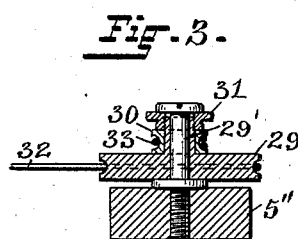
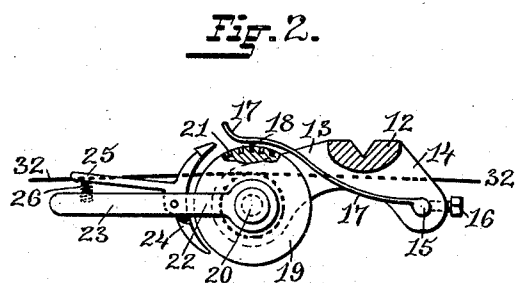
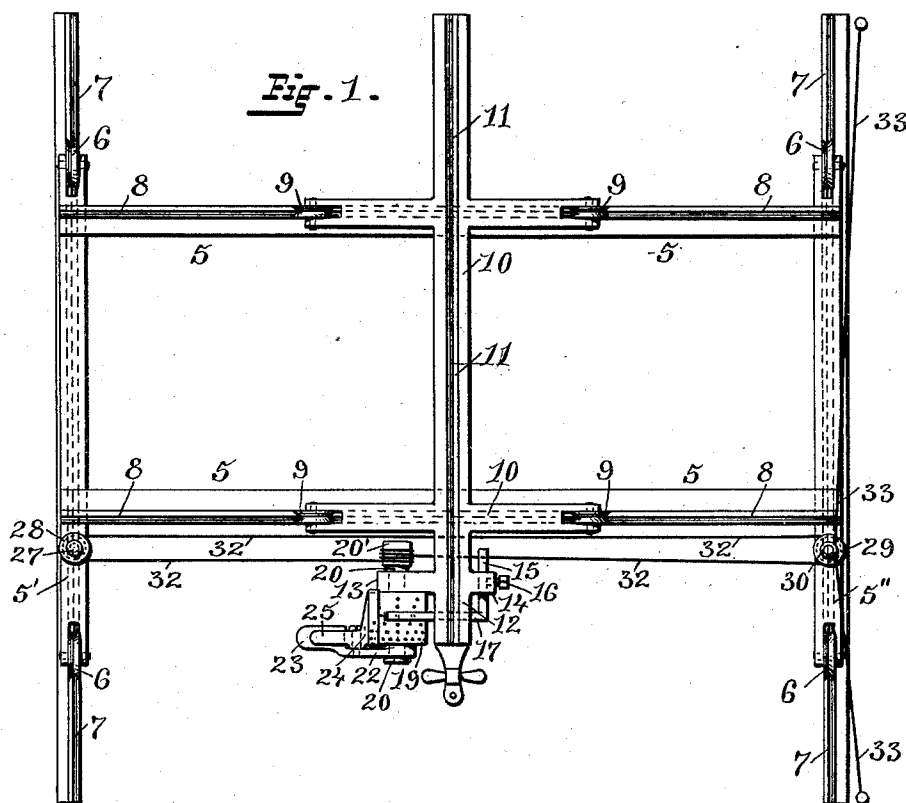


(No Model.)

W. CLEGG.  
PANTOGRAPH ENGRAVING MACHINE.

No. 476,186.

Patented May 31, 1892.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

WILFRID CLEGG, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO THE JOHN HOPE & SONS ENGRAVING AND MANUFACTURING COMPANY, OF SAME PLACE.

## PANTOGRAPH ENGRAVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 476,186, dated May 31, 1892.

Application filed November 4, 1891. Serial No. 410,839. (No model.)

*To all whom it may concern:*

Be it known that I, WILFRID CLEGG, of the city of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Pantograph Engraving-Machines; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference more especially to improvements in pantograph engraving-machines by which said machines are adapted for grounding or filling in an outline with diagonal lines separated by predetermined spaces.

The object of the invention is to produce a pantograph engraving-machine in which when set for grounding the tracing-points moving over the surface of the copper roll and the stylus traveling over the pattern will move only in a diagonal direction.

The further object of this invention is to produce a grounding attachment for pantograph engraving-machines in which the angle of the diagonal lines and the distance between these lines can be absolutely regulated and varied at will for different patterns or colors.

The invention consists in the peculiar construction of the regulating devices and the combination therewith of mechanism by which the motion of the regulator is conveyed to the carriages of the pantograph, as will be more fully described hereinafter, and pointed out in the claims.

Figure 1 represents a plan view of the pantograph-carriage and the improved grounding device attached thereto, the mechanism for supporting the copper roll and operating the engraving-points being removed. Fig. 2 represents an end view, partially in section, of the stylus-arm and regulating device attached thereto. Fig. 3 represents a sectional view of one arm of the traverse-carriage and the pulleys by which motion is imparted through belts from one carriage to the other and by which the angle of the diagonal lines is regulated.

Similar numbers of reference designate corresponding parts throughout.

As the polished surfaces of copper rolls are not adapted to take up and carry sufficient quantities of color to print with, it becomes necessary to treat these surfaces by tracing lines into which the color may lodge, and thus present a better body of color to the article to be printed. This tracing has heretofore been accomplished on the pantograph engraving-machines by tracing over a pattern held under the stylus, the tracing-points supported against the surface of the copper roll following every movement of the stylus, which it was necessary to move absolutely correct, and when one line was finished the utmost care was necessary to space the lines equally, a task of great nicety, as these grounding-lines are placed very close together, often as many as sixty or even more to an inch. Again, the grounding-pattern has usually been made in a small piece, and it was necessary to move this pattern from one position to another on the table to trace the grounding lines on the several patterns outlined on the copper roll, and it was almost impossible to place this grounding-pattern in a position to correspond with the exact angle of the lines in the previous position. My invention is adapted to remove these difficulties, and I will now proceed to describe the same more particularly.

In the drawings, 5 indicates the traverse-carriage, which is supported on the wheels 6 6, having circumferential V-shaped grooves traveling on the rails 7 7. This carriage 5 is provided with the longitudinal rails 8 8, on which the grooved surfaces of the wheels 9 9, carrying the stylus-carriage 10, travel. The stylus-carriage 10 is provided with the ordinary traverse-groove 11, in which moves the wheel of the arm which actuates the engraving-points in unison with the movement of the stylus. On the forward extension 12 of the stylus-carriage I provide the projecting brackets 13 and 14. That marked 14 has a transverse perforation, through which the arm 15 is free to move, but is set in the desired position by the set-screw 16. Secured to and carried by this arm 15 is a spring 17, having the downwardly-extending pin 18 at its forward end.

The regulator-wheel 19 is rigidly secured

to a shaft 20, journaled in a bearing formed through the bracket 13 and provided at the end opposite said regulator-wheel with the spindle-barrel 20'. The surface of the regulator-wheel 19 is provided with holes 21 of sufficient size to readily admit the pin 18, which is pressed down therein by the spring 17. These holes 21 are arranged in rows extending around the circumference of the regulator-wheel, the distances between the holes in the same row being equal, while the number of holes in the different rows is graduated—as, for instance, the row nearest the operator may number thirty holes, while the inner row may have but twelve.

The brake-frame 22 is pivoted to the outer end of the shaft 20 and is free to move without revolving the regulator-wheel. This frame 22 has a handle 23 and carries a brake 24, pivotally secured to said frame and operated by pressure on the handle 25, compressing the coiled spring 26, supported on the handle of the brake-frame.

The side rail 5' of the traverse-carriage 5 is provided with the vertical spindle 27, on which the grooved pulley-wheel 28 is free to revolve, the rail 5'' being also provided with a vertical spindle, on which the grooved pulley 29 is free to move. This pulley 29 has, however, a hollow shaft extension 29', on which the smaller grooved pulley-wheel 30 revolves, the upper portion of this extension being threaded to allow the washer 31 to be screwed down onto the pulley-wheel 30, and thus clamp it to the pulley-wheel 29.

The belt 32, ordinarily made of wire, is passed around the grooved pulleys 28 and 29. The ends are then wound around the spindle-barrel 20' and the ends fastened to said barrel. The belt 33, also of wire, is wound around the pulley 30 one or more times. The ends are then drawn taut and secured to pins fastened in the frame of the machine.

A number of the pulley-wheels 30 are provided with each machine, their size varying in proportion to the pulleys 29, the proportion in size of these pulleys determining the angle at which the diagonal lines will be ruled, as when the circumference of the pulley 29 is three inches and that of the pulley 30 is one inch and one revolution of the pulley 29 is made by pushing the stylus-carriage to the left or right three inches the motion will be transmitted through the belt 32 to the pulley 29, which will make one revolution, carrying with it the pulley 30, which, being but one-third the size, will only take up one inch of the belt 33 and advance or retire the traverse-carriage 5 that distance. If this pulley 30 be made larger or smaller, the movement of the traverse-carriage will be increased or diminished accordingly.

Where a new line is to be traced, the handle 23 of the brake-frame 22 is lifted, carrying with it the brake 24, the upper extension of which lifts the free end of the spring 17 and disengages the pin 18 from the hole of the

regulator-wheel in which it has been forced by the spring 17. The handles of the frame and of the brake are now pressed together and depressed. The lower extension of the brake now engages with the surface of the regulator-wheel and revolves the same until the pin 18 reaches the next hole and is forced therein by the spring 17, which has been allowed to act by the depression of the brake. The movement caused by revolving the regulator-wheel, as described, will be transmitted through the spindle-barrel 20 to the belt 32, and thence through the pulleys 29 and 30 and the belt 33 to the traverse-carriage, which will thus be advanced the proper distance to start on the next line; but the mere advancing of the traverse-carriage by hand without revolving the regulator will not accomplish this end, as the slightest advance of the traverse-carriage will be conveyed through the belts to the stylus-carriage and that carriage driven toward the right.

The pin 18 can be readily arranged to engage any particular row of holes by the adjustment of the arm 15.

When it is desired to operate the machine as an ordinary pantograph, the washer 31 is unscrewed from contact with the pulley 30, thus releasing that pulley from the one marked 29 and allowing them to move independently.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a pantograph engraving-machine, the combination, with the stylus-carriage and a belt secured to said carriage and extending around pulleys revolving on supports provided on the traverse-carriage, of one or more pulleys also revolving on said supports and carrying belts adapted to be clamped to the first-mentioned pulleys to revolve with them and take up said belts and thus operate the traverse-carriage, as described.

2. In a pantograph engraving-machine, the combination, with a stylus-carriage and a regulating device carried thereon, of a belt attached to and operated by said regulating device and means for transmitting the motion of the belt to the traverse-carriage, as described.

3. In a pantograph engraving-machine, the combination, with a stylus-carriage and a belt secured thereto and passing around pulleys revolving on supports secured to the traverse-carriage, of graduated pulleys adapted to be clamped to the first-mentioned pulleys and operating-belts to transmit the motion of the stylus-carriage to said traverse-carriage in a greater or less degree.

4. The combination, with the stylus-carriage 10, having the arms 13 and 14, a regulator-wheel 19, secured to the shaft 20, having the barrel 20' and journaled in bearings in said arm 13, and a spring 17, supported by the arm 15, adjustable through a perforation in the arm 14 and having a pin 18, adapted to

enter the holes in said regulator-wheel, of the belt 32, secured to the barrel 20' and extending around the pulleys 28 and 29, the pulley 30, adapted to be clamped to the pulley 29, and the belt 33, wound around said pulley 30 and having its ends fastened, as described.

5 5. The combination, with the regulator-wheel 19, secured on a shaft 20, journaled in an arm carried on the stylus-carriage, and  
10 having the holes 21, a spring-operated pin engaging in such holes, and a brake-frame 22, pivoted to said shaft 20 and provided with the brake 24, operated by the handle 25 to lift the  
15 pin 18 out of the holes 21 and adapted to revolve the regulator-wheel, of the belt or band

32, passing over the pulleys 28 and 29 and attached to the spindle-barrel 20', the pulley 30, adapted to be clamped to the pulley 29 and to revolve with the same, and the belt 33, wound around said pulley 30 and having its 20 ends fastened, adapted to advance or retire said pulley when revolved in the proper direction, as described.

In witness whereof I have hereunto set my hand.

WILFRID CLEGG.

Witnesses:

CHAS. H. HOPE,  
HENRY J. MILLER.