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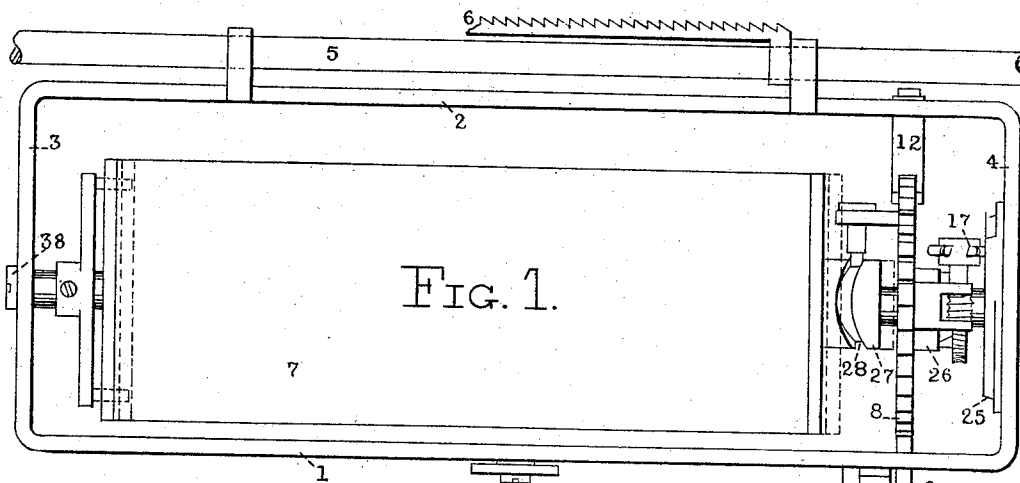
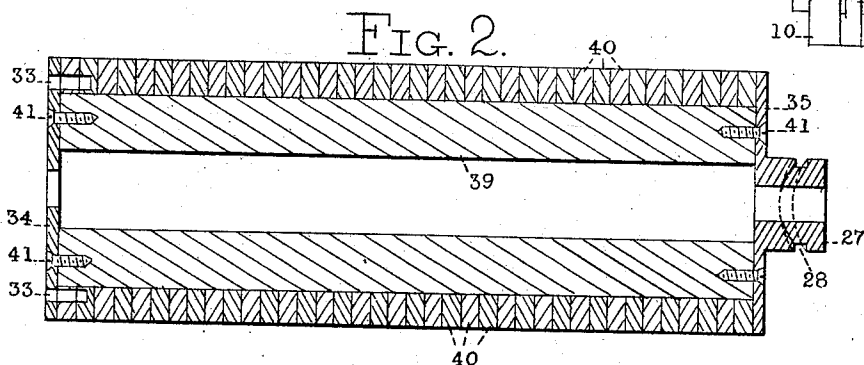
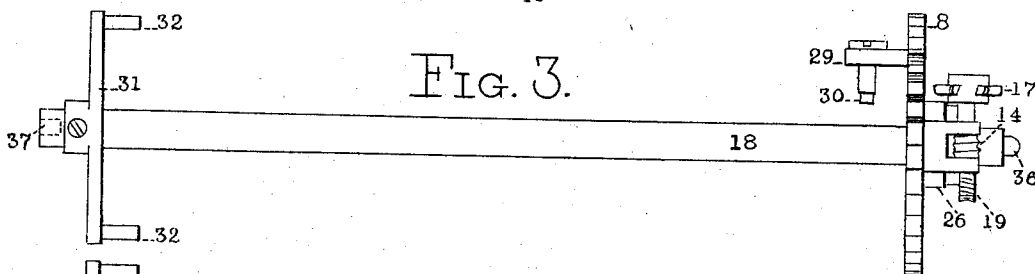
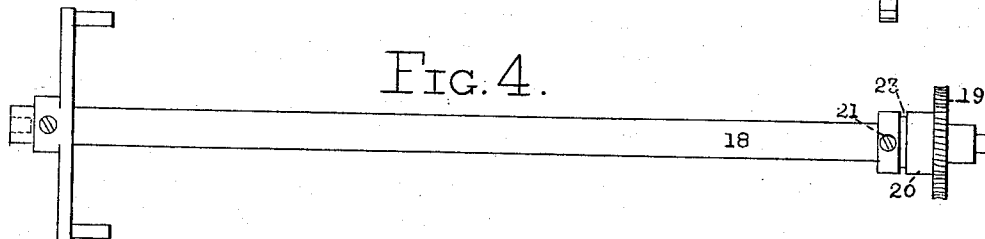
Patented Oct. 24, 1899.

B. C. STICKNEY.
TYPE WRITING MACHINE.

(Application filed Sept. 22, 1896.)

(No Model.)

2 Sheets—Sheet 1.



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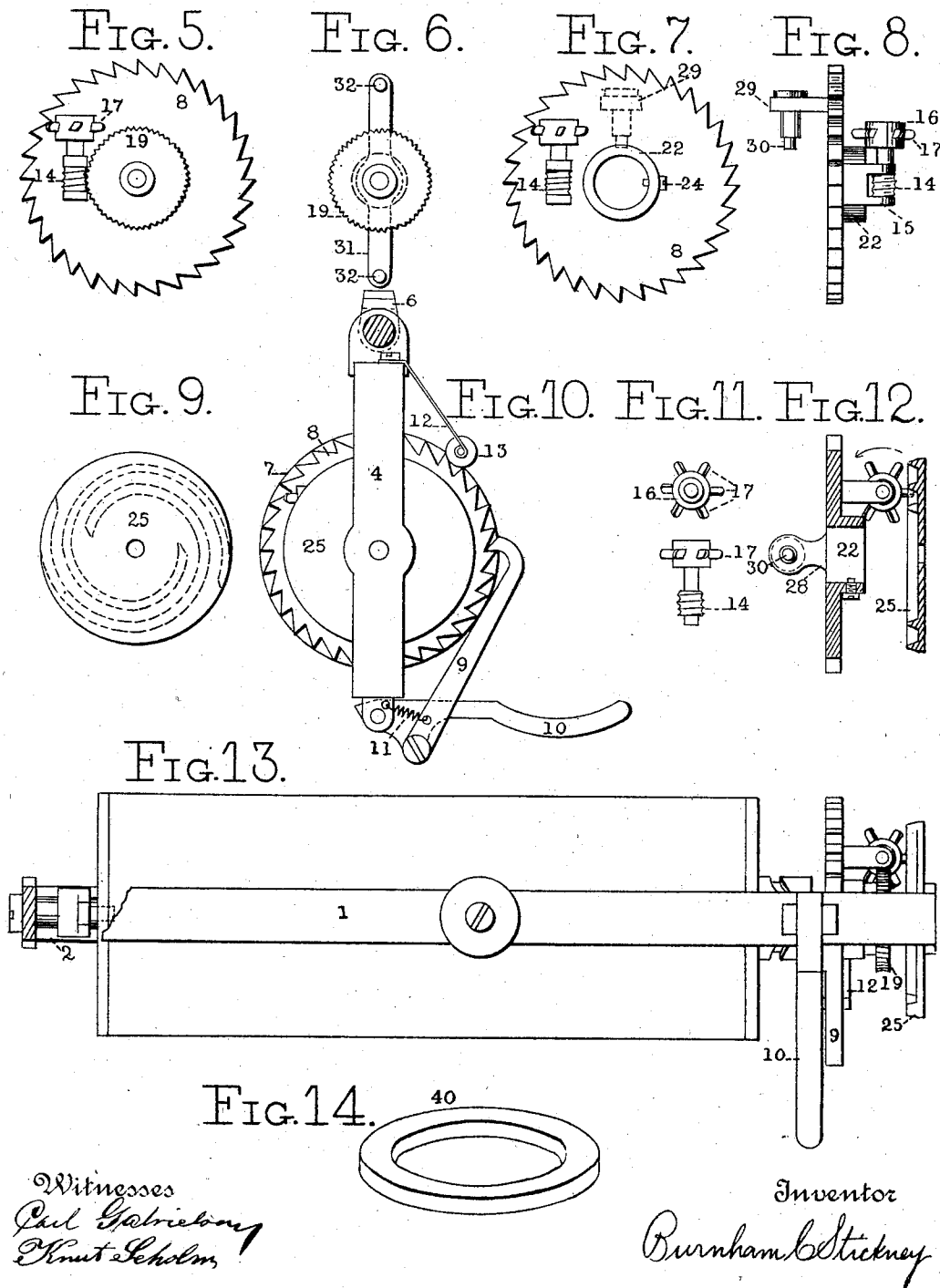
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UNITED STATES PATENT OFFICE.

BURNHAM C. STICKNEY, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO
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TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 635,609, dated October 24, 1899.

Application filed September 22, 1896. Serial No. 606,609. (No model.)

To all whom it may concern:

Be it known that I, BURNHAM C. STICKNEY, a citizen of the United States, and a resident of Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to the platens of type-writing machines; and its object is to prevent the repeated hammering action of the types from indenting or corrugating the surface of the platen and also to provide the platen with an improved cover or printing-surface.

After short use a platen presents a series of indentations which make it impossible to obtain perfect impressions of the types upon the paper. They are caused by the repeated hammering of the types in the same places, the sharp types, such as the period and comma, making the deepest impressions. The indentations extend in lines lengthwise of the platen at intervals corresponding to the teeth in the letter-spacing rack, and the lines extend around the platen at intervals corresponding to the teeth in the line-space wheel.

My invention consists in combining with a platen means for progressively subjecting the entire circumference thereof to the hammering action of the types, whereby the smoothness and evenness of its surface will be preserved, in combining with a platen means for turning it through an aliquant part of a complete revolution at each line-spacing operation, in combining with a platen and a line-space wheel means for rotating the platen relatively to the line-space wheel, in combining with a platen and a line-space wheel provided with evenly-spaced teeth means for turning the platen an aliquant part of a complete revolution at each line-spacing operation, in combining with the platen means for progressively subjecting the printing-surface thereof to the impact of the types throughout its length, in combining with a platen means for progressively giving it slight lengthwise movements independently of the letter-spacing movements, and in providing means for regulating the density of the platen-cover or printing-surface; and it further consists in the various features of construction and combi-

nations of devices hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a plan of so much of a type-writer carriage as is necessary to show my invention. Fig. 2 is a sectional plan of the platen. Fig. 3 is a plan of the platen-shaft and attached devices, the platen having been removed. Fig. 4 is another plan of the platen-shaft, the ratchet-wheel having also been removed. Fig. 5 is an end view of Fig. 3. Fig. 6 is an end view of Fig. 4. Figs. 7 and 8 are respectively end and plan views of the line-space wheel and attached devices. Fig. 9 is an end view of the scroll. Fig. 10 is an end view of Fig. 1. Fig. 11 shows plan and elevation of the worm. Fig. 12 is a sectional front elevation of the line-space wheel and scroll, showing the manner in which the worm is caused to revolve on its own axis by the scroll during the rotation of the line-space wheel. Fig. 13 is a front elevation of Fig. 1, and Fig. 14 is a perspective view of one of the washers that constitute the printing-surface of the platen.

In the various views the same numeral of reference will be found to designate the same part.

1, 2, 3, and 4 are respectively the front, back, and end bars of the platen-frame, which may be hinged to the guide-rail 5 in the usual manner.

6 is the usual letter-spacing rack.

The carriage may be supported in front by the usual rail, on which may run the roll shown attached to the front bar 1, and may be propelled by a spring or other means.

7 is the platen, and 8 the line-space wheel, provided with evenly-spaced teeth.

9 is the line-spacing pawl, and 10 the line-spacing-lever, which after actuation are restored to normal position by spring 11.

12 is the check-spring, provided with an antifricition-roll 13 and engaging the line-space wheel to prevent accidental rotation thereof.

Method of subjecting the entire circumference of the platen to the impact of the types.—I have so organized the machine that the line-space movements of the platen do not match the teeth of the line-space wheel—that is to

say, while the teeth of the line-space wheel are evenly spaced, so that each tooth occupies an aliquot part of the periphery of the wheel, the platen at each line-space operation is rotated through an aliquant part of a complete revolution. Consequently the blows of the types do not fall upon exactly the same spot at successive revolutions of the platen, so that instead of deepening the impressions left by preceding types they tend rather to obliterate such former impressions. The entire circumference of the platen is thus progressively subjected to the action of the types. I have devised a variety of means for carrying out this portion of my invention and will now describe the preferred construction.

To the line-space wheel 8 is secured a bracket 15, in which is mounted a screw or worm 14, Figs. 7 and 8, which is provided with a head 16, which has a series of flat pins 17, (shown clearly at Fig. 11,) by which the worm is actuated, as will presently be explained.

To the platen-shaft 18 is rigidly secured a worm-wheel 19, Fig. 4, which is provided with a hub that fits the shaft and is secured thereto by the set-screw 21. This hub also fits inside the hub 22 of the line-space wheel 8.

In Figs. 3 and 5 the parts just described are shown assembled, the worm 14 meshing with the worm-wheel 19. The platen-shaft may be rotated independently of the line-space wheel by the actuation of the worm 14. To prevent lateral motion of the line-space wheel, the hub 20 is provided with an annular peripheral groove 23, and the hub 22 is provided with an inwardly-projecting screw 24, which enters the groove. As the screw 24 locks the worm-wheel and shaft against independent rotation, the rotary motion of the line-space wheel at the line-spacing operation will be transmitted to the platen-shaft and platen.

To rotate the worm about its own axis, the teeth 17 are arranged in engagement with the stationary scroll 25, Fig. 12. These teeth are twisted or set diagonally into the head 16, so as to match the grooves in the scroll at the point of their engagement therewith. During the rotation of the line-space wheel the worm 14 is carried bodily around and its teeth 17 follow the evolute grooves of the stationary scroll, which causes the worm to turn on its own axis. During six revolutions of the line-space wheel the worm will make one revolution on its own axis, as there are six of the teeth 17. Hence during six revolutions of the line-space wheel the relative positions of the line-space wheel and worm-wheel 19 will be altered to the extent of one tooth of the latter, and there is of course the same relative change in the positions of the platen-shaft and platen as compared with the line-space wheel. Assuming that there are fifty teeth in the worm-wheel, the platen will make six and one-fiftieth revolutions while the line-space wheel is making six. During one revolution of the latter the platen makes

one and one three-hundredths revolutions, and during three hundred revolutions of the line-space wheel the platen makes three hundred and one revolutions. Assuming the circumference of the platen to be six inches and that the line-space wheel has thirty-two teeth, it will be seen that at every thirty-third line the writing will fall upon the platen at a point one-fiftieth of an inch in advance. The line-space distance or interval will be three hundred and one sixteen-hundredths of an inch, which of course is an aliquant part of six inches, the entire circumference. At each line-space movement the platen will revolve through eleven and twenty-three eightieths degrees, which is an aliquant part of a complete revolution of three hundred and sixty degrees.

If desired, the platen may be made to revolve more slowly than the line-space wheel by making the scroll-threads involute instead of evolute or by reversing the threads of the worm-gear.

I provide a friction device between the platen and the line-space wheel the resistance of which must be overcome when the platen is rotated independently of the latter. The object thereof is to prevent the accidental independent motion of the platen, which might occur by reason of loose fit or wear of the parts and which would cause a wavy and irregular appearance of the lines of writing. The friction device consists of a split washer 26, which fits over the hub 20 and is arranged to expand against the inner side of the worm-wheel 19 and the outer edge of the hub 22, Figs. 1 and 3. By this means the frictional opposition to the independent rotation or shake of the platen may be rendered as great as or greater than the resistance offered by the check-spring 12 to the rotation of the line-space wheel, thus effectually preventing erratic movements of the platen.

Lengthwise platen motion.—The previously-described devices will serve to considerably prolong the life of the platen; but I prefer to also employ means for subjecting the platen progressively lengthwise to the hammering action of the types, thus increasing the tendency of the blows to obliterate preceding impressions and also avoiding the liability of circumferential grooves being cut in the platen by the sharper types.

I provide the platen at its right-hand end with a hub 27, in the periphery of which is cut a cam-groove 28; Figs. 1 and 2. To the line-space wheel 8 is fixed a bracket 29, from which projects a pin 30, that engages the cam-groove. The pin traverses the groove during the independent motion of the platen relatively to the line-space wheel, thus causing the platen to reciprocate endwise slowly, the extent of such motion being about one-tenth of an inch. The groove is shaped so that during one independent revolution the platen moves endwise twice in each direction. It

may, however, be caused to move three times or only once by changing the shape of the cam-groove. At Fig. 1 the platen is shown in full lines at the extreme left-hand end of the lengthwise movement and in dotted lines at the extreme right-hand end. During the line-spacing operation the whole system will appear to revolve together as one piece around the axis of the platen, as the independent motions of the platen relatively to the line-space wheel are so gradual as to be imperceptible. To cause the platen to rotate with the shaft, the latter is provided at its left-hand end with a cross-arm 31, from which project inwardly pins 32, parallel with the shaft, Figs. 3 and 6. The platen is provided with holes 33, which receive the free ends of the pins 32. The pins transmit the motion of the shaft to the platen and are sufficiently long to permit the latter to move independently endwise the required distance. To minimize the possibility of shake or lost motion between the platen and shaft, the pins 32 are placed as near as possible to the periphery of the platen.

The nipple 36, formed upon the right-hand end of the platen-shaft, fits into a hole in the end bar 4. A hole in the other end of the shaft receives the end of a screw 38, secured in the end bar 3. The shaft is thus easily removed from the carriage.

Improved platen construction.—The required density of rubber platen-covers is obtained by mixing with the pure rubber, which is too soft to form a suitable printing-surface, a suitable quantity of various mineral substances. Platens or platen-covers made from such composition begin at once to harden and in a short time become unfit for use for making single copies, as when the platen is too hard the outlines of the letters do not show clearly. I have provided means for obtaining the required density of the platen or printing-surface by compression and am enabled thereby to employ other substances, such as leather or felt, which will not harden with age and the density of which may be increased or decreased to the proper degree.

A series of washers 40, preferably leather, are placed side by side upon a wooden core 39, a sufficient number being used to extend beyond the ends of the core. The end plates or disks 34 35 are then secured to the core by screws 41, thus compressing the washers. If desired, the washers may be submitted to pressure before being placed in position to increase their density. If the platen is found to be too soft, one of the end plates may be removed and one or more washers added. Then the plate may be replaced and screwed into its former position, compressing all the washers and making them harder. If the platen is found to be too hard, the screws may be turned a little, so as diminish the pressure, or one of the washers may be removed, allowing the others to expand and soften. No rubber composition of which I

am aware will serve equally well for single copies and heavy manifolding. Leather, however, may be compressed until it is hard enough to serve excellently for manifolding purposes, and at the same time it will be unsurpassed for making single copies, because it has a low degree of elasticity and therefore brings out sharply the complete outlines of the types upon the paper. In consequence of its comparative inelasticity, however, the types will penetrate its surface more readily than that of the usual rubber composition; but this will not prove an objection when the entire printing-surface is subjected uniformly to the action of the types, as in the manner above described.

If desired, other means may be employed to make the line-space distance an aliquant part of the circumference of the platen or to secure progressive wear of the platen circumferentially or lengthwise or to rotate the platen independently of the line-space wheel or to move the platen independently endwise or to perform the various other offices of the invention. The means I have described for performing the several functions are those preferred by me; but so far as the broad features of my invention are concerned it is not my intention to limit myself to the described means. So far as both the broad and minor features of my invention are concerned, many changes in form and detail construction and arrangement may be made without departing from the spirit of my invention and it is not my intention to limit myself in any instance to the precise details above described.

What I claim herein as new, and desire to secure by Letters Patent, is—

1. In a type-writing machine, as a means for securing even wear of the platen, the combination with a platen of automatically-operating means for slightly varying the position thereof relatively to the printing-point, substantially as set forth.

2. In a type-writing machine, the combination with a platen of automatically-operating means for progressively causing slight variations in the position thereof relatively to the printing-point, substantially as set forth.

3. In a type-writing machine, the combination with a cylindrical platen of means for progressively subjecting the entire circumference thereof to the action of the types, substantially as set forth.

4. In a type-writing machine the combination with a cylindrical platen and a reciprocatory driver therefor, such as a line-space lever, of means actuated by the lever for progressively subjecting the entire circumference of the platen to the action of the types, substantially as set forth.

5. In a type-writing machine, the combination with a cylindrical platen and its line-space lever of means for turning the platen through an aliquant part of a complete revolution at each actuation of the line-space lever, substantially as set forth.

6. In a type-writing machine, the combination with a cylindrical platen and a line-space wheel provided with evenly-spaced teeth of means for turning the line-space wheel through an aliquant part of a complete revolution and simultaneously turning the platen through an aliquant part of a complete revolution, substantially as set forth.

7. In a type-writing machine the combination with a cylindrical platen and a line-space wheel connected thereto of automatically-operating means for slightly rotating the platen relatively to the line-space wheel, substantially as set forth.

8. In a type-writing machine, the combination with a cylindrical platen and a line-space wheel connected thereto of automatically-operating means for progressively rotating the platen relatively to the line-space wheel, substantially as set forth.

9. In a type-writing machine the combination with a cylindrical platen and a line-space wheel connected thereto of means for progressively rotating the platen relatively to the line-space wheel during the rotation of the latter, substantially as set forth.

10. In a type-writing machine the combination with a cylindrical platen and a line-space wheel connected thereto of automatically-operating means arranged between the wheel and the platen for progressively rotating the platen relatively to the wheel, substantially as set forth.

11. In a type-writing machine, the combination with a cylindrical platen and a line-space wheel connected thereto and rotating simultaneously therewith, of a screw device arranged between the platen and the line-space wheel and serving to transmit the motion of the line-space wheel to the platen, and also adapted to cause alterations in the relative positions of platen and line-space wheel, substantially as set forth.

12. In a type-writing machine, the combination with a cylindrical platen, a line-space wheel, and means arranged between them for automatically varying their relative positions, of a friction device also arranged between the platen and line-space wheel and serving to oppose the independent rotation of the former relatively to the latter, substantially as set forth.

13. In a type-writing machine, the combination with a cylindrical platen provided with a worm-wheel, of a line-space wheel provided with a worm to mesh therewith, and means for actuating the worm to rotate the worm-wheel and platen relatively to the line-space wheel, substantially as set forth.

14. In a type-writing machine, the combination of a platen-frame provided with a threaded device, such as a scroll, a line-space wheel provided with a worm having a series of teeth to engage the scroll, and a platen provided with a worm-wheel to engage the worm, substantially as set forth.

15. In a type-writing machine, the combina-

tion with a platen of automatically-operating means for progressively subjecting the printing-surface thereof to the action of the types throughout its length, substantially as set forth.

16. In a type-writing machine, the combination of a platen, a carriage or frame therefor, and automatically-operating means for progressively moving the platen lengthwise independently of the carriage or frame, substantially as set forth.

17. In a type-writing machine, the combination of a platen, a carriage or frame therefor, and automatically-operating means for progressively reciprocating the platen lengthwise independently of the carriage or frame, substantially as set forth.

18. In a type-writing machine, the combination with a platen arranged to move lengthwise for letter-spacing and to revolve for line-spacing, of means for automatically moving the platen gradually endwise during successive revolutions thereof, substantially as set forth.

19. In a type-writing machine, the combination with a cylindrical platen of means for progressively subjecting the entire printing-surface thereof both lengthwise and circumferentially to the action of the types, substantially as set forth.

20. In a type-writing machine the combination with a platen and a laterally-inactive line-space wheel connected thereto of means for gradually rotating and moving the platen endwise relatively to said wheel, substantially as set forth.

21. In a type-writing machine, the combination with a platen provided with a cam of a relatively-fixed pin arranged in engagement with the cam, to cause the platen to move endwise when rotated relatively to the pin, substantially as set forth.

22. In a type-writing machine, the combination with a platen and a laterally-inactive line-space wheel of a cam device arranged between the platen and the line-space wheel, and operating to reciprocate the platen endwise when the latter is rotated independently of the line-space wheel, substantially as set forth.

23. In a type-writing machine the combination with a platen provided with a cam-groove of a laterally-inactive line-space wheel provided with a pin for engaging the cam-groove, and means for rotating the platen relatively to the line-space wheel, substantially as set forth.

24. In a type-writing machine, the combination with a frame of a shaft mounted therein, a platen having an automatic reciprocating movement upon the shaft, means for rotating the shaft, and means for causing the platen to revolve with the shaft, substantially as set forth.

25. In a type-writing machine, the combination of a platen having a limited automatic reciprocating movement and provided with

one or more openings 33, and a shaft provided with an arm or arms 31 and pins 32 to enter the openings, substantially as set forth.

26. In a type-writing machine, the combination of a shaft, means for rotating it, a platen arranged to automatically reciprocate upon the shaft, and means fixed to the shaft and connected to the platen at a point near its periphery to cause the platen to revolve with the shaft, substantially as set forth.

27. In a type-writing machine, the combination of a platen-frame provided with a threaded device, such as a scroll; a line-space wheel provided with a worm having a series of teeth to engage the scroll, and provided also with a pin, as 30, said line-space wheel being held against lateral motion; a shaft mounted in the frame and provided with a worm-wheel for engaging the worm; and a platen mounted upon the shaft and adapted to slide thereon but to revolve therewith, and provided with a cam-groove to engage the said pin, substantially as set forth.

28. In a type-writing machine, the combination with a rigid cylindrical platen or platen-cover of means connected thereto for regulating the density thereof by compression or expansion, substantially as set forth.

29. In a type-writing machine, the combination with a series of washers set side by side to form a rigid cylindrical printing-surface or platen, of means for compressing the washers, substantially as set forth.

30. As a new article of manufacture, a cylindrical platen or platen-cover for type-writing machines composed of a series of compressed-leather washers, substantially as set forth.

31. In a type-writing machine, a cylindrical platen comprising a core or frame provided with end plates and a series of washers arranged between the plates and compressed thereby, substantially as set forth.

32. In a type-writing machine, the combination with a cylindrical platen or platen-cover constructed from compressed leather of means for progressively subjecting the entire printing-surface thereof to the action of the types, substantially as set forth.

33. In a type-writing machine, and in a line-space mechanism comprising means for turning the platen step by step either forward or backward as desired, the combination with the platen and the line-space wheel of means for causing the platen to turn at a different

speed from the line-space wheel, substantially as set forth.

34. In a type-writing machine, the combination of a cylindrical platen, a line-space wheel, and an intermediate turning device for operatively engaging the platen to the line-space wheel; the turning device being constructed to alter the relative circumferential positions of the platen and line-space wheel, whereby different portions of the platen are exposed to the action of the types; substantially as set forth.

35. In a type-writing machine, the combination of a line-space wheel, a cylindrical platen movable independently of the line-space wheel, and an intermediate fixed brake constructed to oppose the movement of the platen independently of the line-space wheel, substantially as set forth.

36. In a type-writing machine, the combination of a cylindrical platen, a line-space wheel, intermediate means for altering the relative circumferential positions of platen and line-space wheel, whereby different portions of the platen are exposed to the action of the types, and a brake constructed to oppose the movement of the platen independently of the line-space wheel, substantially as set forth.

37. In a type-writing machine, the combination of a cylindrical platen, a line-space wheel, an intermediate turning device for operatively engaging the platen to the line-space wheel; the turning device being constructed to alter the relative circumferential positions of platen and line-space wheel, whereby different portions of the platen are exposed to the action of the types; and a brake constructed to oppose the movement of the platen independently of the line-space wheel; substantially as set forth.

38. In a type-writing machine, the combination of a cylindrical platen, a line-space wheel, and an intermediate graduated adjusting device for altering the relative circumferential positions of platen and line-space wheel, substantially as set forth.

Signed at Elizabeth, in the county of Union and State of New Jersey, this 21st day of September, A. D. 1896.

BURNHAM C. STICKNEY.

Witnesses:

JOSEPH F. JAQUITH,
EDWARD BRYCE.