J. P. JAMISON.

Art of Producing Printing Surfaces.

No. 198,847. Patented Jan. 1, 1878.

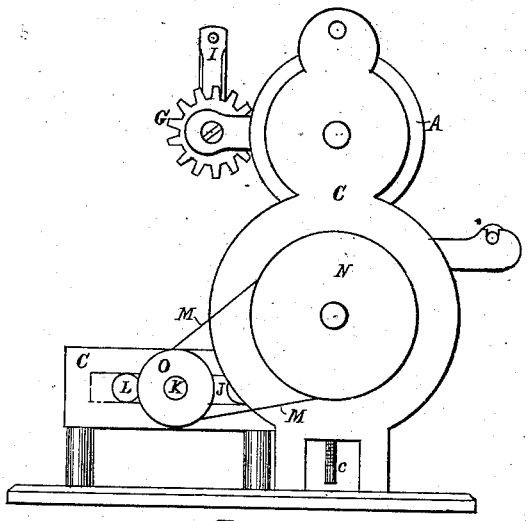

FIG. 1.

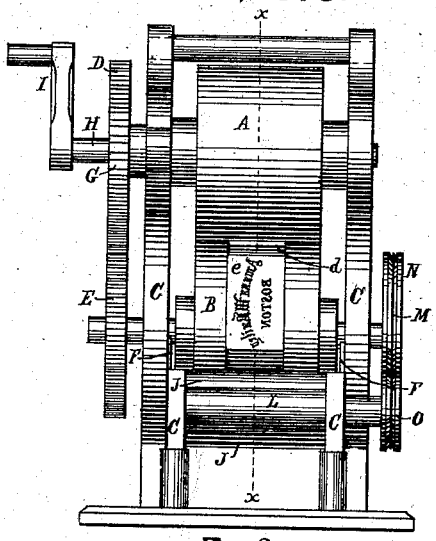

FIG. 2.

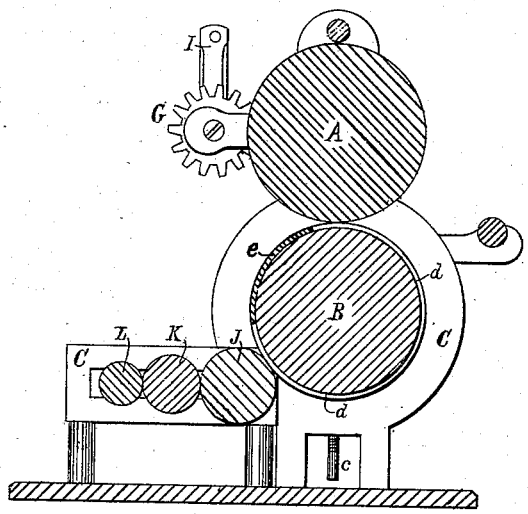

FIG. 3.

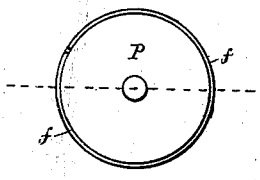

FIG. 4.

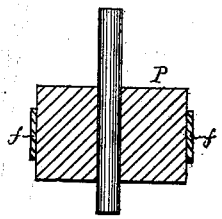

FIG. 5.

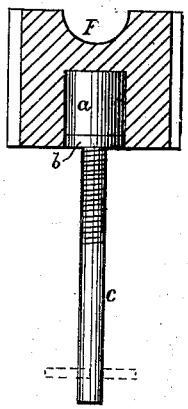

FIG. 6.

WITNESSES.

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UNITED STATES PATENT OFFICE.

JOHN P. JAMISON, OF CAMBRIDGE, MASSACHUSETTS.

IMPROVEMENT IN ART OF PRODUCING PRINTING-SURFACES.

Specification forming part of Letters Patent No. **198,847**, dated January 1, 1878; application filed August 17, 1877.

To all whom it may concern:

Be it known that I, JOHN P. JAMISON, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful improvements in the art of producing sunken designs, &c., in metal, wood, or other material, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to improvements in the art of producing sunken and raised figures, letters, or designs, in imitation of hand-engraving, in metal, ivory, wood, leather, or other compressible material, whereby such articles, when required in quantities, can be produced at a very small cost as compared with hand-engraving—the method of producing such work heretofore practiced.

My invention consists, first, in the method of producing figures or ornamental designs in relief upon flat plates of metal, wood, ivory, or other compressible material, by first engraving or sinking said design into the surface of a thin flat plate of steel, and then passing said engraved plate, with its engraved face resting upon the surface of a flat plate of softer metal, wood, ivory, or other compressible material, between a pair of smooth rolls or cylinders under a heavy pressure.

My invention further consists in the method of producing designs in relief upon cylindrical or curved surfaces, that shall be adapted to emboss the reverse of such designs in metal, wood, ivory, or other compressible material, by first engraving said design or sinking it into the surface of a thin flat plate or ribbon of soft steel, tempering or hardening said engraved plate or ribbon, producing the reverse of said design in relief upon a soft-metal plate or ribbon, by passing the two plates between a pair of powerful pressure-rolls, with the engraved surface of the hardened plate or ribbon in contact with the surface of the softer metal plate, bending said relief-plate or ribbon into the form of a circular hoop, or segment of a hoop, tempering or hardening the same, and then securing it to the periphery of a cylinder, with its engraved or relief-surface outward.

A great many articles are constantly being manufactured in metal, ivory, and wood that require to be lettered or ornamented by having engraved or cut therein the desired design, or affixed thereon printed labels or painted designs.

In the case of metal or ivory articles, such, for instance, as checks or buttons for organ-stops and name-plates, the lettering or design has heretofore been done by hand, by means of the graver, as also have certain kinds of ornamentation of wood-work, such, for instance, as the gilded vines and scroll-work now so common on black-walnut and ebony picture-frames.

Cigar-boxes have printed labels pasted thereon, which are liable to be injured by exposure to the weather and the rough handling which they receive.

Manufacturers of pianos, organs, and other musical instruments place their names in some conspicuous place upon the front of their instruments, which is usually done by painting or stenciling directly upon the wood. One objection to this method of applying the name is that it is comparatively an easy matter to remove a name from an inferior instrument and place thereon the name of some other manufacturer of greater note, and sell the instrument for one of his manufacture.

This objection may be obviated by using my improved method of applying the name, together with any desired design, by sinking the letters and other figures below the general surface of the wood by passing it between the pressure-rolls, and at the same time applying to said design a size, to which the required bronze or gold-leaf may be afterward applied.

I also propose to substitute for the printed paper labels now used on cigar and other small packing-boxes designs and lettering printed directly onto the wood before the parts of which the box is made are nailed together, said designs and lettering being impressed into the wood in imitation of hand-engraving.

Designs of any desired form, as well as lettering, may be successfully applied to metal or ivory, in exact imitation of hand-engraving, by my improved method; and the arti-

cles heretofore mentioned, and many others, when a number of duplicates are required, may be produced at a very small cost.

Figure 1 of the drawings is a side elevation of a machine which I use to carry out my improved method of producing imitation engraving. Fig. 2 is an end view. Fig. 3 is a vertical section on line *x x* on Fig. 2. Figs. 4 and 5 are, respectively, an end view and a central longitudinal section of the pressure-roll and engraved steel band to be used in producing the design upon a softer metal band; and Fig. 6 is a detail, illustrating one of the yielding bearings for the pressure-roll.

A and B are a pair of pressure-cylinders, the former of which has a smooth periphery of the same diameter throughout, and is mounted in fixed bearings in the side frames C C, and has secured to the end of its shaft the spur-gear wheel D, which engages with the gear-wheel E, secured to the shaft of the cylinder B.

The cylinder B has its bearings in the half-boxes F, which rest upon the rubber springs *a*, beneath which is placed the metal plate *b*, which rests upon, and may be adjusted to vary the pressure or distance apart of, the cylinders A and B by means of the set-screw *c*, as shown in detail, drawn to an enlarged scale, in Fig. 6.

G is the driving-pinion, mounted upon the short shaft H, and engaging with the gear-wheel D, for the purpose of imparting rotary motion to the cylinders A and B when revolved by means of the crank I, or by means of a pulley and belt substituted therefor.

J is an inking-roll, mounted in suitable bearings in the side frames, and adapted to be revolved in contact with the raised design on the cylinder B and the distributing-roll K, which takes the ink or size from the roll L and transfers it to the roll J, from which it is deposited upon the raised design.

Motion is imparted to the inking-rolls by means of the belt M, leading from the pulley N secured upon the shaft of the cylinder B to the pulley O on the end of the shaft of the roll K.

The cylinder B has formed in its periphery a shallow groove, *d*, of suitable width, within which is placed a thin metal band, or a portion of a band or hoop, *e*, having formed thereon in relief, or raised above the general level or surface of said band, letters, figures, or designs, the exact reverse of an engraved plate the counterpart of which it is desired to reproduce upon metal, ivory, or wood.

P is a cylinder, having secured thereto the steel band or hoop *f*, upon the outer face of which has been engraved by hand the desired design while in a flat state, the letters or design being cut into or below the surface of the plate, and the band is hardened after being bent to the desired circle or arc of a circle and secured firmly to the periphery of the cylinder.

The cylinder P, with its engraved band, is placed in the machine beneath the cylinder A, or a similar one, to which a heavy pressure is applied in any well-known manner; and a plate or ribbon of softer metal is passed between said cylinders, to form upon the softer metal band or strip the exact reverse of the engraved design.

In cases where the engraved design is to be duplicated in metal, the relief design is formed upon a soft-steel band or ribbon, which is afterward tempered or hardened.

I am aware that it is common to engrave designs upon steel rolls, and produce the reverse of such designs by rolling said steel roll in contact with a softer metal roll or cylinder; but this is a very expensive method, and one that could not be successfully applied to the production of such cheap articles as it is designed to apply this invention to.

By engraving the design on a thin flat plate of steel, and then applying it to a cylinder or roll, which may be of cast or wrought iron, a comparatively inexpensive machine is produced, and an economical method of duplicating engraved designs.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The method of producing letters, figures, or ornamental designs in relief upon flat plates of metal, wood, ivory, or other compressible material, by engraving or sinking said design into the surface of a thin flat plate of steel, and then passing said engraved plate, with its engraved face resting upon the surface of a flat plate of softer metal, wood, ivory, or other compressible material, between a pair of pressure-rolls, substantially as described.

2. The method of producing designs in relief upon cylindrical surfaces, adapted to emboss the reverse of said designs in metal, wood, or ivory, by first engraving or sinking the design into the surface of a soft flat plate or ribbon of steel, tempering or hardening said plate or ribbon, passing said plate or ribbon, with its engraved surface in contact with a similar plate or ribbon of soft steel, between a pair of smooth pressure-rolls, to produce upon said soft-steel plate or ribbon the reverse of said design in relief, bending said relief plate or ribbon into the form of a circular hoop or segment, tempering said hoop or segment, and then securing said hoop or segment to the periphery of a cylinder, substantially as described.

Executed at Boston, Massachusetts, this 10th day of August, 1877.

JOHN P. JAMISON.

Witnesses:

N. C. LOMBARD,

JOSIAH W. HUBBARD.