

F. S. ROSE, DEC'D.

G. F. ROSE, ADMINISTRATOR.

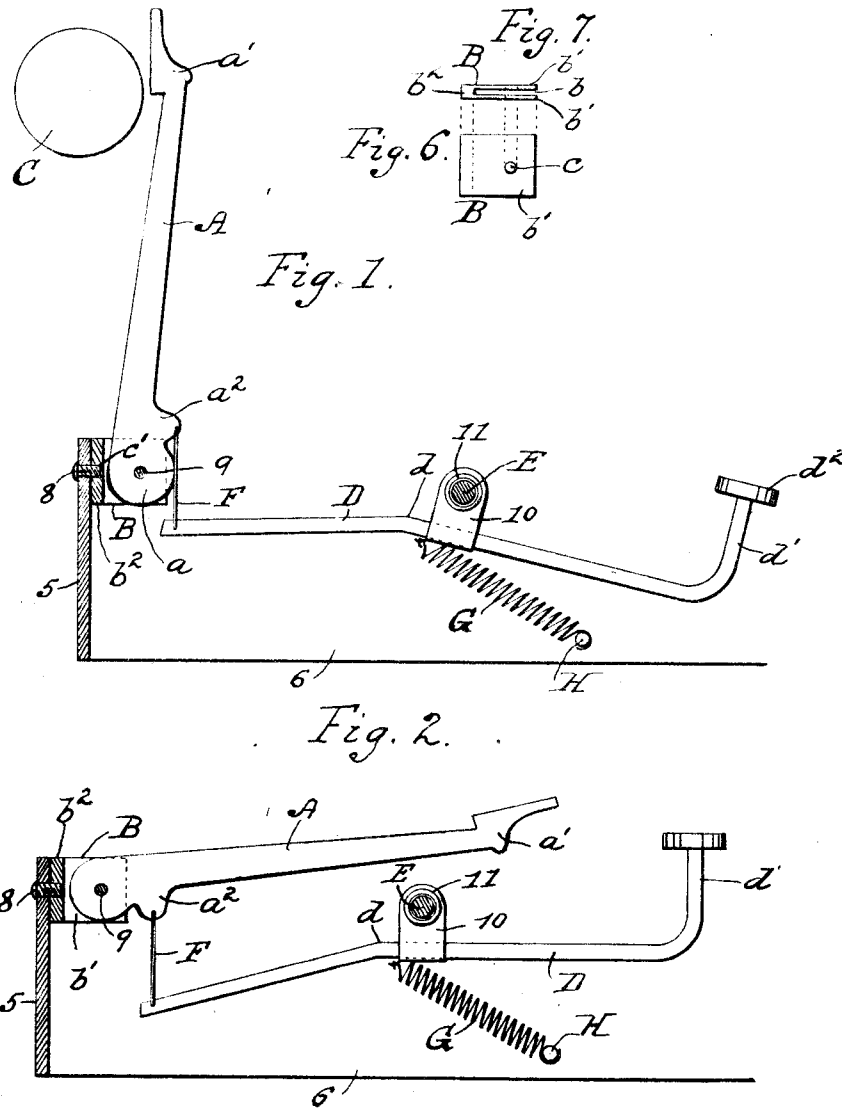
TYPE WRITER.

APPLICATION FILED JAN. 25, 1905.

1,065,842.

Patented June 24, 1913.

2 SHEETS—SHEET 1.



WITNESSES:

V. E. Nichols
R. A. Mooney.

INVENTOR

Frank S. Rose
BY
Griffin & Bernhardt
ATTORNEYS.

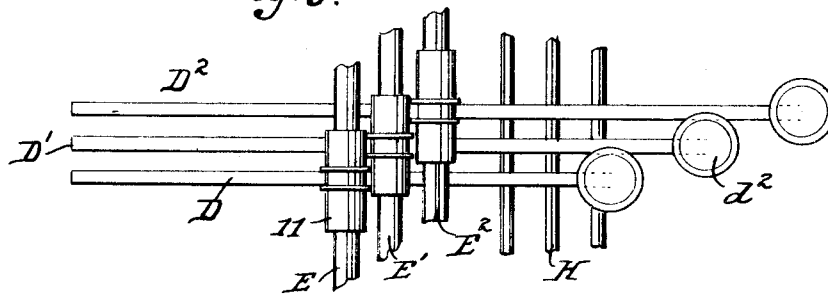
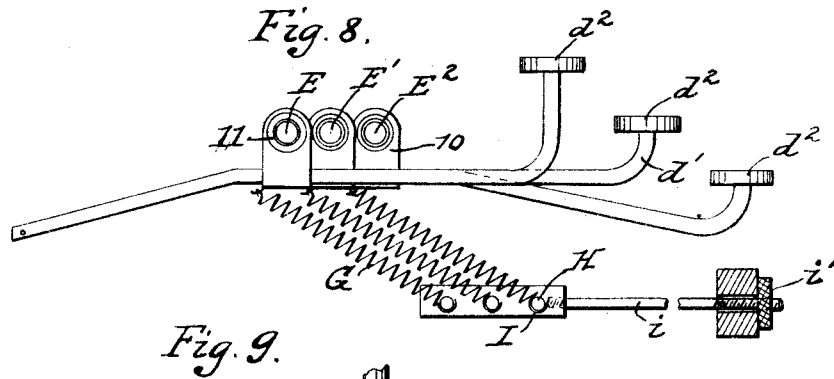
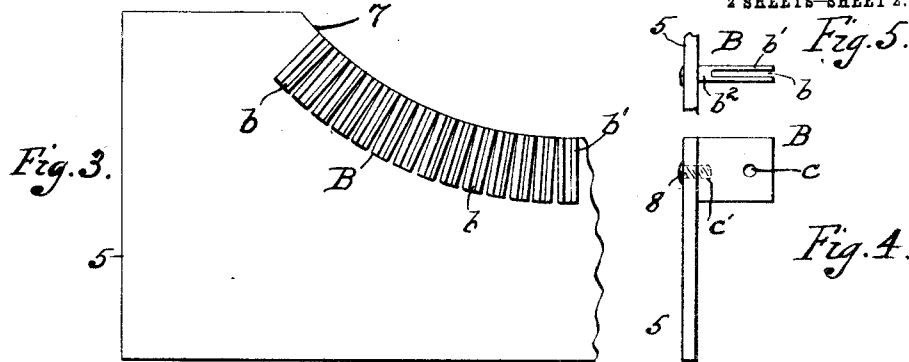
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UNITED STATES PATENT OFFICE.

FRANK S. ROSE, OF NEWARK, NEW JERSEY; GEORGE F. ROSE, ADMINISTRATOR OF SAID FRANK S. ROSE, DECEASED, ASSIGNOR TO STANDARD TYPEWRITER COMPANY, A CORPORATION OF NEW YCRK.

TYPE-WRITER.

1,065,842.

Specification of Letters Patent.

Patented June 24, 1913.

Original application filed February 11, 1903, Serial No. 142,828. Divided and this application filed January 25, 1905. Serial No. 242,629.

To all whom it may concern:

Be it known that I, FRANK S. ROSE, a citizen of the United States, residing in the city of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Type-Writers, of which the following is a specification.

The present invention relates more particularly to typewriters such as disclosed in my Patent No. 754,243, dated March 8, 1904.

One improvement consists in such an organization of parts comprising a type-bar, a key-lever, and an intermediate link that at all points in the arcuate or swinging movement of the key-lever or the type-bar, said intermediate link maintains a proper vertical position. The advantage of this is, on the depression of the key-lever, the link exerts an upward thrust on the type-bar at all points of its travel, there being no "dead center." According to this part of my invention each key-lever is so arranged with relation to the fulcrum of the type-bar, with which said key-lever is associated, that on the depression of the key-lever at one end, the other end is caused to continually approach toward the fulcrum of the type-bar. As the link remains normally in a vertical position, it follows that the type-bar is actuated on the upward thrust of the link in a constant manner, thus overcoming any possible tendency of the parts to reach a dead center. It follows, also, that as the link is pivoted directly to the type-bar and also to the key-lever, and as the length of the link remains constant, the movement of the type-bar is quicker or faster than the motion of the lever, the arc of movement of the lug a^2 being of a radius considerably shorter than the arc of the lever arm to which the link is pivoted, in consequence of which the type-bar has an accelerated movement as compared with the key-lever by which the type-bar is actuated.

Another part of the invention is a novel construction of the sector which forms a part of the machine frame, said sector consisting of individual brackets for the separate type-bars, and each bracket being secured removably to a part of the frame by a readily accessible fastening, the whole be-

ing so arranged that any type-bar can be detached by simply removing it with the bracket.

Another part of the invention consists in an arrangement of the key-levers in groups, a tension device for all the groups of key-levers, and means for regulating said devices so as to vary the tension exerted thereby on the key-levers of the groups.

I prefer to arrange the key-levers of one group to swing on a different center or centers from the other group or groups. Furthermore, it is preferred to have the levers arranged for the finger keys thereof to lie in two or more banks, and the axes of the key levers all lie in substantially the same horizontal plane.

Reference is to be had to the accompanying drawings, forming a part of this specification, wherein like characters of reference are used to indicate corresponding parts in all the figures.

Figure 1 is a view in side elevation with parts in section illustrating the type-bar in the act of striking a platen. Fig. 2 is a sectional side view of the parts in the positions they assume when the type-bar is lowered. Fig. 3 is a front elevation of the back part of the machine frame, illustrating the sector, in which the type-bars are pivotally supported. Fig. 4 is an edge view of the back part of the machine, illustrating the sector. Fig. 5 is a plan view of the parts shown by Fig. 4. Figs. 6 and 7 are views in side and edge elevation, illustrating one of the brackets of the sector. Fig. 8 is a side elevation, illustrating means for adjusting a tension device for the key-levers, and Fig. 9 is a detail plan view of a number of key-levers and the supports therefor.

The framework of the machine may be of any preferred construction. One member of this framework is a back plate or wall 5, which is joined to or made in one piece with the sides 6, of the frame. This back plate or wall 5 has a recess formed therein, the edge 7 of which recess is segmental. On the face of the back plate or wall 5 is a sector for the reception of the type-bars A. This sector consists of a plurality of brackets B, shown by Figs. 1 to 7 inclusive. Each bracket is made of a single piece of

metal with a longitudinal slit or kerf b , thereby producing a bracket having parallel side walls b' , and a closed or solid back wall b^2 . From this construction it is clear that each bracket consists of a thin flat plate having a vertical kerf which opens through the top, bottom and front edges of said plate, said kerf being quite narrow for the reception of an end portion of one type-bar. The side walls b' of the bracket are provided with coincident openings c , and the closed back wall b^2 of said bracket has a tapped opening c' . A desired number of brackets are assembled in the order shown by Fig. 3, for the top edges of said brackets to be flush with the segmental edge 7 of the back plate, the closed back wall b^2 of said bracket resting firmly against the back plate 5. The brackets are arranged in the form of a sector, and they lie in radial positions for the purpose of making the type-bars A strike at a common center. These brackets are fastened individually in place to the back plate or wall, a single screw 8 being used to attach each bracket to the back plate. By reference to Figs. 1 and 2 it will be noted that the screw passes loosely through an opening in the back wall and engages with the threads in the tapped opening c' of the bracket.

Each type-bar A is provided with a flattened heel a , the edge of which is curved as shown by Figs. 1 and 2. The heel of the type-bar fits snugly between the parallel side walls b' of the bracket, which walls form lateral supports for said type-bar, and through each bracket and the type-bar fitted therein passes a pivotal pin, stud or screw 9, the latter serving to pivotally connect the type-bar to its bracket and to furnish a horizontal axis for the swinging movement of the type-bar. Each type-bar is provided at its other end with a striking head a' , provided with the desired number of type faces, and this striking head operates against a suitable platen C, forming a part of the typewriter. As disclosed by my prior patent, the series of type-bars A, are adapted to rest upon a suitable cushion when said type-bars are lowered to their normal positions. In Fig. 2, one of the type-bars is shown in a substantially horizontal position, and below the plane of the platen C, thus exposing said platen and the work in the carriage therefor.

The key-levers D of my improved machine are all arranged in the same horizontal plane. Each key lever is bent at a point intermediate of its length as at d , and is provided at one end with an upstanding finger or arm d' , having the usual finger piece d^2 . In order to arrange the finger pieces d^2 of the whole series of key-levers in different banks so that the individual levers may be operated without hindrance or con-

fusion, I arrange the key-levers in groups, and pivotally support the key-levers of the different groups on horizontal axes which are disposed in different vertical planes, although the axes for said different groups of key-levers all lie in the same horizontal plane, substantially as shown by Figs. 8 and 9 of the drawings. In said figures, D, D', D², designate key-levers belonging to three different groups, said groups of key levers being parallel one to the other and having their finger pieces d^2 in different vertical planes, so as to arrange them in banks, as heretofore described.

Extending horizontally across the frame are arbors or rods E, E', E², said arbors being supported by the side portions of the machine frame in any suitable way. The arbors are arranged alongside of each other, in the same horizontal plane, and these arbors provide the pivotal supports for the different groups of key-levers D, D', D².

I prefer to suspend each key-lever from one of the plurality of arbors, and in the embodiment shown, each key-lever is provided near its angle or bend with an upstanding plate 10, which has a horizontal sleeve 11. The sleeve lies above the key-lever, transversely across the same, and said sleeve is fitted loosely on one of the arbors, so as to turn freely thereon when the key-lever is rocked or oscillated. The key-levers of the different groups extend toward the back plate 5, so as to terminate substantially below the sector which affords the pivotal support for the type-bars, and said inner ends of the key-levers are connected with the type-bars individually. This individual connection is secured by the employment of links F, which are so arranged relative to the key-levers and the type-bars as to maintain themselves in vertical positions at all times and at all points in the swinging movement of the levers and bars. The lower end of each link is pivoted to one key-lever at the inner extremity thereof, while the upper end of each link is pivoted to a type-bar at a point between the striking head and the pivoted end portion thereof. I prefer to provide each type-bar with an offset portion a^2 , located quite close to the pivot 9, and the upper end of one of the links is connected loosely to this offset portion a^2 .

It will be seen that on the depression of the key end of one lever, the latter turns on the pivot afforded by one of the arbors and the inner end portion of said key-lever swings in an upward and forward direction. This upward movement of the key-lever is communicated directly to the link, which as heretofore described, maintains a vertical position, and the upward movement of this link exerts a pushing action on the type-bar A, thus moving the latter freely and posi-

tively, so as to cause its head to strike the platen with the required force.

Special importance is attached to the organization or combination of parts, wherein the link between each key-lever and type-bar maintains a vertical position at all points in the swinging movement of the key-lever and the type-bar, whereby said link is adapted to exert a pushing action on the type-bar when the key-lever is depressed.

By reference to Figs. 1 and 2 of the drawings, it will be noted that the key-lever D is so related to a type-bar that the end of said lever to which the link F is pivoted is caused, on the depression of the other end of said lever, to approach in a continuous manner toward the fulcrum *g* of the type-bar, or in other words, the end of the key-lever moves nearer and nearer toward the pivot *g*, as will be seen by comparing Fig. 2 with Fig. 1. The link F is pivoted in a permanent or unchangeable manner directly to the type-bar and the key-lever, so that the length of the link remains constant. Furthermore, the link F is pivoted to the type-bar at such a point that on the upward movement of the type-bar and the key-lever the link will rise above the fulcrum *g* of the type-bar, see Fig. 2. In consequence of this novel relation of the key-lever, the type-bar and the link, the parts are not only precluded from reaching a "dead center" point which would make them even momentarily inactive but the upward travel of the type-bar with relation to the movement of the key-lever is accelerated in order to secure quick action of the mechanism.

Another part of my invention consists in the employment of a tension device which is adapted to vary the tension of all the springs employed for holding the key-levers in their normal positions. Each key-lever is under the control of a spring G, the same being preferably a coiled spring arranged below said lever and occupying an inclined position. The upper end of each spring is connected or hitched to one key-lever at a point close to the bend *d* thereof, while the lower end of said spring is connected to one of a plurality of rods H. The springs G are arranged in groups, the springs of one group being connected with the key-levers of one group, and the different groups of springs are arranged one in rear of the other, as indicated by Fig. 8. The rods H lie in the same horizontal plane at the lower part of the machine frame, and these rods are fastened to horizontal slides I, the latter being arranged at the sides of the frame and supported thereon in a suitable way for horizontal adjustment. The slides I carry or support the plurality of horizontal rods H, and these slides are adapted to be adjusted for the purpose of varying the strength of the springs G.

Each slide I may be adjusted by any suitable means, but as shown, I prefer to employ a threaded rod *z*, adapted to extend through the front rail of the machine and to receive an adjusting nut *z'*, the latter being arranged to bear against said front rail and to be exposed for convenient access by the operator. It is evident that the tension of the springs G tend to draw the slides I in one direction and to maintain the key-levers in such positions that the finger pieces thereof will be raised. The rods *z* and the thumb nuts *z'* counteract the pull of the springs and enable the slides to be adjusted, so as to increase or relax the tension of said springs.

Changes in the form, size, proportion, and minor details in construction may be made without departing from the spirit of the invention or sacrificing any of the advantages thereof, and I, therefore, reserve the right to make such alterations and modifications as fairly fall within the scope of my invention as defined by the annexed claims.

By reference to Figs. 1 and 8 of the drawings it will be noted that each spring, G, is connected to one key at a point in the rear of the vertical plane of the rod from which the key lever is underhung. This construction is advantageous for the reason that the upward movement of the rear part of the key lever due to the depression of the front part thereof causes a slight expansion, only, of the spring. This enables me to employ stronger springs, and such stronger springs wear or last longer than springs which would otherwise be employed.

In my machine, each key lever is bent at a point intermediate its ends so as to produce a rear arm which is at a slight angle to the front arm of said lever. This enables the fulcrum of the key levers to be positioned a considerable distance above the base line of the machine, and about in the horizontal plane of the pivotal connection of the type bars with the sector. Said relative location and organization of the parts provides ample space between the fulcrum of the key levers and the base line of the machine for the accommodation of the key lever springs and of certain other parts employed in the machine. In addition thereto, the inner inclined arms of the key levers are brought into such positions below the pivoted type bars that links, F, will remain, practically at all times, in vertical positions, when the type bars are lowered and particularly during the upward thrust of the links in the operation of actuating the type bars, such vertical positions of the links being very desirable in connection with certain shorter links at the respective ends of the sector, or in other words, at the respective sides of the machine. As is usual, the key levers are arranged in "banks" or groups, preferably three in number, see Fig. 8. 130

Said key levers of the different banks vary in length, but in my machine the keys comprised in each group are underhung from a common rod, to accomplish which I employ as many fulcrum rods, E , E' , E'' , as there are groups or banks. Said fulcrum rods are positioned in the same horizontal plane, see Fig. 8, and each key lever is underhung from one rod, and at a point intermediate its ends, the entire arrangement being such that the key levers of all the groups or banks may be depressed for equal and uniform distances to properly actuate the type bars, that is to say, the key lever of one group does not require to be depressed a greater distance than any other key lever of the same group or either of the other groups.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a front-strike typewriter, the combination with pivotal type-bars normally lying in a substantially horizontal position, of a plurality of transversely extending supports, key-levers underhung in groups from said supports and having their body portions also extending in substantially a horizontal plane under the type-bars, vertically arranged links connecting the inner ends of the key-levers directly to the type-bars at a point adjacent to the pivots of said type-bars, and separate springs for said key-levers, said springs being held at one end at a point below and in front of the fulcrum of said key-levers and each spring being connected at its other end to its corresponding key-lever at a point close to and in the rear of the fulcrum of said key-lever.

2. In a front strike typewriter, pivoted type bars, underhung key levers each bent at a point intermediate its ends and provided with a rear arm which lies at an obtuse angle to the remainder of the key lever, the rearward extremity of said inclined arm of each key lever being below the pivot of one type bar, a link connecting the extremity of said inclined arm with one type bar, and

a spring connected to each key lever at a point adjacent to the bent part thereof.

3. In a front-strike typewriter, the combination of pivotally held type-bars, a plurality of fulcrum rods positioned parallel to each other and all lying in the same horizontal plane, groups or banks of key-levers, the key-levers of each group being pivotally supported by one of said rods and underhung therefrom at a point intermediate the ends of said key-levers, each key-lever being arranged under the type-bars and substantially parallel thereto, separate links connected to the ends of the key-levers and to the type-bars at a point adjacent to the pivot of said bars, and separate springs each connected to one of said key-levers.

4. In a typewriter, a plurality of fulcrum bars, groups of key levers, the key levers of each group being underhung from one of said fulcrum bars, springs connected separately with the key levers, slidable tension means to which substantially all the springs are attached, and hand operated means for adjusting said tension means.

5. In a typewriter, key-levers, movable members, cross members carried by said movable members, and springs connected to said members and attached individually to the key levers.

6. In a typewriter, groups of key-levers, rods movable below said key-levers, groups of springs connected to said rods and said springs connected individually to the key-levers, and means for adjusting the rods.

7. In a typewriter, key-levers, slides below said levers, cross rods carried by the slides, springs connected to the key levers and the cross rods, threaded rods connected to the slides, and nuts for adjusting the rods.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK S. ROSE.

Witnesses:

H. F. BERNHARD,
V. E. NICHOLS.