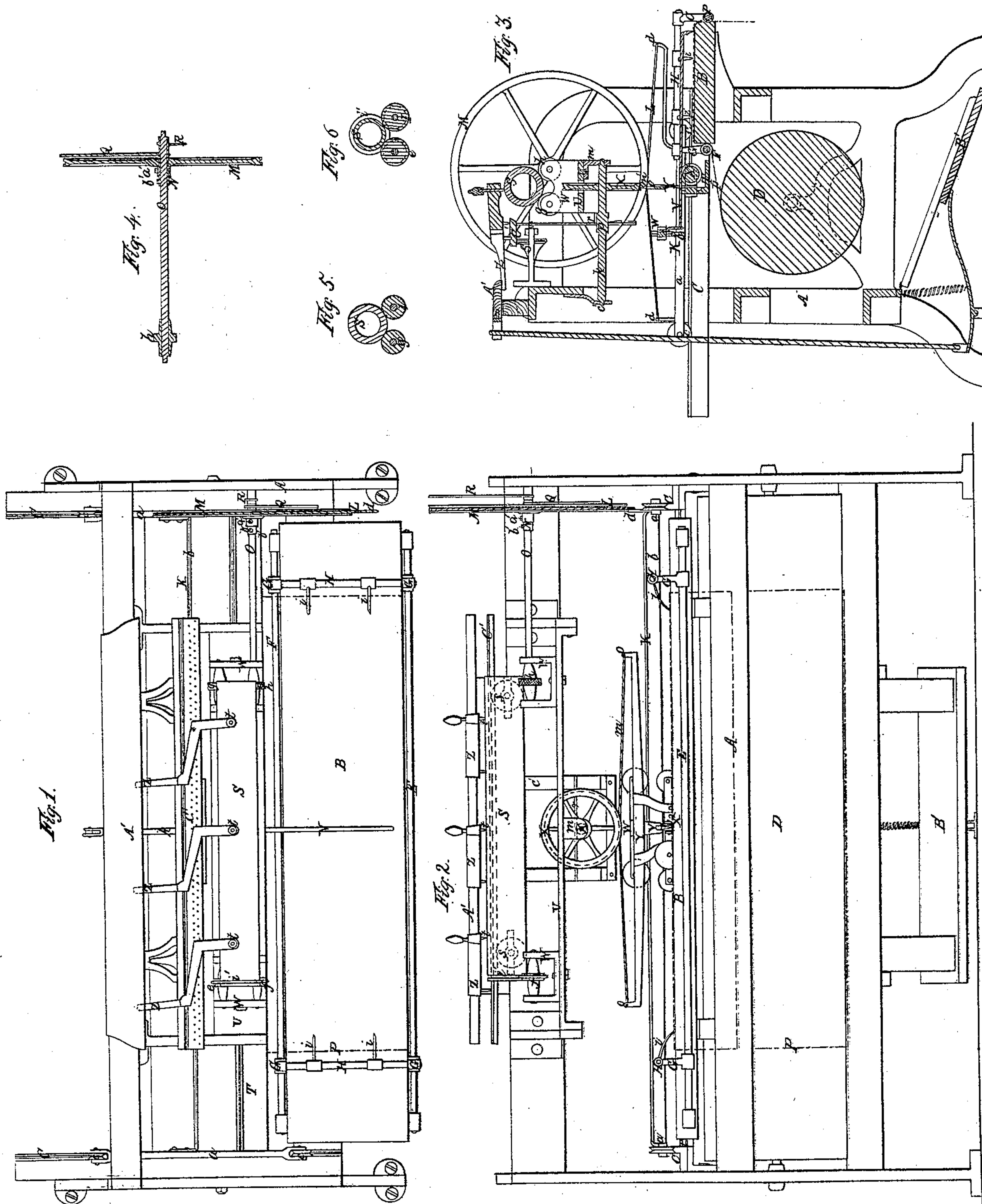


Engraving Mach.

N^o 13,462.

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UNITED STATES PATENT OFFICE.

JOHN HOPE AND THOMAS HOPE, OF PROVIDENCE, RHODE ISLAND.

MACHINE FOR ENGRAVING CALICO-PRINTERS' ROLLERS.

Specification forming part of Letters Patent No. 13,462, dated August 21, 1855; Reissued February 22, 1870, No. 3,849.

To all whom it may concern:

Be it known that we, JOHN HOPE and THOMAS HOPE, of Providence, in the county of Providence and State of Rhode Island, have invented an Improved Machine for Engraving the Surface of a Calico-Printer's Roller Preparatory to Its Being Etched; and we do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, letters, figures, and references thereof.

Of said drawings, Figure 1 denotes a top view of the said machine; Fig. 2 is a front elevation of it; and Fig. 3, is a vertical, central, and transverse section of it.

A, in the drawings, is its frame, such having applied to it a plane table or platform B, and two horizontal and parallel V rails, C, C, as seen in Figs. 1, 2, and 3. Below the said rails there is supported in the frame a large roller or drum, D, around which the sheet of pattern cloth or paper, on which the design is drawn is to be wound, it being extended therefrom upward to the adjacent edge of the table B, thence over the top of said table and down between the front edge of the table and the hold back or rod E, arranged along said front edge of the table as seen in the drawings, wherein the said pattern cloth is represented by red lines at P. Another such hold back or rod F, is applied to the rear edge of the table each of said rods being made to carry two posts or uprights G, G, which slide freely upon them in longitudinal directions. Above the table are two rods H, H, which extend horizontally over and transversely across it and are respectively supported by said posts. These rods carry measuring points or markers, *i*, there being two of such points or markers to each of the rods and each being adapted to it so as to be capable of being slid and turned thereupon.

If desirable a clamping screw may be applied to each of the markers and posts in order to confine such in its position on the rod.

On the rails, C, C, there is a carriage K, formed of two parallel bars, *a*, *a*, connected by means of a long rail or bar *b*, said carriage being supported on rollers or wheels as seen at *c*, *c*. A cord or band L, connected at its two ends, to two standards, *d*, *d*, of the carriage K, passes around a large

grooved wheel or pulley M, which is fixed upon a tubular shaft N, supported on a shaft *o*. Said shaft *o*, has an index arm R, affixed to it and extended outward from it toward the grooved wheel M. Another such index arm Q is attached to the shaft N and extends outward and to the side of the rim of the wheel M.

Fig. 4, is a section taken through the shafts O, N, the wheel M, and the arms Q, and R. The wheel M, may turn with friction upon the shaft N, or it may have a set screw *a'*, applied to it by which it may be affixed thereto if necessary. So in regard to the shaft N, it should turn with friction upon the shaft O, or have a set screw *b'*, applied to it by which it may be clamped to the shaft. The object of the index arms or indices Q, R, so applied to the shafts O, N, and wheel M, will be hereinafter explained.

The shell or cylinder to be engraved is shown at S, as supported on two sets of rollers *e* *f* and *g*, *h*, one of which, viz *h*, is fixed upon the shaft O.

In Fig. 5 is represented a transverse section of the shell S, and the rollers *g*, *h*, while in Fig. 6, is exhibited a similar section taken through the rollers *e*, *f*. A set comprising two of these rollers supports each end of the shell or cylinder S, the rollers *e*, *f*, extending into a groove *i*, formed around the surface of the cylinder close to its left end, such groove serving to prevent endwise or longitudinal movement of the cylinder. When the driving wheel *h*, is turned around on its axis it will produce a transverse rotary motion of the shell or cylinder upon it.

Sustained by the main frame A, are two shelves T, U, which are arranged as seen in the drawings. The shelf U, supports the saddles W, W, of the rollers *e*, *f*, *g*, *h*. A projection *m*, from the shelf U, sustains one end of a shaft, K, of a grooved pulley X, the opposite end of the shaft being supported in a similar projection *c'*. Underneath the said grooved pulley is a carriage Y, whose wheels rest and turn upon the shelf T, or on suitable guides or rails applied thereto. A band *m'*, extending around the pulley X, has its ends fastened to arms *o*, *o*, extended in opposite directions from the carriage Y, as seen in Fig. 2.

V is a tracer which projects from a carriage W (supported on the rail *b*, of the carriage K,) and rests in the grooved periphery

of a wheel X^2 sustained by the carriage V. The point of the tracer projects over the table and up on the design carried thereby. On the shaft h , there is a small gear or wheel, p , upon which rests a horizontal bar or rock, r , affixed to the carriage C' , which is supported on rollers as denoted by dotted lines at s, s , in Fig. 2, one of said rollers being seen at s , in Fig. 3. The said carriage C' , serves to support the internal levers Z, Z, Z , of the gravers t, t , the rear arms or tails of such levers extending underneath a rocker bar, A' , operated in the usual way by a foot treadle, B' . The object of the said rocker bar is to press downward the tails of the graver levers or carriers, so as to cause the several gravers to be lifted off the varnished surface of the shell or cylinder S. By laying hold of the tracer, V, and moving it forward and backward, or in other words, transversely of the machine the carriage K, will be put in motion on its rails and by means of the band L, will communicate motion to the wheel M so as to rotate the shaft O and of course produce a rotary movement of the cylinder or roller S, the extent of movement of the surface of the cylinder S in comparison to that of the carriage K, being in the ratio of the circumferences of the wheels, h , and M. When the tracer is moved longitudinally of the table it will produce a corresponding motion of the carriage, Y, and of course an equal rotary movement of the periphery of the grooved wheel X^2 , and consequently effect a longitudinal movement of the carriage C' , so as to move the several gravers in a longitudinal direction on the surface of the cylinder, S, such movement with respect to the movement of the tracers being in the proportion which the diameter of the wheel, P, bears to that of the wheel X^2 .

In constructing the machine, we make the diameters of the wheels, P, and X^2 , in the same proportion to each other, as those of the wheels, h , and M, such proportions being those which exist between the dimensions of the pattern to be traced and those of the engraving on the surface of the cylinder.

In arranging the machine for operation the two index arms, Q, and R are disposed at an angle to each other equal to that measured by the arc through which the surface of the cylinder is moved while a section of the pattern is being engraved. Having effected the engraving of such section it becomes necessary to draw forward the pattern sheet a distance equal to another such section, which distance corresponds with that between either two marking points i, i of each set thereof. Before this has been accomplished, the marking points should be pressed downward upon the pattern cloth so as to mark it, or marks may be made on

it—where they touch it. This having been done, the pattern cloth should be moved forward so as to bring those marks which were previously under the rear markers, directly underneath the front markers: Next, with a piece of chalk make marks on the side of the rim of the wheel, M, where the index points Q, R, cross it. Next loosen the set screw of the wheel M, so that it can revolve freely upon the shaft, N, and draw the tracer forward to that part of the design upon which it rested previously to the pattern being moved as above described. While doing this, although the wheel M, will be rotated upon its shaft, it will produce no rotation of the shaft, O. Next the foot should be taken from the treadle so as to throw the gravers of the cylinder. This having been done, the attendant takes hold of the arm, R, and turns the shaft, O, until the arm comes up to the mark which was previously made where the arm, Q, rested against the wheel M. This movement of the shaft will have rotated the cylinder S, the distance necessary for the engraving corresponding to the section of the pattern or design over which the tracer is next to be carried. After clamping the wheel M, to the shaft N, and letting the gravers down upon the surface of the cylinder, S, the machine will be ready, for the tracer to be moved over a fresh section of the pattern.

While the markers or pointers serve as a ready means of determining the distance to which the pattern is to be moved after a section of it has been engraved the rods, e, f , operate as hold backs or means of keeping the pattern cloth firmly or properly strained upon the top surface of the table.

Although the machine above described for engraving the varnished surface of a roller, is similar in many respects to other engraving or pantographic machines in use, it differs in several essential particulars therefrom, and especially in the general arrangement of its operative members or parts. By means of it any number of similar figures may be engraved on a cylinder by the use of a single pattern or corresponding figure, the number of such engravings depending on the number of gravers employed.

Having thus described our invention we claim—

1. The combination and arrangement of the two sets of measuring markers the hold back rods and roller with the plane surface table the same being not only to enable the design to be transferred it being brought forward in regular sections, but to be maintained flatly upon the table as described.

2. We also claim the two measuring indices Q, R, in combination with the large pulley, M and the shaft of the driving roller of the cylinder to be engraved.

3. We also claim the means of holding

and moving the cylinder so that it shall not only be rotated by pressure against its external surface but may be readily, either removed from or applied to its supports, the
5 same consisting in employing a driving roller and a bearing roller at one end of the cylinder in combination with two sets of bearing rollers made to extend into a groove around the cylinder and to support such
10 cylinder both laterally and longitudinally as described.

4. We also claim the arrangement of the pattern table, the tracer, and its carriage the several other carriages, the mechanism

for operating each, the wheel M, its shaft 15 and the supports of the roller to be engraved the whole constituting an important improvement in engraving machinery and securing to it important advantages in operation as well as in construction. 20

In testimony whereof we have hereunto set our signatures this thirtieth day of May A. D. 1853.

JOHN HOPE.
THOMAS HOPE.

Witnesses:

R. H. EDDY,
F. P. HALE, Jr.

[FIRST PRINTED 1912.]