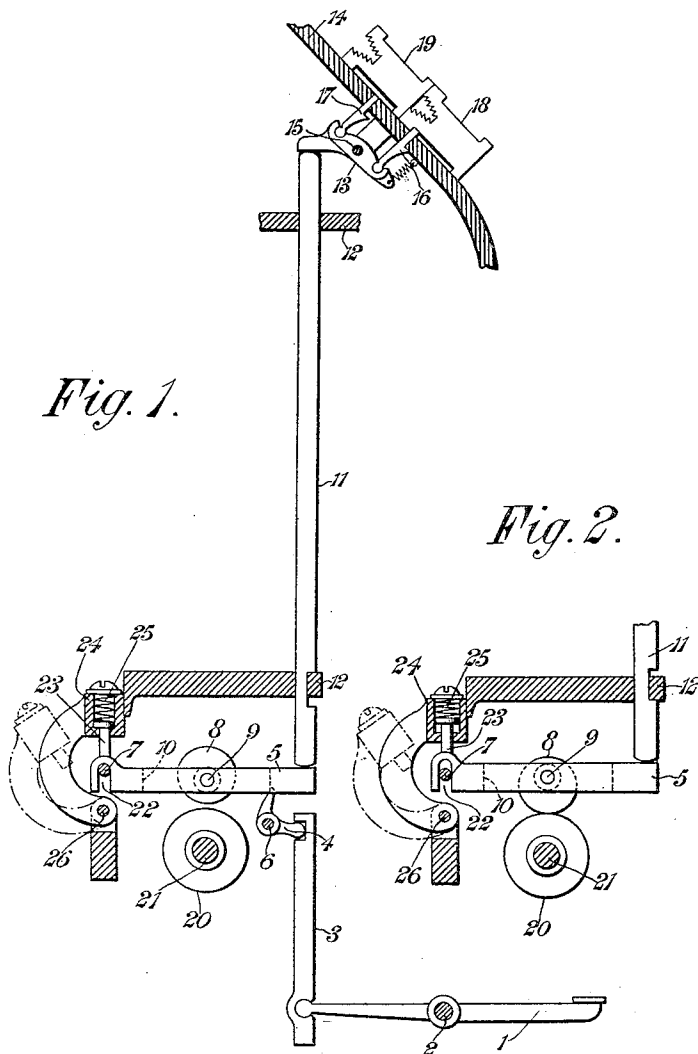


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 ESCAPEMENT MECHANISM OF TYPOGRAPHICAL COMPOSING MACHINES.
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ESCAPEMENT MECHANISM OF TYPOGRAPHICAL COMPOSING-MACHINES.

1,056,355.

Specification of Letters Patent.

Patented Mar. 18, 1913.

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To all whom it may concern:

Be it known that I, CARL MUEHLEISEN, a citizen of the United States of America, residing at 88 Chausseestrasse, Berlin, N. 4, in the Empire of Germany, have invented new and useful Improvements in the Escapement Mechanisms of Typographical Composing-Machines, of which the following is a specification.

The present invention relates to improvements in the escapement mechanisms of typographical composing machines, the actuation of each of which is begun by the depression of a key lever on the keyboard or otherwise and completed by the machine. It is to be understood that the object of such a mechanism is to detain in the machine the respective matrices, type dies, type, or whatever are the pieces to be composed, and to deliver one of them each time a mechanism is actuated. As much of such a mechanism as has its actuation completed by the machine, consists of a series of parts rubbing against each other and, therefore, wearing each other away so much that in time, the motion imparted to the last part of the series, is less than enough for its purpose, the consequence being that the respective depression of the respective key lever fails to deliver a matrix or its equivalent. The invention proposes to prevent such failure by providing that at least one of the said parts shall receive an excess motion enough to compensate for the maximum wear which they may have suffered. It includes means for taking up as much of that motion as may not be required to effect the respective delivery. My mechanism also prevents strain or breakage of the parts in the event of an escapement pawl banking against the ear of a matrix in such manner as to prevent the pawl from completing its normal movement. The accompanying figures illustrate it by way of illustrating its application to a line casting machine known commercially under the trade mark "linotype." Referring to them, Figure 1 is a sectional side elevation of a complete escapement mechanism including a key-lever and the two matrices next to the escapement lever, all at rest, and Fig. 2 is a detail sectional side elevation.

1 is a key lever; 2, its fulcrum; 3, a key rod engaged by the lever 1; 4, a bell crank lever having one arm engaged by the key rod 3, and the other by a lever or cam carriage 5 which rests upon it; 6, 7, the respec-

tive and stationary fulcra or pivots of the lever 4 and cam carriage 5; 8, an eccentric or cam pivoted by a horizontal pin 9 to turn within a slot 10 in the cam carriage 5; 11, an escapement rod resting by its bottom end on the free end of the cam carriage 5; 12, 12 guides in which the rod 11 reciprocates vertically; 13, an escapement lever in engagement with the top end of the rod 11, and connected to the matrix magazine 14 by its fulcrum 15; 16, 17 the two pawls of the lever 13, and 18, 19, two of the matrices. 20 is a roll under the eccentric or cam 8 and constantly rotated by the machine about a stationary pivot 21. So long as the key lever 1 is not depressed, the top arm of the lever 4 rests under the solid part of the cam carriage 5, thereby holding the eccentric 8 off the roll 20 but with its smallest radius next to it. The depression of the key lever 1 rocks the top arm of the lever 4 under the slot 10, whereupon the cam carriage 5 drops, thereby putting the eccentric 8 in frictional contact with the roll 20. The consequent rotation of the eccentric 8 raises the rod 11 and makes the escapement pawl 16 first release the matrix 18 and then detain the following one 19. While the cam carriage 5 is being raised, the key lever 1, rod 3 and lever 4, return to their original positions. When the eccentric 8 has completed one rotation, it is stopped by a device not shown in the figures but which is of well-known construction, and the cam carriage 5 again rests upon the top arm of the lever 4. The rod 11 and escapement lever 13 are also returned to their original positions. All these parts and movements are as heretofore—see the specifications of Letters Patent 530,931, 531,266 and 554,842. The eccentricity of the eccentric 8 has hitherto been sufficient, so long as the other parts of the escapement mechanism have not worn each other away, to give the eccentric and consequently the free end of the cam carriage 5, a motion sufficient to effect the release of a matrix 18. In order to insure the proper actuation of the escapement, notwithstanding the wear of the actuating parts, I arrange the parts to give the cam carriage 5 an excess motion, or overmotion, sufficient to compensate for the wear and insure the full movement of the escapement. This is preferably accomplished by giving the cam or eccentric 8 such eccentricity, and so locating its axis, that under normal con-

ditions it will tend to move the cam carriage and connecting parts farther than is actually required. When the wear is less than the maximum, the improved eccentric will impart, or try to impart, to the free end of the cam carriage 5, a motion more than sufficient to effect the release of a matrix 18 and jam the roll 20 against the eccentric 8. To prevent this, the pivoted end of the cam carriage 5, which has hitherto had only a rotary motion on its pivot or fulcrum 7, has its pivot bearing in the form of a vertical slot 22 so that as soon as a sufficient motion has been given to the free end of the cam carriage 5, the excess motion is transferred to and taken up by the slot 22.

The pivoted end of the cam carriage 5 is kept down upon its fulcrum by a stud 23 working in a bar 24 extending over the entire bank of cam carriages 5. The stud is pressed into contact with the said end by a spring 25 or its equivalent. The stud 23 may be dispensed with, the spring 25 being arranged to press directly upon the cam carriage 5. The bar 24 is pivoted at 26 so that it can be swung open as shown by the dotted lines, to give access to the bank of cam carriages 5. If, as sometimes happens, the pawl 17 should bank against the ear of a passing matrix, which would limit its movement, while the cam 8 continues to urge the reed 11 upward, the spring 25 will yield and permit the pivoted end of a cam yoke 5 to rise in relation to the pivot 7, thus relieving the parts from strain.

I believe it to be wholly new in the art to combine with the cam yoke through which the escapement is actuated a yielding fulcrum or support, so arranged that the yoke may yield at its pivoted end in the event of the escapement devices meeting with abnormal resistance, thus allowing the cam to continue its action without endangering the other parts.

In this class of machines the cam carriages or yokes 5 are arranged side by side in series or rows. It is frequently desirable to remove the individual cams in order that they may be cleaned, oiled or repaired. It will be observed that the slot 22 admits of each yoke being instantly and individually removed from the machine without disturbing the pivot 7, after first swinging back the bar 24.

The employment of the stationary pivot 7 in connection with the cam yokes or frames 5 having the slot 22 to receive the pivots is advantageous in that a single continuous pivot may be used for the entire series of cam yokes, as in the ordinary machine of the present day, and the yokes held down to their operative positions by a confining device overlying the series and bearing thereon.

Having described my invention, what I

claim and desire to secure by Letters Patent is:—

1. In a mechanism of the class described, an escapement, including two alternately acting pawls, in combination with a cam carrying carriage and intermediate devices adapted to impart an excess motion to the pawls, and a yielding support for the cam carriage; whereby the full movement of the pawls is insured, notwithstanding the wear of the parts, and the parts relieved from the strain to which they would otherwise be subjected by the over-motion.

2. In a typographical composing machine, the combination with two escapement pawls adapted to be reciprocated in respectively opposite directions relatively to a magazine, for releasing, one at a time, matrices contained in such magazine, a device operatively connected to the pawls adapted to reciprocate them to the extent necessary for effecting such release, a cam carriage adapted to impart motion to the said device sufficient for attaining said result, a pivot for the cam carriage, a slotted bearing engaging with the pivot with a capacity for sliding thereon and means adapted to retard the said sliding movement.

3. In a typographical composing machine, the combination with two escapement pawls adapted to be reciprocated in respectively opposite directions relatively to a magazine, for releasing, one at a time, matrices contained in such magazine, a device operatively connected to the pawls adapted to reciprocate them to the extent necessary for effecting such release, a cam carriage adapted to impart motion to the said device sufficient for attaining said result, a stationary pivot for the cam carriage, a slotted bearing in the cam carriage engaging with the pivot and capable of sliding thereon, and a spring adapted to act on the cam carriage and retard the said sliding movement.

4. In a typographical composing machine, the combination with two escapement pawls adapted to be reciprocated in respectively opposite directions relatively to a magazine, for releasing, one at a time, matrices contained in such magazine, a device operatively connected to the pawls adapted to reciprocate them to the extent necessary for effecting such release, a cam carriage adapted to impart motion to the said device sufficient for attaining said result, a stationary pivot for the cam carriage, a slotted bearing in each cam carriage engaging with the pivot and capable of sliding thereon, a stud in operative contact with the cam carriage, a spring in operative contact with the stud and adapted to retard the sliding of the cam carriage on its pivot, and a bar containing the spring and forming a guide for the stud.

5. In a typographical composing machine, the combination with two escapement

pawls adapted to be reciprocated in respectively opposite directions relatively to a magazine, for releasing, one at a time, matrices contained in such magazine, a device
 5 operatively connected to the pawls adapted to reciprocate them to the extent necessary for effecting such release, a cam carriage adapted to impart motion to the said device sufficient for attaining said result, a station-
 10 ary pivot for the cam carriage, a slotted bearing in each cam carriage engaging with the pivot and capable of sliding thereon, a stud in operative contact with the cam carriage, a spring in operative contact with the
 15 stud and adapted to retard the sliding of the cam carriage on its pivot, a bar containing the spring and forming a guide for the stud, and a pivot for the bar whereby the latter can be moved from its operative position in which the stud is in contact with the
 20 cam carriage, into an inoperative position in which the spring has no effect on the cam carriage.

6. In a typographical composing machine, the combination with a series of
 25 pairs of escapement pawls the pawls of each pair adapted to be reciprocated in respectively opposite directions relatively to a magazine, for releasing, one at a time, matrices contained in such magazine, a device
 30 operatively connected to each pair of pawls adapted to reciprocate them to the extent necessary for effecting such release, a cam carriage adapted to impart motion to the
 35 said device sufficient for attending said result, means adapted to move the cam carriage more than is necessary for attaining the said result, a stationary pivot common to all of the cam carriages, a slotted bearing
 40 in each cam carriage, engaging with the pivot and capable of sliding thereon, a stud in operative contact with each cam carriage, a spring in operative contact with each stud and adapted to retard the sliding of the re-
 45 spective cam carriage on the pivot, a bar containing the series of springs and forming guides for the studs, a pivot for the bar whereby the latter can be moved from its operative position in which each stud is in
 50 contact with its respective cam carriage, into an inoperative position in which the springs have no effect on the several cam carriages.

7. In a mechanism of the class described,
 55 a continuously driven roll, an eccentric, 8, receiving motion therefrom, a movable carrier for the eccentric, a yielding fulcrum for one end of said carrier, and an escapement mechanism connected with the opposite
 60 end of the same.

8. In a mechanism of the class described,

the cam carrying yoke 5, vertically slotted at one end, in combination with a fixed pivot, 7, passing through said slot, a hinged bar, 24, and a yielding member carried by
 65 said bar and acting to hold the yoke down normally in its operative position.

9. In a typographical machine, the escapement actuating devices comprising a pivoted member and power operated means
 70 to move the member about its pivot, the said member being arranged to yield at its pivotal point in the event of its meeting with abnormal resistance.

10. In a typographical machine, the escapement actuating devices comprising a
 75 pivoted member and power operated means to move the member about its pivot, the said member being formed with an open slot to engage the pivot so as to permit it to yield in
 80 the event of abnormal resistance.

11. In a typographical machine, escapement actuating devices comprising a plurality of pivoted members and a common
 85 pivot rod therefor, each of the members being formed with an open slot to engage the pivot rod, together with common means for holding the said members in pivotal engagement with the rod.

12. In a typographical machine, escapement actuating devices comprising a plu-
 90 rality of pivoted members and a common pivot rod therefor, each of the members being formed with an open slot to engage the pivot rod, together with common means for
 95 holding the said members in pivotal engagement with the rod, and the said holding means being so constructed as to permit the members to yield in the event of their being subjected to abnormal resistance.

13. In a typographical machine, the escapement actuating devices comprising in combination the pivotally-mounted cam-
 10 carrying yoke and yielding means which hold the yoke in normal relation to its pivotal point but permit it to yield in the event of abnormal resistance.

14. In a typographical machine, the escapement actuating devices comprising the
 11 pivotally-mounted cam-carrying yoke, the said yoke being formed with an open slot to engage the pivot, combined with yielding means which hold the slotted yoke in normal relation to the pivot but permit it to
 11 yield in the event of abnormal resistance.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

CARL MUEHLEISEN.

Witnesses:

HENRY HASPER,
 WOLDEMAR HAUPT.