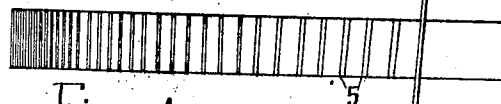
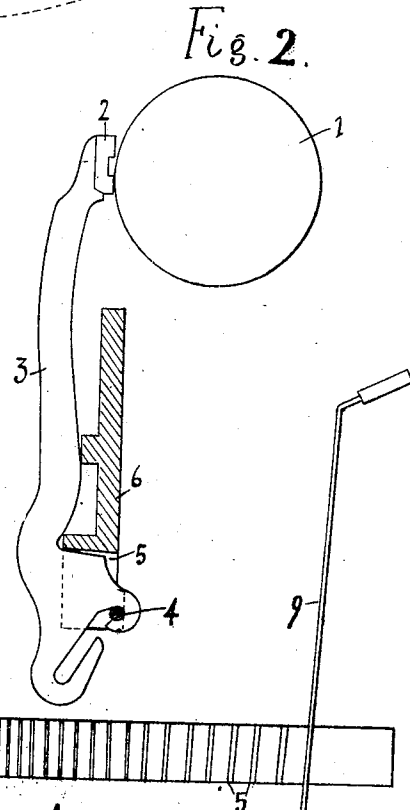
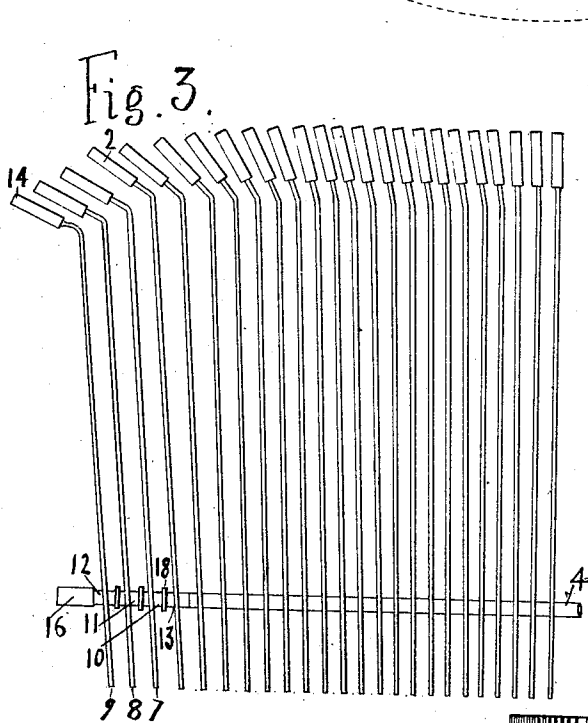
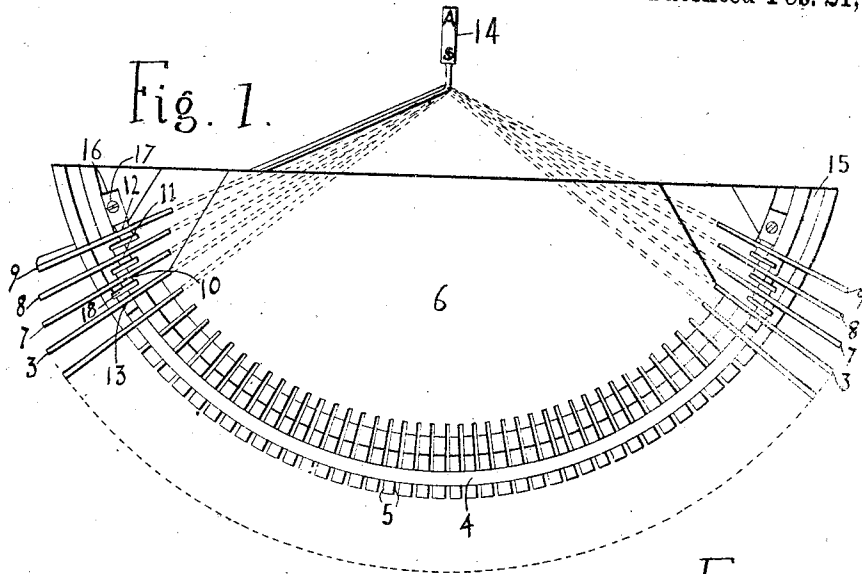


F. X. WAGNER.
TYPE WRITING MACHINE.
APPLICATION FILED DEC. 4, 1905.

984,621.

Patented Feb. 21, 1911.



Witnesses
H. Frankfort.
J. Braden.

Inventor
Franz X. Wagner
By his Attorney O. Stickney

UNITED STATES PATENT OFFICE.

FRANZ X. WAGNER, OF NEW YORK, N. Y., ASSIGNOR TO UNDERWOOD TYPEWRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FRANZ X. WAGNER, a citizen of the United States, residing in Bronx borough, New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to the type-bars and type-bar pivots of those machines in which all the type-bars are mounted, usually in a segment, upon one side of the printing point. In such machines, it is usual to mount and form the type bars so that the types (of which two or more are provided upon each bar) are offset from the bars to progressively greater degrees from the middle to the sides of the system, and the larger the segment, measured in degrees, the greater the angles at which the types lie to their bars at the sides of the system. This angularity of the types is objectionable, and hence it is a practice to make the segment as small or short (measured in degrees) as possible, and hence it becomes necessary to crowd the types closely together as they lie at rest, and this results in undue liability of clashing of the types in rapid operation.

One of the principal objects of my invention is to secure greater separation of the type ends of the bars without increasing the length of the segment measured in degrees. To this end, I provide pivotal supports or guides for the type bars having slightly skewed relation to one another, such that separation of the type ends of the bars is thereby produced. I illustrate my invention in connection with the well known front strike "Underwood" writing machine, in which the type bars lie normally at about an angle of 90 degrees to their printing positions. Heretofore, in this and similar machines, the space occupied by the type ends of the bars has been equal to the space occupied by the pivot ends, the bars extending forwardly substantially in parallelism. In said former machines, the planes in which the several type bars swing intersected at a common point, but according to my invention such planes not only intersect, but are also skewed or eanted relatively to one another. These planes of vibration are so skewed as to have the greatest separation at about the position of the type ends of the bars when, at rest, that is, when lying at

about an angle of 90 degrees to their printing positions. By this means, a slight extra separation of the types is produced, which is sufficient to enable them to clear one another satisfactorily in rapid operation, while the length of the segment is not thereby increased, and hence the angularity of the types to their bars is not increased. In such machines, it is necessary to make the type-bars so short that their weight will not be an objection in operation, and it has been found very difficult in practice to assemble upon one side of the printing point and out of the way of the platen and its appurtenances, as large a number of type-bars as is desirable. Accordingly typewriting machines are almost universally manufactured with about forty type-bars to include the alphabet, figures and punctuation marks; although in many machines less than forty are employed. It is usual to provide each type-bar with two types for upper and lower case letters, and also for additional punctuation and accent marks.

In order to equip a machine for writing the Russian language, it is necessary to provide several more characters than can be placed upon either forty or forty-two type bars. In machines as usually manufactured, the long or double types at the extremes of the system lie almost end to end, so that it becomes impracticable within the limited space to add several more type bars at the ends of the system, if the same plan or disposition of the type bars is to be followed for the additional or auxiliary bars as for those in the main system. It is highly desirable, however, from an economical standpoint to employ for writing the Russian and other languages, machines such as are regularly manufactured, and with as little change therein as possible. This difficulty has been overcome by me by adding auxiliary bars to the ends of the usual system of forty-two bars in such a manner that but very little additional space is occupied by the auxiliary bars and types, and both the main and the auxiliary bars. I mount to swing in skewed planes so that it is rendered practicable to add to machines that are regularly manufactured with type bars swinging in skewed planes, enough types to adapt them to the Russian and other languages. I contrive to bring not only the main type bars, but also the auxiliary bars,

in such close arrangement, at their pivot ends that a relatively short segment, measured in degrees, may be employed; so that the types do not stand at prohibitive angles to their bars even upon the extreme auxiliary bars.

In the accompanying drawings, Figure 1 is a rear elevation of the type bar segment of the well known "Underwood" front strike writing machine showing my improvements applied thereto in one form. Fig. 2 is a sectional elevation showing a type-bar in printing position. Fig. 3 shows the type bars that are mounted upon the right hand half of the segment including the auxiliary bars. In this figure, the bars are shown in the positions they would occupy if their fulcrum rod were straightened and made horizontal, that is, if their pivots were changed from the arrangement seen at Fig. 1, and placed in one straight horizontal line. In this figure, the types show substantially the same relation each to the next as they bear in the usual curved or segmental type-basket; but the bars instead of being parallel in accordance with the usual arrangement, are divergent from their pivot ends to their type ends, so as to give extra clearance to the types while occupying no more room in the segment. Fig. 4 shows an end view of the segment with the extreme auxiliary type bar in normal position therein, said type bar being oblique with reference to the segment, and the type-bar guiding slots being shown as skewed or obliquely placed relatively to one another.

1 designates the platen of said typewriting machine upon the front side of which strike multiple types 2 carried upon radiating type bars 3, which are mounted upon a fulcrum rod 4, which is usually in the form of a segment of a circle. The type bars work in radiating slots 5 formed upon the lower border of a vertical segment 6. The main system is illustrated as comprising forty-two type bars; although some styles of "Underwood" and other machines carry a smaller number. The first auxiliary type bar at each end of the system is designated as 7, the next as 8 and the third as 9; and they are all pivoted in the same vertical plane as the type bars in the main system. The type bar 7, however, is shorter than the main type bars, and is mounted upon a pivot 10 which is correspondingly nearer the printing point than the pivots for the main type bars. The type-bar 8 is shorter than the type-bar 7, and is mounted upon a pivot 11, which is nearer than 10 to the printing point. The type-bar 9 is shorter than 8 and mounted upon a pivot 12, which is nearer than 11 to the printing point. These pivots 10, 11 and 12 may be formed integral, as illustrated and secured by solder or otherwise to the segment 6; and if desired this

zig-zag pivot member may at one end be provided with a pivot 13 for the extreme main type-bar 3; such portion 13 adjoining the main fulcrum wire 4, as seen at Fig. 1. The pivots of the auxiliary bars may, however, be otherwise formed and supported in connection with either the main system shown, or other main systems. It will be seen from Figs. 1 and 3, that the auxiliary type-bars are close together as compared with some of the extreme type-bars in the main system; but that their types have ample clearances from one another and from the extreme type 2 in the main system. Beginning with the middle of the system, the multiple types are set at increasing angles with their bars until the final auxiliary type, designated as 14, is nearly at right angles with its bar; but it will be seen that the auxiliary types, instead of lying substantially end to end are placed substantially one behind another, according to the progressively diminishing lengths of their bars. It will be understood that the type-bars at the left hand of the system correspond in position and otherwise with those illustrated at Fig. 3.

The curved fulcrum rod 4 occupies a slot 15 in the segment, and the first pivot 13 of the auxiliary cranked pivot-member fits in said slot; said auxiliary pivot member having a plate 16 through which passes a screw 17 to secure the pivot member to the segment 6. Said pivot member comprises the pivots 10, 11, 12 and 13, with intervening arms 18, the device being preferably cut from solid stock. At Fig. 4 it will be seen that the type-bar guiding slots 5, instead of being at right angles to the contour lines of the segment, as heretofore, are skewed or oblique relatively thereto, and also that said slots are skewed relatively to one another instead of being in parallelism. It will further be seen that by means of these skewed slots, the type bars are caused to separate or diverge at their type ends as seen clearly at Fig. 3. The skewing of the planes of vibration of the type bars is such that the greatest divergence of the types is secured when the type bars lie at an angle of about 90 degrees to their printing positions, that is, at about right angles from the position seen at Fig. 2, so that the greatest benefit from the skewing is obtainable by having the type bars lie horizontally when at rest. The greatest obliquity of the slots seen at Fig. 4 is but a few degrees, yet this deviation from parallelism, when divided up among half of the type bars in the machine, effects sufficient clearance from the types one from another, and affords a material advantage over having the type bars in parallelism when at rest. It will thus be seen that the separation of the types is gained without lengthening the type bars or increasing the

travel of the types from printing to normal positions or increasing the separation of the type bars in the segment; and further that the improvement can readily be applied in the manufacture of machines of the style now in vogue. Owing partly to the adoption of the progressively shorter auxiliary type bars at the ends of the system, and partly to the skewing of the type bars, it is possible to compress the large number of bars required for the Russian language and other purposes within very nearly the same length of segment, measured in degrees, as has heretofore been required for only forty-two type-bars. It will be seen at Fig. 3 that the middle type bars are very nearly or quite parallel, there being little or no skewing at this portion of the system; while the remaining type bars lie normally at progressively increasing angles to the middle type bar or bars.

Variations may be resorted to within the scope of the invention, which is not limited to type bars which are provided with guiding slots, since they may be otherwise guided in planes skewed to one another for the purpose of the invention; and portions of my improvements may be used without others, as for instance the auxiliary type bars may be omitted.

Having thus described my invention, I claim:

1. In a typewriting machine, a system of radiating swinging type bars arranged in a curve upon one side of the printing center, a common curved fulcrum wire upon which the type bars are hung, and means guiding said type bars so that they swing in planes which intersect at a common center but which are skewed or canted relatively to said wire to gradually increasing degrees

from the middle to the ends of the system in such a manner as to separate the types as they lie at rest; the extent to which the type-bars are skewed being so slight that the outermost bar lies approximately at a right angle to the wire.

2. In a typewriting machine, the combination with a system of type bars, of a segment having radiating slots in which said type bars are guided, and a common curved fulcrum wire for said type bars, said slots skewed relatively to one another and to said wire, so as to separate the type ends of the bars as they lie at rest, the skewing being least at or near the middle of the system and gradually increasing from the middle to the sides of the system, and the extent to which the type bars are skewed being so slight that the outermost bar lies approximately at a right angle to the wire.

3. In a typewriting machine, the combination with a system of type bars, of a segment having radiating slots in which said type bars are guided, and a pivot-wire for said type bars, said slots skewed relatively to one another and to said wire, so as to separate the type ends of the bars as they lie at rest, the skewing being least at or near the middle of the system and gradually increasing from the middle to the sides of the system, and the extent to which the type bars are skewed being so slight that the outermost bar lies approximately at a right angle to the wire; and auxiliary type-bars mounted at the ends of said segment, and shorter than the bars in said series and pivoted nearer the printing center.

FRANZ X. WAGNER.

Witnesses:

F. W. WAGNER,
GEORGE WOHN.