

No. 669,057.

Patented Feb. 26, 1901.

M. H. BAKER.
ELECTRIC ARC LAMP.

(Application filed Mar. 12, 1900.)

(No Model.)

Fig. 1

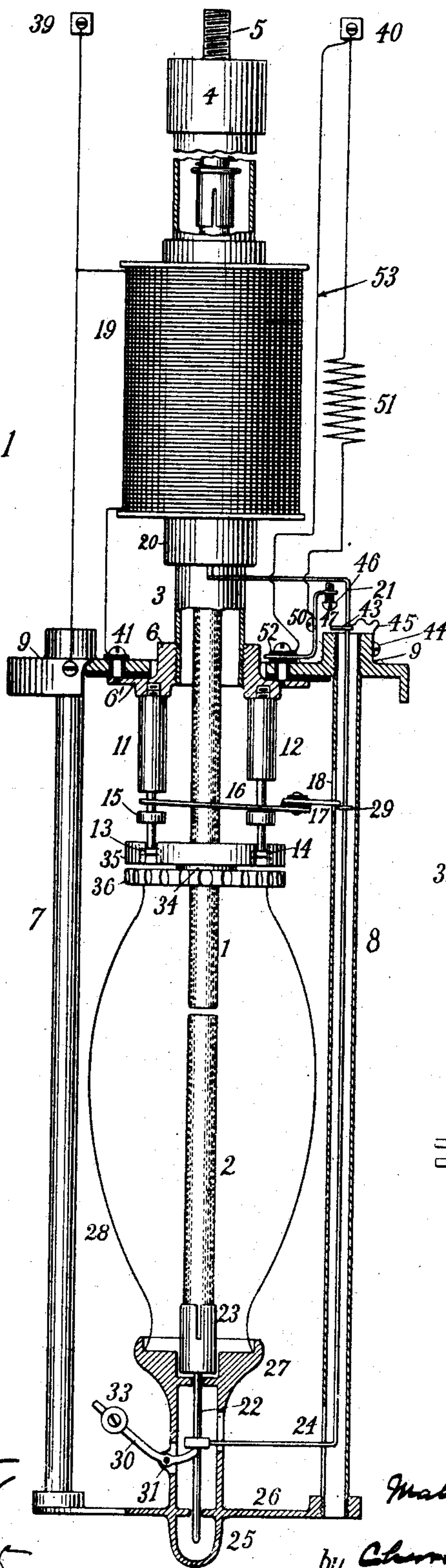


Fig. 2

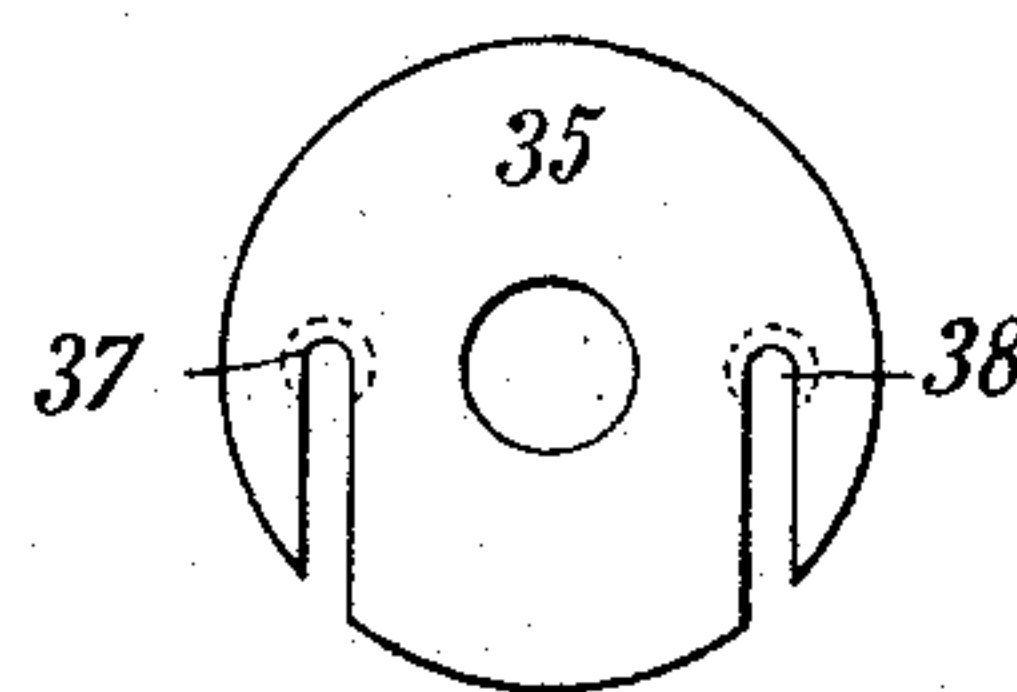
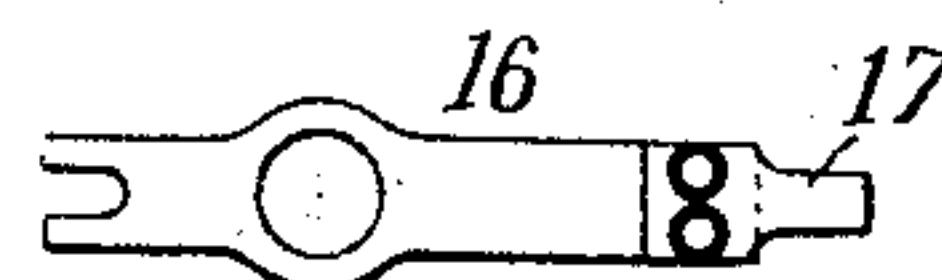


Fig. 3



Witnesses:

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UNITED STATES PATENT OFFICE.

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ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 669,057, dated February 26, 1901.

Application filed March 12, 1900. Serial No. 8,256. (No model.)

To all whom it may concern:

Be it known that I, MALCOLM H. BAKER, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Inclosed-Arc Lamps, of which the following is a specification.

My invention relates to improvements in the construction of electric-arc lamps, its object being to provide a simple, compact, reliable, and economical form of lamp.

In carrying out my invention I have made several improvements in the general organization of arc-lamps and in the details of their construction.

In another application of even date herewith I have shown and described an arc-lamp in which the lower carbon is mounted upon a core or armature of the usual shunt-magnet and the movement of the said core or armature is made to operate also the clutch of the upper carbon. In this arrangement the arc is established by the dropping of the lower carbon under the influence of gravity. In other words, the structure is so organized that the operation of the shunt-magnet first acts to raise the lower carbon toward the upper carbon and afterward releases the upper carbon, so as to bring the points together, after which, the shunt-magnet being partially deenergized, the lower carbon drops by gravity and establishes the arc.

In the structure illustrated and described in the application referred to the shunt-magnet is located below the carbons and the lower carbon is mounted upon a rod in the same axial line as the core of the magnet. In the present form of lamp the shunt-magnet is located above the carbons, and its armature or core is connected to the lower carbon through the medium of a bent rod, which also carries a tripping device for the lamp-clutch. These and other devices of my lamp will be fully explained in the specification which follows and will be more particularly pointed out in the claims.

I have illustrated my invention in the accompanying drawings, in which—

Figure 1 is an elevation, partly in section,

of a complete lamp structure, including also a diagram of the electric circuits. Fig. 2 is a detail of the gas-check structure connected with my lamp, and Fig. 3 is a detail of the lamp-clutch.

The characters 1 and 2 represent, respectively, the upper and lower carbons of my lamp. The upper carbon, which is provided with any suitable kind of carbon carrier or holder, is adapted to reciprocate within a metallic tube 3, the upper end of which carries a cap 4 and a screw-stud 5 for attachment to any suitable support. To the lower end of the tube or pipe 3 is secured a boss or hub 6, forming part of a plate 6', which is joined to but insulated from the main plate 9 of the lamp-frame. To the plate 9 are secured the side rods 7 and 8 below the plate 6', which supports two posts 11 and 12, both of which are narrowed at their lower ends and provided with buttons 13 and 14, respectively. The rod 11 also carries a stop 15, which forms what I call the "stationary" portion of my lamp-clutch, the clutch itself being shown at 16 and being provided with a yoke, which passes around the rod 11 at a narrow portion thereof and rests for the most part upon the stop 15. At the opposite end of the clutch 16 I mount an insulated tailpiece 17, the end of which extends into an opening 18 in the side rod 8.

The shunt-magnet is shown at 19 in the form of a solenoid having a core 20, to which is secured a bent rod 21, which passes down through the side rod 8 and is again bent and attached at its remote end to a vertical rod 22, on which is mounted a carrier 23 for the lower carbon. A slot 24 is made in the side rod 8 to permit the upward and downward motion of the bent rod 21 at that point. The lower end of the rod 22 extends into a housing 25, which protects the said rod at a point where it would otherwise be exposed to injury. The rod 22 is adapted to move up and down and is guided in such motion by the lower lamp-plate 26, through which it passes, and also by a standard 27, mounted on the plate 26 and having its upper end cupped to receive the lower end of a glass globe 28, which surrounds the ends of the carbons.

On the bent rod 21, at a point just below the end of the tailpiece 17 of the clutch 15, is a collar 29, which coöperates with the tailpiece and is adapted to lift it, and thereby trip the clutch when the shunt-magnet is operated. The core of this magnet being connected by the bent rod 21 to the vertical rod 22 also lifts the lower carbon, causing it to approach the upper carbon, while if this motion is continued far enough the clutch for the upper carbon will be tripped and the said upper carbon will be allowed to descend into contact with the lower. This is the action which takes place when the current is first turned on at the time when the major part of the current passes through the shunt-magnet and operates it. The carbon-points having been brought together, as above described, the arc is established by the falling of the lower carbon under the influence of gravity.

Coöperating with the magnet, so as to assist in its lifting effect upon the lower carbon and to resist the effect of gravity, is a lever 30, pivoted at 31 and so connected to the rod 22 as to act upon it through a critical angle, whereby the effect of the adjustable weight 33 at the outer end of the lever shall gradually increase with the ascent of the lower carbon and the magnet-core in a degree corresponding to the decreasing lifting effect of the magnet as the core approaches equilibrium within the same.

By means of the rods 11 and 12 and the buttons 13 and 14 thereon a cylinder 34, containing a gas-check, is supported. The cylinder is provided at each end with rings or flanges 35 and 36, the latter being cup-shaped at the bottom and constituting a cap for the glass globe 28, the former being slotted, as shown in Fig. 2, so as to be slipped over the rods 11 and 12 and readily removed therefrom. Depressions 37 and 38 are made in the under side of the ring or flange 35 at the inner ends of the slots to receive the buttons 13 and 14, by which structure the gas-check cylinder is centered and held in place until it is lifted for the purpose of slipping the ring 35 and the parts connected therewith off the rods 11 and 12 when it is desired to trim the lamp. Inasmuch as the upper carbon can be moved up out of the way inside the main tube or pipe 3 the described construction permits of trimming the lamp, as will be readily understood.

The lamp-circuit enters at the binding-post 39 and passes out by way of the binding-post 40. From the binding-post 39 the circuit passes directly to the shunt-magnet 19 and thence to a binding-screw 41, which is in electrical connection with the plate 6'. The said plate 6' is in electrical connection with a binding-screw 52, and the circuit continues by way of the wire 53 to the binding-post 40. The main lamp-circuit passes from the binding-post 39 to the plate 9, and thence to the side rods 7 and 8 and the lower and upper carbons,

the binding-screw 52, wire 53, and binding-post 40.

The cut-out for the lamp is arranged to act in connection with the reciprocating rod 21, on which is mounted a contact-piece 43, connected to the lamp-frame at 44 by means of a flexible cable 45. In the path of movement of the contact-piece 43 is mounted an adjustable contact 46, secured to an insulated standard 47. The latter is attached by an insulated screw 52 to the plate 6'. On the standard 47 is a binding-screw 50, which is joined through a resistance 51 to the outgoing binding-post.

The invention claimed is—

1. In an electric-arc lamp, a longitudinally-movable lower carbon and an upper carbon combined therewith, in combination with a shunt-magnet located above the arc and having its core or armature connected with the lower carbon.

2. In an electric-arc lamp, a main circuit including the carbons, and a shunt-circuit including a magnet or solenoid located above the arc, the armature or core of the said magnet or solenoid being operatively connected with the lower carbon.

3. In an electric-arc lamp, the combination with the usual carbons, of a shunt-magnet located above the meeting point of the said carbons, a vertical rod connected to the lower carbon, and a lever joining the said vertical rod to the core or armature of the shunt-magnet.

4. In an electric-arc lamp, the combination with a lower carbon, of a shunt-magnet located above the carbons and having a core connected to the said lower carbon by a bent rod or lever, a clutch for the upper carbon, a trip for the said clutch, the said trip being connected with the bent rod or lever and being in line with a portion of the said clutch.

5. In an electric-arc lamp, a frame having side rods one of which is hollow, a pair of carbons in the main circuit of the lamp, and a shunt-magnet in circuit around the arc, in combination with a clutch for the upper carbon and a trip for the said clutch, the said trip being located inside the hollow rod.

6. In an electric-arc lamp, a frame having side rods, one of which is hollow, a carbon-clutch extending into the said hollow rod, a trip for the said clutch located inside the rod, and a shunt-magnet around the arc, the core of the said magnet being connected with the said trip.

7. In an electric-arc lamp, a frame having side rods one of which is hollow, a pair of carbons, a shunt-magnet located in the circuit around the arc, and above the meeting point of the carbons, and a bent lever extending in part through the hollow rod and connecting the core of the shunt-magnet with the lower carbon.

8. In an electric-arc lamp, the combination with the lower carbon, of a carrier therefor,

and a vertical rod connected to the said carrier, of a base-plate for the lamp constituting a guide for the said rod, and a shield surrounding the lower end of said rod for protecting the same.

5 9. In an electric-arc lamp, a main circuit including the carbons, a shunt-circuit including a magnet, and a cut-out circuit containing a resistance, in combination with a lever
10 connecting the core of the shunt-magnet to

the lower carbon, and also carrying the movable terminal of the cut-out.

Signed at New York, in the county of New York and State of New York, this 16th day of February, A. D. 1900.

MALCOLM H. BAKER.

Witnesses:

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