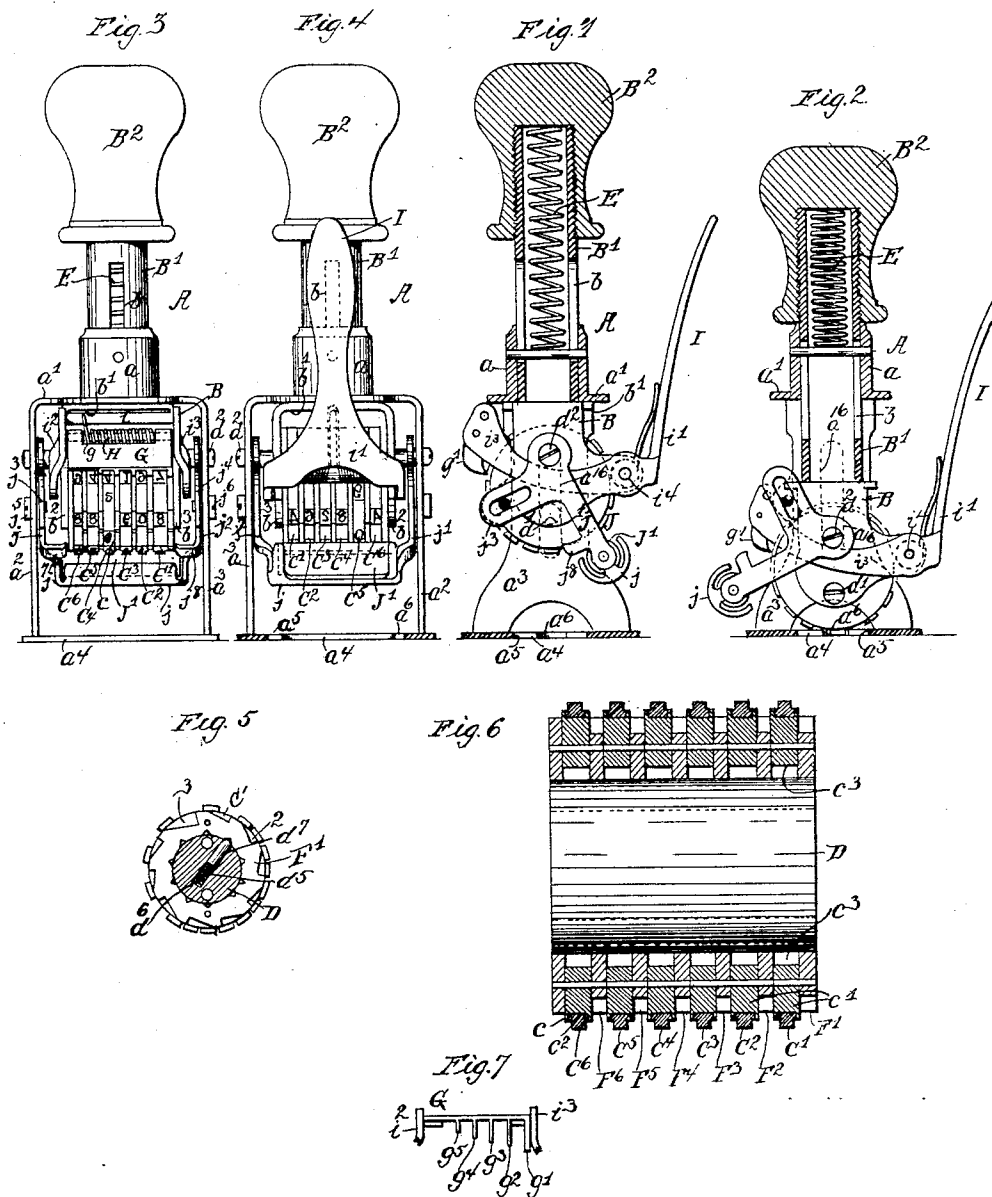


(No Model.)

C. H. SHAW.
NUMBERING MACHINE.

No. 478,241.

Patented July 5, 1892.



Witnesses
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NUMBERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 478,241, dated July 5, 1892.

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To all whom it may concern:

Be it known that I, CHARLES H. SHAW, of Brooklyn, Kings county, and State of New York, have invented a certain new and useful Improvement in Numbering-Machines, of which the following is a specification.

The object of my improvement is to produce a simple, effective, and durable machine for use in offices as a means for numbering pages or papers.

I will describe a machine embodying my improvement, and then point out the novel features in the claims.

In the accompanying drawings, Figure 1 is a side view of a machine embodying my improvement, a portion of the main frame being removed, so as to prevent it from concealing other parts, but being indicated in dotted outline. In this view the parts are represented in their normal positions. Fig. 2 is a similar view; but here the parts are represented in the positions which they occupy during printing. Fig. 3 is a front view of the machine. Fig. 4 is a back view of the machine. Fig. 5 is a sectional end view of a cylinder or hub upon which is mounted a series of wheels for printing, and a side view of one of the wheels for printing, and a side view of a ratchet-wheel. Fig. 6 is a side view of the said cylinder or hub and a diametrical section of the wheels for printing and ratchet-wheels. This view is made on a larger scale than the others. Fig. 7 is a view of the lower end of a pawl-plate whereby motion is imparted to the ratchet-wheels and thence to the wheels for printing.

Similar letters and numerals of reference designate corresponding parts in all the figures.

A designates the main frame of the machine. As here shown it has a horizontal portion a' and two vertical portions or legs $a^2 a^3$, and all these parts are formed integral and stamped or cut and bent out of a single piece of thin metal. From the horizontal portion a' a socket of cylindric or other suitable shape a extends upwardly. This socket may be made separately of sheet metal and fastened thereto in any suitable manner—as, for instance, by riveting or soldering. To the lower end of the vertical portions or legs $a^2 a^3$ a plate a^4 may be fastened. This plate can be advan-

tageously secured to the vertical portions or legs $a^2 a^3$ by riveting. The plate a^4 is provided with an opening a^5 , through which the printing-wheels of the machine may protrude in order to perform the printing. I have shown the opening as of rectangular form and as having notches $a^5 a^6$ formed at its ends. The advantage of these notches is to facilitate the printing of numbers upon any particular line. When the notches are used, they may be set with their sides 1 contiguous to a line marked upon any paper, and then the printing will be done upon that line.

B designates a movable frame or yoke carrying a series of wheels $C^1 C^2 C^3 C^4 C^5 C^6$ for printing. Of course there may be more or less of these printing-wheels than in the illustration which I have given of my improvement. The yoke has a horizontal portion b' and two vertical portions $b^2 b^3$, and all its parts may be formed integral by stamping or cutting and bending the same out of a single piece of thin metal. Between the vertical portions $b^2 b^3$ of the yoke B a hub or cylinder D is supported. As it is not intended that this hub or cylinder shall rotate, it may be secured to the vertical portions $b^2 b^3$ of the yoke by means of screws $d^1 d^2$, passing through the vertical portions $b^2 b^3$ of the yoke and engaging with tapped holes in the hub or cylinder. The screws d^1 are shown as having their heads countersunk in the vertical portions $b^2 b^3$ of the yoke; but the screws d^2 are shown as extending outwardly a considerable distance beyond the yoke, and when so extended these screws have several functions in addition to contributing to the fastening of the hub or cylinder to the yoke. These screws d^2 extend into vertical slots a^{16} , with which the vertical portions or legs $a^2 a^3$ of the main frame A are provided, and owing to this said screws d^2 form guides whereby the proper relation between the yoke B and main frame A will be preserved during the upward and downward movements which said yoke and its appurtenances will have in the operation of the machine. The yoke B is combined with an upwardly-extending rod or shank B' , which, as here shown, is of cylindrical form to fit the socket a of the main frame A and is made tubular, so as to be capable of containing a spring E, whereby the yoke and its appurte-

nances will be moved upwardly and maintained in an elevated position when the machine is not in operation. The rod or shank B' is provided with vertical slots *b*, which receive a pin that extends diametrically through the socket *a* of the main frame A. The function of this pin is to support the lower end of the spring E. This spring is shown as of helical form, and its upper end bears against a handle B², which is arranged at the upper end of the rod or shank B'. The upper ends of the slots *a*⁶ form stops with which the screws *d*² coact for the purpose of limiting the upward movement of the yoke B and its appurtenances under the influence of the spring E. It will be understood that the printing-wheels C' C² C³ C⁴ C⁵ C⁶ will normally be maintained in an elevated position and that when it is desired to print they will be lowered by pressure applied to the handle B² against the resistance of the spring E.

I may make the bodies *c*' of the wheels C' C² C³ C⁴ C⁵ C⁶ of any suitable material. They may be made of bronze, as this will be sufficiently strong and can be more easily worked than a harder metal. The bodies *c*' of these wheels, as may be seen by reference to Fig. 5, are annular in form and snugly fit around the hub or cylinder D. Printing-pieces, which may be made in the form of tires or endless bands or facings *c*², of soft india-rubber or analogous material, are fitted to the peripheries of the bodies *c*' of the wheels C' C² C³ C⁴ C⁵ C⁶. A feature of great importance in the construction of these wheels C' C² C³ C⁴ C⁵ C⁶ is side supports *c*, extending close to the sides of the printing-pieces *c*². These side supports are shown as made in the shape of flanges formed integral with the bodies *c*' of the wheels; but it is not essential that they should be thus constructed.

To the side of each of the wheels C' C² C³ C⁴ C⁵ C⁶ a ratchet-wheel is attached. These ratchet-wheels are designated, respectively, F' F² F³ F⁴ F⁵ F⁶. Preferably they will be made of steel. It will be seen that all except the first of these ratchet-wheels are between two adjacent printing-wheels. Obviously the ratchet-wheels must not project peripherally so far as the numbers on the wheels C' C² C³ C⁴ C⁵ C⁶, and this being so the notches between the ratchet-teeth of said ratchet-wheels will produce spaces between the printing-wheels. But for the side supports *c* of the printing-wheels the printing-pieces of the wheels C' C² C³ C⁴ C⁵ C⁶ might be dislodged during the operation of the machine or might by pressure be flattened or spread out over the ratchet-wheels. Besides obviating these mishaps, the side supports also prevent oil used to lubricate the machine from reaching the printing-pieces. The side supports *c* are also useful for preventing the spreading of the ink over the ratchet-wheels. The ratchet-wheels may be identical in construction in that they will all have a number or corresponding shallow teeth 2 and one deep tooth 3.

The wheels C' C² C³ C⁴ C⁵ C⁶, with their ratchet-wheels, are of course free to rotate on the hub or cylinder D. Each wheel C' C² C³ C⁴ C⁵ C⁶, with its ratchet-wheel, may rotate independently of the others.

To prevent the wheels C' C² C³ C⁴ C⁵ C⁶ from being shifted accidentally, I employ detents of suitable construction. As here shown, the hub or cylinder D has a radial recess *d*⁵ opposite the body of each printing-wheel. In such recess is fitted a helical spring *d*⁶, and beyond this is inserted in the recess a pin *d*⁷, which is pressed outwardly by such spring. The inner circumference of the body of each printing-wheel is provided with a series of notches *c*³, with which said pin may engage. The outer end will preferably be rounded and the notches made to flare toward their open ends, so that while the pin will act as a detent it will not positively lock the corresponding printing-wheel.

G designates a pawl-plate provided with five pawls *g*' *g*² *g*³ *g*⁴ *g*⁵ for imparting motion to the ratchet-wheels F' F² F³ F⁴ F⁵, and consequently to the wheels C' C² C³ C⁴ C⁵. The highest printing-wheel C⁶ is intended to be operated by the hand of the user of the machine applying force with some suitable utensil to the corresponding ratchet-wheel. It will be seen that the pawls *g*' *g*² *g*³ *g*⁴ *g*⁵ are of different lengths, the pawl *g*' being the longest, the pawl *g*⁵ being the shortest, and the intermediate pawls being regularly graded in length between the two extremes. The pawl-plate is reciprocated up and down over the ratchet-wheels and printing-wheels. Ordinarily only the pawl *g*' will be operated, and so that at each reciprocation of the pawl it will move the ratchet-wheel F' and wheel C' far enough to shift one number of said wheel C' out of position for printing and another into such position. Nothing else can occur until the pawl *g*' is brought opposite to the deep tooth 3 of the ratchet-wheel F'. When this deep tooth 3 is opposite the pawl *g*', the latter can descend far enough into the ratchet-wheel F' to allow the second pawl *g*² to engage with the ratchet-wheel F² and impart motion to the wheel C². It must of course be understood that the pawl-plate is impelled inwardly or toward the ratchet-wheels whenever it is free to move in that direction. A spring H serves to impart to it this inward movement. Motion will be imparted to the second ratchet-wheel F² only periodically at each time that the deep tooth 3 of the first ratchet-wheel F' comes opposite the pawl *g*'; but whenever the deep tooth of the second ratchet-wheel comes opposite the second pawl the pawl-plate will be free to move still farther inward, and then will allow the third pawl to engage with the third ratchet-wheel to move the latter still farther onward. Whenever the third pawl comes opposite the deep tooth of the third ratchet-wheel, the fourth pawl will engage the fourth ratchet-wheel, and when the fourth pawl comes opposite the deep tooth

of the fourth ratchet-wheel it permits the fifth pawl to operate the opposite ratchet-wheel.

The pawl-plate G is pivotally connected by a pin g to a lever I, here shown as comprising a handle portion i' and two arms i^2 i^3 , which pass across the vertical portions b^2 b^3 of the yoke B and between the vertical portions or legs a^2 a^3 of the main frame A. Through the front ends of the arms passes the pin g and also a pin or rod i . The pawl-plate G is notched at the upper portion, and within this notch the spring H is coiled around the pin g . One end of this spring bears against the pin or rod i and the other end either laps over the front of the pawl-plate or engages with a hole therein.

The lever I is fulcrumed to the vertical portions b^2 b^3 of the yoke B by means of a pin i^4 , which passes through the arms of the lever I and through lugs extending rearwardly from the vertical portions b^2 b^3 of said yoke B. Owing to this, the lever I is of course carried by the yoke B. A spiral spring surrounding the pin i^4 and at its ends engaging with the lugs of the yoke B, through which said pin extends, is bent upwardly at the middle, so as to extend against the front side of the handle portion i' of said lever I. The spring thus presses the handle portion of the lever backward and elevates the arms of the lever and by elevating the arms of the lever causes the pawl-plate to travel upwardly over the wheels C' C^2 C^3 C^4 C^5 C^6 and ratchet-wheels. The upward movement of the arms is arrested by the screws d^2 . The return movement of the lever to its normal position is thus terminated. The lever I may have its handle portion and arms formed integral by suitably stamping or cutting and bending a piece of thin metal.

J designates an inking-lever fulcrumed on the screws d^2 . As here shown, it comprises two parallel and similar arms j' j^2 , hung at their upper ends upon the screws d^2 and having at their lower ends an inking-roller J' journaled in them. This lever J is shown as having a portion j extending intermediate of its arms j' j^2 and constructed so as to form a guard to the roller, which when said roller is carried forward will prevent it from depositing ink upon any object with which it may contact. This guard is so arranged that when the roller is carried rearward into its normal position the roller will be exposed, so that ink may readily be applied to it. As the lever I projects farther rearward than the roller, it affords adequate protection to any articles with which the roller might otherwise come in contact. Not only is the lever J provided with arms j' j^2 , but it also has arms j^3 j^4 , which extend at an angle from the arms first mentioned. The arms j^3 j^4 are longitudinally slotted and engage with screws or equivalent devices j^5 j^6 , which extend from the vertical portions or legs a^2 a^3 of the main frame A. Owing to this engagement of the arms j^3 j^4 with the main frame A, the inking-lever will be rocked

under the printing-wheels each time the latter are lowered. Of course the swing of the lever will be such as to carry the inking-roller entirely beyond the printing-wheels before the latter are lowered to the position in which they perform printing.

The arms j' j^2 on the lever J are provided with inwardly-extending lugs j^7 j^8 . These lugs extend beneath the arms of the lever I. Their office is to prevent the wheels C' C^2 C^3 C^4 C^5 C^6 from being carried down to perform printing before the lever I shall have been released and allowed to resume its normal position, and they perform this function by coming in contact with the arms of the lever I when the wheels C' C^2 C^3 C^4 C^5 C^6 are lowered, if at that time the handle portion of the lever should be held close to the handle B^2 of the yoke B.

The various parts of the lever J may be formed integral by stamping or suitably cutting and bending sheet metal.

My machine is very compact, light, and easy to operate. The main frame A, yoke B, and levers I J when made severally, as suggested, of a single piece of thin metal will have the advantage of cheapness as well as lightness, to say nothing of the great strength which they will possess.

It will be seen that my pawl-lever I is fulcrumed rearward of the printing-wheels and that my inking-lever is fulcrumed considerably above the axis of said wheels.

As I have rendered the use of rubber printing-pieces practicable, I not only cheapen the machine, but I am enabled to produce a very clear impression with the application of a moderate amount of force, which is important, because the various parts of the machine are subjected to less wear and tear.

It will be observed that my pawl-plate is normally in an elevated position and my inking device normally rearward of the wheels C' C^2 C^3 C^4 C^5 C^6 . This affords great advantage for supporting the printing-wheels and enables any one to see while the parts are all in their normal positions what the next number printed will be. Because of this the wheels C' C^2 C^3 C^4 C^5 C^6 may be adjusted while the various parts of the machine occupy their normal positions.

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

1. In a numbering-machine, the combination of wheels for printing having printing-pieces of soft material applied to their peripheries, ratchet-wheels arranged intermediately of the wheels for printing and attached each to one wheel for printing, pawls extending from a support which is located beyond the peripheries of the wheels for printing and extending between the wheels for printing to the ratchet-wheels, and side supports for the printing-pieces, located at the sides of the said printing-pieces and preventing the latter from spreading out so as to lap over the ratchet-wheels or interfere with the pawls, substantially as specified.

2. In a numbering-machine, the combination of a main frame, a support for wheels for printing, wheels for printing, a pawl-lever, and an inking-lever provided with stops coacting with the pawl-lever for preventing the wheels for printing from operating before the ink-distributor carried by the inking-lever resumes its normal position, substantially as specified.
- 5 3. In a numbering-machine, the combination of a support for wheels for printing, pins or projections extending therefrom, an ink-ing-lever fulcrumed to said pins or projections, and a pawl-lever which is arrested in its return movement by said pins or projections, substantially as specified. 15
- In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHAS. H. SHAW.

Witnesses:

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