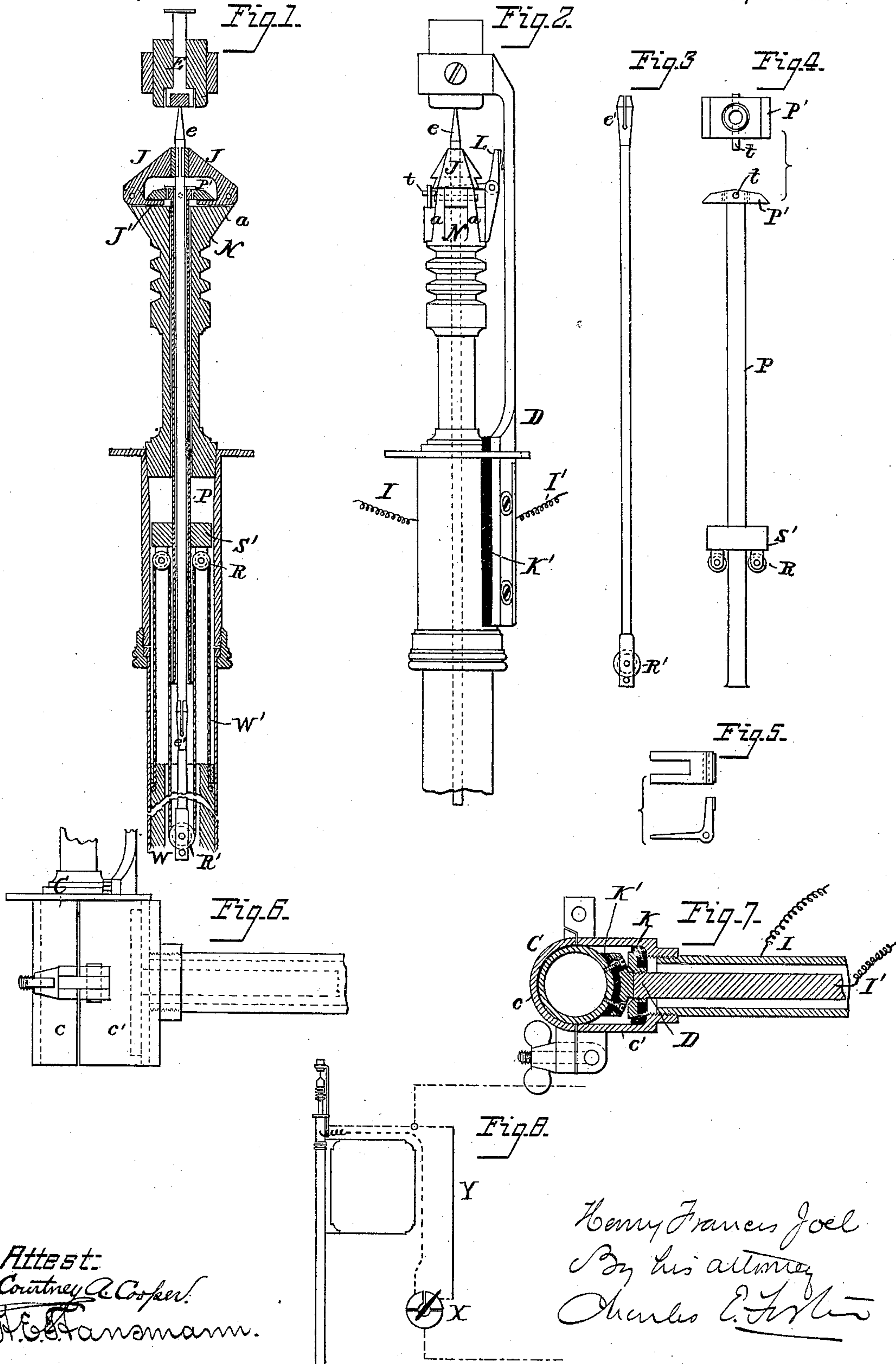


(No Model.)

H. F. JOEL.
ELECTRIC LIGHT LAMP.

No. 249,632.

Patented Nov. 15, 1881.



Attest:
Courtney A. Cooper.
H. F. JOEL.

Henry Francis Joel
By his attorney
Charles E. Felt

UNITED STATES PATENT OFFICE.

HENRY FRANCIS JOEL, OF LONDON, ENGLAND.

ELECTRIC-LIGHT LAMP.

SPECIFICATION forming part of Letters Patent No. 249,632, dated November 15, 1881.

Application filed June 9, 1881. (No model.) Patented in England December 16, 1879.

To all whom it may concern :

Be it known that I, HENRY FRANCIS JOEL, of 52 Queen Victoria street, in the city of London and Kingdom of England, engineer, have
5 invented Improvements in Electric-Light Lamps, (for which I have obtained a patent in Great Britain, No. 5,157, bearing date December 16, 1879,) of which the following is a specification.

10 .My improved electric-light apparatus consists, principally, of an arrangement for making good electrical contact on electrodes, while the movement of the electrode is rendered more certain, and the lateral and forward pressures
15 thereon have a definable and adjustable ratio the one to the other. I further arrange a short-circuiting contact in combination with the above; also, of an arrangement of contacts and supports for electric lights; also, of im-
20 provements in the details of such lamps.

I will now proceed more particularly to describe the above improvements.

Figure 1 is a front sectional view of my application of contact-jaws to an incandescent
25 lamp, as well as an improved construction of such a lamp. Fig. 2 is a side view of the same. Figs. 3, 4, and 5 are detached views of parts; Figs. 6 and 7, views of the lamp-support; Fig. 8, a diagram showing the arrangement of the
30 lamp in a circuit, with means for throwing in a resistance when the lamp is thrown out.

Two jaws, J J, or contact-clips, of a bell-crank form, are pivoted to ears *a a* on the guide or nipple N, the lower arms, J', of these jaws be-
35 ing horizontal and the upper arms inclined, so as to meet together. Passing through the nipple N there is a rod or tube, P, with a pivoted flange, P', secured by a cross-pin, *t*, at the top, and with a collar, S', and rollers R near the
40 bottom end. (Shown separately in Fig. 4.) A weight, W, is suspended from the rollers R by means of a cord, W', and, through the medium of the tube P, presses upon the bottom arms of the jaws and presses the top arms of the jaws
45 together. The cord also passes through a roller, R', fixed to the under side of the pencil-electrode holder *e'*. (Shown separately in Fig. 3.) The pencil-electrode *e* is inserted in the socket at its end, and is guided into the guide-nipple N,
50 passes through the jaws J, and impinges upon the terminal electrode E, so that the weight acts

in a double manner by pressing the pencil-electrode *e* upward, and also at the same time restraining it and making good contact by the pressure it exerts on the jaws J. By making
55 the length of the inclined arm of the cranked contact-jaws J greater or less than the horizontal arm J', the upward pressure of the electrode *e* can be regulated to any nicety, and, moreover, the supporting-flange P' being pivoted,
60 any inequality in the pencil-electrode *e* causes the flange to tilt up and one-half of the pressure of the jaws J to be supported on the fixed holder or nipple N, thus relieving the pencil-electrode *e*. When the electrode *e* has com-
65 pletely burned away to its end, the end of the socket-rod *e'*, which is shaped to be larger than the pencil-electrode, presses a small contact bell-crank arm, L, (shown in Fig. 2, and separately in Fig. 5,) and so short-circuits the lamp. 70
I make the contact-jaws above described of copper, with an insertion of graphite, which latter I find keeps the contact clean and free from oxidation. I also make the terminal electrode E, which may be of any convenient shape, of
75 copper with an insertion of graphite, and support it by an arm, D, insulated from the nipple by rubber K', and connected with the wire I'.

The light is produced by the heating to incandescence of the end of the carbon-pencil
80 electrode *e* between the jaws J and the top electrode, E. The electric current enters at the wire I, Fig. 2, passes through the nipple N to the jaws J and the electrode *e*, which, with a
85 suitable current, becomes intensely heated at its end in contact with E, where it becomes pointed by the action of the current. In addition to the light produced by the incandescence of the carbon, there is also the glow or flame
90 from the sides of the burning carbon to the copper electrode, similar to the flame of an arc-lamp. A peculiar feature in the light is, that the incandescent point of carbon becomes
95 slightly curled in shape, somewhat like a mushroom, at its extreme point in contact with E, and burns away at the edges, while the point is pressed and embedded in the center of the mushroom formation, thus keeping the contact perfect.

I support and mount the foregoing incan- 100
descent electric-light lamp in such a way that the act of fixing it in its support also makes

the contacts between the two electrodes and the conducting-wires. This I effect, as shown in side view and sectional plan at Figs. 6 and 7, by means of a hollow clamp, C, in which the lamp is placed. The clamp is connected to one of the wires I, and is in electrical contact with the nipple. The arm D, insulated from the nipple, as described, comes into electrical contact with the wire I', which is insulated from the clamp by rubber K. In fixing the lamp tight contacts are secured.

I also arrange a commutator or switch, X, with the lamp, (see Fig. 8,) together with a rod or stick of carbon, Y, as a resistance equal in resistance to the lamp when burning, and by turning a tap or key at the commutator I arrange that the lamp may be put in circuit and thrown out and be lighted up or put out at will, without disturbing any other lights in the same circuit, and also without interfering with the action of the machine, the act of turning the lamp out putting the carbon resistance in circuit.

I do not here claim the use of graphite to prevent oxidation of the holding-surfaces.

What I desire to claim and secure by Letters Patent is—

1. The combination, with the carrier of the movable electrode, of clamping-jaws bearing against said electrode, a bar bearing on said jaws, and connected by a tube, P, to supporting-pulleys R, a cord connected to the carrier passing over the pulleys and weighted, whereby the same weight holds the jaws upon the electrode and raises the latter, substantially as set forth.

2. The combination, with the movable elec-

trode, of jaws bearing against the same, and a weight and connecting devices, substantially as described, whereby the said weight presses the jaws against the electrode, and also elevates the latter.

3. The combination of pivoted jaws J, cord W', weight W, and tube P, with pivoted bar P', substantially as described.

4. The combination of the support of the fixed electrode and the holder of the movable electrode with the short-circuiting device arranged to make electrical connection with the movable electrode, and to form a contact with the said support and with the holder-socket, when the latter is near the fixed electrode, substantially as described.

5. The combination, in an electric lamp, of a carbon pencil, pencil-carrier, jaws bearing against the pencil, and a cord and weight connected to the pencil-carrier to elevate the latter, and mechanism, substantially as shown, connecting the weight to the jaws, whereby the latter are pressed against the pencil, substantially as set forth.

6. The combination of the clamp connected to one wire, I, and adapted to hold the lamp, and an insulated wire, I', arranged to make contact with the insulated electrode-holder of the lamp, substantially as set forth.

In witness whereof I have signed my name in the presence of two subscribing witnesses.

HENRY FRANCIS JOEL.

Witnesses:

JOHN DEAN,

J. WATT,

Both of 17 Gracechurch Street, London.