

(No Model.)

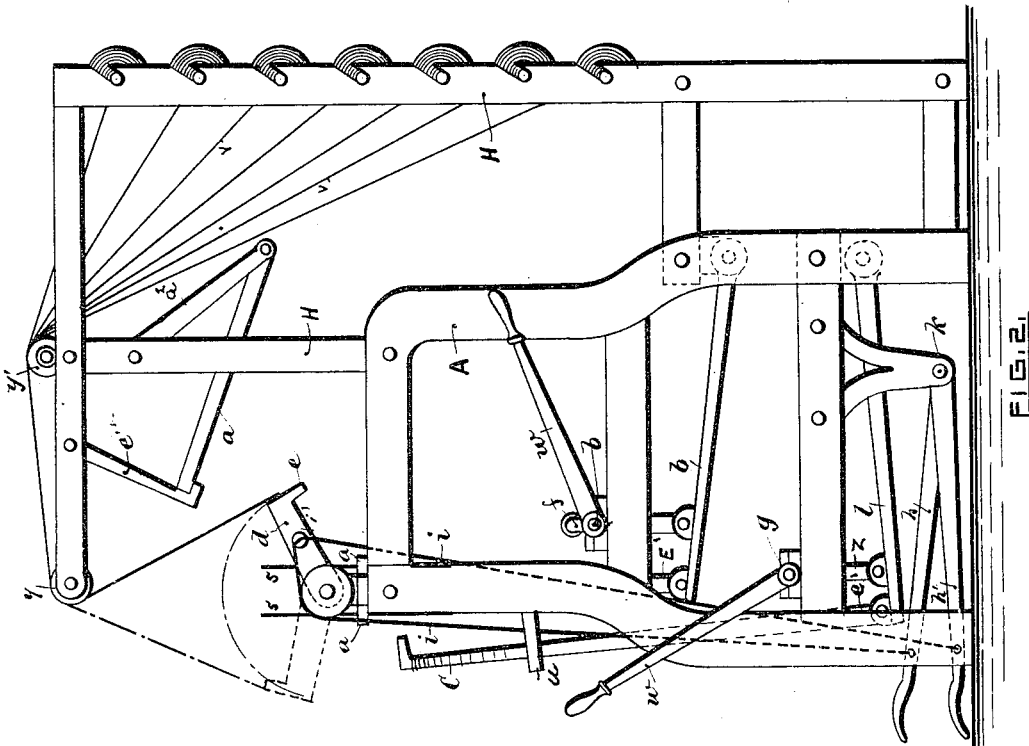
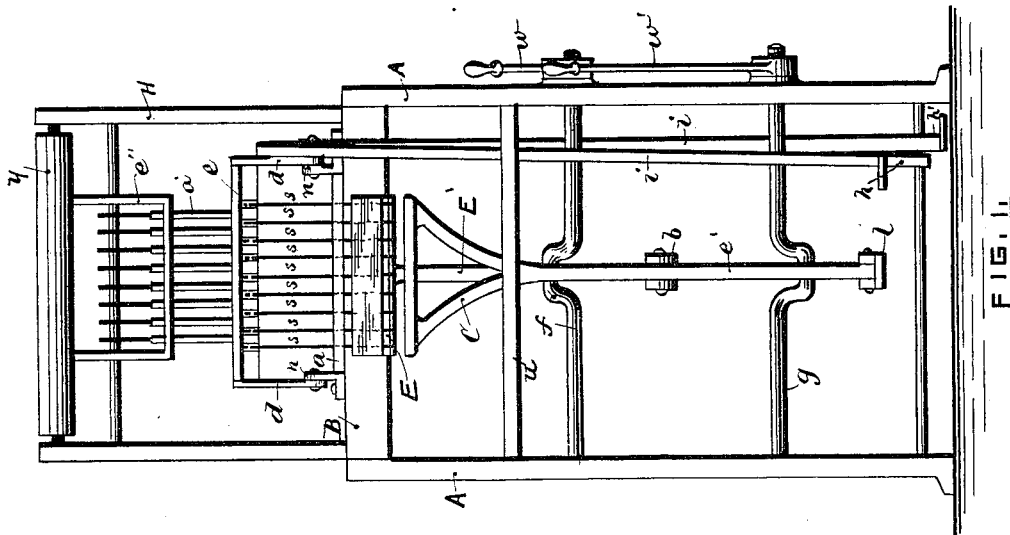
2 Sheets—Sheet 1.

J. EARNSHAW.

MACHINE FOR MAKING BRUSHES.

No. 344,361.

Patented June 29, 1886.



WITNESSES,

Jacob Holland
Benj. Arnold

INVENTOR,

John Earnshaw

(No Model.)

2 Sheets—Sheet 2.

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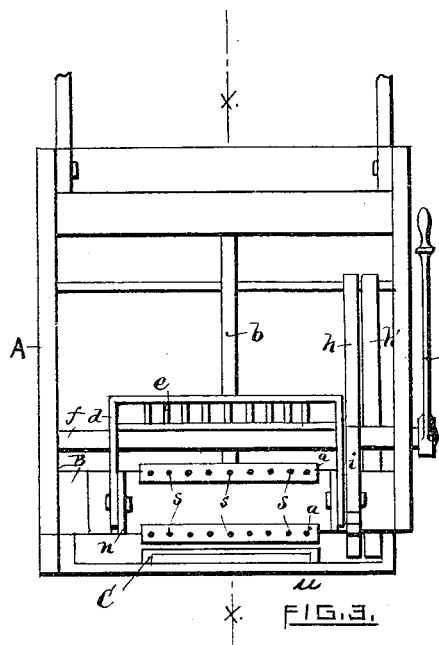


FIG. 3.

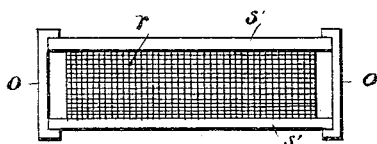


FIG. 5.

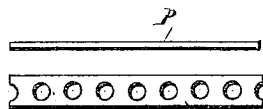


FIG. 6.

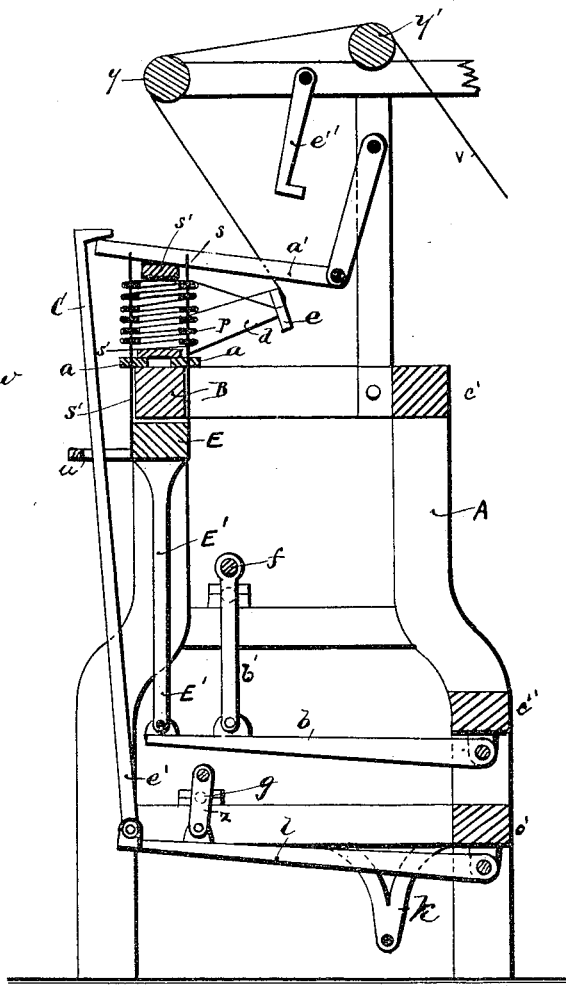


FIG. 4.

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MACHINE FOR MAKING BRUSHES.

SPECIFICATION forming part of Letters Patent No. 344,361, dated June 29, 1886.

Application filed March 31, 1885. Serial No. 160,756. (No model.)

To all whom it may concern:

Be it known that I, JOHN EARNSHAW, of Warwick, in the county of Kent and State of Rhode Island, have invented certain new and useful Improvements in Machines for Making Brushes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to that class of brush-machines used in making brushes of strands of coir or other suitable material, as described in my Letters Patent of the United States for improvements in brushes, No. 165,719, and is illustrated in the accompanying drawings.

Figure 1 shows a front elevation of the machine. Fig. 2 is an end elevation of the same. Fig. 3 is a top plan view of the machine without the creel and the rollers attached to it. Fig. 4 shows a vertical cross-section of the machine, taken through the line *xx* in Fig. 3. Fig. 5 shows the clamping-plates *s's*, and the end clamps, *oo*, inclosing a pair of brushes as they are when taken from the machine. Fig. 6 shows a top and edge view of one of the strips of wood used in making the brushes.

The frame of the machine consists of two end frames, *A A*, connected together by a beam, *B*, at the top in front, and the beams *c'*, *c''*, and *o'* at the back. The top beam, *B*, holds the devices immediately connected with forming the brushes. Two rows of vertical pins *s s* varying in number according to the size of the brushes to be made, are secured on each side of the block *E*, which is placed below the beam *B*, so that the pins shall pass up each side of or through the beam, and through the guide-plates *a a* on the top of the beam.

The distance between the two rows of pins *s s* is such as will contain the pile of two brushes laid face to face, as one brush is formed on each row of pins at one and the same time, the brushes being connected together in the middle, to be afterward separated by being cut apart, like double-pile fabrics. The distance of the pins *s* from each other in the rows is governed by the number of strands used in making the brushes.

The block *E*, holding the pins *s*, is connected

by a bar, *E'*, to a lever, *b*, pivoted at its back end to the beam *c''*, and a vertical motion is given to the block *E* and its pins *s* through the lever *b* by means of a connecting-rod, *b'*, and a crank on the rocker-shaft *f*, which is held in bearings on each end frame, and has a hand lever, *w*, made fast to it on the end outside of the frame, by which it is operated.

An angular frame, *d*, is suspended on pivots *n n*, held in stands made fast to the top of the beam *B* at each end of the rows of pins *s s*. This frame *d* is carried up high enough in the middle to swing over the pins in the direction of the front or back of the machine. (See dotted lines in Fig. 2.) A reed, *e*, is attached to the top of the frame, the dents of the reed agreeing in number and position with the pins *s* in the rows, so that the open spaces in the reed will correspond with those between the pins in the rows.

A swinging motion forward and back over the pins *s s* is given to the frame *d* by a strap, *i*, made fast in its middle to a stud, *v'*, in one side of the frame *d*. One part of this strap passing down outside of the beam *B* has its end attached to the treadle *h*, and the other part of the strap *i* passes down inside of the beam and has its end fastened to the treadle *h'*. The treadles *h* and *h'* have their rear ends pivoted on a bar held in the pendants *k*, fast to the end frames. *C* is a vertical iron frame, the upper part of which is made triangular, and the lower part a single bar, *c'*, extending down to the lever *l*, to the front end of which the lower end of the bar is pivoted. The top cross-bar of the frame *C* is bent over toward the machine, and a fender-bar, *u*, is carried across the front of the machine, outside of the frame, to keep it in place when not in use.

The frame *C* has a vertical motion, which it receives from a crank on the shaft *g*, through a connecting-bar, *z*, extending from the crank to the lever *l*, to which the bar *c'* is attached. A hand-lever, *w'*, is fastened on the outer end of the rocker-shaft *g*, for the purpose of moving the frame *C*.

A series of bars, *a'*, the same in number as the spaces between the pins *s* in the rows, are pivoted at their back ends to as many other bars, *a''*, which swing on a bar held in the standards that support the upper frame. The bars

a' are so arranged as to come between the pins $s s$ when they are brought forward, as shown in Fig. 4. When the bars a' are not in use, they are swung back, and their front ends raised and held up by the hook-bar e'' . A creel, H, is placed back of the machine to hold spools, on which the strands $v v$ are wound. The strands v are carried from the spools up over the rollers $y' y$, and then down to the reed e , and through the spaces between the pins $s s$, to the front of the machine, forming what may be called the "warp."

The operator, having previously placed one of the plates s' between the two rows of pins $s s$ underneath the strands, takes one of the strips of wood p , and placing it over the back row of pins s presses it down on the strands between them. The treadle h is then pressed down, which, by means of the strap i , draws the frame d over to the front of the machine, (see dotted lines, Fig. 2,) bringing the strands in the reed with it, and doubling the strands over the piece of wood p just put on the back pins. He now places another of the strips of wood p over the front row of pins and presses it down on the strands between them, and, changing the power to the treadle h' , draws down on the back part of the strap i , which throws the frame d over the pins toward the back, carrying the strands with it and doubling them over the strip of wood in front. This leaves the strands lying between the back pins ready for another strip of wood, as at first. These motions of the reed forward and back and the placing of the strips of wood are repeated until enough to form the proper width of the brush have been made. Then one of the plates s' is placed between the rows of pins on top of the strands, and the bars a' are unhooked, brought forward, and laid on the top plate s' between the pins $s s$. The frame C is then raised up and hooked onto the projecting ends of the bars a' , as shown in Fig. 4. The

operator then, by means of the hand-lever w' , turns down the crank on shaft g , and thereby depressing the lever l and frame C compresses the strands on the pins $s s$ together with great force. While in this position a clamp, o , is placed one on each end of the plates s' , and hooking over them, as shown in Fig. 5, to hold them together. The pressure is then removed by pushing back the hand-lever w' . The frame C is taken from the bars a' , which are swung back, raised, and secured by the hook-bar e'' . The hand-lever w' is then pulled forward, and the lever b is depressed by means of the crank on the shaft f , which draws down the block E, pulling the pins $s s$ out of the brushes formed on them. The pair of brushes are then removed, retaining the plates and clamps on them, to keep them in shape until they are bound and otherwise finished, as described in my patent aforesaid. In making brushes with flexible backs the strips of wood are left out, and strands passing around the pins $s s$ are inserted in place of them.

Having thus described my improvements, what I claim as my invention is—

1. In a machine for making brushes, the combination of the frame d , reed e , pins $s s$, and plate s' , substantially as and for the purpose set forth.

2. In combination with the frame d , reed e , pins $s s$, and plate s' , the block E, lever b , and shaft f , substantially as described, for the purpose specified.

3. The combination, with the frame d , reed e , pins $s s$, and plate s' , of the bar a' , frame C, lever l , and shaft g , substantially as described, and for the purpose set forth.

4. The frame d , reed e , pins $s s$, and plate s' , in combination with the strap i , and treadles $h h'$.

JOHN EARNSHAW.

Witnesses:

BENJ. ARNOLD,
JAMES HOLLAND.