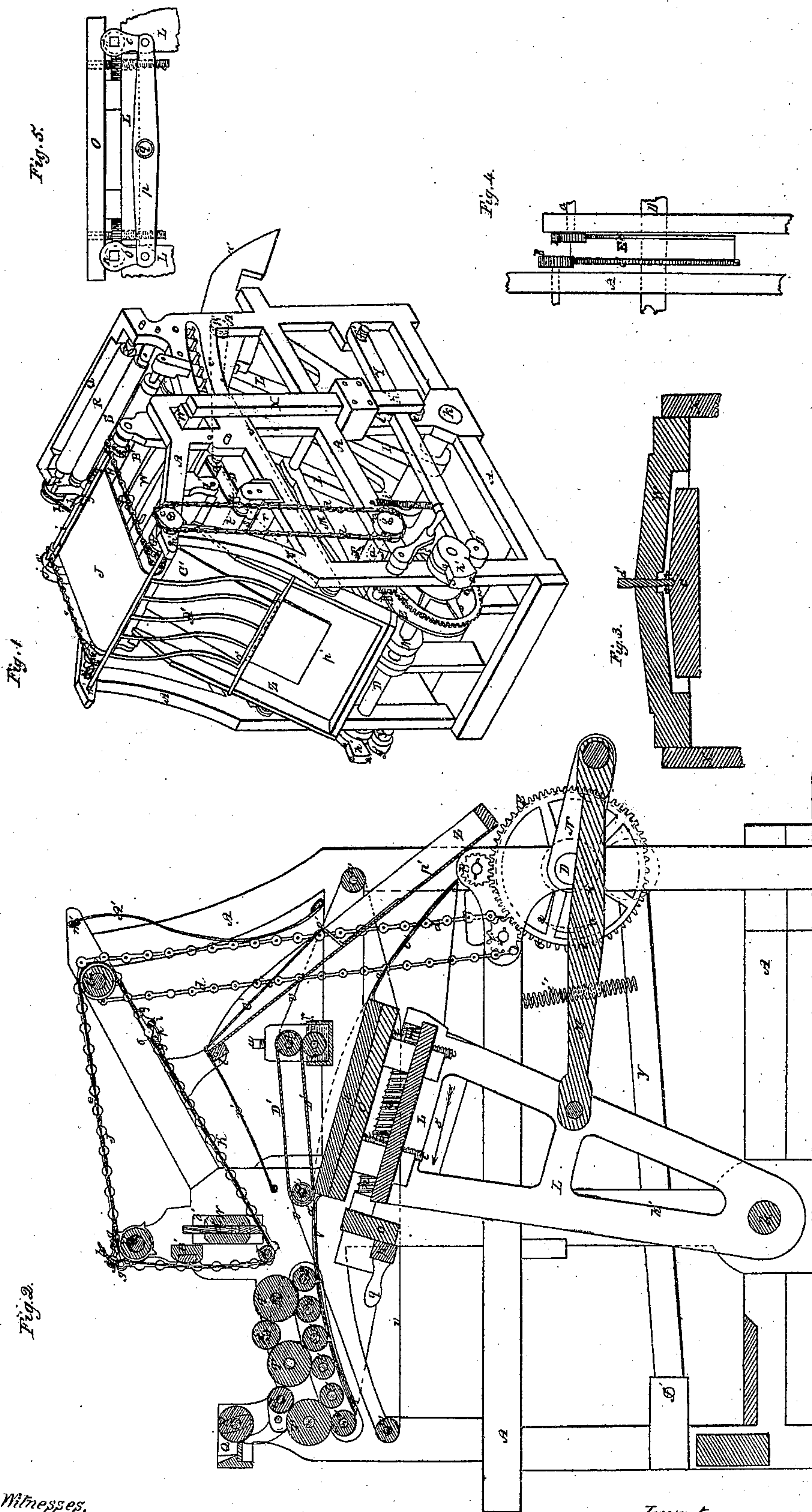


J. W. H. Stübbe.
Lithographic Press.
N^o 42125 Patented Mar. 29, 1864.



Witnesses.
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IMPROVEMENT IN LITHOGRAPHIC-PRINTING PRESSES.

Specification forming part of Letters Patent No. 42,125, dated March 29, 1864.

To all whom it may concern:

Be it known that I, J. W. H. STÜBBE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Presses for Lithographic and Zinc Printing, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of my improved press. Fig. 2 is a central longitudinal section through the same with the carriage in a different position; Fig. 3, a longitudinal section through the scraper and bar to which it is attached, showing the manner in which it is pivoted; Fig. 4, detail showing the wheels C and E as viewed from the interior of the machine; Fig. 5, detail showing the method of raising and lowering the table O.

The object of this invention is to perform the several operations of moistening and inking the stone or plate of zinc and of taking the impression upon the paper, all by means of improved automatic machinery, the construction and operation of which I will now proceed to describe in such terms that others skilled in the art may understand and use my invention.

In the accompanying drawings, A is the frame-work of the machine, in suitable bearings in which is supported the shaft of the driving-wheel B, which engages with the cog-wheel C upon the shaft D. Upon this shaft is also secured another wheel, E, similar to C, excepting that one-half of its circumference is not provided with teeth, as seen in Figs. 1 and 4. The teeth of this wheel E engage with the teeth of a gear, F, on a short shaft, a, (seen dotted in Figs. 1 and 4,) which has its bearings in the frame-work and carries at its opposite end a sprocket-wheel, b, over which and a similar sprocket-wheel, c, on the end of a roll, G, is stretched the chain d. Over this roll G and two other rolls, H and I, are stretched the tympan J K, of leather or other suitable material, and these rolls are caused to revolve together by the chains e, which pass over sprocket-wheels f. The rolls G H I have their bearings in the frame-work A. The chains e are connected together by flat strips of metal g, to which the tympan are riveted, and also

by rods 9, over which the other ends of the tympan are stretched, and by thus attaching the tympan to the chains any tendency of the tympan to slip on the rolls is prevented, while it also insures the proper surface motion required by the traverse of the carriage. The spring-nippers, of which there is one set for each tympan, are seen at h, and are operated by rods i, which have their bearings in ears projecting from the chains e, and are provided with tappets 10, which strike against the projections j j' as the chain revolves, and thus open the nippers at the required points, the nippers being closed at other times by coiled springs on the rods i.

L is a carriage, which is pivoted at k to the frame-work, and is vibrated back and forth by the connecting-rod M, secured to a crank, N, on the shaft D. At the upper part of this carriage is the bed O, for supporting the stone or other material, P, on which is the design to be printed. This bed is made adjustable, to accommodate stones of varying thickness by means of the screws l, (one at each corner,) which are permanently secured to the bed O, and are raised and lowered by means of nuts m, having teeth cut on their peripheries, in which work the worms n, which are furnished at one end with cranks o, connected together by a bar, p, to which the handle q is attached. (See Fig. 5.) This arrangement enables me, after the stone is once placed in the proper position, to raise or lower all points of its surface simultaneously.

I will now describe the apparatus by which the stone is damped or moistened previous to being inked.

r is a box or trough, secured in the frame-work and partially filled with water, in which revolves a roll, s. Above this roll s is a similar roll, t, which is forced down onto the roll s by means of a screw, u, at each end, and is driven by a cord, v, fastened to the carriage L, and passing over rolls w, running on studs projecting from the frame-work. Over the roll t and another roll, x, is stretched an endless band of deer-skin, cloth, or other suitable material D', which takes water from the roll s, and carries it forward for the purpose of moistening the stone, the upper roll, t, being regulated by the screws u, so as to press out any excess of water. The roll x

consists of an iron shaft covered with wood, and over this is stretched a cylinder of rubber or other soft material. The ink is contained within the trough Q, from which it is transferred by rolls R and S to the distributing-cylinders T, by which the ink-rolls *y* are served, and in contact with these latter the stone passes twice, once as it advances and again as it returns. The roll R is driven by a cord, *z*, from the main shaft D. As the ink is liable to be deteriorated by absorbing moisture from the stone, I have placed distributing-tables U V on either side of the stone, which receive the ink as they pass under the ink-rolls, and thus expose it to the atmosphere on an extended surface, by which means the moisture is partially evaporated at each traverse of the carriage, and the ink is more evenly distributed. These tables U and V are hinged at one end, so as to afford access to the parts beneath. The ledges *a'* serve as cams to press the ink-rolls *y* up into contact with the distributing-cylinders T when they are not engaged in inking the stone.

I will now describe the method by which the tympan is carried down by the "scraper," so as to bring the paper into contact with the stone for the purpose of receiving the impression.

W is a longitudinal bar, sliding in guides *b'* in each side of the frame-work. This bar carries the scraper *c'*, which fits in a groove, and is pivoted at the center, as seen in Figs. 2 and 3, so as to adapt itself to the stone in a lateral direction, and is adjusted by means of the screw *d'*, to which it is pivoted. To the bar W is attached, on each side of the machine, a rod, X, furnished at its lower end with two rollers, *e'*, between which passes a lever, Y, pivoted at *f'* to the frame-work. The levers Y (one on each side of the machine) are provided at their outer ends with rolls *g'*, which are acted upon by the cams *h'* on the main shaft D, and thus as the cams *h'* revolve the bar W, with the scraper and tympan, is brought down as required, and the lever Y assumes a horizontal position. As soon as the cams *h'* cease to act upon the rolls *g'*, the levers Y are raised by the springs *i* and assume their former position, raising the scraper up from the tympan. The form of the cams *h'* is such that when the rolls *g'* travel from 1 to 2 the scraper is suddenly depressed, while passing from 2 to 3 the scraper holds the tympan and paper against the upper surface of the stone, and when passing from 3 to 4 the levers Y, and scraper connected therewith are raised by the springs *i'*. It is evident that the distance from *f'* to *h'* in the levers Y being one-half the distance from *h'* to *g'*, the distance to which the scraper is raised is also but one-half the throw of the cams *h'*. When a stone is used whose surface is curved instead of flat, the curved faces of the cams *h'* are varied, as indicated by the red line, Fig. 2, so as to cause the scraper to press the tympan and paper against the stone with uniform pressure. The cams *h'* may be re-

placed by others of different sizes and having different bearing-surfaces, so as to correspond with the length of stone employed, and thus prevent the scraper from carrying the tympan down past the edge of the stone, which would be liable to crack and injure the tympan. As the tympan is required to remain stationary while the carriage L is being moved in the direction of the arrow 5, the wheel E, which engages with the gear F and sets the tympan in motion, as before stated, is constructed with teeth on one-half of its periphery only, being that portion encompassed by the red line, Fig. 2, and seen more clearly in Figs. 1 and 4. This wheel is so adjusted on the shaft D that its teeth shall engage with the gear F only after the carriage has completed its traverse in the direction of the arrow 5, and commences to move in the opposite direction to bring the stone into position to give the impression. As soon as the tympan commences to move, the paper, which is fed into the nippers *h* by the attendant, is carried round beneath the scraper and into contact with the stone, so as to receive the impression, after which it is carried around until the tympan is arrested at the point 6, Fig. 2. On the next movement of the tympan the nippers are opened by the tappet 10 coming into contact with the projection *j'*, when the paper falls, printed side up, onto the receiving-table Z, which is hinged to the frame-work at *l'*, so as to allow it to be raised to afford convenient access to the carriage beneath.

A' is a frame composed of strips of metal, and is hinged to the frame-work at *m'*, and serves to guide the paper onto the receiving-table, and also to prevent it from falling out. The paper is prevented from coming in contact with the damping apparatus by guides *n'*. (Seen in section, Fig. 2.)

I have heretofore spoken of two tympan only as being used, but by extending the distance between the rolls G H I three or more tympan may be employed, thus lessening their liability to heat in proportion to the number used by allowing one to cool while the others are in use, each tympan being furnished with a set of nippers, *h*.

B' is a box corresponding in width to the tympan, and placed contiguous to their interior surface, which is filled with greased cotton waste, so as to keep it lubricated, and thus allow the edge of the scraper to run smoothly over it. It also lessens the liability of the tympan to become heated, and prevents them from tearing.

The printed sheets are caused to fall one on the top of the other on the receiving-table in the following manner: C' is a metallic plate attached to the table Z, and is inclined thereto, as seen in Fig. 2, so as to form a shoulder at *o'*, the sheets as they fall passing over this shoulder into the space *p'*, formed between it and the ledge at the bottom of the table. The sheet falling from the nippers, being guided by the

frame A', is thus prevented from striking the edges of those already on the table, and the sheets are laid one over the other until the space p' is full, when they are removed by the attendant.

Operation: The parts being in the position represented in Fig. 2, the carriage L is caused to move in the direction of the arrow 5 through the connections explained, the stone being moistened by the band D' as it passes the roll x . The stone next passes under the inking-rolls y , by which it is inked. During this period (or while the carriage is moving in the direction of the arrow 5) the tympan on which the paper is placed remains stationary, the toothless portion of the wheel E being opposite the gear F. As soon, however, as the carriage L starts to return, the portion of the wheel E provided with teeth, having arrived in a position to engage with the gear F, the tympan through the connections explained commences to revolve, carrying with it the paper, which has been before fed into the nippers. When the forward part of the stone P reaches a position immediately beneath the scraper C', the paper will have arrived at the proper point for commencing the impression, and the scraper C' (through the before-mentioned connections) is depressed, causing the tympan to bring the paper uniformly against the design upon the stone during its traverse. The tympan continues to revolve, carrying with it the printed paper until it arrives at the point 6, when it is arrested, as before stated. On the next movement of the tympan the paper is carried around by the nippers until they are opened by the tappet coming in contact with the projection j' , when the paper falls, as before stated, printed side up, onto the receiving table Z, being guided by the frame A'. As soon as the paper commences to leave the stone, the latter commences to be damped, and on the return of the carriage the stone is damped a second time, the process of damping and inking the stone being twice repeated before each impression, excepting the first time, when it is damped but once and inked twice.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with a carriage, L, that supports the bed O, and that vibrates in the arc of a circle, a jointed scraper, C', that is actuated in a line radial to that arc, substantially as described.

2. Raising and lowering the bed O by means of screws and worm-gears, or their equivalents,

substantially as set forth, for the purpose specified.

3. The removable cams h' , the form of which is made to correspond with the surface of the stone or zinc, whether it be curved or flat, for the purpose of pressing the scraper uniformly onto the stone during its traverse, and of such a width of bearing-surface that the scraper will be held down a length of time corresponding to the length of the stone, substantially as set forth.

4. The revolving tympan J K, and nippers h , in combination with the rolls G H I, when said tympan serve the purpose and are used in lieu of a roller or platen, and operating substantially as set forth, for the purpose specified.

5. Revolving the tympan which move under the heavy pressure of a scraper, and are used without a roller or platen to give pressure by means of chains and sprocket-wheels, substantially as set forth.

6. The method, substantially as described, of combining and attaching the tympan and nippers to and operating them by means of the chains e , for the purpose set forth.

7. The employment of two or more revolving tympan, when used without a roller or platen, to give pressure, and two or more sets of nippers as set forth, for the purpose described.

8. Disengaging the printed sheet from the nippers at such a time during the revolution of the tympan that it will fall, printed side up, onto the receiving-table, in the manner substantially as set forth.

9. The swinging receiving-table, Z, with its inclined plate C', in combination with the frame A', for the purpose of laying the printed sheets one on top of the other, substantially as described.

10. The endless band D', in combination with the rolls $s t x$ and trough r , for the purpose of damping the stone or zinc, substantially as set forth.

11. The grease-box B', for the purpose of lubricating the interior surface of the tympan, substantially as described.

12. The distributing-tables U and V, in combination with the ink-distributing cylinders T and ink rolls y , for the purpose of evaporating the superfluous moisture absorbed by the ink, substantially as set forth.

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Witnesses:

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