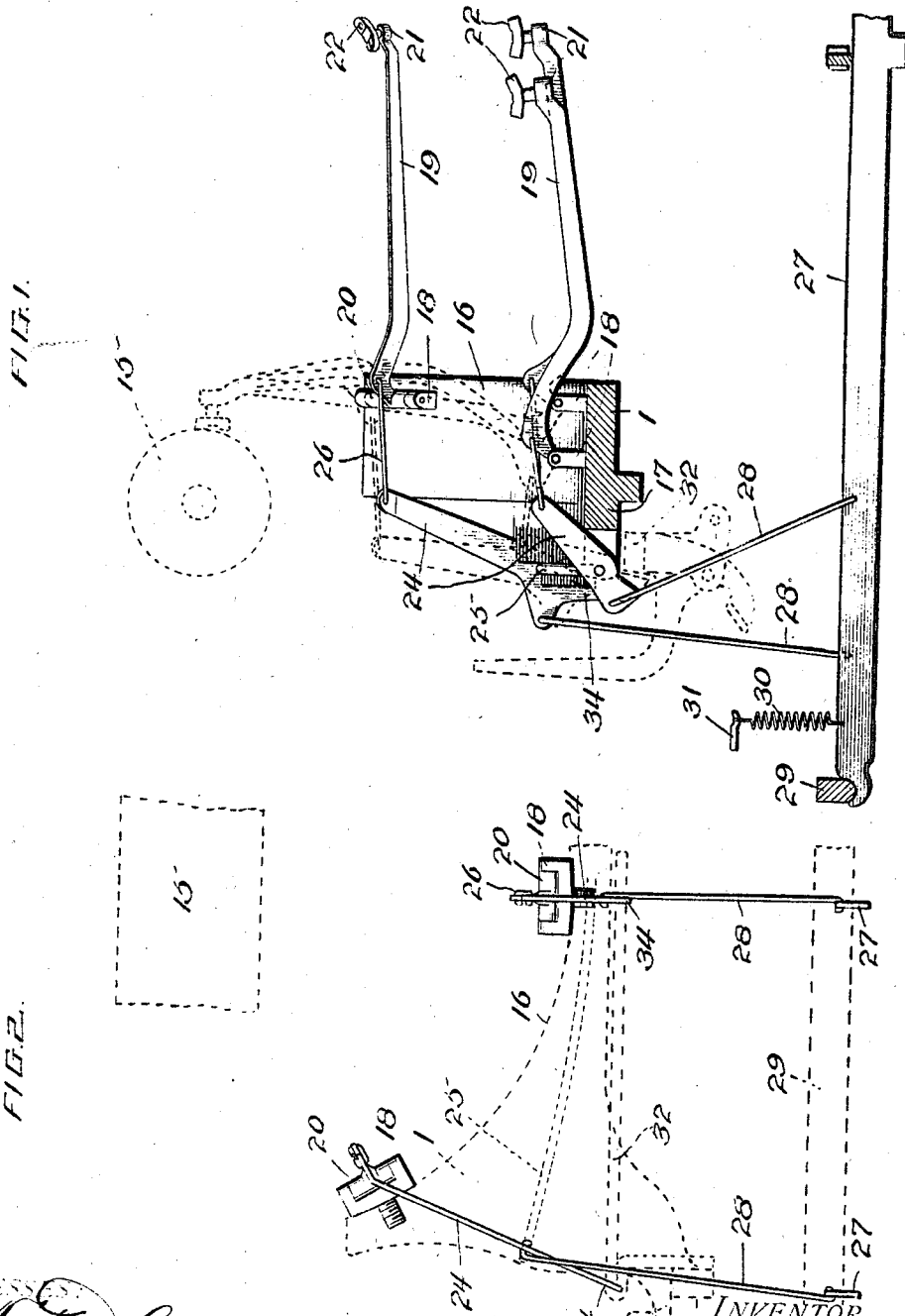


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TYPE BAR MECHANISM.
APPLICATION FILED JULY 29, 1910.

Patented Mar. 28, 1911.

2 SHEETS—SHEET 1.



WITNESSES:
H. F. Kayfe
Alfred T. Lange

BY

E. J. Stocking
Attorney

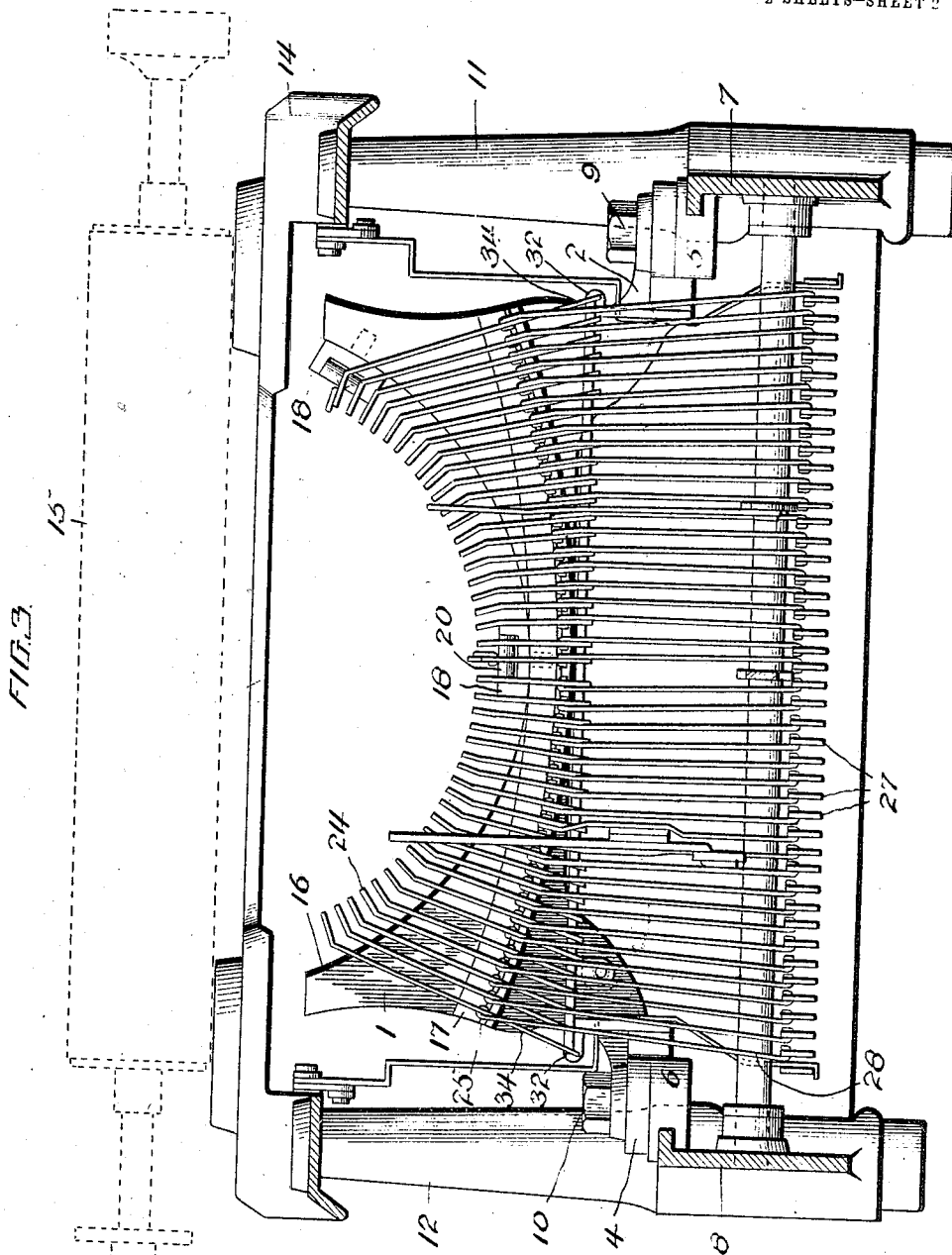
INVENTOR
Charles Spiro

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2 SHEETS—SHEET 2



WITNESSES:
W. F. Kyle
Alfred I. Gage

INVENTOR
Charles Spiro.
By *E. B. Stocking*
Attorney

UNITED STATES PATENT OFFICE.

CHARLES SPIRO, OF NEW YORK, N. Y.

TYPE-BAR MECHANISM.

987,762.

Specification of Letters Patent.

Patented Mar. 28, 1911.

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To all whom it may concern:

Be it known that I, CHARLES SPIRO, a citizen of the United States, residing at New York, county of New York, State of New York, have invented certain new and useful Improvements in Type-Bar Mechanism, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention relates broadly to the art of typewriting machines and specifically to type bar actuating mechanism particularly adapted for front strike machines.

The principal object of this invention is 15 to construct a type bar mechanism for a typewriting machine in such manner that the type bar hangers, the actuating sub-levers and the universal bar may all be mounted in a unitary structure or segment that is adapted to be introduced into and removed 20 from the machine frame as a unit structure.

Another object of this invention is to construct an actuating mechanism for the type bars in such manner as to permit the type 25 bar hangers to be arranged upon a segment of a small arc, thus permitting the use of short light type bars and at the same time arranging the segment in such manner as to permit the use of long pivots in the type 30 bar hangers.

Another object of this invention is to construct an actuating mechanism for front strike type bars which are arranged upon a segment of a small arc in such manner as to 35 form a uniform touch over the various keys in the key board.

Another object of this invention is to arrange the type bars of a front strike typewriting machine upon a segment of a small 40 arc, and to mount the actuating sub-lever for the type bars upon the segment of a greater arc in such manner as to evenly distribute torsional strains throughout the various pivotal connections of the actuating mechanism 45 for each particular type bar.

Another object of this invention is to construct an actuating mechanism for type bars particularly adapted for front strike typewriting machines, in such manner as to use 50 actuating sub-levers of graduated lengths so

constructed that each sub-lever turns through an equal angular movement during the actuation of each type bar throughout the type bar system.

A further object of this invention is to 55 construct an actuating mechanism for type bars particularly adapted for front strike typewriting machines, in such manner that the actuating sub-levers of the mechanism are graduated and arranged in such manner 60 as to pick up the universal bar when the type bars have moved through a definite pre-determined distance in moving from the position of rest on the type bar rest to the printing point. 65

A still further object of this invention is to construct an actuating mechanism for type bars for use in a front strike typewriting machine, in such manner that the type 70 bar hangers are arranged upon a segment of a small arc, the actuating sub-levers being arranged upon a segment of a larger arc and are adapted to operate a pivoted universal bar having a contact face in substantially a straight line beneath a segment of the actuating levers. 75

Still other and further objects of this invention will in part be obvious and will in part be pointed out in the specification which follows hereinafter, by reference to 80 the accompanying drawings in which like characters are used to represent like parts throughout the several figures, and the scope of the invention will be indicated by the appended claims. 85

Figure 1 is a view showing a portion of the type bar actuating mechanism in longitudinal sectional elevation. Fig. 2 is a view showing a portion of the type bar actuating mechanism in transverse elevation. Fig. 3 90 is a transverse sectional elevation showing the relationship of the segments and actuating links.

Referring particularly to Fig. 3 of the drawings, a segmental frame 1, is provided 95 with wing portions 2 and 4, that are adapted to be seated upon abutinent members 5 and 6, that are formed integral with sides 7 and 8 of the machine frame, and are adapted to be firmly held in fixed position in the ma- 100

chine frame by means of stud bolts 9 and 10, which pass through openings in the wing portions 2 and 4, and bolt into the abutment members 5 and 6, thus fixedly and positively positioning the segmental member 1 in definite relation to the other elements of the typewriting machine which are carried by the machine frame. The machine frame is also provided with supporting posts 11 and 12, which are adapted to carry a top plate 14, upon which is mounted for reciprocation the usual platen and carriage mechanism 15. However, as these parts do not form a specific part of the combination of the present invention, they have only been illustrated diagrammatically, and further description is thought to be unnecessary.

Referring particularly to the segmental frame 1, it is comprised of a type bar hanger segment 16, that is constructed in the nature of a portion of a cylinder, beneath and to the rear of which is carried a sub-lever segment 17, which is formed upon an arc having a greater radius of curvature than the radius of the arc upon which the type bar hanger segment is constructed. The type bar hanger segment 16, is constructed in such manner as to permit type bar hangers 18 to be located in parallel planes which cut its interior surface at right angles to the axis of the cylinder about which the type bar hanger segment is formed. A series of curved type bars 19, all of which are of uniform length, are mounted upon long pivot members 20, that are pivotally attached to the type bar hangers 18. The type bars 19, are formed with clearance curves near their outer ends, and are provided beyond these curves with socket portions 21, in which are mounted the usual type head 22. The sub-lever segment 17, is formed with slots upon its rear edge, which constitute guiding means for the sub-levers 24, that are pivotally mounted upon a pivot wire 25, which is located in a retaining groove formed near the rear edge of the sub-lever segment. The sub-levers 24 are operatively connected at their upper ends by means of connecting links 26, to the type bars, and at their lower or middle portions the sub-levers 17 are connected to key levers 27 by means of connecting links 28. The key levers 27 are provided upon their forward ends with the well known form of key caps (not shown in the drawings), and are pivoted at their rear ends beneath a pivotal support 29, which is mounted in the machine frame. Key lever returning springs 30, are adapted to be suspended from supporting members 31, and are attached at their lower ends to the key levers 27 in such manner as to return the key levers to normal position after they have been actuated for the printing operation. A substantially horizontal or straight universal bar

32, is pivoted upon the wing portions 2 and 4 of the segmental frame 1, and is arranged to lie beneath downward extending portions 34 of the sub-levers 24, in such manner that the downwardly extending portions 34, will contact with the face of the universal bar when the type head upon the type bar has traveled a pre-determined distance in its path of movement from rest to the printing point, thus rocking the universal bar to actuate ribbon mechanism and escapement mechanism (not shown in the drawings), at a definite time in each printing operation.

Referring particularly to Figs. 1 and 3 of the drawings, it will be noted that the type bar hanger segment is formed upon a segment of an unusually small arc, and that sufficient space is gained for the long pivots of the type bars by placing the type bar hangers in different planes in the segment. The advantage of the small segment is that it permits a short and light type bar to be used, thus making a light key action. However, in the use of a small segment for the type bar hanger, difficulty is experienced in securing a sufficient "fanning out" of the actuating links and sub-levers to properly connect with the key levers without causing an extreme amount of torsional strain.

Referring particularly to Fig. 3, it will be noted that the arrangement of the sub-levers 24, upon the pivot wire 25, carried in the sub-lever segment 17, is such that the angular relationship of the sub-levers to the type bar connections and to the key lever connections, is such as to substantially balance or equally distribute the torsional strains throughout the various pivotal points of the connections. This particular feature is especially noticeable in the arrangement of links and actuating sub-levers at the extreme sides of the system. It will also be noted upon referring to Fig. 3, that while the sub-lever segment 17 is curved, the universal bar 32 which is adapted to be actuated by the downwardly extending portions 34 of the sub-lever 24, is a straight line, as has been hereinbefore set forth. Since the universal bar is formed substantially straight and is pivoted below the contact face, it will be seen that a predetermined amount of movement at any point on the actuating face will give a predetermined amount of angular movement to the pivotal supports. Such a condition is not true for a pivotally mounted curved universal bar. The sub-levers 24, as has been hereinbefore specified, are formed of gradually increasing size from the middle of the segment to the sides thereof. The increase of the distance from the connection to the type bar link to the pivot wire 25, is proportional to the increase from the key lever connection to the pivot 25, and also the distance from the pivot wire 25 to the top of the universal

bar 32 is proportional to the increase in length between the pivotal points hereinbefore specified. In other words, the entire relationship of the various controlled and
 5 controlling elements of the sub-levers 17, is proportionately increased from the middle of the segment to the sides thereof, and the arrangement of parts is such that the whole of the system is in a uniform relationship
 10 so as to give a uniform touch throughout the entire key board (not shown).

Having thus described my invention what I desire to claim is:—

1. In a typewriting machine, the combination of a main frame, a segmental frame mounted thereon and provided with a type bar hanger segment, a sub-lever segment, said
 15 sub-lever segment being formed upon a radius of curvature greater than the radius of curvature of the type bar hanger segment, type bars pivotally mounted upon said type bar hanger segment, sub-levers pivotally
 20 mounted upon said sub-lever segment to swing in planes radial to the sub-lever segment, operative connections between said
 25 sub-levers and said type bars, the axis of the pivot for each of said connections with the sub-levers being parallel with the axis of its pivot in the corresponding type bar, and
 30 means for actuating said sub-levers.

2. A type bar action for typewriting machines, including type bars, pivotal means for said type bars arranged in substantially
 35 an arc, actuating sub-levers, pivotal means for said actuating sub-levers substantially arranged in an arc having a greater radius of curvature than the arc upon which the
 40 type bar pivots are located, a straight line universal bar adapted to be operated by said sub-levers, means connecting said sub-levers and said type bars, and means for actuating
 45 said sub-levers, substantially as described.

3. In a typewriting machine, the combination of a main frame, a type bar hanger segment, a sub-lever segment, type bars pivotally
 45 mounted upon said type bar hanger segment, sub-levers pivotally mounted upon said sub-lever segment, operative means connecting said sub-levers and said type bars, a
 50 universal bar having its contact face formed in substantially a straight line and in the path of said sub-levers, and means for actuating said sub-levers, substantially as described.

4. In a typewriting machine, the combination of a main frame, a type bar hanger segment, type bars pivotally mounted upon said
 55 type bar hanger segment, an actuating sub-lever segment arranged below said type bar hanger segment, actuating sub-levers radially mounted upon said actuating sub-lever
 60 segment, a straight horizontal universal bar located beneath said sub-lever segment and adapted to be actuated by said sub-levers, operative means between said sub-levers and

said type bars, and means for actuating said sub-levers, substantially as described.

5. In a typewriting machine, the combination of a main frame, a segmental frame provided with a type bar hanger segment
 70 and a sub-lever segment, type bars pivotally mounted upon said type bar hanger segment, sub-levers pivotally mounted upon said sub-lever segment, said sub-levers being operatively connected to said type bars, key
 75 levers, and links movable in the direction of their length and connecting said sub-levers to said key levers.

6. In a typewriting machine, the combination of a main frame, a segmental frame carried thereby, a concave type bar segment
 80 formed upon said segmental frame, a sub-lever segment also formed upon said segmental frame, said sub-lever segment being located upon the segmental frame at a position
 85 below said concave type bar segment, and means for fixedly mounting said segmental frame in said main frame.

7. In a typewriting machine, the combination of a main frame, a segmental frame carried thereby, a type bar hanger segment
 90 formed upon said segmental frame, a sub-lever segment formed upon said segmental frame, said sub-lever segment being located below and formed upon an arc of greater
 95 radius and having its center at a different elevation than the arc upon which said type bar hanger segment is formed, and means for attaching said segmental frame in said
 100 main frame.

8. In a typewriting machine, the combination of a main frame, a segmental frame, type bars operatively mounted upon said
 105 segmental frame, actuating sub-levers for said type bars pivotally mounted upon said segmental frame, a universal bar carried by said segmental frame and adapted to be actuated by said actuating sub-levers, operative
 110 connections between said actuating sub-levers and said type bars, means for actuating said sub-levers, and means for fixedly mounting said segmental frame in said main frame.

9. In a typewriting machine, the combination of a main frame, a segmental frame fixedly mounted thereon, type bar hangers
 115 mounted on the upper face of said segmental frame, type bars pivotally mounted in said hangers, sub-levers pivotally mounted along one side of said segmental frame, means
 120 above said segmental frame for operatively connecting each sub-lever to its associated type bar, and actuating means mounted in the main frame and operatively connected
 125 to the sub-levers.

10. In a typewriting machine, the combination of a main frame, a segmental frame fixedly mounted thereon, type bar hangers
 130 mounted on the inner side of said segmental frame, type bars pivotally mounted in said

hangers, sub-levers pivotally mounted along
one side of said segmental frame, means on
the upper side of said segmental frame for
operatively connecting each sub-lever to its
5 associated type bar, and actuating means
mounted in the main frame and operatively
connected to the sub-levers.

In testimony whereof I affix my signature
in presence of two witnesses.

CHARLES SPIRO.

Witnesses:

EDWD. E. JONES,
FRANK H. CORBIN.