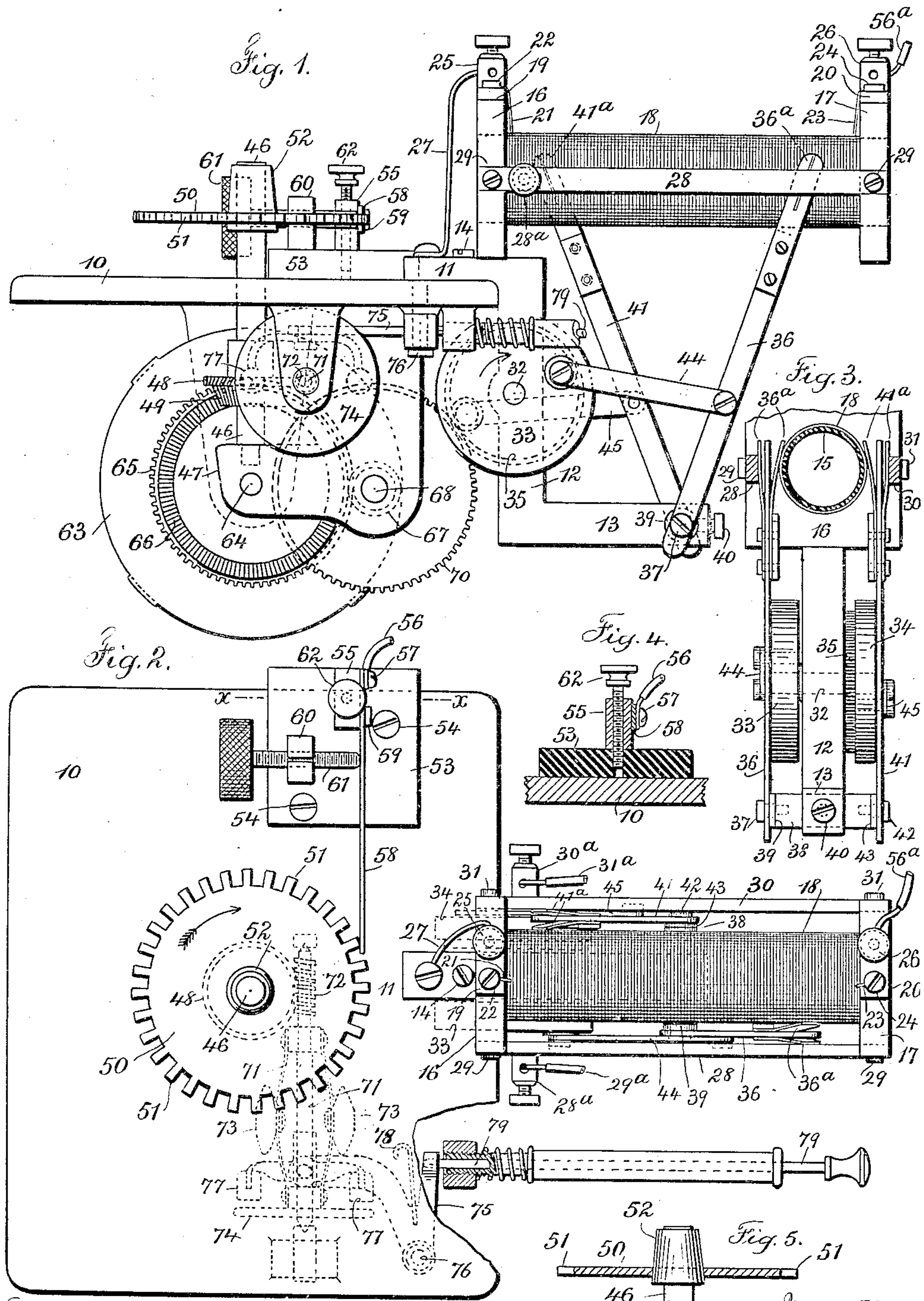


R. H. WAPPLER.
ELECTROMEDICAL APPARATUS.
APPLICATION FILED DEC. 30, 1907.

903,640.

Patented Nov. 10, 1908.



Witnesses

Charles Smith

A. L. Serrell

Inventor

Reinhold H. Wappler.

by Harold Serrell

his atty.

UNITED STATES PATENT OFFICE.

REINHOLD H. WAPPLER, OF NEW YORK, N. Y., ASSIGNOR TO WAPPLER ELECTRIC
CONTROLLER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ELECTROMEDICAL APPARATUS.

No. 903,640.

Specification of Letters Patent.

Patented Nov. 10, 1908.

Application filed December 30, 1907. Serial No. 408,554.

To all whom it may concern:

Be it known that I, REINHOLD H. WAPPLER, a citizen of the United States, residing at the borough of Manhattan, city, county, and State of New York, have invented an Improvement in Electromedical Apparatus, of which the following is a specification.

My invention relates to an electro medical apparatus and particularly to an improvement on the electro medical apparatus shown and described in Letters Patent No. 581091, granted to me April 20th, 1897, the object of the present invention being to provide an apparatus which is not only a pole changing, current varying and sine curve current generator for the purposes described in the Letters Patent aforesaid, but also an apparatus in which when required, the sinusoidal shunt current employed in the treatment of the patient, may be made and broken at predetermined intervals, so that while the current increases and decreases in intensity, it is also intermittently interrupted.

In carrying out my present invention, I employ a coil, means for taking a sinusoidal shunt current from the said coil, means for interrupting the current and means for operating both the aforesaid means, as will be hereinafter more particularly described.

In the drawing, Figure 1 is a side elevation of my improved medical apparatus. Fig. 2 is a plan of the same. Fig. 3 is a front elevation and section showing the contact bars and their contacts bearing against the surface of the coil and bars by means of which the shunt current is taken from the coil. Fig. 4 is a sectional elevation on line x, x , Fig. 2, and Fig. 5 is a sectional elevation through the interrupter wheel and the spindle by which the same is turned.

Referring particularly to the drawing, 10 designates a base which is preferably made of metal and may be supported by and inclosed in a box or other suitable structure. Together with this base 10, I prefer to employ a Z shaped frame member, whose upper portion 11 is secured to the base 10 by means of the screw 14 or otherwise, the central portion 12 of the Z shaped member depending from the base 10, while preferably the portion 13 of the Z shaped member is parallel with the upper portion 11 thereof. I also employ a cylinder, indicated at 15 in Fig. 3, and made of paper, rubber or other similar insulating material and provided at

its respective ends with the heads 16, 17, which are also preferably made of similar insulating material, and on the cylinder 15, a coil of suitable wire 18 is wound. The head 16 of the cylinder is provided with a contact plate 19 and the head 17 with a similar contact plate 20; one end 21 of the coil 18 is connected electrically to the contact plate 19 by means of the binding screw 22, and the other end 23 of the coil 18 is connected to the contact plate 20 by means of the binding screw 24, and the contact plate 19 is provided with a binding post 25 and similarly the contact plate 20 is provided with a binding post 26, the binding post 25 being electrically connected to the Z shaped frame member and the base 10 by means of a wire 27 or otherwise.

On one side of the coil 18, I employ a bar 28 which is connected to the respective cylinder heads 16, 17, by means of screws 29 or otherwise, and extends parallel and also longitudinally with the coil 18. Similarly on the other side of the coil 18 is a bar 30, which is secured to the cylinder heads 16, 17, by means of screws 31 or otherwise, and the bar 28 is provided with a shunt circuit terminal or binding post 28^a and the bar 30 with a shunt circuit terminal or binding post 30^a, from which binding posts the lead wires 29^a 31^a respectively of the shunt circuit are connected, the bars 28 and 30 being preferably constructed of a good conducting material.

In the central depending portion 12 of the Z shaped frame member, a shaft 32 is mounted. On this shaft 32 and on one side of the depending portion 12 of the Z shaped frame member, a disk 33, preferably of insulating material, is secured and on this shaft 32 and on the opposite side of the portion 12 of the Z shaped frame member, a disk 34 and the gear wheel 35 are secured.

36 designates a contact bar or oscillating member which at one end is connected by a pivot screw 37 to a spacer rod 38 with an intervening washer 39; the spacer rod 38 passes through an aperture provided therefor in the extremity of the portion 13 of the Z shaped frame member and is secured therein by a set screw 40 or otherwise and this spacer rod is preferably made of insulating material. 41 also designates a contact bar or oscillating member which by means of the pivot screw 42 is connected at

one extremity to the opposite side of the spacer rod 38 with an intervening washer 43. At its other or upper extremity, the contact bar 36 is provided with a pair of spring contacts 36^a, one of which is adapted to bear against the bar 28 and the other against the surface of the coil 18, and similarly the upper end of the contact bar 41 is provided with a pair of spring contacts 41^a, one of which is adapted to bear against the bar 30 and the other against the surface of the coil 18. The contact bar 36 is connected to the disk wheel 33 by means of the connecting rod 44 and the contact bar 41 is connected to the disk wheel 34 by means of the connecting rod 45.

46 designates a spindle passing at right angles through the base 10 and mounted and adapted to turn in suitable bearings, and on this spindle 46 a worm wheel 48 and a bevel gear 49 are secured.

50 designates an interrupter wheel which may be made of any good conducting material and in whose periphery there is a series of teeth 51. The interrupter wheel 50 is adapted to fit over a conical hub 52 on the upper extremity of the spindle 46 with which this wheel engages frictionally and as will hereinafter appear, the size of the teeth 51 on this interrupter wheel and the extent of the spaces between the same, may be varied to regulate the desired period of interruption of the electric current through the apparatus and consequently with a given apparatus, a series of interchangeable interrupter wheels having different sized teeth, may be provided. I also employ a block of insulating material 53 which is secured to the base 10 by means of screws 54 or otherwise and suitably connected to this block of insulating material, is a contact plate 55, to which latter a lead wire 56, from a suitable source of electricity, may be secured by binding screws 57. A spring contact 58 is also connected to the contact plate 55 by a screw 59, as shown or otherwise, and this spring contact 58 is adapted at its free end to bear against the toothed periphery of the interrupter wheel 50. I may also provide a standard 60 fixed in the block of insulating material 54 and provided with an adjusting screw 61 by means of which the tension on the spring contact 58 may be varied, or if desired, the free end thereof may be entirely removed from contacting with the teeth of the interrupter wheel 50.

The contact plate 55 is provided with a circuit controlling screw 62, which as will be apparent by reference to Fig. 4, may be turned to pass entirely through the block of insulating material 53 and to contact with the base 10, the function of which will be hereinafter set forth.

Together with the hereinbefore described

apparatus, I prefer to employ a spring motor, similar for instance to those employed in phonographs, graphophones and other like instruments, and as shown in the drawing, this spring motor may comprise a casing 63 and a shaft 64, on which is also secured a gear wheel 65 and a bevel gear 66,—the bevel gear meshing with the hereinbefore named bevel gear 49,—an intermediate shaft 68 on which a pinion 67 and a gear wheel 70 are secured, the pinion 67 meshing with the gear wheel 65 and the gear wheel 70 meshing with the gear wheel 35 to drive the shaft 32 and the disks 33 and 34 thereon. The spring motor also includes a governor shaft 71 on one end of which is a worm 72 meshing with the worm wheel 48, a governor indicated at 73 and a brake disk 74 at the opposite end of the governor shaft adapted to be engaged by the brake shoes 77 actuated through the lever 75 pivotally mounted at 76 and controlled through the action of the spring 78 by means of the rod 79, which as is customary in motors of this class, is used to start and stop the motor as well as to determine the speed thereof when running.

In the hereinbefore described apparatus, the contact plate 55 is connected to one terminal of a suitable source of electricity by the lead wire 56, while the binding post 26 is connected to the opposite terminal of the source of electricity by the lead wire 56^a and as will be understood, provided the screw 61 is in such a position that the spring 58 will not contact with the teeth of the interrupter wheel 50 and the screw 62 in such a position as to contact with the base or bed 10, the electric circuit will be closed through the contact plate 55, the base 10, the current passing through by way of the screw 62, thence through the base to the portion 11 of the Z shaped member connected to the base, by way of the wire 27 to the binding post 25 to the contact plate 19 through the coil 18 to the contact plate 20 and through the binding post 26 to the lead wire 56^a to the negative terminal of the source of electricity and upon the motor being started, the action of the apparatus will be as described in my Letters Patent aforesaid; that is to say, a shunt circuit of varying intensity and changing polarity, the current therein being a sinusoidal curve current, will be closed through the patient by means of suitable apparatus inserted therein between the binding posts 28^a and 30^a, this current being of greatest intensity when the contacts 36^a and 41^a are at the extremities of the coil and of little or no current value, as these contact points pass each other at the center of the coil when the polarity of the shunt circuit is changed, whereas if as indicated in the drawing, the spring 58 is permitted by the adjustment of the screw 61 to contact with the teeth 51 of the interrupter wheel 50 and

screw 62 in the position shown in Fig. 4, that is, out of contact with the base 10, the circuit will be closed from the contact plate 55 through the spring 58, the interrupter wheel 50 and thence through the frame of the machine to and through the coil as hereinbefore described, and in so doing, the current as will be manifest, is intermittently interrupted as the spring 58 passes from tooth to tooth of the interrupter wheel 50. The particular object of thus interrupting the circuit is in order to obtain stronger muscular contractions when these seem desirable in the treatment of the patient. It will also be apparent that together with the functions hereinbefore described which are made possible by the apparatus herein, that it is also capable of use in other connections where different purposes are desired to be effected by the use of electric currents of a different nature. That is to say, together with being adapted to be employed merely as a rheostat or as a sinusoidal current generator, interrupted or non-interrupted, the apparatus may also be employed to produce a current in the shunt circuit which is either direct and interrupted or non-interrupted; for instance by making the terminals of the shunt circuit the binding posts 25 and 26, the current being interrupted or non-interrupted depending upon whether the screw 62 is in contact with the base 10 or out of contact with the same. Then again, the apparatus may be used for an undulating current which is positive only and interrupted or non-interrupted for instance, by taking the shunt circuit from the terminal 28^a and the binding post 26, it being interrupted or non-interrupted as in the former case depending upon whether or not the screw 62 is in contact with the base 10 or out of contact with the same, and furthermore the apparatus may be employed to set up an undulating current in the shunt circuit which is negative only and this may be effected by taking the shunt circuit from the binding post 28^a and binding post 25 and in this case as in those to which reference has been hereinbefore made, the current may be interrupted or non-interrupted depending upon whether or not the screw 62 contacts with the base 10.

I claim as my invention:

1. An electro-medical apparatus comprising a base, a coil, bars extending longitudinally of the said coil, means adapted to contact electrically with the said bars and coil, disk wheels, bearings for the same, devices for connecting the said disk wheels respectively with the said contact means, and means for turning the said disk wheels to move the said devices and so actuate the said contact means.

2. An electro medical apparatus comprising a base, a frame connected thereto, a coil,

heads therefor, bars connected to the said heads, shunt terminals connected to the said bars, oscillating members, contacts on the said oscillating members and adapted to contact with the said bars and the surface of the said coil, a shaft mounted in the said frame, disk wheels fixed on the said shaft, connecting rods connecting said disk wheels and oscillating members, and means for rotating the said disk wheels to actuate the said oscillating members, as and for the purposes described.

3. An electro medical apparatus comprising a base, a frame connected thereto, a coil, heads therefor, bars connected to the said heads, shunt terminals connected to the said bars, oscillating members, contacts on the said oscillating members and adapted to contact with the said bars and coil, a shaft mounted in the said frame, disk wheels fixed on the said shaft, connecting rods connecting said disk wheels and oscillating members, and a spring motor for actuating the parts.

4. An electro medical apparatus comprising a coil, means for taking a sinusoidal shunt current from said coil, an interrupter disk, means for completing the electric circuit and intermittently interrupting the same through said disk, and means for simultaneously rotating the said interrupter disk and actuating the said means for taking a sinusoidal shunt current from said coil.

5. An electro medical apparatus, comprising a coil, means for taking a sinusoidal shunt current from said coil, an interrupter disk, a spindle on which the same is mounted, a contact plate, a spring connection from the said contact plate to the periphery of the interrupter disk, and means for simultaneously rotating the interrupter disk and actuating the means for taking the sinusoidal shunt current from the said coil.

6. An electro medical apparatus comprising a coil, means for taking a sinusoidal shunt current from said coil, an interrupter disk, a spindle on which the same is mounted, a contact plate, a spring connection from the said contact plate to the periphery of the interrupter disk, means for disconnecting the spring contact from the interrupter disk, means for electrically connecting the said contact plate electrically with the said coil, and means for simultaneously rotating the said spindle and interrupter disk and actuating the means for taking the sinusoidal current from the said coil.

7. An electro-medical apparatus comprising a base, a frame connected thereto, a coil, heads therefor, bars connected to said heads, shunt circuit terminals connected to the said bars, oscillating members, contacts on the said oscillating members and adapted to bear against the said bars on the surface of the said coil, a shaft mounted in the said frame, disk wheels fixed on the said shaft, connect-

ing rods connecting the said disk wheels and
oscillating members, an interrupter disk, a
spindle on which the same is mounted, a
contact plate, a spring connection from the
5 said contact plate to the periphery of the
said interrupter disk and means for simul-
taneously rotating the said spindle and in-
errupter disk and for actuating the said
oscillating members to cause the said con-

tacts connected therewith to slide over the 10
surface of and between the said bars and
coil.

Signed by me this 13th day of December,
1907.

REINHOLD H. WAPPLER.

Witnesses:

GEO. T. PINCKNEY,
BERTHA M. ALLEN.