

No. 773,567.

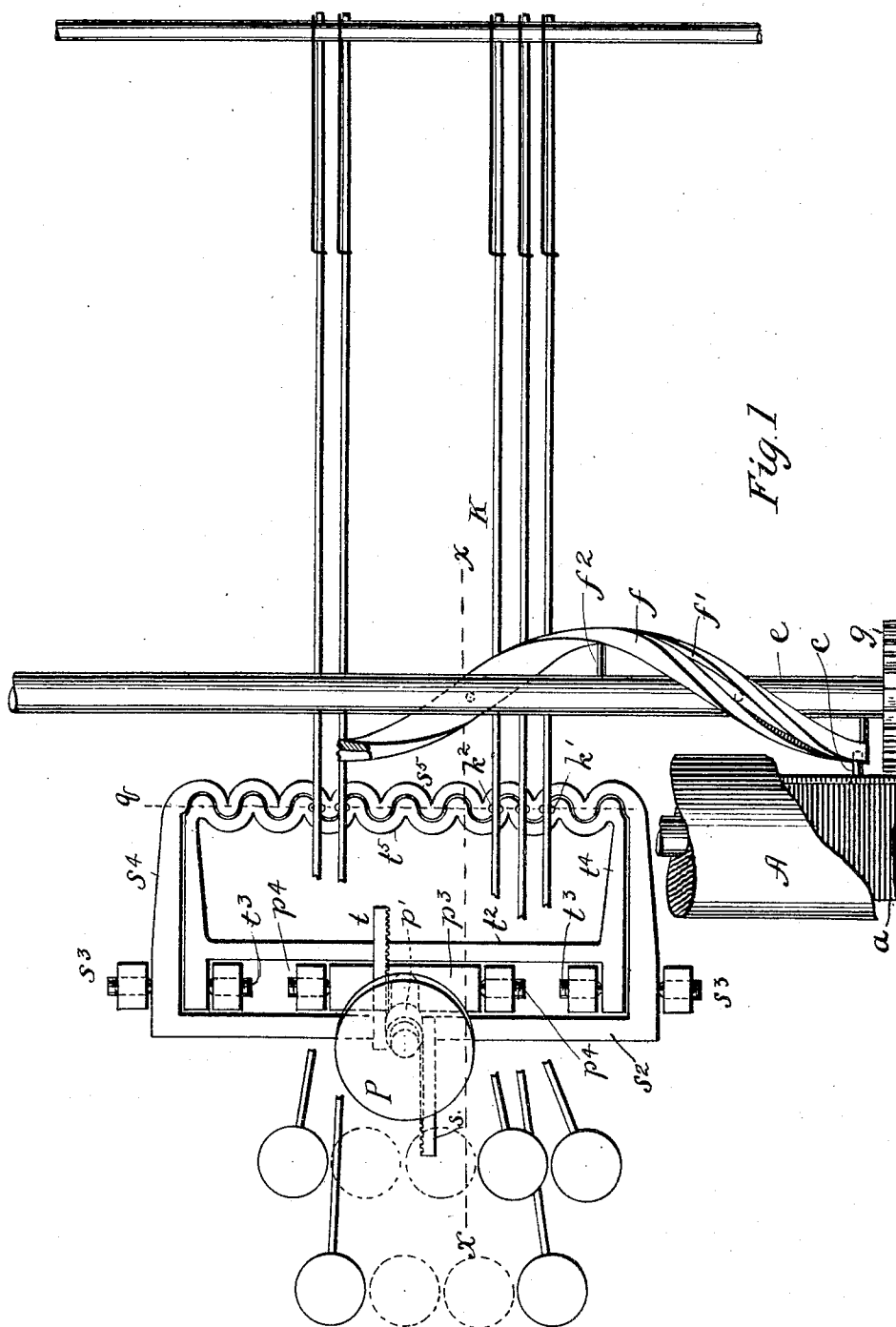
PATENTED NOV. 1, 1904.

F. E. HEATH.
TYPE WRITER.

APPLICATION FILED DEC. 12, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses
Frank S. Ober.
Maldo M. Chapin

Inventor
Frank E. Heath
By his Attorney Wm. A. Rorabaum

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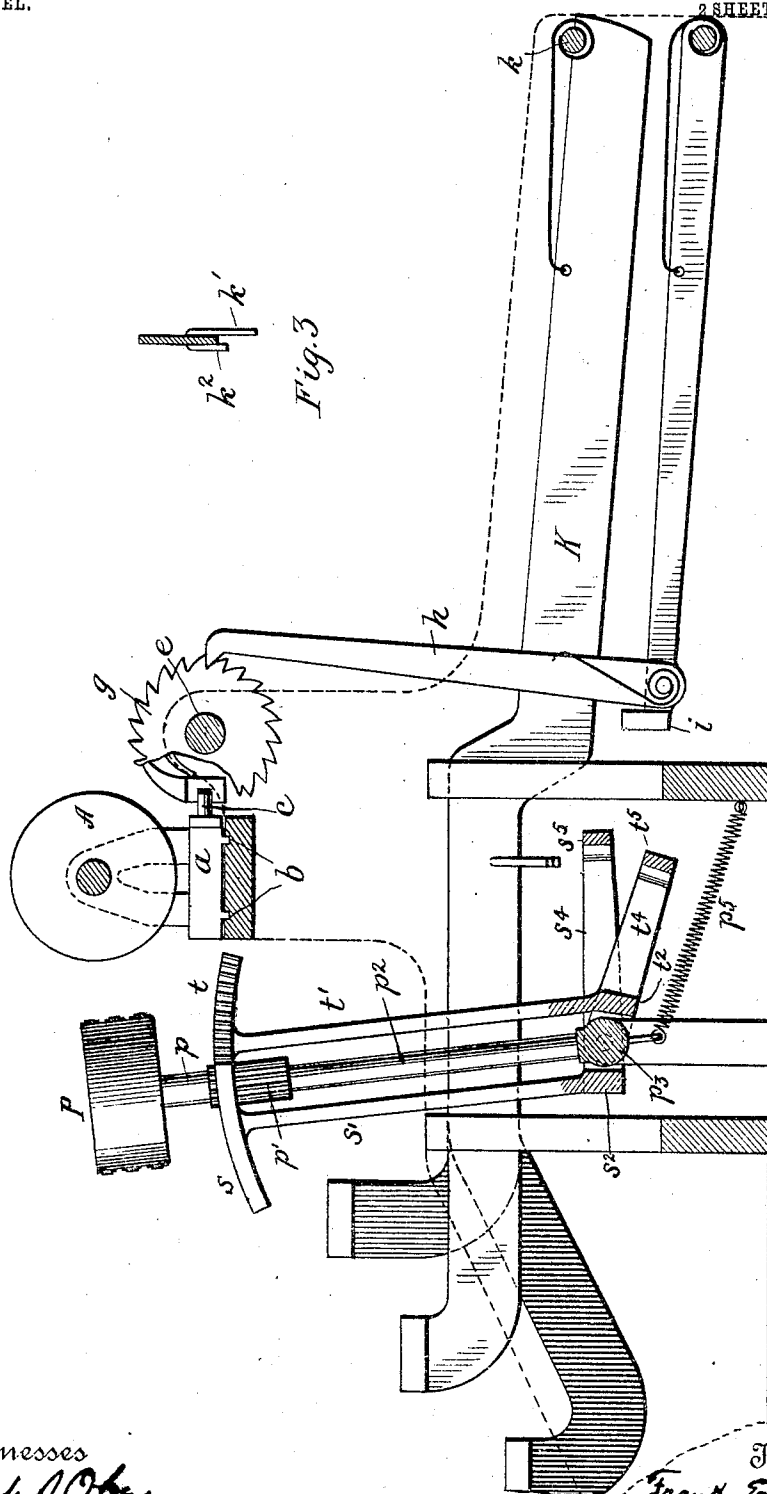


Fig. 2.

Witnesses
Frank D. Ober
Waldo M. Chapin

Inventor
Frank E. Heath
By his Attorney Wm. A. Rasmussen

UNITED STATES PATENT OFFICE.

FRANK E. HEATH, OF NEW YORK, N. Y.

TYPE-WRITER.

SPECIFICATION forming part of Letters Patent No. 773,567, dated November 1, 1904.

Application filed December 12, 1903. Serial No. 184,862. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. HEATH, a citizen of the United States, residing at the city of New York, in the borough of Manhattan and State of New York, have invented certain new and useful Improvements in Type-Writers, of which the following is a full, clear, and exact description.

This invention relates to type-writers, having special reference to that class of machine in which the type are located upon a wheel or cylinder which is by the operation of the key turned to printing position and then driven against the paper carried on the paper-platen.

My invention consists, in general, of three frames, upon one of which is mounted the type-wheel and a pinion through which the same is rotated and on each of the other two frames a gear-segment, arranged to engage with the pinion for the purpose of rotating the wheel to its printing position. The two frames carrying the segments and the frame carrying the type-wheel are mounted on coincident axial lines. The segment-carrying frames and the type-wheel-carrying frame are actuated by the key-levers, the segment-carrying frames being first moved until the type-wheel has been brought to the printing position and locked in that position, after which the further movement of the key-lever, while still acting through the segment-frames, causes the type-wheel to move forward and make the impression. To accomplish this the segment-frames have radial extensions, which are engaged by the key-lever and which thereby cause the pinion to be rotated to the required extent in either direction until the segments, by their opposing action upon the pinion, become locked to the wheel-carrying frame, so that the further pressure of the key-lever upon the radial extensions of the segment-frames is necessarily communicated to the type-wheel frame, which therefore swings bodily to make the impression.

The machine illustrated contains certain improvements in the paper-carriage feed which are not claimed herein, but are reserved for another application.

In the accompanying drawings, Figure 1 is a plan of portions of a type-writer to which my

invention relates, parts being broken away and only a few of the key-levers being shown. Fig. 2 is a vertical section taken substantially on line *xx* of Fig. 1, and Fig. 3 is a detail section of one of the key-levers.

The printing-wheel is indicated at P, being fixed upon sleeve *p*, upon which is formed or attached a pinion *p'*, the sleeve being passed over the upper end of the rod or arm *p*². This rod or arm is attached to a hub *p*³ and mounted on a horizontal axis by means of pointed screws *p*⁴. The hub, the arm, and the sleeve constitute what may be called a "type-wheel-carrying frame," which, it will be seen, is capable of swinging upon the horizontal axis described. Behind the type-wheel the platen A is mounted in a position to be struck by the type on the face of the wheel when the wheel is thrown rearward to make the impression. After the impression the wheel is returned to the normal position shown by a spring *p*⁵, which may be located in any manner to accomplish this movement.

The pinion *p'* is engaged upon opposite sides by gear-segments *s* and *t*, respectively. These segments are carried at the extremities of arms *s'* and *t'*, attached to frames *s*² and *t*², said frames being pivoted on an axial line coincident with the axial line of the hub *p*³, the pivot for the frame *s*² being formed by the screws *s*³ and the pivot for the frame *t*² being formed by the screws *t*³. Each of the frames *s*² and *t*² have radial arms *s*⁴ and *t*⁴, which are connected, respectively, by cross-bars *s*⁵ and *t*⁵. These cross-bars are correspondingly fluted, so that a projecting portion of one will enter a depressed portion of another, and thereby cause the projections from each to overlap or cross a median line, those portions of the bars in the plane of the median line being equidistant from the axial line of the frames. This median line is indicated by the dotted line marked *q*. The key-levers K are pivoted at the rear of the machine at *k* and extend over the bars *s*⁵ and *t*⁵. Each key-lever is provided with two legs *k*¹ and *k*², which are in a plane with the median line *q*, the keys being so positioned with respect to the bars that one of the legs will strike bar *s*⁵, while the other will strike the bar *t*⁵ on the

median line when the key-lever is pushed downward. This construction provides that the movement imparted to each of the segments by a given key shall be the same.

5 The operation of the invention is as follows: When a key is actuated, one of its legs strikes one of the segment-frames, forcing it downward and causing the corresponding segment to rotate the pinion. The rotation of the pinion in turn causes the other segment to move in the opposite direction. The motion continues until the second segment strikes the second leg on the key. In these movements the type-wheel has been rotated to bring the letter indicated by the key to the printing position, this being determined by the individual and the relative length of the two legs k' and k'' on the key. When by the coöperation of the two segments the type has been selected, the wheel and the relative movements of the segments are locked, and any further movement of the segments must necessarily be in the same direction instead of the opposite direction. Now since the segment-frames and the type-wheel frame are mounted on coincident axes and since the segment-frames are locked to the type-wheel frame further downward movement of the key must be accompanied by a movement of the segment-frames and type-wheel frame as one body, and the type-wheel is accordingly swung rearward to impress the presented type against the platen. Upon the release of the key its individual spring returns it to normal position, and spring p^4 returns the type-wheel to its normal position, as shown. The segments, however, are not disturbed in their relation to each other. Consequently the type last printed from remains at the printing position.

40 When the next character-key is pressed, if it is a different key from the one last actuated, the legs k' and k'' thereon being of a different length, cause the segments to again swing in opposite directions and rotate the printing-wheel to bring the character corresponding to the actuated key to the printing position. This having occurred, as before, both segments move in the same direction and carry with them as one body the printing-wheel to make the next impression. Thus it will be seen that the segments first coöperate with each other by movements in opposite directions to lock the selected type at the printing position, and they coöperate with each other by movements in the same direction to carry the type-wheel against the platen. Hence by providing coincident axes for all three of the frames I am able to first position the type-wheel and then make the impression by a very simple mechanism. Referring now briefly to the carriage-feed, the platen A is mounted in suitable bearings on a carriage a , adapted to move transversely of the machine in guides b . At the rear of the carriage and about midway of its length a stud

projects and carries an antifriction-roller c . Back of the guide and in the main frame of the machine is mounted a shaft e , adapted to rotate, but not to slide. This shaft supports a spiral body f , containing a spiral groove f' , the body being sustained by spokes f'' radiating from the shaft at suitable intervals. The roller c projects into this groove. On the end of the shaft is a rigid wheel g , with which engages a pawl h , connected with a universal bar i , which extends under all of the keys. When a key is depressed, the end of the pawl slips over a tooth of the rigid wheel. On the return stroke of the key, and consequently after a letter has been printed, the pawl engages with a tooth and rotates the wheel one step. Since the roller c is in engagement with the inclined walls of the spiral groove f' , the short rotary movement of the spiral wheel causes the carriage to slide laterally the space of one letter. At the end of a line of printing the carriage can be moved back by hand or other means, the roller meanwhile dragging in the groove and rotating the spiral backward, suitable means being provided for disengaging the pawl h to permit of this movement.

Having described my invention, I claim—

1. In a type-writer, the combination of a type-wheel adapted to rotate to bring its characters to the printing position and to swing bodily to make the impression, with two gear-segments and a key-lever, the gear-segments being adapted to be moved in opposite directions by the key-lever to rotate the type-wheel to the printing position and to be moved in the same direction by the key-lever to swing the type-wheel bodily to make the impression.

2. In a type-writer, the combination of a frame, a type-wheel rotatably mounted thereon, two other frames, either of which, when actuated, will rotate the type-wheel, while the actuation of both simultaneously will lock the type-wheel, and a key-lever adapted to first actuate one frame to rotate the type-wheel, then both frames to lock it and finally the printing-wheel frame through the two locked frames.

3. In a type-writer, a type-wheel having a rotary motion to select the type and a bodily motion to print in combination with two opposing frames and a key-lever, said key-lever being adapted to first move the two frames with respect to each other to rotate the type-wheel and then to move them as one body to impart the printing movement to the type-wheel, and means for applying opposing forces to the type-wheel during its printing movement to prevent the rotation thereof.

4. In a type-writer, three independent frames mounted upon coincident axes, in combination with a key-lever, a printing-wheel and means whereby the key-lever will first positively actuate two of the frames successively to select the type and lock the wheel and then positively actuate the two frames to—

gether for moving the third frame to make the impression.

5 5. In a type-writer, the combination of a rocking frame carrying thereon a rotary type-wheel and attached pinion; two segment-frames pivoted upon the same axis as the rocking frame and carrying, respectively, gear-segments which engage the opposite sides of said pinion, a key-lever adapted to engage the
10 segment-frames successively to rotate the pin-

ion to a locked position and then to move the segment-frames together to rock the type-wheel frame.

In witness whereof I subscribe my signature in presence of two witnesses.

FRANK E. HEATH.

Witnesses:

WM. A. ROSENBAUM,
WALDO M. CHAPIN.