(No Model.)

C. L. REDFIELD.

ESCAPEMENT DEVICE FOR MATRIX MAKING MACHINES.

No. 416,743. Patented Dec. 10, 1889.

Fig. 3

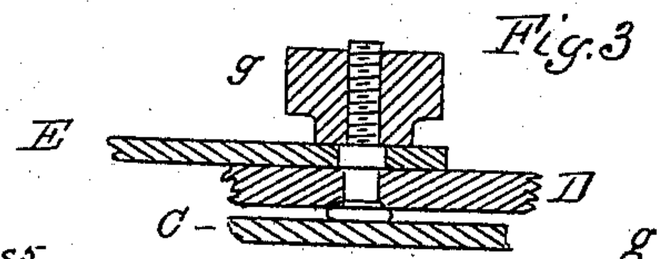
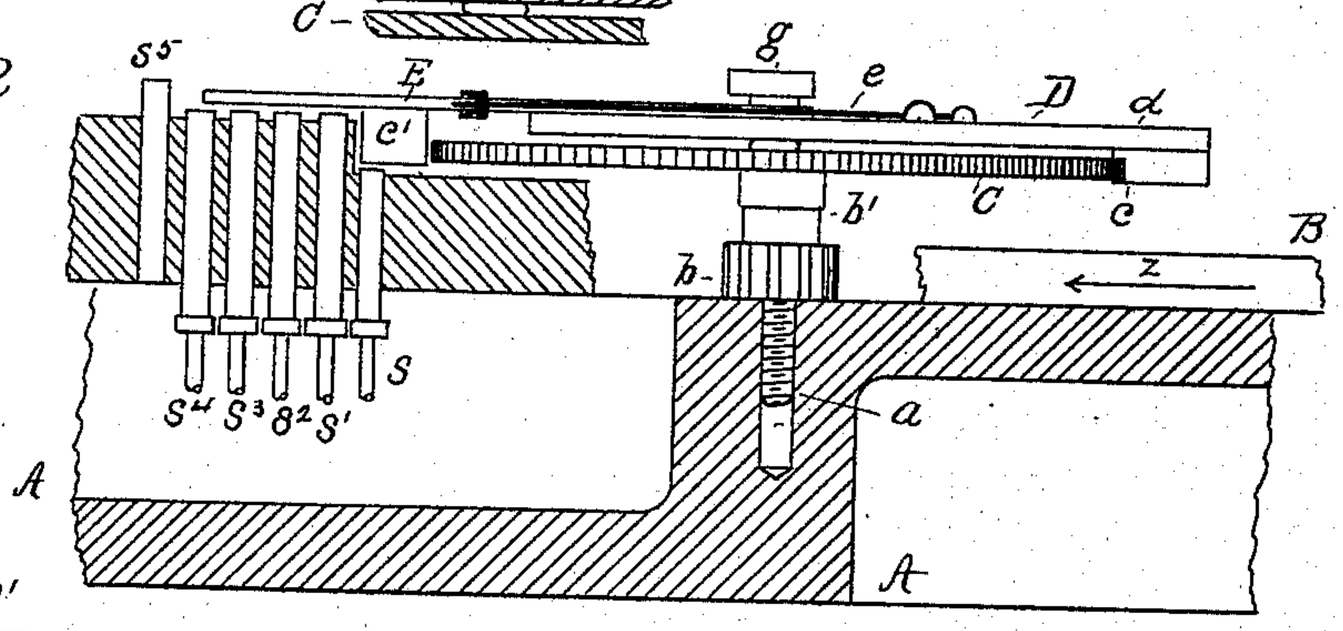


Fig. 2



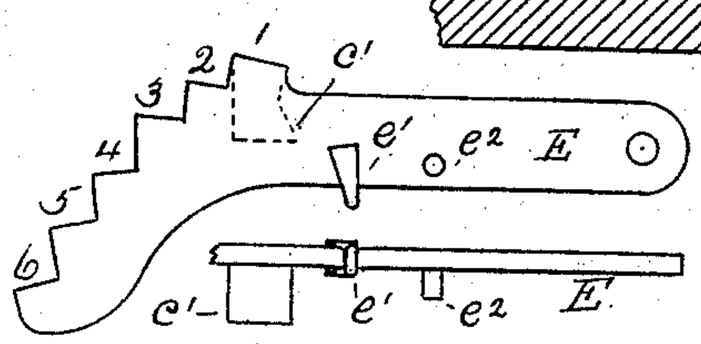


Fig. 4

Fig. 5

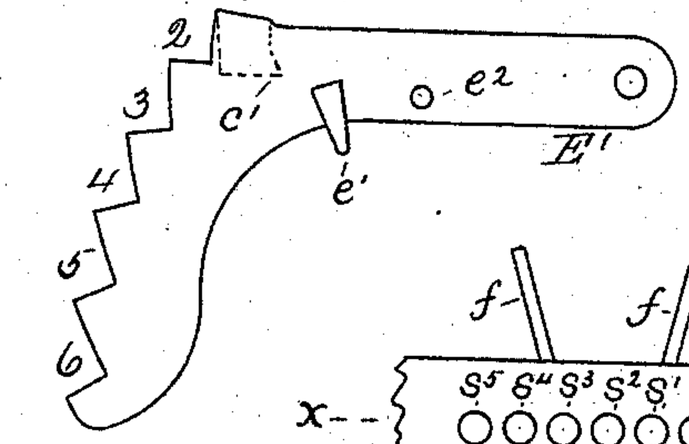


Fig. 6

Fig. 1

Witnesses

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CASPER L. REDFIELD, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE CHICAGO MATRIX MACHINE COMPANY.

ESCAPEMENT DEVICE FOR MATRIX-MAKING MACHINES.

SPECIFICATION forming part of Letters Patent No. 416,743, dated December 10, 1889.

Application filed March 22, 1889. Serial No. 304,317. (No model.)

To all whom it may concern:

Be it known that I, CASPER L. REDFIELD, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Escapement Devices for Matrix-Making Machines, of which the following is a specification.

My invention relates to devices connected with the electrically-operated mechanism in a matrix-making machine for causing and controlling a variable feed of the matrix-body for spacing the impressions. The object of the invention is improvement of the devices for operating the escapement, whereby the devices used for one system of movements can be readily removed and others for a different system of movements substituted.

In prior devices no provision is made for the substitution of one set of escapement devices for another for changing the quantities of the feed movements, and in such prior devices the minimum movement was measured by the space of one tooth of the scape-wheel, the next movement by the space of two teeth, the third movement by three teeth, and so on, thus making the second movement twice the extent of the first, the third three times the first, and so each of the movements increased by the space of one tooth.

The purpose of my improvements is to enable feed movements to be made that are not necessarily multiples of the minimum movement, and for the further purpose of enabling the speedy substitution of escapement devices that will change the quantities of the feed-movements.

My present devices relate to escapement mechanism of the same general character as that shown in prior application for patent made by me March 18, 1889, Serial No. 303,657.

In the accompanying drawings, in which my improvements are illustrated, Figure 1 is a plan view of the escapement devices. Fig. 2 is a sectional view thereof on the line $x\,x$ of Fig. 1. Fig. 3 is a sectional detail of a portion of the scape-wheel and lever devices, and Figs. 4, 5, and 6 are details of the escapement-lever.

In said drawings, A designates a portion of the machine-frame. B is the rack connected with the matrix-carriage, and by reason of springs connected with such carriage has a constant tendency to move in the direction of the arrow z. In engagement with this rack is a pinion b, that is formed at the base of a sleeve b' on a post a, secured in the base of the frame A. On this sleeve is mounted an escapement-wheel C, that turns with the pinion and sleeve in the direction of the arrow z'. Over the wheel is a lever or pawl-carrier D, fulcrumed at its end to the frame at D'. One of the arms d carries a pawl c, that engages the teeth of the scape-wheel to restrain movement. The other arm d' has a widened end, in which is a curved slot d^2. On the lever D is fulcrumed, over the center of the escapement-wheel, a second lever E, that carries the free pawl c'. On the end of this lever E are formed steps 1, 2, 3, 4, 5, and 6, for engaging the stops s, s', s^2, s^3, s^4, and s^5. These stops are normally below the plane at which they could be engaged by the lever E, and are thrown up singly by levers f, that carry armatures f' on their outer arms, and are acted upon by electro-magnets F.

The arrangement of the steps 1 2 3, &c., and their respective stops s s' s^2, &c., may be such that the minimum movement shall be the space of two of the scape-wheel teeth, the second measure of movement, controlled by the step 2 and stop s', equal to the space of four teeth, and the other longer movements, controlled by the steps 3 4, &c., and stops s^2 s^3, &c., each increasing by the space of two teeth over the last preceding measure. This is the arrangement for the lever E. (Shown in full lines in Fig. 1.) The lever E' (shown in dotted line in Fig. 1) is adapted to cause a minimum movement equal to three teeth, and to produce longer movements, in sequence increasing by the space of three teeth each.

The steps of the levers E E' are gaged according to the space required by the respective dies in the machine for which the levers are designed to space the matrix, and thus there may be provided, by the substitution of the levers E E', &c., a feed movement corresponding with the requirements of the particular dies it is designed to use for making impressions.

The lever E has a spring *e* for retracting it from the stops, one end of the spring being attached to the lever-arm *d* and the other end inserted in the hook *e'*, attached to the back of the lever E. The return movement of the lever E is limited by a pin e^2 in the slot d^2 of the lever-arm *d*. By unscrewing the thumb-screw *g* the lever E can be lifted off, the spring passing out of its hook *e*, and another lever, as E', having different steps, substituted. The lever D carries an armature H, to throw the lever over and free the pawl *c* from engagement, to permit the rack to rotate the scape-wheel, and the lever is returned from the magnet *h* by means of a spring *i*.

In operation, when it is desired that a feed movement should be made, the pawl-carrier D is moved toward the right, which may be done by a circuit completed through the magnet *h* by any suitable electrical devices, causing the disengagement of the pawl *c* and engagement of the pawl *c'* with the teeth of the scape-wheel. The wheel being thus free to turn makes a partial rotation, carrying with it the engaged lever E or E', as the case may be, until one of the lever-steps engages the stop *s s'*, &c., that has been lifted to position simultaneously with the act that freed the pawl *c*, and further rotation of the scape-wheel is thus stopped. When the lever D is again relieved from action of the magnet *h*, the spring *i* retracts it to position to cause re-engagement of the pawl or detent *c*, and this movement of the lever D serves also to cause disengagement of the pawl *c'*, whereupon the spring *e* will retract the lever E, and the devices will then again be in position for another feed movement.

Generic features of invention herein disclosed and not herein claimed relative to the stepped lever and co-operating stops and the means for actuating them are reserved to be claimed in an application for patent by me filed March 18, 1889, Serial No. 303,657.

Having described my invention, what I claim, and desire to secure by the Letters Patent, is—

1. In a matrix-making machine, the combination, with the feed-escapement thereof and the stop-pins, of interchangeable levers pivoted to the prime lever, carrying pawls and stepped to engage the stops by different measures of movement, substantially as set forth.

2. The combination, in a matrix-making machine, with the escapement for controlling the matrix-feed, of an electrically-operated lever carrying the holding-pawl, and a removable stepped lever pivoted to the former and carrying the second pawl, and stops for limiting the throw of such stepped lever.

3. The combination, in a matrix-making machine, with the scape-wheel and a lever carrying the holding-pawl, of a second lever carrying the free pawl and having steps proportioned to the measurement of feed required, the spring holding the latter lever, and means, substantially as described, for removing said stepped lever and substituting therefor a differently-stepped lever.

4. In a matrix-making machine, in combination with a rack connected to the matrix-carriage, a pinion, a scape-wheel rotated thereby, a lever pivoted to swing over the wheel and engage the teeth at one side, an armature and magnet for disengaging the same, a second lever pivoted on the first and engaging opposite teeth of the wheel and having stepped notches on its outer arm, means for substituting therefor similar levers with different-sized stepped notches, and electrically-operated stop-pins therefor whose arrangement is constant, substantially as set forth.

5. In a feed-escapement for a matrix-machine, a scape-wheel, a prime-lever carrying the holding-pawl on one lateral arm and having a slot in the other lateral arm, a removable secondary lever intermediately pivoted, carrying the free pawl and having a pin in said slot, a spring secured to the former and detachably connected to the latter lever, stepped notches on the outer arm of the removable lever, and stops therefor, substantially as set forth.

6. In an escapement for a matrix-feed, a prime lever carrying the holding-pawl, a secondary removable lever pivoted thereto carrying the free pawl, stops for engaging the latter lever to limit its throw, and steps on its outer arm arranged to permit a wheel movement equal to two or more teeth for each step, substantially as set forth.

7. In combination with a feed-escapement, a reciprocating holding-pawl carrier, interchangeable revoluble carriers connected thereto, provided with a free pawl and having, respectively, steps of varying extent, and a series of stops co-operating therewith, and means for projecting them separately into the path of the stepped pawl-carrier, substantially as set forth.

8. In a matrix-machine feed-escapement, a reciprocating holding-pawl carrier, interchangeable free-pawl carriers pivoted thereto and having arms stepped to produce different degrees of feed movement, and a series of stops in radial alignment adapted to be projected separately into the plane of movement of said arms, for the purpose set forth.

9. The combination, with a feed-escapement for a matrix-machine, of interchangeable stepped revoluble pawl-carriers, and co-operating stops arranged to be projected separately to engage them, whereby the feed movements may be varied, substantially as set forth.

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Witnesses:

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