

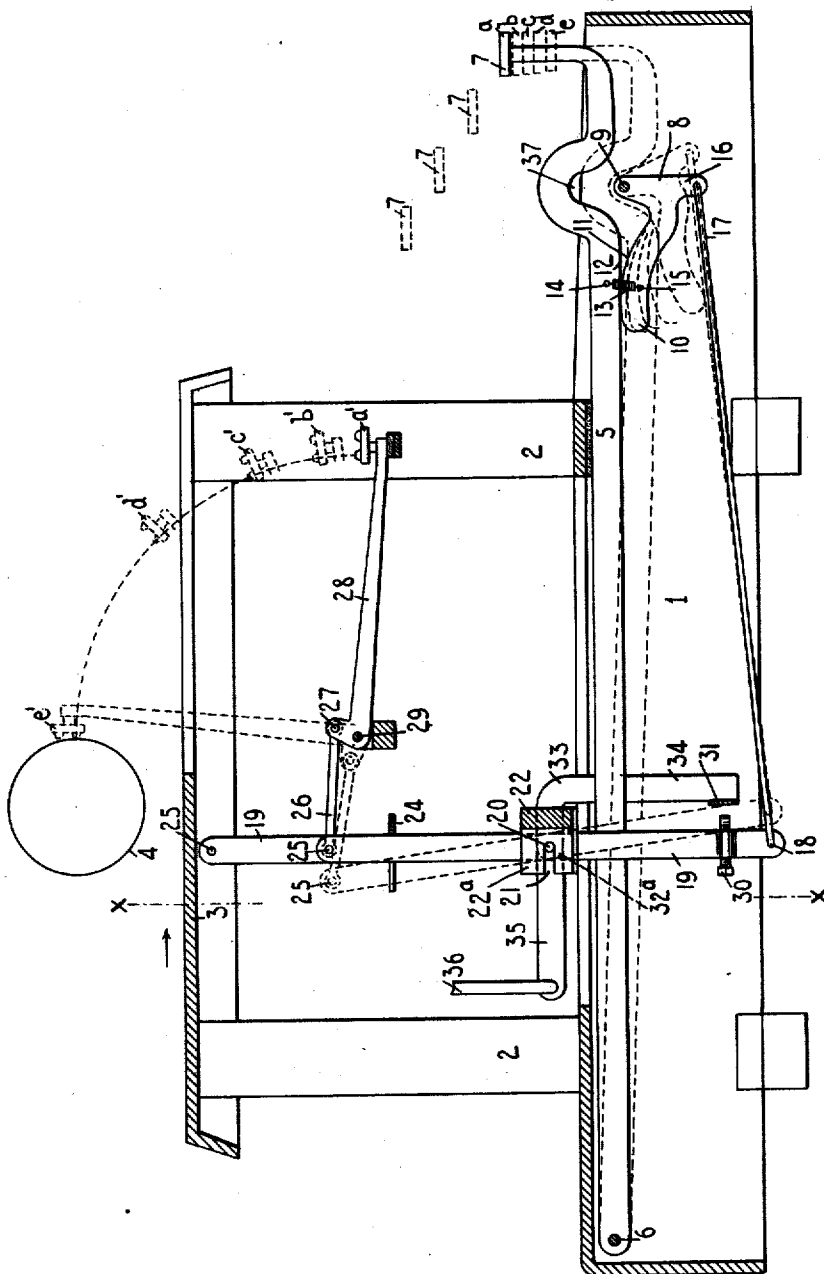
1,012,168.

G. A. SEIB.
TYPE WRITING MACHINE.
APPLICATION FILED MAR. 18, 1911.

Patented Dec. 19, 1911.

2 SHEETS—SHEET 1.

FIG. 1.



WITNESSES:

M. F. Hanniker
Wm. E. Smith

INVENTOR:

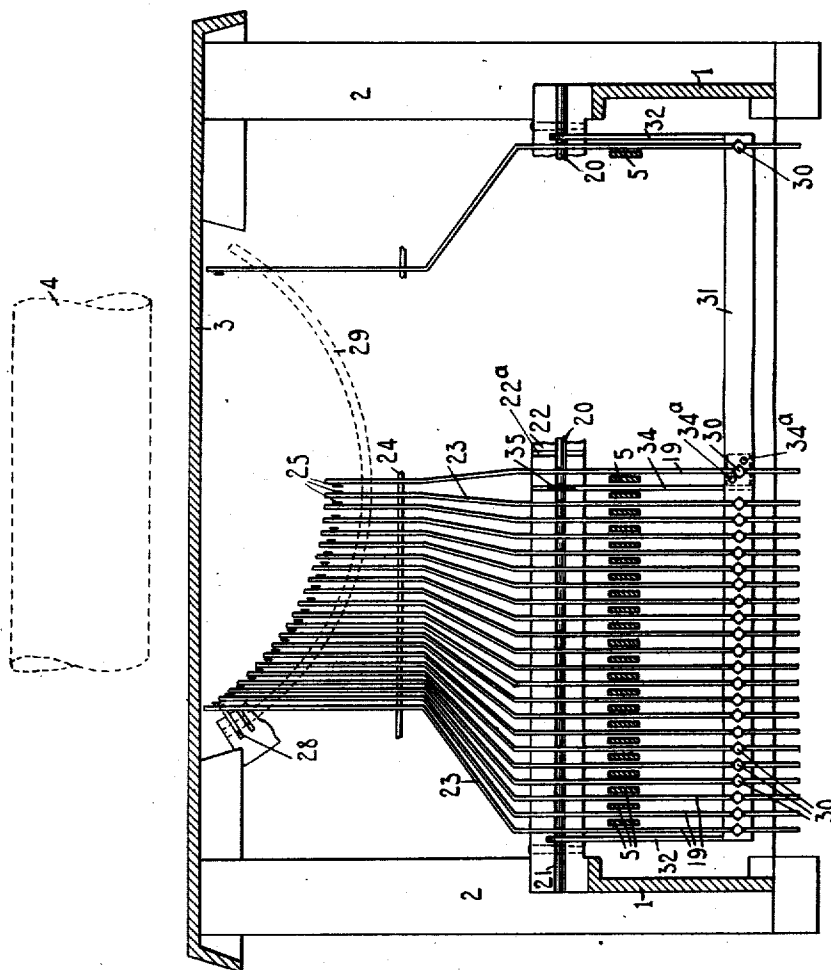
George A. Seib
By Jacob F. Felt
HIS ATTORNEY

1,012,168.

G. A. SEIB.
TYPE WRITING MACHINE.
APPLICATION FILED MAR. 16, 1911.

Patented Dec. 19, 1911.
2 SHEETS-SHEET 2.

FIG. 2.



WITNESSES:

M. L. Hammer
Charles Smith

INVENTOR:

George A. Seib
For James Seib

HIS ATTORNEY

UNITED STATES PATENT OFFICE.

GEORGE A. SEIB, OF ILION, NEW YORK, ASSIGNOR TO UNION TYPEWRITER COMPANY,
OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

1,012,168.

Specification of Letters Patent.

Patented Dec. 19, 1911.

Application filed March 16, 1911. Serial No. 614,907.

To all whom it may concern:

Be it known that I, GEORGE A. SEIB, citizen of the United States, and resident of Ilion, in the county of Herkimer 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 particularly to type actions.

The main object of my present invention, generally stated, is to provide an easy operating type action which affords an extremely light "touch" at the first part of the key depression, and in which the movement of the type bar is gradually accelerated as it approaches the printing position.

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

In the accompanying drawings wherein like reference characters indicate corresponding parts in the various views, Figure 1 is a vertical fore and aft central sectional view of one form of typewriting machine embodying my invention, only sufficient number of parts of the machine being shown to illustrate my invention in its embodiment therein. Fig. 2 is a transverse vertical sectional view of the machine taken on the line $x-x$ of Fig. 1 and looking in the direction of the arrow at said line; parts being omitted in this figure to avoid confusion.

I have illustrated my invention in the present instance embodied in a front-strike machine, although it should be understood that from certain aspects of the invention it is immaterial what style of typewriting machine the type actions are employed in.

The frame of the machine comprises a base 1, corner posts 2 and a top plate 3. A platen 4, diagrammatically illustrated in the drawings, is carried by a suitable carriage (not shown) mounted to move across the top plate from side to side of the machine. Key levers 5 of the second order are pivoted at their rear ends on a fixed pivot rod 6 and

are each provided with a finger key 7. Arranged beneath each key lever and in the plane thereof, is an angular sub-lever 8 fulcrumed on a fixed pivot rod 9 arranged beneath the system of key levers. The various sub-levers 8 are arranged at the forward part of the machine beneath the key board and are pivoted at their forward ends on the pivot rod 9. The sub-levers have rearwardly extending arms 10 each provided at its upper edge with a contact face 11 co-operative with a contact face 12 formed by the lower edge of the associated key lever. One of these contact faces 11 and 12 is curved to provide a rolling fulcrum or contact; the contact face 11 being so curved in the present instance. It will be understood from an inspection of Fig. 1 that a depression of the key lever causes the companion sub-lever 8 to be moved from the full to the dotted line positions and that the engagement between the contact faces 11 and 12 on the sub-lever and key lever, respectively, gradually recedes from the fulcrum 6 of the key lever and approaches the fulcrum 9 of the sub-lever. A contractile restoring spring 13 is connected at one end to a laterally projecting pin 14 on the key lever and at its opposite end to a laterally projecting pin 15 on the companion sub-lever 8 of each type action. A depending arm 16 on each sub-lever 8 is connected to the forward end of a substantially horizontally disposed pull link 17 arranged beneath the associated key lever 5 and sub-lever 8. The rear end of each pull link is pivotally connected at 18 to the lower end of an upright sub-lever 19 of the first order. These sub-levers 19 are fulcrumed on a pivot rod or wire 20 received in a groove 21 at the rear side of a bar 22 secured to the base of the machine and extending transversely of the machine above the system of key levers. These upright sub-levers 19 cross the key levers, each sub-lever extending between two adjacent key levers as shown in Fig. 2. The upright sub-levers 19 are gradually longer as the sides of the machine are approached, the upper ends of the sub-levers terminating in an arc. These sub-levers are received and work in guide slots 22^a in the bar 22,

and the sub-levers are bent inwardly as indicated at 23. The upper parallel end portions of the sub-levers are received in guide slots in a fixed guide bar 24, so that the upper ends of the sub-levers 19 are guided in their movements fore and aft of the machine. Each sub-lever 19 is provided with a laterally projecting pin 25 near the upper end thereof for cooperation with a forwardly extending pull link 26, which in turn is pivoted at its forward end as at 27 to the crank arm of an associated type bar 28. The type bars are segmentally arranged and are pivoted at 29 to move upwardly and rearwardly to strike against the front face of the platen 4.

The construction and arrangement of the parts are such that the arc formed by the upper ends of the sub-levers 19 is substantially co-extensive and parallel with the arc formed by the segmentally arranged system of type bars, and each sub-lever is connected through its pull link 26 with the associated type bar by a straight connection extending fore and aft of the machine. From an inspection of Fig. 2 it will be seen that the bends 23 in the sub-levers 19 compensate for the difference in width between the system of type bars and the system of key levers, and that there is a straight fore and aft pull exerted from the upper end portions of the sub-levers 19 on the respective type bars with which they are connected. The lower end of each sub-lever 19 is tapped to receive an adjustable screw 30 which extends beyond the sub-lever at its forward end and constitutes a contact which is cooperative with a substantially horizontally movable universal bar 31. This universal bar extends beneath the system of key levers and is connected at its ends with upwardly extending arms 32 (see Fig. 2) pivoted on the pivot rod 20. Arranged centrally of the universal bar is an angular lever 33 which has a depending arm 34 connected with the universal bar at 34^a. This angular lever is pivoted on the pivot rod 20 and has a rearwardly extending arm 35 connected by an upwardly extending link 36 with a suitable dog rocker of the escapement mechanism. It will be understood that the depending arms or links 32 which are connected to the universal bar at the ends thereof, and preferably are formed integral with said bar, are shaped as viewed from the side like the angular lever 33, except that they each terminate at 32^a and therefore have no rearwardly extending arm 35.

In the operation of the machine a depression of the finger key 7 is effective to depress the rearwardly extending arm 10 of the associated sub-lever 8, thereby pulling forward on the pull link 17. This movement is

effective to move the associated sub-lever 19 from the full to the dotted line position indicated in Fig. 1, and to move the companion type bar to the printing position. The first part of the key depression, to start the parts in motion, is effected by a light resilient "touch" and the movement of the type bar is gradually accelerated as it approaches the printing position. This, it is believed, will be clearly understood by a comparison of the different positions and indicated at *a*, *b*, *c*, *d* and *e* of the finger key as shown in Fig. 1, with the corresponding positions of the type bars indicated at *a'*, *b'*, *c'*, *d'* and *e'*. From this it will be seen that the first three-quarters of the depression of the key from *a* to *d* is required to move the type bar from the normal position through about one-half of its movement to the printing position; whereas it requires but the remaining quarter of the depression of the key to move the type bar throughout the other one-half of its movement. It will be understood therefore that it requires but little power to start the parts in motion; that an easy action is afforded at the first part of the key stroke; and that as the type bar and the actuating devices which control its movement are set in motion and acquire speed, the resistance is increased and the speed of the type bar is gradually accelerated as the type bar approaches the printing position. Moreover, it will be understood that the arrangement of the sub-levers 8 beneath the key levers and the arrangement of the sub-levers 19 in the rear of the type bars are such that the parts in question may be arranged to the best advantage without conflict or interference with other working parts of the machine. Furthermore, each sub-lever 8 occupies no greater widthwise space than that required for the associated key lever.

Each of the key levers is formed with a recess 37 therein to receive the pivoted end of the associated sub-lever 8 so that the sub-lever and its pivot will not constitute an obstruction to the depression of the key. This is indicated by the dotted line position of the key lever in Fig. 1.

By connecting each key lever and its sub-lever 8 by the spring 13 in the manner shown, the rolling contact faces 11 and 12 on the sub-lever and key lever, respectively, are maintained in constant engagement during the operation of a type action and the spring at the same time constitutes a restoring spring to return the parts to normal position, and there is no jumping of the finger keys. If desired, an additional returning spring may be applied directly to each key lever or type bar.

The adjustment of the screws 30 enables each sub-lever 19 to take up the universal bar at the proper time irrespective of the fact

that the sub-levers 19 are of different lengths. By this arrangement a uniform extent of movement may be transmitted to the universal bar from the different sub-levers 19, notwithstanding the fact that these sub-levers have different extents of angular movement. Thus by individual adjustment of the different screws 30, one sub-lever 19 which has a greater extent of angular movement than another, may be made to take up the universal bar at the same instant that the other sub-lever 19 does that has less extent of angular movement.

Various changes may be made without departing from the spirit and scope of my invention.

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

1. In a typewriting machine, the combination of a key lever; a type bar; and intermediate actuating connections between said type bar and key lever, said connections comprising a sub-lever pivoted and arranged beneath the key lever and having a rolling engagement therewith, a pull link extending from said sub-lever and arranged beneath the key lever, and an upright sub-lever crossing the key lever and connected at one end with said pull link and operatively connected at the other end with said type bar.

2. In a typewriting machine, the combination of a key lever; a type bar; and intermediate actuating connections between said type bar and key lever, said connections comprising a sub-lever pivoted and arranged beneath the key lever at the key board of the machine and having a rolling engagement with the key lever to afford a gradual acceleration in the movement of the type bar as it approaches the printing position, a substantially horizontally disposed pull link extending from said sub-lever and arranged beneath the key lever, and an upright sub-lever of the first order crossing the key lever and connected at one end to the rear end of said pull link and operatively connected at the other end with said type bar.

3. In a typewriting machine, the combination of a key lever; a type bar; and intermediate actuating connections between said type bar and key lever, said connections comprising a sub-lever pivoted and arranged beneath the key lever and having a rolling engagement with the key lever, a pull link extending from said sub-lever and arranged beneath the key lever, an upright sub-lever crossing the key lever and connected at one end with said pull link and operatively connected at the other end with said type bar, and a spring connected at one end to the key lever and at its opposite end to said first mentioned sub-lever.

4. In a typewriting machine, the combination of a key lever having a recess therein, an angular sub-lever pivoted at its forward end beneath the key lever and beneath the key board of the machine, a portion of said sub-lever being received in the recessed portion of the key lever, a curved contact on one of the sub-lever and key lever members and with which the other of said members coöperates to effect a gradual acceleration of the type bar in its movement to the printing position, and a second sub-lever which crosses the key lever and which is operatively connected to the type bar and to said first mentioned sub-lever.

5. In a typewriting machine, the combination of a type bar, a key bearing lever, a sub-lever having a rolling contact with the key lever to afford an acceleration in the movement of the type bar as it approaches the printing position, a second sub-lever connected with the type bar, a pull link intermediate said sub-levers, and a universal bar actuated by said second sub-lever.

6. In a typewriting machine, the combination of a type bar, a key bearing lever, a sub-lever having a rolling contact with the key lever to afford an acceleration in the movement of the type bar as it approaches the printing position, a second sub-lever connected with the type bar, a pull link intermediate said sub-levers, a universal bar actuated by said second sub-lever, and an adjustable contact device intermediate said second sub-lever and the universal bar.

7. In a typewriting machine, the combination of a type bar, a key bearing lever of the second order, a sub-lever arranged beneath said key bearing lever and having a rolling contact therewith to afford an acceleration in the movement of the type bar as it approaches the printing position, a second sub-lever of the first order connected with the type bar, a pull link intermediate said sub-levers, and a universal bar actuated by said second sub-lever.

8. In a front-strike typewriting machine, the combination of an upwardly and rearwardly swinging type bar, a key bearing lever of the second order, an angular sub-lever arranged beneath said key bearing lever and having a rolling engagement therewith which effects a gradual acceleration in the movement of the type bar as it approaches the printing position, a second sub-lever of the first order arranged upright in the rear of the type bar and operatively connected at its upper end with the type bar, and a substantially horizontally arranged pull link extending fore and aft of the machine and connecting said sub-levers.

9. In a front-strike typewriting machine, the combination of an upwardly and

rearwardly swinging type bar, a key bearing lever of the second order, an angular sub-lever arranged beneath said key bearing lever and having a rolling engagement therewith which effects a gradual acceleration in the movement of the type bar as it approaches the printing position, a second sub-lever of the first order arranged upright in the rear of the type bar and operatively connected at its upper end with the type bar, a substantially horizontally arranged pull link extending fore and aft of the machine and connecting said sub-levers, and a substantially horizontally movable universal bar with which said second sub-lever is cooperative.

10. In a front-strike typewriting machine, the combination of an upwardly and rearwardly swinging type bar, a key bearing lever of the second order pivoted at its rear end, an angular sub-lever pivoted at its forward end and arranged beneath said key bearing lever, one of said key bearing and sub levers having a curved contact face which coöperates with the other of said levers to afford a rolling engagement therewith which effects a gradual acceleration in the movement of the type bar as it approaches the printing position, a spring which connects said sub-lever and said key bearing lever, a second sub-lever of the first order arranged upright in the rear of the type bar and operatively connected at its upper end with the type bar, and a substantially horizontally arranged pull link extending fore and aft of the machine and connecting said sub-levers.

11. In a front-strike typewriting machine, the combination of an upwardly and rearwardly swinging type bar, a key bearing lever of the second order pivoted at its rear end, an angular sub-lever pivoted at its forward end and arranged beneath said key bearing lever, one of said key bearing and sub levers having a curved contact face which coöperates with the other of said levers to afford a rolling engagement therewith which effects a gradual acceleration in the movement of the type bar as it approaches the printing position, a spring which connects said sub-lever and said key bearing lever, a second sub-lever of the first order arranged upright in the rear of the type bar and operatively connected at its upper end with the type bar, a substantially horizontally arranged pull link extending fore and aft of the machine and connecting said sub-levers, a universal bar operated by said second sub-lever, and an adjustable contact between said second sub-lever and said universal bar.

12. In a front-strike typewriting machine, the combination of an upwardly and rearwardly swinging type bar adapted to strike against the front face of the platen, a key

lever of the second order pivoted on a fixed fulcrum at its rear end, an angular or bell crank sub-lever pivoted at its forward end beneath the key lever and beneath the key board of the machine, one of said levers having a curved contact face with which the other lever coöperates to effect a gradual acceleration in the movement of the type bar as it approaches the printing position, and intermediate operative connections between said sub-lever and the type bar, said connections including a link extending rearwardly from said sub-lever.

13. In a front-strike typewriting machine, the combination of an upwardly and rearwardly striking type bar, a key lever of the second order pivoted on a fixed fulcrum at its rear end, a sub-lever pivoted at its forward end beneath the key lever and beneath the key board of the machine, one of said levers having a curved contact face with which the other lever coöperates to effect a gradual acceleration in the movement of the type bar as it approaches the printing position, intermediate operative connections between said sub-lever and the type bar, said intermediate connections comprising a second sub-lever operatively connected with the type bar, and a pull link arranged beneath the key lever and connecting said sub-levers.

14. In a front-strike typewriting machine, the combination of an upwardly and rearwardly striking type bar, a key lever of the second order pivoted on a fixed fulcrum at its rear end, a sub-lever pivoted at its forward end beneath the key lever and beneath the key board of the machine, one of said levers having a curved contact face with which the other lever coöperates to effect a gradual acceleration in the movement of the type bar as it approaches the printing position, intermediate operative connections between said sub-lever and the type bar, said intermediate connections comprising a second sub-lever operatively connected with the type bar, a pull link arranged beneath the key lever and connecting said sub-levers, and a universal bar actuated by certain of said intermediate connections.

15. In a front-strike typewriting machine, the combination of an upwardly and rearwardly striking type bar, a key lever of the second order pivoted on a fixed fulcrum at its rear end, a sub-lever pivoted at its forward end beneath the key lever and beneath the key board of the machine, one of said levers having a curved contact face with which the other lever coöperates to effect a gradual acceleration in the movement of the type bar as it approaches the printing position, intermediate operative connections between said sub-lever and the type bar, said intermediate connections comprising a second sub-lever operatively connected with the

type bar, a pull link, arranged beneath the
key lever and connecting said sub-levers, a
universal bar actuated by certain of said
intermediate connections, and an adjustable
5 contact device between the universal bar and
the said certain of the intermediate connec-
tions with which it coöperates.

Signed at Ilion, in the county of Her-
kimer, and State of New York, this 13th
day of March, A. D. 1911.

GEORGE A. SEIB.

Witnesses:

GEO. E. NEALE,

MARY GLEASON.

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