

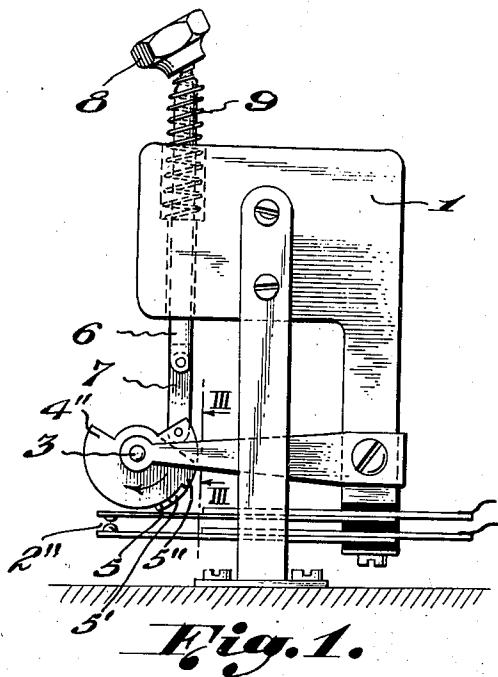
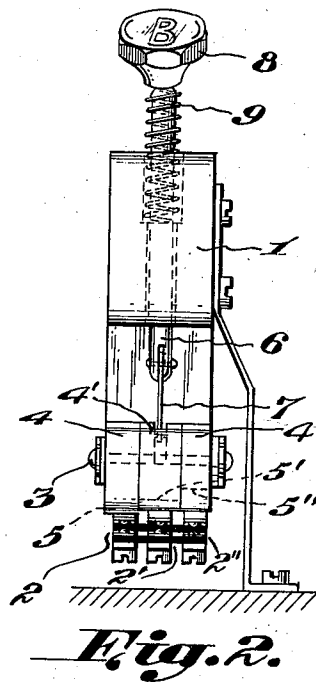
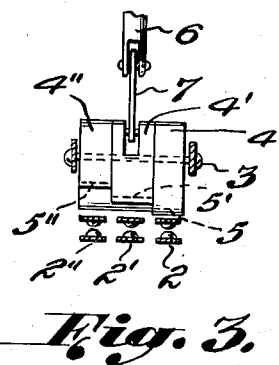
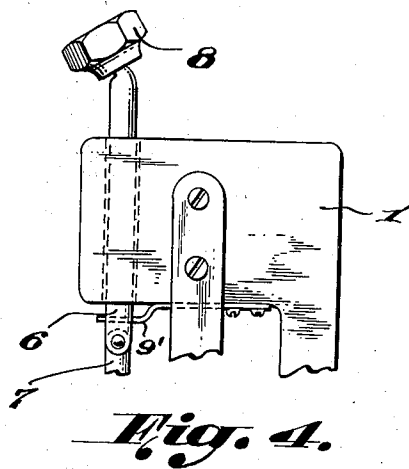
July 30, 1940.

K. BENDORFF

2,209,556

MATRIX SETTING AND TYPE-LINE-CASTING MACHINE

Filed Jan. 24, 1939



Inventor,
K. Bendorff
Glascok Downing & Seibold
Atty's.

By:

UNITED STATES PATENT OFFICE

2,209,556

MATRIX SETTING AND TYPE-LINE-
CASTING MACHINEKurt Bendorff, Berlin, Germany, assignor to the
Firm Typograph G. m. b. H., Berlin, GermanyApplication January 24, 1939, Serial No. 252,669
In Germany February 4, 1938

10 Claims. (Cl. 199—18)

The invention relates to the construction of the release keyboard of a matrix composing and type line casting machine, the matrix releasing devices of which are actuated by the current flowing through a circuit which is closed upon depressing the corresponding keys. This invention more particularly relates to the construction of keys whereby it is possible by depressing one key to actuate a plurality of release devices successively in a very definite sequence, that is to say, to release successively in this way a number of different or identical matrices. The compositor is thereby enabled to compose frequently recurring words or syllables by depressing a single key, while heretofore he has always had to strike a plurality of keys corresponding to the number of letters of the syllables to be composed. In order to facilitate this work of composing frequently recurring syllables or combinations of letters, attempts have already been made to use wide matrices, corresponding to the said syllables or combinations of letters and possessing a plurality of letter characters, so-called ligatures or logotypes, the latter being applicable only to a limited extent and particularly not for the mechanical operation of a composing machine.

According to the invention, the cam or switch disc, which is connected to the syllable key by means of a joint and, on the depression of the key, actuates the electrical contacts, is equipped with cams corresponding in number to the number of contacts to be closed on one stroke of the key and offset relatively to one another in such a manner that the contacts to be closed by them are actuated successively. The throw of each of these cams is adapted to the necessary and permissible flexion of the contact springs and is independent of the further stroke of the key effected after the closing of the contact associated with said cam. The cam discs corresponding to the individual letters of a syllable may be combined to form a switch roller to be connected to the syllable key, or such syllable switch rollers may be made in one piece with contact cams offset relatively to one another on their periphery.

A constructional example of the invention for a syllable consisting of three letters is shown diagrammatically in the accompanying drawings, wherein:

Figure 1 shows a side elevation of the syllable key,

Figure 2 shows a front elevation of Figure 1,

Figure 3 shows a section on the line III—III of

Figure 1, and

Figure 4 is a fragmentary elevational view of a modified spring means for supporting the keys.

Fixed in the key mechanism frame 1 rigidly secured to the machine frame are the electrical contact spring pairs 2, 2', 2'', and above the free ends of the contact springs 2, 2', 2'', cam or switch discs 4, 4', 4'' are pivotally mounted on a spindle 3 in the key mechanism frame 1. Each of these cam discs 4, 4', 4'' is provided with a contact cam 5, 5', 5'', the throw of which is the same for all and corresponds to the necessary and permissible flexion of the contact springs 2, 2', 2''. The switch discs 4, 4', 4'' are rigidly connected together and are offset relatively to one another in such a manner that during a full stroke of the key, their contact cams 5, 5', 5'' successively close the contact spring pairs 2, 2', 2'', whereby the matrix releasing devices corresponding to them are actuated in the same sequence. Thus, the letter matrices corresponding to the desired syllable are released by a full key depression. Instead of combining a plurality of single cam discs 4, 4', 4'', it is also possible to provide switch rollers rotatably mounted on the spindle 3 and having on their periphery contact cams 5, 5', 5'', offset relatively to one another. The key pin 6, adapted to slide longitudinally in the key mechanism frame 1 is pivotally connected, by means of a rod 7 pivoted to its lower end, to the switch roller carrying the contact cams 5, 5', 5'', or to one of the switch discs 4, 4', 4'', which are rigidly connected together. A spring, for example a helical spring 9 mounted below the key head 8 secured to the key pin 6 and bearing against the key mechanism frame 1, or a leaf spring, secured to the key mechanism frame 1 and engaging the key pin 6 with its free end, tends to move the key 6, 8 upwardly and hence all the parts, that is to say also the bar 7 and the switch roller 4, 4', 4'', into their position of rest, ready for operation, as shown in the drawing.

It will be seen from the figures that upon depressing the key 6, 8 all the cam discs 4, 4', 4'' are rocked simultaneously, but the contact cams 5, 5', 5'' in consequence of their offset arrangement, come into engagement, during the full stroke of the key, successively in the example shown in the sequence 5, 5', 5'', with the contact spring pairs 2, 2', 2'' associated with them. The cams 5, 5', 5'' are so constructed that after they have once bent the contact springs 2, 2', 2'' sufficiently, they do not bend the latter any further on further depression of the key 6, 8 and also do not allow them to spring back; on the con-

trary, release of the contacts 2, 2', 2'' may only take place upon the return of the key 7, 8 or switch discs 4, 4', 4''. The observance of this condition is necessary in order that, for instance, the circuit first closed will not be opened again on the further movement of the key 6, 8 and then closed again on the return movement, that is to say, so that the same matrix will not be released twice. Such a cam construction could, however, be expedient if, during the return of the switch roller, it was necessary to release again for the end of the syllable a matrix already released once before by this cam disc for the same combination of letters.

The parts of the switch discs 4, 4', 4'' which are situated opposite the cams 5, 5', 5'' and are inoperative, that is to say do not come into engagement with the contact springs 2, 2', 2'' are preferably constructed symmetrical, that is to say likewise corresponding to the full discs, in order in that way, upon depressing the key 6, 8 to have a force counteracting the pressure of the key and assisting the spring 9. This permits an arrangement in which the moving parts alone maintain the equilibrium and the return spring 9, which may then be particularly weak, has to exert only a slightly stronger action necessary for overcoming the friction between the switch cams 5, 5', 5'' and the contact springs 2, 2', 2''.

Having thus fully described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. In a matrix composing and type line casting machine of the class including composing keys, electromagnetic matrix releasing devices, and opposed contact springs for closing the circuit to said releasing devices, a switch roller operatively connected to at least one of the keys, and a plurality of off-set contact cams on said roller for engaging a complementary series of contact springs successively in a predetermined sequence, to close the circuit to a series of releasing devices, whereby upon a full stroke of a single key, a predetermined combination of independent matrices are released.

2. Apparatus as claimed in claim 1, wherein each of said contact cams is adapted to maintain its complementary contact springs in circuit closing position without interruption, independently of the further stroke of the key.

3. Apparatus as claimed in claim 1, wherein said cams are recessed to permit said cams to engage and release said contact springs during the depression of the key, and to permit a second engagement and release of said cams with

said contact springs during the return movement of said key, whereby a second identical combination of independent matrices are released upon the single full stroke operation of said key.

4. Apparatus as claimed in claim 1, wherein said contact cams are off-set relatively to one another on said switch roller.

5. In a matrix composing and type line casting machine of the class including composing keys, electromagnetic matrix releasing devices, and opposed contact springs actuated by said keys for closing the circuit to said releasing devices, a spindle, a switch mechanism rotatably mounted on said spindle for engaging a plurality of contact springs successively in a predetermined sequence, to close the circuit to a predetermined number of matrix releasing devices, and means operatively connecting said switch mechanism to one of said composing keys, whereby upon the single depression of said key, a plurality of selected independent matrices are released.

6. In a matrix composing and type line casting machine of the class including composing keys, electromagnetic matrix releasing devices, and opposed contact springs actuated by said keys for closing the circuit to said releasing devices, a spindle, a series of switch discs rotatable on said spindle for engaging a plurality of contact springs successively in a predetermined sequence to close the circuit to a predetermined number of matrix releasing devices, and means operatively connecting said discs to one of said composing keys, whereby upon the single depression of said key, a plurality of selected independent matrices are released.

7. Apparatus as claimed in claim 6, including a cam on each of said switch discs, said cams being off-set relatively to one another.

8. Apparatus as claimed in claim 6, wherein said last named means comprises a rod pivotally connected at one end to said composing key.

9. Apparatus as claimed in claim 5, wherein said switch mechanism comprises a roller, and a series of off-set cams on the periphery of said roller.

10. In a matrix composing and type line casting machine of the class including composing keys and electromagnetic matrix releasing devices; a switch mechanism operatively connected to at least one of said keys comprising a roller, and means on said roller for selectively actuating a plurality of matrix releasing devices successively in a predetermined sequence, whereby upon the depression of said key a combination of individual matrices are released.

KURT BENDORFF.