(Model.)

F. F. WAGNER.

Paper Ruling Machine.

No. 231,694. Patented Aug. 31, 1880.

Fig. 1.

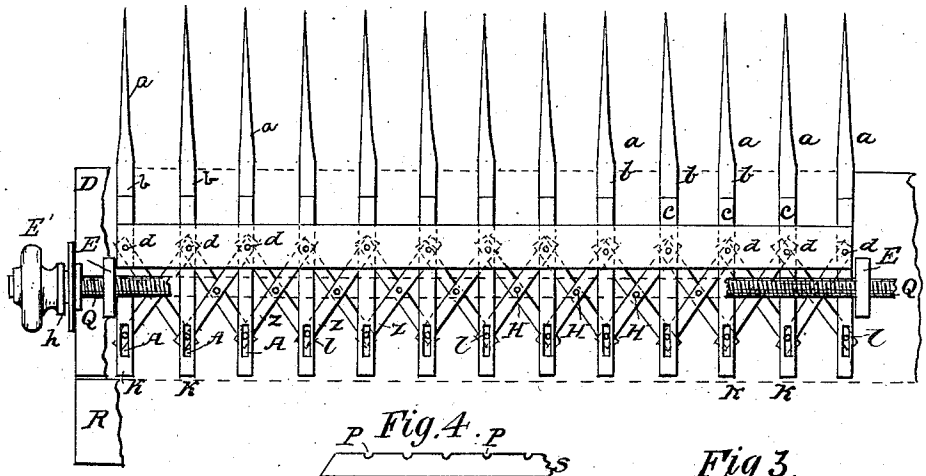


Fig. 4.

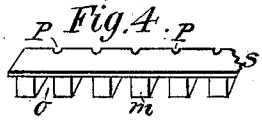


Fig. 3.

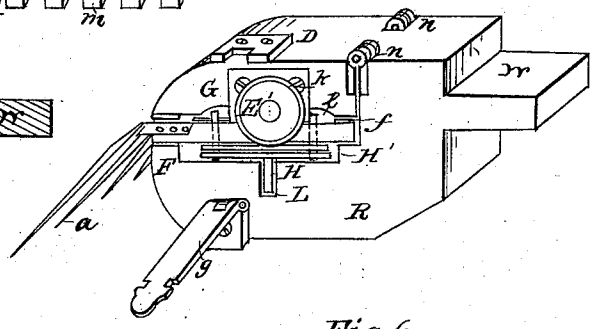


Fig. 2.

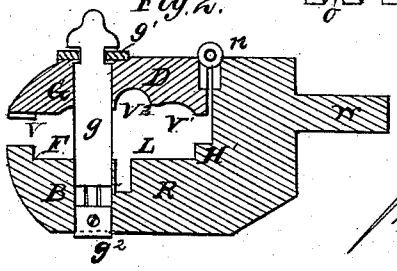


Fig. 5.

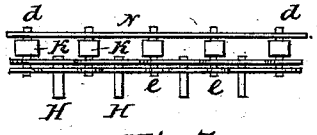


Fig. 6.

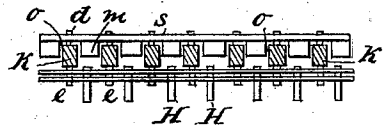


Fig. 7.

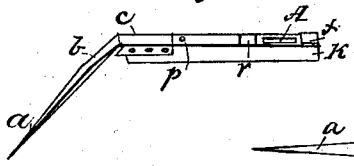


Fig. 8.

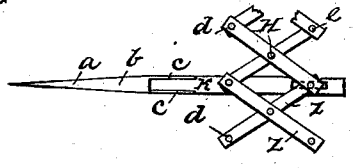
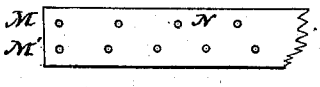


Fig. 9.



Witnesses:

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B. B. Hamlin.

Inventor

Ferdinand F. Wagner

Theophilus Weaver Atty.

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UNITED STATES PATENT OFFICE.

FERDINAND F. WAGNER, OF HARRISBURG, PENNSYLVANIA.

PAPER-RULING MACHINE.

SPECIFICATION forming part of Letters Patent No. 231,694, dated August 31, 1880.

Application filed May 31, 1880. (Model.)

To all whom it may concern:

Be it known that I, FERDINAND F. WAGNER, of Harrisburg, county of Dauphin, and State of Pennsylvania, have invented new and useful Improvements in Paper-Ruling Machines, of which the following is a specification.

My invention relates to improvements in ruling-machines in which the pens are adjustably mounted in the pen-clamp on machines employing the usual pen-rest, striker, and other attachments, and in which the paper while being ruled is moved by aprons or carriers under the pens.

The objects of my improvements are, first, to provide a superior ruling-pen of the ordinary single nib terminated with a new and improved attaching-shank; second, to provide a new and improved ruling-pen holder, by which the pens are independently attached and guided; third, to provide the ruling-pen holders with attachments for adjusting them to vary the distance between them, and thus to vary spaces between the lines of the ruled paper; fourth, to provide means to hold the pens and their holders at various determined distances from each other, and connected by removable registering transverse pieces; fifth, to provide a means to shift the connected series of pens, or the ruling-machine proper, back and forth transversely to the lines of the ruled paper without undoing the clamp in which the ruling apparatus is inserted; sixth, to provide a superior pen-clamp. I attain these objects by mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a top view of my ruling-machine proper, showing the ruling-pens, the pen-holders, the lazy-tongs connecting the pen-holders, the registers for gaging the distances between the pens, and the screw for adjusting the pen-holders. Fig. 2 is an end view of pen-clamp. Fig. 3 is a perspective view of my pen-clamp with the ruling apparatus inserted therein. Figs. 4 and 9 represent my pen-holder registers respectively notched and perforated. Figs. 5 and 6 represent rear end views of my ruling-machine proper, with registers respectively perforated and notched, mounted on the pen-holders. Fig. 8 represents a part of the lazy-tongs by which my pen-holders are connected.

Similar letters refer to similar parts throughout the several views.

My ruling-pen consists of the single nib *a*, the fluted part *b*, and the attaching-shank *c*, as shown in Figs. 1, 3, and 7. The said shank is made cap form, or flanged, to cap the end of its holder, to which it is attached in fixed position. The front ends of the flanges of said shanks project obliquely forward against the body of the pen and support it at a certain inclination, to enable the operator to readily align the pens with each other.

My pen-holder K has a rectangular body, having in it the bearing *p* and the slot A, vertically directed, and located as shown. By said bearing the pivotal stud *d* connects a lazy-tongs joint with a pen-holder, and by the said slot the guiding stud or stem *l* keeps the same pen-holder directed parallel with the other pens of the series.

The middle pivotal studs or stems, H, by which the legs or levers of the lazy-tongs are held crossed, enter a slot, L, in the bed-plate of the pen-clamp, and are thus guided to keep the ruling apparatus properly inserted in the pen-clamp, as the paper, while being moved under the pens, would otherwise draw it from its place. The ends of the studs are flush with the levers *z*, that they may be folded compactly when close ruling is being executed by the machine.

The pen-clamp has the flutes V V′ in the lid to clear the stems *d* and *l* and allow the apparatus to be freely shifted transversely to the direction of the lines of the paper being ruled, by the means hereinafter described.

My ruling-pens are held equally and securely spaced from each other by means of registering pieces or gages N or S. (Shown in Figs. 9 and 4, respectively.) The piece N is a strip of sheet metal, perforated with at least one series of holes, M or M′, regularly spaced from each other in each series, differently spaced in different series. The said holes snugly

admit the stems *d* through them when the gage is applied, as shown in Figs. 1 and 5, on top of the pen-holders.

The perforated gages are preferred when the ruling-pens are to be set close together for fine ruling; but when the rules are to be far apart the gage S may be used to better advantage, because the arms of the lazy-tongs are then widely extended, and the guiding-stems *l* are then nearer to the stems *d*, and more lost motion is to be compensated for by firmly holding the pen-holders. Gage S is composed of a bar having angular notches *o* on its under side, in which the holders of the pens fit snugly when it is applied to them, as shown in Fig. 6. The same gage is there shown capable of holding the pens also at intermediate notches. When either form of gage is applied to the pen-holders and the clamp-lid D is shut down on them in the manner shown in Fig. 3, the lid of the clamp holds it securely to its place of duty on said pen-holders, yet not so tightly that the connected series may not be slid or laterally adjusted while the clamp is closed by any suitably-arranged shifting mechanism to locate the pens at either end of the pen-clamp or at intermediate points thereof, as desired. The adjusting device for said purpose (shown in Figs. 1 and 3) is the stationary or endless screw Q, having on its end the thumb-piece E′ and collar *k*. It is attached by bearings in plates *k* on the ends of the clamp-lid D, and has on it two nuts or followers, E, which set between the pen-holders or at the opposite ends of the series, and move only laterally when the said screw is operated, thus pushing the connected series of pens, pen-holders, and their connectors transversely to the lines or rules of the paper. When the lid D of the clamp is opened the said screw is lifted with it, and the pen mechanism is disengaged therefrom, and may be freely slid by hand to any desired place on the bed-plate of the clamp, the screw being used mainly to nicely adjust the pens to draw intermediate rules exactly after the series is nearly slid to place and the clamp closed. The same set of pens may therefore be used to rule paper the second time, after adjusting the pens to bring the lines between those made before. Moreover, any one or more of the pens or holders may be removed from the series by simply opening the clamp, releasing the registering-piece, and lifting the holder or holders from the series, and then replacing the registering-piece and clamp-lid, and proceed as before.

The said clamp consists of two main parts—the bed-plate R and lid D—hinged together at *n*, held closed by a hasp, *g*, and catch *g′*.

The part R has an extension, W, by which the clamp is attached to the pen-lifting device in the usual manner. The said part has in it near its middle the groove L through its entire length, or nearly so, in which are admitted the studs or stems H, by which the apparatus is confined to its proper place in the clamp.

The ledges F and H′ at the sides of the seat in the bed-plate are supports, on which the pen-holders K are laid and clamped by the lid D, which is made to press on said holders at cushioned or raised parts *r f* opposite said ledges F H′, and said lid is recessed at V V′, as already specified, a corresponding longitudinal recess, V^2, being made in the lid for the body of the thumb-screw Q to be free of the wood-work.

Having thus clearly and sufficiently described the new and useful features of my invention, it remains simply to state that heretofore ruling-pens were usually struck from sheet metal without any special make of shank, and connected to each other by a back, comb form, said back thereof being the means by which they were held in the crevice of a clamp, whose parts were simply bolted together by a number of thumb-screws; and the pens were made with different distances between nibs in different sets of pens, requiring the paper-ruler to have on hand a large assortment of pens varying in degrees of fineness. When he ruled paper with differing spaces between the rules he usually cut the sheet of pens and set the pieces in the pen-clamp at desired points, guided solely by hand and sight. This operation was attended with much difficulty and loss of pens, as the severed sheets, when minutely divided, could not be used to advantage thereafter. The thumb-screws of the clamp were also reached with difficulty, the pens being often bent and deranged by the hand in reaching under the apparatus to operate them.

All the foregoing difficulties are overcome by my superior construction of the pens and by my method of mounting them, holding and operating them.

Nearly all the features of my improvement are therefore new and useful, and I desire to secure them by Letters Patent of the United States, substantially as set forth in the following claims.

I claim—

1. A single-nibbed or uncleft pen for ruling-machines, provided with bent shank and struck-up flanges or direction-rests for mounting it separately from others of a series of regular ruling-pens, substantially as set forth.

2. The independent or removable pen-holders K, provided with the ruling-pens *a b c*, in combination with the registering-piece S or N, and with the lazy-tongs *d* H *l z*, all operating conjointly, substantially as set forth.

3. The independent or removable pen-holder K, provided with a ruling-pen, and having the bearings *p* and *f*, for the correct presentation

of the pen to the paper, in combination with the studs or stems *d l*, fixed to the lazy-tongs *d* H *z*, substantially as and for the purposes set forth.

4. The series of pen-holders K, connected by the lazy-tongs *d* H *l z*, and registering-pieces S or N, in combination with the screw Q, or equivalent device for shifting the series laterally, substantially as set forth.

5. The ruling-pen holding and adjusting mechanism, in combination with the clamp D R W, all constructed and arranged for operation substantially as set forth.

6. The ruling-machine pen-clamp composed of the bed or main part R, lid D, hinged to said bed, and held, when closed, to bear on the inclosed pen-holders by hasps arranged at the ends of the clamp, and accessible without interference with the ruling-pens, substantially as and for the purpose herein set forth.

In testimony that I claim the foregoing as my invention I have hereunto set my hand this 15th day of May, 1880.

FERDINAND F. WAGNER.

Attest:

THEOPHILUS WEAVER,
PETER STUCKER.