

(No Model.)

2 Sheets—Sheet 1.

W. LEWIS.
BRUSH DRAWING MACHINE.

No. 445,855.

Patented Feb. 3, 1891.

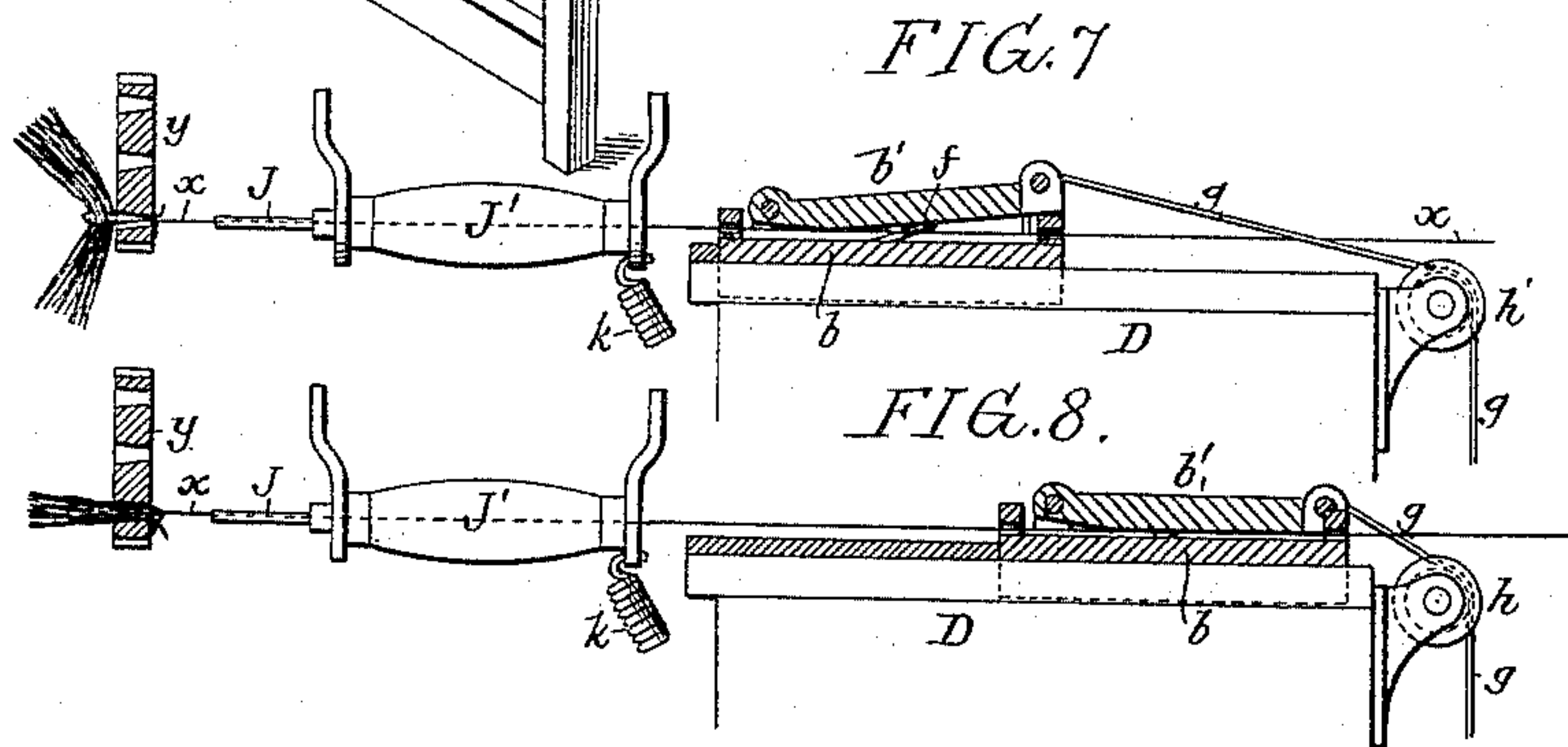
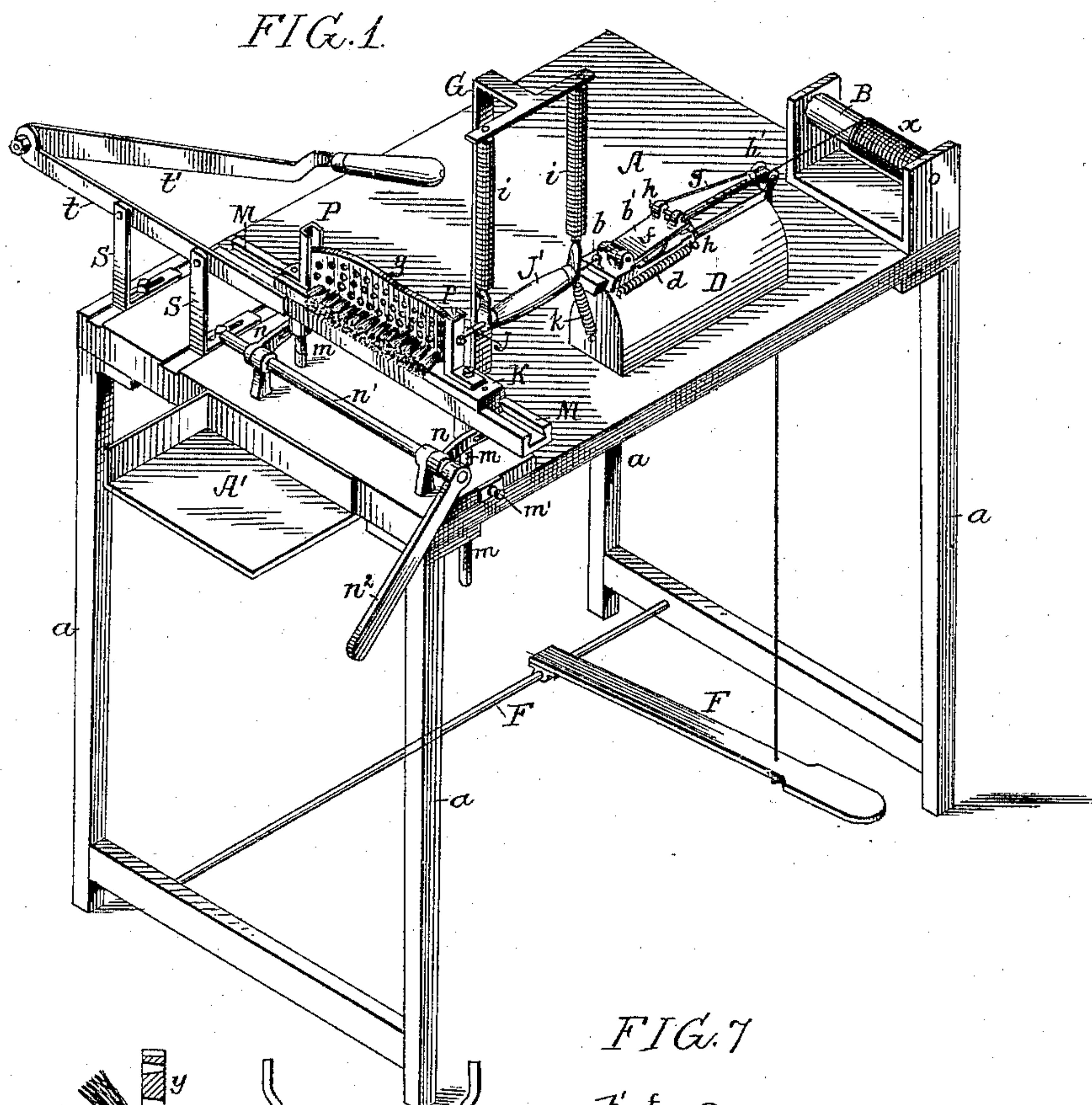
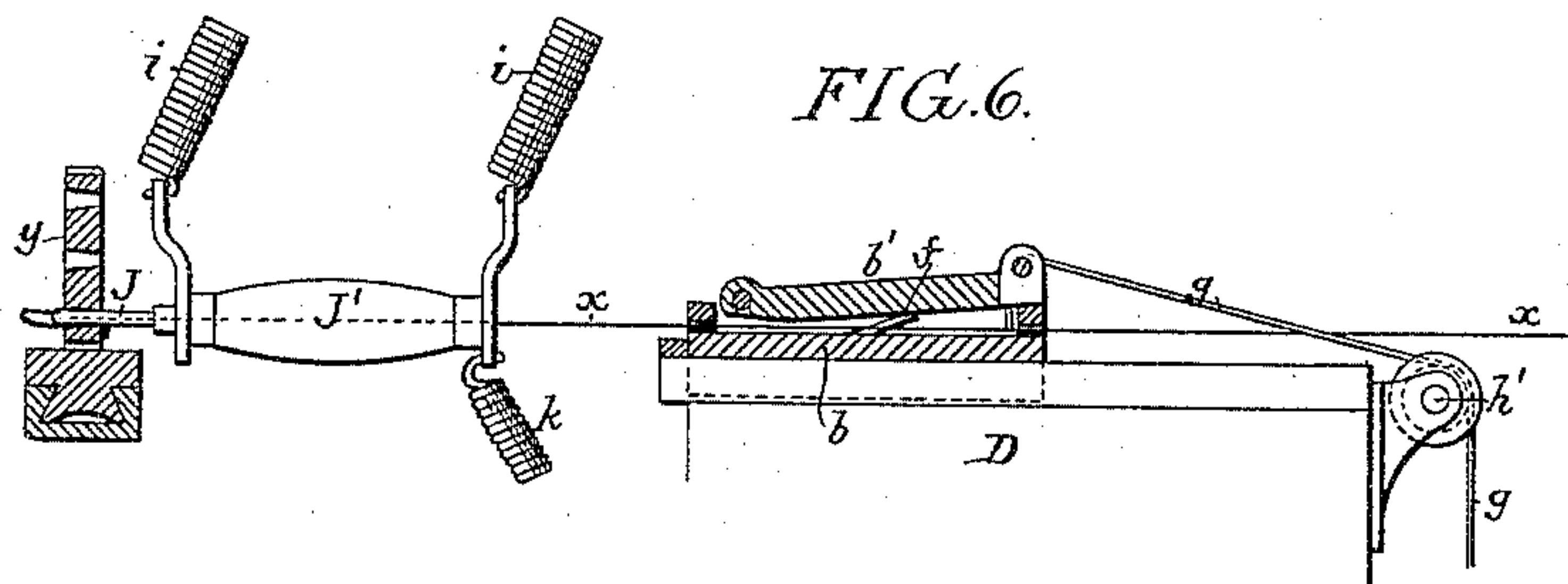
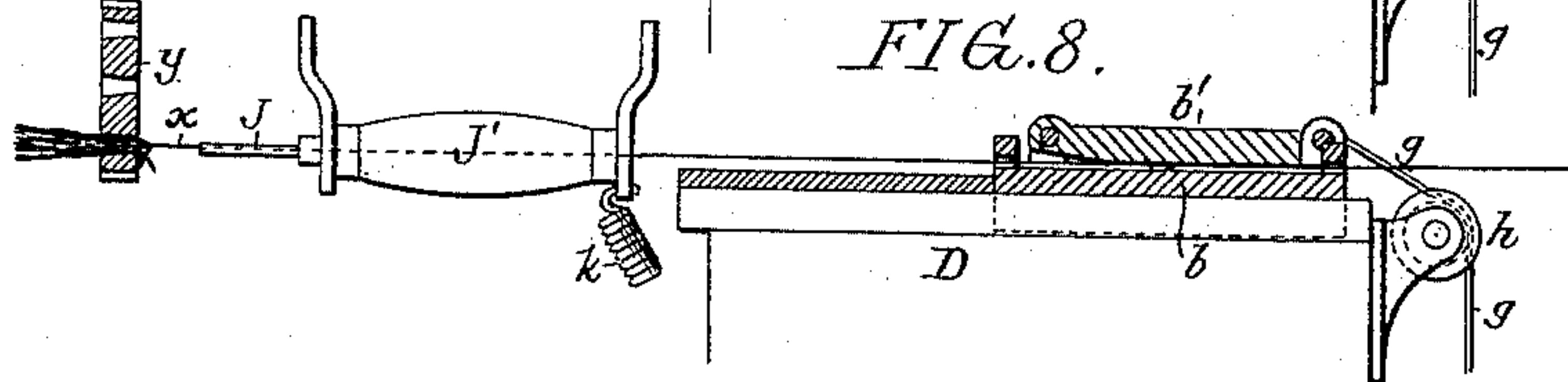


FIG. 8.



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(No Model.)

2 Sheets—Sheet 2.

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BRUSH DRAWING MACHINE.

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Patented Feb. 3, 1891.

UNITED STATES PATENT OFFICE.

WALTER LEWIS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO EDWARD L. RABORG, OF BALTIMORE, MARYLAND.

BRUSH-DRAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 445,855, dated February 3, 1891.

Application filed May 8, 1890. Serial No. 351,048. (No model.)

To all whom it may concern:

Be it known that I, WALTER LEWIS, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Brush-Drawing Machines, of which the following is a specification.

The object of my invention is to provide a simple and effective machine whereby knots or bunches of bristles may be drawn into the openings in a brush-block more securely and with greater rapidity than by the usual method of drawing them in by hand, provision being also made for shearing off each row of bristles as it is drawn into the block.

In the accompanying drawings, Figure 1 is a perspective view of a brush-drawing machine constructed in accordance with my invention. Fig. 2 is a longitudinal sectional view of part of the same on a larger scale. Fig. 3 is a transverse section, partly in elevation. Figs. 4 and 5 are enlarged sectional views of parts of the machine, and Figs. 6, 7, and 8 are diagrams illustrating the operation of the machine.

A represents a table mounted upon suitable legs *a*, and having at one end a box *A'* for the reception of the bristles. At the other end of the table are bearings for a reel *B*, on which is wound the wire *x*, whereby the bunches or knots of bristles are secured to the brush-block *y*. Mounted upon the table in advance of this reel is a block *D*, and on the latter is a movable vise consisting of a plate *b*, free to slide longitudinally on guides on the block *B*, and having pivoted to its upper side a plate *b'*, which constitutes the movable jaw of the vise. The slide *b* is normally held in a position at the front end of the block *D* by means of springs *d*, and the upper or clamping plate *b'* of the vise is raised by means of springs *f*, inserted between the same and the slide *b* at the opposite sides of the latter. Connected to said slide, however, are cords or straps *g*, which pass over lugs or projections *h* at the free end of the plate *b'*, thence over a guide-roller *h'* at the end of the block *D*, and thence down through an opening in the table *A* to the treadle *F*, which is hung to a rod *F'* at the rear of the support-

ing-frame. It will be seen, therefore, that while the normal position of the vise is that represented in Figs. 1 and 2—that is to say, with the slide *b* at the front end of the block *D* and the clamping-plate *b'* elevated—pressure upon the treadle will cause the depression of said clamping-plate, so as to cause it to grip the wire *x*, passed between the same and the plate *b*, the vise being then caused to move rearward on the block *D*, so as to impart draft to the wire.

In advance of the block *D* is a standard *G*, from which is suspended by means of a pair of springs *i* a hollow needle *J*, which has a suitable handle *J'*, whereby it may be readily manipulated, this needle being normally held in a retracted position by means of a spring *k*.

In advance of the needle is a slide *K* for carrying the brush-block *y*, this slide being mounted upon and guided transversely on a bar *M*, which has legs *m*, passing through openings in the table *A*, the bar being acted upon by arms *n* on a rock-shaft *n'*, mounted in bearings on said table and having an operating arm or handle *n''*, so that said bar *M* and its slide can be raised and lowered, one of the legs *m* of the bar being notched for engagement with a spring retaining-bolt *m'*, so that the bar may be supported in any desired vertical position. (See Fig. 3.) The slide *K* is provided with opposite clamps *P* for receiving and retaining the ends of the brush-block *y*, these clamps being adjustable longitudinally on the slide *K* to adapt them to blocks of different lengths, and one flange of each clamp being adjustable laterally, as shown in Fig. 5, so as to adapt the clamps for the reception of blocks of different thicknesses.

Mounted on a table *A* so as to be adjustable longitudinally thereon and in a direction transversely to the movement of the slide *K* are a pair of standards *S*, which carry the lower fixed blade *t* of a pair of shears, the upper or movable blade *t'* of which is pivoted to the fixed blade at its outer end and has at the inner end a suitable operating-handle *t''*.

The operation of the device is as follows: The brush-block having previously been prop-

erly bored for the reception of bristles is adapted to the clamps P, and the bar M is adjusted vertically, so as to bring the lowest row of openings in line with the needle J.

5 The wire x is then drawn from the reel B and passed between the plates $b b'$ of the vise, and thence through the hollow needle J, the front end of the wire being suitably secured to the brush-block. The operator grasps the
10 handle J' of the needle in the right hand and forces the needle through the first opening in the brush-block, so as to cause its front end to project some distance beyond said block, as shown in Fig. 6, the needle being
15 then retracted either by the motion of the hand or by releasing the handle J', so as to permit the spring k to retract it. The wire is not confined by the hollow needle, but passes freely through the same. Hence the retraction
20 of the needle does not withdraw the wire, but allows the same to remain projected beyond the brush-block in the form of a loop, as shown in Fig. 7. Meanwhile the operator has selected a bunch of bristles and in-
25 serts them into this loop so that they extend about equally on each side of the same, and this being done, pressure is applied to the treadle F, which has the effect of first closing the plates of the vise upon the wire
30 and then drawing the latter rearward, thus pulling the loop of wire and its knot of bristles into the opening in the brush-block, as shown in Fig. 8. Pressure is then removed from the treadle and the vise is first opened
35 and then drawn forward, so as to be in position for the next operation, and the needle J is passed through the next opening in brush-block, and so on, until the drawing of the brush has been completed, the block being
40 moved as desired by shifting the slide K or raising or lowering the bar M, so as to bring the openings in succession within range of the needle. There need not, however, be an ad-
45 justment of the block for every movement of the needle, as the flexible and elastic support for the latter permits it to move freely in all directions, so that a series of knots may be drawn before any readjustment of the brush-block becomes necessary.

50 A single spring may constitute the support for the needle, if desired, although the use of a pair of springs is preferred.

When a row of bristles has been drawn into the brush-block, the slide K may be moved so
55 as to carry said row of bristles between the shear-blades $t t'$, and the movable blade t' may be depressed so as to trim the projecting bunches or knots of bristles to uniform length, the adjustability of the standards carrying
60 the shears in respect to the bar M permitting the formation of knots or bunches of any desired length.

By use of a hollow needle J the formation of the successive loops of wire can be effected
65 with great rapidity, as the formation of a loop must necessarily follow the projection of the needle through an opening in the brush-block,

no particular care or skill on the part of the operator being required beyond that necessary in properly guiding the needle through the
70 opening.

The use of a vise operated by a treadle is also preferable to a hand-operated wire-pulling device, as it provides for the imparting of the necessary tension to the wire with ease
75 and without any liability of cutting or otherwise injuring the hand.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination, in a brush-drawing
80 machine, of a block-holder and a hollow needle through which the drawing-wire is passed without confinement, whereby on projecting the needle through an opening in the brush-block a projecting loop of wire will be formed
85 for the reception of the knot of bristles, which loop is not disturbed on the retraction of the needle, substantially as specified.

2. The combination, in a brush-drawing
90 machine, of a block-holder and a hollow needle with a flexible suspending device for said needle, whereby the latter is free to move in all directions in respect to the block, substantially as specified.

3. The combination, in a brush-drawing
95 machine, of a block-holder, a hollow needle, and a spring-support for the latter, substantially as specified.

4. The combination, in a brush-drawing
100 machine, of a block-holder, a hollow needle, a spring-support for the latter, and a retracting-spring therefor, substantially as specified.

5. The combination, in a brush-drawing
105 machine, of a block-holder, a looping-needle, a movable vise for the draw-wire, and a treadle connected to said vise, substantially as specified.

6. The combination, in a brush-drawing
110 machine, of a block-holder, a looping-needle, a movable vise for the draw-wire, a treadle for operating said vise, and a treadle-strap connected to the fixed plate of the vise and having a bearing upon the movable plate of the same, whereby on the depression of the
115 treadle the vise is first closed and then moved bodily on its guides, substantially as specified.

7. The combination, in a brush-drawing
120 machine, of the looping-needle with a brush-block holder consisting of a vertically-adjustable bar and a slide movable transversely thereon and having clamps for the brush-block, substantially as specified.

8. The combination, in a brush-drawing
125 machine, of the looping-needle with a block-carrier having vertical clamps with flanges for embracing the opposite ends of the brush-block, said flanges being adjustable laterally in respect to each other, substantially as specified.

9. The combination, in a brush-drawing
130 machine, of a brush-block holder, means for drawing knots of bristles into the same, a movable carrier for the holder, and a pair of shears mounted beyond the block-holder, but

in line with the movement of the same, substantially as specified.

10. The combination of the slide carrying the clamps for the brush-block, a bar on
5 which said slide is mounted, a rock-shaft having arms for acting on said bar to raise and lower the same, depending guided legs on the bar, and a retaining-bolt engaging with notches in one of said legs to retain the

bar in the desired vertical position, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WALTER LEWIS.

Witnesses:

EUGENE ELTERICH,
HARRY SMITH.