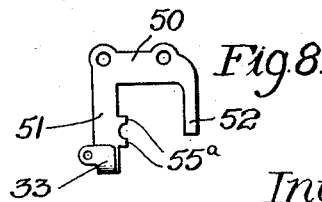
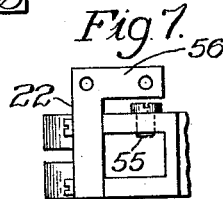
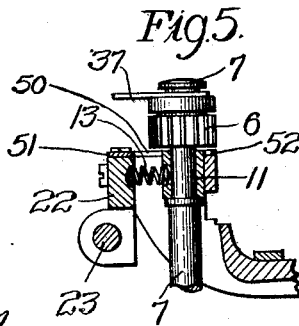
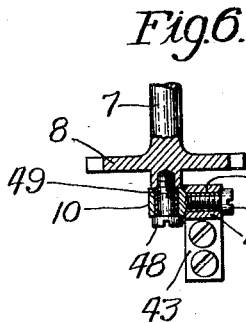
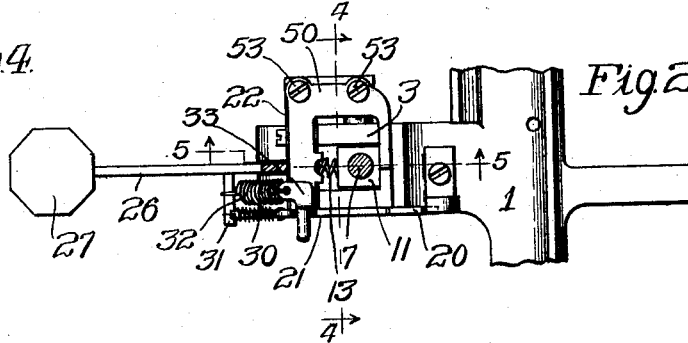
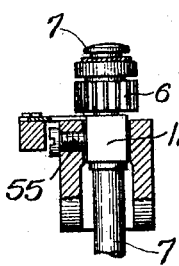
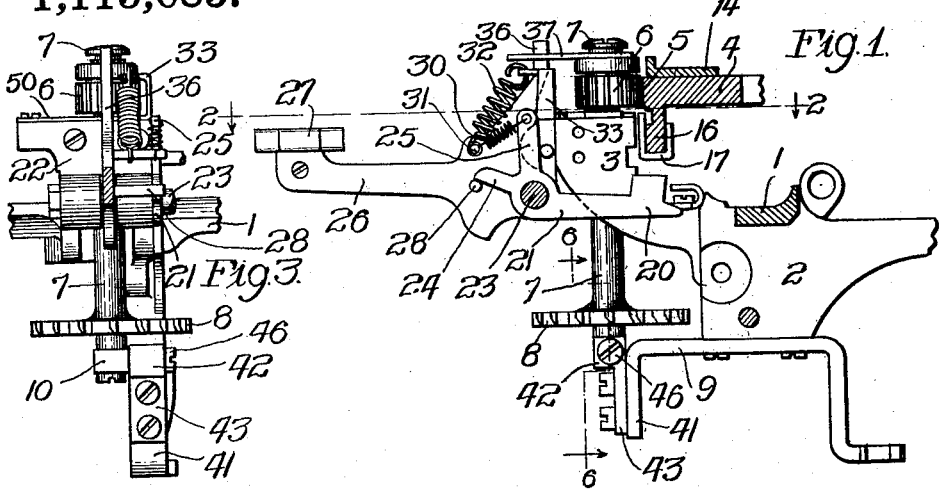


T. L. KNAPP.  
 TYPE WRITING MACHINE.  
 APPLICATION FILED JAN. 21, 1914.

1,115,685.

Patented Nov. 3, 1914.



Witnesses:  
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 by *Boole & Crouser* Attys.

# UNITED STATES PATENT OFFICE.

THERON L. KNAPP, OF WOODSTOCK, ILLINOIS, ASSIGNOR TO THE OLIVER TYPEWRITER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

TYPE-WRITING MACHINE.

1,115,685.

Specification of Letters Patent.

Patented Nov. 3, 1914.

Application filed January 21, 1914. Serial No. 813,363.

To all whom it may concern:

Be it known that I, THERON L. KNAPP, a citizen of the United States, and a resident of Woodstock, in the county of Mc-Henry and State of Illinois, have invented certain new and useful Improvements in Type-Writing Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to means for effecting the release of the paper carriage from the letter-spacing mechanism in typewriting machines of that class having letter-spacing mechanism which includes rack-teeth on the carriage frame, and an escape-wheel shaft, provided with a gear-pinion engaging the said rack teeth, and in which the gear-pinion is movable with the end of the escape-wheel shaft on which it is mounted, toward and away from the rack-teeth on the carriage to effect the engagement of the carriage with, and its disengagement from, the letter-spacing devices.

The invention relates more particularly to means for mounting the escape-wheel shaft in a manner permitting swinging or oscillating movement thereof, to means for limiting the extent of movement of the gear-pinion toward and from the carriage rack-teeth, and to certain details of construction in the machine, associated with the features referred to.

The invention is herein shown as applied to a typewriting machine of the kind known as the "Oliver" machine, but the features constituting the invention may be applied to machines of other kinds.

The invention consists in the matters hereinafter set forth and pointed out in the appended claims.

In the accompanying drawings illustrating my invention: Figure 1 is a view in side elevation, with parts in vertical section, of the portion of the typewriting machine to which the invention relates; Fig. 2 is a plan view of the same, with parts in horizontal section, taken on line 2—2 of Fig. 1; Fig. 3 is a view in front elevation of the parts shown in Figs. 1 and 2; Fig. 4 is a cross-section of the bracket on the shift-frame, taken on line 4—4 of Fig. 2; Fig. 5 is a vertical, longitudinal, detail sectional view,

taken on line 5—5 of Fig. 2; Fig. 6 is a detail section of the lower bearing of the escape-wheel shaft, taken on line 6—6 of Fig. 2; Fig. 7 is a plan view of the bracket on the shift-frame, with other parts removed; Fig. 8 is a detail plan view of the stop-plate on the said bracket.

Said drawings show the main part 1 of the shift-frame, by which the paper-carriage is immediately supported and which has shifting movement backwardly and forwardly on the machine frame. The paper-carriage has endwise or letter-space movement on said shift-frame, and said shift-frame has backward and forward movement on the machine frame to provide for shifting the platen in such manner as to bring the paper in position for receiving impressions from two or more types upon each type-bar of the machine. Said shift-frame is provided with a depending part or arm 2, and with a forwardly projecting bracket 3. The drawings also illustrate the longitudinal front frame-member 4 of the paper-carriage, which constitutes the rack-bar of the carriage and is provided on its front edge with a series of rack-teeth 5, which are engaged by a gear-pinion 6 attached to the upper end of an upright escape-wheel shaft 7, located forward of the shift-frame. Said shaft 7 has, at its lower end, an escape-wheel 8 which constitutes a part of the escape mechanism which is operated by the universal bar of the machine and by which is controlled the endwise or letter-space movement of the carriage under the action of its actuating spring. The escape-wheel shaft is supported, at its lower end, by a bracket member 9, which is attached to, and extends forward from, the depending arm 2 of the shift-frame. Said shaft, at its upper end, engages a bearing block 11, which is adapted to slide horizontally in a guide slot formed in the upper end of the bracket 3. The sliding movement of the bearing block 11 in the said bracket 3 permits the gear-pinion 6 to be moved or shifted forwardly and backwardly into and out of engagement with the rack-teeth 5, and said block is held normally at the rearward limit of its movement by an expansively acting coiled spring 13 (Figs. 2 and 5), applied between the outer face of said block and the outer end of the slot in the bracket 3. The release bar 14 of the carriage is arranged

horizontally above the frame-bar 4 and is adapted to slide thereon in a horizontal plane. Said release bar is operated by the usual devices provided on the carriage for that purpose, and when said release bar is thrown forward it acts on the upper end of the escape-wheel shaft to throw the same outwardly or forwardly and thereby release the carriage from the letter-spacing mechanism.

The drawings illustrate certain parts or features forming part of a column-stop or tabulating mechanism, as follows: The front frame member or rack-bar 4 of the paper-carriage is provided with a depending, longitudinal flange 16, provided at its lower edge with a plurality of notches. Mounted on said flange 16 are stop-members 17, one of which is shown in Fig. 1, which are adjustable on said flange endwise of the carriage.

A key-actuated stop 20 is mounted on the shift-frame and is movable vertically thereon to bring it into and out of the path of the stop-member 17 on the carriage. Said stop 20 is attached to the rear or inner end of a lever 21, arranged to extend from front to rear of the machine and pivoted on the bracket 3 of the shift-frame. A vertically arranged plate 22 is attached to the forward end of the bracket 3 so as to close the forward end of the slot therein. Said plate extends below the said bracket and affords support for a horizontally arranged pivot-rod 23, constituting a journal or bearing for said lever 21. The lever 21 is provided with two rigid arms 24 and 25; the arm 24 constituting a forward extension of said lever and the arm 25 projecting upwardly from the pivotal axis thereof.

A key-lever 26 for operating the column-stop devices, is mounted on the pivot-rod 23 projects forward from the bracket 3. Said key-lever is provided at its outer end with a key 27 by which it may be operated. Said key-lever is provided with a stud 28 which projects from the right-hand face thereof in position to engage the under side of the arm 24 on the lever 26. Said key-lever 26 is connected with the upwardly extending arm 25 of the lever 21 by means of a contractile, coiled spring 30 connected at one end with said arm 25 and at its opposite end with a stud 31 affixed to and projecting from the right-hand side of said key-lever. Said key-lever 26 is provided with a coiled lifting spring 32, by which its front end is held normally elevated; said lifting spring being connected at its lower end with the stud 31 and at its upper end with the bracket 3.

The key-lever 26 is provided at its rear or pivoted end with an upwardly extending rigid arm 36, the upper end of which is adapted to engage a horizontally arranged

connecting bar 37, through the medium of which action is transmitted from the key-lever to the upper end of the escape-wheel shaft 7. Said bar 37 is provided at its forward end with a longitudinal slot through which the upper end of the arm 36 of the key-lever upwardly projects; the front and rear edges of the arm being adapted for contact with the opposite ends of the said slot, which is made long enough to afford a desired extent of lost motion between the key-lever and the said bar. In the normal or elevated position of said key-lever 26, the upper end of its arm 36 stands in a position intermediate between the ends of the slot in the connecting bar 37, so as to leave said bar 37 free to be moved forwardly with the upper end of the escape-wheel shaft 7, when the latter is swung forwardly to disengage the pinion from the carriage rack-bar 3, as occurs in the operation of the release device on the paper-carriage.

So far as described, the parts illustrated are constructed and operate in the same manner as in the "Oliver" typewriting machines as heretofore constructed.

In order to provide for the forward and backward swinging movement of the upper end of the escape-wheel shaft, a novel construction is provided in the bearing for the lower end of said shaft, as follows: A bearing member 10 is supported on the forward end of the bracket arm 9 on the shaft-frame. The forward end of said bracket arm is bent downwardly to form a vertical depending arm 41. Attached to the front face of said arm is a supporting member, having the form of a block 42, on which the bearing-member 10 is pivotally supported in such manner as to turn or rotate on a horizontal, transverse axis. As shown, the block 42 is provided with an integral, depending arm 43, arranged parallel with and in contact with the arm 41, and secured thereto by screws. The pivotal connection between the bearing member 10 and the block 42 is formed by an integral cylindrical stud or journal 45 (Fig. 6), which extends laterally from said bearing member 10 and is adapted to turn in a horizontal, cylindrical bore or bearing aperture formed in the block 42. The bearing member 10 is held in engagement with the block 42 by means of a screw 46 inserted in the end of the bearing stud 45, and provided with a head which overlaps and bears against the outer face of said block 42. The lower end of the escape-wheel shaft extends through and turns in a cylindrical bearing aperture formed in the bearing member 10. A screw 48 is inserted vertically into the lower end of the shaft, and is provided with a head which overlaps and bears against the bottom of the said bearing member. The shaft is provided, above the bearing 10, with a downwardly

facing annular shoulder 49, which, with the head of the screw 48, serves to hold the shaft from vertical movement relatively to the said bearing member 10. By reason of the pivotal or swinging connection thus provided between the bearing member 10 and the frame arm or member which supports the same, said bearing member is free to oscillate about its horizontal axis when the upper end of the escape-wheel shaft is swung or moved forwardly and backwardly, so that the said bearing member is maintained always in axial alinement with said shaft and the frictional resistance to the turning of the shaft in the bearing member will be the same in all positions of the shaft.

The bracket 3 is provided with a stop-plate 50 forming stops adapted to act on the bearing block 11 for limiting the movement of the upper end of the escape-wheel shaft and the gear-pinion toward and from the rack-bar. Said stop-plate is provided with a forward transverse arm 51 acting as a front-stop, and with a rear transverse arm 52 acting as a rear stop, for the bearing block 11. As shown, said stop-plate is arranged horizontally on the top face of the bracket 12, and is secured thereto by two screws 53, 53 inserted vertically through the main part of the plate, which extends from front to rear of the bracket at one side of the escape-wheel shaft. The forward stop-arm 51 of said stop-plate acts as a stop to arrest the movement of the escape-wheel shaft when drawn forwardly in the operation of the key-lever 26. Said arm 51 is shown as provided with two rearwardly extending lugs 55<sup>a</sup>, 55<sup>a</sup> for contact with the front face of the bearing block 11. The rear arm 52 of said plate acts as a stop to arrest the rearward movement of the said shaft under the action of the spring 13. Said rear arm is made narrow from front to rear and is bendable in a horizontal plane, or adapted to be bent at its free or right-hand end, backwardly or forwardly, in order to provide accurate adjustment thereof with respect to the bracket. The stop-plate 50 is secured to the bracket in such position that its forward stop arm 51 will properly limit the forward movement of the gear-pinion when the key-lever 26 is depressed. By bending the rear arm 52 forwardly or backwardly, the rearward position of the gear-pinion may be accurately determined, at the time its teeth are in engagement with those of the carriage rack-bar. The rear arm 52 is so adjusted as to prevent the said rack-bar and the carriage being subject to the rearward pressure of the pinion, due to the action of the spring 13, which throws the bearing block 11 rearwardly; it being found that the pinion engages and acts on the carriage rack-bar more smoothly, uniformly, and with less friction and wear, when held

from backward pressure against the rack-teeth and in proper operative position relatively to the said teeth, by the rear stop arm.

As hereinbefore stated, the lifting spring 32, for the key-lever 26, is connected at one end with the bracket 3. As a further improvement, an arm or standard 33, rising from the bracket 3, is provided for supporting the upper end of said spring 32. Said arm 33 is made in one piece, or integral with the stop-plate; said arm forming an extension of, and being bent upwardly from, the right-hand end of the forward stop-arm 51 of said stop-plate.

In the bracket 3, at the left-hand side of the slot therein, is inserted a screw-plug 55, the inner end of which forms a bearing surface to take the lateral pressure of the bearing block, which is pressed toward the left by the tension of the carriage-actuating spring, exerted through the carriage and rack-bar, on the gear-pinion. The said screw-plug is provided with a head, which bears against the outer face of the bracket, and accurately determines the position of the inner or bearing end of the plug. The front plate 22 of the bracket 3 is provided with a rearwardly extending, integral arm 56 (Fig. 7), arranged at the left side of, at a short distance from the said bracket, and the screws 53, 53, which secure the stop-plate 50 to the bracket, are inserted through holes in said stop-plate and into the upper edge of said arm 56. By reason of this feature of construction, it is possible to locate the said screws at the left of the escape-wheel shaft, and in position in which they are readily accessible for the removal and replacement of the stop-plate. This construction also provides for the attachment of the top-plate to the left-hand side of the bracket, without interference with the screw-plug 55.

The features of construction illustrated may be variously modified without departure from the spirit of my invention, and I do not, therefore, desire to be limited to the exact details shown in the drawings and hereinbefore described, except so far as pointed out in the appended claims.

I claim as my invention:

1. In a typewriting machine, the combination with a carriage rack-bar, and an escape-wheel shaft provided at one end with a gear-pinion adapted for engagement with said rack-bar, of a sliding bearing-block engaging the end of the shaft, which carries the gear-pinion, and affording movement thereof toward and from the rack-bar, a bearing-member for the opposite end of said shaft, and a support for said bearing-member, said bearing-member having pivotal connection with said support, affording swinging movement of the bearing-member on an axis

transverse to the axis of rotation of the shaft, in the movement of the pinion toward and from the rack-bar.

2. In a typewriting machine, the combination with a carriage rack-bar, and an escape-wheel shaft provided at one end with a gear-pinion adapted for engagement with said rack-bar; said pinion being movable with the end of said shaft toward and from the rack-bar, of a bearing-member for the opposite end of said shaft provided with a bearing aperture for the said shaft, and with a laterally extending, cylindric stud, and a support for said bearing-member, consisting of a block having a bearing aperture for said stud.

3. In a typewriting machine, the combination with a carriage rack-bar, of an escape-wheel shaft provided at one end with a gear-pinion adapted for engagement with said rack-bar, said pinion being movable with the end of said shaft toward and from said rack-bar, a bearing for the opposite end of said shaft, provided with a laterally extending bearing-stud, a support for said bearing-stud, comprising a bearing block provided with a bearing aperture for said stud, and a screw inserted into the end of said bearing stud, with its head in contact with the outer face of said block.

4. In a typewriting machine, the combination with a carriage rack-bar, and an upright escape-wheel shaft provided with a gear-pinion adapted for engagement with said rack-bar, said shaft being movable at its upper end toward and from said rack-bar, of a bearing member provided with a cylindric bearing-recess adapted to receive the lower end of said shaft, and a support for said bearing member, said bearing member having pivotal connection with said support, affording rotative movement of the bearing member on a horizontal axis, and the shaft having a downwardly facing, annular shoulder in contact with the top of the bearing member, and a headed screw inserted into the lower end of said shaft with its head engaging the bottom of the bearing-surface.

5. In a typewriting machine, the combination with a bracket provided with a guide slot, of an escape-wheel shaft provided with a gear-pinion, a bearing block for said shaft having sliding movement in said guide-slot, a spring applied to press the pinion and the upper end of the shaft toward the rack-bar, and a stop-plate secured to the said bracket at one side of the said shaft, said stop-plate having a laterally extending arm forming a back-stop for said bearing block, said arm being bendable in the plane of the stop-plate to afford adjustment of the position of the back-stop.

6. In a typewriting machine, the combination with a carriage rack-bar, and an escape-wheel shaft provided with a gear-pinion

adapted for engagement with said rack-bar, of a bracket provided with a guide slot, a spring acting on said shaft to press the pinion toward the rack-bar, a bearing block for said shaft having sliding movement in said guide-slot, a key-lever acting on the escape-wheel shaft to draw the pinion away from the rack-bar, and a stop-plate secured to the said bracket, said plate having a laterally extending arm forming a front-stop for the said bearing block and a second laterally extending arm forming a back-stop for said bearing block, said second arm being bendable in the plane of the stop-plate to afford adjustment of the position of the back-stop.

7. In a typewriting machine, the combination with a bracket provided with a guide-slot, of an escape-wheel shaft, a gear-pinion on said shaft, a bearing block for said shaft having sliding movement in said guide-slot, a key-lever, acting on said shaft to give forward movement to the same, a stop-plate attached to the said bracket and provided with an arm forming a front-stop for the said bearing block, a standard integral with said arm and extending upwardly therefrom, and a lifting spring for the said key-lever, attached at one end to said key-lever and at its other end to said standard.

8. In a typewriting machine, the combination with a bracket provided with a guide-slot, of an escape-wheel shaft, a bearing block for said shaft, having sliding movement in said slot, a spring located between the said bearing-block and the forward end of said slot, a plate attached to the forward face of the bracket for closing the outer end of said slot, said plate being provided with an integral arm extending rearwardly therefrom at one side of the bracket, a key-lever acting on the escape-wheel shaft to draw the same forwardly, and a stop-plate secured to the upper face of said arm, and forming a stop to limit the forward movement of said block and shaft under the action of said key-lever.

9. In a typewriting machine, the combination with a carriage rack-bar, and an escape-wheel shaft provided with a gear-pinion, of a bracket provided with a slot, a bearing-block for the shaft having sliding movement in said slot, and a screw-plug inserted through the bracket at one side of said slot, the inner end of said screw-plug forming a bearing surface for one of the lateral faces of said block.

10. In a typewriting machine, the combination with a bracket provided with a guide-slot, of an escape-wheel shaft, a bearing-block for said shaft, having sliding movement in said slot, a screw-plug inserted laterally through the bracket at one side of said slot, the inner end of said screw-plug forming a bearing surface for one of the lateral faces of said block, a plate attached to the

forward face of the bracket for closing the  
outer end of the slot therein, said plate being  
provided with an integral arm extending  
rearwardly therefrom at the side of the  
5 bracket at which the screw-plug is located,  
and a stop-plate secured to the upper face  
of said arm, and forming a stop to limit the  
movement of said bearing block.

11. In a typewriting machine, the combi-  
10 nation of a rack-bar, and an escape-wheel  
shaft provided with a gear-pinion adapted  
for engagement with said rack-bar, said pin-  
ion being movable with said shaft toward  
and from said rack-bar, a bearing-member  
15 for said shaft, and a support for said bear-

ing-member, said bearing-member having  
pivotal connection with said support, afford-  
ing swinging movement of the bearing-mem-  
ber on an axis transverse to the axis of rota-  
tion of said shaft, in the movement of the 20  
pinion toward and from the rack-bar.

In testimony, that I, claim the foregoing  
as my invention I affix my signature in the  
presence of two witnesses, this 19th day of  
January A. D. 1914.

THERON L. KNAPP.

Witnesses:

EUGENE C. WANN,  
MAURICE D. HERMAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,  
Washington, D. C."