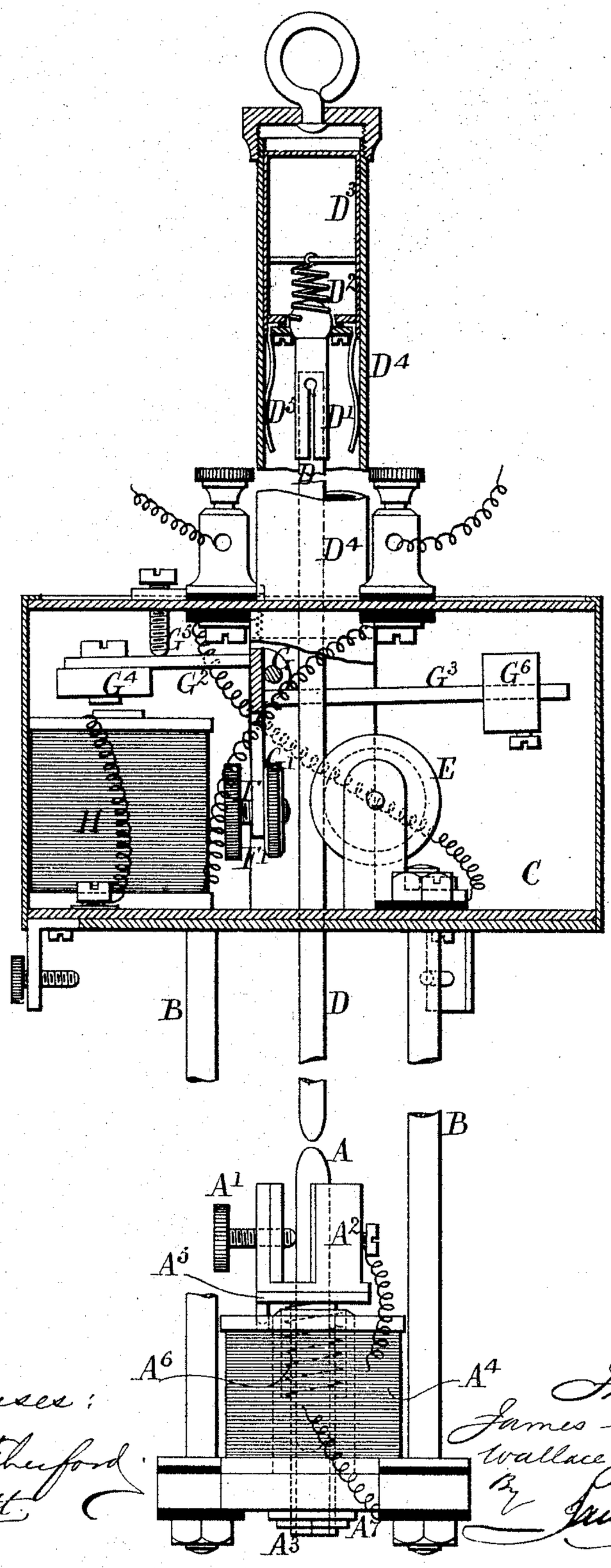
(No Model.)

J. SUGDEN & W. J. L. SANDY.

ELECTRIC ARC LAMP.

No. 490,992. Patented Jan. 31, 1893.



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UNITED STATES PATENT OFFICE.

JAMES SUGDEN AND WALLACE J. L. SANDY, OF LONDON, ENGLAND, ASSIGNORS TO CHARLES HENRY FREEDMAN, FRANK WEST SUTER, AND HARRINGTON WYMAN, OF SAME PLACE.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 490,992, dated January 31, 1893.

Application filed July 13, 1892. Serial No. 439,913. (No model.) Patented in France June 28, 1892, No. 222,653, and in England April 13, 1892, No. 7,095.

To all whom it may concern:

Be it known that we, JAMES SUGDEN, residing at 99 Wyndham Road, Camberwell, and WALLACE JAMES LAMBERT SANDY, residing at 41 Choumert Road, Peckham, London, England, citizens of England, have invented certain new and useful Improvements in Electric-Arc Lamps, (for which we have obtained patents in England, No. 7,095, dated April 13, 1892, and in France, No. 222,653, dated June 28, 1892,) of which the following is a specification.

Our invention relates to the mechanism for automatically feeding the carbons or other electrodes of electric arc lamps and regulating their distance as we shall describe referring to the accompanying drawing which is a vertical section partly in elevation of a lamp according to our invention.

The lower carbon A is clamped by a setting screw A′ in the socket head A^2 of a tube A^3 which passes through the tubular core of an electro magnet A^4 having its coil in the lamp circuit. To the underside of the socket A^2 is fixed an iron washer A^5 constituting an armature which is attracted when the electro magnet A^4 is excited and is drawn down in opposition to a spring A^6, but when A^4 is inert is pushed up by the spring as far as permitted by a nut A^7 acting as a stop. The electro magnet A^4 is itself carried by the rods B B which with a casing C to which they are secured constitute the framing of the lamp. The upper carbon D is held in a split spring socket D′ which is pivoted by a ball pressed by a spring D^2 within a hollow plunger or piston D^3 which fits but not tightly the interior of a tube D^4 which is closed at the top. Spring blades D^5 project down from the piston D^3 and rub against the interior of the tube D^4 so as to insure conducting electrical contact therewith. One side of the carbon D bears against the periphery of a grooved roller E; facing its other side is the end of a screw F which by means of a milled nut F′ can be adjusted nearer to or farther from the carbon. The screw F is held in one arm G′ of a bell crank lever pivoted at G; another arm G^2 carries an armature G^4 to an electro magnet H and has its stroke limited by an adjusting screw G^5. The third arm G^3 of the lever carries an adjustable counterweight G^6. The coil of the electro magnet H, as well as that of A^4 is in the lamp circuit which is so arranged with the parts suitably insulated, that the current from the one leading in wire passes through the coil of H to the casing C tube D^4, blades D^5 piston D^3 to the upper carbon D, then through the arc to the lower carbon A, through the coil of A^4 up one of the rods B to the other leading in wire.

The action of the lamp is as follows:—The points of the two carbons A and D, being in contact, A being then held up by the spring A^6 when the lamp is put in circuit, both the magnets A^4 and H are excited. The one A^4 attracts its armature A^5 lowering the lower carbon A, while the other H attracts its armature G^4 and thereby causes the point of the screw F to press against the upper carbon D, and to prevent it from descending, thus by the separation of the point of the carbon the arc is struck. Afterward when owing to consumption of the carbons the resistance of the arc increases, the weight G^6 overcomes the attraction of the armature G^4 and the point of F is withdrawn from the carbon D, which is thus permitted to descend, but it can only descend very slowly, because it takes time for air to leak past the piston D^3 to the space in the tube above it. As the upper carbon is thus permitted to approach the lower carbon, the resistance is lessened, the armature G^4 is again attracted, and the carbon D is again held stationary by the pressure of the screw F. The electro magnet H might have its coil in a shunt to the lamp circuit, the lever carrying the screw F being arranged so that the carbon should be re-

leased when the armature G^4 was attracted owing to greater current in the shunt resulting from greater resistance of the arc.

Having thus described the nature of our invention and the best means we know for carrying the same into practical effect we claim:—

The combination in an electric arc lamp, of a lower electro magnet having a spring supported armature to which the lower carbon is attached, with a closed air tube, a piston within the closed air tube to which the upper carbon is attached, a roller at one side of the upper carbon, and an electro magnet having an armature lever the arm of which is located at the opposite side of the upper carbon and acts in connection with the roller as a brake to hold the upper carbon stationary, substantially as described.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, the 28th and 30th days of June, A. D. 1892.

JAMES SUGDEN.
WALLACE J. L. SANDY.

Witnesses to the signature of James Sugden:

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WILLIAM SCRUTON,
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