3 Sheets—Sheet 1.

H. SPRINGBORN & C. H. BAUSH.

CLOTH FINISHING MACHINE.

No. 193,193. Patented July 17, 1877.

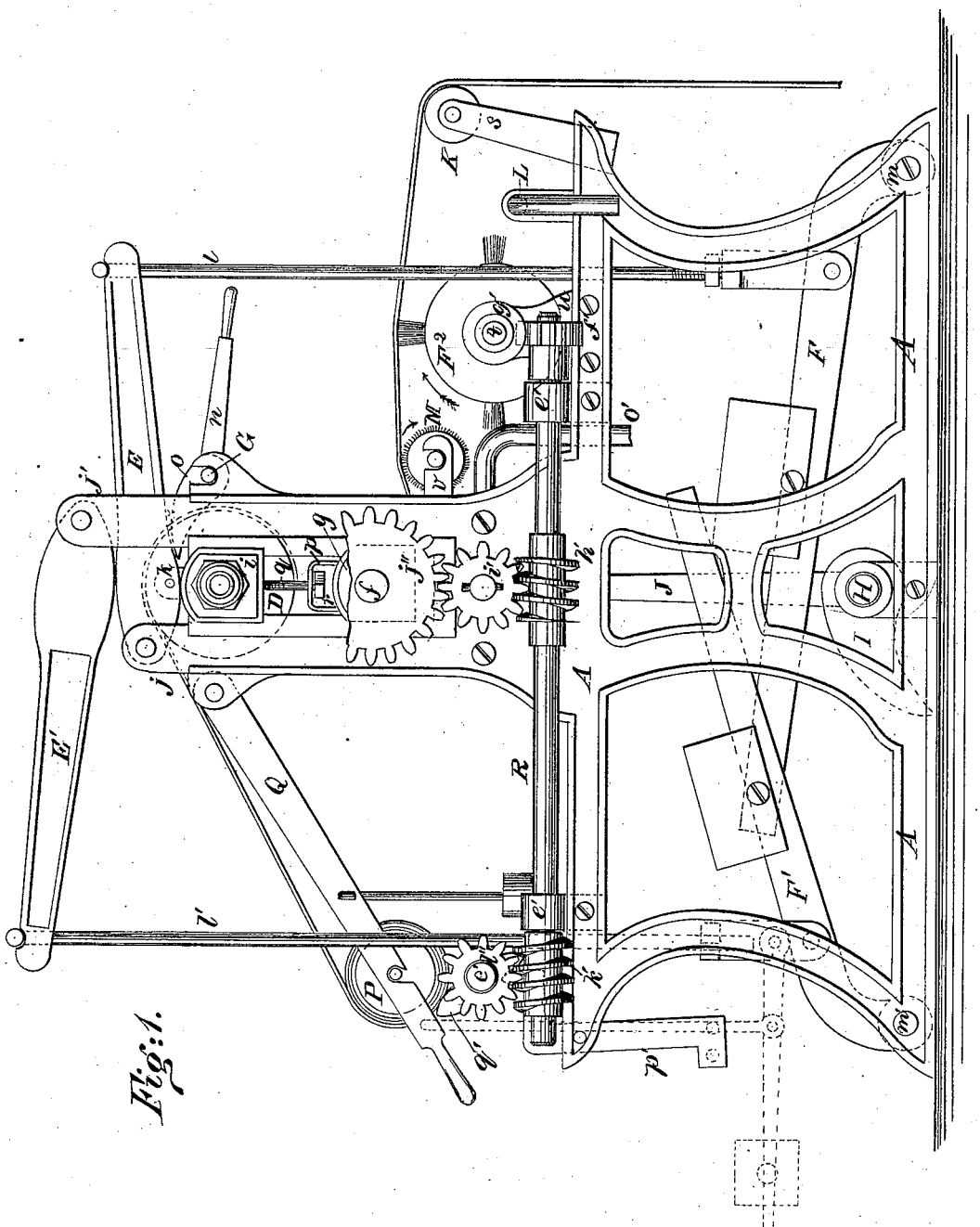

Fig: 1.

WITNESSES:

Chas. Nida

J. H. Scarborough.

INVENTORS

H. Springborn.

BY C. H. Baush.

Munn & Co

ATTORNEYS.

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Fig: 2.

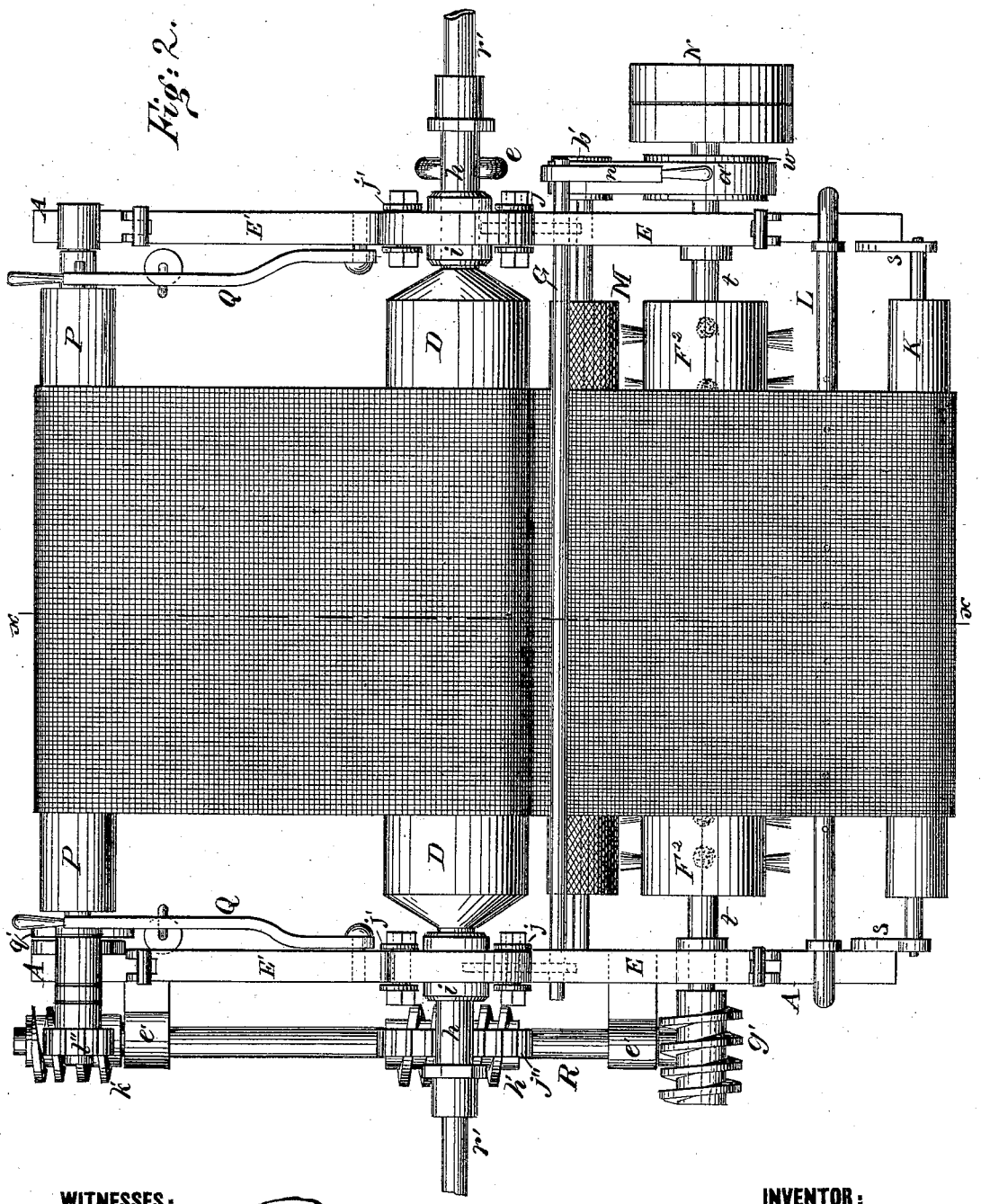

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Fig. 3.

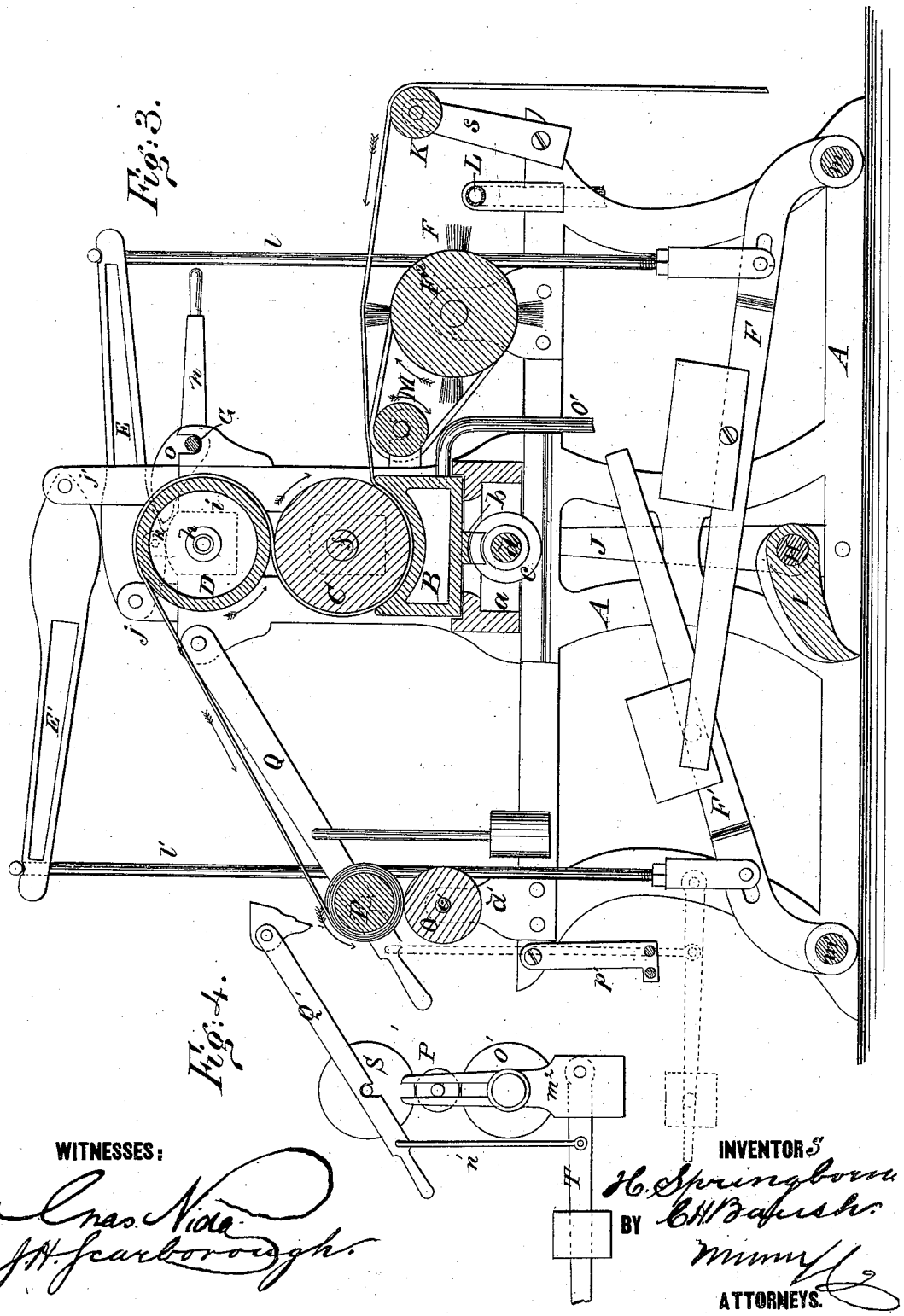

Fig. 4.

WITNESSES:

Chas. Nida

J. H. Scarborough.

INVENTORS

H. Springborn

C. H. Baush.

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

HERRMAN SPRINGBORN AND CHRISTIAN H. BAUSH, OF HOLYOKE, MASS.

IMPROVEMENT IN CLOTH-FINISHING MACHINES.

Specification forming part of Letters Patent No. **193,193**, dated July 17, 1877; application filed February 26, 1877.

To all whom it may concern:

Be it known that we, HERRMAN SPRINGBORN and CHRISTIAN H. BAUSH, of Holyoke, in the county of Hampden and State of Massachusetts, have invented a new and Improved Cloth-Finishing Machine, of which the following is a specification:

Figure 1 is a side elevation; Fig. 2 is a plan view. Fig. 3 is a transverse section on line *x x* in Fig. 2. Fig. 4 is a detail view of a modified form of a part of the machine.

Similar letters of reference indicate corresponding parts.

Our invention relates to machines for finishing woolen cloth; and it consists in the combination of a perforated steam-pipe for directing jets of steam against the surface of the cloth as it enters the machine; a rotating brush and a plush roller for brushing and finishing the surface of the cloth; a heated stationary bed and a roller fitted to the same, for hot-pressing the cloth; a hollow roller, through which passes a current of cold air or water for cold-pressing; a device for rolling, and also a device for folding, the cloth.

The object of the invention is to provide a machine that will at one operation dampen, brush, hot and cold press, and roll or fold the cloth, or perform a part only of these operations, as may be required.

Referring to the drawing, A is the frame of the machine, having a cross-piece, *a*, to which is fitted a hollow concave bed, B, which is capable of sliding longitudinally in the cross-piece *a*.

A rack, *b*, is attached to the under surface of the concave bed B, and projects downward through a slot in the cross-piece, and is engaged by a worm, *c*, placed on the shaft *d*, having the hand-wheel *e*.

C is a solid roll that fits the concavity of the bed B, and whose shaft *f* is journaled in boxes *g*, placed in vertical slots in the frame A.

D is a hollow roll placed above the roll C, and whose shaft *h* is tubular, and is journaled in boxes *i*, which are also placed in the vertical slots in the frame A.

E E are levers that are pivoted to ears *j*, that project upward from the frame A. These levers rest upon the boxes *i*, and are recessed to receive ears *k*, (shown in dotted lines,) that project upward from the said boxes. A pin passes through the lever and through the ear *k*, making a connection by which the boxes *i* are lifted when the levers E are raised.

The end of the long arm of the lever E is slotted to receive a rod, *l*, and is notched to receive the T-head of the said rod. The lower end of the rods *l* are connected with weighted levers F, that are fulcrumed on the rod *m*, that holds the side pieces of the frame A together.

Levers E′ are fulcrumed in ears *j′*, that project upward from the frame A, at the sides of and beyond the levers E. The levers E′ bear upon the levers E, and project in the opposite direction from the said levers E, and are connected by rods *l′* with weighted levers F^1, which are fulcrumed on the rods m^1, that connect the side pieces of the frame of the machine.

G is a shaft journaled in the frame A, and provided with the lever *n* and the cams *o*, that, when turned, raise the levers E.

A stirrup, *p*, is attached to the upper side of the boxes *g*, and a stud, *q*, projects downward through the stirrup, where it is provided with an adjusting-nut, *r*.

H is a shaft journaled in the lower part of the frame A, and provided with cams I, for raising the levers F F^1, and with a lever, J, by which it is turned.

K is a roller, whose shaft is journaled in the posts *s* at the front of the machine, and L is a perforated steam-pipe that runs transversely across the frame A.

A cylindrical brush, F^2, having very firm bristles, is secured to the shaft *t*, which is journaled in standards *u*, that project upward from the sides of the frame A.

M is a plush-covered roller, that is placed between the brush F^2 and the bed-piece B, and whose shaft is journaled in the brackets *v*, that project from the vertical part of the frame A.

A pulley, N, is placed on the end of the shaft *t*, for receiving the belt that drives the machine, and a pulley, *w*, is secured to the shaft *t*, for driving the plush-covered roll M by a belt, *a′*, which runs over a pulley, *b′*, placed on the shaft of the said roll.

O is a roll, whose shaft *c′* is journaled in

the standards d', attached to the frame at the rear of the machine, and P is a perforated hollow metallic roll, that is journaled in weighted levers Q, which are pivoted to the vertical part of the frame A.

A shaft, R, is placed at right angles to the other shaft of the machine, and is journaled in brackets e', that project from the sides of the frame A. Upon this shaft a pinion, f', is placed, which is revolved by a worm, g', secured to the shaft t.

Motion is imparted to the roll C by the worm h', placed on the shaft R, that engages an intermediate pinion, i', that meshes into the spur-wheel j'', placed on the shaft f of the said roll. The roll O is turned by the worm k', that engages the pinion l'', secured to the shaft c'.

A screw is placed under each of the boxes g, which supports the roll C, and prevents it from coming into contact with the bed-piece B when the cloth runs out of the machine.

The modification shown in Fig. 4 is designed to produce more pressure upon the perforated roll P than can be produced by the device shown in the other figures. In this figure, m^2 m^2 are slotted standards secured to the frame A, in which is journaled the driving-roll O', and in the slots of which the journals of the perforated roll P' revolve.

S is a pressure-roll that is journaled in the levers Q', and rests upon the roll P'. A weighted lever, T, is pivoted to the standards m^2, and connected with the lever Q' by the rod n'. p' is the ordinary folding device, which is moved by cams q' on the shaft c'.

The operation of the machine is as follows: The unfinished cloth is taken over the roll K, and over the brush F^2 and plush roll M, between the roll C and bed B, and between the rolls C D, whence it passes to the perforated roll P. Steam is taken into the pipe L, the perforations of which direct it against the under surface of the cloth. Steam is also taken into the bed-piece B through the pipe o'. The brush F^2 and the plush roll M rotate in the direction indicated by the arrows, and as the cloth is slowly drawn through the machine the rapidly-moving brush and plush roll finish the surface of the cloth, and lay the nap before it is pressed between the roll C and the heated bed B.

The cloth, after being hot-pressed between the roll C and bed B, is cold-pressed between the roll C and the roll D, the latter being cooled by a current of cold water or air passing through the pipes r' and hollow journals h.

The cloth, after the cold-pressing, is wound upon the perforated roll P, and is afterward "dry-steamed," in the usual way. If the cloth, after leaving the roll D, is not sufficiently dry, a fan may be placed between the rolls D and P, for creating a current of air to carry away the moisture.

If, during the passage of the cloth through the machine, it is at any time necessary to remove the pressure from it, the rods l l' may be disengaged from the levers E E', after raising the weighted levers F F^1 by means of the cams I, when the levers E, and, by virtue of their connection with the boxes i, the roll D also, may be raised by turning the cams o by means of the lever n. When the roll D is raised, so as to clear the cloth, the nuts r on the studs q, strike the stirrups p and raise the boxes g and with them the roll C, so that the cloth is nowhere subjected to pressure.

The bed B is adjustable lengthwise in the machine, and when a piece of cloth having heavy listing at its edges is passed through the machine, the bed may be placed so that the listing will pass at the ends of the bed, and not between the bed and the roll. By raising the rolls C D, by means of the hand-lever n, the machine may be used for brushing alone.

The folder p' is provided with an arm, which is engaged by the cam q' on the shaft of the roll O as the said roll is revolved. Each time the folder falls it makes a fold in the cloth.

The advantages claimed for our invention are, that the cloth is steamed, brushed, hot and cold pressed, and rolled up in one operation, thereby avoiding the use of press-paper and hydraulic presses, and also obviating shrinkage to a considerable extent.

A great saving of labor and time in handling the cloth is also effected.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. The combination, in a cloth-finishing machine, of the hollow bed B, solid roll C, and hollow roll D, substantially as herein shown and described.

2. In combination with roll C, the bed B, adjustable lengthwise on its foundation, as and for the purpose set forth.

3. The levers E, boxes i, having ears k, studs q, stirrup p, and boxes g, in combination, as shown and described.

HERRMAN SPRINGBORN.
CHRISTIAN H. BAUSH.

Witnesses:
J. G. MACKINTOSH,
E. A. RAMSAY.