J. A. Bazin,

Making and Operating Numbering Machines,

No. 16,323, Patented Dec. 23, 1856

Fig 18

Fig. 1.

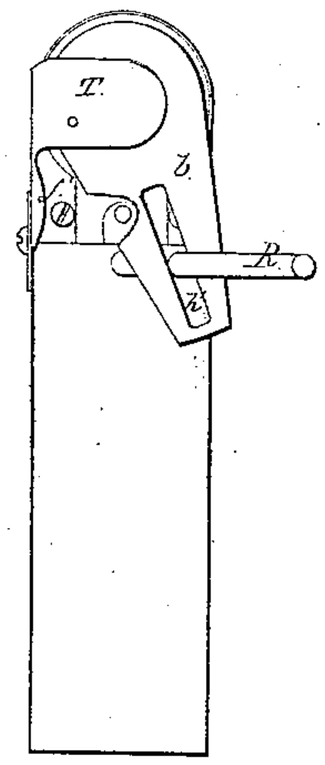
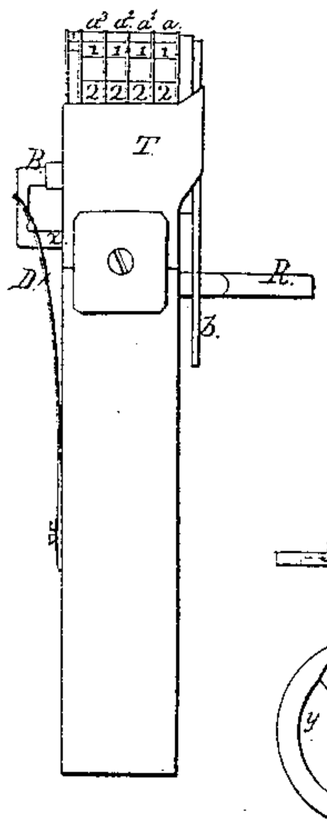


Fig. 2.



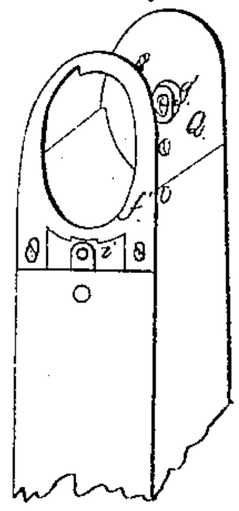
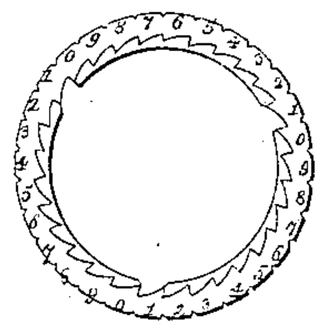


Fig. 19.



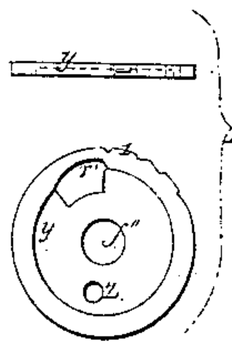


Fig 16.

Fig. 3.

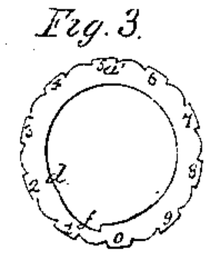


Fig. 4

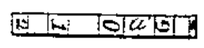


Fig 7.

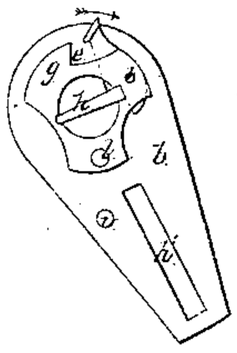


Fig. 8.

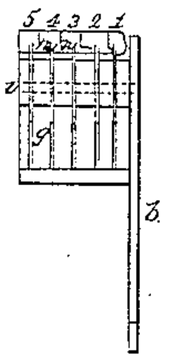


Fig. 11.

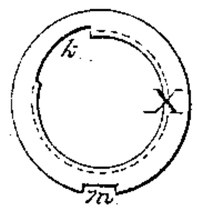


Fig. 5.

Fig 12

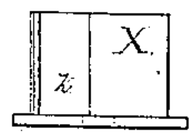


Fig. 6.

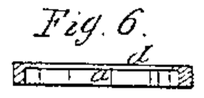


Fig 9.

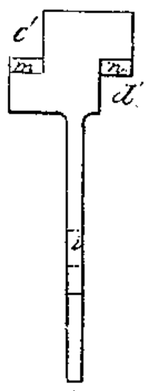


Fig. 10.

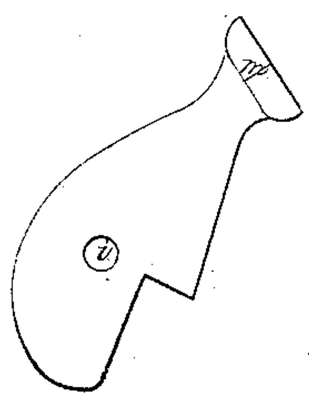


Fig 13.

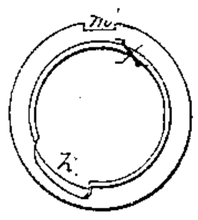


Fig. 14

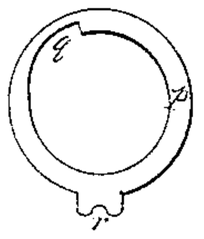


Fig. 15.

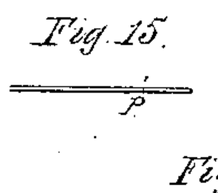


Fig 21.

Fig. 11.

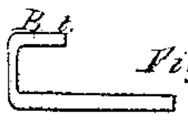
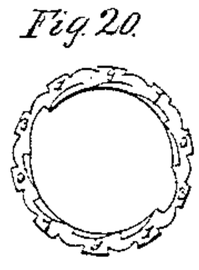


Fig. 20.



UNITED STATES PATENT OFFICE.

JAMES A. BAZIN, OF CANTON, MASSACHUSETTS, ASSIGNOR TO A. B. ELY, OF BOSTON, MASSACHUSETTS.

COUNTING-MACHINE.

Specification of Letters Patent No. 16,323, dated December 23, 1856.

To all whom it may concern:

Be it known that I, JAS. A. BAZIN, of Canton, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Numbering-Wheels and in the Method of Constructing and Operating Them, which improvements are applicable to a great variety of numbering and counting machines, pedometers, &c., and also to machines for paging books and numbering bank-bills and other papers; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figures 1, and 2, are views of a counting machine with my improvements attached; Figs. 3, 4, 5, and 6, detached views of the numbering wheels; Figs. 7, and 8, are detached views of the pawls by which the wheels are set in motion; Figs. 9, and 10, are enlarged views of one of these pawls; Figs. 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, and 21 details of which will be referred to hereafter.

My invention has for its object to secure greater simplicity and surety in operating the figure wheels of counting machines and the type wheels of paging and numbering machines and consists in the peculiar arrangement of the numbering wheels and of the pawls by which they are set in motion.

To enable others skilled in the art to understand my invention, I will proceed to describe the manner in which I have carried it out.

In the accompanying drawings is represented a counting machine with my improvements attached.

The numbering wheels or rings are seen at a, a^1, a^2, a^3, Figs. 1, and 2, and detached in Figs. 3, 4, 5, and 6, the numbers 1, to 0 being arranged around the exterior periphery, as seen in Figs. 2, and 4. Upon the interior of the rings are a series of notches c, (Fig. 5) for the reception at certain intervals of the driving pawls by which the rings are rotated, as will be hereafter described, these notches do not extend entirely through the rings which upon the opposite side seen in Fig. 3, have a flange d, in which is a single notch f, corresponding to one of the notches c, upon the other side of the ring. The numbering wheels are all constructed in a similar manner, the object of the flange d, being to keep the pawl which actuates the next succeeding wheel, out of the notches c, until in the revolution of the rings the notch f, in the flange is brought opposite to the pawl which permits it to fall into the notch c, of the next wheel and move it a single step. In order that this may take place each of the pawls with the exception of the first one is of sufficient width to cover not only the notches of the particular wheel which it is to actuate, but also the flange of the next preceding wheel, by which its action is governed.

The driving pawls are constructed and arranged, as follows: They are seen enlarged and detached in Figs. 9, and 10, and in place in Figs. 7, and 8. The hub g, to which they are pivoted at i is attached to the plate b. h, are springs which force the pawls out from the hub in the direction of the arrows Fig. 7, when they are not otherwise pressed into the recess e, formed in the hub to receive them. They are so formed that when any one of them is pressed down, all those which succeed it are also forced into the recess, while those which precede it remain unmoved; thus if No. 1, be pressed down all the others are carried with it; if No. 5, be pressed down the others remain unmoved; if No. 3, be pressed down 4, and 5, go with it, but 1, and 2, remain unmoved. This is accomplished by means of the notches c', d', upon the pawls; No. 1, being notched only at c', and No. 5, only upon the opposite side at d'. The surface m, of each pawl is caused to bear upon the surface n, of the next succeeding one, and thus as any one pawl is depressed all the succeeding pawls are depressed with it.

I will now describe the carrier cylinder X, within which the hub g, with its pawls is supported and steadied, and upon the exterior surface of which the numbering rings revolve; this cylinder is supported at one end by the front plate f' and at the other, by the recess in the plate y, into which it enters; it is prevented from rotating by the projection i' which enters the notch m' in the flange of the cylinder. Upon one side it has a slot k, through which the pawls project to operate upon the rings. Between each of the numbering wheels is a division plate p, (Figs. 14, and 15,) which is provided with a notch q, opposite to the pawls

that they may not be obstructed in their operations. These plates are held stationary by the projection *r*, which drops into a groove in the frame work of the machine, or in any other suitable manner; their office is to separate the numbering rings and prevent any motion imparted to any one of them from being communicated to those contiguous to it, and also to hold the rings steady and prevent them from being carried back by the recession of the pawls. T, is a clasp which serves to hold the other parts in place.

It now remains to describe the parts by means of which the machinery is arrested when the desired number has been counted off or when the machinery has counted or printed the highest number of which it is capable. *y*, (Figs. 2 and 16) is a plate of the same exterior diameter as the rings *a a'*, &c., and which is recessed upon its front face to receive and support the interior end of the carrying cylinder X; this plate has a single number (1,) upon its circumference; and also a single notch *r'* which is operated upon by the pawl 5. Before the machine is started this plate is turned back a distance equal to a single throw of the pawl, so as to place its number out of gear, and in readiness to be brought into action by its pawl 5, (Fig. 8,) when this is permitted by the flange upon the ring a^3 to rise and enter its notch *r'*; this can only occur when the rings have printed 9999 and the 0 upon all these rings is brought into action by the next movement of the pawls at the same instant the pawl 5, is allowed to rise and move the plate forward by which the "1" is brought into line with the other numbers and the machine numbers 10,000. This partial revolution of the plate *y*, brings the hole *z*, opposite to the bolt B, the short arm of which is shot by its spring D, through this plate, the short arm *t* entering the hole *l*, of the hub *g*, the long arm *x*, entering the hole *v*, in the plate *b*, by which means the parts are locked and held stationary. It is not absolutely necessary that there be but a single number upon the plate *y;* it may if desired be furnished like the numbering rings with the nine digits or this locking plate may be attached to the last ring of the series. When applied as a counter to measuring machines, printing presses, or to any other machinery, the performance of which requires to be registered, the bolt B, as it shoots in may be made to ring a bell, or to shift the driving belt and stop the machinery, this however is a well known device and need not be further described. Fig. 21, is a perspective view of the numbering rings and pawls in operation.

Operation: The parts are arranged in the following manner: The front plate *f*, and back plate Q, are secured to the body or frame of the counter (Fig. 18,) by screws or otherwise; the plate *y*, is then placed upon the back plate, the pivot *z'*, passing through the hole *f''*, in the plate; the bolt B, is then inserted, and its short arm *t*, is allowed to rest against the back surface of the plate which is turned into such a position that when it is moved by its pawl 5, its number ("1") shall be brought into action and the arm *t*, of the bolt B, shall pass through the hole *z*, and enter the hole *l*, of the hub and lock it as before explained. The numbering rings are now placed side by side next to this plate as seen in Fig. 2, and are separated by the dividing plates, or rings *p*, (Fig. 14,) as before explained. The rings are now all arranged so that if advanced a single notch their figure "1" shall be brought into action. The carrying cylinder X, is now inserted within the rings, the projection *i'*, (Fig. 18,) entering the notch *m*, which brings its slot *k* into the required position to permit the pawls to operate upon the rings. The hub *g*, is now inserted within the carrying cylinder, the pawls being held down by pressure upon the first one (No. 1,) to enable them to enter the cylinder, they are then retained depressed into the recess *e*, by the flange *d*, upon the rings with the exception of the first pawl, which is designed to be constantly in action upon the notches or teeth of the first wheel *a*.

R, is a crank which vibrates in a slot *h'*, in the plate *b*, by which means the requisite motion is given to the pawls. As the plate *b*, and hub *g*, are thus made to vibrate the pawl "1," engages with each succeeding tooth of the wheel *a*, and the numbers upon this wheel are brought successively into action the numbers upon the wheels being set out of gear, and their pawls all depressed by the flanges upon the rings. The first wheel continues to move until the number 9, is brought into action at which instant the notch *f*, in the flange of this wheel is brought opposite to the pawl 2, which is permitted to rise and enter a notch in the wheel or ring *a'*, and when the plate *b*, is again vibrated the rings *a*, and *a'*, are moved one notch and the 0, of the first wheel is brought into action with the "1," of the second wheel and "10" is produced; the pawl 2, is now again depressed by the flange *d*, of the wheel *a*, (the notch *f*, having passed on) and the second wheel remains stationary until the first one has made another revolution when the arrival of the notch *f*, again permits the second wheel to move one notch and "20" is produced; this operation continues, the second wheel moving a single notch each time the first one makes a complete revolution, until 99 is produced when the notch *f*, on the second wheel permits the

pawl 3, to engage with a tooth of the 3rd wheel (a^2) and 100 is produced. This operation continues until 999 has been produced, when another wheel is brought into operation, and thus the machine continues to count or to print, its capabilities being limited only by the number of wheels which it contains. In the one represented in the accompanying drawings in which there are four numbering wheels after 9999 has been produced, all the pawls are allowed to rise by the occurrence in a line of the notches *f*, in all the flanges, and when the hub *g*, is again vibrated the wheels are all moved one notch together with the plate *y;* and 10,000 is produced; at the same instant the hole *z*, as before explained is brought opposite to the bolt B, which is thus permitted to shoot in and stop the machine.

It is not essential that the numbering rings or wheels should contain but a single set of figures; these may be repeated any number of times upon the same wheel, as seen in Fig. 19, in which there are 3 sets of numbers upon the same wheel; in such cases it is necessary that there be a notch *f*, for each set of numbers. When my improvements are applied to paging machines and it becomes necessary to print alternate numbers, 1, 3, 5, 7, 9, &c., the numbers may be repeated in this order upon the first ring, (Fig. 20,) there being one ring required for the odd, and another for the even numbers. If it be desired to count off a certain number, as in measuring a given distance upon the ground with a pedometer, or for the purpose of measuring a specified length of cloth, the required number may be deducted from the ultimate number which the machine is capable of registering, which before starting, is set to this difference, the machine is then run to the end (until it stops) and the required number will be counted or measured off. Thus the machine above represented is capable of counting 10,000—suppose it be required to count or measure off 756. If the numbering wheels be set at start to read 9244, and the machine be set in motion; when it has reached its limit and its motion is arrested by the bolt B, it will have counted the required number 756.

I do not claim operating a series of numbering wheels by a corresponding series of mutually dependent pawls when the pawls are arranged upon the outside of the wheels, but I only claim—

The within described arrangement of the numbering wheels and the parts immediately connected therewith; that is to say, hanging the pawls to the central drum within the rings, and operating them in the manner substantially as herein set forth.

JAMES A. BAZIN.

Witnesses:

JOHN HARTSHORN,

SAM COOPER.