A. SMITH.

RECORD MAKING MACHINE.

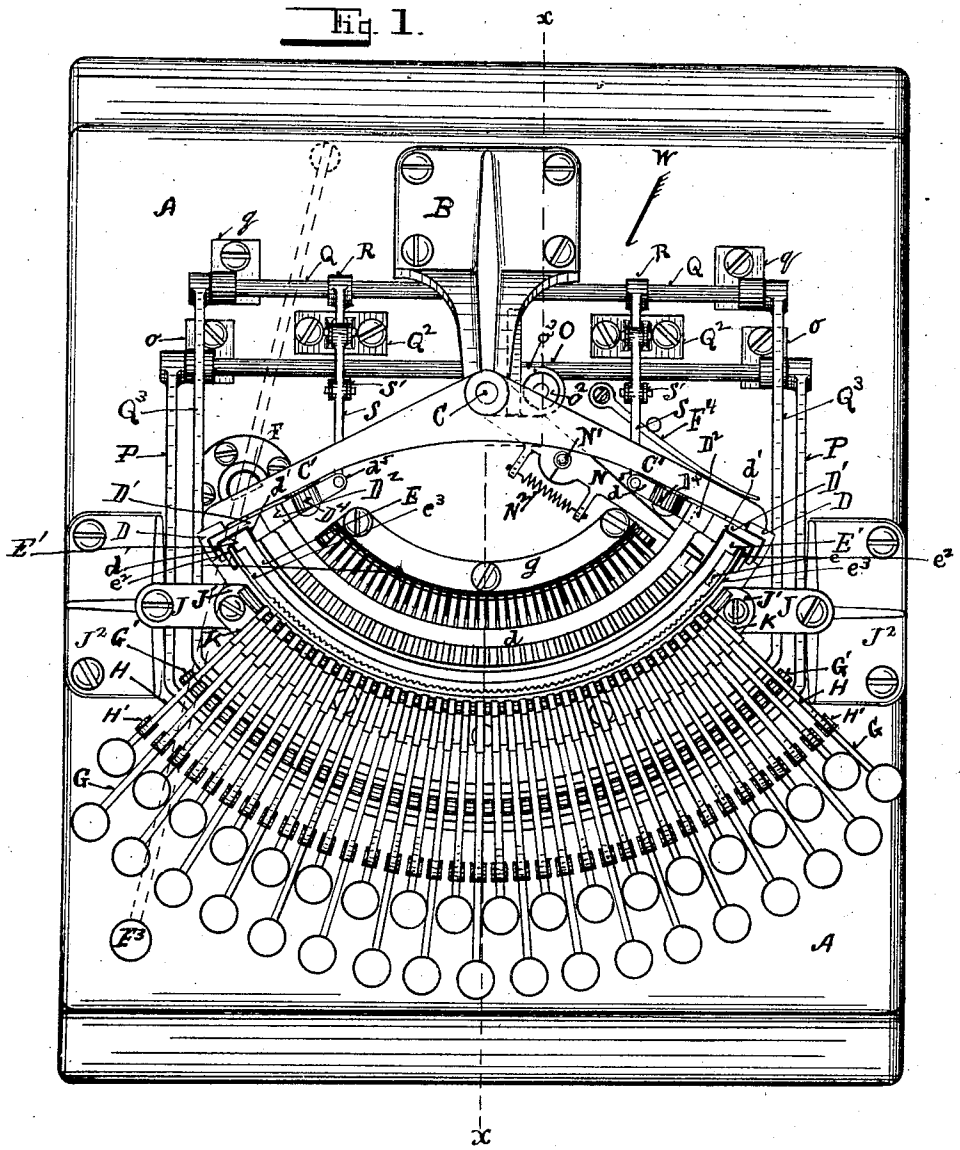
APPLICATION FILED FEB. 2, 1911.

1,050,496.

Patented Jan. 14, 1913.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

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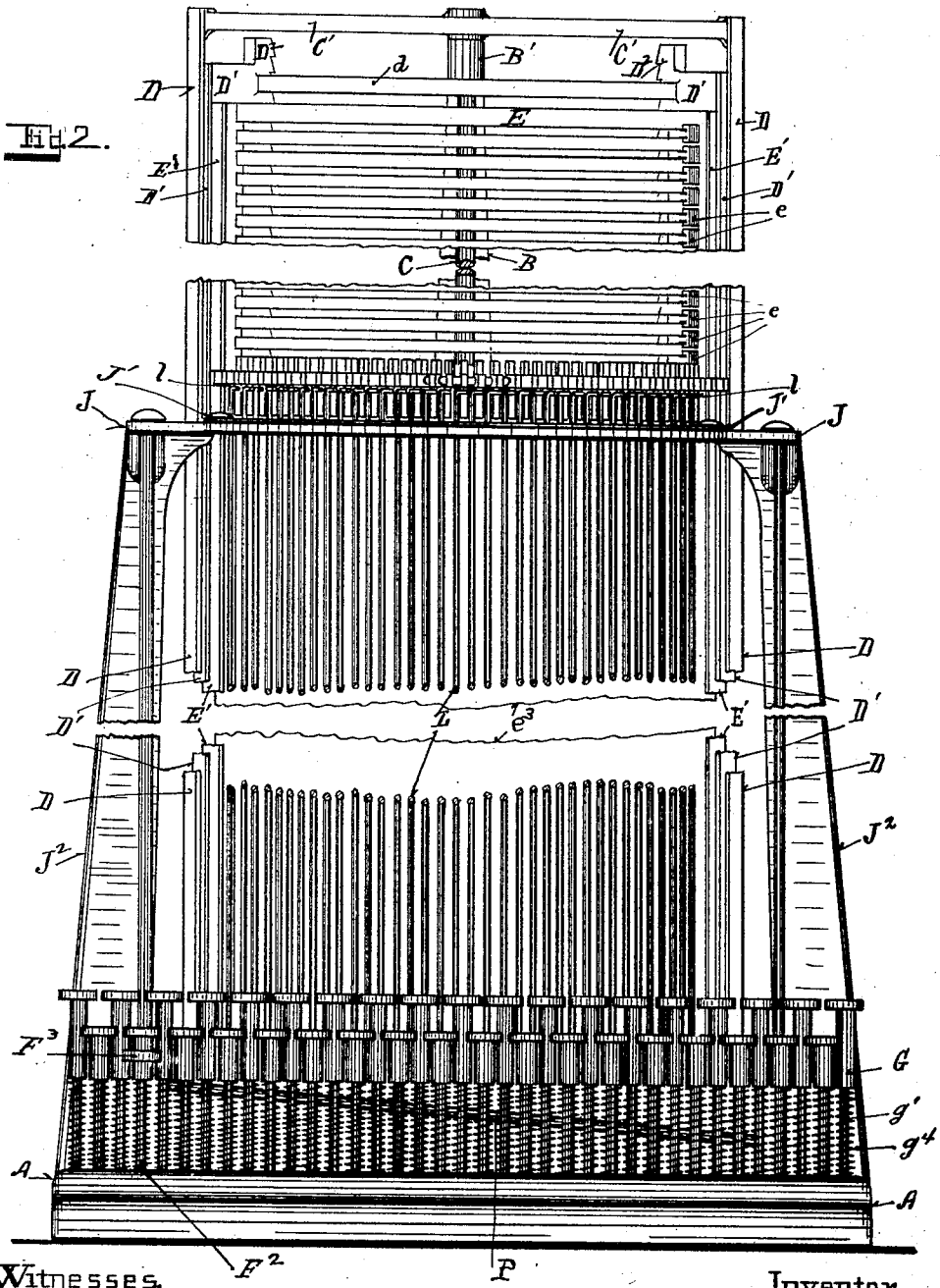
4 SHEETS—SHEET 2.

Fig. 2.



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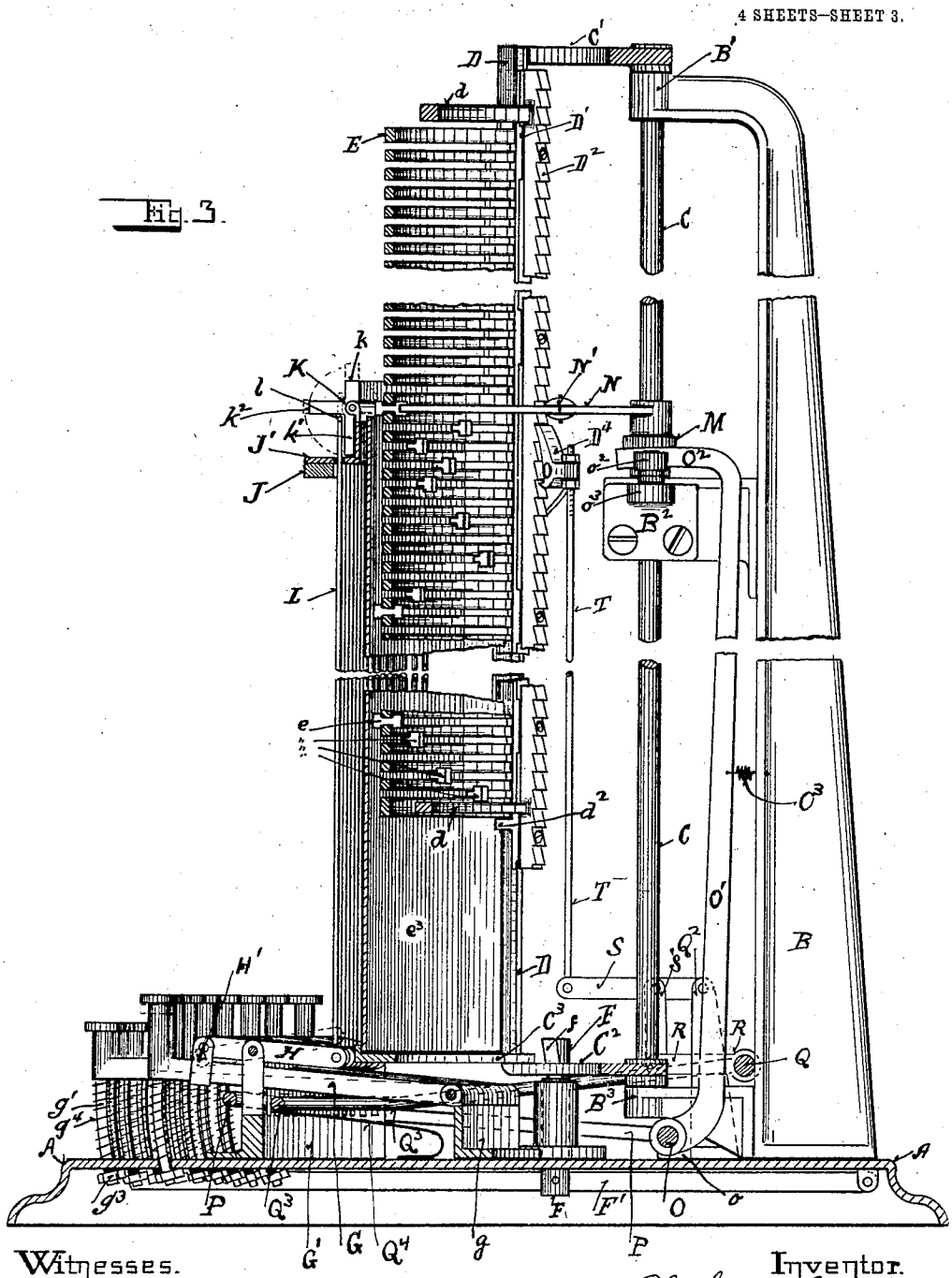
4 SHEETS—SHEET 3.

Fig. 3.



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4 SHEETS—SHEET 4.

Fig. 4.

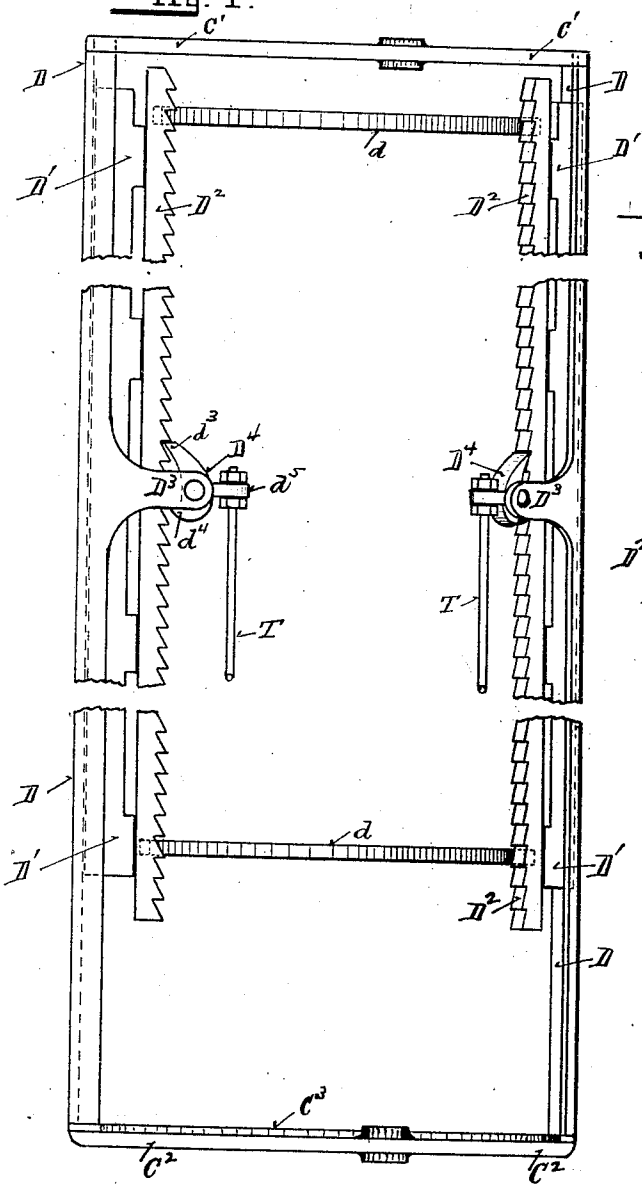


Fig. 5.

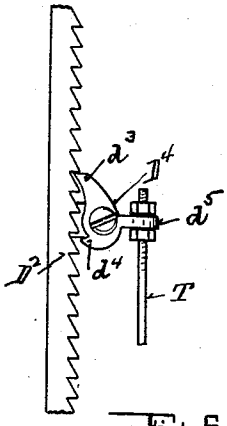
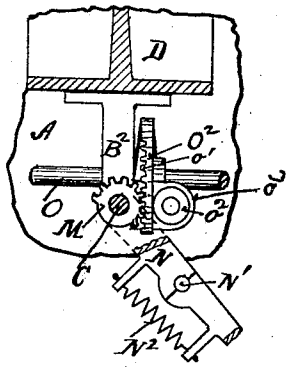


Fig. 6.



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UNITED STATES PATENT OFFICE.

ABRAHAM SMITH, OF ERIE, PENNSYLVANIA.

RECORD-MAKING MACHINE.

1,050,496. Specification of Letters Patent. Patented Jan. 14, 1913.

Application filed February 2, 1911. Serial No. 606,191.

To all whom it may concern:

Be it known that I, ABRAHAM SMITH, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Record-Making Machines; 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification.

My invention relates to record-making machines whereby a record element adapted to control the operation of type-setting and distributing machines may be made, and the object of my present invention is to construct a machine whereby and wherewith the particular form of record element shown and described in my application for Letters Patent filed in the United States Patent Office November 21, 1910, Serial No. 593,471 (the same being considered in Room 303), may be arranged as desired.

The features of this invention are hereinafter set forth and explained and illustrated in the accompanying drawings, in which:

Figure 1, is a plan view of my record making machine. Fig. 2, is a front view in elevation of the same, with portions thereof broken away. Fig. 3, is a vertical section of the same on the line *x*—*x* in Fig. 1 with portions thereof broken away. Fig. 4, is a rear view of that portion of my invention adapted to contain the record element desired to be arranged, looking at the same in the direction of the arrow, *w*, in Fig. 1. Fig. 5, is a detail of the escapement mechanism. Fig. 6, is a sectional fragment illustrating a feature of my invention.

In these drawings illustrating my invention, A, is the base thereof. Upon the rear portion of this base, A, I place a vertical arm, B. In bearings B′, B², and B³, upon the arm, B, is placed a vertical rock-shafft, C. Upon the upper and lower portions of this rock-shaft C, I place radial arms, C′, C′ and C² C², and from the upper to the lower of said arms, C′ C′ and C² C², I place vertical slide-ways, D D, between which I place a vertically slidable sash, D′, provided with ratchet-bars, D² D²; the vertical side bars of this sash, D′, being connected by means of curved cross-bars, *d*, *d*, so that said sash, D′, and ratchet bars, D² D² will move vertically in the slide-ways D, D, as hereinafter described.

Within the vertically slidable sash, D′, in suitable vertical ways, *d*′, in the side bars thereof, I place a record element, E—*e*³, similar to that shown and described in my application for patent above mentioned, the rear or slotted plate, E, of which is supported and carried by the said vertically slidable sash, D′, the lower end of said slotted plate, E, resting upon ledges, *d*², (see Fig. 3) while the lower end of the front or corrugated plate *e*³, of said record element, E—*e*³, rests upon the curved bottom plate, C³, extending between the ends of the lower radial arms, C² C², the said members, E—*e*³ of said record element being adapted to slide upon each other as illustrated and described in my said application for patent filed November 21, 1910.

Through the base, A, of the machine, at one side of the lower radial arms, C² C², I place a vertically movable slide, F, suitably supported against lateral movement, the upper end of said slide being provided with an inclined face, *f*, adjacent to one of said radial arms, C², and against which inclined face, *f*, said radial arm contacts. I also provide a spring F⁴, which is secured upon the base so that the free end thereof will engage the other lower radial arm, C², with sufficient yielding pressure to keep the opposite lower radial arm, C², against the inclined face, *f*, on said vertically movable slide, F. For operating said slide, F, I provide a key-bar F′, under the base, A, of the machine, one end thereof being pivoted to the base, A, the intermediate portion thereof being pivoted to said slide, F, and the free end of said key-bar, being provided with a key-stem, F², (see Fig. 2) which extends upward through said base, A, and terminates in a finger key-plate, F³, all for the purpose hereinafter set forth.

The record element, E—*e*³, above mentioned is provided with small transversely

slidable stops, *e*, which, when said element is inserted in the vertical ways, *d'*, *d'*, in the sash, D', of this machine, are to be manually moved over to the right hand side of the rear or slotted plate E, of said element so that they will occupy a vertical line parallel with the right hand edge of said slotted plate, E. This, however, cannot be done until the record element, E—e^3, has been inserted in place in the vertical ways, *d' d'*, and the sash, D', and ratchet bars, D^2, carrying said element, E—e^3 have been raised to their uppermost position in their vertical ways D, D, so that the front or corrugated plate e^3 can be moved downward in its retaining grooves, e^2, in the edges of the plate, E, until its lower end rests upon the curved plate, C^3, extending between the ends of the lower radial arms, C^2, and the upper end of said corrugated plate, e^3, is just below the lowest of said stops, *e*, so that the corrugations on the rear side of said plate, e^3, are out of engagement with the ends of said stops, *e*, thereby leaving them free to be moved transversely in the slots in the plate E.

At the intermediate portions of the vertical ways, D, D, are rearwardly projecting ears, D^3 D^3, to which are pivoted double-acting ratchet dogs, D^4, provided with teeth engaging points, d^3 and d^4. Said dogs, D^4, are also provided with short lever projections, d^5, by means of which said dogs, D^4, may be operated. It will be obvious from the drawings that when the point, d^3, is disengaged from a tooth on the ratchet bar, D^2, the lower point, d^4, will engage a tooth thereon, permitting said ratchet bar to move downward only a small fraction of the distance between the teeth thereon, and when the upper point, d^3, is moved back toward the ratchet bar, it will enter the notch below the next succeeding tooth to the one previously engaged thereby, and will engage the next tooth when the said ratchet bar is released by the receding of the lower point, d^4, on the dog, D^4.

Upon the base, A, of the machine, I mount a series of key levers G, by means of the curved pivot support, *g*, each of said key-levers extending radially outward therefrom through slots in the segmental fulcrum plate, G', secured to the base, A, under said key levers, G. On the outer ends of the key levers, G, are the usual finger plates each bearing a designation of the characters which each key lever represents, and extending downwardly from the free end of each key lever G, there is a curved rod *g'*, which extends slightly through openings in the base, A, where they are provided with nuts g^3, adapted to limit the upward movement of said key levers, and upon these curved, rods, *g'*, I place spiral springs, g^4, adapted to maintain the levers, G in a normally raised position, as shown in Fig. 3.

In the upper edge of the segmental fulcrum plate, G', in the slots therein, above the key levers, G, I pivot short levers, H, intermediate of their length, one end thereof being secured to the key-levers, G, by means of the link-loops, H', or by any other means whereby one end of said levers, H, may be made to move in unison with the key-levers, G.

Above the free ends of the levers, H, I place a segmental supporting bar, J, the extremities of which rest and are secured upon upright arms, J^2 J^2 secured upon the base, A, at each side of the key-levers, G. Upon this supporting bar, J, by means of a flanged plate, J', I mount a series of weighted, bell-crank levers, K, so that when the upwardly projecting short arm, *k*, thereof is turned inward, the extremity thereof will just clear the slotted plate, E, of the record element when the same is placed in position, the said bell-crank levers, K, being pivoted adjacent to the upper edge of the corrugated plate, e^3, of said record element. Extending upward from the free ends of the levers, H, through small openings in the flanged plate, J', are small rods, L, one from each of said levers, H, to each of said bell-crank levers, K, said rods, L, being adapted, when a key-lever, G, is depressed and the free end of the lever, H, thereby raised to push upward under one arm of the bell-crank lever, K, and turn said lever so that the upwardly extending short arm, *k*, thereof will be turned inward, as shown by broken lines in Fig. 3, at which time the long, downwardly projecting weight arm, *k'*, will be raised to a horizontal line, and the upper ends of the rods, L, being provided with a short, right-angular projection, *l*, (see Fig. 2) permits the lower arms of said bell-crank levers to pass said rods, L, and the laterally projecting upper end, *l*, of said rod, L, will slide along up the side of the then upwardly projecting arm, k^2, while the key-lever, G, is being depressed to its lowermost point.

Upon the rock-shaft, C, and supported by the bearing, B^2, I place a pinion gear, M, to which is secured a hinged arm, N, of sufficient length to reach to a point adjacent to the inner, or concave side of the slotted plate, E, of the record member when the same is in position in the machine, and is adapted, when the pinion, M, is rotated on the rock-shaft, C, to push one of the stops, *e*, mounted in a slot in said plate, E, transversely across said plate until the outwardly extending end of said stop, *e*, contacts with the inwardly turned arm *k*, of one of the bell-crank levers, K. In order to permit the arm, N, to yield slightly when the stop, *e*, contacts with one of the bell-crank levers, K, I provide said arm, N, with a stop-hinge, N', and on the back side of said hinge, N', I arrange a spring mechanism, N^2, adapted to

retain said hinge joint in a normally open position, the tension of said spring mechanism being sufficient to slide one of the stops, *e*, forward in its slot in the plate, E.

For operating the pinion, M, I mount a shaft, O, upon the base A, in suitable bearings, *o*, and upon said shaft, O, I place an upwardly extending lever arm, O′, upon the upper end of which there is a short rack-bar, O^2, the teeth, *o′*, on which intermesh with the gear teeth on the pinion, M, and extending from the ends of said shaft, O, there is a U-shaped lever, P, around under the key levers, G, in front of the fulcrum plate, G′, the said U-shaped lever, P, being higher at the left-hand side than at the right-hand side of the machine, because of the fact that the key-levers, G, at the right of the machine are not required to move the arm, N, as far as do the key-levers on the left of the machine. To retain the rack, O^2, in mesh with the pinion, M, I mount a small supporting roller, o^2, behind said rack, upon a suitable supporting bracket, o^3.

For the purpose of operating the escapement mechanism hereinbefore described, I mount a shaft, Q, upon the base, A, in suitable bearings, *q*, and upon the base, A, I also secure bifurcated fulcrum arms, Q^2, and upon the shaft, Q, I secure short arms, R, which pass through said bifurcated fulcrum arms, Q^2. In the upper ends of the fulcrum arms, Q^2 I pivot one end of a lever, S, and from the intermediate portion of each of said levers, S, a link, S′ extends to and is pivoted to the end of each lever, R. And from the free end of each of the levers, S, a rod, T, extends upward and is secured to the arm, d^5 on the dogs, D^4, of the escapement mechanism hereinbefore described. From the ends of the shaft, Q, a U-shaped lever Q^3 extends around under the key levers, G, behind the fulcrum plate, G′, and at a sufficient average elevation to permit of sufficient movement of the arm N, before the escapement mechanism is operated. In the form of my invention illustrated by the drawings in this case, each of the key levers, G, and its corresponding bell-crank lever K, represents two characters, (letters, figures or other marks) and for each key lever, G and its corresponding bell-crank lever, K, there are two corrugations, ribs, or projections on the plate, e^3, of the record element, of which corrugations, each one represents alternately a small letter and its relative large letter, as in the ordinary single key-board double case type writer. In this present machine the key-board is normally lower-case, or for small letters, the record-holder, (separately illustrated in Fig. 4 of the drawings) being held in its farthest laterally normal position by the spring, F′, in which position the corrugations of the plate, e^3, which represent the small letters only will engage the stops, *e*, as the slotted plate, E, moves downward during the operation of the machine. When, however, a capital letter is wanted, the shift-key, F^3 is pressed downward, which operates through the key-lever, F′, to draw the slide, F, downward, which causes the inclined surface, *f*, thereon to push the record holder (illustrated in Fig. 4) over against the spring, F′, sufficiently to permit the corrugation on the plate, e^3, representing the relative capital of the lever operated, to engage and retain the stop, *e*.

In operation, when it is desired to make a record from which to set up and distribute a line of type, a record element, E—e^3, is inserted into the grooved ways, *d′*, of the sash, D′, and then the sash, D′, is raised upward to its highest point of traverse in its vertical ways, D, and the corrugated front plate, e^3, pushed downward in its ways e^2, in the slotted plate, E, until its lower end rests upon the curved plate, C^3. Now the first letter in the line to be set up is selected among the several key-levers, and if it is to be a capital letter the shift key, F^3, is first depressed which causes the record holder and the record element, E—e^3, contained therein to be moved toward the right of the machine a distance equal to the width of one corrugation, and then while the shift key, F^3, is held down, the key-lever representing the first letter to be set up is depressed, which action of the key-lever, G, causes the lever, H, to turn over the corresponding bell-crank lever, K, so that its short, upwardly projecting arm, *k*, will be turned inward toward the slotted plate, E, of the record element, when the further depressing of the key-lever, G, depresses the U-shaped lever, P, which causes the lever, O′, and rack, O^2, to actuate the pinion and arm, M and N, so that the arm, N, will push a stop, *e*, along in its slot in the plate, E, until said stop contacts with the arm, *k*, of the bell-crank lever, K. The key lever, G, on further depression then contacts with the U-shaped lever, Q^3, and thereby operates the dogs, D^4, so that the point, d^4, thereof engages the ratchet teeth on the ratchet bars, D^2, which operation permits of a slightly downward movement of the record carrying sash, D′, which movement is of sufficient extent to permit the slotted plate, E, to move downward far enough that the stop, *e*, may be engaged by the upper end of the corrugations on the plate, e^3, when the releasing of the key lever, G, first returns the arm, N, again to its starting point, at which time the further upward traverse of the key lever, G, permits the U-shaped lever, Q^3, to rise, which causes the point, d^3, of the dogs, d^4, to move toward the ratchet bars, D^2, to engage the same when released by the lower point, d^3, thereon, which action of the escapement mechanism

permits the sash, D′, and the record element, E—e^3, carried thereby to move downward one notch, which, however only takes place after the arm, N, has returned to its starting point. The downward movement of the said sash and record element carries with it the next succeeding stop, *e*, into position in front of the extremity of the arm, N, so that the next movement of said arm will move it in its slot. Meanwhile the completed upward movement of the key lever, G, has caused the rod, L, through the lever, H, to return to its normally downward position, which permits the bell-crank lever, K, to reassume its normal position as shown by full lines in Fig. 3. This operation is repeated until the sash, D′, and the record element carried thereby has moved downward in its ways to the bottom thereof, at which time the plate, e^6, will have been moved entirely into its grooves, e^2, in the ends, E′, of slotted plate, E, and the record element, E—e^3, can be thence removed without danger of any of the stops, *e*, therein becoming dislocated from the positions thereof at which they have been placed by the hereinbefore described operation of this machine.

Having thus fully shown and described my invention so as to enable others to construct and operate the same, what I claim as new and desire to secure by Letters-Patent is:

1. The combination in a device of the character described, of a record-carrier, escapement mechanism adapted to control the movement thereof, a transversely slotted record-element having record-stops slidably mounted in its slots removably secured in said record-carrier and having a longitudinally slidable, grooved plate adapted to engage said record-stops as it moves into said slotted record-element, bell-crank-lever mechanism adapted to be operated to limit the movement of said record-stops in the slots in said record-element, an arm adapted to engage one of said record-stops and move the same forward in its slot, and key-lever mechanism adapted to move said arm until said record-stop engages said bell-crank-lever mechanism and to operate said escapement mechanism substantially as set forth.

2. The combination in a device of the character described, of a record-carrier having runways therein to receive the edges of a record-element, ratchet teeth on the edges of said record-carrier, escapement dogs adapted to engage said ratchet teeth and control the movement of said record-carrier, a transversely slotted record-element having record-stops slidably mounted in its slots removably secured in said record-carrier and having a longitudinally slidable grooved plate adapted to engage said record-stops as it is moved into said record-element, bell-crank-lever mechanism adapted to be operated to limit the movement of said record-stops in the slots in said record-element, an arm adapted to engage one of said record-stops and move the same in its slot, and key-lever mechanism adapted to actuate said arm and said escapement dogs, substantially as set forth.

3. The combination in a device of the character described, a record carrier having runways therein, a transversely slotted record element in said runways in said record carrier, transversely slidable stops in the slots therein, escapement mechanism adapted to control the movement of said record carrier, an arm adapted to move said stops in the slots in said record element, bell-crank-lever mechanism adapted to limit the movement of said stops; key lever mechanism adapted to cause said arm to move a predetermined distance and to operate said escapement mechanism and a corrugated plate adapted to be moved longitudinally into grooves in said record-element to engage and retain said stops after they are positioned in their slots, substantially as set forth.

4. The combination in a device of the character described, a record carrier having runways therein, a transversely slotted record element having longitudinal grooves in the edges thereof mounted in said runways, transversely slidable stop-blocks in the slots therein, a longitudinally corrugated plate longitudinally slidable in grooves in the edges of said slotted record element, escapement mechanism adapted to control the movement of said record carrier, an arm adapted to move said stop blocks in the slots in said record element, bell-crank-lever mechanism adapted to limit the movement of said stops, key lever mechanism adapted to move said arm a predetermined distance and to operate said escapement mechanism to lower said record carrier and slotted record element sufficiently that the stop-block just moved by said arm may be engaged and retained in position by said corrugated plate, substantially as set forth.

5. In an apparatus of the character described the combination of, a record carrier, escapement mechanism to control the movement of said record carrier, a transversely slotted record plate having longitudinal grooves in the edges thereof mounted in said carrier, a corrugated plate longitudinally slidable in grooves in the edges of said slotted record plate, stop-blocks slidably mounted in the slots in said record plate, bell-crank lever mechanism adapted to be operated to limit the movement of said stop-blocks in the slots in said record plate, an arm adapted to successively engage each of said stop-blocks in said slotted plate until the same contacts with said bell-crank lever mechanism, and key lever mechanism, adapted to succes-

sively operate said bell-crank lever mechanism, said arm, and said escapement mechanism, substantially as set forth.

6. In an apparatus of the character described the combination of, a laterally movable record carrier holder, a record-carrier therein, lever and spring mechanism adapted to control the lateral movement of said carrier holder, a transversely slotted record-element having record-stops slidably mounted in its slots secured in said record-carrier and having a longitudinally slidable grooved plate adapted to be moved into said record-element to engage the record-stops as it is moved into said record-element, bell-crank-lever mechanism adapted to be operated to limit the movement of said record-stops in the slots in said record element, escapement mechanism adapted to control the movement of said record carrier in said carrier holder, an arm adapted to oscillate between the side bars of said record carrier, and key lever mechanism adapted to cause said arm to oscillate and to operate said escapement mechanism, substantially as set forth.

7. The combination in a device of the character described, a record carrier, escapement mechanism adapted to control the movement thereof, bell-crank lever mechanism in front of said record carrier, an arm mounted in the rear of said record carrier adapted to oscillate between the side bars of said record carrier, a transversely slotted record-element having longitudinal grooves in the edges thereof, record-stops slidably mounted in its slots, adapted to be moved therein by said oscillating arm removably secured in said record carrier, a longitudinally grooved plate slidably mounted in said grooves in the edges of said record-element adapted to consecutively engage the record-stops at each operation of said escapement mechanism, and key lever mechanism adapted to operate said bell-crank lever mechanism, said arm, and said escapement mechanism, substantially as set forth.

8. The combination in an apparatus of the character described, a record carrier adapted to receive and retain a record element, a transversely slotted record-element having longitudinal grooves in the edges thereof, record-stops slidably mounted in said slots removably secured in said record-carrier, a longitudinally grooved locking-plate slidably mounted in said grooves in the edges of said slotted record-element adapted to consecutively engage said record-stops at each operation of the machine, ratchet teeth on said record carrier, escapement dogs adapted to engage said ratchet teeth and control the movement of said record carrier, bell-crank lever mechanism in front of said record carrier, an arm mounted in the rear of said record carrier adapted to oscillate between the sides of said record carrier, and key lever mechanism adapted to successively operate said bell-crank lever mechanism, said arm, and said escapement mechanism, substantially as set forth.

9. The combination in a device of the character described, of a record carrier, a transversely slotted record element having longitudinal grooves in the edges thereof mounted in said carrier, transversely slidable stop-blocks in the slots therein, block-stopping mechanism mounted in front of said record element, an arm adapted to move said stop-blocks in said slotted record element, a longitudinally grooved locking-plate slidably mounted in grooves in the edges of said record-element adapted to consecutively engage said record-stops at each operation of the mechanism, key lever mechanism adapted to operate said block-stopping mechanism to limit the movement of said stop-blocks in the slots in said record element, said arm to move said stop-blocks, and said escapement mechanism, substantially as set forth.

10. The combination in a device of the character described, a record carrier having runways therein, a transversely slotted record element in said runways, transversely slidable stop-blocks in the slots therein, a stop-block locking plate adapted to be moved into engagement with said stop blocks, stop-block stopping mechanism adapted to be operated to limit the movement of said stop-blocks, escapement mechanism adapted to control the movement of said record carrier, an arm adapted to move said stop-blocks in the slots in said record element, and key lever mechanism adapted to actuate said block-stopping mechanism, said arm and said escapement mechanism, substantially as set forth.

11. In an apparatus of the character described the combination of, a record carrier, escapement mechanism to control the movement thereof, a transversely slotted record element mounted in said carrier, having longitudinal grooves in the edges thereof, a corrugated plate longitudinally slidable in grooves in the edges of said slotted record plate, stop-blocks slidably mounted in the slots in said record plate, block-stopping mechanism adapted to limit the movement of said stop-blocks in the slots in said record-plate, an arm adapted to successively engage and move each of said stop-blocks in said slotted plate, and key lever mechanism adapted to actuate said block-stopping mechanism, said arm, and said escapement mechanism, substantially as set forth.

12. In an apparatus of the character described the combination of, a laterally movable record carrier holder, a record carrier mounted therein, record-stops transversely slidable in said record-carrier, a locking plate adapted to be moved into said record-

carrier to consecutively engage said record-stops at each operation of the mechanism, lever and spring mechanism adapted to control the lateral movement of said record carrier holder, stop mechanism mounted in said apparatus, escapement mechanism adapted to control the movement of said record carrier in said holder, an arm adapted to oscillate between the sides of said record carrier, and key lever mechanism adapted to operate said stop mechanism, said arm, and said escapement mechanism, substantially as set forth.

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

ABRAHAM SMITH.

Witnesses:
H. M. STURGEON,
P. V. GIFFORD.