(No Model.) 2 Sheets—Sheet 1.

A. DAVIDSON.

TYPE WRITING MACHINE.

No. 493,252. Patented Mar. 14, 1893.

Fig. 1.

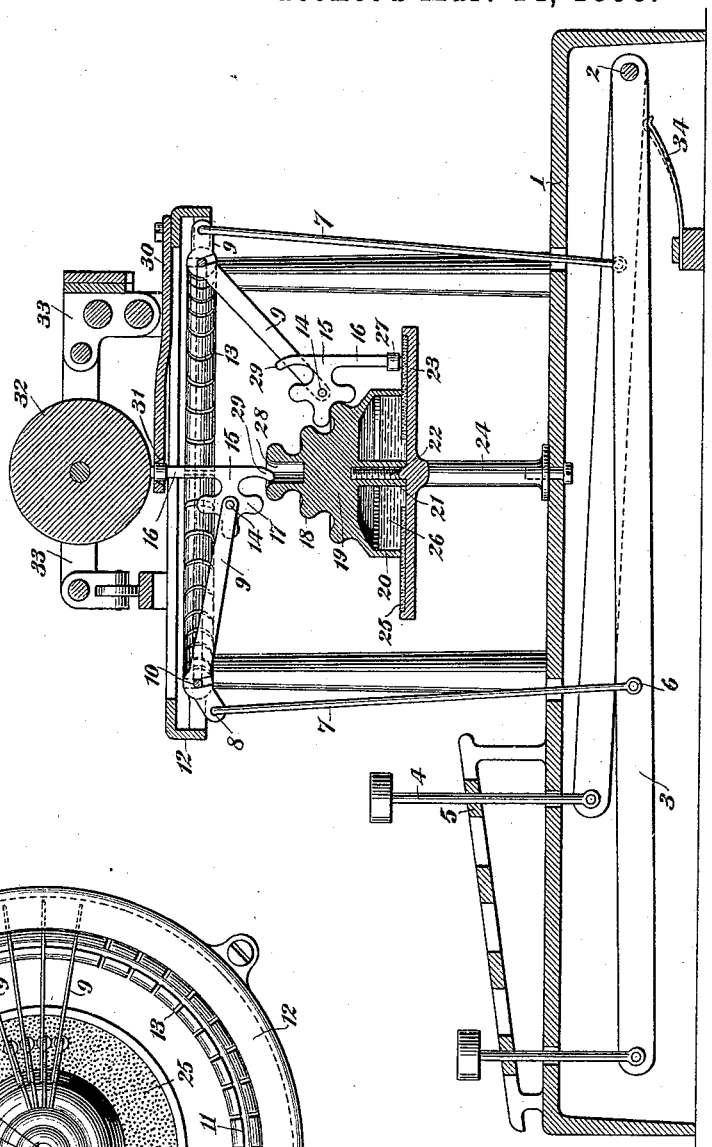
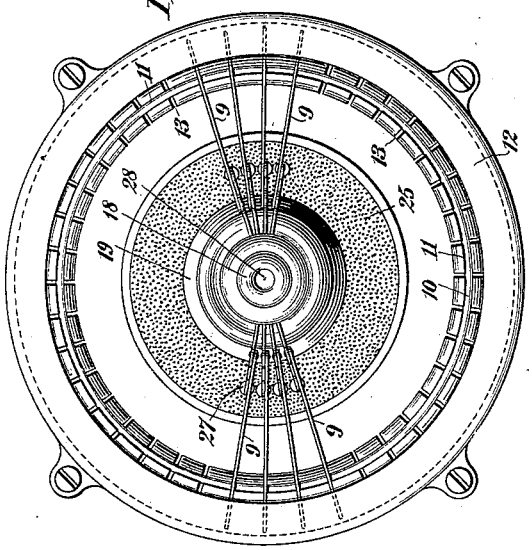


Fig. 2.



Witnesses.
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H. W. Lloyd.

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By his Attorney
Jacob Felbel

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3,

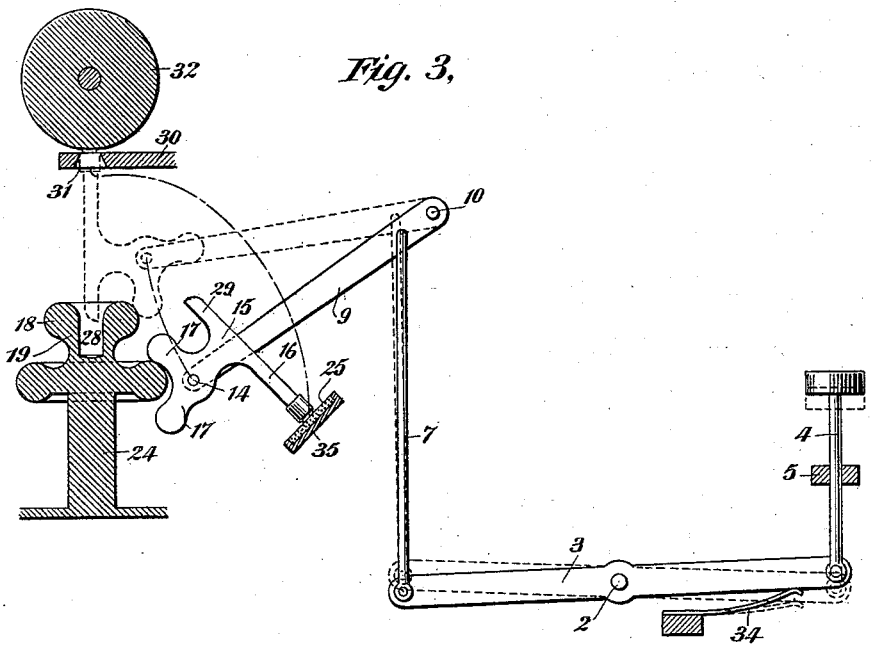
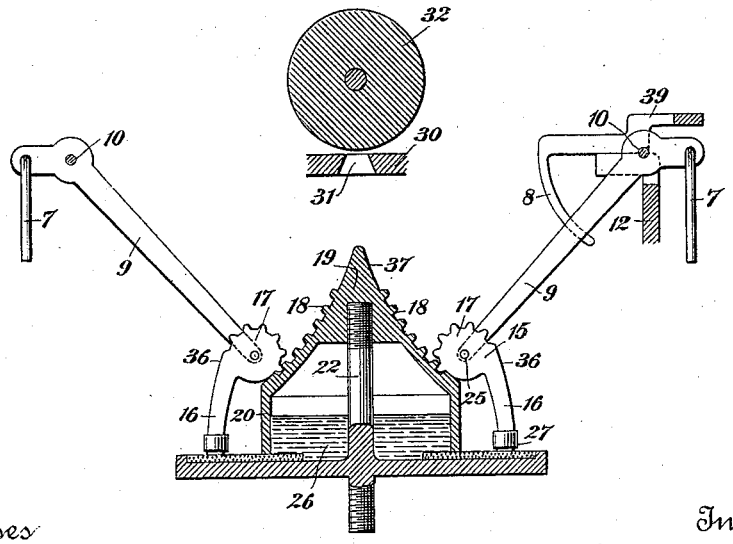


Fig. 4,



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UNITED STATES PATENT OFFICE.

ALEXANDER DAVIDSON, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE YOST WRITING MACHINE COMPANY, OF NEW YORK, N. Y.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 493,252, dated March 14, 1893.

Application filed November 28, 1892. Serial No. 453,314. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER DAVIDSON, a citizen of the United States, and a resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to that class of type writing machines made the subject matter of an application filed by me April 3, 1888, Serial No. 269,445, and patented November 29, 1892, No. 487,047, and having the same objects in view consists in the various features of construction and combinations of devices hereinafter more fully described and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a central vertical section of as much of a type writing machine as is necessary to illustrate my improvements. Fig. 2 is a plan view, omitting the carriage and its supports as well as the base portion of the machine. Fig. 3 is a detail, sectional view, showing a modified construction, and Fig. 4 is a detail, sectional view, showing still a further variation.

In the several views the same parts will be found designated by the same numerals of reference.

Referring to Fig. 1, 1 designates a bed or base plate, beneath which are pivoted at 2, the key-levers 3 having each at its forward end a stem key 4, which preferably passes through a guide or bridge-piece 5. To each key-lever is pivoted, at 6, the lower end of a connecting-rod 7, whose upper end is attached, at 8, to the outer arm of a driving or actuating lever 9, which is hooked or fulcrumed upon a circular ring 10, which is seated in a groove or depression 11 in a top-plate or type ring 12, provided with a series of radial slots 13 to receive the series of levers 9. If desired, a clamping ring may be placed upon or over the tops of the levers 9 to prevent any accidental lifting or disarrangement thereof.

At the inner, free end of each driving lever is pivoted at 14, a type-carrier 15, which consists essentially of a type-bearing arm 16 and a circular rack or partial pinion 17. The teeth forming the rack or partial pinion 17 are formed on a lateral extension of the type-bearing arm and radially of the pivot 14. These teeth mesh or engage with a rack 18 formed on a center-piece or pivotal support 19, which is hollowed out on its underside to form a chamber 20, and provided with a central stem 21, interiorly threaded, which is screwed upon a threaded post 22, projecting upwardly from a circular horizontally-arranged plate 23 mounted upon or formed integral with a standard 24, which is attached to the base-plate or arranged centrally of the series or system of driving levers 9. Upon the plate 23 is arranged a circular inking pad 25, which may be made of felt, plush, silk or other material, and which may be supplied with ink in any desired manner. The pad may be impregnated with ink or coloring matter before being placed in position for use, and when thus prepared it will last a considerable length of time. But, if desired, the chamber 20 may serve as a receptacle for ink, which latter is indicated by the numeral 26, and which may be supplied through an opening in the center-piece or in some other way. The pad extending within the ink receptacle will, by capillary attraction, take up the ink and feed it out to those portions of the pad against which the type 27 come in contact, so that the type may ink themselves on their return to and while in normal position. The rack 18 is made or formed preferably of three horizontal concentric rings or ridges of different diameters, the smallest one being at the top of the support, at which point the latter is provided with a depression 28, into which the rearmost or uppermost end 29 of the type-bearing arm enters before the type is brought to the printing point. This portion 29 of the type-carrier may be considered as a tooth, although it is not formed radially of the pivot 14.

Upon the top-plate is secured an arm 30, which extends inwardly and is provided with an opening 31 to guide the type to the printing point. This guide is at the center of the system of type-carriers, and is arranged in line with the center of the support 19 and the vertical axis of the platen 32, which latter is mounted in a suitable paper-carriage 33, as heretofore.

The construction and operation of the carriage being well understood by those skilled

in the art need not be further alluded to. Any known or suitable carriage may of course be employed in lieu of that shown.

At Fig. 2 I have shown only a few of the type-carriers and their actuating levers, in order to simplify the view, and for the same reason I have omitted many of these devices from Fig. 1. In the normal positions of the parts the type faces rest upon or against the face of the exteriorly-arranged pad, as shown at the right hand side of Fig. 1.

In operation, when any lever 9 is vibrated upwardly, through its connecting-rod and key-lever, its type-carrier is caused to rotate or creep up the rack 18, and at the same time turn about its pivotal connection with said lever. When the lever 9 is vibrated to the proper extent the type-face will be turned from the inking-pad, passed through the center-guide 31 and presented to the paper on the platen. In this movement the type is reversed or turned from its downwardly-pointing vertical normal position to an upwardly-pointing vertical printing position. Upon removing the finger from the key-lever the actuating-lever 9 will of course descend (as the key-lever is caused to ascend by a spring 34), and the type-carrier will then run down the rack or series of fulcrum rings 18 and turn about its pivotal connection with said lever in an opposite direction until the type strikes perpendicularly against the pad.

The end portion or tooth 29 of each type-carrier turns over into or enters the depression 28 in the center-piece or pivotal support before the type enters the guide and operates to give the type-carrier its final turning movement before entering the guide, as well as to give it its initial turning and reversing movement on receding from the guide. This tooth also serves to prevent the type-carrier from losing its operative relation to the rack, or in other words, insures the engagement of the teeth of the partial pinion 17 with the rack 18 upon the descent of the radially-arranged driving-lever 9. But for this guiding portion or tooth 29 the type-carrier might become disarranged, immediately the type emerges from the center-guide on its downward movement, since at this moment the teeth of the partial pinion 17 are not in mesh or gear with the rack 18.

Referring to Fig. 3, it will be observed that in place of the key lever of the second order shown at Fig. 1, I have illustrated a key-lever of the first order, and that in lieu of a connecting-rod which is to be pulled down, I have shown one that is to be pushed up. It will also be observed that the partial pinion 17 is provided with one tooth less than in Fig. 1, and that the rack 18 is composed of only two concentric rings.

It will be furthermore noticed that the ink-pad 25 instead of being arranged in a horizontal position is disposed obliquely, and that in normal position the type-bearing arm of the type-carrier stands in this view obliquely instead of vertically, as in Fig. 1. The pad in Fig. 3 is not provided with any means to render it self-inking. It is intended to represent a previously inked pad mounted in a suitable case or holder 35. These are the main differences between the construction shown at Fig 3, and that shown at Fig. 1. As illustrated by the full and dotted lines, the action of the type-carrier is substantially the same as that shown at Fig. 1. From Figs 1 and 3 it will be understood that the inking-pad may be arranged at any point in the curve described by the type as it descends from the platen. The pad may be formed of a single length of material or it may be made up of sections joined or separated.

Referring to Fig. 4, the center-piece or pivotal support 19 is formed more nearly like a cone, and is provided with six concentric fulcrum rings to form the rack 18. Each type-carrier is provided with as many radial teeth as there are rings upon the support, and also with a bearing portion 36, which works against a face 37 above the uppermost ring and serves to guide the type to the directrix 31 during the last or vertical portion of the movement of the type-carrier. At the end of the upward movement of the type, or at the moment the impression takes place, there still remains a contact between the bearing 36 and face 37, and by reason thereof the type-carrier is guided back into mesh or engagement with the rack on the return movement of the lever 9. The top-plate may be provided with bifurcated guide-fingers 38 for the driving levers 9, and these fingers may be made integral with a cover-plate 39 such as above referred to. The operation of the construction shown at Fig. 4 is substantially the same as that shown at Fig. 1.

At Fig. 1 the type-carrier on the right hand side is shown in its normal position, and the one on the left side hand in its printing position.

At Fig. 3, the type-carrier is shown by full lines in its normal position, and by dotted lines in its printing position, the path of the type and the path of the pivot 14 being shown by broken lines.

At Fig. 4 both type-carriers are shown in their normal positions.

To obtain the best results in inking and printing the type should strike at right angles or perpendicularly to the inking-pad and to the paper or printing surface, and I have so organized my machines as that this desideratum is secured. But, as far as the type movement is concerned, the inking-pad may be omitted entirely (although I prefer to use it) and the type arranged to print through an inking ribbon as in the well-known machines at present in use, and although I prefer to employ a center-guide, as thereby the best results in alignment may be obtained, some of my improvements may, however, be used without the same.

Various changes in detail construction may

be made without departing from the spirit of my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a type writing machine, the combination with a rack or series of fulcrum rings, of a type-carrier adapted to mesh therewith, and means for moving said carrier.

2. In a type writing machine, the combination with a rack or series of fulcrum rings, of an actuating lever, and a type-carrier pivoted to said lever and provided with a series of teeth.

3. In a type writing machine, the combination with a rack formed of a series of superposed rings of varying diameter, of an actuating lever, and a type-carrier pivoted to said lever and provided with a series of teeth to engage said rack.

4. In a type writing machine, the combination with a rack or series of fulcrum rings, of an actuating lever, and a creeping type-carrier.

5. In a type writing machine, the combination of an actuating lever, a type-carrier pivoted to said lever, and a centrally-arranged support adapted to afford a series of fulcrums or pivotal points for said carrier.

6. In a type writing machine, the combination with a central support having a series of fulcrum rings of varying diameter, the smallest one being at the top, of a toothed type-carrier adapted to successively engage said rings, and means for lifting said type-carrier.

7. In a type writing machine, the combination of a platen, a type-carrier, an inking-pad, a series of fulcrum rings, a toothed type-carrier, and an actuating lever.

8. In a type writing machine, the combination with a platen and an ink-pad, of a swinging type-carrier provided with teeth, and a rack for independently turning said carrier during its swinging movement.

9. In a type writing machine, the combination with a platen and an ink-pad, of a swinging type-carrier provided with teeth, and a series of fixed fulcrums or pivotal points for independently turning said carrier in order that its type may be turned on leaving the ink-pad and thus presented perpendicularly to the platen.

10. In a type writing machine, the combination with a platen, of a type-guide, an inking-pad, a series of fulcrum rings, an actuating lever, a toothed type-carrier pivoted thereto, and means for insuring engagement between said carrier and said rings during the return movement of the type-carrier.

11. In a type writing machine, the combination of a platen, a type-guide, an inking-pad, a central support having a series of fulcrum rings and a central depression, an actuating lever, and a pivoted type-carrier adapted to gear with said fulcrum rings and provided with a tooth to enter said depression.

12. In a type writing machine, the combination of a platen, an actuating lever, a type-carrier pivoted thereto and having its type arranged to stand normally in a substantially vertical position with its face downward, a substantially horizontal inking-pad on which the type-face normally rests, and means for turning said carrier about its pivot during the vibration of said lever for the purpose of inverting the type and causing it to move vertically upward immediately before the time of impression.

13. In a type writing machine, the combination of a fulcrum support having an ink-chamber, an ink-pad, a creeping type-carrier, and means for actuating the same.

14. In a type writing machine, the combination of a fulcrum support having an ink-chamber, an ink-pad, a bed or holder therefor to which said fulcrum support is adjustably and removably connected, an actuating lever, and a type carrier geared to the said fulcrum support and pivoted to said actuating lever.

Signed at Bridgeport, in the county of Fairfield and State of Connecticut, this 17th day of November, A. D. 1892.

ALEXANDER DAVIDSON.

Witnesses:

SIGMUND DORMITZER,

CORNÈL TAYSTERE.