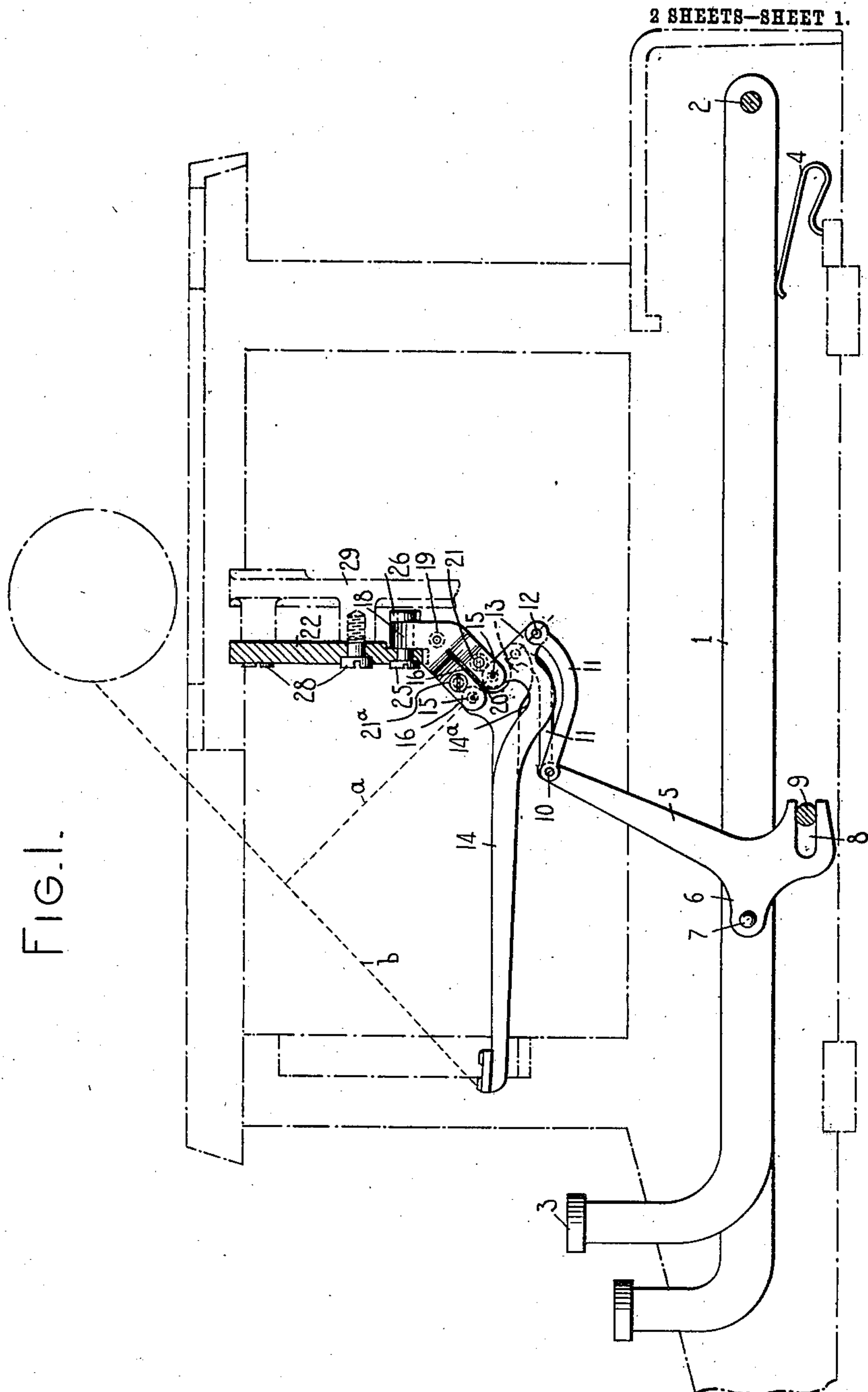


No. 862,591.

PATENTED AUG. 6, 1907.

Z. G. SHOLES.
TYPE WRITING MACHINE.
APPLICATION FILED APR. 14, 1904.

2 SHEETS—SHEET 1.



WITNESSES.

E. M. Wells.
Charles Smith

INVENTOR:

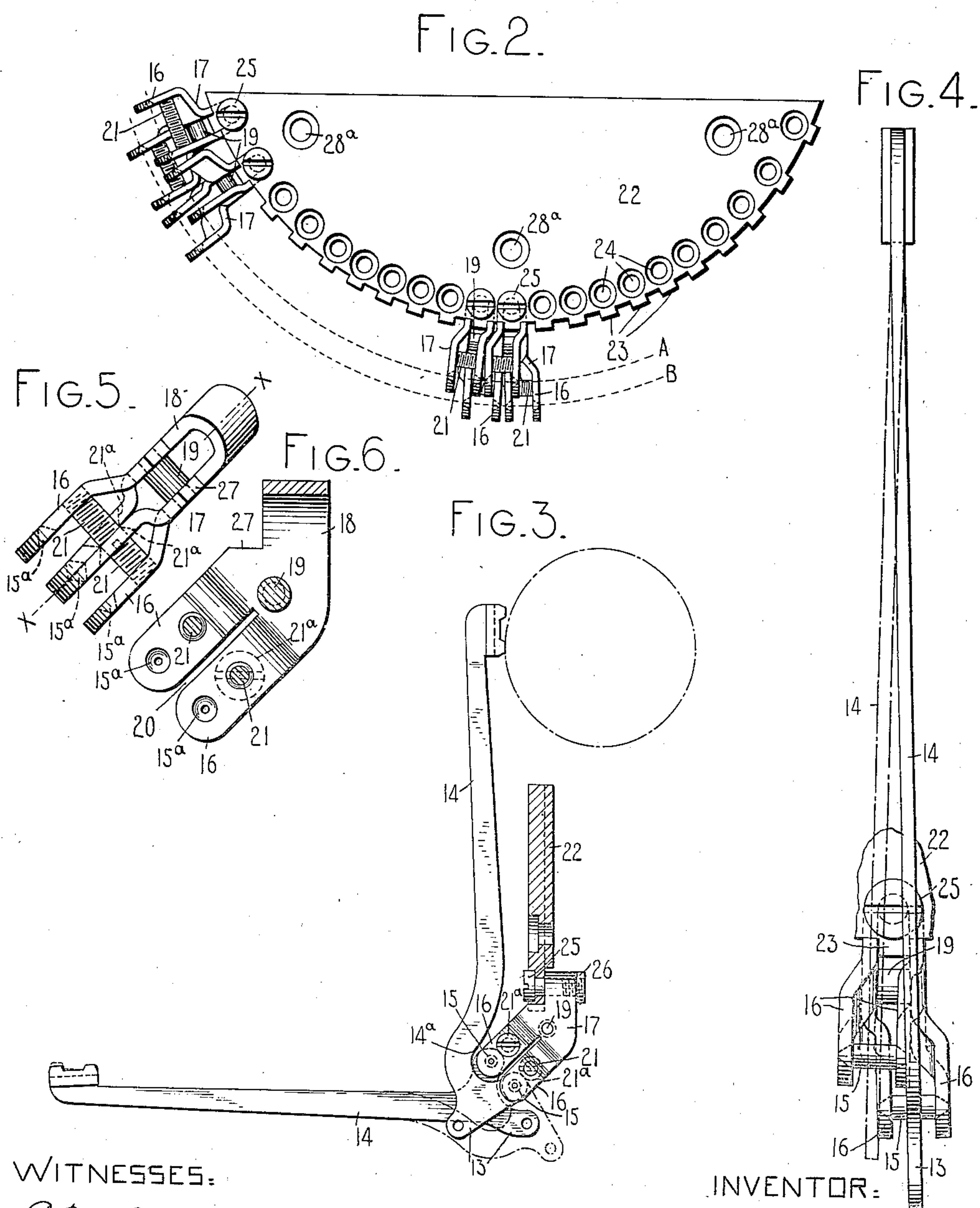
Salmon G. Sholes
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HIS ATTORNEY

UNITED STATES PATENT OFFICE.

ZALMON G. SHOLES, OF NEW YORK, N. Y., ASSIGNOR TO UNION TYPEWRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

No. 862,591.

Specification of Letters Patent.

Patented Aug. 6, 1907.

Application filed April 14, 1904. Serial No. 203,122.

To all whom it may concern:

Be it known that I, ZALMON G. SHOLES, a citizen of the United States, and a resident of the borough of Manhattan, city of New York, 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.

My invention relates to type actions and more particularly to the type bars and hangers thereof.

One of the main objects of my invention is to provide simple and efficient means whereby a large number of type bars can be mounted in a comparatively small space, or on a short type bar segment, and yet have widely separated pivot bearings.

Another object is to reduce the number of separate hangers and to provide for their firm securement in position.

To the above and other ends which will hereinafter appear, my invention consists in the features of construction, arrangement of parts and combinations of devices to be hereinafter described and particularly pointed out in the appended claims.

In the accompanying drawings wherein like reference characters represent corresponding parts in the different views, Figure 1 is a side view of two type actions embodying my invention; the frame of the machine and platen being shown in dotted lines; Fig. 2 is a detail front elevation of the type bar segment with some of the hangers shown in place; Fig. 3 is a detail side elevation of two of the type bars and the hanger therefor secured to the segment, the segment being shown in section; Fig. 4 is an enlarged detail front elevation showing a type bar hanger secured to the segment with two type bars mounted therein and illustrated in the printing position, one bar being shown in dotted lines; Fig. 5 is an enlarged detail plan view of one of the hangers; Fig. 6 is a transverse sectional view of the same taken on the line xx of Fig. 5.

While I have shown my invention applied to a front-strike machine it should be understood that it may be embodied in various other styles of typewriting machines.

Key levers 1 are pivoted at 2 in the base of the frame of the machine, and each key lever is provided with the usual finger-key 3 and restoring spring 4. An inclined sub-lever 5 has a forwardly extending off-set portion 6 by which it is pivoted at 7 to its associated key lever. The lower end portion of each sub-lever is slotted at 8 for the reception of a fixed fulcrum bar 9 that extends from side to side of the machine beneath the key levers and is secured to the frame of the machine. The upper end of each sub-lever is pivoted at 10 to a rearwardly extending downwardly curved link 11, the opposite end of the link being pivoted at 12 to a crank projection 13 on the associated type bar 14.

Each type bar has laterally extending trunnion-like pivots 15 that are conoidal or tapering at the ends where they seat in counterpart bearings 15^a in arms 16 of type bar hanger 17. The pivots project to equal extents on opposite sides of the type bars and the pivot of each bar extends at right angles to the hanger arms, so that each type bar swings in a median plane between its bearings and wear upon both bearings of each bar is evenly distributed. Each hanger is preferably formed of sheet metal with a substantially U-shaped stem or shank 18.

A shouldered stud or rivet 19 is interposed between the sides of the substantially U-shaped shank of each hanger and the reduced ends of each stud pass through openings in the sides of the shank and are riveted or headed, in order to form a firm connection between the separated plate portions of the shank and thus prevent relative displacement between the side arms 16 of the hanger. The sides of each hanger are slitted at 20 so as to divide the hanger into two sets of type-bar bearing arms 16. Each coöperating set of arms 16 is off-set or staggered relatively to the other set of arms formed on or as a part of the same hanger. In other words, it will be seen on examination of Fig. 4 that the upper set of arms is bent laterally to the left and that the arms of said set are substantially parallel at their forward end portions, whereas the arms 16 of the lower set are bent laterally to the right and are substantially parallel at their forward end portions. Moreover it will be seen that the arms of each set are parallel to the radial plane in which the associated type bar moves, so that the pivot of the bar will be disposed at the proper angle to bring about a movement of the type bar in the proper plane. In this manner the type bar which is pivoted to a lower pair of arms may be arranged radially of the printing point and likewise that pivoted to the upper pair of arms. While the two type bars are mounted in the same hanger they may, nevertheless, each be provided with a long pivot 15 and one set of arms on the hanger may overlap the arms of the other set. Each set of arms 16 has a transverse headed screw 21 which extends between the arms and one end of the screw enters a threaded opening in one of the arms, whereas the head 21^a of the screw is seated in a countersunk in the other arm. By turning the screw 21 the associated arms of the hanger controlled by said screw may be brought closer together or may be allowed to separate in order to effect a proper relative adjustment between the arms of each set, to properly assemble the parts and to compensate for any wear between the pivots 15 and their bearings 15^a.

A type bar segment 22 has a series of spacing lugs 23 on the lower edge thereof, and near each spacing lug a plain hole 24 is drilled through the segment to receive a headed screw 25. Each screw projects through the

U-shaped stem of its associate duplex hanger and co-operates with a nut 26 that straddles or overlaps both plates of the stem, thus securing the hanger to the segment at the rear side thereof. Each hanger is provided with shoulders 27 which are adapted to bear against the under side of the segment upon opposite sides of its associated spacing lug 23. The sides of the lugs being cut on the proper radii, the proper radial position of each hanger on the segment is thus readily predetermined, and inasmuch as the lugs 23 fit snugly between the shouldered portions of the hangers, the latter are prevented from swinging laterally about their holding screws, and from twisting or otherwise getting out of true position. The hangers thus secured to the rear face of the segment project around the bottom edge thereof and the type bearing arms project forward of the front face of the segment.

From an examination of Fig. 2, it will be observed that the hangers at the sides of the segment are more widely separated than at the center and that the arms 16 of each set are likewise more widely separated at the sides of the segment than are the arms at the center, although the shanks of the hangers are all of the same size. By this construction the type bars at the sides of the segment have longer pivots than those at the center, as the side bars have a greater tendency to get out of alinement than those at the center of the segment. This tendency is due to the fact that the type bars swing in planes which approach the horizontal, and the gravity of the bars causes them to wear their bearings more on the inner or lower side and to develop "shake," which at the type end is reduced to a minimum by the use of long pivots. The center bars swing in planes which approach the vertical, and their tendency to lateral deflection is less than that of the side bars, and hence their pivots may be shorter.

Each of the type bars 14, that is pivoted in the lower set of hanger arms, is formed with a recess at 14^a in order to enable it to clear the upper set of hanger arms and the pivot of the other type bar mounted on the same hanger, as indicated in Fig. 3.

Referring more particularly to Figs. 1 and 2, it will be seen that the type bars mounted on each hanger are pivoted at different distances from the printing point; that all the upper pivots are alined in an arc indicated by the dotted line A, whereas all the lower pivots are alined in an arc indicated by the dotted line B; that the pivot of each type bar is parallel to the plane of the type bar segment; that the pivots of the type bars on each hanger are arranged in an inclined plane represented by the dotted line *a*, which is substantially midway between the printing point and the type bearing ends of the type bars when at rest, and that this plane is at substantially right angles to a line indicated at *b*, drawn from the printing point to a type on one of the type bars. By this arrangement I am enabled not only to provide the overlapping arrangement heretofore described at the bearings, with long pivots for each type bar, but when the type bars are at rest in the basket they are alined or in one row at their forward or type ends, notwithstanding the fact that the pivots of the type bars are arranged at different distances from the printing point and that the bars themselves are of different lengths.

Each curved link 11 which extends forwardly from

its type bar is pivotally connected thereto in the same plane (*a*) that the pivots of the associated type bars are located in.

The type bar segment may be secured in place by any suitable means, as by headed screws 28, the stems of which pass freely through holes 28^a in the segment and are received in threaded openings within a portion 29 of a part of the machine that may be shifted in any suitable manner, in order to change the relation between the type bars and the platen. If desired, however, the platen may be shifted relatively to the type bars.

From an inspection of Fig. 2, it will be seen that each terminal type bar hanger has a bent or off-set arm 16 with the pivot bearing portion thereof at a height co-extensive with or extending above the screw which secures the hanger in place and an associated substantially straight hanger arm 16 radially disposed from the printing center and that these two arms support a terminal type bar in place. The purpose of this arrangement is to decrease the height or extent of the segment. Thus, it will be understood that if the securing shank for the screw were not off-set and lower than the off-set upwardly bent arms 16 of the terminal hanger, the screws for these hangers would necessarily be much higher than they are and that it would be necessary to make the segment higher or of a greater length than it is.

By providing hanger arms for a plurality of type bars on each hanger, it is necessary to use only about half as many fastening screws as pairs of hanger arms, and consequently larger screws may be used and the parts be more securely held in place; yet ample space is provided for the screws and without the necessity of staggering them or inserting the screws from opposite sides of the segment. By the arrangement shown, the hangers may all be secured to the segment on the same side thereof and ready access to the holding screws 25 is afforded from the front of the machine. It should be understood, however, that from certain aspects of my invention it is immaterial whether different sets of superposed staggered hanger arms are connected to the same shank or to different shanks.

Various changes may be made without departing from the spirit of my invention, and certain features thereof may be employed without the others.

What I claim as new and desire to secure by Letters Patent, is:—

1. In a typewriting machine, the combination of a type bar hanger comprising a plurality of sets of hanger arms, the arms of one set being off-set or bent laterally relatively to the arms of another set, and a type bar received between each set of hanger arms and wholly supported thereby, so that a plurality of type bars is wholly carried by each hanger.
2. A type bar hanger comprising a plurality of sets of hanger arms, the arms of one set being off-set or bent laterally relatively to the arms of another set, and means for affording a relative adjustment between the arms of each set.
3. In a typewriting machine, the combination of a type bar hanger comprising a plurality of sets of hanger arms, the arms of one set being staggered relatively to the arms of another set, and a type bar received between each set of hanger arms and wholly supported thereby, so that a plurality of type bars is wholly carried by each hanger.
4. In a typewriting machine, the combination of a type bar hanger comprising a plurality of sets of hanger arms,

the arms of one set being staggered relatively to the arms of another set, an adjusting screw passing between the arms of each set, and a type bar received between each set of hanger arms and wholly supported thereby, so that a plurality of type bars is wholly carried by each hanger.

5 5. A type bar hanger comprising a plurality of sets of hanger arms, the arms of one set being off-set laterally relatively to the arms of another set, carrying members for the hanger arms, and bracing means interposed between said carrying members.

10 6. A type bar hanger comprising a plurality of sets of hanger arms, the arms of one set being off-set laterally relatively to the arms of another set, means for affording a relative adjustment between the arms of each set, carrying members for said hanger arms, and a bracing stud between said carrying members.

15 7. A type bar hanger comprising a plurality of sets of hanger arms, the arms of one set being staggered relatively to the arms of another set, an adjusting screw passing between the arms of each set for effecting a relative adjustment thereof, carrying members for said hanger arms, and shouldered bracing rivets interposed between said arm carrying members of the hanger.

20 8. In a typewriting machine, the combination of a hanger having a plurality of sets of overlapping staggered arms, and a type bar pivoted between each set of arms, the type bars carried by each hanger radiating from the printing point.

25 9. A sheet metal hanger having a plurality of sets of type bar bearing arms, one set of arms on the hanger being bent laterally away from another set of arms thereon.

30 10. In a typewriting machine, the combination of a type bar segment having spacing lugs thereon, type bar hangers that project around the bottom from the rear to the front side of said segment and have their pivotal bearings in front of the segment, the hangers cooperating with said spacing lugs, and screws, each of which co-acts with a hanger to secure it in place on the segment.

35 11. In a typewriting machine, the combination of a type bar segment having spacing lugs on the bottom edge thereof, hangers having shoulders that bear against the bottom edge of the segment, the shoulders of each hanger being disposed on opposite sides of a spacing lug, and screws that pass through the stems of the hangers and into a face of the segment to secure the hangers in place.

40 12. In a typewriting machine, the combination of a segment, type bar hangers that are secured to the rear side or face of the segment and extend to the front thereof, and each of which hangers has a plurality of sets of type bar supporting arms, the arms of one set being staggered and overlapping the type bar supporting arms of another set on the same hanger.

45 13. A type bar hanger struck up from a single piece of sheet metal with a substantially U-shaped stem, and a plurality of sets of arms, one set of arms on the hanger being bent laterally relatively to the arms of another set on the hanger.

50 14. A type bar hanger struck up from a single piece of sheet metal with a substantially U-shaped stem and a plurality of sets of arms; one set of arms on the hanger being bent laterally relatively to the arms of another set on the hanger, a screw that passes through the substantially U-shaped stem to secure the hanger in place, and a bracing stud that passes from one side to the other of the substantially U-shaped stem and maintains them properly spaced apart.

55 15. A type bar hanger struck up from a single piece of sheet metal with a substantially U-shaped stem and a plurality of sets of arms; one set of arms on the hanger being bent laterally relatively to the arms of another set on the hanger, a screw that passes through the substantially U-shaped stem to secure the hanger in place, a bracing stud that passes from one side to the other of the substantially U-shaped stem and maintains them properly spaced apart, and means for effecting a relative adjustment of the arms of each set.

60 16. In a typewriting machine, the combination of a hanger having a plurality of sets of type bearing arms, the arms of one set being off-set or bent laterally relatively

to the arms of another set, a plurality of type bars pivoted to said arms at different distances from the printing center and in a plane that is substantially midway between the printing point and the types on said bars when the latter are at rest.

85 17. In a typewriting machine, the combination of a hanger having a plurality of sets of type bearing arms, the arms of one set being off-set or bent laterally relatively to the arms of another set, a plurality of upwardly and rearwardly striking type bars pivoted to said arms at different distances from the printing center and in an inclined plane that is substantially midway between the printing point and the types on said bars when the latter are at rest and at substantially right angles to a line between the printing point and the type bearing end of one of the type bars.

90 18. In a typewriting machine, the combination of a plurality of type bars pivoted at different distances from the printing point and with the pivots thereof arranged in a plane substantially midway between the printing point and the type bearing ends of said bars, and key actuated devices connected to said type bars in the same plane that the pivots of the bars are situated in.

95 19. In a typewriting machine, the combination of a hanger, a plurality of upwardly and rearwardly striking type bars pivoted to said hanger at different distances from the printing point and with the pivots thereof arranged in an inclined plane substantially midway between the printing point and the type bearing ends of said bars, and key actuated devices connected to said type bars in the same plane that the pivots of the bars are situated in.

100 20. In a typewriting machine, the combination of a hanger, a plurality of upwardly and rearwardly striking type bars pivoted to said hanger at different distances from the printing point and with the pivots thereof arranged in an inclined plane substantially midway between the printing point and the type bearing ends of said bars and at substantially right angles to a line drawn from the printing point to the type bearing end of a type bar, forwardly extending actuating links pivoted to said type bars in the same plane that the pivots of the bars are situated in, sub-levers connected to said links, and key levers for actuating said sub-levers.

105 21. In a typewriting machine, the combination of hangers, each hanger having a plurality of sets of hanger arms, the arms of one set being off-set laterally relatively to the arms of another set, and a type bar pivoted between each set of arms on a hanger and situated centrally of the pivotal bearings of the type bar.

110 22. In a typewriting machine, the combination of a plurality of sets of hanger arms, the arms of one set being off-set laterally relatively to the arms of another set, means for effecting a relative adjustment of the arms of each set, and a type bar pivoted to each set of hanger arms and situated centrally of the pivotal bearings of the type bar.

115 23. In a typewriting machine, the combination of a hanger having a plurality of sets of overlapping staggered arms, and a type bar pivoted between the arms of each set, each type bar having trunnion-like pivots that project to equal extents from opposite sides of the bar and at right angles to the hanger arms.

120 24. In a typewriting machine, the combination of a sheet metal hanger having a plurality of sets of type bar bearing arms, and a substantially U-shaped shank, one set of arms on the hanger being bent laterally away from another set of arms thereon, and a type bar pivoted between the hanger arms of each set on trunnion-like pivots that project to equal extents from the body of the bar.

125 25. In a typewriting machine, the combination of a plurality of sets of hanger arms, the arms of one set being off-set laterally relatively to the arms of another set, and a type bar pivoted to each set of hanger arms and situated centrally of the pivotal bearings of the type bar, the pivotal centers of the type bars on each hanger being located in a plane that is substantially midway between the printing point and the types on the bars when the latter are at rest.

130 26. In a typewriting machine, the combination of a plurality of sets of hanger arms, the arms of one set being off-set laterally relatively to the arms of another set, and

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a type bar pivoted to each set of hanger arms and situated centrally of the pivotal bearings of the type bar, the type bars on each hanger being pivoted at different distances from the printing point and in a plane that is substantially midway between the printing point and the types on the bars when the latter are at rest.

27. In a typewriting machine, the combination of a hanger having a plurality of sets of overlapping staggered arms and a type bar pivoted between the arms of each set, each type bar having trunnion-like pivots that project to equal extents from opposite sides of the bar and at right angles to the hanger arms, the type bars on each hanger being pivoted at different distances from the printing point and in a plane that is substantially midway between the printing point and the types on the bars when the latter are at rest and at substantially right angles to a line drawn from the printing point to the type on one of said bars.

28. In a typewriting machine, the combination of a segment, a plurality of sets of superposed staggered hanger arms secured upon one side only of the segment, the arms of each set being off-set or bent laterally relatively to the arms of the other set a single screw for securing said plurality of sets of said arms to the segment, and a type bar pivoted to each set of hanger arms.

29. In a typewriting machine, the combination of a segment, a plurality of superposed staggered hanger arms secured upon one side only of the segment, a single screw for securing said plurality of sets of said arms to the segment, and a type bar pivoted to each set of hanger arms by trunnion-like pivots that project to equal extents from the type bar and which are at substantially right angles to their associated hanger arms.

30. In a typewriting machine, the combination of a segment, a plurality of superposed staggered hanger arms secured upon one side only of the segment, a single screw for securing said plurality of sets of said arms to the segment, and a type bar pivoted to each set of hanger arms by trunnion-like pivots that project to equal extents from the type bar and which are at substantially right angles to their associated hanger arms, the type bar pivots for the superposed sets of hanger arms being situated in a plane that is substantially midway between the printing point and the types on the bars.

31. In a typewriting machine, the combination of a segment, a plurality of superposed staggered hanger arms secured upon one side only of the segment, a single screw for securing said plurality of sets of said arms to the segment, and a type bar pivoted to each set of hanger arms by trunnion-like pivots that project to equal extents from the type bar and which are at substantially right angles to their associated hanger arms, the type bar pivots for the superposed sets of hanger arms being situated in a plane that is substantially midway between the printing point and the types on the bars when the latter are at rest and at substantially right angles to a line drawn from the printing point to a type on one of said bars.

32. In a typewriting machine, the combination of a segment, a plurality of sets of superposed staggered hanger arms secured upon one side only of the segment, the arms of each set being off-set or bent laterally relatively to the arms of another set, a single screw for securing said plurality of sets of said arms to the segment, and a type bar pivoted to each set of hanger arms, the type bar pivots for the superposed sets of hanger arms being at different dis-

tances from the printing point and situated in an inclined plane between the printing point and the types on the bars when at rest.

33. In a front-strike typewriting machine, the combination of a segment, a plurality of superposed hanger arms secured upon one side only of the segment, a single screw for securing said plurality of sets of said arms to the segment, and an upwardly and rearwardly striking type bar pivoted between each set of hanger arms by trunnion-like pivots that project to equal extents in opposite directions from the type bars and which are at right angles to the associated hanger arms, the type bar pivots for the superposed sets of hanger arms being at different distances from the printing point and situated in a plane that is substantially midway between the printing point and the type on one of said bars when the latter are at rest and at substantially right angles to a line drawn from the printing point to a type on one of said bars.

34. In a typewriting machine, the combination of a type bar segment, a type bar hanger secured thereto, said hanger having a substantially straight arm and a laterally bent arm, the bent arm being uppermost, and a type bar between said arms and the pivot of which is received in bearings in the arms and which is parallel to the plane of the segment.

35. In a typewriting machine, the combination of a substantially vertically disposed segment, a series of type bar hangers secured thereto, and a series of type bars pivoted to said hangers, the pivotal axes of the type bars being parallel to the plane of the segment, the terminal type bar hangers each having a substantially straight arm and a bent arm, the bent arms of said terminal hangers being uppermost.

36. In a front-strike typewriting machine, the combination of a substantially vertically disposed type bar segment, a series of type bar hangers secured thereto, and a series of type bars pivoted to said hangers, the pivotal axes of the type bars being parallel to the plane of the segment, the terminal type bar hangers each having an arm that is off-set from the securing means for the hanger, the off-set arms of said terminal hangers being uppermost.

37. In a typewriting machine, the combination of a segment, a series of type bar hangers secured thereto, and a series of type bars carried by said hangers, the pivotal axes of the type bars being parallel to the plane of the segment, the terminal type bar hangers of the series each having a substantially straight radially disposed arm and a bent arm that is off-set relatively to the fastening means, the bent arms of the terminal hangers of the series being uppermost.

38. In a typewriting machine, the combination of a segment, a hanger secured thereto, said hanger having a substantially straight arm and a laterally bent arm, both of said arms bearing against the face of the segment to which the hanger is secured, and a type bar pivoted to said hanger, the pivotal axis of the type bar being parallel to the plane of the segment.

Signed at borough of Manhattan, city of New York, in the county of New York, and State of New York this 13th day of April, A. D. 1904.

ZALMON G. SHOLES.

Witnesses:

E. M. WELLS,

M. F. HANNWEBER.