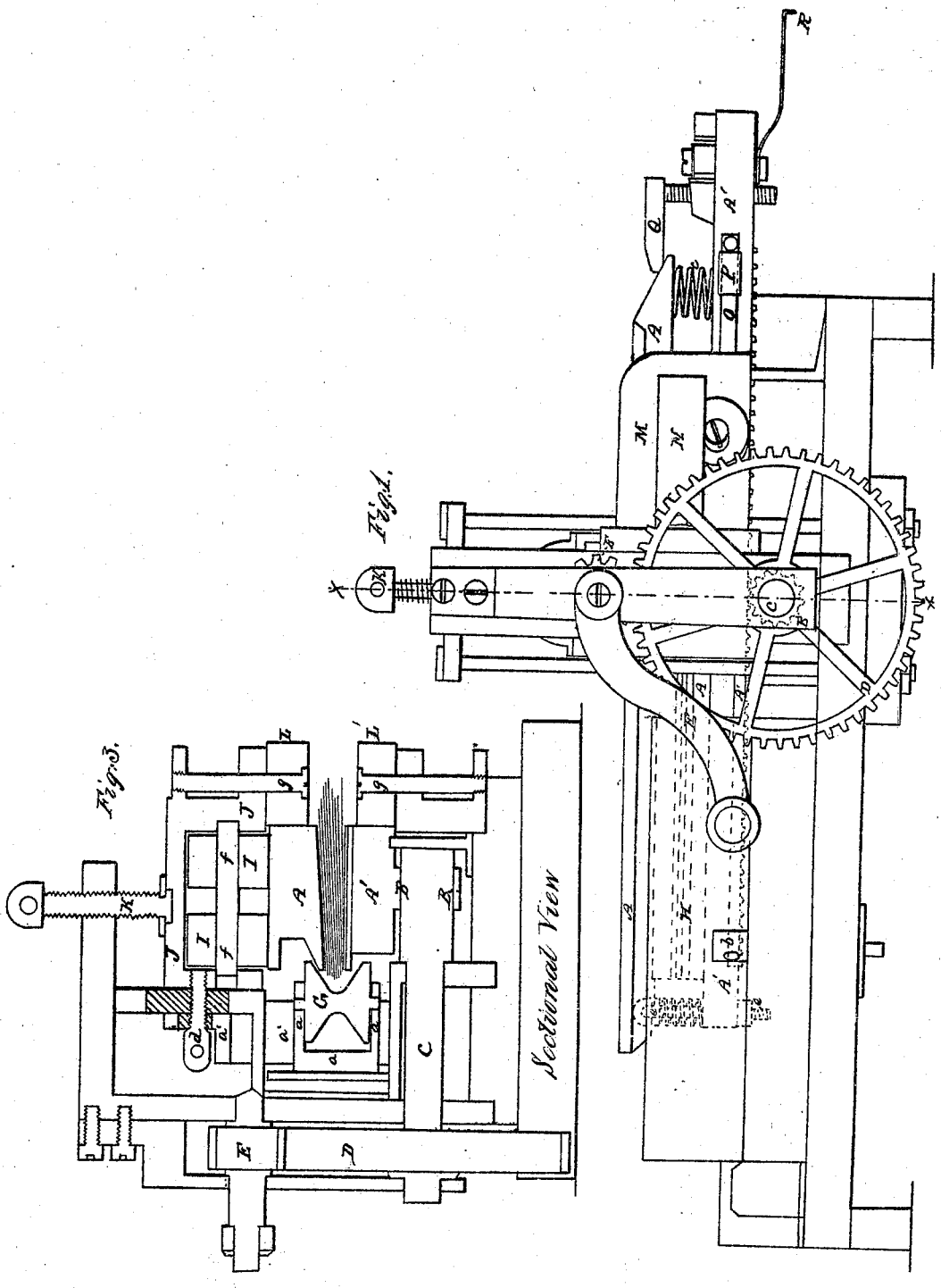
W. Laighton. Sheet 1. 2 Sheets.

Book-Binding Mach.

No. 3880. Patented Jan. 10. 1845.



W. Laighton. Sheet 2. 2 Sheets.

Book-Binding Mach.

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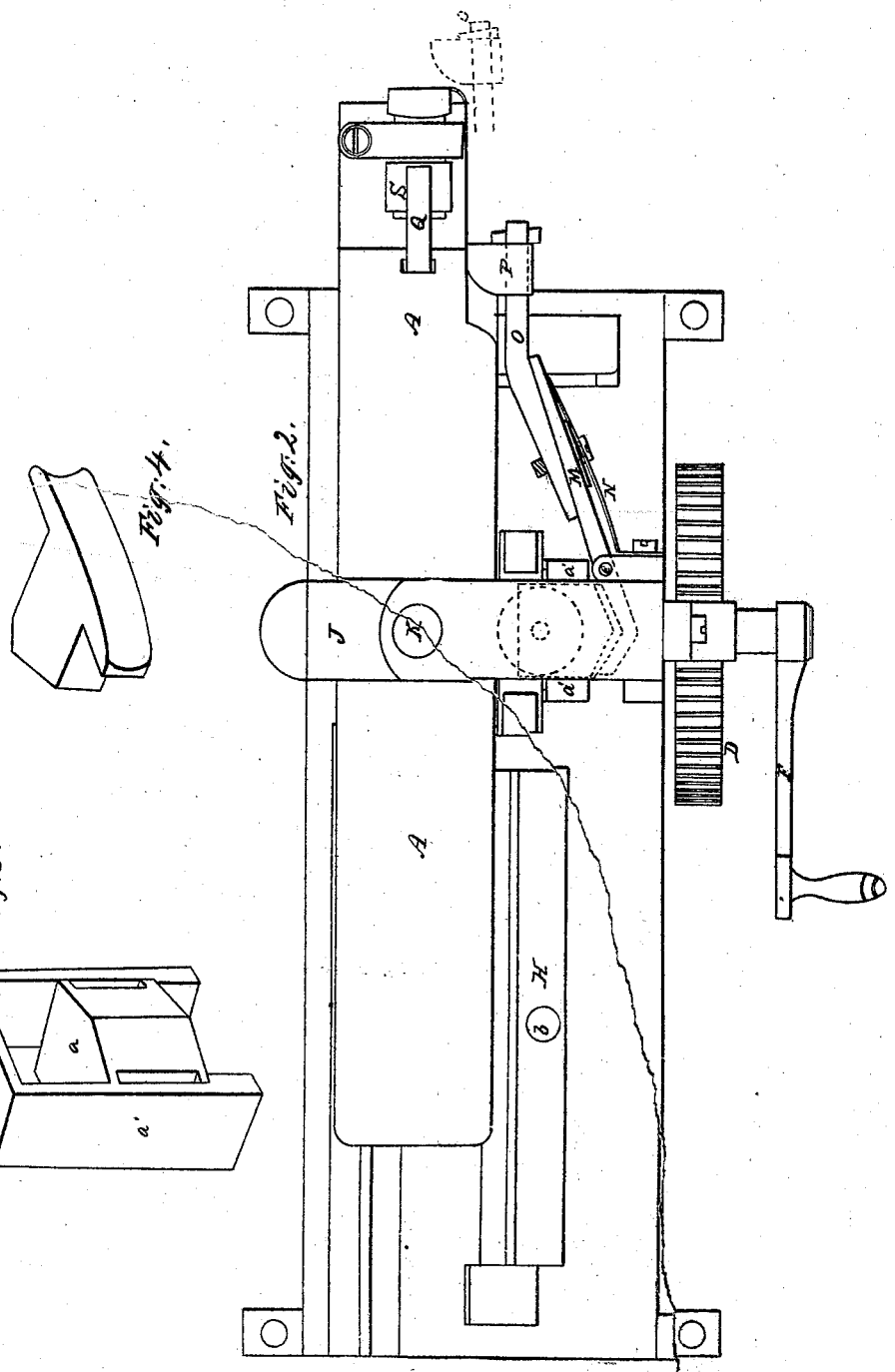

UNITED STATES PATENT OFFICE.

WILLIAM LAIGHTON, OF PORTSMOUTH, NEW HAMPSHIRE.

MACHINE FOR BACKING BOOKS.

Specification of Letters Patent No. 3,880, dated January 10, 1845.

To all whom it may concern:

Be it known that I, WILLIAM LAIGHTON, of Portsmouth, in the county of Rockingham and State of New Hampshire, have invented a new and useful machine by means of which the operation in the art of bookbinding that is denominated "backing" is performed with great facility and in a manner more perfect than can be effected in the ordinary way; and I do hereby declare that the following is a full and exact description thereof.

The operation of backing consists in giving that roundness, or convexity, to the back of the book which is necessary to prepare it for the reception of the covering of leather, or other material. This process is usually performed by confining the book, after it has been stitched and cut, between suitable boards, or plates of metal, which are pressed firmly together by means of screws, and the back is then hammered into the desired form. In my machine, the book to be backed is confined between two plates, or jaws, of iron which are made to clasp it firmly, as between the jaws of a vise; and these plates are so arranged as when closed to constitute a carriage, which, by means of a rack and pinion, is moved on in a straight line, so as to bring the back of the book against a roller, or against a block of iron, or other metal; when a roller is used, it is made hollowing, or concave, on its periphery and is so adjusted as to force the back of the book to assume the desired convex form, leaving it perfectly straight from end to end, and giving to it an equal convexity in all its parts. When, instead of the concave roller above named, I use a block of iron, or of other metal, which is made to occupy the place of the roller, said block has that side of it which is toward the back of the book made concave, or hollowing, lengthwise, and the back of the book as it passes along being made to press against this block, receives the desired form; this latter manner of forming the instrument possesses some advantages over the roller, and will, probably, be generally preferred.

In the accompanying drawings, which show the machine of half the size of one suitable for octavos, Figure 1, is a side elevation of it; Fig. 2, a top view thereof, and Fig. 3, a vertical cross section of it, in the line *x*, *x*, of Fig. 1.

A, A, are what I call the backing irons, which consist of two jaws of iron that are to receive the book between them, and are to hold it, as in the jaws of a vise. The lowermost of these jaws, A′, has rack teeth on its under side, into which the teeth, B, of a pinion, Fig. 3, engage, so as to move the jaws and book back and forth. This pinion is on the shaft, C, of a cog wheel, D, that is driven by a pinion E, by means of the wrench, F. The two jaws of the backing irons are hinged together at their rear end, but the hinge joint is attached to a sliding pin that allows the jaws to be placed at any desired distance apart, while they preserve their parallelism to each other, by which they are allowed to take in books of different thicknesses. The red lines, shown in the section, Fig. 3, represent a book between the backing irons. The rack teeth on the jaw A′, with the pinion B, working into them are shown by dotted lines in Fig. 1; as is also the manner of hinging the jaws together by the sliding pin *c*, *c*.

G, is the backing roller which revolves on gudgeons in a frame, or box, *a*, *a*, that is received within a box, or frame, *a′*, *a′*, and may be removed at pleasure, so as to change the roller, or block. The box, *a*, and that in which contains it are shown in Fig. 5, which is a back view of them.

Fig. 4, represents the metal block which may be used instead of the roller; of these rollers, or blocks, there may be three or four of different sizes, to each machine, which will suffice for books of nearly all thicknesses; as a roller, or block, of about an inch thick will answer for the thinnest book, or for one nearly an inch in thickness.

H, is a gage piece to regulate the distance that the back of the book shall project from the jaws, and enables the operator to place it accurately; this gage piece is held in place by a set screw, *b;* a spiral spring, *c*, may be placed between the jaws at each of their ends, to hold them apart.

I, I, are two rollers that revolve on a shaft P, P, and press upon the upper jaw, A, and hold it down as the backing is effected. These rolers are contained in a sliding frame, J, J, that may be raised, or lowered by means of a screw, K. To this frame is also attached a roller, L, that bears against the outer edge of the upper jaw, A and another roller, L′, pressing, in

like manner, against the lower jaw, so as to bear the book up against the roller, or block, by which it is to be backed; these rollers revolve on bolts, or gudgeons *g*, *g*. The place of the backing roller, or block, must be changed, to adapt it to the thickness of the book that is to be operated on, and this may be done by means of a set screw, *d*, Fig. 3, which confines the case, *a'*, *a'*, at the height at which it may be placed.

When a book is to be backed, were its end brought up directly against the backing roller, it would be unduly pressed down and bruised, and to prevent this, the roller is removed back until the end of the book, which would first come into contact with it, has passed beyond its center, and this withdrawing of the roller I effect in the following manner.

M, is an iron plate, or flat lever, which works on a joint pin at *e*, and has a spring, N, bearing against its back; to this plate is attached an arm, O, that is to press against, and to be acted upon by, the jaws, A. The short end of the flat lever, M, bears against the roller box, *a*, *a*, or against the block used instead thereof, and forces it forward by the action of the jaws on the arm, O; in the position in which this arm is represented in the drawing, the backing roller, or block, would be forced up, by the lever M, against the book, the jaws having advanced sufficiently far for that purpose; but if the jaws were less advanced, the arm, O, might be in the position shown by the dotted lines ○, and the backing roller would then be withdrawn from the back of the book, but would be brought up against it when the jaws, by advancing, acted against the piece P, at the end of the arm O. The piece P, is capable of sliding freely back and forth on the arm, O, and as the jaws travel backward, the friction of the piece P, against their edge, causes it to slide inward upon the arm, and the roller, which had been withdrawn from the end of the book, as above stated, is, consequently, kept in contact with its back, until it has operated upon said end, and the backing is thereby perfected.

Q, is a catch that may be made to bear upon the fore end of the upper jaw, A, serving to hold it down before it enters under the rollers I, I; it is attached to a sliding piece S, in the end of the jaw, and it is drawn back, so as to disengage it, by the hooked piece, R, coming into contact with the bed of the machine when the jaws are fully retracted, there being a mortise through the jaw to allow the sliding piece to move back and forth.

Having thus fully described the nature and construction of my machine for backing books in the process of binding, what I claim therein as new, and desire to secure by Letters Patent, is—

The manner herein described of causing the backs of such books to be carried along against a fluted roller, or a block of metal, while they are confined between the jaws of what I have herein denominated the backing irons, the respective parts of said machine being arranged and operating substantially as herein fully made known.

WILLIAM LAIGHTON.

Witnesses:

THOS. P. JONES,

WILLIAM RIDER.