

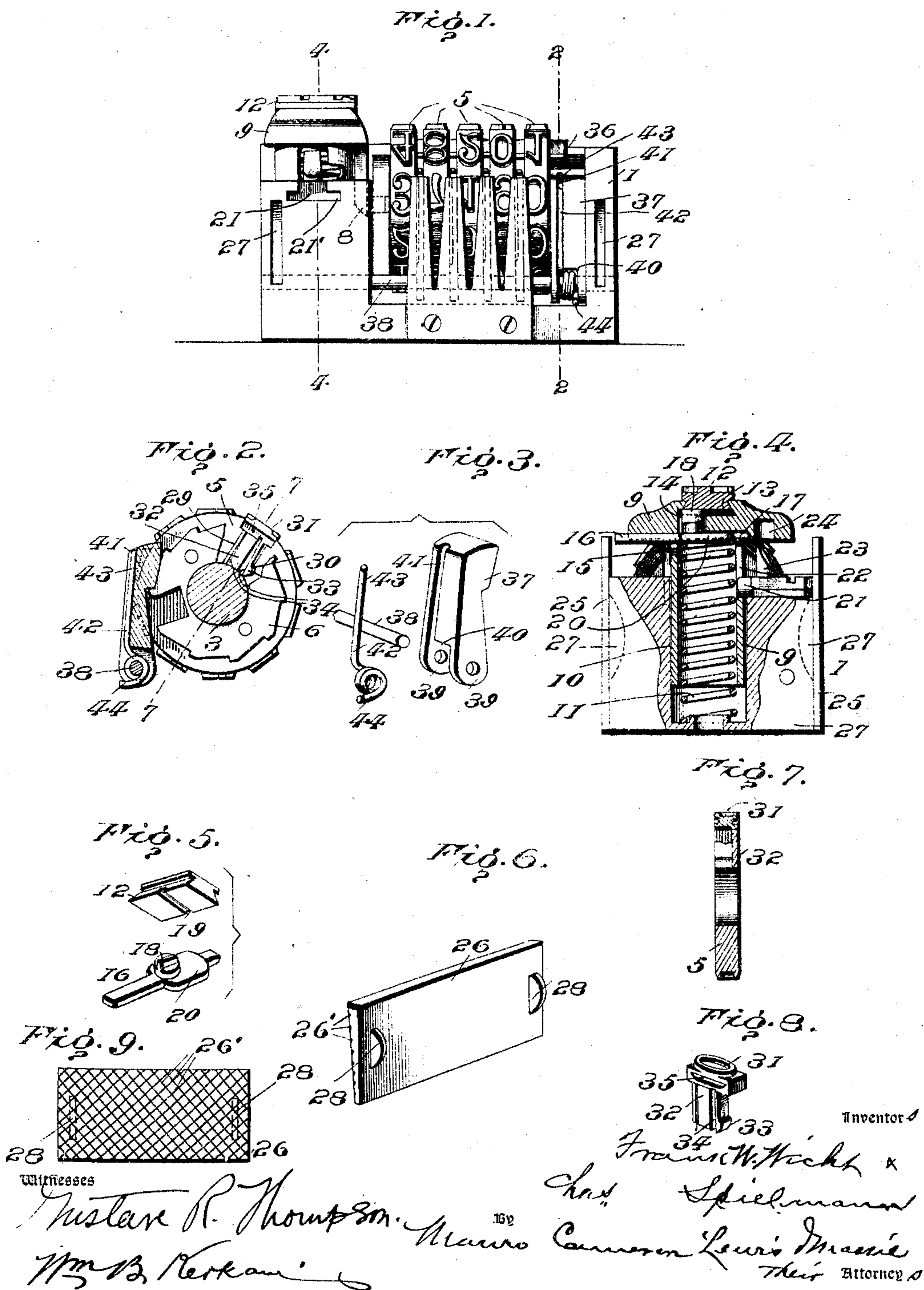
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NUMBERING MACHINE.

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UNITED STATES PATENT OFFICE.

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NUMBERING-MACHINE.

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To all whom it may concern:

Be it known that we, FRANK W. WICHT and CHARLES SPIELMANN, of Brooklyn, New York, have invented a new and useful Improvement in Numbering-Machines, which invention is fully set forth in the following specification.

This invention relates to automatic numbering-machines of the character employed to set up in connection with a form of type the type-matter surrounding the numbering-machine on a printing-cylinder or on a flat surface, as the case may be.

The object of the invention is to simplify the construction of such machines, doing away with unnecessary parts, and particularly to avoid the presence of minute parts which are difficult to manufacture and exceedingly liable to be lost in handling.

A further important object of the invention is to provide means for adapting the machine either to a cylindrical or a flat bed or printing-form, as may be desired.

With this object in view the invention consists in the details of construction and relation of parts hereinafter more specifically described and then pointed out in the claims.

The invention involved may receive various mechanical expressions, one of which, for the sake of illustration, is shown in the accompanying drawings, in which—

Figure 1 is a side elevation of a machine embodying the invention with the side plates which are used when the machine is set up in the form of type removed. Fig. 2 is a transverse section on the line 2 2, Fig. 1. Fig. 3 is a detail of the main retaining-pawl; and Fig. 4 is a broken vertical section on the line 4 4, Fig. 1, the side plates which are applied to the machine when it is set up with a form of type on a flat bed in position. Fig. 5 is a detail of a character-block and its retaining-catch which is mounted upon the main plunger of the machine. Fig. 6 is a perspective view of a form of side plate which is used when the machine is set up in a type-form on a cylindrical bed, and Fig. 9 is another view of the same. Fig. 7 is a transverse section of a number-wheel, taken on the line 7 7, Fig. 2, the ratchet secured to said numbering-wheel being removed; and Fig. 8 is a perspective

view of a removable character carried by the number-wheel.

Referring to the drawings, 1 is the frame of the machine, having the usual transverse shaft 3, Fig. 2, upon which a series of numbering-wheels 5 are mounted to turn, each of said numbering-wheels being provided with a ratchet 6, Fig. 2, which is engaged by a suitable spring-actuated retaining-pawl to prevent backward movement of the number-wheel. These numbering-wheels are actuated in the usual or any suitable manner, as by means of a series of actuating-pawls, such as are ordinarily employed in machines of this character, said actuating-pawls being operated by means of an arm 8, (shown in dotted lines in Fig. 1,) depending from a plunger 9, mounted in a vertical cavity in the framework of the machine, as will be understood from an inspection of Figs. 1 and 4. This plunger consists of a head piece or part secured to a hollow cylindrical part, the latter being preferably integrally formed, and the hollow cylindrical part plays in a cylindrical cavity 10 in the framework of the machine, carrying with it in its up-and-down movements the depending arm 8, which impinges upon and actuates any suitable actuating-pawl or pawl-lever. The plunger-cavity 10, Fig. 4, is of such size as to just receive the hollow cylindrical part of the plunger 9, and within said hollow cylindrical part is a spring 11, against whose tension the plunger is depressed, the spring reacting to raise the plunger when the pressure is removed therefrom.

In machines of this class it is frequently desirable to place upon the plunger a suitable printing character—as, for example, the character “No.”—and as it is desirable to substitute for this character characters of a different description for different classes of work it is desirable that they should be readily removable without disassembling the machine. As heretofore constructed this removable character 12 (shown in Figs. 1, 4, and 5) has been retained in place by a suitable catch engaging the bottom part of the character-block, which catch is retained in engagement with the character-block by a catch-actuating spring which forces the catch into a groove or recess formed

in the block. This spring has usually been of very minute construction, and one of the aims of the present invention is to do away with the particular spring employed for this purpose, while at the same time holding the catch for the character-block in yielding engagement therewith. The character-block has a dovetailed bottom portion, which is slid into a corresponding dovetailed groove formed in the top of the plunger 9, as will be readily understood from an inspection of Figs. 4 and 5. Beneath the dovetailed character-retaining groove is a groove formed in the under side of the head of the plunger, which groove communicates with the dovetailed character-retaining groove 13 by means of an opening 14, Fig. 4, and one side of the wall of the cylindrical portion of the plunger is cut away, as shown at 15. A character-retaining catch 16 is loosely fulcrumed, as at 17, in the groove thus formed on the under side of the plunger-head, said catch 16 being provided with a lug 18, which projects upward through the communicating opening 14 and engages with the groove 19, Fig. 5, on the under side of the character-block. The cut-away portion 15 of the cylindrical part of the plunger permits the outer end of the catch 16 to be depressed far enough to withdraw the lug 18 from the groove 19 in the block 12, so that the character-block is freed and can be slid longitudinally out of the dovetailed groove 13 when it is desired to remove the character-block and substitute another therefor. The catch 16 has an enlarged part 20, Fig. 5, which rests immediately over the spring 11, so that the spring 11 normally acts to hold the catch 16 with the retaining-lug 18 in engagement with the groove in the bottom of the block. When these parts are assembled, the plunger is depressed, so as to put the spring 11 under slight tension, and is held in this position by the retaining-catch 21, which is mounted to have transverse movement in an undercut slot 21' in the framework of the machine and engage in a slot 22, formed on one side of the cylindrical portion of the plunger 9, as will be readily understood by an inspection of Fig. 4. This retaining-catch 21 is provided with an upwardly-projecting cam-pin 23, lying in such position that it may be reached by a pencil-point or knife-blade and engaged thereby to slide the catch to one side when it is desired to withdraw the catch 21, so as to permit the parts to be disassembled, and in order that the upwardly-projecting pin 23 may not interfere with the reciprocations of the plunger the head of the plunger is provided with a cut-away opening 24, registering with the cam-pin 23, as will be readily understood from an inspection of the drawings, and engaging the cam-pin to force it into locking position when the plunger is depressed.

From the foregoing it will be perceived that the main plunger-spring 11 acts not only to re-

turn the plunger to its upward position when it has been depressed in the act of printing, and thereby place the arm 8 in position to again operate the actuating-pawl, but such spring also acts upon the retaining-catch 16 to hold the same in engagement with the character-block 12. It will thus be perceived that the single spring 11 has the double function of a plunger-actuating spring and a retaining-catch spring and that the parts are of such size that they may be readily manufactured and handled in assembling without danger of the parts being lost.

It frequently occurs that after the numbering-machine has been assembled in the form with type set up around it on a flat surface it is found desirable to assemble it upon a cylindrical bed or surface. When the same is to be assembled on a flat surface, two side-plates 25 25 are employed, which plates are of even thickness from top to bottom, as is shown in Fig. 4, and when it is desired to assemble the machine on a cylindrical bed there are substituted for the plates 25 25 of even thickness plates which are thicker at the top than they are at the bottom, as illustrated at 26, Fig. 6. In substituting the one form of plate for the other it is desirable to have the plates so constructed that they will accurately occupy the desired position and may be withdrawn and replaced without taking the machine out of the type-form and without doing anything more than slightly loosening the form. For the purpose of accurately locating the side plates in their proper position there are cut in the framework of the machine, at each end thereof, vertical slots 27 27, Fig. 1, which slots are preferably semicircular or, in any event, struck upon an arc, as shown in dotted lines in Fig. 4, and the plates 25 or 26, as the case may be, are provided with lugs 28 28, which are shaped to approximately conform to the size of the slots 27 27 and to fit with some slight friction therein. With this construction when it is desired to remove the plates 25 or 26, as the case may be, it is only necessary to grasp the top of the plate and draw it very slightly outward and upward. It is therefore unnecessary to do anything more than loosen the form without removing the machine therefrom. The exterior faces of plates 25 26 are preferably roughened, as by cross-hatching, (shown at 26', Fig. 6^a.) to prevent the machine from rising out of a cylindrical type-form when subjected to pressure.

In machines of this character it is frequently desirable to have one or more of the printing characters carried by the character-wheels removable from the wheel, and as heretofore constructed such characters have been provided with a retaining pin or part actuated by a minute spring, which holds the retaining-pin in engagement with a suitable notch or cut-away portion in the removable character.

This retaining-pin and its actuating-spring are necessarily of very minute character, and their construction and handling in assembling and disassembling the parts is one requiring considerable care in order to avoid the loss of such parts. By the present invention we have provided a character which can be readily inserted and removed from the printing-wheel without any danger of the loss of parts. Such character is shown in Figs. 2, 7, and 8, in which there is shown formed in one of the character-wheels 5 a radial recess 29, which recess is provided on one of its sides with a notch 30. A removable character 31 is mounted on a stem 32, and integral therewith is a lug 33, formed to engage in the notch 30, formed in one side of the radial recess 29 in the wheel. This result is secured by providing the stem 32 with one or more kerfs or splits 34, Figs. 2 and 8, so that when the stem of the removable character is forced into the radial recess 29, which it snugly fits, the lug 33 yields or is pressed inward until it reaches the notch 30 in the side of the radial recess 29, when it springs out and engages the notch, thereby retaining the character in its position in the numbering-wheel. This lug 33 is preferably slightly beveled upon its upper and lower sides, as is also the notch 30, and by firmly grasping the character and pulling it outward the lug 33 is forced inward and the character readily removed. For the purpose of securing a suitable hold upon the character there is preferably formed a finger-nail notch or groove 35 in the head of the removable character, as is plainly shown in Figs. 2 and 8. It will be perceived that the removable character, its stem, and its retaining-lug are integrally formed and that the parts are of such size that they may be readily handled without danger of loss and that in order to provide for the yielding action of the lug 33 it is only necessary to cut the kerfs or splits 34 in the stem 32 of the character.

In machines of this character the first numbering-wheel 5 is the one which is much more frequently used than any of the other wheels and is therefore subjected to most wear. Consequently it is desirable in such machines that the ratchet 36, Fig. 1, which is secured to said wheel, shall be more substantially constructed than in the case of the other wheels—*i. e.*, shall be thicker and heavier—and it is also desirable that the pawl 37, which operates in connection with said ratchet-wheel 36, should also be thicker and stronger than the pawls operating in connection with the other numbering-wheels. Moreover, it is desirable that the spring which actuates said pawl 37 should be efficient in operation and not liable to deterioration as the result of continued use. Various constructions have been heretofore proposed for applying this spring to the actuating-pawl of the first numbering-wheel, all of which, so far as we are informed, were so con-

structed and applied as to occupy space which might otherwise be utilized either in the increased thickness of the pawl or else were so applied as to leave the spring exposed at the side, and therefore liable to injury. All of the retaining-pawls in the present construction are mounted, as shown, upon a shaft 38, extending longitudinally of the machine, and the pawl 37 is made of unusual thickness and provided with two ears 39 39, having an opening therethrough, so that the pawl may turn upon the shaft or pin 38. The lower end of the pawl between the ears is cut away, as shown at 40, Figs. 1 and 3, the rear side of the pawl having a groove 41, extending from said cut-away portion 40 upward, preferably to the top of the pawl. A coiled spring 42 encircles the pin or shaft 38, having a long arm 43, resting in the groove 41, and a short arm 44, resting upon the framework of the machine, as shown in Fig. 1, all of which will be understood from an inspection of Figs. 1, 2, and 3. By this construction it will be observed that a stout and efficient spring is provided for the pawl 37, which spring is effectively housed in the cut-away part 40 and the groove 41, and that the spring is applied without occupying any of the longitudinal space between the ends of the frame, so that the pawl 37 may be made quite heavy.

From the foregoing it will be perceived that we have provided a numbering-machine which may be used with cylindrical or flat printing-beds and change from one to the other without removing the machine from the form; that we have provided on the actuating-plunger a movable character which is retained in place with the fewest possible number of parts; that we have also provided a movable character for each numbering-wheel which is simple in construction and readily removable, while at the same time it is firmly retained in position; and, furthermore, that we have provided a retaining-pawl for the main numbering-wheel which is of great strength and capable of prolonged wear without increasing the size of the machine or exposing the actuating-spring thereof to injury and permitting it to occupy any unnecessary space.

The side plates can be removed by moving them in an outward and upward direction and replaced by a reverse movement—*i. e.*, by a movement in a downward and inward direction—and will be clamped to the machine simply by the pressure exerted in locking up the form in which they are inserted.

The character-retaining catch works in a groove upon the under side of the plunger-head, where it is protected from the entrance of ink, which might otherwise interfere with its free action, thus constituting a marked improvement over those forms in which the catch is located in a slot opening through the top of the plunger-head.

What is claimed is—

1. In an automatic numbering-machine, the combination of the machine-frame, numbering-wheels mounted thereon, means for operating said wheels, and a removable side plate
5 secured to said frame and capable of simultaneous upward and outward movement but held against longitudinal movement.

2. In an automatic numbering-machine, the combination of the machine-frame and a re-
10 movable side plate therefor, one of said parts having a vertical arc-shaped lug extending outward from its face and the other having a vertical arc-shaped slot cut into its face for frictionally receiving and holding the lug on the
15 other part.

3. In an automatic numbering-machine, the combination of the machine-frame, with a side plate, and means securing said side plate
20 against longitudinal movement relative to said frame while leaving it free to be moved upward and outward or laterally.

4. In an automatic numbering-machine, the combination of the machine-frame, and a side plate tapering in thickness from top to bot-
25 tom, said plate being removably attached to the frame by arc-shaped lugs on the plate engaging corresponding arc-shaped recesses in the face of the frame.

5. In an automatic numbering-machine, the
30 combination of the frame, the numbering-wheels mounted thereon, the actuating-plunger therefor, a removable printing character mounted on the top of said plunger, a character-retaining catch and a spring actuating both
35 said plunger and catch.

6. In an automatic numbering-machine, the numbering-wheels, the frame in which the same are mounted, the actuating-plunger for
40 said wheels, the plunger-spring, the removable printing character mounted on the plunger-head and the character-retaining catch yieldingly held in engagement with the printing-character body by the plunger-spring.

7. In an automatic numbering-machine, the
45 numbering-wheels, the frame in which the same are mounted, the actuating-plunger for said wheels, the plunger-spring, the removable printing character mounted on the plunger-head, and a character-retaining catch fulcrumed on the plunger, with its lower face
50 resting on the plunger-spring and its upper face bearing against the plunger-head.

8. In an automatic numbering-machine, a numbering-wheel having a removable print-
55 ing character mounted in a recess therein and having an integrally-formed yielding lug engaging a notch or depression in one of the walls of said recess.

9. In an automatic numbering-machine, a
60 numbering-wheel having a radial recess formed therein with a notch or depression in one of its walls, in combination with a removable printing character having a stem and a

spring-blade secured thereto, said spring-blade having a lug yieldingly engaging said
65 notch or depression.

10. In an automatic numbering-machine, the combination of a numbering-wheel having a radial recess, with a removable printing
70 character having a stem fitting in said recess, one of said parts having a notch or depression and the other having an integrally-formed spring-blade bearing a lug engaging said notch or depression.

11. In an automatic numbering-machine, a
75 numbering-wheel having a removable printing character mounted in a recess therein, said character being provided with a shank having a plurality of splits or kerfs whereby members are formed having yielding contacts
80 with the walls of said recess.

12. In an automatic numbering-machine, the numbering-wheels, the frame in which the same are mounted, the actuating-plunger for
85 said wheels, the plunger-spring, the removable printing character mounted on the plunger-head, and character-retaining means held in engagement with the printing-character body by the plunger-spring.

13. In an automatic numbering-machine, 90 the numbering-wheels, the frame in which the same are mounted, the actuating-plunger for said wheels, the plunger-spring, the removable printing character mounted on the plunger-head, character-retaining means held in en-
95 gagement with the printing-character body by the plunger-spring, said retaining means being provided with character-releasing means.

14. In an automatic numbering-machine, 100 the combination of the machine-frame, numbering-wheels mounted thereon, means for operating said wheels, a removable side plate provided with retaining means permitting it
105 to be moved simultaneously upward and outward relative to said frame and having its exterior face roughened.

15. In an automatic numbering-machine, the combination of the machine-frame, num-
110 bering-wheels mounted thereon, means for operating said wheels, a removable side plate secured to said frame said plate tapering in thickness from top to bottom and having its exterior face roughened, said plate being re-
115 movably attached to the frame by arc-shaped lugs extending from one of said parts and engaging corresponding arc-shaped recesses in the face of the other of said parts.

In testimony whereof we have signed this specification in the presence of two subscrib-
120 ing witnesses.

FRANK W. WICHT.
CHARLES SPIELMANN.

Witnesses:

JOHN J. CHATTAWAY,
RUDOLPH SPIELMANN.