

Oct. 1, 1957

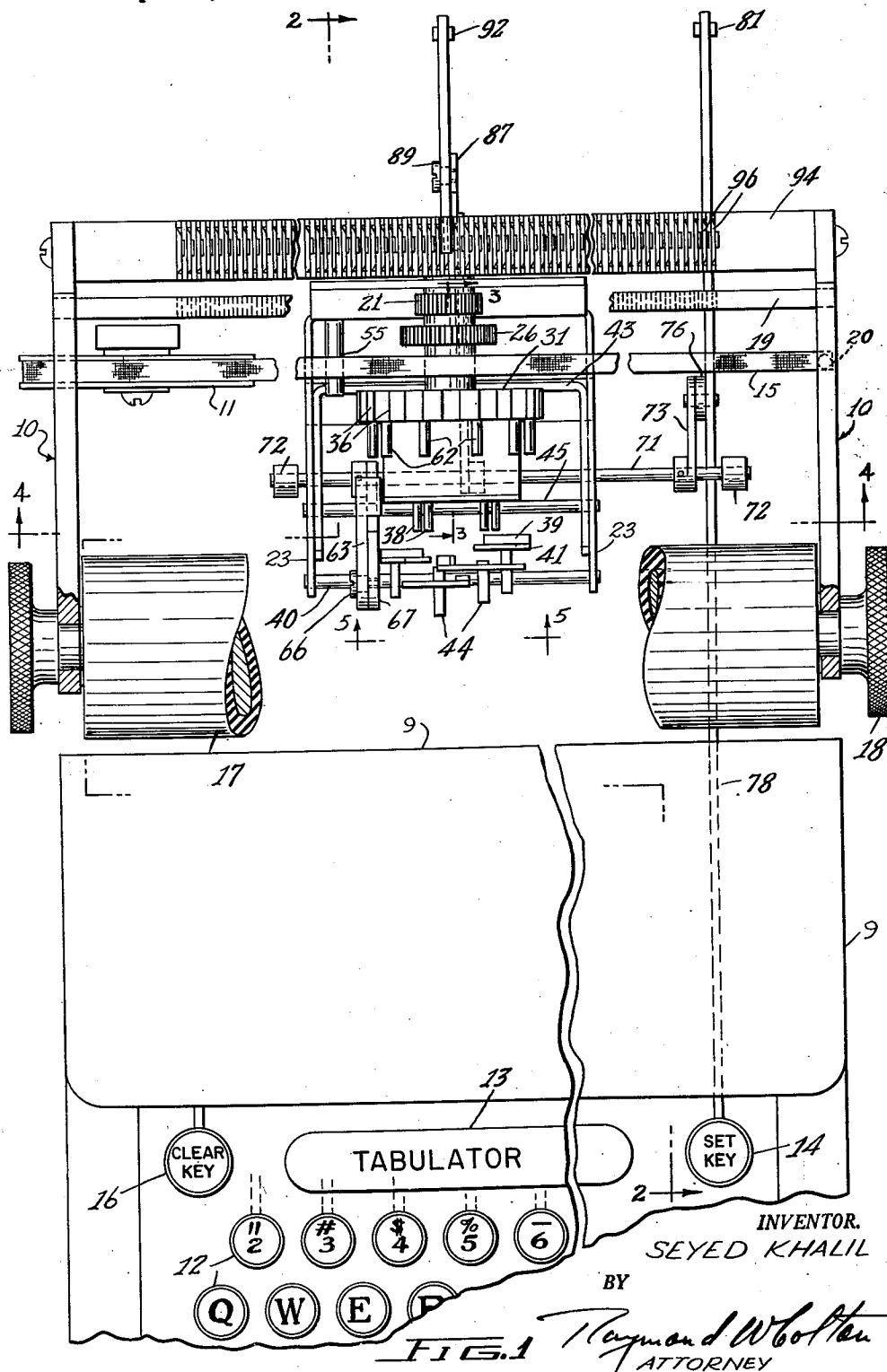
S. KHALIL

2,808,143

TABULAR STOP JUSTIFYING AND SETTING MECHANISM

Filed Sept. 19, 1955

5 Sheets-Sheet 1



Oct. 1, 1957

S. KHALIL

2,808,143

TABULAR STOP JUSTIFYING AND SETTING MECHANISM

Filed Sept. 19, 1955

5 Sheets-Sheet 2

FIG 5

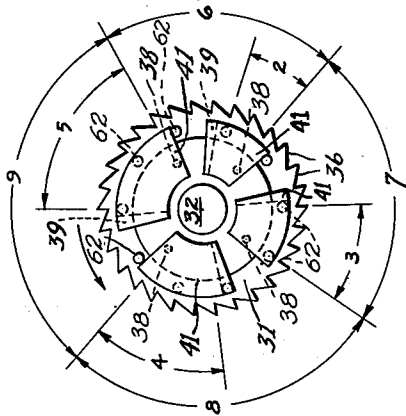


FIG. 5-A

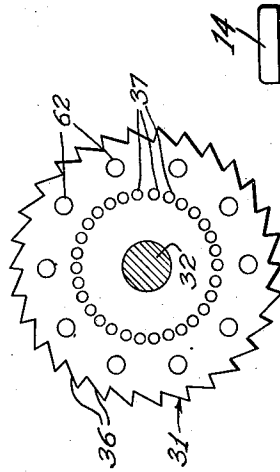
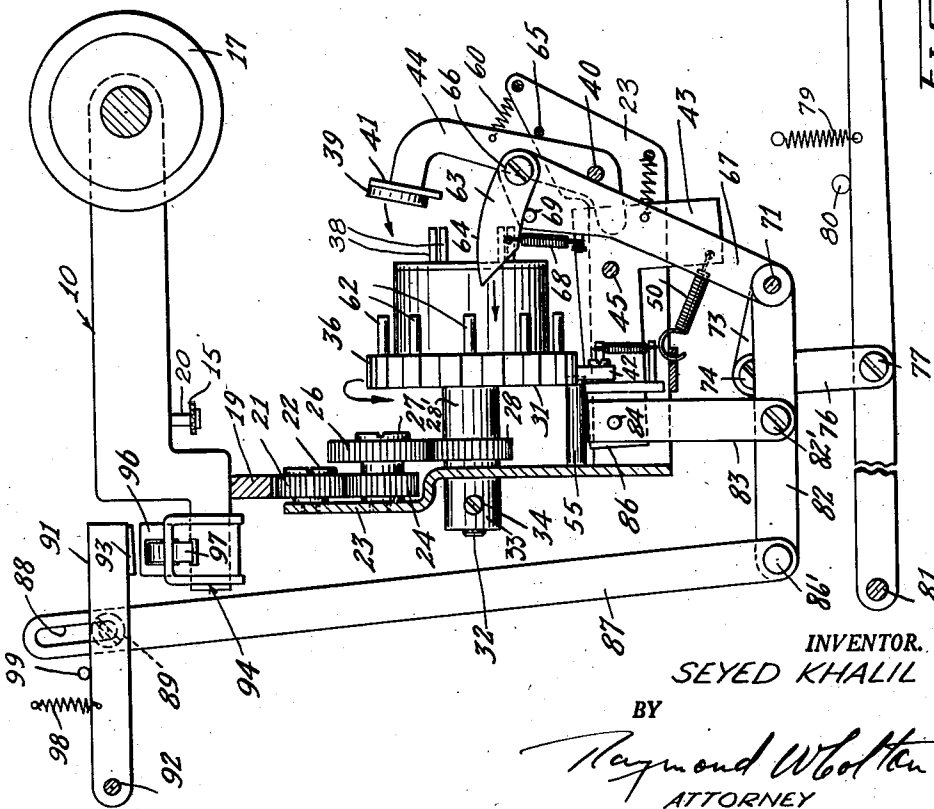


FIG. 2



INVENTOR.
SEYED KHALIL

BY

Raymond Wholton
ATTORNEY

Oct. 1, 1957

S. KHALIL

2,808,143

TABULAR STOP JUSTIFYING AND SETTING MECHANISM

Filed Sept. 19, 1955

5 Sheets-Sheet 3

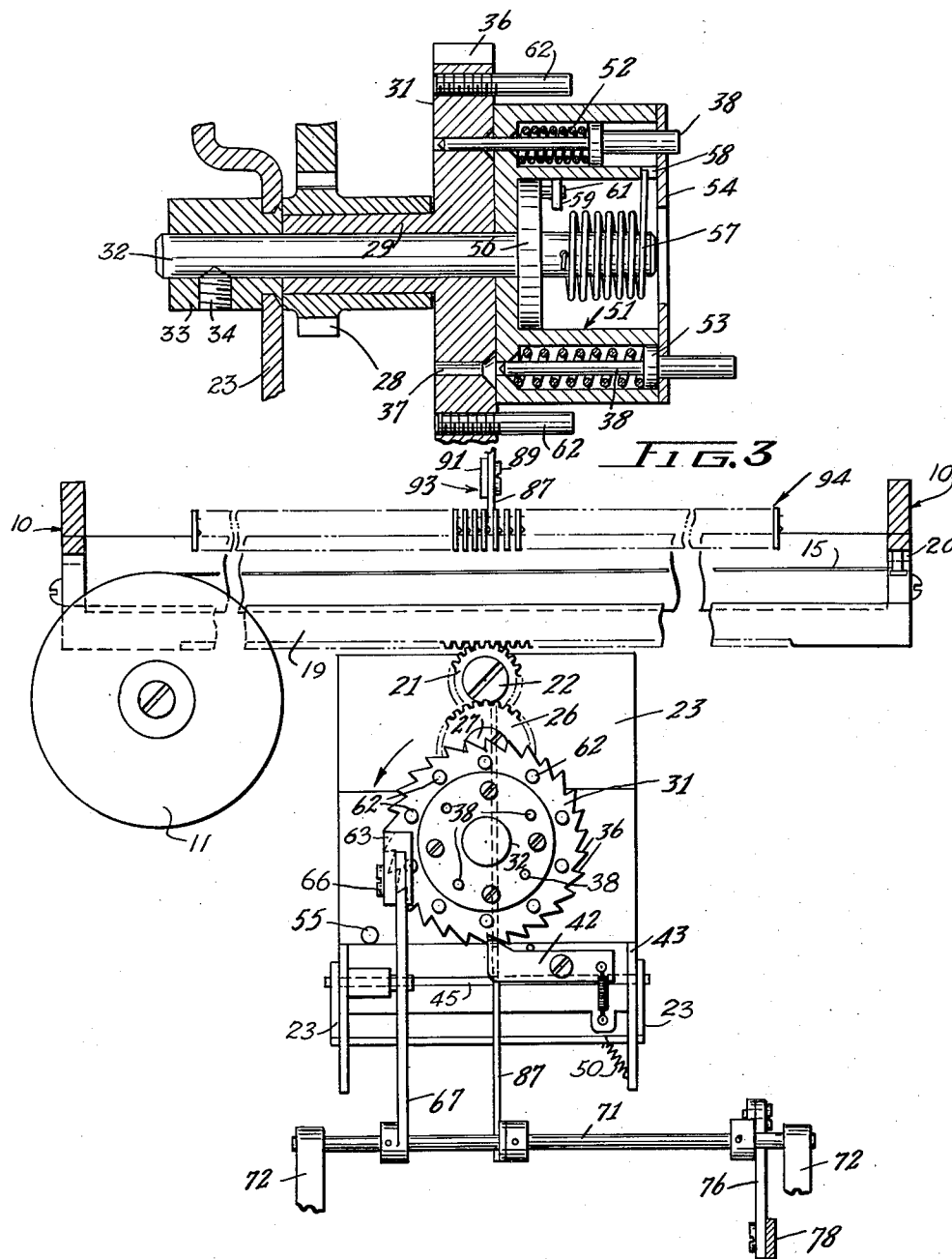


FIG. 4

INVENTOR.

SEYED KHALIL

BY

Raymond W. Cotton
ATTORNEY

Oct. 1, 1957

S. KHALIL

2,808,143

TABULAR STOP JUSTIFYING AND SETTING MECHANISM

Filed Sept. 19, 1955

5 Sheets-Sheet 4

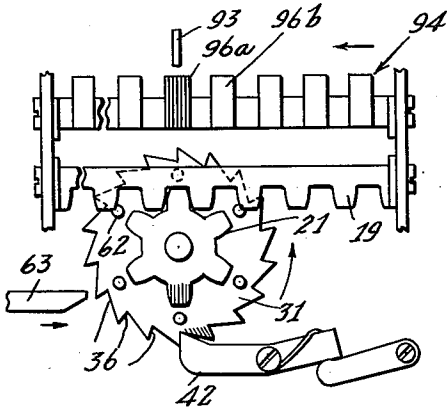


FIG. 6A

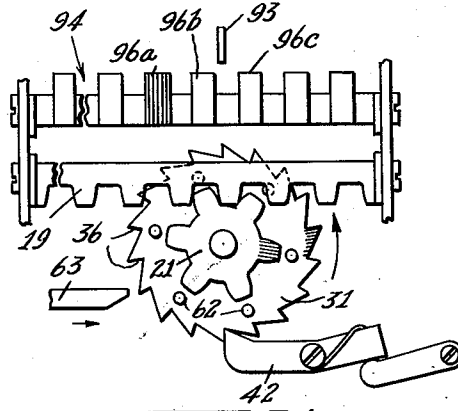


FIG. 7A

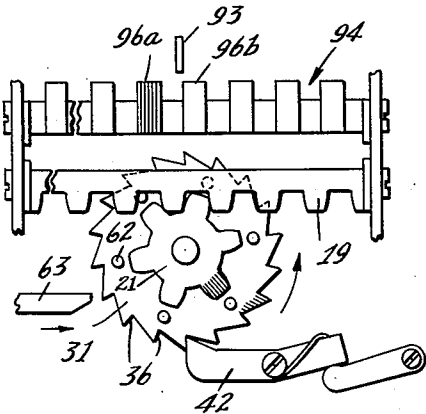


FIG. 6B

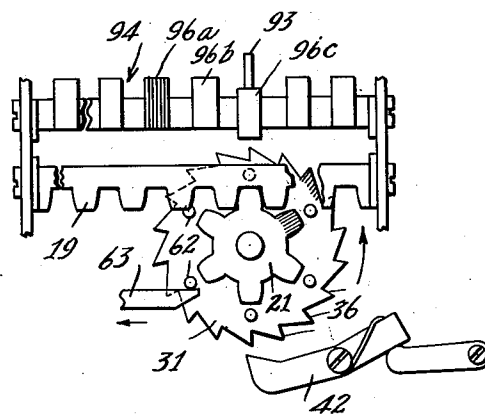


FIG. 7B

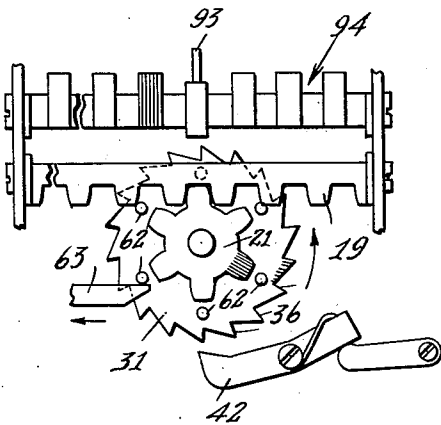


FIG. 6C

INVENTOR.
SEYED KHALIL

BY

Raymond W. Lott
ATTORNEY

Oct. 1, 1957

S. KHALIL

2,808,143

TABULAR STOP JUSTIFYING AND SETTING MECHANISM

Filed Sept. 19, 1955

5 Sheets-Sheet 5

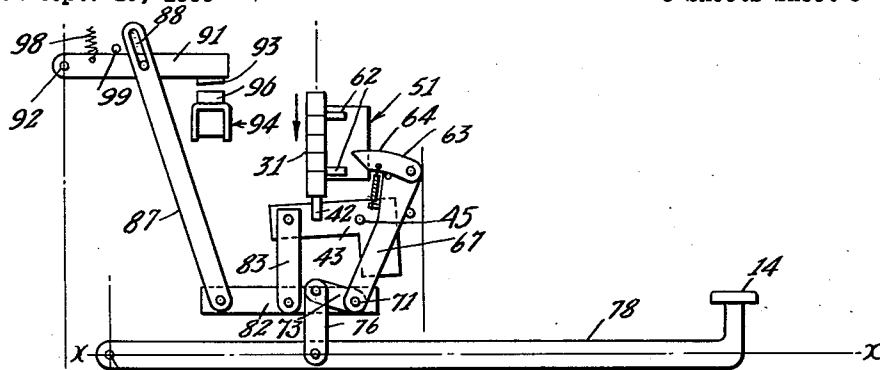


FIG. 8A

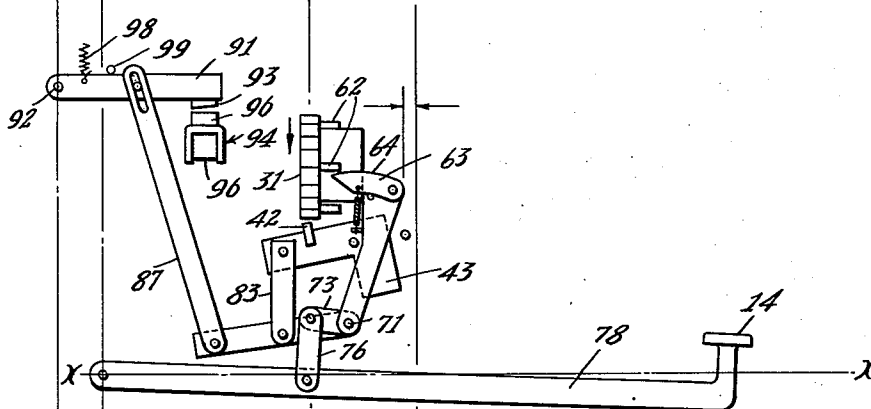


FIG. 8B

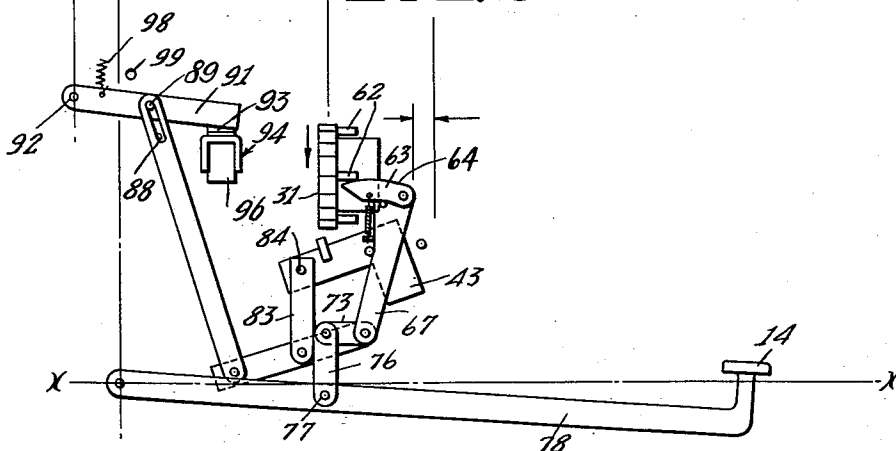


FIG. 8C

INVENTOR.
SEYED KHALIL

BY

Raymond Wootton
ATTORNEY

1

2,808,143

TABULAR STOP JUSTIFYING AND SETTING MECHANISM

Seyed Khalil, New York, N. Y.

Application September 19, 1955, Serial No. 535,135

20 Claims. (Cl. 197—179)

This invention relates to a tabular stop justifying and setting mechanism for typing machines, particularly adapted for proportional spacing typewriters and typewriters of small pitch.

The term "pitch" as used in connection with a feed mechanism signifies the number of characters typed per horizontal inch. Accordingly, typewriters having a pitch of 10, 12, or 16 will type 10, 12, or 16 characters per horizontal inch respectively. As applied to the tabular rack however, the term "pitch" refers to the number of its settable stops per horizontal inch.

In proportional spacing typewriters the width of characters is generally expressed in terms of "units" rather than pitch. This is due to the fact that in proportional spacing typewriters, unlike standard typewriters, the characters are positioned in accordance with their widths, which are referred to in terms of space-units. For example, the width of the letter "i" is two space-units; the width of the letter "n" is three space-units, the width of the letter "N" is four space-units; and the width of the letter "M" is five space-units.

Tabular mechanisms of conventional typewriters ordinarily employ three keys, a set key, a tabulating key, and a clearing key. The present invention employs these same keys, the tabulating and clearing keys performing their conventional functions, while the setting key performs additional functions which render it possible for the first time to achieve tabular stop setting in proportional spacing and small pitch typing machines by effecting automatic justification whenever required.

The tabular set key of a standard typewriter is operatively connected to a tabular setting lever pivotally mounted on the frame, the free end of the lever always registering with the settable stops of the tabular rack. In order to set a particular tabular stop, the set key is depressed, actuating the tabular setting lever which shifts the tabular stop with which it is in registry to an operative position. The positions assigned to the tabular stops relative to the teeth of the feed rack are such that the tabular stops successively assume registration with the free end of the tabular stop setting lever. Hence on a 12 pitch standard typewriter, the tabular rack also has a pitch of 12, and since the tabular rack and feed rack are supported by the carriage with the settable stops of the tabular rack in fixed relationship with respect to the teeth of the feed rack, the typing feed mechanism alone will suffice to assure registration of the settable stops with the tabular stop setting lever.

In a 16 pitch standard typewriter, whereas a feed rack of 16 pitch is entirely feasible and in fact already in use, a tabular rack of 16 pitch is far too weak to withstand the shock of tabulating. There are 16 pitch typewriters having tabular racks of 8 pitch, permitting alternate tabular stops only to be set.

Since there is no known manner in which a typing feed rack or tabular rack can have its tooth or stop spacing correspond to the width of more than one character, the setting of tabular stops of proportional spacing typewriters

2

has presented a difficult problem. For example, if tabular stops are spaced three units apart, they will not successively register with the tabular stop setting lever where characters of four units, five units, or two units are typed.

With the tabular stop setting mechanism of the present invention the set or setting key is depressed and tabular stops, whether of a proportional spacing typewriter or a standard typewriter, particularly one of small pitch, are automatically set regardless of the relative position of the tabular stops with respect to their setting lever.

In accordance with the present invention, the set key is so connected with the tabulating dog, typing dog and tabulating stop setting lever, that it operates them successively by a single stroke, first projecting the tabulating dog to limit movement of the feed mechanism, then retracting the typing dog, and finally actuating the stop setting lever which sets one of the settable stops to an active position on the tabulating rack.

If a tabulating stop is already in registry with the setting lever, then of course no carriage motion will occur as the set key is depressed. In the event that none of the tabular stops is in registry with the tabular stop setting lever however, depression of the set key will result in movement of the carriage to an extent necessary to bring the tabular stop nearest thereto in the typing direction into registry with the lever, whereupon the final downward movements of the lever will set the stop.

For proportional spacing typewriters according to this invention, it is proposed to use a feed rack and a tabular rack of identical pitch. It has been found to be advantageous to employ a 3-unit feed rack and a 3-unit tabular rack for the reasons that: all of the numerals and most of the characters of proportional spacing typewriters have widths of three units; a 3-unit tabular rack requires a minimum carriage displacement to effect registry in connection with the more commonly used proportional spacing typewriters.

For standard typewriters of small pitch it is proposed herein to use a tabular rack of larger pitch than that of the feed rack. For example, for a typewriter having a 16 pitch feed rack, a tabular rack of 8 pitch is proposed, in which case justification will be effected where required.

A more complete understanding of the invention will follow from a detailed description of the accompanying drawings wherein:

Fig. 1 is a fragmentary plan view showing portions of a typewriter and the manner in which the mechanism of the present invention is associated therewith;

Fig. 2 is a fragmentary sectional elevation substantially along line 2—2 of Fig. 1;

Fig. 3 is a fragmentary sectional elevation on an enlarged scale, substantially along line 3—3 of Fig. 1;

Fig. 4 is a fragmentary elevation substantially along line 4—4 of Fig. 1;

Fig. 5 is a somewhat diagrammatic elevation along line 5—5 of Fig. 1;

Fig. 5A is an elevation of the escapement wheel used in the feed mechanism; and

Figs. 6A, 6B, 6C, 7A, 7B, 8A, 8B, and 8C are diagrammatic representations to illustrate the operation of the present invention.

With particular reference to the fragmentary showing of Fig. 1, the typewriter includes side frame members 9, typing keys 12, a tabulating key 13 designated "Tabulator," a tabular stop setting key 14 designated "Set key" and a tabular stop clearing key 16 designated "Clear key." A platen 17 having hand knobs 18 at its end is conventionally mounted on a movable carriage 10. A feed spring 11 is provided with a conventional band or tape 15 having its end fastened to the carriage by means of a stud 20 for urging the carriage in a typing direction. A feed rack 19 mounted on the carriage 10 has teeth projecting down-

wardly from its lower surface for engagement with the teeth of a pinion gear 21 rotatably supported by a shoulder screw 22 threadedly secured to a stationary frame member 23. The gear 21 meshes with a companion gear 24 secured to a coaxial larger gear 26 for rotation therewith about a screw 27 likewise secured to the frame member 23. The gear 26 in turn meshes with a gear 28 having a hub 28' secured to the hub 29 of an escapement wheel 31 provided with teeth or detents 36 equally spaced about its periphery. The gears 21, 24, 26 and 28 are designed with respect to the escapement wheel 31 and its teeth 36 so that rotational movement of the escapement wheel corresponding to three of its teeth will produce rotation of the gear 21 corresponding to one of its teeth. The hub 29 is rotatably supported on a stud or shaft 32 fixed by means of a set screw 34 to a boss 33 suitably secured to the frame member 23. The escapement wheel 31, as best shown in Figs. 3 and 5A contains a series of openings 37 for reception of a series of clutch pins 38 to achieve feed movements of the carriage in a typing direction in varying amounts or distances responsive to the operation of actuating levers as fully described in a copending application Serial No. 467,457, filed on November 8, 1954, in the name of the present inventor. Briefly, the feeding mechanism is arranged to permit projection of one of the clutch pins 38 into one of the escapement wheel openings 37, the exposed end of the clutch pin cooperating with a shoulder 39, as shown in Fig. 1, formed on the particular plate 41 which has been actuated to permit varying degrees of rotation of the escapement wheel. The escapement wheel 31 contains a number of openings 37 equal to the number of its teeth or detents 36, and as best shown in Fig. 5A, thirty such openings are employed. The number of clutch pins 38, four in this case, corresponds to the number of different character widths provided by the machine. In the apparatus illustrated there are characters occupying two, three, four and five space-units. As shown in Fig. 4, the escapement wheel 31 is normally prevented from rotating by the engagement of a typing, rigid or holding dog 42 with one of its teeth 36. Concomitantly with the operation of one of the plates 41, the dog 42 mounted on a yoke member 43 is retracted, releasing the escapement wheel to permit its rotation in a counter-clockwise direction as viewed in Fig. 4, until further rotation thereof is interrupted by engagement of the exposed end of one of the clutch pins 38 with the shoulder 39 formed on the plate 41 that has been actuated. The plates 41 are carried at the free ends of bell cranks 44 which are pivoted on a shaft 40 as shown in Fig. 2. The bell cranks 44, only one of which has been depicted in Fig. 2, are biased towards a stop 65 by means of a spring 60. The yoke 43 carrying the typing dog 42 is pivotally mounted on a transverse pin 45, a spring 50 biasing the center of the yoke towards a stop pin 55.

The clutch pins 38 are mounted in a drum 51 for axial movement with respect to the shaft 32 and are normally urged to the right as viewed in Fig. 3 by means of springs 52 interposed between the base of the drum and shoulders 53 formed on the pins 38. A circular plate 54 containing openings through which the exposed ends of the pins 38 project is suitably attached to the end of the drum 51 to retain the pins 38 therein. The drum 51 is rotatably mounted on the shaft 32 and is retained against the proximate radial face of the escapement wheel 31 by means of a disc 56 secured to or formed integrally with the shaft 32. A spring 57 coiled about the end of the shaft 32 within the drum 51, has one end anchored to the shaft, its other end extending into an opening 58 in the peripheral wall of the drum, tending to rotate the drum in a clockwise direction as view in Fig. 4 normally urging a pin 59 extending radially inwardly from the drum towards engagement with another pin 61 extending from the face of the stationary disc 56. When one of the clutch pins 38 is advanced and projected into one of the openings 37 in the escapement wheel, with the rigid dog 42 re-

tracted from the tooth 36 of the escapement wheel 31, the drum 51 and the escapement wheel 31 will rotate together an amount governed by the arcuate length of the plate carried by the particular bell crank 44 that has been operated. Upon restoration of an actuated bell crank to its normal position as shown in Fig. 2, the disengaged rigid dog 42 reengages the tooth 36 of the escapement wheel with which it is in registration and the operated clutch pin resumes its normal position under the influence of its spring 52, whereupon the spring 57 returns the drum 51 to its normal position determined by abutment of the pin 61 against the pin 59.

Extending about the drum 51 from the right end of the escapement wheel 31 as viewed in Fig. 3, are a series of ten pins or detents 62 equally angularly spaced and for purposes of the present description there is one such pin for each three teeth 36 of the escapement wheel. For co-operation with the pins 62, as shown in said Fig. 2, there is provided a tabular dog 63 having a convex upper surface 64, mounted for pivotal movement by a shoulder screw 66 carried at the upper end of an arm 67. A spring 68 having its opposite ends attached to the tabular dog 63 and arm 67 normally holds the dog against a stop 69 also carried by the upper end of the arm 67. The arm 67 is secured at its lower end to a transverse rod 71 suitably supported in posts 72 (Fig. 4) from the base of the typewriter. An operating arm 73 also has one end secured to the rod 71 as shown in Figs. 1 and 2, the other end of the arm being attached by means of a pivot screw 74 to the upper end of a link 76 whose lower end is pivotally connected to a key lever 78 of the set key 14 by means of a shoulder screw 77. The rear end of the key lever 78 is pivotally mounted on a fixed pivot 81, the set key 14 itself being disposed in proximity to the keys 12 of the typewriter keyboard, as shown in Fig. 1. The key 14 is normally held in an elevated position by means of spring 79 which pulls the lever 78 against a stop 80, as shown in Fig. 2.

Also fixed to the rod 71 and extending towards the rear of the typewriter, there is a second operating arm 82, to an intermediate portion of which a screw 82' pivotally connects a short link 83 whose upper end is in turn pivotally connected by means of a pin 84 to an extension 86 projecting rearwardly from the central portion of the yoke 43. Pivotally attached to the outer end of the arm 82 by means of a pin 86' there is a long link 87 having a slot 88 in its upper end to receive a shoulder screw 89 carried by a lever 91. The lever 91 is pivoted on a pin 92 suitably mounted at the central portion of the typewriter frame, the forward free end of the lever carrying a suitable setting finger 93 disposed above the settable stops 96 carried by the tabular rack 94. The tabular rack 94 is of conventional construction and includes a plurality of settable stops 96 each provided with a leaf spring 97 to yieldably restrain it against accidental displacement from either its normal elevated position or its operating lowered position. A spring 98 interposed between the lever 91 and the typewriter frame normally holds the lever upward against a stop 99 also carried by the frame.

The proportional escapement wheel 31, illustrated by way of example as having thirty teeth or detents, is geared to the carriage so that one rotation of the wheel advances the carriage to permit the typing of ten characters having a width of three units each, such as the letter "n." Accordingly, each revolution of the thirty tooth escapement wheel advances the carriage a distance equal to thirty units. And since in one revolution of said escapement wheel ten characters each of three units width are typed, the feed rack 19 and the tabular rack 94 advance ten teeth respectively.

Each of the tabulating pins or detents 62 is aligned with one of the thirty typing teeth or detents 36 of the escapement wheel permitting the use of five, six, ten, fifteen or thirty of such pins.

5

In a preferred form of the invention however, the escapement wheel has been shown as provided with ten such tabulating pins or detents, that is, one pin for each three typing teeth 36 of the escapement wheel. The tabular rack 94 is provided with a number of settable 5 tabular stops 96 to the horizontal inch corresponding to the number of teeth per horizontal inch provided on the feed rack, namely, ten. Thus it will follow that one revolution of the escapement wheel will correspond with an advance of ten stops of the tabular rack and ten 10 teeth of the feed rack.

Referring to Fig. 5 it can be seen that there are four plates 41 which enable the escapement wheel 31 to rotate five, four, three and two units or teeth respectively, as shown by the arrows. And, as already indicated by way of example, five units are required by "M," four units by "N," three units by "n," and two units by "i."

Operation of tabular stop setting mechanism

In order to illustrate the manner in which the carriage 10 is moved to bring one of the settable tabular stops 96 into registration with the setting finger 93, reference may be had to the diagrammatic showings of Figs. 6A, 6B, 6C, 7A, and 7B, looking from the front of the machine, and Figs. 8A, 8B and 8C, looking from 20 the side thereof, all of these figures for purposes of clarity depicting the elements according to different scales, proportions, relationships, and forms from those employed in the presentation of Figs. 1, 2, 3, 4, 5 and 5A.

Referring to Figs. 6A, 6B, and 6C, for simplification 30 the feed pinion 21 has been shown as directly mounted on the hub of the escapement wheel 31, and in mesh with the teeth of the feed rack 19, above which the tabular rack 94 is disposed. The tabular dog 63 is represented by a finger also designated 63 to the left side of the escapement wheel. Each tooth 36 of the escapement wheel 31 corresponds to one unit of spacing, whereas each tooth of the feed pinion 21 and of the feed rack 19 corresponds to three units of spacing, and the interval between each settable stop 96 of tabular rack 94 likewise corresponds to three units of spacing. 40

In Fig. 6A the shaded stop 96a, the shaded tooth of feed pinion 21, and the shaded tooth of the escapement wheel 31 indicate positions assumed by these elements at a given point of departure, wherein the stop 96a is in registration with the setting finger 93 whose operation would effect setting of the stop 96a. 45

Fig. 6B shows the carriage after it has been advanced two units from its position of Fig. 6A, as can be observed from the location of shaded stop 96a which has advanced to the left of the finger 93, and also from the new positions of the shaded teeth of the feed pinion and escapement wheel. Such an advance of two units would result from typing a character such as "i" or "l" (lower case) whose width corresponds to two units. Were the setting finger 93 depressed under these conditions it would jam between the stops 96a and 96b operating neither of them. However, in accordance with the present invention, operation of the set key will effect a carriage movement corresponding to one unit bringing the next stop 96b to a position directly below the setting finger 93 as shown in Fig. 6C. This results from the interposition of the tabulating dog 63 into the path of the detents or pins 62 before the typing dog 42 has been retracted from its engaged typing detent or tooth on the escapement wheel, so that upon retraction of the dog 42, the escapement wheel will turn until it is stopped by the tabulating dog 63 in the position indicated in Fig. 6C. 50

Another sequence of operation is illustrated by Figs. 7A and 7B. Starting with the condition depicted in Fig. 6A, when a character of four units, such as "N" or "L," is typed, rotation corresponding to four teeth or detents 36 of the escapement wheel 31 will occur, producing a relationship as shown in Fig. 7A, wherein none of the 70

6

stops 96 is in registration with the setting finger 93. Projection of the tabular dog 63 into the path of the pins 62 and withdrawal of the typing dog 42 from the registering tooth of the escapement wheel will permit the carriage 10 to move a distance corresponding to two units and thereby place the stop 96c directly below the setting finger 93 as shown in Fig. 7B. Thus whenever there is no stop in registry with the finger 93, operation of the set key will permit such movement of the carriage as may be necessary to bring the next stop in the direction of forward movement of the carriage into direct registration with the setting finger 93, before the finger has moved downwardly sufficiently to engage a settable stop.

Now, with reference to the diagrammatic showings of Figs. 8A, 8B and 8C, as the movements would appear from the left side of the typewriter, it will be noted that the number of pins 62 has been reduced below that shown in the preceding figures for clarity of illustration. The base lines x, x in Figs. 8A, 8B and 8C indicate the degree of displacement of the set key 14 relative to the typewriter frame. With the set key 14 in its normal position, as shown in Fig. 8A, the left end of the tabulating dog 63 is out of the path of movement of the tabulating pins 62, and the rigid or typing dog 42 is engaged with one of the teeth 36 of the escapement wheel 31 to prevent its rotation under the influence of the carriage feed spring 11. When the set key 14 is depressed, downward movement of the key lever 78 and link 76 imparts counterclockwise movement to the rod 71 through the arm 73, producing downward movement of the link 83 and pivotal movement of the yoke 43 in a counterclockwise direction about its pivot 45. A slight pivotal movement of the set key causes the tabulating dog 63 to project into the path of the tabulating detents or pins 62, a slight further movement retracting the typing dog 42 from its engaged tooth 36 on the escapement wheel 31. Accordingly, as the escapement wheel 31 is released by the typing dog 42 it will be free to rotate under the influence of the carriage feed spring until the under-side of a pin 62 engages the upper curved surface of the tabulating dog 63. Such relative positions of the elements are shown in Fig. 8B, under which conditions the link 87 will have moved downwardly to some extent, but due to the slot 88 in its upper ends, no movement will have been imparted to the stop setting lever 91. As the set key is further depressed to the limit of its downward travel as depicted in Fig. 8C, the curved upper surface 64 of the dog 63 continues to slide under its engaged pin without imparting rotation to or permitting rotation of the escapement wheel 31. At this time the link 87 will have moved downwardly sufficiently for the upper end of the slot 88 to engage the shoulder screw 89 and thereby rock the stop setting lever 91 in a clockwise direction against the action of its spring 98, causing its finger 93 to depress the tabular stop 96 with which it is now in registry. 55

The pins or detents 62 and the gearing between the escapement wheel and the typewriter feed rack 19 are so arranged that with the escapement wheel 31 at rest in any one of its ten positions determined by the pins or detents 62 relative to a point on the frame, one of the tabular stops 96 will lie directly beneath the tabular stop setting finger 93. Thus whenever the tabular set key 14 is operated, the finger 93 will be in registry with one 60 of the stops 96 permitting a setting operation.

While the invention has been described with respect to only a preferred embodiment, it will be obvious that various modifications can be made therein without departing from the spirit or essential attributes thereof, and it is desired therefore that only such limitations be placed thereon as are specifically set forth in the appended claims.

I claim:

1. A tabular stop justifying and setting typewriter comprising a frame, a carriage slidably mounted on said 75

frame, said carriage supporting a platen, a feed rack of uniform pitch, a tabular rack bearing a plurality of settable stops of uniform pitch, a plurality of typing keys and a feed mechanism controlled by said typing keys to impart movement to said carriage; said feed mechanism including a set of uniformly displaced typing detents and a set of tabulating detents displaced uniformly but differently from said typing detents, and at least one dog for each set of detents, a set lever for setting said stops and a set key operatively connected with said set lever and said dogs to effect setting of said stops.

2. A typewriter as set forth in claim 1 wherein the displacement between adjacent tabulating detents equals the displacement between at least two of said typing detents.

3. A typewriter as set forth in claim 1 wherein the ratio of typing detents to tabulating detents is a whole number.

4. A typewriter as set forth in claim 3 wherein the whole number is three.

5. A typewriter as set forth in claim 1 wherein said feed mechanism includes a feed spring biasing said carriage in one direction under the control of said typing detents, said tabulating detents and said dogs.

6. A typewriter as set forth in claim 1 wherein said set key actuates said tabulating dog before said typing dog.

7. A typewriter as set forth in claim 1 wherein said set key actuates said tabulating dog before setting one of said stops.

8. A typewriter as set forth in claim 1 wherein said set key actuates said typing dog before setting one of said stops.

9. A typewriter as set forth in claim 1 wherein said set key sequentially actuates said tabulating dog, typing dog and set lever.

10. A typewriter as set forth in claim 1 wherein depression of said set key when none of said stops registers with said set lever actuates said dogs to advance said carriage until the stop most proximate to said set lever registers therewith.

11. A typewriter as set forth in claim 1 wherein depression of said set key when one of said stops registers with said lever actuates said dogs to restrain said carriage against movement.

12. A tabulating mechanism comprising a frame, a carriage having a tabular rack slidably mounted on said frame, settable stops on said rack, a setting element for said stops carried by said frame, a feed mechanism for advancing said carriage relative to said frame, a dog for said feed mechanism, a set key mounted on said frame, means connecting said set key with said dog and setting element to actuate said feed mechanism and set one of said stops, and carriage arresting means for effecting registration of said setting element and stops upon actuation of said feed mechanism.

13. A tabulating mechanism comprising a frame, a carriage having a tabular rack slidably mounted on said frame, settable stops on said rack, a setting element for said stops carried by said frame, a feed mechanism for advancing said carriage relative to said frame, a dog for said feed mechanism, a set key mounted on said frame, and means connecting said set key with said dog and setting element to actuate said feed mechanism and set one of said stops, said feed mechanism including a second dog connected to said set key to control carriage movement upon actuation of said feed mechanism.

14. In combination with a typewriter having a frame, a carriage bearing a feed rack slidably mounted on said frame, a feed spring biasing said carriage in a typing direction, said carriage supporting a tabular rack bearing a plurality of settable stops of uniform pitch, an escapement wheel provided with uniformly spaced typing teeth rotatably mounted for movement in a typing direction under the influence of said spring; a typing dog engaging the teeth on said wheel to restrain it against movement in a typing direction, said escapement wheel having a set of uniformly spaced tabulating detents spaced differently than the typing teeth and a tabular dog therefor; and a setting mechanism including cooperating elements for interposing said tabular dog into the path of said tabulating detents and disengaging said typing dog from said typing teeth for releasing said carriage for movement in a typing direction limited to an amount less than that corresponding to the spacing of said tabulating detents.

15. The invention as set forth in claim 14 wherein the spacing of said tabulating detents exceeds that of said typing teeth.

16. The invention as set forth in claim 14 wherein movement of the carriage from one tabular stop to the next corresponds to movement from one detent to the next.

17. The invention as set forth in claim 14 wherein engagement of said typing dog with one of the typing teeth and disengagement of the tabular dog from the tabulating detents restrains said wheel against movement.

18. The invention as set forth in claim 14 wherein engagement of said tabular dog with one of the tabulating detents and disengagement of the typing dog from the typing teeth restrains said wheel against movement.

19. The invention as set forth in claim 18 wherein one of said tabular stops registers with said setting mechanism when said wheel is restrained against movement.

20. The invention as set forth in claim 14 wherein the ratio of the pitch of said detents and the pitch of said teeth is a whole number.

References Cited in the file of this patent

UNITED STATES PATENTS

2,606,641 Kleinschmidt ----- Aug. 12, 1952