis, ready for the imprinting operation.

The printing or recording mechanism is inclosed within a casing 18, in the opposite ends

of which are bearings for the reception of a movable shaft carrying a paper-roll 168, on which is wound a ribbon or band of paper or other suitable material of a width sufficient to pass under all of the type-disks. The end of the paper 169 is laid between two feed-rolls 170 and 171, held in suitable bearings and adapted to clamp upon and draw the paper with a step-by-step movement from the feed-roll 168. At the end of the feed-roll 170 is a ratchet-wheel 171', with which engages a pawl 172, pivoted between ears 173 on a rocking frame 106, which is pivoted at 105 within the casing and has an operating-key 107, which is depressed in effecting the recording operation. On the upward movement of the frame 106 the pawl 172 engages the ratchet-wheel and turns the feed-roll to the extent of one or more teeth, so as to expose a fresh imprinting-surface on a strip of paper. Backward movement of the feed-roll is prevented by the engagement of a pawl 174 with the ratchet-teeth 171'. On the pivoted frame 106 are two standards 175, forming supports for a spindle 176, on which is mounted a revolvable platen 177, provided with a cover 178 of rubber or other yielding material for the purpose of securing a good impression-surface. Projecting laterally from the standards 175 are bracket-arms 179, carrying spindles 180, on which are mounted spools 181, carrying an inked ribbon 182, similar to the type-writer ribbon in ordinary use. The imprinting mechanism is operated by the pivoted frame 106, the depression of the finger-key 107 raising the platen 177 and forcing the paper 169 into contact with the inked ribbon 182 and the type on the various segments and disks previously described. The resultant imprint on the paper shows the amount of purchase and the name or initial of the salesman, together with the month, date, hour, minute, and second at which the transaction occurred, or, if used for a time-recorder, shows the name or number of the workman and the time of his entry or departure from the factory or shop. The clockwork mechanism is contained within the section 19 of the casing, and at the front of the casing is an ordinary clock-dial over which move hour, minute, and seconds hands, (marked 187, 188, and 189, respectively.) Mounted in suitable bearings in the casing 19 is the main arbor 190 of the clock mechanism. This arbor is connected by reducing-gearing 191, of an ordinary type, to the shaft 192, the latter carrying a spring 193 and being provided with a squared end 194, projecting through an opening in the dial and adapted for the reception of an ordinary winding-key. This spring serves to operate the main portion of the mechanism. On the arbor 190 is a loose sleeve 195, to which are secured a cam-wheel 196 and an escapement-wheel 197, the sleeve with these two wheels being rotated continuously by a spring 198, mounted on a shaft 199 in the upper portion of the casing, and having a squared end 200 projecting through an opening in the dial for the reception of the winding-key. The shaft 199 is connected to the sleeve 195 through reducing-gearing 201 of the usual character, the spring operating only on the cam-wheel and the escapement-wheel, and its action is regulated by a pendulum 202. To the arbor 190 is secured a wheel 203, a bevel-gear 204, and the seconds-hand 189, and the operation of the parts is such that the seconds-hand will be operated only twelve times in each minute, moving over five-seconds graduations at each operation. To accomplish this result, the wheel 196 is provided with six cams 205, Fig. 4, and the wheel 203 has six ratchet-teeth, with which engage locking-dogs 207 208, the spring shank portions of which are fixedly secured to the clock-casing, the free ends of the dogs being bent laterally and adapted to pass over the periphery of the cam-wheel into position for operative engagement with the toothed wheel 203. In the operation of this portion of the device the dog 207 being in engagement with one of the teeth of the wheel 203 and holding the latter in position shown in Fig. 2 the continuous rotation of the cam-wheel 196 will bring one of the cams 205 into engagement with said dog 207 and raise the dog from its engaging position and permit the wheel 203 to revolve. The movement of the wheel 203, however, is checked by the engagement of the same tooth which engaged the dog 207 with the dog 208 and is there held until by the further movement of the wheel 196 the dog 208 is raised from engagement with said tooth and the dog 207 is engaged by the next succeeding tooth. This mechanism gives a step-by-step movement to the seconds-wheel 157 through the bevel-gear 204 and a mating bevel-gear 210 on the shaft 21. The seconds-hand of the clock is similarly operated and moved over an interval of five seconds on the dial-plate. The minute-hand 188 is secured on a sleeve 189', surrounding the arbor 190 and carrying at its inner end a toothed wheel 212, adapted to be engaged by a dog 213, carried on the rear face of the bevel-gear 204 and passing over a fixed disk 214 of a diameter equal to or greater than the diameter of the wheel 212 and having a peripheral notch or recess into which the dog descends once during each revolution of the gear-wheel 204 and moves said wheel 204 to the extent of one tooth, the minute-hand 188 being moved for an angular distance on the dial representing one minute. The hour-hand 187 is secured on the sleeve 216 concentric with the sleeve 211 and the arbor 190, and at the inner end of the sleeve is secured a toothed wheel 217, adapted to be acted upon by a dog 218, secured to one face of the wheel 212. The dog 218 passes over a fixed disk 219, having five notches 219', Fig. 7, into which said dog passes during each revolution, one complete revolution of the minute-wheel 212 serving to actuate the wheel 217 to the extent of five teeth and each movement of a tooth being to the

extent of one-fifth of an hour division on the dial, or a greater or less number of notches or actuating-dogs may be employed in order to adjust the hour-hand to an approximately correct position with relation to the position of the minute-hand. Owing to the peculiar construction of the timing mechanism, the escapement-wheel and pendulum are continuously operated, and the clock may be regulated with the same accuracy as any ordinary clock mechanism, while the movement imparted to the seconds-printing disk, being only twelve times per minute, will always insure the stationary position of the seconds-printing disk during the imprinting operation. The work of the remaining portions of the clock mechanism and the intermittent movement of the printing-disks being accomplished by the spring 193, the proper operation of the escapement-wheel and pendulum will not be interfered with.

In some cases, especially during an imprinting operation, the shaft 21 may be held from rotation by the contact of the seconds-disks with an inked ribbon. To permit this without stopping the clockwork, a spring 225 is inserted between the shaft and the bevel-gear 210, the movement of the clockwork serving to rotate the bevel-gear and partly wind up the spring, and the spring serving to transmit the movement to the shaft 21 when the printing-disks return from contact with the ribbon. This construction permits of a continuous operation of the clockwork during the printing operation.

In order to properly set the clockwork in case the latter has been stopped for any length of time, I employ a longitudinally-movable bar 226, adapted to guides 227 and having projecting lugs adapted to engage the dogs or pawls 207 and 208 and move the latter from engagement with the wheels 196 and 203, a pivoted lever 228 being connected to the bar and extending out through a slot in the casing for this purpose. When the outer end of the lever is depressed, both dogs are raised from operative position and permit the rapid turning of the clockwork mechanism until the hands on the dial have been set to the correct time. For minor adjustments of the hands a key may be placed on the end of the arbor 190 in the usual manner.

This timing mechanism may be employed in connection with recording devices of a variety of characters other than that herein illustrated and described.

While the construction herein described, and illustrated in the accompanying drawings is the preferred form of the device, it is obvious that various changes in the form, proportions, size, and minor details of the structure may be employed without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described my invention, what I claim is—

1. In a device of the class specified, a pair

of concentrically-arranged shafts, an independent actuating mechanism for imparting rotative movement to each shaft, means for controlling the speed of rotation of one of the shafts, and mechanism carried partly by each shaft whereby continuous rotative movement of one shaft results in intermittent rotative movement of the second shaft.

2. A clockwork mechanism comprising a controlling-pendulum, means for actuating the same, a dial, time-indicating hands, a secondary actuating means for moving the hands, and mechanism controlled by the first actuating means for regulating the movement of the second actuating means.

3. A clockwork mechanism including a dial and time-indicating hands, means for imparting rotative movement to a portion of the operating mechanism, and an auxiliary independently-operated controlling means for checking the movement of the hand-operating mechanism and transforming the rotative movement to a step-by-step rotative movement.

4. In a device of the class specified, a clockwork mechanism including an actuating device and a dial-face, an auxiliary governing mechanism, a seconds-hand, mechanism under the control of the governing device for permitting a step-by-step movement of the seconds-hand, minute and hour indicating hands, and mechanism for imparting a step-by-step movement to each of said hands.

5. In a device of the class specified, a type-disk, mechanism for rotating the same, an auxiliary governing mechanism, a dial, a seconds-hand, mechanism under the control of the governing device for permitting a step-by-step movement of the type-disk and the seconds-hand, and minute and hour indicating hands actuated by the type-disk-operating mechanism.

6. In a device of the class specified, a recording-disk, a toothed wheel operatively connected thereto, means for rotating said toothed wheel, a pair of locking-dogs engaging alternately with the teeth of said wheel for stopping the same, and a controlling mechanism for alternately raising said dogs from engagement with said teeth at regular intervals of time.

7. In a device of the class specified, a recording-disk, a toothed wheel operatively connected thereto, means for revolving said toothed wheel, a pair of locking-dogs adapted to engage alternately with said toothed wheel, and a controlling mechanism for alternately moving the dogs from engaging with the wheel and permitting a partial rotative movement thereof at regular predetermined intervals.

8. In a device of the class specified, a recording-disk, a toothed wheel operatively connected thereto, means for revolving said toothed wheel, a pair of locking-dogs adapted to engage alternately with said toothed wheel, a cam-wheel adapted to act alternately on the dogs to move one to releasing and the other

to engaging position, and means for revolving said cam-wheel.

9. The combination in clockwork mechanism, of an actuating means, a controlling means therefor, mechanism for connecting the two, and means for disconnecting such mechanism to permit the free movement of the clock mechanism.

10. In a device of the class specified, a clock mechanism including a toothed wheel, a pair of locking-dogs adapted to engage alternately with said toothed wheel, a cam-wheel adapted to move an engaged dog from the wheel, means for revolving said cam-wheel, and a movable arm having lugs for engaging both dogs whereby said dogs may be moved to inoperative position.

11. In a device of the class specified, a plurality of type-disks, a revoluble shaft operatively connected to the initial disk of the series, a tube carried by the shaft and supporting the remaining type-disks, stationary disks secured to the tube and arranged one between each two of the type-disks said stationary disks being provided with peripheral cams, annular flanges formed on each type-disk and provided with internal ratchet-teeth

of a number corresponding to the number of type on the periphery of the disks, and spring-pressed pawls carried by the type-disks and adapted to be moved into operative engagement with the ratchet-teeth by contact with said peripheral cams.

12. In a device of the class specified, a minute-recording disk having imprinting-type for registering each minute in an hour, means for imparting a step-by-step rotative movement to said disk to bring the consecutive type into printing position, an hour-registering wheel having on its periphery a number of type corresponding to the number of type on the minute-disk and arranged in groups of five each of the same number, and means for transferring the movement of the minute-registering disk to the hour-registering disk.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN L. ROBERTS.

Witnesses:

GABRIEL A. HOLLOCHER,
CORNELIUS S. HOLLOCHER.