No. 772,658. PATENTED OCT. 18, 1904.

G. F. GROVE.

ELECTRIC ARC LAMP.

APPLICATION FILED JAN. 11, 1904.

NO MODEL.

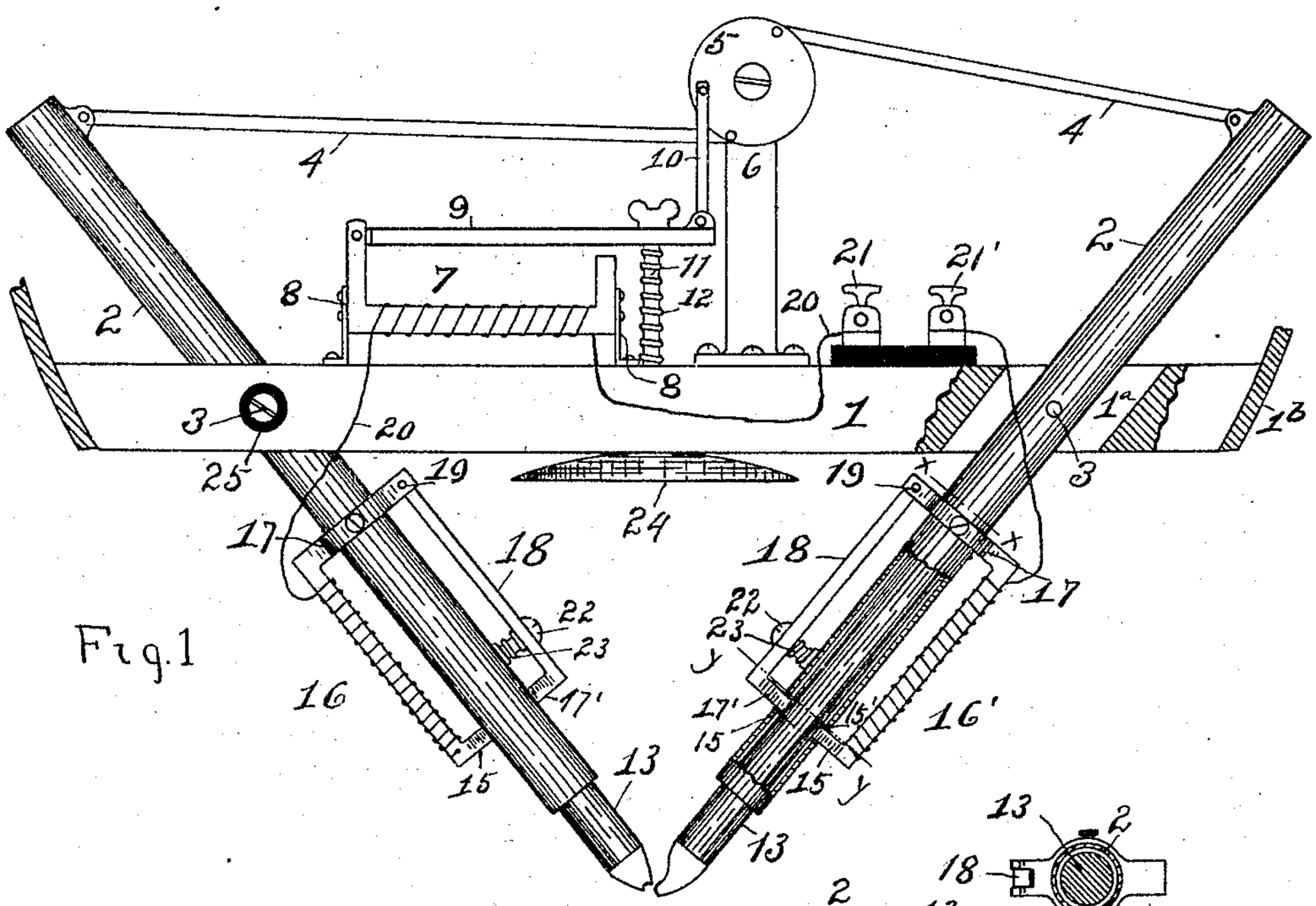


Fig. 1

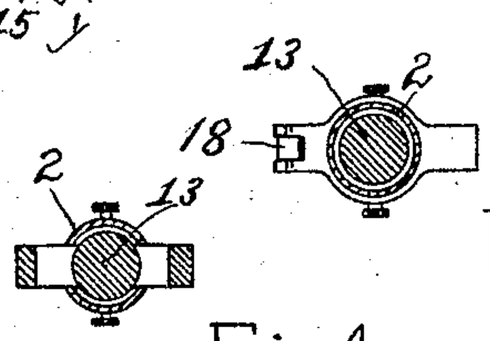
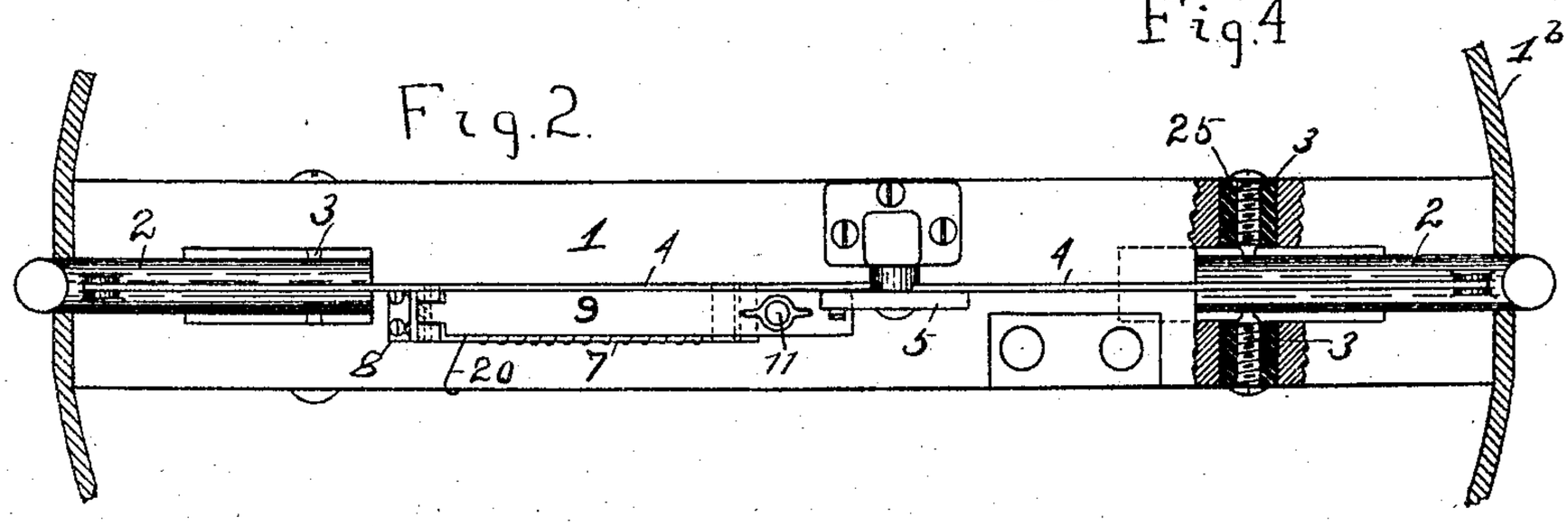


Fig. 3

Fig. 4

Fig. 2.



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No. 772,658. Patented October 18, 1904.

UNITED STATES PATENT OFFICE.

GEORGE F. GROVE, OF DAYTON, OHIO.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 772,658, dated October 18, 1904.

Application filed January 11, 1904. Serial No. 188,481. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. GROVE, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Electric-Arc Lamps; 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 figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in electric-arc lamps.

The invention has for its object the improvement and simplification of the construction of arc-lamps, which render their action greatly improved in many respects.

Principally among the advantages may be mentioned, first, that there is nothing to obstruct the rays of the luminous arc—such, for example, as carbon-holders, globe-holders, &c., which cast shadows. The arc is at the lowermost point of the lamp. Second, the avoidance of the use of solenoid-coils with massive windings which heat and burn out. Third, the ability to place a reflector directly back or above the arc, thus enabling the rays of light to be thrown or reflected, as desired. Fourth, the ability to use the lamp when suspended with the arc downward for general lumination in places with much lower ceilings than is commonly found. This is due to all the working parts being within the space occupied by the carbons and carbon-holders. In other words, the mechanism all being within the space inclosed by the carbons and carbon-holders the lamp as a whole is shorter and requires less vertical space. Fifth, the great saving of time of the lamp trimmer, owing to the fact that he can use the regular lengths of carbons without cutting them preparatory to placing them in the holders. In thus placing the carbons there are no binding-screws to turn or adjust. The regular lengths of carbons are simply inserted in the holders. Sixth, the great time saved to linemen, owing to the fact that they are not required to be constantly on the lookout for fear of getting the lamp connected "upside down," as it is usually called. Seventh, the employment of the electromagnetic carbon-clutches herein described does away with the usual amount of mechanism, which constantly causes sticking of the clutches heretofore in use. Eighth, the avoidance of dash-pots to gum up and stick, as is one of the great troubles with the lamps now commonly in use. Ninth, the avoidance of the danger of burning carbon-holders by one carbon being consumed faster than the other. Tenth, the fact that the luminous arc remains in a permanent and definite position at all times while the carbons last, thus obtaining the best effect from a reflector. Eleventh, the electromagnetic carbon-clutches, carbons, and electromagnetic arc-controller all being connected electrically in series with one another utilize all the current used by the lamp in and through the luminous arc, thus avoiding shunt-currents.

Preceding a detail description of my invention, reference is made to the accompanying drawings, of which—

Figure 1 is an elevation of my improved arc-lamp with the casing and globe removed. Fig. 2 is a top plan view. Fig. 3 is a section on the line *x x* of Fig. 1. Fig. 4 is a section on the line *y y* of Fig. 1.

Throughout the specification similar reference characters indicate corresponding parts.

1 designates a base to which a casing and globe-holder 1^b is attachable, said base having suitable openings 1^a, through which the tubular carbon-holders 2 project and in which said holders are pivoted at 3.

4 designates connecting-rods which are joined to the upper ends of the carbon-holders and are pivotally attached at opposite points to a disk 5, the latter being of insulation material. The disk 5 is pivotally supported upon a stand 6, which is secured to the base 1.

7 designates an electromagnetic arc-controller which is supported upon standards 8, constructed of non-magnetic material and are united to the base 1. 9 designates an armature-lever of said magnetic arc-controller, which is connected at the end opposite its pivot to the disk 5 by means of a short connecting-rod 10.

11 designates an adjusting-screw which penetrates the base 1. This screw is inclosed by an adjusting-spring 12, between the upper end of which and the head of the screw the armature-lever 9 lies, and by means of said screw and spring proper adjustments of said armature-lever are obtained.

13 designates the carbons, which fit loosely in the tubular holders 2 and are held by electromagnetic carbon-clutches 16 and 16′, which are placed at or near the lower ends of the holders and are held in place by band-clamps 17, which are slipped over said shoulders at such points and are held by set-screws.

18 designates armature-levers of said magnetic clutches, which are pivoted at 19 and have their ends turned at an angle 17′ to grip the carbon on one side, the other side of said carbon being gripped by the angular ends 15 of the magnet-cores. The carbon-holders at these points are provided with openings 15′, which permit of the ends of said armatures and magnet-cores coming in contact with the carbons.

20 designates one end of the magnetic winding—for example, the positive end—which enters the binding-post 21 and forms the winding of electromagnetic arc-controller, from whence it extends to the electromagnetic carbon-clutch 16 and thence into the carbon held by said clutch and through the arc into the other carbon and electromagnetic carbon-clutch 16′ and thence to the negative binding-post 21′.

24 designates a reflector secured to the base. Other reflectors may be placed in positions at right angles to that shown.

Briefly describing the operation of my improved arc-lamp, it will be assumed that the lamp is connected with a source of electrical current which passes through the winding of the electromagnetic arc-controller 7 and the windings of the electromagnetic carbon-clutches 16 and 16′, attracting the armatures of each of said clutches and also the armature of the arc-controller, thus causing said clutches to grip the carbons and the armature of the electromagnetic arc-controller to transmit movement to the disk 5 and thence to the carbon-holders to open the space which increases the arc. As the current passing through the arc-controller weakens, the expansion of the spring 12, acting upon the armature 9, decreases the space of the arc. As the carbons are consumed the clutches release said carbons and permit gravity or pressure to bring them closer together to maintain a proper size or uniform arc. The adjustment of the arc is obtained through the adjusting-screw 11 and the spring 12 thereon. Adjustments of the armatures of the electromagnetic carbon-clutches are obtained in a similar manner through adjusting-screws 22 and springs 23. In the event that the base 1 should be made of other than insulation material the carbon-holders should be insulated from said base at the points of their pivots by inserting an insulating-bushing 25, allowing it to protrude through the slots 1ª, so that the carbon-holders cannot come in electrical contact with said base.

Having described my invention, I claim—

1. In an arc-lamp, the combination with an electromagnetic arc-controller, of two converging carbon-holders containing carbons, an electromagnetic carbon-clutch secured to each of said carbon-holders and gripping the carbons at or near their lower converging ends, said electromagnetic carbon-clutches and the electromagnetic arc-controller being connected electrically in series with one another thereby utilizing all the current consumed by the lamp in and through the luminous arc.

2. In an arc-lamp, the combination with an electromagnetic arc-controller, of two converging carbon-holders, connections between said arc-controller and said carbon-holders by which the positions of said holders are controlled, electromagnetic carbon-clutches electrically connected with said arc-controller in series whereby the carbons in said holders feed together so that the arc is maintained in permanent position.

3. In an arc-lamp, the combination with a base, of carbon-holders pivotally mounted in said base and having their lower ends converging, a disk pivoted above said base, connecting-rods between said disk and the ends of the carbon-holders, an electromagnetic arc-controller having one end of its armature connected with said disk, electromagnetic carbon-clutches rigidly attached to the carbon-holders, the said electromagnetic carbon-clutches and the electromagnetic arc-controller being connected electrically in series, and the arc being maintained in a permanent position.

4. In an arc-lamp, the combination with a base, of carbon-holders pivotally connected to said base, a disk mounted above said base, link connections between the ends of the carbon-holders and said disk, an electromagnetic arc-controller mechanically connected to said disk, electromagnetic carbon-clutches secured to said carbon-holders and gripping the carbons through said holders, said clutches being connected electrically in series with the electromagnetic arc-controller.

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

GEO. F. GROVE.

Witnesses:
R. J. McCarty,
Thos. B. Herrman.