

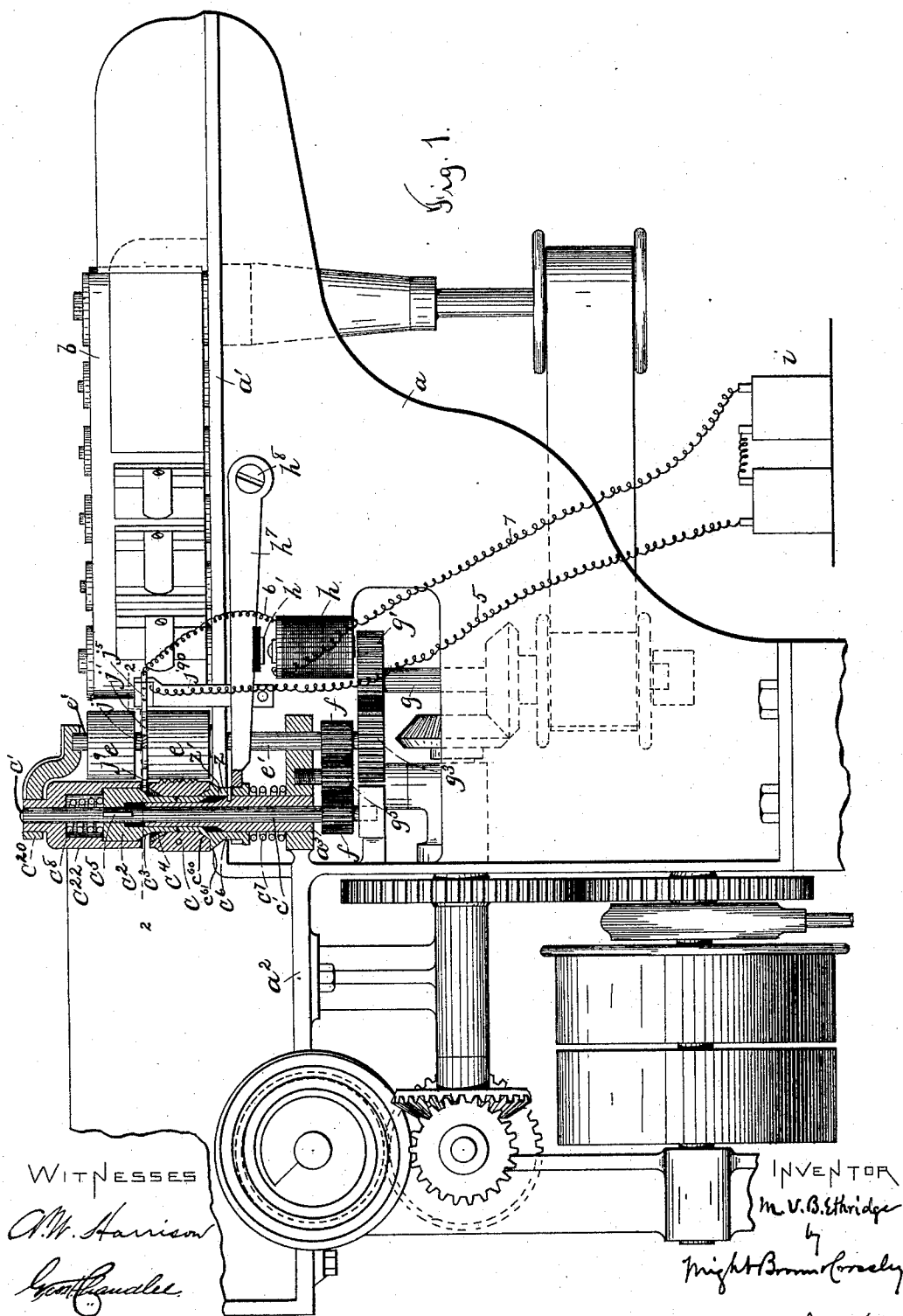
(No Model.)

3 Sheets—Sheet 1.

M. V. B. ETHRIDGE.
MACHINE FOR MARKING MAIL MATTER.

No. 468,775.

Patented Feb. 9, 1892.



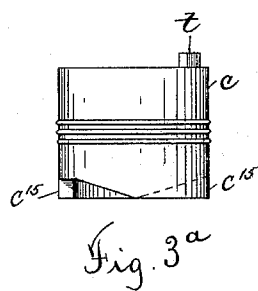
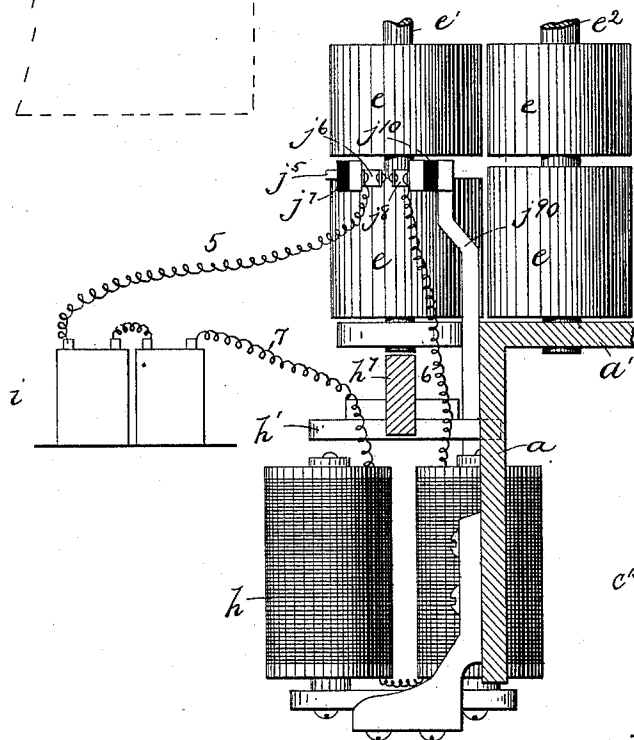
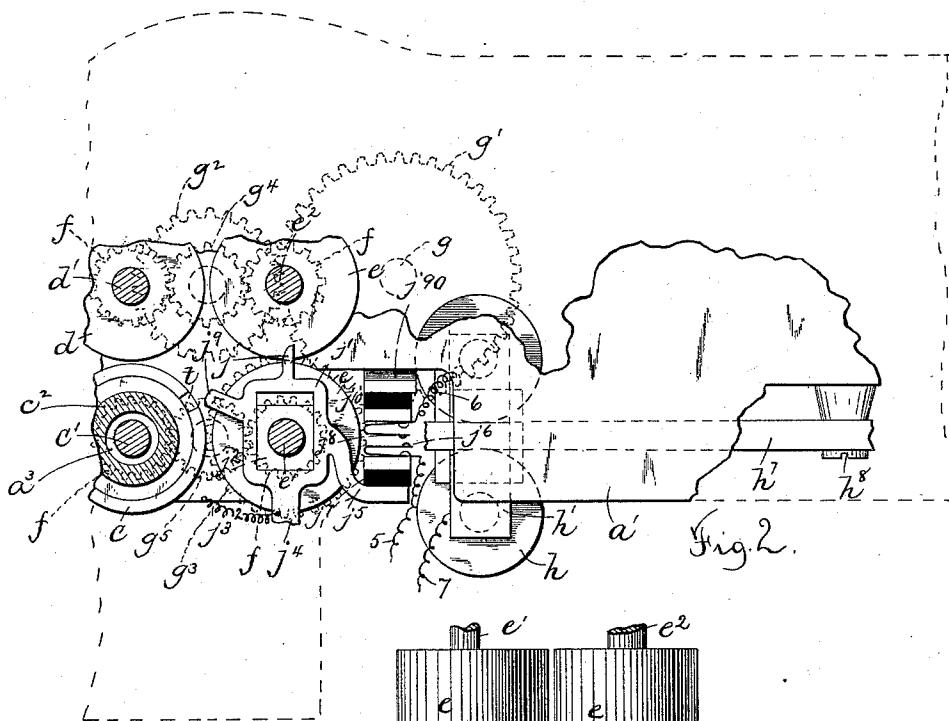
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3 Sheets—Sheet 2.

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Patented Feb. 9, 1892.



WITNESSES

W. H. Harrison
Govt. Chandler.

INVENTOR
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AT T'Y.S

(No Model.)

3 Sheets—Sheet 3.

M. V. B. ETHRIDGE.
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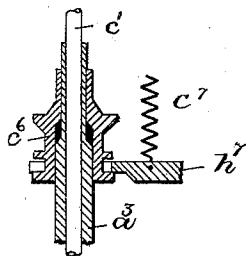


FIG. 4.

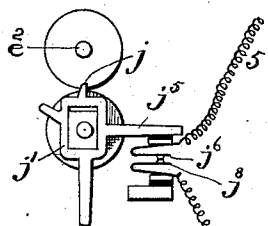


FIG. 5.

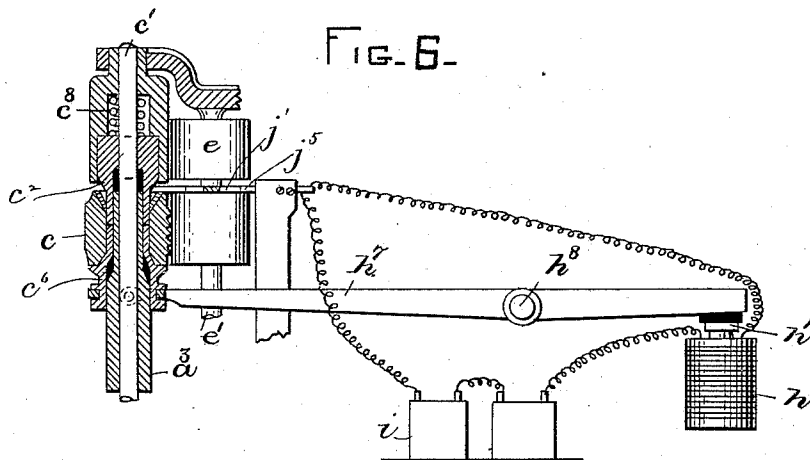


FIG. 6.

WITNESSES.

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UNITED STATES PATENT OFFICE.

MARTIN V. B. ETHRIDGE, OF EVERETT, MASSACHUSETTS, ASSIGNOR TO THE
AMERICAN POSTAL MACHINES COMPANY, OF PORTLAND, MAINE.

MACHINE FOR MARKING MAIL-MATTER.

SPECIFICATION forming part of Letters Patent No. 468,775, dated February 9, 1892.

Application filed October 16, 1891. Serial No. 408,944. (No model.)

To all whom it may concern:

Be it known that I, MARTIN V. B. ETHRIDGE, of Everett, in the county of Middlesex and State of Massachusetts, have invented certain
5 new and useful Improvements in Machines for Marking Mail-Matter, of which the following is a specification.

This invention relates to that class of machines for marking letters and other pieces
10 of mail-matter in which a die-cylinder or printing-roll is employed which is normally locked to prevent it from rotating and a driver for said die-cylinder which is engaged with the die-cylinder and causes it to rotate
15 through the instrumentality of a letter advancing toward the die-cylinder.

The invention has for its object to provide a simple and efficient machine of this class in which the power required to establish the
20 connection between the die-cylinder and its driver is supplied by an electric motor included in an electric circuit, which is made operative by a letter advancing toward the die-cylinder. To this end the invention consists
25 in the improvements which I will now proceed to describe and claim.

In the accompanying drawings, forming part of this specification, Figure 1 represents a side elevation of a machine embodying my
30 invention, the die-cylinder and the clutch portion of the driver being shown in section. Fig. 2 represents a section in line 2 2, Fig. 1, and a top view of a portion of the machine below said line. Fig. 3 represents an end
35 elevation of the portion of the machine shown in Fig. 2. Fig. 3^a represents a side view of the die-cylinder. Figs. 4, 5, and 6 represent modifications.

The same letters and numerals of reference
40 indicate the same parts in all the figures.

In the drawings, *a* represents the supporting-frame having a shelf or table *a'*, along which the letters to be marked are carried by means such as a conveying-belt *b* and
45 pressure devices co-operating therewith to the feed-rolls and printing mechanism, presently described, and another table *a''*, which receives the printed letters and is provided with a packing device, the packing-table being
50 preferably located at a lower plane than the feeding or supply table, so that the

printed letters after leaving the table *a'* descend onto the packing-table. The feed-table is preferably formed to continuously support the letters, not only while they are being impelled by the carrying-belt, but also
55 while they are under the positive control of the feed-rolls and printing and impression rolls next described.

c represents the printing-roll or die-cylinder, 60 which is located above the table *a'* and is mounted on a fixed tubular journal or sleeve *a''* and rotated by a continuously-rotating driver, which is composed of a shaft or spindle *c'*, passing through said journal or
65 sleeve, and a movable clutch on said shaft, the die-cylinder receiving motion from said driver only when connected therewith by the clutch, which is caused to connect the die-cylinder with the shaft by a letter approaching
70 the die-cylinder, as hereinafter described, and maintains the connection until the die-cylinder has made a complete rotation, the connection then being automatically discontinued, so that the rotation of the die-cylinder
75 ceases. A clutch or locking device is provided to arrest the die-cylinder and prevent it from rotating loosely at the moment of its disconnection from the shaft, so that the die
80 is at all times positively controlled, said locking device comprising a clutch-surface *c''* on the sleeve *c'*, adapted to engage a corresponding surface on the interior of the die-cylinder, and teeth *c'''* on said sleeve adapted to enter slots or recesses *c'''* in the lower end of
85 the die-cylinder.

An impression-roll *d* co-operates with the die-cylinder in printing the letters, and the letters are positively presented to the impression-roll and die-cylinder by means of feed-rolls *e*, arranged to receive the letters from
90 the conveyer *b*. The impression-roll is affixed to a shaft *d'* and the feed-rolls *e* are affixed to shafts *e'* *e''*. The said shafts *c'*, *d'*, *e'*, and *e''* are provided with gears *f* at their lower
95 ends and are rotated by power communicated from a shaft *g* by means of a gear *g'* on said shaft meshing with an independent gear *g''* and a gear *g'''*, affixed to the shaft *e'*, a gear
100 *g''''*, affixed to the independent gear *g''* and meshing with the gears *f* *f* on the shafts *e''* and *d'*, and a gear *g''''*, meshing with the gears

ff on the shafts *e'* and *c'*, as shown in Fig. 2, the feed-rolls, die-cylinder, driver, and impression-roll being rotated simultaneously by said gearing and all receiving motion from the shaft *g*.

The letter-operating mechanism that engages the die-cylinder with its driver is as follows: *c*², Fig. 1, represents a sleeve adapted to slide on the shaft *c'* and connected thereto with by means of a feather or spline *c*⁵ on the shaft engaging a groove (not shown) in the sleeve, this connection causing the sleeve to rotate with the shaft and permitting it to slide thereon. The sleeve *c*² is provided with a clutch surface or member *c*³, formed to engage a corresponding clutch surface or member *c*⁴ on the die-cylinder *c*, said members being preferably formed to act as a clutch of the frictional type, although they may be formed to act positively, if preferred. The sleeve *c*² is normally held in the position shown in Fig. 1, to make the clutch members inoperative, by means of a sleeve *c*⁶, which is mounted to slide on the fixed bearing or sleeve *a*³, and is normally raised by a spring *c*⁷ into contact with the sleeve *c*². A spring *c*⁸ is arranged to press the sleeve *c*² in the opposite direction, and thus operatively connect the two clutch members; but said spring is weaker than the spring *c*⁷. Hence it acts only when the spring *c*⁷ and sleeve *c*⁶ are retracted, as presently described. The clutch members *c*³ and *c*⁴ are therefore normally separated by the spring *c*⁷, leaving the die-cylinder loose upon its driving-shaft. The upper end of the driver-shaft *c'* is supported by a bearing *c*²⁰, affixed to the supporting-frame.

*c*²² is a roll or drum mounted on the shaft *c'* and having a cavity which receives the spring *c*⁸, said roll being formed to cover the driver-clutch collar *c*² and to co-operate with one of the feed-rolls in supporting and guiding the letters. The sleeve *c*⁶ is prevented from rotating by means of a pin or stud *z*, affixed to the sleeve or bearing *a*³ and passing through a slot *z'* in said sleeve. The electric motor, which establishes the connection between the driver-clutch *c*² and the die-cylinder *c*, is here shown as composed of an electro-magnet *h*, suitably affixed to the supporting-frame, and a lever *h*⁷, pivoted at *h*⁸ to the supporting-frame and having attached to it the armature *h'* of the electro-magnet. The swinging end of the lever *h*⁷ bears on a flange on the lower end of the sleeve *c*⁶. When the said sleeve is in the position shown in Fig. 1, it raises the lever *h*⁷ and holds the armature *h'* away from the poles of the electro-magnet. The electro-magnet is included in an electric circuit, which also includes a battery *i*, or other source of electricity, and a circuit-closing device, which is arranged to be operated by a letter approaching the feed-rolls *ee*, the arrangement being such that when the circuit is closed through the electro-magnet the armature *h'* is attracted and gives a movement to the lever *h*⁷, which causes the retraction

of the sleeve *c*⁶ and allows the spring *c*⁸ to throw the driver-clutch *c*² into engagement with the die-cylinder, thus causing the rotation of the latter.

The circuit-closing device includes a finger *j*, which is attached to a movable yoke *j'*, mounted on a block *j*², which is supported and adapted to oscillate upon the feed-roll shaft *e'*. Said yoke is normally held by a spring *j*³, engaged with an arm *j*⁴ on the yoke in the position shown in Fig. 2, the finger *j* projecting across the path in which a letter moves in entering between the feed-rolls. The yoke *j'* is provided with another arm *j*⁵, which supports a contact-spring *j*⁶, said spring being insulated from the arm *j*⁵ by a block *j*⁷ of rubber or other insulating material. The contact-spring *j*⁶ is an electrode and is connected by a wire 5 with one pole of the battery *i*. The circuit-closing device also includes a contact-spring or electrode *j*⁸, which is supported by an arm or bracket *j*⁹, affixed to the supporting-frame, and is insulated from said arm by an insulating-block *j*¹⁰. The electrode *j*⁸ is connected by a wire 6 with one pole of the electro-magnet *h*. The electrodes *j*⁶ and *j*⁸ and the wires 5 and 6 form parts of an electric circuit which includes the battery and the electro-magnet, the pole of the battery opposite to the one connected to the wire 5 being connected to one pole of the electro-magnet by a wire 7, while the other pole of the electro-magnet is connected with the electrode *j*⁸ by the wire 6, as already described. When a letter moving forward between the feed-rolls strikes the finger *j*, it displaces the said finger against the stress of the spring *j*³, thus swinging the yoke *j'* and causing the arm *j*⁵ to move the electrode *j*⁶ into contact with the electrode *j*⁸. This contact closes the circuit, energizes the electro-magnet *h*, and causes said magnet to attract its armature *h'*, the result being the movement of the lever *h*⁷, which establishes the connection between the driver-clutch and the die-cylinder, the latter being thus caused to rotate and print the advancing letter. The die-cylinder is provided with a tooth or projection *t*, which is arranged to strike an arm *j*⁹ on the yoke *j'* just before the die-cylinder has made a complete rotation, the contact of said tooth with the arm *j*⁹ moving said arm and thus restoring the yoke *j'*, finger *j*, and arm *j*⁵ to their original positions, the finger *j* being thereby restored to the letter-path and the electrode *j*⁶ separated from the electrode *j*⁸, thus breaking the circuit and causing the electro-magnet *h* to release the armature *h'*. The spring *c*⁷ then acts to separate the driver-clutch from the die-cylinder and at the same time move the lever *h*⁷ so as to prepare it for the next operation of establishing the connection between the driver-clutch and the die-cylinder. It will be observed that the yoke *j'*, carrying the electrode *j*⁶, constitutes the movable part or member of a circuit-closer, the other member of which is the electrode *j*⁸. It will also be observed that the only

duty required of the said movable circuit-closer is to establish contact between the electrodes j^6 and j^8 , which duty is extremely light, so that the advancing letter has to exert but a very slight pressure upon the finger j to accomplish the desired result, the force required to establish the connection between the driver-clutch and the die-cylinder being furnished by the electric motor which is energized by the closing of the circuit.

The form of electric motor here shown, comprising the electro-magnet, an armature therefor, and the lever h^7 , attached to the armature, is the simplest and most practicable form at present known to me. I do not limit myself, however, to this particular electric motor, but may use any other suitably-constructed motor adapted when made operative by the closing of an electric circuit to furnish the power required to establish a connection between the driver-clutch and the die-cylinder.

I am aware that it has been proposed to operate a letter-marking stamp by power furnished by an electric motor included in a circuit which is closed by the movement of a letter, the motor furnishing all the power which operates the stamp and causes it to make an impression upon the letter.

My invention is distinguished from all previous attempts to operate a letter-marking stamp or die by an electric motor in that the motor does not furnish the power which operates the stamp or die, but simply furnishes the power required to establish an operative connection between the printing device or die-cylinder and a continuously-operated driver, which is impelled by the power of the machine.

The advantage of my improvement in positiveness and reliability of operation is obvious.

In Fig. 4 I show the lever h^7 engaged at its swinging end with two flanges on the sleeve c^6 , so that the lever may move the sleeve in both directions. In this case the spring c^7 , that causes the displacement of the driver-clutch and the retraction of the armature, would be attached to the lever h^7 and to a suitably-affixed support.

My invention is not limited to the particular construction of devices herein shown, and said construction may be variously modified without departing from the spirit of my invention.

In another application for Letters Patent of the United States filed concurrently herewith I have shown, described, and claimed a machine organized substantially as herein shown, with the exception that the motor is not electrically operated, but is a cylinder provided with a piston adapted to be operated by a fluid under pressure, the admission of said fluid to the cylinder and its exhaust therefrom being controlled by a valve which is moved to one position to cause the motor to establish a connection between the driver-

clutch and die-cylinder by a movement of an advancing letter and to another position to reset the motor and permit the separation of the driver-clutch from the die-cylinder by the rotation of the die-cylinder caused by the first action of the motor. While, therefore, I have shown in this application several features which are found also in the machine shown in the other above-named application, I have limited the claims of this application to the features involved by the employment of an electric motor.

If desired, the motor may be operated by breaking the circuit instead of closing it, the circuit being normally closed. In Figs. 5 and 6 I show a suitable arrangement for operating the motor by breaking the circuit. In this case the movable electrode j^6 is held in contact with the other electrode j^8 by the frame j' when said frame is in its normal position and the finger j is in the letter-path. The lever h^7 is extended rearwardly beyond its pivot h^8 and the armature h' is attached to the rear end of the lever, as shown in Fig. 6, the electro-magnet h being correspondingly located. It will be seen that when the finger j is displaced by the advancing letter the circuit will be broken, thus causing the release of the armature h' . The spring c^8 is thus permitted to act in connecting the driver-clutch c^2 with the die-cylinder. The circuit is closed by the action of the tooth or projection t on the die-cylinder during the latter part of the rotation thereof, the magnet thus being caused to attract its armature and thus move the lever h^7 so as to displace the driver-clutch and stop the rotation of the die-cylinder. The lever h^7 is in this case engaged with two flanges on the sleeve c^6 , so that it moves said sleeve positively in both directions. In this modification the spring c^7 is not required.

I claim—

1. In a machine for marking mail-matter, the combination of a die-cylinder, a driver having a clutch normally separated from the die-cylinder and adapted to be engaged therewith, an electric motor, and devices controlled by said motor whereby a connection between the driver-clutch and die-cylinder is established when the motor is actuated, an electric circuit including said motor, and a device operated by an advancing letter to control the circuit, as set forth.

2. In a machine for marking mail-matter, the combination of a die-cylinder, a driver having a clutch normally separated from the die-cylinder and adapted to be engaged therewith, an electric motor, and devices controlled by said motor whereby a connection between the driver-clutch and die-cylinder is established when the motor is actuated, an electric circuit including said motor, a make-and-break device operated in one direction by an advancing letter, and devices operated by the resulting rotation of the die-cylinder to move the make-and-break device in the other direction, substantially as set forth.

3. In a machine for marking mail-matter, the combination of a die-cylinder, a driver having a clutch normally separated from the die-cylinder and adapted to be engaged there-
 5 with, an electric motor, devices controlled by said motor whereby a connection between the clutch and die-cylinder is established when the motor is actuated, an electric circuit including said motor, a circuit-closing
 10 device including a movable part or member having a finger normally in the letter-path, the circuit being closed to energize the motor by the displacement of said movable member by an advancing letter, means for restoring
 15 said movable member to its normal position by the rotation of the die-cylinder, whereby the circuit is broken, and a device, such as a spring *c*⁷, whereby the motor is reset for its next operation and the driver-clutch is sepa-
 20 rated from the die-cylinder, as set forth.

4. In a machine for marking mail-matter, the combination of a die-cylinder, a driver having a clutch normally separated from the die-cylinder and adapted to be engaged there-
 25 with, an electric motor, devices controlled by said motor whereby a connection between the driver-clutch and die-cylinder is established when the motor is actuated, an electric circuit including said motor, a circuit-
 30 closer including a movable part or member having a finger held in the letter-path, and an electrode included in the circuit, said electrode being moved to close the circuit and energize the motor by the displacement of
 35 said finger, and a projection on the die-cylinder arranged to restore the movable member of the circuit-closer to its normal position during the rotation of the die-cylinder and there-
 40 by break the circuit, and a device, such as a spring *c*⁷, adapted to reset the motor and separate the driver-clutch from the die-cylinder, as set forth.

5. In a machine for marking mail-matter, the combination of a die-cylinder, a driver
 45 therefor including a continuously - rotated

shaft and a clutch thereon movable toward and from the die-cylinder, a clutch-spring adapted to engage said clutch with the die-cylinder, a stronger spring which normally
 50 overcomes the clutch-spring and separates the clutch from the die-cylinder, an electric motor including an electro-magnet, a lever attached to the armature of said magnet and arranged to retract said stronger spring when
 55 moved by the attraction of the armature by the magnet, thus permitting the driver-clutch to engage and rotate the die-cylinder, an electric circuit including said magnet, and a circuit-closing device operated by an advancing
 60 letter to close the circuit and thereby energize the electro-magnet, as set forth.

6. In a machine for marking mail-matter, the combination of a die-cylinder, a driver therefor including a continuously - rotated
 65 shaft and a clutch thereon movable toward and from the die-cylinder, a clutch-spring adapted to engage said clutch with the die-cylinder, a stronger spring which normally overcomes the clutch-spring and separates
 70 the clutch from the die-cylinder, an electric motor including an electro-magnet, a lever attached to the armature of said magnet and arranged to retract said stronger spring when moved by the attraction of the armature by
 75 the magnet, thus permitting the driver-clutch to engage and rotate the die-cylinder, an electric circuit including said magnet, a movable circuit-closing device arranged to be operated by an advancing letter to close the circuit,
 80 and a device, such as the projection *t*, operated by the rotation of the die-cylinder to break the circuit, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 9th day of Oc-
 85 tober, A. D. 1891.

MARTIN V. B. ETHRIDGE.

Witnesses:

C. F. BROWN,

A. D. HARRISON.