R. NEALE.

COPPER PLATE PRINTING.

No. 12,213 Patented Jan. 9, 1855.

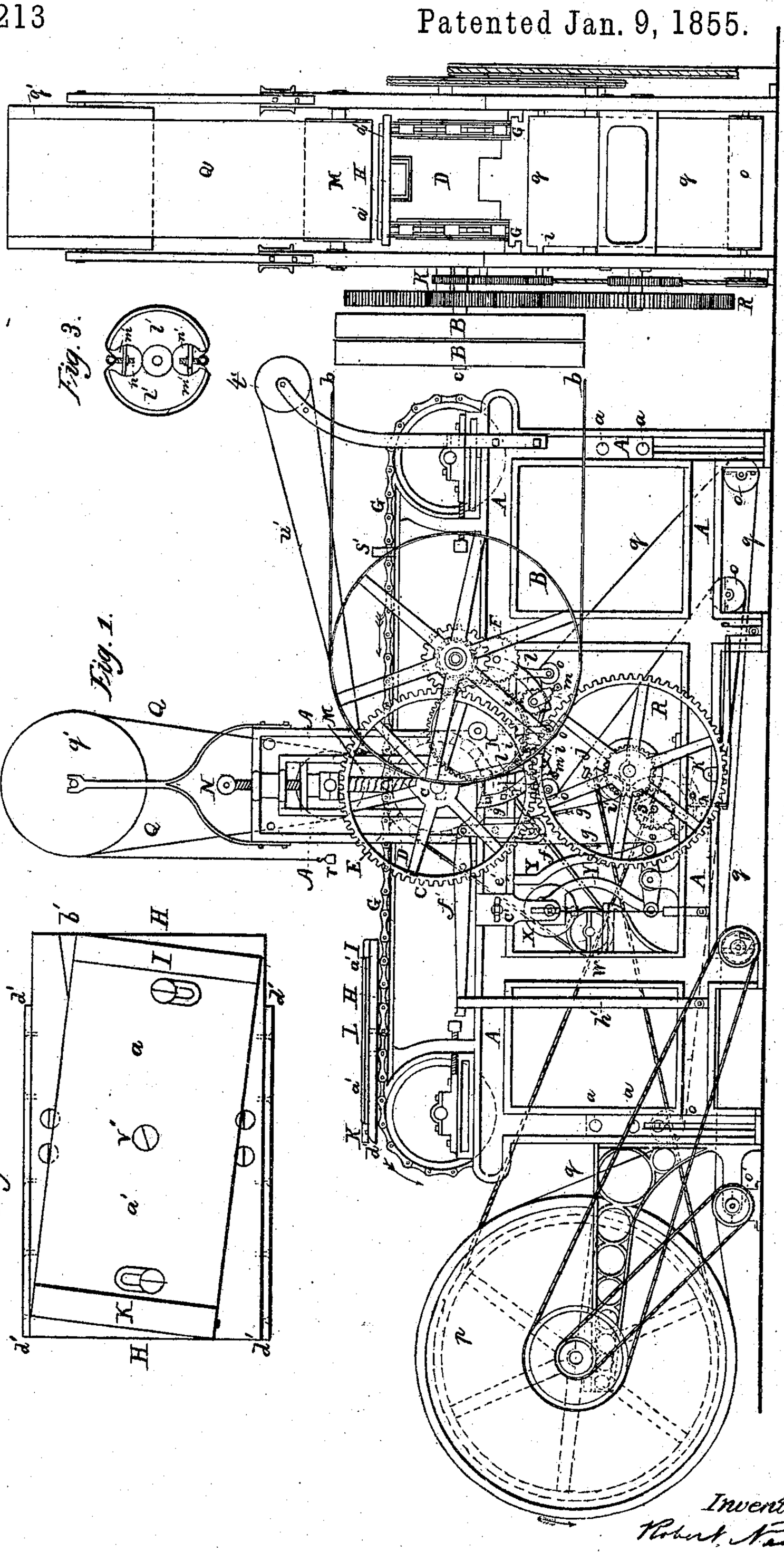

Fig. 1.

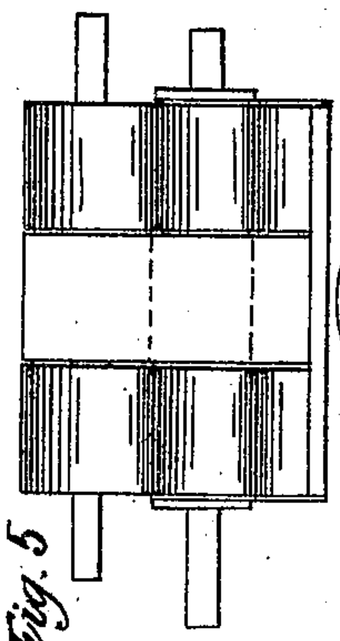

Fig. 5

Fig. 3.

Fig. 4.

Inventor:
Robert Neale

UNITED STATES PATENT OFFICE.

ROBERT NEALE, OF CLERMONT COUNTY, OHIO.

MACHINE FOR PRINTING FROM ENGRAVED PLATES.

Specification forming part of Letters Patent No. **12,213**, dated January 9, 1855.

To all whom it may concern:

Be it known that I, ROBERT NEALE, of Clermont county, in the State of Ohio and United States of America, a citizen of the United States, but now temporarily residing in London, England, have invented certain new and useful improvements in the process of copper and other plate and cylinder printing and inking, wiping, and polishing by machinery the engraved plates and cylinders while used in the process, (for which invention Letters Patent were granted to me by Her Majesty Queen Victoria on the 18th day of January, in the year of our Lord 1853;) and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, on which—

Figure 1 is a side view of a machine; Fig. 2, an end view of the same. Fig. 3 shows a modified form of polisher. Fig. 4 is an enlarged view of the bed-plate and turn-table or plate-holder, and Fig. 5 represents improved divided ink-trough and inking-rollers for printing several colors at once.

In the figures, A A represent the cast-iron frame of the machine.

B is the driving-wheel with its band *b b*.

C is the great spur-wheel, fixed on the end of the axis *c* and driven by a pinion on the axis of B. This wheel gives motion to the lower printing-roller D, (shown in dotted lines,) and also to the toothed wheel E, (also shown in dotted lines,) which is fixed on the same axis, but inside the frame A A.

G G is the endless chain, which gears into and is driven by the toothed wheel E. The direction of its motion is shown by the darts.

H is the iron bed-plate, fastened to the endless chain and revolving with it.

On the top of the bed is placed a turn-table or plate-holder *a' a'*, which is attached to the bed by a central pivot or axis *v'*, so as to allow the table or plate-holder to be moved laterally back and forth upon the bed H. To the corner of this table is attached a triangular projection *b'*, Fig. 4. This piece, when the plate passes out from under the printing-rollers, comes in contact with a projecting stud, (not shown in the drawings,) and gives to the turn-table or plate-holder a diagonal position on the bed H. The object of this arrangement is to prevent the ink from being applied to the plate and wiped from it in the direction of the lines of the engraving, which might allow the whole of the ink to be removed from the plate. Just before the bed-plate passes under the printing-rollers the side of the turn-table opposite to that on which the triangular projection *b'* is placed comes in contact with the stud in the frame and the table or holder is again placed in a position parallel to the bed preparatory to the operation of printing. The movable slide *k* and cleat, before described as attached to the bed-plate, are here attached to the plate-holder or turn-table.

L is the engraved plate, with the upper edges beveled, so as to fit under the beveled edges of the slide and cleat K and L just described.

M is the upper printing-roller with its adjusting-screw N.

u' is the endless feeding-apron revolving around the rollers *t'* and *x*.

Q represents the blankets. The blankets and feeding apparatus may be arranged in any convenient way.

The spur-wheel R receives motion from wheel C and has on its axis a pinion which gears into and gives motion to wheel S. Wheel S carries roller *e*, around which and roller *f* passes the wiping-belt *g g* in the direction shown by the darts. This wiper or belt may be made of leather or other suitable material, and it may be lined with flannel or other soft fabric to make it pliable and elastic to the touch. It is designed that the said revolving wiper shall wipe off the chief portion of ink or coloring-matter from the plates, and also that it shall be cleaned free from ink or coloring-matter by means of a scraper pressed against it or in any other equivalent manner. It may also be further cleaned by bringing a movable belt of cotton sheeting in contact with it. The belt may be of any desired length and pass over one or more rollers to press it in contact with the engraved plate, and it may pass over any number of rollers and drums that may be convenient. It may also be used without a scraper, if preferred, and be cleaned in any suitable manner and changed when required.

The pressure of the wiping-belt against the plate may be regulated with great nicety by means of the levers *f'*, acting upon the axle of the roller *f*, the bearings of which move up and down in the fork-guides *g'*. The amount of pressure is governed by weights or springs

h', attached to the levers f'. The wiping-belt is elongated and shortened by means of a small pressure-roller i and a set-screw j in a carriage K′, placed on the axis of the roller or drum of the wiping-belt inside the frames A A A A. The set-screw presses the belt firmly against the roller and prevents its slipping. The carriage K′ is held fast to the frame by a bolt and screw in a curved slotted arm. The ink-rollers form one side of the ink-troughs.

W represents the ink-troughs with regulating-screws attached. Each ink-trough may contain ink or coloring-matter of one or more colors with partitions to divide and keep apart the color one from the other. The bottom of each ink-trough presents a straight edge to each lower ink-roller, and the quantity of ink supplied to each ink-roller may be regulated by the screws more or less pressing each ink-trough to or from each lower inking-roller.

X represents the upper inking-rollers, which move in spaces formed for the purpose in the iron frame A.

Fig. 5 shows an ink trough and rollers divided by partitions for the purpose of applying several colors at once.

Y Y are the levers which elevate the inking-rollers to the engraved plate at each passage of the bed-plate over them.

The width to which the ink is to be applied to the plate is regulated by the width of the inking-roller, it being easy to have rollers of various widths which can be changed at pleasure. The part of the plate to which the ink is applied in the leading end of the plate is regulated by the adjustable fork or slotted guide c', in which the axis of the inking-roller moves. This fork can be moved back and forth by means of the slot and pin, so as to apply the ink at any part of the plate that may be desired. The line at which the inking-roller shall cease to act upon the plate is regulated by the side strips or bearers d', fastened by screws or in any suitable manner on the sides of the bed-plate. These bearers are rounded at one end, as shown in the drawings at d', Fig. 1. When the bed is just arrived at the point where the ink is to be applied to the engraved plate, the rounded ends of the strips or bearers come in contact with the rounded ends e of the levers Y and force the inking-roller up to its work. When the ends of the levers Y Y have passed the strips, the levers rise and the inking-roller falls away from the plate. The length of the strips, which may be varied to suit all cases, regulates the line at which the ink shall cease to be applied to the plate. By means of these several contrivances I am enabled to control with the greatest accuracy the application of the ink so as to confine it to the engraved portion of the plate without the use of stencils.

$i\ i$ are the circular revolving wipers or polishers, driven by the wheel K, which receives motion from F, which is driven by a pinion on the axis of wheel B. The wipers are constructed, operated, and adjusted as before described.

To obviate the difficulty of making these polishing-rollers of large size, which is apt to be attended with stretching of the leather of which they are made, and consequent irregularity of surface and action, I contemplate making them in the manner shown by Fig. 3, which represents an end view of my proposed modification. In this contrivance the leather is stretched over (a number of) arms $l'\ l'$, stuffed and prepared as before described, and its tension is regulated by means of the rods m' and screws n', as clearly shown in the drawings.

$o\ o\ o\ o$ are the rollers over which the endless belt of cotton sheeting $q\ q\ q$ moves. The office of this belt has been already described.

Underneath the drum P and moved by a band from it is placed a roller o', covered with cloth or flannel, which revolves slowly in a box of whiting or other suitable drying-powder in contact with the cotton sheeting (or belt) and applies the whiting or powder to the surface of said sheeting. The superfluous whiting and any other adhering particles of dust or grit are removed from the sheeting by the revolving brush p', kept in motion by a band from the drum p.

Having thus described the nature of my said invention and the manner of operating the same, I would have it understood that what I claim is the combined apparatus herein explained for inking, wiping, and polishing engraved plates used in copper and other plate-printing, the same consisting—

1. In the attachment of the engraved plate to an endless chain, with which it revolves while undergoing the several processes of inking, wiping, polishing, and printing, substantially in the manner hereinbefore described.

2. In the bed-plate H, with its movable plate-holder a' and its strips or bearers, the same constructed and operated substantially in the manner described.

3. In the mode of inking the plate so as to confine the ink to the engraved portion, substantially as described.

4. In the mode of regulating the pressure of the wiping-belt upon the plate, substantially as described.

5. In the mode of keeping the polishers clean by an endless belt of cotton or other proper cloth, itself kept in proper order by the application of whiting or other suitable drying-powder, and preserved from dust and grit by the action of the revolving brush.

In witness whereof I, the said ROBERT NEALE, have hereunto set my hand this 20th day of June, in the year of our Lord 1854.

ROBERT NEALE.

Witnesses:
CHAS. F. STANSBURY,
G. W. YAPP,
Both of 17 *Cornhill, London.*