

996,813.

C. E. TOMLINSON.
TYPE WRITING MACHINE.
APPLICATION FILED SEPT. 19, 1907.

Patented July 4, 1911.

2 SHEETS—SHEET 1.

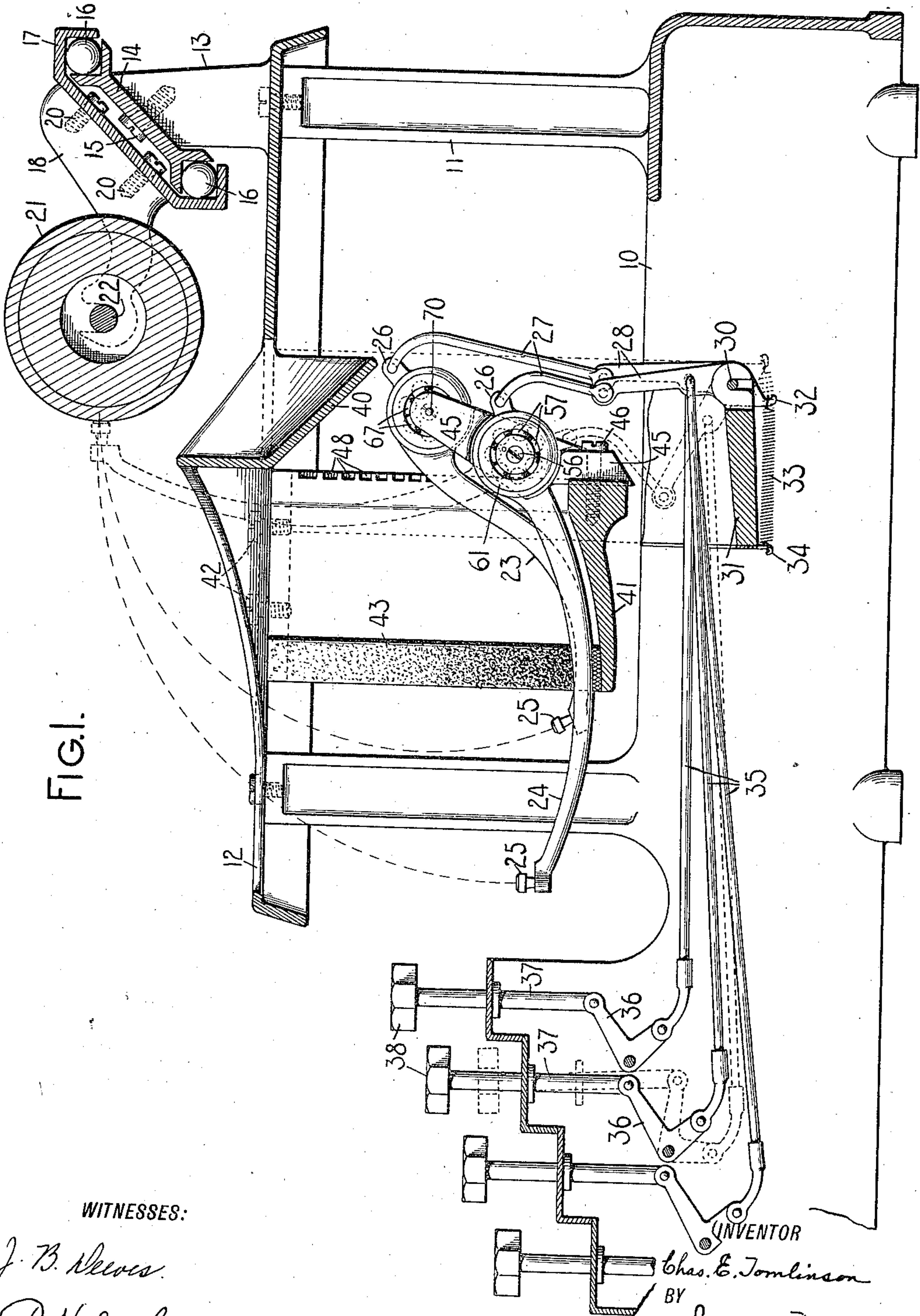


FIG. 1.

WITNESSES:

J. B. Reeves.

R. H. Brooker.

INVENTOR

C. E. Tomlinson

BY

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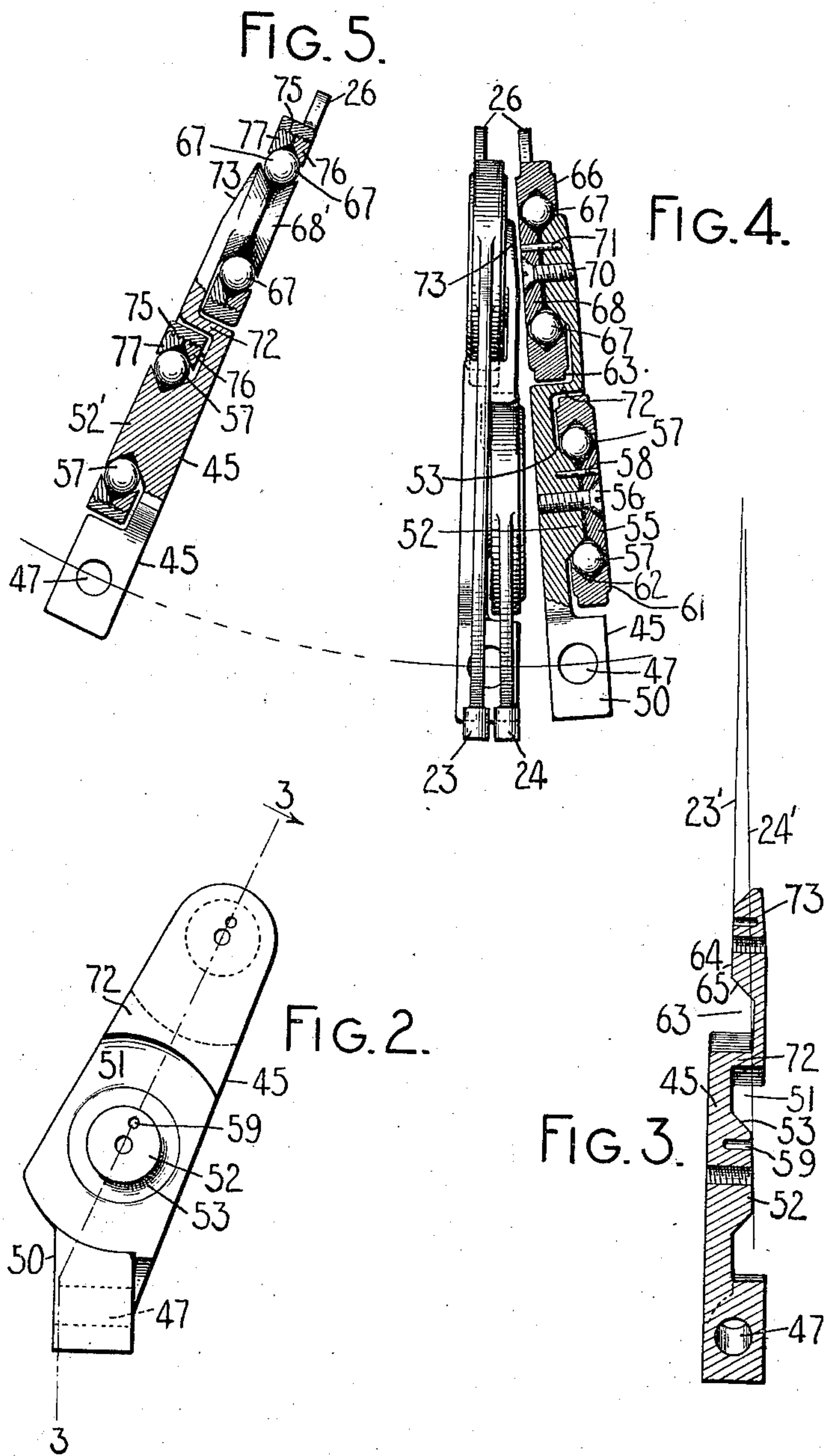
ATTORNEY

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2 SHEETS—SHEET 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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TYPE-WRITING MACHINE.

996,813.

Specification of Letters Patent.

Patented July 4, 1911.

Application filed September 19, 1907. Serial No. 393,695.

To all whom it may concern:

Be it known that I, CHARLES E. TOMLINSON, citizen of the United States, and resident of Syracuse, in the county of Onondaga 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 typewriting machines and more especially to a ball bearing type bar and hanger construction for front strike or "visible" typewriters.

The principal object of my invention is to provide efficient means for mounting in a "visible" typewriter a large number of type bars on separately removable hangers, and to provide each type bar with a wide pivotal bearing.

To the above and other ends which will hereinafter appear my invention consists in certain features of construction and combinations and arrangements of parts all of which will be fully set forth herein, and particularly pointed out in the claims.

In the accompanying drawings:—Figure 1 is a partial front to rear vertical central sectional view of a typewriting machine having my invention embodied therein. Fig. 2 is a side view of one of the type bar hangers. Fig. 3 is a sectional view of the said hanger taken on the line 3, 3 of Fig. 2 and looking in the direction of the arrow at said line. Fig. 4 is a view of two hangers and the type bars pivoted thereto, one of said hangers and its type bars being shown in section and the other in front elevation. Fig. 5 is a front view partly in section of another form of type bar and hanger.

In the drawings I have shown my invention applied to a front strike typewriter, the main frame of which comprises a base 10 having corner posts 11 which support a top plate 12. Standards 13, rising from the top-plate, support a stationary carriage rail 14, which is inclined upward toward the rear of the machine, as shown in Fig. 1, and which is secured to said standards by screws 15. The rail 14 is grooved in its opposite edges to form race-ways for anti-friction balls or rollers 16 which support a carriage rail 17 having carriage end pieces 18 secured thereto by screws 20. The platen 21 has its shaft 22 journaled in the end pieces 18.

The type bars are in two sets, consisting

of shorter type bars 23 and longer type bars 24, the shorter type bars alternating with the longer bars and each carrying at its free end a single type 25, and said type bars are so mounted as to strike the front face of the platen 21, as indicated in Fig. 1. Each of the type bars has a lug or arm 26 projecting from the heel thereof, and these arms are connected by links 27 with sub-levers 28, all of which are pivoted on a pivot wire 30 seated in a suitable groove in a sub-lever segment 31. The links 27 and sub-levers 28 extend approximately radially away from the lugs 26 so that each link and lever is in the plane of movement of the associated type bar or approximately so. Each of said sub-levers has a downward projecting arm 32 to which is secured one end of a restoring spring 33, the forward end of which is secured to a hook 34 projecting from a plate secured to the front face of the segment 31. The sub-levers 28 have pivoted thereto forwardly extending links 35 which at their forward ends are pivoted to bell-crank key levers 36 to which are connected the stems 37 of the printing keys 38. The construction is such that when one of the keys 38 is depressed the corresponding type bar will be thrown to the printing point, as indicated by dotted lines in Fig. 1. The type-bar-actuating mechanism just described is not of my invention but is the invention of John H. Barr.

The top plate 12 is formed with a downward and rearward sloping conical dust guard 40 which lies above the pivots of the type bars and of the sub-levers. This dust guard and the other features of the top plate substantially as shown in the drawings are not of my invention but are of the invention of A. J. Briggs.

The type bars are supported by a type bar segment 41 which is secured at its ends to the under side of the top plate by means of screws 42. This segment is preferably made of same width fore and aft of the machine and has mounted thereon along its forward edge portion a pad 43 which serves as a rest for the several type bars. The type bars are on separately detachable hangers 45, each of which is secured to the rear edge or face of the segment 41 by a screw 46 passing through a suitable opening 47 in the lower end of the hanger and threaded into the segment. In order to hold the

hangers against lateral displacement or from turning on their screws the segment 41 has a series of shallow radial slots 48 (Fig. 1) cut in its rear face and each of the hangers
 5 is seated in one of these slots. Each of the hangers has pivoted thereto two type bars, one of each set, and preferably these type bars are pivoted to opposite sides or faces of the hanger. The hanger itself has the
 10 form best shown in Figs. 2 and 3. Said hanger is made of one piece which comprises a stem or securing portion 50, which is seated in a slot 48 and through which the hole 47 passes. Above this stem or securing
 15 part the hanger arm extends in a direction upward at an inclination toward the rear of the machine as shown in Figs. 1 and 2. Just above the stem 50 the hanger has in one face thereof an annular cut-out 51 leav-
 20 ing a boss 52, the periphery 53 of which is conical and forms one part of the stationary element of the ball bearing for a long type bar 24. The other part of said stationary element consists of a disk 55 se-
 25 cured to the face of the boss 52 by means of a screw 56, which is threaded into the body of the hanger at the center of the boss 52 and the head of which is counter-sunk in the disk 55. The conical surface 53 of
 30 the boss and the conical periphery of the disk 55 together form a V-groove in which the balls 57 run. A pin 58 extending through the disk and into a hole 59 in the boss prevents the disk from turning about
 35 the screw 58.

The heel of the type bar 24 consists of a ring-like hub 61 which, or part of which, is received in the annular cut-out 51, but without touching the hanger. This ring-
 40 like hub of the type bar forms an eye having an internal V-groove 62, which constitutes the movable element of the ball bearing, cooperating with the balls 57. Above the cut-out 51 and preferably on the
 45 opposite side of the hanger there is formed a second cut-out 63 similar to the cut-out 51, and a boss 64 having a conical periphery 65 similar to the periphery of the boss 52. Each shorter type bar 23 has an internally
 50 grooved eye 66 which, or part of which, occupies a cut-out 63. The bearing for each shorter type bar is or may be similar to that for each of the type bars 24, comprising balls 67, and a disk 68 secured to the
 55 boss 64 by a screw 70 and having also a pin 71 corresponding to the pin 58. It will be understood that the bearings may be adjusted by means of the screws 56 and 70 and that the pins 58 and 71 prevent the disks
 60 55 and 68 from turning when the type bars are operated, thus preventing the adjustment of the screws from being disturbed by the operation of the machine.

The long type bars 24 alternate with the
 65 short type bars 23, and the two type bars

which are pivoted to a single hanger therefore swing in planes which converge at the printing point and the bosses 52 and 64 are constructed accordingly. In Fig. 3 the plane
 70 of motion of the type bar 24 is indicated by the line 24' and that of the type bar 23 by the line 23'. It will be seen that these two lines are at a distance apart less than the thickness of one of the type bars so that
 75 it is possible to pass a plane through the printing point, which plane would cut through the pivotal ends of both type bars, in other words, the two type bars overlap, as viewed from the printing point. It will
 80 also be seen that the two cut-outs 51 and 63 overlap as viewed from the printing point, these two cut-outs being separated by a solid part or cross-portion 72 of the hanger. By reference to Fig. 2 it will be seen that
 85 near the front and rear edges of the hanger this solid connecting part is of considerable width so as to maintain the stiffness of the hanger. It will also be noted by reference to Fig. 3 that the lower part of the hanger
 90 is made thicker than the upper part, this also contributing to the stiffness of the hanger. At its extreme upper parts the face of each hanger opposite to that to which the type bar 23 is pivoted, is beveled off as
 95 indicated at 73, Fig. 3, so as to avoid interfering with the next hanger of the series, as will be understood by reference to Fig. 4. It will be perceived that the type bars are each pivoted on a single set of balls which
 100 is arranged substantially in the plane in which the type bar swings.

As shown in Fig. 1 the width of the hanger is such that when the type bar 24 is in normal position, said type bar projects
 105 out of the cut-out 51 at the lowermost part of said cut-out and that when the said type bar is at the printing point it projects out of the uppermost part of said cut-out, the motion of the type bar being not quite suf-
 110 ficient to cause the elongated part of said bar to strike against the connecting portion or solid part 72 of the hanger. On the other hand, the lug 26 of this type bar when in normal position is close to, but not quite in
 115 contact with this connecting part 72. The width of the hanger, considered fore and aft of the machine, is less than the diameter of the cut-out so as to leave room for the type bar and the lug 26 to have the necessary
 120 swinging motion, but the hanger is preferably made as wide as may be without interfering with the motion of the parts. At its upper end the hanger has the outline of the boss 64.

By my invention I am able to mount in a
 125 front strike or "visible" typewriter a full set of eighty-four type bars on separately detachable hangers, there being two type bars on each hanger. The arrangement of the pivotal ends of the type bars of the two
 130

series out of alinement facilitates the mounting of this large number of type bars in segmental arrangement in the machine.

The details of the ball bearing may vary within the scope of my invention and in Fig. 5 I have shown one such variation. In this figure the segment and the general form of the hanger and type bars are substantially the same as in the other figures of the drawing, but instead of the bosses 52 and 64 and disks 55 and 68, I employ bosses 52' and 68' respectively, which bosses have V-grooves cut in their peripheries for the balls 57 and 67. The pivotal end of each type bar, instead of being internally grooved, is internally threaded at 75 and two rings 76 and 77 are threaded into the eye of each type bar, each of said rings being beveled on its inner face so that the two rings together form a V-groove to coöperate with the bearing balls. This bearing is adjusted by screwing the rings 76 and 77 in or out. The broad idea of a type bar having an internally threaded eye at its pivot and two rings threaded into said eye to form parts of a ball bearing for the type bar substantially as shown in Fig. 5, is not of my invention.

Various other changes in the details of construction and arrangement may be made without departing from my invention.

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, a plurality of type bars mounted on said hanger, a ball bearing for each of said type bars having a single set of balls substantially in the plane of motion of the corresponding type bar, and said type bars being so disposed on said hanger that a single plane through the printing point and perpendicular to the type bar segment cuts two type bars on the same hanger.

2. In a typewriting machine, the combination of a series of type bars arranged in two sets, so disposed that a single plane through the printing point and perpendicular to the type bar segment cuts a type bar of each set, a single series of separately detachable hangers supporting both series of type bars, and ball bearings for said type bars, each ball bearing having a single set of balls substantially in the plane of motion of the corresponding type bar.

3. In a typewriting machine, the combination of a series of type bars arranged in two sets, the pivotal axes of the type bars of the different sets being arranged in different lines and the said lines being parallel throughout the entire sets of type bars, separately detachable hangers for said type bars, each hanger carrying a type bar of each set, and each hanger having a cut-out or recess in one side thereof, in which cut-

out or recess the pivotal end of a type bar is received.

4. In a typewriting machine, the combination of a series of type bars arranged in two sets, and a series of separately detachable hangers for said type bars, each hanger carrying a type bar of each set, one on each side of said hanger, and each hanger having two cut-outs or recesses, one on each side of the hanger and one above the other, in which cut-outs or recesses the pivotal ends of the type bars are received.

5. In a typewriting machine, the combination of a series of type bars arranged in two sets, and a series of separately detachable hangers for said type bars, each hanger carrying a type bar of each set, and each hanger having two cut-outs or recesses in which the pivotal ends of the type bars are received, one of said cut-outs or recesses overlapping the other as viewed from the printing point.

6. In a typewriting machine, the combination of a series of type bars arranged in two sets, and a series of separately detachable hangers for said type bars, each hanger carrying a type bar of each set, and ball bearing pivots for said type bars each having a single set of balls arranged substantially in the plane in which the type bar swings, and the bearing of a type bar of one set overlapping that of a type bar of the other set as viewed from the printing point.

7. In a typewriting machine, the combination of a type bar hanger and two type bars pivoted to said hanger on opposite sides thereof, said type bars at their pivotal ends overlapping each other as viewed from the printing point.

8. In a typewriting machine, the combination of a hanger arm having two cut-outs in opposite faces thereof, and two type bars pivoted to said hanger arm and having their pivotal ends received in said cut-outs, and said type bars being so mounted that a single plane through the printing point and perpendicular to the type bar segment cuts both type bars.

9. In a typewriting machine, a type bar hanger arm having two bosses projecting therefrom, one from each side of the hanger arm, each boss having a V-groove ball-race in its periphery, and said bosses being arranged one beyond the other when viewed from the printing point.

10. In a front-strike typewriting machine, the combination of a platen, a segment consisting of one wide integral piece, a series of front-strike type bars supported on the rear edge of said segment, and a type rest on the forward edge of said segment.

11. In a front-strike typewriting machine, the combination of a type bar segment, a series of hangers mounted on said segment and extending therefrom toward the platen,

and a series of type bars pivoted to said hangers in a plurality of sets, each hanger having pivoted thereto a type bar of each set, one above the other.

5 12. In a typewriting machine, the combination of a hanger comprising a securing part or stem and a single arm, and two type bars pivoted to and carried wholly by said single hanger arm, at different distances
10 from said securing part, the hanger arm being tapered or thinned away toward its free end and comparatively thick at its end next to said stem.

13. In a typewriting machine, a type bar
15 hanger having a securing portion, an outward extending portion having a type bar 24 pivoted to one side thereof, a cross-portion 72, and a portion extending outward from said cross-portion and having a type
20 bar 23 pivoted to one side thereof.

14. In a front-strike typewriting machine,

the combination of a series of front-strike type bars arranged in two sets, the type bars of one set alternating with those of the other set, ball bearing pivots for said type bars 25 each having a single set of balls substantially in the plane of motion of the type bar, and the entire outline of the ball bearings of the type bars of one set being entirely out of alinement with the entire outline of the 30 ball bearings of the type bars of the other set, and separately detachable hangers for said type bars, each hanger carrying a type bar of each set.

Signed at Syracuse, in the county of On- 35
ondaga and State of New York this 31 day
of August A. D. 1907.

CHARLES E. TOMLINSON.

Witnesses:

C. C. SCHOENECK,
J. A. PROSS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."