No. 875,833. PATENTED JAN. 7, 1908.

J. A. MEAHER.

ELECTRIC ARC LAMP.

APPLICATION FILED OCT. 29, 1906.

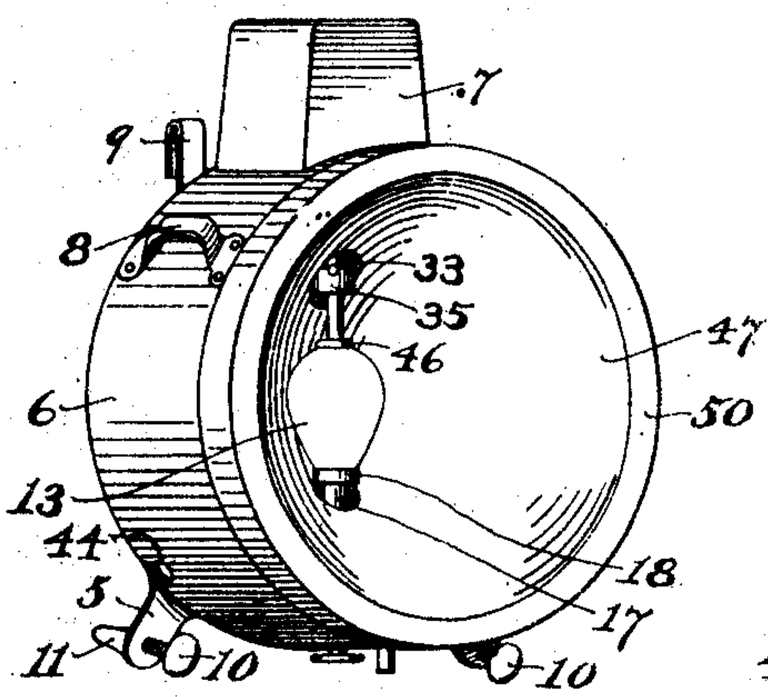

Fig. I.

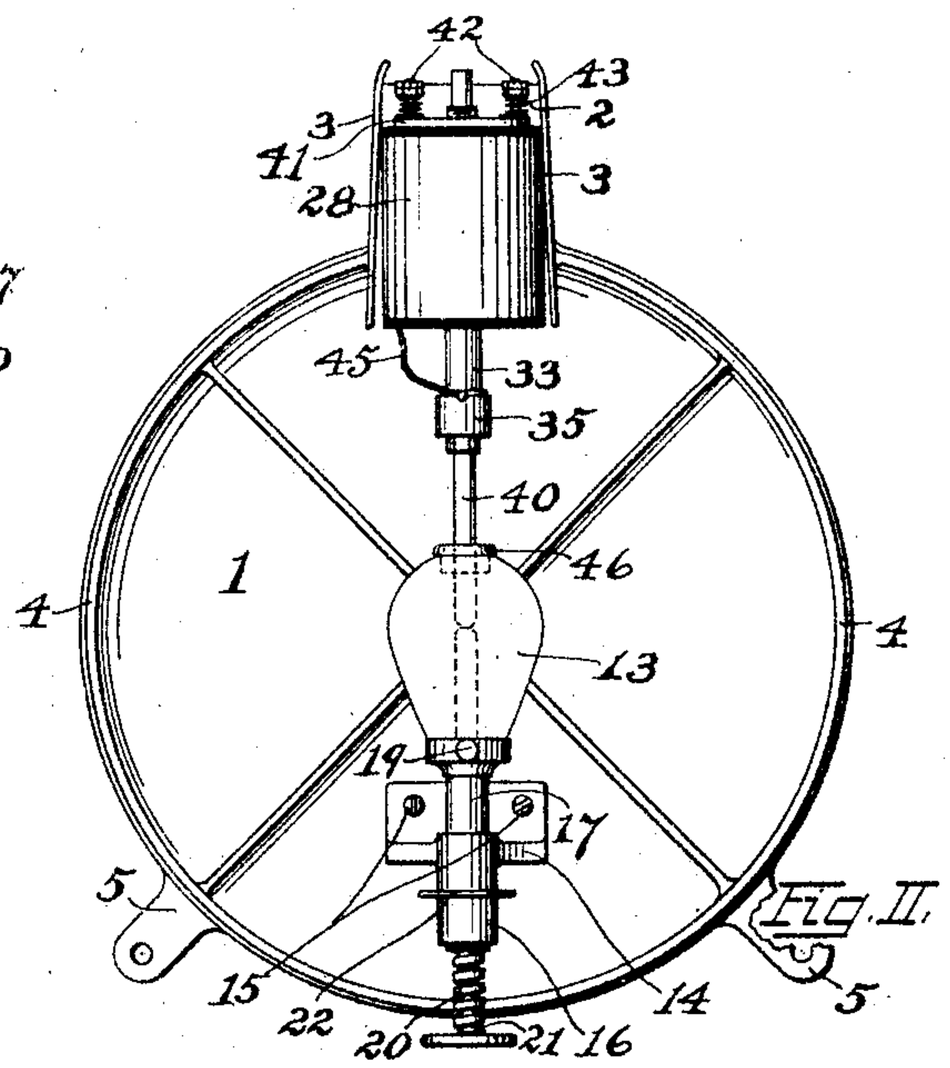

Fig. II.

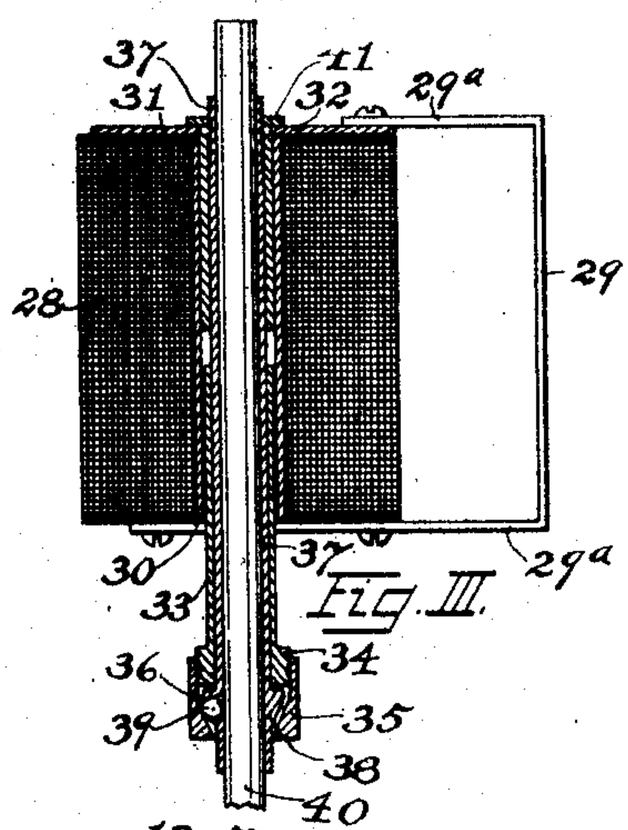

Fig. III.

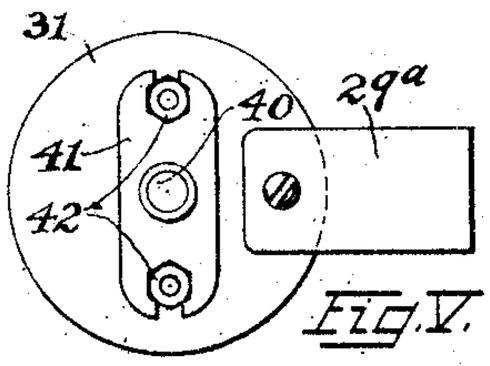

Fig. V.

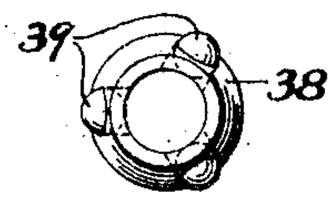

Fig. VI.

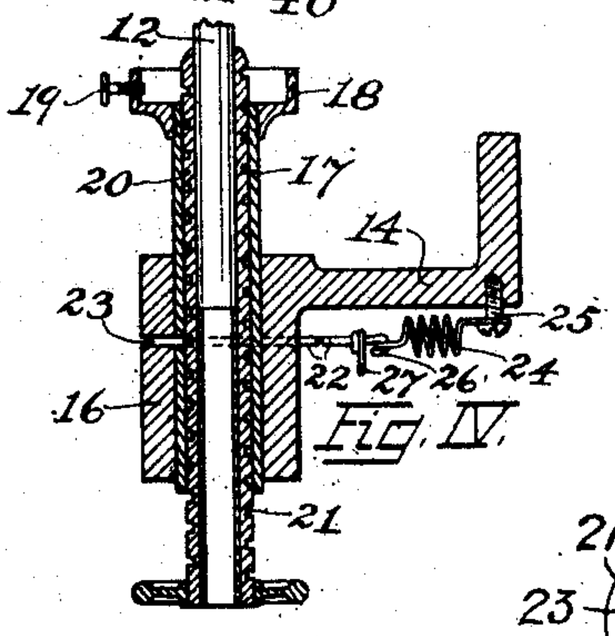

Fig. IV.

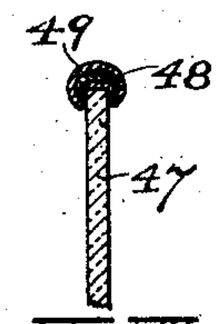

Fig. VII.

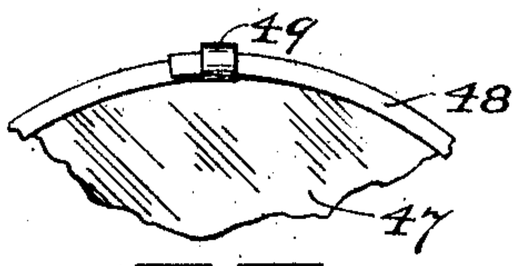

Fig. VIII.

Fig. IX.

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UNITED STATES PATENT OFFICE.

JOSEPH A. MEAHER, OF CLEVELAND, OHIO.

ELECTRIC-ARC LAMP.

No. 875,833. Specification of Letters Patent. Patented Jan. 7, 1908.

Application filed October 29, 1906. Serial No. 341,024.

To all whom it may concern:

Be it known that I, JOSEPH A. MEAHER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Electric-Arc Lamps, of which the following is a specification.

My invention relates to improvements in electric-arc lamps and the paramount object is to produce a generally improved lamp of this class which will be exceedingly simple in construction, cheap of manufacture, and efficient in use.

The present embodiment of the invention is in the form of a head-light specially designed for use in connection with electric suburban cars, steam locomotives, etc.

The invention relates more particularly to improvements in the construction and operation of devices for holding and positioning the upper and lower carbon electrodes.

An object is to construct a simple and efficient feeding mechanism for so controlling and regulating the descent of the upper movable carbon electrode that there will be no perceptible variation in the arc when once struck. This object is attained by what may be called a "carbon ball-clutch".

With these ends in view, the invention consists in the novel construction, arrangement, and combination of parts hereinafter described and illustrated in the accompanying drawings, and particularly pointed out in the appended claims.

Referring to the accompanying drawings, forming a part of this specification, Figure 1, is a perspective view of an improved head-light, constructed in accordance with my invention and adapted to be attached to the dash-board of an ordinary electric car. Fig. 2, a front elevation of the same with the casing and reflector removed. Fig. 3, a vertical sectional view of the magnet and upper carbon clutch mechanism. Fig. 4, a vertical sectional view of the lower or fixed carbon holding mechanism. Fig. 5, a top plan view of the adjustable tension mechanism for the upper carbon clutch. Fig. 6, a plan view of the bottom or engaging portion of the upper carbon clutch. Fig. 7, a sectional detail view of a broken away portion of the glass and rim attaching and clamping mechanism. Fig. 8, a front view of the same. Fig. 9, a cross sectional view of the lower or fixed carbon holding mechanism.

Similar characters of reference designate like parts throughout all the figures of the drawings.

In the present embodiment of my invention, the various parts of the lamp are supported from a supporting-back-plate or disk 1, and a magnet supporting-plate 2, provided with shields or wings 3. The disk or back plate is also provided with an annular flange or ring 4, and depending lugs or wings 5.

The casing 6, is provided with a magnet-dome or shield 7, and handles 8, and is designed to be fastened to the back-plate by having its rear edges take over the annular flange 4, with the dome 7, taking over the shields or wings 3. The rear edges of the casing are secured to the flange 4, by means of screws, or in some other suitable and convenient manner.

The lamp is secured to the dash-board of a car by means of suspending-hooks 9, which take over the upper edge of the dash-board, and adjusting-bolts 10, carried by the lugs 5, and provided with bumper-heads or blocks 11, which abut against the face of the dash-board. The said adjusting-bolts 10, and bumper-heads 11, enable the operator to make the proper adjustment of the lamps of dash-board.

The holding and adjusting mechanism for the lower or fixed carbon 12, and the holder for the globe 13, are supported by means of a bracket 14, secured to the back-plate 1, by means of screws 15. The end of the bracket is provided with a depending head 16, provided with a central bore or opening in which is mounted a tubular shank 17, provided at its top with a cap or receptacle 18, in which rests the bottom of the globe 13. The shank 17, is stationary in the head 16, and the globe 13, is secured in the cap 18, by means of a screw 19.

The lower carbon holder 20, is mounted within the tubular shank 17, and is provided with a central opening or bore in its top portion to form a seat to receive the lower carbon.

In order to enable the operator to remove the carbon holder instantly and yet allow a screw adjustment, the holder 20, is provided

about its periphery with a deep spirally-arranged groove 21, adapted to be engaged by one side of a wire loop 22, which takes into and is positioned within a horizontal slot 23, formed in one side of the bracket-head 16, and tubular shank 17. The loop 22, encircles the bracket-head 16, and is yieldingly held in its normal position by means of a coil-spring 24, one end of which is fastened to the bracket 14, by means of a screw 25, and the other secured to a hook or loop 26, of the shank portion of the loop 22. The shank portion of the loop 22, is preferably provided with handle portion 27, by means of which the loop may be moved against the tension of the spring to disengage the same from the groove 21 of the holder 20, whereby the latter may be removed instantly from the bracket-head 16.

The tubular magnet 28, is supported and secured to the magnet supporting-plate portion 2, of the back-plate 1, by means of a bracket 29, the arms 29^a, of which take over and are secured to the upper and lower end of the magnet to prevent the latter from getting out of alinement with the lower fixed carbon.

The magnet comprises the usual magnetic coil or solenoid formed about a spool made up of a tubular portion 30, and heads 31. A tubular core portion 32, is mounted in the upper end of said tubular portion 30, and forms a guide for the upper portion of the tubular upper movable carbon clutch holder to be hereinafter described.

A tubular armature 33, is mounted within the lower portion 30, and has its lower end depending from the magnet and provided with a screw threaded head 34. The head 34, of the armature carries a head block 35, provided with a central opening the walls of which are threaded to engage the threaded portion of the head 34, and an inverted truncated cone-shaped chamber or cavity 36.

The upper carbon clutch-holder comprises a tubular shank portion 37, carried within the tubular armature 33, and extending upwardly through the tubular core portion 32, of the magnet. The lower end of the clutch-holder is provided with an inverted truncated cone-shaped head 38 having a depending carbon guide 38^a, and the clutch-holder is movably mounted within the tubular armature by means of the head block 35, provided with the cavity 36, taking over the same.

The head 38, is provided with three or more radially-extending apertures or recesses in which are located bearing-balls 39, the construction being such that when the head block 38, is in the lower portion of the chamber or cavity 36, of the head 35, of the armature, and the latter is raised slightly, the balls 39, are revolved and moved inwardly by contact with the inclined walls of the cavity 36, whereby the balls engage the upper carbon 40, holding the latter and permitting it to be raised with the tubular armature to form the arc, and when the armature is lowered by the burning away of the carbon until the arc-adjusting plate 41, carried by the upper end of the carbon clutch holder, strikes the upper end of the magnet-spool, the head block 35 of the armature will be moved downwardly over the balls 39, and the same will assume or be revolved outwardly to the larger diameter of the cavity of the head, and the carbon being thereby released from the clutch of the balls will fall until again grasped and held by the balls as the armature moves upward by the increased strength of the magnet, caused by the reëstablishment of the current by the contacting of the carbons.

The upper end of the tubular shank portion of the armature abuts against the lower end of the tubular core portion to limit the upward movement of the same, and the length of the "pick-up" or size of the arc, when the current is turned on, is regulated by means of the arc-adjusting plate 41, threaded on the upper end of the shank portion of the tubular clutch. The adjustment is made by revolving the clutch.

The downward pressure of the upper carbon clutch is made by means of bolts and adjusting nuts 42, and tension springs 43, taking over the ends of the arc-adjusting plate 41.

The electrical connection is made through a wire (not shown) connected to the upper end of the magnet-coil or solenoid and passing out through an opening 44, in the side of the lamp casing. The current passing from the magnet coil through the medium of a wire 45, suitably connected to the head of the armature.

When the lamp is in operation, the current passes to the lower carbon, thence through the bracket 14, back-plate 1, and hooks 9, to the ground circuit.

A globe-cap 46, takes into the upper carbon-opening of the globe 13, and is provided with a central opening adapted to receive the upper movable carbon. The cap fits snugly to the parts and is adapted to prevent air from getting into the globe, thus insuring long life to the carbon.

The glass 47, is fitted within an annular groove of a clamping ring 48, the meeting ends of which are secured together by means of a slidably mounted clamping member 49. The ring 48, is mounted within a flanged door ring 50, which slips over the end of the case.

From the foregoing description, taken in connection with the accompanying drawings, the operation and advantages of my invention will be readily understood.

Having thus described my invention, without having attempted to set forth all the

forms in which it may be made, or all the modes of its use, I declare that what I claim and desire to secure by Letters Patent, is,—

1. In an electric arc-lamp, a solenoid provided with a tubular portion, a stationary tubular core portion mounted in the upper end of said tubular portion of the solenoid, a tubular armature mounted within the lower end of said tubular portion of the solenoid and having its lower end depending from the magnet and provided with an exteriorly-threaded head, a head-block provided with a central opening in its lower portion and an enlarged inverted truncated cone-shaped cavity having the upper edges of its walls threaded to engage said exteriorly-threaded head, an upper carbon clutch-holder comprising a tubular shank portion carried within said tubular armature and extending through said stationary tubular core portion and provided at its lower end with an inverted truncated cone-shaped head movably-mounted and normally sustained within said tubular armature by means of said head-block taking over and forming a seat for said inverted truncated cone-shaped head, radially-extending apertures formed in said head and carrying bearing-balls, and a spring-resisted arc-adjusting-plate mounted above the solenoid and adjustably-secured to and normally carried by the upper end of said carbon clutch-holder.

2. In an electric arc-lamp, a magnet provided with a tubular core portion and a tubular armature provided with a depending exteriorly-threaded head block carrying an adjustably mounted interiorly-threaded head provided with an inverted truncated cone-shaped cavity having a central opening, and a tubular carbon-clutch member provided with a similarly-shaped head mounted in said cavity and having a depending carbon-guide extending through said central opening, said last-mentioned head being provided with radially-extending openings carrying bearing-balls adapted to bear against the inclined walls of said cavity.

3. In an electric arc-lamp, an upper carbon holder comprising a tubular shank portion and an inverted truncated cone-shaped head provided with a depending carbon-guide and radially extending openings containing bearing-balls, and a tubular armature taking over said shank portion and provided with an adjustably-mounted detachable exterior head taking over said cone-shaped head and provided with a similarly-shaped cavity the walls of which are adapted to engage said bearing balls and a central opening in its lower portion taking over said depending carbon-guide.

4. In an electric arc-lamp, a lower carbon holder comprising a bracket provided with a depending head having a central opening therein, a tubular portion mounted in said opening and provided about its periphery with a deep spirally-arranged groove, a horizontal slot formed in the front side of said depending head, and a spring-resisted wire loop attached to said bracket diametrically-opposite and taking into said horizontal slot and said spirally-arranged groove.

5. In an electric arc-lamp, a lower carbon holder comprising a bracket provided with a depending head, a tubular shank mounted in said head and provided with a cap or receptacle for supporting the globe, a second tubular shank mounted therein and provided with a spirally-arranged groove, a horizontal slot or opening formed in said depending head and said first mentioned shank mounted therein, and a spring-resisted wire loop attached to said bracket and taking into said horizontal slot and said spirally-arranged groove.

6. In an electric arc-lamp, the combination with a magnet provided with a tubular core and armature, a tubular ball clutch member mounted therein and provided at its lower end with an inverted truncated cone-shaped head having a depending carbon-guide; of spring-resisted arc-adjusting-plate mounted at the upper end of said magnet and adjustably-secured to the upper end of said tubular ball clutch member, and a removable head-block provided with a central opening taking over said depending carbon-guide and a cavity forming a seat for the head at the lower end of said ball clutch member and adjustably-secured to the lower end of said armature.

7. In an electric arc-lamp, an upper carbon clutch-holder comprising a tubular shank portion terminating in an inverted truncated cone-shaped head provided with radially-extending openings containing bearing-balls, a tubular armature taking over said shank portion and provided with an enlarged exteriorly-threaded head, and a head-block provided with a central opening in its lower portion and an enlarged inverted truncated cone-shaped cavity taking over said inverted truncated cone-shaped head and having its upper edges interiorly-threaded and taking over said enlarged exteriorly-threaded head of the armature.

8. An electric arc-lamp, comprising a tubular armature provided with an exteriorly-threaded depending-head, a tubular core mounted above said tubular armature to limit the upward movement of the same, a tubular ball clutch mounted within said armature and core and provided with an inverted truncated cone-shaped depending-head having radially-extending openings provided with balls, a spring-resisted plate adjustably secured to the upper end of the armature and the upper end of said tubular ball clutch, and an interiorly-threaded head-block adjustably-secured to said exteriorly-

threaded depending head of the lower end of said armature and provided with an inverted truncated cone-shaped cavity taking over and carrying said depending-head of said ball clutch.

9. In an electric arc-lamp, a tubular armature provided at its lower end with an exteriorly-threaded head, an upper carbon clutch-holder comprising a tubular shank mounted within said tubular armature and extending through and above the magnet and provided at its lower end with an inverted truncated cone-shaped head, an interiorly-threaded adjustable head-block taking over said exteriorly-threaded head and having an inverted truncated cone-shape cavity taking over said inverted truncated cone-shaped head and normally and movably-sustaining said upper carbon clutch-holder, and a spring-resisted arc-adjusting-plate adjustably secured to and normally carried by the upper end of said carbon clutch-holder.

10. In an electric arc-lamp, a tubular armature terminating in an exteriorly-threaded head, an upper carbon clutch-holder comprising a tubular shank mounted within said tubular armature and having its upper portion exteriorly-threaded and extending above the magnet, and its lower portion provided with an inverted truncated cone-shaped head having radially-extending openings carrying bearing-balls, a head-block provided with a central opening in its lower portion and an enlarged inverted truncated cone-shaped cavity inclosing said inverted truncated cone-shaped head and having the upper edges of its walls threaded to engage said exteriorly-threaded head of the armature, and an arc-adjusting plate mounted upon said exteriorly-threaded upper portion of the upper carbon clutch-holder and mounted above and secured to the magnet by means of adjustably-mounted tension-springs.

11. In an electric arc-lamp, the combination with a tubular armature provided with an exteriorly threaded head at its lower end, and a spring-resisted tubular carbon-clutch member adjustably mounted therein and provided with an inverted truncated cone-shaped head having radially-extending openings carrying balls; of a screw threaded adjustable head-block taking over said exteriorly threaded head of the armature and provided with a similarly shaped cavity inclosing said last mentioned head and balls.

12. In an electric arc-lamp, the combination with a tubular armature provided with a head at its lower end; of a spring-resisted tubular carbon-clutch member adjustably mounted therein and provided with an inverted truncated cone-shaped head carrying balls, and a head-block adjustably secured to said head of the armature and provided with an inverted truncated cone-shaped cavity inclosing said head and balls of the clutch member.

13. In an electric arc-lamp, an upper carbon clutch holder comprising a tubular shank portion provided with an inverted truncated cone-shaped head having radially-extending openings carrying bearing-balls, a tubular armature taking over said shank portion and provided with an enlarged exteriorly-threaded head, a head-block provided with an inverted truncated cone-shaped cavity taking over said inverted truncated cone-shaped head and having interior threads secured to said exteriorly-threaded head of the armature, an arc-adjusting-plate normally-carried by the upper end of said tubular shank portion of the carbon clutch-holder, guide-bolts mounted at the ends of said arc-adjusting-plate, adjusting-nuts secured to the upper ends of said guide-bolts, and tension-springs mounted on said guide-bolts and interposed between said adjusting-nuts and the ends of said arc-adjusting-plate.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH A. MEAHER.

Witnesses:
OBED C. BILLMAN,
A. MATTMUELLER.