(No Model.)

J. H. REINHARDT & C. S. ELLIS.

CONSECUTIVE NUMBERING MACHINE.

No. 318,803. Patented May 26, 1885.

Platen

Fig. 1.

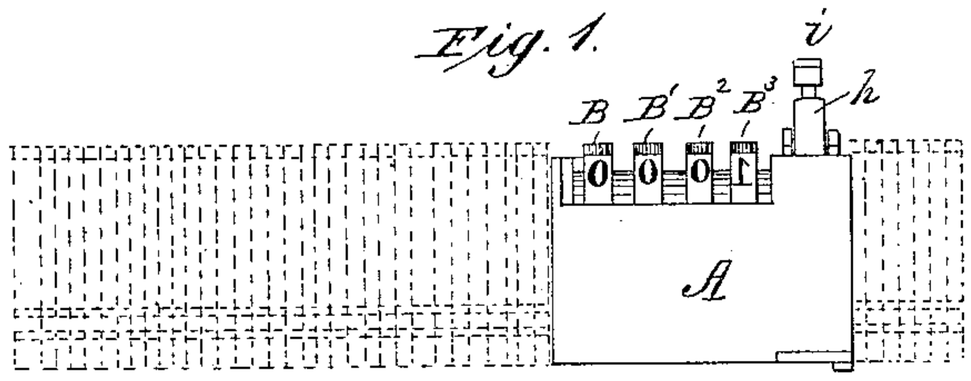


Fig. 2.

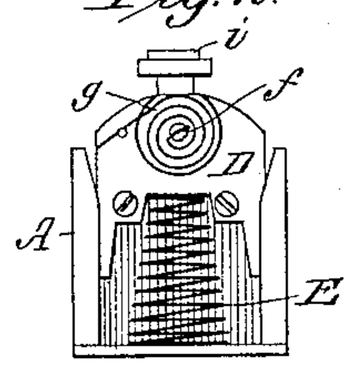


Fig. 3.

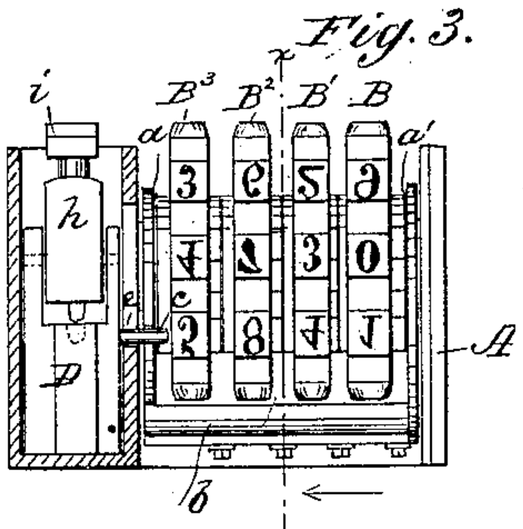


Fig. 4.

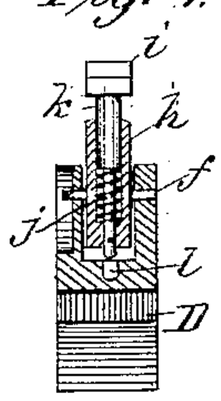


Fig. 5

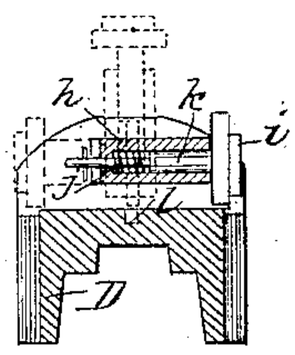


Fig. 6.

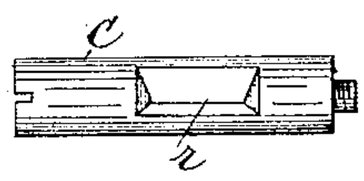


Fig. 7.

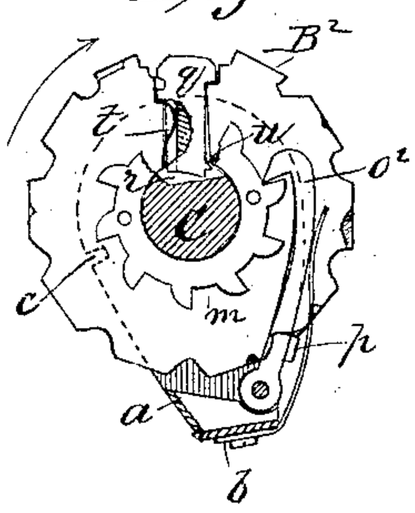


Fig. 8.

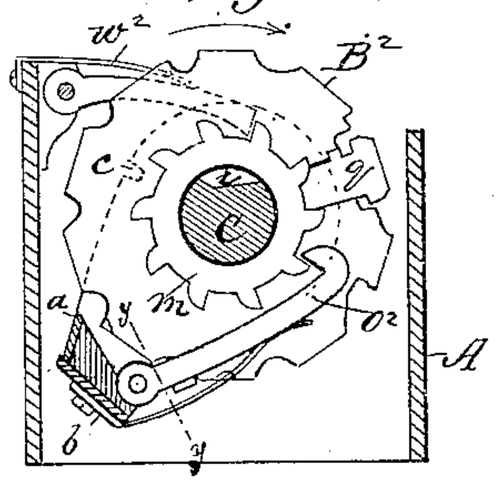


Fig. 8ª.

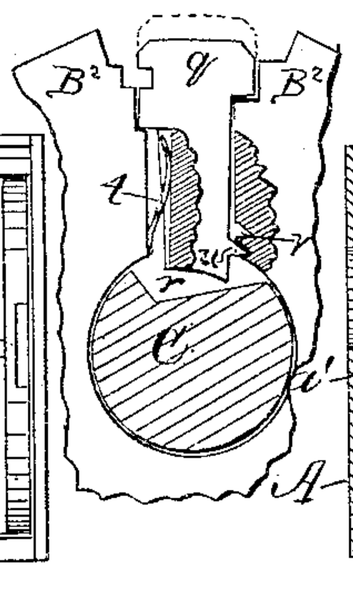


Fig. 9.

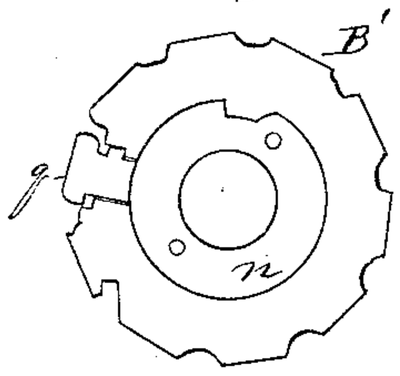


Fig. 9ª.

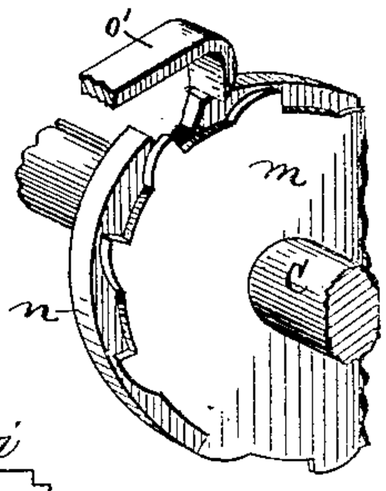


Fig. 10.

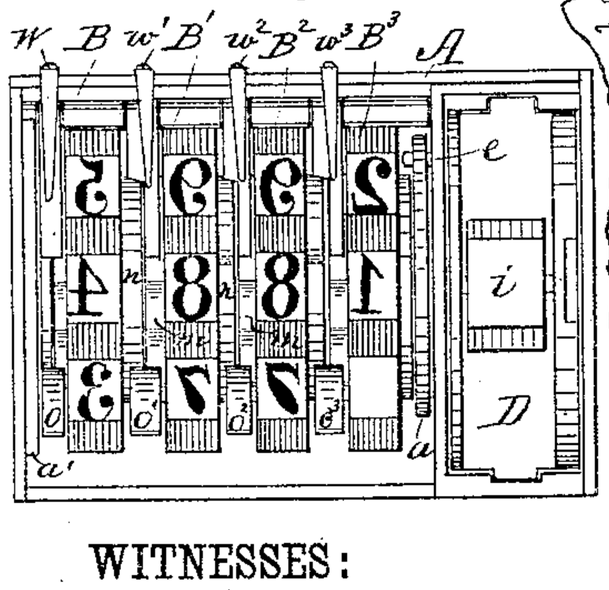


Fig. 11.

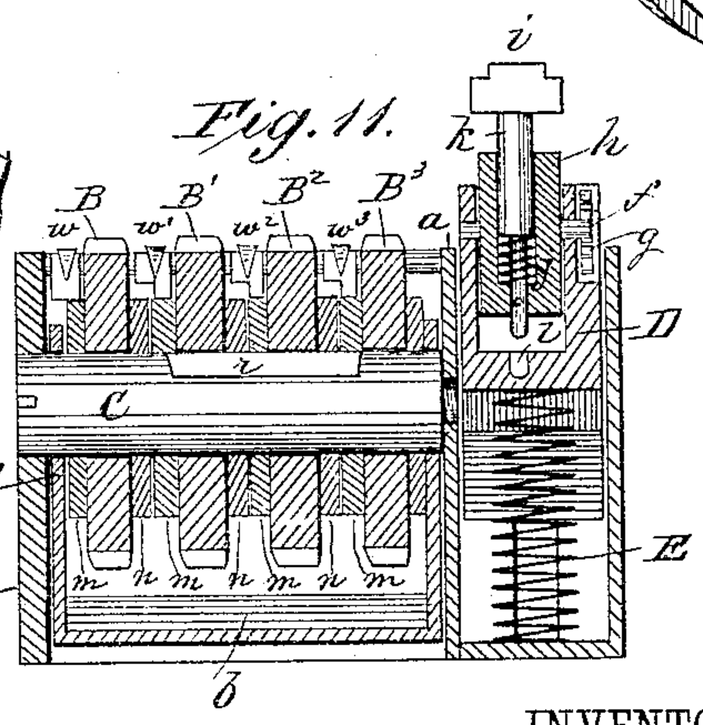
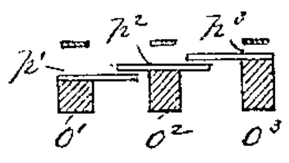


Fig. 12.



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UNITED STATES PATENT OFFICE.

JAMES H. REINHARDT AND CHARLES S. ELLIS, OF MEMPHIS, TENNESSEE;
SAID ELLIS ASSIGNOR TO GEORGE SCHMALZRIED, OF SAME PLACE.

CONSECUTIVE-NUMBERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 318,803, dated May 26, 1885.

Application filed May 3, 1884. (No model.)

To all whom it may concern:

Be it known that we, JAMES H. REINHARDT and CHARLES S. ELLIS, citizens of the United States, residing at Memphis, in the county of Shelby and State of Tennessee, have invented certain new and useful Improvements in Consecutive-Numbering Machines, of which the following is a description.

The object of our invention is to provide a numbering device for printing consecutive numbers, as is required on bank-checks, certificates of stock, tickets, &c., which may be made of such dimension and character as to be set up with the form in a printer's chase, the same as if it were a type, and in any portion of the form, or as many places as may be desired, and which shall be in the nature of a type that changes its number with each consecutive impression, and prints consecutive numbers on the paper-stock without being organized with the working machinery of the press, and without any other co-operation than that of the descending platen in making the impression. Consecutive-numbering devices operating on this general principle have heretofore been constructed, and our invention comprehends certain features of improvements thereon, as will be hereinafter fully described, and pointed out in the claims.

Figure 1 is a side view of the numbering-machine, showing in dotted lines the relation of the type and the platen thereto. Fig. 2 is an end view with the end plate removed. Fig. 3 is a side elevation on a larger scale, with one side of the case broken away. Figs. 4 and 5 are sectional views at right angles to each other of the plunger and its attachment, showing different positions of the head-plate and socket-piece. Fig. 6 is a detail of the axial shaft. Figs. 7 and 8 are sectional views through the line *x x* of Fig. 3, showing different positions of the wheel-actuating mechanism, the view being taken in the direction of the arrow. Fig. 8^a is an enlarged detail of block *q*, showing its relation to coacting parts. Fig. 9 is a view of the numbering-wheel B′, looking in the opposite direction from the arrow in Fig. 3. Fig. 9^a is a perspective view of the notched rings *m* and *n* juxtaposed, showing their relation to the pawl *o*′. Figs. 10 and 11 are respectively a plan and a central vertical longitudinal section of the machine on a larger scale, and Fig. 12 is a sectional detail through the line *y y* of Fig. 8.

In the drawings, A represents the outer casing of our automatic numbering-type, which casing is made of metal, preferably steel, and strong enough to withstand the wedging action of being locked up in the form without being sprung or bent so as to cramp the mechanism within. This case is nearly the vertical depth of the length of a type, and contains four (more or less) numbering-wheels, B B′ B^2 B^3, each bearing type-numbers from 0 to 9, which are successively brought to the level of the type-face of the form. Of these wheels, B represents the units, B′ the tens, B^2 the hundreds, and B^3 the thousands; and these wheels representing different denominations are, as in all numbering-machines, regulated to revolve intermittently, so that any one wheel of any denomination moves only the space of one notch or figure for every revolution of a wheel representing the next lower denomination. Thus the tens-wheel B′ moves one notch for every revolution of the unit-wheel B, and the hundreds-wheel B^2 one notch for every revolution of the tens-wheel B′, and so on. These wheels are hung loosely on an axle or center shaft, C, fixed rigidly in the framework, and on this shaft, between the end wheels and the casing, are hung loosely two plates, *a a′*, connected by a cross-bar, *b*, Figs. 3, 7, 8, upon which are mounted the gripping hooks or pawls and their springs, by which the number-wheels are intermittently moved when the swinging frame *a a′ b* is oscillated. To transmit to this swinging frame this oscillating motion, one of its plates, *a*, is formed with notch *c*, and next to this slotted plate *a* the casing is formed with a vertical chamber, in which moves up and down in guides the plunger D, Fig. 3. This plunger is normally held up by a subjacent spring, E, Fig. 2, of spiral or other form, and has a pin, *e*, Fig. 3, that projects through a slot in the casing and enters the notch *c* of the swinging frame, by which arrangement, as the plunger D moves up and down, the frame *a a′ b* is moved back and forth on the central shaft,

and its hooks or pawls are made to rotate the numbering-wheels. The upper portion of the plunger D is chambered, and in the same a vertical socket-piece, *h*, is pivoted by means of a short shaft or axis, *f*, Figs. 4 and 11, one end of which is affixed to a coil-spring, *g*, Figs. 2 and 11, contained in a recess of the plunger and attached at one end thereto. The effect of this coil-spring is to hold the socket-piece *h* vertical, and yet allow it to be turned into a horizontal position on either side of its axis, as in Fig. 5, the coil-spring serving to restore it after being so turned.

Within the socket-piece *h* is arranged a stem, *k*, bearing at its upper end a head-plate, *i*, (which may be a type bearing the abbreviation for the word "number"—thus, "No.,") which head-plate and stem are pressed upwardly by a spiral spring, *j*, Figs. 5 and 11, within the socket-piece and coiled around the stem. The lower end of this spring-seated stem protrudes through the bottom of the socket-piece *h*, and is in a vertical line with a notch or recess, *l*, in the top of the plunger D.

Now, the purpose of this construction and the operation of these parts are as follows: When the form is set up and the case A is wedged in the chase with the other type, the head-plate *i* projects above the type-face of the form, and when the platen of the press comes down the head-plate socket-piece *h* and plunger D are forced down, as in Fig. 3, and the necessary movement given to the swinging frame *a a' b* to set it so that its hooks are ready to turn the numbering-wheels, as in Fig. 7. Then when the platen rises the spring under the plunger raises the latter, and the pin on the plunger, playing in slot *c*, turns the swinging frame *a a' b* in the opposite direction, as in Fig. 8, which gives the adjustment to the numbering-wheels. Now, when the inking-roller is passed over the form, it does not find an obstruction in the projecting head-plate *i*, but the latter, with its socket-piece *h*, turns on the pivots into a horizontal position, as in Fig. 5, first in one direction and then in the other, the coil-spring serving to bring them back to a true vertical position. To prevent this head-plate and socket-piece from slipping sidewise and turning on its pivot when the platen strikes it in descending, the stem *k* is, as before stated, spring-seated, and the initial movement of the same in yielding to the platen causes its lower end to lock into the notch or recess *l* in the plunger, and thus by locking the socket-piece prevents the latter from turning on its pivots without interfering with the yielding of the socket-piece to any side pressure, such as is afforded by the inking-roll.

For giving to the wheels B B' B^2 B^3 their proper movement, each wheel is provided on one side with a ring, *m*, Figs. 7, 8, and 11, having ten teeth or notches, and on the other side with a ring, *n*, Figs. 9 and 11, having one notch, and the single-notched ring *n* of one wheel lies adjacent to the ten-notched ring of the next higher denomination of wheel, as shown in Fig. 9ª. On the first ten-notched ring *m* there rests a spring-hook, *o*, Fig. 10, carried by the frame *a a' b*. On the single-notched ring *n* of this unit-wheel B and the ten-notched ring *m* of the tens-wheel B' rests a second spring-hook, *o'*, and so on the spring-hooks o^2 and o^3 occupy corresponding positions between the wheels of high denominations. The unit-wheel B, it will be seen, moves from the action of its hook *o* at every movement of the swinging frame *a a' b;* but the tens-wheel B' moves only one notch for every complete revolution of the unit-wheel, because its hook *o'* (see Fig. 9ª) is held out of its toothed ring *m* by the single-notched ring *n* of the unit-wheel until the single notch comes beneath it, at which time the hook drops into the notch, and then when the swinging frame *a a' b* moves this hook *o'* engages and moves the ten-notched ring *n* of the tens-wheel, and after this movement said hook *o'* rides up again on the single-notched ring, and so on. Each of the hooks *o o' o^2 o^3* after that for the units is provided with a lap-plate, *p' p^2 p^3*, Fig. 12, of which those of the higher denomination overlap each succeeding one of lower denomination. The object of this is, that in numbers beginning with 9—as 90, 940, 9,280, &c.—the numeral 9 indicating the highest denomination does not need to be changed until that denomination is changed to a higher one. Thus in 90 the 9 does not need to be changed until 91, 92, 93, &c., are gone through with, and as the single-notched wheel would allow the 9 of any denomination to be changed at the next movement by dropping the pawls of higher denomination, the lapping of one plate, p^2, over *p'*, &c., prevents the hooks of the higher denomination from falling into engagement with their wheels until the hooks of smaller denomination have completed their work. In other words, referring to Figs. 10 and 12, the hook *o'* represents tens, o^2 hundreds, and o^3 thousands, and it is obvious that when 9 of the tens-wheel is reached, indicating 90, another movement of the tens-wheel would indicate 100, which of course would not be consecutive numbering. To keep the hundreds-wheel from turning until the series of 90, 91, 92, 93, &c., is complete is the object of this device, and as the plates p^2 of the hundreds denomination hold the hundreds-pawl o^2 up and out of contact with its toothed wheel as long as pawl o^2 of the tens is up, it is clear that the wheels of higher denomination cannot be moved till the series of each lower one is completed. This, however, is only required for denominations beginning with 9.

In using the device it is necessary to set the 0 of each wheel after the units, so that it will not print, or otherwise the numbering would start with 001, instead of 1, and to secure this result of preventing these 0's from printing, and then successively bring the 0's to a printing contact, we make the said ciphers on a radially-sliding block, *q*, Figs. 7, 8, and 8ª, the inner ends of which rest in a longitudinal

channel, *r*, in the axial shaft C, Figs. 6, 7, and 8, being pressed down into the same by the thumb when the instrument is set. Then when the type-block *q*, bearing the 0, comes around on the rigid shaft in position for printing, after the two front wheels have made a complete revolution, the inner end of this type-block rises up on the rigid shaft, and in passing out of the channel in said shaft rises to a point which brings its type-face on a level with the rest of the form. When it becomes thus automatically raised, a spring, *t*, Fig. 7, throws the inner end of said type-block sidewise, and causes its shoulder *v* to enter a notch, *u*, of the numbering-wheel, and this takes the strain of the impression and relieves the central shaft of friction.

To hold the numbering-wheels to place against back motion, a set of spring-detents, *w* w' w^2, are fixed to the casing and rest upon the toothed rings of the wheels.

Having thus described our invention, what we claim as new is—

1. A numbering device consisting of a series of wheels, with means, substantially as described, for effecting consecutive changes in position, in combination with a spring-seated plunger having a vertically-projecting and radially-swinging head-plate for depressing the plunger and yielding laterally to the inking-roller, as described.

2. The combination, with the spring-seated plunger D, having socket-piece *h* pivoted thereto, and maintained in a vertical position by a spring, of a spring-seated stem and head-plate located within said socket-piece, and adapted to lock the socket-piece on its pivots by engagement with a notch in the plunger, as described.

3. The combination, with the case A, having two compartments with a slotted partition between, of a set of numbering-wheels, an axial shaft, and a swinging frame, *a a' b*, with pawls arranged in one compartment and a vertically-sliding spring-seated plunger, D, arranged in the other compartment, and having a pin, *e*, protruding through the partition, and engaging with the swinging frame to actuate the wheels, substantially as shown and described.

4. The combination, with the center shaft having a channel or recess in one side of the same, of the numbering-wheels having the type-section bearing the cipher made radially adjustable, and adapted, as described, to drop into said channel or ride upon the shaft.

5. The numbering-wheel having a radially-sliding type-section with a spring, *t*, and shoulder *u*, as and for the purpose described.

JAMES H. REINHARDT.
CHARLES S. ELLIS.

Witnesses to the signature of Reinhardt:
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CHAS. A. PETTIT.
Witnesses to the signature of Ellis:
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