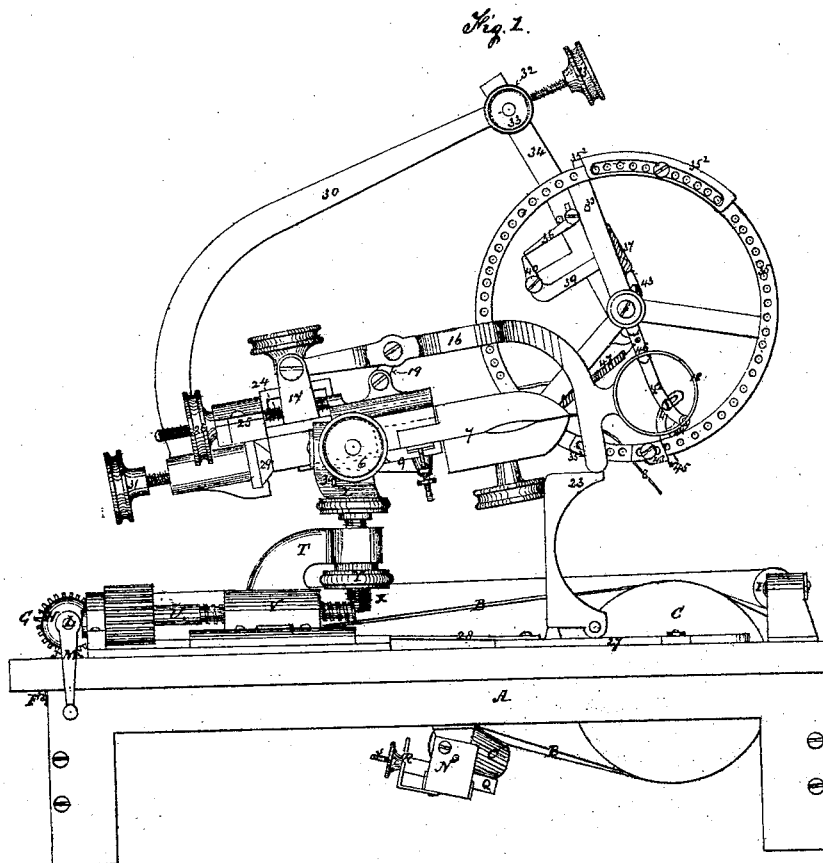


JAMES TREGURTHA.

Improvement in Paper-Ruling Machines.

No. 114,886.

Patented May 16, 1871.



Norman J. Mayer
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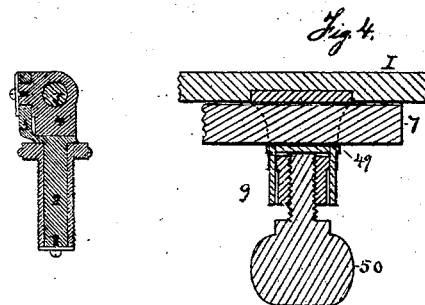
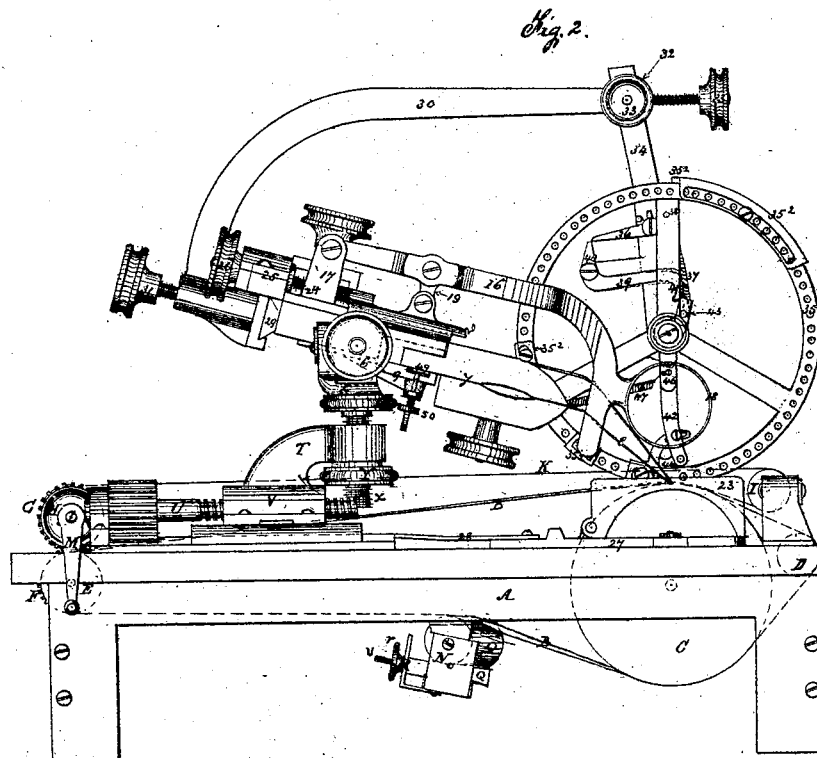
James Tregurtha by
Atkins & Co. atty

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John W. P. Carter

James Tregurtha by
Whitney & Co. attys

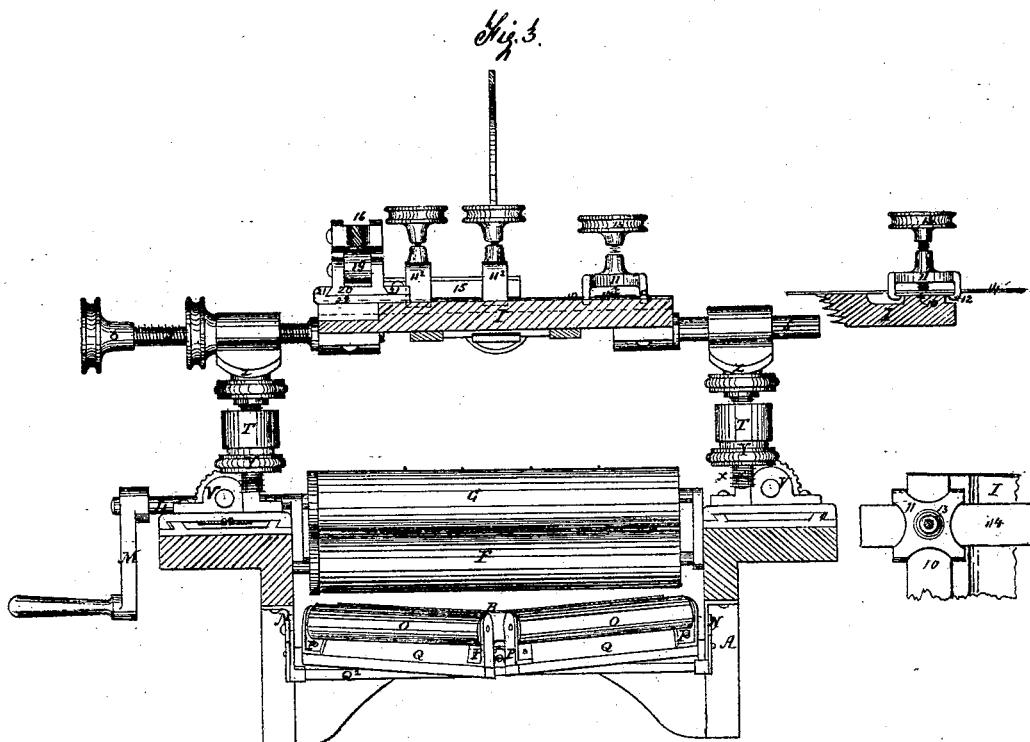
3 Sheets--Sheet 3.

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Norman J. Mayer
Per H. H. H. H. H.

James Tregurtha, by
Alf. H. H. H. H.

United States Patent Office.

JAMES TREGURTHA, OF CHARLESTOWN, MASSACHUSETTS, ASSIGNOR TO
GEORGE H. SANBORN, OF BROOKLYN, NEW YORK.

Letters Patent No. 114,886, dated May 16, 1871.

IMPROVEMENT IN PAPER-RULING MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that I, JAMES TREGURTHA, of Charlestown, Middlesex county, Massachusetts, have invented, made, and applied to use certain Improvements in the Construction of Paper-Ruling Machines; and that the following is a full, clear, and correct description of my improvements, reference being had to the accompanying drawing making part of this specification and to the letters of reference marked thereon, in which—

Figure 1 is a side elevation of my improved paper-ruling machine.

Figure 2 is a side elevation of the same.

Figure 3 is a transverse section of the same, the front portion of the machine being removed.

Figure 4 is a detached view of the clamp 9.

In the drawing like parts of the invention are pointed out by the same letters of reference.

The nature of the present invention consists—

a. In the use or employment of the adjustable standards in combination with the adjusting-screws, for the purpose of adjusting the position of the pen-beam, as more fully hereinafter set forth.

b. In the use or employment of the "extension" or "over" pen-holders, as more fully hereinafter set forth.

c. In combining with the pen-regulator a rest or support, as more fully hereinafter set forth.

d. In the means employed when not in use.

e. In the use or employment of a "striper," as more fully hereinafter set forth.

f. In the use of a clamp, 9, as more fully hereinafter described.

To enable those skilled in the art to make and use my improvements, I will describe the same.

A shows a frame for supporting the operative parts of my improved machine, which frame may be made of wood or any suitable material;

B shows the endless belt or apron to receive and carry the paper to be ruled beneath the pens; this belt or apron is made in the usual manner, of any suitable material;

C shows the "pen-roll," secured in boxes held in the rear end of the frame A; and

D is the "back-cloth" roll, placed behind the pen-roll C, and held in adjustable boxes secured in the frame A.

E is the driving-cloth roller, held in boxes secured in the forward end of the frame A, and over these rolls C, D, and E the endless belt or apron B is stretched sufficiently tight, so that, as motion is imparted to the driving-cloth roll, as hereinafter described, the belt or apron B will move freely over the rolls C, D, and E.

Upon one end of the driving-cloth roll is keyed a gear-wheel, F, gearing into the gear-wheel G, secured

upon one end of the string-roll H, secured in boxes upon the frame A, over which and the adjustable cord-roll I, held also in boxes in the rear end of the frame, the cords K, employed to hold the paper upon the belt or apron during its transit through the machine, pass.

This roller H is supported upon a shaft, L, upon the end of which is secured a crank or handle, M, by which the machine is operated.

Attached to the under side of the frame A, about midway its length, are the hangers N, intended to receive the guiding-rollers O, held in the supports P, secured upon the blocks Q, held upon a cross-piece, Q², placed in the hangers N, which hangers are made adjustable.

About the center of the cross-piece Q² is secured a standard, R, in which is placed a nut, r, by which the screw s, attached at one end to a plate connected to the blocks Q, is operated, so that by turning the nut r the guiding-rollers O are advanced or withdrawn angularly to the same extent.

These guiding-rollers O, when placed in position in the machine, bear upon the under side of the endless belt or apron B, and serve to retain the same in position upon the rolls C, D, and E, as any tendency of the cloth to move sidewise upon the rolls while in motion is corrected by the rollers O placed angularly, and directing the cloth in a straight line, the back-cloth roll having been first properly adjusted.

Upon the upper side of the frame A are secured the standards T, employed in connection with the adjusting-screws U to adjust the position of the pen-beam to the paper to be ruled; and the following description of one will answer for both, as they are similar.

The standard is composed of a base-plate, a sliding plate, and a threaded upright, and upon the upper side of the sliding plate is secured a nut, V, into which the screw U works, so that as the screw is turned the sliding plate will be moved backward or forward, while in the threaded upright the hollow screw X is inserted, having upon its lower end a retaining-nut, Y, so that after the screw has been set in the proper position by tightening the retaining-nut Y upon the screw X the same will be held in position.

Z shows the support for supporting the pen-beam I.

This support consists of a spindle or stem, 2, which, when in position, enters the hollow-screw X and is free to move therein.

Upon the top of the stem 2 is formed the curved support 3, to receive a movable bearing, 4, in which the spindle or stem 5 of the pen-beam is received and is free to move.

It will be observed that this bearing is so construct-

ed that it is self-acting or self-adjusting, which results from the fact that the bearings rest in curved supports, and that the curved portions of the bearings and the curved portion of the supports have a common center.

The spindle or stem 5 has a screw-thread cut upon it engaging with or working into a female thread upon the interior of the movable bearing 4, and by turning this screw-thread, by means of the nut 6, in one direction or in the opposite direction, the pen-beam can be adjusted laterally relatively to the frame A.

The vertical adjustment of the pen-beam is accomplished by the hollow screws Y, in which rest the stems or supports Z, provided with the curved supports receiving the movable bearings, in which rest the threaded and plain spindles 5 of the pen-beam, while the longitudinal movement of the pen-beam is accomplished by means of the sliding plates of the standards and the screws U.

I shows the pen-beam, formed of wood or any suitable material, and having secured to its ends the metal supports for the threaded and the plain spindles 5; one of these supports forms a journal for the threaded spindle, while the other support holds the plain stem or spindle rigidly.

The pen-clamps 7, to receive the ruling-pens 8, are attached to the pen-beam by the metal clamps 9, secured upon the under side of the pen-beam; these pen-clamps 7 are constructed in the ordinary manner.

Upon the back of the upper side of the pen-beam are placed the means or appliances by which the extension pens are held. These consist of a plate of metal, 10, running the full length of the pen-beam and secured upon the same, a portion of the pen-beam being cut away to allow the metal to project, as also to afford room for the introduction of the clamps 11.

The clamp 11 is provided with four claws or hooks, 12, which claws or hooks pass under the edges of the strip of metal when the clamp is placed over the strip of metal.

The clamp 11 is also provided with a set-screw, 13, and the clamp having been passed over the strip of metal, one end of the extension pen 14 is inserted beneath the clamp between the claws, rests on the strip of metal, and is held in position by depressing the set-screw, which bears upon the extension pen and holds it in position lengthwise while the claws or hooks prevent its lateral movement. The clamps 11 are free to move upon the strips of metal 10, thus adjusting the position of the extension pens.

When a "gang" of pens or one or more pens are to be employed, the compound clamp (see fig. 3) is used in connection with the strip of metal.

This is composed of the clamps 11² constructed about half the size of the clamp 11, and furnished with two claws or hooks instead of four, and the strip 15; the ends of the extension pens rest beneath the strip 15 and upon the strip of metal 10, while the strip 15 is held in position by depressing the set-screws in the clamps. The clamps and clamping-strip can be placed upon any portion of the strip of metal 10, or may be made to extend its full length, so that the position of the extension pens can be regulated anywhere along the full length, as desired.

The means employed by me to adjust the bearing of the pens to the paper to be ruled now should be spoken of.

They consist of a curved arm, 16, held between the standards 17, and provided with a hooked or ringed end, 18, serving as a handle for the operator, and resting upon the block 23.

This arm is also provided with a link, 19, one end of which is held in a recess in the curved arm, while its opposite end is held in a sliding plate, 20, dovetailed and moving in the ways 21, upon a plate, 22, secured upon one side of the pen-beam.

To the rear end of the sliding plate 20 is secured a stem, 24, having a screw-thread cut upon it and moving freely in a threaded journal secured in a journal-box, 25, as the nut 26 upon the rear end of the threaded-stem is turned, by which movement the plate is moved in the ways, carrying with it one end of the link 19, which, by its position being changed, raises or lowers the pen-beam, and thus controls the bearing of the pens upon the paper.

In connection with arm 16 the block 23 should be spoken of. This block is of metal, and is hinged at one end to a sliding plate, 27, secured upon the upper portion of the frame A, and connected by a strip of metal, 28, to the sliding plate of the standard T, so that it shall be moved in the same direction with the sliding plate and thus afford a constant support for the arm 16. It is hinged at one end, that it may be turned up and support the arm 16 when the pen-beam is lifted away from the work.

I will now speak of the "striker," or device employed to raise or lower the ruling-pens at the proper time.

At the back side or edge of the pen-beam is placed a dovetail block, 29, of metal, over which is passed the dovetailed clamping end of a curved arm, 30, intended to receive and support the striker, which arm is secured upon the block of metal 29 by the set-screw 31.

At the forward end of the arm 30 the striker is secured, being held in the double clamp 32, provided with set-screws 33, placed at right angles to each other so that the striker can be adjusted longitudinally and vertically.

The striker consists of an upright, 34, one end of which is inserted and held in the vertical clamp, while to its other end is attached the striking-wheel 35, provided upon its rim with a series of set-screw holes.

In connection with the wheel is employed a series of cams, 35², projecting beyond the rim of the wheel, and held upon the same in any desired position by means of the set-screws screwed into the set-screw openings.

These cams are so positioned upon the wheel that they shall, by being brought into contact with the paper as the wheel revolves, elevate the pen-beam and thus govern the contact of the pens with the paper to be ruled, and thus regulate the distance between the lines ruled upon the paper.

36 shows a stop-lever secured upon the upright 34, which lever has attached to its forward end one end of a spiral spring, 37, the opposite end of which is held on a pin inserted in the upright 34.

Against the stop upon this lever a pin, 38, secured in one of the spokes of the wheel, impinges when the wheel has made a full revolution.

39 shows a stop-lever attached to a portion of the upright 34, and provided with a stop, 40, with which the stop-lever 36 is brought into contact, and also provided at its other end with a cam, 41, the lever 39 resting upon a pin inserted in the upright when in proper position to stop the lever 36.

Over the hub of the wheel 35, and free to move upon the same, is passed a lever, 42, provided at its upper end with an inclined surface, 43, against which the cam 41 bears.

At the other or lower end of this lever is hung a foot, 44, provided with a toe, 45, which toe projects beyond the cams 35, secured upon the wheel, and rests upon the belt or apron after the wheel has completed a revolution.

Attached to the foot is a slotted arc, which limits the movement of the foot and toe, the arc moving over a pin secured in the lever 42.

The lever 42 is held in position upon the hub of the wheel by means of a supporting plate, 46, passed over the other hub of the wheel and pinned to the lever 42.

47 shows a spiral spring, one end of which is attached to a spoke of the wheel and the opposite end to the lever 42, while upon the same spoke is held a check, the forward end of which bears against the lever and stops it as the spiral spring 47 contracts, when the lever returns after having been operated upon by the paper.

The wheel having completed a revolution during the operation of the machine in ruling, and the pin having been brought into contact with the stop upon the stop-lever, the wheel would cease to operate unless some means of removing contact between the pin and stop were employed. These means consist of the lever already described, provided with the toe and foot.

A second sheet of paper to be ruled, having been conducted beneath the cords upon the endless belt or apron to the wheel, is brought into contact with the toe, which it carries with it sufficiently far for the other end of the lever to lift the stop-lever by the inclined surface bearing against the cam upon the lever.

At this point the friction between the paper and the wheel sets the wheel in motion, and the stop having been removed, the stop-lever is depressed and the wheel continues to operate until the pin is again brought into contact with the stop, the stop-lever meanwhile having resumed the proper position to stop the wheel.

48 is a cam held upon the wheel by means of a set-screw, and slotted for adjustment.

This cam is placed near the toe, is rounded on the side nearest the advancing sheet, and is used for the purpose of lifting the pens off of the cloth or apron after the ruled sheet has passed through, and until the succeeding sheet is presented to be ruled.

The side nearest the sheet is rounded to prevent it catching the edge of the sheet, and to pass it (the sheet) beneath the cam.

The operation of the machine in all respects not

herein described is similar to the ordinary ruling-machine, the sheet of paper to be ruled being conducted to the ruling pens upon the belt or apron, and leaving the machine after ruling upon the same.

The clamp 9 is formed of brass or any suitable metal, and is so shaped as to receive the tongue of the pen-clamp.

The clamp is provided on the lower inside with a sliding plate, 49, which can be elevated or depressed as desired, by means of the thumb-screw 50, the sliding plate 49 bearing upon the tongue of the pen-clamp and serving to hold the same in position, in connection with the upper portion of the clamp.

Having thus set forth my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the standards T, hollow adjusting-screws X, supports Z, and spindles 2, supporting the pen-beam, constructed and operating substantially as and for the purposes set forth.

2. The combination of clamp 11 provided with set-screw 12, and the strip of metal 10 secured upon the pen-beam, as and for the purposes specified.

3. In combination with the curved arm 16, the block 23, hinged at one end and connected to the standard T, substantially as and for the purposes described.

4. The wheel 35, provided with the permanent stop 38, in combination with levers 36, 39, 40, and 42, springs 37 and 47, and toe 45, when the same shall be constructed and operate substantially as and for the purposes set forth.

5. The clamp 9, provided with the sliding plate 49 and set-screw 50, when constructed and operating substantially as described, for the purposes set forth.

JAMES TREGURTHA.

Witnesses:

A. SIDNEY DOANE,
WM. HASTINGS.