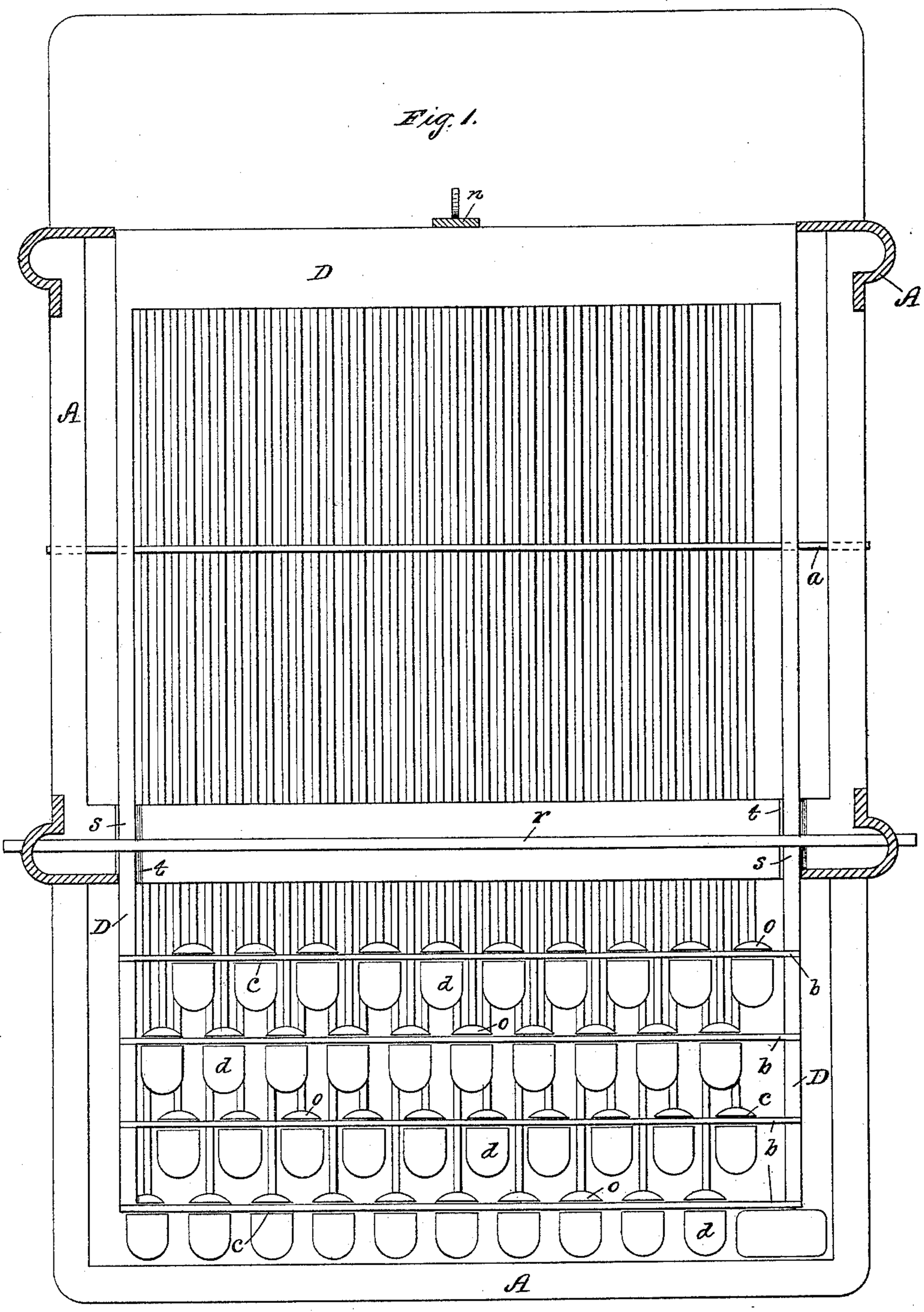
(No Model.) 2 Sheets—Sheet 1.

F. H. HARRIS & C. E. CRANDALL.

WORD SPACING MECHANISM FOR TYPE WRITING MACHINES.

No. 442,315. Patented Dec. 9, 1890.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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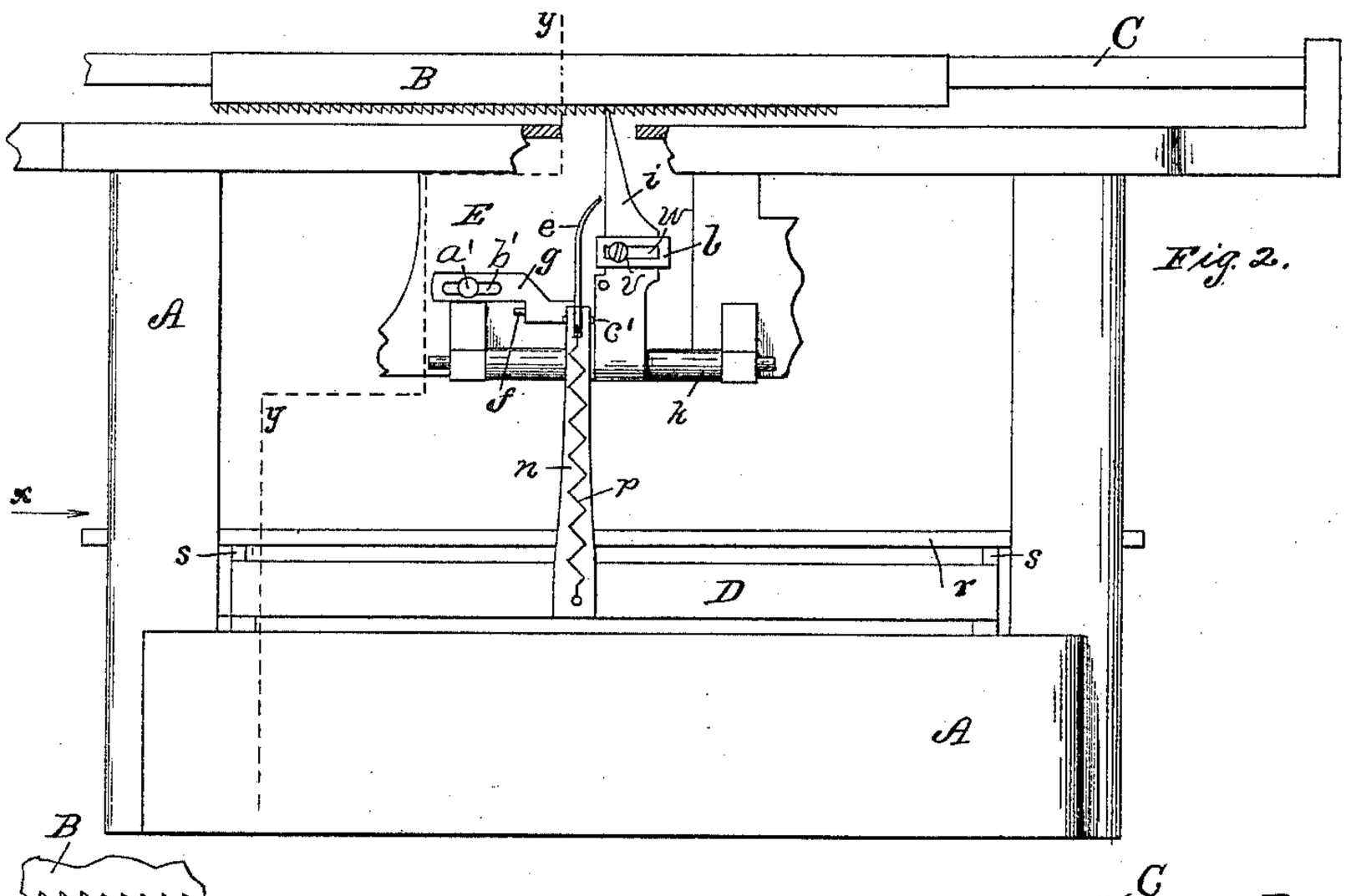


Fig. 2.

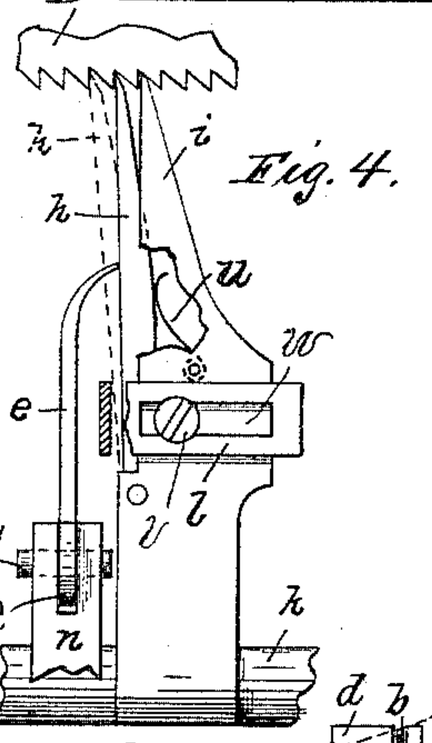


Fig. 4.

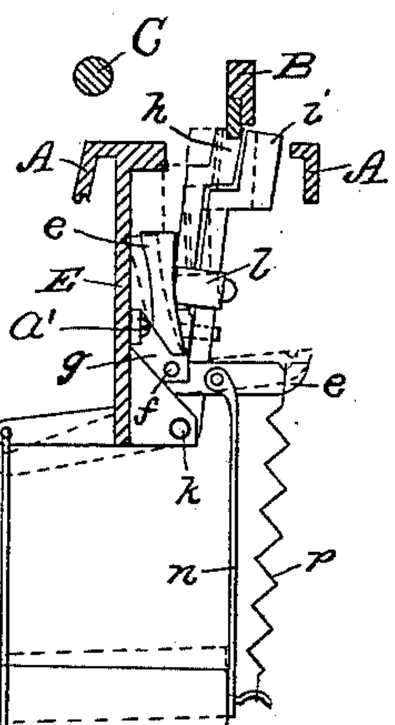
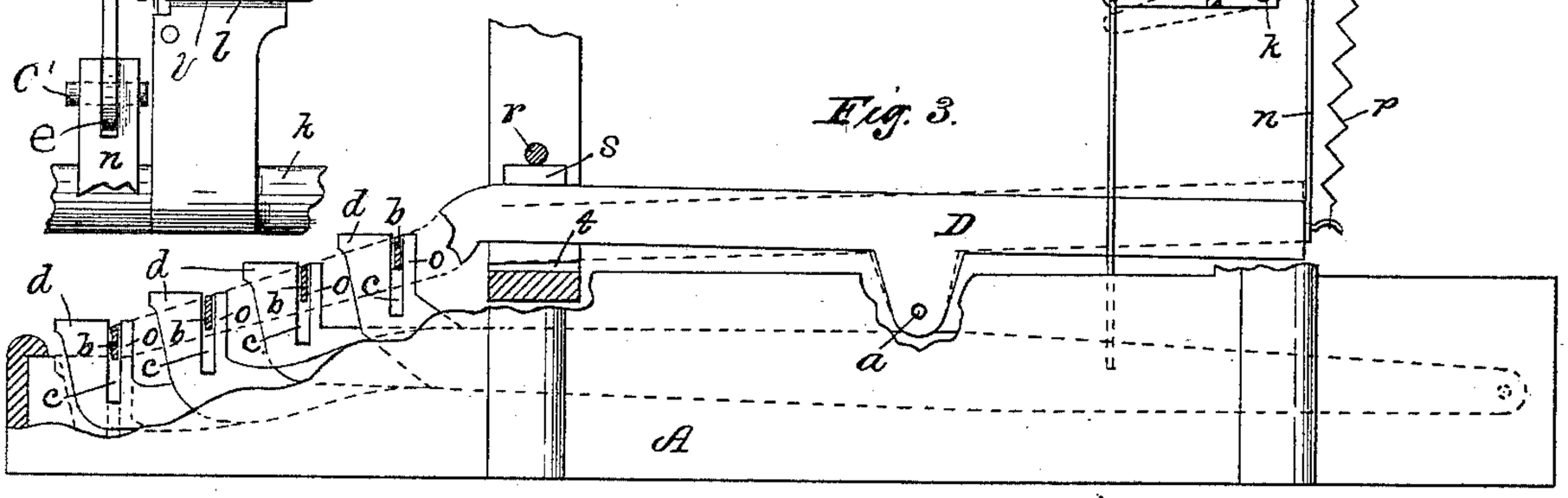


Fig. 3.



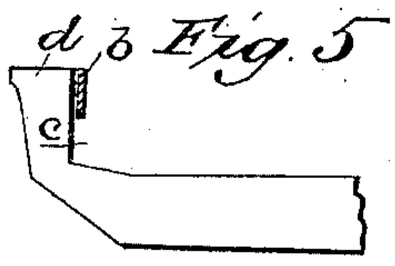


Fig. 5

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UNITED STATES PATENT OFFICE.

FRANK H. HARRIS AND CORYDON E. CRANDALL, OF CANANDAIGUA, NEW YORK.

WORD-SPACING MECHANISM FOR TYPE-WRITING MACHINES.

SPECIFICATION forming part of Letters Patent No. 442,315, dated December 9, 1890.

Application filed May 19, 1890. Serial No. 352,363. (No model.)

To all whom it may concern:

Be it known that we, FRANK H. HARRIS and CORYDON E. CRANDALL, of Canandaigua, in the county of Ontario and State of New York, have invented a new and useful Improvement in Attachments for Type-Writing Machines, which improvement is fully set forth in the following specification, and shown in the accompanying drawings.

Our invention is an attachment to type-writing machines applied for the purpose of producing a word-space with the printing of the last letter of each word.

The object of the invention is to avoid the extra or special movement of the hand and the additional touch of the finger to make the word-space after the word is printed. The invention is hereinafter fully described, and more particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a plan of the lower parts of a type-writer showing our attachment; Fig. 2, a rear elevation of the machine with parts broken away and omitted; Fig. 3, a side elevation of the machine seen as indicated by arrow *x* in Fig. 2, parts being vertically sectioned, as on the dotted line *y y* in Fig. 2; Fig. 4, a rear elevation of the spacing-dogs and associated parts, this figure being drawn to a scale larger and Figs. 2 and 3 drawn to a scale smaller than Fig. 1; and Fig. 5 is a modification of the form of the keys.

Referring to the parts shown, A is the frame of a type-writing machine, B being the ratchet-bar, and C the carriage-way rod, all of common construction, the hanger E, rocker *k*, spacing-dogs *i* and *h*, and loose-dog stop *l* being also substantially of common form. The loose-dog stop *l* is secured to the dog *i* by means of a clamp-screw *v*, passed through a slot *w* in the stop *l*.

Within the frame A we place a tilting frame or lever D, held to turn on a horizontal pivot-rod *a* in the frame A, as shown in Figs. 1 and 3. The frame D is polygonal in form, made to inclose a space within its rigid sides, and preferably constructed to inclose the keys of the machine. It is not connected in any way with either of the spacing-dogs. The pivot-rod *a* crosses the space within the frame at a point near the middle of the latter, the frame acting as a lever of the first order. The form of the frame in rear of the pivot-rod is not essential, it there serving only to be connected with parts above it, as hereinafter explained. At the forward end this tilting frame is provided with horizontal touch-bars *b*, rigid with the frame and forming part thereof.

d are the keys of the machine. These are split or divided by spaces *c* in right lines across the machine, which spaces are occupied by the respective touch-bars *b*, as shown. Now, from this description and illustration it will be understood that any key may be depressed by the finger of the operator, as usual, without disturbing the tilting frame, or that by slightly extending the finger when the touch is made, so as to cover a touch-bar, the tilting frame may also be depressed with the key.

The device is so arranged that when the frame is thus tilted two teeth of the ratchet-bar will pass the spacing-dogs instead of only one tooth, as when the key alone is depressed. This produces a word-space between two consecutive words.

The loose-dog stop *l*, which has been heretofore set so as to arrest the motion of the loose dog *h* when it has advanced one tooth of the ratchet-bar, we adjust so that it will allow the dog to advance two teeth and provide another movable stop *e* to arrest the dog when it has advanced one tooth. Now by throwing this movable stop *e* out of the way of the dog the latter will move forward two teeth along the rack, as shown by dotted lines in Fig. 4, or against the stop *l*, which will allow the carriage to advance sufficiently to form a word-space after a word is printed. The stop *e* is held to turn in a vertical plane upon a pivot-pin *f*, the latter being secured rigidly in a bracket or holder *g*. The holder *g* is secured to the hanger E by a clamp-screw *a'*, Figs. 2 and 3, which screw, entering a horizontal slot *b'* in the holder, admits of a horizontal adjustment of the latter. This admits of an adjustment of the stop *e* in a direction toward or from the loose dog *h* to regulate the action of the latter with reference to the teeth of the ratchet-bar.

n is a simple part forming a connection between the tilting frame and the stop e, secured to the frame by some simple and well-known means—as screws, for instance. The part n is secured to the stop e by means of a pin c' passed through both. By means of this connection or part n when the frame is tilted, as shown by dotted lines in Fig. 3, the stop e will be turned laterally out of the way of the loose dog h, allowing it to move over two teeth of the ratchet-bar against the stop l, as already stated. The dog is actuated by a slender spring u, Fig. 4, in the usual manner.

To illustrate: In writing the words "The man," when the key is depressed to form the final letter "e" of the word "The," caution is taken to also depress the tilting frame. This forms the proper space between the words "The" and "man," and no further thought is given to the matter of the word-space. The next act of the operator is to commence the final word by depressing the "m" key.

The minor parts o of the keys may be omitted, as shown in Fig. 5; but they are found in practice to constitute desirable rests for the end of the finger when depressing the touch-bar with the key, thus rendering the touch of the keys more agreeable.

A slender spring p, connecting the rear part of the tilting frame with an extended part of the stop e, serves to hold the tilting frame in its normal position. (Shown in full lines in Fig. 3.) This the spring effects, for the reason that its bearing-point on the stop e is farther from the pivot f of the stop than the bearing-point of the connection n is from said pivot. Thus any upward motion of the rear part of the tilting frame will increase abnormally the tension of the spring and cause it to tend to return the frame to its normal position.

The tilting frame is below the ribbon-shift rock-shaft r, which shaft forms a stop for the upward motions of the forward part of said frame, cushions s being inserted between the frame and the shaft. Cushions t may also be placed beneath the frame, if desirable, to soften its downward stops.

What we claim as our invention is—

1. In a type-writer, the combination, with the key-board composed of a series of substantially parallel proximate rows of keys, of finger parts operating to feed the carriage a greater distance than said keys and arranged in proximity to each row of the latter, whereby any key and a finger part may be operated simultaneously by a single movement of the operator's hand to print a letter and augment the following spacing.

2. In combination with the keys and the loose spacing-dog of a type-writing machine, a polygonal tilting frame rigid as to its parts and disconnected from the spacing-dogs and having parts associated with the respective rows of keys and other parts to control the action of said dog, substantially as and for the purposes specified.

3. In combination with the keys and the loose spacing-dog of a type-writing machine, a rigid frame disconnected from the spacing-dog, having parts associated with the respective rows of keys and other parts to control the action of said spacing-dog, said frame being held to turn upon a pivot-rod and acting as a lever of the first order, substantially as described.

4. The combination, with the divided keys and loose spacing-dog of a type-writing machine, and a tilting frame having parts held within the spaces of said divided keys, of parts connected with said tilting frame in position to arrest the motion of said dog, substantially as shown and described.

5. The loose spacing-dog and the keys of a type-writing machine, in combination with a fixed stop and a movable stop for said loose spacing-dog, a tilting frame having parts associated with the respective rows of keys, and a part connecting said frame with the movable stop, the latter being made adjustable, substantially as shown and described.

6. The loose spacing-dog and the keys of a type-writing machine, in combination with a fixed stop and a movable stop for the spacing-dog, a rigid tilting frame polygonal in form, having parts associated with the respective rows of keys, a rigid part connecting said frame and the movable stop, and a spring having a bearing at one end upon said stop and at the other end upon said frame to connect said parts, substantially as and for the purpose set forth.

In witness whereof we have hereunto set our hands, this 13th day of May, 1890, in the presence of two subscribing witnesses.

FRANK H. HARRIS.
CORYDON E. CRANDALL.

Witnesses:
SPENCER GOODING,
OLIVER C. ARMSTRONG.