

1,057,802.

D. A. CARPENTER.
TYPE WRITING MACHINE.
APPLICATION FILED NOV. 10, 1910.

Patented Apr. 1, 1913.
5 SHEETS—SHEET 1.

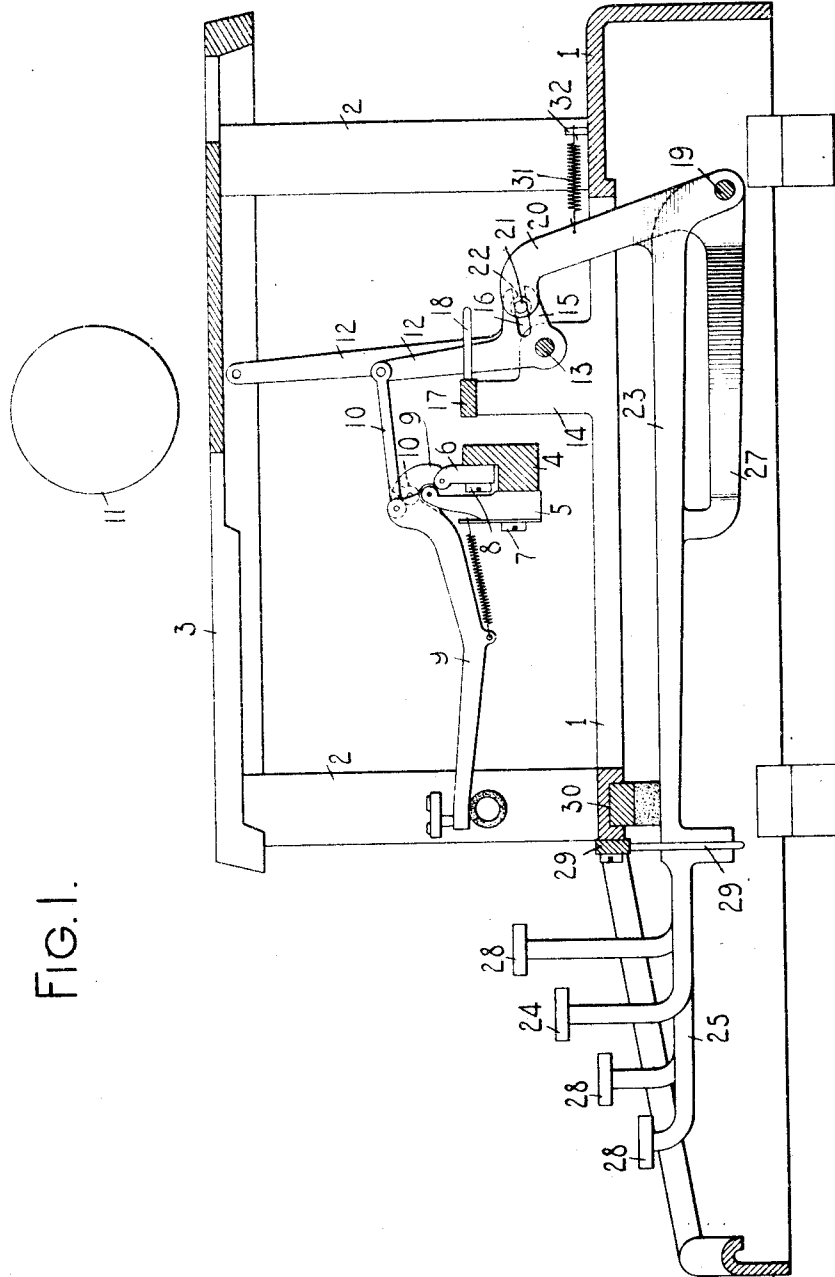


FIG. 1.

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5 SHEETS—SHEET 3.

FIG. 3.

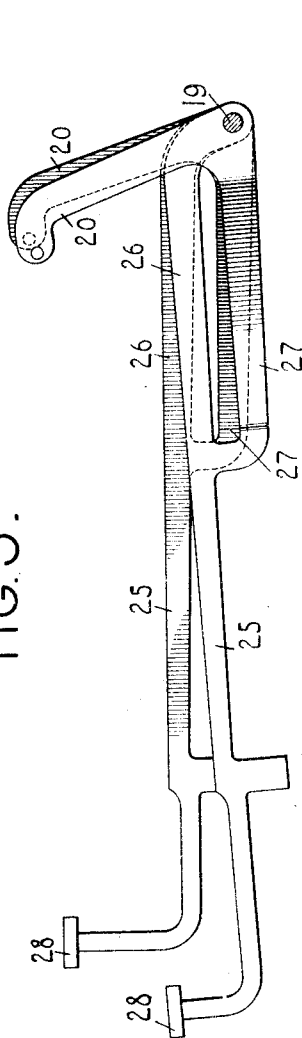


FIG. 4.

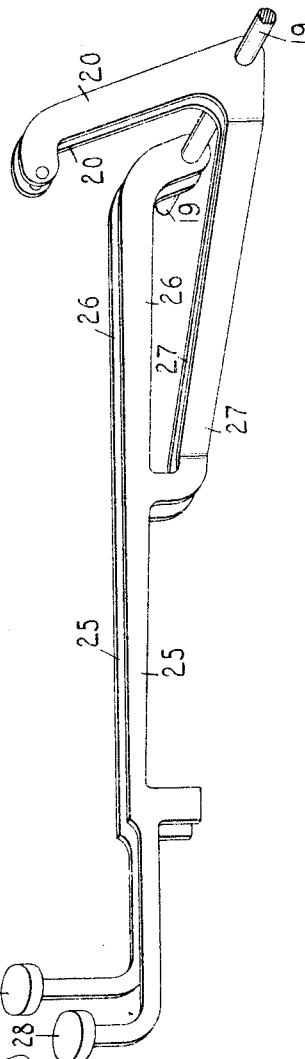
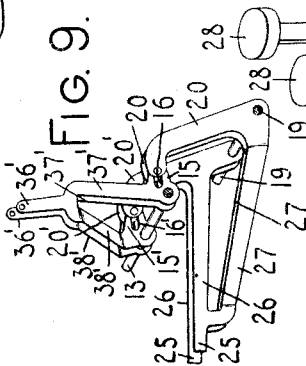


FIG. 9.



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6 SHEETS—SHEET 4.

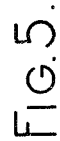


Fig. 7.

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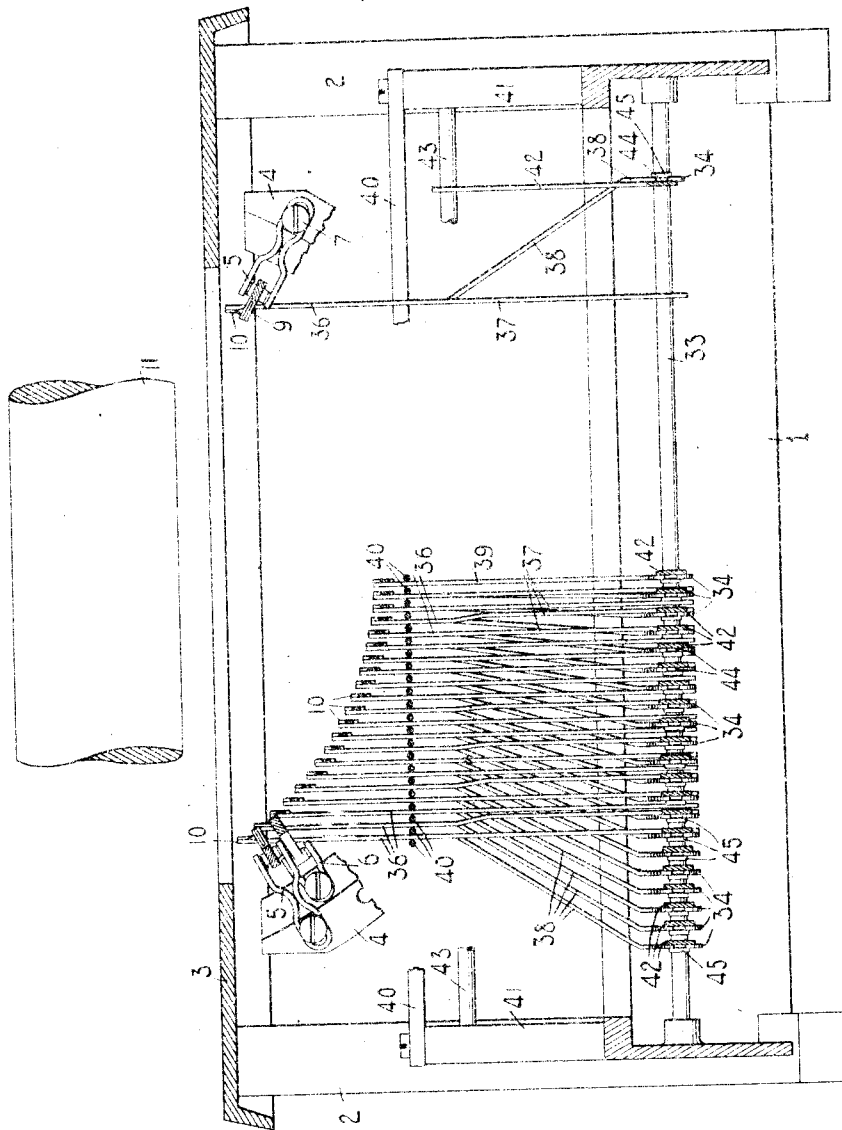
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5 SHEETS-SHEET 5.

FIG. 6.



WITNESSES:

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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.

1,057,802.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed November 10, 1910. Serial No. 591,694.

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.

This invention relates particularly to improvements in type bar actuating mechanism which comprises a system of key levers and a system of sub-levers, the sub-levers being connected with the type bars of a system whose width is less than that of the system of key levers, but the invention also relates to improvements in the construction *per se* of a system of key levers, or a system of sub-levers, forming part of type bar actuating mechanism.

The object of the invention is to embody in such mechanism means which will prevent the development of serious torsional strains in either system of levers when the type bars are operated.

On the accompanying sheets of drawings, which illustrate the invention embodied in structures of three forms, and on which like reference numerals designate like parts in different views, Figure 1 is a side and sectional elevation of parts of a typewriting machine that contains the invention; Fig. 2, a plan of parts of the frame and of the system of key levers of this machine; Fig. 3, a side elevation of two of the key levers, one of the keys being shown depressed; Fig. 4, a perspective view of these two key levers, shown in their normal positions; Fig. 5, a side and sectional elevation of parts of another machine that contains the invention; Fig. 6, a front elevation of parts of the frame, platen, system of sub-levers and system of type bars of this machine; Fig. 7, a side elevation of two of the sub-levers of this machine; Fig. 8, a perspective view of these two sub-levers; and Fig. 9, a perspective illustrating a modification of the two structures represented by the other views.

The parts which each of these machines contains and which are not shown herein may be like parts of the well known Monarch typewriting machine. In the frame of each of these machines, which comprises

the base 1, posts 2 and top plate 3, is mounted the shifting segment 4, to which are attached two sets of hangers in which the type bars are pivoted, the hangers 5 and 6 being fastened to the segment by screws 7 and 8, and to each type bar 9 is pivoted a rearwardly extending link 10 whereby the type bar can be turned on its pivotal axis until one of the type strikes the platen 11. The construction and operation of this mechanism will be readily understood by persons who are familiar with the Monarch machine, which contains substantially the same mechanism.

The links 10 of the machine which is represented by Figs. 1 *et seq.* to 4 inclusive are pivoted at their rear ends to sub-levers 12, which are mounted on a rod 13 which forms the fulcrum of the sub-levers and which is supported by uprights 14, formed on the sides of the base 1 of the frame. Each of these sub-levers has an arm 15 in which is a slot 16. The sub-levers 12 are parallel, and fit loosely between teeth of a comb 17 which is fastened on the uprights 14, the teeth 18 of the comb forming keepers and guides for the sub-levers. The key levers of this machine are mounted on a fulcrum rod 19, each key lever having a short arm 20 which extends upward from the rod 19 to the arm 15 of a sub-lever, and on which, at its upper end, is a roller 21 that fits loosely in the slot 16 of the sub-lever, the roller being mounted on a pin having a head 22 which crosses the slot 16 and helps to confine the roller in the slot. The arms are parallel. Each of the two central key levers of the system is composed of a short arm 20, and a long arm 23 (Figs. 1 and 2) which extends from the rod 19 to the key board and on which at its front end is a key head 24, the right and left sides or faces of one arm of the key lever being in planes that also contain the right and left faces of the other arm. Each of the other key levers of the system is composed of a short arm 20, and a long forked arm which includes a part 25 and branches 26 and 27 and which extends from the rod 19 to the key board and on which at its front end is a key head 28, the arm 20 being formed on or affixed to the branch 27, and both branches bearing on the fulcrum rod 19. The branches 27 extend

downward from the parts 25 and branches 26, and thence inward and backward to the rod 19, near which the lateral faces of the branches 27 are in planes that cut the rod at right angles, and the branches 26 extend backward above the branches 27, from the parts 25 nearly to the rear ends of the long arms of the levers, and then downward to the rod 19.

A few of the branches 26 are bent at their front ends to make them clear branches 27 and arms 20 of the levers near the rod 19, whereas each of the other branches 26, and the part 25 of the lever which includes that branch, have their lateral faces in the same planes. The branches 27 of the key levers which are on the left of the two central levers project to the right from the parts 25, while the branches of the key levers which are on the right of the central levers project to the left from the parts 25. Some of the branches 27, it will be seen, extend under and across several branches 26 of the other key levers, as well as under and across several sub-levers. The parts 25 of the forked key levers and the arms 23 of the central levers are parallel and pass through a comb 29 which is affixed to the cross bar 30 of the frame. Restoring springs 31, attached to the arms 20 and to fixed pins 32, tend to keep the key levers in their normal positions. The branches 27 are far enough below the branches 26 so that when any key is depressed none of the branches 27 will interfere with the action of the key lever, which will transmit motion to the sub-lever with which it is connected and by which the proper type bar will be actuated.

The links 10 of the machine represented by Figs. 5 to 8 inclusive are connected at their rear ends to sub-levers which are mounted on a fulcrum rod 33 whose ends are affixed to the sides of the base 1. Each of these sub-levers includes a short forwardly extending arm 34 and a long upwardly extending arm, the arm 34 containing a slot 35. The long arm of each of the sub-levers of the system, except the two central levers, is composed of a part 36 and a fork having branches 37 and 38, both of which branches bear on the fulcrum rod 33. The lower ends of the branches 37 are directly under, or almost directly under, the forks, a few of these branches being bent slightly to make them clear branches 38 of other levers, whereas the branches 38 project laterally from the parts 36 and branches 37, some of the branches 38 extending behind and across several of the branches 27. The short arms 34 of these forked levers are formed on the branches 38. One of the two central sub-levers, which are duplicates, is the short sub-lever of which side elevation is shown in Fig. 5. This

lever, the front of which is shown in Fig. 6, has the long arm 39 whose lateral faces are in the vertical planes that contain the lateral faces of the short arm 34 of the lever. The branches 38 of the forked levers which are on the left of the two central levers project to the left from the parts 36, and the branches 38 of the forked levers which are on the right of the two central levers project to the right from the parts 36. The branches 38 which extend behind branches 37 of other levers are far enough away from the latter branches to enable any lever to do its work without striking another lever. The relations to one another of two adjacent forked levers, when one is in its normal position and the other in the position which it takes when its upper end reaches the limit of its backward movement, are illustrated in Fig. 7. The parts 36 of the forked levers and the arms 39 of the two central sub-levers pass through a comb 40 which is attached to posts 41 that are affixed to the base 1.

The key levers 42 of the machine illustrated in Figs. 5 and 6, are mounted on a fulcrum rod 43 which is fastened at its ends to the posts 41, each of these key levers extending backward from the key board to the system of sub-levers and upward to the fulcrum rod. On the key levers are rollers 44 which fit and work in the slots 35 in the arms 34 of the sub-levers, the pins on which these rollers are mounted having heads 45 which cross the slots 35 and help to keep the rollers in the slots. The key levers pass through a comb 29 which is fastened to the cross bar 30 of the frame, and restoring springs 46, attached to pins formed on a fixed bar 47 and to the key levers, tend to keep these levers in their normal positions. It will be understood that when the key head of any of the key levers 42 is depressed the roller 44 mounted on the key lever will force upward the arm 34 of the sub-lever with which it is connected and the proper type bar will be operated.

From Fig. 9 and the foregoing description it will be understood that a system of key levers having branches 26 and 27 and arms 20 and having other similar arms 20' formed on the branches 26, can be combined with a system of sub-levers having parts 36', branches 37' and 38' and arms 15', and having other similar arms 15' formed on the branches 38', each key lever having two rollers mounted on its arms 20 and 20' and fitting in the slots 16 and 16' in the two short arms of a sub-lever. The branches 38' of the sub-levers which are on the left of the central sub-levers will extend toward the left of the machine, and the branches 38' of the sub-levers which are on the right of the central sub-levers will extend toward the right of the machine.

The invention could also be embodied in various other modifications of the structures which are shown herein.

It is evident that key levers having some or all of the peculiar characteristics of the key levers above described might be embodied in machines not containing sub-levers, such for example as well known under-stroke machines, and some forms of visible writing machines, and that sub-levers like those above described might be used when not combined with key levers. For this reason, and the further reason that these systems of key levers and sub-levers appear to be novel, they are claimed separately as well as in combination with other levers.

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

1. In a typewriting machine, the combination of a system of key levers and a system of sub-levers, one of said systems including levers having laterally projecting branches which are cut at oblique angles by vertical planes that are perpendicular to the axis of the platen, said branches crossing levers of the other system from side to side and being connected with levers of the other system, some of said branches projecting toward the right and others toward the left side of the machine, and all of them forming part of the means by which the levers that include them are pivotally supported in the machine.

2. In a typewriting machine, the combination of a system of key levers and a system of sub-levers, one of said systems including forked levers having branches which cross levers of the other system from side to side and with which levers of the other system are connected, some of said branches projecting toward the right and others toward the left side of the machine, and all of them forming part of the means by which the levers that include them are pivotally supported in the machine.

3. In a typewriting machine, the combination of a system of key levers and a system of sub-levers, one of said systems including levers having a common fulcrum and laterally projecting branches which cross levers of the other system from side to side and with which levers of the other system are connected, some of said branches projecting toward the right and others toward the left side of the machine, and all of them forming part of the means by which the levers that include them are pivotally supported in the machine.

4. In a typewriting machine, the combination of a system of key levers and a system of sub-levers, one of said systems including forked levers having a common fulcrum extending through the branches of the forks, one of the branches of each fork diverging laterally from the other and being

connected to a lever of the other system, and the branches of each of the forks, except some which are near the middle of the system, being farther apart where they rest on said fulcrum than are the levers of the other system.

5. In a typewriting machine, the combination of a system of key levers and a system of sub-levers, each of said systems including levers having laterally projecting branches which are cut at oblique angles by vertical planes that are perpendicular to the axis of the platen, said branches crossing parts of levers of the other system, some of said branches projecting toward the right and others toward the left side of the machine, and all of them forming part of the means by which the levers that include them are pivotally supported in the machine.

6. In a typewriting machine, the combination of a system of key levers and a system of sub-levers, each of said systems including forked levers having laterally projecting branches which cross branches of other levers of the system from side to side, the branches of each forked key lever bearing on the fulcrum of the key lever and being connected with the branches of a forked sub-lever, and the branches of each forked sub-lever bearing on the fulcrum of the sub-lever.

7. In a typewriting machine, the combination of a system of key levers and a system of sub-levers, the former system including levers which have inwardly projecting branches that cross parts of other key levers and are connected with levers of the other system, each of the key levers which have said branches having two bearings on the fulcrum of the lever, some of these key levers being on the right and others being on the left of the middle of the system, and all of said branches forming part of the means by which the key levers that include them are pivotally supported in the machine.

8. In a typewriting machine, the combination of a system of key levers and a system of sub-levers, the former system including levers which have a common fulcrum and inwardly projecting branches that cross parts of other key levers and bear on said fulcrum and are connected with levers of the other system, the key levers which have said branches having other parts which also bear on said fulcrum, and some of these key levers being on the right and others being on the left of the middle of the system.

9. In a typewriting machine, the combination of a system of key levers and a system of sub-levers, the former system including levers which have inwardly projecting branches that extend underneath parts of other key levers and from side to side thereof and are connected with levers of the other system, some of the key levers which

have said branches being on the right and others being on the left of the middle of the system, and all of said branches forming part of the means by which the key levers that include them are pivotally supported in the machine.

10. In a typewriting machine, the combination of a system of key levers and a system of sub-levers, the former system including levers which have a common fulcrum and inwardly projecting branches that extend underneath parts of other key levers and from side to side thereof and which bear on said fulcrum and are connected with levers of the other system, some of the key levers which have said branches being on the right and others being on the left of the middle of the system.

11. In a typewriting machine, the combination of a system of key levers and a system of sub-levers, the former system including levers which have a common fulcrum and inwardly projecting branches that cross parts of other key levers and bear on said fulcrum and have extensions that form arms of the levers and are connected with levers of the other system, some of the key levers which have said branches being on the right and others being on the left of the middle of the system.

12. In a typewriting machine, the combination of a system of key levers and a system of sub-levers, the former system including levers which have a common fulcrum and inwardly projecting branches that extend underneath parts of other key levers and from side to side thereof and which bear on said fulcrum and have extensions that form arms of the levers and are connected with levers of the other system, some of the key levers which have said branches being on the right and others being on the left of the middle of the system.

13. In a typewriting machine, the combination of a system of key levers and a system of sub-levers, the latter system including levers which have outwardly projecting branches that cross parts of other sub-levers and are connected with levers of the other system, some of the sub-levers which have said branches being on the right and others being on the left of the middle of the system, and all of said branches forming part of the means by which the sub-levers that include them are pivotally supported in the machine.

14. In a typewriting machine, the combination of a system of key levers and a system of sub-levers, the latter system including levers which have a common fulcrum and outwardly projecting branches that cross parts of other sub-levers and bear on said fulcrum and are connected with levers of the other system, some of the sub-levers which have said branches being on the right

and others being on the left of the middle of the system.

15. In a typewriting machine, the combination of a system of key levers and a system of sub-levers, the latter system including levers which have a common fulcrum and outwardly projecting branches that cross parts of other sub-levers and bear on said fulcrum and have extensions that form arms of the levers and are connected with levers of the other system, some of the sub-levers which have said branches being on the right and others being on the left of the middle of the system.

16. In a typewriting machine, the combination of a system of key-levers and a system of sub-levers, the latter system including forked levers having a common fulcrum extending through the branches of the forks, one of the branches of each fork diverging laterally from the other and being connected to a lever of the other system, and the branches of each of the forks, except some which are near the middle of the system, being farther apart where they rest on said fulcrum than are the levers of the other system.

17. In a typewriting machine, the combination of a system of 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, said branches crossing parts of other levers from side to side, some of said branches projecting toward the right and others toward the left side of the machine, and all of them forming part of the means by which the levers that include them are pivotally supported in the machine, and the levers which have said branches also having arms which are extensions of said branches.

18. In a typewriting machine, a system of key levers including levers having a common pivotal axis and 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 co-axial levers and all of the branches forming part of the means by which the levers that include them are pivotally supported in the machine.

19. In a typewriting machine, a system of key levers including forked levers having a common fulcrum on which the branches of the forks bear, some of said branches crossing parts of the forks of other levers.

20. In a typewriting machine, a system of key levers having a common fulcrum, said system including forked key levers whose branches all bear on said fulcrum, some of said branches crossing parts of the forks of other key levers.

21. In a typewriting machine, a system of key levers including levers having forks whose branches form part of the means by

which the forked levers are pivotally supported in the machine, the branches of each fork springing from the front part of the lever and extending from that part to the
5 fulcrum.

22. In a typewriting machine, a system of key levers including forked levers having a common fulcrum on which the branches of the forks bear, some of said branches
10 crossing parts of the forks of other levers, and each of said forked levers having an upwardly extending part adapted to be connected with a type bar.

23. In a typewriting machine, a system of
15 sub-levers including levers having laterally projecting branches which all lie side by side and are cut at oblique angles by vertical planes that are perpendicular to the axis of the platen, some of said branches
20 crossing parts of other levers and all of the branches forming part of the means by which the sub-levers that include them are pivotally supported in the machine.

24. In a typewriting machine, a system of
25 sub-levers including forked levers having a common fulcrum on which the branches of the forks bear, some of said branches crossing parts of the forks of other sub-levers.

30 25. In a typewriting machine, a system of

sub-levers having a common fulcrum, said system including forked sub-levers whose branches all bear on said fulcrum, some of said branches crossing parts of the forks
35 of other sub-levers.

26. In a typewriting machine, a system of sub-levers including levers having forks whose branches form part of the means by which the forked levers are pivotally supported in the machine, the branches of each
40 fork springing from the upper part of the lever and extending from that part to the fulcrum.

27. In a typewriting machine, a system of sub-levers including forked levers having a
45 common fulcrum on which the branches of the forks bear, some of said branches crossing parts of the forks of other levers and each of said forked levers having a horizontally extending part adapted to be connected
50 with a key actuated device.

Signed at the borough of Manhattan, city of New York, in the county of New York and State of New York, this 9th day of Nov., A. D. 1910.

DANIEL A. CARPENTER.

Witnesses:

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M. F. HANNWEBER.

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