(No Model.) 5 Sheets—Sheet 1.

H. BESSON.

BRUSH MACHINE.

No. 521,630. Patented June 19, 1894.

Fig. 1.

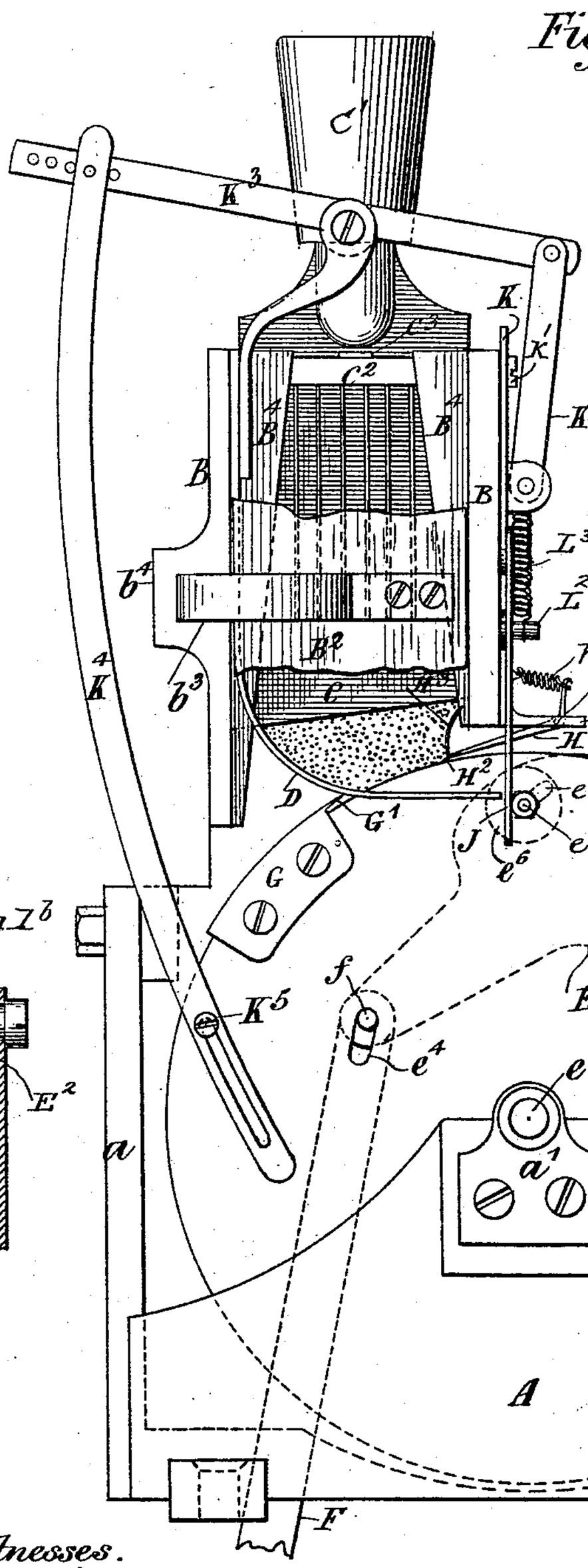


Fig. 1a.

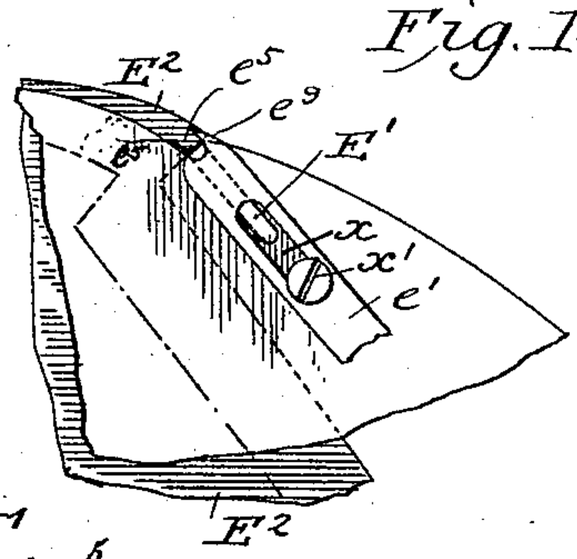
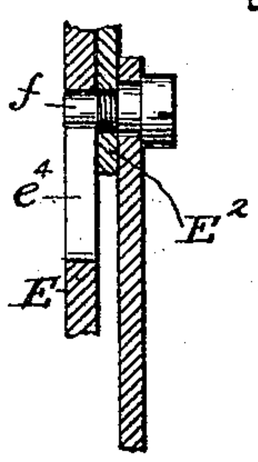


Fig. 1b.



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C. F. Sensner.

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(No Model.) 5 Sheets—Sheet 2.

H. BESSON.

BRUSH MACHINE.

No. 521,630. Patented June 19, 1894.

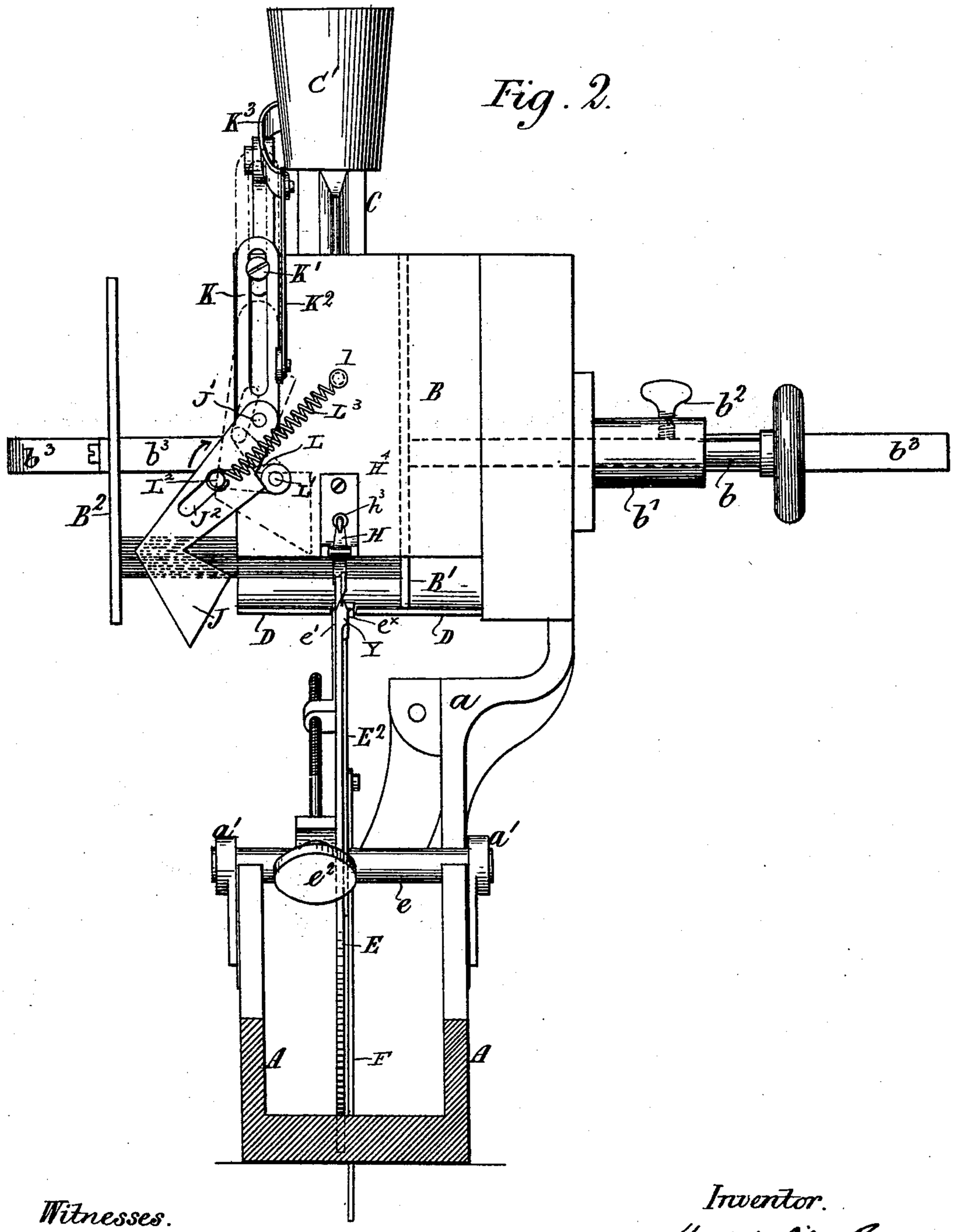

Fig. 2.

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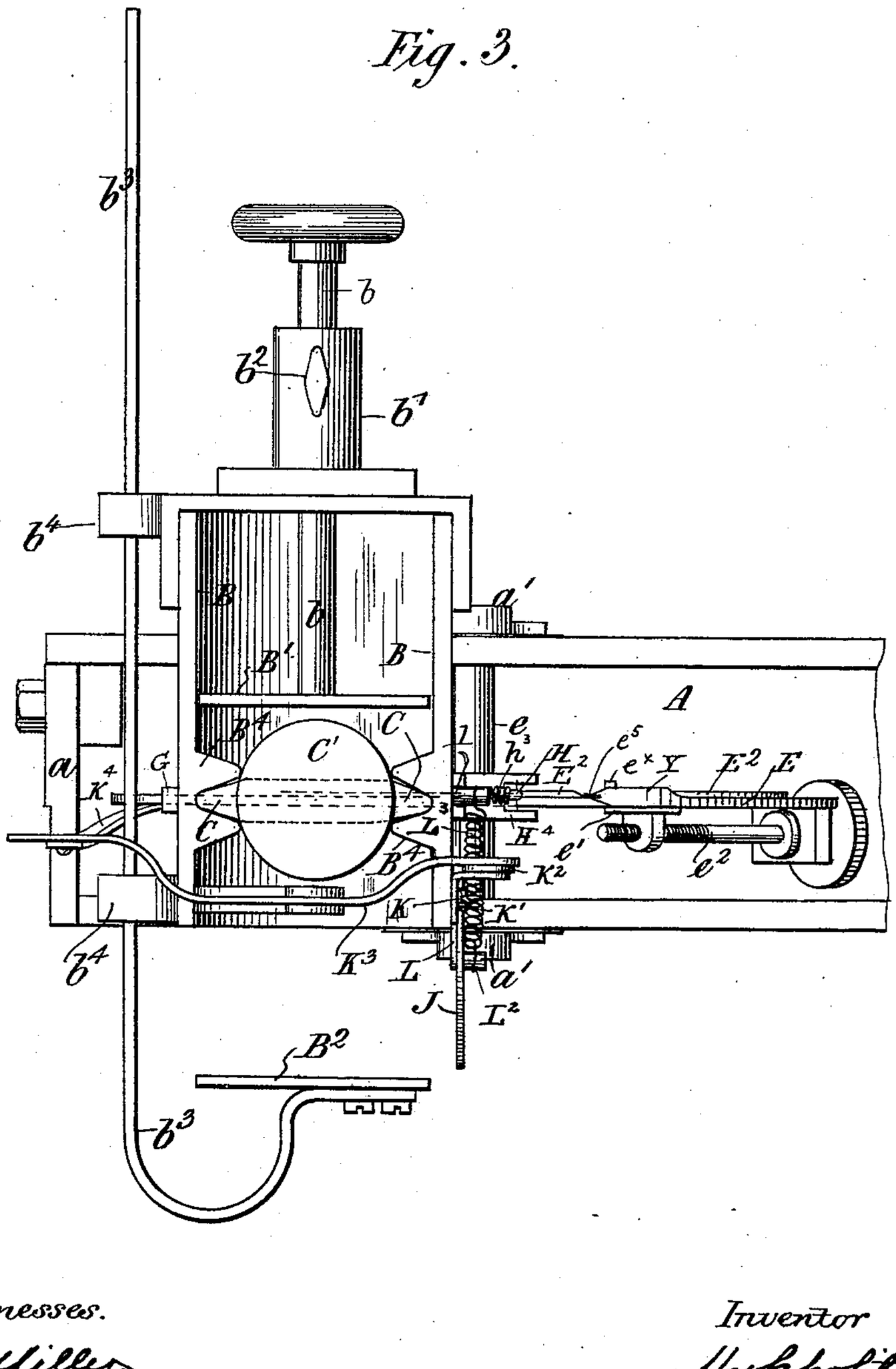
(No Model.) 5 Sheets—Sheet 3.

H. BESSON.

BRUSH MACHINE.

No. 521,630. Patented June 19, 1894.

Fig. 3.



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(No Model.) 5 Sheets—Sheet 4.

H. BESSON.

BRUSH MACHINE.

No. 521,630. Patented June 19, 1894.

Fig. 4.

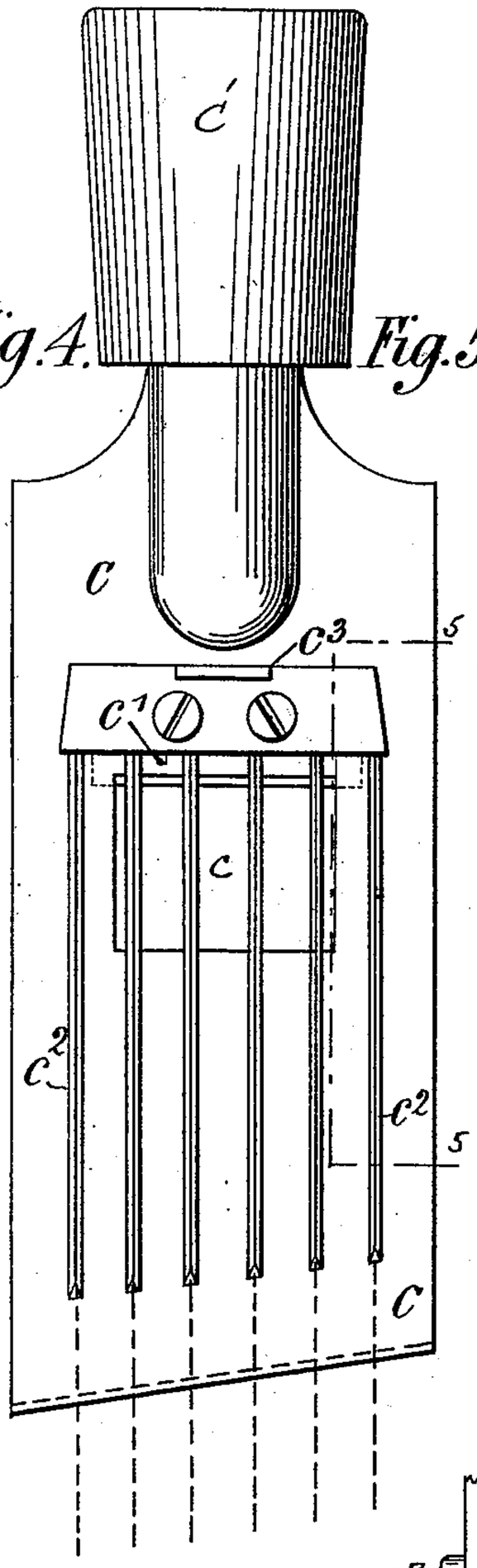


Fig. 5.

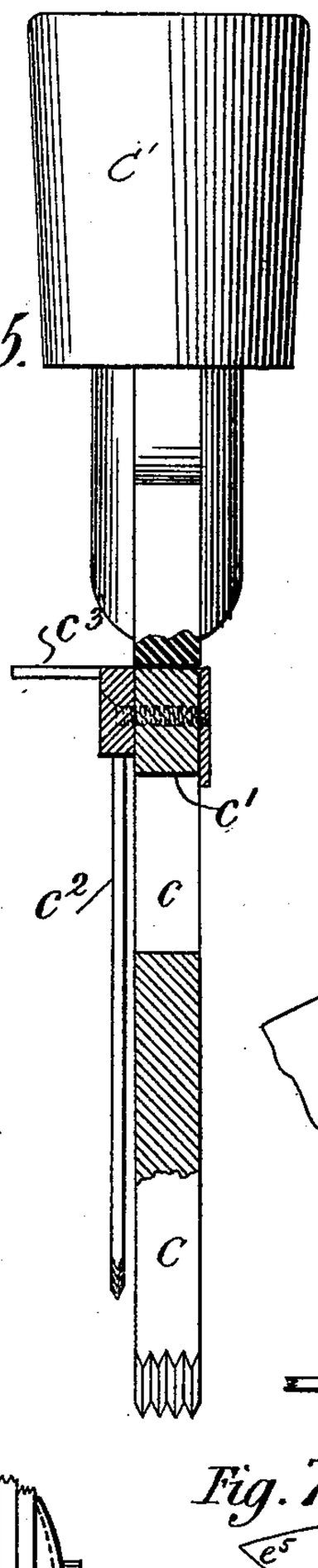


Fig. 10.

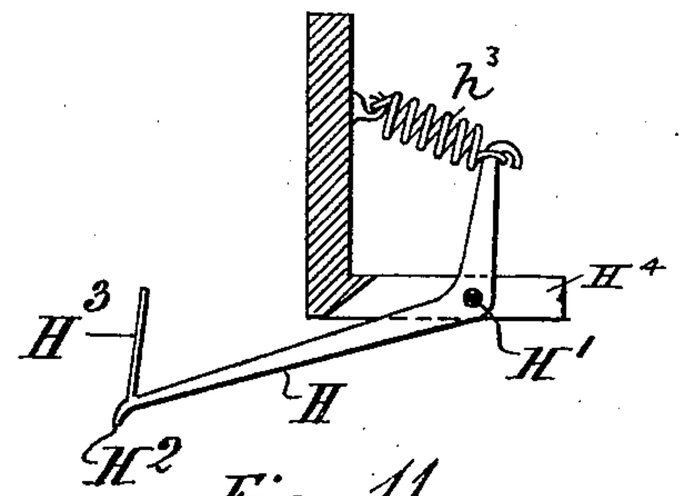


Fig. 11.

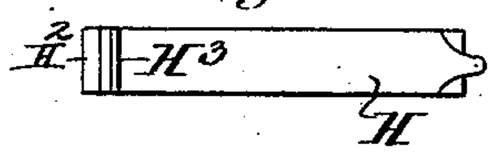


Fig. 8

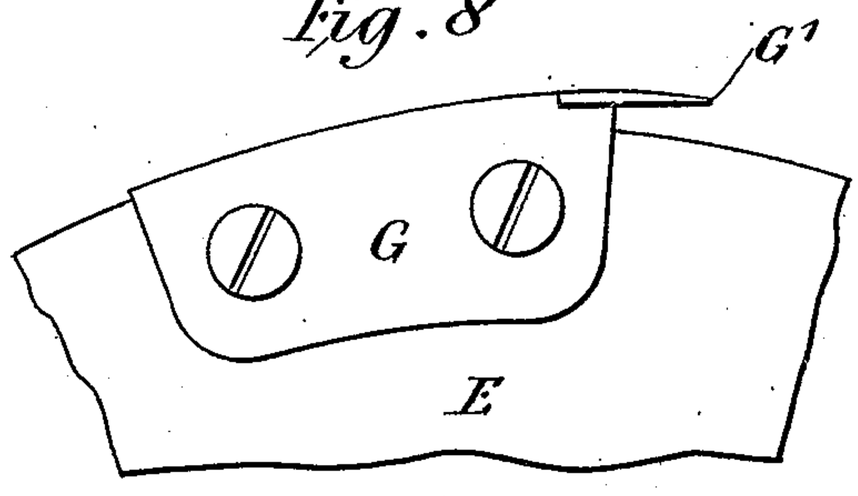


Fig. 9.

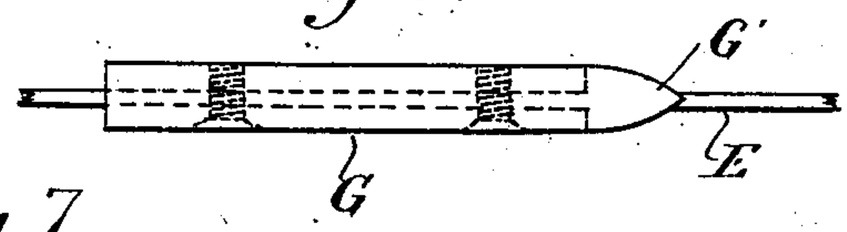


Fig. 7.

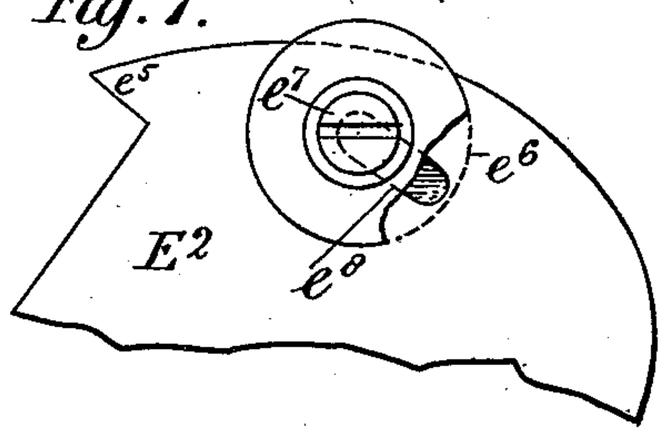
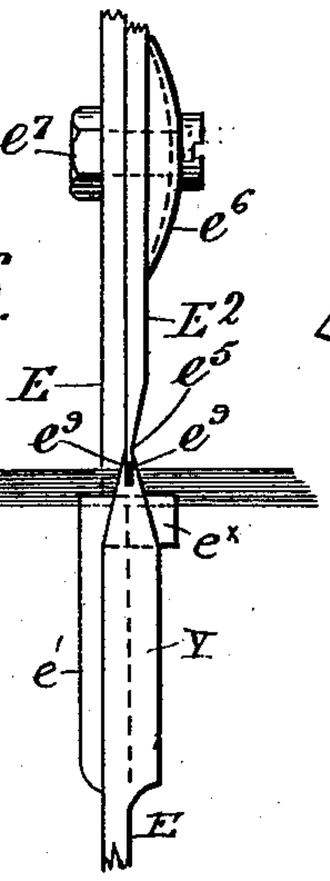


Fig. 6.



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(No Model.) 5 Sheets—Sheet 5.

H. BESSON.

BRUSH MACHINE.

No. 521,630. Patented June 19, 1894.

Fig. 12.

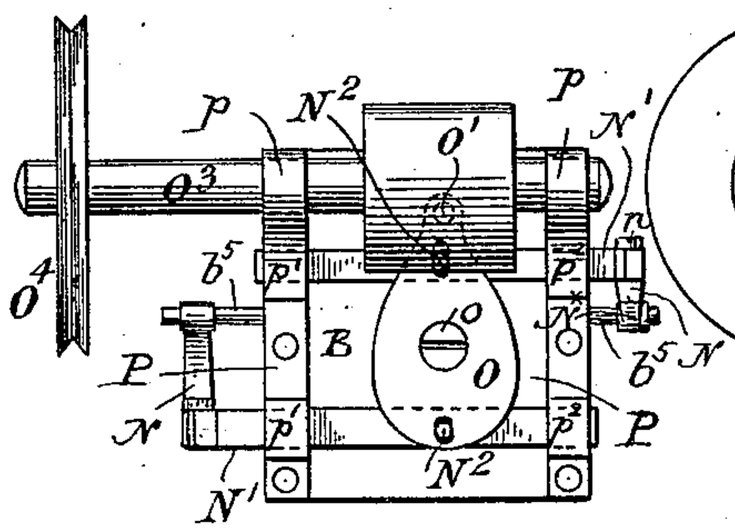


Fig. 13.

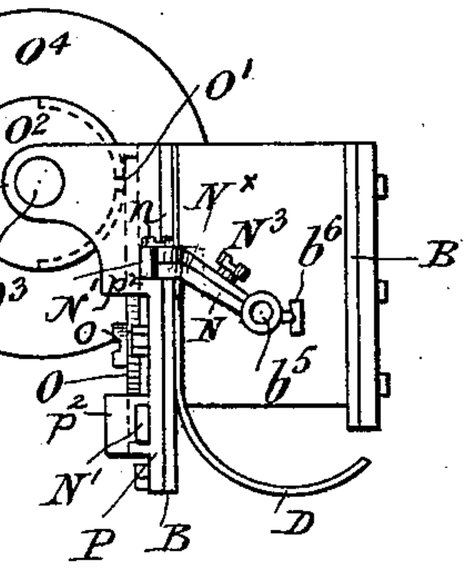


Fig. 14.

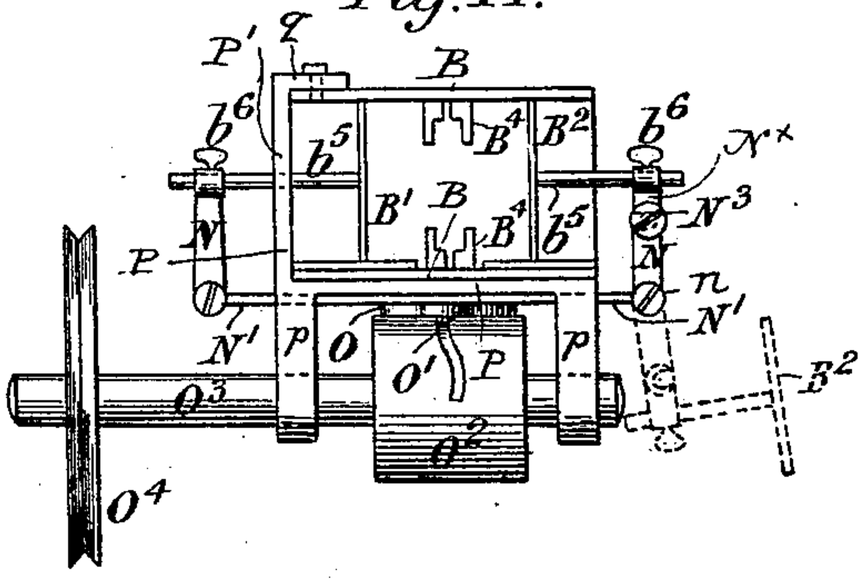
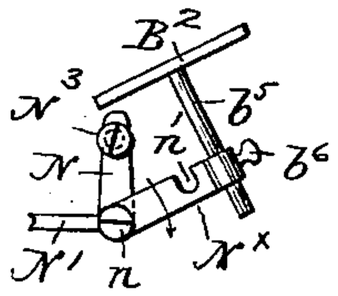


Fig. 14a



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UNITED STATES PATENT OFFICE.

HYPPOLITE BESSON, OF LONDON, ENGLAND, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE CONSOLIDATED MANUFACTURING COMPANY, OF PHILADELPHIA, PENNSYLVANIA.

BRUSH-MACHINE.

SPECIFICATION forming part of Letters Patent No. 521,630, dated June 19, 1894.

Application filed September 29, 1892. Serial No. 447,353. (No model.) Patented in England November 30, 1891, No. 20,808; in France September 20, 1892, No. 225,070; in Belgium September 21, 1892, No. 101,437; in Germany September 29, 1892, No. 72,471; in Italy September 30, 1892, No. 32,714; in Spain December 21, 1892, No. 13,811; in Canada November 16, 1893, No. 44,711, and in Austria-Hungary March 20, 1894, No. 44 and No. 558.

To all whom it may concern:

Be it known that I, HYPPOLITE BESSON, mechanical engineer, a subject of the Queen of Great Britain, residing at 63 Alexandra Road, Hornsey, London, county of Middlesex, England, have invented a certain new and useful Machine for Gaging Knots of Bristles for Brushes, (for which I have received patents in the following foreign countries: England, No. 20,808, dated November 30, 1891; France, No. 225,070, dated September 20, 1892; Belgium, No. 101,437, dated September 21, 1892; Germany, No. 72,471, dated September 29, 1892; Italy, No. 32,714, dated September 30, 1892; Spain, No. 13,811, dated December 21, 1892; Canada, No. 44,711, dated November 16, 1893; and Austria-Hungary, No. 44 and No. 558, dated March 20, 1894,) of which the following is a specification.

My invention relates to the class of brush machines known as bristle bunching machines, which separate tufts or knots from a bundle or mass of bristles contained in a hopper or like receptacle, and deliver them to the operator or to suitable receiving mechanism in condition to be mounted.

My improvements are embodied in that class of machines known as the Pickering bristle bunching machine, in which a notched tuft-collecting plate, blade or disk is moved across the mouth of a hopper containing a mass of bristles held by pressure in contact with the blade. In these machines, the depth of the notch is regulated by a gage, and a cut-off plate is operated to separate bristles in the hopper from those in the notch, and to close the mouth of the notch as the tuft or knot is withdrawn from the hopper. Tufts or knots are taken from the mass of bristles as the blade is operated, and are successively delivered to the operator.

In order to prepare the bristles in the hopper for delivery in uniform tufts, I employ one or more beater plates which act upon the bristles to even-up their ends, and I also, in this same connection, employ a comb which may be mounted upon a weighted plate, and which is vertically adjustable, so that it may be made to either enter the mass of bristles or to be withdrawn therefrom. When the comb is inserted in the mass of bristles, and the beater plates are reciprocated, the bristles will be straightened out, so that they shall all be parallel with each other, and thus be in proper condition for forming knots or tufts. The beater plates are mounted on stems or rods arranged in guides and are moved back and forth in straight lines at right angles to the tuft-carrying plate, or in other words, lengthwise of the bristles in the hopper, by which arrangement the ends of all the bristles are acted upon, and evened up, should they be disarranged. The weighted plate has an inclined lower end, arranged in such manner as to impel or feed the bristles toward the delivery end or side of the hopper, and the lower edge of the weighted plate is formed with serrations, the grooves of which are straight and parallel and are disposed transversely at right angles to the axes of the bristles, by which arrangement, they are held against lengthwise movement but are free to move lengthwise of the serrations toward the feed end or side of the hopper.

In order that the bristles may be uniformly compacted in the hopper, and in the best condition to be taken up by the notched plate, and in order that loose bristles may not escape from the hopper, I employ a feeder or compacter, which acts upon the mass of bristles on its under side to move them toward that end of the hopper at which the notched plate receives the tufts, and at this end of the hopper I employ an intercepter, which is preferably spring-controlled, and bears on the edge of the disk, and at times, on the edge of the cut-off plate, and is free to have a vertical movement. On one end of the spring intercepter there is an upwardly projecting arm, against which the bristles lie, and by which they are retained in the hopper. When long bristles are employed, there is a tendency for the flag ends of the bristles in the tuft to remain entangled with, or adhere to, the bristles in the hopper, while

the tuft is being withdrawn on the reverse movement of the tuft-carrying plate. To remedy this difficulty, I employ a separator which at the proper time is given a proper movement to enter between the bristles in the tuft, and those in the hopper, and separate them from each other in such manner that the tuft may be carried away from the hopper without withdrawing loose bristles therefrom.

In order that the depth of the notch in the tuft-collecting plate may be accurately and quickly adjusted while the machine is still in operation, I add to the adjustable gage heretofore employed, an adjusting screw, which is adapted to move the gage back and forth to the desired extent without the use of tools, and thus enabling the adjustment to be made by comparatively unskilled operators.

In order that the tuft or knot of bristles may be held securely and evenly and in such manner that the bristles shall be held all parallel with each other, and end-to-end, I cause the cut-off plate to operate between a pair of jaws at the edge of the notch and centrally over the gage at the bottom of the notch. Heretofore, the cut-off plate has been pivoted at one end while its upper end has been free. Sometimes, in this construction, bristles will find their way in between the blade and the cut-off plate, and the latter will be separated laterally from the blade. To remedy this defect, I secure that end of the cut-off plate opposite to its pivoted end to the disk or notched plate by means of a bolt and yielding or spring washer. The bolt extends through a curved slot in the notched plate, the arrangement being such that the cut-off plate can have an oscillating movement relatively to the notched plate, but is held at all times close to the notched plate, and bristles are prevented from entering between the cut-off plate and the blade.

In the accompanying drawings illustrating my invention, Figure 1 is a left-hand side elevation of a machine embodying my improvements. Fig. 1^a is a detail view, on an enlarged scale, of a portion of the collecting disk and cut-off plate. Fig. 1^b is a detail view in section showing the connection between the operating rod, the disk and the cut-off plate. Fig. 2 is a front elevation, and Fig. 3, a plan view of the machine. In Figs. 1, 2 and 3, some of the parts are omitted to show the others more clearly. Figs. 4 and 5, are a side elevation and a vertical, central section, partly in elevation, of the weighted plate and the adjustable comb carried thereby. Figs. 6 and 7 show a right-hand side elevation, and plan of part of the cut-off plate and tuft-collecting disk, on an enlarged scale. Figs. 8 and 9 are detail views on an enlarged scale, of the feeder or compacter, which acts on the bristles to move them from one side of the hopper to the other. Figs. 10 and 11 are a side elevation and plan of the intercepter. Fig. 12 is a front elevation, Fig. 13, an end view, Fig. 14, a plan of mechanism for operating the beating plates simultaneously, and Fig. 14^a is a detail view of the devices for adjusting one of the beater plates.

That side of the machine where the tufts of bristles leave the hopper, I call the front side; the opposite, the rear. That end of the machine at the left of an operator facing the front, I call the left; the opposite, the right.

The mechanism, unless otherwise specified, is of usual well-known construction. Brackets a for supporting the upper part of the machine are fixed on the base A. Plates B B, are secured to the brackets a, and form two sides of the hopper or receptacle for the bristles. The two other sides or ends of the hopper are formed by beater plates B′ B^2. The plate B′ is mounted on a stem b, free to move in a tubular support b' fixed to one of the brackets a. The plate may be held in any desired position by means of a set screw b^2. The bristles are placed in the hopper with their thicker ends against the plate B′, which may be shifted or adjusted to suit different lengths of bristles. The plate B^2 is mounted on a rod b^3 extending through bearings b^4 b^4. The rod b^3 forms a handle by which the plate B^2 can be moved backward and forward, thus acting as a beater against the thin ends or "flag" of the bristles, and cause all their thicker ends to come against the plate B′. The plates B B, have projections or ribs B^4 B^4 on them extending vertically from their upper to their lower ends, and which serve as guides to receive a plate or plunger C, forming the lower part of a weight C′, shown in side elevation and in vertical transverse section in Figs. 4 and 5. The plate C, has a slot c in it to receive a slide c', to which a comb c^2, provided with a handle c^3, is fixed. When it is found that the bristles are not parallel with each other and lying at right angles to the plates B′ and B^2, as they should do, the comb c^2 should be pushed down through the bundle of bristles into the position shown by dotted lines in Fig. 4, the thumb nut b^2 loosened, and the plates B′ B^2 pushed backward and forward, carrying the bristles lengthwise backward and forward between the teeth of the comb, thus causing them to straighten out and take their proper position. The bottom of the weighted plate C, is serrated or grooved transversely to the axes of the bristles to prevent them from slipping endwise. It will be observed that the weighted plate C, is inclined at its lower end from its rear end upwardly, toward the delivery end of the hopper, by which arrangement the bristles are moved toward the delivery opening. The serrated lower edge of the plate, while holding the bristles against endwise movement, affords practically no obstruction to their sidewise movement.

The bottom of the hopper is formed mainly of a curved plate D, which is slotted to allow the edge of the blade or tuft-carrying disk E to pass through it into the hopper. The

disk E, is mounted on a spindle *e*, working in bearings *a'* on the base A. The plate or blade has in it a notch E' the depth of which is regulated by a gage *e'*, actuated by the screw and thumb nut e^2. The gage *e'* has an arm $e^\times$ projecting laterally through the notch E', and it forms the bottom of the notch. The gage is slotted at *x*, and is secured to the disk by a screw *x'*, extending through the notch. The screw, however, does not clamp the gage tightly, but permits of its adjustment when actuated by the screw e^2. By these devices, the depth of the notch, and consequently, the size of the tufts or knots, may be regulated without the use of tools and while the machine is in operation.

The cut-off plate E^2 is pivoted to the disk at e^3, and its upper outer end is provided with a shoulder e^5, is adapted to open and close the notch. In order that the cut-off plate may oscillate back and forth on its pivot e^3 without separating laterally from the disk, I secure it to the disk by a bolt e^7, and a yielding or spring washer e^6. The bolt extends through a curved slot e^8 in the cut-off plate, which is thus permitted to have the requisite pivotal movement relatively to the disk. The notched blade or disk E, is caused to partially rotate or oscillate backward and forward through a small angle by a rod F, actuated by a treadle not shown in the drawings. The rod F, is connected to the disk E, by a pin *f*, secured to it and working in a slot e^4 in the disk. One end of the pin *f* also works in a bearing in the cut-off plate E^2, so that the plate always moves with the rod F, while by reason of the slot e^4, the disk E, remains stationary for a short time whenever the direction of the motion of rod F, is changed. In Fig. 1, the arm F is at the top of its stroke, and is about to move downward, carrying with it the cut-off plate E^2, while the disk E remains stationary, so that the notch E' will be uncovered. When the pin *f* reaches the bottom of the slot e^4, the disk E will begin to move in the direction of the arrow, and when the open notch E' enters the hopper, it will fill with bristles. When the motion of the rod F, is reversed, and it commences to move upward, the disk will, for a short time, remain stationary, but the cut-off plate E^2 will at once commence to move backward, so that its shoulder e^5 will come over the mouth of the notch E', and thus hold the bristles in it, and prevent more from entering it.

As shown particularly in Fig. 6, the disk or blade E, is provided with an enlargement Y, in which the notch E' is formed. The outer side or jaw of the notch E' is slotted through this enlargement, so that it terminates in two points or jaws e^9 e^9, which receive the point or shoulder e^5 of the cut-off plate E^2 between them. In this way, the bristles are held firmly with their axes uniformly transverse to the plate and disk, and are delivered to the operator in the best possible condition for mounting.

In order to push the bristles toward and compact them at the front of the machine, or toward the right-hand side of the hopper, as seen in Fig. 1, where the notch E' enters it, I secure to the blade or disk E, a plate G, the outer edge of which is arranged eccentrically or slightly inclined, as shown particularly in Fig. 8, and it is provided with a forwardly projecting finger G', between which and the edge of the disk there is thus formed a receptacle or pocket. When the disk E, is moved back in the reverse direction to that indicated by the arrow in Fig. 1, the pocket fills with bristles which are carried by the movement of the disk to the right-hand side of the mouth of the hopper, the projecting portion of the blade acting on the bristles to lift them to a slight extent to permit the plate to more readily move under them to carry the bristles adjacent to the disk forward. When the disk revolves back again in the direction indicated by the arrow, the bristles remain behind, escaping from the pocket and are held in position by the weighted plate, which was previously raised slightly by the eccentric plate G, acting on the mass of bristles beneath the weighted plate.

In order to prevent the bristles from being drawn out through the small spaces between the disk and the edge of the slot in the curved plate D, I employ a spring-actuated intercepter, which, as shown, consists of an arm H, pivoted at H', to a bracket H^4, secured to the hopper. The end H^2 of the arm H is held by means of a spring h^3 in position to engage with the edge of the disk, and with the edge of the cut-off plate. The end of the arm may move vertically to a slight extent to accommodate the projecting edge of the cut-off plate as it moves into the hopper. At the inner end of the arm H, is secured an upwardly projecting inclined plate H^3 which is preferably made of spring metal, and has its upper end housed within a groove at the side of the hopper between the ribs B^4. The incline H^3, causes any bristles pushed to the right in advance of the point G' of the feeder, to travel upward into the hopper and bristles are prevented from escaping from the hopper over the top of the arm H^2, which arm, in like manner, prevents loose bristles from escaping along the edge of the disk under the arm.

In order to separate the flag or thin ends of the bristles in the notch from the flag of the bristles in the hopper, I provide a separator J. This consists of a blade pivoted at J' to a vertical slide K, slotted to receive a screw K', and pivoted to a vertical rod K^2, to which an intermittent up-and-down motion is given by the lever K^3 and connecting rod K^4, the lower end of which is slotted to receive the pin K^5 fixed to the disk E. By this arrangement, the separator J, is prevented from moving downward until some time after the disk has commenced to move backward. An arm L, pivoted at L' to the plate B, carries at its

outer end a pin L^2 working in a slot J^2, in the separator. A spring L^3 secured to pin L^2, and to the plate B, at *l*, draws the arm L^2 upwardly and inwardly in the direction of the arrow.

By the above described organization, the separator J, is at first moved vertically downward, its point entering between the tuft of bristles and the bristles in the hopper, but when the pin L^2 comes to the end of the slot J^2, the seperator J, and the arm L, pivot about L′, and the separator moves sidewise, or longitudinally relatively to the bristles, as well as downward. Thereby the ends of the bristles in the tuft are separated from the bristles in the hopper and the withdrawal of loose or extra bristles in the hopper is prevented.

The devices just described are particularly designed for use with uncut bristles. When the machine is to be used for bristles which have been cut to length, the arrangements for operating the beater plates B′ and B^2 may be modified, as shown in Figs. 12, 13, 14 and 14^a. As there shown, the hopper is composed of side plates B B, as before, with guides B^4 B^4, for the weighted plate. A curved plate D, is also employed as in the machine first mentioned. The beater plates B′ B^2 are shown as mounted on stems B^5, adjustably connected by screws B^6, to arms fixed to rods N′. The arms are preferably made in two parts, N and $N^\times$, as shown in Fig. 14^a. The arms N are rigidly secured to the rods N′, while the arms $N^\times$ are pivotally secured thereto at *n*, and may be turned thereon, as indicated in Figs. 14 and 14^a. The rods N′ carry pins N^2 entering grooves in the double lever O, which has fixed to it a pin O′, received into the cam O^2 on the shaft O^3, rotated or moved either by hand or mechanically by the pulley O^4. The lever O is pivoted at *o* to the hopper.

To provide bearings for the rods and shaft above referred to, I provide a casting P, which has brackets *p* to receive the shaft O^3 and guide brackets *p*′ and p^2 for the sliding rods N′. The casting is shown as formed with a lateral extension P′, which extends around one end of the hopper and is provided with an angular extension *q*, secured to one of the sides B, of the hopper. By the arrangement described, the plates B′ and B^2 may be moved back and forth in opposite directions at the same time, operating on both ends of the bristles. A comb may be employed in the same manner as that described in connection with Fig. 1. One or both of the arms, which carry the stems b^5, may be connected to the corresponding rod N′, by a pivot as above explained, and as shown in Fig. 14^a. That is to say, the portion $N^\times$, of the arm is pivoted at *n* to its rod N′, and it is slotted or recessed at *n*′. The portion N, of the arm is provided with a set screw N^3, which is adapted to enter the notch *n*′, and by this means, the two parts of the arm may be clamped together. When the arm sections are rigidly secured, these plates may be moved back and forth to straighten out the bristles. When the set screws N^3 are loosened, the beater plates may be removed from the hopper, as indicated in dotted lines in Fig. 14.

I have shown my improvements embodied in a machine in which the tuft-collecting blade is in the form of a disk, but I wish it understood that some of my improvements are equally applicable to machines in which other kinds of tuft-collecting blades are employed.

I claim as my invention—

1. In a brush machine, the combination of a hopper, a tuft-gathering blade or plate movable across the mouth of the hopper, and an end plate of the hopper secured to a sliding stem or rod, and bodily movable to and fro at right angles to the blade or in other words, freely adjustable lengthwise of the bristles in the hopper, as and for the purpose specified.

2. In a brush machine, the combination of a hopper, a tuft-gathering plate or blade movable beneath the hopper a pair of end plates in the hopper both of which are carried by rods or stems arranged in guides and freely movable in straight lines and adjustable in a direction cross-wise of the plate or parallel with the length of the bristles within the hopper.

3. In a brush machine, the combination of a notched blade or plate, a hopper, a pair of end plates secured to rods or stems arranged in guides and movable in straight lines in a direction lengthwise of the bristles in the hopper, and means for enabling the end plates to be moved simultaneously.

4. In a brush machine, the combination of a notched blade or plate, a hopper having freely movable end plates, and a movable comb occupying a plane parallel with the sides of the notched blade, substantially as specified.

5. In a brush machine, the combination of a hopper, a tuft-collecting plate moving across the mouth of the hopper on which the bristles rest a weighted plate in the hopper, and a vertically movable comb carried by the weighted plate.

6. In a brush machine, the combination of a hopper, movable beater plates at opposite ends thereof, a weighted plate in the hopper carrying a vertically movable cone, and a notched plate moving beneath the hopper.

7. In a brush machine, the combination of a hopper, a notched plate movable beneath the hopper, and a bristle feeder or compacter on the edge of the plate projecting upwardly for moving the bristles from the rear side of the hopper toward the front side, for the purpose specified.

8. In a brush machine, the combination of a hopper, a notched plate movable beneath the hopper, a bristle collector or compacter secured to said plate projecting therefrom and having a forwardly projecting finger between which and the edge of the plate the

bristles are collected, compacted and moved from the rear side of the hopper toward the front side.

9. In a brush machine, the combination of a hopper, a notched plate movable beneath the hopper and having jaws at the edge of and above the notch and a cut-off plate, the edge or top of which intermittingly occupies the space between the jaws.

10. In a brush machine, the combination of a hopper, a plate movable beneath the hopper and having a notch formed in an enlargement at the side of the plate, and provided with jaws at the edge of and above the notch, and a cut-off plate, the edge or top of which intermittingly occupies the space between the jaws.

11. In a brush machine, the combination of a hopper, a notched plate or blade movable beneath the hopper, a cut-off plate, the edge of which co-operates with jaws at the edge of and above the notch in the movable notched plate, a pivot bolt connecting the cut-off plate with the notched plate, means for moving the cut-off plate relatively to the notched plate, and a spring washer or yielding clamp connected by a bolt with the notched plate and cut-off plate, for the purpose specified.

12. In a brush machine, the combination of a hopper, a notched tuft-carrying plate movable beneath the hopper, a cut-off plate, means for giving movement to the notched plate and to the cut-off plate, an adjustable gage for varying the depth of the tuft notch, and an adjusting screw for giving movement to the gage in a direction parallel with the length of the notch.

13. In a brush machine, the combination of a hopper, a tuft-collecting plate movable across the mouth of the hopper, a vertically moving arm bearing on the edge of the plate and having an upwardly projecting finger at its inner end.

14. In a brush machine, the combination of a hopper, a tuft-collecting plate or blade movable beneath the hopper, a spring-actuated arm bearing on the edge of the plate beneath the hopper and having a spring finger projecting upwardly from the end of the arm into the hopper.

15. In a brush machine, the combination of a hopper, a tuft-collecting plate movable beneath the hopper, an arm having a vertically moving outer end bearing on the edge of the plate beneath the hopper and having also a spring arm projecting upwardly into the hopper and a collector carried by the plate for moving the bristles in the hopper toward the spring plate carried by the arm.

16. In a brush machine, the combination of a hopper, a tuft-collecting plate movable beneath the hopper, a separator blade for separating the ends of the bristles collected on the plate from those remaining in the hopper, and means for giving to the separator blade proper movements in a plane parallel with the axes of the bristles.

17. In a brush machine, the combination of a hopper, a tuft-collecting plate movable beneath the hopper, a separator blade for separating the ends of the bristles collected by the plate from those remaining in the hopper, means for giving an up-and-down or vertical movement to the separator blade, and means for moving the blade horizontally for the purpose specified.

HYPPOLITE BESSON.

Witnesses:
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