(No Model.) 3 Sheets—Sheet 1.

L. TEAL.

PEDAL SWITCH FOR ELECTRIC MOTORS.

No. 497,144. Patented May 9, 1893.

FIG. 1.

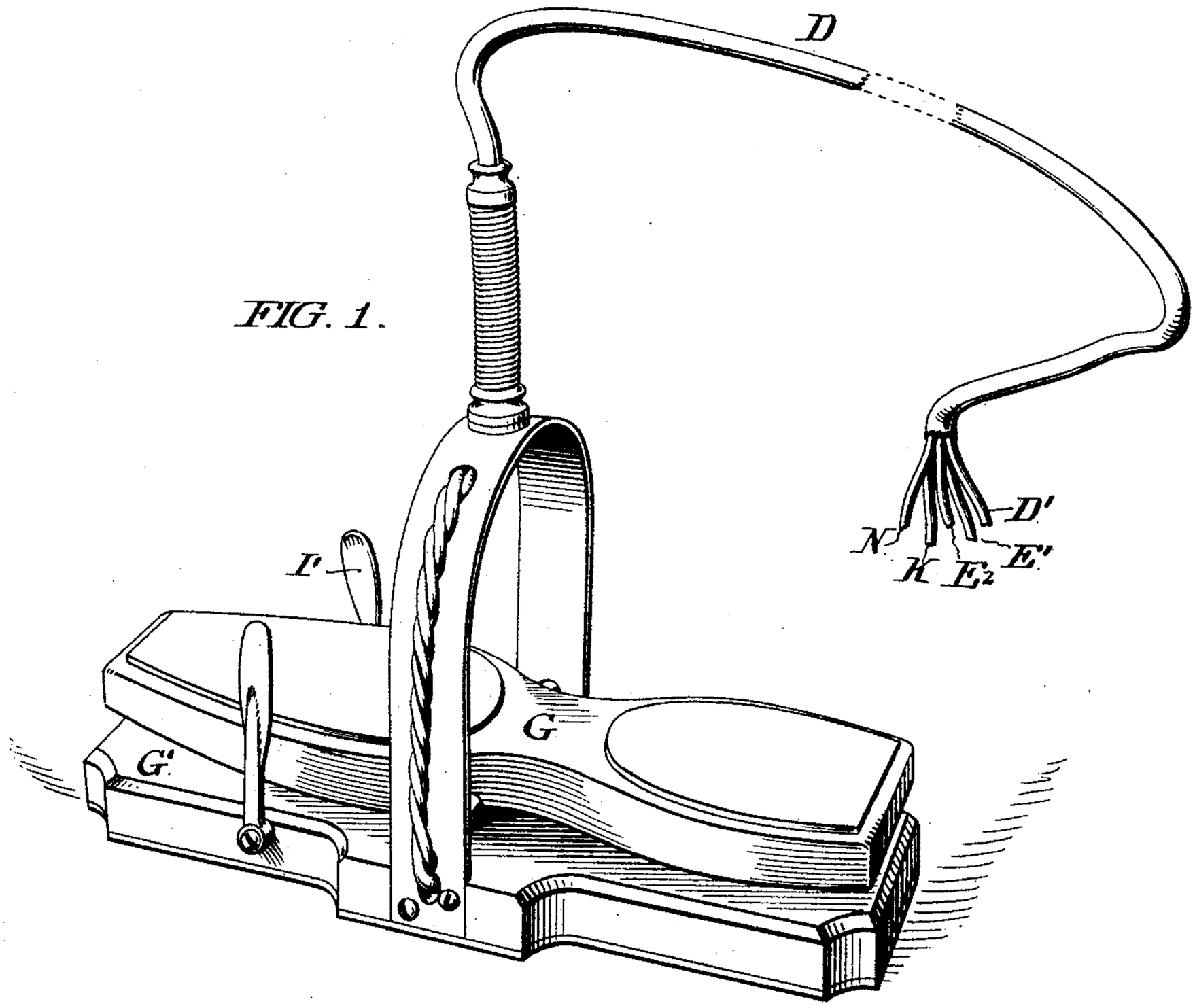
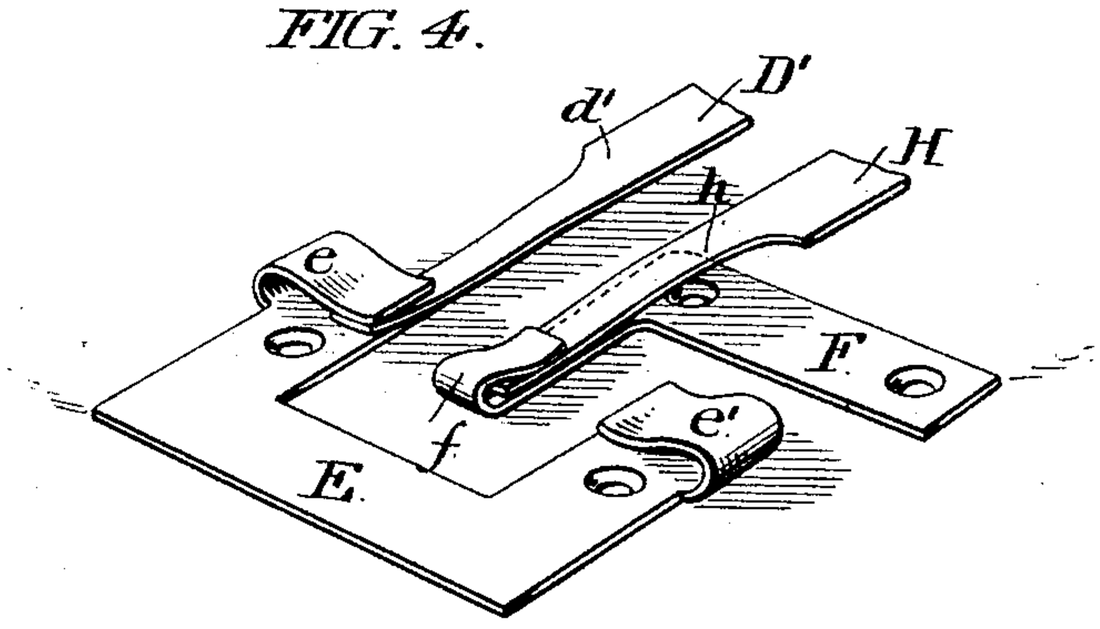


FIG. 4.



WITNESSES:

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INVENTOR:

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by his Atty

L. C. Taylor.

(No Model.) 3 Sheets—Sheet 2.

L. TEAL.

PEDAL SWITCH FOR ELECTRIC MOTORS.

No. 497,144. Patented May 9, 1893.

FIG. 2.

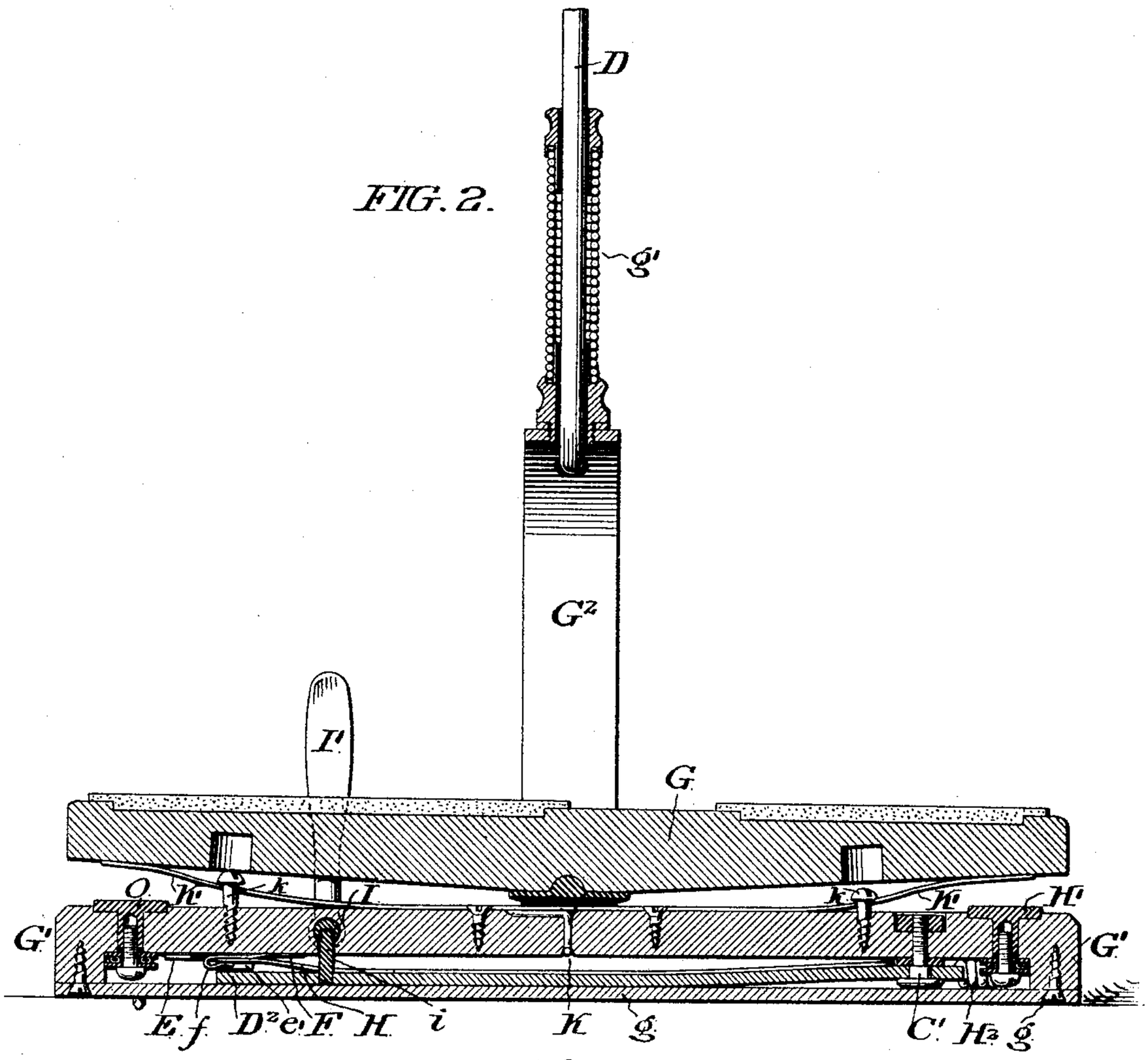
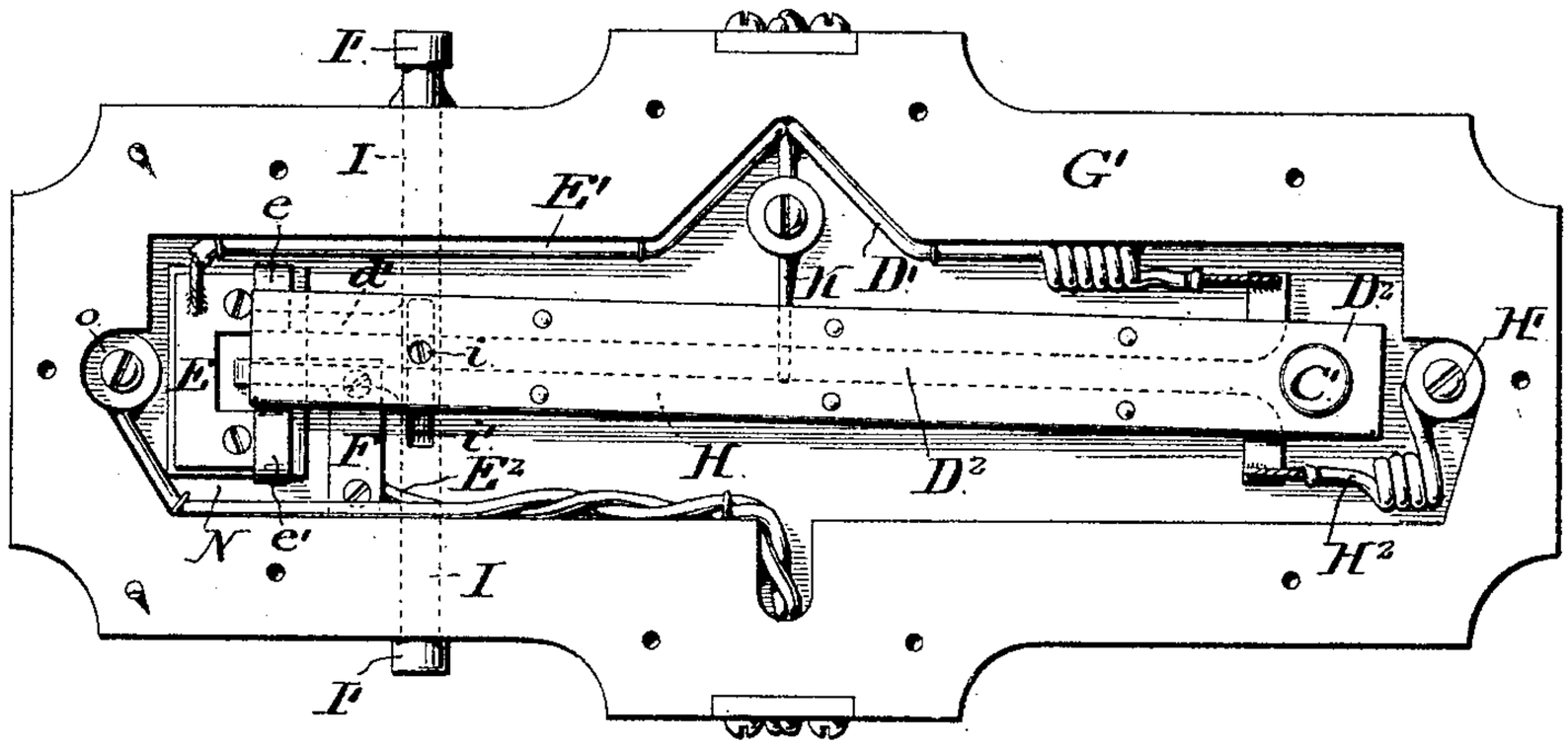


FIG. 3.



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(No Model.) 3 Sheets—Sheet 3.

L. TEAL.

PEDAL SWITCH FOR ELECTRIC MOTORS.

No. 497,144. Patented May 9, 1893.

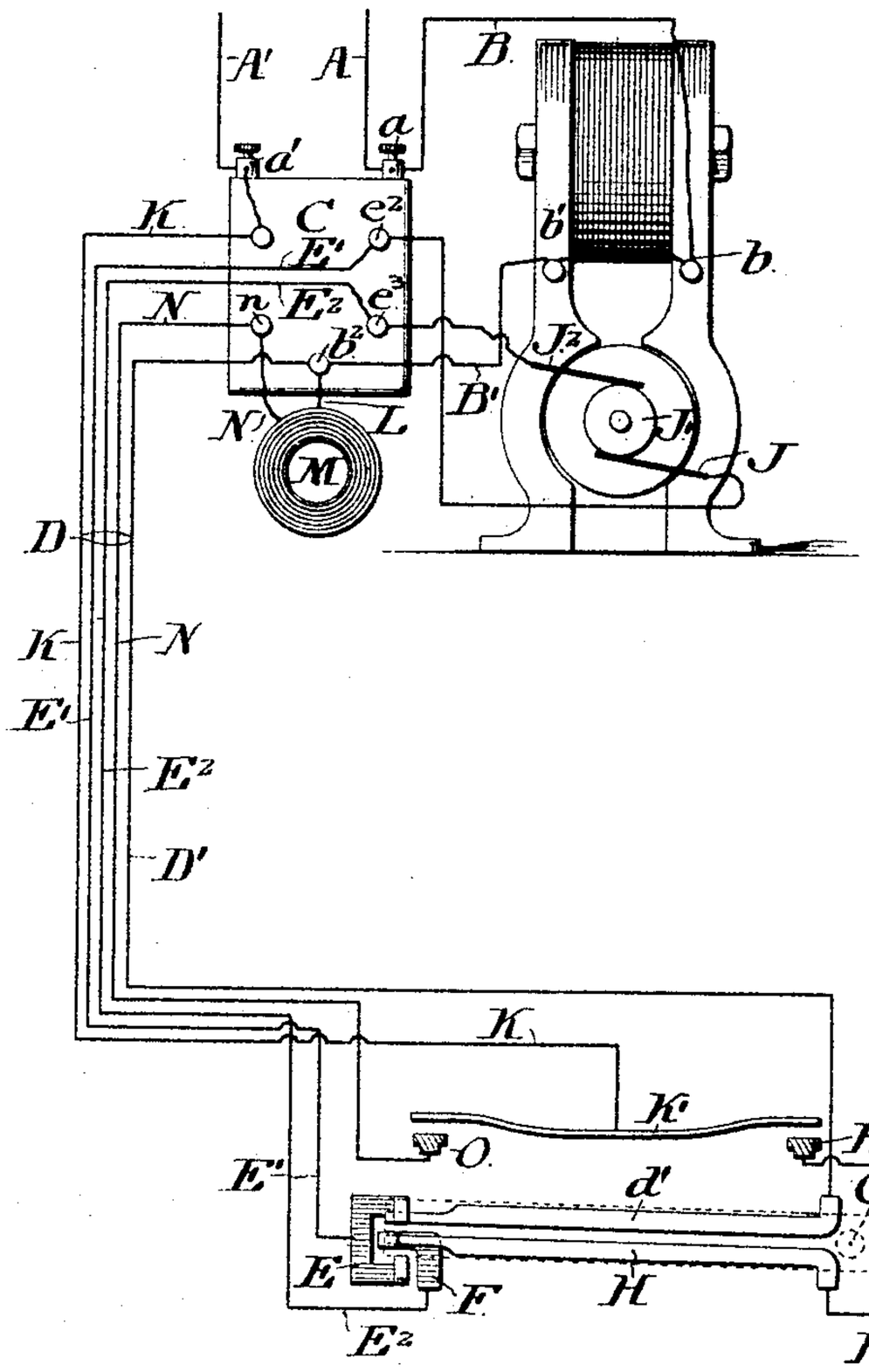

FIG. 5.

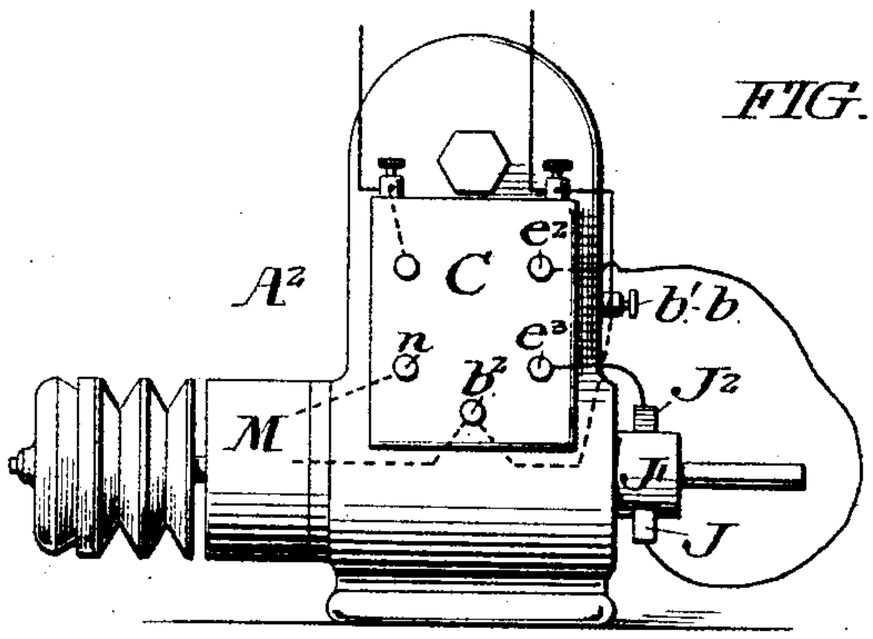

FIG. 6.

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UNITED STATES PATENT OFFICE

LEVI TEAL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE S. S. WHITE DENTAL MANUFACTURING COMPANY, OF SAME PLACE.

PEDAL-SWITCH FOR ELECTRIC MOTORS.

SPECIFICATION forming part of Letters Patent No. 497,144, dated May 9, 1893.

Application filed January 16, 1893. Serial No. 458,563. (No model.)

To all whom it may concern:

Be it known that I, LEVI TEAL, of the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Pedal-Switches for Controlling Electric Motors, of which the following is a specification.

My invention relates to certain improvements, hereinafter specifically claimed, in foot-actuated switch controlling mechanism for electric motors applicable to use for operating dental engines. My object is to provide in compact form simply constructed mechanism by the actuation of which to stop, start, and reverse the direction of rotation of the electric motor.

In the accompanying drawings Figure 1 represents in perspective a suitable embodiment of my invention. Fig. 2 is a vertical central section with parts shown in elevation. Fig. 3 is a bottom view or inverted plan with the bottom plate of the switch box or case removed. Fig. 4 is a view on an enlarged scale of the reversing contacts detached as seen from the under side. Fig. 5 is a diagram designed to illustrate the circuits through the motor, its armature, the pedal switch mechanism and the electro-magnetic clutch mechanism. Fig. 6 is a side elevation of the motor with the sufficiently indicated clutch mechanism and a cable connecting plate in proper position.

Conductors A A′ for the electric current connect respectively with binding posts *a a′* on an insulated connecting plate C secured to the frame of a suitable motor A^2. Binding post *a* is electrically connected by conductor B with one terminal of the ordinary field coil of the motor. The other terminal binding post *b′* of the field coil is electrically connected by conductor B′ with the inner end of a binding post b^2 of the connecting plate C. This plate serves as a medium for electrically connecting the motor by the cable D with switch mechanism in particular way as to be explained. The cable is shown as composed of five insulated conductors, one of which, D′, is connected at one end to the binding post b^2 and at its opposite end to a contact plate *d′* mounted on a reversing lever D^2 composed of suitable non-conducting material. This lever is jointed to have sidewise horizontal movement by means of a pivot C′ which connects it with the base of a suitable foot pedal G. This pedal base is of non-conducting material in the form of a shallow box or case G′ having a detachable bottom *g*. The switch box is provided with a foot guard or stirrup G^2 upon which is secured a tubular spring standard *g′*. The cable of conductors passes through this standard and the conductors are divided and pass in two groups by the opposite sides of the stirrup to their respective contacts in the switch box.

The reversing lever D^2 carries a second contact plate H which is electrically connected by conductor H^2 to a contact plate H′ extending through and slightly above the switch box beneath one end of the pedal G. Near the contact plate H′ the conductor H^2 is coiled to give it flexibility so as not to interfere with the movements of the reversing lever. A contact plate E having two forks terminating respectively in springs *e* and *e′*, is so placed adjacent to the free end of the reversing lever D^2 that by movement of this lever in one direction the contact plate *d′* may be engaged with the fork *e* of the contact plate E, while movement of the lever in the other direction serves to engage contact H with the fork *e′* of this contact plate. A contact plate F terminates in a spring arm or end *f* projecting between the forks of the contact plate E. By reference to Fig. 4 it will be seen that when contact *d′* engages contact fork *e*, the contact H necessarily engages end *f* of contact F, and that with contact H in engagement with contact fork *e′*, contact *d′* necessarily engages contact end *f*.

To adapt the reversing lever to be actuated by the foot it is connected by a pin *i* with an endwise sliding rod I which passes transversely through the switch box and is provided at its ends with controlling arms I′ I′. The connecting pin *i* projects at its lower end into a hole in the reversing lever, is rigidly connected at its upper end with the slide rod I, and travels in a slot *i′* of the switch box when the slide rod is actuated.

Electrically connected with the forked contact plate E is a conductor E′ of the cable, which is also electrically connected with bind-

ing post e^2 of the cable connecting plate C, and with the brush J resting on the commutator J′ of the motor armature. Contact plate F is electrically connected by conductor E^2 of the cable with binding post e^3 of the cable-connecting plate and with the other brush J^2 of the commutator T′.

The binding post a' of the connecting plate is electrically connected by a conductor K with a spring contact plate K′ which is rigidly secured midway its length to the top of the switch box beneath the pedal. The conductor K is shown as secured to the under side of this spring contact plate at its center. The ends of this spring contact plate bear upward against the under side of the pedal near the opposite ends thereof, and when the action of this plate is not interfered with by actuating the pedal it holds the pedal in its level or normal position in which it is represented in Fig. 2. Upward movement of the ends of this spring contact plate is limited by screws k, and in this way an equal upward pressure upon both ends of the pedal by the spring contact plate is provided for. The binding post b^2 of the connecting plate is also electrically connected by a conductor L with suitable electro magnetic clutch mechanism indicated at M, for throwing a pulley on the armature shaft of the motor into and out of engagement with said shaft. From the clutch mechanism a conductor N electrically connects with a binding post n of the connecting plate and with a contact plate O under one end of the pedal and passing through the top of the switch box.

In operation, to start the motor the spring contact plate K′ is brought into contact with the contact plate H′, by depressing the heel end of the pedal, thus completing the electric circuit through the motor as follows:—The current from the main line binding post a passes through conductor B to binding post b, through the field of the motor to the binding post b', thence by conductor B′, the binding post b^2 and conductor D′ of the cable, to the contact plate d' of the reversing lever D^2, and when this lever is in position as shown in Fig. 2 the current next passes to contact plate E and through conductor E′, to binding post e^2 of the connecting plate and to the brush J; thence through the commutator and armature of the motor, and the brush J^2 and through conductor E^2 by way of binding post e^3 of connecting plate to contact plate F, through contact piece H and conductor H^2 to contact plate H′; thence through contact spring K′ and conductor K to binding post a' and out at main line. To reverse the direction of rotation of the motor, the electrical connections just described are maintained with the following exceptions: The reversing lever is actuated by pressure of the side of the foot of the operator upon the proper arm I′ to move the slide rod I in the direction to cause engagement of contact plates d' and H respectively with contact plate F and the fork e' of contact plate E. The current now passes through the field of the motor as before described, until the plate d' is reached, and next through contact plate F, conductor E^2, binding post e^3, brush J^2, the commutator, the motor armature, the brush J, the conductor E′ by way of binding post e^2 to contact plate E, thence by contact plate H and so on to main line as before explained. When the pedal is allowed to assume a horizontal position as shown by Fig. 2, the electric circuit is broken between K′ and H′, and the motor gradually comes to rest. To suddenly stop the driving pulley which connects in suitable way with the external work to be done, the toe end of the pedal is depressed to cause contact-spring K′ to engage contact plate O, and an electric circuit is now made as follows:—From main line, through binding post a, conductor B, binding post b, field of motor, binding post b', conductor B′, binding post b^2, conductor L, magnetic clutch mechanism M, conductor N, by way of binding post n, to contact plate O and through spring contact K′, and conductor K to main line by binding post a'.

I claim as my invention—

1. The combination, in an electric motor controller, of the pedal, the pedal base, the reversing lever pivoted at one end in the pedal base, the two contact plates carried by the reversing lever, the contact plate having two forks, the contact plate having the arm projecting between said forks, the slide rod connected with the reversing lever, and the controlling arms of the slide rod, substantially as set forth.

2. The combination, in an electric motor controller, of the pedal, the pedal base, the spring contact plate beneath the pedal and bearing upwardly against it, the contact plate with which said spring contact plate is engaged by depression of the pedal heel, the reversing lever pivoted at one end in the pedal base, the two contact plates carried by the reversing lever, the contact plate having two forks, the contact plate having the arm projecting between said forks, the slide rod connected with the reversing lever, and the controlling arms of the slide rod, substantially as set forth.

In testimony whereof I have hereunto subscribed my name.

LEVI TEAL.

Witnesses:
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H. H. MUSTIN.