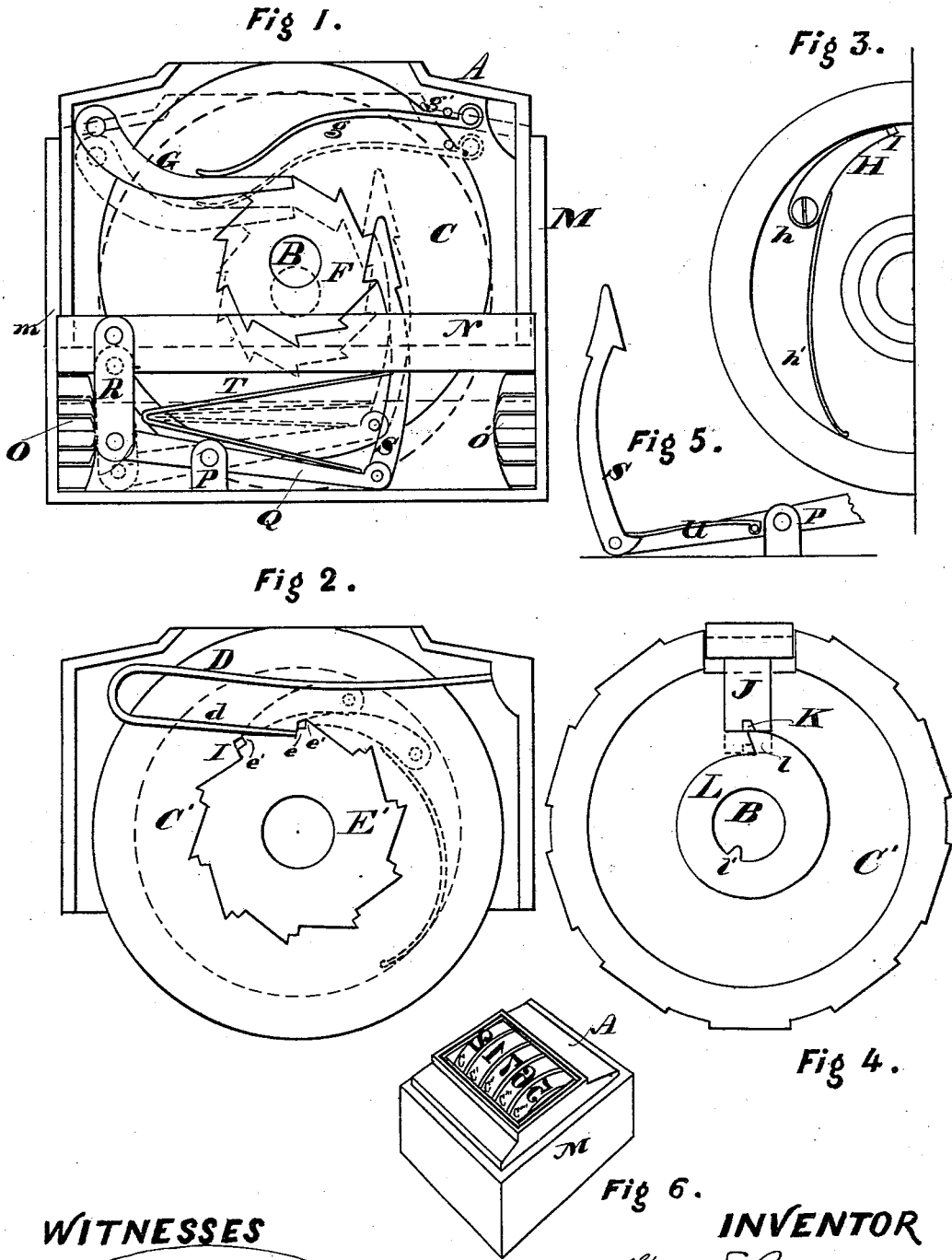


T. S. BOWMAN.
Consecutive Numbering-Machine.

No. 166,681.

Patented Aug. 17, 1875.



WITNESSES

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Fig 6.

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THOMAS S. BOWMAN, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN CONSECUTIVE-NUMBERING MACHINES.

Specification forming part of Letters Patent No. **166,681**, dated August 17, 1875; application filed October 24, 1874.

To all whom it may concern:

Be it known that I, THOMAS S. BOWMAN, of St. Louis, Missouri, have invented a new and useful Improvement in Consecutive-Numbering Machines for Printing-Presses, of which the following is a full, clear, and exact description, reference being had to the annexed drawing making part of this specification, in which—

Figure 1 is a side elevation of the invention, the end wall of the outer, and also the end wall of the inner, case being removed to show the movement of the inner case and its contents in the outer case, and the means for effecting such movement. The dotted lines indicate the position of the parts when the inner case is depressed. Fig. 2 is a vertical transverse section, taken on the line of the face of the ratchet-wheel, of any of the numeral-bearing wheels beyond the first numeral-wheel. The dotted lines indicate the different positions of the dog which is attached to the numeral-wheel next before the one shown, and which is the means of communicating the motion of said previous wheel to the one shown. Fig. 3 is a side elevation of one of the numeral-wheels, showing the dog in the position it occupies when not depressed against the ratchet of the succeeding numeral-wheel. Fig. 4 is a side elevation of a numeral-wheel, showing the movable portion thereof, which bears the cipher or numeral 0. The actuating-cam is also shown. The dotted lines indicate the movement. Fig. 5 shows a spring which is used to press the hook down upon the ratchet of the first wheel. Fig. 6 is a perspective of the invention.

Like letters indicate like parts.

The object of the present invention is to provide means for consecutively numbering impressions of type-matter, which are economical in construction and readily operated. It consists, mainly, in a portable device, which is inclosed in the chase as part of the form, and which is caused by the action of the platen to form consecutive numbers, which are successively printed as part of the impression.

In its general construction the invention consists as follows: An inner case, containing a series of wheels bearing numerals, is in turn contained in an outer case, which is locked in the chase with the type-matter, the device

constituting part of the form. The inner case has a slight vertical reciprocating movement in the outer case, in connection with which movement, and as a result thereof, the consecutive numbers are successively formed in the top of the device, to be printed at the same time, and by the same means, with which the remainder of the form is printed.

In the drawing, A represents the inner case, which is in the form of a square frame, open above and below. A shaft, B, is hung longitudinally in it, resting in the end walls of the case. This shaft does not rotate. C C' C'' C''' C'''' represent the series of numeral-bearing wheels arranged and turning upon the shaft B. D D' D'' D''' (the last three not shown in drawing) represent pawls arranged, respectively, between the first and second, the second and third, the third and fourth, and the fourth and fifth wheels. They prevent the wheels from rolling either backward or forward as the impression is being printed.

The pawls are made of elastic wire, which, at one end, is fastened to the side of the case, and which extends horizontally nearly across the case, and is then turned down and back under the upper portion, as shown in Fig. 2. The under fold *d* of the pawl engages in a ratchet, E E' E'' E''' (the last three not shown in the drawing,) which is attached to the side of each of the numeral-wheels after the first wheel. The teeth in these last-mentioned ratchets are peculiarly constructed. About half-way down the face of the tooth there is an offset, *e*. The pawl *d* falls against the face of the offset *e*, or lower part of the tooth, and rests upon the back of the succeeding tooth throughout the entire length of such back, or nearly so, during the pauses in the motion of the wheel. The angle of the face of the offset *e* is such, and also the relative position of the tooth and pawl, as to bring the latter firmly against the offset as the numeral on the rim of the wheel comes into position above to be used. The face of the upper or outer part *e'* of the tooth is in the line of a diameter drawn from the outer point of the tooth across the wheel. The angle of the inner part or offset *e* with the back of the succeeding tooth is slightly obtuse. The ratchet of the first numeral-wheel (or that wheel

which imparts motion to the other wheels) is made in the ordinary way, as shown at F, Fig. 1. The pawl used for stopping this wheel C is shown at G, Fig. 1. A spring, *g*, presses it upon the ratchet. A stud, *g'*, prevents the spring from leaving the top of the pawl. To communicate motion to the second wheel C' and cause it to turn, the first wheel C is, on the side toward the second wheel, provided with a dog, H, which is pivoted to the wheel at *h*, and is furnished with a spring, *h'*, arranged to press the dog outward toward the rim of the wheel, as shown in Fig. 3. The dog lies in a depression (the end of the spring pressing against the offset formed by this depression) in the face of the wheel, the only part projecting from the face of the wheel being the point I of the dog. This point projects at right angles to the face of the wheel, and sufficiently to come into the plane of the ratchet of the second wheel, and it is of shape suitable to fit into and against the upper part *e'* of the tooth of the ratchet, as shown in Fig. 2, and to fill out the tooth to the line of the face of the offset *e*. As the first wheel C rotates, the point I of the dog strikes against the under side of the pawl *d*, and is deflected against the upper part *e'* of the tooth, which is next after the tooth which is being held by the pawl *d*, and causes the wheel C' to rotate a distance equal to that between the teeth of the ratchet. As the point I reaches the end of the pawl it flies upward past the end of the pawl and into the position shown in Fig. 3. At the same moment the pawl *d* has dropped directly downward against the face of the offset *e* of that tooth against the upper part of which the point I has just been acting. The different positions of the dog and point are indicated in dotted lines in Fig. 2. The pawl holds the wheel in this position until another revolution of the wheel before it. All of the succeeding numeral-wheels in the series (saving the last) are provided with similar dogs, similarly arranged and operated.

All of the numeral-wheels, saving the first and last in the series, are constructed so that the portion of the wheel bearing the cipher or the numeral 0 can be depressed from the circumference of the wheel. This is shown in Fig. 4. The part J has a movement in and out from the center of the wheel. It is set inwardly by moving the wheel forward until the stud K, with which, at the side of its inner end, the part J is provided, drops below the point *l* of a cam, L, which is fixed on the shaft B between the wheels. The wheel is then turned back to its original position, bringing the stud close against the face of the point *l*. Similar cams L L' L'' (the last two not shown in drawing) are arranged between the first and second, the second and third, and the third and fourth wheels. They are fixed on the shaft by means of a feather, *v*, fitting into a corresponding groove in the shaft, and they are turned so that the projection or point *l* is in the direction of the top of the device.

The stud K rides upon the cam, causing the outward movement of the part J. The shape of the stud corresponds to the under side of the projection *l*. The inner case A, with its contents, is placed in the outer case M, resting upon a movable ledge therein, which extends around the inside of the wall of the case. The ledge N rests upon springs O O', which are arranged at either side of the case, resting upon the bottom of the outer case. The springs O O' press the ledge, and with it the inner case, upward against a shoulder, *m*, in the wall of the outer case. P represents a post attached to the bottom of the outer case, in the line, or thereabout, of the inner edge of the ledge, and far enough from the corner of the case to enable it to serve as a fulcrum for an arm, Q, which is pivoted to the post, and which, at the end between the post and the corner of the case, is connected by a pivoted connection, R, to the ledge above, and which, at the other end, on the other side of the post, has pivoted to it a hook, S, which extends upward past the ledge, and into the inner case between its inner wall and the first numeral-wheel C. The arm Q is arranged beneath the ledge. Thus arranged and connected, a downward movement of the ledge lifts the hook, and an upward movement of the ledge depresses the hook. To assist the upward movement of the ledge an auxiliary spring, T, is arranged between the arm Q and the ledge. The hook S engages in the ratchet, which is attached to the outer side of the first numeral-wheel C, and to insure its engagement a spring, U, is attached to the side of the arm Q, which bears upon a projection with which the hook, on the side toward the ratchet, is provided.

In operation, the outer case is first locked up in the form with the type, and, after the form is made ready on the press, the inner case A (the figures first being set to the desired initial number) is dropped in its place in the outer case. In setting the numeral-wheels the parts bearing the ciphers are suitably depressed. The operation of the device is caused by the action of the platen of the press. When the device is in position the top of the numeral-wheels is one-twentieth of an inch, or thereabout, above the level of the surrounding type-matter. The numbers are then inked at the same time, and by the same means, as the remainder of the form. As the platen descends, and as the impression is being made, the inner case descends to the level of the type, causing the hook S to rise and engage in the next tooth of the ratchet of the first numeral-wheel. As the pressure is relieved the inner case and ledge rise, and the first wheel is moved to bring the next numeral into position. The operation is repeated until the dog of the unit-wheel causes the second numeral-wheel to move one tooth. The second wheel is then stationary until the dog of the unit-wheel comes round again. The operation of the succeeding wheels is similar. As the second, and also all the suc-

ceeding wheels, saving the last, make a revolution, the stud K in each of said last-mentioned wheels, riding upon the cam, causes the parts bearing the ciphers to be successively pushed out, there to remain until reset, as above stated.

The inner case is kept from being pulled from the outer case by the suction of the rollers by a suitable spring-catch. (Not shown in the drawing.)

While the above-described invention may be used as described, it is obvious that one or any desired number of the machines may be locked up in a form without type-matter, and used for numbering only on a printing-press.

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

1. The combination of the outer case M, the ledge N, springs O O', and the inner case A, containing a series of numeral-bearing wheels, substantially as described.

2. The wheel C', ratchet E', provided with the offset e, the pawl d, and dog H, provided with the point I, combined and operating substantially as described.

3. The combination of the numeral-wheel C', part J, stud K, cam L, and shaft B, substantially as described.

4. The combination of the outer case M, ledge N, springs O O', hook S, spring U, arm Q, post P, inner case A, wheel C, and its ratchet, substantially as described and shown.

5. The combination of the outer case M, ledge N, springs O O', hooks S, spring U, arm Q, post P, case A, wheel C, and its ratchet, dog H, pawl D, wheel C', and its ratchet, substantially as described.

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Witnesses:

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SAML. S. BOYD.