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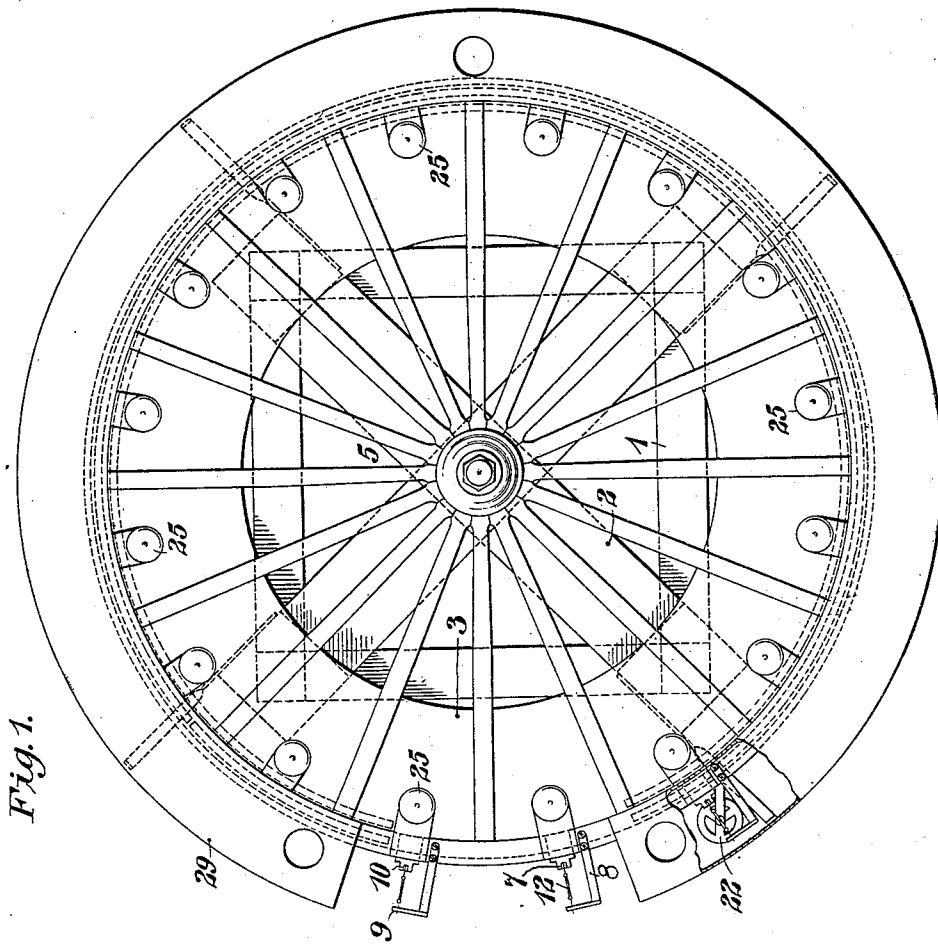
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SORTING DEVICE FOR ELECTRIC LAMP GLOWERS.

APPLICATION FILED MAY 5, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



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SORTING DEVICE FOR ELECTRIC-LAMP GLOWERS.

SPECIFICATION forming part of Letters Patent No. 722,790, dated March 17, 1903.

Application filed May 5, 1902. Serial No. 106,004. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER JAY WURTS, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Sorting Devices for Electric-Lamp Glowlers, of which the following is a specification.

My invention relates to the manufacture of electric-lamp glowers which are conductors of electricity only when heated to a relatively high temperature; and it has for its object to provide an apparatus for conveniently and expeditiously "sorting" such glowers after they have been formed and provided with terminal wires. The treatment to which the glowers are subjected consists in first passing an electric current through them for a sufficient length of time to insure a uniform operating condition and then measuring their resistance when traversed by a given constant current in order to determine the voltage to which they are adapted.

With this end in view I have devised the means shown in the accompanying drawings, in which—

Figure 1 is a plan view of my apparatus, a small portion being broken away. Fig. 2 is a vertical sectional view of the apparatus shown in Fig. 1, parts of the supporting-framework being broken away. Fig. 3 is a diagram of the circuits of the apparatus. Fig. 4 is a sectional detail view of a portion of the apparatus, and Fig. 5 is a front elevation of the parts shown in Fig. 4.

The supporting-stand 1 may be of any form and dimensions suitable for steadily supporting the working parts of the apparatus at a convenient height, and it has a top frame 2, upon and above which is mounted an annular plate 3 of suitable non-conducting material. Rotatably supported upon the stand 1 2 and above the plate 3, by means of a suitable shaft or stud 4, is a wheel 5, here shown as having the general construction of a wagon-wheel, though its operativeness in the connection in which it is used is not dependent upon this specific construction. The rim 6 of the wheel is provided with a series of glower-holding clips arranged uniformly around the periphery. One clip, 7, of each set

or pair is pivotally mounted upon the rim 6 and is so proportioned as to normally assume a vertical position. The other clip, 8, is rigidly fastened to the rim and projects vertically substantially in the plane of the corresponding clip 7, nearly to the height of the latter, and from that point horizontally to a distance somewhat greater than the length of the glower and then laterally in a horizontal plane to such a point that the ends of its gripping-jaws 9 will be in substantial alinement both horizontally and vertically with the gripping-jaws 10 of the clip 7. With this arrangement of clips it will be seen that the respective terminal wires 11 of the glower 12 (see Fig. 4) will be yieldingly held by the clips and there will be a minimum danger of accidental disengagement.

Any other form of supporting means which will grasp the terminal wires and exert a slight degree of tension thereon and from which the glower may be readily removed may be employed, and the glower may be supported in either a vertical or an inclined position, if desired.

The current for treating and sorting the glowers is supplied to the clips from any suitable source, a transformer 13 being indicated in Fig. 3 for this purpose. A lead 14 from one end of the secondary of the transformer 13 and a lead 15 from a point in the secondary which corresponds to the voltage desired are respectively connected to two collector-rings 16 and 17, which are fastened to the under side of the plate 3. The contact-rings 16 and 17 are interrupted at the front side of the apparatus, as indicated in Figs. 1 and 3, in order to facilitate the insertion and removal of the glowers. The length of the ring 17 is less than that of the ring 16, and an auxiliary ring-segment 18 is provided, which is substantially a continuation of ring 17, except that it is electrically independent, its purpose being hereinafter more fully set forth.

Each clip 7 is connected to a contact-brush 19, and each clip 8 is connected to a brush 20, the brushes 19 and 20, respectively, making contact with collector-rings 16 and 17, and each brush being supported from the rim 6 of the wheel 5 by means of an arm 21, from which they are suitably insulated.

For the purpose of raising the glowers successively to conducting temperature I have shown a Bunsen burner 22, located at the right of the open or dead space, as indicated in Figs. 1 and 3. Any other suitable source of heat for raising the glowers to conducting temperature may obviously be employed, if desired.

In order that the wheel, which, as indicated, will be rotated in a contra-clockwise direction, may be conveniently stopped in the predetermined positions necessary to properly locate the glowers successively adjacent to the source of heat 22, I provide the under side of the rim with a series of equally-spaced conducting-pieces 23, having notches or recesses 23^a, and fasten a spring-arm 24 to the edge of the annular plate 3, so that it may successively engage such notches. As here shown, the spring-arm 24 also serves as a contact-brush, as will be hereinafter described, though separate devices for the two functions may be employed, if desired.

In treating the glowers it is desirable to employ ballast-resistances having positive temperature coefficients, as is well known in this art, and for this purpose I have shown ordinary incandescent lamps 25, which are respectively connected in circuit between the brushes 19 and the corresponding glower-terminals.

For the purpose of sorting the glowers I employ a substantially constant current, which may be obtained as follows: Each glower is connected in circuit with the entire length of the secondary of the transformer 13 when it reaches the ring-segment 18, as will be seen by reference to Fig. 3, and, on account of the high voltage, I include several incandescent lamps 26 in series in the circuit. Any other suitable form of resistance may of course be employed to reduce the voltage and provide an approximately constant current for the glower. An ammeter 27 is provided for indicating the current passing through the glower, and for the purpose of measuring the voltage I connect a voltmeter 28 across the sorting-circuit by joining its respective terminals to the ring-segment 18 and the brush 24, as indicated. Any other suitable means may be employed for securing the desired constant current for sorting the glowers, if desired.

For the purpose of protecting the lighted glowers from drafts and also shielding the eyes of the user of the apparatus I provide a sheet-metal shield 29, which incloses all of the glowers and glower-holding clips except at the open or dead portion of the apparatus, as is clearly indicated in Figs. 1 and 2. Individual shields for the several glowers may of course be employed, if desired.

In the use of the apparatus described the wheel is rotated slowly step by step, and as each untreated glower is brought into contact with the flame of the device 22 it is retained in that position until it becomes con-

ductive, and the wheel is then moved forward to bring the next glower into position over the source of heat, and so on until the entire set of glowers have become conductive, the clips, brushes, and contact-rings serving to maintain the current through them until they emerge successively into the open space after having made a substantially complete circuit. When each glower reaches the ring-segment 18, it will be included in the sorting-circuit, and while the brush 24 is in the notch 23^a the indicated voltage will be noted. The open or dead space comprises two positions, in the first of which the glower is permitted to cool, and when the second position is reached the glower may be removed and another put in its place for treatment. It will thus be seen that the process may be made substantially continuous, if desired. The wheel may be rotated and its movement controlled by means of suitable mechanism or partially thereby and partially by hand, or the entire operation may be manually effected. As here illustrated, the wheel is arranged for manual operation.

The apparatus may obviously be arranged so as to rotate in a vertical instead of a horizontal plane, if desired, and the details of construction may be otherwise modified within considerable limits without departing from the spirit and scope of the invention.

I claim as my invention—

1. The combination with a rotatable frame provided with a series of sets of glower-holding clips and a corresponding series of ballast devices, of means for supplying current to said clips and means for successively heating the glowers to conducting temperature.

2. The combination with a rotatable frame provided with glower-holding clips, current-collecting brushes and ballast devices, of stationary contact-rings with which said brushes make engagement and means for supplying current thereto.

3. The combination with a wheel having glower-holding terminal clips, ballast devices and collector-brushes, of a stationary frame having collector-rings with which said brushes make contact, means for supplying current to said rings and means for heating the glowers to conducting temperature successively.

4. The combination with a wheel having a series of glower-holding clips and a series of collector-brushes, arranged in pairs, and a series of ballast devices, of a stationary frame having collector-rings, means for supplying an approximately constant voltage to said rings, means for heating the glowers to conducting temperature successively, and means for successively subjecting the treated glowers to an approximately constant current.

5. The combination with a wheel having a series of glower-holding clips arranged in pairs and means for supplying a constant voltage to nearly all of said clips in parallel, of means for supplying a constant current to said clips successively.

6. The combination with a wheel having a series of pairs of glower-holding clips, a series of pairs of collector-brushes and a series of ballast devices, of a glower-heating means, 5 means for supplying a constant voltage to nearly all of the collector-brushes in parallel and means for thereafter supplying a constant current to the pairs of brushes successively.

10 7. The combination with a wheel having a series of glower-holding devices and a series of ballast devices, of means for supplying current to said holding devices and means for stopping the wheel in predetermined positions. 15

8. The combination with a wheel having a series of annularly-disposed glower-holding devices and brushes, of a stationary frame having collector-rings, means for successively 20 heating the glowers and means for supplying current to the collector-rings.

9. The combination with a wheel having glower-holding devices, ballast devices and brushes, of a frame having collector-rings 25 with which said brushes make contact, means for supplying current thereto and means for heating each glower when it reaches a predetermined position.

10. The combination with a wheel having 30 a series of glower-holding clips, ballast devices and brushes, of a frame having collector-

rings with which said brushes make contact, means for supplying a given voltage to said rings, an insulated extension for one of said rings and means for supplying a constant current to said extension and the other ring. 35

11. A sorting device for electric-lamp glowers, comprising a wheel having an annular series of terminal clips, ballast devices and contact-brushes, means for supplying a given 40 voltage to said brushes throughout the greater portion of their path of movement, means for supplying an approximately constant current to each pair of brushes in one position adjacent to the end of the path of movement and 45 means for indicating the voltage of the circuit in said last-named position of the brushes.

12. A sorting device for electric-lamp glowers, comprising means for subjecting an annular set of glowers to an approximately constant voltage, means for successively subjecting 50 said glowers to an approximately constant current and means for indicating the voltage of each glower when subjected to the constant current. 55

In testimony whereof I have hereunto subscribed my name this 18th day of April, 1902.

ALEXANDER JAY WURTS.

Witnesses:

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