C. E. SAMPSON.

LINE SPACER.

APPLICATION FILED MAR. 18, 1916.

1,241,026.

Patented Sept. 25, 1917.

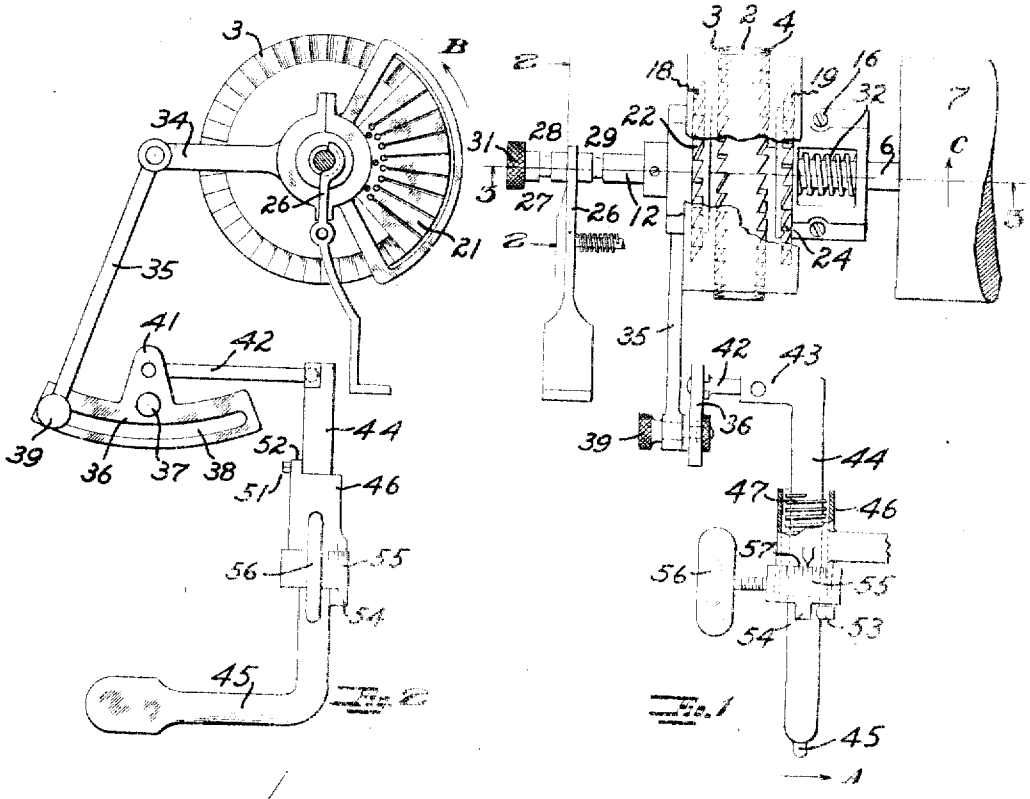

Fig. 2

Fig. 1

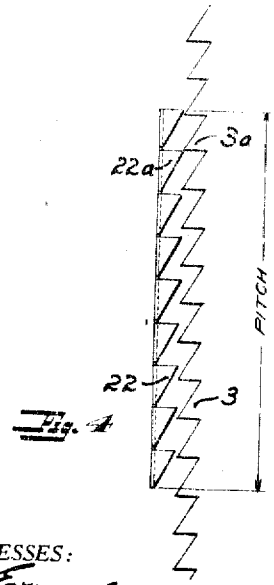

Fig. 4

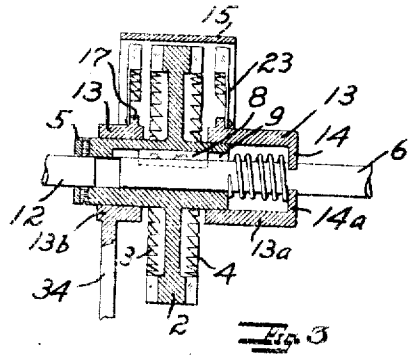

Fig. 3

WITNESSES:

C. L. Evans

J. B. Gardner

INVENTOR.

C. E. SAMPSON

BY White & Frost

HIS ATTORNEYS.

UNITED STATES PATENT OFFICE.

CARLOS E. SAMPSON, OF SHALE, CALIFORNIA.

LINE-SPACER.

1,241,026. Specification of Letters Patent. Patented Sept. 25, 1917.

Application filed March 18, 1916. Serial No. 85,068.

To all whom it may concern:

Be it known that I, CARLOS E. SAMPSON, a citizen of the United States, and a resident of Shale, county of Kern, State of California, have invented a new and useful Line-Spacer, of which the following is a specification.

My invention relates to line spacers for use in typewriters, adding and billing machines and similar devices, and particularly relates to adjustable line spacers.

An object of my invention is to provide an adjustable line spacer wherewith the operator of the machine in which it is incorporated may obtain automatically with the reversing of the carriage, any spacing of lines required.

Another object of the invention is to provide a line spacer with which the direction of the feed of the platen roll may be reversed, so that the paper being written upon may be fed from the top of the sheet toward the bottom as in ordinary typing, or from the bottom toward the top.

Another object of the invention is to provide an adjustable line spacer which is adapted to be set for a certain desired platen feed, either from markings or conditions appearing on the paper to be written on; or adapted to be set without reference to the paper by means of a scale.

The invention possesses other features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of my invention which is illustrated in the drawings accompanying and forming part of the specifications. It is to be understood that I do not limit myself to the showing made by the said drawings and description as I may adopt variations of the preferred form within the scope of my invention as set forth in the claims.

Referring to the drawings:

Figure 1 is a plan view of the line spacer mechanism.

Fig. 2 is an end elevation of the same, the projecting shaft being shown in section on the line 2—2 of Fig. 1.

Fig. 3 is a vertical section on the line 3—3 of Fig. 1.

Fig. 4 is a diagrammatical representation of a portion of the mechanism.

In the line spacer of my invention a double ratchet wheel is slidably secured to the platen roll shaft of the typewriter or other machine with which it is used. An oscillatable casing is disposed about the ratchet wheel and is provided with ratchet sectors, one lying on each side of the ratchet wheel. Means are provided for moving the wheel longitudinally of the shaft to bring it into engagement with either sector of the casing. Means are provided for rocking or oscillating the casing, and the teeth or projections on the wheel and sectors are formed so that the oscillating of the casing will communicate intermittent motion to the wheel in either direction according to which sector of the casing is in engagement with the wheel, thus turning the platen roll and effecting the required spacing of the lines. The means for oscillating the casing include a manually operated lever and in order that the working stroke of the lever may always be in the same direction, reversing means are included in the connections so that the impulse of the lever may be communicated to the casing either on the forward or backward half of a complete oscillating movement. The lever moves the casing through the first or working half of its oscillating movement and a spring returns the lever and casing to first position. Means are also provided for insuring that one of the teeth or projections on the sector will always operatively engage one of the teeth or projections on the wheel so that no lost motion occurs.

A wheel 2 having ratchet teeth 3 and 4 oppositely disposed on the lateral faces and having a long hub 5 is mounted on the shaft 6 of the platen roll 7. A spline 8 in the shaft 6 and a groove 9 in the hub 5 permit the wheel to be moved longitudinally of the shaft, but prevent relative rotation between them. The outer end of the hub 5 is extended outwardly by the shaft 12 which is secured in the end of the hub.

Inclosing the end of the shaft 6 and the hub 5 is a three part casing 13, 13^a, 13^b. The end walls 14, 14^a of the casing engage an annular groove in the shaft 6 so that relative longitudinal movement between shaft and casing does not occur, but relative rotative movement is not prevented. The upper portion 13 of the casing is provided with a hood 15 which arches over the wheel 2

and connects into an integral structure, the upper parts of the casing lying in opposite sides of the wheel. The portions 13^a and 13^b of the casing are secured in any suitable way as by screws 16, to the main portion 13.

Secured to flanges 17 on the casing 13 are ratchet sectors 18 and 19, one on each side of the wheel 2. The body of the sector 18 is formed of spring metal and is divided into a plurality of smaller sectors 21, each bearing a ratchet tooth 22. The sector 19 is similarly formed. The sectors 18 and 19, therefore, comprise a plurality of radial spring arms 21 and 23 respectively, each arm separately supporting a tooth. The teeth on each sector are normally in alinement and together form a ratchet sector. The teeth on the wheel and those on the sectors are spaced equidistant radially from the shaft. Relatively to each other the teeth on the two sides of the wheel are oppositely disposed and the teeth on each sector are disposed oppositely to those on the adjacent side of the wheel, so that the teeth of the wheel may be operatively engaged by the sector teeth and the thrust of the sector to be exerted upon the wheel in one direction or the other according to which sector is engaged. That is, the teeth 22 of the sector 18 are adapted to engage the teeth 3 of the wheel, and the teeth 24 of the sector 19 are adapted to engage the teeth 4 of the wheel, and in their operative effects, these engagements are in contrary directions.

Means are provided for moving the wheel 2 longitudinally of the shaft so that its teeth are brought into engagement with the teeth of one of the ratchet sectors. As previously explained, the wheel 2 turns with, but is movable longitudinally of, the shaft 6. The extension 12 of the hub 5 of the wheel provides means for moving the wheel to the left or to the right, Fig. 1, and the spring held latch 26 adapted to separately engage the annular grooves 27, 28 and 29 in the shaft 12, holds the shaft 12 and the wheel 2 in the desired position. Fig. 1 shows the latch engaging the middle groove 28, the ratchet wheel 2 being in neutral position between the ratchet sectors 18 and 19. The end of the shaft conveniently terminates in a grip such as the knob 31 and a spring 32 lying between the opposite end of the hub 5 and the walls 14 of the casing 13 tends to force the wheel 2 toward the left, Fig. 1. From this it is clear that when the wheel 2 is in engagement with the right hand sector 19, or when the wheel is in neutral position, a release of the latch 26 from the groove 27 or 28 automatically throws the wheel toward the left to engage with the sector 18. By raising the latch, pressure upon the grip 31 pushes the wheel to the right, Fig. 1, to neutral position in which the platen roller may be revolved freely without contact of the ratchets; or to the extreme right, in which position the wheel engages the sector 19. The engagement of the latch in the corresponding groove retains the wheel in the desired position.

Means are provided for oscillating the casing 13 so that intermittent motion may be transmitted to the wheel 2 when the wheel is in engagement with either one of the ratchet sectors carried by the casing, the direction of the motion imparted to the wheel and to the platen roll depending on which ratchet sector is engaged. This means includes a lever adapted to be actuated by the hand and it is desirable that the working thrust of the lever should always be in the same direction. In oscillating upon the shaft 6, the thrust of the casing 13 upon the wheel 2 may be in either direction forward or backward according to which ratchet sector is engaged. A reversing mechanism is, therefore, interposed between the actuating lever and the casing, so that the thrust of the hand upon the lever in one direction is delivered by the casing upon the wheel, in either direction.

The lower outside portion 13^b of the casing 13 carries a lever 34. A link 35 connects this lever with a rocker 36 pivoted at 37 on the carriage and having a slot 38 in which the end of the link 35 is adjustable by means of the thumb screw 39. The grooved rocker 36 is provided with an arm 41 to which is pivoted the link 42. The other end of the link 42 is connected by a ball and socket joint to the arm 43 on the shaft 44 of the actuating lever 45. The shaft 44 of the actuating lever is oscillatable in a bracket bearing 46 which is part of the carriage. Without further explanation it will be apparent that when the lever 45 is thrown to the right in the direction of the arrow A, Fig. 1, the lever 34, Fig. 2, is pulled over and the casing 13 oscillated by a thrust in the direction of the arrow B. By loosening the thumb nut 39 the link 35 may be connected to the upper end of the slotted rocker, so that the same movement of the lever 45 results in oscillating the casing 13 by a thrust contrary to the direction of the arrow B. If the wheel 2 is shifted so that the teeth 3 engage the ratchet sector 18, the link 35 being connected to the lower end of the rocker as in Fig. 2, it is obvious that a movement of the lever 45 will result in a turning of the platen roll 7 top surface toward the rear (arrow C, Fig. 1) so that the paper on the roll will be advanced to the following line, but by shifting the wheel 2 to the other side of the casing to engage the ratchet sector 19 and moving the link 35 to the top of the rocker 36, the same movement of the lever 45 will result in a turning of the platen, top surface forward so that the paper is moved backward to the preced-

ing line. A coil spring 47 interposed between the shaft 44 and the bracket bearing 46 returns the lever 45 and connected mechanism to normal position after the line spacing has been accomplished.

By varying the throw of the lever 45 the amount of movement of the casing and hence the platen, can be controlled. A pin 51, Fig. 2, in the shaft 44 contacts with the fixed stop 52 located on the bracket 46 and determines the limit of the spring operated recovery movement of the lever 45. Another pin 53, Fig. 1, contacts with the stop 54 located on the sleeve 55 which is revolubly adjustable on the bracket bearing 46. The position of the sleeve 55 in which it is secured by the thumb screw 56, determines the limit of the manually operated actuating throw of the lever 45. A graduated scale 57 is preferably arranged on the sleeve 55. Adjustment of the space independent of the scale is made by loosening the thumb screw, turning the sleeve to bring the stop 54 into contact with the pin and then moving the lever 45 to give the desired spacing movement of the platen. The sleeve is then locked in that position and subsequent operation of the lever 45 will produce the desired spacing of the platen.

It is clear that if the pitch of the sector and wheel teeth are the same, the shifting of the wheel may by chance fully mesh the teeth, the straight sides touching, in which case there would be no lost motion between them when the casing is rocked, but except very rarely this would not happen and so means are provided for securing an immediate operative engagement of the ratchet sectors with the wheel when the latter is shifted longitudinally, thus preventing any lost motion between them when the casing is rocked to actuate the wheel.

In Fig. 4 the teeth 3 of the wheel and the teeth 22 of the sector 18 are shown diagrammatically. The sector 18 may conveniently be provided with nine teeth, but for the same arc the wheel is provided with one more or one less, as for instance, ten teeth. That is, the pitches of the sectors and the wheel vary by 1. With these relative pitches, one tooth of the quadrant will always be in position to engage one tooth on the wheel no matter what their relative rotational positions. Previously it has been stated that each tooth of the sectors is individually supported on a radial spring arm. This mounting permits a lateral deflection of the teeth and so when the wheel 2 is shifted to the left, Fig. 1, the teeth 3 on the wheel enter the spaces between the teeth 22 on the sector in varying degree depending on the distance between the radial sides of the teeth, but ~~one pair, as for instance~~ 3^a, and 22^a, Fig. 4, will always be found to be substantially in line so that they engage each other for the maximum distance. The thrust of the rotation of the sector is communicated to the wheel through these engaged teeth.

On moving the wheel out of engagement with the sector, the teeth on the sector reassume their alined position in the sector by reason of their spring mounting and as the wheel is moved to the right, a similar deflection of the teeth of the ratchet sector 19 results, except a single pair which lying in line will be engaged in the manner just explained.

Other pitches of teeth on the wheel and sectors may be used as desired, but the variation between the number of teeth in the sector and the corresponding arc of the wheel should always be 1.

With a given setting, the turning of the lever 45 by the hand operates to turn the platen roll, and the carriage of the machine may be reversed by the continued movement of the hand after the lever has reached the limit of its rotational movement, in the well known manner. With the release of the lever 45 the coil spring 47 effects a recovery of the parts to normal position, the teeth of the wheel and engaged ratchet sector slipping past each other on the recovery movement owing to resiliency of the mounting for the latter. On reaching the limit of the recovery movement, two teeth are again in substantial alinement, so that a second movement of the lever again turns the platen through a space corresponding to the particular setting.

I claim:

1. In a typewriter, a rotatable platen shaft, a longitudinally movable wheel on said shaft, a casing on said shaft disposed about said wheel, means on each side of said casing adapted to engage said wheel, means for moving said wheel longitudinally into contact with either of said engaging means, and means for oscillating said casing.

2. In a typewriter, a rotatable platen shaft, a longitudinally movable wheel on said shaft, an oscillatable casing on said shaft disposed about said wheel, means on each side of said casing adapted to engage said wheel, means for moving said wheel into contact with either of said engaging means, an actuating lever for said casing, and means for varying the throw of said lever.

3. In a typewriter, a rotatable platen shaft, a longitudinally movable wheel on said shaft, an oscillatable casing on said shaft disposed about said wheel, means on each side of said casing adapted to engage said wheel, means for moving said wheel into contact with either of said engaging means, an actuating lever for said casing, and means for reversing the direction of the thrust of said lever on said casing.

4. In a typewriter, a rotatable platen

shaft, a longitudinally movable wheel on said shaft, an oscillatable casing on said shaft disposed about said wheel, means on each side of said casing adapted to engage said wheel, means for moving said wheel into contact with either of said engaging means, an actuating lever for said casing, means for reversing the direction of the thrust of said lever on said casing, and means for varying the throw of said lever.

5. In a typewriter, a rotatable platen shaft, a longitudinally movable wheel on said shaft, an oscillatable casing on said shaft disposed about said wheel, means on each side of said casing adapted to engage said wheel, means for moving said wheel into contact with either of said engaging means, an actuating lever for said casing, means for reversing the direction of the thrust of said lever on said casing, means for varying the throw of said lever and means for returning said lever and said casing to normal position after said thrust.

6. In a typewriter, a rotatable platen shaft, an oscillatable member on said shaft provided with resiliently mounted teeth, a wheel on said shaft adjacent said member provided with teeth of a pitch differing by one tooth from the pitch of the teeth of said member, the teeth on said wheel and said member being adapted to be engaged, and means for oscillating said member.

7. In a typewriter, a rotatable platen shaft, an oscillatable member on said shaft provided with resiliently mounted teeth, a wheel on said shaft adjacent said member provided with teeth of a pitch differing by one tooth from the pitch of the teeth of said member, said wheel being movable to bring one of its teeth into operative engagement with one of the resiliently mounted teeth on said members and means for oscillating said member to move said wheel.

8. In a typewriter, a rotatable platen shaft, an oscillatable member on said shaft provided with resiliently mounted teeth, a wheel on said shaft adjacent said member provided with teeth of a pitch differing by one tooth from the pitch of the teeth of said member, said wheel being movable to bring a portion of its teeth into lateral contact with all but one of the teeth on said member and one of its teeth into operative engagement with the remaining tooth on said member, and means for oscillating said member

9. In a typewriter, a rotatable platen shaft, a toothed wheel longitudinally movable on said shaft, a sector on said shaft comprising a plurality of resiliently mounted teeth, means for longitudinally moving said wheel into operative engagement with said sector and means for oscillating said sector about the axis of said shaft.

10. In a typewriter, a rotatable platen shaft, a wheel on said shaft having two series of oppositely disposed teeth, a sector comprising a series of resiliently mounted teeth arranged adjacent to each series of teeth on said wheel, the teeth on the wheel being adapted to engage individual teeth on said sectors, means for moving said wheel into contact with either of said sectors and means for oscillating said sectors upon said shaft.

11. In a typewriter, a rotatable platen shaft, a toothed wheel on said shaft, an oscillatable sector comprising a plurality of resiliently mounted teeth arranged on each side of said wheel, the teeth on said wheel and said sectors being oppositely disposed, means for engaging said toothed wheel with individual teeth on either of said sectors, and means for oscillating said sectors.

12. In a typewriter, a rotatable platen shaft, a toothed wheel on said shaft, an oscillatable sector comprising a plurality of resiliently mounted teeth arranged on each side of said wheel, the teeth on said wheel and said sectors being oppositely disposed, means for engaging said toothed wheel with individual teeth on either of said sectors, an actuating lever mediately connected to said sectors, and means for reversing the direction of the thrust of said lever on said sectors.

13. In a typewriter, a rotatable platen shaft, a toothed wheel on said shaft, an oscillatable sector comprising a plurality of resiliently mounted teeth arranged on each side of said wheel, the teeth on said wheel and said sectors being oppositely disposed, means for engaging said toothed wheel with individual teeth on either of said sectors, manually operated means for moving said oscillatable sector in one direction and spring means for effecting the recovery movement of said sectors.

In testimony whereof, I have hereunto set my hand at Fellows, California, this 11th day of March, 1916.

CARLOS E. SAMPSON