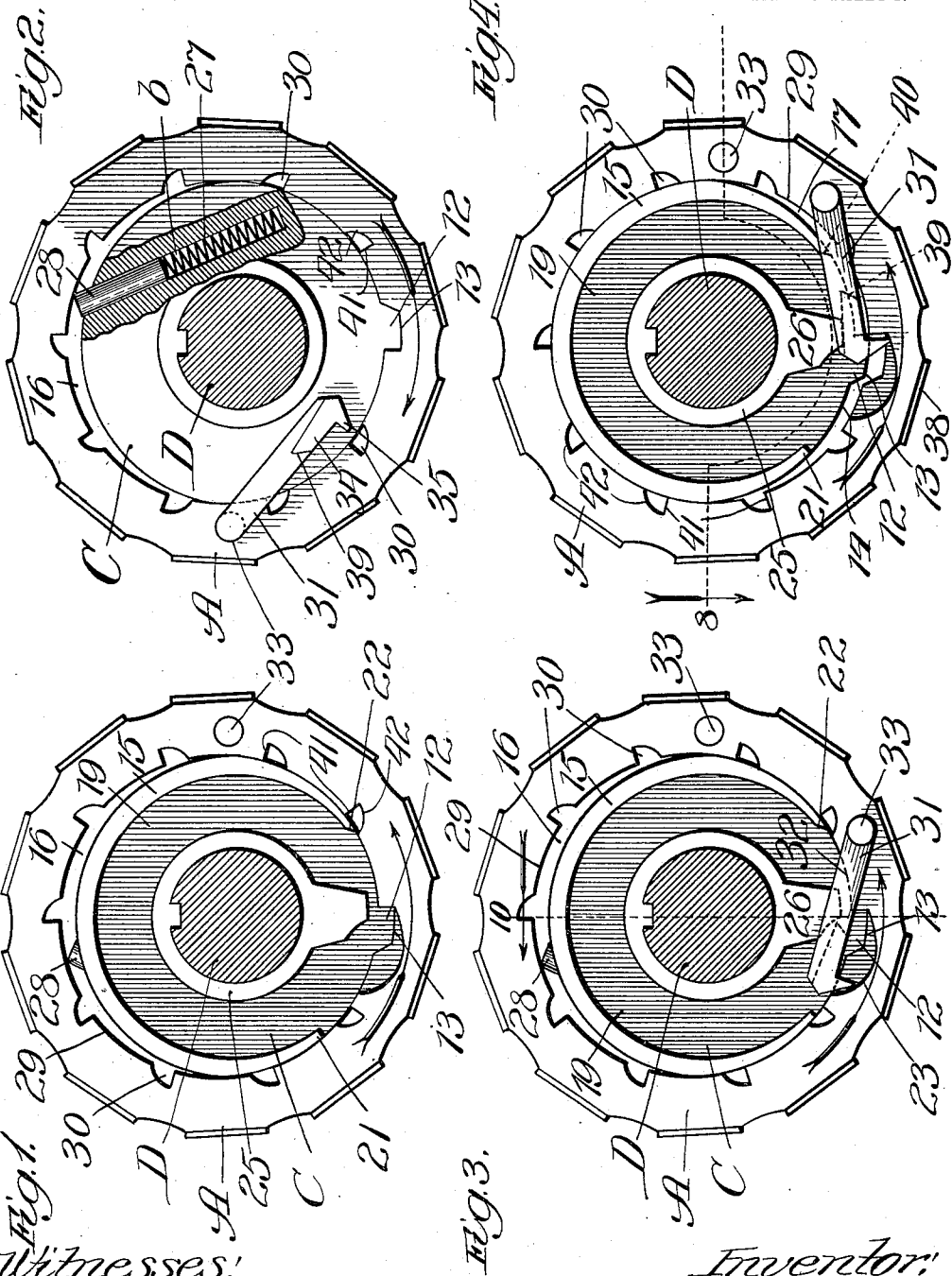


W. C. DOWNING.
 NUMBERING MACHINE.
 APPLICATION FILED JULY 5, 1910.

1,046,155.

Patented Dec. 3, 1912.
 2 SHEETS—SHEET 1.



Witnesses:
 E. C. Chubb
 J. F. Chase

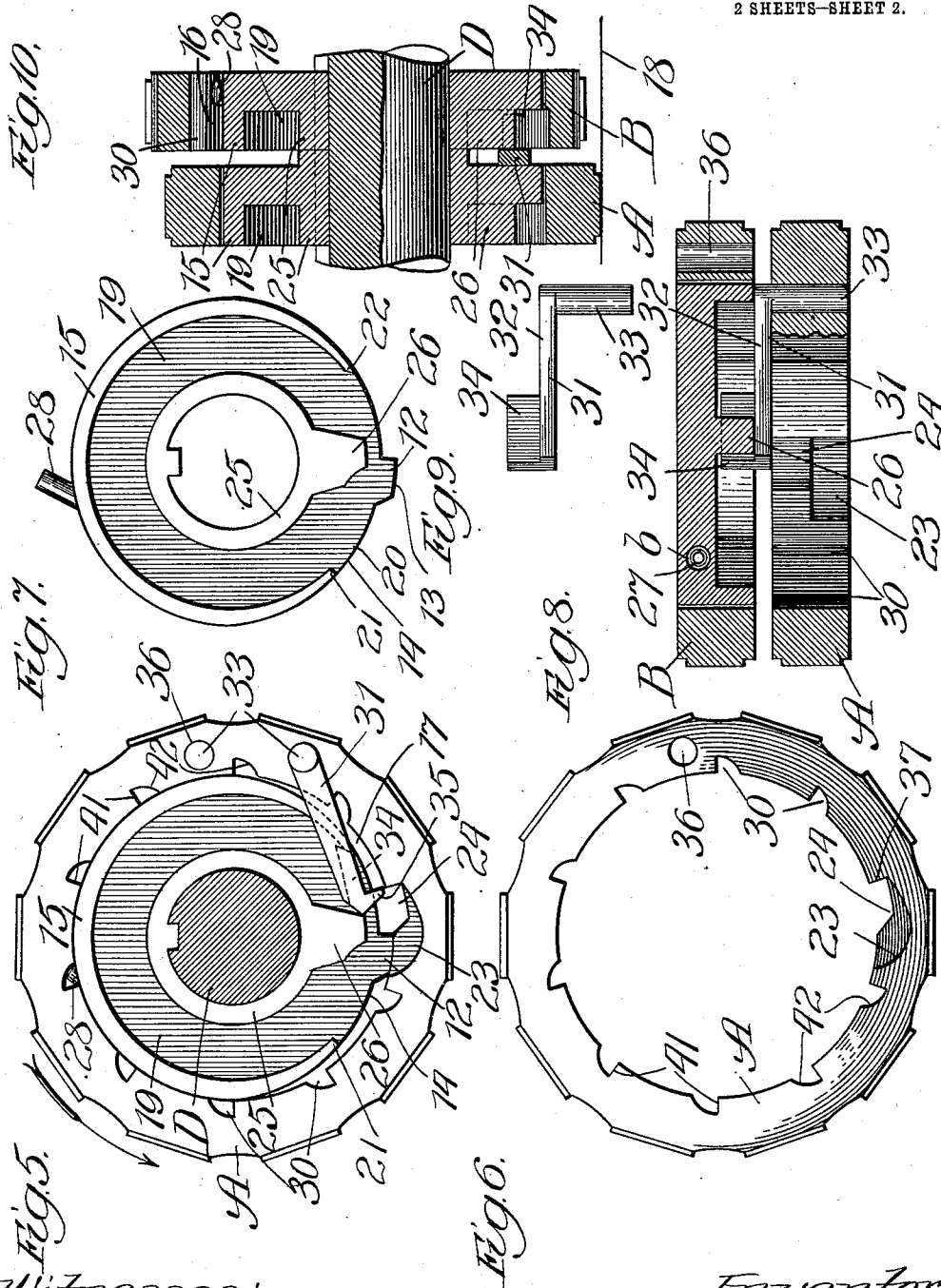
Inventor:
 William C. Downing
 By L. B. Coupland,
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UNITED STATES PATENT OFFICE.

WILLIAM C. DOWNING, OF CHICAGO, ILLINOIS.

NUMBERING-MACHINE.

1,046,155.

Specification of Letters Patent.

Patented Dec. 3, 1912.

Application filed July 5, 1910. Serial No. 570,479.

To all whom it may concern:

Be it known that I, WILLIAM C. DOWNING, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Numbering-Machines, of which the following is a specification.

This invention relates to improvements in numbering machines, and more especially of the class set forth in my Letters Patent, No. 829,260, of August 21, 1906.

The object of this invention is to provide a device of this character embodying means for dropping the cipher character and automatically moving certain printing wheels into their printing position at the proper time.

Figure 1 is a side elevation of a wheel embodying the improved features. Fig. 2 is a similar view of the opposite side thereof. Fig. 3 is a similar view to that of Fig. 1 showing a movement pawl in its working position. Fig. 4 is a similar view showing the movement pawl in a different position. Fig. 5 is a similar view showing the pawl as having just passed out of its engaged position. Fig. 6 is an elevation of one of the printing wheels dismantled from its carrying hub-part. Fig. 7 is an elevation of the hub part. Fig. 8 is a section on line 8, Fig. 4. Fig. 9 is a detached plan view of an actuating or movement pawl. Fig. 10 is a section on line 10, Fig. 3.

It is desirable in this class of numbering machines to omit the ciphers when they come before the other numerals or characters as the value or meaning would not be increased. For instance, suppose that the device is provided with six numbering-wheels set to begin printing with the numeral 1, and the ciphers were not taken out of the printing line the result would be like this 000001.

Therefore this improvement is to provide a simple, positive and efficient device whereby all or any one of the numbering wheels except the units and last wheel may be moved away from and back into their printing position at the proper time.

The term movable as used in connection with the numbering wheels, means those that can be moved out of the printing line.

Normally all of the movable numbering wheels are held away from their printing position, except the first or units wheel and

the last one of the series which does not carry a cipher character.

Starting in with the numeral 1 of the units-wheel, the tens-wheel will be moved into its printing position at the proper time to add the numeral 1 of the tens-wheel and bring the cipher of the units-wheel in position to print 10, and so on in regular continuous order until each movable numbering wheel of the series is brought into use.

For a practical and operative illustration, two numbering wheels are shown, the tens-wheel A and the hundreds-wheel B. The two numbering wheels A and B are of the form shown in Fig. 6, being merely a ring revolving around a stationary axial disk C, and are free to be moved away from and back into a printing position. The axial disk or disks C are rigidly mounted on a stationary shaft D. The numbering wheels and the axial disks may be said to have an eccentric relation to provide for the movement of the wheels away from and back to the printing line, as will be described. The disks C are provided on the periphery with a lug 12, as best shown in Figs. 2 and 7. This lug is formed by gradually reducing the distance from the periphery of the disks on the lug side to a common center of the shaft D. A true circle of the disks would take in the edge 13 of the lug 12, but the diameter is gradually reduced until the circular line 14 falls inside of the edge line 13 of the disks. This feature will also be understood from the gradually diminishing thickness of a rim-flange 15 in the direction of the lug 12, as best shown in Fig. 7. This provides an eccentric space 16 at one side when the numbering wheels are moved or raised from their printing position, and the corresponding space 17 opposite thereto when the wheels are in their printing position. Fig. 10 shows one wheel in printing position and the companion wheel away from the printing line 18. The rim-flange 15 is formed on one side of the disks 12 and provides a recess 19. A gap or space 20 separates the terminal ends 21 and 22 of the flange 15.

The numbering wheels are provided in the inner edge with a curved out recess 23 and a notch 24 in line therewith, the recess 23 stopping short of the thickness of the wheel to allow material for the notch 24. The lug 12 is in engagement with notch 24 when the numbering wheels are away from the print-

ing position, as shown in Figs. 1, 2 and 3. The specific purpose and coöperation of this lug and notch will be explained farther along. The hubs 25 of the disks C are provided on one side thereof with a lug 26.

The disks C are provided with an aperture *b* stopping therein, as best shown in Fig. 2. A spring 27 is inserted in aperture *b*, as is also a plunger 28. The inner circumferential edge 29 of the numbering wheels is provided with a number of notches 30 disposed at required intervals, and with which, the outer free end of spring actuated locking plunger 28 is adapted to engage in order of succession. When not in engagement with the notches 30 the plunger is compressed against the action of its spring and rides the inner edge 29 of the numbering wheels as they are turning, as shown in Figs. 1, 2 and 3. In this position and by the action of the spring actuated plunger, the numbering wheels are automatically moved away from their printing position.

A movement pawl 31 is connected with the units-wheel and each of the movable numbering-wheels. This pawl (Fig. 9) comprises a stem part 32, a pivot-shaft 33 on the outer end thereof, a projecting lug 34 and a hook-end 35. It will be understood that the pawl shown in Figs. 3, 4 and 5 is the one that is attached to the units-wheel (not shown) and engages with and imparts the required impulse movement to the tens-wheel at periodical intervals; the tens-wheel carrying the pawl for the one hundreds-wheel as shown in Figs. 1 and 2. The pawl is on the opposite side in Fig. 1, the end of the pivot-shaft 33 being shown which locates the relative position of the same as shown in Fig. 2, which is the reverse of Fig. 1. Each of the wheels carrying a movement pawl is provided with an aperture 36 for the insertion of the pivot-shaft 33, as best shown in Figs. 6 and 8. In its normally disengaged position the free hook end 35 of the movement pawl 31 rides around on the inner edge surface of the rim flange 15, and is thereby prevented from engaging the notches 30 in the numbering-wheels except when each notch is brought into position adjacent to the curved out recess 23.

It will be understood that when the machine has been set by hand and the lug 12 and its notch 24 are in engagement, the first or initial impulse of the tens numbering wheel is not given by the hook end of pawl 31 engaging one of the notches 30, but clears the end 21 of the rim-flange 15 and drops down into the curved out recess 23, as best shown in Fig. 3. The particular notch 30, of the series nearest to the recess 23 not being in position to be engaged by the movement pawl. As the pawl enters the recess 23 the lug 34 thereof comes in contact with the lug 26 on the disks C, as indicated by dotted

lines in Figs. 3 and 4. This contact has a wedging depressing action and moves the particular numbering wheel being acted upon into its printing position and disengages the lug 12 from its notch 24, as best shown in Fig. 4, which also shows the progressive position of the movement pawl which has now reached the point to engage the straight wall 37 of the curved out recess 23 and imparts an impulse to the numbering-wheel and brings the printing face 38 to the printing line as shown in Fig. 5. On its way through the recess 23, the hook end of the pawl bears on the bottom thereof in bringing the wheel to the printing line from the pressure exerted by the lug 26. In Fig. 5 the hook-end of the pawl is raised out of its engaged position, which is brought about by the beveled edge 39 of the lug 34 coming in contact with the correspondingly beveled edge 40 of the end 22 of the rim-flange 15. The lug 12 now rests on the inner edge of the numbering wheel and remains thereon until rotated by hand to bring the lug 12 and the notch 24 into engagement in resetting the machine. The lug 12 resting on the inner rim edge of the numbering wheels receives the force of the blow or pressure in the operation of printing. This first impulse movement brings one of the notches 30 into position to be engaged the next time by the movement pawl, each notch 30 being engaged in regular order thereafter.

The tens printing disk is prevented from rising out of its printing position when changing from 99 to 100, by means of the pawl 31 and the lug 26 being in engagement at the proper time, as shown in Fig. 4.

The spring actuated plunger is set at an inclined angle and does not bear square against the adjacent surface of the numbering-wheels. The notches 30 have a straight wall 41 and a curved wall 42, and the relative position of the plunger when in engagement therewith is shown in Fig. 5. In its engaged position the end of the plunger bears against the curved wall of the notch and against the direction in which the numbering-wheels are turning as indicated by the arrow. The purpose of these particular shaped notches is to always bring the faces bearing the printing characters to an exact square position on the printing line, as for instance; in practical operation the momentum has a tendency to carry the wheels a little past the true printing position; but they are instantly returned by the action of the spring pressed plunger. This feature also provides for a slight yielding flexible action instead of being rigid but firmly locks the wheels in their printing position.

Having thus described my invention, what I claim is:—

1. In a numbering machine, a numbering-wheel having a series of notches of a uni-

form size disposed at intervals around the inner edge thereof, a large notch located in said series and means for periodically holding said numbering wheel away from its printing position, a stationary axial disk around which said wheel is adapted to turn, said disk being provided with a lug adapted to engage said larger notch when the numbering wheel is held away from its printing position and means for moving said numbering wheel back to its printing position and the notch out of engagement with said lug at the proper time.

2. In a numbering machine, a numbering-wheel, an axial disk bearing an eccentric relation thereto and rigidly mounted on a stationary shaft, said disk having a lug extending downward from the hub-part thereof, a movement pawl having one end pivoted in the numbering wheel and the free end adapted to engage a notch in the numbering wheel in giving an impulse thereto, and means for moving said wheel into its printing position at the same time.

3. In a numbering machine, a numbering-wheel having an impulse notch in the inner edge thereof, a stationary disk provided with a rim flange having a gap between the terminal ends thereof, a movement pawl adapted to engage said impulse notch at the proper time and when not in engagement therewith, ride around on said rim-flange, means for moving said wheel to its printing position during the time said pawl is in engagement with said notch, and means for moving said wheel out of printing position.

4. In a numbering machine, a numbering wheel, a stationary disk having a lug extend-

ing from the hub part thereof, a movement pawl provided on its free end with a lug adapted to engage the first named lug with a wedging action in moving the wheel to its printing position, means for disengaging said pawl at the proper time, and a spring actuated plunger for moving said wheel out of printing position.

5. In a numbering-machine, an axial disk, having a spring actuated plunger inserted therein, a numbering-wheel provided with a series of notches disposed at intervals around the inner edge thereof, a movement-pawl adapted to engage said notches in order of succession and impart an impulse to said wheel, means for disengaging said pawl and means associated therewith for moving said wheel away from, and back to its printing position.

6. In a numbering-machine, a stationary axial disk, a spring actuated plunger seated therein at an inclination, a numbering wheel turning around said disk and provided with a series of impulse notches having a straight wall on one side and a curved wall in opposite relation thereto, said plunger being adapted to lock the numbering wheel against turning after each impulse and move said wheel away from its printing position at the proper time, and means for holding said wheel on the printing line against the raising action of said plunger.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM C. DOWNING.

Witnesses:

H. D. STANTON,
G. E. CHURCH.