

F. P. HUYCK.

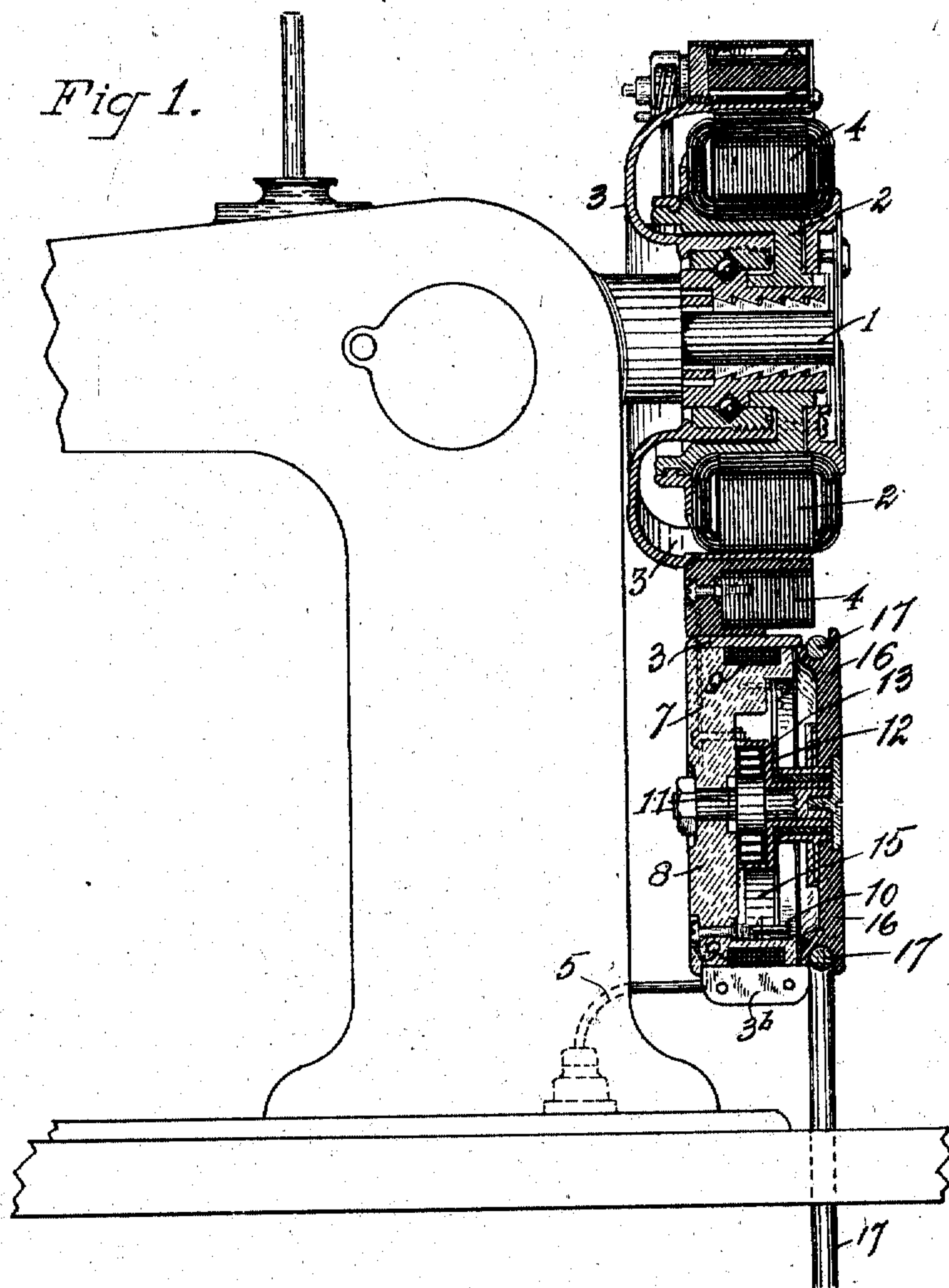
CONTROLLER FOR ELECTRIC MOTORS FOR SEWING MACHINES.

APPLICATION FILED DEC. 28, 1907.

Patented Feb. 28, 1911.

2 SHEETS-SHEET 1.

985,758.



WITNESSES.

*D. C. Walter*

*C. V. Ferson*

INVENTOR

*Francis P. Huyck*

*By his Attorney*

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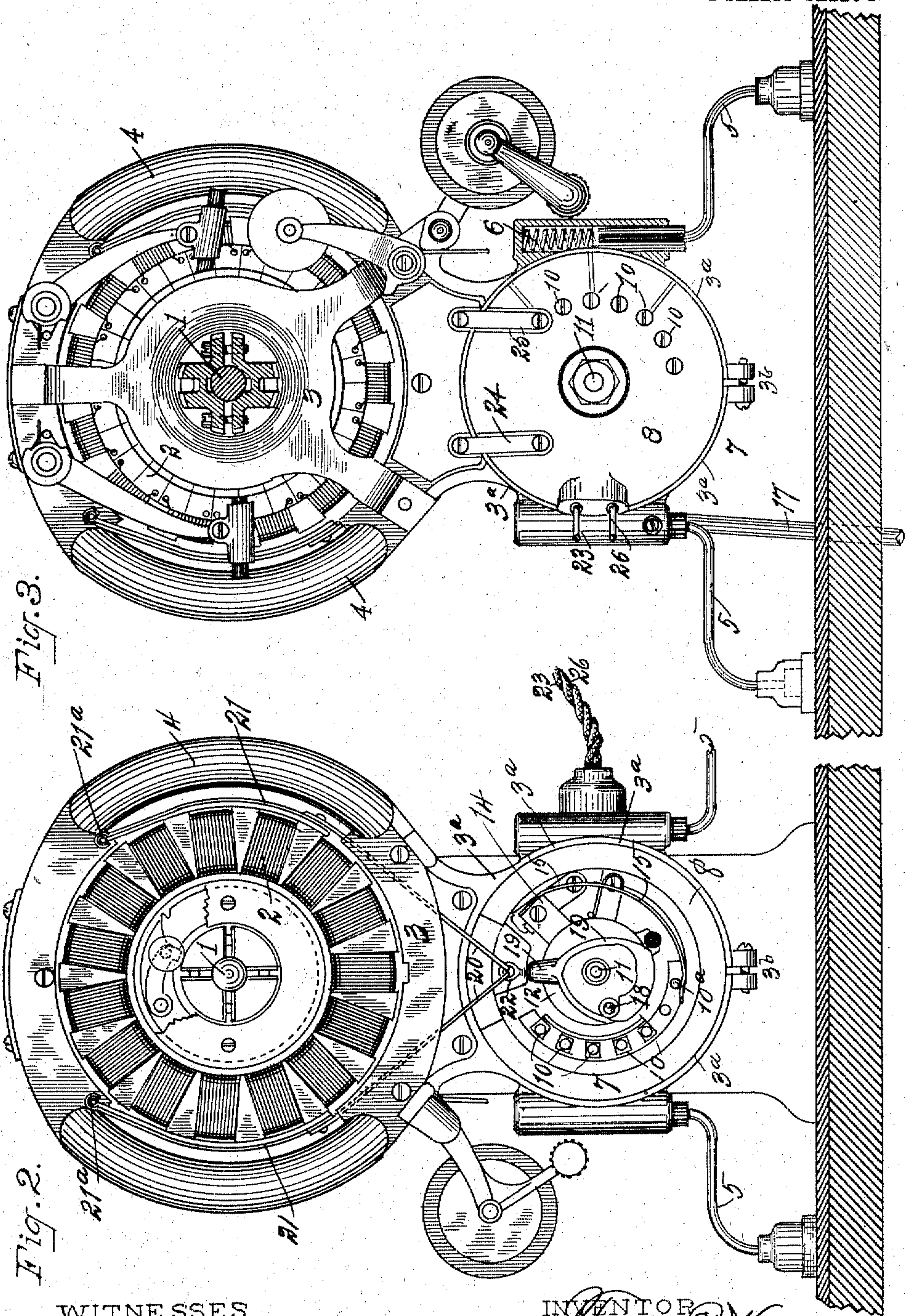


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# UNITED STATES PATENT OFFICE.

FRANCIS P. HUYCK, OF TOLEDO, OHIO, ASSIGNOR TO EDWARD H. RHOADES, JR.,  
TRUSTEE, OF TOLEDO, OHIO.

CONTROLLER FOR ELECTRIC MOTORS FOR SEWING-MACHINES.

985,758.

Specification of Letters Patent.

Patented Feb. 28, 1911.

Original application filed June 7, 1907, Serial No. 377,710. Divided and this application filed December 23, 1907. Serial No. 408,338.

*To all whom it may concern:*

Be it known that I, FRANCIS P. HUYCK, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Controllers for Electric Motors for Sewing-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to electric motors for sewing machines, and its object is to furnish in connection with a motor, designed to be mounted directly upon and operatively connected with the shaft of a sewing machine, a controlling device consisting of a rheostat and a brake assembled with the motor as a compact unitary structure adapted, as above stated, to be connected directly with the shaft of a sewing machine, thus dispensing with the controlling devices heretofore in use in which the rheostat is an independent mechanism secured separately beneath the sewing machine table.

The structure here indicated is intended to occupy such small space that it may be employed with any drop-head sewing machine in common use, and folded with the machine into its receptacle without necessitating the removal of the motor as has been necessary with sewing machine motors heretofore in use.

A further object of my invention is to provide a stopping and starting and braking mechanism in which a single movement releases the brake and starts the motor, and in which the reverse movement, by which the brake is applied and the current is cut off, is attained automatically.

I attain these objects by means of the devices and construction hereinafter described, and shown and illustrated in the accompanying drawings in which—

Figure 1 is a central vertical sectional elevation of my controller mounted in operative relation to its motor and to a sewing machine; Fig. 2 a front elevation of the same with the front cover of the rheostat

removed, and Fig. 3 a rear elevation of the same.

Like numerals represent like parts throughout the drawings.

In my application for a patent for sewing machine electric motors, filed June 7, 1907, Serial Number 377,710, of which this application is a division, I have shown and described an electric sewing machine motor comprising a rotary member and a stationary member concentrically mounted in substantially the same plane with a supporting frame or housing, the rotary member being operatively connected with a sewing machine shaft, the frame and the stationary member being revoluble about the sewing machine shaft but being provided with table-rests which prevent their rotation. These parts being there sufficiently described there will be given here only such description of the motor and its associated parts as will give a proper understanding of my controlling devices.

In the drawings, 1 is a sewing machine shaft to the projecting end of which is attached, in the place usually occupied by the hand-wheel or balance-wheel of the machine, the rotary member 2 of an electric motor.

3 is a frame or housing which supports the stationary member 4 of the motor concentrically with the part 2, the frame being adapted and arranged to rotate about the shaft of the sewing machine independently of the rotor. To prevent such rotation of the frame and to hold it and its burden stationary, two arms 5 are provided, the upper ends of these arms being socketed in the frame and being pressed normally downward by springs 6. (See Fig. 3.) The lower ends of the arms 5 are shot with soft rubber or other suitable substance and rest upon the top of the sewing machine table. These arms are designed also to take, largely, the weight of the frame and its burden from the sewing machine shaft. The frame or housing has two downwardly extending arms 3<sup>a</sup> curved in semi-circular form to form a circle. At their extremities the arms have corresponding ears 3<sup>b</sup> through which pass clamping screws.

Clamped or otherwise secured within the circular extension of the frame 3 is a rheostat 7, consisting of a hollow spool 8 of dish-



like form, of porcelain or other non-conducting substance, about the periphery of which spool is wound a series of resistance coils 9, connected respectively with contact-pins 10, the electric resistance decreasing through the series of contact-pins from right to left or clockwise. (See Fig. 2.) Centrally of the spool is a stud 11 upon which is journaled a barrel 12 containing a coiled spring 13, one end of which is connected with the barrel the other end being connected with the barrel-arbor. Projecting radially from the barrel is a lug 14, (see Fig. 2,) to which is secured rigidly one end of a curved contact-spring 15, the other end being adapted and arranged to engage successively the resistance contact-pins 10. The spring 13 holds the contact-spring 15 retracted and normally against idler-pin 10<sup>a</sup> and out of circuit.

16 is a disk having a grooved periphery secured centrally to and revolving with the barrel 12. This disk forms both a pulley for rotating the barrel and a cover for the cavity of the spool 8 and its supporting ring 3<sup>a</sup>. In the peripheral groove of the pulley 16 is secured one end of a flexible band 17, partly embracing the pulley and which leads and is secured to and is controlled by the treadle of the sewing machine or other suitable device for controlling the band 17 and its pulley 16. It will be seen that when the band is drawn downwardly and unwound from the pulley, the pulley is rotated, carrying with it the barrel and the contact-spring, and that the contact-spring is thus quickly and securely moved into contact with either of the resistance pins 10 as may be desired.

Projecting from the face of the barrel 12 is an insulated crank-pin 18, (see Fig. 2,) which is engaged by a stirrup 19 which is connected with two metal bands or brake-rods 20 leading to and connected with the lower ends of brake-shoes 21 through suitable apertures formed in the stationary member of the motor. The brake-shoes are flexible sheet-metal and are secured at their upper ends, as at 21<sup>a</sup>, to the inner side of the stationary magnet as shown. The brake-shoes are faced with leather or other suitable material. The metal of the brake-shoes is resilient and forms springs which tend to hold the brake-shoes normally out of contact with the periphery of the rotary member of the motor. The connection between the stirrup 19 and the brake-rods 20 is through a turn-buckle 22 which furnishes means for adjusting the tension between the brake-shoes and the crank-pin 18. It will be seen that when the pulley and barrel are rotated to move the contact-spring 15 into contact with the various resistance-pins 10, the movement of the barrel, at the same time, releases the tension upon the brake-shoe springs in advance of the contact-

spring's touching the first spring in the series, permitting the rotor to revolve freely, and that, reversely, when the barrel is moved by its spring 13 into its normal position, the superior tension of the spring 13 overcomes the brake-springs and automatically sets the brakes upon the rotor, instantly overcoming its momentum and stopping the machine. By means of the co-operating variable resistance and brake-mechanism here described the speed and movement of the machine may be exactly controlled.

The course of the electric current is through inleading wire 23 through link 24 to and through the appropriate windings brushes and commutator of the motor, thence through the link 25 to the contact-pin of lowest resistance in the series of pins 10 in the rheostat, thence through the selected windings of the rheostat, through the contact-spring 15 and the arbor 11 through a link, not shown, to the outleading wire 26.

From the foregoing description of my device the assembling and operation of the same will be fully understood without further explanation.

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

1. In a device of the described character, an electric motor the rotor of which is adapted for operative connection with a sewing machine shaft, a rheostat, a brake mechanism for the rotor, a housing which supports said motor rheostat and brake mechanism in operative relation as a unitary structure, means for manually actuating the rheostat and brake mechanism in harmony, and means for detachably and revolvably mounting the housing upon such shaft.

2. In a device of the described character, an electric motor, a spring-controlled brake normally set, a normally open spring-controlled rheostat, connections between the brake and rheostat for releasing the brake in advance of the closing of the circuit through the rheostat and for opening such circuit in advance of the setting of the brake, and a housing adapted for connection with a sewing machine shaft and which supports the motor and rheostat in operative relation.

3. In a device of the described character, an electric motor, a spring-controlled brake normally set, a normally open spring-controlled rheostat, connections between the brake and rheostat for releasing the brake in advance of the closing of the circuit through the rheostat and for opening such circuit in advance of the setting of the brake, a housing adapted for connection with a sewing machine shaft and which supports the motor and rheostat in operative relation, and means for manually releasing the brake and closing the circuit.



4. In a device of the described character, an electric motor adapted for operative connection with a sewing machine shaft; a rheostat comprising a series of resistance  
5 coils disposed in curvilinear relation, a contact-piece journaled in the rheostat and adapted to close a circuit through said coils in succession, a spring which holds the contact-piece normally in open circuit position;  
10 a normally set spring-controlled brake for the motor; means for actuating the contact-piece and the brake in harmony, and a housing adapted for engagement with the shaft of a sewing machine and which supports in  
15 operative relation the stationary member of the motor and the rheostat.

5. In a device of the described character, an electric motor adapted for operative engagement with a sewing machine shaft, a brake  
20 interposed between the rotary and stationary members of the motor and adapted to directly engage in frictional contact such rotary member, a rheostat and means for actuating the brake and the rheostat in har-  
25 mony with each other.

6. The combination with an electric motor, of a rheostat comprising a hollow spool, a resistance conductor wound peripherally  
30 about said spool, a rotary switch within the hollow spool controlling said resistance, a rotary member for actuating said switch, a brake for said motor, and a connection between said rotary member and brake where-  
35 by said brake and switch are operated in cooperation.

7. The combination with an electric motor, of a rheostat therefor comprising a hollow spool in the plane and at one side of  
40 said motor, a resistance conductor wound about said spool, a switch within said spool controlling said resistance, a rotary member for actuating said switch a brake for said motor and a connection between said brake and said rotary member within the spool.

45 8. The combination with an electric motor, of a controlling rheostat therefor comprising a hollow spool, a resistance conductor wound about said spool, a brake for said motor, and mechanism within said hollow  
50 spool for controlling said resistance and actuating the brake.

9. The combination with an electric motor, of a controlling rheostat therefor comprising a hollow spool, a resistance conductor  
55 wound about said spool, a switch for controlling said resistance within said spool, a rotary member also within said spool for operating said switch, a brake for said motor, a connection between said brake and  
60 said rotary member within said spool, a spring within said spool for actuating said rotary member in one direction and a revolvable cover for said spool for actuating said rotary member against the tension of said  
65 spring.

10. The combination with an electric motor, of a controlling rheostat for said motor arranged adjacent thereto and comprising a hollow spool, a resistance conductor wound  
70 about said spool, a switch within said spool, a rotary member within said spool for actuating said switch, brake straps for peripherally engaging the rotor of said motor on opposite sides thereof and having converg-  
75 ing actuating connections extending into said hollow spool, a crank pin on said rotary member within said spool and a stirrup engaging said crank pin and connected to said brake operating connections.

11. The combination with an electric motor comprising a rotor and a stator concentrically arranged the one about the other, of  
80 a switch eccentrically arranged and mechanically connected to said stator, a brake arranged intermediate said rotor and stator, and a common actuating connection for said brake and said switch.

12. The combination with an electric motor comprising a rotor and a stator concentrically arranged the one about the other, of  
90 an eccentrically arranged switch, a brake for engaging the periphery of said rotor, a connection between said brake and switch, and actuating means for said switch.

13. The combination with an electric motor, of a controlling switch and mechanical  
95 brake therefor, a rotary member for successively operating said switch and brake, a flexible connection for rotating said member in one direction and automatic means for rotating said member in the opposite direc-  
100 tion.

14. The combination with an electric motor, of a rotary controlling switch and mechanical brake therefor, a housing for said  
105 switch, brake operating mechanism also inclosed in said housing forming the actuating member for said switch and brake operating mechanism.

15. The combination with an electric motor, of a rotary controlling switch and a  
110 mechanical brake therefor, a housing for said switch secured to the stator of the motor, brake actuating mechanism also inclosed in said housing, and a rotary closure for said housing forming an actuating member for said switch and brake operating  
115 mechanism.

16. The combination with an electric motor, of an annular housing secured to the  
120 stator of said motor, a brake for said motor arranged between the rotor and stator thereof, a rotary controlling switch for said motor within said annular housing, an actuating device for said brake also within said housing and a connection between said  
125 actuating device and brake passing through a recess in the stator.

17. The combination with an electric motor, of a rotary controlling switch, and a  
130



mechanical brake therefor, a housing inclosing said switch, brake operating mechanism also inclosed within said housing, a rotary closure for said housing forming an  
5 actuating member for said switch and brake operating mechanism, a flexible connection surrounding the periphery of said closure for actuating the same in one direction and

a spring within said housing for actuating said mechanism in the opposite direction. 10

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

FRANCIS P. HUYCK.

Witnesses:

CLAYTON MURPHY,  
WM. HANSEN.