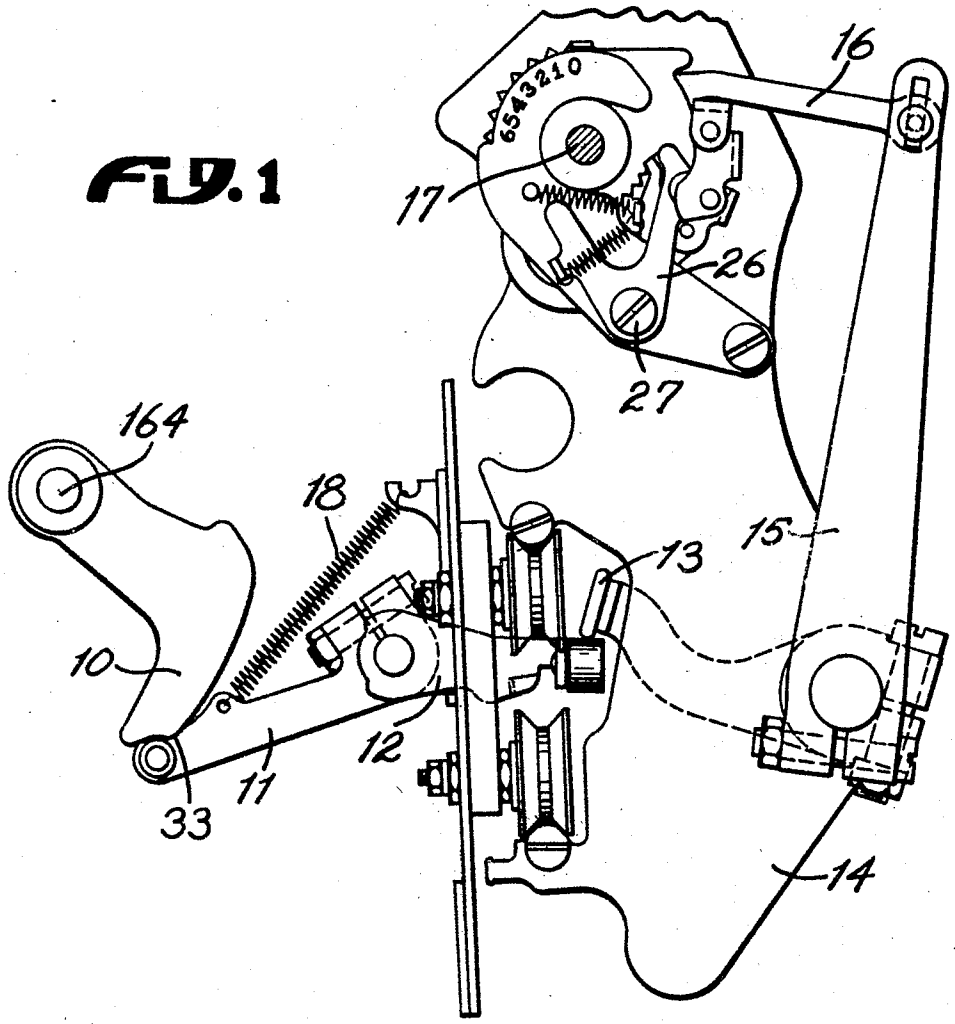
June 10, 1941. L. P. CROSMAN 2,245,142

LINE SPACER

Filed June 5, 1940 2 Sheets-Sheet 1

FIG. 1



WITNESS

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LINE SPACER

Filed June 5, 1940 2 Sheets-Sheet 2

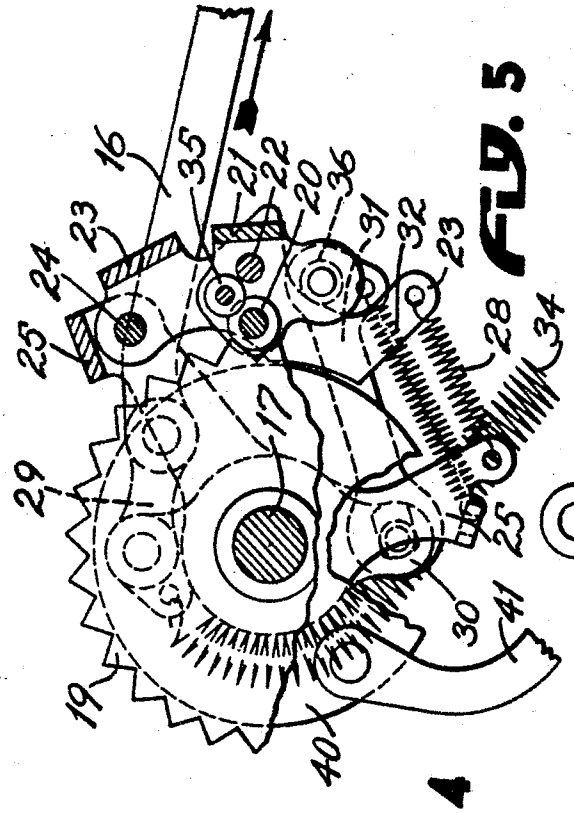


FIG. 5

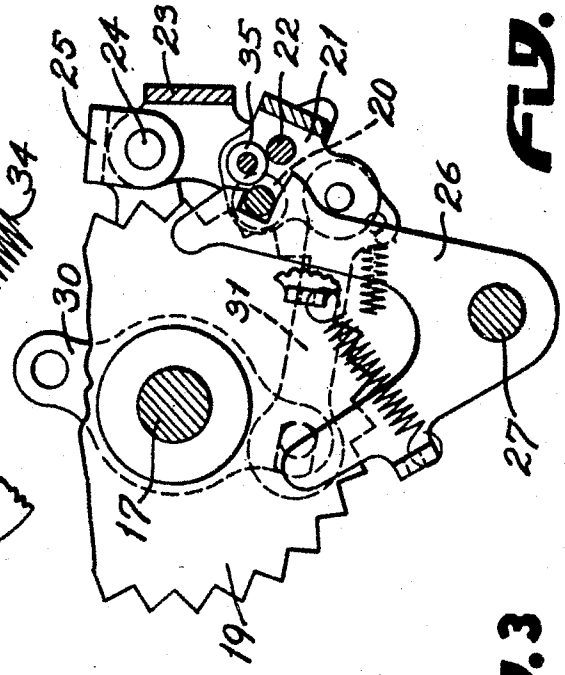


FIG. 2

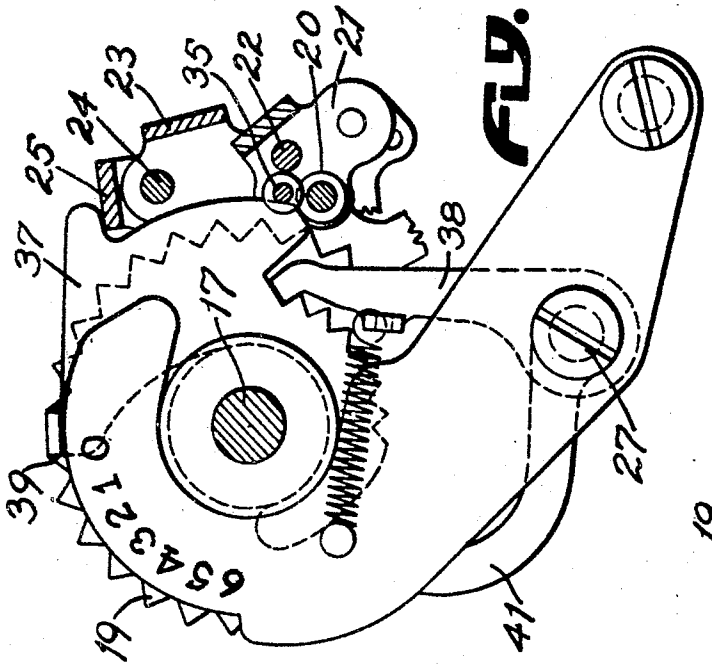


FIG. 4

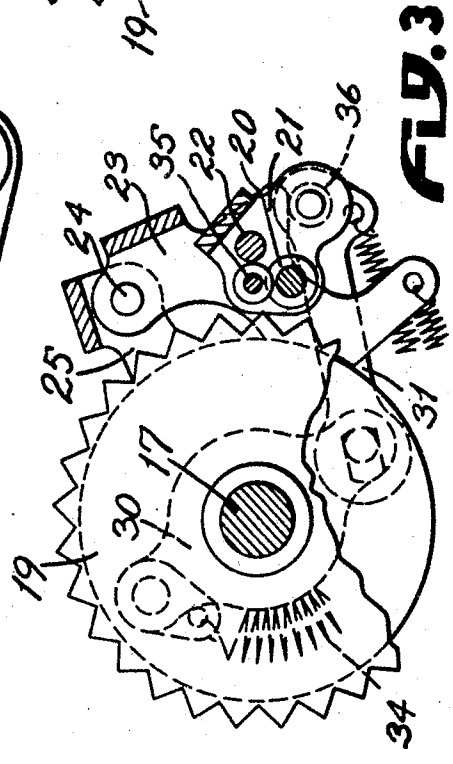


FIG. 3

WITNESS

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Patented June 10, 1941

2,245,142

UNITED STATES PATENT OFFICE

2,245,142

LINE SPACER

Loring Pickering Crosman, Maplewood, N. J., assignor to Monroe Calculating Machine Company, Orange, N. J., a corporation of Delaware

Application June 5, 1940, Serial No. 338,939

5 Claims. (Cl. 197—114)

The invention has relation to a line spacer designed for use in a rotary platen printing machine, and particularly useful in effecting automatic line spacing in a listing adding machine. The invention is designed to provide for a quiet, light action and is capable of effecting a movement of the platen of a considerable extent, where wide spacing is desired.

The invention consists in the novel construction and combination of parts, as set forth in the appended claims.

In the accompanying drawings, illustrating the invention:

Fig. 1 is a right side elevation of the platen carriage of a listing adding machine, with the associated line spacing mechanism.

Fig. 2 is a detail right side elevation, with parts broken away, showing the detent and shifting pawl and associated parts, shown in normal position.

Fig. 3 is a similar view with the parts shown during the idle stroke of a line spacing operation.

Fig. 4 is a similar view with the parts shown in the position assumed when the idle movement is stopped by the adjustable line determining element.

Fig. 5 is a similar view with the parts shown during the active stroke of the line spacing operation.

In these drawings the invention is shown as applied to a listing adding machine such as that disclosed in United States Patent No. 1,946,572, issued on February 13, 1934, to Loring P. Crosman.

The line spacing is effected upon movement of a shaft 164 (Fig. 1 and shown in Patent No. 1,946,572, Figs. 12 and 21), this shaft being reciprocated during the printing cycle of the machine, in known manner. A cam 10 is fast on shaft 164 and operates upon a cam follower 11 having connection with a rearwardly extending arm 12 on which is mounted an anti-friction roller, these parts being mounted in the stationary framing of the machine. A bail 13 is mounted in the framing 14 of the platen carriage, and is held in contact with the roller of arm 12, an arm 15 being fast with bail 13 and having at its upper end link connection 16 with the parts of the line spacing mechanism supported from the platen shaft 17.

Cam follower 11 is held against cam 10 by a spring 18, and reciprocation of cam 10 will cause reciprocatory movement of the parts 11, 12, 13, 15 and 16, to effect a line spacing rotation of the platen.

Fast on the platen shaft is a toothed locator wheel 19 (Figs. 2–5), the teeth of which are normally engaged by an anti-friction roller 20 mounted on a pawl 21. Pawl 21 is pivotally connected at 22 with an intermediate arm 23, said arm having pivotal connection at 24 with a supporting arm 25, loosely mounted on platen shaft 17. In the normal position of the parts, illustrated in Fig. 2, the spindle of anti-friction roller 20 is engaged between the opposite walls of a latch 26, pivoted at 27 upon the framing 14, this latch engagement serving to prevent movement of pawl 21 about point 22 when the platen and locator wheel 19 are rotated during the feeding and ejection of record sheets. During these movements of the platen intermediate arm 23 will yield against the tension of a spring 28, pivoting about point 24, allowing a ratcheting movement of the pawl over the teeth of wheel 19. In this normal position of the parts, therefore, arm 23 and pawl 21 serve as a spring detent or locator for the platen.

The line spacing link 16 is connected with pawl 21 by means of a flexible link 29, a plate 30, pivotally supported upon shaft 17 and a link 31, the latter having a lost motion pin and slot connection with plate 30 and pivotal crank connection with pawl 21. The lost motion connection between plate 30 and link 31 is normally held in the position shown in Fig. 2 by means of a spring 32, said spring also tending to rock pawl 21 clockwise (as viewed in Figs. 2–5) about point 22.

The first stroke of the line spacing operation will be idle, serving to position the pawl 21 at a point around wheel 19 distant from the normal position of the pawl by the required line spacing. During this idle stroke the heavier parts of the mechanism, being the parts 10, 11, 12, 13, 15 and 16, will move a given fixed distance, the different line spaces being provided for by limiting the idle movement of the arms 23, 25 and pawl 21.

At the beginning of the movement, cam 10 moving clockwise around shaft 164 (as seen in Fig. 1), follower 11, after rising over the high point 33 of the cam, will be moved clockwise about its pivot by the action of spring 18, allowing bail 13 and arm 15 to be moved counterclockwise, under the influence of a spring 34 (Figs. 3 and 5) fast at one end to the plate 30 and at the other end to the framing 14. Thus, through link 31, pawl 21 will be rocked about point 22, bringing a pin 35 of said pawl into contact with the latch 26, whereby the roller

20 and latch 26 will be moved in opposite directions, the pawl will be rapidly freed from the latch, and stud 36 (of the pivotal connection between link 31 and pawl 21) will be brought in contact with a shoulder of intermediate arm 23, as seen in Fig. 3, the arms 23 and 25 and pawl 21 being moved as a unit about the platen shaft 17 to the desired line space determining position. At this point, arm 25 will contact with a shoulder of a stop plate 37 (Fig. 4) mounted for pivotal movement about shaft 17 and held in any one of a plurality of selected positions by means of a click pawl 38, pivoted upon the framing 14. In Fig. 4, plate 37 is shown as adjusted to 0 position, wherein no line spacing will occur, since pawl 21 will drop back to the same notch of the wheel 19 from which it has been displaced. It will be obvious, however, that by adjustment of stop plate 37, so that the indicating edge 39 thereof will come opposite any of the designations 1, 2, 3, 4, 5, 6, the movement of pawl 21 will be extended and line spacing of different extent may be effected.

Friction means are provided for holding the roller 20 of pawl 21 away from the teeth of wheel 19 during the idle movement of the parts, this means consisting of a friction disk 40, supported upon shaft 17, connected with framing 14 by a tie rod 41 and lying in the plane of intermediate arm 23. During the idle movement of the parts, spring 28 will hold intermediate arm 23 against friction disk 40, thus creating resistance to the movement of arm 25 about shaft 17, and insuring that the pressure of link 31 will rotate pawl 21 about point 22, lifting roller 20 away from the teeth of wheel 19 and effecting contact of stud 36 with the shoulder of arm 23.

Should arm 25 be arrested before cam follower 11 has dropped to the low point of cam 10, plate 30 will be brought to rest with the arms 23, 25, etc., while the continued movement of bail 13 and arm 15, under momentum, will be allowed by a buckling of the link connections 16, 29.

At the end of the idle stroke of the parts, the direction of movement of shaft 164 will be reversed and cam 10 will move follower 11 and arm 12 counter-clockwise, giving a positive clockwise movement to bail 13 and arm 15. Thus, through links 16 and 29, plate 30 and link 31 will rock pawl 21 about point 22, this rocking movement being assisted by the frictional contact of arm 23 with plate 40, until the roller 20 engages between the teeth of wheel 19, whereupon the rocking movement of pawl 21 will lift arm 23 free of the friction disk 40, and the stud 36 will come in contact with a second shoulder of intermediate arm 23 (Fig. 5), preventing further lifting of said arm due to the ratcheting tendency of teeth of wheel 19 and providing that continued movement of link 31 will rotate arms 23 and 25 and pawl 21 as a unit back to their normal position, the pawl carrying therewith locator wheel 19 and the platen into the line spaced position. As the pawl arrives in normal position, the spindle of roller 20 will engage the cam face of latch 26, riding over the latching tooth, and resuming the position illustrated in Fig. 2. During this action latch 26 serves as a stop for the parts carried by arm 25, so that the tension on link 31 will be maintained to prevent overthrow of the platen.

At the end of the stroke of cam 10, follower 11 will drop from the high point 33 of the cam, allowing the lost motion connection between parts 30 and 31 to resume the position illustrated in Fig. 2, wherein lifting of intermediate arm 23 will be permitted during the paper feed movement of the platen.

I claim:

1. A line spacer for a rotary platen printing machine having a frame, a platen shaft supported thereon, and a toothed locator wheel fast on said shaft; comprising a supporting arm loose on the platen shaft, a yieldably positioned intermediate arm pivoted thereto, a spring urged pawl pivoted on the intermediate arm, adapted to engage between the teeth of the locator wheel and having a stud engageable with the intermediate arm, a latch supported on the platen frame and normally engaging the pawl to obstruct pivotal movement thereof, said pawl in the rotation of the platen operating to lift the intermediate arm and to ratchet over the teeth of the locator wheel, and a reciprocatory member movable in one direction to release said pawl from said latch and oscillate said arms and the pawl about the platen shaft, said pawl in one direction of movement operating to escape from said latch, to engage the stud thereof with a portion of the intermediate arm and from the teeth of the locator wheel and said member acting in the opposite direction of movement to force the pawl between the teeth of the locator wheel, to engage the stud of said pawl with another portion of the intermediate arm and to rotate the pawl, the arms, the locator wheel and the platen as a unit to latched position.

2. A line spacer for a rotary platen printing machine having a frame, a platen shaft supported thereon, and a toothed locator wheel fast on said shaft; comprising a supporting arm loose on the platen shaft, a yieldably positioned intermediate arm pivoted thereto, a spring urged pawl pivoted on the intermediate arm, adapted to engage between the teeth of the locator wheel and having a stud engageable with the intermediate arm, a latch supported on the platen frame and normally engaging the pawl to obstruct pivotal movement thereof, said pawl in the rotation of the platen operating to lift the intermediate arm and to ratchet over the teeth of the locator wheel, and a reciprocatory member having crank connection with the pawl, operable in one direction of movement to rotate the pawl free of the latch, to engage the stud of said pawl with a portion of the intermediate arm and to move the pawl, with the intermediate and supporting arms, idly past the teeth of the locator wheel, and in the opposite direction of movement to force the pawl between the teeth of the locator wheel, to engage the stud of said pawl with another portion of the intermediate arm and to rotate the pawl, the arms, the locator wheel and the platen as a unit to latched position.

3. A line spacer for a rotary platen printing machine having a frame, a platen shaft supported thereon, and a toothed locator wheel fast on said shaft; comprising a supporting arm loose on the platen shaft, a yieldably positioned intermediate arm pivoted thereto, a spring urged pawl pivoted on the intermediate arm, adapted to engage between the teeth of the locator wheel and having a stud engageable with the intermediate arm, a latch supported on the platen frame and normally engaging the pawl to obstruct pivotal movement thereof, said pawl in the rotation of the platen operating to lift the

intermediate arm and to ratchet over the teeth of the locator wheel, a reciprocatory device including driving elements and a link having a lost motion connection with a driving element and a crank connection with the pawl, a spring pressed cam follower having operative connection with said device, and an oscillatory cam adapted upon operation in one direction to allow the spring pressed follower to move the said device in one direction to rotate the pawl free of the latch, to engage the stud of said pawl with a portion of the intermediate arm and to move the pawl, with the intermediate and supporting arms, idly past the teeth of the locator wheel, and upon movement in the reverse direction to operate the follower to move the said device in the opposite direction to force the pawl between the teeth of the locator wheel, to engage the stud of said pawl with another portion of the intermediate arm and to rotate the pawl, the arms, the locator wheel and the platen as a unit to latched position, said cam having a point of extreme throw operable upon the follower in mid-return stroke of the reciprocatory device, final movement of the cam being operable to reverse the motion of the driving elements and thereby, through the lost motion connection, free the intermediate arm from restraint by the stud of said pawl.

4. A line spacer for a rotary platen printing machine having a frame, a platen shaft supported thereon, and a toothed locator wheel fast on said shaft; comprising a supporting arm loose on the platen shaft, a yieldably positioned intermediate arm pivoted thereto, a spring urged pawl pivoted on the intermediate arm, adapted to engage between the teeth of the locator wheel and having a stud engageable with the intermediate arm, a reciprocatory device having a crank connection with the pawl and a flexible link portion, a cam follower having operative connection with said device, and an oscillating cam adapted upon operation in one direction to allow the spring pressed follower to move the said device in one direction to engage the stud of said pawl with a portion of the intermediate arm and to move the pawl, with the intermediate and supporting arms, idly past the teeth of the locator wheel, and upon movement in the reverse direction to operate the follower to move the said device in the opposite direction to force the pawl between the teeth of the locator wheel, to engage the stud of said pawl with another portion of the intermediate arm and to rotate the pawl, the arms, the locator wheel and the platen as a unit, and an adjustable stop supported on the platen frame and adapted to stop the first stated movement of the supporting arm at one of a plurality of intermediate points relative to the reciprocation of said device.

5. A line spacer for a rotary platen printing machine having a frame, a platen shaft supported thereon, and a toothed locator wheel fast on said shaft; comprising a supporting arm loose on the platen shaft, a spring urged intermediate arm pivoted thereto, a spring urged pawl pivoted on the intermediate arm, adapted to engage between the teeth of the locator wheel and having a stud engageable with the intermediate arm, a friction disk loose on the platen shaft, having connection with the platen frame and located in the plane of the intermediate arm, and a reciprocatory member having crank connection with the pawl, operable in one direction of movement to engage the stud of said pawl with a portion of the intermediate arm, to lift the pawl free of the teeth of the locator wheel and to permit spring engagement of the intermediate arm with the friction disk, and to move the pawl, with the intermediate and supporting arms, idly past the teeth of the locator wheel, and in the opposite direction of movement to force the pawl between the teeth of the locator wheel, to engage the stud of said pawl with another portion of the intermediate arm and to rotate the pawl, the arms, the locator wheel and the platen as a unit.

LORING PICKERING CROSMAN