

No. 724,232.

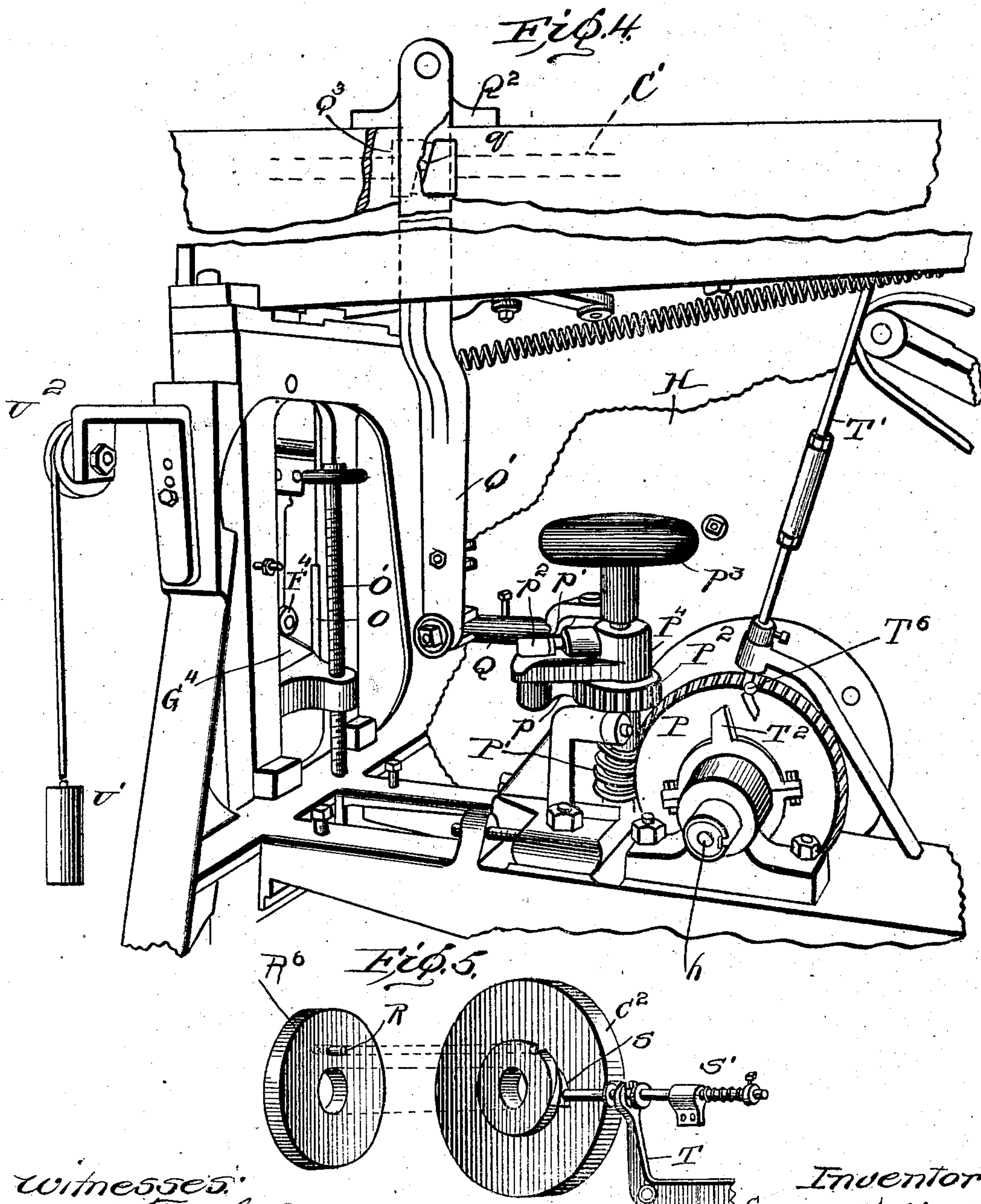
PATENTED MAR. 31, 1903.

E. F. ABBEY.
BRUSH MACHINE.

APPLICATION FILED AUG. 8, 1902.

NO MODEL.

3 SHEETS—SHEET 2.



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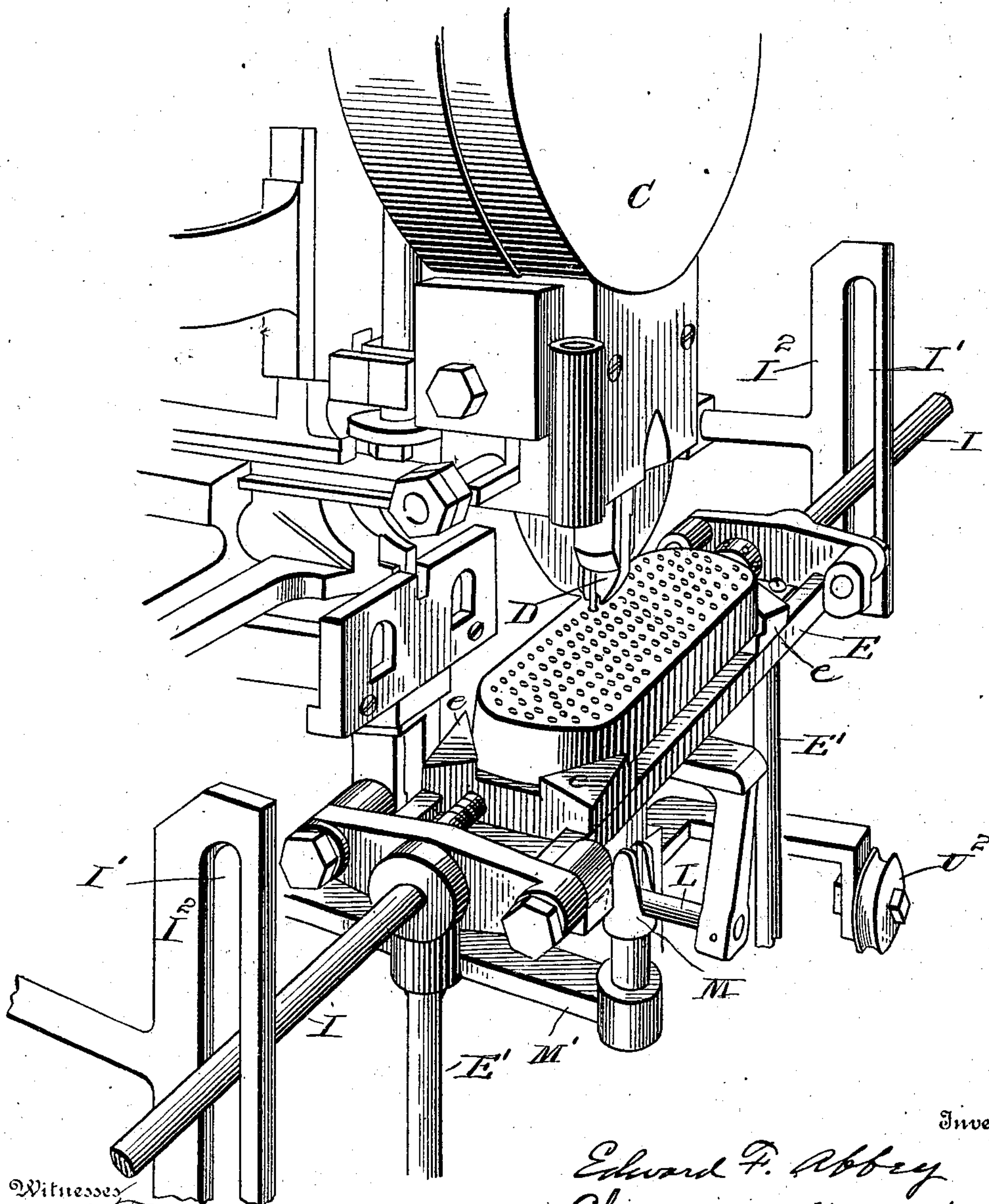
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Fig. 6



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EDWARD F. ABBEY, OF TOLEDO, OHIO.

BRUSH-MACHINE.

SPECIFICATION forming part of Letters Patent No. 724,232, dated March 31, 1903.

Application filed August 8, 1902. Serial No. 118,912. (No model.)

To all whom it may concern:

Be it known that I, EDWARD F. ABBEY, of Toledo, in the county of Lucas, State of Ohio, have invented certain new and useful Improvements in Brush-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to improvements in brush-machines, the objects of the invention being to provide an improved mechanism for automatically presenting the blocks constituting the brush-backs in proper position and at the proper angle to the cooperating tool, which latter may be an inserter or filler for inserting and anchoring the bristles or tufts of bristles or a tool for forming the holes or sockets for the reception of the bristles.

I have shown the present improvements in connection with a filling-machine of a well-known type, and as the details of the same form no part of the invention it will not be described in detail, especially as it is to be understood that the invention may be used in connection with the mechanism shown or other preferred or well-known mechanisms for operating on the block when properly positioned with relation thereto.

The invention consists in certain novel details of construction and combinations and arrangements of parts, all as will be now described, and pointed out particularly in the appended claims.

In the accompanying drawings, Figure 1 is a perspective view of a machine embodying the present improvements. Fig. 2 is a perspective view of a part of the mechanism for moving the block-carrier. Fig. 3 is a similar view of another part of said mechanism. Fig. 4 is a view of the feed and part of the stop mechanism. Fig. 5 is a detail of the clutch and its operating-lever. Fig. 6 is a perspective view, on an enlarged scale, showing details of the block clamp and carrier with associated parts.

Similar letters of reference in the several figures indicate the same parts.

The machine illustrated and in connection with which the present invention is shown

is a type of machine now on the market and known as the "Frazier filling-machine." It embodies a stand or base-frame A and a superframe B, the latter having suitable bearings and supports for the filling mechanism proper. The major portion of the filling mechanism proper is contained in or supported by a head C and is operated by a horizontally-arranged drive-shaft C', carrying a drive-pulley C² at the rear end, to which power may be applied from any suitable source. Through the operation of this filling mechanism the bristles are advanced to an inserter D and by the latter inserted and anchored in suitable sockets previously formed in a block or brush-back when the latter is presented in proper position for cooperation with the inserter. For the purpose of positioning the block the latter is mounted on a carrier E, where it is clamped by suitable clamps e of any well-known form, which will properly center and hold the blocks while being operated upon. The carrier is mounted on or constitutes part of a frame, the remaining portion of which is formed by downwardly-extending rods E', adjustably mounted at their lower ends in bearings on a shaft E², and the latter is journaled in a second frame F, having a downwardly-extending support F', pivoted in and guided by a vertically-adjustable frame G. The pivots or axes on which the carrier-frame and secondary frame swing are arranged at right angles to each other, and while the radius of the arc described by the carrier with the shaft E² as a center may be varied by adjusting the rods E' the radius of the arc described by the carrier by the swing of the secondary frame is preferably made adjustable by providing a series of holes f in the support F' and a corresponding series of holes g in the frame G, through any of which holes the pivot-pin for the secondary frame may be inserted. With such construction of supporting mechanism the carrier is free to swing in two arcs at right angles to each other, and by combining such movements the block may be adjusted beneath the inserter to any desired position and so as to present the block for the insertion of the bristles at the desired angles. The movement corresponding to the length of the carrier and length of the block has the longest radius in order to permit of

the formation of symmetrical brushes of oblong or elongated shape.

For controlling the position of the carrier two pattern-cams (lettered H) are provided, both preferably mounted on a cam-shaft h , and independent mechanism is interposed between said cams and carrier, each of said mechanisms serving to position the carrier in an arc the plane of which is at right angles to the other. For positioning the carrier with the shaft E^2 as a center said carrier is provided with guides or rods I, extending therefrom at each end, said rods working in vertically-extending slots or guideways I' in the forward ends of controller-frames I². The latter are movable longitudinally, being for this purpose mounted at the forward ends in swivel-blocks i , adjustable on rock-arms i' , and at their rear ends on arms K, rigid on a transversely-extending rock-shaft K', Fig. 2. The shaft K' is provided with an arm K², having a roller k^2 , adapted to rest on one of the pattern-cams, the connection between the arm and shaft preferably being made adjustable through a segment K³, rigid on the shaft, and an adjustable connection, as set-screws K⁴, between the segment and arm. The arm K² and cam will thus effect the movement of the carrier on one center, but at the same time the carrier is free to swing on the other center, because of the elongated slot or guideways on the controller-frames and along which the guides are free to travel, this mechanism constituting one operating mechanism for moving the carrier in one arc and for guiding it in its movements in the other arc. The movement of the carrier on these guideways or in the plane of the other arc is effected through the medium of a controller rod or guide L, located beneath the carrier and working in the forked end of a second controller-guide M, the latter being carried by one arm of a bell-crank lever M', Fig. 3, pivoted on the machine-frame and connected by a link M² with the upper end of an arm N, journaled on the shaft K'. Also journaled loosely on said shaft K' is a second arm N', corresponding to the arm K², but adapted to cooperate with the other pattern-cam and adjustably connected with the arm N by set-screws n , as shown. This mechanism constitutes the other operating mechanism for moving the carrier in the other arc and for guiding it while being moved by the other operating mechanism. The cams, it will thus be seen, control the movements of the carrier in both arcs, and said cams may be so formed as to properly position any shape of brush-back for the insertion of bristles at any desired angle, or if a socket-forming tool be substituted for the inserter the sockets may be correspondingly formed.

In the ordinary operation of the machine a back having the sockets therein is usually clamped in the carrier and the latter moved by hand, such movement being utilized to position the ends of the arms K² and N', and by

marking from the latter or by substituting cutters for the rollers the cams may be readily formed from suitable blanks. Obviously when the pattern-cams have been formed they will position other blocks exactly in accordance with the master-block from which the cams were formed.

The frame G, in which the secondary frame F is journaled, is preferably vertically adjustable on guides O, such adjustment being effected by a screw O' in rear of the frame G, (see Fig. 4,) and to further guide said secondary frame and relieve the pivot-pin the upper edge of the frame G is formed into a curved guide G⁴, and the support F' is provided with a roller F⁴, adapted to bear on said guide in the movements of the carrier from side to side. This guide assists in keeping the face of the brush-block the same distance from the inserter and is changed from time to time, as required to suit the different arcs.

For imparting intermittent motion to the pattern-cams the cam-shaft is provided with a worm-gear P, Fig. 4, with which meshes a worm P', carrying a ratchet-wheel P² and a hand-wheel P³. Journaled on the worm-shaft is an oscillatory pawl-frame P⁴, carrying a pawl p , held in engagement with the wheel by a spring-pin p' , bearing against a flat face on the pawl-stud p^2 , the arrangement being similar to that in my prior patent, No. 666,217, dated January 15, 1901. The pawl-frame is connected by a link Q with the lower end of a lever Q', pivoted at the upper end to a bracket Q² on the main frame and having at an intermediate point a roller or stud q , working in a cam-groove in a cam Q³ on the main drive-shaft.

The pulley C² is connected with the shaft C' by a clutch adapted to be released automatically when the pattern-cams have reached a predetermined position—as, for instance, when the block has been completely filled. In the preferred construction the clutch is formed by a spring-pin R, carried by a collar or disk R⁶, rigid on the shaft, Fig. 5, and adapted to enter a semicircular recess in a flange or disk on the pulley, and a trip in the form of a wedge S, adapted to engage the pin to press it back and out of the recess, is provided for disconnecting the clutch. This trip is supported by the frame and moved out of the path of the pin by a spring S' and into the path of the pin by a bell-crank shifting-lever T, one arm of which is connected with an operating-rod T', extending down into position for its lower end to engage and be operated by a stop projection T², carried by the pattern-cam shaft. The extreme end of the operating-rod is preferably jointed at T⁶, whereby reverse movement of the shaft may take place without affecting the clutch, and what is of greater importance when the parts come to rest with the rod resting on the projection the end of the rod may be moved by hand out of engagement with the projection to release the rod and permit the reengage-

ment of the clutch without the necessity of moving the pattern-cams and shaft on which the stop projection is mounted. Any lost motion is taken up and the control-arms held against the cams by springs or weights. Thus springs U serve to hold the frames I² forward, and a weight U', connected with the secondary carrier-frame by a flexible connection passing over a pulley U², serves to hold the carrier pressed in one direction, thereby preventing play should any of the joints or bearings become loose or worn.

In operation the attendant places a block in the carrier and clamps the same firmly in place. Thus to inaugurate the movement of the machine he advances the cam-shaft a short distance or moves the end of the clutch-rod out of engagement with the stop T², thereby releasing the clutch. The movements of the parts are so timed that the block is positioned and comes to rest before the inserter or coöperating tool operates thereon, and the movement of the block and carrier to a new position takes place after the said inserter or tool has withdrawn from engagement with the block. The positioning mechanism is simple and effective, and when a block has been operated on the parts are left in position for beginning to operate on a new block, thereby avoiding the necessity of a reverse or return idle movement of the parts in order to reach the starting position.

It will be observed that the carrier has guides which are arranged at right angles to each other, each of said guides operating to move the carrier in one arc or on one of its centers and to guide the carrier in its movements on the other arc or on its other center—that is to say, if one pattern-cam only were operated the carrier would be swung in one direction only and the motion would be transmitted to the carrier by the guide controlled by that cam; but the other guide would operate to prevent movement of the carrier in any other direction, because its operating mechanism would be fixed and the guide would slide thereon. This construction is simple and highly effective, inasmuch as it brings the control mechanism directly into engagement with the carrier.

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

1. In a brush-machine, the combination of the following instrumentalities, to wit; a tool for operating on the brush-block, a block-carrier mounted on centers to swing in arcs at right angles to each other, guides on the carrier arranged at right angles to each other, independent operating mechanism coöperating with said guides to move the carrier in one arc and to guide it in its movements in the other arc and pattern-cams controlling said operating mechanism; substantially as described.

2. In a brush-machine, the combination of the following instrumentalities, to wit; a tool

for operating on the brush-block, a block-carrier mounted on centers to swing in arcs at right angles to each other, guides for the carrier extending in planes corresponding to the plane of said arcs, operating mechanism having sliding engagement with the said guides whereby the carrier will be guided in each plane by one guide when moved by the other, and pattern-cams controlling the operating mechanism; substantially as described.

3. In a brush-machine, the combination with a tool for operating on a brush-block, of a positioning mechanism for the block embodying a carrier mounted on centers to swing in arcs at right angles to each other and having guides connected therewith arranged at right angles to each other, pattern-cams and independent operating mechanism controlled by the cams loosely engaging the guides on the carrier, whereby each cam controls the movement of the carrier in one direction and said carrier is free to move in the other direction under the influence of the other cam; substantially as described.

4. In a brush-machine, the combination with the carrier mounted on centers to swing in arcs at right angles to each other and a tool adapted to coöperate with a block held by said carrier, of a positioning mechanism for the carrier embodying pattern-cams and independent mechanism controlled by the respective cams with connections between said mechanism and carrier embodying guideways extended in the planes of movement of the carrier and sliding guides coöperating therewith, whereby each guideway and sliding guide operates as a guide for the carrier when moved by the other guideway and sliding guide; substantially as described.

5. In a brush-machine, the combination with the carrier mounted on centers to swing in arcs at right angles to each other and a tool adapted to coöperate with the block held by said carrier, of a guide beneath the carrier extended in one of the planes of movement of the carrier, a controlling-slide coöperating with said guide, a pattern-cam and connections intermediate said cam and controlling-slide for moving the carrier transversely of the guide, a second guide extended in the other plane of movement of the carrier, a controlling-frame having a guideway for said guide, a second pattern-cam and connections intermediate said cam and controlling-frame for moving said carrier transversely of said second guide; substantially as described.

6. In a brush-machine, the combination with the block-carrier mounted on centers to swing in arcs at right angles to each other and a tool adapted to coöperate with a block held by the carrier, of a guide extending longitudinally of the carrier at each end, a guide extending transversely of and below the carrier, independent controllers in which said guides travel and whereby the support is positioned, pattern-cams and connections inter-

mediate the pattern-cams and controllers for moving said controllers transversely of the guides with which they coöperate; substantially as described.

5 7. In a brush-machine, the combination with the block-carrier mounted on centers to swing in arcs at right angles to each other and a tool adapted to coöperate with a block held by the carrier, of a guide extending longitudinally of the carrier at each end, a guide
10 extending transversely of the carrier, a controller coöperating with the latter guide for moving the carrier longitudinally, controllers having vertically-extending guiding-surfaces
15 coöperating with the longitudinal guides, pattern-cams and independent connections intermediate the cams and controllers; substantially as described.

20 8. In a brush-machine, a block-carrier having downwardly-extending rods adjustably mounted in a transverse shaft, a secondary frame in which said shaft is journaled, having a downwardly-extending support, a vertically-adjustable frame in which said secondary
25 frame is pivotally supported and means for controlling the swing of the carrier with the shaft and pivot of the secondary frame as centers; substantially as described.

9. In a brush-machine, the combination with a block-carrier mounted on adjustable
30 centers to swing in arcs at right angles to each other, whereby the radius of the arcs may be varied, of an adjustable supporting-frame for said centers, whereby the position of the carrier may be adjusted without changing the radius of the arcs; substantially as
35 described.

10. In a brush-machine the combination with a block-carrier mounted on centers to swing in arcs at right angles to each other, 40 guides on the carrier arranged at right angles to each other to guide the carrier in its said movements, and controllers engaging said guides, of controller-operating mechanism embodying pattern-cams, independent
45 rock-arms operated by said cams, and connections between said rock-arms and controllers, one of said connections embodying a bell-crank lever on which the controller is mounted whereby said controllers are moved
50 in planes at right angles to each other; substantially as described.

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