W. RÖDIGER & C. MUEHLEISEN.

TYPOGRAPHICAL COMPOSING MACHINE.

APPLICATION FILED MAY 25, 1911.

1,041,676. Patented Oct. 15, 1912.

3 SHEETS—SHEET 1.

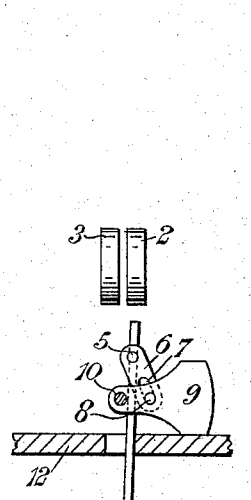

Fig. 1.

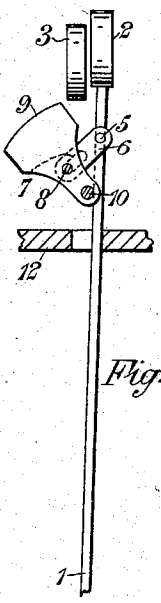

Fig. 2.

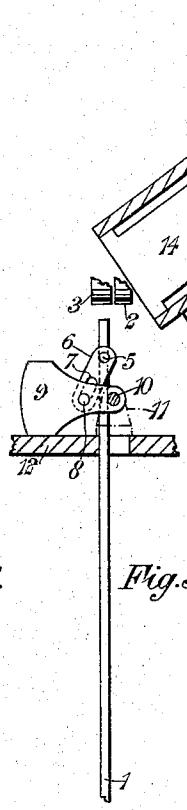

Fig. 3.

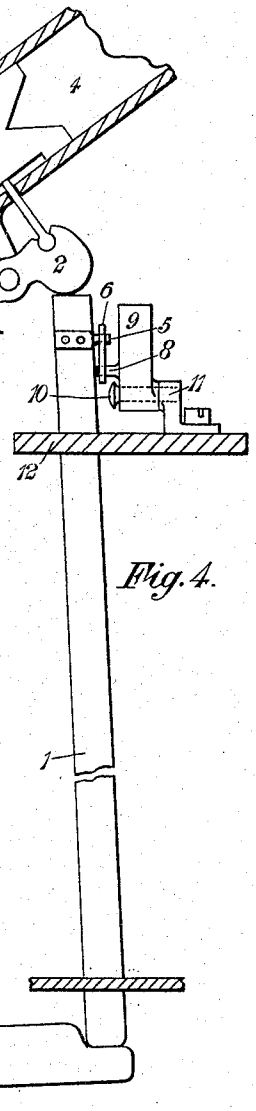

Fig. 4.

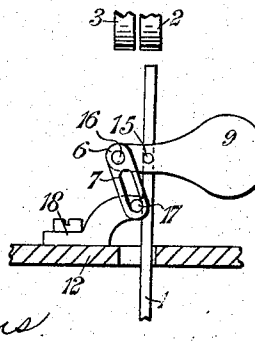

Fig. 5.

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3 SHEETS—SHEET 2.

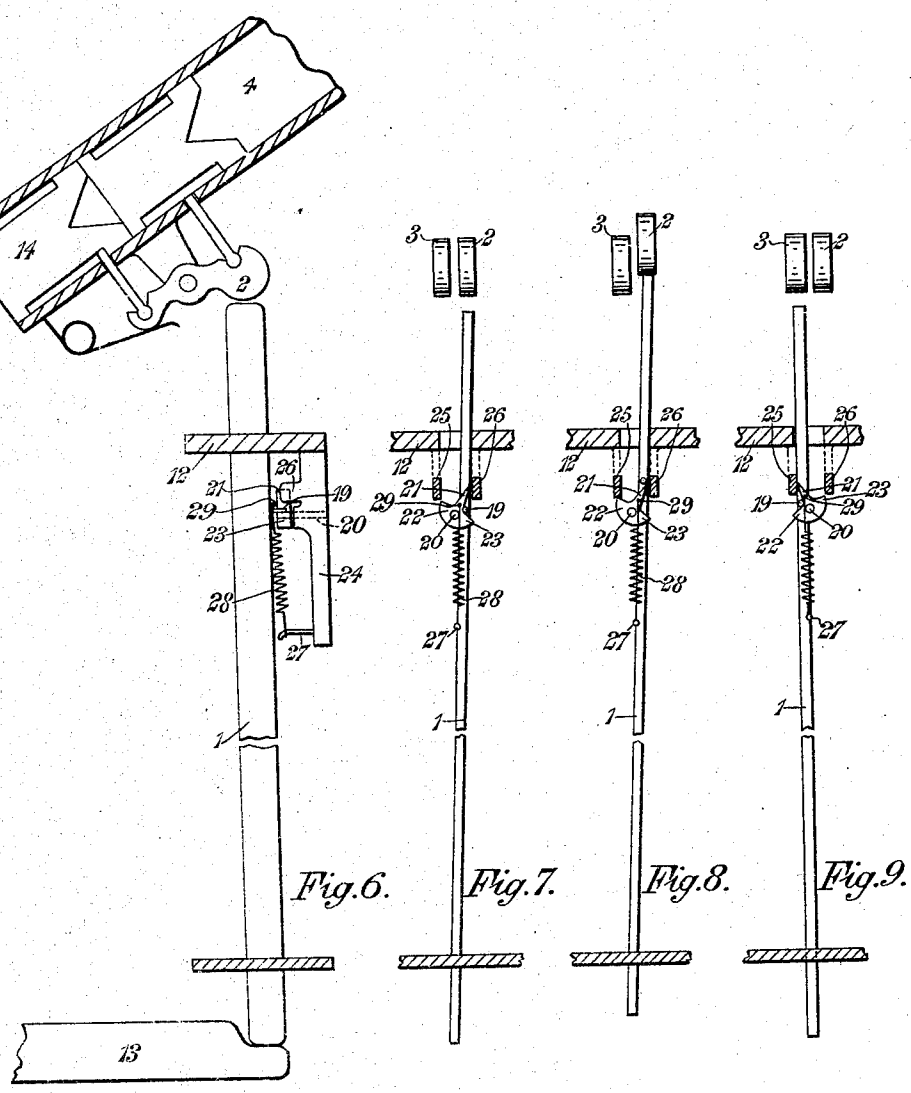


Fig.6. Fig.7. Fig.8. Fig.9.

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3 SHEETS—SHEET 3.

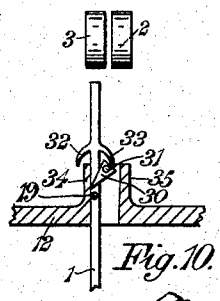


Fig.10.

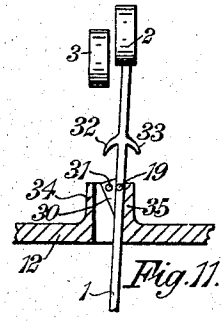


Fig.11.

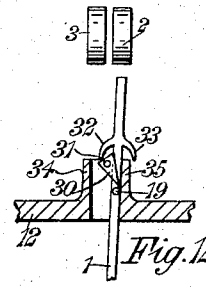


Fig.12.

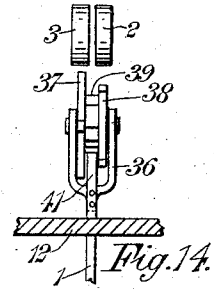


Fig.14.

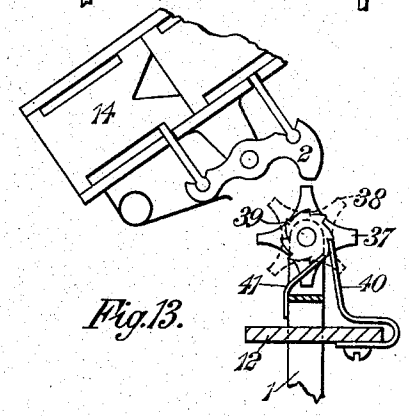


Fig.13.

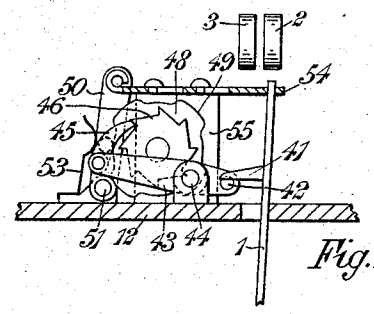


Fig.17.

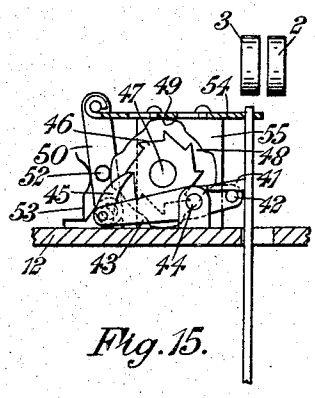


Fig.15.

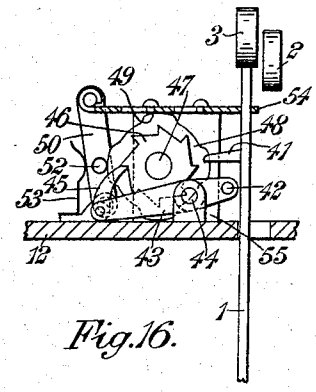


Fig.16.

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# UNITED STATES PATENT OFFICE.

WILHELM RÖDIGER, OF DRESDEN-BLASEWITZ, AND CARL MUEHLEISEN, OF BERLIN, GERMANY, ASSIGNORS TO MERGENTHALER LINOTYPE COMPANY, A CORPORATION OF NEW YORK.

## TYPOGRAPHICAL COMPOSING-MACHINE.

1,041,676. Specification of Letters Patent. Patented Oct. 15, 1912.

Application filed May 25, 1911. Serial No. 629,329.

*To all whom it may concern:*

Be it known that we, WILHELM RÖDIGER, a subject of the German Emperor, and CARL MUEHLEISEN, a citizen of the United States of America, residing, respectively, at Berggartenstrasse, No. 17, Dresden-Blasewitz, and 88 Chausseestrasse, Berlin, in the German Empire, have invented new and useful Improvements in Typographical Composing-Machines, of which the following is a specification.

This invention relates to typographical composing machines of the class in which the matrices or devices to be composed, are stored in channeled magazines, and are released one at a time from their respective magazine channels, by escapement mechanism operated or controlled by finger keys actuated by the operator.

So far as the present invention is concerned it matters not whether the machine is adapted to compose matrices, type dies or type, and for that reason, the word "matrix" or "matrices" as herein employed, is intended to include all of such devices. A well-known example of the above-named class of composing machine is that commercially known under the trade mark "Linotype", and for convenience of illustration, that machine has been selected as the one in connection with which the present invention is herein described.

The object of the present invention is to provide improved means whereby matrices can be released alternately from two different magazine channels by successive operations of one and the same key, and the invention may be said to consist in these means being so arranged that the longitudinal movement of an escapement rod or reed common to two magazine channels, shall effect an automatic transference of the said rod from operative relationship with the escapement of one channel to operative relationship with the escapement of another channel.

To avoid unnecessary repetition the word "transfer" or "transference" is hereinafter used for denoting the just mentioned movement of the escapement rod into and out of operative relationship with the respective escapement levers.

In the accompanying drawings which are to be taken as part of this specification and read therewith:—

Figures 1, 2 and 3 are front elevations and Fig. 4 is a side elevation partly in vertical section, of one constructional embodiment of this invention, Figs. 1, 2 and 3 respectively showing the mechanism in three of its different operative positions. Fig. 5 is a front elevation of an alternative form of the arrangement shown in Figs. 1, 2, 3 and 4; Figs. 6, 7, 8 and 9 are views respectively similar to Figs. 4, 1, 2 and 3 of another constructional embodiment of the invention. Figs. 10, 11 and 12 are views respectively similar to Figs. 3, 2 and 1 of another constructional embodiment of the invention. Figs. 13 and 14 are respectively a side elevation partly in vertical section and a front elevation of another constructional embodiment of the invention, and Figs. 15, 16 and 17 are front views of a further constructional embodiment of the invention.

Throughout this specification like reference numerals are used to indicate like or corresponding parts.

In the embodiment of the invention represented in Figs. 1, 2, 3 and 4, the escapement rod 1, which is common to the escapement levers 2, 3 of two adjacent magazine channels 4 (only one of which latter is shown in the drawings, see Fig. 4), is provided with a pivot pin 5 on which is pivoted the upper end of a link 6. At its lower end the link 6 is provided with a slot 7 engaging with a pin 8 fast to a tilting lever or weight 9 pivoted by a pin 10 to a bracket 11 fast to a plate 12 which is penetrated by, and serves to guide, the rod 1. The lever or weight 9, hereinafter referred to as a weight, is capable of swinging from one to the other of the two terminal positions in which it is respectively represented in Figs. 1 and 3, the plate 12 serving to prevent it from moving beyond these terminal positions. The escapement rod 1 is operated

through a key lever 13 and the usual intermediate mechanism, not represented in the drawings, and at each depression of this key lever, the rod 1, besides being raised to effect the release of a matrix 14 from the respective magazine channel 4 as ordinarily, is transferred from beneath the escapement lever 2 to beneath the escapement lever 3, or vice versa. This transference of the rod 1 is effected in the following manner. Let it be assumed that the rod 1 is in operative relationship with the escapement lever 2, and that the said rod, weight 9 and other coöperating parts are therefore in the positions in which they are respectively represented in Fig. 1. When, now, the key lever 13 is depressed, it raises the escapement rod 1 and escapement lever 2, and at the same time, through the link 6, jerks the weight 9 upward so that it acquires sufficient momentum to carry it from the right-hand to the left-hand side of its vertical position as indicated in Fig. 2, during which motion, the pin 8 has traveled up and down the slot 7. After this juncture, the pin 8 is at the lower end of the slot 7 so that the descent or continued swing of the weight 9 serves to carry the upper end of the escapement rod 1 to its left-most position in which it is beneath the escapement lever 3 as shown in Fig. 3, the said weight during this latter part of its motion, serving also to assist in lowering the rod 1 to its normal position. When the key lever 13 is next depressed, the escapement lever 3 is actuated and the weight 9 is swung rightward and serves to move the escapement rod 1 from beneath that lever to beneath the lever 2; again, at the next succeeding depression of the key lever 13, the weight 9 is swung leftward as previously described with reference to Figs. 1 to 4. By these means therefore, successive depressions of the key lever serve to release matrices alternately from two different magazine channels 4 and at the same time automatically effect the before mentioned transference of the escapement rod 1 from operative relationship with one to the other of the two respective escapement levers 2, 3.

Instead of the weight 9 being capable of turning upon a stationary pivot 10 as in Figs. 1 to 4, it can, as shown in Fig. 5, have its pivot fast to, and movable with, the respective escapement rod 1. In this arrangement, the pivot 15 is situated between the two ends of the weight 9, and the upper end of the link 6 is pivoted to one of those ends by a pin 16, while the lower and slotted end of the link is free to slide upon a stationary pin 17 fast to a bracket 18 rigidly secured to the plate 12. If the different parts of the last described arrangement be assumed to be in the positions in which they are respectively shown in Fig. 5, then the first depression of the key lever 13 will effect the operation of the escapement lever 2 in the ordinary way, and will also jerk the heavier end of the weight 9 upward and toward the left, the slot 7 in the lower end of the link 6, meanwhile sliding over the stationary pin 17. When the weight has moved beyond the center of its oscillation, its gravity carries it to its extreme left-most position and effects the operative transfer of the escapement rod 1 from the escapement lever 2 to the escapement lever 3. At the next ensuing depression of the key lever 1, the escapement lever 3 is operated, the weight 9 is swung rightward and the escapement rod 1 is moved out of operative relationship with the escapement lever 3 and into operative engagement with the escapement lever 2.

In the embodiment illustrated in Figs. 6 to 9, the before described transference of the escapement rod 1 is automatically effected by means of a pin 19, fast to the said rod, acting in conjunction with a switch pivoted on a stationary pivot 20 and comprising an upwardly-directed tongue 21 and two laterally-extending arms 22, 23. For convenience, wherever the switch is hereinafter referred to in this specification, the numeral 21 is used to denote it. The pivot 20 is supported by a bracket or arm 24 fast to, and extending downward from the plate 12 the said arm being provided with two stops 25, 26 for limiting the motion of the switch 21 at its two terminal positions (see Figs. 7 and 9). The arm 24 is also provided with a hook 27 to which is attached the lower end of a spring 28 whose upper end is attached to the switch 21 at a point 29 above the axis of the pivot 20. The hook 27 is situated in the same vertical plane as is the pivot 20, and as the point 29 swings to either side of this plane, the spring 28 will serve to retain the switch 21 in its two terminal positions with just sufficient force to prevent accidental reversal and yet to admit of the said reversal being automatically effected by each descent of the escapement rod 1. If it be assumed that the escapement rod 1 be in position for operating the escapement lever 2, as indicated in Fig. 7, then the switch 21 will also be in the position in which it is represented in that figure, that is to say, the tongue of the said switch will be held by the spring 28 against the stop 26, and the pin 19 will be at the right of the tongue 21 and bearing on the arm 23. When, therefore, the escapement rod 1 is next raised, it operates the escapement lever 2 in the usual way, and the pin 19 passes up between the stop 26 and the right-hand side of the tongue 21, which, in consequence thereof, is turned slightly toward the left against the action

of the spring 28, which latter returns the tongue 21 into contact with the stop 26 as soon as the pin has passed between them. At the immediately following descent of the escapement rod 1 the pin 19 slides down the left-hand side of the tongue 21 which, acting thereon as a cam, causes the said rod to be deflected toward the left so that its upper end shall be beneath the escapement lever 3. This descent of the rod 1 also causes the pin 19 to bear on the switch arm 22 and thereby to tilt the switch 21 from the position in which it is shown in Figs. 7 and 8 to that in which it is shown in Fig. 9. At the next ensuing operation of the escapement rod 1, the escapement lever 3 is operated, the pin 19 passes up between the stop 25 and the left-hand side of the tongue 21, and descends along the right-hand side of the said tongue so that the escapement rod 1 is laterally deflected from the position in which it is shown in Fig. 9 to that in which it is shown in Fig. 7, these lateral deflections of the escapement rod 1 taking place at each of its descents.

In the embodiment illustrated in Figs. 10, 11 and 12, the escapement rod 1 is provided with a pin 19, as in the embodiment herein last previously described, which cooperates with a switch 30 for effecting the before mentioned transference of the said rod. In this embodiment, the switch 30 is in the form of a double taper or wedge the thicker and upper end of which is pivoted on a stationary pivot 31 on which the said switch is capable of turning from one to the other of the two terminal positions represented respectively in Figs. 10 and 12. The escapement rod 1 is provided with two arms 32, 33 which, during the descent of the said rod, engage with the upper end of the switch on either side of its axis of oscillation so as to rock the said switch from one to the other of the above-named terminal positions. If it be assumed that the last described devices be in the positions in which they are respectively shown in Fig. 10, then the next ascent of the escapement rod 1 will cause the pin 19 to travel up the right-hand side of the switch 30 and in so doing will also cause the said rod to be deflected rightward from beneath the escapement lever 3 to beneath the escapement lever 2 and to tilt the switch 30 into the position indicated in Fig. 11, the continued upward movement of the escapement rod 1 serving to operate the last named lever (2) also as shown in Fig. 11. During the descent of the rod 1, the pin 19 passes down between the right-hand side of the switch 30 and the adjacent stop 35, and by the time that the pin 19 has moved clear of the switch, the arm 32 has reached the top of the said switch and, by its continued downward movement, this arm cants the switch toward the right so as to bring its point or lower end into contact with the stop 35, all as shown in Fig. 12. At the next ensuing ascent of the rod 1, the pin travels up the left-hand side of the switch 30 and thereby deflects the said rod leftward so that its upper end passes from under the escapement lever 2 to beneath the escapement lever 3. In this way the pin 19 causes the switch 30 to tilt so that its left-hand side is practically vertical and parallel with the adjacent stop 34. During the next following descent of the escapement rod 1 the pin 19 passes down between the switch 30 and the stop 34, and by the time that the said pin is clear of the switch 30 the arm 33 has reached the top of the latter and by bearing thereon, tilts it toward the left into the position in which it is arrested by the stop 34, so that at its next following ascent, the rod 1 will be again deflected rightward as before described.

In the embodiment illustrated in Figs. 13 and 14, the escapement rod 1 is provided with a forked bearing 36 within which is rotatable as a single entity two four-armed star wheels 37 and 38, and a ratchet wheel 39, all rigidly attached to, or integral with, each other. The arms of the respective star wheels 37, 38 are in staggered relationship to each other, so that when an arm of the star wheel 37 is in position for operating the respective escapement lever 3, no arm of the star wheel 38 will be in position for operating the escapement lever 2 and vice versa. A spring pawl 40 fast to the plate 12, projects into the downward path of the ratchet wheel 39 so that at each descent of the escapement rod 1 the said wheel is brought into contact with the pawl 40 and is rotated thereby, through an angle corresponding to that between any two adjacent arms of the wheels 37, 38, that is to say, in the example illustrated, an angle of 45 degrees. A spring detent 41 fast to the escapement rod 1 and engaging with the ratchet wheel 39, serves to retain the latter and the star wheels 37, 38 against accidental rotation. The last described arrangement operates as follows, it being assumed that, at the commencement of such operation, the different parts of the arrangement are in the positions indicated in Figs. 13 and 14. At the next following ascent of the escapement rod 1 and wheels 37, 38, 39, the ratchet wheel 39 is moved away from the pawl 40, and the upwardly-presented arm of the star wheel 37, acts on the escapement lever 3, as though it (the said arm) were actually the upper extremity of the rod 1, and thereby effects the release of a matrix 14 in the ordinary way. When the rod 1 deseends, the ratchet wheel 39 is

brought into contact with the stationary pawl 40 and is thereby turned about its axis through an angle of 45 degrees thus moving the star wheels 37 and 38, into respectively inoperative and operative positions, so that at the next following ascent of the rod 1, the escapement lever 2 will be operated, while the other lever 3 will remain stationary.

In the embodiment represented in Figs. 15, 16 and 17, the transfer of the escapement rod 1 from one to the other of the escapement levers 2, 3 is effected during the descent of the said rod, and for this purpose, a spur 41 fast to the rod 1, at each such descent, engages with a stud 42 fast to one end of a two-armed lever 43 which is pivoted upon a stationary pivot 44, and whose other end has pivoted to it, a pawl 45 which engages with a ratchet wheel 46, turning about a fixed axis. This ratchet wheel 46, through its shaft 47 or otherwise, is rigidly fast to a cam 48 which is formed with half as many projections 49 as there are teeth in the ratchet wheel 46. 50 is a lever capable of rocking upon a stationary pivot 51, and carrying a pin 52 which is held constantly in contact with the periphery of the cam 48 by a blade spring 53. To the upper end of the lever 50 is pivoted a guide plate 54 which is free to slide horizontally on the top of the vertical plate 55 which also serves to support the before mentioned shaft 47. The guide plate 54 is attached to the vertical plate 55, by a pin-and-slot connection which admits of it (the said guide plate) moving only in a longitudinal direction, and it is provided with an opening through which the upper end of the escapement rod 1 is free to slide. If it be assumed that the different parts of the last described arrangement be in the positions in which they are respectively represented in Fig. 15, then the operation may be described as follows. When the escapement rod 1 is raised, it operates the escapement lever 3 in the ordinary way, as shown in Fig. 16, and when it descends, its spur 41 engages with, and depresses the stud 42 and thereby raises the pawl 45 and turns the ratchet wheel 46 to the extent of one tooth and thus presents to the pin 52, one of the depressions of the cam 48 which depressions are situated between the before described projections 49. The lever 50 is thus allowed to move rightward under the pressure of the spring 53 and thereby to transfer the escapement rod 1 from the escapement lever 3 to the lever 2 as shown in Fig. 17, so that at the next ascent of the said rod, it will operate the escapement lever 2. At the next following descent of the escapement rod 1, the spur 41 again engages the stud 42 and effects a partial rotation of the cam 48 so as to present a projection 49 (instead of a depression) to the pin 52 and thereby move the plate 54 leftward and bring the rod 1 beneath the escapement lever 3.

Having described our invention, we declare that what we claim and desire to secure by Letters Patent is:—

1. In a typographical composing machine, the combination of a plurality of escapements, a movable actuating device therefor, and additional means controlled by the movement of said device for causing it to actuate the escapements successively.

2. In a typographical composing machine, the combination of a plurality of escapements, an actuating device shiftable to different positions to engage one or another of said escapements, and means controlled by the movement of said device for shifting its position each time it is actuated.

3. In a typographical composing machine, the combination of a plurality of escapements, a movable device for engaging said escapements one at a time, and means controlled by the movement of said device for causing it to operate the escapements in predetermined order.

4. In a typographical composing machine, the combination of a plurality of escapements, an actuating device for engaging said escapements one at a time, and additional means for causing said device by its repeated actuations to engage the escapements in succession.

5. In a typographical composing machine, the combination of a plurality of escapements, escapement actuating means comprising a member to engage and actuate the escapements, and means controlled by the actuating movement of said member for causing it to engage the escapements successively.

6. In a typographical composing machine, the combination of two escapement levers, a single escapement rod movable longitudinally to operate the said levers one at a time, and transfer devices operative by the longitudinal motion of the escapement rod to effect a transfer of the said rod from one to the other of the two levers alternately.

7. In a typographical composing machine, the combination of two escapement levers, a single escapement rod movable longitudinally to operate the said levers one at a time, and transfer devices operative by the longitudinal motion in one direction only, of the escapement rod to effect a transfer of the said rod from one to the other of the two levers alternately.

8. In a typographical composing mechanism, two escapements, a movable device for actuating said escapements one at a time, and means coöperating with said actuating device, and dependent on its movement, for

causing it to operate the escapements alternately.

9. In a composing mechanism, two escapements, an escapement actuating device, and means causing the actuating device to operate the escapements alternately, said means being caused to operate by the movement of said actuating device.

In witness whereof we have hereunto set our hands in the presence of two witnesses.

WILHELM RÖDIGER.
CARL MUEHLEISEN.

Witnesses:
HENRY HASPER,
WOLDEMAR HAUPT.