

A. J. WURTS & M. W. HANKS.
REMOVABLE PART FOR GLOWER LAMPS.

(No Model.)

(Application filed July 24, 1899.)

Fig. 1

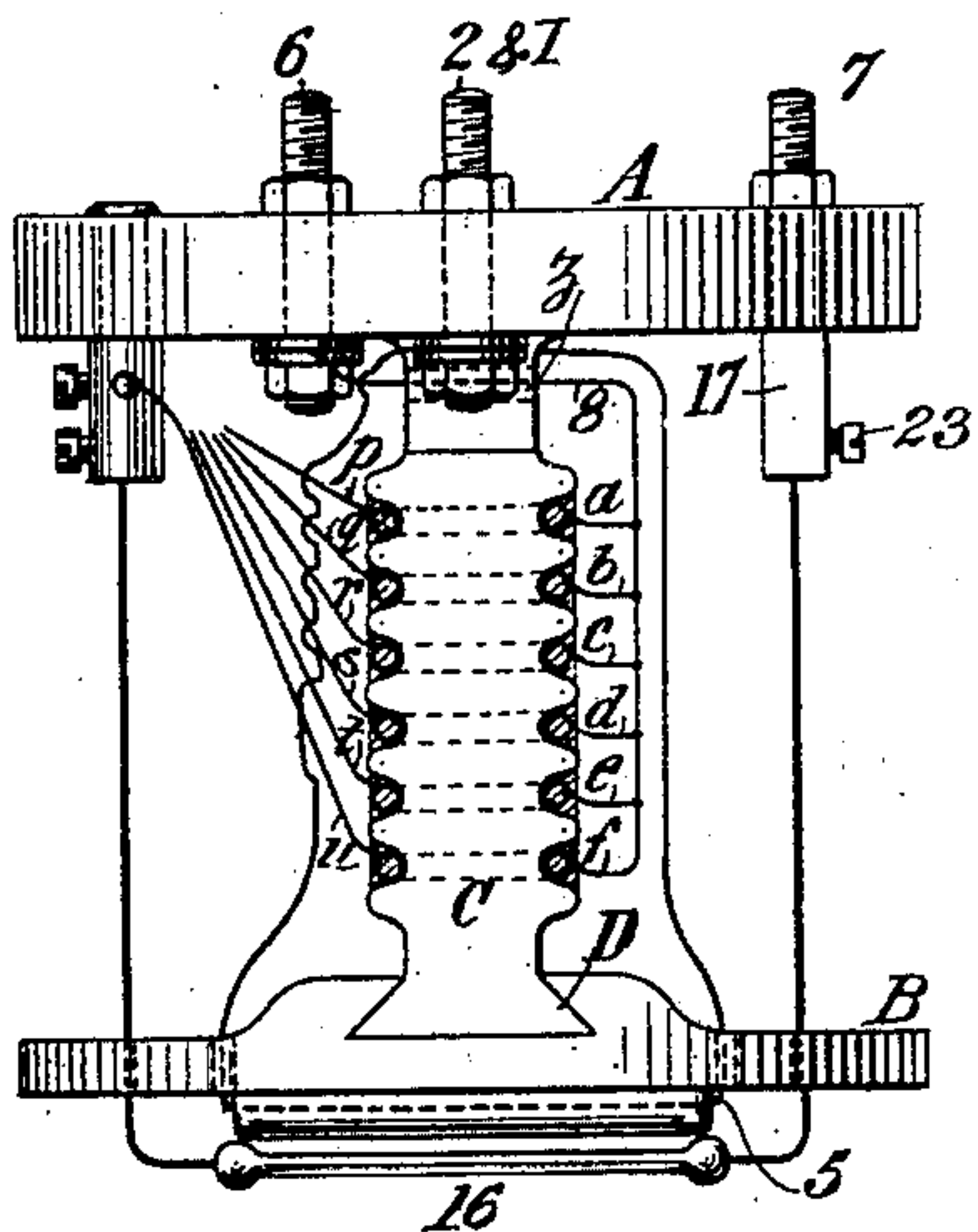


Fig. 2

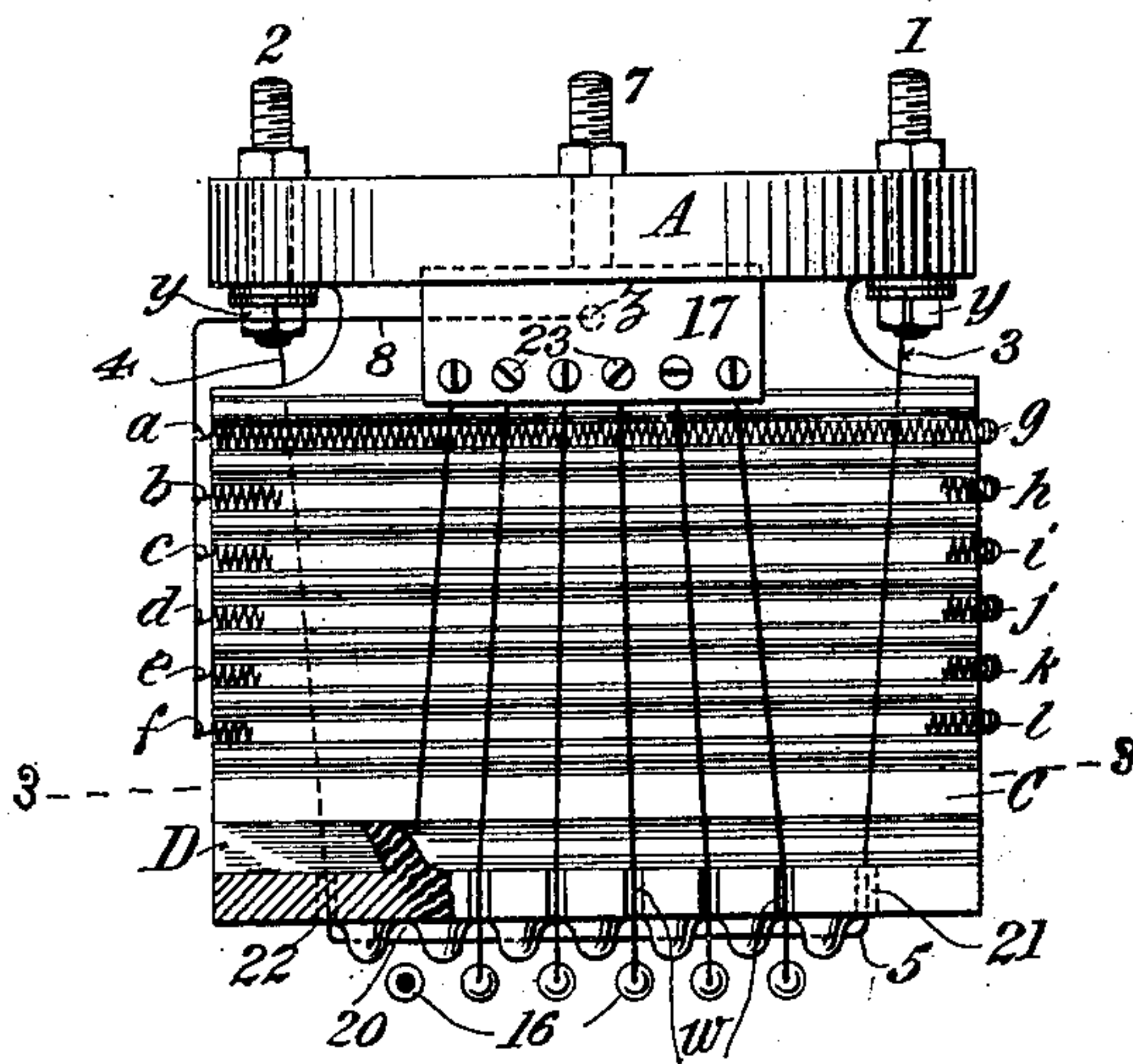


Fig. 4

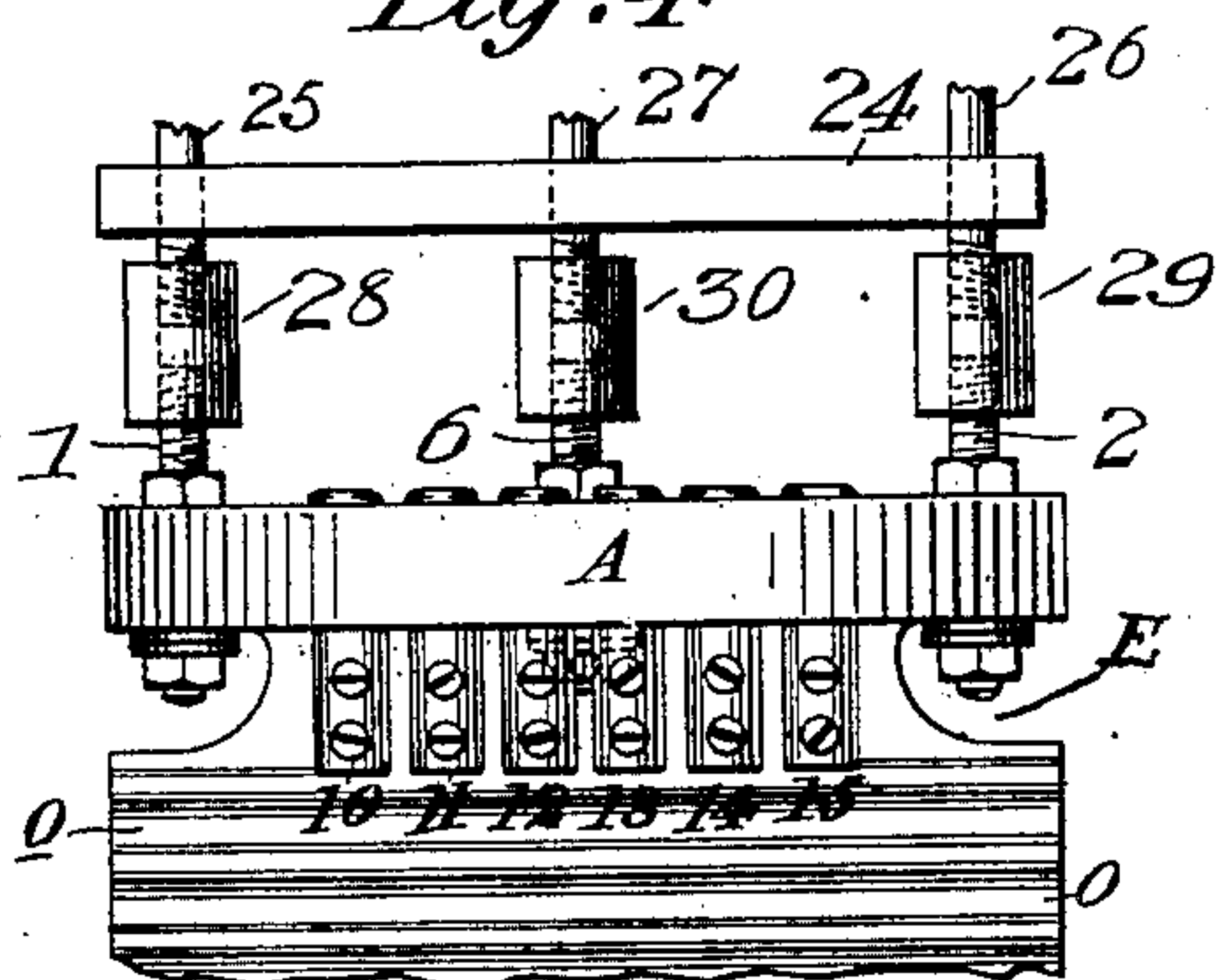
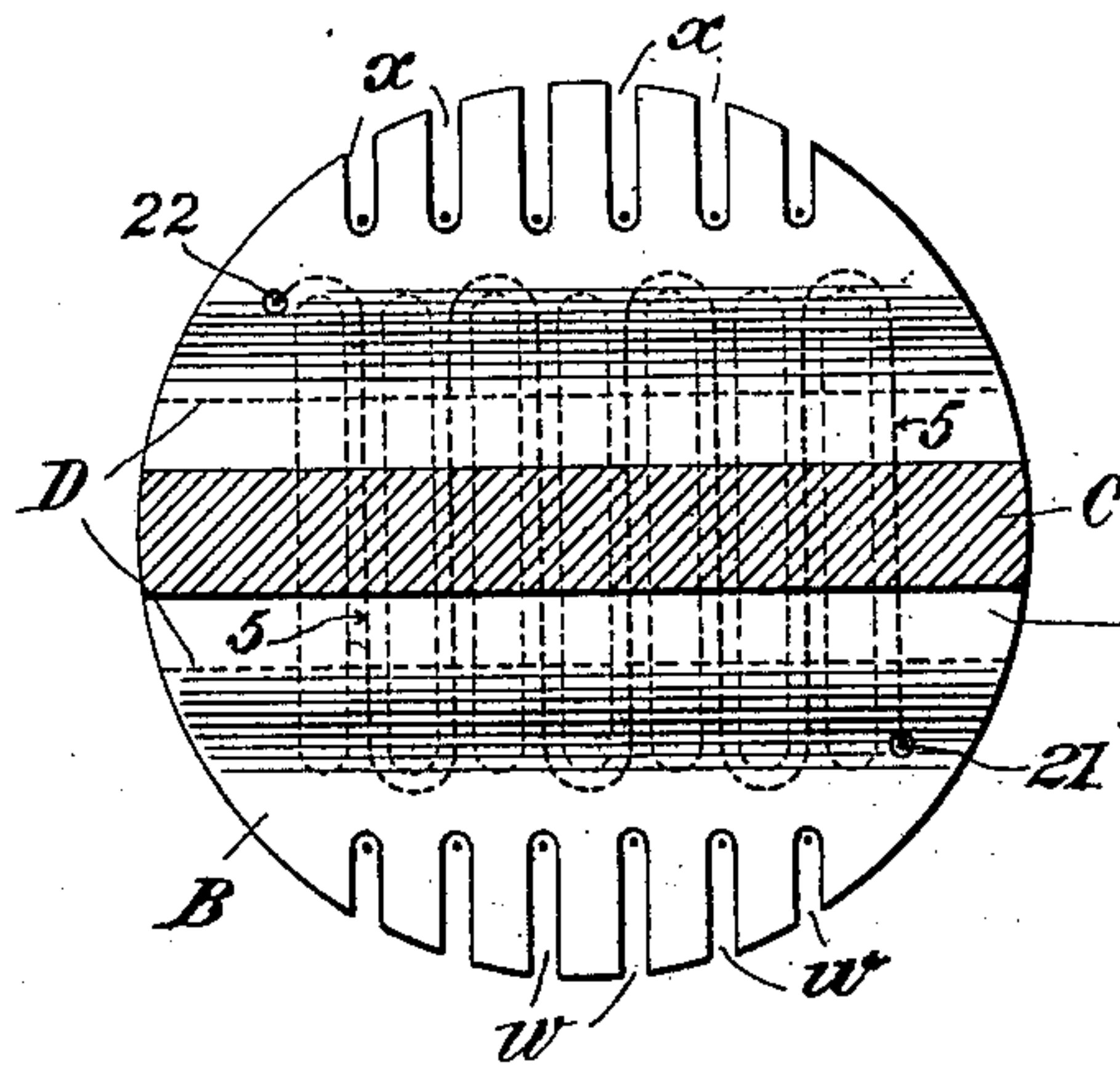


Fig. 3



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UNITED STATES PATENT OFFICE.

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REMOVABLE PART FOR GLOWER-LAMPS.

SPECIFICATION forming part of Letters Patent No. 652,703, dated June 26, 1900.

Application filed July 24, 1899. Serial No. 724,893. (No model.)

To all whom it may concern:

Be it known that we, ALEXANDER J. WURTS and MARSHALL W. HANKS, citizens of the United States of America, and residents of
5 Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Removable Parts for Glower-Lamps, of which the following is a specification.
10 In the construction of electric-lighting apparatus having glowers formed from rare earth or a mixture of rare earths, and having the same general character as the lamps known as "Nernst" lamps, it has been suggested that
15 the lamp as a whole should be made of a fixed part or fixture and a removable part constituting the electric lamp in a more restricted sense. It is, however, convenient to describe the complete apparatus as an electric lamp
20 and to refer to the portion which might be called the "lamp proper" as a removable part of the lamp. The present invention relates to this removable part, and is particularly designed to provide means whereby such removable part may be made compact, easy to handle, and durable. Lamps of this class are
25 generally provided with heaters for causing the initial heating of one or more glowers, which glower or glowers are maintained at an intense heat by the passage of current there-
30 through after the initial heating has been discontinued. For this reason it is desirable that the parts of the structure adjacent to the glowers and the heater be made of materials
35 which are practically indestructible by heat, and one feature of our invention relates to such a construction. The removable part of the lamp has consisted generally of two disks, of porcelain or other non-conducting material,
40 one forming a support for the glowers and for the terminals by means of which the removable part is mechanically and electrically connected to the fixed part and the other constituting a support for the heater-wire. These
45 disks have been supported at a convenient distance from each other by means of metallic posts which formed a rigid frame for the removable portion of the lamp. In the present invention we do away with the metallic posts
50 (which are liable to deteriorate in time under the influence of the excessive heat of the glow-

ers) and use a web of the same material as the disks themselves. With a lamp so constructed the parts which are exposed to the heat of the glowers are of such a character as to be practically unaffected thereby. The web may be in
55 one piece with the two disks or it may be joined to the lower or heater disk by a dovetail or other connection. In some instances it is of advantage to have the lower or heater disk
60 removable, so that it can be replaced by another should the heater get out of order or become inoperative for any reason. We may supply the connecting-web with corrugations, so as to provide a convenient arrangement
65 for winding the ballast-wires, one of which is usually interposed in the circuit of each of the lamp-glowers. For this purpose we provide as many corrugations as there are glowers, each corrugation being adapted to hold
70 a single ballast-wire. It is convenient and suitable to make the web of substantially the same length as the diameter of the disks and to provide on the under side of the lower disks a series of corrugations at right angles to the
75 corrugations upon the web. The corrugations on the bottom of the lower disk are adapted to receive the heater-wire, which is wound back and forth through the said corrugations. Moreover, it is convenient to arrange the terminals of the heater-wire directly
80 over the ends of the web, which, in order to permit of this arrangement, is cut away to admit of the said terminals being held in place by suitable nuts.
85

It will be observed that the structure described is in general such as to make the removable part of the lamp substantially H-shaped. It will also be observed that by virtue of the general organization all the perish-
90 able metal parts are removed from proximity to the intense heat of the glowers.

In order that our invention may be clearly understood, we have illustrated it in the accompanying drawings, in which—
95

Figure 1 is an elevation of the removable part of a lamp looking toward one end of the web. Fig. 2 is the side elevation and partial section thereof looking toward one side of the web. Fig. 3 is a section along line 3 3
100 looking downward; and Fig. 4 is a side elevation of the upper portion of the removable

part, the view being taken from the opposite side of the lamp from that which appears in Fig. 2.

In the drawings, A is the upper disk, B the lower disk, and C the connecting-web. In the present instance we have illustrated the web as joined to the lower disk by a dovetail connection, appearing at D. The disk A carries binding-screws 1 and 2, which constitute the terminals of the heater-circuit. These elements, besides acting as simple circuit-terminals, also form the means for mechanically attaching the removable part to the fixed part of a lamp of this sort and for making electrical connections with corresponding terminals on the said fixed part.

In Fig. 4 the fixed part is represented by the disk 24, carrying contact-posts 25 26 27, which are coupled by nuts 28 29 30 with the corresponding binding-screws 1, 2, and 6, a corresponding post for the binding-screw 7 not appearing in this figure, as it is behind the post 26.

The binding-screws 1 and 2 are connected by wires 3 and 4, respectively, to the opposite terminals of the heater-wire 5. The latter is wound back and forth, as shown, through corrugations 20 20, formed in the under side of the lower disk B. The said wires 3 and 4 pass through openings 21 22 in the lower disk, as shown in Fig. 3.

The binding-screw 7 is connected below the upper disk A with a terminal 17, which is common to all the lamp-glowers. The binding-screw 6, on the other hand, is connected in multiple by means of wires *a b c d e f* to the ends of a number of ballast-wires *g h i j k l*. On its way from the binding-screw 6 to the points where it is connected to the ballast-wires the wire 8 passes through an opening *z* in the web C. The ballast-wires are laid in corrugations *o o o o o o*, formed in opposite sides of the web C. Each ballast is first formed into a spiral and then wound entirely around the web, with the exception of the front edge thereof, which faces the observer in Fig. 1. With the construction illustrated this length of ballast-wire is found to be sufficient in practice. The left-hand ends of the said ballast-wires are connected by wires *p q r s t u* to separate insulated binding-posts 10 11 12 13 14 15, supported on the under side of the upper disk A. The ballast-wires, after being wound within the corrugations O, above described, may be held in place securely by means of an enamel covering, holding each wire to the web. It will be seen that the said binding-posts are set into openings in the said disk and secured by screws at the top thereof, the posts being shouldered underneath the disk, so as to form a suitable bearing and provide a rigid support.

The posts 10 11 12 13 14 15 are each connected with a separate one of a series of glowers 16 16, supported in any suitable manner underneath the lower disk B. In passing from the binding-posts mentioned to the glow-

ers the connecting-wires pass through slits or notches *w w* in the edge of the lower disk B, while the leading-wires which pass from the opposite ends of the glowers pass through similar slits or notches *x x*, directly opposite the slits *w w*. The last-named lead-wires go directly from the opposite terminals of the glowers to binding-screws 23 23 on the common terminal 17, which is connected electrically to the binding-screw 7.

The described arrangement possesses many qualities of convenience which combine to make an effective and durable electric lamp. The upper corners of the web C are cut away at E on each side to admit the nuts *y y* for securing the binding-screws 1 and 2 in position. These nuts may be made of aluminium.

By the term "disk" in this application we mean a plate of any convenient outline, whether curved or angular.

It will be noted that in the present instance the upper disk not only supports the lamp-terminals, but also the glowers.

We claim as our invention—

1. In an electric lamp wherein one or more glowers formed from one or more rare earths are the incandescing bodies, a removable part consisting of a heat-resisting disk for supporting the glowers and the circuit-terminals, and a second heat-resisting disk supporting a heater, the said disks being connected by heat-resisting material.

2. In an electric lamp wherein one or more glowers formed from one or more rare earths are the incandescing bodies, a disk of heat-resisting material for supporting the glowers and the circuit-terminals, a disk of heat-resisting material for carrying a heater, and a web, also of heat-resisting material, interposed between the said disks.

3. In an electric lamp wherein one or more glowers formed from one or more rare earths are the incandescing bodies, a disk of heat-resisting material supporting the glowers and the circuit-terminals, a disk of heat-resisting material carrying a heater, and a web also of heat-resisting material connecting the two disks, the said heater-disk being detachably connected to the said web.

4. In an electric lamp wherein one or more glowers formed from one or more rare earths are the incandescing bodies, a disk of heat-resisting material carrying a heater in proximity to the said glower or glowers, a support for the said disk, also of heat-resisting material, the said disk being detachably connected to its support.

5. In an electric lamp wherein one or more glowers formed from one or more rare earths are the incandescing bodies, a disk of heat-resisting material carrying the glowers and the circuit-terminals, a similar disk carrying a heater, and a web connecting the two disks and having approximately the same width as the diameter of the disks.

6. In an electric lamp wherein one or more

glowers formed from one or more rare earths are the incandescing bodies, a disk of heat-resisting material, lamp-terminals and one or more glowers mounted thereon, a similar disk
5 having arranged below the first a web of the same material as the disks connecting the two, and a heater-wire on the lower disk arranged in proximity to the said glower or glowers.

7. In an electric lamp wherein one or more
10 glowers formed from one or more rare earths are the incandescing bodies, a disk of heat-resisting material, one or more glowers supported near the exposed side thereof, a second disk of heat-resisting material having
15 lamp-terminals mounted upon it, and a web of the same material as the disks connecting the two, and a heater-wire on the lower disk arranged in proximity to the said glower or glowers.

20 8. In an electric lamp wherein one or more glowers formed from one or more rare earths are the incandescing bodies, a glower and terminal carrying disk of heat-resisting material and a heater-carrying disk joined thereto by
25 a web of similar material, the said web being corrugated to receive the ballast-wires for the glowers.

9. In an electric lamp wherein one or more glowers formed from one or more rare earths
30 are the incandescing bodies, an upper disk carrying the lamp terminals and glowers, a lower disk carrying the heater in proximity to the glowers and an intermediate web having as many corrugations as there are glowers.

35 10. In an electric lamp wherein one or more glowers formed from one or more rare earths are the incandescing bodies, an upper disk carrying the lamp terminals and glowers, a lower disk carrying the heater, and an intermediate web having as many corrugations as
40 there are glowers, in combination with a ballast-wire in each groove or corrugation, each ballast-wire being connected in circuit with one of the glowers.

45 11. In an electric lamp wherein one or more glowers formed from one or more rare earths are the incandescing bodies, an upper disk carrying the lamp terminals and glowers, a lower disk supporting a heater, an intermediate web connecting the two disks, the said
50 web and the said glower-disk being provided with corrugations which are at right angles to each other.

12. In an electric lamp wherein one or more
55 glowers formed from one or more rare earths are the incandescing bodies, an upper disk carrying the lamp terminals and glowers and a lower disk carrying a heater, a corrugated web connecting the two disks, and ballast-wires spiral in form in the several corruga-
60 tions.

13. In an electric lamp wherein one or more glowers formed from one or more rare earths are the incandescing bodies, an upper disk
65 carrying the circuit terminals and glowers, a lower disk carrying a heater, and an interme-

diate web connecting the two disks, the said web being corrugated, and ballast-wires of spiral form within said corrugations and held in place by enamel.

70 14. In an electric lamp wherein one or more glowers formed from one or more rare earths are the incandescing bodies, an upper disk carrying the lamp terminals and glowers, a lower disk carrying a heater, and an intermediate
75 web of heat-resisting material, the said web being provided with corrugations, ballast-wires held within the said corrugations, each being connected in circuit with one of the glowers, and each being wound entirely
80 around the web except at one end.

15. In an electric lamp wherein one or more glowers formed from one or more rare earths are the incandescing bodies, an upper disk carrying the lamp terminals and glowers,
85 and a lower disk carrying a heater and an intermediate web of heat-resisting material of approximately the same length as the diameter of the disks, and a heater-wire on the lower disk in proximity to the glowers,
90 the binding-screws for the said heater-wires being located directly above the ends of the web, the said web being cut away to admit nuts for holding the said binding-screws.

16. In an electric lamp wherein one or more
95 glowers formed from one or more rare earths are the incandescing bodies, a disk or plate, a heating device supported thereon, one or more glowers supported in proximity to the said heating device, a plate remote from the
100 radiating effects of the said glowers, and ballast-wires equal in number to the glowers and supported upon the said plate.

17. In an electric lamp wherein one or more glowers formed from one or more rare earths
105 are the incandescing bodies, a disk or plate, a heating device supported thereon, one or more glowers supported in proximity to the said heating device, a corrugated plate remote from the radiating effects of the said
110 glowers, one or more ballast-wires supported in the said corrugations, the number of ballast-wires being equal to the number of glowers.

18. In an electric lamp wherein one or more glowers formed from one or more rare earths
115 are the incandescing bodies, a disk or plate, a heating device supported thereon, one or more glowers supported in proximity to the said heating device, a corrugated plate remote from the radiating effects of the said
120 glowers, one or more ballast-wires in spiral form located in the said corrugations, the number of ballast-wires being equal to the number of glowers.

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