No. 685,945. Patented Nov. 5, 1901.

W. P. QUIMBY.

ESCAPEMENT MECHANISM FOR TYPE WRITERS.

(Application filed Feb. 1, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

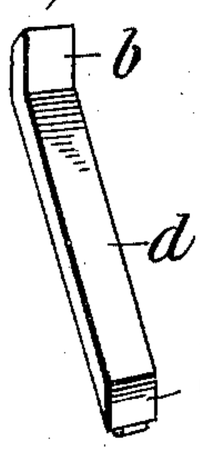


Fig. 2.

Fig. 3.

Fig. 4.

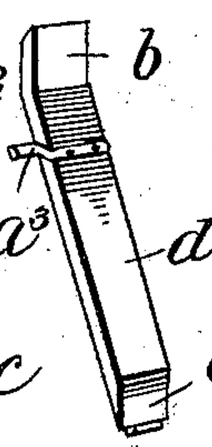


Fig. 5.

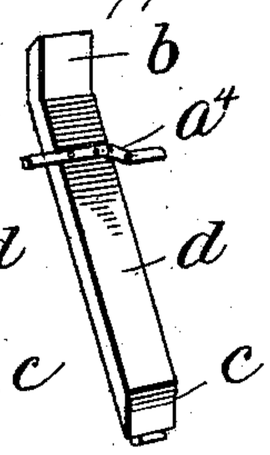


Fig. 6.

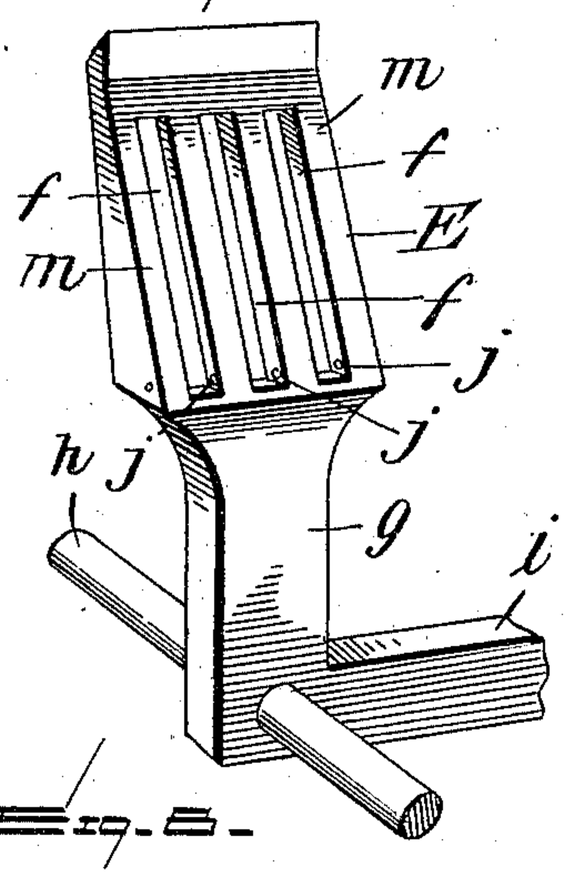


Fig. 7.

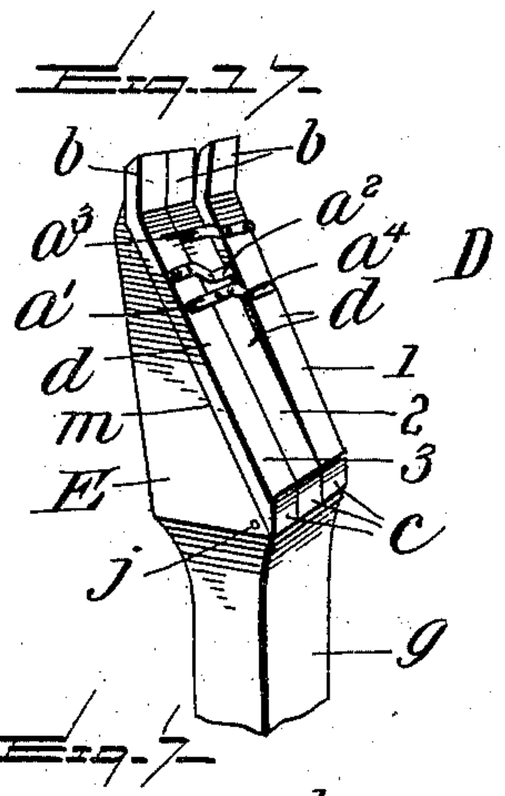


Fig. 8.

Fig. 9.

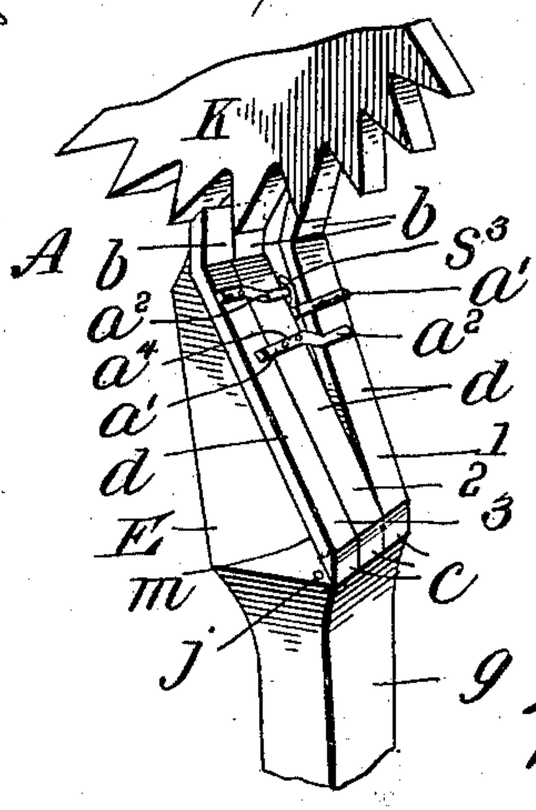


Fig. 10.

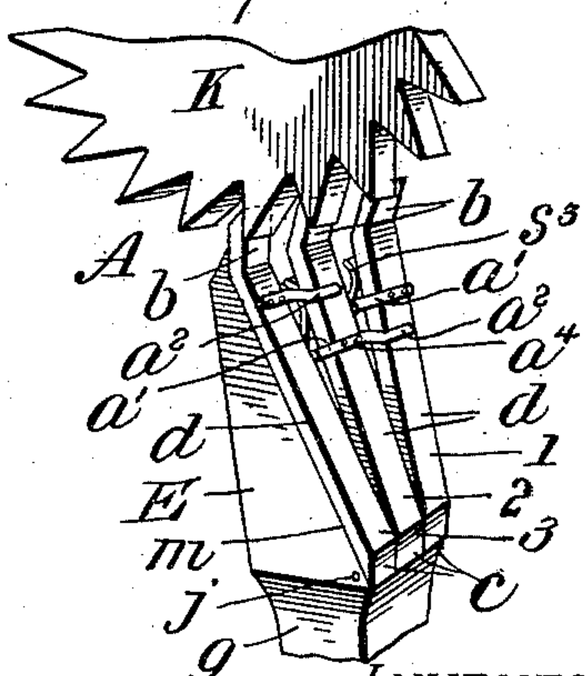


Fig. 11.

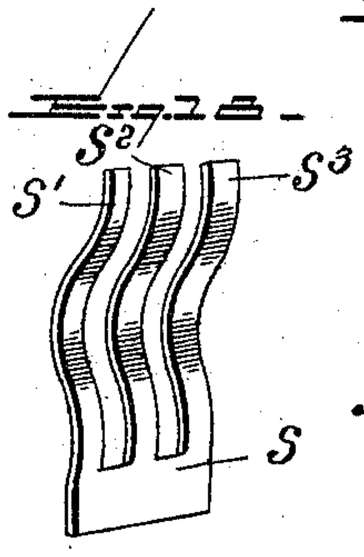
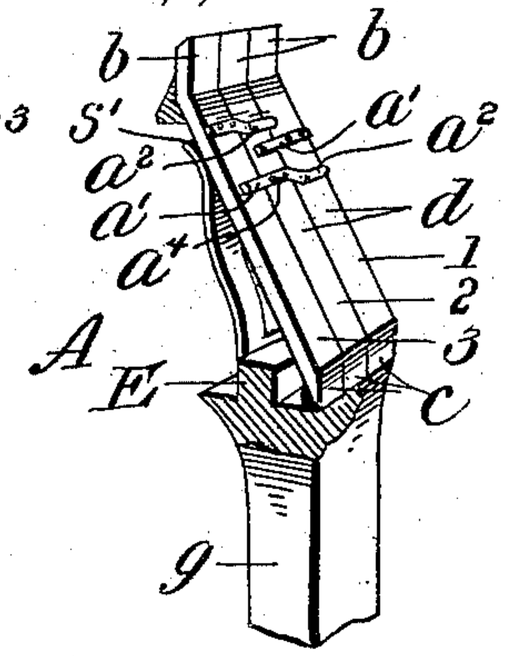


Fig. 12.



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No. 685,945. Patented Nov. 5, 1901.

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(No Model.) 2 Sheets—Sheet 2.

Fig. 22.

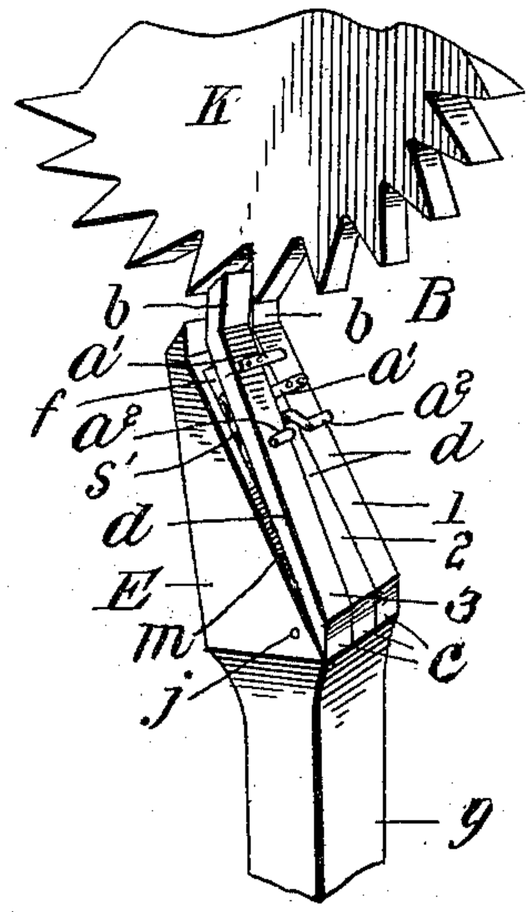


Fig. 24.

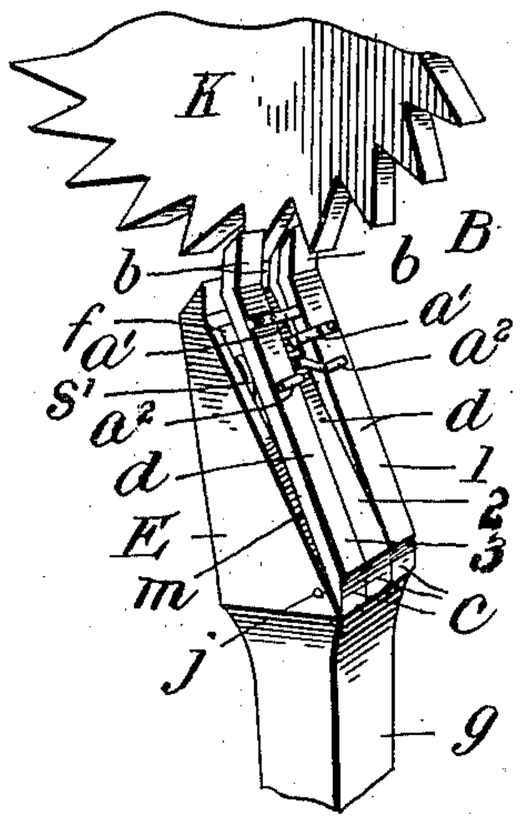


Fig. 23.

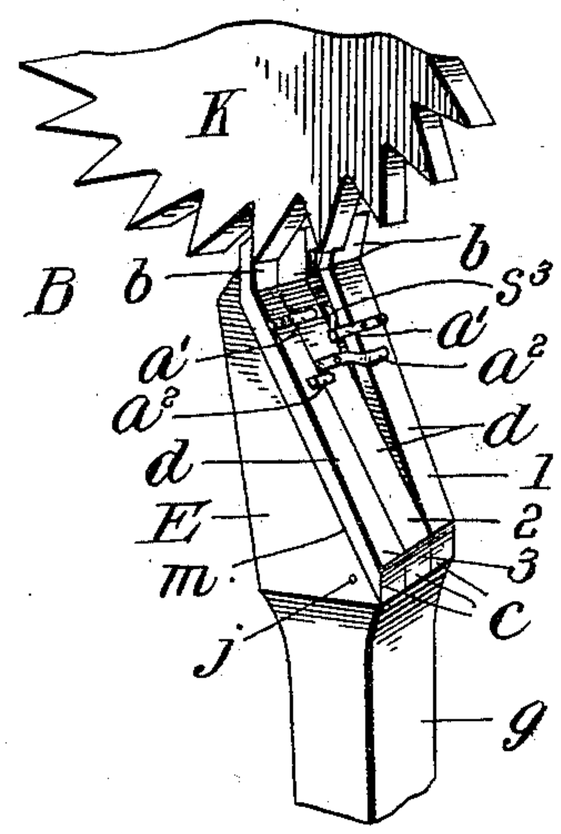


Fig. 29.

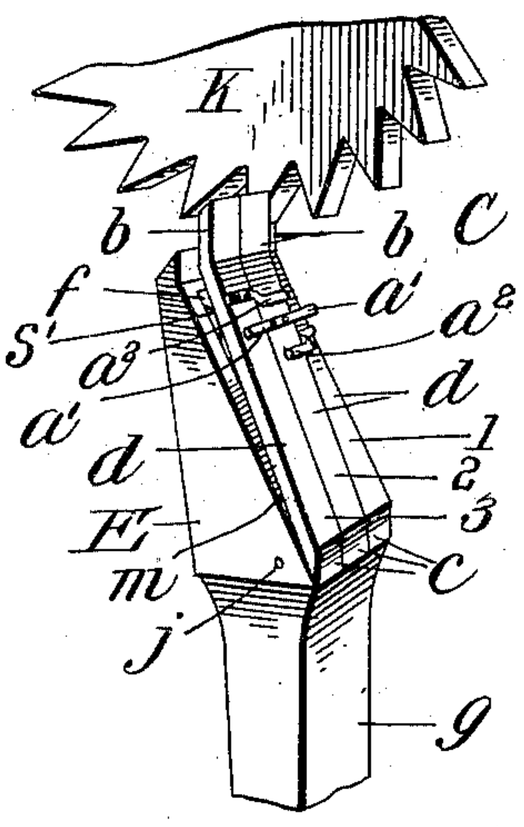


Fig. 25.

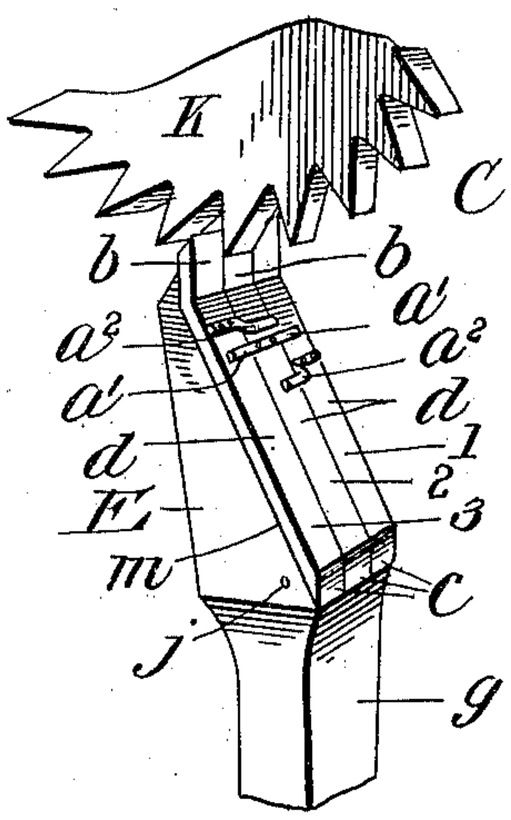
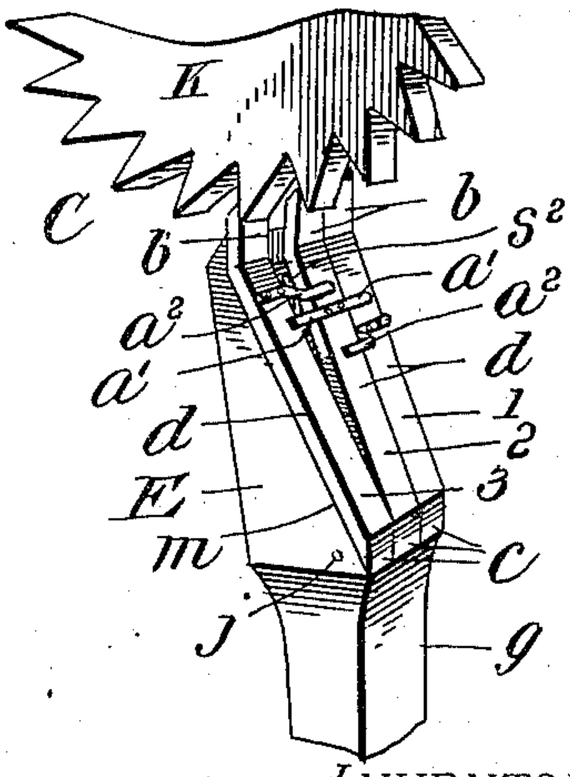


Fig. 26.



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WILLIAM PERRY QUIMBY, OF GETTYSBURG, PENNSYLVANIA.

ESCAPEMENT MECHANISM FOR TYPE-WRITERS.

SPECIFICATION forming part of Letters Patent No. 685,945, dated November 5, 1901.

Application filed February 1, 1901. Serial No. 45,654. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM PERRY QUIMBY, a citizen of the United States, residing at Gettysburg, in the county of Adams and State of Pennsylvania, have invented certain new and useful Improvements in the Escapement Mechanisms for Type-Writers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is designed for and is applicable to type-writing machines having a movable paper-carriage connected with a ratchet-escapement; and said invention comprises the mechanism determining, limiting, and controlling the movements of said escapement.

My invention is presented as arranged for attachment to a standard Remington machine provided with the usual ratchet-escapement. Such modifications as would be required for adaptation to other similar escapements are matters of mechanical detail and not of principle.

In the description the observer is assumed to be facing the rear of the machine. Terms definitive of direction when applied to the entire mechanism are used with reference to the observer; but when applied to the separate parts of said mechanism called "dogs" "forward" and "backward" indicate, respectively, to the right and left of the observer.

The purpose and effect of my invention are the production of either one or two units of motion in the associated ratchet-escapement, corresponding to similar units of motion imparted to the combined dogs, and a consequent motion of the attached paper-carriage equal to one or two letter-spaces—*i. e.*, a letter or word space. The production at will by a single motion of the hand of the said one or two units of motion in the combined dogs is possible when said mechanism is connected with the type and spacing bars through a second special mechanism, for which said second special mechanism I now hold Letters Patent of the United States bearing date the 7th day of February, A. D. 1899, under No. 619,260. My present invention is designed as an improvement upon the equivalent portion of the mechanism protected by said Letters Patent.

In the drawings, to which reference is made, corresponding and equivalent parts are indicated by the same letter, and their variation in form without change of function is shown by superscript figures.

Figures 1, 2, 3, 4, and 5 show the dogs used in the hereinafter-described combinations in the fundamental form, Fig. 1, and with the varying attached stops, Figs. 2, 3, 4, and 5. Fig. 6 shows the supporting-arm of a rocking lever. Fig. 7 shows combination A mounted on rocking lever with the head cut away to show the actuating-springs in position. Figs. 8 9 10, 11 12 13, and 14 15 16 show, in sets of three, perspective views of the several combinations A, B, and C mounted on the rocking-lever arm in working relations with a circular escapement and indicate, respectively, the varying positional relations of the several combined dogs in each combination at rest and under one and two units of rocking-lever motion. Fig. 17 shows the arrangement of dogs and the form of the attached stops constituting combination D. Fig. 18 shows the actuating-springs for the dogs in the several combinations.

Description of Figures.

The several elements of said mechanism, as shown in the drawings, separate and combined, are:

First—Dogs, Figs. 1, 2, 3, 4, and 5.—These in their fundamental form, Fig. 1, are thin rectangular bars with heads *b* set at an angle with the bodies *d* and bearing a posterior projecting arbor-bearing *c*. Their distinctive features are found in certain projecting or attached stops. (Shown in Figs. 2, 3, 4, and 5.) These stops are of three forms. Stop a', Fig. 2, has its projecting face in the plane of the face of the body of the supporting-dog. Stop a^2, Fig. 3, has its projecting face a definite distance in advance of the face of the body of the supporting-dog. Stop a^3, Fig. 4, has its projecting face a definite distance to the rear of the face of the body of the supporting-dog. These stops may be either single, *i. e.*, projecting from one side of the dog only; double, *i. e.*, projecting from each side of the dog in the same form, (dog 2 in Figs. 11 to 16,) or in combination, (a^4, Fig. 5,) *i. e.*, different forms of stops on the opposite sides of one dog. With the dogs mounted in combination on a common arbor, Figs. 7 to 17, it is obvious that the effect of stop a' is to prevent an adjacent dog from advancing beyond the dog bearing such stop and of stop a^2

to allow but limit such advance. Stop a^3 holds an adjacent dog in a plane posterior to the supporting-dog. When used with a linear ratchet, the angularly-set heads are not necessary, and if for any reason a straight dog is desirable such a one may be used with a circular ratchet.

Second—Rocking lever, Fig. 6.—This is here presented as the common angular rocking lever with an axis-bearing *h*, an actuating-arm *i*, and a supporting-arm *g*, having a head E arranged to carry three loose dogs on a common arbor in the bearings *j j*. The bearing-face *m m* of this face E is made to fit the backs of the dogs and is placed at a predetermined angle with the body *g* of the supporting-arm. The head E has slots *f f f* for the actuating-springs s' s^2 s^3, Fig. 18, which are attached by their common body *s* to the posterior face of the supporting-arm.

Third — Springs, Fig. 18. — These are formed of a body *s*, which is attached to the supporting-arm at the base of the head E, and of three arms s' s^2 s^3, which working in the slots *f f f* actuate the several dogs.

Fourth—Ratchet-escapement K, Figs. 8 to 16.—This is the common toothed wheel with teeth fitted to engage the dogs.

Fifth—In combination, Fig. 7.—Three dogs are mounted by their bearings *c c c* on a common arbor in the bearings *j j j* (see Fig. 6) and the spring *s* attached to the head E, with the arms s' s^2 s^3 bearing on the dogs through the slots *f f f*. When in association with a ratchet-escapement, Figs. 8 to 16, one or another dog is constantly held by a ratchet-tooth and the other dogs are controlled by the several attached stops.

Combinations and Motions.

My invention consists fundamentally in interchangeable combinations of three separate, independent, but mutually-controlling dogs designed to produce various forms of motion in an associated ratchet-escapement. For this description the dogs are numbered from before backward, and "right" and "left" as defining the side of the dog from which a stop projects indicate, respectively, toward the front and back of the machine as the dogs stand in working relations with the ratchet-escapement, Figs. 8 to 16.

In the several combinations of separate dogs in sets of three the specific form of their attached stops is determined by the character of the escapement motion desired. Of the numerous motions attainable four are most important and all-sufficient. The stop arrangements of the several combinations designed to attain and the manner in which they do attain these several motions are shown in respective figures as follows:

First—Common motion, combination A, Figs. 7, 8, 9, and 10.—In this combination dog 1 has stop a' at left, dog 2 has stop a^2 at right and stop a' at left, dog 3 has stop a^2 at right, and the combination gives both units of escapement after the release of the letter and space bars.

Second—Semi-expert, combination B, Figs. 11, 12, and 13.—In this combination dog 1 has stop a' at left, dog 2 has stop a^2 double at right and left, dog 3 has stop a' at right, and the combination gives the single unit of escapement after and the two units half with and half after the letter-bar depression.

Third—Expert, combination C, Figs. 14, 15, and 16.—In this combination dog 1 has stop a^2 at left, dog 2 has stop a' double, dog 3 has stop a^2 at right, and the combination gives the single unit of escapement with and the double unit half with and half after the letter-bar depression.

Fourth—Duplex, combination D, Fig. 17.—In this combination dog 1 has stop a^3 at left, dog 2 has stop a^2 at right and stop a' at left, dog 3 has stop a^2 at right, and the combination gives the single unit of escapement half with and half after and the double unit one-fourth with and three-fourths after the letter-bar depression.

These combinations are interchangeable on a common rocker-arm for use with the same ratchet-escapement.

Working Relations.

In adjustment, Figs. 8 to 16, the rocker-arm bearing the combined dogs is so placed in relation to the escapement K and the angle between the heads and the bodies of the dogs is so fixed that when the head of any given dog rests against the head of said arm the engaging face of that dog will be in the plane of the face of the engaging ratchet-tooth and the vertical plane through the axis of the ratchet-escapement, while the common axis of rotation of the combined dogs is in advance of said vertical plane. As a result of these relations, the tip of any dog is raised when forced forward to correspond with the ratchet-tooth with which it is intended to engage.

Action.

First—Common motion, combination A, Figs. 8, 9, and 10.—Given the above-described combination A with the machine at rest, Fig. 8, the rocker-arm is thrown back to the limit. Dog 1 now engages a ratchet-tooth and is pressed against the rocker-arm. Dogs 2 and 3 are held by the stops a' in the same plane as dog 1. Now as one unit of motion is given to the rocker-arm, Fig. 9, the combined dogs are carried forward. Dog 2 engages the tooth held by dog 1 and holds it unmoved while dog 1 is released and is forced forward, but only one unit of motion, by reason of stop a^2 on dog 2, whereby with the return motion of the combined dogs said dog 1 engages the first succeeding tooth, and as dog 2 is released on completion of said return motion is forced to its original position, thereby developing one unit of escapement motion for letter-spacing. With two units of motion

imparted to the rocker-arm and combined dogs, Fig. 10, dogs 2 and 3 successively take the tooth held by dog 1, and dog 2, being released anteriorly with dog 1, not only is forced forward itself the one unit allowed by stop a^2 on dog 3, but thereby allows dog 1 to be advanced a second unit. From this position on return motion dog 2 engages the first and dog 1 the second succeeding tooth and are successively forced to their original positions, thereby developing the two units of escapement necessary for word-spacing.

Second—Semi-expert, combination B, Figs. 11, 12, and 13.—In this case at rest, Fig. 11, dogs 1 and 2 are against the rocker-arm and dog 3 is advanced one unit. Under one unit of rocker-arm motion, Fig. 12, the action is as in case first. With two units of rocker-arm motion, Fig. 13, dog 2 passes over the tooth held by dog 1, while dog 3 engages the first succeeding tooth and gives one unit of escapement on forward motion. With the return motion dog 2 passes over the tooth held by dog 3, while dog 1, having been forced forward one unit, takes the next tooth, and thus adds the second unit of escapement.

Third—Expert, combination C, Figs. 14, 15, and 16.—Here at rest, Fig. 14, dog 1 engages and dogs 2 and 3 are together advanced one unit. Under one unit of combined motion, Fig. 15, dog 2 engages the first succeeding tooth and develops the single unit of escapement on forward motion. There is no escapement on return, as dog 2, bearing stop a' at both right and left, holds dog 1 in the same plane with itself. With two units of rocker motion, Fig. 16, on advance dog 3 takes the same first succeeding tooth as dog 2, giving a single unit of escapement on advance, as before. With the release anteriorly of dog 2 dogs 2 and 1 are forced forward in the same plane in position to develop the second unit of escapement on return motion.

Fourth—Duplex, combination D, Fig. 17.—In this case, for which only the mounted dogs are shown, at rest dog 1 engages, dog 2 is held posterior to dog 1 by stop a^3 on dog 1 a distance equal to one-half unit of escapement and in the same plane as dog 3. On one unit of rocker motion dog 2 takes the tooth held by dog 1, but by reason of its posterior position allows one-half unit of escapement, while dog 1 being forced forward the limit of stop a^2 on dog 2 takes the next tooth on return, and thus completes the single unit of escapement. Under two units of rocker motion dog 3 takes the tooth released by dogs 1 and 2, giving the half unit of escapement, as before, while dogs 2 and 1 are forced forward to take the first and second succeeding teeth, respectively, on return, and thus complete the two units of escapement.

Not only are these several combinations interchangeable on a common rocker-arm, but the dogs are also interchangeable in the different combinations, so that with four dogs having the appropriate stops it is possible to make the four combinations above described. If combination D, which has little practical value, be omitted, the three central dogs as given for combinations A, B, and C may be so combined as to form each of those combinations, and a machine supplied with such dogs may thus be adjusted for the needs of a tyro or the most expert operator. In making these combinations the central dog in each remains and the central dogs from the other two become dogs one and three, according to the stop requirements. It will be observed that while in any one combination as thus composed there are two inactive stops, these same stops become active and controlling in each of the other two combinations, and hence are necessary to render three dogs sufficient for the formation of the three combinations A, B, and C. Designating these central dogs by the letters of the combinations in which they appear and assuming the dogs as numbered to stand thus 321, the several combinations would then read as follows: combination A=B, A, C; combination B=C, B, A, and combination C=A, C, B.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In type-writing machines having a ratchet-escapement: the combination of three loose, independent and mutually-controlling dogs whereby the motion of said escapement is determined, limited, and controlled.

2. In type-writing machines having a ratchet-escapement: the combination of three loose, independent and mutually-controlling dogs made interchangeable, by attached stops, for the production of differently-effective mechanisms whereby the motion of said escapement may be controlled.

3. In type-writing machines having a ratchet-escapement: the combination of a mechanism controlling the motion of said escapement, consisting of three loose, independent and mutually-controlling dogs, and a lever-arm having a head provided with a bearing-face and an arbor-bearing for supporting said controlling mechanism in specified relations with said escapement, for the object and in the manner essentially as described.

4. In type-writing machines: the combination of a ratchet-escapement; a mechanism limiting and controlling the motion of said escapement consisting of three loose, independent and mutually-controlling dogs with attached stops; actuating-springs for said dogs; and a lever-arm having a head provided with a bearing-face and an arbor-bearing for supporting said controlling mechanism essentially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM PERRY QUIMBY.

Witnesses:

JOHN A. COX,

SAMUEL P. COX.