C. F. LAGANKE.

TYPE WRITING MACHINE.

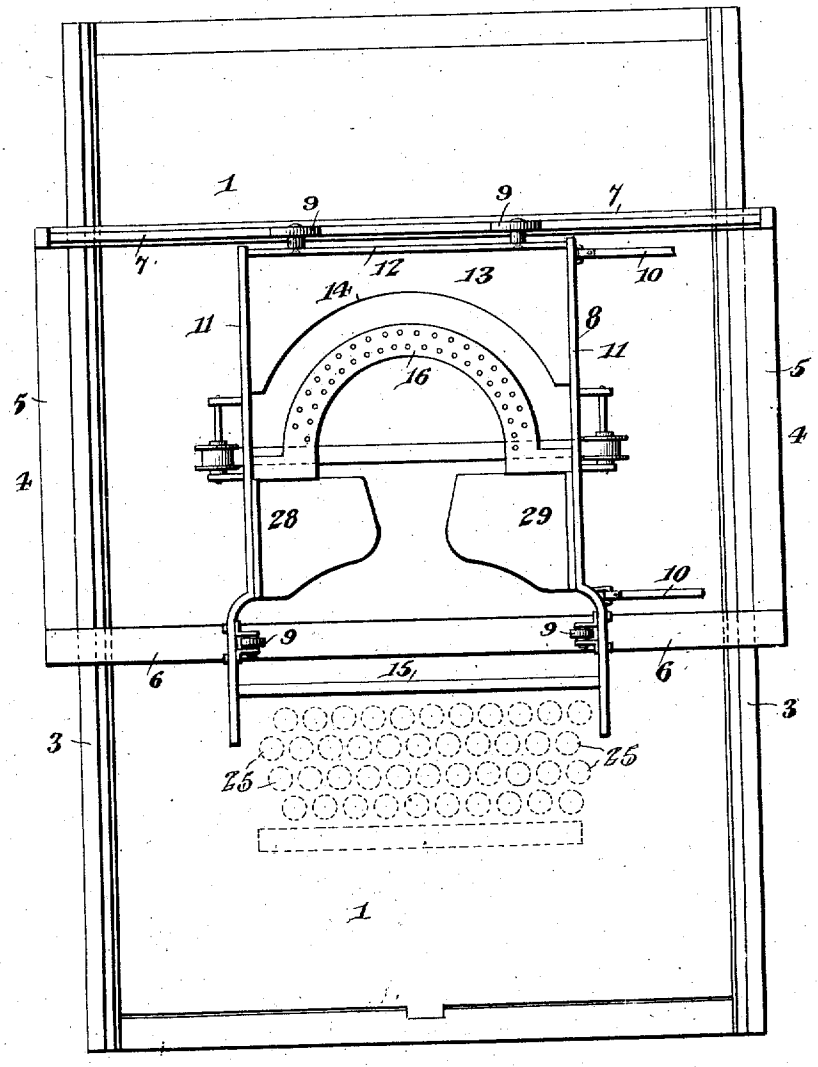
APPLICATION FILED APR. 3, 1907.

986,471.

Patented Mar. 14, 1911.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses
Jas. K. McCutchan
Louis G. Julihn

Charles F. Laganke, Inventor
By E. G. Siggers
Attorney

C. F. LAGANKE.

TYPE WRITING MACHINE.

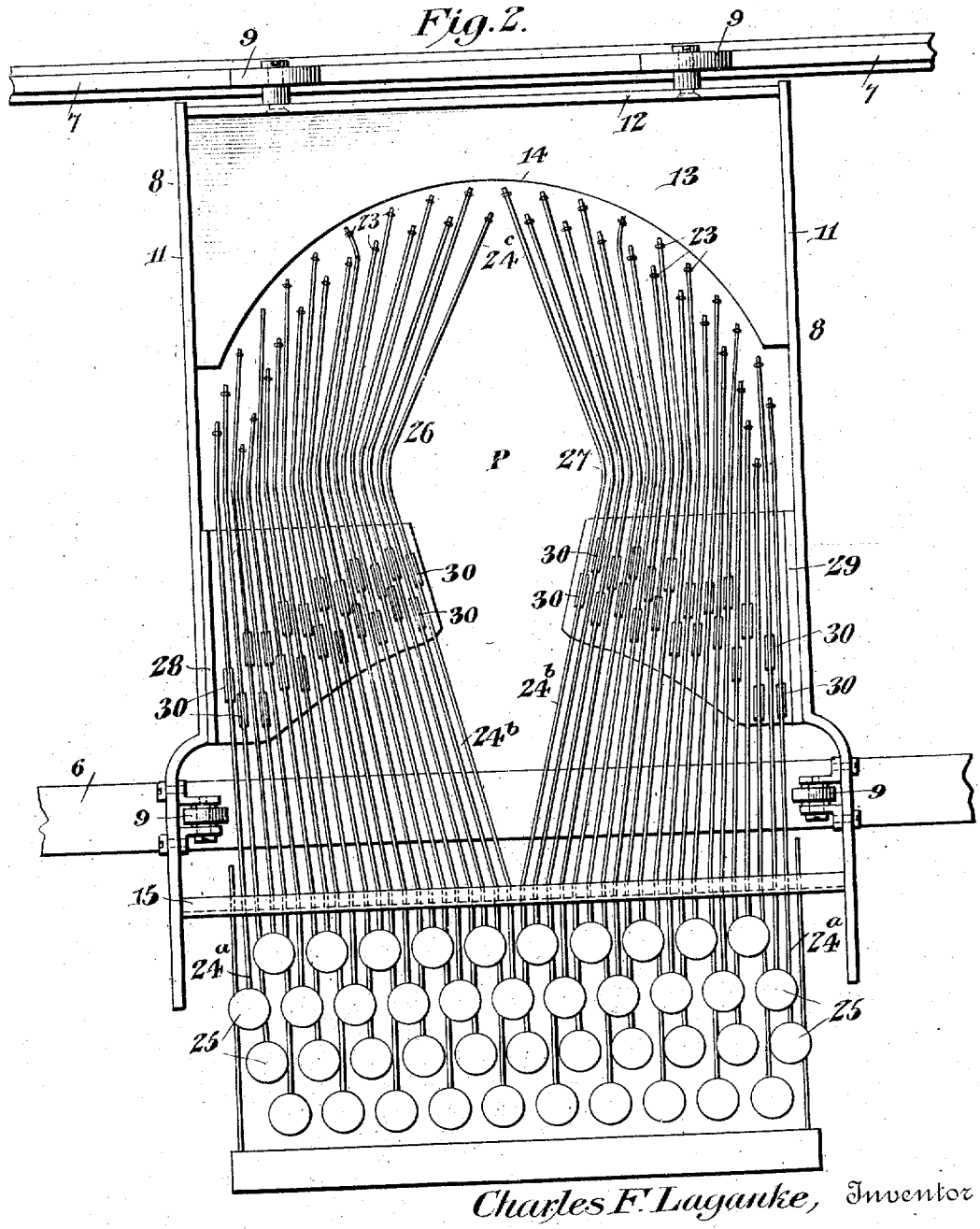
APPLICATION FILED APR. 3, 1907.

986,471.

Patented Mar. 14, 1911.

4 SHEETS—SHEET 2.

Fig. 2.



Charles F. Laganke, Inventor

Witnesses

Jas. K. McCathran

Louis L. Julihn

By F. G. Siggers

Attorney

C. F. LAGANKE.

TYPE WRITING MACHINE.

APPLICATION FILED APR. 3, 1907.

986,471.

Patented Mar. 14, 1911.

4 SHEETS—SHEET 3.

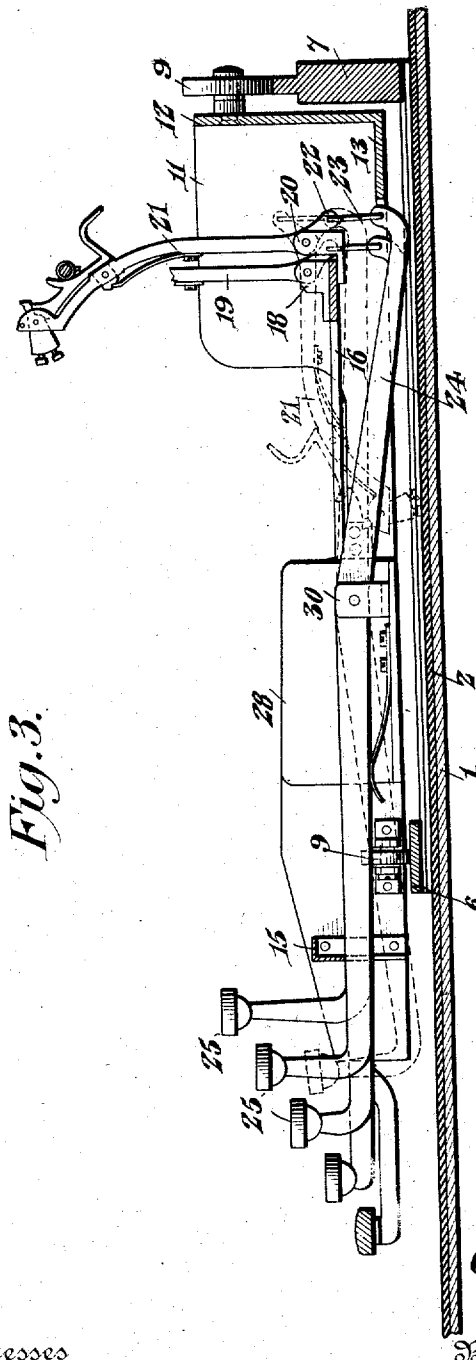


Fig. 3.

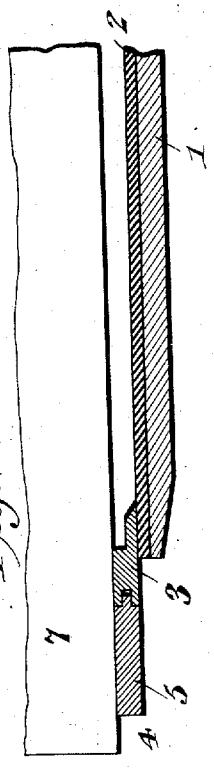


Fig. 4.

Witnesses

Jas. K. McCathran

Louis G. Julihn

Charles F. Laganke,
Inventor

By E. G. Siggers

Attorney

C. F. LAGANKE.

TYPE WRITING MACHINE.

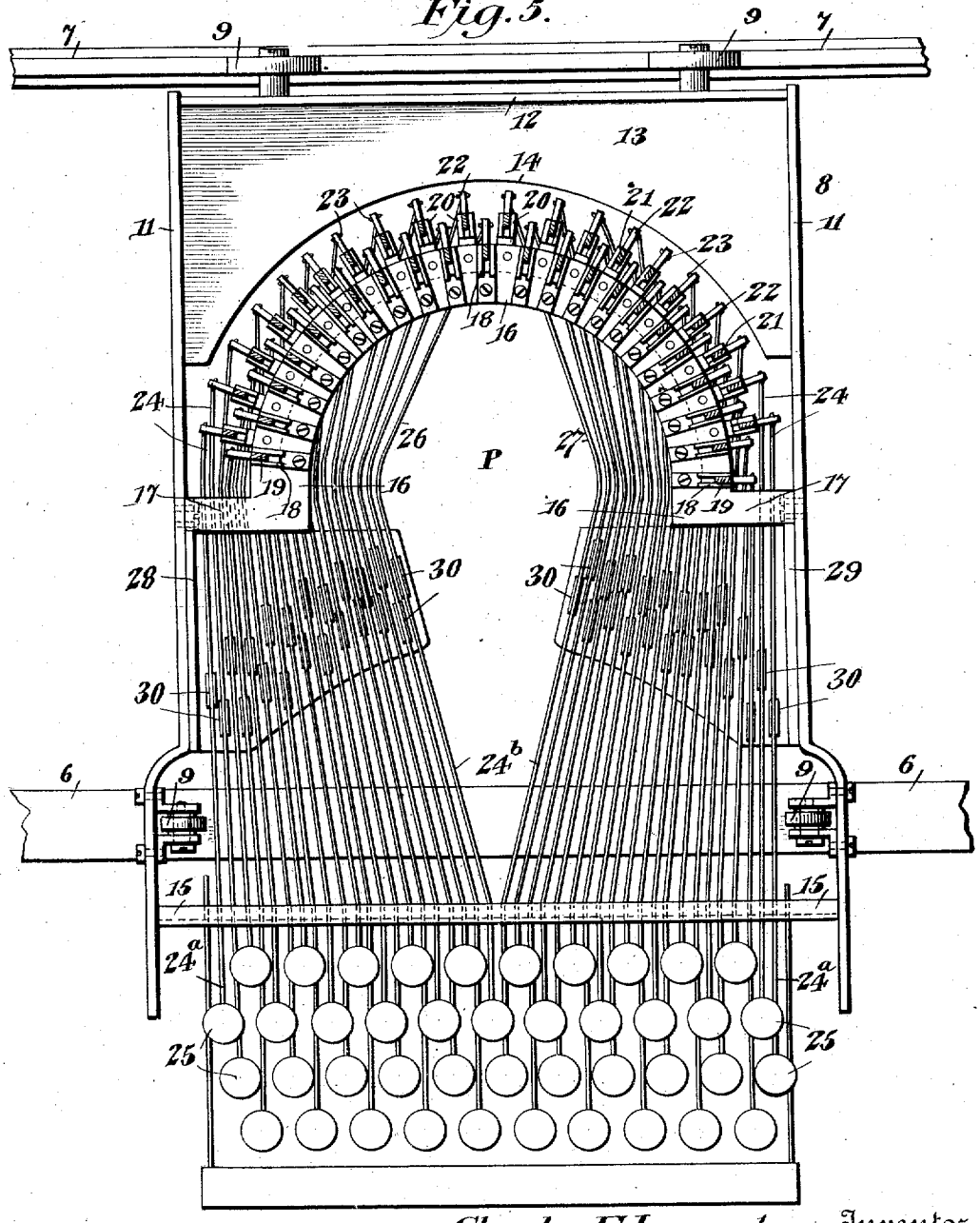
APPLICATION FILED APR. 3, 1907.

986,471.

Patented Mar. 14, 1911.

4 SHEETS—SHEET 4.

Fig. 5.



Charles F. Laganke, Inventor

By E. G. Siggers

Attorney

Witnesses

Jas. E. McCathran

Louis G. Julihn

UNITED STATES PATENT OFFICE.

CHARLES F. LAGANKE, OF HARRISBURG, PENNSYLVANIA, ASSIGNOR TO ELLIOTT-FISHER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

TYPE-WRITING MACHINE.

986,471. Specification of Letters Patent. Patented Mar. 14, 1911.

Application filed April 3, 1907. Serial No. 366,175.

To all whom it may concern:

Be it known that I, CHARLES F. LAGANKE, a citizen of the United States, residing at Harrisburg, in the county of Dauphin and State of Pennsylvania, have invented a new and useful Type-Writing Machine, of which the following is a specification.

This invention relates to typewriting machines of what is known as the flat platen or book type.

The primary objects of the invention are to secure the advantages of a low keyboard and complete visibility of the writing.

Machines of this class are characterized by type bars which swing downwardly to a flat surface, as for instance, a platen or book, from a point above the writing plane. Therefore, it has been deemed necessary to sacrifice either the low keyboard or visibility of the writing.

In some forms of machines the keyboard has been located in advance of the printing point of the machine and has thus obstructed the operator's view of the writing. In another form the keyboard has been placed above the type bars with a view to securing greater visibility, but this arrangement results in an undesirable elevation of the keyboard from the writing plane and also causes the work to be more or less overshadowed, so that neither the advantage of a low keyboard or of complete visibility is secured. In still another form an effort has been made to secure the advantages of a low keyboard by arranging the type bars in a rearwardly opening crescent so that the bars strike downwardly and rearwardly. This presents the printing point too far from the keyboard, and a series of upstanding type bars obstruct the view, which is only rendered slightly better if the type bars are separated into spaced groups, as the field of view thus secured is only of indifferent proportions at best.

In accordance with my present invention, the keyboard is placed as close to the writing plane as the movementof the type bar operating connections will permit. The type bars are arranged in a forwardly opening crescent above the rear ends of the key levers and strike downwardly and forwardly between two banks of key levers so mounted that while they establish an operative connection between a standard keyboard and a continuous segmental series of type bars, they leave a considerable unobstructed space or opening through which a considerable portion of the writing is visible. The arrangement thus results in the attainment of the objects stated, to-wit, the production of a low keyboard and the securing of visibility without necessitating a considerable interval between the keyboard and the printing point.

Other objects, subordinate to those stated, will appear as the succeeding description of the illustrated embodiment of the invention is developed.

In the accompanying drawings—Figure 1 is a plan view of the machine mounted on a flat platen, certain elements of the machine structure being omitted, and the keyboard being indicated in dotted lines. Fig. 2 is a plan view, on a somewhat enlarged scale, of the carriage and a portion of the machine frame, the arrangement of the key levers being clearly shown. Fig. 3 is a longitudinal sectional view through the machine and platen. Fig. 4 is a detail transverse section through a portion of the platen, one of the tracks and the adjacent portion of the machine frame, and Fig. 5 is a plan view of the carriage with the type bars in section.

Each part is indicated by the same reference character wherever shown.

1 indicates a flat platen provided with a rubber or other suitable writing surface 2. Along the opposite side edges of the platen extend, as usual, tracks or guides 3. The guides 3 serve to support and guide the machine frame 4, the side members 5 of which are interfitted with the guides 3, as shown in Fig. 4. The front and rear members or rails 6 and 7 of the machine frame serve to connect the side members 5 and constitute front and rear carriage guides for a traveling carriage 8. As usual in this type of machines, the machine frame 4 travels longitudinally of the platen 1 to line space the writing, and the carriage 8 travels transversely of the platen on the frame 4 to letter space the writing.

The manner in which the carriage 8 is mounted, propelled and controlled is immaterial, so far as the present invention is concerned. In the illustrated embodiment

of the invention, the carriage is mounted on rollers 9 which facilitate its movement along the guides 6 and 7, and in Fig. 1 is indicated a part of an ordinary type of carriage propelling mechanism, which includes tapes 10 connected to the carriage and wound upon spring drums, not shown.

In accordance with my invention, the carriage comprises side plates 11, a rear end plate 12, a bottom plate 13, located at the rear end of the carriage and having an arcuate front edge 14, and a transverse comb or key lever guide 15 which extends between the side plates 11 at a point in advance of the front carriage guide 6. These elements, related in the manner shown, serve to form a light, smoothly running rigid frame of skeleton form.

In advance of the front edge 14 of the bottom plate 13 and concentric therewith, but in a slightly higher plane than said plate, is disposed a segmental, preferably semi-circular, type-bar supporting-plate, or, as it is sometimes called, the type-bar fulcrum-plate 16, having laterally extended ends 17 securely bolted to the side plates 11 and adding additional strength to the frame structure of the carriage. To the upper side of the plate 16 is attached a series of equidistant fulcrum brackets 18 disposed radially with respect to the center from which the segmental or arcuate plate 16 is struck. In the brackets 18 are fulcrumed a series of type bars 19 equipped with one or more types which are presentable at a common printing point at the surface of the platen when the arms are swung down from their normal upright positions indicated in Fig. 3. Immediately in rear of the plate and secured to the under side thereof is another series of fulcrum brackets 20 likewise disposed radially with respect to the plate 16 and disposed in alternating arrangement with the brackets 18. In the brackets 20 are fulcrumed a second series of type bars 21 which, like the bars 19, are provided with one or more types presentable at the printing point by the downward swinging of the bars, it being understood of course that the entire complement of type bars are arranged to print at the same point.

Attention is particularly directed to the fact that the complement of type bars is arranged in a forwardly opening cresent-shaped, segmental, arcuate or semi-circular bank so that all of said bars print at a point in advance of the points at which the bars are fulcrumed.

The lower end 22 of each type bar extends downwardly and rearwardly from the fulcrum of the bar and is connected by a link or push rod 23 to the rear end of one of a complement of key levers 24 at the front ends of which are located the keys 25 having any suitable arrangement, but preferably that of the keyboard of an ordinary typewriting machine.

The key levers 24 are arranged in two side series or banks 26 and 27, spaced apart in a manner to produce an intermediate opening which, in the present embodiment of the invention, is approximately diamond-shaped, so that the maximum separation of the banks of levers occurs at the line of writing, the printing point being indicated in the drawings by the letter P. The levers of the respective banks 26 and 27 are fulcrumed at points in advance of the line of writing upon fulcrum plates or lever supporting plates 28 and 29 suitably secured to the side plates 11 of the carriage and extended inwardly to the inner edges of the banks of levers. In order to secure maximum visibility, these plates 28 and 29 are separate and distinct elements, spaced apart by a considerable interval, but it is obvious that if desired, a single plate extending entirely across the carriage may be utilized for the support of the levers, provided its configuration is such that it does not obstruct the operator's view of the line of writing, or that portion thereof which is exposed between the two banks of levers.

The manner of mounting the key levers on the plates is immaterial, but, as shown in the drawings, a convenient arrangement is to fulcrum the levers in brackets 30 grouped on the plates in staggered relation. The levers 24 are downwardly inclined in rear of the fulcrums thereof so that while the front ends of the levers are sufficiently elevated above the platen to accommodate the key stroke, the rear ends of said levers will be normally located closely adjacent to the platen in order to bring the fulcrums of the type bars as near the writing plane as may be consistent with the mounting of the bars above the levers.

As shown in Fig. 2, all of the levers of each bank are laterally deflected somewhat, but the degree of deflection varies with the several levers. The use of levers of this character is made necessary by the fact that the keys are all regularly spaced and that the type bars are also spaced in a definite order upon the fulcrum plate. It is apparent that since the levers connect the uniformly spaced keys and the uniformly spaced type bars, and since the two banks of levers are separated by a considerable interval at the reading line, the levers must be of more or less irregular form, as their front and rear ends must be regularly spaced apart, while a very wide interval must occur at the reading line between certain levers of the complement. A very convenient and compact arrangement is that shown

in the drawings. The front ends 24^a of all of the levers extend forwardly from the comb 15 and are parallel and substantially equidistant. The intermediate portions 24^b extending between the comb and the reading line are divided into groups or banks which diverge, but the units of each bank converge rearwardly. The rear ends 24^c of the levers of each bank extending from the reading line to the type bar connections are rearwardly divergent, but the rear ends of the two banks converge rearwardly from the writing line. It will thus be seen that the two banks of levers converge in opposite directions from the reading line and that the width of the entire complement of levers at the reading line is little if any greater than the width of the keyboard, notwithstanding the fact that a considerable portion of the line of writing, at and upon opposite sides of the printing point, is exposed to the view of the operator.

The manner in which line spacing and letter spacing is secured is immaterial, so far as the present invention is concerned. The machine frame and carriage may be advanced manually step-by-step longitudinally and transversely, respectively, of the platen. It is contemplated, however, to provide some usual form of line spacing mechanism for advancing the frame longitudinally of the platen and to control the letter space advance of the carriage by a suitable form of escapement mechanism operated from the typewriter keys.

From what has been said, it will be obvious that the type bars 19 and 21 are fulcrumed above the rear ends of the type levers and move forwardly and downwardly to the platen at a point between the two banks of levers, attention being directed to the fact that interference of the type bars with the levers in the descent of the former is avoided where necessary by curving or bowing the type bars, as shown in Fig. 3.

It is thought that from the foregoing, the construction and operation of my typewriter will be clearly comprehended, but while the present embodiment of the invention appears at this time to be preferable, I wish to be understood as reserving the right to effect such changes, modifications and variations of the illustrated structure as may come fairly within the scope of the protection prayed.

What I claim is:—

1. In a typewriter, the combination with keys, of key-operated type bars mounted in rear of the keys, on a forwardly opening arc concentric with a common printing point located intermediate of the type bars and keys, operating connections extended between the keys and type bars and arranged in banks laterally spaced at the printing point to render the latter visible to the operator, and a platen below said connections.

2. In a typewriter, the combination with a type bar support, of type bars arranged in a forwardly opening arcuate series on the support and having a common printing point, keys located in advance of the printing point, operating connections extending rearwardly from the keys to the type bars and arranged in groups or banks spaced apart to permit the operator to view the writing at and adjacent to the printing point, and a platen having its writing surface located in a lower plane than said operating connections.

3. In a typewriter, the combination with a forwardly opening crescent-shaped series of type bars having a common printing point, of keys located in front of the type bars, operating connections including key levers arranged in groups or banks deflected laterally in opposite directions to permit the operator to view the work at and adjacent to the printing point, and a platen below said connections.

4. In a typewriter, the combination with a forwardly opening crescent-shaped series of type bars, of keys located in front of the bars, operating connections, including key levers, located at opposite sides of the printing point and converging in opposite directions from the line of writing, and a platen below said connections.

5. In a typewriter, the combination with a forwardly opening crescent-shaped series of downwardly acting type bars having a common printing point, of keys, and operating connections including key levers arranged in banks converging in opposite directions from the writing line, the levers of a given bank diverging in opposite directions from the writing line.

6. In a typewriter, the combination with a flat platen, of keys, type bars, and intermediate horizontally disposed operating connections all mounted above the platen, and types mounted on the type bars and movable downwardly between certain of the operating connections to the platen.

7. In a typewriting machine, the combination with a flat platen, of a forwardly opening crescent-shaped series of type bars, keys, and intermediate operating connections all mounted above the platen, said operating connections being arranged in groups or banks spaced apart to expose the printing point of the platen, and types mounted on the type bars and movable downwardly and forwardly between the banks of connections to the platen.

8. In a typewriter, the combination with a flat platen, of a forwardly opening crescent-shaped series of type bars, a keyboard including a key for each bar, and operating

connections between the keys and the type bars, the bars, keys, and connections all being mounted above the platen, said operating connections including key levers arranged in laterally spaced banks, and types mounted on the type bars and movable between the banks of levers to ...e platen when the bars are swung forwardly and downwardly by the depression of the keys.

9. The combination with a stationary flat platen, of a traveling printing mechanism including series of normally upstanding type bars mounted above the platen and arranged to swing forwardly and downwardly to the platen, keys arranged to operate the type bars and located in front of the type bars and in a lower plane than the upper ends of the bars when the latter are in normal upstanding position and operating connections extending between the keys and type bars and laterally spaced at the printing point to accommodate the type arms.

10. In a typewriter, the combination with a flat platen, of a type bar support mounted in a plane above the platen, a forwardly opening crescent-shaped series of type bars fulcrumed on the support, a series of keys located in front of the type bars, and operating connections connecting the keys and type bars and extended between the type bar support and platen.

11. In a typewriter, the combination with a flat platen, of a type bar support mounted above the same, a forwardly opening crescent-shaped series of downwardly acting type bars fulcrumed on the support, keys mounted in advance of the support, and key levers extended between the type bar support and platen from the keys and operatively connected to the type bars.

12. In a typewriter, the combination with a flat platen, of a type bar support mounted thereover, type bars fulcrumed on the support, keys located in advance of the type bar support, key levers extended between the type bar support and platen from the keys, and means located in rear of the type bar support and operatively connecting the type bars to the key levers.

13. In a typewriter, the combination with a type bar support and a series of type bars mounted thereon, of a key lever support located in advance of and in a plane below the type bar support, key levers fulcrumed on the key lever support, means for connecting the key levers with the type bars in rear of the type bar support, keys arranged to operate the key levers, and a stationary flat platen located below said connecting means.

14. In a typewriter, the combination with a carriage comprising an open frame, of an arcuate type bar supporting plate extending across the frame and opening toward the front side thereof, a series of type bars fulcrumed on said plate and arranged to swing forwardly below the plane of the plate, a pair of laterally spaced fulcrum plates extended inwardly from the opposite sides of the frame, banks of key levers fulcrumed on the fulcrum plates and operatively connected to the type bars, and keys located in advance of the fulcrums of the key levers and arranged to operate the latter.

15. In a typewriter, the combination with a forwardly opening, arcuate, type-bar supporting-plate, of forwardly swinging type bars fulcrumed on said plate in staggered arrangement, two laterally spaced banks of key levers, the levers of each bank being fulcrumed in staggered arrangement in advance of the type bar supporting plate, keys for the key levers, and a platen below said levers.

16. In a typewriting machine, the combination with a series of type bars mounted in a uniformly spaced forwardly opening arcuate series and having a common printing point, of a keyboard including uniformly spaced keys, and operating connections extending between the type bars and keys, the front and rear ends of said connections being spaced to conform to the uniformly spaced type bars and keys and said connections being divided into widely separated banks at the printing point.

17. The combination with a stationary flat platen, of a printing mechanism mounted to travel in two directions thereover, said printing mechanism including a forwardly opening crescent-shaped series of normally upstanding, downwardly acting type bars, a keyboard located in advance of the type bars, and operating connections extending from the keys to the type bars and arranged in separated banks at the writing line.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CHARLES F. LAGANKE.

Witnesses:
JOHN A. SMITH,
HERBERT D. BALTON.