C. Walton. Sheet 1. 2 Sheets.

Ruling Mach.

No. 45,195. Patented Nov. 22, 1864.

Fig II

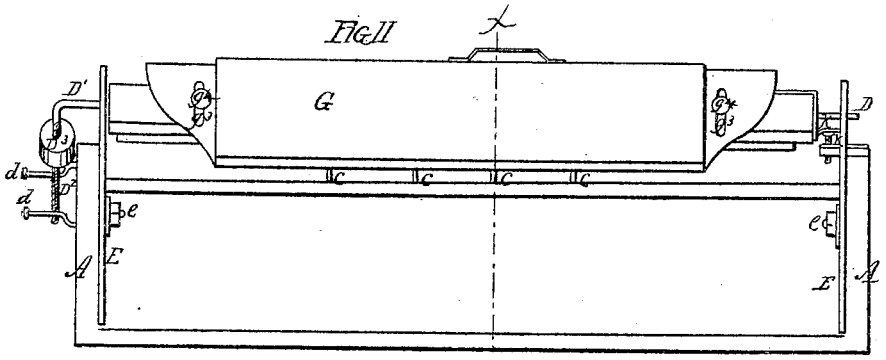


FIG I.

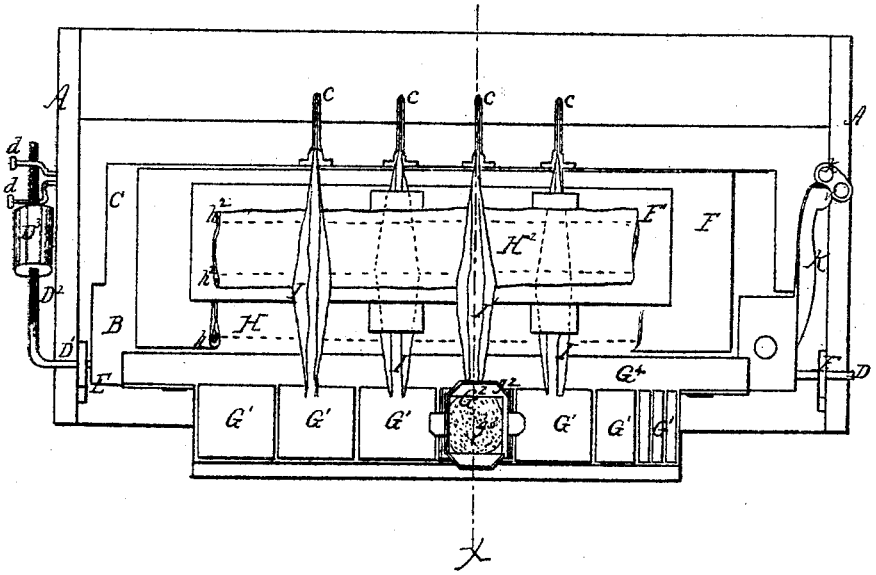
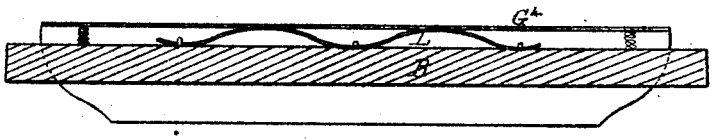


Fig 4.



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Inventor:

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C. Walton. Sheet 2. 2 Sheets.

Ruling Mach.

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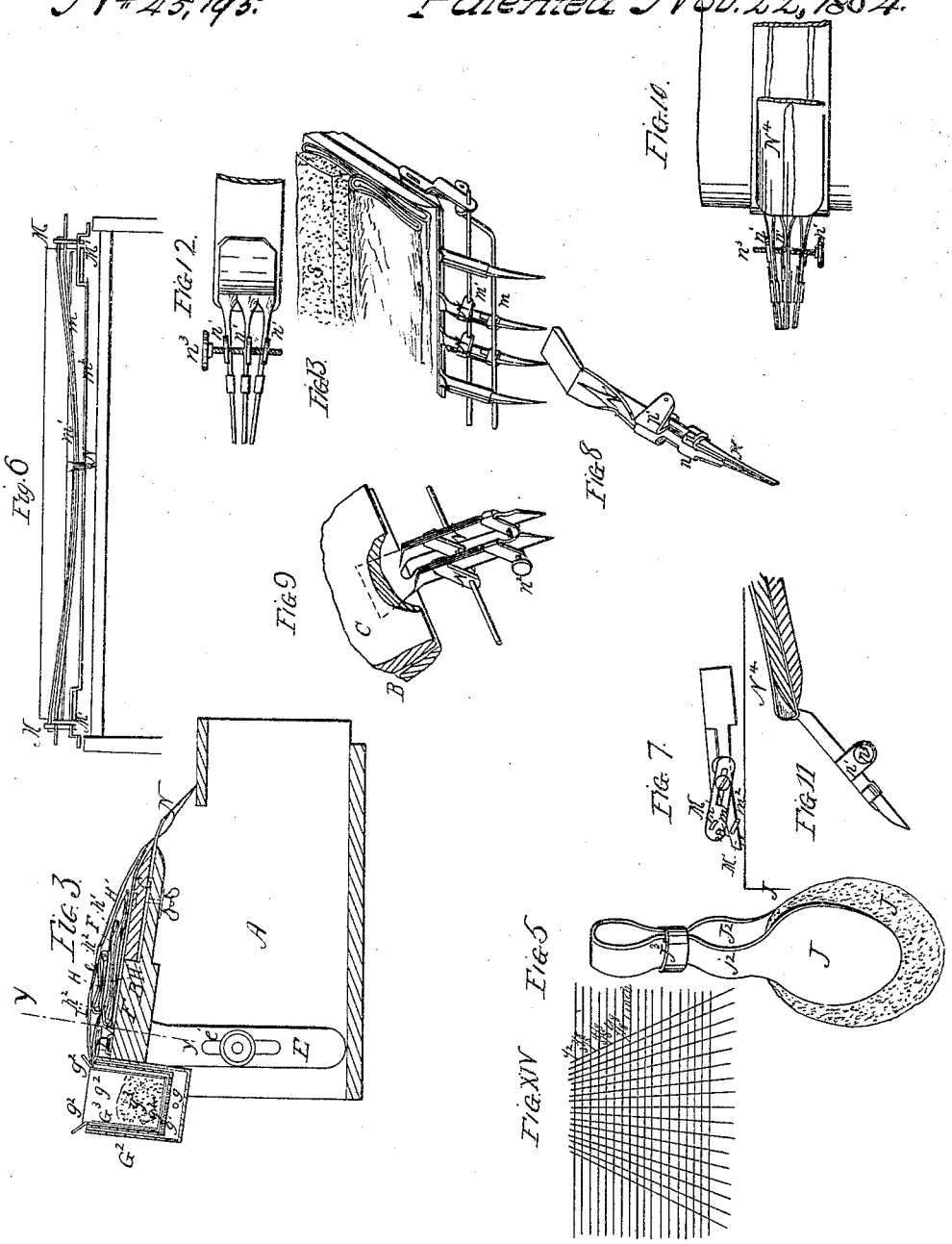

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UNITED STATES PATENT OFFICE.

CHAUNCEY WALTON, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN PAPER-RULING MACHINES.

Specification forming part of Letters Patent No. 45,195, dated November 22, 1864.

To all whom it may concern:

Be it known that I, CHAUNCEY WALTON, of the city and county of Washington, in the District of Columbia, have invented certain new and useful Improvements in Paper-Ruling Machines; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan of a portion of a ruling-machine illustrating my invention. Fig. 2 is a rear-end elevation of the same. Fig. 3 is a vertical section in the line *x x* of Fig. 2. Fig. 4 is a vertical section in the line *y y* of Fig. 3. Fig. 5 is a perspective view of the feeding spoon or tongs, hereinafter described. Figs. 6 and 7 illustrate an improved arrangement of devices for controlling the pens. Fig. 8 is a perspective view of my improved pen. Fig. 9 is a perspective view of an adjustable double pen. Fig. 10 is a plan of an adjustable treble pen for ruling close lines with different-colored ink. Fig. 11 is a side elevation of the same. Fig. 12 is a bottom view thereof. Fig. 13 is a perspective view of a part of the pen-clamp and pens, illustrating modes of supporting and adjusting the latter.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists, first, in an improved construction of pens and devices for adjusting and regulating the pens and pen-clamps; second, in a peculiar construction of fountain and means for adapting the same to rise in such manner as it is depleted that the ink will retain an unvarying level, all as will be hereinafter fully explained; third, in means for filtering the ink as it is supplied to the pens and maintaining a constant flow of ink with but little labor to the attendant.

In order that others skilled in the art to which my invention appertains may be enabled to fully understand and use the same, I will proceed to describe its construction and operation.

In the accompanying drawings, A A may represent a portion of the frame of the machine. B represents a table, and C a pen-clamp, connected together in the manner shown, and supported by shafts D D′, which are rigidly secured in the table B, so as to cause the table and pen-clamp to move or turn simultaneously therewith. The shafts D D′ have their bearings in the upper ends of metallic plates E E, in which they are allowed freely to turn, in order the vary the inclination of the table B and clamp C. The plates E E are secured to the frame A A by thumb-nuts *e e*, which pass through vertical slots *e′* in the said plates and adapt them to be adjusted vertically for the purpose of elevating or lowering the table B and pen-clamp C, in order to accommodate pens of different lengths. The thumb-nuts *e e* also constitute pivots upon which the plates may be turned, so that when required the table B and clamp C may be caused to assume a forward position.

D^2 represents a deflected extension of the shaft D′, the same constituting an arm on which may be adjusted a balance-weight, D^3, said weight being provided with a screw-threaded aperture, which works over corresponding threads on the arm D^2. The office of the weight D^3 is to counterbalance the weight of the fountain G and hold the pens *c* in contact with the paper while the machine is in operation. The end of the arm D^2 may be formed like a crank, and supported or retained in any position by adjustable crank-shaped pins *d d*, secured in the frame A A.

It has hitherto been the practice to hold down the pen-clamp by means of an adjustable weight applied to one end of the clamp itself. As the pen-clamp is usually made of light and somewhat flexible material, this weight at one end has been found a very defective arrangement, in that the preponderance of pressure or tension at one end of the clamp had a tendency to hold the pens thereof more firmly in contact with the paper than the pens contained in the other end, and hence cause some of the pens to work less effectually than others. In my invention it is apparent that the shafts D′ D equalize throughout the entire extent of the clamp C the power applied to hold the same in working position.

The fountain G, as shown in the drawings, is an oblong rectangular box, which is divided into a number of compartments, G′, and a central filtering-compartment, all of which may communicate with each other through apertures *g* when only one sort of ink is being used, but communication between any or all the compartments may be stopped by wax, cork, or any other suitable substance, in order

to adapt them to contain severally various sorts of ink when it is designed to rule lines of different colors. In the compartment G^2 is placed a box, G^3, the bottom of which forms a filter, g'. On the interior the sides and bottom of the box G^3 are lined or covered with blotting-paper, as shown at g^2, and within said box is placed a sponge, g^3. It will thus be seen that before the ink enters the compartments G′ it undergoes a most thorough filtering process, so that when the ink is drawn from the compartments by the siphon-cloths, to be presently described, it is entirely free from sediment and all deleterious matter, the presence of which in the ink has hitherto greatly retarded the work, detracted a great deal from the elegance thereof, and rendered it necessary to keep some one continually cleaning the pens.

F represents a rubber cloth, spread upon the clamp C and table B, to prevent contact of the ink therewith.

H represents a feeding-cloth, between the folds of which at the lower edge is inserted the edge of a secondary cloth, H′. In the upper edge of the secondary cloth H is sewed a cord, *h*, and in the edge of the cloth H′, which is inserted between the lower edges or folds of the cloth H is sewed a cord, *h′*. These cords *h h′* adapt the cloth H to form a basin-like concavity, in order that the same may contain a greater supply of ink, and the cord *h′*, as employed in connection with the cloth H, prevents the too rapid flow of ink in the direction of the pens *c*. Flat sponges may be laid on the feeding-cloths for the purpose of gathering the surplus ink when the machine is not in operation, or to serve as a holder of ink and filter the same in ruling with the usual arrangement of cloths. The said sponges are shown at S in Fig. 13.

I I represent siphon-cloths, employed to convey blue ink from the two compartments, G′ G′, directly adjoining the filtering-compartments G^2, to the feeding-cloths H. These cloths I I may, as shown in the drawings, be extended to the mouths of the pens, but, if desired, they may extend only as far as the cloth H, in which case suitable conducting-cloths are to be employed to supply the pens with ink from the cloth H.

The accompanying illustration of my invention represents the employment of two cloths only for supplying the pens with blue ink, whereas in practice any desirable number may be employed. Over the siphon-cloths I I and feeding-cloths H may be spread a rubber cloth, F′, to prevent the intermixture of the blue ink with red ink when such is employed. To provide for the effectual use of this red ink there is placed upon the rubber cloth F′ a feeding-cloth H^2, both edges of which may be corded, as shown at h^2 h^2, for the objects set forth in explanation of the use of the cords *h h′*. The upper edge of the rubber cloth F′ may be corded, to prevent the ink from flowing back into the fountain.

I′ I′ represent the siphon-cloths for conveying red ink from the compartments which may contain ink of this sort to either the feeding-cloth H^2 or directly to the red-ink pens. The construction of the siphon-cloths I I′ is clearly illustrated in the drawings. The form of each may be likened to that of an elongated rhombus. This peculiar form greatly promotes the capillary action of the cloths I I′, in that the attraction of the particles increases in the direction of the feeding-cloths in proportion to the increase in the width of the cloths, which insures a constant and full supply of ink to the feeding-cloths, and at the same time adapts the quantity of ink drawn from the fountain to be increased or diminished to any desired extent.

If the flow of ink be greater than may be desired, it is only necessary to adjust the cloths I I′ so that their ends will be less deeply immersed in the ink.

Another advantage of this peculiar construction of siphon-cloths is that when they are employed to conduct the ink directly to the pens the converging form of their ends decreases the capillary attraction in the direction of the pens as the ink traverses that portion of the siphon-cloths which may constitute conductors from the feeding-cloths, whereby the ink is supplied to the pens in a gradual regular quantity.

By the use of feeding-cloths of the above construction, separated by the rubber cloths in the manner explained, any number of colors may be ruled simultaneously. At the commencement of the operation the feeding-cloths and siphon-cloths are thoroughly saturated with ink. To effect this saturation of the feeding-cloths in a more effectual and expeditious manner, I have devised a novel pair of tongs, which are illustrated in Fig. 5. Between the jaws J J of these tongs is placed a sponge, J′, from which the ink may be expressed by pressing together the handles J^2 J^2. These handles J^2 are to be made of steel or other suitable elastic material, so that by means of a sliding collar or ring, J^3, they may be held firmly together, with the sponge between them, in order to form a brush, by which any surplus ink may be sopped from the feeding-cloths. As the sponge J′ may be capable of containing a considerable quantity of ink, the tongs J J^2 may be used to advantage in supplying ink to the fountain.

Any number of filtering-boxes G^3 may be employed, according to the nature of the work to be performed.

K represents an arm, secured to the end of the table B and operating in connection with an adjustable screw, *k*, whereby the clamp C may be held in an elevated position when it is desired to suspend the ruling operation and arrest the flow of ink to the feeding-cloths.

The same device may serve also as a pen-rest during the ruling operation.

L represents an elastic bar, constituting a number of semi-elliptical springs, which press

upward against a flange, G^4, formed on the fountain G, and gradually elevate the fountain as the same is depleted, so as to cause the ink to maintain an unvarying level, said fountain being provided with vertical slots g^3 g^3, through which pass the screws g^4 g^4, by which the fountain is secured to the table B.

The elastic support may be applied beneath the fountain or to the front, back, or ends thereof, in any position preferred.

To the respective ends of the pen-clamp are pivoted slotted plates M M′, which support rods or wires m m'. N, Fig. 8, represents a novel form of pen, which I employ in connection with the rods m m', said pen being provided with small perforated lugs n', through which the wire m' passes. These rods may be adapted to vary the inclination of the pens or to move the same out of contact with the paper by either being moved or turned simultaneously with the plates M M or moved to any position independently of said plates, and adjusted by suitable nuts. The pen N may be made sufficiently elastic at the shank N′ to conform to the various inclinations it may be required to assume. The pen proper, N, is securely held in the shank N′ by clasps n, but is capable of being withdrawn therefrom with facility, so that when unfit for use another may be readily substituted. This pen may be readily sharpened, and it is also adapted to have its length varied at will to any necessary extent. M′ M′ represent slotted plates, which may be turned upon the same pivots as the plates M M, and which support a rod or wire, m^2, which is employed for the purpose of regulating any additional pens that may be used for ruling lines of different colors.

As a means for adjusting the pens in order to strike lines at any distance asunder I have devised and propose to employ a scale, consisting of a number of regularly-diverging lines, in connection with which, and at any number of points, may be employed suitable indices. By this device the operation of adjusting the pens may be greatly expedited and the lines struck with nice exactitude. A scale of this description is illustrated by a diagram in Fig. 14. The range of pens is placed across the diverging lines at the point where the distance of the latter corresponds with that at which the lines are to be ruled, and the pens being then adjusted to the diverging lines will be accurately equidistant. By the aid of this scale and my adjustable pens I am enabled to rule to any desired pattern with a single set of pens. The necessity for a variety or great number of pens is thus dispensed with, and with a single set of adjustable pens I can rule lines at intermediate widths which cannot be produced even with a great variety of fixed pens.

The shank may be duplicated into double or single points or any desired number in one shank or holder. The pen-points are separate and hence can be fitted at pleasure, and may be varied in length to suit the work required and to commence lines simultaneously from various head-lines. The double and treble pens are provided with screws, as shown at n^2 in Fig. 9, to set the points at a greater or less distance apart.

The treble pen represented in Figs. 10, 11, and 12 has a right-and-left screw, n^3, adapted to turn freely within the lug n' of the central pen, but prevented from moving endwise by collars. Its right-and-left threads being fitted in the screw-threaded lugs n' of the outside pens, it will be apparent that by turning the screw in either direction the side pens will be moved simultaneously toward or from the center pen, so as to produce three equidistant lines of any width required.

N′ represents the shank for securing the pens to the clamp, as already described. N^4 is a conducting-plate, connecting with the channel of the central pen and projecting over the side pens. The purpose of the said plate is to separate the ink which is supplied to the respective pens. The feeding-cloth of the central pen is placed above the plate N^4 and the feeding-cloths of the side pens beneath it. This will be understood by reference to Fig. 10, where the central pen is represented as supplied with red ink and the side pens with blue.

By placing the bar m^2 over some pens and under others, as shown in Fig. 13, it is adapted to depress a portion of the pens at will, for the purpose of ruling broken lines in some places and continuous lines in others or for commencing lines from different heads.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The spring or bar L, operating, as herein set forth, to gradually elevate the fountain as the same is depleted, so as to maintain an unvarying level of the ink.

2. The adjustable weight D^2, or its equivalent, employed, in combination with the shaft D D D′, operating to balance the fountain and equalize the power applied to hold the pens in working position, substantially as described.

3. The combination of the arm K and adjustable support k, fitted to turn on a vertical pivot, to serve as a pen-rest or retain the clamp C in any desired position.

4. The siphon-cloths I I′, tapering or converging from their central portion toward their respective ends, in the manner and for the purposes herein shown and described.

5. The pen N N′ n n, constructed substantially in the manner and for the purposes herein set forth.

6. In combination with the pens N N′ n n, the rods or wires m m' m^2, arranged and operating substantially as described.

7. A ruling-pen constructed with two, three, or more points, set at any distance asunder by a screw, n^3.

8. The treble-pen, substantially as represented, with a right-and-left screw for adjusting the outer points simultaneously and equally.

9. The bar m', applied and operating as described, as an additional support for the pens.

10. The bar M, employed to depress or raise any desired number of the pens at will, as explained.

11. A ruling-pen constructed with an extensible point, substantially as described.

12. The sponge S, employed in the manner described, as an ink-holder and filter.

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Witnesses:

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E. P. WALTON.