(No Model.)

J. KELLER.

ELECTRIC MOTOR FOR DENTAL WORK.

No. 493,431. Patented Mar. 14, 1893.

Fig 2.

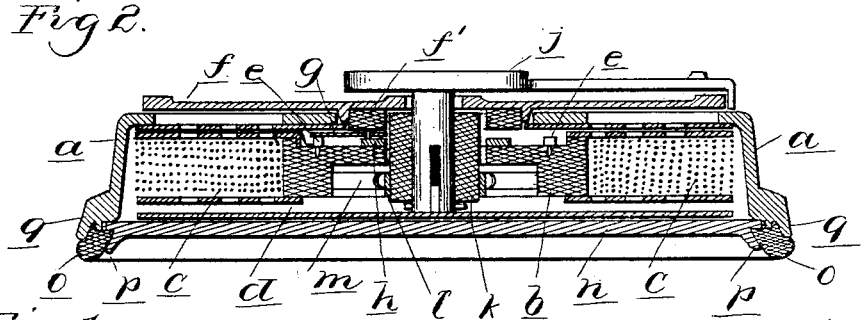

Fig 1.

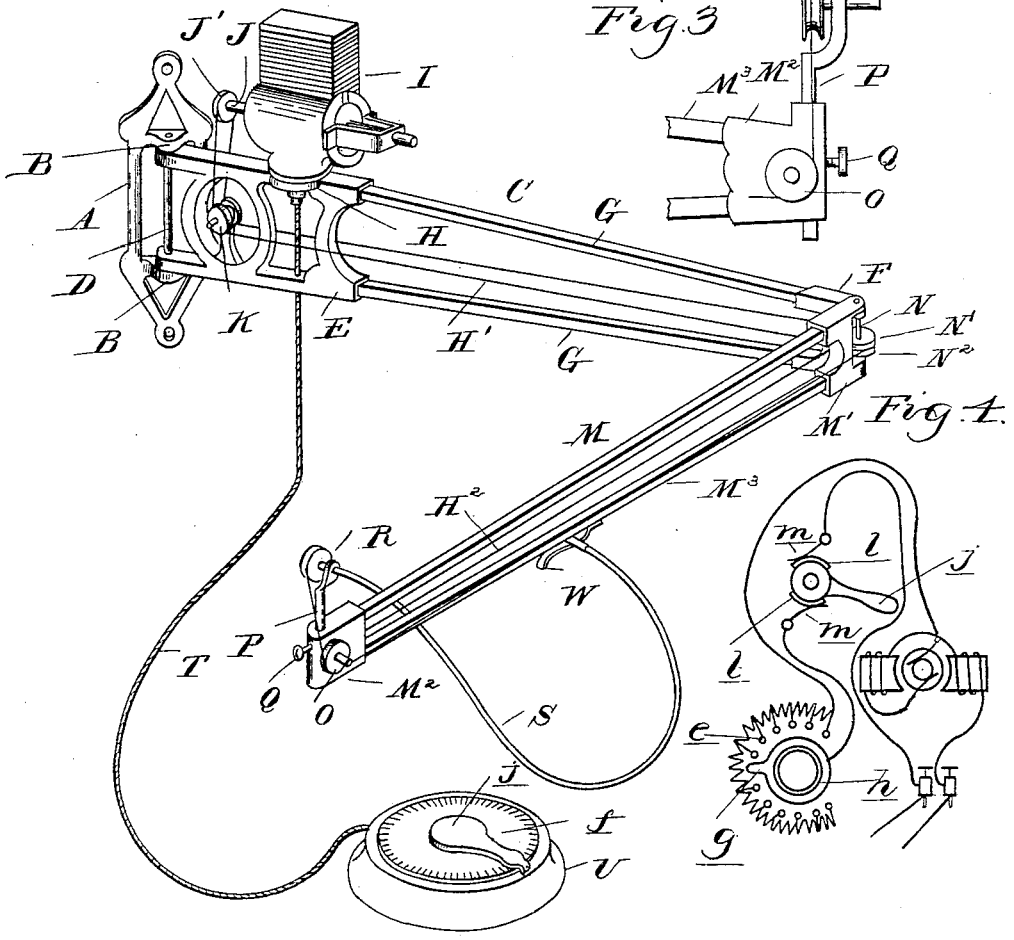

Fig 3

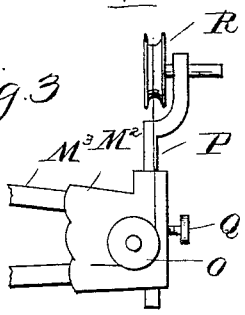

Fig 4.

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UNITED STATES PATENT OFFICE.

JEREMIAH KELLER, OF CANTON, OHIO.

ELECTRIC MOTOR FOR DENTAL WORK.

SPECIFICATION forming part of Letters Patent No. 493,431, dated March 14, 1893.

Application filed June 6, 1892. Serial No. 435,708. (No model.)

To all whom it may concern:

Be it known that I, JEREMIAH KELLER, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Electric Motors for Dental or other Work, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to new and useful improvements in electric motors for dental and other work, and it is the object of my invention to provide a motor and means for transmitting power therefrom to a dental tool or other instrument in such manner that the operator can carry his power wherever it is wanted without the device being even in his way either in or out of use, and also to afford perfect and simple control without interfering with the perfect freedom of the operator in doing his work.

To this end my invention consists in the peculiar construction and arrangement and combination of parts as more fully hereinafter described.

In the drawings, Figure 1 is a perspective view of my improved motor together with its swinging support and combined foot switch and resistance box. Fig. 2 is a vertical section through the combined foot switch and resistance box. Fig. 3 is an enlarged elevation of the outer end of the swinging support; Fig. 4 a diagram of the foot switch and adjustable resistance.

The motor is mounted upon a swinging support or so-called wall bracket consisting of a plate A provided with suitable means of securing it to a wall and having lugs B to which the arm C is hinged to swing in a horizontal plane, by means of the bolt or pivot pin D. This swinging arm is preferably composed of end castings E and F joined by the rods G, secured in sockets in the castings.

The casting E is provided on its top with a base plate H upon which the electric motor I is firmly mounted. This motor is preferably placed to have its revolving armature shaft J longitudinally in line with the arm C of the bracket and carries a grooved pulley J'.

K K are a pair of grooved pulleys supported by the arm C of the bracket on the sides of the casting E, and adapted to revolve independently of each other.

To the casting F of the swinging arm C is hinged the swinging arm M formed in a similar manner to the arm C of the end castings M' M^2 and the connecting rods M^3.

N is a vertical shaft sleeved upon the pivot pin which connects the two arms C and M, it is provided with two grooved pulleys N' N^2, which are adapted to revolve together. The outer end of the swinging arm M carries two small grooved pulleys O O, which revolve in vertical planes independent of each other upon a short stub shaft secured in the casting M^2. This casting carries a round post P which is adjustably secured by means of a set screw Q in a vertical socket formed centrally between the pulleys O O. The upper end of the post P is bent to one side and forms a journal for a short stub shaft upon the free end of which is secured the grooved pulley R which revolves in a plane with the axis of the post. By means of these pulleys motion is communicated from the armature of the motor by a rope H' passing over the pulleys J' K, K, to the pulley N', and from there by a rope H^2 passing over the pulleys N^2, O, O, to the pulley R.

To the shaft of the pulley R is secured the flexible shaft S by means of which the motion is communicated to the dental tool or other device to be driven thereby.

The motor is controlled by means of a combined switch and resistance box U, which is designed to be operated by the foot and which is constructed as follows: Within an outer casing or box *a* of circular shape is inclosed a spool *b* upon which a number of resistance coils *c* are wound. The spool *b* is of insulating material and has the flanges *d* which are preferably perforated to admit of free circulation of air, thereby preventing any danger arising from the heating of the coils. A series of contacts *e* are concentrically arranged around the upper surface of the spool *b* and connected to the terminals of the different resistance coils in the well known manner of connecting the resistances in series. A disk *f* revolves loosely on top of the case *a* and it

has a hub f' of insulating material passing through a central aperture in the top of the casing; a contact arm g being secured in this hub and adapted to pass over the contacts e so as to make electrical contact therewith. The inner end of this arm is in contact with a metallic ring h secured upon the spool b. Within a central aperture formed in the spool is mounted the hub k of insulating material and to this hub is secured in any suitable manner the switch lever j which turns freely with the hub k on top of the disk f. To the lower end of the hub k are secured segmental contact plates l which are adapted to form electric contact with two brushes m which bear against the hub and are secured in a suitable recess on the underside of the spool. The casing a is preferably closed by a cover n on the underside and has a rubber rim o clamped in position by means of flanges p and q formed respectively on the cover n and casing a. The motor is provided with a suitable binding post (not shown) to which the service conductors for the motor are secured; the terminals of the motor circuit are inclosed in a braided rope T of some length and extend to the foot switch where one is connected to one terminal of the resistance and the other to one of the brushes m while the ring h is connected with the other brush m; that is, the resistance and switch are connected in series with the motor circuit as in the usual manner of connecting. In practice with the parts thus constructed and with the motor connected to its circuit and the combined foot switch and resistance placed upon the floor, the operator is enabled to start or stop the motor by turning the arm j with his foot; at the same time he may regulate the power and speed by throwing in or out resistance which is accomplished in the same manner by manipalating the disk f with his foot, as the disk f turns independent of the switch lever j. To turn the disk more readily it is preferably provided with a serrated edge. The arrangement of the belts and pulleys is such that the swinging arm may be turned in any position to be out of the way of the operator without interfering with the free transmission of power from the motor to the flexible shaft which actuates the tool or dental engine. The lower side of the arm M is provided with a spring catch W in which the free end of this flexible shaft may be held when not in use. By adjusting the vertical post P the belt H' may be tightened when necessary, and the flexible shaft turned in any desired direction.

What I claim as my invention is—

1. In an electric motor for the purpose described, the combination of a bracket in two sections hinged together and provided with means for pivotally securing it to a wall, an electric motor mounted upon the bracket, a pulley mounted upon the free end of the bracket, two pulleys journaled at the pivotal connection of the two sections and revolving together horizontally, a rope transmission between one of said pulleys and the armature shaft, and a rope transmission from the other one of said pulleys to the pulley mounted on the free end of the bracket, substantially as described.

2. In an electric motor for the purpose described, the combination of a bracket in two sections hinged together and provided with means for pivotally securing it to a wall, an electric motor mounted upon the inner end of said bracket, with its armature shaft in line therewith, and provided with a pulley, two pulleys mounted at the pivotal connection of the two sections of the bracket and revolving together horizontally, a rope transmission between one of said pulleys and the pulley on the armature shaft, passing over two pulleys journaled on the inner end of the bracket and revolving independently of each other, and a rope transmission from the other end of said pulleys to the pulley mounted upon the inner end of the bracket and passing around two pulleys mounted at the outer end of the bracket and revolving independently of each other, substantially as described.

3. In an electric motor for the purpose described, the combination of the bracket consisting of the two sections C and M hinged togther, the plate A to which the section C is hinged and provided with means for securing it to the wall, the motor I mounted upon the section C of the bracket in line therewith, the pulley J' upon the armature shaft, the independently revolving pulleys K mounted in the inner end of the bracket, the pulleys N' N^2 mounted in the pivotal connection of the two sections of the bracket and revolving together horizontally, the rope H transmitting power thereto from the armature shaft, the pulleys O O mounted on the outer end of the bracket and revolving independently of each other in vertical planes, the pulley R mounted upon the adjustable post P upon the outer end of the bracket and the rope H^2 for transmitting motion from the pulley N^2 to the pulley R, substantially as described.

4. In an electric motor for the purpose described the combination with the motor, of a combined foot switch and resistance for said motor, and comprising the casing a, containing the operating parts of the resistance and switch, the movable disk f carrying the contact hand of the adjustable resistances and the switch lever j carrying the contacts of the switch, all arranged to operate, substantially as described.

5. In an electric motor for the purpose described, the combination with the motor mounted upon the swinging bracket, a combined resistance and switch for said motor, consisting of the case a, the fixed spool b provided with the resistances, the contacts e to which said resistances are connected, the disk f mounted upon and loosely revolving upon said case and carrying a contact hand, the ring h on the spool contacting with said contact

hand, the switch lever *j* mounted upon and turning independently of the disk, the insulating hub *k* of the switch lever carrying the contacts *l*, the brushes *m m* and the circuit connecting the switch and resistance in series with the motor circuit, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JEREMIAH KELLER.

Witnesses:
F. M. KELLER,
JOSEPH H. KELLER.