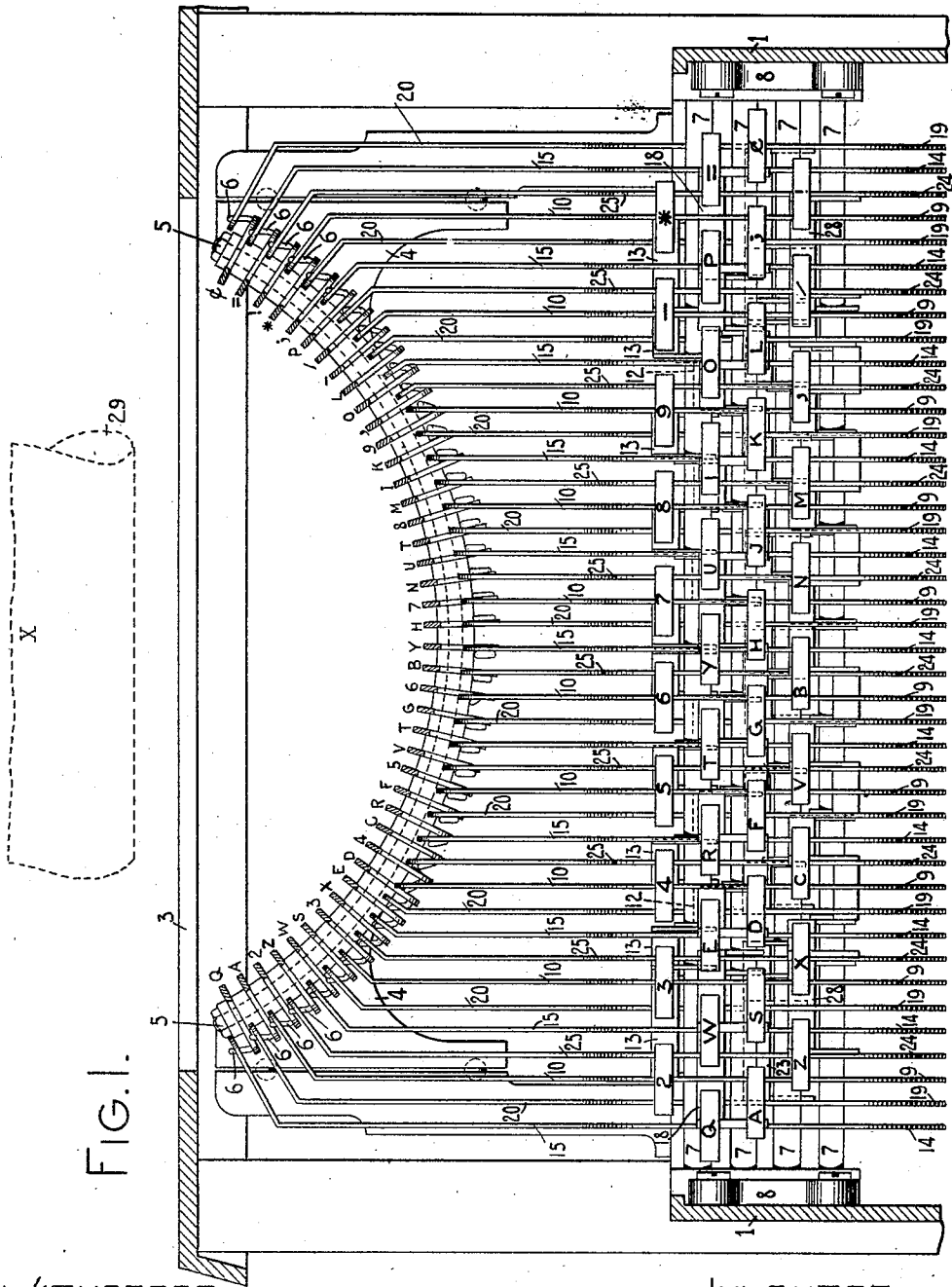


1,057,996.

Patented Apr. 1, 1913.

3 SHEETS—SHEET 1.



WITNESSES:

*E. M. Wells.*  
*M. F. Hammer*

INVENTOR:

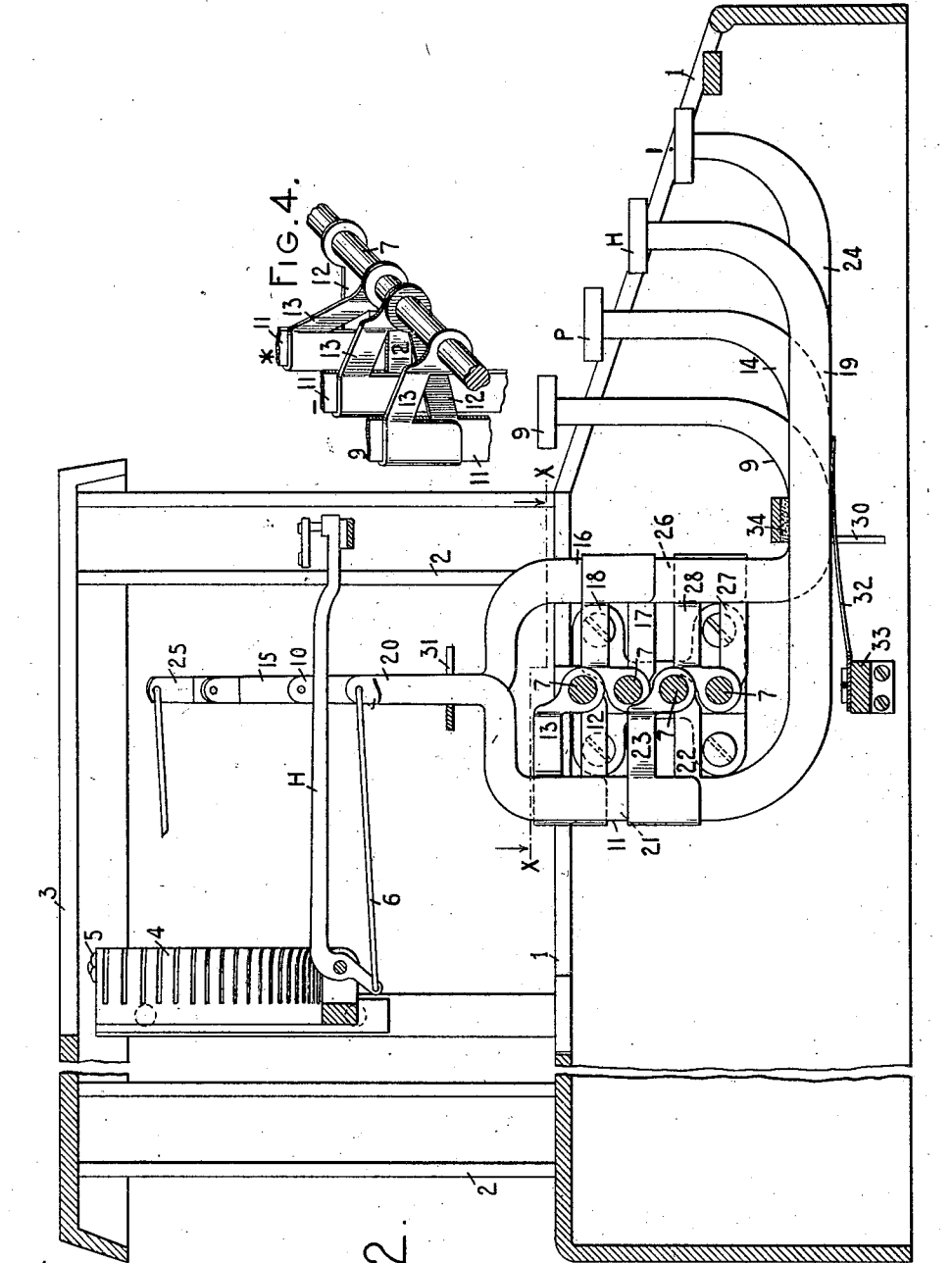
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1,057,996.

D. A. CARPENTER.  
TYPE WRITING MACHINE.  
APPLICATION FILED JAN. 12, 1912.

Patented Apr. 1, 1913.

3 SHEETS—SHEET 2.



WITNESSES:  
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FIG. 2.

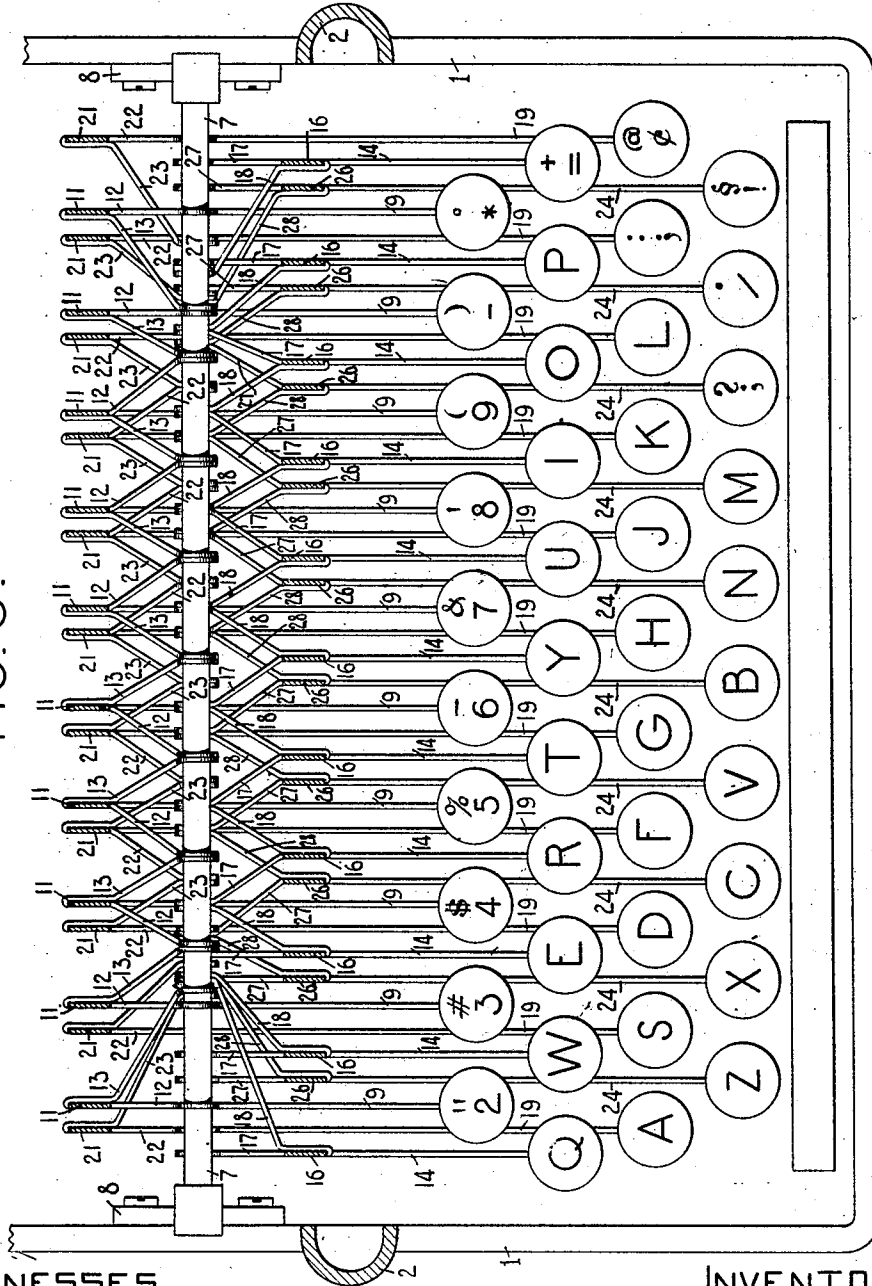
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3 SHEETS-SHEET 3.

FIG. 3.



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# UNITED STATES PATENT OFFICE.

DANIEL A. CARPENTER, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS,  
TO UNION TYPEWRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## TYPE-WRITING MACHINE.

1,057,996.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed January 12, 1912. Serial No. 670,767.

*To all whom it may concern:*

Be it known that I, DANIEL A. CARPENTER, citizen of the United States, and 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.

10 This invention relates especially to improvements in the construction and arrangement of the key levers of front-stroke type bar machines, the main object being to produce a system of key levers adapted to do  
15 work which is commonly done by key levers and sub-levers combined, and to act so as not to subject any of the type bars or other actuating mechanism to serious torsional stress.

20 The invention consists of a system of key levers, composed of levers constructed and arranged as hereinafter described and specified in the claims.

On the accompanying sheets of drawings  
25 on which like reference numerals designate like parts of different views, Figure 1 is a front elevation of a system of key levers, a type bar segment and connecting links, and a front and sectional elevation of a machine  
30 frame and a set of type bars mounted on the segment and connected with the key levers by the links, this system of key levers representing a preferred form of the invention. Fig. 2 is a side elevation of four of the key  
35 levers, a type bar and a connecting link, and a vertical, longitudinal section of the frame and segment, the frame being broken behind the segment. Fig. 3 is a sectional plan of the system of key levers and part of the  
40 frame, the section being on the planes  $x-x$  of Fig. 2. Fig. 4 is a perspective of fragments of three of the key levers.

The parts of the machine which are not shown may be of common and well known  
45 construction. The frame and shifting segment are those of some of the early forms of the Monarch machine, except that the base 1 of the frame, on which are the posts 2 that support the top plate 3, is deeper than  
50 the base of Monarch frames. The type bars which are indicated in Fig. 1 by characters which the type bear, are pivoted on a common wire which lies in a groove in the seg-

ment 4 and which is secured therein by nuts 5, the type bars fitting loosely in radial slots 55 in the segment and having arms to which are attached the connecting links 6 through which the type bars are actuated by the key levers. This system of key levers is suitable for use in machines in which the platen 60 is shifted when writing in upper case characters is to be done, as well as in machines in which the segment and type bars are shifted for writing in upper case.

The key levers are made from flat sheet 65 metal, and mounted on a support composed of four rods or fulcrums 7, which preferably fit at their ends in blocks 8 that are fastened by screws to the sides of the base 1, the blocks, rods and levers all being removable 70 together from the base, in which they can also be readily inserted and secured after they have been assembled. The key levers are arranged in four groups, each group having a separate fulcrum, the levers whose 75 heads form the upper bank of the keyboard being one group, mounted on the uppermost rod or fulcrum 7, the levers whose heads form the next bank being another group, mounted on the next fulcrum 7, the levers 80 whose heads form the next bank being another group mounted on the next fulcrum 7, and the levers whose heads form the lowest bank being another group mounted on the lowest fulcrum. The levers of the first mentioned group have curved front arms 9 and 85 upwardly extending arms 10, the arms of each lever being united in the part 11 which is behind the fulcrums and from which the front arm 9 extends under the fulcrums and 90 forward to the keyboard, while the arm 10 extends forward from the part 11 and then upward, the upper ends of the arms 10 being the upper ends of the levers of the group and being connected with type bars by links 95 6. Each of these levers comprises also two forwardly projecting branches 12 and 13, which are formed on the part 11 and project from it to the upper fulcrum 7 which passes through them at their front ends and forms 100 a pivotal support therefor and for the rest of the lever. The branches 13 may be formed on the rear edges of the parts 11 and bent across those parts as shown, or may be made in separate pieces and riveted or 105 otherwise fastened to the parts 11. The

lower edges of the branches 13 are to be higher than the upper edges of the branches 12, so that one lever will not interfere with another, as will be understood when their operation is considered.

5 The levers whose heads form the next to the highest bank in the keyboard have curved front arms 14 and upwardly extending arms 15, the arms of each of these levers being united in the part 16, which is similar to the parts 11 of the levers above described, but which is in front of instead of behind the fulcrums 7. The arms 15 of these levers extend backward from the parts 16 and then upward, their upper ends being the upper ends of the levers of the group and being connected with type bars by links 6. Each of these levers comprises two rearwardly projecting branches 17 and 18, which are formed on the part 16 and are similar to the branches 12 and 13 of the levers that are mounted on the uppermost fulcrum, and these branches 17 and 18 project from the parts 16 to the fulcrum 7 which is next to the highest and which passes through them at their rear ends and forms a pivotal support for the levers which include these branches.

30 The levers whose heads form the next to the lowest bank in the keyboard have curved front arms 19 and upwardly extending arms 20, the arms of each of these levers being united in the part 21, which is similar to the parts 11 of the levers whose heads form the upper bank in the keyboard, the parts 21 being behind the fulcrums 7, and parallel to and at the sides of the parts 11, as appears by Fig. 3. The arms 20 extend forward from the parts 21 and then upward, their upper ends being the upper ends of the levers of the group and being connected with type bars by links 6. Each of the levers of this group has two forwardly projecting branches 22 and 23 which are formed on the parts 21 and are similar to the branches 12 and 13 of the levers of the first described group, and the branches 22 and 23 project from the pivots 21 to the fulcrum 7 which is next to the lowest and which passes through them at their front ends and forms a pivotal support for the levers which include these branches.

55 The levers whose heads form the lowest bank in the keyboard have curved front arms 24 and upwardly extending arms 25, the arms of each of these levers being united in the part 26 which is similar to the parts 11, 16 and 21 of the levers of the three other groups, the parts 26 being in front of the fulcrums 7, and parallel to and at the sides of the parts 16, as appears by Fig. 3. The arms 25 extend backward from the parts 26 and then upward, their upper ends being the upper ends of the levers of the group and being connected with type bars by links

6. Each of the levers of this group has two rearwardly projecting branches 27 and 28 which are formed on the parts 26 and are similar to the branches 17 and 18 of the levers which include the parts 16, the branches 27 and 28 projecting from the parts 26 to the lowest fulcrum 7, which passes through them at their rear ends and forms a pivotal support for this group of levers.

75 As appears by Figs. 1 and 3, all of the branches 13, 18, 23 and 28, and some of the branches 12, 17, 22 and 27 not only project forward or backward from those parts of the levers on which they are formed, but also project laterally therefrom, so that they are cut at oblique angles by vertical planes which are perpendicular to the axis of the platen 29, and branches of levers of each group cross branches of other levers of the group, and the upwardly extending arms of some of the levers at each side of the system are inclined inward so that the width of the system at the upper ends of those arms is less than its width at the keyboard, and approximately equal to the width of the set of type bars, the upper end of each of the upwardly extending arms being directly or almost directly in front of the type bar arm to which it is connected and between planes that cut the bearings of the key lever and are perpendicular to its pivotal axis. It will be seen that the lateral branches of several levers at each side of the system all project toward the middle thereof, whereas each of the other levers has branches that project both toward and from the middle, or else to opposite sides of the middle, of the system. The relation of the fulcrums 7 to the key heads of the levers is such that when any key is depressed to its lowest position it crosses the horizontal plane that contains the axis of the fulcrum of the lever, the elevations of the fulcrums varying to the same extent as do the elevations of the key-heads of the different banks. Combs 30 and 31 (Fig. 2) through which the key levers pass, keep them from working to the right or left of their proper positions, and render it unnecessary to put spacing sleeves or other similar devices on the fulcrums between the branches of the levers. The front arms of the levers rest on restoring springs 32, which are attached to a cross bar 33, the levers being normally held by these springs in contact with a padded stop 34 (Fig. 2).

The arrangement of the branches of three of the levers which are mounted on the uppermost fulcrum is especially illustrated in Fig. 4, which shows fragments of the levers which actuate the type bars that write the characters: 9, -- and \*.

It is to be understood that the invention might be embodied in mechanism differing

more or less in details of construction and arrangement of parts from that shown and specifically described herein.

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

1. In a typewriting machine, a system of key levers including levers having laterally projecting branches which are cut at oblique angles by vertical planes that are perpendicular to the axis of the platen, some of said branches crossing parts of other levers and all of the branches forming part of the means by which the levers that include them are pivotally supported in the machine, said system comprising groups of key levers and said groups having different fulcrums.

2. In a typewriting machine, a system of key levers including levers having laterally projecting branches which are cut at oblique angles by vertical planes that are perpendicular to the axis of the platen, some of said branches crossing parts of other levers and all of the branches forming part of the means by which the levers that include them are pivotally supported in the machine, said system comprising groups of key levers and said groups having fulcrums which are at different elevations.

3. In a typewriting machine, a system of key levers including levers having laterally projecting branches which are cut at oblique angles by vertical planes that are perpendicular to the axis of the platen, some of said branches crossing parts of other levers and all of the branches forming part of the means by which the levers that include them are pivotally supported in the machine, said system comprising four groups of key levers and said groups having four fulcrums.

4. In a typewriting machine, a system of key levers including levers having laterally projecting branches which are cut at oblique angles by vertical planes that are perpendicular to the axis of the platen, some of said branches crossing parts of other levers and all of the branches forming part of the means by which the levers that include them are pivotally supported in the machine, said system comprising four groups of key levers and said groups having four fulcrums which are at different elevations.

5. In a typewriting machine, a system of key levers including levers having laterally projecting branches which are cut at oblique angles by vertical planes that are perpendicular to the axis of the platen, some of said branches crossing parts of other levers and all of the branches forming part of the means by which the levers that include them are pivotally supported in the machine, said system comprising four groups of key levers and said groups hav-

ing four fulcrums which are at different elevations that vary to the same extent as do the elevations of the key heads in the keyboard.

6. In a typewriting machine, a system of key levers having branches that connect the other parts of the key levers with their bearing support, some of said branches extending to said support from one side thereof and others extending to it from the opposite side thereof.

7. In a typewriting machine, a system of key levers arranged in groups, each group having a separate fulcrum, said key levers having parts from which project branches that connect said parts with the fulcrums, some of said parts being at one side and the other at the opposite side of the fulcrums.

8. In a typewriting machine, a system of key levers arranged in four groups, each group having a separate fulcrum, the key levers of two of the groups having parts that cross the fulcrums at one side thereof, and the key levers of the two other groups having parts that cross the fulcrums at the other side thereof, and said key levers having branches that connect said parts with the fulcrums.

9. In a typewriting machine, a system of key levers arranged in groups, each group having a separate fulcrum and the fulcrums being at different elevations, the key levers of some of the groups having parts that extend in front of the fulcrums and have rearwardly projecting branches, and the other key levers having parts that extend behind the fulcrums and have forwardly projecting branches, the branches of each group extending to and being connected with the fulcrum of that group.

10. In a typewriting machine, a system of key levers arranged in four groups, each group having a separate fulcrum and the fulcrums being at different elevations, the key levers of two of the groups having parts that extend in front of the fulcrums and have rearwardly projecting branches, and the key levers of the other two groups having parts that extend behind the fulcrums and have forwardly projecting branches, the branches of each group extending to and being connected with the fulcrum of that group.

11. In a typewriting machine, a system of key levers arranged in four groups, each group having a separate fulcrum, the fulcrums being at different elevations, the key levers of two of the groups having parts that extend in front of the fulcrums and have rearwardly projecting branches, and the key levers of the other two groups having parts that extend behind the fulcrums and have forwardly projecting branches, the rearwardly projecting branches extending

to and being connected with fulcrums that are respectively above and below another fulcrum, and the forwardly projecting branches extending to and being connected with fulcrums that are respectively above and below another fulcrum.

12. In a typewriting machine, a system of key levers arranged in groups, each group having a separate fulcrum and including levers having branches which cross one another and by which the levers that include them are pivotally supported in the machine.

13. In a typewriting machine, a system of key levers including levers having laterally projecting branches and upwardly extending arms, each of these levers having two bearings, one of which is in a laterally projecting branch, said branches being cut at oblique angles by vertical planes, that are perpendicular to the axis of the platen and some of said branches crossing parts of other levers, the upper end of each of the upwardly extending arms being between planes that cut the bearings of the lever and that are perpendicular to its pivotal axis.

14. In a typewriting machine, a system of key levers arranged in groups, each group having a separate fulcrum and including levers having branches which cross one another, each of these levers having two bearings, one of which is in a laterally project-

ing branch, and having an upwardly extending arm, the upper end of each of these arms being between planes that cut the bearings of the lever and that are perpendicular to its pivotal axis.

15. In a typewriting machine, a system of key levers having upwardly extending arms, the width of the system at the upper ends of said arms being less than its width at the keyboard, each key lever having two bearings and the upper end of each of said arms being between planes that cut the bearings of the lever and that are perpendicular to its pivotal axis.

16. In a typewriting machine, a system of key levers having upwardly extending arms, several levers at each side of the system having inwardly projecting lateral branches, each of these levers having two bearings, one of which is in a lateral branch, and the upper end of the upwardly extending arm of each of these several levers being between planes that cut the bearings of the lever and are perpendicular to its pivotal axis.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 11th day of January A. D. 1912.

DANIEL A. CARPENTER.

Witnesses:

M. F. HANNWEBER,  
CHARLES E. SMITH.