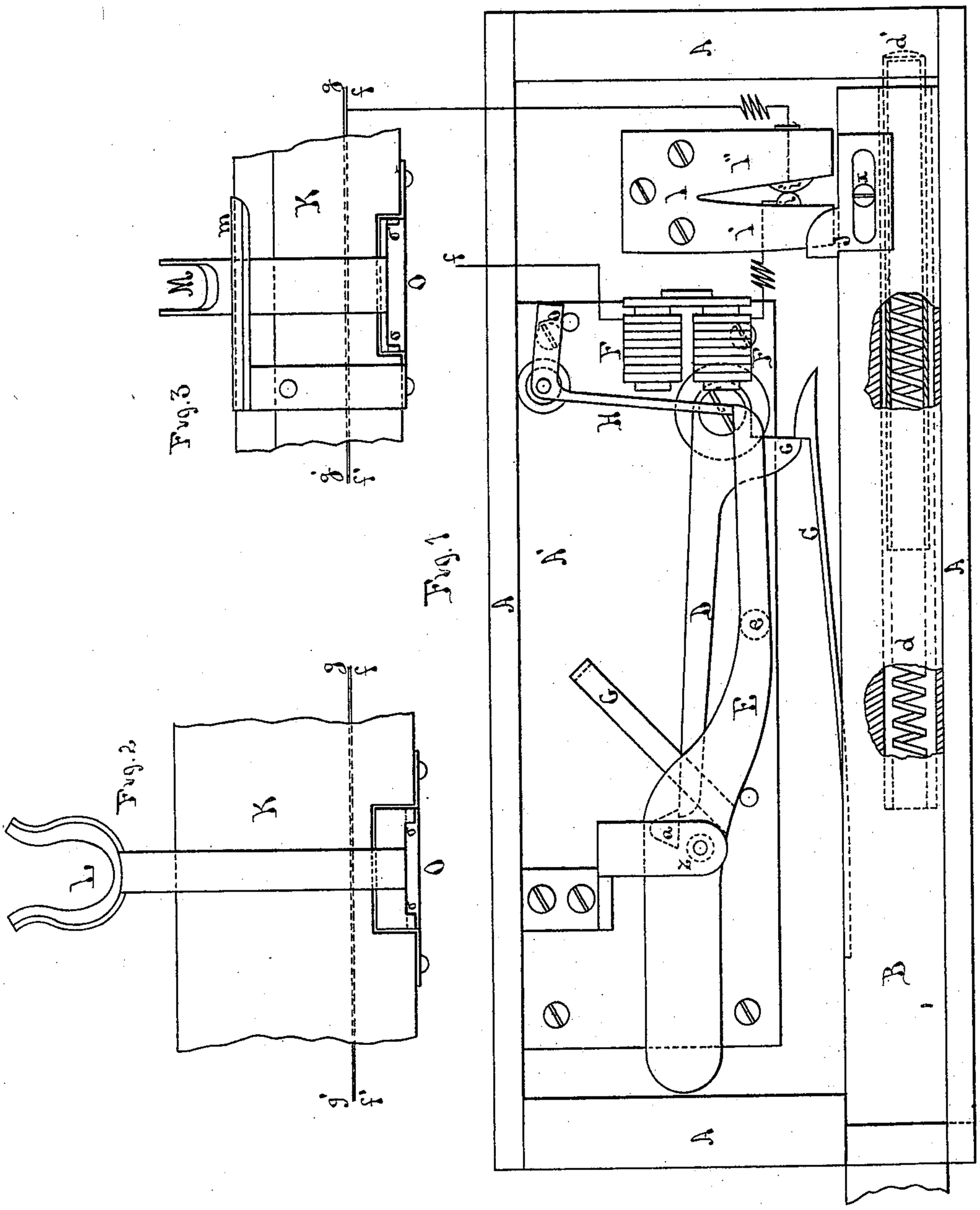
2 Sheets—Sheet 1.

E. BOYDEN.

ELECTRO-MAGNETIC STOP-MOTION FOR DRAWING OR ROVING MACHINERY.

No. 177,058. Patented May 9, 1876.



Witnesses
Wm H. Nash
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2 Sheets—Sheet 2.

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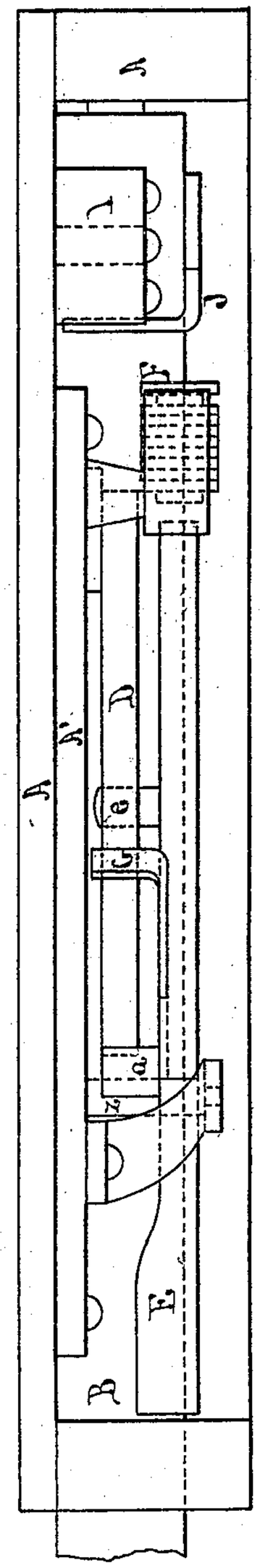

Fig. 4.

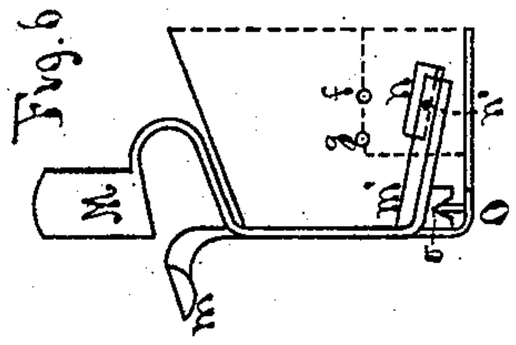

Fig. 6.

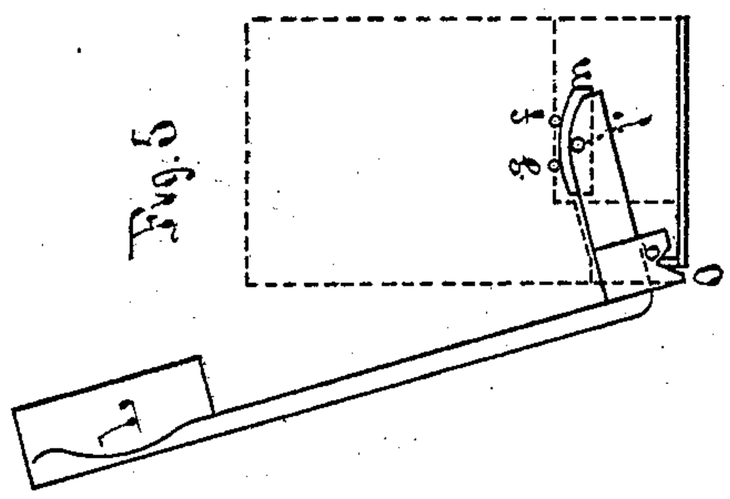

Fig. 5.

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UNITED STATES PATENT OFFICE.

ERASTUS BOYDEN, OF LOWELL, MASSACHUSETTS.

IMPROVEMENT IN ELECTRO-MAGNETIC STOP-MOTIONS FOR DRAWING OR ROVING MACHINERY.

Specification forming part of Letters Patent No. **177,058**, dated May 9, 1876; application filed March 25, 1876.

To all whom it may concern:

Be it known that I, ERASTUS BOYDEN, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Electro-Magnetic Stop-Motions for Drawing or Roving Machinery, of which the following is a specification:

My invention relates, first, to certain improvements in the latching mechanism, the object of this part of my invention being to secure greater certainty in the automatic working of the several parts; second, to certain improvements in the construction of the roving-guides, and the method of hanging them upon metallic edges, the object of this part of my invention being to secure greater lightness and sensitiveness in the action of the guides; third, to a new and improved device for closing the circuit when the end runs through or the roving breaks, the object of this part of my invention being to secure a more certain and sensitive method of closing the circuit; fourth, to a new and improved device for opening the circuit at the same instant that the belt-shipper is released, the object of this part of my invention being to prevent any waste of battery-power, which would occur were the circuit to remain closed for any sensible period of time.

In the drawings, Figure 1 represents a front elevation of the latching mechanism and sliding shipper-bar with my improved circuit-opener. Figs. 2 and 3 are front views of thread-guides, to which are attached my improved circuit closer or connector. Fig. 4 is a top view of the latching mechanism. Figs. 5 and 6 are vertical sections of my improved thread-guides and circuit-closer.

A is the box in which is placed the latching mechanism and circuit-opener. A′ is a metal plate screwed to the side of the box, and upon which the several parts of the latching mechanism are fastened. I is a piece of rubber having the two legs I′ and I″ so cut as to form a spring, as shown in Fig. 1.

The box A is attached to the machine in any convenient position, so that the sliding bar B may be easily connected with the shipper-lever, and at the same time allow the latter to work independently of the former.

The battery is placed in any convenient place, and one wire, *f*, from the battery connects with the electro-magnet F, passes through the spring-legs I′ and I″ of the rubber I, and through the thread-guide rail K, Fig. 2 or 3, and ends at *f′*. The other wire, *g*, passes directly from the battery through the rail K parallel with and alongside of the wire *f*, and ends at *g′*.

Within the sliding bar B is a coil-spring, *d*, one end of which is placed against a post, *d′*, upon which the bar slides, while the other end of the spring operates against the sliding bar. Upon the inner end of the sliding shipper-bar is placed a lug, J, which may be easily adjusted by means of the slot and screw *x*. This lug bears against the spring-leg I′.

In each spring-leg of the rubber I is a metallic knob, *i i′*, each of which is connected with the wire *f*. When the sliding bar is in position the lug J presses the leg I′ against the leg I″, so that the two knobs *i i′* touch each other and keep the circuit closed in the box; but when the sliding bar is released the spring-legs of the rubber are released and spring apart, thus separating the knobs *i i′* and opening the circuit in the box instantly.

C is a spring-latch, which catches the short arm of the bent lever D, while the long arm is caught by the stud *a*. H is the armature, which is bent at right angles and hung upon a pin, so that the weight of the arm *b* will more than balance the weight of the armature H, and throw it out of a perpendicular line and away from the magnet, thus enabling it to catch the lever E, which oscillates upon the pin *z*. Upon the lever E is placed the arm G, bent at right angles at its upper end, as shown at G, Fig. 4.

Hitherto it has been found that when the magnet attracts the armature H and releases the catch-levers, the coil-spring *d* operates with such force as to throw the lever D up to the top of the box, and before it falls back into its position the lever E falls, thus preventing the lever D from falling below the stud *a*, and prevents the automatic latching of the mechanism when the sliding bar is returned. In order to avoid this difficulty I attach the arm G to the lever E in such position, and bent at its upper end, that when the lever D

flies up, as described, it will strike against the bent end of the arm G and rebound under the stud *a*, while the pin *e* in the lever E will prevent the lever D from falling to the bottom of the box, whereby the lever D is always kept in place, so that the spring-latch C will automatically catch behind its short end *c*. I thus insure the complete automatic adjustment of the latching mechanism to the shipper lever.

M is one form of my improved roving-guide, which is attached to the rail K by means of the saddles *o o* resting upon the metallic edge O, thus securing a more light and sensitive adjustment than if pivoted in the usual way. The lower part of this guide is bent at right angles inward, and upon the upper side of this end, and directly under the two wires, is placed a balanced or oscillating circuit-closer, *n*, which is hung upon the pin *n'*. This method of hanging the circuit-closer loosely upon a pin makes its action absolutely certain, as it will always adjust itself to any wear or displacement of the parts which may result from long and continued wear.

In front of the guide M is placed a bar or finger, *m*, in such position relative to the guide M, that the bulk of the roving, however fragile, will prevent the guide from falling, and thus keep the circuit open by its bulk, instead of the tension of the thread. This form of thread-guide, with its bar or finger *m*, is found especially valuable for bulky and fragile threads or rovings. The circuit-closer *n*, touching both wires, thus closes the circuit whenever the guide falls over the finger *m*. The rail K is placed in such position on the roving-frame, that a guide will be directly in front of each bobbin.

L is another form of my improved guide hung upon a metallic edge, in the manner above described, and provided with my improved circuit-closer, in which the tension or weight of the roving holds the guide back, and keeps the circuit open.

This form of guide may be used with a strong roving, while the former is adapted to a frangible roving.

When the frame is in motion, the roving from the bobbin passes under the finger *m*, and through the guide M, the latter being so balanced on the metallic edge O that the bulk of the roving, however fragile, will prevent the guide from falling over the finger, and keep the circuit open.

When the end of the roving runs through the guide, either because the roving breaks or unwinds from the bobbin, the guide M falls forward, and causes the circuit-closer *n* to complete the circuit, when the magnet attracts the armature H and releases the catch-levers, and the coil-spring throws the sliding bar, which, being connected with the shipper-lever, throws the latter and stops the frame. At the same instant that the sliding bar is thrown out, the spring-leg I' of the rubber I is released from the pressure of the lug J, and springs back, separating the two knobs *i i'* and opening the circuit again instantly. This prevents any waste of battery-power, the circuit being open in the rail when it is closed in the box, and opened in the box at the same instant it is closed in the rail. When the frame is started again, the action of the shipper-lever presses the sliding bar back into the box, and sets the latching mechanism. My improved arm G prevents the lever D from getting out of place, while the shipper-lever, being loosely connected with the sliding bar, can be worked independently of it, and the frame started and stopped whenever necessary without operating the stop-motion machine, thus again preventing any unnecessary loss of battery-power.

I claim as new and of my invention—

1. The combination, with the levers E and D, of the stud *a* and arm G, substantially as described.

2. The combination of the two wires *f g* from a battery, with the balanced or oscillating circuit-closer *n*, substantially as described.

3. The thread-guide M, provided with a circuit-closer attachment, and combined with the metallic edge O by the saddles *o o*, substantially as described.

4. The balanced thread-guide M, in combination with the finger *m*, substantially as described.

5. The metallic points *i i'*, placed upon the leg I'' and the spring-leg I', in combination with the lug J actuated by the shipper-bar, substantially as described.

ERASTUS BOYDEN.

Witnesses:

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ALFRED K. GARLAND.