(No Model.)

J. McADAMS.

ELECTRIC ATTACHMENT FOR PAPER RULING MACHINES.

No. 559,190. Patented Apr. 28, 1896.

FIG. 1.

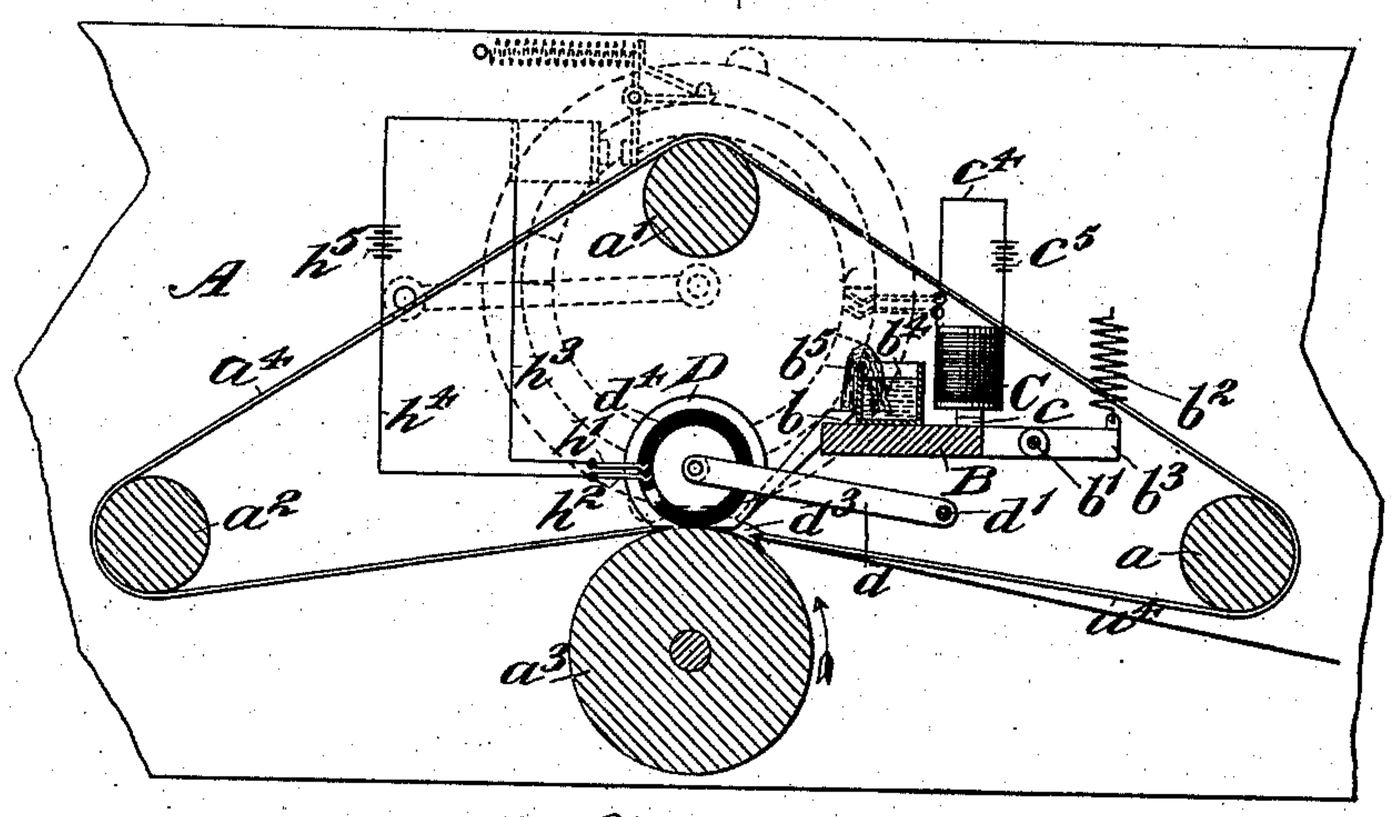


FIG. 2.

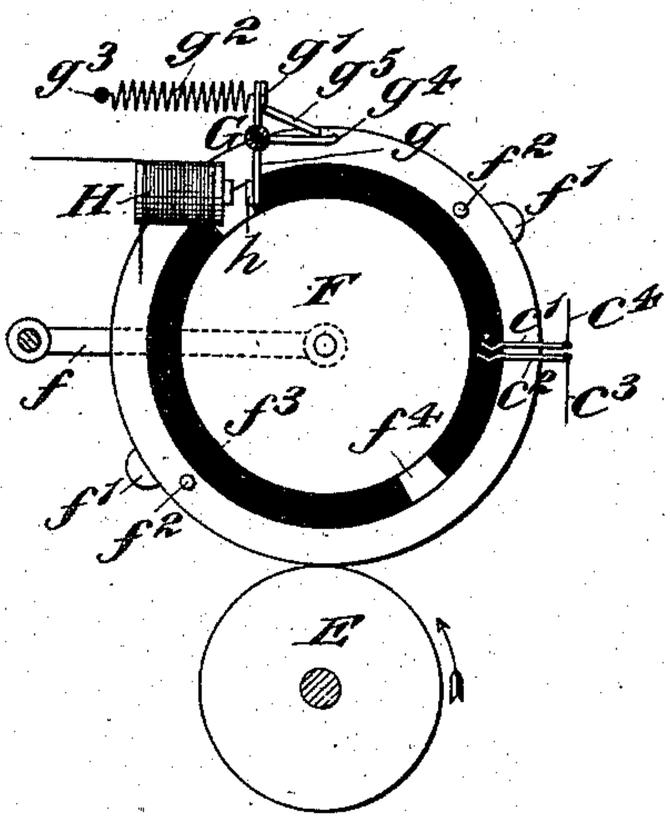


FIG. 4.

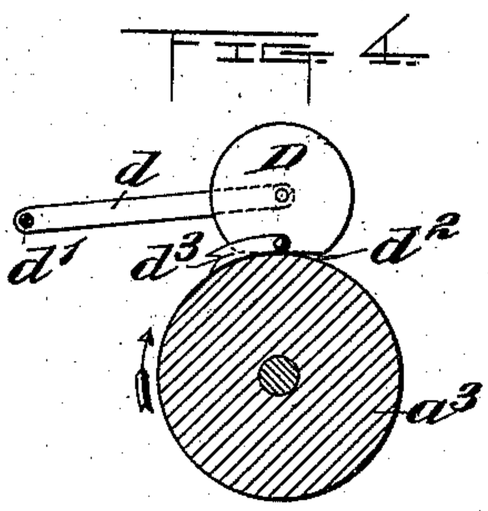
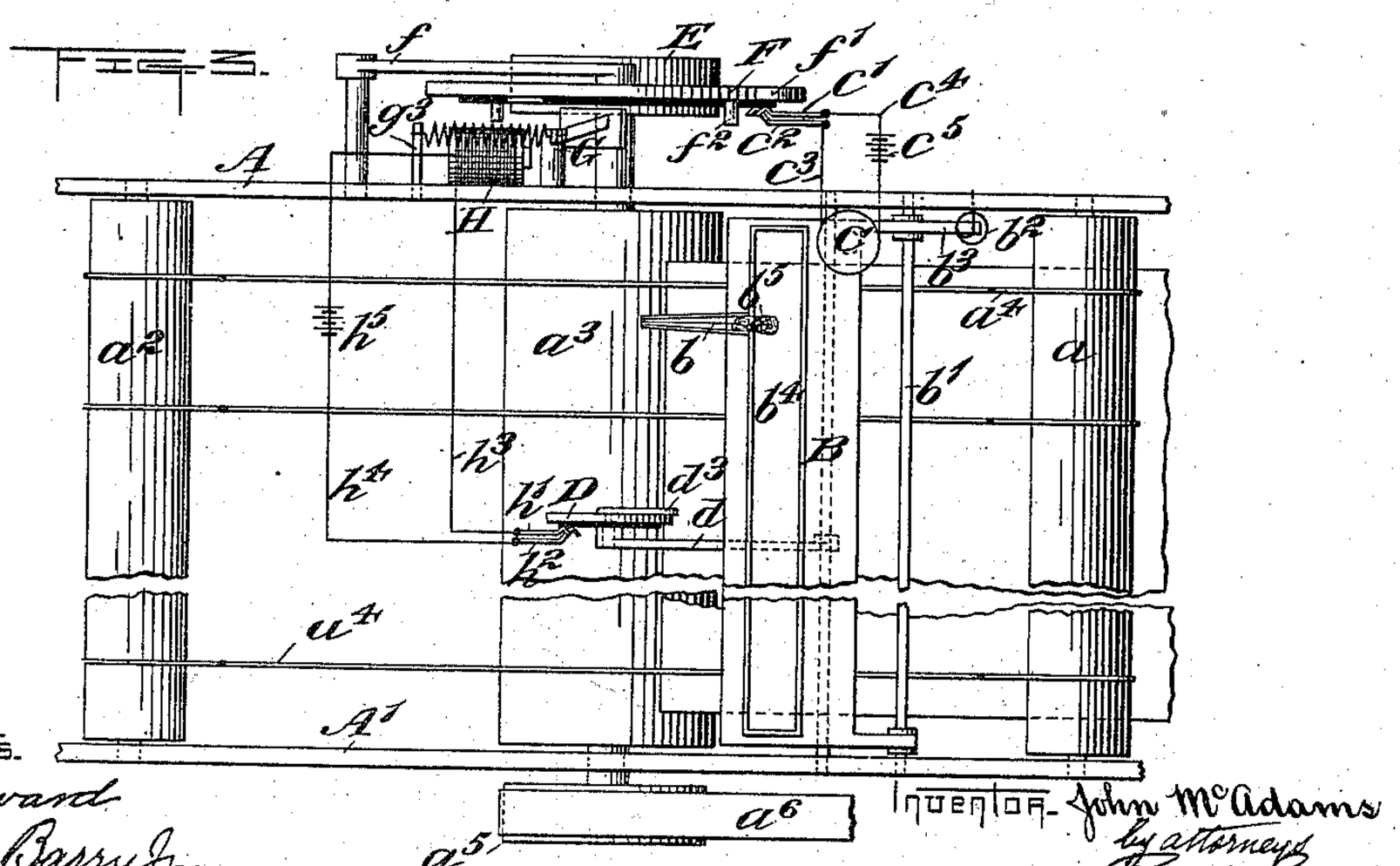


FIG. 3.



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ELECTRIC ATTACHMENT FOR PAPER-RULING MACHINES.

SPECIFICATION forming part of Letters Patent No. 559,190, dated April 28, 1896.

Application filed February 8, 1896. Serial No. 578,525. (No model.)

To all whom it may concern:

Be it known that I, JOHN MCADAMS, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Electrically-Controlled Pen-Ruling Attachments for Paper-Ruling Machines, of which the following is a specification.

The object of my invention is to provide an attachment for pen-ruling machines which is under electrical control, so that the pen or pens may be lifted from their engagement with the sheet of paper being ruled at predetermined intervals and, furthermore, raise the said pens as often as desired while a single sheet of paper is passing beneath them.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a sectional view of a portion of a ruling-machine, showing the position of my electrical pen-controlling attachment thereon, the pens and their support being shown held in their raised position away from the paper by an electromagnet against the tension of a spring. Fig. 2 is a side view of the friction-wheel and the disk which it rotates, the disk being shown in its lowered position in engagement with the friction-wheel. Fig. 3 is a top plan view of a portion of the machine and the pen-controlling devices, and Fig. 4 is a reversed view of one of the feed-rolls and the disk which rests thereon.

The rolls for guiding the paper to be ruled are denoted by a a' a^2 a^3, and they are supported in suitable side frames A A'. These guide-rolls have suitable cords a^4 passing around them for feeding the sheets of paper through the machine under the ruling-pens. The roll a^3 is driven in the direction indicated by the arrow (see Fig. 1) by a pulley a^5, around which passes a drive-belt a^6.

The rocking pen-support is denoted by B and is provided with one or more pens b, which are secured in position, so that when the said support is held in its depressed position by the spring to be hereinafter described the pens will engage the sheet of paper as it is passing through the machine. This pen-support B is pivoted upon a suitable cross-rod b', which extends transversely to the machine between the two side frames A A', and it is normally held in its lowered position with the pens in engagement with the paper by a suitable spring b^2, one end of which spring is secured to a rearwardly-extended arm b^3 on the pen-support and the other end to the side frame A. A suitable ink-supply pan b^4 is carried by the pen-support and a suitable cloth or other absorbent material b^5 extends from the pan into each of the pens for feeding the ink thereto.

The pen-support B may be rocked upwardly against the tension of the spring b^2 by the energization of a suitable electromagnet C, the armature c of which is located on the pen-support.

I mount a rotary disk D on the free end of a rocking arm d in such a position that the edge of the said disk rests upon the paper-roll a^3 or upon the sheet of paper when it is being fed through the machine. The rocking arm d is mounted upon a cross-rod d', which extends transversely to the machine between the side frames A A'. This disk is cut away for a short distance, as shown at d^2, so that when the said disk has been rotated until the cut-away portion is opposite the paper roll a^3 it will be prevented from further rotation. The disk D is further provided with a swinging latch d^3, which is pivoted in such a manner that when the cut-away portion d^2 of the disk is opposite the roll a^3 the free end of the said latch rests upon the said roll in position to be engaged by the edge of the sheet of paper as it is advanced, whereby the further advance movement of the sheet of paper will rotate the said disk until the latch is raised out of the way and the paper engages the curved portion of the edge of the disk D.

Proceeding to describe the means for causing the pens to be lifted away from the paper at predetermined intervals, a friction driving-wheel E is mounted to rotate synchronously with the paper-feed roll a^3, in the present instance by being mounted upon the same axle as the said roll. A controlling-disk F is mounted in a swinging support f, which support is secured to the side frame A in such a position that the said disk normally rests upon the friction-wheel E and is rotated thereby. This disk is provided along its circumference with suitable abutments f'

(in the present instance two are shown) for causing the controlling-disk to be raised when the said abutments are engaged by the friction-wheel E.

A rocking stop-lever G is mounted on the side frame A in proximity to the face of the controlling-disk F, and it is provided with a downwardly-extended arm g, upon which is located an armature h of an electromagnet H. The said lever G is further provided with an upwardly-extended arm g', to which is connected one end of a spring g^2, the opposite end of said spring being attached to a pin g^3 on the side frame A. This spring holds the armature h away from its electromagnet H, except when said electromagnet is energized. The rocking lever G is further provided with a rearwardly-extended arm g^4, the rear end of said arm being preferably turned up slightly to retain a pin upon the disk F.

Pins f^2 are secured to the face of the controlling-disk F in position to be engaged by the rearwardly-extended arm g^4 of the rocking lever G when the controlling-disk is raised by the engagement of the abutments f' with the friction-wheel E. In the present instance two of these pins are shown to correspond with the two abutments f'. The disk F will be held raised by reason of the engagement of the pin with the rocking lever G until the electromagnet H may be energized, when the rocking of the lever will release the pin from its engagement with the said rearwardly-extended arm, and thereby allow the disk F to be again rotated. The rocking stop-lever G is preferably further provided with a swinging stop g^5, which will allow the pin f^2 to pass in one direction, but will prevent its reverse movement.

The electromagnet H is under the control of the disk D heretofore described in the following manner: The disk D is provided with an annular strip of insulating material d^4 around its face, which is in position to be engaged by contact-brushes h' h^2, which brushes are connected by suitable wiring h^3 h^4 with the electromagnet H. The wire h^4 runs through a suitable battery h^5 for energizing the electromagnet H when the contact-brushes are connected. The insulation d^4 on the disk D is broken for a short distance, and when the contact-brushes h' h^2 pass over said broken portion a circuit is formed through the electromagnet H.

The electromagnet C, which raises the pen-support B when energized, is under the control of the controlling-disk F in the following manner: The controlling-disk F is provided with an annular strip of insulating material f^3 along its face, the said insulating material being broken at intervals, as shown at f^4. Two contact-brushes c' c^2 are located in position to engage the insulating material f^3 and connecting-points f^4. These contact-brushes c^2 c' are connected with the electromagnet C by suitable wires c^3 c^4, the wire c^4 passing through a suitable battery c^5. It will thus be seen that when one of these contact-points f^4 in the insulating-strip f^3 is engaged by the contact-brushes c' c^2 a circuit is formed through the magnet C, thereby raising the pens b from contact with the sheet of paper passing through the machine. These pens will be held away from the paper until the insulating-strip again engages the contact-brushes c' c^2. It will also be seen that by locating any number of these breaks in the insulating material on the disk F the magnet may be energized any number of times while the sheet of paper is passing through the machine, thereby forming any desired length of line upon the paper.

In operation a sheet of paper is inserted in the machine and the edge of the paper, by engaging the swinging latch on the disk B, will rotate the said disk until the break in the insulating material thereon comes in contact with the brushes h' h^2, and a circuit is thereby formed through the electromagnet H. This energization of the magnet H will attract the armature h' upon the rocking lever G and will rock the same and release the pin f^2 from engagement with its arm g^4, thereby lowering the controlling-disk into frictional engagement with the driving-wheel E. The rotation of the wheel E will then rotate the disk F, and when the contact portions or breaks in the insulation on the disk F are engaged by the brushes c' c^2 the magnet C will be energized and the pens lifted away from their position upon the paper being ruled. As the paper is being fed through the machine it will rotate the disk D until the cut-away portion in its edge comes opposite the paper-roll a^3 and the latch on the said disk is brought down into position to be engaged by the next succeeding sheet of paper. As the friction-wheel E rotates the controlling-disk F one of the abutments f' upon the said disk will be engaged by the friction-wheel and will raise the said disk up so as to cause one of its pins f^2 to be engaged by the rocking lever G, and the disk will then be held against further movement until the said lever G is rocked by the energization of the magnet H, which is controlled by the disk D, resting upon the sheet of paper.

It is to be understood that the disk F may be of any required size and may be provided with any number of abutments and pins to suit different lengths of sheets of paper and that the insulation and breaks in the same may be located to suit different styles of ruling. Furthermore, while I have shown the friction-wheel E as mounted upon the same shaft as the paper-feeding roll a^3, it is to be understood that the said friction-wheel and the disk which it controls may be located at some distance from the machine and be connected by suitable gearing or belting, as may be desired, as long as the said disk E be rotated synchronously with the paper-feeding roll a^3. It will be further seen that by locating two sets of ruling-pens in the same ma-

chine one set may be utilized for ruling on one side of the sheet of paper and the other set upon the other side of the sheet of paper while the paper is being passed through the machine, the two sets of ruling-pens being under the control of a single controlling-disk.

It is obvious that other slight changes might be resorted to in the form and arrangement of the several parts without departing from the spirit and scope of my invention. Hence I do not wish to limit myself strictly to the structure herein set forth; but

What I claim is—

1. In a ruling-machine, the combination with means for feeding a sheet of paper to be ruled, of a pen supported in position to move into and out of engagement with the paper, an electromagnet for controlling the movements of the pen, and a circuit maker and breaker driven by the paper-feeding means for energizing and deënergizing the said electromagnet, substantially as set forth.

2. In a ruling-machine, the combination with means for feeding a sheet of paper to be ruled, of a pen supported in position to move into and out of engagement with the paper, an electromagnet for controlling the movements of the pen, a circuit maker and breaker driven by the paper-feeding means for energizing and deënergizing the said electromagnet, a second electromagnet for controlling the rotation of the said circuit maker and breaker, and a second circuit maker and breaker controlled by the advance movement of the paper for energizing and deënergizing the second electromagnet, substantially as set forth.

3. In a ruling-machine, the combination with means for feeding a sheet of paper to be ruled, of a friction-wheel driven by said paper-feeding means, a pen supported in position to move into and out of engagement with the paper, an electromagnet for controlling the movements of the pen, and a controlling-disk rotated by said friction-wheel and having circuit makers and breakers thereon for energizing and deënergizing the said electromagnet, substantially as set forth.

4. In a ruling-machine, the combination with means for feeding a sheet of paper to be ruled, of a friction-wheel driven by said paper-feeding means, a pen supported in position to be raised from the paper at predetermined intervals, a rotary disk driven by said friction-wheel having circuit makers and breakers thereon, an electromagnet in position to operate the said pen under the control of said circuit makers and breakers, a rocking stop-lever in proximity to the disk, a pin on the disk and an abutment on the disk in position to be engaged by the friction-wheel for lifting the disk out of engagement with the wheel and causing the pin to engage the said stop for holding the disk against rotation until released, substantially as set forth.

5. In a ruling-machine, the combination with means for feeding a sheet of paper to be ruled, of a friction-wheel driven by said paper-feeding means, a pen supported in position to be raised from the paper at predetermined intervals, a rotary disk driven by said friction-wheel having circuit makers and breakers thereon, an electromagnet in position to operate the said pen under the control of said circuit makers and breakers, a rocking stop-lever in proximity to the disk, a pin on the disk, an abutment on the disk in position to be engaged by the friction-wheel for lifting the disk out of engagement with the wheel and causing the pin to engage the said stop for holding the disk against rotation until released and a second electromagnet in position when energized to rock the stop-lever to release the disk, the energization of the said second electromagnet being under the control of the advance movement of the paper, substantially as set forth.

6. In combination, a friction-wheel, means for driving it, a controlling-disk driven by said friction-wheel, a rocking stop-lever in proximity to the disk, an abutment on the disk in position to be engaged by the friction-wheel for lifting the disk out of engagement with the said wheel, a pin on the disk in position to engage the said rocking stop-lever for holding the disk out of engagement with the friction-wheel and a latch on said rocking lever engaging the said pin for preventing its movement in the reverse direction, substantially as set forth.

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Witnesses:
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IRENE B. DECKER.