(No Model.) 2 Sheets—Sheet 1.

F. FELT & I. W. ARCHIBALD.

TYPE WRITING MACHINE

No. 406,437. Patented July 9, 1889.

Fig. 1.

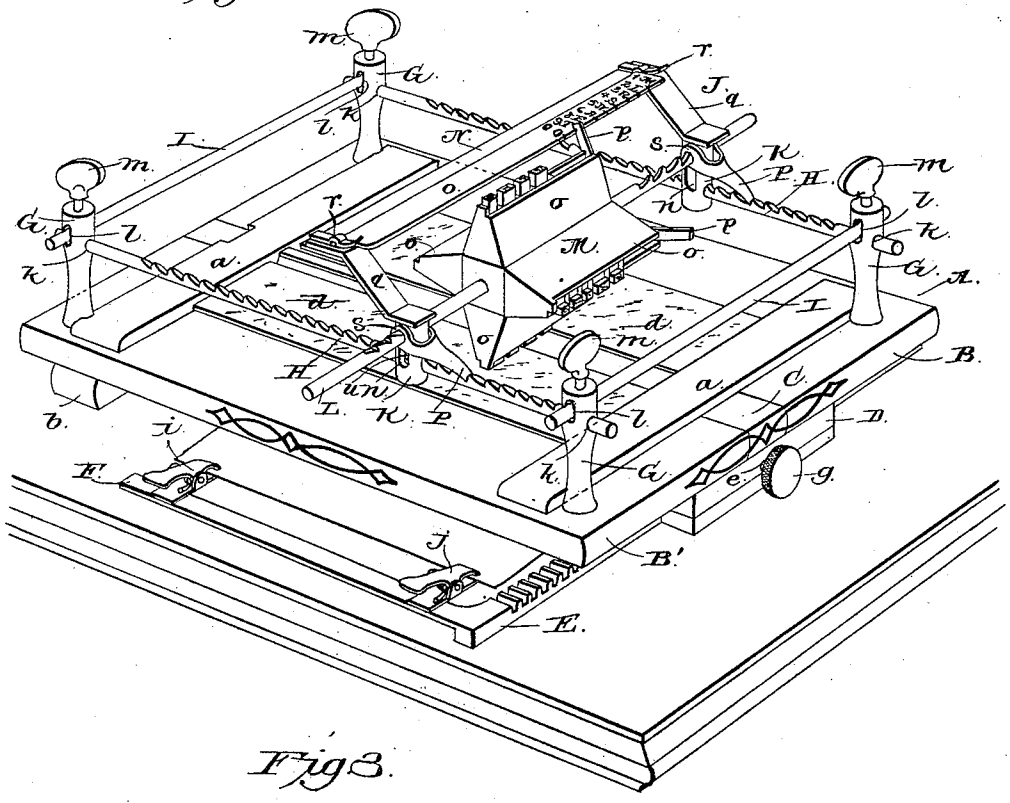
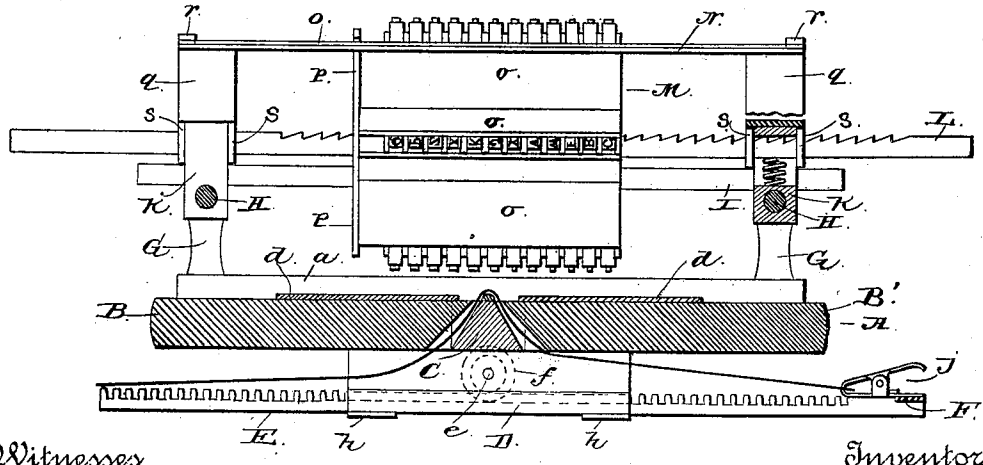


Fig 3.



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(No Model.) 2 Sheets—Sheet 2.

F. FELT & I. W. ARCHIBALD.

TYPE WRITING MACHINE.

No. 406,437. Patented July 9, 1889.

Fig. 2.

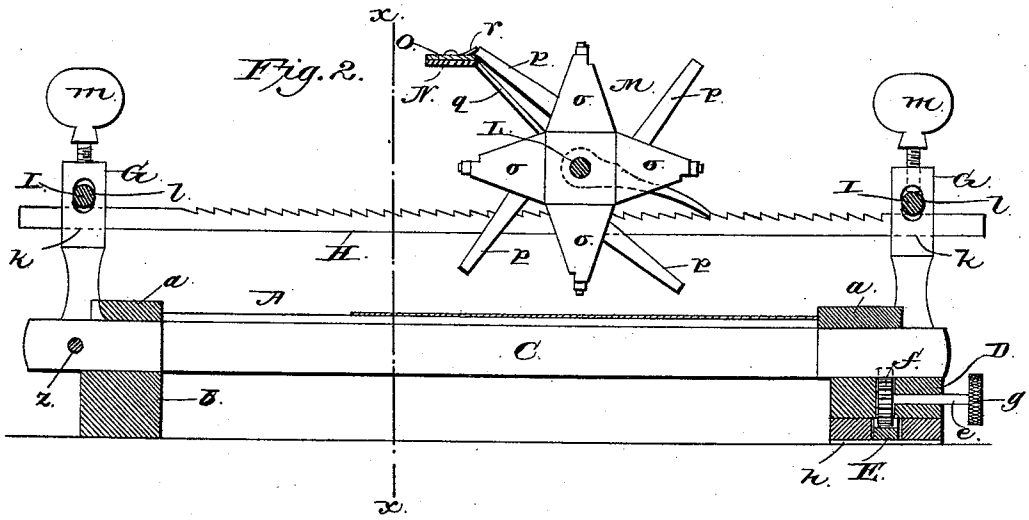


Fig. 4.

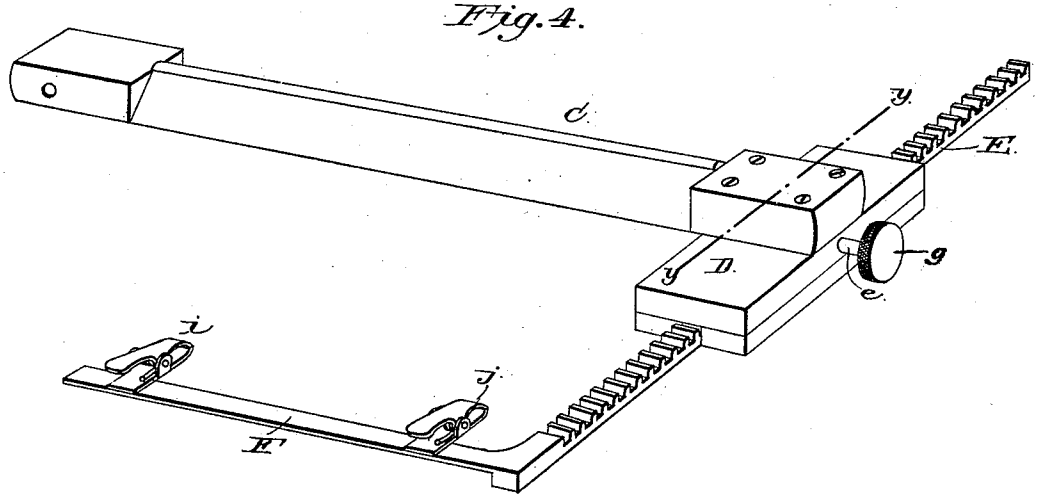
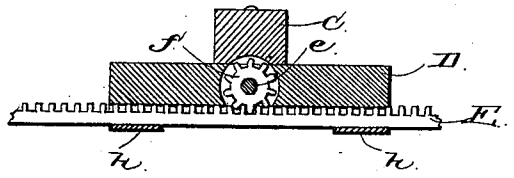


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANK FELT AND ISAAC WADDELL ARCHIBALD, OF EVERETT, MASSACHUSETTS.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 406,437, dated July 9, 1889.

Application filed November 2, 1887. Serial No. 254,097. (No model.)

To all whom it may concern:

Be it known that we, FRANK FELT and ISAAC WADDELL ARCHIBALD, citizens of the United States, residing at Everett, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Type-Writing Machines, of which the following is a specification.

This invention has reference to type-writing machines; and it consists in the improved construction hereinafter fully described, whereby the general construction of this class of machines is simplified and cheapened and its general efficiency enhanced.

In the accompanying drawings, forming part of this specification, Figure 1 is a perspective view of a type-writing machine constructed in accordance with our invention. Fig. 2 is a longitudinal sectional view of said machine. Fig. 3 is a transverse section on line *x x* of Fig. 2. Fig. 4 is a detail perspective view of the paper-feeding device, and Fig. 5 is a detail section on the line *y y* of Fig. 4.

The frame proper of the machine has a base A, which consists of longitudinal plates B B′, which are rigidly secured by means of bars or strips *a a*, arranged transversely at each end. The plates B B′ are so arranged as to leave a longitudinal slot between them. The adjacent edges of said plates are beveled on their under side, so as to make the slot of a triangular configuration. Transversely at the rear and under side of the base is located a cross-bar *b*, which is centrally recessed or cut away to permit the movement of a platen or bed C, which is pivoted at Z between the rear ends of the plates B B′, and which in cross-section is of a form to adapt it to enter and fit the slot beneath the plates. The location of the platen C within the slot is such that its upper edge will occupy a position in the same horizontal plane with two pads *d d*, secured, respectively, upon the upper side of the plates B B′.

A block D is connected to the free end of the platen C, and is transversely recessed on its under side for the reception of a transverse rack-bar E, which has teeth upon its upper side. A small shaft *e* is journaled in said block, and carries on its inner end a pinion *f*, which occupies a recess therefor in the block and meshes with the teeth on the rack-bar E. The other end of the shaft projects beyond the front face of the block, where it carries a thumb-disk *g*, by which the shaft and its pinion may be readily rotated. Strips *h h* are secured on the under side of the block, so as to retain the rack-bar E within its recess. One end of the bar E has secured thereto another bar F, at right angles thereto, as shown in Figs. 1 and 4, and said bar is provided with a pair of spring-clips *i j*, adapted to grasp and retain the end of a sheet of paper.

At each corner of the base A is located a standard G, which has respectively a lower longitudinal opening *k* and an upper transverse opening *l*. A longitudinal bar H has its ends permanently secured in the lower openings *k k* of the front ends of the standards, at each side. The upper surface of the bar is provided with rack-teeth. A transverse rod I is located at both the front and rear, and has its ends located in the upper openings *l* of the front pair and rear pair of standards. The openings *k* and *l* in each standard are so made that they intersect each other, and thus enable a single binding-screw *m* to secure the ends of both the bar and rod in each standard. It will be readily understood, of course, that the upper openings *l* are slightly elongated, so as to allow the proper play of the rod I.

J refers to the type-carriage. The frame of this carriage is supported upon the bars H by means of blocks K K, which are short cylindrical sections, perforated at their bases for the passage of the bar H. The size of the perforation is such that the block will move freely along said bar. The major portion of each block contains an extended slot *n*, formed at right angles to the perforation beneath, and through which passes one end of a transverse shaft L, upon which is mounted the type-head M. The general form of the type-head is shown most clearly in Fig. 1. It is provided with a number of radially-arranged portions *o*, each of which is transversely grooved to receive and retain a series of type so ar-

ranged that the impression of each will be made on the paper transverse to the position of the machine. A series of inclined arms *p* are secured on one side of the type-head M, so that one of the same will form a partial support for the head when it is depressed. A plate *q* is secured at its lower end upon the upper end of each block K. Each plate *q* is inclined upward and bent rearwardly, so that its upper portion will form the bearing for one end of a transverse plate N, as shown. We have represented the plates *q q* and N as all being formed from one piece. A spring-ear *r* is secured on the upper portion of each plate *q*.

An index-plate O has its front edge notched or graduated, and carries upon its upper side a scale or characters corresponding with the characters on the type in the head. The scale is divided up into a number of parallel series of characters, each of which corresponds with the characters in one of the portions of the head. The plate O has a projection at each end adapted to engage with the spring-ears *r*, to hold said plate in position.

A dog P has a bifurcated portion turned so as to form two parallel ears *s s*, which are perforated for the passage of the shaft L, said ears embracing the blocks K. The forward free portion of each dog is curved downward to a slight extent, so as to engage one of the teeth on the bar H beneath.

In using the machine the base-plate and its appurtenances are lifted so as to expose the paper-feeding device, and while in this position the sheet of paper is attached at one end to the clips. The thumb-screw and its shaft are manipulated to cause the clip-bar to occupy a position insuring the proper point of the paper to rest upon the upper edge of the platen. The base is then lowered until the paper-covered platen rests in its slot. The type-carriage and its head are then moved in close proximity to the forward end of the machine, and the head is then rotated until the portion having the desired character arrives at its lowermost position. The shaft L is then moved transversely until the highest arm *p* registers with the notch in the index-plate, aligned with the representation of the character to be printed. The shaft and its head are then depressed, causing the character to affix its impression upon the paper, while the remaining characters of the series contact with the pads on the base and become inked for subsequent impressions. The index and the type-head are so arranged that the rows of characters on the index correspond with the series of letters in each radial portion of the type-head, as well as with the separate type of each series. By this means the operator is enabled to print accurately and at all times secure the impression from the desired letter. As the type-head is depressed the dogs P engage the teeth in the bars H and push the type-head forward the proper distance to correctly space the letters. When the type-head is raised, the dogs will be lifted so as to ride over one tooth and engage the same to push the type-head forward on its next downward stroke, as will be readily understood. When a line has been printed upon the paper, the dogs are lifted and the type-carriage brought forward, after which the thumb-screw is manipulated to cause the shaft and pinion to move the rack-bar and feed the paper for a new line. The engagement of the dogs with the bars H locks the carriage against back movement. It will be noted that the type of the series that is lowered will be inked at each depression of the head, no matter what the position of the latter may be.

A spiral or other desirable spring *u* may be placed in each slot below the shaft L, in order to normally maintain the type-head above and out of contact with the platen.

It will be noticed that the machine is of simple and durable construction and can be made at a comparatively slight expense. Moreover, the arrangement of the head is such as to adapt it for readily changing the style of type, while an index-plate may be substituted to accord therewith.

We claim—

1. In a type-writer, the combination of the base consisting of a stationary platen and the parallel longitudinal plates having their rear ends pivoted to the opposite sides of the platen at the rear end thereof and adapted to rest on opposite sides of the platen, and a type-carriage mounted on the said parallel plates, as set forth.

2. In a type-writer, the combination of the stationary platen, the parallel plates pivoted to the platen and adapted to rest on opposite sides of the same, the type-carriage frame mounted on said plates, a shaft mounted in the type-carriage frame and adapted to move transversely and vertically therein, and a rotatable type-head mounted on said shaft and having radial portions carrying type, as set forth.

3. The combination of the platen, a block secured to one end of the same having a recess in its under side, a rack-bar arranged in said recess, a bar secured to the rack-bar and provided with paper-securing clips, a shaft journaled in the block on the platen and carrying a pinion meshing with the rack-bar, and the parallel plates pivoted to the platen and adapted to rest on opposite sides of the same, as set forth.

4. The combination of the platen, the parallel plates pivoted thereto on opposite sides thereof, the notched bars mounted on said parallel plates, the blocks mounted on said notched bars, the shaft inserted through the blocks, the type-head on said shaft, the springs arranged within the blocks and bearing against the said shaft, and the dogs engaging the notched bars and having ears pivotally mounted on the said shaft, as set forth.

5. The combination of the platen, the plates pivoted thereto, the type-carriage mounted

on said plates and having the blocks K, the inclined plates *q*, secured on said blocks, the spring-ears *r* on the upper ends of the said plates, the index-plate secured by said ears and having a series of notches at its front edge, the shafts mounted on the blocks K, the type-head mounted on said shaft, and the radial arms at the end of the type-head adapted to engage the notches in the index-plate, as set forth.

6. The combination, in a type-writing machine, of side bars, standards having intersecting openings for said bars, binding-screws for the same, and type-carriage and platen, substantially as described.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of two witnesses.

FRANK FELT.
ISAAC WADDELL ARCHIBALD.

Witnesses:
W. M. GRUBER,
JOSEPH H. CANNELL.