

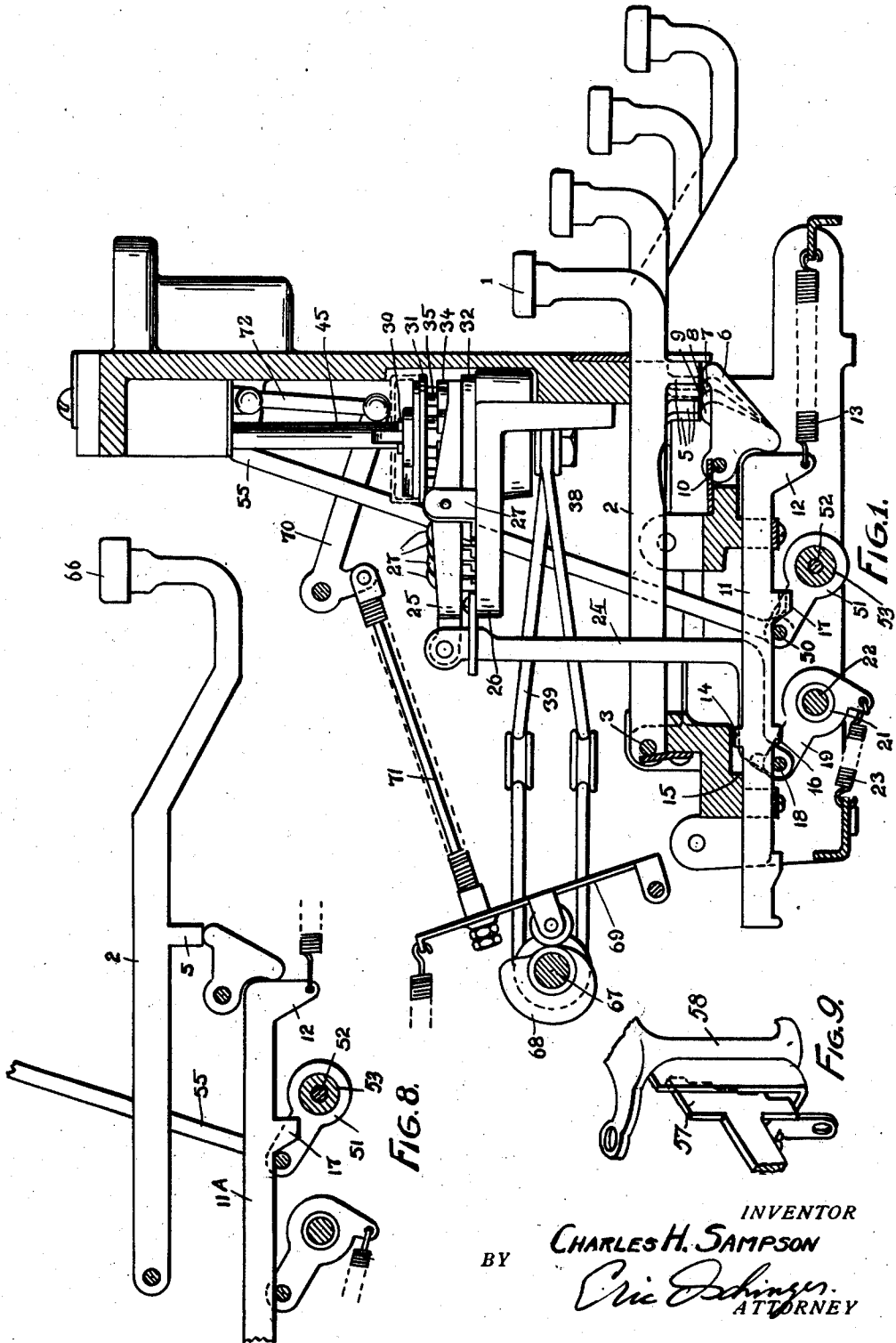
Dec. 4, 1934.

C. H. SAMPSON

1,983,099

KEYBOARD MECHANISM

Original Filed Jan. 18, 1929 4 Sheets-Sheet 1



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KEYBOARD MECHANISM

Original Filed Jan. 18, 1929 4 Sheets-Sheet 2

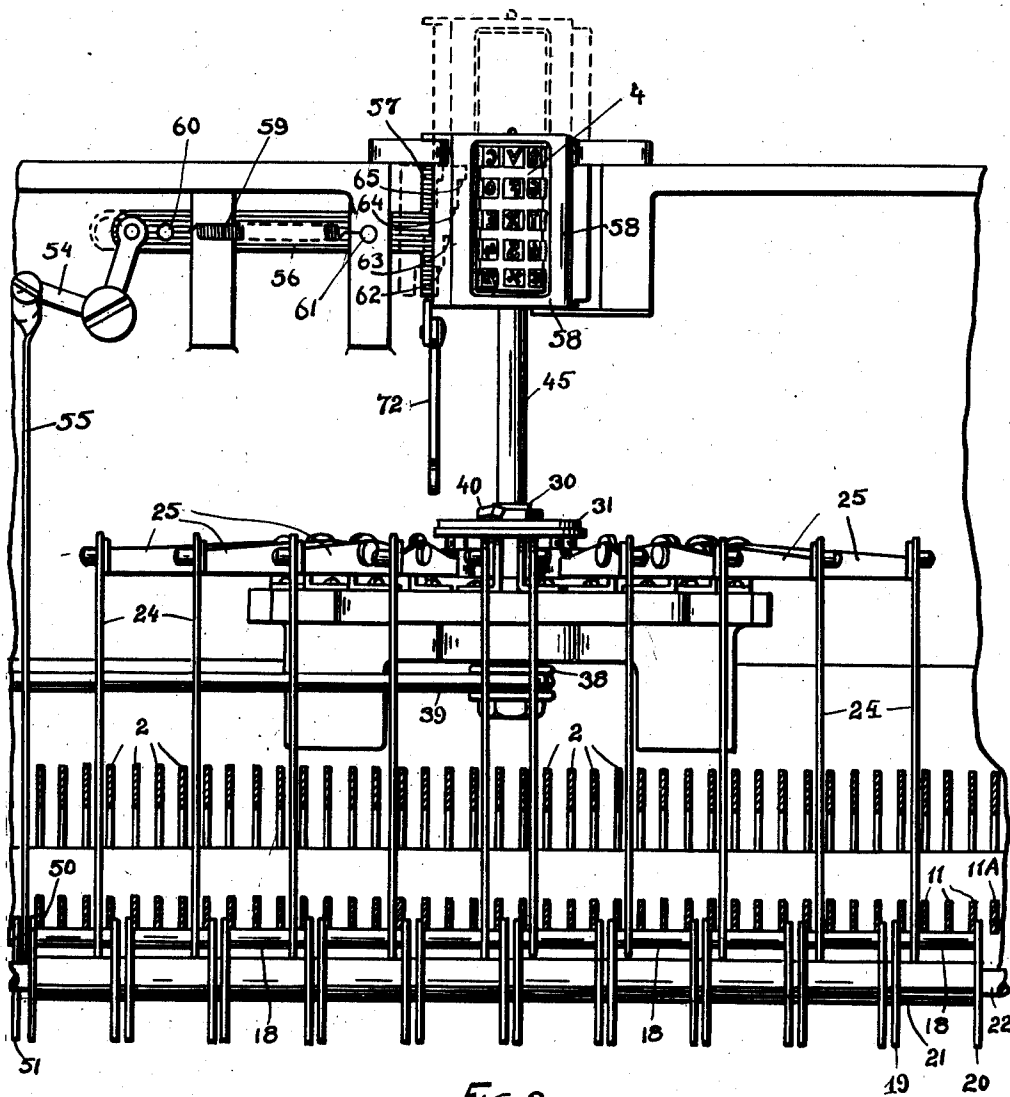


FIG. 2.

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KEYBOARD MECHANISM

Original Filed Jan. 18, 1929 4 Sheets-Sheet 3

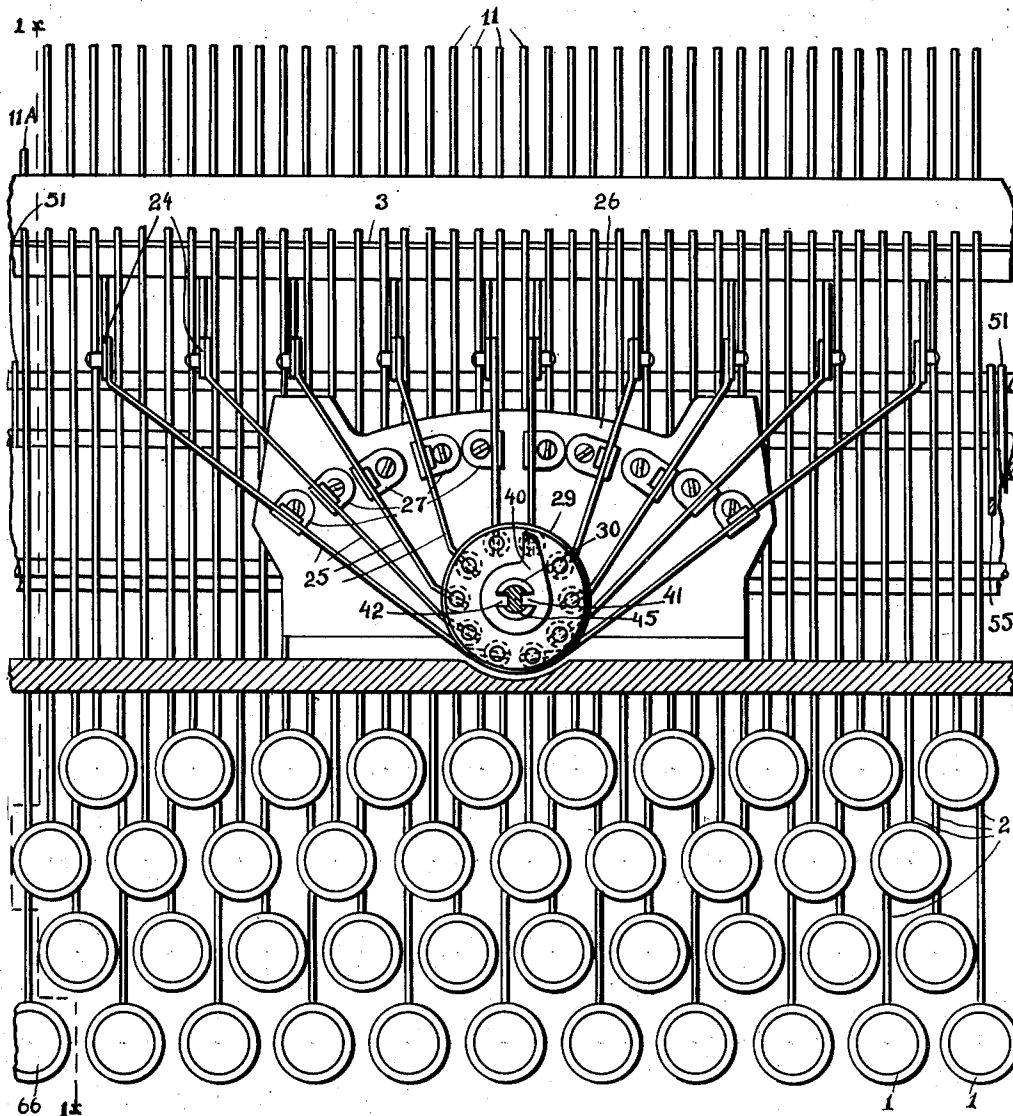


FIG. 3.

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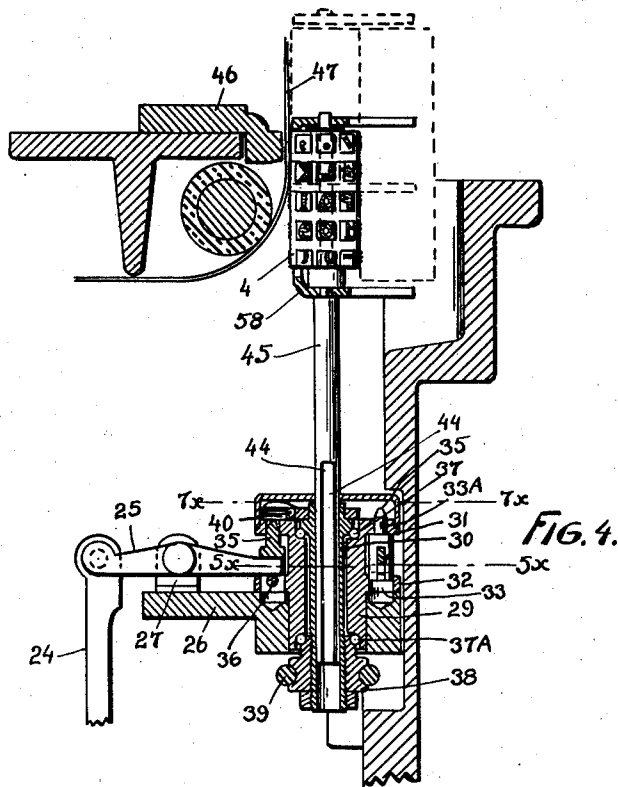
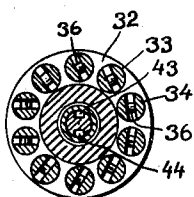


FIG. 5.

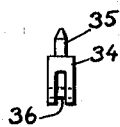


FIG. 6.

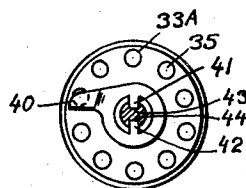


FIG. 7.

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1,983,099

KEYBOARD MECHANISM

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Original application January 18, 1929, Serial No.
333,300. Divided and this application August
18, 1931, Serial No. 557,937

5 Claims. (Cl. 197-49)

This invention relates to key board mechanisms for typewriting and other printing machines in which a key board is used for selecting and positioning the type and one of the objects of the invention is to provide a simplified and novel construction for the selecting and positioning mechanism.

Another object of the invention is to impart a constant rotary motion to the type carrier to provide the means for positioning the type after it has been selected.

These and other objects of this invention will become more readily apparent from the detailed description of the invention which follows, reference being had to the accompanying drawings in which

Figure 1 is a longitudinal vertical sectional view of the type selecting mechanism.

Figure 2 is a rear elevation of the type selecting mechanism.

Figure 3 is a horizontal sectional view of the type selecting mechanism.

Figure 4 is a vertical sectional view of the spindle support of the type carrier.

Figure 5 is a horizontal sectional view of the spindle support, the section being taken on the line 5x-5x of Figure 4.

Figure 6 is a detail view of one of the selecting pins of the spindle support.

Figure 7 is a top plan view of the spindle support.

Figure 8 is a diagrammatic view of the shift lever mechanism.

Figure 9 is a perspective view showing the co-operation of the type carrier carriage with the justifying member.

In the several figures of the drawings like reference numerals indicate like parts.

The key board operated selecting mechanism for typewriters and other printing machines forming the subject matter of my present invention is an improvement of the key board selecting mechanism illustrated and described in my prior application Serial No. 333,300 filed January 18, 1929 and is intended for use in connection with the printing machine illustrated in that application.

The present key board selecting mechanism is illustrated in the several figures with forty-one keys 1, 1, forty of which are arranged in four rows of ten keys in each row. The levers 2, 2 of these keys are mounted parallel to each other and are pivoted on the common pivot pin 3 located in the rear of the frame of the machine.

The keys are arranged so that the first, second,

third etc. keys of the four rows of keys have their levers placed side by side so that the first four consecutive key levers are those of the first keys of each row. The following four consecutive key levers are those of the second keys of each row. The next four consecutive key levers are those of the third keys of each row etc. In this way the keys and their key levers are grouped into ten successive groups with four levers in each group. These groups of keys and key levers correspond to the ten groups of types provided on the type carrier 4 as will hereinafter be described.

Each of the key levers is provided with a depending lug 5 and the lugs of each group of levers are spaced as illustrated in Figure 1 to engage the upper ends of the bell crank levers 6, 7, 8 and 9. These levers are hinged on the pivot pin 10 and their lower ends each engage the front end of one of the sliding cam bars 11, 11 which are mounted in suitable bearings in the frame of the machine parallel to each other. Each key and key lever is thus adapted to transmit its motion thru one of the bell cranks to a sliding cam bar 11.

Each sliding cam bar 11 has at its forward end a depending lug 12 which is connected with the frame of the machine by the springs 13 which normally draw the cam bars to the right in Figure 1 against the bell crank levers and forces the upper ends of these bell crank levers against the lugs 5 of the key levers in order to yieldingly hold these levers in their normal inoperative position. In this way each key bell crank and sliding cam bar is operated against the tension of one of the springs 13 which returns these members to their normal starting position as soon as the key is released.

On the top edge of each of the sliding cam bars is a lug 14 which is located in the same position on each bar. These lugs engage the shoulder 15 provided on the frame of the machine when the sliding cam bars are moved endways on the operation of a key and thus limit the movement of each sliding cam bar to a uniform travel.

On the bottom edge of each of the sliding cam bars 11 is provided a cam lug 16 and on the bottom of three of these sliding cam bars is provided a lug 17. The cam lugs 16 are identical on each cam bar 11 while the cam lugs 17 vary in height in each group of three for a purpose that will presently be described.

Held yieldingly against the bottom edge of the sliding cam bars 11 to one side of the cam lugs

16 thereof are a series of ten pins 18, each of which is supported in a cradle made up of a pair of bell cranks 19 and 20. The bell cranks are connected and spaced by a sleeve 21 which in turn is pivoted on the transverse pivot pin 22. Each bell crank shaped cradle is thus mounted to rock on the pivot pin 22 and one end of one of the bell crank levers, making up the cradle, is connected with the frame of the machine by means of a spring 23 to normally hold the pin 18 thereof in contact with the bottom edge of the cam bars.

As illustrated in Figure 2, each bell crank shaped cradle embraces four of the sliding cam bars 11 and the ends of the bell cranks making up each cradle engage the side of the first and fourth of these cam bars of the group of bars which they embrace. The ten cradles thus embrace ten successive groups of four cam bars 11 as illustrated in Figure 2.

Pivoted on each of the pins 18 of the cradles is an angular link 24 which connects each cradle with a horizontal lever arm 25. The ten lever arms to which the cradles are connected are located on the platform 26 and are mounted to rock on the lugs 27 supported thereon. These lugs are grouped in back of the vertical spindle bearing 29 in which the hollow spindle 30 is mounted to rotate. The spindle bearing comprises a cylindrical sleeve member which is anchored in a suitable hole in the platform 26 and on the sleeve member are provided two annular flanges 31 and 32 which are located above the platform and are suitably spaced from each other. Each of these flanges is provided with a series of ten holes which are circularly arranged and equally spaced from each other. The holes 33 in the flange 32 are adapted to have the shank of a stop pin 34 slide up and down therein and the holes 33A provided in the flange 31 in line with the holes 33 and are adapted to have the reduced extension 35 of these pins project thereinto so that as these pins are raised the upper ends thereof are made to project above the flange 32 for a purpose that will presently appear.

The stop pins 34 are slotted from the bottom to within a short distance of the reduced extensions 35 thereof and in the slotted portions of the stop pins is provided a cross pin 36 which closes the slot in the stop pin and restricts the opening made by the slot in order to receive the free ends of the lever arms 25 and permit them to positively raise and lower the stop pins on the rocking motion thereof.

The spindle 30 is supported in the spindle bearing by a pair of antifriction bearings 37 and 37A, one near the upper end and the other near the lower end thereof. Threaded to the lower end of the spindle 30 at a point below the spindle bearing 29 on the under side of the platform 26 is a small pulley 38 which is driven by an endless belt 39 from the motor which operates the printing machine. On top of the spindle 30 is carried the selector arm 40, one side of which projects from the spindle 30 substantially radial thereto. The hub of this selector arm, which telescopes over the end of the spindle, is provided with a pair of diametrically placed keys 41 and 42 which engage suitable slots in the spindle to hold the selector arm keyed thereto. These keys also project into the hollow center of the spindle where they engage the keyways 43 and 44 of the vertical sliding shaft 45 which carries at its upper end the

type carrier 4. The shaft 45 is thus splined to the hollow spindle 30 so as to rotate therewith while permitting an endwise movement therein to raise and lower the type carrier for a purpose that will presently appear.

The types on the type carrier are grouped in ten groups, each of which is arranged in a vertical row on the carrier. Facing the type carrier is a horizontally moving platen 46 which is normally held spaced from it to permit a paper sheet 47 to be fed thru between the platen and the type carrier. The face of the platen has substantially the outline of one of the types provided on the type carrier and in its horizontal movement forces the paper sheet in contact with the face of the type located opposite to it. By rotating and raising the type carrier, the types of the ten groups of types can thus be individually brought opposite to the face of the platen 46 and have this platen bring the paper in contact with the selected type.

In positioning a type, the rotation of the type carrier is therefore arrested when the group of types containing the particular type is located opposite to the platen. This is done by a stop pin 34 by the selecting mechanism heretofore described. For example if an impression is to be made of the type which is designated on the first key of the top row of keys indicated by reference character 1, this key is depressed and thru its lever 2 and bell crank 6 moves the sliding cam bar 11 to the left until a further movement is arrested by the engagement of the lug 14 with the shoulder 15. During this movement of the sliding cam bar 11 the cam 16 thereof engages the pin 18 of a predetermined one of the cradles made up of the bell crank levers 19 and 20 and rocks this cradle with the pin 18. The angular link 24, which has its lower end connected to this particular pin 18, transmits this movement of the pin to its lever arm 25 and rocks it so that its free end raises the stop pin with which it makes engagement. The reduced upper end of the stop pin thus raised, then projects above the annular flange 32 into the path of the rotating selector arm 40 as illustrated in Figure 4. When the selector arm then strikes the stop pin a further rotation thereof is arrested and the type carrier is held stationary in a position in which the particular type indicated on the depressed key is located opposite to the platen 46.

By operating any one of the keys in one of the groups of four keys, the type carrier is thus brought to a standstill in the same angular position and the types on the carriers are so arranged that in this position the types of all four of these keys are located in the vertical row of types which faces the platen. It then remains to bring the selected type of this group of four opposite to the platen in order to have the platen move the paper in contact with this selected type for the impression. The vertical movement of the type carrier to bring this about is automatically governed by the cam lug 17 of the particular sliding cam bar which has been operated by the key. The cam lugs of the three sliding cam bars included in each group of four which have a cam have a varying height. The cam bar 11 from which the cam 17 is eliminated when operated, keeps the type carrier in its original position. The cams 17 of the other three sliding cam bars however are of increasing size so that as their particular sliding bar is

operated it will depress the cross rod 50 varying distances.

This cross rod extends across the lower edges of all of the sliding cam bars and is supported at each end by a short arm 51 pivoted on the pivot pin 52. In order to have the short arms 51 swing in unison to provide a uniform motion for the cross pin 50 when depressed at any point thereof by one of the cams 17 of the sliding cam bars, the two short arms 51, which support the cross pin 50 at its outer end, are connected by the sleeve 53 which surrounds the pivot pin 52. Near one end thereof the cross pin 50 is connected with the bell crank 54 by means of the link 55 so that as the cross pin is depressed this bell crank rocks to the left in Figure 2 and moves the slide 56 which is also connected thereto.

The slide 56 is provided with the justifying member 57 which is formed at one end of the slide in the form of a series of lugs which project varying distances into the open side of the carriage 53 which surrounds the type carrier 4. A spring 59 stretched between the lug 60, carried on the slide 56, and the lug 61 provided on top of one of the guides which guide the slide, serves to normally hold the slide and its justifying member 57 in the full line position indicated in Figure 2 and holds the cross pin 50 yieldingly in contact with the lower edges of the sliding cam bars thru the connection provided by the bell crank 54 and the link 55.

Four shoulders 62, 63, 64 and 65 are thus formed on the justifying member and these shoulders, when placed into the path of the carriage of the type carrier, serve as stops for the carriage and type carrier when the type carrier is moved longitudinally.

As heretofore pointed out, one in each group of four of the sliding cam bars has no cam lug 17 so that on the movement of this particular sliding cam bar the normal position of the slide 50 and its justifying member 58 is not affected by the operation of the key which operates this sliding cam bar. The types on the type carrier which are indicated on the ten keys which operate the sliding cam bars having no cam lugs 17 are the types located at the top of each vertical row of types and the type carrier need only be rotated in order to bring one of these types opposite to the platen 46.

The other three sliding cam bars each have a cam lug 17 but the size of these lugs differ so that each lug when moved separately over the cross pin 50 will depress this pin a different distance and move the slide 56 and its justifying member 58 a corresponding distance away from the carriage of the type carrier. Thus one of the keys of each group of four operates a sliding cam bar having a cam lug 17 which operates the slide 56 and its justifying member so that a vertical movement of the carriage 58 of the type carrier is arrested by the shoulder 62. Another of the keys operates the sliding cam bar having a cam lug 17 which operates the justifying member so that the carriage is arrested by the shoulder 63 thereof and another of the keys operates a sliding cam bar having a cam lug 17 which operates the justifying member so that the vertical movement of the carriage is not arrested until it reaches the shoulder 64 thereof. In this way the second, third or fourth type in each row of types on the type carrier may be brought opposite to the platen on a vertical movement thereof while each of the ten

types equally spaced around the periphery of the type carrier is brought opposite to the platen by the rotary motion of the type carrier heretofore described.

The fifth type in each row of types carried by the type carrier 4 is located by the shaft key 66. This key and its mechanism is illustrated in Figure 8 and its location with relation to the other forty keys is shown in Figure 3. This shift key operates in conjunction with one of the row of ten keys to select and locate one of the fifth types of each row of types. For this reason the sliding cam bar 11A, operated by the shift key 66, is provided with a cam lug 17 which has a height greater than the cam lugs of the other sliding cam bars 11. When therefore the shift key is operated the justifying member is operated so that the vertical movement of the type carrier is arrested by the shoulder 65. In this position the fifth of each of the rows of types is on the level with the platen 46. As no cam lug 16 is provided on the cam bar 11A the rotary movement of the type carrier is not arrested by the operation of this shift key. For this reason one of the ten keys of one of the rows of keys must be operated in conjunction with the shift key in order to position opposite to the platen the desired one of the fifth type in each of the ten rows of types.

The motion for the vertical or endwise movement of the type carrier is provided by the motor (not shown) which operates the printing machine. This motor rotates the power shaft 67 which carries the cam 68. A swinging arm 69 is operated by this cam and as it swings to the right in Figure 1 it operates the bell crank lever 70 thru the link 71. Another link 72 connects the bell crank lever 70 with the type carriage 58 and raises the carriage in the manner and for the purpose above described.

As illustrated in Figure 2 the side of the tip of the selector arm is beveled so that as soon as the stop pin which has arrested the movement of the selector arm is released, the beveled surface will depress the pointed end thereof and thus assist in the withdrawal of the pin from in front of the selector arm.

I claim:

1. In a key board selecting and positioning mechanism including a rotating type carrier mounted on a shaft and a series of keys one for each of the types on said type carrier, the combination of a hollow spindle, means for rotating said spindle, said type carrier shaft being splined to said spindle to rotate therewith and move longitudinally thereto, a selector arm carried by said spindle, a series of stop pins grouped around said spindle, a rocker arm connected to each of said stop pins, a cradle, a pin carried by said cradle, a link connecting said pin with one of said rocker arms and means operated by one of said keys for rocking said cradle and operate the rocker arm connected therewith and move the stop pin of said rocker arm into the path of said selector arm to stop the rotation thereof with said type carrier in a predetermined angular position.

2. In a key board selecting mechanism including a rotating type carrier mounted on a shaft and a series of operating keys one for each of the types on said type carrier, the combination of a hollow spindle, said shaft being splined into said hollow spindle, a selector arm carried by said spindle, a spindle bearing surrounding said spindle, a series of stop pins grouped around said

- spindle and adapted to move and project beyond said spindle bearing into the path of said rotating selector arm, means controlled by said keys for raising said stop pins, a pointed tip on the end of said stop pins, an angular tip on the end of said selector arm, said angular tip of said selector arm being adapted to slide over the pointed tip of said stop pins to depress said pins on the release thereof by said operating means.
3. In a key board selecting mechanism including a rotating type carrier mounted on a shaft and a series of operating keys for each of the types on said type carrier, a sliding cam bar operated by each of said operating keys, a series of cradles mounted to rock below said sliding cam bar, a pin carried by each of said cradles and means for yieldingly holding said cradles to have the pins carried by them engage the under side of a predetermined number of said sliding cam bars, a cam lug provided on the under side of each of said sliding cam bars, means for limiting the movement of said cam bars on the operation of said keys, said cam lugs on said sliding cam bars operating to engage said pins of said cradles and rock said cradles on the limited movement thereof, a selector arm rotating with said type carrier shaft, means for constantly rotating said type carrier shaft and means connected to said cradles to arrest the rotation of said type carrier shaft with the type carrier in a predetermined angular position on the operation of one of said operating keys.
4. In a type selecting mechanism for printing machines the combination of a plurality of key operated sliding cam bars having a uniform endwise movement, a series of grouping members dividing said sliding cam bars into groups and operated thereby, a rotating spindle, a type carrier supported on said spindle, means for rotating said spindle and its type carrier, a selector arm carried by said spindle, movable stop pins located around said spindle and connecting means connecting each of said grouping members with one of said stop pins to cause a stop pin to move into the path of said selector arm and arrest the rotation of said spindle and type carrier on the operation of one of a group of said sliding cam bars.
5. In a type selecting mechanism for printing machines, the combination of a rotary type carrier, types circumferentially arranged and longitudinally spaced in series on said carrier, means for constantly rotating said carrier, intermittently operating means for moving said carrier longitudinally, stop means for the rotary motion of said type carrier to hold one of the circumferentially spaced types in a predetermined angular position, a carriage for said type carrier, a series of stop means adapted to engage said carriage and cooperating with said longitudinal moving means for locating said type carrier longitudinally and single key operated joint control means for simultaneously controlling both of said stop means to locate one of the series of types of the type carrier in a predetermined position.
- CHARLES H. SAMPSON.

40	115
45	120
50	125
55	130
60	135
65	140
70	145
75	150