E. G. LATTA.

TYPEWRITING MACHINE.

APPLICATION FILED SEPT. 30, 1916.

**1,331,441.**

Patented Feb. 17, 1920.

4 SHEETS—SHEET 1.

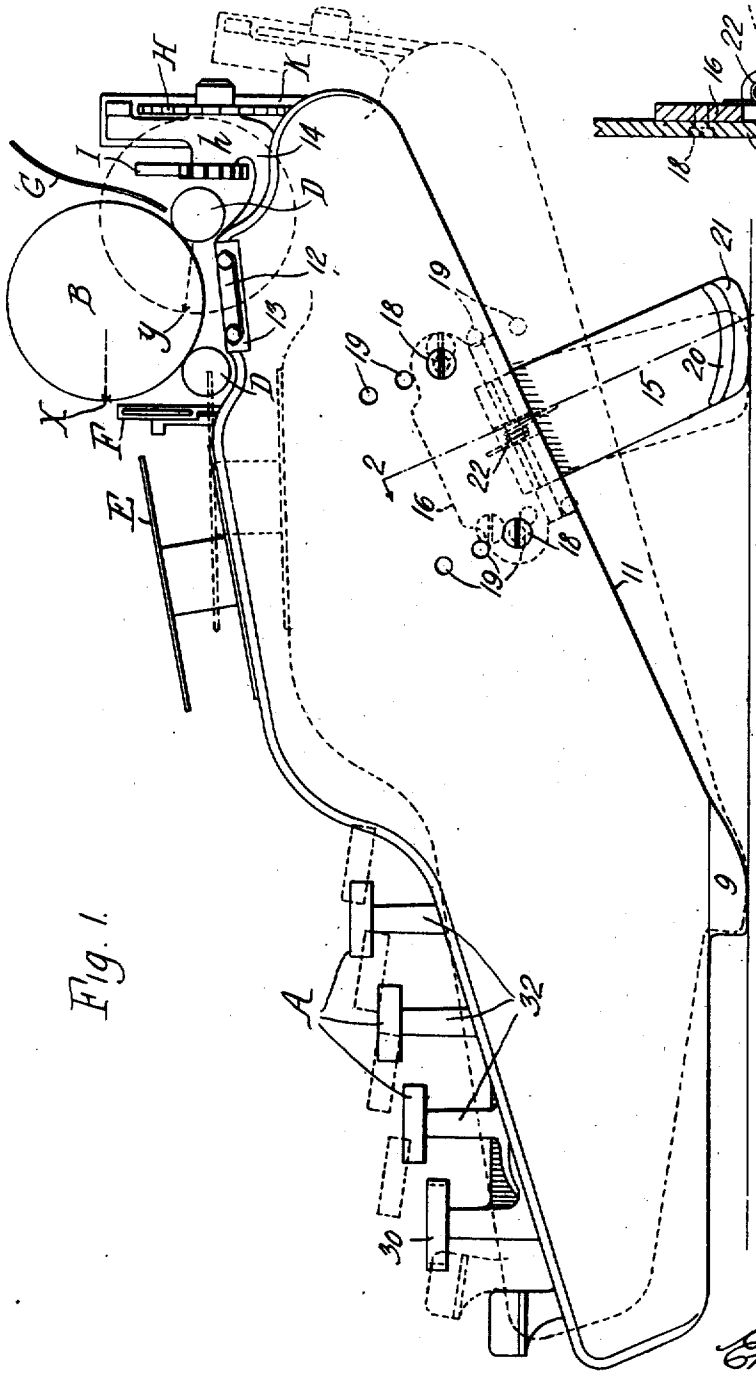


Fig. 1.

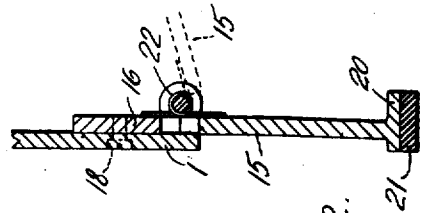


Fig. 2.

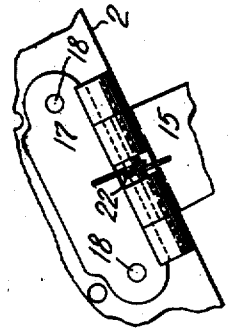


Fig. 3.

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4 SHEETS—SHEET 2.

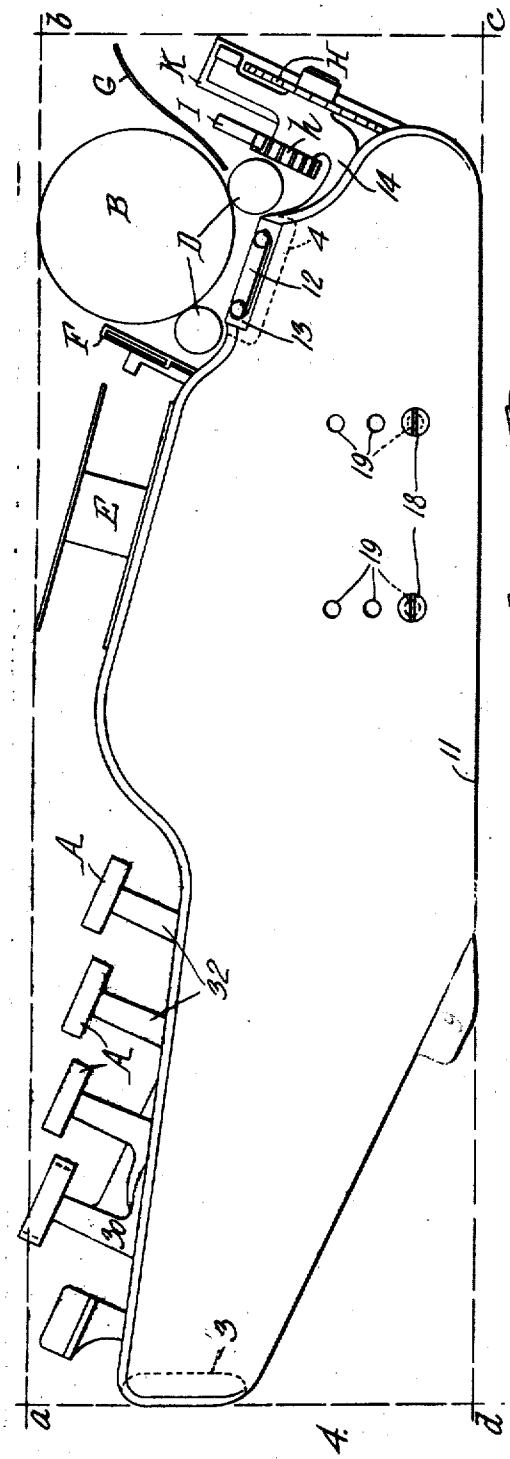


Fig. 4.

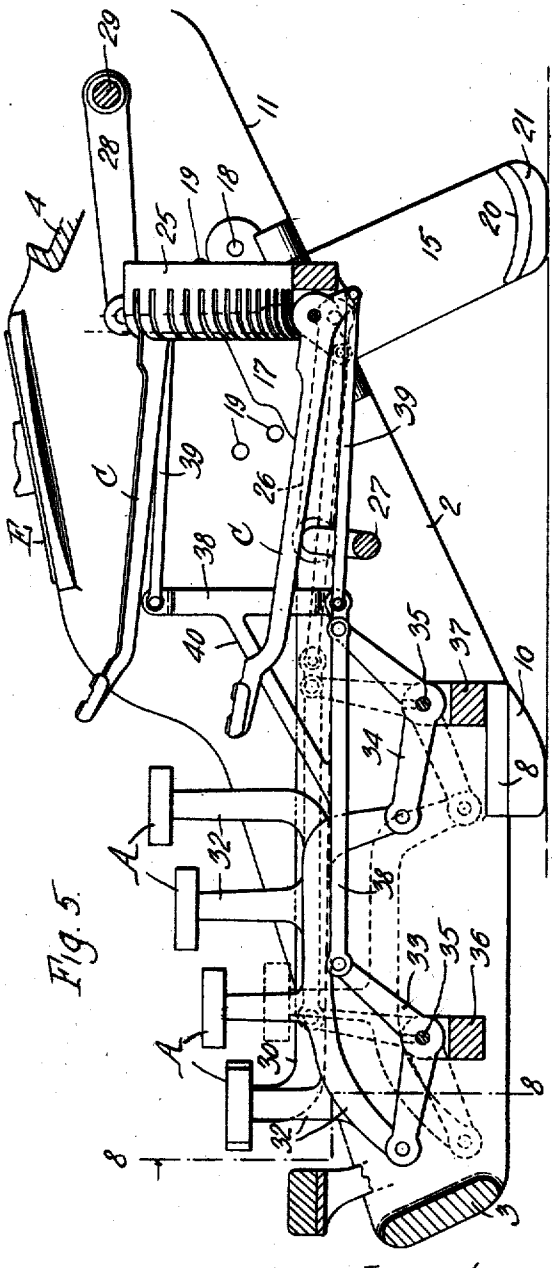


Fig. 5.

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4 SHEETS—SHEET 3.

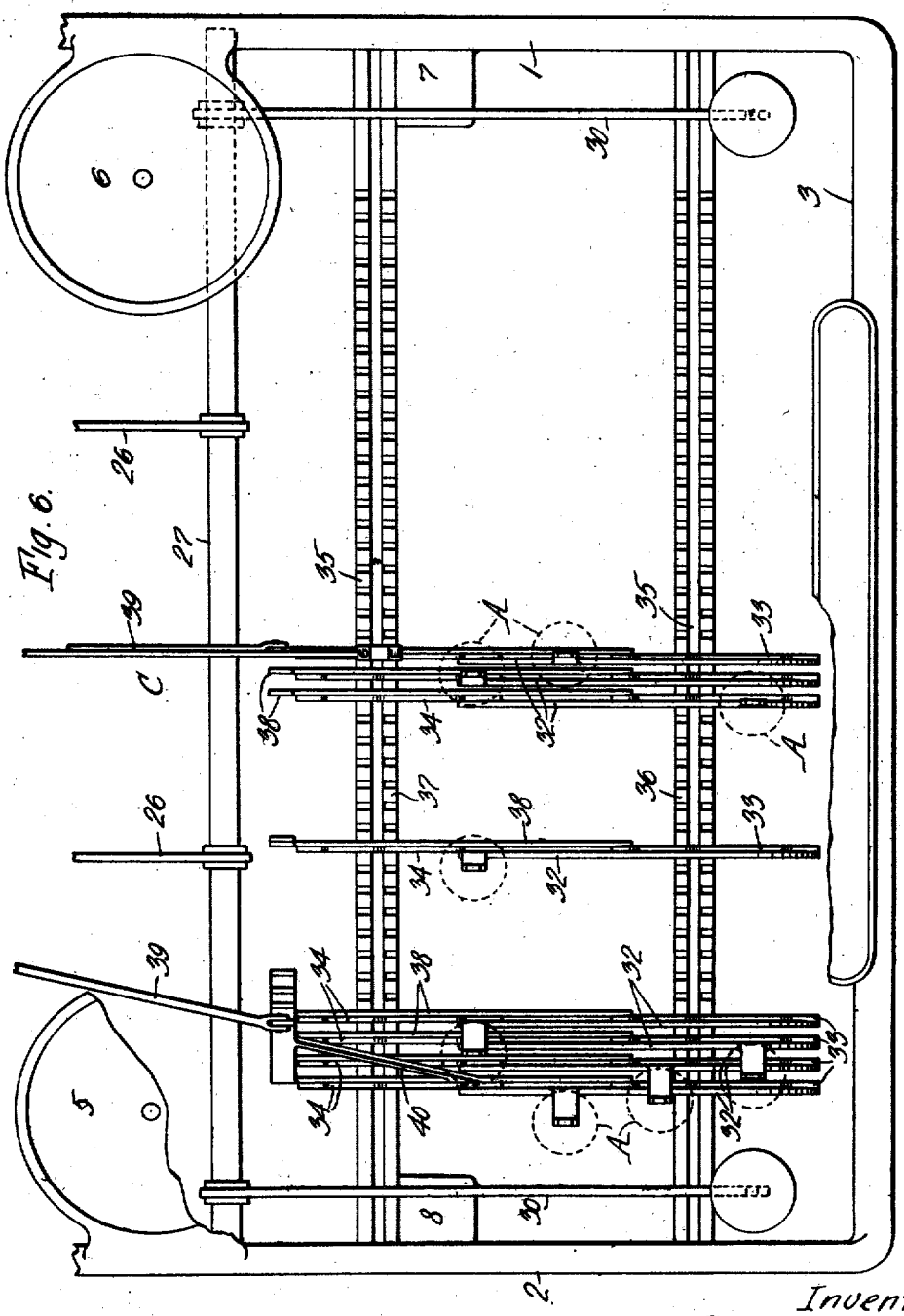



Fig. 6.

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4 SHEETS—SHEET 4.

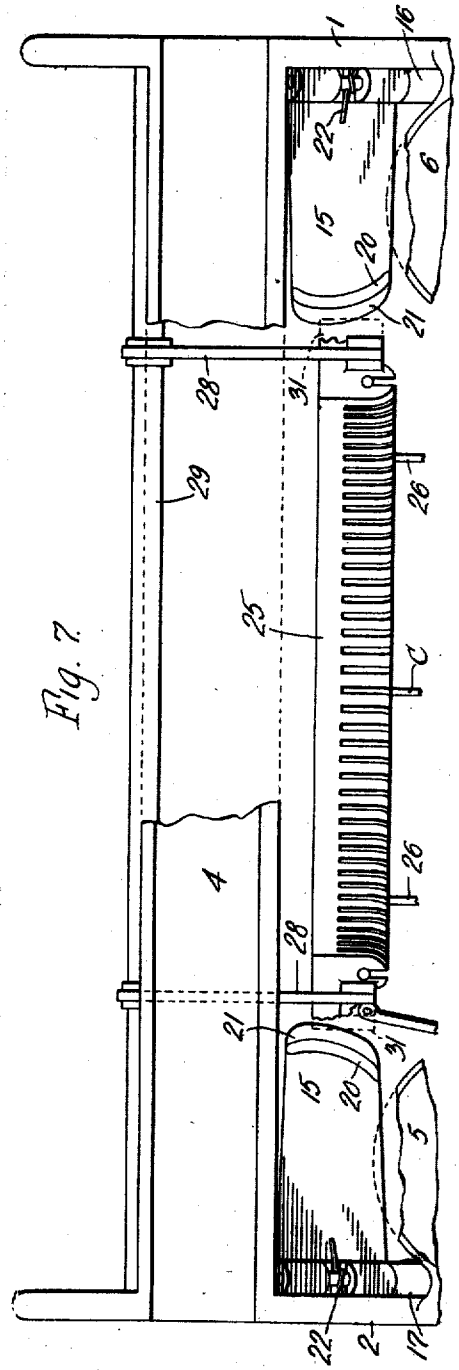


Fig. 7.

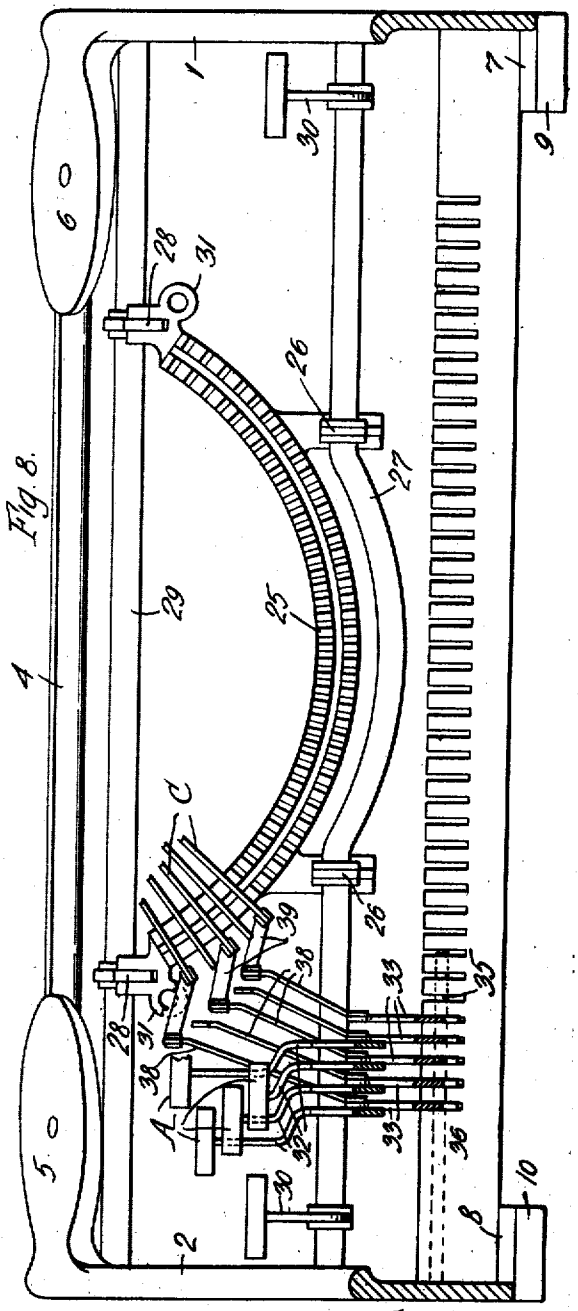


Fig. 8.

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# UNITED STATES PATENT OFFICE.

EMMIT G. LATTA, OF SYRACUSE, NEW YORK.

## TYPEWRITING-MACHINE.

1,331,441. Specification of Letters Patent. Patented Feb. 17, 1920.

Application filed September 30, 1916. Serial No. 123,160.

*To all whom it may concern:*

Be it known that I, EMMIT G. LATTA, a citizen of the United States, residing at Syracuse, in the county of Onondaga and State of New York, have invented a new and useful Improvement in Typewriting-Machines, of which the following is a specification.

This invention relates to improvements in typewriting machines, one object of the invention being to produce a typewriter equipped with a full size keyboard and a complete set of finger keys and type, such as employed in standard makes of typewriters, but which is of unusually compact form and is adapted to be quickly and easily reduced to much smaller dimensions for convenience in transportation. Other objects of the invention are to produce a visible writing typewriting machine which can be readily adjusted to cause the tyye to print at different locations at the front of the platen either on or above a line at the horizontal plane of the axis of the platen without changing the relative operative positions of any of the working parts of the machine; and also to improve typewriting machines in the other respects hereinafter described and set forth in the claims.

In the accompanying drawings:

Figure 1 is a partially complete side elevation of a typewriting machine embodying the invention, showing the same in position for use and indicating by broken lines a different adjustment of the machine for causing the type to print on a line at the front of the platen above the horizontal plane of the axis of the platen.

Fig. 2 is a section on line 2—2, Fig. 1, showing one of the movable rear supports for the machine.

Fig. 3 is a fragmentary inside elevation of the rear support.

Fig. 4 is a side elevation of the machine showing the same moved from its operative position to a recumbent position for transportation.

Fig. 5 is a fragmentary longitudinal sectional elevation of the machine.

Fig. 6 is a partially complete plan view of the front portion of the machine, parts being broken away and omitted to disclose the underlying parts.

Fig. 7 is a similar plan view of the rear portion of the machine, omitting the carriage and associated parts.

Fig. 8 is a partially complete transverse sectional elevation of the machine on line 8—8, Fig. 5.

According to this invention, the typewriter comprises, as usual, the finger keys A arranged in banks or rows, preferably four rows, at the lower front portion of the machine, the paper platen B journaled to rotate on a transversely movable carriage arranged at the upper rear portion of the machine at an elevation above the keyboard, and the printing instrumentalities, preferably comprising type bars C pivoted in the usual segmental order, and their operating connections located intermediate of the finger keys and the platen carriage. This invention is not restricted to any particular construction of these and the other working parts or devices of the machine, and it is not necessary to show and describe in detail the construction of the parts. Other parts, as the paper feed rolls D, one of the ribbon spools E, the ribbon vibrator F, the paper table G, the carriage escapement wheel H, feed pinion *h*, the rack bar I on the carriage meshing with the pinion for controlling the letter space movements of the carriage, and the driving spring drum K for the carriage are, however, indicated in outline in the drawings to show their positions or relative arrangement in the machine and illustrate the convertibility of the machine.

All of these parts are mounted in the relative positions indicated in the drawings and above briefly stated, on a single or rigid main frame which is of rocker-like form, or is so shaped that it is adapted to be supported stationarily in the operative position shown in Figs. 1 and 5, with the rear portion of the frame and the platen carriage and other parts thereon at an elevation above the keyboard, and to be rocked or tilted on the supporting table or surface to lower the rear portion of the frame with the parts thereon from their operative position to a materially lower position as indicated in Fig. 4, whereby the machine is adapted to be placed in a carrying case of the small inside dimensions indicated by the broken lines *a—b—c—d* in Fig. 4. The machine is supported in the operative position with its rear end elevated by suitable rear supports or legs which are adapted to be moved or folded for permitting the lowering of the rear end of the machine.

The main frame preferably comprises two

side plates 1 and 2 of the shape shown in Figs. 1 and 4, and connecting plates or cross bars 3 and 4 located respectively at the front and upper rear parts of the frame. 5 and 6 represent ribbon spool supports which preferably consist of integral parts of the frame projecting inwardly from the upper portions of the side plates. The side plates are provided at their lower forward portions, preferably intermediate of their ends, with lugs 7 and 8 shod with rubber or other suitable cushions 9 and 10 which form front supports for the machine, and the side plates incline or extend upwardly and rearwardly from these front supports gradually receding from the supporting surface for the machine. 11 indicates the upwardly and rearwardly extending lower edges of the side plates. The upper rear cross bar 4 shown, supports the carriage guide track, which may be of any suitable construction, the guide shown consisting of complementary race bars 12 and 13 with interposed antifriction balls. 14 indicates a bracket extending rearwardly from the central part of the track bar 12 and forming the support for the driving spring drum and escapement mechanism.

The rear supports for the machine are preferably formed by two hinged or folding legs 15 which are adapted to be placed in upright position as shown in Figs. 1, 2 and 5, for supporting the machine in operative position or to be folded inwardly as indicated in Fig. 7, and by broken lines in Fig. 2, to permit the machine to be rocked on its front supports 9 and 10 to lower the rear portion of the machine. The legs are preferably hinged by knuckle joints to plates 16 and 17 which are rigidly secured to the side plates 1 and 2, each by two screws 18. Three holes 19 are made in each side plate for each of the screws so that the hinge plates may be placed as shown in Fig. 1, or in either of two other positions for determining the elevation of the operative position of the platen. As shown, the hinge plates are secured in their lowest positions, causing the rear part of the machine to stand in its highest position. The printing point X will then lie on a line in the horizontal plane of the axis of the platen as in the majority of front strike typewriters. If the operator prefers to have the printing line in a more conveniently visible position the hinge plates can be secured in their highest position, when the parts will occupy positions indicated by broken lines in Fig. 1 and the printing line will be at $y$ above the horizontal plane of the axis of the platen. The highest and lowest adjustments are indicated by the full and broken lines in Fig. 1. By securing the hinge plates in their intermediate positions the printing line can be located between the positions indicated in Fig. 1. The lower ends of the legs 15 preferably have oppositely projecting rocker-shaped flanges 20 and are shod with rubber or other suitable shoes 21 so that in any adjustment of the legs they rest on curved surfaces. 22 indicates springs surrounding the hinge pins for the legs and acting, when permitted, to hold the legs in the supporting position shown in Figs. 1, 2 and 5. As the rubber shoes extend outwardly beyond the vertical plane of the hinge pin, as seen in Fig. 2, the weight on the legs cooperates with the springs in retaining the legs in the upright supporting position. When it is desired to transport the machine the legs 15 are simply pushed inwardly and the machine permitted to assume the recumbent position shown in Fig. 4, when the weight of the machine will retain the legs in this position. The front supports 9 and 10 also preferably have curved or rocker-shaped lower edges adapted to rock on the table or supporting surface when the machine is adjusted or lowered to its recumbent position. When the machine is to be used after having been lowered, the rear end is simply raised, whereupon the springs will cause the legs 15 to swing outwardly to their upright supporting position.

In the machine shown in the drawings the type-bars C are pivoted on a segment 25 of the usual slotted form. This segment is pivotally connected to a front pair of arms 26 fixed to a rock shaft 27, and a rear pair of arms 28 fixed to a rock shaft 29. The rock shafts are journaled at their ends in suitable bearings on the frame side plates 1 and 2. 30 represents shift levers fixed to the shaft 27 and acting when depressed to raise the segment and type-bars from normal lower case to upper case printing position. The middle part of the front rock shaft 27 is bowed downwardly somewhat, as shown in Fig. 8, to clear the type-bar actuating links hereinafter described. The two pairs of arms 26, 28 and a spring (not shown) form the entire support for the segment, and suitable stops (not shown) are provided for limiting the movements of the segment. The perforated lugs 31, shown in Fig. 8, are for receiving the rear ends of a pair of forwardly extending rods (not shown) that support the type-bar basket. The segment and its shifting mechanism are so arranged that they will not project below the plane of the inclined lower edges 11 of the frame side plates when the machine is lowered to its recumbent position, and the same applies to all other parts of the machine. The heels of the central type-bars extend slightly below this plane, as shown in Fig. 5, when the machine is in operative position with the segment in the lower case position, and the front edges of the shift key and of the lower bank of writing keys normally project slightly above a plane, indicated by the line

*a*—*b*, Fig. 4, which extends in a direction from the front bank of finger keys to the top of the platen, but when the rear end of the machine is lowered the heels of the central type-bars will strike the table or bottom of the carrying case for the machine, and this will raise the segment to upper case position, thereby bringing the lower edge of the type-bar heels on the line *c*—*d* of the lower edges of the frame and at the same time lowering the shift key and the lower bank of writing keys below the line *a*—*b*. When closing the carrying case if it is made of the inside dimensions in vertical section, indicated by the lines *a*—*b*—*c*—*d*, Fig. 4, the cover will depress the lower bank of finger keys enough to clear the line *a*—*b*. All of the parts of the machine are thus located substantially between the plane of the lower edges 11 of the frame and a plane parallel therewith, represented by the line *a*—*b*, and the machine can be placed in a carrying case of the small inside dimensions represented by the lines *a*—*b*—*c*—*d* in Fig. 4.

In order that the key actions and their connections with the type-bars may be located entirely above the plane of the lower edges 11 of the side frames, a novel construction is shown in the drawings, as follows:

32 represents a series of key bars all of the same length and all pivotally mounted at opposite ends on the front arms of two corresponding series of bell crank levers 33 and 34. These bell crank levers are centrally pivoted by wires 35 supported in longitudinal slots in bars 36 and 37 which are rigidly secured at their ends to the frame side plates 1 and 2. The upper edges of these bars are transversely slotted to receive the bell crank levers. 38 represents a series of draw bars connecting the rear arms of the two series of bell crank levers and 39 is a link connecting each draw-bar to its respective type-bar. Only a few of the key bars, draw-bars and links are shown in order to simplify the drawings. The draw-bars, except a few at the center of the machine, have upturned rear ends which are of graduated lengths in order to locate the front ends of the links 39 on horizontal lines halfway between the upper and lower case positions of the rear ends of the links so that the type-bars are actuated alike in both positions of the segment. A few of the draw-bars which have the highest rear ends are stiffened by integral braces 40, see Fig. 5. The remaining draw-bars can be of simple L-shape. The draw-bars, bell crank levers and key bars are preferably made of sheet metal stampings, while the links 39 preferably consist of such stampings bent into inverted U-shape in cross section. The key bar shown in full in Fig. 5 is for the second bank of finger keys. The other key bars are similar except that the key posts, or upstanding parts of the bars which carry the finger keys, are of different lengths and located at the proper places lengthwise of the bars for the different banks of keys as illustrated in Fig. 5. Springs not shown, act to return the key actions to normal positions. The keyboard is considerably longer than the segment and the upper bank of keys is nearer to the type-bars than usual, causing a great divergence in the lines of the type-bars at the ends of the segments to the keys at the ends of the keyboard. The divergence in the links 39 is lessened by offsetting the key posts and bending the upright rear ends of some of the draw-bars at the end portions of the keyboard inwardly, as shown in Figs. 6 and 8. The key posts are offset outwardly, inwardly or not at all, as may be desirable to properly space the finger keys. For machines having only twenty-eight type-bars in which the keyboard is not so long and especially in such machines in which the upper bank of keys is located at the usual distance in front of the type-bars and having longer type-bars which require a longer segment, it is not necessary to offset any of the key posts or bend inwardly the upright ends of any of the draw-bars.

It will be seen from Figs. 1 and 4 that when the rear end of the machine is lowered by rocking or tilting it on its front supports 9 and 10, the front end of the machine is raised. The front supports are preferably located so that the front of the key-board will not rise substantially above the elevation of the upper part of the platen when the rear end of the machine is lowered. When the rear end of the machine is lowered the rubber cushions of the front supports 9 and 10 are adapted to yield enough to permit the inclined lower edges 11 of the frame side plates to rest in contact with the supporting surface of the table or the bottom of the carrying case for the machine. By reducing the diameter of the platen and the ribbon spools the machine could be inclosed in a carrying case of even less height than indicated in Fig. 4.

By reason of the construction described it is not necessary to make the main or supporting frame jointed or of a folding or collapsible nature, but all of the operative parts of the machine can be mounted on a single rigid frame or support. The working parts of the machine can therefore be adjusted and tuned up with all the nicety and permanence of a standard rigid frame, non-portable typewriter. The writing parts of the machine cannot be affected by any looseness in the joints of the rear supports or legs.

While the invention is herein shown and described in connection with a typewriting machine having a shifting segment instead of a shifting platen, it is not intended to

limit the invention to a machine in which the segment is shifted for different case printing. In a machine having a fixed segment and shifting platen, it would only be necessary for the lower edges 11 of the frame side plates to lie at or below the lower edges of the heels of the type-bars with no other change in the dimensions of the frame. The provisions for locating the printing line at different more or less conveniently visible elevations on the platen and for lowering the rear end of the machine for reducing the dimensions of the machine, have been combined in the one machine in this application, but either of these features could be employed independently of the other and it is not intended to restrict the claims for either feature to use in connection with the other. Furthermore, the invention is not restricted to typewriters having type-bars since other printing instrumentalities, such as a type wheel or shuttle, could be employed.

I claim as my invention:

1. In a typewriting machine, a frame supporting a rotatable platen at its rear portion, a series of type bars, and a keyboard at its front portion, and having an intermediate rocker support adapted to rest loosely on a supporting surface and on which the frame is adapted to rock whereby the platen is lowered and the keyboard raised when the frame is rocked on its support.

2. In a typewriting machine, the combination with a keyboard in front, a series of type-bars in rear of the keyboard and at a higher elevation than the lowest part of the keyboard, and a platen at a higher elevation than the type-bars, of a frame supporting said parts in operative relation at all times, and a movable rear support whereby said frame can be moved to lower the platen to the level of the keyboard.

3. In a typewriting machine, the combination with a keyboard in front, a series of segmentally arranged type-bars in rear of the keyboard, and a platen in rear of the type-bars and at a higher elevation, of a rocker frame supporting said parts in operative relation, all of said parts and frame being arranged between two substantially parallel inclined planes, one of which extends upwardly and rearwardly substantially from the upper side of the keyboard to the upper side of the platen, and the other substantially from a point under the rear of the keyboard to a point adjacent the lowest part of the type-bar segment, and supporting means for said frame permitting it to be lowered from an inclined operative position.

4. In a typewriting machine, the combination of a frame supporting the operative parts of the machine, a rocker front support for the frame adapted to rest loosely and rock on a supporting surface, and a movable rear support whereby the frame may be rocked on its front support.

5. In a typewriting machine, the combination with a series of segmentally arranged type-bars, a platen in rear of and above said segment, a keyboard in front of the segment, and parts connecting the keyboard and type-bars located entirely in front of the lower end of the type-bars, of a frame supporting said parts in relatively fixed operative position and adapted to rock on a front support to lower the platen.

6. In a typewriting machine, the combination with a platen, a series of shiftable segmentally arranged type-bars, and a keyboard, of a frame supporting said parts and adapted to rock on a front support to lower its rear part, and supporting and actuating parts for the shiftable segment located above an inclined plane extending substantially from said front support of the frame upwardly and rearwardly near to the lower part of the type-bar segment.

7. In a typewriting machine, the combination with a platen, a keyboard, and a series of segmentally arranged type-bars, of a frame supporting said parts and adapted to rock on a front support to lower the rear part of the frame, and connections between the keyboard and type-bars arranged entirely above an inclined plane extending substantially from the rocking front support of said frame to the lowest part of the type-bars.

8. In a typewriting machine, a rocker-like frame which supports the operative parts of the machine and is adapted to rest and rock on a supporting surface for lowering the rear part of the machine from a normal elevated position, and means for supporting the machine with its rear part elevated.

9. In a typewriting machine, a supporting frame for the operative parts of the machine having bottom supports at its forward portion and extending upwardly and rearwardly from said supports whereby the rear portion of the frame can be rocked downwardly, legs for supporting the rear part of the frame elevated, and springs for moving the legs into supporting position when the frame is raised.

10. In a typewriting machine, a supporting frame for the operative parts of the machine having bottom supports at its forward portion and extending upwardly and rearwardly from said supports whereby the rear portion of the frame can be rocked downwardly, said machine including type bars movably mounted on the frame and arranged to be moved from one position to another by engagement with the supporting surface for the machine when the machine is rocked downwardly.

11. In a typewriting machine, the combination with a rotatable platen, a series of in-

dependently movable type-bars, and finger keys for actuating the type-bars, of a frame on which all of said parts are mounted and which in its normal position supports the platen at the rear of the machine with its axis at a higher elevation than the type-bars and finger keys, said type-bars being movable to printing positions in a substantially upright plane at the front portion of the platen, said frame and said parts supported thereby being located between two substantially parallel planes one of which extends upwardly and rearwardly substantially tangential to the finger keys and platen, and the other under and adjacent to the type-bars, and means for supporting said frame in and permitting it to be lowered from an inclined operative position.

12. In a typewriting machine, the combination with a rotatable platen, a series of type-bars, and finger keys for actuating the type-bars, of a frame on which all of said parts are mounted and which in its normal position supports the finger keys in front of and lower than the axis of the platen, said type-bars being pivoted back of the finger keys to swing to printing positions in a substantially upright plane at the front portion of the platen, said frame and said parts supported thereby being located between two substantially parallel planes one of which extends upwardly and rearwardly substantially tangential to the finger keys and platen, and the other under and adjacent to the type-bars, and means for supporting said frame in and permitting it to be lowered from an inclined operative position.

13. In a typewriting machine, the combination with a rotatable platen, a series of type-bars, and finger keys for actuating the type-bars, of a frame on which all of said parts are mounted and which in its normal position supports the type-bars in front of and lower than the axis of the platen, said type-bars being arranged to swing to printing positions in a substantially upright plane at the front portion of the platen, said frame and said parts supported thereby being located between two substantially parallel planes one of which extends upwardly and rearwardly substantially tangential to the finger keys and platen, and the other under and adjacent to the type-bars, and means for supporting said frame in and permitting it to be lowered from an inclined operative position.

14. In a typewriting machine, the combination with a rotatable platen, a series of type-bars, and finger keys for actuating the type-bars, of a frame on which all of said parts are mounted with the type-bars pivoted on an upright segment which in the normal position of the machine is located at an elevation lower than the axis of the platen, said frame and said parts supported thereby being located between two substantially parallel planes one of which extends upwardly and rearwardly substantially tangential to the finger keys and platen, and the other under and adjacent to the type-bars, and means for supporting said frame in and permitting it to be lowered from an inclined operative position.

15. In a typewriting machine, the combination with a rotatable platen, a series of independently movable type-bars, and finger keys for actuating the type-bars, of a frame on which all of said parts are mounted and which in its normal position supports the platen at the rear of the machine with its axis at a higher elevation than the type-bars and finger keys, said finger keys being arranged in banks ascending from front to rear, said type-bars being movable to printing positions in a substantially upright plane at the front portion of the platen, said frame and said parts supported thereby being located between two substantially parallel planes one of which extends upwardly and rearwardly substantially tangential to the finger keys and platen, and the other under and adjacent to the type-bars, and means for supporting said frame in and permitting it to be lowered from an inclined operative position.

16. In a typewriting machine, the combination with a rotatable platen, a carriage therefor, driving and escapement mechanism for said carriage, type-bars, finger keys, and actuating connections between said finger keys and type-bars, of a frame on which all of said parts are mounted and which in its normal position supports the platen at the rear of the machine with its axis at a higher elevation than the type-bars and finger keys, said type-bars being movable to printing positions in a substantially upright plane at the front portion of the platen, said frame and said parts supported thereby being located between two substantially parallel planes one of which extends upwardly and rearwardly substantially tangential to the finger keys and platen, and the other under and adjacent to the type-bars, and means for supporting said frame in and permitting it to be lowered from an inclined operative position.

17. In a typewriting machine, the combination with a rotatable platen, a series of independently movable type-bars, each provided with a plurality of type, and finger keys for actuating the type-bars, of a frame on which all of said parts are mounted with the type-bars pivoted on an upright segment which in the normal position of the machine is located at an elevation lower than the axis of the platen, said segment being shiftable for printing different case characters, said frame and said parts supported thereby

being located between two substantially parallel planes one of which extends upwardly and rearwardly substantially tangential to the finger keys and platen, and the other under and adjacent to the type-bars, and means for supporting said frame in and permitting it to be lowered from an inclined operative position.

18. In a typewriting machine, the combination with a rotatable platen, a series of independently movable type-bars, and finger keys for actuating the type-bars, of a frame on which all of said parts are mounted and which in its normal position supports the platen at the rear of the machine with its axis at a higher elevation than the type-bars and finger keys, said type-bars being movable to printing positions in a substantially upright plane at the front portion of the platen, said frame and said parts supported thereby being located between two substantially parallel planes one of which extends upwardly and rearwardly substantially tangential to the finger keys and platen, and the other under and adjacent to the type-bars, and means for supporting said frame in and permitting it to be lowered from an inclined operative position, said supporting means being adjustable for changing the operative positions of the platen and type-bars to print at different elevations without changing their operative relation to each other.

19. In a typewriting machine, the combination with a rotatable platen, a series of independently movable type-bars, and finger keys for actuating the type-bars, of a frame on which all of said parts are mounted and which in its normal position supports the platen at the rear of the machine with its axis at a higher elevation than the type-bars and finger keys, said type-bars being pivoted on a substantially upright segment to swing to printing positions in a substantially upright plane at the front portion of the platen, said frame and said parts supported thereby being located between two substantially parallel planes which incline upwardly and rearwardly one close to the tops of the finger keys and the other close to the bottom of the type-bar segment.

20. In a typewriting machine, the combination of a rotatable platen, a series of independently movable type-bars, and finger keys for actuating the type-bars, of a frame on which all of said parts are mounted and which in its normal position supports the platen at the rear upper portion of the machine, the lower portion of said frame comprising front and rear parts extending at an angle to each other from a point between the front and rear ends of the frame, whereby the frame is adapted to swing substantially about such point to permit the rear portion of the frame to be raised and lowered to and from an operative position.

21. In a typewriting machine, the combination with a rotatable platen, a series of independently movable type-bars, and finger keys for actuating the type-bars, of a frame on which all of said parts are mounted and which in its normal position supports the platen at the rear upper portion of the machine, the lower portion of said frame comprising front and rear parts extending at an angle to each other from a point approximately at the rear of the finger keys, whereby the frame is adapted to swing substantially about such point to permit the rear portion of the frame to be raised and lowered to and from an operative position.

Witness my hand, this 28th day of September, 1916.

EMMIT G. LATTA.

Witnesses:
LURA B. LATTA,
ELMER E. STANTON.