

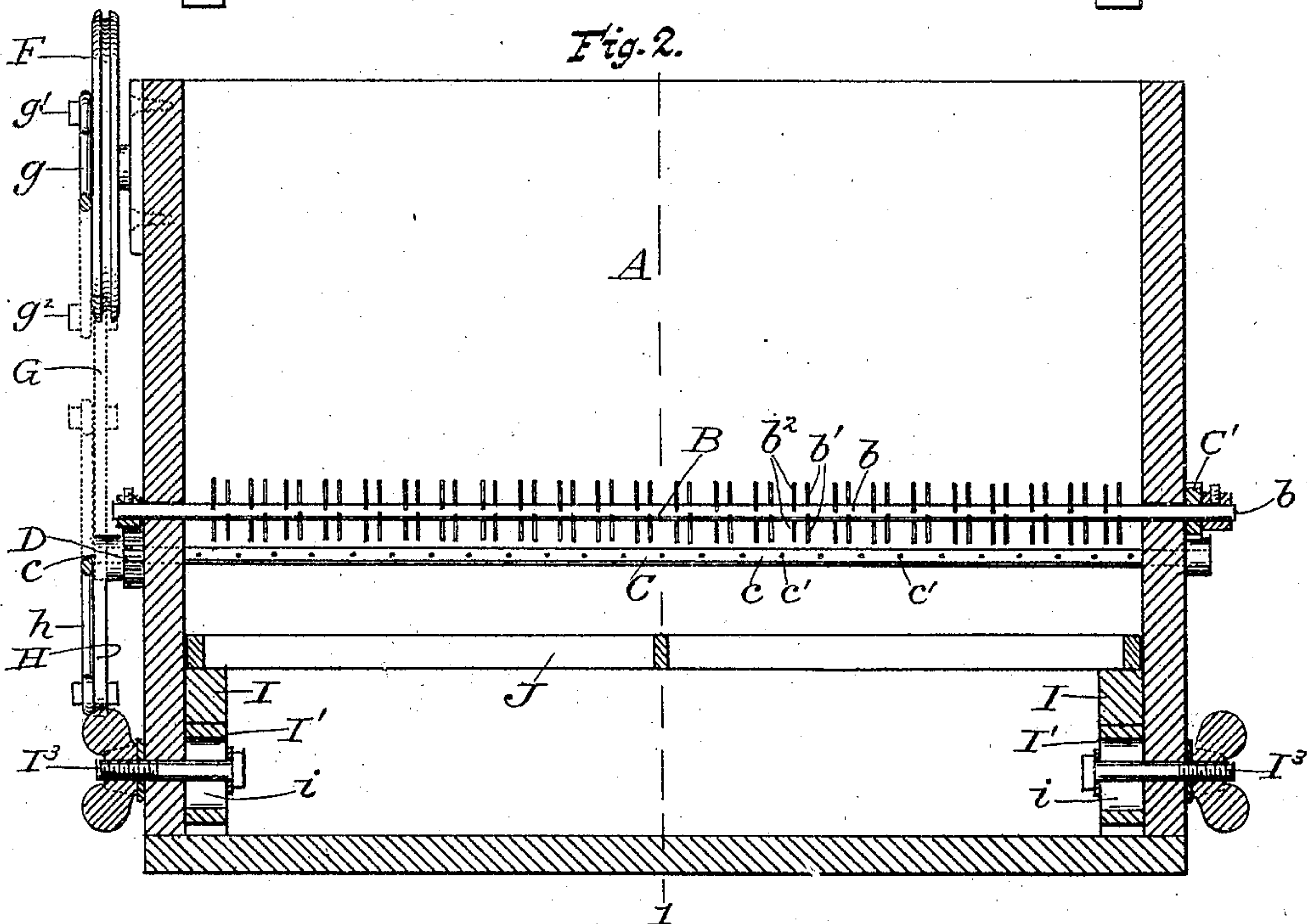
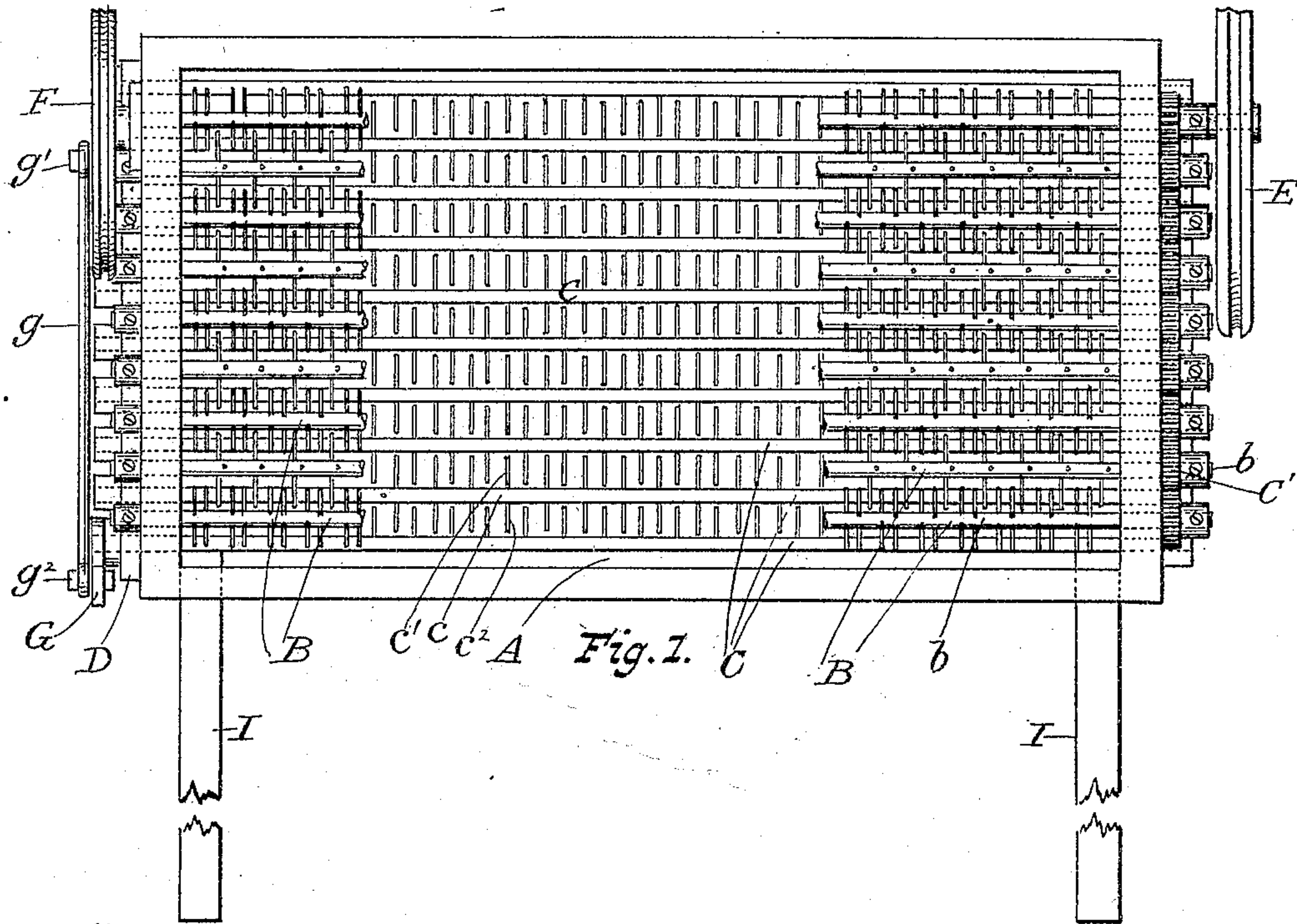
No. 790,147.

PATENTED MAY 16, 1905.

D. G. MORRISON.
MACHINE FOR FILLING BRISTLES IN BACKS OF BRUSHES.

APPLICATION FILED OCT. 15, 1903.

2 SHEETS—SHEET 1.



Witnesses.

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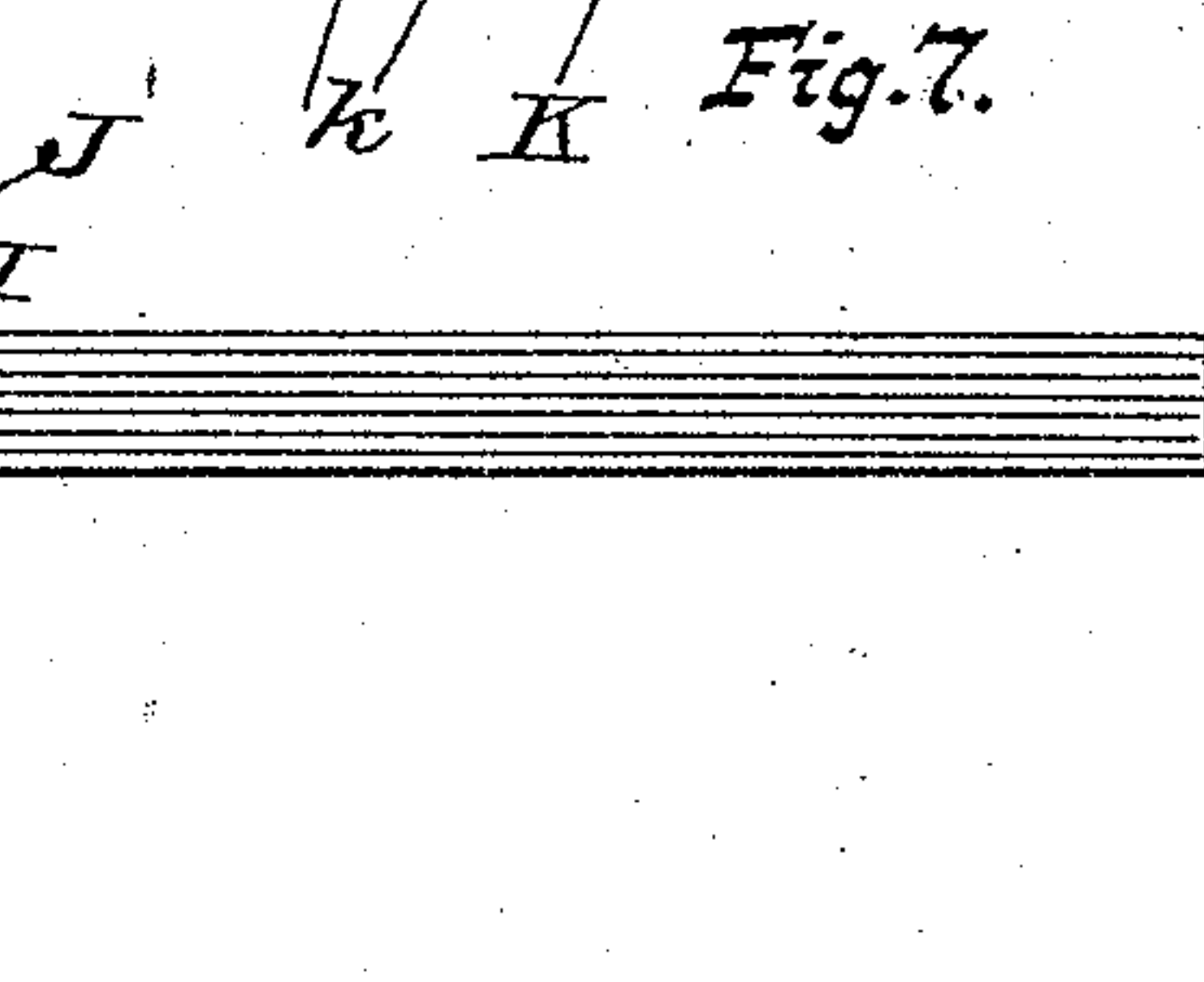
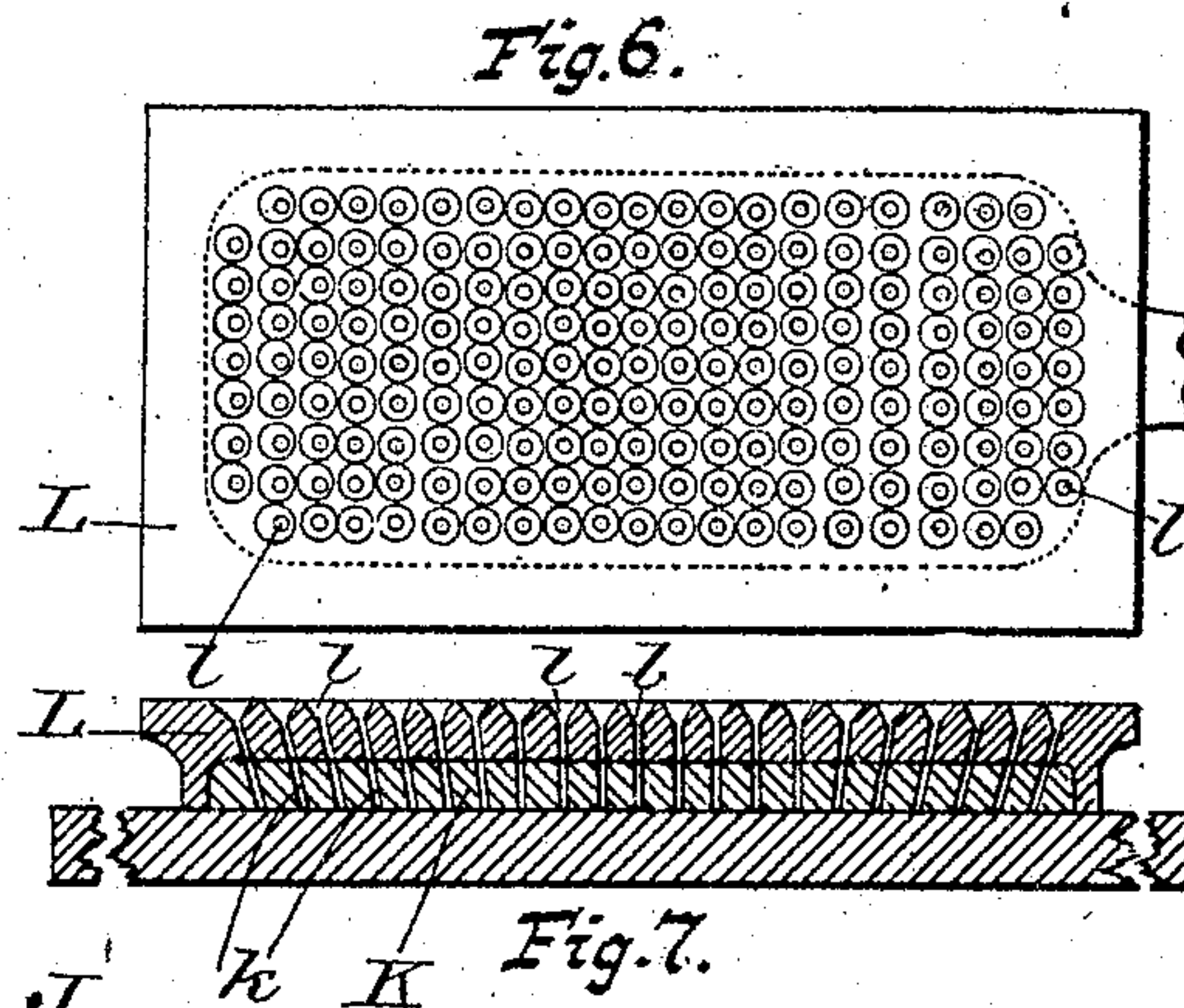
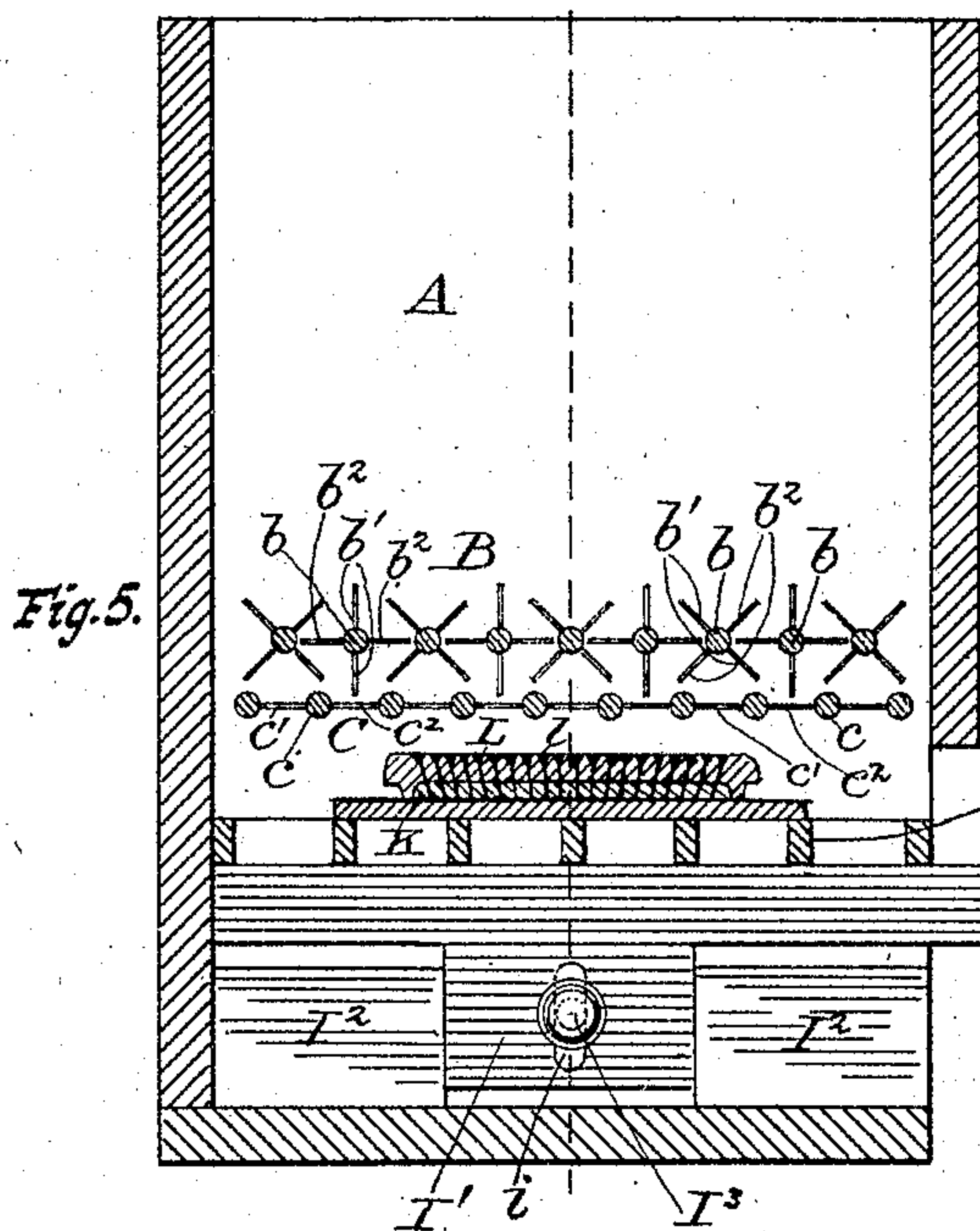
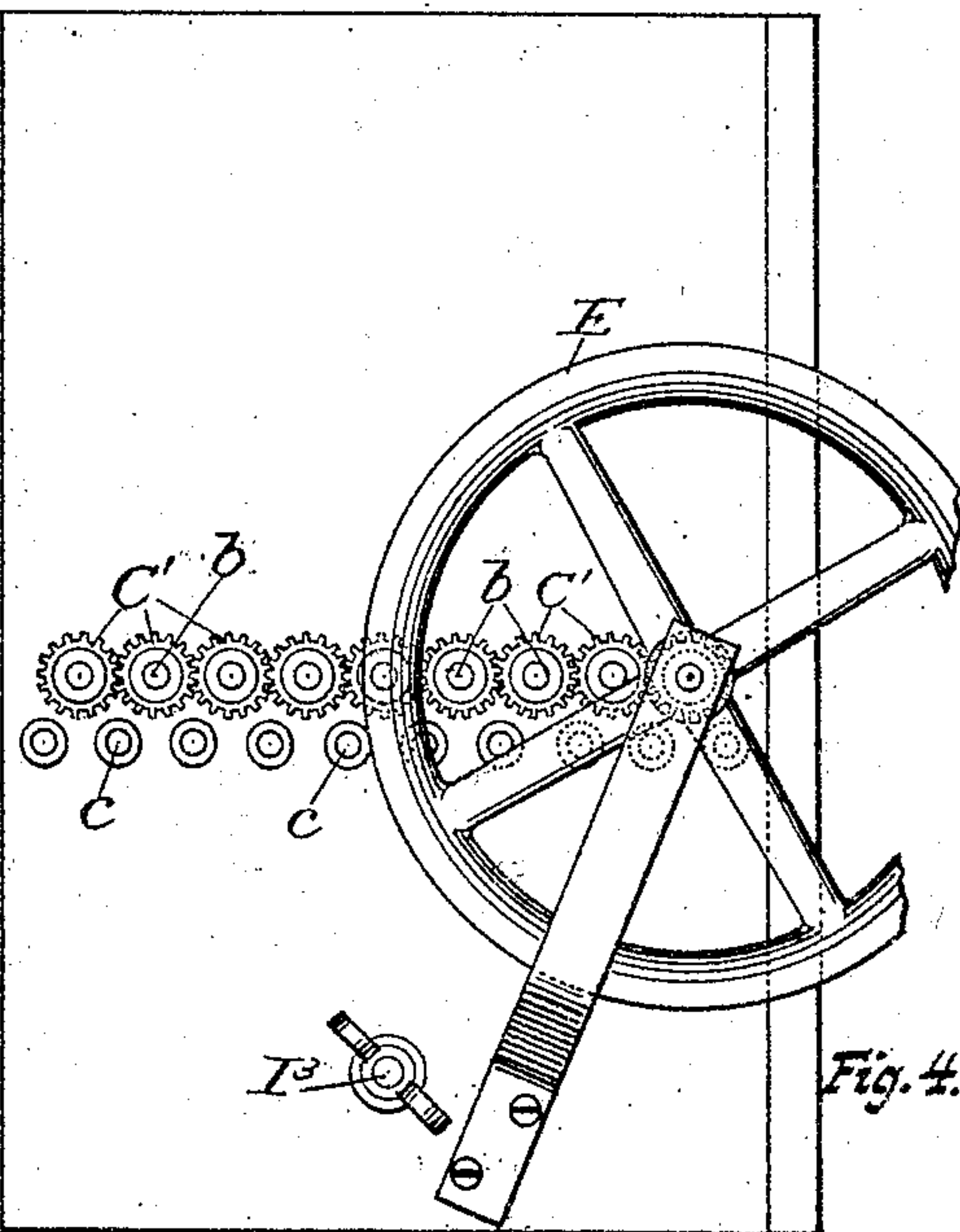
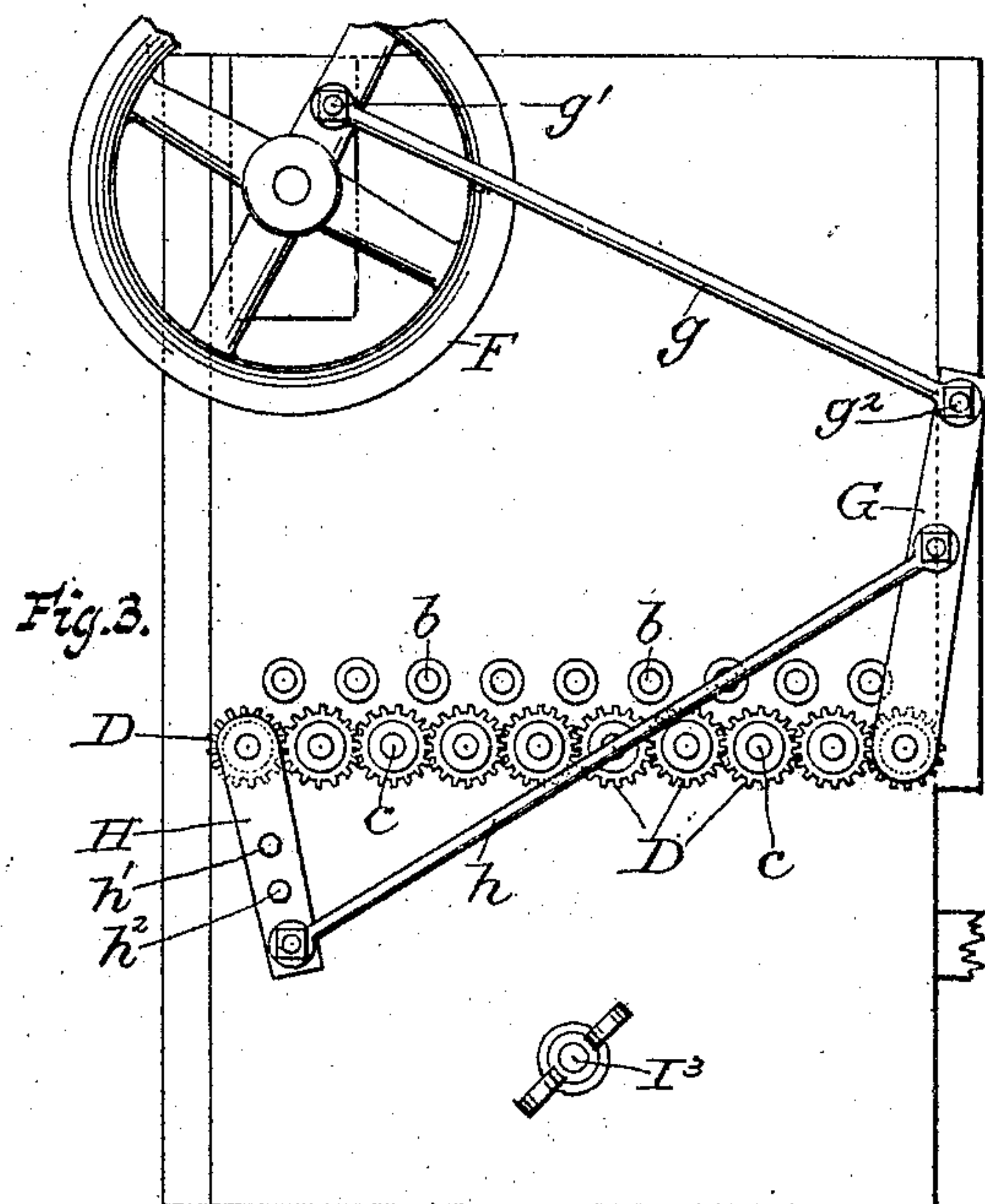
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MACHINE FOR FILLING BRISTLES IN BACKS OF BRUSHES.

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2 SHEETS—SHEET 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

DAVID G. MORRISON, OF TROY, NEW YORK.

MACHINE FOR FILLING BRISTLES IN BACKS OF BRUSHES.

SPECIFICATION forming part of Letters Patent No. 790,147, dated May 16, 1905.

Application filed October 15, 1903. Serial No. 177,153.

To all whom it may concern:

Be it known that I, DAVID G. MORRISON, a citizen of the United States, and a resident of Troy, in the county of Rensselaer and State of New York, have invented new and useful Improvements in Machines for Filling Bristles in Blocks of Brushes, of which the following is a specification.

This invention relates to machines for filling blocks of brushes with bristles and in bunched condition for cementing them in place; and it consists in the novel devices and the novel combinations and arrangements of devices and parts hereinafter described, and set forth in the claims.

The objects of this invention are to provide mechanism for effecting mechanical operations with mixed and tangled bristles, which may disentangle the bristles, straighten them out, and gradually change their position from horizontal to vertical for passage through the numerous bristle-conductors (provided in a suitable bristle-conveyer plate) and into bunch-receiving holes provided in brush-blocks as they are commonly prepared.

Other purposes and advantages will be clearly understood from the following description, when taken in connection with the accompanying drawings, in two sheets, forming a part of this specification, in which—

Figure 1 is a plan of a machine embodying the improvements with the upper bed of revoluble shafts and arms in part broken away for exposing the parts of the lower bed of vibratory shafts and arms. Fig. 2 is a longitudinal section on line 2 2, Fig. 3. Fig. 3 is an end elevation, (left hand.) Fig. 4 is an end elevation, (right hand.) Fig. 5 is a section taken at line 1 in Fig. 2. Fig. 6 is a plan of a bristle-conductor plate, and Fig. 7 is a section of the same and a brush-block in place beneath on line 7 7.

Similar letters of reference refer to similar parts throughout the several views.

A is a receptacle into which bristles are thrown, and in the bottom of said receptacle is mechanism composed of a bed formed by a series of oppositely-revoluble devices B and a bed formed by a series of vertically-vibra-

tory devices C, the latter devices being arranged on a plane below the former.

The revoluble devices B consist of a series of longitudinal cylindrical shafts of suitable diameter, as, say, five-sixteenths of an inch, or more or less, as may be found to be most advantageous for carrying each a series of suitable arms. These revoluble devices B comprise each a shaft *b*, to each of which is secured several series of radial arms *b'* *b'* and *b*² *b*², which latter are relatively at an angle with the former, as shown in Fig. 5, and these shafts are so arranged in relation to each other that one set of shafts have their arms *b'* *b'* and *b*² *b*² vertical and horizontal, while the arms of the alternating shafts are diagonal. Of course when these shafts are revolved the relative positions of the arms will be constantly changing. The arms *b'* *b'* of each shaft are in alinement with each other, while arms *b*² *b*² are in alinement with each other, but out of alinement with arms *b'* *b'* of the same shaft and those of the adjoining shafts, so that the arms of one shaft may freely pass those of its adjoining shafts and also produce suitable openings for free passage of bristles from above to vibratory mechanisms below. These revoluble devices B are continuously revolved by means of a series of cog-wheels *C'* *C'*, secured to the outer ends of shafts *b* *b*.

Below the bed of the series of revoluble devices is arranged the bed of series of vibratory devices C, which vibratory devices comprise each a series of shafts *c*, provided with radial arms *c'* *c'*. The arms are all on a plane and extend through the shafts to form a horizontal crated-like bed on which the bristles fall from the bed B. These radial arms are set at about one inch apart throughout the length of each shaft, and these shafts are so placed and arranged that the arms of every other shaft may be out of alinement with those of their adjoining shafts, so that they may pass each other at a distance of one-fourth of an inch apart or more or less, as may be found to be advantageous. These vibratory devices are vibrated vertically by any suitable mechanism, yet I prefer to employ cog-wheels *D* *D* similar to cog-wheels

C' C' for that purpose. These cog-wheels D are secured to the outer ends of the shafts c at one end of the machine, with the cogs of each wheel working in between the cogs of the adjoining wheels, and they are simultaneously turned about their axes to a distance of less than one-half of a full revolution with each alternating cog-wheel turning in opposite direction to their adjoining cog-wheels, so that each alternating vibratory device C may have its arms c' c'' vibrated in reversed direction continuously, with the arms of each shaft passing those of the other at short distances apart.

E is a driving-wheel secured, preferably, on the rearward shaft of the series of revolving devices B and at one end of the receptacle, as shown in Figs. 1 and 2. This drive-wheel may be actuated from any source of power or motion, and when revolved continuously will, through the series of gear-wheels C' C', revolve all the shafts of the revolving devices B simultaneously with adjoining shafts moving in opposite direction.

F is an actuating-wheel arranged at the opposite outer end of the machine, which wheel is driven from any suitable source of power or motion and is mounted on a suitable spindle secured to the said end of the machine. Pivoted on the outer end of one of the shafts of the vibratory devices C, and preferably on the rearward shaft of the series, which may be projected to a sufficient distance out past the cog-wheel D fixed thereon, is a vibrating arm G. A connecting-rod g connects the wrist-pin of said actuating-wheel F with the upper end of said arm G by means of pivots g' g'' , respectively.

H is a vibrating arm pivoted, preferably, on the first vibrating cog-wheel D' and preferably depending from the same, as shown in Figs. 2 and 3. This vibrating arm H is connected at its lower end with vibrating arm G by means of connecting-rod h at a point about midway between its lower end and its upper end, pivoted on connecting-rod g . When actuating-arm F is revolved to carry wrist-pin g' around the center of said wheel, the connecting-rod g will have imparted to it a reciprocating movement, and thereby vibrate arm G, which in its turn will impart to connecting-rod h an endwise-reciprocating movement, and thereby vibrate arm H, which arm being secured to one of the cog-wheels D vibrates the cog-wheel secured to it and through said wheel all the other cog-wheels D in the series, and imparts to the vibratory devices C a vibratory motion in which the arms c' and c'' of each adjoining shaft c moving alternately in opposite direction to the limit permitted by the length of movement of the vibrating arm H. The length of movement of vibrating arm may be changed by changing the points of pivotal connection of connecting-rod h with vibrating arm H and arm G by means

of pivot-holes h' and h'' , provided in said arms H and G. (Shown in Fig. 3.)

I I, Figs. 2 and 5, designate an adjustable track secured to vertical adjustable tongues I', which are properly guided between guide-pieces I² I² and are secured in places adjusted to by clamping-bolts I³, passing through slot-form opening i , provided in each vertical tongue and holding by its head with said tongues and passed through end pieces of the machine and provided with a suitable thumb-nut for tightening or loosening the same, as may be required. These tracks I I support a movable rack or bed J, which may be moved from the projected end portions of the same inward beneath the series of revolving devices B and series of vibratory devices D and may be moved vertically to near the latter devices or farther from the same, as the length of the bristles operated with may require for best operations and results.

The manner in which the parts in this machine operate is as follows: The tracks I and bed J will be adjusted vertically as the length of the bristles to be operated with may require, and the back K of the brush provided with the usual bunch-holes will be placed on said bed and beneath the metal-bristle-conveyer plate L, which will be in place up near to vibratory bed C as the radial arms c' c'' may allow. Revolving wheel E will now be revolved and revolve all the cog-wheels on the shaft of the revolving devices B. The one-half of the number alternating with the other will be revolved in one direction and the other half in another, at the same time actuating-wheel F will be revolved and through mechanism provided as above described will impart to each alternate vibratory device C a vibratory motion in which the radial arms c' c'' of each alternating shaft D' will be vibrated vertically in one direction to a sufficient distance for gradually changing the positions of the bristles from horizontal to vertical or approaching near to vertical as they are passed down by the action of the revolving devices B in a straightened and disentangled condition. Portions of the bristles will now be passed into the conducting perforations l , provided in plate L, and from thence into the perforations l' , provided in the brush-blocks K, until all perforations therein have been filled. When filled, these blocks K of the brushes will be removed and have cleared from the bristles attending an overflow of the same, when the bunched bristles will be ready for being secured in place by process of cementing or otherwise.

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

1. In a machine for filling bristles in blocks of brushes, the combination with a chamber for receiving mixed and tangled bristles, of a bottom comprising a series of shafts each

shaft having a plurality of arms lying in planes at right angles to one another, a lower bed or series of vibratory shafts having their axes between vertical lines which may be drawn through the axes of the revoluble shafts, mechanism for revolving each alternate revoluble shaft in one direction and for revolving the others of the series in the opposite direction, and mechanism for vibrating each alternate shaft of the series of vibratory shafts in one direction and for vibrating the others in the opposite direction.

2. In a machine for filling bristles in blocks of brushes, the combination with a chamber for receiving mixed and tangled bristles, of a bottom comprising a series of revolving devices, mechanism for revolving each alternate revoluble device in one direction and for revolving the others of the series in the opposite direction, a lower bed consisting of a series of vibratory devices having their axes between vertical lines which may be drawn through the axes of the revoluble devices, and mechanism for vibrating each alternate device of the series of vibratory devices in one direction and for vibrating the others in the opposite direction.

3. In a machine for filling bristles in brush-blocks, the combination with a receptacle for receiving mixed and tangled bristles, mechanism consisting of a series of revolving shafts and arms, a mechanism consisting of a series of shafts and vibrating arms below the former and out of alinement with the same, two vertically-adjustable horizontal ways extended from the rear side of a chamber formed below said vibrating mechanism, mechanism for adjusting the same in vertical direction, a bed supported on said horizontal ways, and a bristle-conducting plate supported by said bed beneath said vibrating mechanism and admitting a brush-back to be interposed between said bristle-conveyer plate and said bed.

4. In a machine for filling bristles in brush-blocks, the combination with a series of coacting revolving gear-wheels, revoluble shafts on which said gear-wheels are mounted, of means imparting motion to the gears, a series of arms carried by the shafts, a series of vibrating shafts, a series of intermeshing gears mounted on the vibrating shafts, a series of arms on said shafts, a revolving crank-wheel, an arm connected to one of the gears, a connecting-rod pivoted at or near the outer end of said arm and to the said wheel, a second arm depending from one of said coacting vibrating gears, and a connecting-rod between the said two arms.

5. In a machine for filling bristles in blocks of brushes, in combination with a bristle-receiving chamber, a series of revoluble devices, each revolving device comprising a shaft and arms projecting from said shaft, intermeshing gears on the shafts, a series of vibratory devices, each vibratory device comprising a

vibrating shaft and arms projecting from said shaft, the arms on alternate vibrating shafts being arranged between the arms of the remaining vibratory shafts, intermeshing gears on the vibratory shafts, a bristle-conveyer plate formed with a series of bristle-holes, means for supporting said bristle-conveyer plate between the series of vibratory devices and a brush-back to be filled, a driving-wheel for simultaneously revolving the gears of the revoluble shafts, and a crank-wheel and lever mechanism for actuating the series of vibratory shafts at the same time the revoluble shafts are in motion.

6. In a machine for filling bristles in blocks of brushes, in combination with a bristle-receptacle, a series of revoluble shafts having arms, the arms of adjoining shafts projecting at different angles with relation to a horizontal plane drawn through the shafts, intermeshing gears mounted on the said shafts, a series of vibratory shafts having their axes between vertical lines which may be drawn through the axes of the revoluble shafts, each vibratory shaft having arms arranged in pairs and in a plane, the arms on one shaft being between those on the adjoining shafts, intermeshing gears on the vibratory shafts, mechanism for driving the series of gears on the revoluble shaft, mechanism for vibrating the vibratory shafts a distance less than a half-revolution, and a bristle-conducting plate formed with bristle-conducting holes for leading bristles to the holes in a block of a brush.

7. In a machine for filling bristles in brush-blocks, the combination with a bristle-receiving receptacle, a plurality of revolving means in the receptacle, mechanism for revolving said means, a series of vibrating means below the revolving means, means for vibrating the latter means, a bed below the vibrating means, and a bristle-conducting plate formed with bristle-openings, said plate supported on the bed and adapted to direct bristles into openings in a brush-back.

8. In a machine for filling bristles in brush-blocks, the combination with a bristle-receptacle, an adjustable bed, a bristle-conducting plate supported by said bed, openings formed in said plate for directing bristles to a brush-block, revoluble means in the receptacle for separating the bristles, vibrating means for arranging the bristles in alinement, the revoluble means and the vibrating means being located over the bristle-conducting plate.

9. In a machine for filling bristles in brush-blocks, the combination with a bristle-receptacle, shafts in the receptacle, arms on the shafts, the arms of each shaft being arranged in pairs at right angles to each other and differently disposed with relation to the arms of adjoining shafts, mechanism operating said shafts, a second series of shafts under the aforesaid shafts, arms on each of the second series of shafts, said arms projecting toward

the adjoining shafts and normally in a horizontal plane, mechanism operating the second series of shafts, a bristle-conducting plate formed with openings, and a bed supporting
5 the said plate.

10. In a machine for filling bristles in brush-blocks, the combination with a bristle-receptacle, mechanism in the receptacle for separating the bristles, mechanism under the sepa-

rating mechanism for arranging the bristles in alinement, a bed, and a bristle-conducting plate supported by the bed and under the bristle-alining mechanism.

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Witnesses:

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