

(Model.)

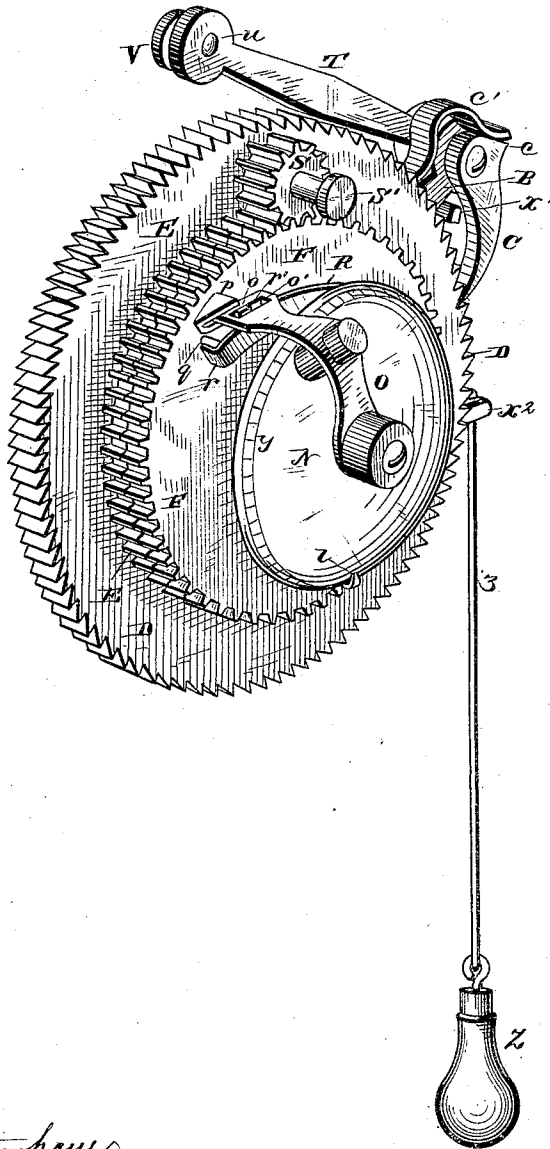
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S. F. PAYNE.
REGISTER AND ALARM.

No. 247,577.

Patented Sept. 27, 1881.

Fig. 1



WITNESSES

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(Model.)

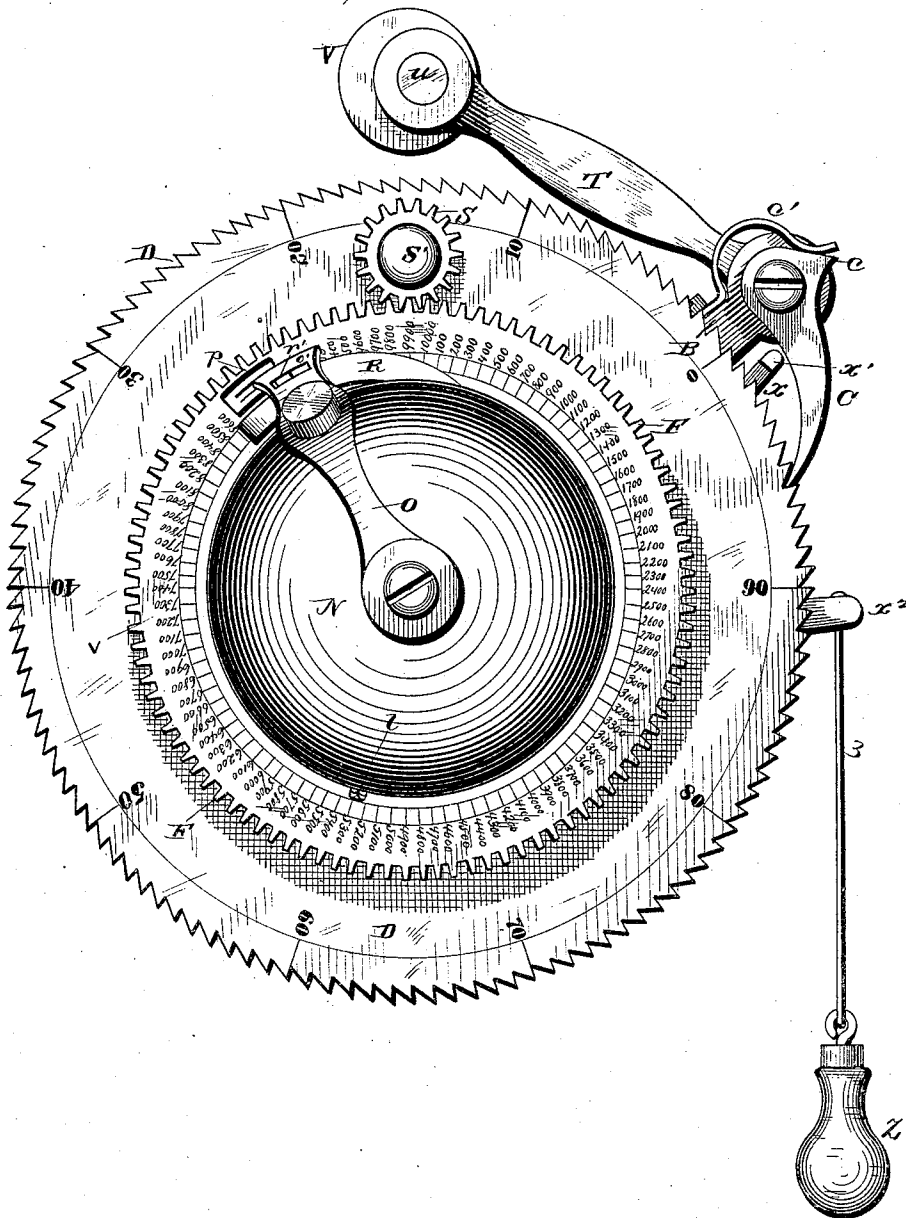
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FIG. 2.



WITNESSES

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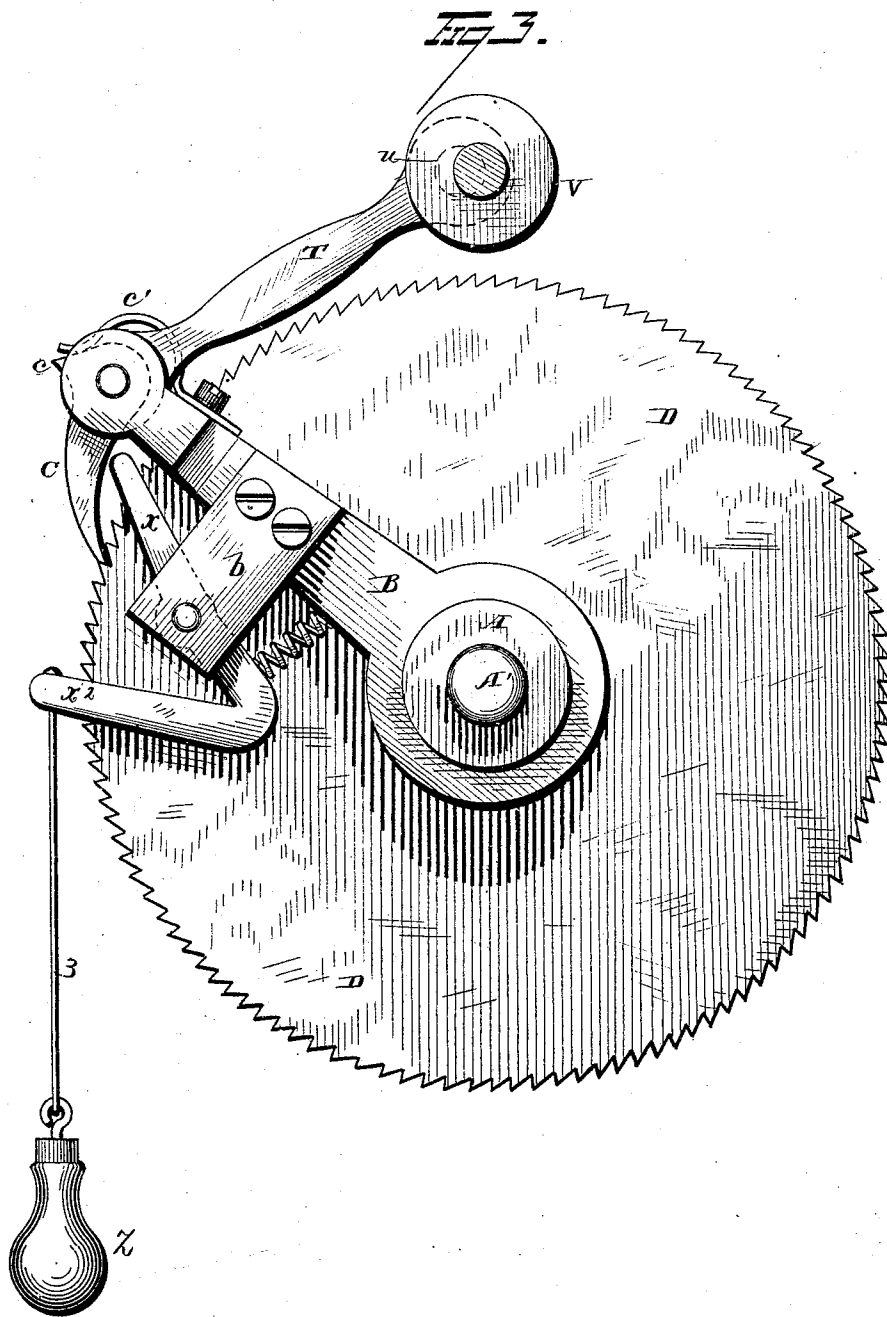
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WITNESSES

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(Model.)

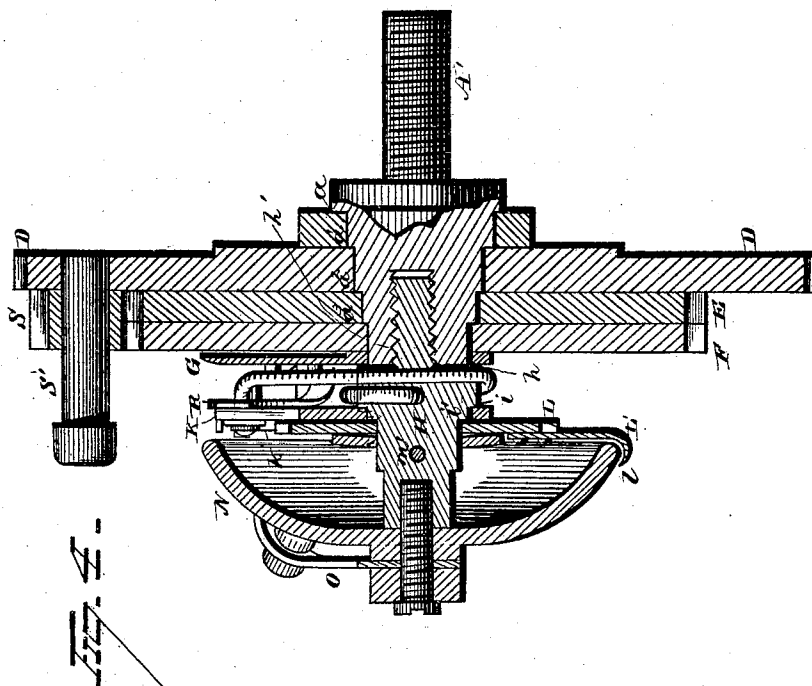
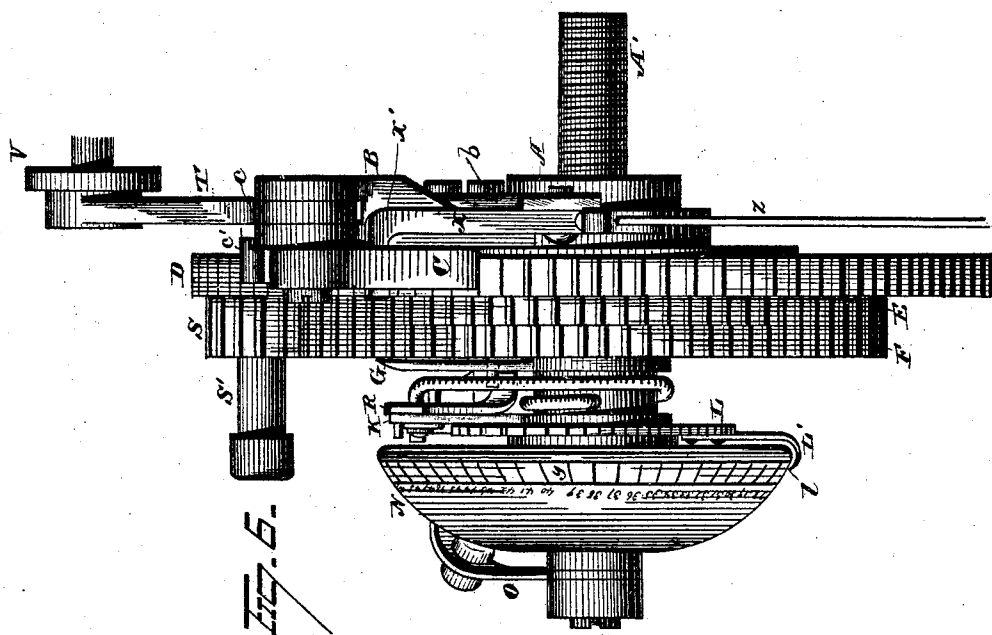
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S. F. PAYNE.

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No. 247,577.

Patented Sept. 27, 1881.



WITNESSES

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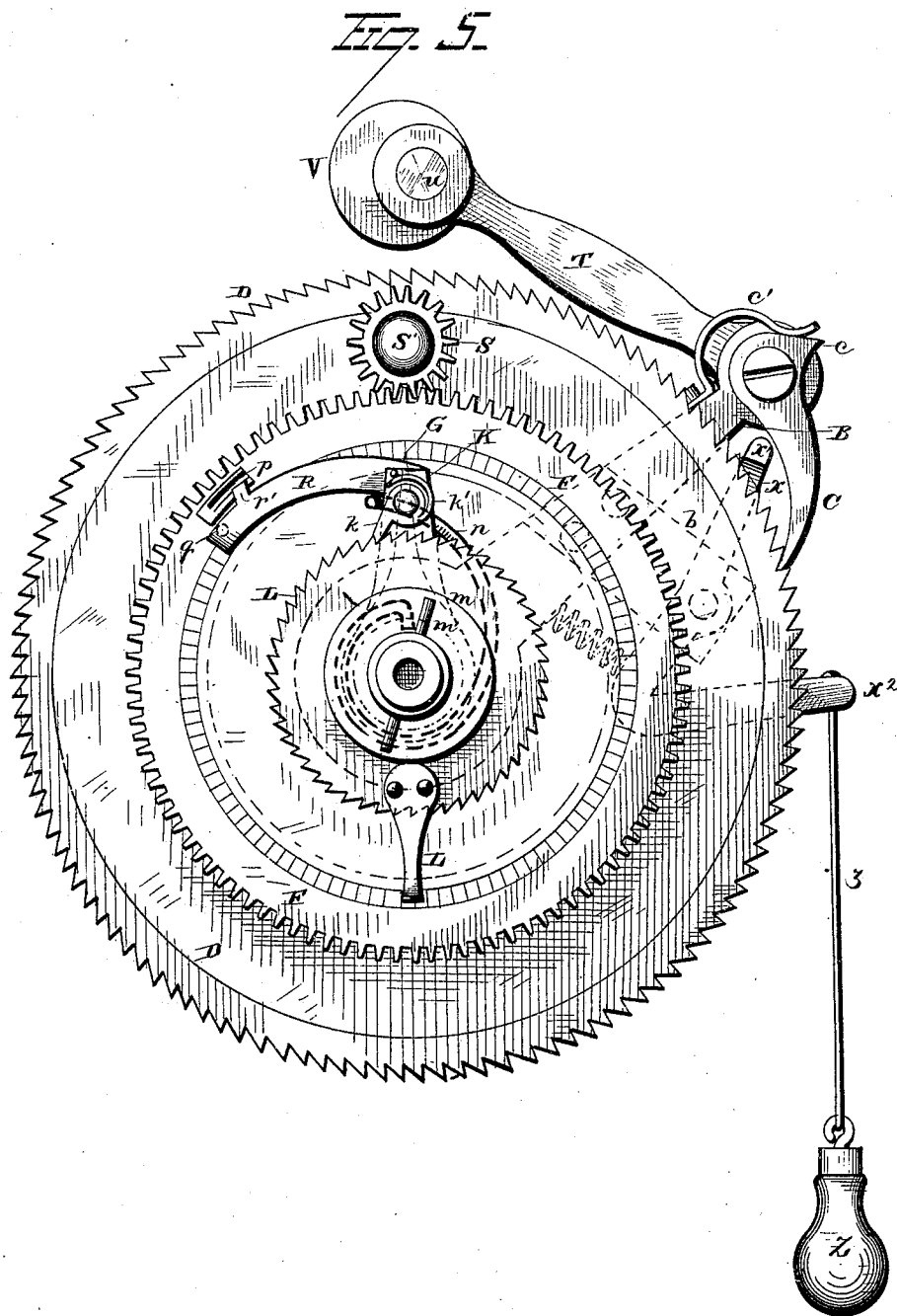
(Model.)

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S. F. PAYNE.
REGISTER AND ALARM.

No. 247,577.

Patented Sept. 27, 1881.



WITNESSES

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UNITED STATES PATENT OFFICE.

SHELDEN F. PAYNE, OF GENEVA, OHIO, ASSIGNOR TO HIMSELF AND
ELIHU L. PERKINS, OF SAME PLACE.

REGISTER AND ALARM.

SPECIFICATION forming part of Letters Patent No. 247,577, dated September 27, 1881.

Application filed October 25, 1880. (Model.)

To all whom it may concern:

Be it known that I, SHELDEN F. PAYNE, a citizen of the United States, residing at the village of Geneva, in the county of Ashtabula and State of Ohio, have invented a new and useful Counting-Machine, of which the following is a specification.

My invention relates to that class of counting and registering devices which are used for indicating the number of revolutions or movements made by shafts or other parts of machinery, its objects being to combine in compact form readily applied to use a series of multiplying counting devices arranged to present conspicuously to view the numeration for a high registration; to give notice of the completion of any predetermined number of revolutions or movements; to enable the counting to be commenced and suspended at will, and the devices to be adjusted to commence registering afresh at any time from any desired point.

My invention consists in certain novel combinations and arrangements of multiplying wheels, trips, and an alarm, which will be hereinafter fully described, and pointed out in the claims.

Figure 1 is a view in perspective of the counter and register. Fig. 2 is a view in front elevation. Fig. 3 is a view in rear elevation. Fig. 4 is a vertical section. Fig. 5 is a front view with the bell removed, its position being indicated by dotted lines; and Fig. 6 is a view in side elevation.

The letter A designates the main supporting-stud, having a series of shoulders, a , a' , a^2 , a^3 , and provided with a screw-shank, A' , by means of which and a suitable nut it may be secured in position. Pivoted upon this supporting-stud, against its shoulder a , is an arm, B, having pivoted to its outer end a pawl, C, the free end of which is arranged to engage the teeth of a ratchet-wheel, D, which is mounted loosely upon the supporting-stud against its shoulder a' . From the pivoted end of the pawl a spur, c , projects outwardly, and has both of its edges inclined to the tip. A spring, c' , fixed to the arm B, bears upon this spur to hold the pawl in position of engagement or disengagement, as will be explained hereinafter.

Immediately in front of the ratchet-wheel D a toothed wheel, E, of considerably less diameter than the ratchet-wheel, is immovably secured upon the stud against its shoulder a^2 , and immediately in front of this wheel another toothed wheel, F, of equal diameter, is loosely mounted upon the stud against its shoulder a^3 .

Upon the front end of the supporting-stud is rigidly secured a pointer, G, which extends radially in front of the wheel F, and the office of which will presently be explained. This pointer is held in position by being clamped between the end of the stud A and the shoulder h of a pillar, H, the screw-shank h' of which is screwed into the stud A.

The pillar H has formed upon it the shoulders i and i' , and pivoted upon said pillar, against its shoulder i , is an arm, K, having pivoted at its outer end a pawl, k , the free toothed end of which is, by means of a spring, k' , held in engagement with the teeth of a ratchet-wheel, L, of considerably less diameter than the wheel F, and loosely mounted upon the pillar H against its shoulder i' , said wheel L being retained in position by means of a spring-washer, m , and a pin, m' , passing through the pillar.

To the outer face of the ratchet-wheel L is rigidly secured an arm, L' , which extends radially beyond the periphery of a bell, N, which is fixed centrally upon the outer end of the pillar H, and said arm is pointed, as shown at l , and curved outwardly across the margin of the bell, for a purpose which will presently appear. To the center of the outer surface of the bell is fixed a flat arm, O, which is elastic flatwise, but not edgewise, and extends radially somewhat beyond the periphery of the bell, and is then bent inwardly toward the wheel F, its inner end edge being beveled, as shown at o , and coming in the path of a beveled lug, p , projecting from the face of said wheel F. Said arm O carries on its inner face a hammer, O' , arranged to strike the bell. Just a little inwardly from the lower edge of the lug p a pin, q , projects from the wheel F, and is arranged to strike the inwardly-bent tip r of a spring-arm, R, which projects to the left from the outer end of the arm K, heretofore referred to. From the outer edge of this arm R projects a lug, i , which extends through a slot, o' ,

formed transversely in the arm O near its beveled end.

A pinion, S, having its teeth arranged to mesh with the teeth of both the wheels E and F, is mounted loosely upon a pin, S', projecting from the margin of the ratchet-wheel D, the pin being long enough to permit the pinion to be shifted axially out of engagement with said wheels.

To the outer end of the arm B there is pivoted one end of a link or pitman, T, the other end of which is shown in the present instance as pivoted upon a crank-pin, u, projecting from the end of a shaft, U. This end of the pitman may, however, terminate in a strap embracing an eccentric, or may be connected to a reciprocating part or device, the movements of which are to be counted, the office of the pitman being to transmit such a vibratory motion to the arm B as will cause the pawl C to move the ratchet-wheel D step by step the space of one or more of its teeth.

The apparatus may be supported in any suitable manner or position which the circumstances of its use will suggest, in order that suitable connection may be made to the part the movements of which are to be counted.

The ratchet-wheel D may have any number of teeth; but for illustration we will suppose it to have one hundred. These teeth are numbered, as shown on the front margin of the wheel, from 1 to 100, the numbers running from right to left. If the crank-pin u has a throw to transmit through pitman T to the arm B such a movement as to cause pawl C to move the ratchet-wheel one tooth at each revolution of the shaft, then the number on the ratchet-wheel opposite the pointer G will indicate how many revolutions the shaft has made up to one hundred, starting from the tooth in advance of number 1, which tooth serves as zero at the commencement. The multiplication of revolutions of wheel D must, however, be registered in order to indicate the number of revolutions of the shaft above one hundred. This registration is accomplished by means of the wheels E and F.

The wheel E has a number of teeth one in excess of the number of teeth on wheel F. We will suppose the wheel E to have one hundred and one teeth and the wheel F one hundred. The teeth of the latter are slightly farther apart than those of the former, the difference being the one-hundredth part of the space between two teeth of wheel F, and not sufficient to prevent the teeth of the pinion S from meshing with the teeth of both wheels as it revolves. The pinion has a planetary motion, being carried around the fixed wheel E by the ratchet-wheel, and its engagement with the teeth of said wheel causes it to be rotated on pin S'. In this rotation the teeth of the pinion move the teeth of the loose wheel F successively slightly forward or to the left, each of said teeth being thus brought into line with a tooth of wheel E, which is simultaneously engaged by a tooth of

the pinion, the sum of the advance movements of all the teeth of wheel F in a complete orbital revolution of the pinion being equal to the space between two teeth. On the margin of the wheel F is inscribed a scale, v, the graduating-marks of which are the same distance apart as the teeth of said wheel, and are numbered from left to right from 100 to 10,000, in an arithmetical series, having the first number as its common difference. Coincident with 10,000 is also zero, (0.) It has been shown that the wheel F, during one revolution of wheel D, moves to the left on its axis a distance equal to the space between two of its teeth, so that, starting with the pointer G at zero of both wheels, at the completion of the revolution of wheel D, the pointer will indicate 100 on wheel F—that is, that one hundred revolutions of shaft V have been made, and so a complete revolution of wheel F bringing the 10,000 opposite the pointer. The capacity of the apparatus for counting is not limited to this number, however, for near the completion of a revolution of wheel F the pin q strikes the inwardly-bent tip r of the spring-arm R, and by means of said arm moves to the left the arm K, the pawl k of which moves also the ratchet-wheel L, causing the pointer l to traverse a portion of the margin of the bell, its movement being limited to the distance between two of the marks of a scale, y, inscribed on the margin of the bell, and numbered from right to left from 1 to 50, or zero. When the pointer l has moved one space the tip r of arm R is released from the pin q by the spring-arm O, the beveled end edge of which strikes the beveled face of lug p at the same time that pin q strikes the tip r, and the arm O is thus forced outwardly as its said beveled edge rides over the lug, drawing with it the arm R by means of the lug r', which projects from said arm through the slot o'. The height of the beveled lug p is sufficient to throw the arm O outward far enough to disengage the tip r from the pin q, and its length is just sufficient to permit said tip to remain in engagement with the pin long enough to cause the pointer l to be moved one space over the scale of the bell. When the tip r is released the arm K is retracted by a spring, w, one end of which is secured to the pillar H, while the other bears against the arm in proper direction. When the lug p leaves the beveled edge of the arm O said arm flies inwardly and its hammer O' sounds the bell, announcing the completion of a revolution of wheel F.

Each graduation of the bell-scale, it will be seen, represents ten thousand revolutions of shaft V, and therefore, should the pointer l indicate 2 on the bell, the pointer G 500 on the scale of wheel F, and 90 on the margin of wheel D, the number of revolutions of the shaft V would be indicated and registered as 20,590, and so, by regarding the number indicated by pointer l as the exponent of a multiple of ten thousand by it, and adding to this the numbers indicated by pointer G on wheels F and

D, the number of revolutions made by the shaft can at any time be read.

When it is desired to commence counting and registering afresh and cause the pointers to indicate zero (0) on all the scales, throw up the pawl C so that the spring C' will catch on the opposite side of the spur and turn said wheel with the hand. Shift the pinion S outwardly on pin S', out of engagement with the wheels E and F, and the latter wheel may be turned freely, and as the ratchet-wheel L, which carries arm L' and pointer l, is held only by the friction of the spring-washer m against movement to the left, the pointer l, by a little force, may be moved around to the left to zero. The pawl and pinion being then replaced, the apparatus is ready to begin work. The parts may, of course, in the same way be adjusted to any desired point.

If it should be desired to announce by the bell the completion of any given number of revolutions or movements, the wheel F may be adjusted with the beveled lug p at the proper distance, counting on the scale v from the beveled edge of arm O, to cause it to pass under and leave said edge as the desired number is completed, and so cause the hammer to strike the bell. Provision is made for suspending the operation of the apparatus by pivoting to a projection, b, of the arm B a bent lever, X, one of the arms x of which has a finger, x', projecting from its upper end under the pawl C, while the other arm x extends outwardly, and has connected to it a pendent cord or wire, z, having a handle, Z, attached thereto, by which the lever may be operated to cause the finger x' to throw the pawl up out of engagement with the teeth of the ratchet-wheel D.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a counting and registering apparatus, the combination, with the ratchet-wheel D, fixed gear-wheel E, and loose gear-wheel F, said wheels and their motive devices and adjuncts being constructed and arranged substantially as described, of the ratchet-wheel L, suitable tripping devices for transmitting motion to said ratchet-wheel at the completion of a revolution of said wheel F, the graduated bell arranged in front of said ratchet-wheel L, a pointer operated by said wheel to traverse the scale of said bell, and a suitable trip to cause the ringing of said bell at a predetermined stage of the operation of the apparatus, essentially as set forth.

2. The combination, with the rotary counting-wheel F, having the beveled lug p and pin q, the ratchet-wheel L, carrying pointer l, the spring-retracted arm K, carrying the pawl in engagement with the teeth of said ratchet-wheel, and spring-arm R, having the bent tip r in the path of said pin q, of the graduated bell N, arranged in front of said wheels, the spring hammer-arm O, having its beveled free end in the path of said beveled lug, and provided with a slot engaging a lug projecting from the spring-arm R, and a suitable motive device for wheel F, substantially as set forth.

3. The combination of the counting ratchet-wheel D, the counting-wheel F, the graduated bell N, the movable pointer l and fixed pointer G, and the intermediate connecting and motive devices, substantially as described, the said pointer l and the counting-wheels being adjustable to any desired point of indication, and the scales of said bell and wheels being concentric and exposed to view, as specified.

SHELDEN F. PAYNE.

Witnesses:

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JOSEPH S. BENNETT.