

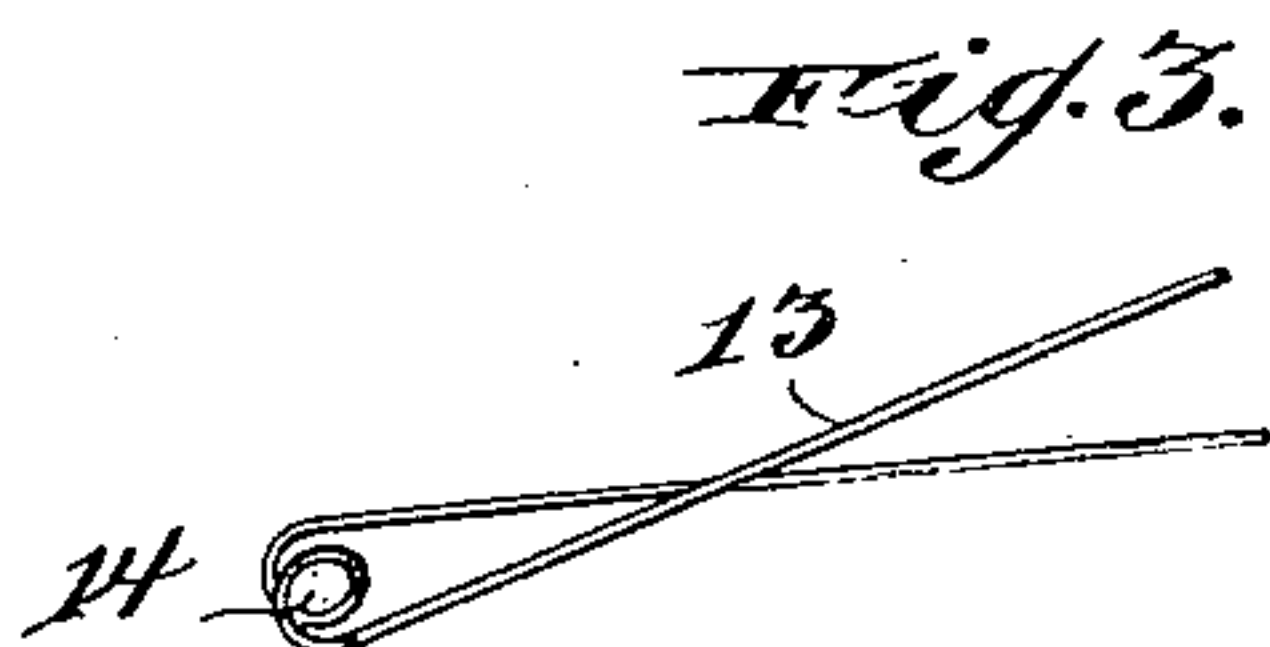
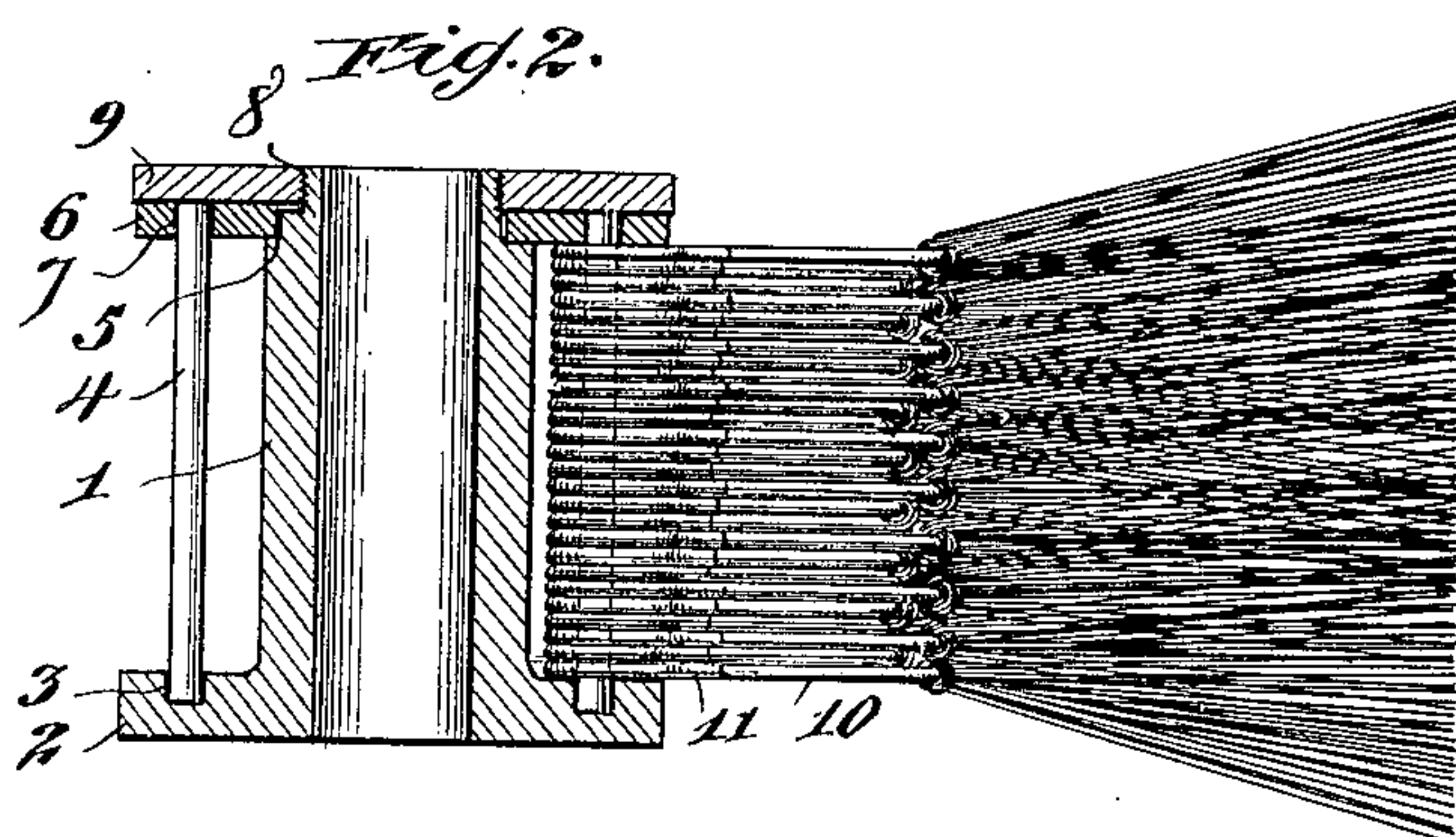
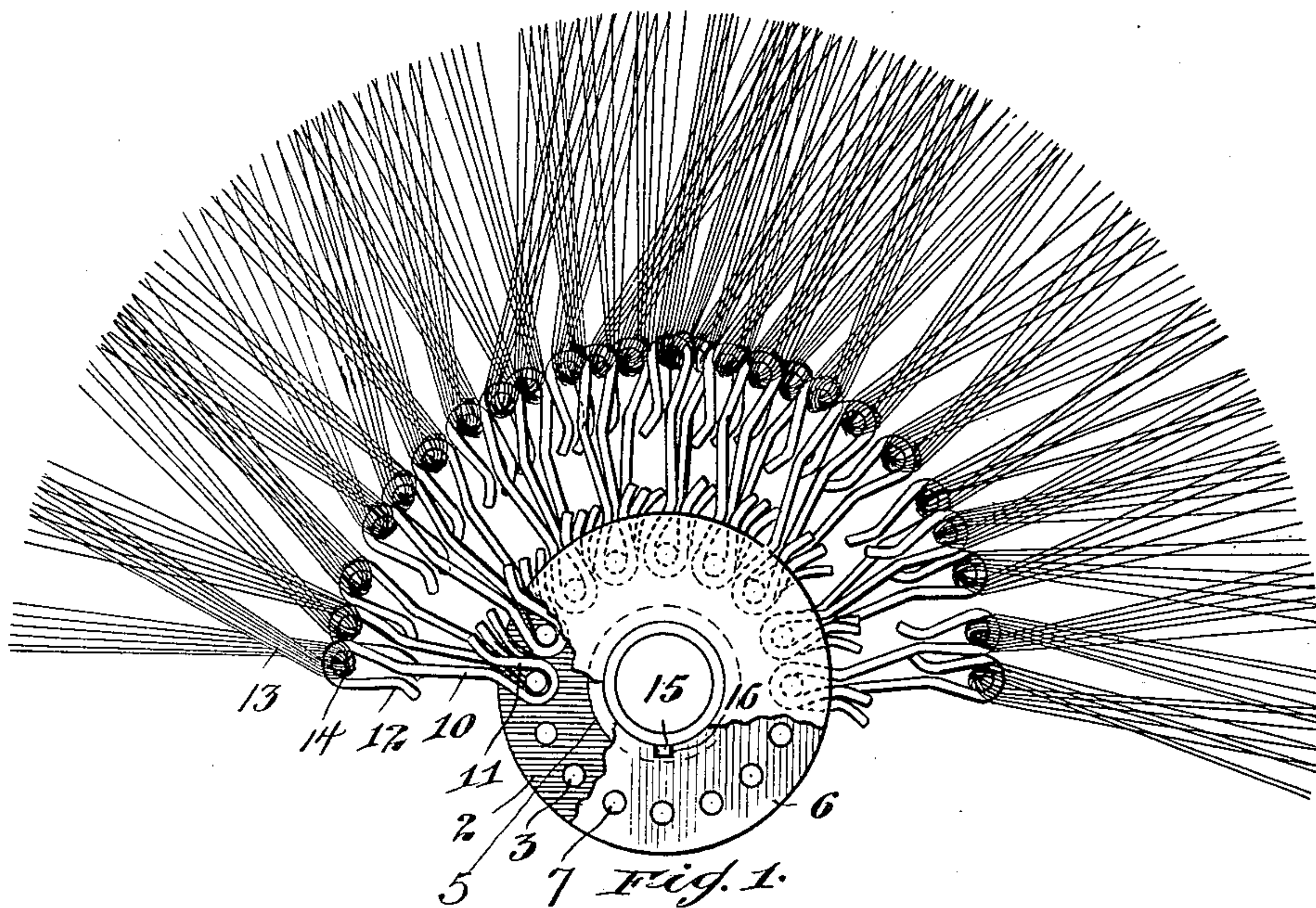
No. 658,416.

Patented Sept. 25, 1900.

F. W. YALE.  
POLISHING BRUSH.

(Application filed Oct. 19, 1899.)

(No Model.)



Witnesses,  
J. D. Mann,  
Frederick Goodwin

Inventor,  
Frank W. Yale,  
By Offield, Towle & Lintineum,  
Attys.



# UNITED STATES PATENT OFFICE.

FRANK W. YALE, OF AURORA, ILLINOIS.

## POLISHING-BRUSH.

SPECIFICATION forming part of Letters Patent No. 658,416, dated September 25, 1900.

Application filed October 19, 1899. Serial No. 734,077. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK W. YALE, a citizen of the United States, residing at Aurora, in the county of Kane and State of Illinois, have invented a new and useful Improvement in Polishing-Brushes, of which the following is a specification.

My invention relates to that class of polishing-brushes wherein the effective polishing agency is a mass of fine wires mounted upon a central body and adapted to be rotated in contact with the surface to be polished. Such brushes are usually employed for polishing metal surfaces, such as the handles of cutlery and other tableware, and my invention is devised with especial reference to such uses.

The object of my invention is to provide a brush of this character in which the wires are mounted more expeditiously than by present methods and in such manner that a superior quality of work is produced and the life of the brush prolonged far beyond that of the brushes now known.

My invention is exemplified in a brush such as shown in the accompanying drawings, and the invention is particularly specified, and pointed out in the claims.

In the drawings, Figure 1 is an elevation, partly broken away, of the brush-body and showing the manner of applying the brush-wires thereto. Fig. 2 is a longitudinal sectional plan view of the body and showing spindles, hanger, and brush-wire tufts in plan; and Fig. 3 is a perspective view of one of the brush-wires, showing the manner of forming the same for attachment to the body.

In the drawings, 1 represents a central hub apertured to receive a shaft, whereon the hub may be mounted for rotation. Said hub has an integral flange 2, provided on its inner surface with seats or sockets 3 for the spindles 4. The opposite end of the hub is reduced to provide shoulders 5 to receive a washer 6, which has perforations or sockets 7 to receive the spindles 4. The outer end of the reduced portion of the hub is threaded, as at 8, to receive a threaded clamping-ring 9, which binds the several parts together.

10 represents hangers, which may be formed with hooks 11 and 12 at their ends to receive,

respectively, the spindles and the brush-wires. The hooks 11 may be closed to form eyes or otherwise adapted for pivotal connection with the spindles; but the hooks 12 are preferably open to permit the hanging of the brush-wires therein.

The wires (marked 13) are preferably for polishing metal very fine, and I have found by experience that wires about five inches in length are suitable for use. Such wires are formed as shown in Fig. 3, each being doubled upon itself and coiled at its middle, the coil 14 being of such diameter as to enable its formation without rupture or fracture of the wire. The free ends preferably extend substantially perpendicular to the axis of the coil and in planes which intersect each other at about their mid-length. A number of these wires may be formed simultaneously, and I have successfully employed seven such wires to form each tuft, each hanger having, when seven wires are used, a tuft with fourteen polishing-points. The wires to constitute each tuft may be formed simultaneously around a mandrel or by hand and the hook 12 of the hanger passed through their coils.

The brush-body may be set on its flanged end with the spindles in place, the washer and clamping-ring removed. The hangers, each provided with a tuft of wires, are then placed on the spindles and preferably with their flat sides in contact, so that when the washer and clamping-ring are applied the hangers are clamped in line on their respective spindles. The washer is secured against movement around the hub by the key 15 and key-seat 16 or in some other equivalent manner, and this prevents the clamping-ring from unscrewing.

It should be understood that Fig. 1 does not show the spindles provided with their full complement of hangers, as such representation would make the illustration obscure. The spindles, as shown in Fig. 2, are filled with hangers, and the spindles are arranged symmetrically, so as to provide a brush circular on its periphery and providing a large number of wire points.

The individual wires are of course very flexible; but when massed in the manner described these wires project outwardly in sub-



stantially-uniform radial lines and to the same distance.

The action is as follows: The brush being mounted on a suitable driving-shaft or clamped in a suitable chuck and rotated at high speed, the work is placed so that the ends of the wires contact therewith during rotation. The character of the work to be done will determine whether the work is to be so placed that the bodies of the wires are bent or whether they simply touch the surface when the brush is revolved. It is undoubtedly true that the centrifugal force developed by the rapid rotation of the brush will cause the wires to extend in radial lines from the center of rotation and their ends to strike the surface which is being operated on with force proportional to the speed and the amount of centrifugal force developed.

The provision of the coils in the wires is important for two reasons. Where such brushes have been made of continuous unjointed pieces of wire, it has been usual heretofore to double each wire around the hook of the hanger and then twist its ends close to the hook. In the first place this twisting was a slow operation, whereas the tufts of coiled wire of my construction afford a convenient and rapid method of mounting the wires. In the second place this twisting weakened the wire and impaired its resiliency, in consequence of which the wires would soon break and the brush soon be rendered unfit for use. My method of mounting is very rapid as compared with the older method, since the whole tuft can be formed and applied in less time than it formerly took to apply a single wire. The coil gives the wire great elasticity and durability. When the brush is completed, the coils are or may be clamped so tightly as to prevent their turning on the hangers, particularly since the tufts are so massed as to prevent free movement around the hub, and in this way the coil itself imparts additional elasticity to the wires. By reason of these peculiarities of construction I am enabled to do much better work than has been possible with these brushes as heretofore constructed. In polishing metal I am enabled to secure a superior satin, Etruscan, or other finish, and my invention may be applied to abrading,

polishing, or finishing other materials than metal.

I claim—

1. A polishing-brush comprising in combination a central hub or body, hangers mounted thereon parallel to its axis and wires doubled upon themselves and having coils whereby they may be attached to said hangers, substantially as described.
2. A polishing-brush having a central hub or body, spindles mounted on said hub parallel to its axis, a movable means for clamping said spindles in place, the removal of said means affording free access to the ends of the spindles, hangers mounted on said spindles and each hanger having a polishing-tuft thereon composed of a plurality of wires, each wire being doubled upon itself and provided at its bent portion with an integral coil substantially as described.
3. In a polishing-brush the combination with a central body or hub having a flanged end provided with seats or sockets concentric to its axis, spindles adapted to said sockets, a perforated washer to afford seats for the opposite ends of the spindles, a clamping-ring for securing the spindles in the sockets, hangers pivotally mounted on the spindles and tufts of wire carried by the hangers, substantially as described.
4. A brush having tufts composed of wires provided with coils intermediate their ends, substantially as and for the purpose described.
5. A brush having tufts composed of a plurality of wires provided between their ends with coils and the end being projected outwardly from the coils and on the same side thereof, substantially as described.
6. A brush having tufts composed of a plurality of wires doubled upon themselves and provided at their bent portions with coils and the end portions of each wire being extended from the coil in planes intersecting each other between the coil and the extremity of said ends, substantially as described.

FRANK W. YALE.

Witnesses:

FREDERICK C. GOODWIN,  
IRVINE MILLER.