

(No Model.)

2 Sheets—Sheet 1.

A. W. STEIGER.
TYPE WRITING MACHINE.

No. 461,553.

Patented Oct. 20, 1891.

Fig. 1.

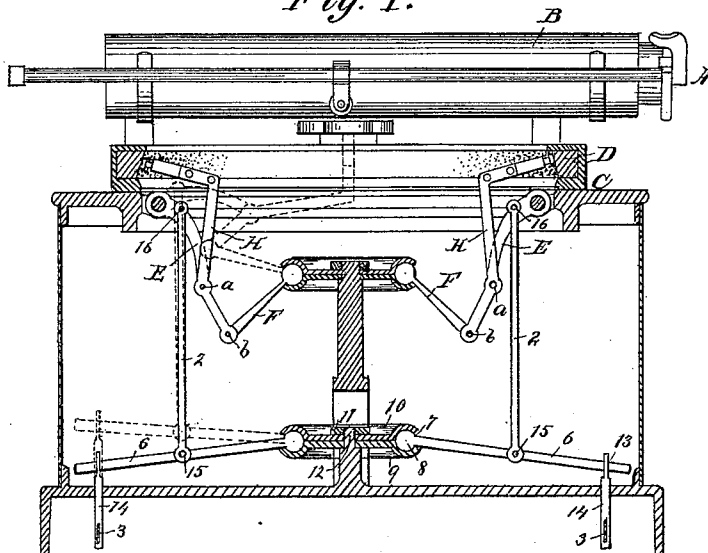
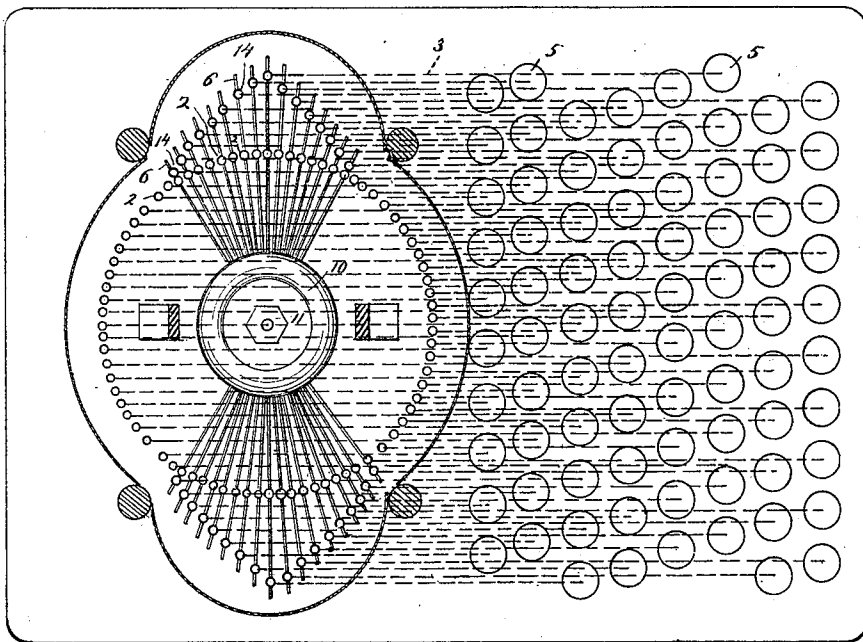


Fig. 2.



Attest:

M. E. Rees.

Martin Rees

Inventor:

Andrew W. Steiger

By Jacob Falbel

Atty:

(No Model.)

2 Sheets—Sheet 2.

A. W. STEIGER.
TYPE WRITING MACHINE.

No. 461,553.

Patented Oct. 20, 1891.

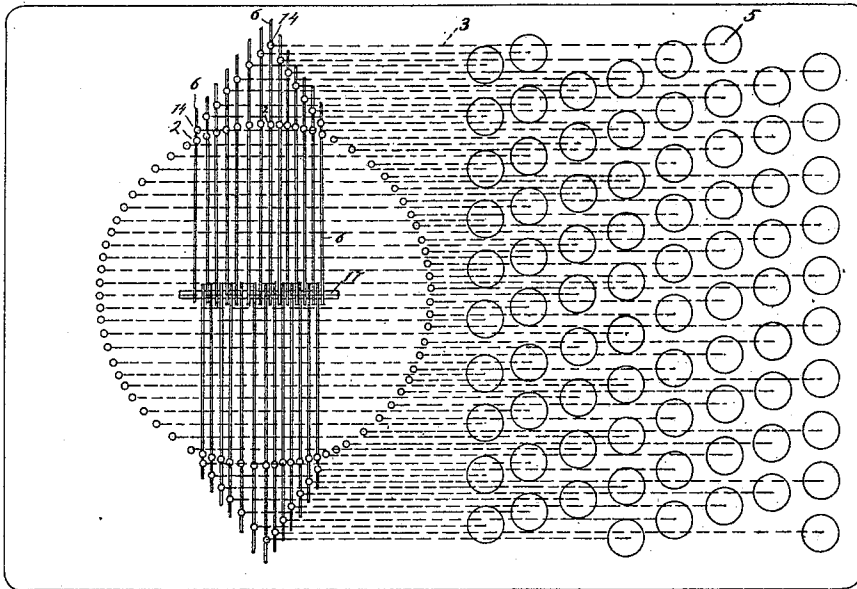


Fig. 5.

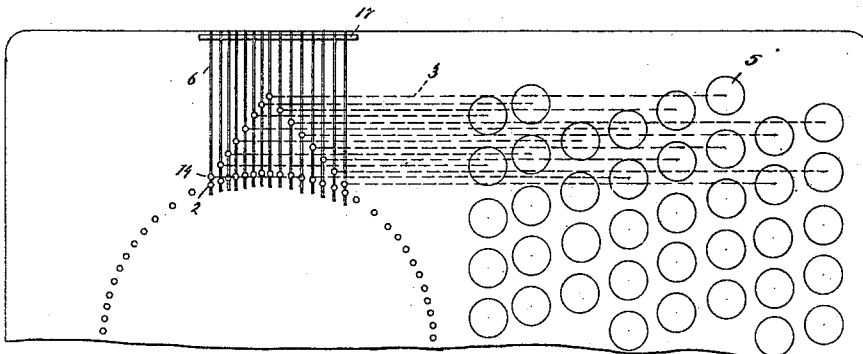


Fig. 4.

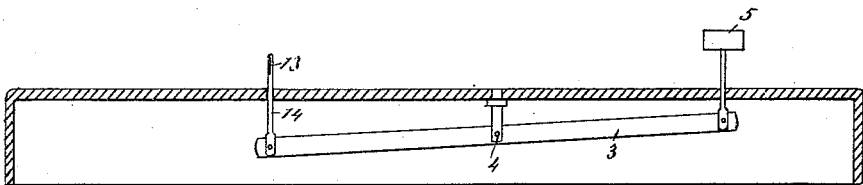


Fig. 5.

Attest:
M. E. Lee.
Martin Gayden.

Inventor:
Andrew W. Steiger
By Jacob Fellbel
Att'y:

UNITED STATES PATENT OFFICE.

ANDREW W. STEIGER, OF NEW YORK, N. Y., ASSIGNOR TO THE YOST
WRITING MACHINE COMPANY, OF NEW YORK.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 461,553, dated October 20, 1891.

Application filed May 6, 1889. Serial No. 309,683. (No model.)

To all whom it may concern:

Be it known that I, ANDREW W. STEIGER, a citizen of the United States, and a resident of New York city, 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 in type-writing machines has for its main object to provide what is known as "straight stringing"—that is to say, a machine in which the key-levers are arranged side by side and parallel and in which the rods which connect the key-levers with the type-carriers are arranged in vertical planes or perpendicular to the key-levers or the bed or base of the machine; and my invention consists in combining sub-levers with certain of the key-levers and connecting-rods, all as will be hereinafter more fully described, and particularly pointed out in the appended claims.

In the drawings accompanying this specification, Figure 1 is a central vertical section of a portion of a type-writing machine embodying my invention. Fig. 2 is a plan view, partly in section, taken above the bed-plate and sub-levers to show more clearly the construction and arrangement of the parts involving my invention. Fig. 3 is a plan view of one modification of my invention. Fig. 4 is a similar view of another modification. Fig. 5 is a vertical section through the bed, showing a finger-key, key-lever, and the coupling used between the key or main lever and its sub-lever.

In the several views the same part will be found designated by the same letter or numeral of reference.

A denotes the paper-carriage, having, as usual, a cylindrical platen B.

C is a top plate supporting an inking-pad D.

E is a link or lever pivoted to the top plate.

F is another link or lever pivoted to a standard at the center of the bed-plate G.

H is a type bar or carrier, to which are pivoted at *a* and *b*, respectively, the links E and F. The links E extend all around the circular top plate, and in practice the machine is provided with as many such links or levers as there are finger-keys and key-levers.

2 2 represent vertically-arranged connect-

ing-rods, which are disposed in a circle, as shown particularly at Figs. 2 and 3.

3 3 represent the key-levers, arranged beneath the bed plate and parallel to each other.

4 denotes the pivot or fulcrum of the key-lever, the outer or forward end of which is provided with a finger-key or head 5.

In the machine represented there are eighty key-levers 3 3 and eighty connecting-rods 2 2. The connecting-rods being arranged in a circle and the key-levers in equidistant and parallel lines, some of the key-levers on the right and some on the left must be located in planes wholly exterior to the circle occupied by the connecting-rods, for it will be seen that the connecting-rods on the right and on the left hand side of the machine occupy so nearly the same vertical longitudinal planes that it is impossible to arrange their respective key-levers directly opposite or in line.

In order to connect the levers which lie outside of the series of connecting-rods with their respective connecting-rods some form of lateral offset or cross connection must be provided. For this purpose I employ a series of sub-levers. Referring particularly to Figs. 1 and 2, the sub-levers designated by the numeral 6 are of different lengths and are radially arranged. The inner ends of these sub-levers 6 6 are fulcrumed at 7 7 in a stand or bracket upon the bed-plate. The fulcrum ends of the sub-levers are preferably formed with round disks 8, which are set edgewise between two annular grooved plates 9 and 10, the former serving as a support for the sub-lever ends and the latter as a cover therefor to prevent accidental displacement. The cover 10 is preferably secured in place by a nut 11, screwed onto a threaded shank 12, projecting through the centers of the plates 9 and 10. The outer ends of the sub-levers are passed through elongated eyes 13 in couplings 14, which extend vertically through the base-plate and connect at their lower ends to the rear ends of those key-levers which lie outside the circle of connecting-rods. Between the ends of each sub-lever is connected, as at 15, the lower end of one connecting-rod 2, whose upper end is connected to the link or lever E, as at 16. At Fig. 2 the sub-levers are made of different lengths and are radi-

ally arranged. This construction and arrangement of the sub-levers I deem preferable, and in practice the machines are made in this manner.

5 The operation will be readily understood. A depression of the finger-key 5 will elevate the rear end of the key-lever 3, which will lift the coupling 14. The coupling is guided in a hole in the bed-plate, and as it rises lifts
10 the outer end of the sub-lever 6 and vibrates it about its fulcrum or pivot, as shown by the dotted lines at Fig. 1. During the ascent of the sub-lever the connecting-rod is pushed up by it and the links E and F are vibrated in
15 opposite directions and the type *c* at the end of the type-carrier is brought to the printing-point and caused to make its impression on the paper on the platen. When the pressure is released, the parts return to first position
20 by gravity; but, if desired, a spring suitably located may be provided for assisting the parts back to their initial positions.

Instead of the specific type-moving devices shown, the links or levers E may be made
25 longer and provided with type, as in machines in common use.

In the modification shown at Fig. 3 the sub-levers 6 are pivoted or fulcrumed upon a common straight bar or pin 17, running longitudinally of the machine and arranged in the center of the circle described by the connecting-rods. These sub-levers extend outwardly from each side of the common pivot in parallel lines beyond the series of connecting-rods.
30 The connecting-rods on the right and on the left are connected to the sub-levers after the manner illustrated at Fig. 1, and the free ends of the sub-levers are by means of vertical couplings or links 14 connected to the key-levers 3 beneath the bed-plate.
40

In the modification shown at Fig. 4 the sub-levers are pivoted or fulcrumed upon a common pivot 17, as in Fig. 3, but are arranged exteriorly of the circle formed by the series
45 of connecting-rods. These sub-levers are connected to the key-levers in the manner explained of the others. In Figs. 1, 2, and 3 the sub-levers are levers of the second kind or order, and in Fig. 4 the sub-levers are levers
50 of the third kind or order. In each case the sub-levers are preferably mounted or arranged above the bed or base plate.

In practice usually from ten to twenty sub-levers on each side will be required, according to the diameter of the circle formed by the connecting-rods and the distance apart of the key-levers. All of the remaining key-levers, it will be observed, may run directly to their respective connecting-rods, as indicated at Figs. 2 and 3 by the parallel dotted lines, which represent the key-levers.
60

By my invention, the connections being made in the form of levers, (which readily turn upon their pivots or fulcrums,) the force
65 applied to the finger-keys is freely transmitted through the sub or auxiliary levers to the connecting-rods, and so easily that in the op-

eration of the machine the difference in touch between the key-levers not connected to sub-levers and those connected thereto is wholly
70 imperceptible to the operator.

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

1. In a type-writing machine, the combination, with type bars or carriers, of vertical
75 connecting-rods arranged in a circle, horizontally-arranged parallel key-levers extending on each side beyond the circle of vertical connecting-rods, horizontally-arranged sub-levers connected to the side connecting-rods
80 and extending laterally and connected to those key-levers which lie beyond the circle of vertical connecting-rods, substantially as set forth.

2. In a type-writing machine, the combination, with type bars or carriers, of vertical
85 connecting-rods arranged in a circle, horizontally-arranged parallel key-levers extending on each side beyond the circle of vertical connecting-rods, horizontally-arranged sub-levers fulcrumed centrally of the machine
90 and extending laterally outward on each side beyond the circle of vertical connecting-rods and connected each at one point to one of the side connecting-rods and at another point
95 to one of those key-levers which lie beyond the circle of connecting-rods, substantially as set forth.

3. In a type-writing machine, the combination, with type bars or carriers, of vertical
100 connecting-rods arranged in a circle, horizontally-arranged parallel key-levers extending on each side beyond the circle of vertical connecting-rods, horizontally-arranged sub-levers fulcrumed centrally of the machine and
105 radiating outward on each side beyond the circle of vertical connecting-rods and connected each at one point to one of the side connecting-rods and at another point by means of a vertical coupling to one of those
110 key-levers which lie beyond the circle of connecting-rods, substantially as set forth.

4. In a type-writing machine comprising a series of type-lever devices and vertical thrust or connecting rods therefor, all in circular arrangement, the combination, with those connecting-rods which are at the transverse portion of their circle of arrangement, of levers suitably fulcrumed and having an engagement for a lever action with the lower
120 ends of said connecting-rods and suitably transversely extended from such engagement, and the key-levers arranged longitudinally and at desired distances apart, connecting, respectively, with said transversely-extended
125 levers.

Signed at New York city, in the county of New York and State of New York, this 15th day of December, A. D. 1888.

ANDREW W. STEIGER.

Witnesses:

JACOB FELBEL,
THOS. B. CLIFFORD.