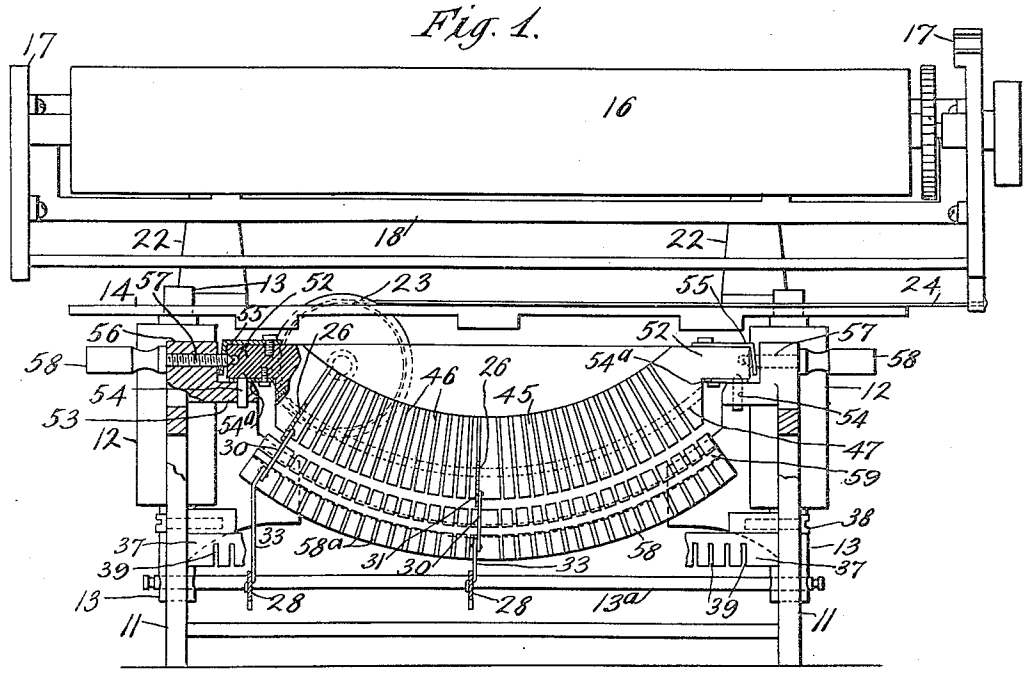
L. R. ROBERTS.

TYPEWRITER.

APPLICATION FILED AUG. 13, 1919.

1,431,983. Patented Oct. 17, 1922.

Fig. 1.



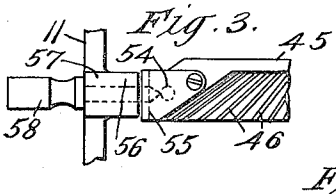
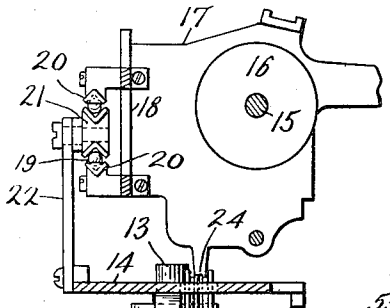


Fig. 3.



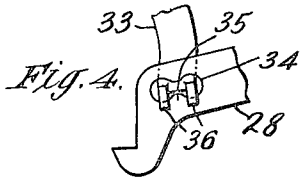


Fig. 4.

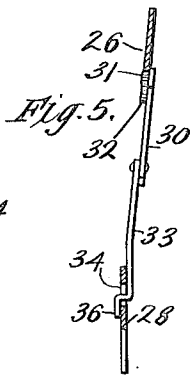


Fig. 5.

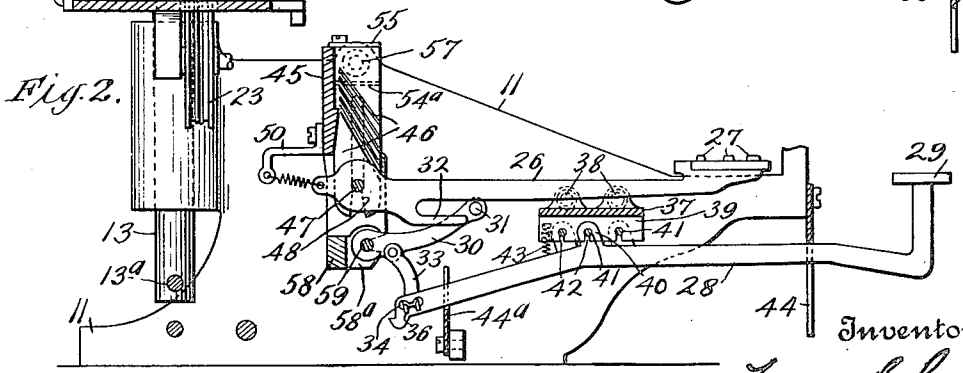


Fig. 2.

Inventor

Lyman R Roberts

By his Attorneys

Philip Thurston Dick Hemmy

Patented Oct. 17, 1922. 1,431,983

UNITED STATES PATENT OFFICE.

LYMAN R. ROBERTS, OF RUTHERFORD, NEW JERSEY, ASSIGNOR TO L. R. ROBERTS TYPEWRITER COMPANY, OF STAMFORD, CONNECTICUT, A CORPORATION OF DELAWARE.

TYPEWRITER.

Application filed August 13, 1919. Serial No. 317,116.

To all whom it may concern:

Be it known that I, LYMAN R. ROBERTS, a citizen of the United States, residing at Rutherford, county of Bergen, and State of New Jersey, have invented certain new and useful Improvements in Typewriters, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to typewriters.

It is the principal object of the invention to provide an improved typewriter in which the type bars may be readily removed and replaced as a unit.

With this general object in view, the invention consists in the combinations, arrangements of parts and details of construction which will be first described in connection with the accompanying drawing and then more particularly pointed out.

In the drawing,

Fig. 1 is a view in front elevation with parts in transverse section and parts broken away, of so much of a typewriter as is necessary to an understanding of the invention;

Fig. 2 is a view of the same in vertical longitudinal section;

Fig. 3 is a plan view showing in detail one end of the type bar segment;

Fig. 4 is an enlarged view of a portion of Fig. 2 showing the connection between a key lever and its link; and

Fig. 5 is a transverse sectional view through one type bar and key lever mechanism removed.

The typewriter illustrated includes, in general, a frame, a carriage truck movable relatively to the frame for case shift movement, and a platen carriage movable across the truck for printing. Referring to the drawing, there is provided in the present embodiment a frame 11 illustrated more or less conventionally. At the rear corners of the frame are cylindrical bearing members 12 in which slide plungers 13. Mounted on these plungers to be moved thereby, is a carriage truck in the form of a rigid plate 14. The plungers 13 are connected below the bearings 12 by a cross rod 13^a which is removable. By means of this cross rod the plungers may be raised to give case shift movement to the carriage truck. This may be accomplished by any suitable construction, such as that shown and described in applicant's copending application, Ser. No. 263,116.

The shaft 15 of the platen 16 is journaled in the end pieces 17 of a platen carriage 18. To mount the carriage for suitable printing movement, two sets of ball bearings 19 ride in grooved rails 20 on the carriage and in a double grooved guide 21 supported from the truck plate 14 by two bracket arms 22. The carriage is driven through an escapement mechanism of any suitable construction, power being derived from a spring drum 23 on the frame, having a cord 24 connected to one end of the carriage.

There is provided a set of type bars and a set of operating mechanisms, each type bar being freely removable from its respective operating mechanism when in a position of rest and locked thereto during operation. In structures embodying the invention to the best advantage, the operating mechanisms include members having sliding contact with the type bars to actuate the same. Although capable of various constructions, in the present embodiment, there is provided a set of type bars 26 each having three type characters 27. These type bars are pivotally mounted, as hereinafter described, to swing upwardly to the platen. The operating mechanisms for the type bars include a set of key levers 28 having finger pieces or keys 29, and a set of operating levers 30. These operating levers, pivotally mounted as hereinafter described, have no positive connection with the type bars but are arranged to operate the latter by sliding contact so that the type bars may be freely removed. To this end, each operating lever 30 is provided with a pin 31 bearing against the bottom edge of its respective type bar. When the operating member 30 is swung upwardly by the key lever, the pin 31 slides along the type bar, thus swinging the latter for its printing stroke.

To lock the type bar and its operating lever together during the operation, the type bar is provided with an arm 32 which forms an open ended slot in which the pin 31 rides during operation. The arm 32 is of such length that when the type bar is at rest the pin is outside the slot. In other words, the type bar is freely removable from lever 30 when at rest, but is locked thereto during operation.

To operably connect the key levers and the operating levers 30, links 33 are provided, these links being pinned to the levers 30. As will be apparent from Fig. 1, the operating levers 30 move in converging or radial planes whereas the key levers move in parallel planes. The various links 33, therefore, are of different lengths and are bent to different angles in accordance wih their position. Thus, those at the outside are longer and have a sharper angle than those nearer the center, as will be clear from Fig. 1.

To connect the key levers with the links operated thereby, as here shown as an example each key lever, near its rear end, is formed with a hole 34 of the form shown in Fig. 4 having an upwardly curved bottom edge 35. Insertable in this hole, is an offset, forked, interlocking portion 36 formed on the end of link 33. It will be seen from Figs. 4 and 5 that with the construction described, the parts are interlocked but the link has play in two directions, the forked end 36 rocking along and across the curved edge 35. At the same time, it is noted there is no undue lost motion and the construction facilitates assembly of the parts.

The several keys 29 forming the key-board are arranged, in the present embodiment, in three banks and to obtain equal throw for the various keys, the key levers of the several banks are pivoted in different transverse planes. There is provided means for pivotally mounting the several key levers and a single support for the several pivots. In structures embodying the invention to the best advantage, there is provided a hanger having longitudinal slots for pivot wires and transverse slots for the key levers. Although capable of various constructions, in that illustrated, extending from side to side of the frame is a hanger 37 in the form of a block of metal suspended in the frame by screws 38. This hanger has a plurality of transverse slots 39 equal in number to the key levers. In these slots the key levers are pivotally mounted. To this end, each key lever has an upwardly extending, perforated lug 40 which enters one of the slots 39. In the slots, the lugs of the key levers of a given bank are hung on a common pivot wire 41 carried in a longitudinal, undercut slot 42 also formed in the hanger 37. Since the keys are arranged in three banks, there are three of these pivot wires, as appears in Fig. 2. Figure 2 shows a representative key lever of the middle bank pivoted on the middle wire, representative pivot lugs of levers of the other two banks being shown hung on the front and rear wires. To return the key levers to normal position after each operation, between the hanger 37 and each key lever is a small coil spring 43.

The structure described provides a one piece hanger for a plurality of banks of key levers such that the pivot wires are all supported adjacent the pivotal points. Furthermore, the same part, that is the hanger 37, serves as a backing for the return springs which are thus largely enclosed and out of the way.

To guide the key levers and to limit their movement in either direction, front and rear comb plates 44, 44ª are provided.

Typewriters embodying the invention in its entirety have provision for the ready removal and insertion of the type bars as a unit. The invention includes a removable type bar segment in which the type bars are pivotally mounted, the segment having supporting projections and being hung between supporting uprights with which the supporting projections cooperate. Although capable of various constructions, as here illustrated, the type bars are pivotally mounted in a segment 45 having a plurality of radial slots 46 which are struck from a common center. Each type bar is formed at its inner end with a rounded portion, as shown more clearly in Figure 2, which is inserted in one of the slots 46 and which is perforated for the reception of a common pivot wire 47. This pivot wire is concentric with the segment and is seated in the bottom of a V-shaped groove 48 formed in the outer edge of the segment. To return the type bars to normal position, the segment carries, for each type bar, a bracket 50 to which is secured a spring 51, the other end of which is secured to the heel of the corresponding type bar.

At each end, the segment is formed with a supporting projection 52, adapted to rest on a flat ledge on a supporting upright 53 formed by part of the frame. Means is provided for accurately positioning the segment on the supporting uprights. This may be accomplished, for example, by a positioning member on one of the cooperating supporting surfaces. As shown, set in the face of the supporting upright 53 is a dowel 54 adapted to enter a suitable hole in the under side of the projection 52 on the segment, this face of the projection being covered with a hardened steel plate 54ª. When the projections 52 are slipped over the dowels 54, the segment is accurately positioned on its supporting uprights.

The invention includes pressure means for clamping the segment in position and means for preventing the force of the pressure means at one side from being transferred across the segment. This may be accomplished, for example, by yielding means for taking the force of the pressure means. Although capable of various constructions, in the present embodiment, secured to the top of the segment 45 is a spring angle-plate 55 of the form shown more clearly in Fig. 1. Opposite the ends of the segment, the frame has bearings 56 through which are threaded

pressure screws 57. Each pressure screw has a shouldered head 58 which serves as a thumb piece and is adapted to make solid contact with the bearing 56. The point of the screw 57 passes through a suitable opening in the spring plate 55 and enters the groove 48 in the segment. When the segment has been positioned, it is securely clamped in place by the two pressure screws 57. The screws 57 pass loosely through the holes in the spring plates, contacting with the plates at the bottom of the holes and thereby directing the force of the screws to press the projections 52 down against the supporting uprights. That is, as the screws are tightened up to the point where the shouldered heads 58 engage the bearings 56, the force of the screws is taken by the yielding plates 55. With this construction, the force of one screw is not transferred across the segment and the pressure on the segment is always substantially the same, with the result that the operation of clamping the segment in place does not disturb the proper alignment of the types.

Below the removable segment 45, as here shown as an example, is a second and fixed segment 58 having a plurality of slots 58ª in which the operating levers 30 are mounted. As will be apparent from the drawings, the operating levers 30 are offset slightly from the type bars. The slots 58ª in the fixed segment are accordingly offset from the slots 46 of the type bar segment, and are cut from a common center which is offset to the same side of the center of the slots 46. As will appear in Figure 1, the operating levers 30 are on the inside of the type bars, so that the positions for one-half of the type basket are reversed in the other half. Consequently, the slots 58ª on the left hand side of the type basket have a common center offset slightly to the right of the center of the slots 46, whereas the right hand slots 58ª are formed on a center similarly offset to the left of the center of the slots 46. The operating levers 30 are pivoted on a common pivot wire 59 which is concentric with the pivot wire 47 of the type bars and is seated in the bottom of a recess 60 formed in the front of segment 57.

With the construction described, removal and insertion of the type bars for substitution or the like, are extremely simple operations. By loosening the screws 57, the segment 45 carrying the type bars is free to be lifted away from its support, the individual type bars being freely separable from their operating mechanisms as before described. In replacing the same, or a substitute segment, it is only necessary to place the segment on its supporting uprights with the projections fitting over the dowels 54, and to tighten the screws 57. There is no necessity for careful adjustment or manipulation of the parts. Further, it is noted that with the construction described, this positioning of the type bar segment reestablishes the operating relation between the type bars and the key lever mechanisms without the loss of alignment.

What is claimed is:

1. In a typewriter, and in combination, a removable type bar segment in which the type bars are pivotally mounted, said segment having supporting projections and being hung between supporting uprights with which said projections cooperate, pressure means for clamping the segment in place, and means for preventing the force of the pressure means at one side from being transferred across the segment.

2. In a typewriter, and in combination, a removable type bar segment in which the type bars are pivotally mounted, said segment having supporting projections and being hung between supporting uprights with which said projections cooperate, pressure means at each side for clamping the segment in position, and yielding means for taking the force of said pressure means.

3. In a typewriter, and in combination, a removable type bar segment in which the type bars are pivotally mounted, said segment having supporting projections and being hung between supporting uprights with which said projections cooperate, one of the supporting parts having a dowel and the other a dowel receiving hole, for positioning the segment, a pressure screw at each side for clamping the segment in position, and yielding means for taking the force of said pressure screws.

4. In a typewriter, and in combination, a removable type bar segment in which the type bars are pivotally mounted, said segment having supporting projections and being hung between supporting uprights with which said projections cooperate, one of the supporting parts having a dowel and the other a dowel receiving hole for positioning the segment, a bearing associated with each supporting upright, pressure screws threaded through said bearings for clamping the segment in place, said screws having shoulders engaging said bearings when the screws are tightened to clamping position, and yielding means for taking the force of said screws.

5. In a typewriter, and in combination, a removable type bar segment in which the type bars are pivotally mounted, said segment having supporting projections and being hung between supporting uprights with which said projections cooperate, dowels on said supporting uprights, dowel receiving holes in said projections, bearings associated with said supporting uprights, pressure screws threaded through said bearings, and a spring plate on each end of the segment for taking the force of said screws.

6. In a typewriter, and in combination, a removable type bar segment in which the type bars are pivotally mounted, said segment having supporting projections and being hung between supporting uprights with which said projections cooperate, dowels on said supporting uprights, dowel receiving holes in said projections, bearings associated with said supporting uprights, pressure screws having shoulders engaging the bearings when the screws are tightened to clamping position, and a spring plate on each end of the segment for taking the force of said screws.

7. In a typewriter, and in combination, a removable type bar segment in which the type bars are pivotally mounted, said segment having supporting projections and being hung between supporting uprights with which said projections cooperate, an arcuate slot in said segment for receiving a pivot wire, bearings associated with said supporting uprights, pressure screws threaded through said bearings and adapted to enter the ends of said slot, and spring plates on the segment, between the latter and the bearings, for taking the force of said screws.

8. In a typewriter, and in combination, a removable type bar segment having a plurality of radial slots in which the type bars are pivotally mounted, and having supporting projections and being hung between supporting uprights with which said projections cooperate; a second segment having a plurality of radial slots in which the operating members for the type bars are pivotally mounted, the slots of the first segment having a common center, and the slots of the second segment having two centers, each common to part of the slots and each offset from the center of the type bar slots, pressure means for clamping the removable segment in position, and yielding means for taking the force of said pressure means.

In testimony whereof, I have hereunto set my hand.

LYMAN R. ROBERTS.