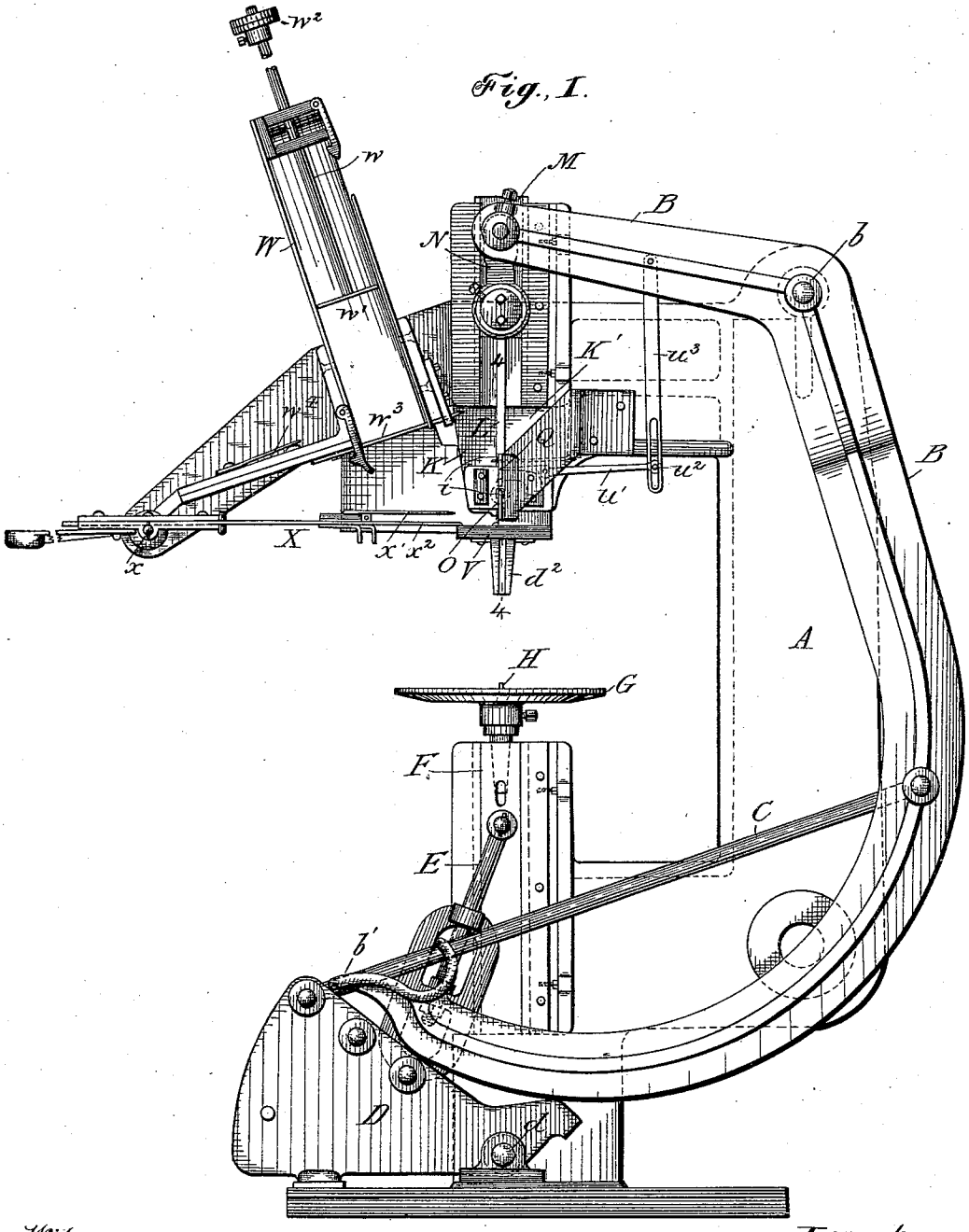
(No Model.) 6 Sheets—Sheet 1.

McCLINTOCK YOUNG.

BRUSH MACHINE.

No. 530,152. Patented Dec. 4, 1894.

Fig. 1.



Witnesses
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W. A. Kennedy

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By Phil T. Dodge
Atty.

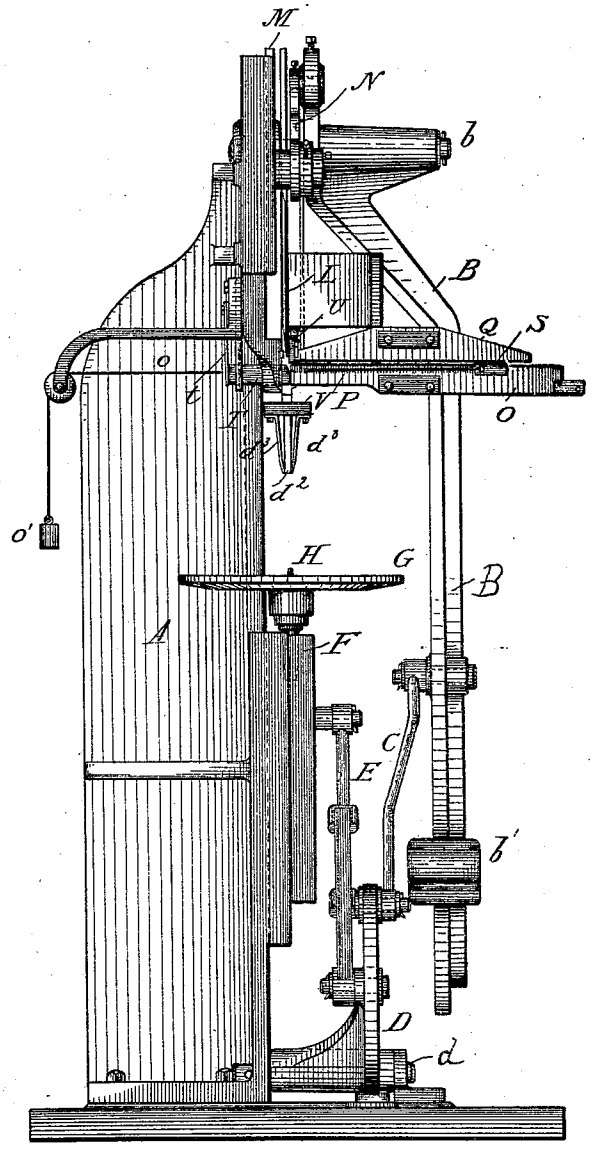
(No Model.) 6 Sheets—Sheet 2.

McCLINTOCK YOUNG.

BRUSH MACHINE.

No. 530,152. Patented Dec. 4, 1894.

Fig. 2.



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(No Model.) 6 Sheets—Sheet 3.

McCLINTOCK YOUNG.

BRUSH MACHINE.

No. 530,152. Patented Dec. 4, 1894.

Fig. 3.

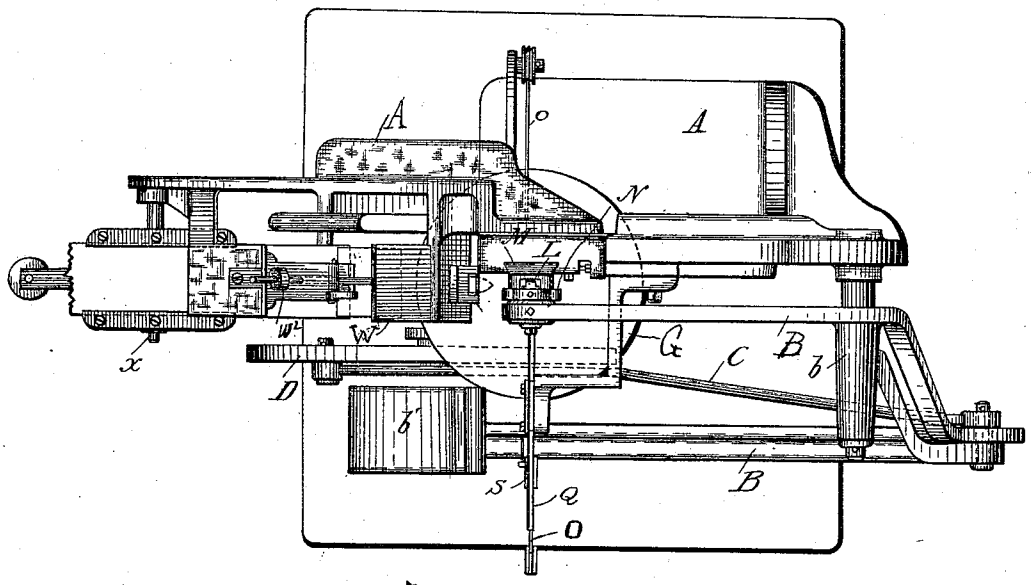
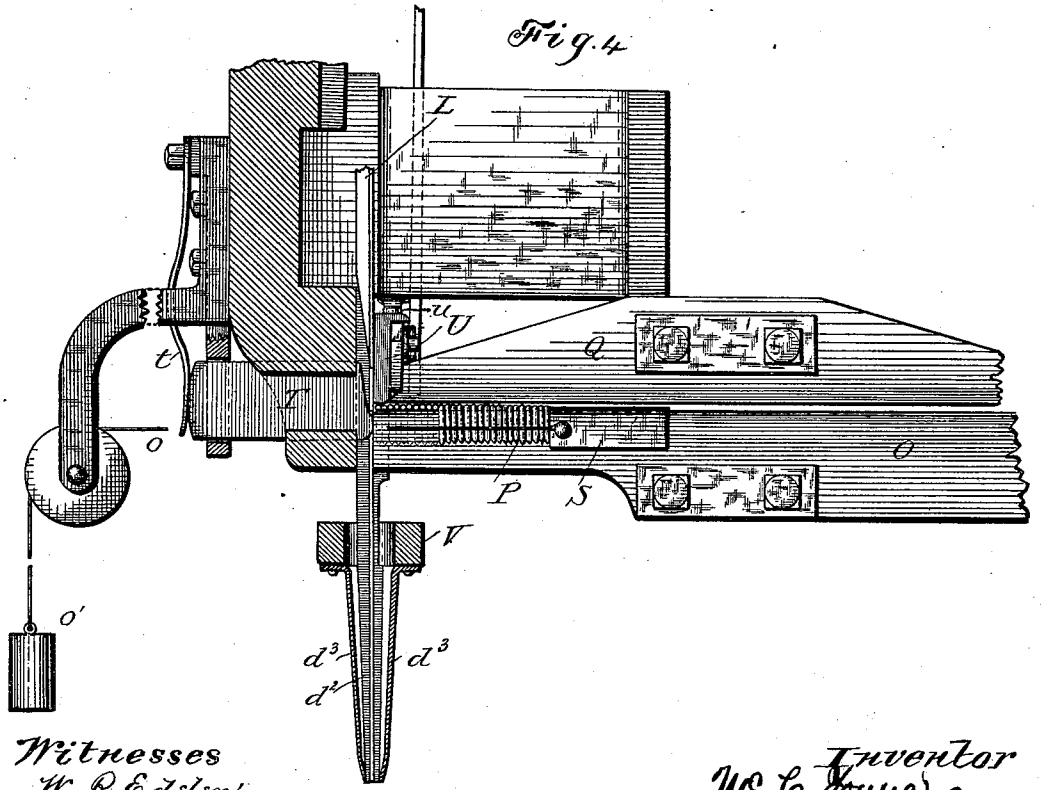


Fig. 4.



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(No Model.) 6 Sheets—Sheet 4.

McCLINTOCK YOUNG.

BRUSH MACHINE.

No. 530,152. Patented Dec. 4, 1894.

Fig. 6.

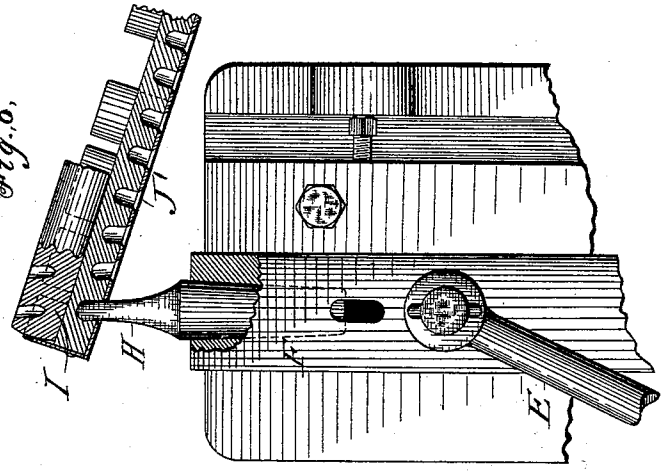


Fig. 7.

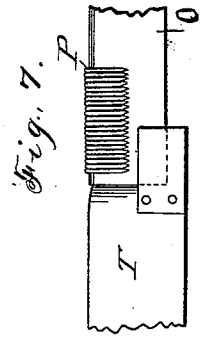
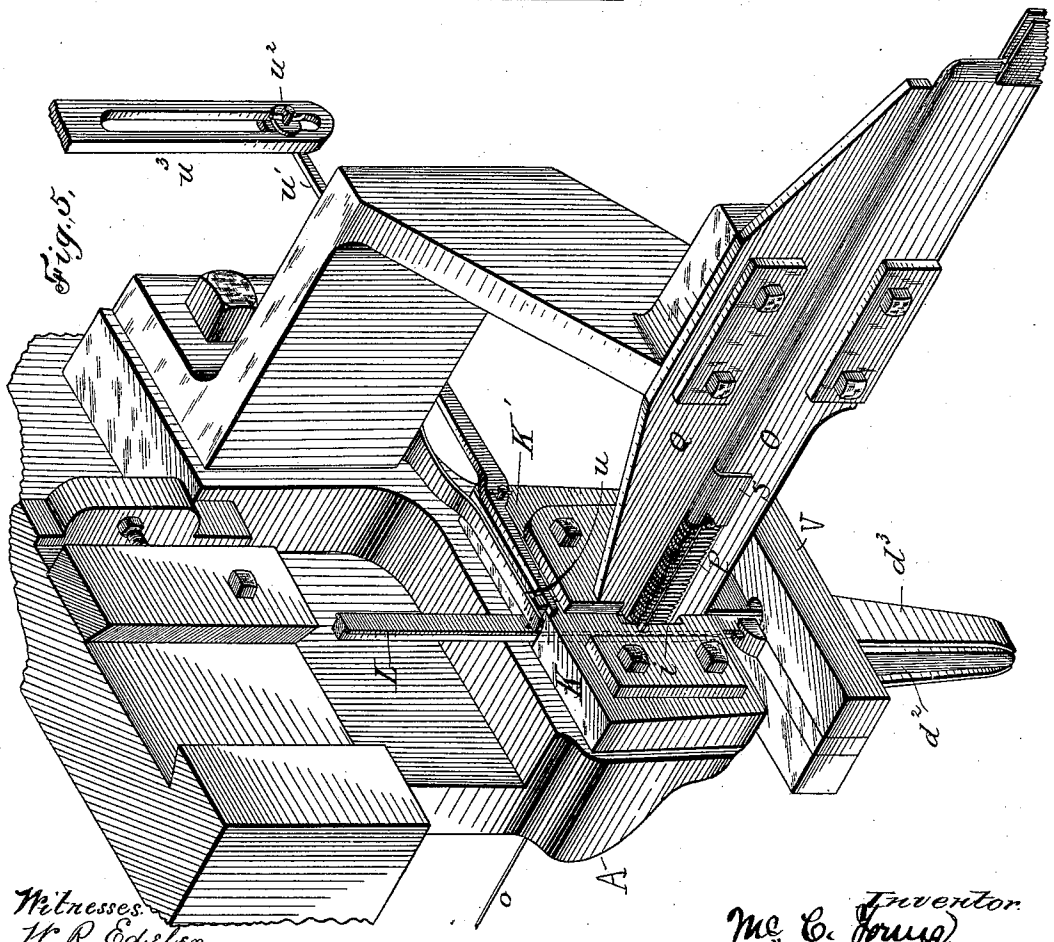


Fig. 5.



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(No Model.) 6 Sheets—Sheet 5.

McCLINTOCK YOUNG.

BRUSH MACHINE.

No. 530,152. Patented Dec. 4, 1894.

Fig. 8.

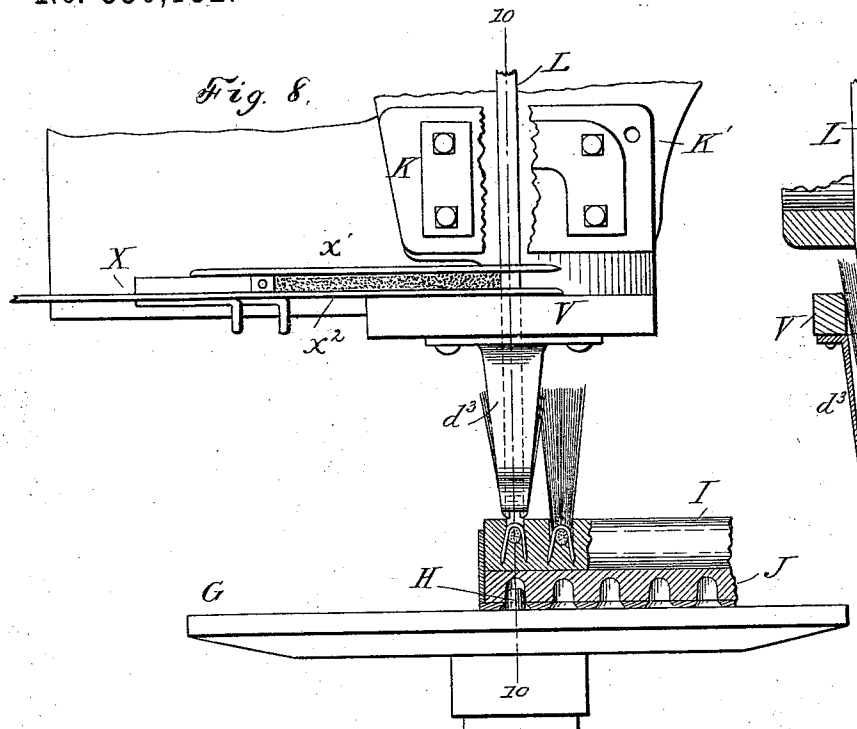


Fig. 10. on line 10-10.

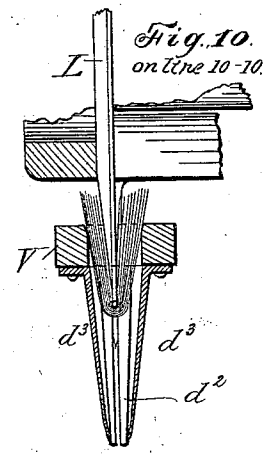
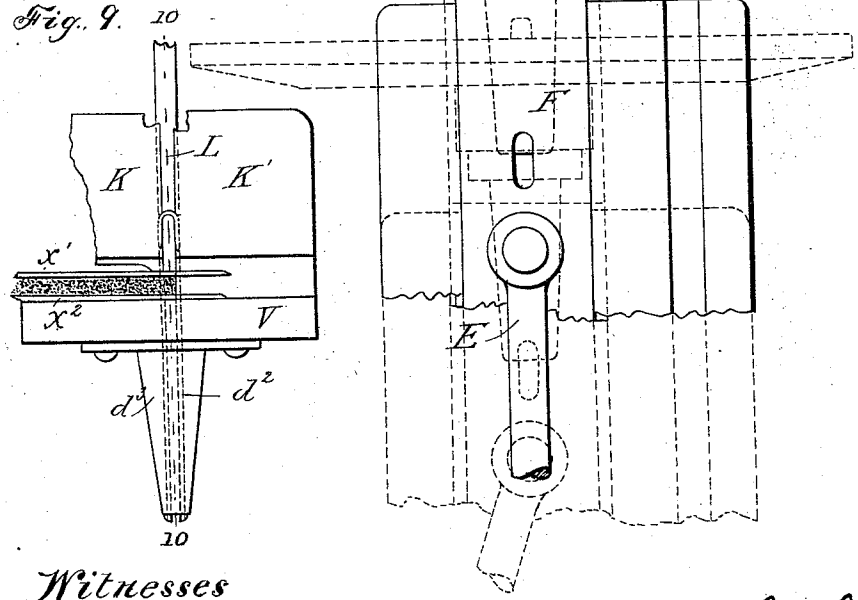


Fig. 9.



Witnesses
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By Pierce & Dodge
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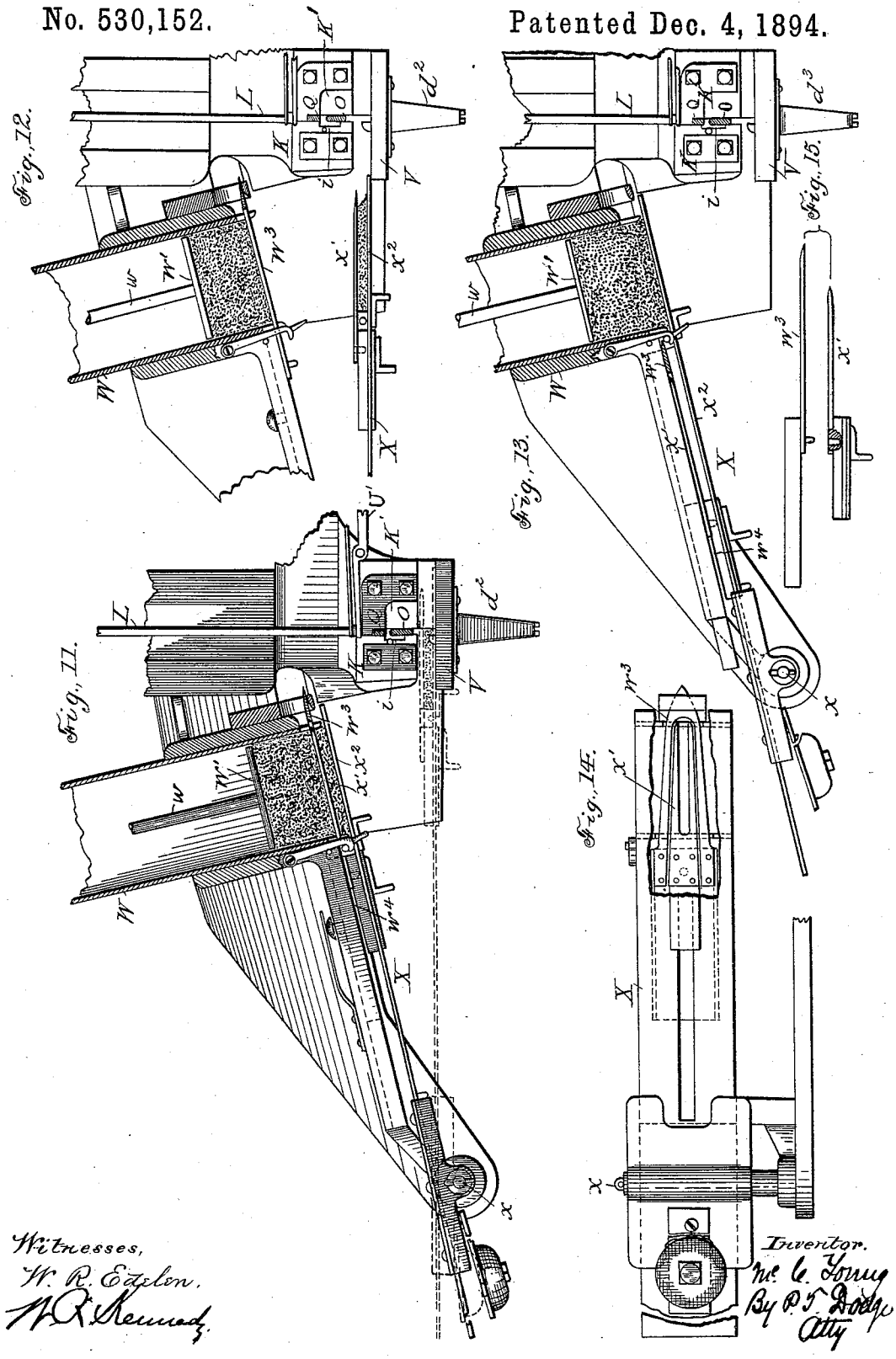
(No Model.) 6 Sheets—Sheet 6.

McCLINTOCK YOUNG.

BRUSH MACHINE.

No. 530,152. Patented Dec. 4, 1894.



Witnesses,
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UNITED STATES PATENT OFFICE.

McCLINTOCK YOUNG, OF FREDERICK, MARYLAND.

BRUSH-MACHINE.

SPECIFICATION forming part of Letters Patent No. 530,152, dated December 4, 1894.

Application filed November 30, 1891. Serial No. 413,522. (No model.)

To all whom it may concern:

Be it known that I, McCLINTOCK YOUNG, of Frederick, county of Frederick, and State of Maryland, have invented a new and useful Improvement in Brush-Machines, of which the following is a specification.

The present machine is designed to automatically feed U-shaped staples, place them astride of the fiber, double the fiber into tufts, and finally drive the tufts and staples into holes in a brush-block until the ends of the staples are seated firmly in place in the wood.

The machine is of the same general organization as that described in another application filed by me of even date herewith and bearing the Serial No. 413,521, the improvements relating mainly to the automatic feed devices and to devices for lifting and sustaining the brush-block during the driving operation.

In the accompanying drawings,—Figure 1 is a side elevation of my improved machine. Fig. 2 is a front elevation of the same with the fiber receptacle and its accompanying parts removed. Fig. 3 is a top plan view of the machine. Fig. 4 is an enlarged view, partly in elevation and partly in section, on the line 4—4 of Fig. 1, illustrating mainly the staple driving mechanism. Fig. 5 is an enlarged view in perspective of the feed and driving mechanisms. Fig. 6 is an elevation partly in section showing the support for the brush-block in modified form. Fig. 7 is an elevation of parts of the staple supporting and feeding devices. Fig. 8 is a side view showing details of the feeding and driving mechanism, the brush-block and its support being shown in vertical section, and the driving blade in its depressed position. Fig. 9 is a side view of the driving devices with the driving blade in its elevated position. Fig. 10 is a vertical section on the line 10—10 of Figs. 8 and 9. Figs. 11, 12 and 13 are vertical sections through the devices for supporting and separating the fibers and delivering the same with the parts in the different positions which they occupy in action. Fig. 14 is a top plan view of the blades for slicing and transferring fibers. Fig. 15 is an edge view of these blades separated from each other and from the supporting devices.

Referring to the drawings,—A represents a rigid main-frame, which may be of any suitable form and construction adapted to give support to the operative parts. As shown, it consists of a standard having an expanded base and an overhanging upper end.

B represents a strong lever mounted near its upper end on a horizontal stud or journal *b*, on the main-frame, and curved forward at its lower end and fashioned into a foot-piece *b'*, so that it may be readily vibrated by the foot of the operator standing or sitting in front of the machine. Near its lower end this lever B is connected by a pitman C, to a segmental weighted lever, D, which is pivoted to the base of the frame at *d*, and connected by a pitman E, to a vertically-movable slide F, mounted in guides in the base of the main-frame, and carrying at its upper end a removable bed or table G and a central stud H, intended to support and guide the brush-block during the action of the inserting devices located thereover. The connections are such that when the lower end of the foot lever is swung to the rear the pitman C lifts the lever D, which in turn, through the pitman E, lifts the slide F; the lever D and pitman E acting after the manner of a familiar toggle or knee joint, so that the stud and staple are given a very solid support at the completion of their rising movement.

When the tufts are to be driven vertically into the brush-block I seat the block I, as shown in Fig. 8, in a block or holder J, the back of which is provided with a series of holes so that when the holder with the block thereon is seated upon the bed or table G, the stud H entering the hole in the holder will serve to bring the brush-block with its holes directly under the inserting devices.

When the tufts are to be driven obliquely or in inclined positions into the brush-block the bed or table G is removed, and a support J' provided with holes corresponding in inclination and position to those in the brush-block, is substituted for the support J shown in Fig. 10, so that when applied to the upper end of the stud H, as shown in Fig. 6, it will cover the proper location of the holes in the brush-block with reference to the driving devices.

I employ as fastening devices ordinary wire staples of U-form with pointed ends, such as

are commonly sold in the market. For the purpose of driving these staples I provide mechanism which I will now describe.

To the upper overhanging end of the frame I bolt, as shown in Figs. 5, 9, &c., two plates K and K′, having vertical parallel edges slightly separated and provided with vertical grooves to receive and guide the legs of the staples so that the staples may be carried downward between them, point foremost, into the brush-block in the manner indicated in Fig. 9.

The driving of the staples is effected by means of the vertically-reciprocating blade L, the lower end of which passes downward through and between the grooved guides. The upper end of this blade is fixed to a vertically-movable slide M, mounted in guides in the top of the main-frame and connected by a link or pitman N, with the upper end of the foot lever B, before mentioned, so that when the lever is swung rearward to lift the supporting table it acts at the same time to carry the driving blade downward between the guides and toward the table.

In order to permit the feeding of the staples to the vertical guides I cut away the guides on the front side, as shown at *i*, to permit the introduction of the staples from the front in a downward direction. In front of this opening I secure in position the horizontal bar O, astride of which the staples P are placed in series, as shown in Figs. 2, 4, 5 and 7. An overlying-bar Q, also fixed in position, prevents the staples from being lifted off from the supporting-bar O. The line of staples is urged constantly forward by a slide S, mounted on the bar O, and connected to a cord *o*, which is carried rearward and downward over a pulley or other guide and provided with a weight *o′*, at its end. The staple-supporting bar O, is projected into the opening between the vertical guides so that as each staple is carried forward from the end of the bar it will drop therefrom into the guides, as plainly shown in Fig. 4.

In order to effect the delivery of the staples one at a time, and to insure their delivery, the following parts are employed: A horizontal slide T, is mounted in line with the supporting-bar O, and urged toward the latter by a spring *t*. The end of this bar T, is beveled backward, and the end of the bar O slightly beveled or rounded on its upper corner, so that as each staple advances from the end of the bar it falls into the angular space between the two bars, and is momentarily prevented from passing downward. The driving blade is provided on its rear side with an inclined or beveled rib, and as the blade descends (see Fig. 4), its beveled face acts against and pushes back the slide T, thus leaving the path clear for the descent of the staple, which is immediately acted upon by the end of the blade, and carried downward through the guides. In order to prevent the next staple from advancing at an improper time, and to prevent the staples from overriding each other, I provide a vertically-movable slide or holder U, mounted in suitable guides and urged constantly downward by a spring *u*, so that it bears normally on top of the foremost staple on the bar. This vertical slide or holder U, is acted upon by one end of lever *u′*, pivoted to the main-frame and carrying at its rear end a stud u^2, projecting into a vertical slot in the lower end of link u^3, attached to the upper end of lever B. This slotted connection permits a limited amount of play or lost motion between the parts so that the lever *u′*, will stand at rest during a portion of the movement of lever B. As the driving blade completes its downward movement, seating a tuft in the brush-block, the holder slide U, is lifted, thereby allowing the line of staples to advance, so that the foremost staple may descend into the angular space between the blade and the front end of bar O, in position to pass into the guide under the blade when the latter is raised. Before the blade rises a sufficient distance to release the staple the slide U is permitted to fall and thus prevent the advance of the succeeding staples. Thus it is that the staples are delivered positively one at a time beneath the driving blade.

In order to deliver the fiber beneath the descending staple that it may be formed into tufts and carried with the staple into the block, I provide as follows: Beneath the staple guides K K′, I fix rigidly in position an arm or support V, to sustain the fiber, and having through it a vertical opening in the path of the driving blade so that when a bunch of fibers is laid on the support and across the opening the descending staple straddling the fibers will carry the same downward at the middle through the opening, as shown in Fig. 10, the ends of the fibers being folded or doubled forward, thus forming a "tuft" to enter the brush-block. Below the support V, slotted guides d^2 are continued downward, as shown in Figs. 1, 2, 5, 8, 10, &c., to direct the staple in its downward course. Two spring-arms d^3, are also extended downward, as shown, in order to embrace the tuft between them, and prevent it opening or spreading as it descends. The guides d^2, and the spring-arms or fingers d^3 jointly inclose and confine the tuft so that it is held in compact form, that the blade may drive it firmly into a hole in the underlying brush block, as represented in Fig. 8.

In order to deliver the fiber to the support V, and into the path of the descending staple I mount on an outreaching arm of the frame a rigid box or reservoir W, open at one side and at the bottom, and intended to receive the cut fibers *en masse* in a horizontal position. In the upper part of this reservoir I mount a sliding rod *w*, provided at the lower end with a pressure plate *w′*, and at the top with a weight w^2, so that it acts constantly to urge the mass of fiber downward with moderate pressure.

At the lower end of the reservoir a blade w^3, to support the mass of fiber above, is attached to a slide moving in transverse guides w^4, so that it may be withdrawn in order to open the lower end of the reservoir and permit the fiber to descend into the transferring device hereinafter described.

X represents the transferring or feeding device consisting mainly of a plate mounted at one end on a horizontal pivot x, and provided at the opposite end with two parallel sliding blades or fingers x' and x^2. The motion of the device around the pivot x admits of these fingers being carried upward to the base of the reservoir or downward to the support V. These parts are shown particularly in Fig. 1 and Figs. 11 to 15.

In operating the device it is swung upward to the base of the reservoir, and the fingers x' and w^3, retracted allowing the mass of fiber to settle upon the plate x^2. The fingers w^3 and x', are then advanced across the base of the reservoir and in the same plane through the mass of fiber, thereby separating from the remaining mass above a slice or layer which will be confined between the overlying fingers x' and w^3, and the underlying finger x^2. The carrier is now swung downward, the effect of which is to carry the slice or layer of fiber down to the level of the support or table V, in such position that it may be urged forward by hand, or by advancing the slide x', beneath the guide K, and against the vertical face of guide K'. The fibers at the front will lie at their middle over and across the hole in the support V, and in position to be straddled by the descending staple. The fibers thus embraced and separated from the remainder by the staple are immediately formed into a tuft and carried downward into the block, as before explained. After the fibers in the carrier are exhausted it is again elevated to remove another slice from the mats in the reservoir, and so on repeatedly.

The operation of the machine as a whole is as follows: Assume that the parts stand in the normal position represented in Fig. 1, with the block-supporting table G, depressed, the driving blade L, elevated, and the carrier X, depressed and filled with fibers. At this time the staple will stand beneath the driving blade sustained by the end of the slide T, and the remaining staples will be held from advancing by the presser U, as shown in Fig. 4. The operator now pushes the lower end of the foot-lever B, rearward, thereby depressing the driving blade and lifting the block-support G. As the blade advances it forces back the slide T, and acting upon the staple forces the same downward through the guides d and d^2. The staple separates from the remaining portion of the slice the end fibers in quantity sufficient to form a tuft and straddling these separated fibers it carries them downward at the middle through the support V, whereby they are folded upward through and around the staple, as shown in Fig. 10. As the blade continues its descent the staple and tuft driven before it are inclosed and guided, as shown in Figs. 8 and 10, until they are driven tightly to their places in the block, the end or bight of the tuft being seated firmly in the bottom of the whole, and the point of the staple driven downward directly into the solid wood beyond the tuft and below the bottom of the hole. Before the tuft is delivered from the guides the block-supporting table G, is lifted until it touches or is in close proximity to the ends of the guides, and during the driving operation it stands at rest or practically so, in this position. When the blade rises the support G is lowered allowing the block to descend from the guide so that it may be readjusted by hand on the support in position to receive the next tuft, and so on repeatedly.

I do not claim herein the staple guide, the driving-blade moving therethrough, or the fiber support, as herein shown, the same being the subject-matter of my other application referred to. Neither do I claim broadly herein the fiber separating or transferring device consisting of the laterally and longitudinally movable blades, a contrivance of the same general character being described and claimed in my Letters Patent No. 423,508, dated March 18, 1890. The present device differs in action from the original, however, in that it is arranged to admit of the slice of fiber being fed gradually into the path of the descending staples so that the staples may separate therefrom one tuft after another.

I believe myself to be the first to construct a machine in which this action occurs; and it is to be understood that the details of construction may be modified at will provided there is no essential departure from the mode of action herein described.

Having thus described my invention, what I claim is—

1. In a brush machine the combination of a staple guide, a reciprocating staple driver therein, an automatic feed mechanism for delivering the staples successively in advance of the driver points forward, a fixed fiber support located a short distance from the end of the staple guide and provided with an opening for the passage of the tufts, and means for delivering a layer of fiber between the end of the staple guide and the fiber support; whereby on the advance of the staple its ends will separate from the layer of fiber the proper quantity to form a tuft and will carry the same downward to the brush box.

2. In a brush machine, the combination of a staple guide, a staple driver, a laterally-extending support to direct the staples in series to the guide, and a pressure device to urge the line of staples forward: whereby the staples are carried forward successively to the driver and acted upon one at a time.

3. In a brush machine the combination of the staple guide, the reciprocating driver, the

staple support, the pressure device acting to advance the staples along the support toward the driver, and the yielding slide whereby the premature descent of the forward staple is prevented.

4. In a brush machine the combination of a brush block support, a horizontal fiber support thereover, provided with an opening for the passage of the tuft, a vertical staple guide having its lower end terminating a short distance below the fiber support, a vertically moving staple driver in said guide, a support for holding the staples in series points downward, an automatic feeding device for carrying the staples transversely into the guide in advance of the driving blade, and mechanism for delivering a layer of fiber between the end of the staple guide and the fiber support; whereby on the descent of the driver the points of the staple will separate a tuft from the layer of fiber and carry the same downward into the brush body.

5. In a brush machine, the staple driver, the pendulous lever connected thereto, the weighted lever D, connected with the first named lever, the guided brush-block support and the pitman connecting the same with lever D.

6. In a brush machine, the staple guide, staple driver and fiber support, in combination with the fiber reservoir, cut off finger or support at its base, and the vibratory carrier provided with its sliding fingers.

In testimony whereof I hereunto set my hand, this 8th day of October, 1891, in the presence of two attesting witnesses.

McCLINTOCK YOUNG.

Witnesses:

EDWIN C. MARKELL,

MARSHALL FOUT.