(No Model.) 2 Sheets—Sheet 1.

S. T. BACON.

COUNTING MACHINE OR REGISTER.

No. 419,100. Patented Jan. 7, 1890.

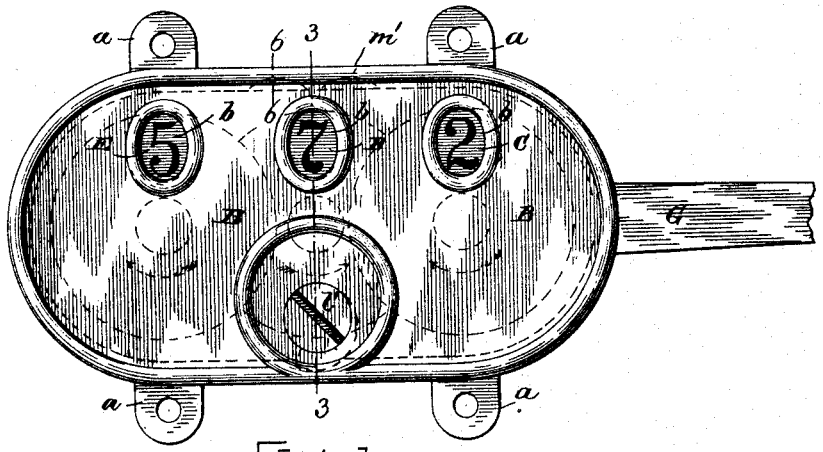

Fig. 1.

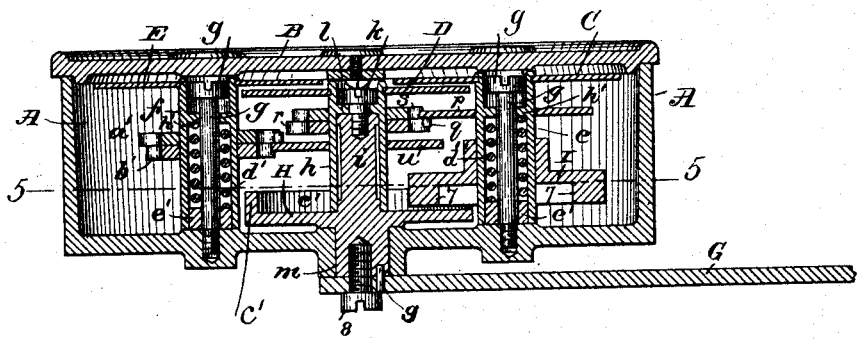

Fig. 2.

WITNESSES.

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Harry W. Aiken

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(No Model.) 2 Sheets—Sheet 2.

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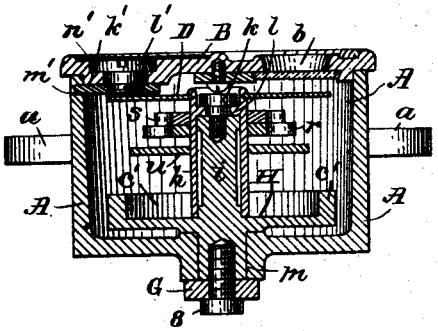

Fig. 3.

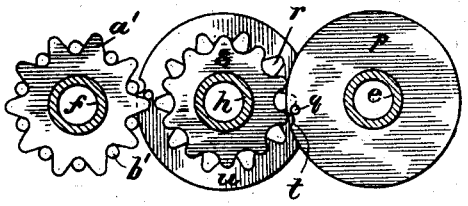

Fig. 4.

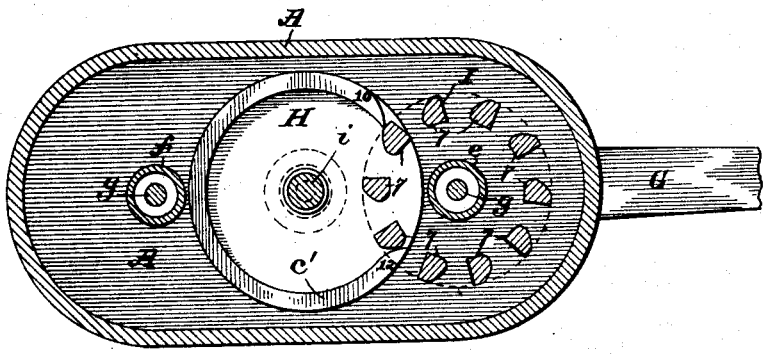

Fig. 5.

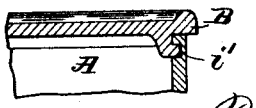

Fig. 6.

Witnesses.
R. Henry Marsh.
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UNITED STATES PATENT OFFICE.

STEUBEN T. BACON, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-FOURTH TO JOHN C. CROSMAN, OF SAME PLACE.

COUNTING MACHINE OR REGISTER.

SPECIFICATION forming part of Letters Patent No. 419,100, dated January 7, 1890.

Application filed July 31, 1889. Serial No. 319,327. (No model.)

To all whom it may concern:

Be it known that I, STEUBEN T. BACON, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Counting Machines or Registers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a front elevation of a counting-register embodying my invention. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is a transverse vertical section on the line 3 3 of Fig. 1. Fig. 4 is a plan view of the actuating and locking wheels by which motion is transmitted from the shaft of one counting-wheel to that of the next. Fig. 5 is a horizontal section on the line 5 5 of Fig. 2, illustrating the escapement by which motion is communicated to the counting-wheels from the driving-lever. Fig. 6 is a sectional detail on the line 6 6 of Fig. 1.

My invention has for its object to provide a compact counting machine or register of simple construction, in which the counting-wheels can be readily disconnected from each other and set back to zero, after having registered any desired number, without disorganizing the machine; and my invention also has for its object to enable the rocking lever which actuates the counting-wheels to be attached to the register at any desired angle, thus facilitating its connection with the machine the motions of which are to be counted, and enabling the register to be applied to a machine in any desired position which may be found convenient.

To this end my invention consists in certain novel features and combinations of parts, as hereinafter set forth and specifically claimed.

In the said drawings, A represents the casing of the register, which is provided with suitable lugs *a*, for convenience of attachment to the machine to which it is to be applied, said casing being also provided with a cover B, having glass-covered apertures *b*, through which the numbers on the faces of the counting-wheels C D E are exposed to view. Each of these counting-wheels bears on its face the numbers 0 to 9, and is immovably secured to one end of a tubular shaft or sleeve. The shaft *e* of the units-wheel C and that *f* of the hundreds-wheel E are each supported by and rotate upon a screw *g*, the lower end of which fits a threaded aperture in the bottom of the casing A, as seen in Fig. 2. The tubular shaft *h* of the tens-wheel D is supported by and rotates upon and independently of the spindle *i*, upon which it is held in place by a screw *k*, the head of which bears upon a flange *l*, formed within the upper end of the shaft *h*. The opposite end of the spindle *i* passes through an aperture *m* in the bottom of the casing A, which forms a bearing therefor, and to this end of the spindle *i* is securely attached, by means of a screw 8 and a pin 9, the driving arm or lever G, which is adapted to be connected with any suitable portion of the machine the motions of which it is desired to count.

The shafts of the counting-wheels C D E are connected together so that rotary motion will be transmitted from one to the other by means of a disk *p* on the shaft *e* of the units-wheel C, which is provided with a single pin *q* located near its periphery, which at each complete revolution of the disk *p*, impinges on one of the teeth of a star-wheel *r* on the shaft *h* of the tens-wheel D, and thus moves the said wheel D a sufficient distance to expose the next number on its face to view through the aperture *b* thereover in the cover B, after which it is locked in position by a star-wheel *s*, also secured to the shaft *h*, two consecutive teeth of which bear upon the periphery of the locking-disk *p*, whereby the wheel *s* is prevented from rotating until one of its teeth enters the notch *t* in the disk *p*, which notch is brought around into position to permit of this movement at the same time that the pin *q* is acting upon a tooth of the star-wheel *r*. The shaft *h* is also provided with a disk *u* similar to the disk *p*, which cooperates with two star-wheels *a'* *b'* on the shaft *f* of the hundreds-wheel E, the parts being constructed and arranged to transmit mo-

tion from the shaft h to the shaft f in the same manner as motion is transmitted from the shaft e to the shaft h, so that at each complete rotation of the wheel D the wheel E will be moved a distance equal to that between two consecutive numbers on its face. When a series of more than three counting-wheels is employed, similar mechanism is used to transmit motion from one shaft to the next throughout the entire series.

The above-described mechanism for connecting the shafts of the counting-wheels forms no part of this invention, as it is substantially the same as is commonly employed in machines of this description, and any other suitable mechanism may be used for this purpose, if preferred. The spindle i carries inside the casing A a pallet-wheel H, having a concentric rim or flange c' at right angles to its face, said flange extending around the greater portion of the periphery of the wheel, and having its two ends brought to an edge, as seen in Fig. 5, forming pallets 10 12, which are adapted to engage with the inclined teeth 7 of an escapement-wheel I, secured to the shaft e of the units-wheel C, and impart an intermittent rotary motion thereto, and thus as the spindle i is rocked within and independently of the shaft h which surrounds it, by the vibrations of the lever G, the units-wheel is intermittingly rotated, as desired. After either of the pallets 10 12 has passed between any two of the inclined teeth 7 of the escapement-wheel I, it is obvious that its motion can be continued still farther on account of the concentricity of the flange c' without in any way affecting the operation of the mechanism, which is a great advantage, as it is immaterial whether the driving-arm G has a greater or less range of motion as long as it has sufficient to actuate the escapement-wheel, and consequently much of the trouble and inconvenience hitherto experienced in connecting the driving-lever, so that it might have a certain predetermined range of motion, is avoided.

By the employment of an escapement constructed as above described I am enabled to connect the driving-lever G at a point immediately under the tens-wheel, whereby the machine is rendered more compact; and, furthermore, the lever G may be swung around the spindle i as a center, and then securely fastened thereto in such manner as to project in any desired direction in a plane parallel with the side of the casing, thereby facilitating its connection with the machine the motions of which are to be counted, and enabling the register to be located in any desired position where it may be found most convenient to attach it; and when a register is employed having only three counting-wheels, as shown, it will be obvious that as the driving-lever G is attached at the center of the side of the casing A it will be of uniform length, without regard to the direction in which it projects.

Within each of the tubular shafts e f is placed a spiral spring d', which encircles the screw g and takes a bearing at the bottom on a washer e', fitted within the bottom of the hollow shaft, the upper end of this spring bearing against a shoulder formed by a flange h' on the interior of the shaft and exerting an upward pressure thereon, which tends to raise or move the shaft in the direction of its length until the flange h' is brought into contact with the head of the screw g, which forms a stop, and is normally located at a short distance above the flange h' in order to permit this movement of the tubular shaft, and when the shafts are in this position their connecting-wheels are thrown out of gear and the counting-wheels are free to rotate in either direction, so that they can be readily set back to zero without disorganizing the machine, which will be found a great convenience in many cases, as it will obviate the necessity of making calculations, thus insuring a more correct register of the work performed by the machine to which the counter is applied. When the cover B is in place, its under surface bears against the upper ends of the shafts e f and holds them down, as seen in Fig. 2, against the resistance of the springs d', in which position the connecting-wheels of the said shafts are in gear and adapted to transmit motion from one to the other, as described; but the instant the cover is removed the springs d' will raise the shafts ef, and thus automatically disconnect the three counting-wheels, leaving them free to be set back to zero, as desired. I do not, however, wish to confine myself to the employment of these springs, as they may be dispensed with, if desired, in which case it will merely be necessary after the cover is removed to lift the counting-wheels C and E with the fingers in order to disconnect their shafts.

Instead of making the two tubular shafts e f movable in the direction of their length, it is obvious that the central shaft may be made movable in a similar manner with respect to the shafts e f, in which case the tens-wheel D would be placed outside or above the units and hundreds wheels C E, to allow of its being raised when the counting-wheels are to be disconnected from each other for the purpose of being set back to zero.

The cover B is provided on one side with one or more lugs or projections i', which enter corresponding recesses on the inside of the casing A, as seen in Fig. 6, and on the opposite side of the cover is a cam-shaped catch k', provided with a notched head l' sunk flush with the cover B, as seen in Fig. 3, said head being adapted to be turned by a screw-driver, whereby the cam-catch k' is caused to enter a recess or notch m' on the inside of the casing A, thus locking the cover B securely in place, and over the head l' may be placed a seat n', as seen in Fig. 3, bearing any desired signature or symbol which will prevent the cover B from being removed by

any unauthorized person without the knowledge of the proprietor or person having the machine in charge.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a counting-machine, a counting-wheel mounted upon a tubular shaft supported upon a pin or screw *g*, and provided on the inside with a flange *h'*, located a short distance below the head of the pin or screw when said counting-wheel is connected with the adjacent counting-wheel, said shaft being adapted to slide in the direction of its length upon said screw, the head of which forms a stop to limit said movement by contact with the flange *h'*, substantially as and for the purpose described.

2. In a counting-machine, a counting-wheel mounted upon a tubular shaft supported upon a pin or screw *g*, and provided on the inside with a flange *h'*, located a short distance below the head of the pin or screw when said counting-wheel is connected with the adjacent counting-wheel, said shaft being adapted to slide in the direction of its length upon said screw, the head of which forms a stop to limit said movement by contact with the flange *h'*, in combination with the cover of the casing, adapted when secured in place to bear upon the end of the tubular shaft of said counting-wheel, substantially as and for the purpose set forth.

3. In a counting-machine, a counting-wheel mounted upon a sleeve or shaft movable in the direction of its length, and having a spring adapted to raise it and thereby automatically disconnect said counting-wheel from the adjacent counting-wheel, in combination with the cover of the casing adapted when secured in place to hold the sliding shaft of the counting-wheel down against the resistance of said spring, whereby when the cover is removed the spring will automatically disconnect said counting-wheels to enable them to be rotated independently of each other, substantially as set forth.

4. In a counting-machine, the combination, with the counting-wheels and their connected shafts, of the rocking spindle *i*, forming a support or bearing for the shaft of the tens-wheel, the pallet-wheel H, secured to the rocking spindle *i* and provided with pallets 10 12, the escapement-wheel I, actuated by said pallets, and the driving arm or lever G, attached to the spindle *i* outside the casing, whereby the movement of the lever G is first transmitted to the spindle *i* and thence communicated through the escapement to the shaft of the units-wheel, substantially as set forth.

5. In a counting-machine, the combination of the counting-wheels C D E and their connected shafts, the escapement, the rocking spindle *i*, forming a support or bearing for the shaft of the tens-wheel D and adapted to actuate by means of the escapement the units-wheel C, and the driving arm or lever G, attached to the spindle *i* at a point beneath the tens-wheel and adapted to be swung around to project in any desired direction, substantially as and for the purpose set forth.

6. In a counting-machine, the combination, with the counting-wheels and their connected shafts, of the rocking driving arm or lever G and the escapement connected therewith, consisting of the escapement-wheel I, and the pallet-wheel H, connected with the driving arm or lever G and provided with pallets 10 12, formed by the ends of the concentric flange *c'*, said pallets passing between the teeth of the escapement-wheel and operating with a variable range of motion of the rocking lever G, substantially in the manner and for the purpose described.

7. In a counting-machine, the combination of the lever G with its spindle *i*, and the tens-wheel D, mounted upon a tubular shaft rotating upon said spindle *i*, the units and hundreds wheels C E, mounted upon tubular shafts *e f*, provided on the inside with flanges *h'* and rotating upon screws *g*, said shafts being adapted to move or slide in the direction of their length upon said screws *g*, the heads of which form stops to limit said movement, the springs *d'*, placed within the tubular shafts *e f* and adapted to move and disconnect the same, the cover B, adapted to bear upon the ends of said tubular shafts *e f* and hold them down in their proper operative positions, and the escapement whereby motion is transmitted from the spindle *i* to the shaft of the units-wheel C, all operating substantially in the manner and for the purpose set forth.

Witness my hand this 29th day of July, A. D. 1889.

STEUBEN T. BACON.

In presence of—
P. E. TESCHEMACHER,
HARRY W. AIKEN.