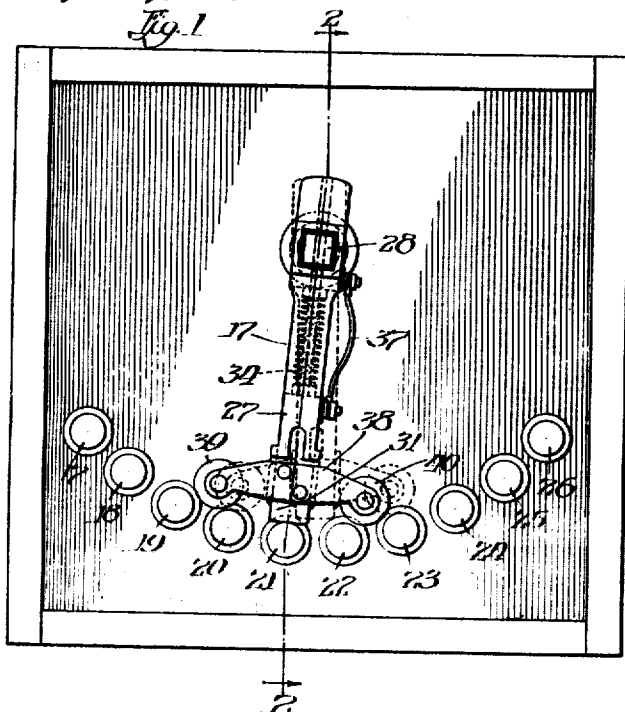
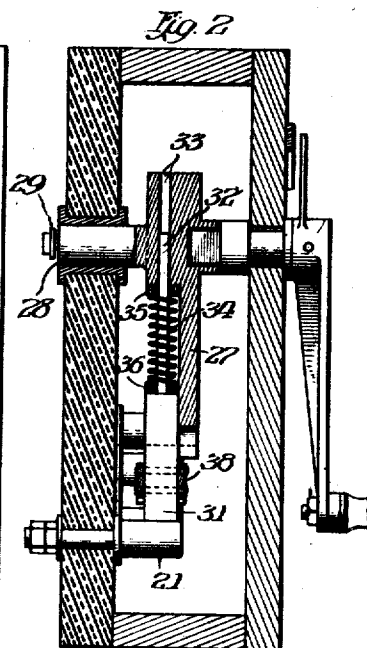
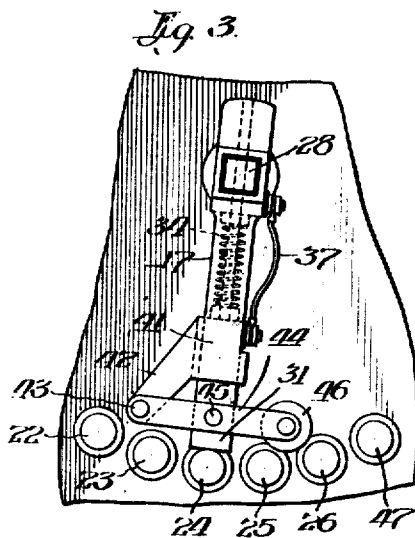
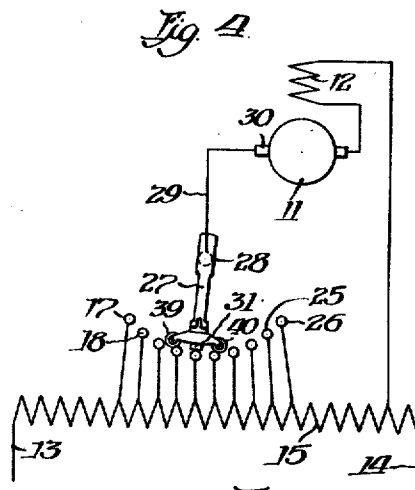


J. D. NIES.
CONTACT ARM FOR VOLTAGE REGULATORS.
APPLICATION FILED SEPT. 10, 1917.

1,285,786.

Patented Nov. 26, 1918.



Witness:
Ed. K. Givins

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Atty's

UNITED STATES PATENT OFFICE.

JOHN D. NIES, OF ST. CHARLES, ILLINOIS, ASSIGNOR TO KIMBLE ELECTRIC COMPANY,
OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

CONTACT-ARM FOR VOLTAGE-REGULATORS.

1,285,786.

Specification of Letters Patent.

Patented Nov. 26, 1918.

Application filed September 10, 1917. Serial No. 190,497.

To all whom it may concern:

Be it known that I, JOHN D. NIES, a citizen of the United States, residing at St. Charles, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Contact-Arms for Voltage-Regulators; of which the following is a specification.

In connection with the use of a direct current, a rheostat may be employed in which the contact arm may momentarily or even permanently rest in contact with two adjacent points without injury, but with an alternating current in connection with a transformer, if the contact carried by the arm be allowed to rest even momentarily in contact with two adjacent points, there will be a short-circuiting of the particular transformer winding with resultant burning out of the same.

It has been proposed to alternate the live transformer points with interposed dead points so as to prevent any short circuiting by reason of the contact arm bridging two live points. This arrangement is not only more expensive to build but it is cumbersome in that it requires a dial of twice the size by reason of the interposed dead points.

It has also been proposed to use a segment plate having concave cam surfaces or scallops within the arc of the dial and on radial lines connecting the points and the pivot of the contact arm. Therein a pin carried by the contact member on the arm, riding upon these cam surfaces, serves to retract the contact as it passes from one to another point on the dial so as to prevent its bridging any two of them. This is a very expensive proposition to build as this segment plate must be of hard steel and the scallops formed by filing. Moreover they must be exactly located and the plate must be accurately fitted upon the panel in order that the contact shall bear equally upon each of the dial points in turn.

The present invention contemplates the employment of the arcuate series of contact points themselves in place of the scalloped segment plate previously referred to, and the movable contact member of the arm is mounted upon a cross head provided with rollers of insulating material which roll into and out of the spaces between the points, causing the contact member to advance into

and retract out of contact with the intermediate point of the dial.

In order that the invention may be readily understood preferred and modified embodiments of the same are set forth in the accompanying drawings and in the following detailed description based thereon. Obviously the invention may be embodied in other constructional forms, wherefore the description and claims are to be taken in an illustrative rather than in an unnecessarily limiting sense. In the drawings—

Figure 1 is an elevation of a voltage regulator embodying the invention;

Fig. 2 is a vertical section on the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary elevation of a modification; and

Fig. 4 is a schematic view illustrating the application of the invention.

Herein an alternating current motor is indicated at 11, the field at 12, the main leads at 13, 14, the transformer at 15, and the transformer points forming the dial at 17—26. The contact arm 27 pivoted at 28, which pivot is electrically connected by means of a wire 29 with the brush 30 has movably mounted thereon a contact member 31 electrically connected with the pivot 28 and arranged to traverse the dial formed by the points 17—26.

Having reference to Figs. 1 and 2 of the drawing, it will be observed that the contact member 31 is guided for reciprocating movement upon the contact arm 27 by means of the stem 32 sliding within the bore 33, the contact member being pressed outwardly by means of the compression spring 34 bearing with its two ends against the insulated plates 35 and 36, whereby the said spring is protected from the electric current which passes from the contact member to the hub of the contact arm through the wire 37.

In order to cause the retraction of the contact arm so as to clear the point comprising the dial when being moved from one point to another, the contact member has rigidly fixed thereon a cross head 38 having mounted in its two extremities the rollers 39 and 40 of insulating material.

It will be evident that when the rollers 39—40 occupy the positions shown in Fig. 1, intermediate the points 19 and 20 and the points 22—23 respectively, the nose of the

contact member 31 will rest upon the intermediate point 21. When, however, the contact arm is moved upon its pivot 28 to the right, as shown in Fig. 1, the roller 39 will ride upon the contact point 20 and the roller 40 will ride upon the point 23, as indicated in dotted lines in said figure thus retracting the contact member 31 to such an extent that it will not bridge the space between the points 21, 22, but will clear the same, and as soon as the rollers 39, 40 drop into the inter-spaces separating the points 20, 21 and 23, 24 respectively the contact member 31 will be permitted to advance under the reaction of the spring 34 bringing its nose into contact with the point 22.

By forming the cross head 38 rigid with reference to the reciprocating contact member 31, the arm may be thrown to the extreme at either end of the dial, depending upon one of the rollers 39 or 40 alone to hold it out of contact even though the other roller be beyond the dial.

Having reference to Fig. 3 of the drawing, the construction is the same with the exception that the cross head 41 has one arm 42 and to its extremity at 43 is pivoted a lever arm 44 which is likewise pivoted to the contact member 31 at 45, and carries at its free end a single roller 46. The operation in this form of construction is precisely the same as that previously described with the exception that there would preferably be provided at the extreme right end of the dial a dead pin or post 47 so as to permit the full sweep of the contact member 31 over all of the live points.

I claim:

1. In a voltage regulator, the combination with the spaced dial-points arranged in an arc, of a contact arm pivoted concentric to said arc, a contact member mounted on said arm for traverse of the dial points, and means connected with the said contact member and riding upon the points and into the spaces therebetween whereby to retract the nose of the contact member as it moves from one point to another to prevent bridging and permit it to advance into contact with a single point when brought into line therewith.

2. In a voltage regulator, the combination with the spaced dial-points arranged in an arc, of a contact arm pivoted concentric to said arc, a contact member mounted on said arm for traverse of the dial points, and means carried by the said contact member and riding upon the points and into the spaces therebetween whereby to retract the nose of the contact member as it moves from one point to another to prevent bridging and permit it to advance into contact with a single point when brought into line therewith.

3. In a voltage regulator, the combina-

tion with the spaced dial-points arranged in an arc, of a contact arm pivoted concentric to said arc, a contact member mounted for reciprocation on said arm, yielding means to press the said member into contact with the dial points as the arm is swung on its pivot, a cross head mounted on said member, a member carried by the cross head and arranged to ride upon the points and into the spaces therebetween, whereby to retract the nose of the contact member as it moves from one point to another to prevent bridging and to permit it to advance into contact with a single point when brought into line therewith.

4. In a voltage regulator, the combination with the spaced dial-points arranged in an arc, of a contact arm pivoted concentric to said arc, a contact member mounted for reciprocation on said arm in line with the radius of said arc, a spring to press the said member into contact with the dial points as the arm is swung on its pivot, a cross head mounted on said member, a member carried by the cross head and arranged to ride upon the points and into the spaces therebetween, whereby to retract the nose of the contact member as it moves from one point to another to prevent bridging and to permit it to advance into contact with a single point when brought into line therewith.

5. In a voltage regulator, the combination with the spaced dial-points arranged in an arc, of a contact arm pivoted concentric to said arc, a contact member mounted for reciprocation on said arm in line with the radius of said arc, yielding means to press the said member into contact with the dial points as the arm is swung on its pivot, a cross head rigidly mounted on said member, a pair of members carried by the cross head and arranged to ride upon the points and into the spaces therebetween, whereby to retract the nose of the contact member as it moves from one point to another to prevent bridging and to permit it to advance into contact with a single point when brought into line therewith.

6. In a voltage regulator, the combination with the spaced dial-points arranged in an arc, of a contact arm pivoted concentric to said arc, a contact member mounted for reciprocation on said arm in line with the radius of said arc, a spring to press the said member into contact with the dial points as the arm is swung on its pivot, a cross head rigidly mounted on said member, a roller carried by the cross head and arranged to ride upon the points and into the spaces therebetween, whereby to retract the nose of the contact member as it moves from one point to another to prevent bridging and to permit it to advance into contact with a single point when brought into line therewith.

7. In a voltage regulator, the combination
with the spaced dial-points arranged in an
arc, of a contact arm pivoted concentric to
said arc, a contact member mounted for re-
5 ciprocation on said arm in line with the
radius of said arc, a spring to press the said
member into contact with the dial points as
the arm is swung on its pivot, a cross head
rigidly mounted on said member, a pair of
10 rollers carried by the cross head arms one
on each side of the contact member and ar-
ranged to ride upon the points and into the
spaces therebetween, whereby to retract the

nose of the contact member as it moves from
one point to another to prevent bridging and 15
to permit it to advance into contact with a
single point when brought into line there-
with.

In testimony whereof I have hereunto
signed my name in the presence of two sub- 20
scribing witnesses.

JOHN D. NIES.

Witnesses:

LEWIS T. GREIST,
MARY C. BROWER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."

Correction in Letters Patent No. 1,285,786.

It is hereby certified that in Letters Patent No. 1,285,786, granted November 26, 1918, upon the application of John D. Nies, of St. Charles, Illinois, for an improvement in "Contact-Arms for Voltage-Regulators," an error appears in the printed specification requiring correction as follows: Page 2, line 42, claim 1, for the word "arm" read *arc*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 28th day of January, A. D., 1919.

[SEAL.]

R. F. WHITEHEAD,

Acting Commissioner of Patents.

Cl. 200—14.