

D. B. TURNER.

ARC LIGHT.

No. 393,405.

Patented Nov. 27, 1888.

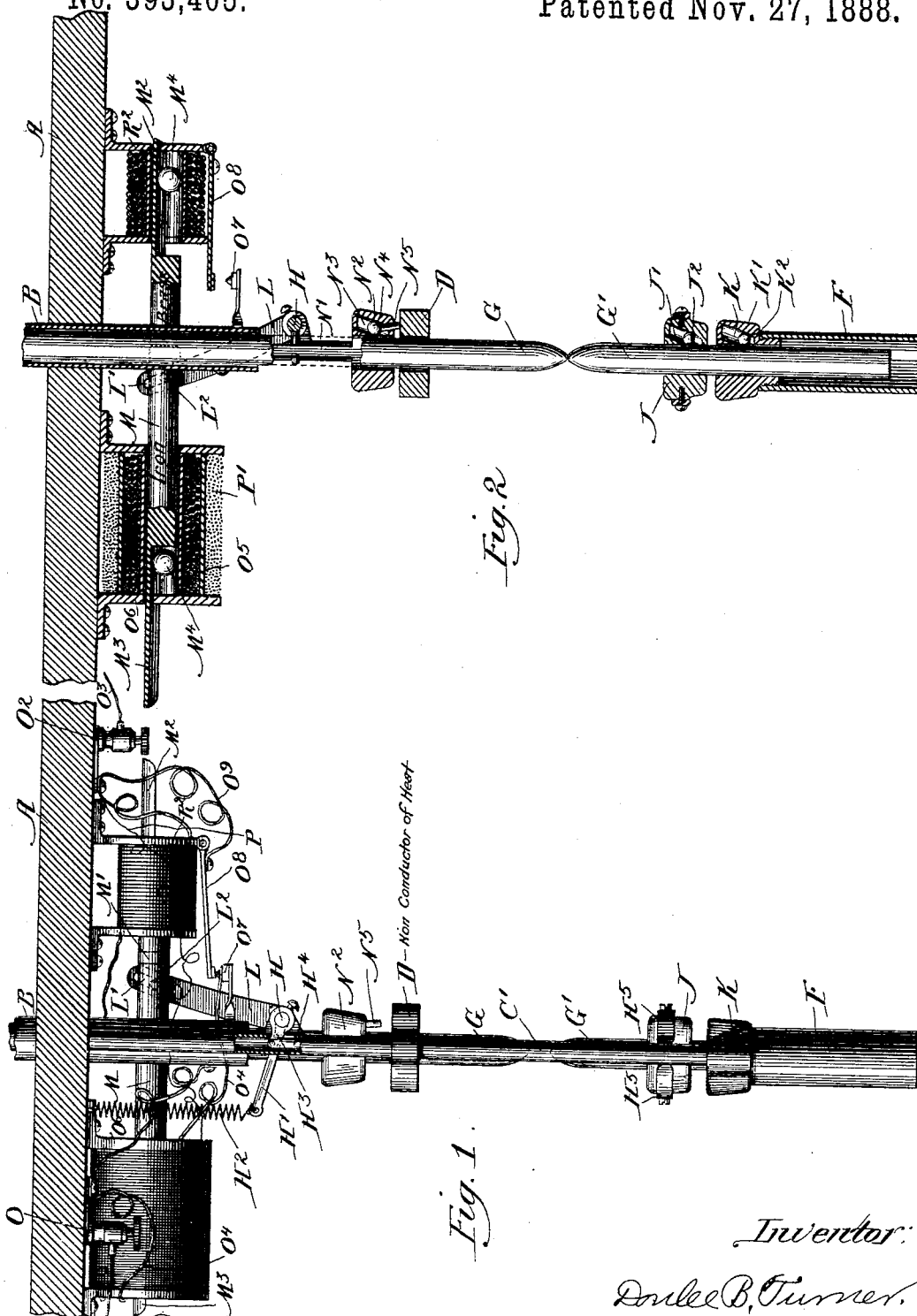


Fig. 1.

Fig. 2.

Witnesses:
Cora L. Chadwallader,
Celeste P. Chapman.

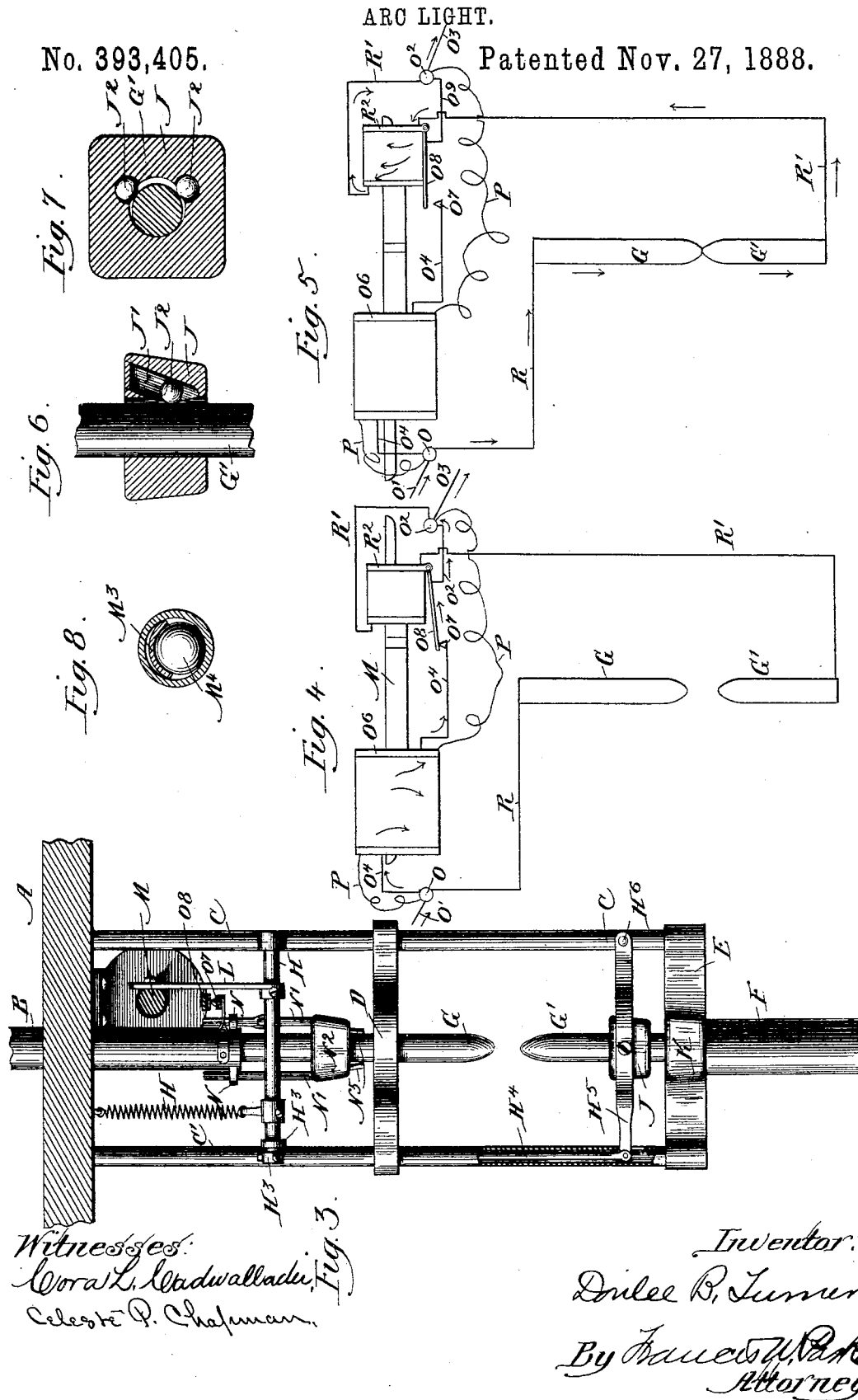
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UNITED STATES PATENT OFFICE.

DONLEE B. TURNER, OF CHICAGO, ILLINOIS.

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SPECIFICATION forming part of Letters Patent No. 393,405, dated November 27, 1888.

Application filed May 7, 1888. Serial No. 273,091. (No model.)

To all whom it may concern:

Be it known that I, DONLEE B. TURNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Arc Lights, of which the following is a specification.

My invention relates to arc lights, and has for its object to provide a convenient and cheap lamp in which both carbons are fed. This object I accomplish by means of the mechanism illustrated in the accompanying drawings, wherein—

Figure 1 is a side view of the upper portion of my lamp. Fig. 2 is a vertical section through the same. Fig. 3 is a side view of the entire lamp with certain portions broken away. Fig. 4 is a diagrammatic view of the lamp out of circuit. Fig. 5 is a diagrammatic view of the same in circuit. Figs. 6 and 7 are detail views of the clutch. Fig. 8 is a cross-section and detail of the reciprocating core.

Like parts are indicated by the same letters in all the figures.

A is the cover or top of the lamp, in which is secured the carbon-protector B, and from which depend the tubular arms C C. These arms are connected about midway by the non-heat-conducting plate D and below by the base of the lamp, which carries the carbon-protector B above.

G is the upper carbon; G', the lower.

H is a rock-shaft journaled on lugs which project from the tubes C C', and having projecting from it the arm H', which is upwardly drawn at its outer extremity by the spiral spring H², also the arm H³, which is pivoted at its extremity to the rod H⁴, adapted to reciprocate within the tube C'. The lower end of the rod H⁴ is pivoted to the lever H⁵, which in turn is pivoted to the opposite tubular piece, C, at the point H⁶. This lever H⁵ is bifurcated and has loosely between its portions the clutch-block J, through an aperture in the center of which passes the carbon G', and which is also provided with one or more inclined holes, J', which terminate in said aperture. In each of said holes is a ball, J², which bears against the carbon, and thus keeps the same from slipping downwardly in the clutch. Within the base or cross-piece E is formed

the clutch-block K, similarly constructed, having a hole, K', with a ball, K², therein. To this block K, which forms part of the base E, is attached the carbon-protector F. To the rock-shaft H is rigidly secured the arm L, which is provided above with the slot L' to engage the pin L² on the reciprocating core M. This core is composed at one end of iron and at the other of non-magnetizing substance, as brass, the two being brought together at the point M', and each of these ends terminates in a part-cylindrical portion, M² M³, which move, respectively, within the coils of the magnets, each of which rests upon the marble roller or ball M' M' to permit the core to easily reciprocate, said marble moving within the magnets.

To the lower end of the carbon-protector B are attached the guideways N N', in which move the arms N' N', to which is attached the clutch-block N². This clutch-block encircles the carbon G and has the inclined hole N³, marble N⁴, and loose pin N⁵, the latter adapted to engage the cross-piece D when the clutch-block N² is lowered.

O is a binding-post, to which the line-wire O' is attached. O² is a second binding-post, to which the other terminus of the line-wire is attached.

O¹ is a heavy conductor passing from connection with the binding-post O to the internal winding O⁵ on the magnet O⁶. This conductor O¹ passes thence to the contact-point O', which receives the pivoted lever O³, to which the conductor O⁹ is attached. This latter connects directly with the binding-post O². The light-conductor P in like manner passes from the binding-post O to the fine winding P' on the magnet O⁶ and thence directly to the binding-post O². From the binding-post O connection is made directly, as indicated in the diagrammatic view, by the conductor R with the upper carbon, while from the lower carbon proceeds the conductor R', which passes into the electro magnet R² and thence to the binding-post.

The use and operation of my invention are as follows: The position of the parts shown in Fig. 4—the diagrammatic view—illustrates the lamp when out of use. In this position it will be when from any defect in the operation of the carbons the lamp fails to work, thus cut-

ting itself out automatically. The current then enters through the line-wire O', binding-post O, conductors O⁴ and P, both windings of the magnet O⁶, conductor P, directly to the binding-post O², onto the line-wire O³, and by the heavy conductor O⁴ to the contact-point O⁷, lever O⁸, conductor O⁹, into the binding-post of the line-wire. If the lamp is in condition for successful operation, this current through the magnet O⁶ will move the reciprocating core M toward the left, thus operating the rock-shaft H, and it will continue this motion until the rock-shaft has rotated so far as to lower the carbons until the arc is formed. When this takes place, a portion of the current passes from the binding-post O along the conductor R, through the carbons, conductor R', through the magnet R², conductor R', binding-post O³, and line wire O³, thus energizing the magnet R². When this occurs, the lever O⁸ is drawn up against the magnet R² and the connection across the conductor O⁴ is broken and a steady current thrown through the carbons. As this current varies in intensity, owing to the varying distance between the carbons, it keeps the reciprocating core M in motion, so as constantly to keep the carbons adjusted the proper distance.

It will be observed that as the rock shaft moves it raises or lowers both carbons simultaneously so long as they are held firmly by the clutches; but the lower one is moved only one-half the distance of the upper, as it is suspended about midway. The lever H⁵ and the arms which operate the upper carbon, and also operate the bar H⁴ from the lever H⁵, are of the same length. When the current through the magnet O⁶ becomes too strong on account of the deflecting of the current through the carbons, the rock-shaft is moved farther in its bearings until the upper clutch, N², is lowered, so that its releasing-pins engage the plate D¹ when the carbon is made free and drops downwardly upon the other point. If it drops the entire distance, so as to engage the point of the lower carbon, a strong current passes through both, and there is an immediate re-

action upon the rock-shaft, thus causing both carbons to ascend slightly, the upper more rapidly than the lower, and thus the arc is formed.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is as follows:

1. In an arc light, the combination of a rock-shaft with one arm, a retracting-spring attached thereto, which tends to turn the shaft in one direction, a second arm connected with the core of the magnet, the motion of which magnet operates the shaft, and two other arms and means whereby the carbons are supported on the latter arms, so that as the current through the magnet varies the position of the rock-shaft changes, and thus the relation of the carbons to each other is varied to effect the arc.

2. In an arc light, the combination of the carbons with clutches, the clutch for the lower carbon consisting of two blocks containing inclined apertures and locking-balls therein, and the clutch for the upper carbon consisting of a single aperture and locking-balls therein and a stop block or cross-piece about the carbon and beneath the upper clutch, and pins projecting from the upper clutch-block and adapted to engage and thus raise the locking-balls when the clutch is lowered upon the cross piece, and a rock-shaft from which both carbons are suspended, substantially as shown and described.

3. In an arc light, the combination of the carbons with the shunt-magnet, and a circuit-closing magnet in the arc circuit, and a movable core-piece which is non-magnetic toward the circuit-closing magnet, and is supported in both of said magnets, and is adapted to operate the magnets, and means connecting the movable core with the carbons, substantially as and for the purpose described.

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Witnesses:

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