

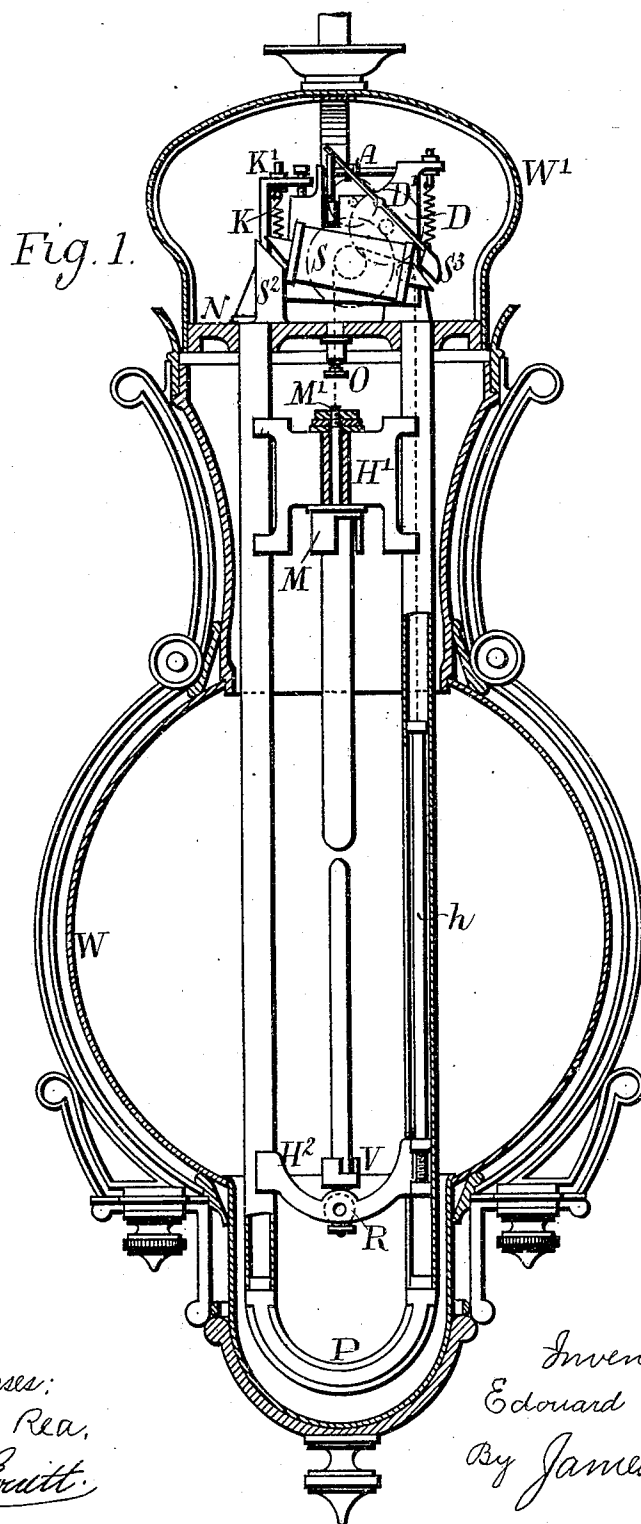
(No Model.)

3 Sheets—Sheet 1.

E. CANNEVEL.
ELECTRIC ARC LAMP.

No. 550,215.

Patented Nov. 19, 1895.



Witnesses:
G. W. Rea,
Albert Corbett.

Inventor:
Edouard Cannevel
By James L. Norris
att'y

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Fig. 2.

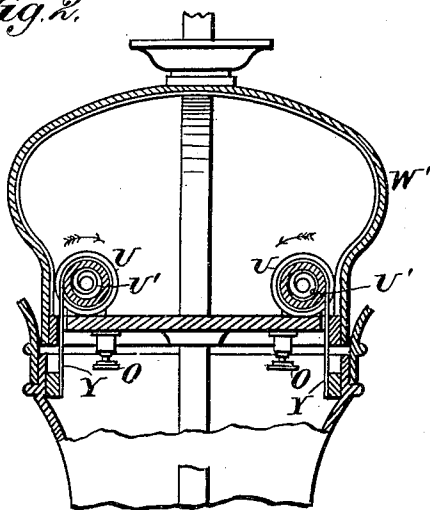


Fig. 7.

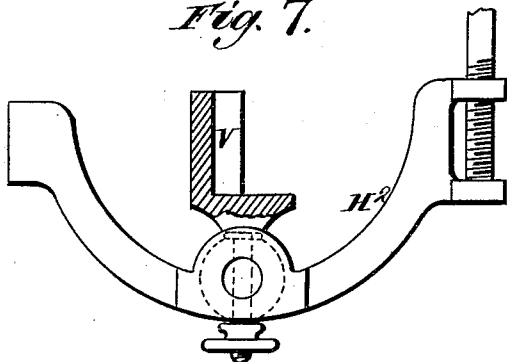


Fig. 8.

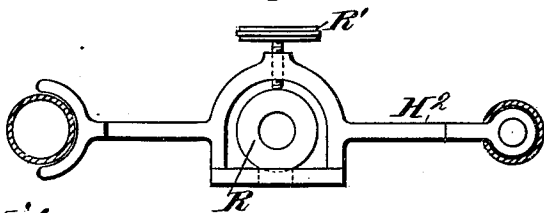
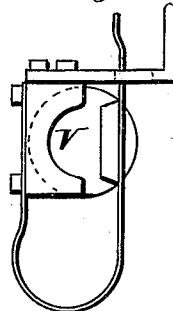


Fig. 9.



Witnesses:
Robert Emmett,
G. W. Rea,

Inventor,
Edouard Cannevel,
By
James L. Norvig,
Atty.

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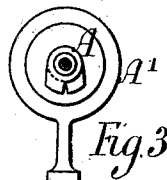
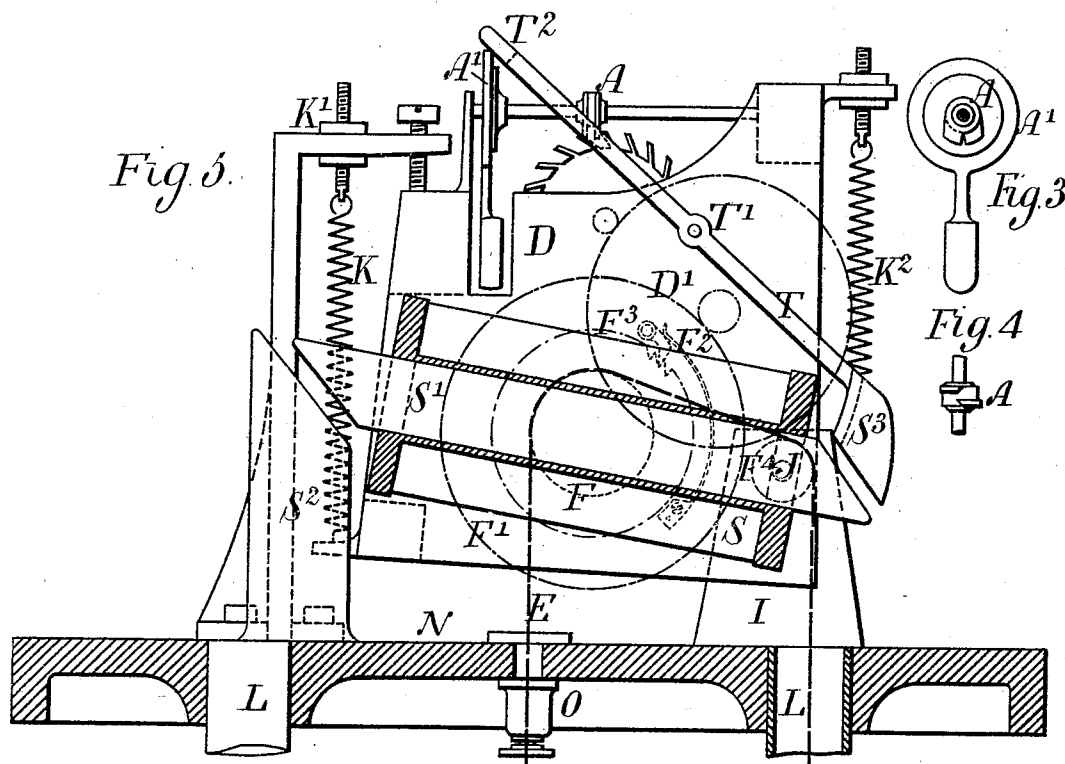
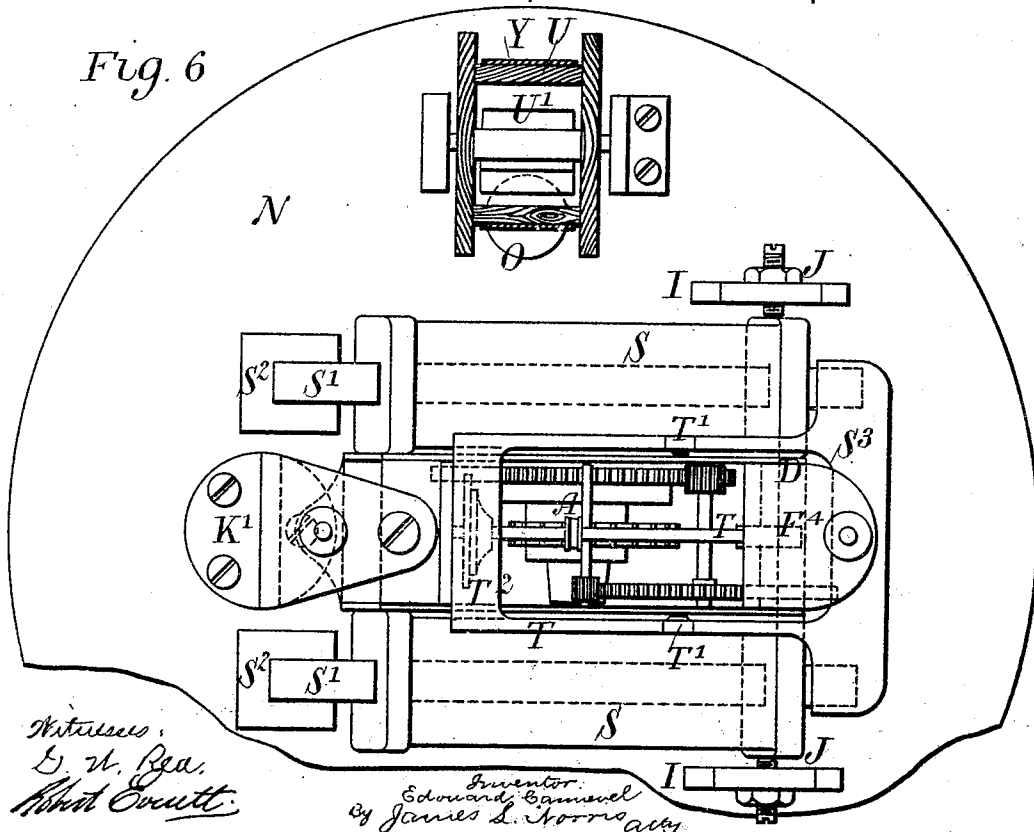


Fig. 6.



Witnesses:
E. H. Rea.
Robert Everett.

Inventor:
Edouard Cannevel
By James L. Norris atty

UNITED STATES PATENT OFFICE.

EDOUARD CANNEVEL, OF PARIS, FRANCE.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 550,215, dated November 19, 1895.

Application filed April 20, 1893. Renewed July 22, 1895. Serial No. 556,744. (No model.) Patented in Belgium September 26, 1892, No. 101,508; in England February 28, 1893, No. 4,390; in France March 25, 1893, No. 228,891; in Italy April 13, 1893, LXVI, 189; in Portugal May 17, 1893, No. 1,792, and in Spain June 21, 1893, No. 14,436.

To all whom it may concern:

Be it known that I, EDOUARD CANNEVEL, a citizen of France, residing at 1 Rue du Platre, Paris, France, have invented certain new and useful Improvements in Electric-Arc Lamps, (for which I have received Letters Patent in Belgium, dated September 26, 1892, No. 101,508; in France, dated March 25, 1893, No. 228,891; in Italy, dated April 13, 1893, Vol. LXVI, 189; in Portugal, dated May 17, 1893, No. 1,792; in Spain, dated June 21, 1893, No. 14,436, and in Great Britain, dated February 28, 1893, No. 4,390,) of which the following is a specification.

This invention relates to an improved construction of electric-arc lamps which offers the following principal advantages:

First. The construction permits of one and the same type of lamp to be employed for currents of all degrees of intensity. The current in tension does not work in passing through the lamp.

Second. A perfect working is obtained with a current passing in series through two lamps with a fall of potential of one hundred and ten volts, with forty-five volts at the terminals of each lamp.

Third. The lamp works well whether arranged in series or in parallel, and whether operating with continuous or with alternating currents.

Fourth. A perfect regulation is obtained owing to the action of the brake combined with the tangent escapement which fulfills all requirements. The regulation is effected within the guaranteed limits of variation of three-tenths amperes in the laboratory and five-tenths in regular working.

Fifth. The carbons are always situated apart when the lamp is not operating.

Sixth. The luminous point always occupies one and the same position.

Seventh. The working parts are of simple and strong construction.

Eighth. The cost of manufacture is comparatively small.

Ninth. Large casings and columns containing racks or rods which always impart to the lamp an unsightly appearance, no matter how

decorated, are dispensed with, leaving out of consideration the great cost.

Tenth. The lamp is so simple in use that it can be manipulated by any one.

Eleventh. The specially-constructed decorative casing for this lamp is of very practical arrangement for the renewal of the carbons. It is inexpensive and enables the lamp to be used in all localities.

I will proceed to describe the lamp with reference to the accompanying drawings, in which—

Figure 1 shows a vertical section of the lamp; Fig. 2, a detail sectional view; Fig. 3, a detached view of the tangent escapement and brake-disk; Fig. 4, an under side view of the escapement; Fig. 5, an enlarged section of the mechanism for controlling the carbons; Fig. 6, a plan of the same; Fig. 7, an enlarged view of the lower-carbon holder; Fig. 8, a plan of the same, and Fig. 9 a plan of one of the carbon-clips.

The lamp consists of a cast-iron platform N, which carries the regulating mechanism above it and below the parts of the arc lamp proper.

L L are two columns fixed to the under side of the platform N and serving as guides to the two carbon-holders H' H² that slide thereon. The upper-carbon holder H' tends to descend by its own weight and actuates the clockwork mechanism D' in a rocking framing D, carrying the tangent escapement A with brake-disk A'. The upper-carbon holder H' is also made to raise the lower-carbon holder H² by its descent by means of a pitch-chain E, which is connected at one end to the upper-carbon holder and at its other end to a rod h, sliding in one of the columns L, to which rod the lower carbon-holder is attached.

The chain E passes over a pitch-wheel F, which is loose upon its spindle, but is connected to a wheel F' of the clockwork fixed thereon by a catch F² on the latter taking into a flange F³ on the pitch-wheel, so that by releasing the catch by hand the wheel F can be turned so as to move the carbons apart without actuating the regulating mechanism. The chain passes over a guide-roller F⁴ into

the tube L. The pitch-wheel F and the regulating clockwork-gear that controls the descent of the upper-carbon holder is mounted on a framing D, which is pivoted on points at J, carried by brackets I cast on the plate N. This framing is held in the position shown by a spring K, adjustably connected at its upper end to a bracket K'. The framing D also carries fixed on each side of it two electromagnets S, which are wound with fine wire on a shunt of the lamp-circuit. The one end of the core S' of each magnet is opposite a soft-iron armature S², fixed to the plate N, so that when the electromagnets are excited by a current passing through their coils the cores, being attracted by the fixed armature, cause the frame D to turn downward on its pivots J against the action of the spring K and thus to lower the pitch-wheel F, and consequently to cause the carbon-holders to approach each other. Opposite the other end of the core S' of the magnets is a second armature S³, carried by a frame T, pivoted at T' and having at its upper end the brake-bar T², situated above the brake-disk A'. When no current is passing through the electromagnets S, a spring K², connected at its upper end to the framing D and at its lower end to the armature S³, holds this and the frame T in the position shown at Fig. 5, in which the bar T² presses against the brake-disk A', and thus prevents the descent of the upper-carbon holder.

When the electromagnets S are excited by a current, they attract the armature S³, and thus turn the frame T so as to hold the bar T² away from the brake-disk A', so that the escapement then allows the clockwork to be set in motion and the upper-carbon holder to descend.

The plate N carries two screw-terminals O, by one of which it is connected directly with the one lead of the main circuit, so that the current passes thence through the plate N and columns L to the negative carbon in the lower-carbon holder H², while from the other insulated terminal O a flexible conductor leads to the screwed stem M' of the socket M of the upper positive carbon, which is insulated from the carbon-holder H'. The two columns L are connected together at the lower end by a cross-piece P.

The socket and spring-clip V of the lower carbon is carried by a ball-and-socket joint R on the carbon-holder, so as to be set accurately in line with the upper carbon, after which it is fixed in position by a setting-screw R', which presses the ball against a hole R² in the side of the socket.

The lamp operates as follows: When no current is passing, the carbons are held separated, as shown at Fig. 1. When the main circuit is closed, the entire current will consequently pass through the electromagnets S, and these, as before described, will cause the framing D to turn on its pivots J, so as to lower the pitch-wheel F and thus bring the

carbons together. At the same time the armature S³ will be attracted, causing the bar T² to release the disk A' and allow the clockwork to be set in motion by the descent of the upper carbon, should this not have already been brought in contact with the lower carbon by the descent of wheel F. The entire current will now pass through the carbons, and the shunt-electromagnets S being no longer excited the spring K will draw up the framing D and the clockwork D' will be stopped by the brake T² A', so that the carbons will now be separated, forming the arc. On the resistance of the arc increasing, owing to the burning away of the carbons, a small amount of current will pass through the shunt-electromagnets, not sufficient, however, to overcome the strong spring K, so that the frame D will remain in the raised position, but the attraction exercised on the armature S³ will be sufficient to overcome the weaker spring K², so that T² will be moved away from A', and the carbon will consequently be allowed to descend until the normal arc has been re-established and the shunt-current stopped or weakened, when the clockwork will be again stopped by S³ T² being drawn away from S' again by the spring K². The glass globe W of the lamp, together with its framework, is suspended by cords Y from two barrels U U, carried by the plate N, the barrels being loose on their axes but connected thereto by spiral springs U', having a tension tending to turn the barrels in the direction of the arrow, Fig. 2, so as to keep the globe in the raised position shown at Fig. 1.

For gaining access to the lamp mechanism the globe is pulled down, thereby drawing the cords Y off their barrels and thus rotating these so as to increase the tension of their springs. The barrels U and the regulating mechanism are covered by an ornamental cap W', secured to the plate N. For arc lamps to be employed in workshops and the like this cap may be made of plain black japanned metal and the globe be provided at top with a metal ring having handles and arranged to be hooked by hand onto studs on the cap.

Having described the nature of my invention and the best means I know for carrying the same into practical effect, I claim—

1. In controlling mechanism for electric arc lamps the combination of a rocking framework D carrying clockwork mechanism D' controlling the motion of a pitch wheel F over which passes a pitch chain E connected to the upper and lower carbon holders, a tangent escapement A with brake disk A' controlling the motion of the clockwork and a brake frame T T² S³ acted upon by a spring K², controlling the motion of the escapement, and electromagnets S S on a shunt of the lamp current and carried by the frame D and controlling the motion of the frame T T² S³ substantially as and for the purposes described.

2. In controlling mechanism for electric

are lamps the combination of a rocking frame-
work D carrying clockwork mechanism D'
controlling the motion of a pitch-wheel F over
which passes a pitch chain E connected to
5 the upper and lower carbon holders, a tan-
gent escapement A with brake disk A' con-
trolling the motion of the clockwork and a
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K², controlling the motion of the escapement
10 and electromagnets S S on a shunt of the
lamp current and carried by the frame D and
controlling the motion of the frame T T² S³
and fixed armatures S² acting upon electro-

magnets S so as to turn frame D on its pivot
against the action of spring K when the en- 15
tire current passes through the shunt circuit
substantially as and for the purposes de-
scribed.

In testimony whereof I have signed my
name to this specification, in the presence of 20
two subscribing witnesses, this 7th day of
March, A. D. 1893.

EDOUARD CANNEVEL.

Witnesses:

CHAS. D. ABEL,
JNO. P. M. MILLARD.