

A. L. WATKINS.

GROOVING OR NECKING METAL TUBES FOR THE MANUFACTURE
OF PAINT BRUSHES OR FOR OTHER PURPOSES.

APPLICATION FILED DEC. 12, 1903.

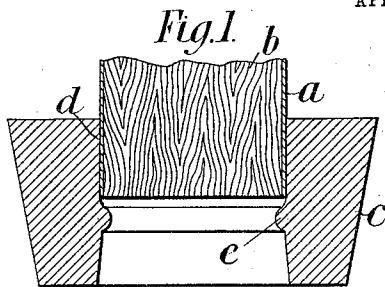


Fig. 3.

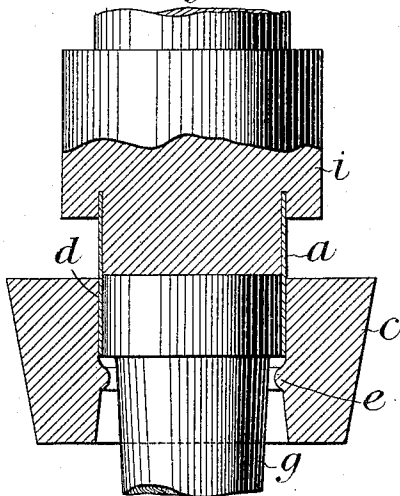


Fig. 4.

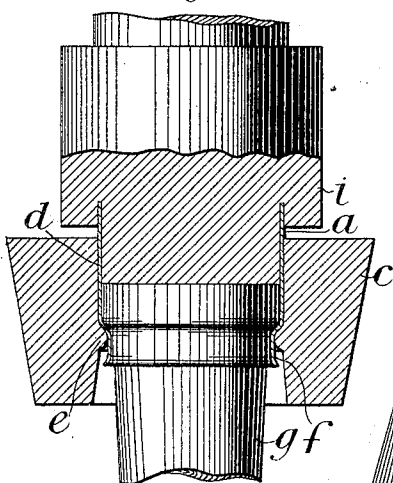


Fig. 7.

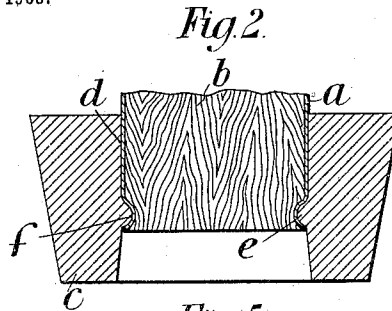
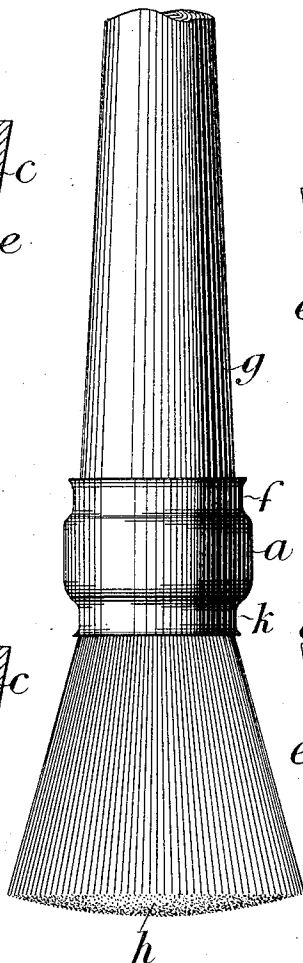


Fig. 5.

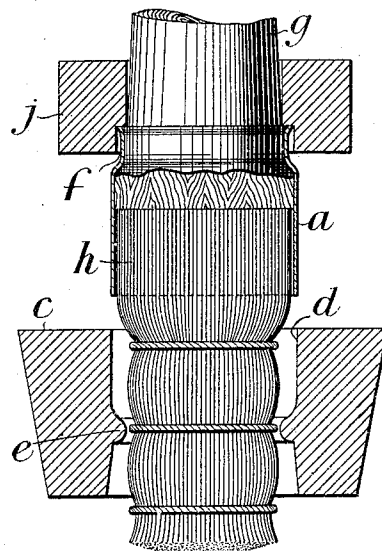
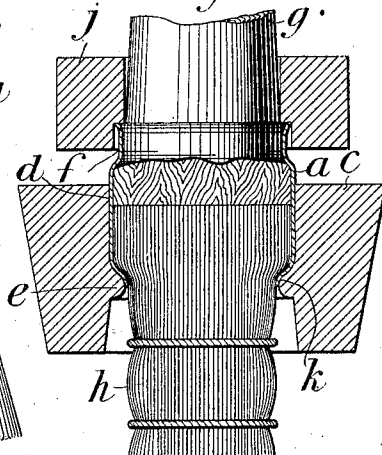


Fig. 6.



Witnesses

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ARTHUR LIDDON WATKINS, OF HAMPSTEAD, LONDON, ENGLAND.

GROOVING OR NECKING METAL TUBES FOR THE MANUFACTURE OF PAINT-BRUSHES OR FOR OTHER PURPOSES.

SPECIFICATION forming part of Letters Patent No. 779,016, dated January 3, 1905.

Application filed December 12, 1903. Serial No. 184,963.

To all whom it may concern:

Be it known that I, ARTHUR LIDDON WATKINS, a subject of the King of Great Britain, residing at 5 Cannon Place, Hampstead, London, England, have invented new and useful Improvements in Grooving or Necking Metal Tubes for the Manufacture of Paint-Brushes or for other Purposes, of which the following is a specification.

10 This invention relates to improvements in grooving or necking metal tubes, and can be applied, for example, for attaching a ferrule to a wood handle or for attaching bristles to the ferrules of paint and other brushes, or for
15 both these purposes.

According to the invention, the metal tube which is to be grooved or necked is filled with a material which has a certain amount of elasticity, such as soft wood or bristles, and the tube so filled is then forced through a die which has a cylindrical hole corresponding to the outside diameter of the tube and at a certain depth is provided with an internal bead or annular projection. When the end of the
25 tube reaches the obstruction offered by the bead or projection, it is forced past the said obstruction, so that at this point it is reduced in diameter. Owing, however, to the elastic substance with which the tube is filled the marginal portion of the metal as it flows past the obstruction is again expanded to approxi-
30 mately the diameter of the bore of the die, so that eventually the tube is left with a circumferential groove or neck formed in it. The die, which is advantageously made in more than one piece, allows of the removal of the ferrule.

In applying the invention to the manufacture of paint or other brushes the grooving or necking is utilized for fixing the bristles in one end of the marginal portion of the metal ferrule and also for fixing the other end of the ferrule to the wooden handle.

To enable the invention to be fully understood, I will describe it by reference to the accompanying drawings, in which—

Figures 1 and 2 are sectional views illustrating the method of grooving or necking a

tube according to the invention. Figs. 3 and 4 are sectional elevations illustrating the method of attaching a ferrule to a wooden or other handle. Figs. 5 and 6 are views similar to Figs. 3 and 4, illustrating the method of attaching bristles to the metal ferrule of a paint-brush; and Fig. 7 is a view of a paint-
55 brush made according to the invention.

Referring first to Figs. 1 and 2, *a* represents the metal tube which is to be grooved or necked, and *b* is the elastic substance, such as wood, which is inserted in the tube. *c* represents the die, which is formed with a cylindrical hole *d* of a diameter equal to the outside diameter of the tube *a*, and *e* is the internal bead or annular projection which is provided inside the said die *c* for forming the
65 groove or neck in the tube *a*. The die is advantageously made, as above described, in a number of parts to facilitate the removal of the tube after the neck has been formed. To form the groove or neck in the tube *a*, the said
70 tube, filled with the elastic substance *b*, is passed into the hole *d* in the die, as shown in Fig. 1, and is then forced past the annular obstruction *e*, as illustrated in Fig. 2, so that the metal flows around the said annular pro-
75 jection and by reason of the presence in the inside of the tube of the elastic substance after passing the annular bead flows out again to approximately the diameter of the bore *d* of the die, as clearly shown in Fig. 2. The
80 die is then taken apart and the elastic substance *b* is removed by any suitable means, leaving the tube with the groove or neck *f* upon its outer circumference.

In applying the invention to the manufacture of paint or other brushes the handle *g* is placed in the ferrule *a* in such a position as to leave sufficient of the latter projecting from the end of the handle to subsequently receive the bristles *h*. The ferrule and handle are
85 then introduced into the die *c*, as shown in Fig. 3, and a plunger *i* forces the said handle and ferrule down through the said die and past the annular bead *e*, as shown in Fig. 4. In its passage past the said bead the groove
95 or neck *f* is formed in the ferrule *a*, as clearly

shown in Fig. 4. The handle, with the ferrule attached, is then removed from the die, and the bristles are inserted in the open end of the ferrule *a* and passed into the die *c*, as shown in Fig. 5. A presser-piece *j* is then placed upon the upper end of the ferrule *a*, and the said ferrule, with the bristles, is forced through the die *c*, as indicated in Fig. 6, so that a second groove *k* is formed in the ferrule *a*, thus securely attaching the bristles to the ferrule, and thereby to the brush-handle *g*. The brush presents when finished the form illustrated in Fig. 6.

Although I have above described the method of attaching both the ferrule to the handle and the bristles to the ferrule by my method of grooving, I wish it to be understood that I can, if desired, secure the ferrule and handle together by other well-known methods, such as by pinning. It will also be understood that my method of grooving tubes is applicable for other purposes than the manufacture of brushes, which I have described above as being one of the chief applications of the invention.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. The method of grooving or necking metal tubes or ferrules, which consists in filling the tube or ferrule with an elastic material, then forcing the tube so filled into a die having a bore of substantially the same diameter as the exterior of the tube, and being provided with an internal annular bead, whereby a portion of the metal tube or ferrule will be compressed in passing the bead, and the margin of the tube will be expanded after passing the bead,

thus forming a groove or neck, substantially as described.

2. The method of attaching the bristles of a brush to the handle by a metal ferrule, which consists in inserting the bristles in the ferrule, forcing the portion of the ferrule containing the bristles into a die having substantially the same diameter as the exterior of the ferrule, and having an internal bead, whereby a portion of the ferrule is compressed in passing the bead, and the margin of the ferrule is then expanded after passing the bead, thus forming a neck or groove which engages and confines the bristles, and attaching the ferrule to the handle, substantially as described.

3. The method of attaching the bristles of a brush to the handle which consists in inserting the handle into one end of a metal tube or ferrule, then forcing the handle and ferrule into a die having an internal diameter substantially equal to the external diameter of the ferrule, and provided with an internal bead, which compresses a portion of the metal and permits the marginal portions thereof to expand after passing the bead, then inserting the bristles in the other end of the ferrule, and forcing the ferrule with the bristles into a similar die and compressing a portion of the metal upon the bristles and permitting the marginal portions of the ferrule to expand after passing the bead of the die, thus forming a neck or groove at each end of the ferrule, the one engaging the handle and the other engaging the bristles, substantially as described.

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Witnesses:

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