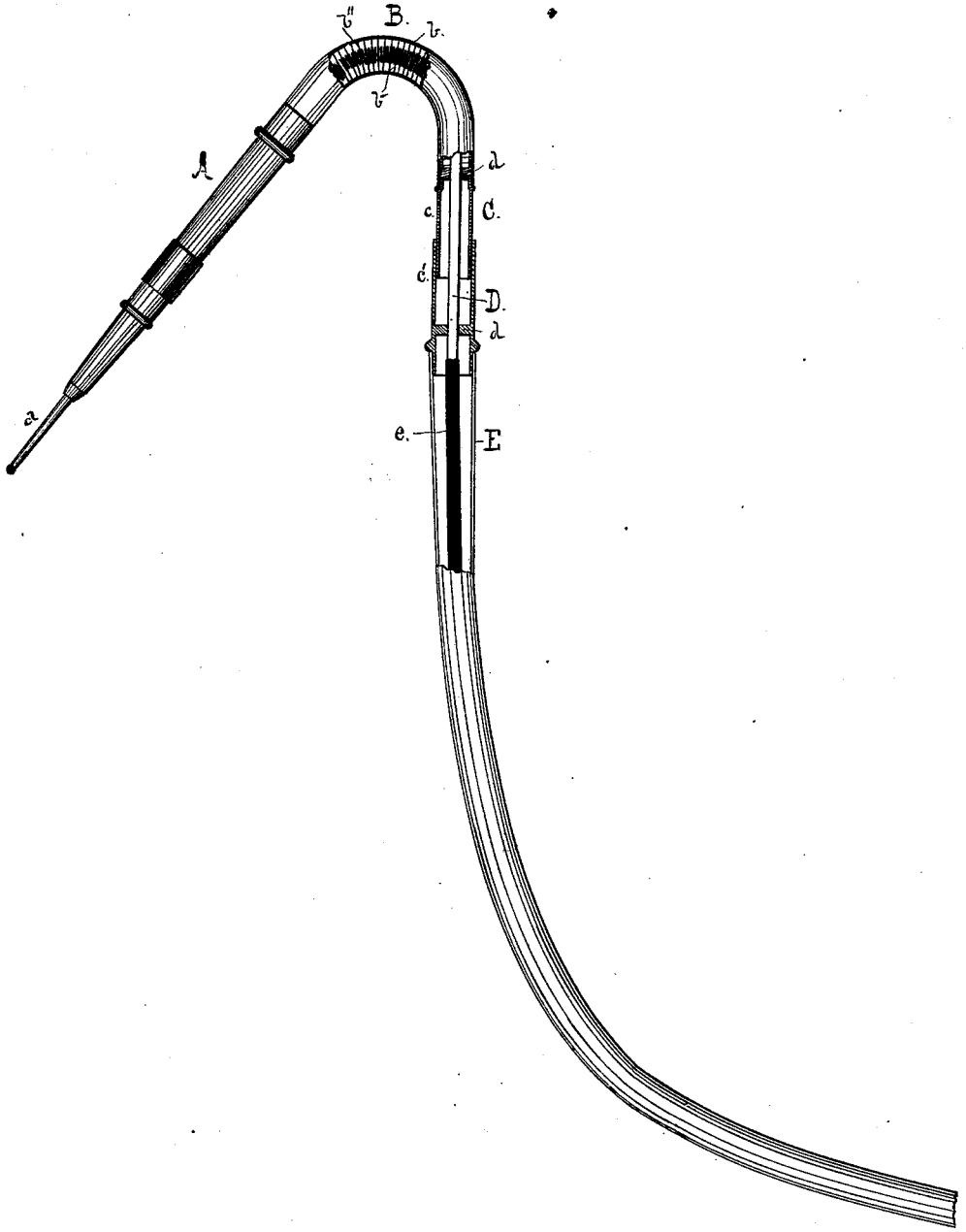
B. M. WILKERSON.

Motor-Cable for Dental-Engines.

No. 204,645. Patented June 4, 1878.



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IMPROVEMENT IN MOTOR-CABLES FOR DENTAL ENGINES.

Specification forming part of Letters Patent No. **204,645**, dated June 4, 1878; application filed May 24, 1878.

To all whom it may concern:

Be it known that I, BASIL M. WILKERSON, of the city of Baltimore, State of Maryland, have invented certain new and useful Improvements in Motor-Cables for Dental Engines; and I hereby declare the same to be fully, clearly, and exactly described as follows, reference being had to the accompanying drawings.

This invention relates to means for communicating motion from a dental engine to its various equipments, such as drills, pluggers, disks, &c.; and it consists in a device for accomplishing that end, constructed as hereinafter described, and possessing points of novelty indicated in the claims.

It has heretofore been customary to attach the spindle of the hand-piece directly to the flexible motor-shaft now in general use, or, in cases where a rigid shaft is substituted for the flexible cable, a short section of a flexible connection, consisting of a spiral coil of wire inclosed in a similarly-formed non-rotating sheath, was used for attaching the hand-piece to the rigid shaft. Either of these methods is objectionable, the former on account of the incident difficulty of manipulating the hand-piece, the latter on account of the liability of entangling the beard of the operator or male patient in the spiral coil; besides, the rigid sections of shafting are even more inconvenient than the flexible shaft or coil. It is obviously desirable that the rotating shaft be inclosed throughout its length in a non-rotating sheath; but heretofore this has not been possible, a portion of the shaft being left bare to admit of longitudinal motion of the sheath thereon caused by flexure.

In order to obviate the above difficulties and secure certain other advantages which will be apparent, I construct the device as follows: A represents the hand-piece, of any suitable form, having the drill-point *a* secured therein. To the spindle of the hand-piece is secured a short section, *b''*, of a highly-flexible spiral-wire coil, inclosed in a readily-flexible sheath, B, preferably of thin rubber tubing, sustained internally by means of a fine spiral coil of wire, *b*, which latter may, if desired, be vulcanized within the sheath B. To the rear end of the coil *b''* is secured a short rigid rod, D, which is arranged to rotate in bearings *d d* within the tubes *c c'* of a telescopic sheath, C, the sheath B being sprung upon or otherwise suitably attached to the tube *c*. To the rod D is suitably secured the usual flexible shaft *e*, its sheath E being attached to the tube *c'*.

Such is, in general terms, a description of the construction of the device, from which its operation will be readily understood.

It will be observed that the rotating shaft is covered throughout its length by a non-rotating sheath, a portion of which is adapted to take up the longitudinal motion caused by flexure.

As an obvious mechanical equivalent, I may mention a section of rubber tubing or any equivalent longitudinally-elastic tube, as a substitute for the telescopic joint.

Important results flow from the described construction and arrangement of parts. The coil *b''* readily admits of a degree of flexure which is impossible with the motor-coil *e*, and, in combination therewith, conduces to greatly-increased facility in performing dental operations. The coil *b''* does not alone possess sufficient stiffness to communicate motion, if of a length required in the operations of drilling or plugging, while the coil *e* is too stiff to admit of the ready manipulation of the drill. Neither coil alone will answer the desired end. A degree of stiffness requisite to communicate motion through, say, two feet of cable is too great to allow the operator to have that control over the motions of the hand-piece and drill-point which is a great desideratum, if not an indispensable requisite.

The highly-flexible section *b''* obviates the difficulty of directing the motions of the hand-piece attending the use of the motor-cable *e* when directly attached to the drill-spindle, and, as it takes up all the flexure except the natural catenary curve of the cable *e*, the friction of the same within the sheath E is reduced to a minimum, the power required to drive the engine and the danger of slipping its driving-belt being, of course, proportionately lessened.

While the telescopic joint hereinbefore described and its rod D are important adjuncts to the motor-coils *e* and *b''*, they are by no

means essential thereto, as the coil *e* may be directly attached to the coil *b''*, their respective sheaths being, of course, secured together, in which case the sheath B will be found to have sufficient longitudinal elasticity to take up the motion caused by flexure.

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

1. A flexible motor-cable for dental engines, terminating in a section more flexible than the rest, and adapted to be attached to the spindle of the hand-piece, substantially as described.

2. A flexible sheath for the motor-cable of a dental engine, terminating in a section more flexible than the rest, and adapted to be attached to the hand-piece, substantially as described.

3. A motor-cable for dental engines inclosed throughout its length in a non-rotating sheath which is longitudinally adjustable for a portion of its length, and thereby adapted to take up the motion caused by flexure, as set forth.

4. A motor-cable for dental engines inclosed in a sheath provided with a telescopic joint, as set forth.

5. In combination with the motor-cable of a dental engine, a rigid rod inclosed in a telescopic sheath, substantially as described.

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