

C. B. CORCORAN.
TYPE WRITING MACHINE.
APPLICATION FILED NOV. 18, 1913.

1,294,622.

Patented Feb. 18, 1919.
2 SHEETS—SHEET 1.

Fig. 1.

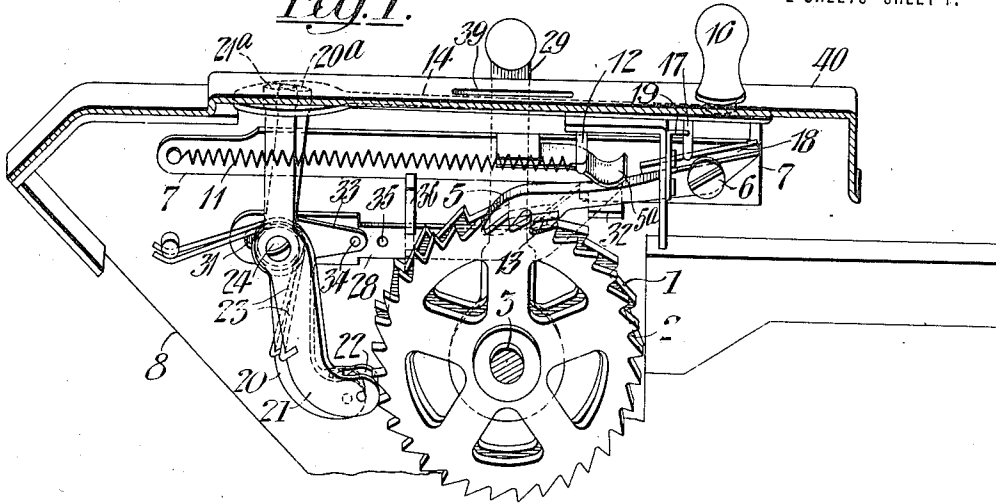


Fig. 2.

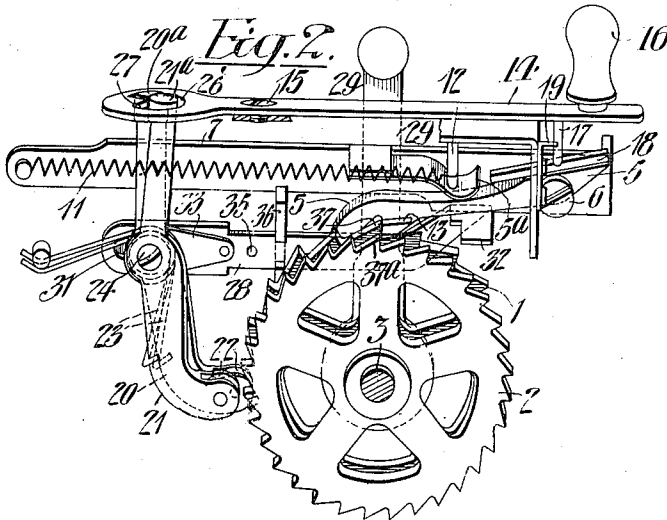
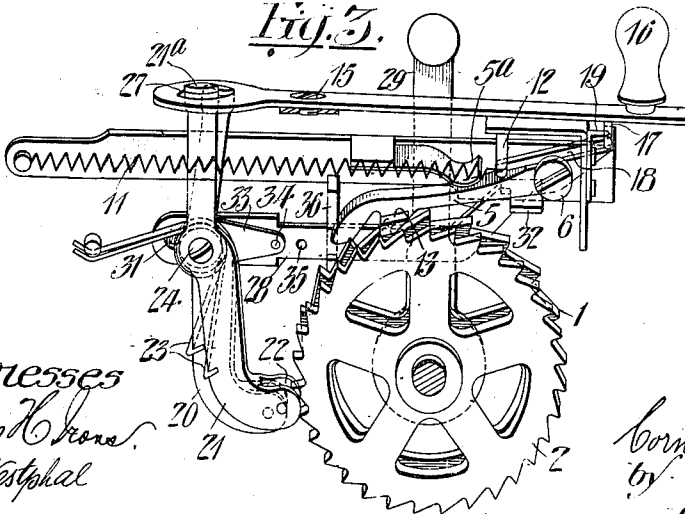


Fig. 3.



Witnesses
Titus H. Kane
W. Westphal

Inventor.
Cornelius B. Corcoran
by D. B. Hickney
his Attorney.

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2 SHEETS—SHEET 2.

Fig. 4.

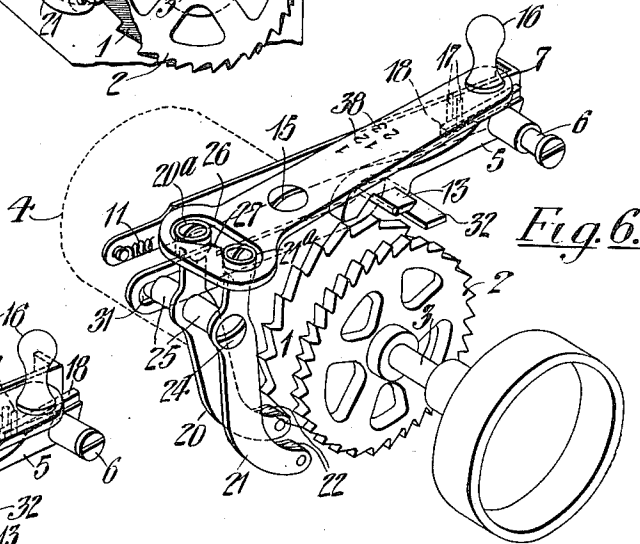
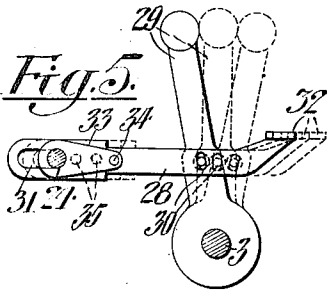
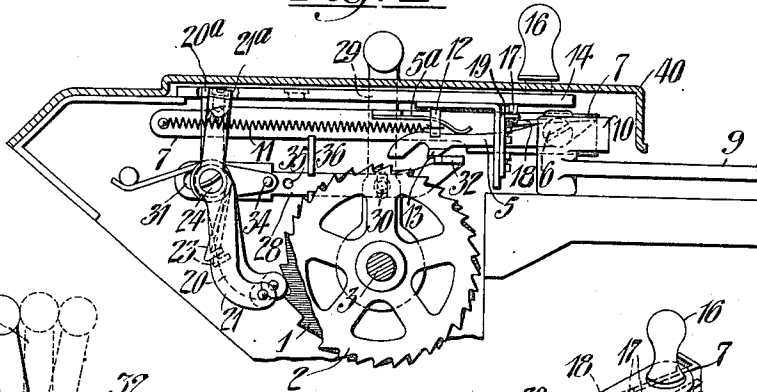


Fig. 7.

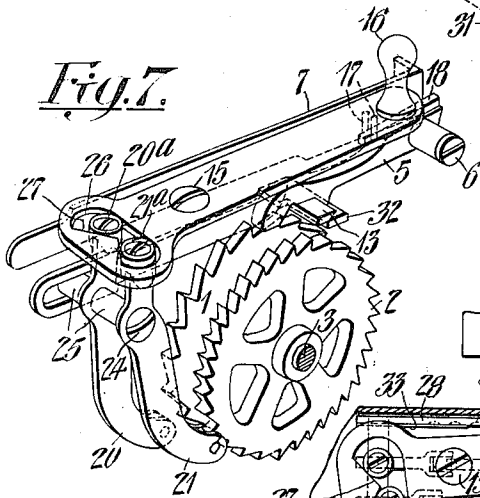
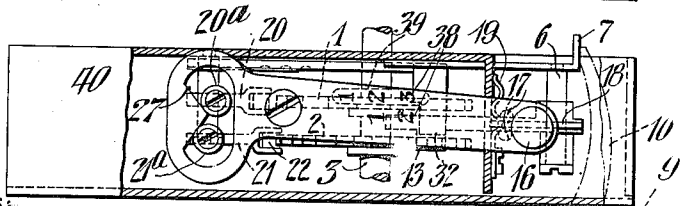
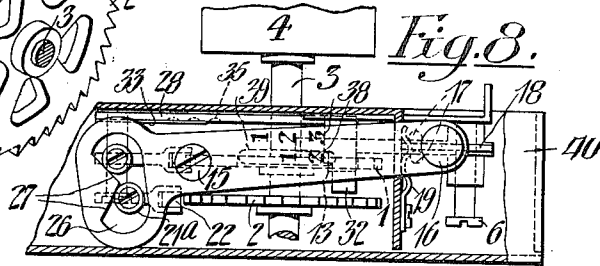


Fig. 8.



WITNESSES:

Titus H. Drown
W. Westphal

Fig. 9.

Inventor:
Cornelius B. Corcoran
by B. C. Stickney
his Attorney.

UNITED STATES PATENT OFFICE.

CORNELIUS B. CORCORAN, OF NEW YORK, N. Y., ASSIGNOR TO UNDERWOOD TYPEWRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

TYPE-WRITING MACHINE.

1,294,622.

Specification of Letters Patent.

Patented Feb. 18, 1919.

Application filed November 18, 1913. Serial No. 801,593.

To all whom it may concern:

Be it known that I, CORNELIUS B. CORCORAN, a citizen of the United States, residing in borough of Bronx, in the county of New York, city and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to line-spacing mechanism for typewriting machines. The usual reciprocating pawl and ratchet line-spacing mechanism enables the operator to space the lines apart a set distance or a multiple thereof.

An object of the present invention is to provide means for spacing the lines a greater number of different distances within a given range than are obtainable with the usual mechanism employing a single ratchet or means for feeding the platen step-by-step through predetermined distances. The invention thus provides for a greater refinement of adjustment, at the same time obtaining a positive and definite spacing operation, and maintaining other advantages of the pawl and ratchet mechanism. The invention is also of advantage in securing fractional line-spacing.

The invention when applied to a revoluble platen may comprise a plurality of ratchets connected to rotate with the platen, the teeth on the two ratchets being differently spaced, to effect line-space rotations of the platen through different distances. A pawl for rotating the platen is shiftable selectively into coöperative relation to either ratchet, as by means of a shifting lever which may also be utilized to alternatively lift spring-pressed detents out of contact with the ratchets. For the latter purpose the shifting lever may be formed with a cam to control the positions of the detent levers so that when the shifting lever is in one position, the detent for the active ratchet, that is, the one with which the pawl is in position to coöperate, is in contact with its ratchet, and the other detent is held in inoperative position, and vice versa. To permit the pawl to be shifted into alinement with either ratchet, it may be slidably mounted on a pivot pin carried by the usual lever-operated slide bar, and shifted on said pin by any suitable connection between the pawl and the shifting lever.

A line-space adjuster maintains an oper-

ative relation to the pawl while the latter is in position to coöperate with either ratchet, and is adjustable to control the number of line-space distances through which either ratchet is rotated.

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a part sectional perspective view of the invention as applied to an Underwood typewriting machine, the parts being at an intermediate position assumed during a line-spacing operation.

Fig. 2 is a similar view, but with the shifting lever reversed.

Fig. 3 is a view similar to Fig. 1, but with the actuating pawl at the limit of its driving stroke.

Fig. 4 is a sectional elevation view with the parts in their normal position of rest.

Fig. 5 is a detail view of a line-space adjuster.

Fig. 6 is a rear perspective view of mechanism shown in Fig. 4.

Fig. 7 is a view similar to Fig. 6, but with the shifting lever reversed, and certain parts of the mechanism omitted.

Fig. 8 is a detail plan view showing the shifting lever in one position.

Fig. 9 is a similar view with the shifting lever in the reverse position.

In accordance with the present invention, the line-space movements of the platen may be controlled by either one of a plurality of ratchets having differently spaced teeth, and by the term ratchets as used in the claims is meant the usual toothed wheel or equivalent means for advancing the platen step-by-step. In the adaptation of the invention to a revoluble platen, line-space ratchet wheels 1 and 2 are fixed to the platen axle 3 on which the platen 4 is mounted. Each of the ratchet wheels is formed with a number of equally-spaced ratchet teeth corresponding to line-space rotations of the platen, the number of teeth on one wheel being greater than that of the other wheel. The size or spacing of the teeth on the two ratchets may bear any desired relation. As shown, the teeth of the outer wheel 2 are substantially smaller than those on the inner wheel 1, although this relation may be reversed, if desired. An actuating pawl or dog 5 to drive the racks 1 and 2 is pivoted on a pin 6 on a slide bar or plunger 7 slidably mounted on the carriage

frame 8 in which the platen axle 3 is journaled.

The slide bar 7 is moved rearwardly to effect a line-space rotation of the platen by means of a line-space lever 9 (Fig. 4) having an arm 10 to engage the slide bar 7 and move it rearwardly when the lever 9 is moved to the right. The slide bar 7, pawl 5 and lever 9 are returned to initial position by a returning spring 11 connected at one end to the slide bar and at the other end to a pin 12 on the platen frame. The pawl 5 has a laterally projecting tooth 13 adapted to cooperate with either ratchet wheel, depending upon the position of the pawl. The pawl is slidable laterally on its pivot pin 6 from its inner position, shown for example in Figs. 6 and 8, in which it cooperates with the inner wheel 1, to the position indicated in Figs. 1, 3 and 9, in which the tooth 13 is adapted to engage the ratchet wheel 2. The pawl is shifted by means of a shifting lever 14 connected by a pivot pin 15 intermediate its ends to the platen frame, and having at its forward end an operating handle 16.

Projecting downwardly from the lever 14 is a pair of pins 17, the lower ends of which straddle a projection 18 on the pawl 5, so that as the lever is shifted the pawl is carried bodily along its pivot pin 6. By means of the projection or rib 18 and the pins 17, the pawl is guided or maintained in engagement with the selected wheel during the driving of the pawl by the lever 9. The pins 17 also engage humps formed on a holding spring 19 to normally retain the shifting lever in either of its shifted positions.

Detent levers 20 and 21 carry detent rollers 22 cooperating with the ratchets 1 and 2 respectively, and are yieldingly held against the ratchet wheels by springs 23. These levers are mounted on a pivot 24 which may be a shouldered screw mounted in the platen frame, and the detent levers may be spaced apart and positioned by collars 25 on said screw. The detent levers are alternately shifted into operative position so that only the active ratchet wheel, that is, the one with which the pawl 5 is in cooperative relation, is controlled by the detent, the other detent being held free from its ratchet to prevent interference. The advantage of having individual detents for the ratchet wheels is that each may position its wheel without reference to the other wheel, and thereby present the teeth properly to the drive pawl 5. For this purpose, one detent arm may vary a trifle in length from the other, as at Fig. 4. The shifting lever 14 which controls the pawl 5 may also conveniently be employed to shift the detent levers, and for this purpose is provided with a cam slot or opening 26 into which project the upper ends of the detent levers 20 and 21. Said levers may be provided with anti-friction rollers 20^a and

21^a respectively, which bear against inclined faces or cams 27 of the slot 26. When the handle 16 of the shifting lever 14 is moved inwardly, as shown in Fig. 8, the upper end of the inner detent lever 20 is permitted to move rearwardly sufficiently to bring its roller 22 against the inner ratchet wheel 1, but the detent lever 21 has its upper end cammed forward by the surface 27 to hold its detent out of engagement with the wheel 2, as shown in Fig. 6. When the shifting lever 14 is reversed to the Fig. 9 position, the inner detent lever is cammed away from its ratchet wheel, and the outer lever 21 is permitted to swing its detent into engagement with the ratchet wheel 2. The detents serve the usual function of holding the ratchet wheels and the platen at definite line-space positions.

The distance the platen is rotated at each operation of the line-space lever is controlled by a line-space adjuster, which is common to both line-space wheels, that is, controls the amplitude of rotation of the platen, whether the pawl cooperates with the inner or the outer line-space wheel. The line-space adjuster (see Fig. 5) comprises a horizontally disposed arm 28 adjustable forwardly and rearwardly by an adjusting lever 29 journaled on the platen axle 3 and having a slot-and-pin connection 30 with the arm 28. Said arm is slidably supported at its rear end on the pivot pin 24, which extends through a horizontal slot 31 in said arm.

The forward end of the arm 28 has a lateral extension 32 in the form of a horizontal plate or ledge, which forms a support for the pawl 5 and holds the pawl off from the ratchet wheel during the initial portion of its throw. That is, when the pawl commences its rearward movement it is held up until the tooth 13 passes beyond the ledge 32 when said tooth moves downwardly to engage the ratchet wheel, and rotates the latter through one or more line-space distances, depending on the adjustment of the arm 28, the position of the latter determining which tooth of the ratchet wheel is engaged by the pawl. The arm 28 is held in definite positions of adjustment by a spring detent arm 33 which may be secured to the pin 24, and is provided with a boss 34 to engage recesses or openings 35 in the arm 28. The ledge 32 on the arm 28 preferably extends laterally a sufficient distance to cooperate with the pawl when the latter is in operative relation to the wheel 2, as well as when moved inwardly or to the right to cooperate with the wheel 1.

In order to make such compensation as may be necessary or suitable for the difference in the pitch of the teeth on the ratchets, the outer end of the ledge 32 may be of a less width than the inner end, to

permit the pawl to drop at a different point in its travel when set to engage the wheel 2, when such difference is necessary or desirable to properly time the movements of the pawl for both wheels. The pawl 5 is held against the ratchet wheels by a leaf spring 5^a carried by the plunger 7, and of sufficient width to bear against the pawl while the latter is in either of its shifted positions.

The rearward movement of the pawl is limited by a stop 36 on the platen frame. The detent levers 20 and 21 are each so adjusted relatively to their respective ratchet wheels, that when a ratchet wheel has been moved to a line-space position by the pawl 5 being brought against the stop 36, the detent roller 22 for said wheel will be squarely seated between two of the ratchet teeth, and thus prevent any movement of the platen when the pawl is withdrawn. The two ratchet wheels are preferably relatively adjusted so that their teeth are alined at one point at least in the periphery of the wheels. In Fig. 2 the tooth 13 of the pawl is shown in engagement with the ratchet wheel 1 at such point, that is, the pawl tooth 13 engages a tooth 37 of the wheel 1, which is in line with a tooth 37^a on the wheel 2. If the pawl 5 while in contact with the tooth 37 be moved from the Fig. 2 position to the limit of its rearward movement, that is, in engagement with the stop 36, both the detent rollers 22 will be in position to seat squarely between teeth of the respective ratchet wheels. That is, the inner detent 20 will be seated against the wheel 1, but if the shifting lever 14 were reversed, the detent 21 would accurately seat against the wheel 2 without any movement of the platen. At other positions to which the platen might be rotated by the line-space pawl, the reversal of the shifting lever might result in a slight rotation of the platen, to permit a proper seating of the detent.

The lever 14 may be provided on its upper face with figures or other characters 38 which are visible through a slot 39 in a cover plate 40 of the platen frame to indicate the position of the line-space adjuster 29, the figures indicating the number of line-space distances through which the platen will be rotated for a corresponding adjustment of the lever 29. The lever 14 may be provided, as shown, with two sets of figures 38 which are respectively brought into view beneath the opening 39 when the lever is shifted, and the number of figures in the two sets may be different for the two ratchet wheels. For instance, when the pawl is set to drive the inner ratchet wheel, only two operative adjustments of the line-space adjuster may be permitted, indicated by the two figures 1, 2 which appear beneath

the opening 39 (Fig. 8). Likewise, three operative adjustments are permitted when the pawl is shifted to drive the outer wheel, as indicated by the index figures 1, 2, 3 at the opening 39 (Fig. 9).

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. In line-space mechanism, the combination with a rotary platen, of ratchet wheels connected to rotate therewith and each provided with uniformly spaced ratchet teeth, the teeth of one wheel being spaced at different angular distances from those of the other, means to selectively drive said wheels to rotate the platen, a holding detent for each wheel arranged to hold it at the positions to which it is brought by said driving means, and means to hold each detent off its wheel while the other wheel is being driven.

2. In a line-space mechanism, the combination with a rotary platen, of ratchet wheels connected to rotate therewith, and each provided with uniformly spaced ratchet teeth, the teeth of one wheel being spaced at different angular distances from those of the other, and the number of teeth of one ratchet wheel being primed with respect to the number of teeth of the other ratchet wheel, an actuating pawl shiftable into co-operative relation with either ratchet wheel singly, a pawl-shifting device, and detents individual to each ratchet wheel and each movable radially of its corresponding wheel, said detents set by said pawl-shifting device and arranged to hold the operative ratchet wheel at the positions to which the wheel is moved by the pawl.

3. In line-space mechanism, the combination with a rotary platen, of ratchet wheels connected to rotate therewith and each provided with uniformly spaced ratchet teeth, the teeth of one wheel being spaced at different angular distances from those of the other, an actuating pawl, a device to shift said pawl out of coöperative relation to one wheel and into position to coöperate with the other wheel, a line-space lever to actuate said pawl when in coöperative relation to either ratchet wheel, and detents to hold the ratchet wheels, said pawl-shifting device operable to hold each detent disengaged from its wheel while the pawl is in coöperative relation to the other wheel.

4. In line-space mechanism, the combination with a rotary platen, of ratchet wheels connected to rotate therewith and each provided with uniformly spaced ratchet teeth, the teeth of one wheel being spaced at different angular distances from those of the other, an actuating pawl, a device to shift said pawl from position to coöperate with one wheel into position to coöperate with

the other wheel, a line-space lever to actuate said pawl when in position to coöperate with either ratchet wheel, spring detents to engage the ratchet wheels, and means to shift the detents into and out of operative position.

5. In line-space mechanism, the combination with a platen, of line-space ratchet wheels connected to rotate with the platen, means to drive either of said wheels to rotate the platen, spring actuated detents for said wheels, and means to automatically permit a detent to engage the driven wheel and to hold off the detent from the other wheel.

6. In line-space mechanism, the combination with a rotary platen, of ratchet wheels connected to rotate therewith, means to drive either of said wheels to rotate the platen, and detent-holding devices individual to said wheels and each set to hold its wheel at the positions to which it is brought by said driving means, each detent-holding device automatically maintained in engagement with its wheel while the latter is in use and out of engagement with the other wheel.

7. In line-space mechanism, the combination with a frame or paper-carriage, of a platen axle and a platen mounted thereon, ratchet wheels fixed to the axle, a pawl shiftable in a direction parallel with the platen axle into positions to coöperate with either ratchet wheel, a pawl-carrier on the carriage and on which the pawl is mounted, a line-space lever mounted on the carriage and arranged to drive said carrier and pawl in a direction transverse to the platen axle to rotate the platen, and a shifter mounted on the carriage to shift said pawl and guide or control the pawl as the latter is driven by said line-space lever.

8. In line-space mechanism, the combination with a platen axle and a platen mounted thereon, of ratchet wheels fixed to the axle, a pawl shiftable in a direction parallel with the platen axle into positions to coöperate with either ratchet wheel, a shiftable lever for shifting said pawl, means to hold said lever in either position to which it is shifted, and means to actuate the pawl and thereby rotate the platen.

9. In line-spacing mechanism, the combination with a rotary platen, of ratchet wheels connected to rotate therewith, a pawl shiftable into coöperative relation with either ratchet wheel, detents coöperating with the ratchet wheels respectively and shiftable into and out of coöperation therewith, and a shifting device for shifting the detents and simultaneously shifting the pawl.

10. In line-spacing mechanism, the combination with a rotary platen, of ratchet wheels connected to rotate therewith, a pawl shiftable from position to engage one of said

wheels into position to engage the other wheel, detents each adapted to move into and out of engagement with one of said wheels, and a shifting lever adapted to shift said pawl and move said detents.

11. In line-spacing mechanism, the combination of a rotary platen, line-space wheels connected to rotate therewith, spring-actuated detents, one adapted to move into and out of engagement with each ratchet wheel, and a shifting device to permit one detent to engage its ratchet wheel and simultaneously disengage the other detent from its ratchet wheel.

12. The combination of a rotary platen, line-space wheels connected to rotate therewith, spring-actuated detent levers carrying detents to engage the respective ratchet wheels, and a shifting lever engaging the detent levers and operable to disengage one detent from its wheel and simultaneously permit an engagement of the other detent with its wheel.

13. In line-spacing mechanism, the combination with a rotary platen, of line-space wheels connected to rotate therewith, detent levers mounted on a common pivot and carrying detent rollers movable into engagement with the respective wheels, springs to hold the detents against their wheels, and a shifting lever having a cam to actuate the detent levers and operable to lift either detent roller from its wheel and simultaneously permit the other roller to engage its wheel.

14. In line-spacing mechanism, the combination with a rotary platen, of line-space ratchet wheels connected to rotate therewith, the teeth on one wheel being finer than those on the other wheel, actuating means arranged to be brought into operative relation to either of said wheels for selectively engaging and rotating said wheels, and a single line-space regulating device operative to control said actuating means while in operative relation to either wheel and adjustable to cause either ratchet wheel to be rotated through a greater or less angle when engaged by said actuating means, said angle determined by the adjustment of said regulating device; said regulating device including provision for making suitable compensation for the difference in the spacing of the teeth on the ratchet wheels.

15. In line-spacing mechanism, the combination with a carriage and a rotary platen thereon, of line-space wheels connected to rotate with the platen, said wheels being of substantially the same diameter and each formed with a series of ratchet teeth on its periphery, the teeth on one wheel being spaced at smaller angular distances than those of the other wheel, a pawl on the carriage and shiftable in the direction of the platen axis into alinement with either wheel,

and a line-space lever having a stationary mounting on the carriage and arranged to actuate said pawl when in either of said positions.

5 16. The combination with a rotatable platen, of line-space wheels connected to rotate therewith, a line-spacing lever, means forming a driving connection between the
10 line-spacing lever and said wheels, shifting means for shifting the driving connection from one wheel to the other to bring the line-spacing lever into driving relation to either wheel, an adjusting device adjustable
15 to control the number of line-space distances through which the platen is rotated by the line-spacing lever at each operation while the said lever is in driving relation to either wheel, an index associated with each
20 wheel to indicate positions of adjustment for said adjusting device to determine the number of line-space rotations through which the platen will be rotated by an operation of the line-space lever through either wheel, and means to automatically present to view
25 the index for the wheel with which the line-space lever is in driving relation, and hide from view the other index.

17. The combination with a rotatable platen, of line-space ratchet wheels connected to rotate therewith, a line-spacing lever, means to form a driving connection between
30 said lever and either line-space wheel, a shifting lever for shifting the driving connection from one wheel to the other, an adjusting device to determine the number of line-space distances through which the platen will be rotated by an operation of the line-spacing lever through either wheel, and an index for each wheel to indicate
35 positions of adjustment for said adjusting device, said shifting lever provided with a sight opening to automatically expose to view the index corresponding to the wheel with which the line-spacing lever is in driving
40 connection, the index for the other wheel being hidden from view by said lever.

18. In a typewriting machine, the combination with a revoluble platen, of line-space ratchet wheels secured side by side to the
50 platen axle, said wheels being of substantially the same diameter, the teeth of one wheel being finer or at smaller angular intervals than those of the other wheel, a pawl carrier movable transversely to the platen
55 axle, a line-spacing lever for moving said carrier, and a pawl pivotally mounted on said carrier and shiftable on its pivot into positions to drive either line-space wheel singly when the line-spacing lever is operated.

60 19. In a typewriting machine, the combination with a revoluble platen, of line-space ratchet wheels secured side by side to the platen axle, said wheels being of substantially the same diameter, the teeth of one
65 wheel being at smaller angular intervals

than those of the other wheel, a pawl carrier movable transversely to the platen axle, a line-spacing lever for moving said carrier, a pawl pivotally mounted on said carrier and shiftable on its pivot into positions to
70 drive either line-space wheel singly when the line-spacing lever is operated, a ledge to hold the pawl off the line-space wheel during a portion of the line-spacing movement of the pawl, and an adjusting device to shift said
75 ledge and thereby vary the point at which the pawl engages the ratchet wheel to regulate the extent of rotation of the platen, said ledge extending into position to control the pawl while the latter is in operative relation
80 to either wheel.

20. In line-spacing mechanism, the combination of a rotary platen, ratchets for rotating the platen, a pawl shiftable to bring it into operative relation to either ratchet,
85 means to actuate the pawl to drive the corresponding ratchet, and detent-holding devices individual to said ratchets and each arranged to engage and hold its ratchet, when the latter is in use, at the position to which
90 it is moved by the pawl, while the other ratchet is free from the influence of its detent-holding device.

21. In line-spacing mechanism, the combination of a rotary platen, ratchets connected to rotate therewith, means to drive
95 either ratchet while the other ratchet is carried idly with the platen, the teeth of one ratchet being differently spaced from those of the other ratchet, and the number of teeth
100 of one ratchet being primed with respect to the number of teeth of the other ratchet, whereby the platen is rotated through greater distances when operated through one ratchet than through the other, holding detents, one
105 for each ratchet, and means to cause each detent to engage its ratchet when the latter is in use and hold the platen at the position to which it is rotated by the driving means, and to free the other ratchet from the influence
110 of its holding detent.

22. In line-spacing mechanism, the combination with a revoluble platen, of ratchets connected to rotate with the platen, a driving pawl, selective means for causing the
115 pawl to drive either ratchet, detent-holding devices individual to the ratchets, and means to cause each holding device to engage its ratchet when the latter is in use and hold it free from its ratchet when the other-ratchet
120 is in use.

23. In line-spacing mechanism, the combination with a platen, of means to advance it step by step for line-spacing the work, said means comprising ratchets having the
125 teeth of one ratchet spaced differently from the teeth of the other ratchet, driving means to engage either ratchet and advance the platen through predetermined distances corresponding to the spacing of the teeth on
130

said ratchet, while the other ratchet is free from said driving means, stopping means to limit the throw of the driving means, and line-space regulating means for coöperation with the ratchets selectively, whereby the line-spacing movements of the platen may be predetermined with either ratchet in use, said regulating means including a provision for making suitable compensation for the difference in the spacing of the teeth on the ratchets.

24. In line-spacing mechanism, the combination with a revoluble platen, of ratchets connected to rotate therewith, the teeth of one ratchet being differently spaced from those of the other ratchet, a reciprocating pawl for driving the ratchets and shiftable into coöperative relation to either ratchet, stop means to limit the driving throw of the pawl, and controlling means to hold the pawl off the ratchets during the initial portion of said throw and permitting it to move into engagement with its ratchet during said throw, the controlling means being individual to each ratchet to correspond with the position of the teeth on said ratchet.

25. In line-spacing mechanism, the combination with a revoluble platen, of ratchets connected to rotate therewith and having the teeth of one ratchet differently spaced from those of the other, a pawl to drive the ratchets and shiftable into coöperative relation to either ratchet, and controlling means to hold the pawl off the ratchets during the initial portion of its driving movement, said controlling means formed to permit the pawl to engage one ratchet at a different point during the advance of the pawl than that at which it engages the other ratchet, the point of engagement for each ratchet being timed by said controlling means to correspond with the spacing of the ratchet teeth and the position to which the ratchet is brought by the pawl.

26. In line-spacing mechanism, the combination with a revoluble platen, of ratchets connected to rotate therewith and having the teeth of one ratchet differently spaced from those of the other ratchet, a driving pawl, a slide on which the pawl is shiftable mounted for movement into coöperative relation to either ratchet, a line-space lever to drive said slide, and a ledge to hold the pawl off the ratchets during the initial movement of the slide and permitting the pawl to move into engagement with either ratchet at a point corresponding to the position and spacing of the ratchet teeth with which the pawl is in coöperative relation.

27. In line-spacing mechanism, the combination with a revoluble platen, of ratchets connected to rotate therewith and having the teeth of one ratchet differently spaced from those of the other ratchet, a driving pawl, a slide on which the pawl is shiftable mounted

for movement into coöperative relation to either ratchet, a line-space lever to drive said slide, a ledge to hold the pawl off the ratchets during the initial movement of the slide and permitting the pawl to move into engagement with either ratchet at a point corresponding to the position and spacing of the ratchet teeth with which the pawl is in coöperative relation, a stop to limit the throw of the pawl, detents individual to the ratchets for holding the ratchets at predetermined positions, and a switch operative to shift the driving pawl and concomitantly bring into use the detent for the active ratchet.

28. In line-spacing mechanism, the combination with a revoluble platen, of ratchets connected to rotate therewith and having the teeth of one ratchet differently spaced from those of the other ratchet, a driving pawl, a slide on which the pawl is shiftable mounted for movement into coöperative relation to either ratchet, a line-space lever to drive said slide, a ledge to hold the pawl off the ratchets during the initial movement of the slide and permitting the pawl to move into engagement with either ratchet at a point corresponding to the position and spacing of the ratchet teeth with which the pawl is in coöperative relation, stopping means to limit the throw of the pawl, detents individual to the ratchets, said detents each adjusted to hold its ratchet at the position to which it is brought by the driving pawl, and means to hold each detent free from its ratchet while the other detent is in use.

29. In line-spacing mechanism, the combination with a revoluble platen, of ratchets connected to rotate therewith and having the teeth of one ratchet differently spaced from those of the other ratchet, a driving pawl, a slide on which the pawl is shiftable mounted for movement into coöperative relation to either ratchet, a line-space lever to drive said slide, a ledge to hold the pawl off the ratchets during the initial movement of the slide and permitting the pawl to move into engagement with either ratchet at a point corresponding to the position and spacing of the ratchet teeth with which the pawl is in coöperative relation, stopping means to limit the throw of the pawl, detents individual to the ratchets, said detents each adjusted to hold its ratchet at the position to which it is brought by the driving pawl, and a switch for shifting the pawl into operative relation to either ratchet and concomitantly shifting the corresponding detent into operative position and withdrawing the other detent.

30. In line-spacing mechanism, the combination with a revoluble platen, of ratchets connected to rotate therewith and having the teeth of one ratchet differently spaced from those of the other ratchet, a driving pawl, a

slide on which the pawl is shiftably mounted for movement into coöperative relation to either ratchet, a line-space lever to drive said slide, a ledge to hold the pawl off the ratchets during the initial movement of the slide and permitting the pawl to move into engagement with a ratchet when the slide is at an intermediate position, and means to shift said ledge to different operative positions and thereby vary the number of single line-space distances through which the platen may be rotated at a single operation of the line-space lever when either ratchet is in use.

31. In line-spacing mechanism, the combination with a carriage and a revoluble platen thereon, of line-spacing ratchets, a driving pawl, a slide on which the pawl is pivotally mounted, said pawl shiftable on its pivot in a direction lengthwise of the platen to bring the pawl into register with either ratchet, and a line-spacing lever on the carriage to actuate said slide.

32. In line-spacing mechanism, the combination with a revoluble platen, of line-spacing ratchets therefor, a driving pawl, a slide on which the pawl is pivotally mounted, said pawl shiftable on its pivot in a direction lengthwise of the platen to bring the pawl into register with either ratchet, a line-spacing lever to actuate said slide, a ledge arranged to hold the pawl off the ratchets during the initial portion of its throw, and means for adjusting the ledge to vary the point at which, during the throw of the pawl, it is permitted to engage its ratchet, whereby the number of line-space distances through which the platen may be rotated when either ratchet is in use, may be regulated.

33. In line-spacing mechanism, the combination with a revoluble platen, of line-spacing ratchets therefor, a driving pawl, a slide on which the pawl is pivotally mounted, said pawl shiftable on its pivot in a direction lengthwise of the platen to bring the pawl into register with either ratchet, a line-spacing lever to actuate said slide, a ledge arranged to hold the pawl off the ratchets during the initial portion of its throw, means for adjusting the ledge to vary the point at which, during the throw of the pawl, it is permitted to engage its ratchet, whereby the number of line-space distances through which the platen may be rotated when either ratchet is in use, may be regulated, detents individual to the ratchets, and means, forming an operative connection between the detents and pawl, for causing each detent to be lifted from its ratchet concomitantly with the shifting of the pawl into register with the other ratchet.

34. In line-spacing mechanism, the combination with a revoluble platen, of line-spacing ratchets therefor, a driving pawl, a slide

on which the pawl is pivotally mounted, said pawl shiftable on its pivot in a direction lengthwise of the platen to bring the pawl into register with either ratchet, a line-spacing lever to actuate said slide, detents individual to the ratchets, a switch, and means operated by the switch to shift the pawl, and to simultaneously lift from its ratchet one detent and permit the other detent to engage the ratchet with which the pawl is brought into register.

35. In line-spacing mechanism, the combination with a platen, of driving means therefor, devices to transmit motion from the driving means to line-space the platen, the line-space distances when one of said devices is in use being differential to those when the other device is in use, means whereby said devices may be selectively brought into use, adjusting mechanism for varying the number of line-spaces through which the platen is driven when either of said devices is in use, indices individual to said devices to indicate the number of line-spaces for which said adjusting mechanism is set, and means to automatically expose to view each index when the corresponding motion-transmitting device is in use, and to hide from view the other index.

36. In line-space mechanism, the combination with a rotary platen, of ratchet wheels connected to rotate therewith and each provided with uniformly spaced ratchet teeth, the teeth of one wheel being spaced at different angular distances from those of the other, an actuating pawl to drive said wheels, a device to shift said pawl out of coöperative relation to one wheel and into position to coöperate with the other wheel, means to actuate said pawl, and line-space regulating means for coöperation with the ratchet wheels, whereby the line-spacing movements of the platen may be predetermined when either ratchet is in use, said regulating means having provision for making suitable compensation for the difference in the spacing of the teeth on the ratchet wheels.

37. In line-spacing mechanism, the combination with a rotary platen, of line-space ratchet wheels connected to rotate therewith, an actuating pawl shiftable into coöperative relation with either wheel, and a line-space regulating device operable to vary the effective throw of the pawl while in coöperative relation to either wheel, said regulating device including provision for making suitable compensation for the difference in the spacing of the teeth on the ratchet wheels.

38. The combination with a platen, of a plurality of ratchets connected thereto, the teeth of one ratchet being of different pitch from those of the other ratchet, a line-spacing lever; a drive-pawl mechanism operable by said line-spacing lever and including means to enable said lever to drive either

ratchet at will, line-space regulating means for said ratchets, to enable said lever to turn either ratchet one or more teeth at each stroke at will, said line-space regulating means including provision individual to the ratchets to make suitable compensation for the difference in the pitch of the teeth, and detent mechanism including shiftable means whereby either ratchet may be detented at will.

39. In line-spacing mechanism, the combination with a carriage and a rotary platen thereon, of line-space ratchet wheels connected with the platen, the ratchet teeth on one of said wheels being smaller angular distances apart, as measured around the platen axis, than the teeth of the other wheel, so that the line-space distances measured by the teeth on one wheel are smaller than the line-space distances measured by the teeth on the other wheel, an actuating pawl shiftable on the carriage into coöperative relation with either wheel, line-space regulating means operable to vary the effective throw of the pawl while in coöperative relation to either wheel and thereby vary the number of line-space distances through which the platen is rotated at each operation of the actuating pawl, individual detents, and means for shifting either detent out of use.

40. The combination with a revoluble platen, of a plurality of ratchets connected thereto, the teeth of one ratchet being of dif-

ferent pitch from those of the other ratchet, a line-spacing lever, a drive-pawl mechanism shiftable to enable said line-spacing lever to drive either ratchet, a manually operable shifter to shift the pawl connection with said lever from either wheel to the other, line-space regulating means for said ratchets, to enable said lever to turn either ratchet one or more teeth at each stroke at will, said regulating means including a provision brought into use by said manually operable shifter, for suitably compensating for the difference in the pitch of the teeth of the ratchets, and detent mechanism including means also controlled by said manually operable shifter, for enabling either ratchet to be detented.

41. The combination of a platen, line-spacing ratchet wheels therefor, the spacing of one ratchet wheel being different from that of the other ratchet wheel, mechanism by which the platen may be controlled by either ratchet at will, and line-space regulating means for coöperation with said ratchets, whereby the line-spacing movements of the platen may be predetermined when either ratchet is in use, said regulating means including a provision for making suitable compensation for the difference in the spacing of the teeth on the ratchet wheels.

CORNELIUS B. CORCORAN.

Witnesses:

TITUS H. IRONS,
F. E. ALEXANDER.