2 Sheets—Sheet 1.

T. S. BOWMAN.
Numbering-Machine

No. 206,924. Patented Aug. 13, 1878.

FIG. 1.

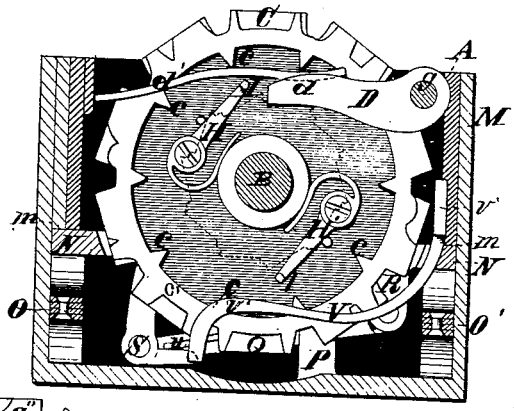


FIG. 2.

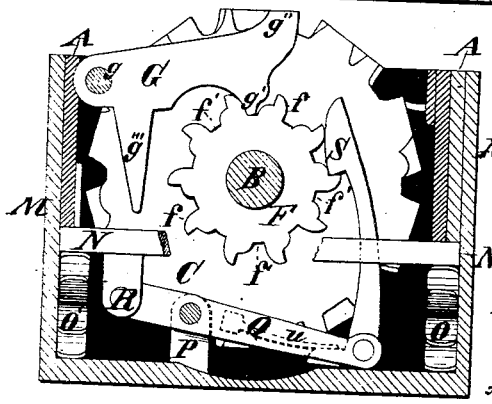


FIG. 3.

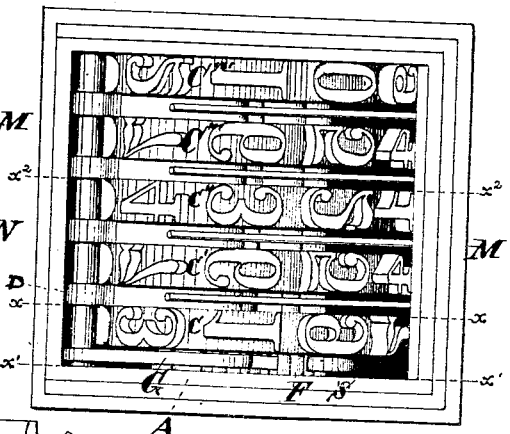
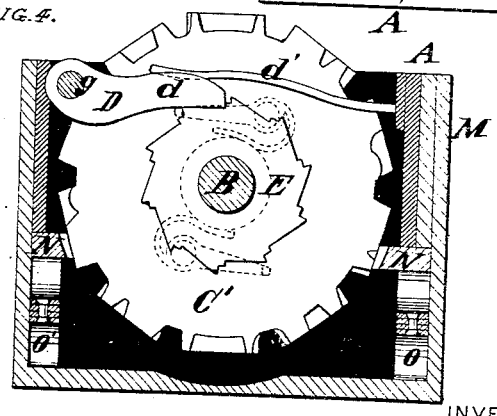


FIG. 4.



ATTEST:

Paul Bakewell

Fred. S. Boyd

INVENTOR:

Thomas S. Bowman,

by Chas. D. Moody,

atty.

2 Sheets—Sheet 2.

T. S. BOWMAN.

Numbering-Machine

No. 206,924. Patented Aug. 13, 1878.

FIG. 5.

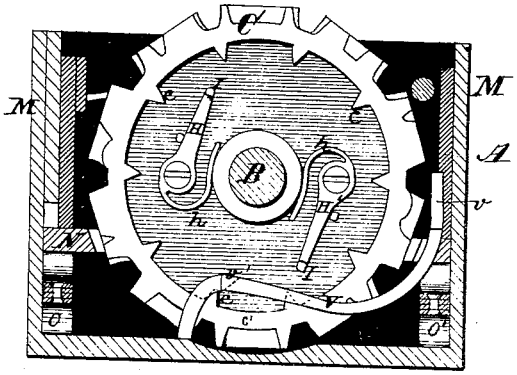


FIG. 6.

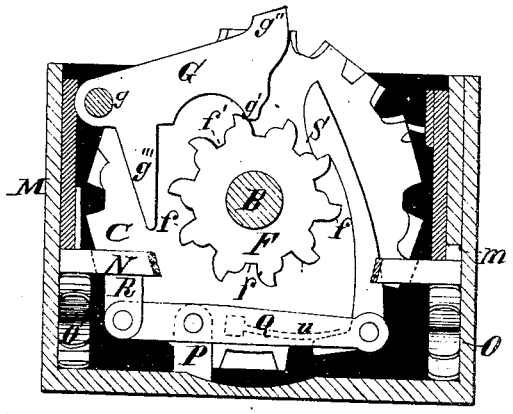
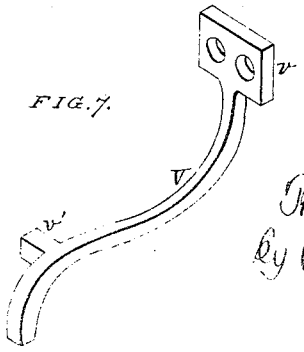


FIG. 7.



ATTEST:

Paul Bakewell

Saml. S. Boyd

INVENTOR:

Thomas S. Bowman.

by Chas. D. Moody

atty.

UNITED STATES PATENT OFFICE

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

IMPROVEMENT IN NUMBERING-MACHINES.

Specification forming part of Letters Patent No. **206,924**, dated August 13, 1878; application filed May 15, 1877.

To all whom it may concern:

Be it known that I, THOMAS S. BOWMAN, a resident of St. Louis, Missouri, have made a new and useful Improvement in Numbering-Machines, 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 vertical section taken on the line *x x* of Fig. 3; Fig. 2, a vertical section taken on the line x^1 x^1 of Fig. 3, looking in the opposite direction to that of Fig. 1; Fig. 3, a plan; Fig. 4, a vertical section taken on the line x^2 x^2 of Fig. 3, looking in the opposite direction to that of Fig. 1; Fig. 5, a similar view to that of Fig. 1, the inner case being depressed; Fig. 6, a similar view to that of Fig. 2, the retarding device being raised; and Fig. 7, a perspective view of the lock used in preventing the wheels from turning more than a space at an impression.

Similar letters refer to similar parts.

I have heretofore made an improvement in consecutive-numbering machines for printing-presses, described in Letters Patent granted me August 17, 1875, and numbered 166,681.

The construction referred to consists, mainly, of an inner case containing a series of numeral-bearing wheels, that in turn is held in an outer case that is locked in the chase with the type-matter 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. I have ascertained this construction needs supplementing in two respects. As numbers are being rapidly printed the number-wheels are liable to turn more than one space between the impressions, and in consequence interrupting the consecutive numbering; also, the wheel is inclined to commence its rotation before the wheels and paper are entirely separated, causing a blurring. The aim of the present improvement is to provide means for obviating these difficulties.

It further relates to the provision by which two or more consecutive numbers, as in printing check-books, can be printed at one impression.

It consists, mainly, in a locking device or devices, according to the number of number-wheels used, by means whereof their movement is thoroughly controlled, and the wheels prevented from moving more than one space at each impression; further, in what I term a "retarding device," which operates to delay the rotation of the unit-wheel) and with it the remaining wheels) until the number-wheels and paper are entirely separated.

Referring to the annexed drawing, A represents the inner case; B, the shaft supporting the numeral-bearing wheels; C C′ C″ C‴ C⁗, the numeral-bearing wheels; D, one of the pawls, and E E the ratchet attached to the tens-wheel, as in the original construction, saving that the pawls D D′ are made in two parts—a pawl proper, *d*, and a depressing spring, *d′*. *m* represents the outer case, and *o o′* the springs used to lift the inner case in the outer case.

The ratchet F on the unit or first wheel is modified. Instead of having the backs of the teeth straight, they are curved, as shown at *f f*, Figs. 2 and 6, and at the end of each tooth is a recess, *f′ f′*. G represents the pawl used in connection with this ratchet. It is hung on a bearing, *g*, that is preferably in the form of a shaft, extending across the inner box and fastened therein, as shown in Figs. 1, 2, 3, 4, and which, also, is made the bearing for the pawls *d d* to turn upon.

The pawl G is provided with a projection, *g′*, made to fit the convex backs *f f* of the teeth of the ratchet F, and also to fit the recesses *f′ f′*. It is also provided with another extension, *g″*, which, when the projection *g′* is down in the recess *f′*, is made to come even with the periphery of the wheel C, as shown in Fig. 2, but which, as the wheel C, by the action of the hook S, is turned, is caused by the projection *g′*, riding upon the tooth *f*, to project beyond the periphery of the wheel, as shown in Fig. 6.

The action of this part of the device is as follows: As the impression is taken the extension *g″* comes in contact with the paper, and evenly with the periphery of the wheel, and the projection *g′* is in the recess *f′*. Now, as soon as the pressure of the platen is relieved,

the wheel C, in the manner and by the means described in the former patent, would turn promptly were it not for the projection g' of the pawl coming against the back f of the tooth of the ratchet. The wheel C now cannot turn without first lifting the pawl—that is, the extension g'' of the pawl must move outward from the periphery of the wheel before the wheel can rotate; but the extension being against the paper, this outward movement of the pawl cannot take place until the platen and paper have been removed. Hence the separation of the paper and wheels is effected practically sufficiently in advance of the rotation of the latter to prevent any blurring. It is evident that the point of the extension g'' is inked in common with the wheels, and that it must make an impression upon the paper. I utilize this impression by causing it to print a period or other character. The curve f on the tooth of the ratchet facilitates the movement of the pawl. But the essential feature of this part of the improvement is in forming the recess f' at the end of the back of the tooth, into which the pawl must drop in order to bring the point of the extension g'' even with the periphery of the wheel as the impression is taken, and from which it must rise before the wheel can turn.

So far as separating the paper and wheels is concerned, any part that moves out from the peripheries of the number-wheels in advance of the rotation of the latter will answer; but I preferably employ a pivoted pawl, as above described.

The pawl is further provided with an arm, g''', that, by coming against the ratchet or any equivalent stop on the wheel, prevents the pawl from being jostled entirely out of its place between the wheels C C'.

The device for keeping the number-wheels from turning more than one space—that is, the distance between two adjoining numerals—at an impression is shown in Figs. 1, 5, and 7. V represents one of a series of spring-arms similarly and respectively arranged between the first and second, the second and third, the third and fourth, and the fourth and fifth, wheels, and at one end similarly attached to the inner case at v, Figs. 1 and 5, the other end of the spring extending below the wheels, and so as to come into contact with the bottom of the outer case as the inner case and wheels are depressed in taking the impression, and thereby be raised. The arms are similarly provided, toward the lower or free end of the spring, with a projection, v', that, when the inner case and wheels are raised, as shown in Fig. 1, comes (and as hereinafter described) against one of a series of stops, $c\ c\ c\ c$, with which each wheel is similarly provided. The series $c\ c$ are ten in number, being one to each numeral, and are arranged evenly around the wheel at the side thereof, and projecting inwardly toward the center of the wheel from the rim c', as shown. The last wheel has a depression (not shown) on the opposite side to that of the other wheels, so that the last spring-arm, which has a projection, v', on both of its sides, may engage with the stops $c\ c$ of both the fourth and fifth wheels.

The operation of this part of the invention is as follows: Until the inner case is depressed the wheel cannot be turned forward by reason of the projection v' coming against one of the stops c, as shown in Fig. 1; but, in taking the impression, the inner case is depressed, as shown in Fig. 5, sufficiently to bring the stop c below the projection v'. This allows the wheel, in the mode described in the former patent, to turn. The wheel, however, cannot turn without rising from the bottom of the outer case. The effect is to bring the projection v' immediately against the stop corresponding to the succeeding numeral, blocking the wheel as before, and so on. The spring-arm V co-operates with the springs O O' in lifting the inner case, A, and therefore can be made sufficiently strong to act promptly as soon as the projection v' passes the stop c.

I claim—

1. The combination of the ratchet F, having the teeth curved at $f\ f$ and the recesses f' f', and the pawl G, having the projection g' and extension g'', substantially as described.

2. In a numbering-machine, a pawl, G, having an extension, g'', that moves outwardly from the periphery of the number-wheel, causing a separation of the paper and the wheel in advance of the rotation of the latter after the impression is printed, substantially as described.

3. The combination of the cases A and M, the spring-arm V, having the projection v', and the wheel C, having the stops $c\ c\ c$, substantially as described.

4. The combination of the cases A and M, number-wheel C C', the springs O O', and the spring V, substantially as described.

THOS. S. BOWMAN.

Witnesses:
CHAS. D. MOODY,
SAML. S. BOYD.