

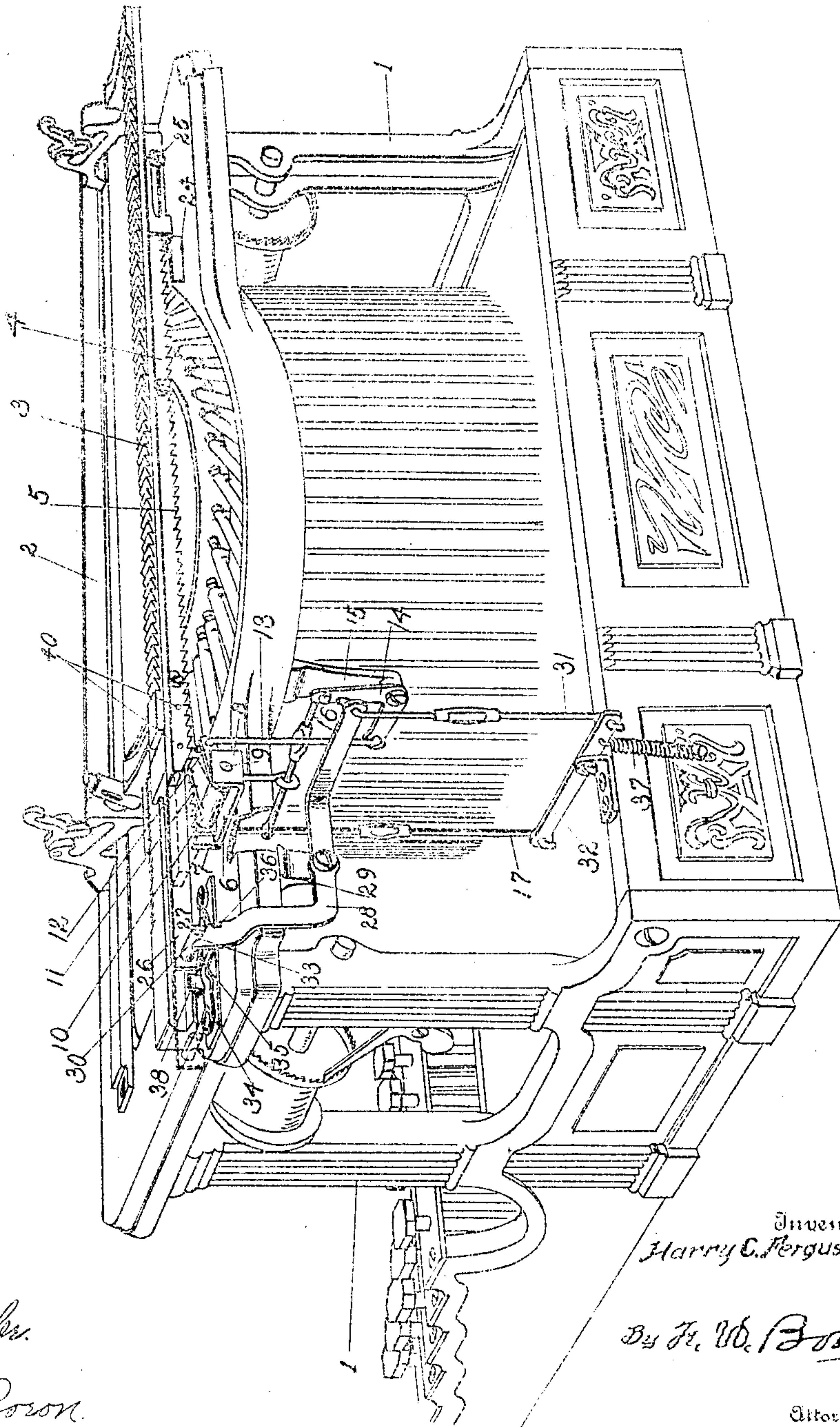
H. C. FERGUSON.
TYPE WRITING MACHINE.
APPLICATION FILED SEPT. 7, 1906.

904,857.

Patented Nov. 24, 1908.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

Jos. G. Foster.

Sylvia Boron.

Inventor
Harry C. Ferguson

By H. W. Bond

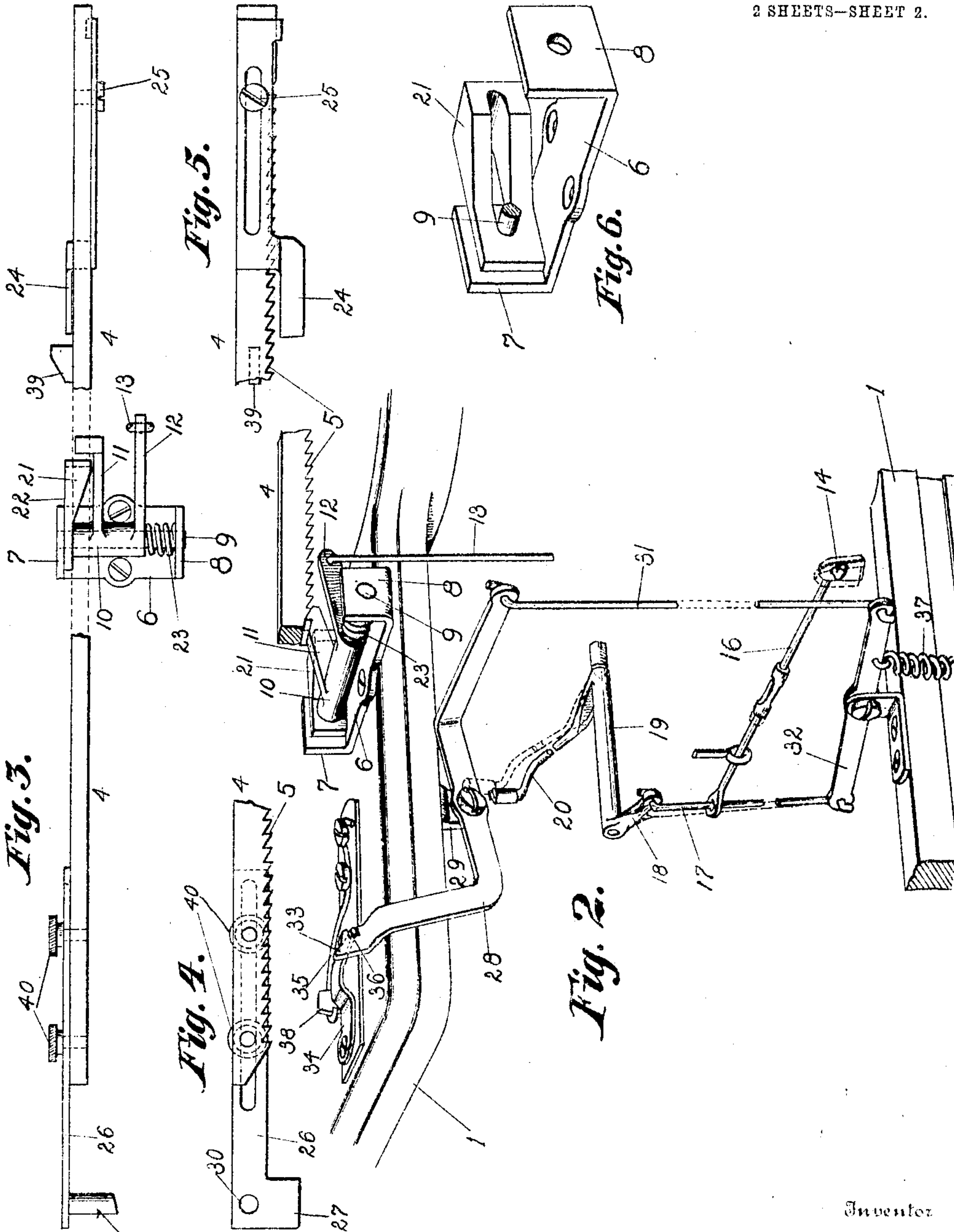
Attorney

H. C. FERGUSON.
TYPE WRITING MACHINE.
APPLICATION FILED SEPT. 7, 1906.

904,857.

Patented Nov. 24, 1908.

2 SHEETS—SHEET 2.



Witnesses
Jos. J. Hosler.
Sylvia Boron.

By

Inventor
Harry C. Ferguson.
J. W. Bond.

Attorney

UNITED STATES PATENT OFFICE.

HARRY C. FERGUSON, OF CANTON, OHIO, ASSIGNOR TO WYCKOFF, SEAMANS & BENEDICT,
OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

No. 904,857.

Specification of Letters Patent.

Patented Nov. 24, 1908.

Application filed September 7, 1906. Serial No. 333,685.

To all whom it may concern:

Be it known that I, HARRY C. FERGUSON, a citizen of the United States, and residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines and more particularly to means for actuating the printing instrumentalities concurrently with or by the travel of the carriage, the invention being especially adapted for what may be termed "liner" work such as the production of "following-lines" in bills, statements and indexes; for producing lines of stars or for underscoring and the like, and the object of the invention is to provide simple and efficient means of the character specified.

To the above and other ends which will hereinafter appear, my invention consists of the features of construction, arrangements of parts and combinations of devices to be set forth in the following specification and particularly pointed out in the appended claims.

In the accompanying drawings wherein like reference characters indicate corresponding parts in the various views, Figure 1 is a rear perspective view showing my improved attachment properly connected to a typewriting machine, the platen, platen frame and different parts associated therewith being omitted. Fig. 2 is a detail perspective view showing the following line producing type bar and the different parts designed to actuate the bar. Fig. 3 is a detail top view of the actuating rack bar and some of the parts associated therewith. Fig. 4 is a detail rear view showing a portion of the rack bar and the adjustable release device or plate connected thereto. Fig. 5 is a detail rear view showing a portion of the actuating rack bar with the setting device connected therewith. Fig. 6 is an enlarged detail view of the releasing and connecting block or wedge.

In various characters of work it is customary to employ "following-lines" or leader lines, lines of stars showing an omission and underscoring. The use of such lines is well understood.

Ordinarily lines of the character referred to above have been produced by repeatedly striking a printing key, one stroke of the key being required for each imprint in the line.

The devices of my invention are intended more particularly to accomplish "liner" work of the above and like characters rapidly and efficiently and to effect a material saving of time and labor on the part of the operator in preparing such work and by automatically and intermittently actuating a type character during the travel of the carriage.

There are various styles or kinds of typewriters. In some machines the paper is applied to a carriage which travels while the printing instrumentalities remain relatively stationary. In other machines the printing instrumentalities are mounted on a traveling carriage while the paper holding devices remain relatively stationary. I have elected to show my invention carried out in the first mentioned kind of writing machines, but I do not wish to be confined or limited to a machine of this description, as my invention may be carried out in any known style or kind of typewriting machines.

In the drawings, 1 represents in a conventional manner, the frame of a typewriting machine. The carriage 2 in the present instance carries a platen (not shown) and is mounted in the usual manner and is provided with the usual feed rack 3. A rack which in the present instance is in the form of a straight toothed bar 4 is secured to the carriage as shown in Fig. 1, said rack being provided with teeth 5 located upon the underside of the rack bar and being in the nature of ratchet teeth, the straight or abrupt face of each tooth being on the left-hand side as seen from the front of the machine; the inclined face being on the right. The teeth 5 are preferably spaced a letter-space distance apart. To the frame 1 of the machine is attached a yoke-like bracket 6 secured to the top plate of the machine and provided with upwardly extending ends or arms 7 and 8 which carry a pivot rod 9 secured at its ends in the arms 7 and 8. A hollow shaft or sleeve 10 is mounted to turn on said pivot rod 9 and is provided with crank arms 11 and 12, the crank arm 11 having a tooth at its free end for cooperation with the teeth 5 formed on the ratchet bar. The second crank arm 12 is connected to an actuating link 13 extended downwardly and pivotally connected to one arm of a bell crank or angular lever 14 pivoted to a depending bracket 15 secured to the top plate

of the machine. A link 16 is pivotally connected to the other arm of the bell crank lever 14 and extends horizontally from the lever and has at its opposite end an eye which loosely surrounds an actuating link 17 for a type carrier or type bar. A guide 16^a is provided for the forward part of the link 16, said guide extending down from the top plate and having a loop at the lower end through which the link 16 works. The link 17 is connected at its upper end to a crank arm 18 formed integral with or attached to a rock shaft 19 which constitutes the axle of a type bar 20 which, in the present instance, is shown as the usual form of type bar employed in the Smith Premier typewriting machine. This type bar is employed for "liner work", the type thereon being in the nature of a dash mark, star, underscoring mark or the like. It will be understood that when the parts are in operative position as shown in Fig. 2 and the carriage 2, together with the different parts carried thereby, is moved toward the right, or to the left as seen in Fig. 1, a short vibrating movement will be imparted to the crank arm 11 by the camming action of the inclined faces of the teeth 5, one vibration of the arm 11 being effected for each letter space movement of the carriage, so that if the carriage is moved a twenty-five letter space distance the arm 11 will receive a corresponding number of vibrations. The movements of the arm 11 are imparted to the arm 12, the link 13, bell crank lever 14 and link 16, which latter is moved fore and aft of the machine and imparts a swinging movement to the upper end of the type bar actuating link 17 which effects a swinging or printing movement of the type bar 20. The movements just above described are, as hereinbefore explained, automatically imparted by and during the travel of the carriage to the right, at which time the line work in the statement, bill or index is produced, each movement of the carriage to the right producing a line of dashes, dots, stars, underscoring marks or the like.

It will be understood that as the carriage approaches the limit of its movement to the right, the arm 11 must be disengaged from the rack or tooth bar 4 so that the type bar 20 will not be brought into action during the movement of the carriage to the left or in the direction of its feed. In order that this result may be accomplished a shifting device comprising a wedge-shaped block 21 is provided, said block being located between the arm 7 of the bracket 6 and one end of the rock shaft 10 as best illustrated in Figs. 2 and 3. The straight faced portion 22 of the wedge 21 is held against the bracket arm 7 by a spring 23 located between the arm 8 of the bracket and one end

of the rock shaft or sleeve 10, and when said sleeve is located with its forward end abutting against the straight face portion 22^a of the wedge or shifting device the arm 11 will be directly below the rack bar 4. When, however, the shifting device or wedge-shaped block 21 is moved endwise or towards the left as seen in Figs. 1, 3 and 6, the beveled face of the wedge will move the rock-shaft 10 longitudinally on its pivot 9 towards the rear of the machine and the arm 11 will be moved out of engagement with the rack bar 4 into a position where the arm cannot cooperate with said rack bar. This renders the rack bar and carriage to which it is connected free to move together to the left or in the direction of the feed of the carriage without imparting any movement to the type bar 20.

For the purpose of automatically moving the rock shaft 10 longitudinally by the movement of the wedge 21 in the manner described the rack 4 is provided with a strike plate or abutment 24 which is adjustably attached to the rack bar 4 by a screw and slot connection, the abutment being held firmly in its adjusted position on the rack by a screw 25 or its equivalent. When the carriage has moved to the right and has about reached the limit of such movement the depending engaging portion of the abutment 24 will come into contact with an end of the wedge 21 and will move it longitudinally a sufficient distance to slide the rock shaft or sleeve 10 on the rod 9 and against the tension of the spring 23, said rock shaft being held in the position to which it is moved until the wedge is moved in an opposite direction from that imparted to it by the abutment 24. Near the right hand end of the rack 4 or upon some other suitable portion of the carriage is attached an adjustable plate 26 which plate is provided with a downwardly extending strike arm or abutment 27 which is for the purpose of moving the wedge endwise when the carriage is moved from right to left. The adjustable plate is so arranged that when substantially the extreme movement of the carriage to the left has been brought about, the wedge 21 will be moved with the carriage to the left a sufficient distance to allow the rock shaft 10 to be moved endwise by means of the spring 23. This endwise movement of the rock shaft brings the arm 11 directly under the rack 4 and in a position to be actuated by the rack when the carriage is moved to the right. It will be seen that by the back and forth movements of the carriage an alternating movement will be imparted to the wedge block 21 by the abutments 24 and 27, shifting it first to the left and then to the right.

It will be understood that a very rapid

printing movement will be given the type bar during the time the carriage is moved to the right and in order to provide for a short stroke or swinging movement of said type bar, its free end should first be brought near the platen or adjacent to the printing position. It is to provide for this that the bell crank lever 28 and the parts associated therewith are employed. This lever is pivotally attached to a bracket 29 and is substantially of the form shown and has an upwardly extending arm with which a rearwardly projecting pin 30 on the member 26 cooperates when the carriage is moved to the right. The effect of the pin 30 contacting with the upright arm of the angular lever 28 is to move the lower rearwardly projecting arm of said lever upwardly, thereby elevating a link 31 connected at its upper end to the angular lever and at its lower end to the rear arm of a lever 32 of the first order pivoted to a bracket secured to the base of the machine and having the link 17 pivoted to its forward arm. The elevation of the link 31 moves the lever 32 against the tension of the spring 37 connected therewith and with the base of the machine. This moves the type bar actuating link 17 downwardly and elevates the type bar 20 but not a sufficient distance to come into contact with the ribbon or the platen, so that when a printing movement is given to the link 17 the type bar will have but a short distance to travel to reach the printing position. The top of the upright arm of the lever 28 is beveled where it cooperates with the pin 30, and in the operation of actuating the lever 28 by the pin 30, said pin passes beyond the upright lever arm and to the right thereof, as shown in dotted lines in Fig. 1.

For the purpose of holding the lever 28 in the position to which it is moved by the pin 30, a locking device or pivoted arm 34 is provided, said locking device being forced into the position illustrated in Fig. 2 by means of the spring 35, the free end of the locking device engaging a notch 36 in the upright lever arm to hold said lever in operated position. This maintains the link 31 elevated and the forward end of the lever 32 depressed, which is effective to maintain the type bar in an elevated position a short distance from the face of the platen, as hereinbefore explained. By this arrangement the type bar 20 is only required to move a short distance at each printing operation; but when the lever 28 is freed from its locking device, the spring 37 pulls the rear end of the lever down, thereby restoring the link 31, lever 28, link 17 and type bar to their normal positions and enabling the type bar 20 to move out of the paths of the other type bars.

A cam 39 is carried by the rack 4 and is adapted to cooperate with a finger or projection 38 on the locking device 34, when the carriage is moved to the right to disengage said locking device from the lever 28.

In order to allow the pin 30 to pass the upright arm of the angular lever 28 from right to left, when the pin is to the right of said lever, as indicated in dotted lines in Fig. 1, the pin 30 is beveled on its end as best shown in Fig. 3, so that it will push or cam the upper resilient arm of the lever 28 rearwardly as the pin moves with the carriage during the travel of the latter to the left. When said pin has passed to the left of and cleared the upright lever arm, said arm is free to spring back to its normal position to be again engaged by the pin when the carriage is moved to the right. It will be understood that the upright arm of the lever 28 should be so constructed and connected with its portion above the pivot of the lever that it will have a spring action or a certain degree of resiliency which enables it to be forced rearwardly by the engagement of the beveled end of the pin 30.

Ordinary shouldered set screws 40 may be employed for holding the adjustable plate 26 in position, said screws engaging in tapped openings in the rack 4 and passing through a longitudinal slot in the plate. By adjusting the contacts 24 and 27 and the pin 30, the points, with reference to the travel of the carriage, when the wedge 21, lever 28, lock 34, etc., are actuated may be nicely regulated, and by so adjusting the plate 26 that the pin 30 is inoperative on the lever 28, or by removing the plate from the machine, the liner devices are rendered inoperative.

In order that the type bar designed to be actuated by the rack 4 may receive a preliminary movement and be partially elevated before the arm 11 is actuated by the rack, it is preferred that the pin 30 moves the lever 28 before the teeth on said rack reach the arm 11 and become effective to actuate the type bar.

In Fig. 2 of the drawing the arm 11 is shown after it has been set for cooperation with the rack 4 and the pin 30 has already actuated the lever 28. Two positions of the pin 30, one when it has reached the lever 28 and the other after it has passed it, are illustrated in full and dotted lines in Fig. 1. In full lines in Fig. 1 the teeth of the rack 4 have not yet engaged the arm 11, though the lever 28 is shown engaged by the pin 30. As the pin moves to the right, thus actuating the lever 28, the teeth of the rack 4 are brought into engagement with the arm 11. The operation is as follows:—

The paper having been inserted in the machine the operator moves the carriage to the

right to begin a line of writing. The act of moving the carriage to the right brings the abutment 24 into contact with the wedge or shifting device 21, thus camming the arm 5 11 towards the rear of the machine where it is out of coöperative relation with the rack 4 and the carriage is at this time free to be moved or fed to the left. This same movement of the carriage to the right brings the 10 cam or abutment 39 into contact with the projection 38 on the locking device 34, thereby moving said device around its pivot toward the front of the machine. The effect of this is to release the locked lever 28 and 15 the spring 37 is operative to effect a restoration of the parts 32, 17, 31, 28 and the type bar 20 to their normal positions and the travel or feed of the carriage to the left is ineffective to actuate the type bar 20. The 20 operator proceeds to write the line and when the end of the line is approached, the abutment 27 is brought into contact with the shifting device 21, thus moving it to the left with the carriage to bring the face 22^a into 25 coöperation with the end of the rock shaft 10, allowing the arm 11 to be brought into coöperation with the rack 4. The operator then moves the carriage back to the right and as it starts to move, the pin 30 coöper- 30 ates with the upright arm of the lever 28, shifting said lever on its pivot to the operated position shown in Fig. 4 and it is automatically locked in such position by the locking device 34. At this time the parts 35 are so disposed that a movement of the carriage to the right will effect an intermittent actuation of the type bar, thus causing a line of dash marks, stars or the like to be 40 imprinted one for each letter space movement of the carriage.

From the foregoing description it will be seen that throwing the type bar into and out of operation is automatically effected by the travel of the carriage but it should be under- 45 stood that the lever 28 may be moved by hand at any time to the operative position shown in Fig. 2 and may be locked in this position if desired by the locking device 34 or that the lever 28 may be released by hand 50 at any time from its locked position.

From the foregoing description it will be seen that the novel devices of my invention are in the nature of attachments and may be applied to existing forms of typewriting machines without changing the structural fea- 55 tures of said machine. It will also be understood that the carriage receives a continuous movement in its return to the right; that it is this continuous movement which 60 actuates the type carrier 20 to effect a succession of imprints; and that at this time the carriage is moved by hand and therefore constitutes a device movable by hand to effect a movement of a toothed device 4, or one

having cam teeth, and thereby effect a suc- 65 cession of printing movements of the type carrier.

Broader claims directed to certain of the features disclosed herein are embodied in my application Serial No. 394,142, the claims in 70 the present case being restricted to features not embodied in my said other application.

Various changes may be made without departing from the spirit of my invention, the invention contemplating broadly the provi- 75 sion of means for automatically actuating the type carrier by or concurrently with the movement of the carriage.

Having fully described my invention, what I claim as new and desire to secure by Let- 80 ters Patent, is—

1. In a typewriting machine, the combination of a carriage, a type carrier, actuating means controlled by the movement of the carriage for actuating said type carrier, and 85 automatically operated means for throwing said actuating means into and out of operation.

2. In a typewriting machine, the combination of a carriage, a type carrier, actuating 90 means controlled by the movement of the carriage for actuating said type carrier, and automatically operated means for rendering said actuating means operative during the travel of the carriage in one direction and 95 for rendering said actuating means inoperative during the travel of the carriage in the opposite direction.

3. In a typewriting machine, the combination of a carriage, a type carrier, actuating 100 means controlled by the movement of the carriage for actuating said type carrier, and automatically operating means for rendering said actuating means inoperative to effect a printing operation of the type carrier 105 during the travel of the carriage from right to left and for rendering said actuating means operative to effect printing operations during the travel of the carriage from left to 110 right.

4. In a typewriting machine, the combination of a carriage, a rack the movement of which is controlled by the movement of the carriage, a type carrier, intermediate actu- 115 ating means between said rack and type carrier, and automatic means for rendering said intermediate connections inoperative to actuate the type carrier.

5. In a typewriting machine, the combination of a carriage, a rack the movement of which is controlled by the movement of the carriage, a type carrier, intermediate actu- 120 ating means between said rack and type carrier, and automatically actuated means for rendering the rack inoperative on said intermediate connections. 125

6. In a typewriting machine, the combination of a carriage, a rack the movement of

which is controlled by the movement of the carriage, a type carrier, intermediate actuating means between said rack and type carrier, and automatically actuated means for moving parts of said intermediate connections into and out of coöperative relation with said rack.

7. In a typewriting machine, the combination of a carriage, a type carrier, preliminary moving means for moving the type carrier partly to the printing position, means for locking said preliminary moving means in its operated position, and means operable concurrently with the carriage for moving the type carrier from said last named position to the printing position.

8. In a typewriting machine, the combination of a carriage, a type carrier, preliminary moving means for moving the type carrier partly to the printing position, automatically actuated means for locking said preliminary moving means in its operated position and for automatically releasing said means from locked position, and means operable concurrently with the carriage for moving the type carrier from said last named position to the printing position.

9. In a typewriting machine, the combination of a carriage, a ratchet bar carried by said carriage, a type carrier actuating means connected with said type carrier and actuated by said ratchet bar, preliminary moving means for moving the type carrier towards but not to the printing position, automatically operating locking means coöperative with said preliminary moving means to automatically lock them in their operated position at about the beginning of the travel of the carriage in one direction, means for automatically releasing the locking means at about the limit of the travel of the carriage in the same direction, automatically actuated means for rendering said actuating means operative at about the limit of the travel of the carriage in one direction, and means for automatically rendering said actuating means inoperative at about the limit of the travel of the carriage in the other direction.

10. In a typewriting machine, the combination of a frame, and a carriage slidably mounted thereon, a type bar, a lever and coöperative means operative to effect a partial movement of the type bar toward the printing position by the movement of the carriage and mechanism operative to move the type bar to the printing position after it has received said partial movement, substantially as and for the purpose specified.

11. In a typewriting machine, the combination of a carriage, a type, means controlled by a continuous movement of the carriage for causing said type to make a succession

of imprints in a line, and means controlled automatically by the carriage for throwing the first mentioned means into and out of operation.

12. In a type-writer attachment of the class described, a type-writer machine frame, a carriage carried by the frame, a toothed bar carried by the carriage, a pivoted type-bar, and mechanism adapted to actuate the type-bar by the return movement of the carriage.

13. In a type-writer attachment, the combination of a type-writing machine frame, and a platen carriage mounted thereon, a toothed bar carried by the carriage, a vibrating arm adapted for contact with the toothed bar carried by the carriage, a type-bar actuating arm, said type-bar actuating arm and a toothed bar engaging arm mounted upon a rocking sleeve, and means carried by the carriage for moving the rocking sleeve longitudinally.

14. In a type-writer attachment of the class described, a typewriter frame and a platen carriage carried thereby, means carried by the carriage adapted to actuate intermediate mechanism and a type-bar actuated by the mechanism carried by the carriage and intermediate mechanism.

15. In a type-writer of the class described, the combination of a type-writer frame, a platen carriage, a toothed bar carried by the carriage, a rock sleeve located below the toothed bar of the carriage, said rock bar provided with vibrating arms, one of said arms adapted for contact with the toothed bar, and the other adapted to actuate a type-bar through mechanism located between the last mentioned arm and the type-bar.

16. In a type-writer of the class described, the combination of a type-writer frame, a platen carriage, a toothed bar carried by the carriage, a rock sleeve located below the toothed bar of the carriage, said rock bar provided with vibrating arms, one of said arms adapted for contact with the toothed bar, and the other adapted to actuate a type-bar through mechanism located between the last mentioned arm and the type-bar, and means for moving the rock sleeve longitudinally.

17. In a type-writer attachment of the class described, a type-writer frame, a platen carriage mounted thereon, a pivoted lever carried by the type-writer frame, a link connected to one end of said lever and a lever connected to the opposite end of the link, a type-bar actuating link, a pin adapted to actuate the lever, by the movement of the carriage and means for holding the lever in moved position.

18. In a type-writer attachment of the class described, a type-writer frame, a car-

riage mounted thereon, a type-bar actuating bar carried by the carriage, a wedge block movable longitudinally, and means carried by the carriage adapted to move the wedge block in opposite directions by the opposite movements of the carriage, a rock sleeve provided with arms and a spring adapted to move the rock sleeve when released, and intermediate mechanism between one of the arms of the rock sleeve and the type-bar whereby the type-bar is actuated by the return movement of the carriage.

19. The combination of a type-writer frame, a lever carried by the frame, means connected to the lever to actuate a single type-bar and means for holding the lever in position to partially elevate a type-bar.

20. In a type-writer attachment, a frame and a carriage mounted thereon, a type-bar actuating lever, said lever adapted to partially elevate the type-bar, means carried by the carriage to actuate the lever, and means adapted to hold the lever in fixed position independent of the means for actuating said lever.

21. In a type-writer attachment, a frame, a carriage mounted thereon, a pivoted lever, a link connected to the lever, a second lever pivoted between its ends, a type-bar actuating link pivoted to said lever, and to a type-bar arm, a pin carried by the carriage, said pin provided with a beveled end, and the lever provided with a beveled end, and means to hold said lever in position to elevate the type-bar.

22. In a type-writer attachment, the combination of a type-writer frame, a carriage mounted thereon, means carried by the carriage adapted to actuate mechanism whereby by a printing movement of the type-bar is

imparted thereto during the return movement of the carriage.

23. In a type-writer attachment of the class described, a frame and a carriage mounted thereon, a toothed bar carried by the carriage, an arm actuated by the longitudinal movement of the toothed bar, a type-bar actuated by mechanism intermediate the toothed bar, and said type-bar and means for partially actuating the type-bar in advance of its full elevation.

24. In a type-writer attachment, the combination of a type-writer machine frame, a carriage, a rock sleeve provided with arms, a toothed bar carried by the carriage and adapted to actuate one of the arms of the rock sleeve, a link pivotally attached to one of the arms of the rock sleeve and an angular lever, a link actuated by the angular lever, a type-bar link actuated by the link connected to the angular lever, and means for throwing the toothed bar actuated arm of the rock shaft out of engagement with the toothed bar carried by the carriage.

25. In a type-writer attachment of the class described, a type-bar carrying a lining character or type, a type-writer frame and a platen carriage mounted thereon, means carried by the carriage adapted to actuate intermediate mechanism between the carriage and the type-bar, whereby the type-bar is actuated by the return movement of the carriage independent of key board action.

In testimony that I claim the above, I have hereunto subscribed my name in the presence of two witnesses.

HARRY C. FERGUSON.

Witnesses:

SYLVIA BOEON,
F. W. BOND.