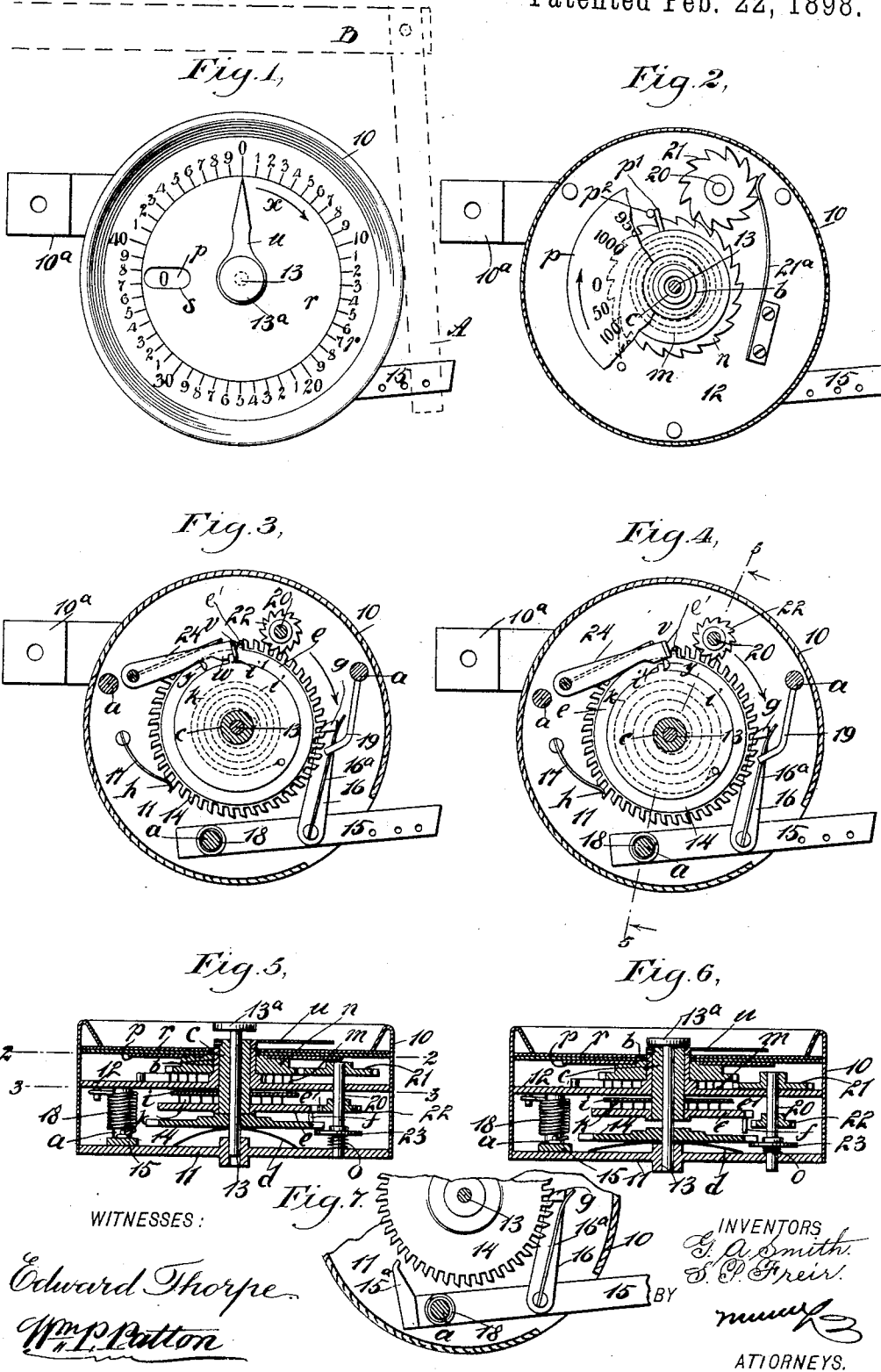


(No Model.)

G. A. SMITH & S. P. FREIR.
REGISTERING DEVICE

No. 599,364.

Patented Feb. 22, 1898.



UNITED STATES PATENT OFFICE.

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REGISTERING DEVICE.

SPECIFICATION forming part of Letters Patent No. 599,364, dated February 22, 1898.

Application filed May 12, 1897. Serial No. 636,224. (No model.)

To all whom it may concern:

Be it known that we, GEORGE A. SMITH, of New York, in the county and State of New York, and SAMUEL P. FREIR, of Hasbrouck Heights, in the county of Bergen and State of New Jersey, have invented a new and Improved Registering Device, of which the following is a full, clear, and exact description.

This invention relates to an improved registering device for numerically registering and visually-indicating periodic movements of other mechanism.

The object of our invention is to provide a novel device of the indicated character which will be of simple construction and be adapted for convenient attachment to a type-writer or other machine for counting periodic movements thereof, the improvement being particularly well adapted for registering and indicating the periodic depressions of a word-spacing bar on a type-writer machine, and thus afford reliable means to register the number of words written on the machine.

A further object is to provide a registering device which is adapted for the assured return of its registering mechanism to zero at any point of its registering movement, so that if desired a new count may be effected from "1" forward at any time.

The invention consists in the novel construction and combination of parts, as is hereinafter described, and defined in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan or front face view of the registering device. Fig. 2 is a partly-sectional plan view substantially on the line 2 2 in Fig. 5. Fig. 3 is a partly-sectional plan view essentially on the line 3 3 in Fig. 5. Fig. 4 is a view similar to that shown in Fig. 3 with working parts differently adjusted. Fig. 5 is a transverse sectional view of the complete registering device, taken substantially on the broken line 5 5 in Fig. 4. Fig. 6 is a transverse sectional view of the registering mechanism on the same line as Fig. 5, showing working parts in changed adjustment; and

Fig. 7 is a fragmentary plan view of a modified form of a detent appliance on the actuating-lever of the register and which is designed to prevent a retrograde movement of the master-wheel that receives step-by-step motion from the lever.

In the drawings illustrating the construction of our improvement, 10 represents a preferably cylindrical case that is provided to inclose the working mechanism of the registering device.

The lower wall 11 of the case 10 is rendered sufficiently substantial to afford a suitable base-plate for support of other parts.

On posts *a*, rising from the base-plate 10, the scaffold-plate 12 is held in a plane parallel with the base-plate.

An upright tubular post *b* is centrally affixed upon the scaffold-plate 12, and within said post an axially-perforated and suitably-elongated hub *c* is loosely fitted.

A cylindric arbor 13 is rotatably held in the bore of the hub *c*, and said arbor extends down through a central perforation in the base-plate 11.

A toothed master-wheel 14 is secured upon the arbor 13 a short distance above the base-plate 11, and this wheel and arbor are supported free to rotate by an arched plate-spring *d*, that rests on the base-plate 11 and is perforated at the crown of its arch to permit the arbor to pass freely through the same. The resilience of the spring *d* maintains the master-wheel 14 properly spaced from the base-plate 11, toward which said wheel may be moved by a depression of the arbor, the purpose of which will be hereinafter explained.

On the lower end of the hub *c* is secured a disk *e*, adapted to seat on the upper face of the hub of the master-wheel 14. The master-wheel 14 is preferably furnished with fifty evenly-spaced teeth, all beveled at their outer ends in the same direction, as shown in Figs. 3, 4, and 7.

On one of the posts *a* a lever 15 is pivoted to swing in a horizontal plane, so as to vibrate in an opening in the case 10, and on the lever an actuating-dog 16 is pivoted, said dog having a tooth *g* formed on its free end, which tooth is suitably shaped to adapt it to enter

a proper distance between any two of the teeth on the master-wheel 14. This engagement of the tooth is defined by the contact of one sloped side of said tooth with the sloped face on the end of an adjacent tooth on the master-wheel 14, as is clearly shown in Figs. 3 and 4.

The dog 16 is located on the upper face of the lever 15, intermediately of the ends of said lever, and from its position is adapted to rock toward and upon the teeth of the master-wheel 14, as before mentioned, an engagement of the tooth *g* with the teeth of the master-wheel being enforced by the spring 16^a, which projects from the pivot of the dog toward the tooth of said dog, on which tooth the spring presses.

It will be seen that a rocking movement of the lever 15 toward and from the master-wheel 14 will cause the dog 16 to communicate a step-by-step rotary movement to the master-wheel in the direction of the curved arrows in Figs. 3 and 4.

A detent-arm 17 is fastened by one end upon the base-plate 11 at a point nearly opposite the tooth *g* of the dog 16, the free end *h* of said detent-arm being adapted to engage with the master-wheel 14 between two adjacent teeth, the body of the arm being sufficiently elastic to permit the end *h* to yield outwardly when the master-wheel is rotated and successively engage the teeth of said wheel, whereby the regular step-by-step movement of the master-wheel is facilitated.

In order to prevent the dog 16 from receiving an excessive vibratory and longitudinal movement, which might occur when the lever 15 is suddenly and forcibly moved on its pivot, a coiled spring 18 is placed upon the post *a* above said lever. One end of the spring 18 is attached to the lever, the other end being affixed to the interior of the case 10. As the tension of the spring 18 is such as to press the lever 15 toward the master-wheel 14 it will serve in an obvious manner to cushion the violent vibration of the lever and also to move the dog 16 forward to engage another tooth. A further check against improper rotative movement of the master-wheel 14 consists in the provision of the guard-arm 19, that projects from one of the posts *a* toward the body of the dog 16, the arm 19 being bent near its free end toward the master-wheel, so that the bent portion will cross the path of the tooth *g* below it, and thus arrest the dog if a stroke on the lever 15 causes the tooth of the dog to impinge upon the guard-arm, a sufficient movement of the dog being permitted to adapt it for successive engagement with the teeth of the wheel 14.

On the hub *c*, between the disk *e* and the scaffold-plate 12, a washer-plate *i* is loosely mounted, and between said washer-plate and the disk *e* a flat spiral spring *k* is located, having the inner end affixed to the hub *c* and its outer end attached to the lower face of

the washer-plate, as is shown by dotted lines in Figs. 3 and 4.

At a point near the periphery of the disk *e* a locking-stud *f* is downwardly projected, which stud is directly above the teeth of the master-wheel 14, and when the parts of the register are in normal adjustment, as shown in Fig. 5, the force of the plate-spring *d* causes such an elevation of the master-wheel as to locate the lower end of the stud *f* between two of these teeth, so that a rotatable movement of the master-wheel will correspondingly move the disk *e*, hub *c*, and arbor 13, such movement serving to wind the helical spring *k* more closely upon the hub *c*.

On the cylindrical post *b*, which has already been mentioned, a helical spring *m* is placed, which loosely seats upon the scaffold-plate 12 and is secured at its outer end upon said plate.

An offset shoulder is formed on the hollow post *b* above and near the spring *m* by reducing the diameter of said post, and on the reduced body of the post a ratchet-wheel *n* is loosely mounted, resting upon said offset shoulder, as is clearly shown in Figs. 5 and 6.

The inner end of the helical spring *m* is attached to the ratchet-wheel *n*, and said spring is coiled in the same direction as is the lower helical spring *k*.

At one side of the master-wheel 14 a vertical counter-shaft 20 is journaled in the base-plate 11 and scaffold-plate 12.

A ratchet-wheel 21 is secured upon the upper extremity of the counter-shaft 20 and is normally meshed with the teeth of the ratchet-wheel *n*, but may be depressed to escape engagement therewith, as will be further explained.

As shown in Fig. 2, a detent-spring 21^a is secured by one end upon the scaffold-plate 12 and extends its free end toward the periphery of the wheel 21, so that its bent end may elastically engage the wheel between the two adjacent teeth thereon and serve to prevent an improper rotary movement of the counter-shaft 20.

On the body of the shaft 20 a toothed pinion 22 is secured at a point which will locate the pinion opposite the periphery of the disk *e* when the latter is elevated by pressure of the plate-spring *d*, and on the disk *e* is formed a single tooth *e'*, adapted to engage with the pinion 22 at every complete revolution of the disk. A radial flange 23 is affixed upon the counter-shaft 20 below the pinion 22, and said flange extends below the edge of the master-wheel 14. A coiled spring *o* on the counter-shaft 20 serves to press the flange 23 upwardly, and this pressure adapts the counter-shaft to be moved in unison with a reciprocal movement of the arbor 13.

On a ratchet-wheel *n* a plate *p* is secured by any suitable means, which plate is graduated, having spaced numerical indications equal in number to the teeth of said wheel.

Immediately above the dial-plate *p* a larger dial-plate *r* is stably supported in a plane parallel therewith, and the dial-plate *r* is graduated numerically to indicate an aggregate number equal to the teeth of the master-wheel 14. Preferably the graduations on the dial-plate *r* aggregate fifty points, that are each opposite a numeral of value, said numerals commencing at "0" and being arranged in consecutive groups of integers, each group increasing in value from "1" to "10," as shown in Fig. 1.

At a proper point within the circular row of graduations on the dial-plate *r* a sight-aperture *s* is formed therein, which aperture, being located immediately above the circular row of graduations on the rotatable dial *p*, serves to expose said graduations singly as they are brought in register with the sight-aperture by a rotatable movement of the dial *p*. Preferably the numerical values of the several graduations on the rotating dial *p* are made to increase in the ratio of fifty units to one graduation thereon—as, for example, from "0" or zero on the dial-plate *p* the graduations are represented sequentially by the integers "50," "100," "150," "200," and so on, to and including "1,000."

On the upper end of the hub *c* an index-hand *u* is secured, so as to be adapted to indicate the rotatable step-by-step movement of the master-wheel 14 and disk *e* when the latter is connected with the master-wheel, as already explained, the free end of the hand being near the circular row of graduations on the dial-plate *r*. A push-button 13^a is preferably formed or secured upon the upper end of the arbor 13 and affords means to conveniently depress the arbor when this is desired.

The relative positions of the parts of the register are such that the zero-point on the dial *p* will be exposed at the sight-aperture *s* when the index-hand *u* is opposite the zero-point on the units-wheel, this adjustment occurring when no registration is effected by the registering device. It is to be understood that the helical spring *m* is placed under tension when the parts of the device are adjusted to return the dial *p* to zero, and said dial is arrested by a radial finger *p'*, which contacts with a stud *p*², rising from the scaffold-plate 12, when the helical spring *m* has returned the dial *p* to the zero-point, as indicated in Fig. 2.

From the periphery of the washer-plate *i* on the hub *c* a toe *i'* is radially projected, and a catch-bar 24, which has one end pivoted upon the upper face of the base-plate 11, is furnished at its free end with a lip *v*, adapted to interlock with the toe *i'* when the latter is brought into such an engagement by a rotatable movement of the washer-plate. A slope *w* is formed on the inner edge of the catch-bar 24 near the lip *v*, and on the upper surface of the master-wheel 14, outside of the

periphery of the washer-plate, an abutment-stud *y* is erected, which is adapted to impinge upon the slope *w* when the master-wheel is moved in the direction of the curved arrow in Fig. 3. Upon the completion of a revolution of the disk *e* the catch-bar 24 is automatically released from the toe *i'*, and the spring *k* will uncoil one turn, a further relaxation of said spring being arrested by the contact of the toe with the stud *y*, as shown in Fig. 4, this provision being essential to prevent the spring *k* from becoming too tightly wound upon the hub *c*.

To illustrate the operation of the device, it may be assumed that the case 10 is secured by a bracket-arm 10^a upon an appropriate part of the type-writer frame or other support near said machine and that the lever 15 is pivoted upon one end of a depending link A, the opposite end of which is pivoted upon one end of a word-spacing bar B, forming a part of the type-writer machine, said link and bar being indicated by dotted lines in Fig. 1. The dials *p* and *r* being respectively at zero, a downward stroke on the spacing-bar B to space between a word that has been written and one that is to follow said written word will move the index-hand *u* one graduation in direction of the arrow *x* in Fig. 1, so as to locate the point of said index-hand opposite the numeral "1" on the units-dial *r*. The continued periodical depression of the lever 15 will result in a rotation of the arbor 13 and index-hand *u* around the circle of graduations. When the stud *y* by the rotary movement of the master-wheel 14 is caused to traverse the slope *w* on the catch-bar 24, the latter will be pressed outwardly thereby and thus disengage the lip *v* thereon from the toe *i'*, with which it has been interlocked to prevent uncoiling of the spring *k*. It is to be borne in mind that the disk *e* is a fixture on the elongated hub *c* and that the depending stud *f* on said disk is interlocked with the teeth of the master-wheel 14 while the act of registering successive movements of the lever 15 is being effected, so that the spring *k* will be wound upon the hub *c* as the hand *u* traverses the units-dial *r*. The close approach of the hand *u* to the zero-point on the dial *r* by a progressive rotary movement of the disk *e* causes the tooth *e'* of said disk to engage with the teeth of the pinion 22 and move the latter a distance equal to the width of one tooth on the upper ratchet-wheel 21. The engagement of the wheel 21 with the rotatable dial-wheel *n* will adapt the specified movement of said wheel 21 to shift the rotatable dial *p* one degree in direction of the arrow in Fig. 2. This will expose the first numerical indication "50" at the sight-hole *s* in dial *r*, this integer being a registered number of the complete cycle of degrees on the units-dial *r*, and the rotatable dial will be moved at the instant the hand *u* points to the zero-mark on the units-dial. It will be evident that a continuation of the reg-

istering operation may be effected until the "1,000" mark on the dial *p* is exposed at the sight-hole *s*.

An essential feature of novelty and merit possessed by our registering device consists in the provision of means for the return of working parts to set the indicators both at zero when this is desired. To effect such an adjustment of the register, it is only necessary to depress the arbor 13 by pressing upon the button 13^a at the top of said arbor. This downward movement of the arbor 13 will release the disk *e* from the master-wheel 14 as the latter is depressed with the arbor. Pressure of the master-wheel on the flange 23 downwardly moves the counter-shaft 20, and this will disengage the ratchet-wheel 21 from the dial-wheel *n*. The release of the hub *c* and dial *p* by the described means permits the springs *k* and *m* to uncoil and carry the hand *u*, as well as the dial *p*, back to zero.

It will furthermore be evident that a depression of the arbor 13 at any point in its rotatable movement will cause the return of the index-hand *u* to zero, so that if but a fraction of the cycle of graduations on the units-wheel *r* have been passed by the index-hand *u* and it is essential to start a new count the register may instantly be adjusted for such a purpose.

In Fig. 7 a modified means for actuating the master-wheel 14 and holding it as it is periodically moved is shown. This comprises a bent arm 15^a, projected from the inner end of the lever 15 near its fulcrum-post *a*, the free end of said arm being designed to contact with the teeth of the master-wheel 14 and serve as a detent to momentarily prevent a retrograde movement of the master-wheel or until the other detent-arm 17 is positively engaged with the teeth of said master-wheel, the frictional impinge of the arm 15^a serving to check a rotatable movement of the wheel 14 in excess of one tooth thereon when the wheel is moved suddenly by a quick vibration of the lever 15 and the dog 16.

The improved register is adapted for use to indicate the paging of a book or the rotations of bicycle-wheels for the computation of the miles run; but the preferred use of the device is for indicating the words printed by a type-writing machine.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. A registering device, comprising a cumulative indicating mechanism including a spring acting to turn the same back to zero, operating mechanism connected thereto acting against said spring, and means by which said connection may be broken at will, permitting the spring to return the registering mechanism to zero, substantially as described.

2. A registering device, comprising a cumulative indicating mechanism including a spring acting to turn the same back to zero, operating mechanism therefor acting against

said spring, and a shaft connecting the operating and registering mechanisms and movable longitudinally to make or break said connections, substantially as described.

3. A registering device, comprising a cumulative indicating mechanism including a spring acting to turn the same back to zero, actuating mechanism therefor, connections between the actuating and registering mechanisms comprising a shaft movable longitudinally to make or break said connections, and a spring acting thereon to maintain said connection, substantially as described.

4. A registering device, comprising a case, a stationary units-dial therein, a rotatable dial below and near the units-dial, an upright arbor adapted for rotation and depression, an index-hand on the arbor indicating on the units-dial, said dial having a sight-hole therein through which graduations on the rotatable dial will appear, a reversing-spring for the arbor, means to move the arbor step by step, means periodically actuated by the arbor to rotatably move the dial one degree and expose an indication through the sight-hole, a reversing-spring for the rotatable dial, both springs, being coiled when the dials are advanced and released to reverse the movement of the arbor and dials when the arbor is depressed, substantially as described.

5. In a registering device, the combination with a case, a stationary units-dial therein having a sight-hole, an upright rotatable arbor which is spring-supported and adapted for depression, a hand on the arbor indicating on the units-dial, a rotatable dial below and near to the units-dial, an actuating-lever pivoted to swing on the bottom of the case and projecting therefrom, a toothed master-wheel on the arbor, a spring-pressed dog on the lever adapted to give a step-by-step rotary motion to the master-wheel when the lever is vibrated, and mechanism adapted to connect the rotatable dial with the arbor for movement of said dial one degree to expose an indication thereon at the sight-hole, when the arbor and hand have completed a revolution, substantially as described.

6. A registering device, comprising a stationary dial having a sight-hole therethrough, and a rotatable dial beneath having characters visible through said hole, an arbor central of said dials, an index-hand or pointer on said arbor, reversing-springs for said arbor and rotatable dial, rotative connections between the same, step-by-step actuating means connected to the arbor and acting to wind the reversing-springs, and means for breaking said connections at will, substantially as described.

7. A registering mechanism, comprising a stationary dial, having a sight-hole therethrough and a rotatable dial beneath having characters visible through said hole, an arbor central of the fixed dial mounted to rotate and to be depressed, a spring normally holding the same outward, an index-hand or pointer

on said arbor, reversing-springs for said arbor and rotatable disk, rotative connections between the same, step-by-step actuating means connected to the arbor and acting to

5 wind the reversing-springs, and means actuated by the depression of the arbor to break the operating connection and to permit the registering mechanism to return to zero, substantially as described.

10 8. In a device of the character described, the combination with the spring-actuated washer-plate, having a radial toe, of the spring-pressed pivoted catch-bar, having a lip on the free end adapted to interlock with the

15 toe to prevent a retrograde movement of the washer-plate while receiving a single rotation, and a stud on a disk moved toward the toe of the washer-plate which by enforced contact with the catch-bar is adapted to release the washer-plate, for a single reverse

20 rotary movement which is arrested by contact of the toe with the stud, substantially as described.

9. In a device of the character described, the combination with the case, and an elongated upright hub rotatably supported in said case, of an arbor rotatable in the hub, means to rotate said arbor step by step, a coiled spring on the hub, having one end attached thereto and the other end secured on

30 the washer-plate, and a device adapted to hold said spring while coiling during a single rotation of the arbor, and releasing the spring on completion of said rotation so that it may recoil to assume normal tension, substantially as described.

10. In a device of the character described, the combination with a case, an upright rotatable arbor, an elongated hub incasing the arbor and held to rotate in the case, a disk fast on the hub, a washer-plate having a radial toe and secured upon said hub above the disk, a coiled spring held by its ends on the hub and plate, means to give the arbor step-

45 by-step rotary motion, and means to releasably hold said arbor from retrograde movement, of a bar pivoted on the case and having a catch-lip on its free end, a spring pressing the catch-lip toward the washer-plate to engage it with the toe on said plate, and a stud on the disk, that contacts with the catch-bar, and releases the toe for a single retrograde movement of the spring and washer-

55 substantially as described.

11. In a device of the character described, the combination with a case, an upright rotatable arbor therein, a scaffold-plate having an upright sleeve and fixed in the case above its base, an elongated hub loose in the sleeve, 60 a master-wheel fast on the arbor below said sleeve, a lever adapted to give the master-wheel a step-by-step rotatable movement, a washer-plate spaced from and above the disk, said washer-plate having a radial toe, and a 65 spring coiled upon the hub between the disk and washer-plate, having one end secured upon the hub and the other end fixed upon said plate, of a catch-bar pivoted on the case and spring-pressed toward the washer-plate, 70 said bar having a lip on its free end that interlocks with the toe of the washer-plate, holding the disk and coiled spring from recession, and a stud on the disk adapted to release the catch-bar from the toe of the washer-

75 plate, when said stud impinges upon a sloped edge of the catch-bar, substantially as described.

12. A registering device, comprising a cumulative indicating mechanism including a spring acting to turn the same back to zero, actuating mechanism therefor, connections between the actuating and indicating mechanisms comprising a shaft or arbor movable longitudinally to make and break said con-

85 nections, a push-button upon the outer end of said arbor, and a spring acting thereon to normally hold the arbor outward and to maintain said connections, substantially as described.

13. In a device of the character described, the combination with registering-gearing in a case, adapted to indicate on a units-dial and a rotatable dial, said mechanism being returned by springs to zero by depression of a supported upright arbor that is the axis for the registering-dials, of a counter-shaft, spring-supported and parallel with the arbor, gearing on the counter-shaft which moves the rotatable dial and holds it from recession, 100 said shaft being depressed to release the rotatable dial for reversion thereof when the arbor is pushed downwardly, substantially as described.

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Witnesses:

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