

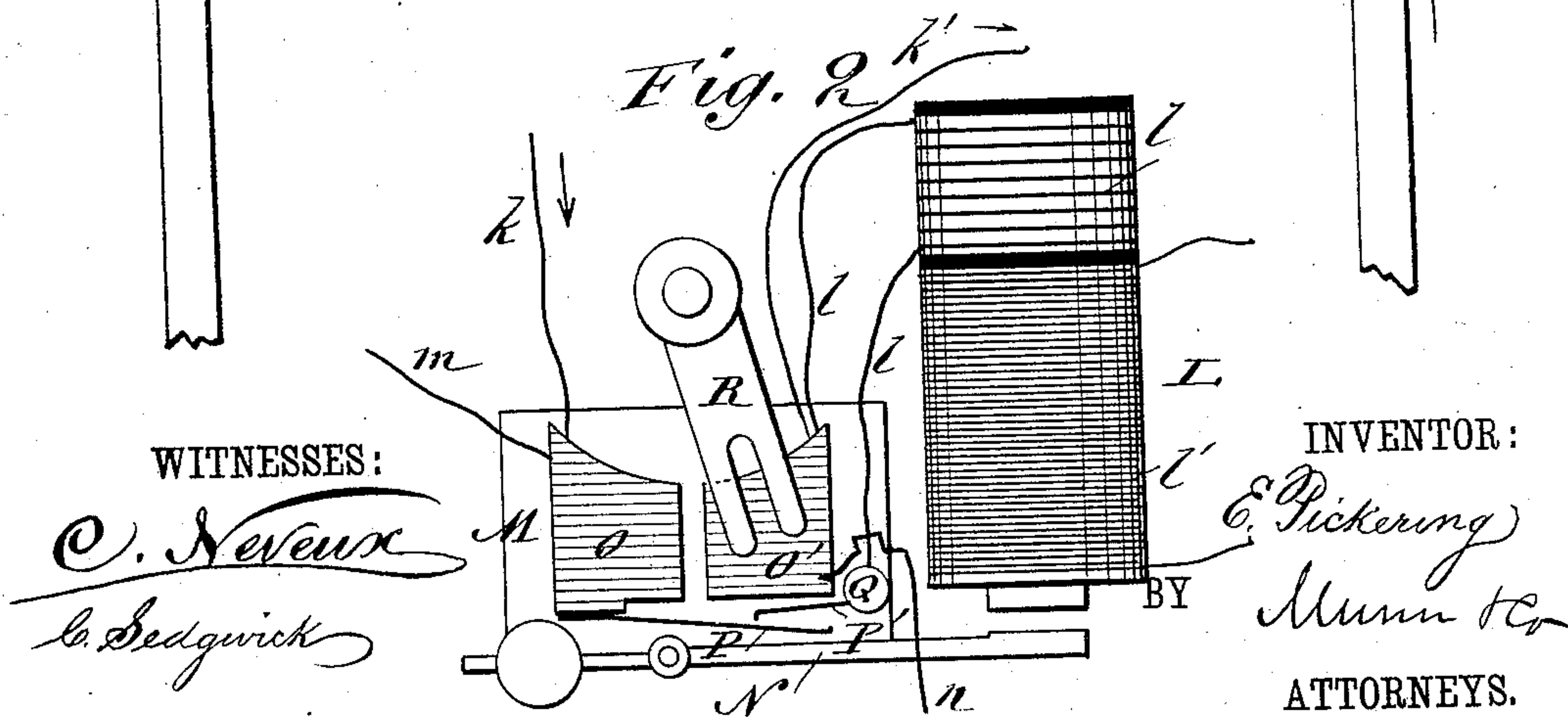
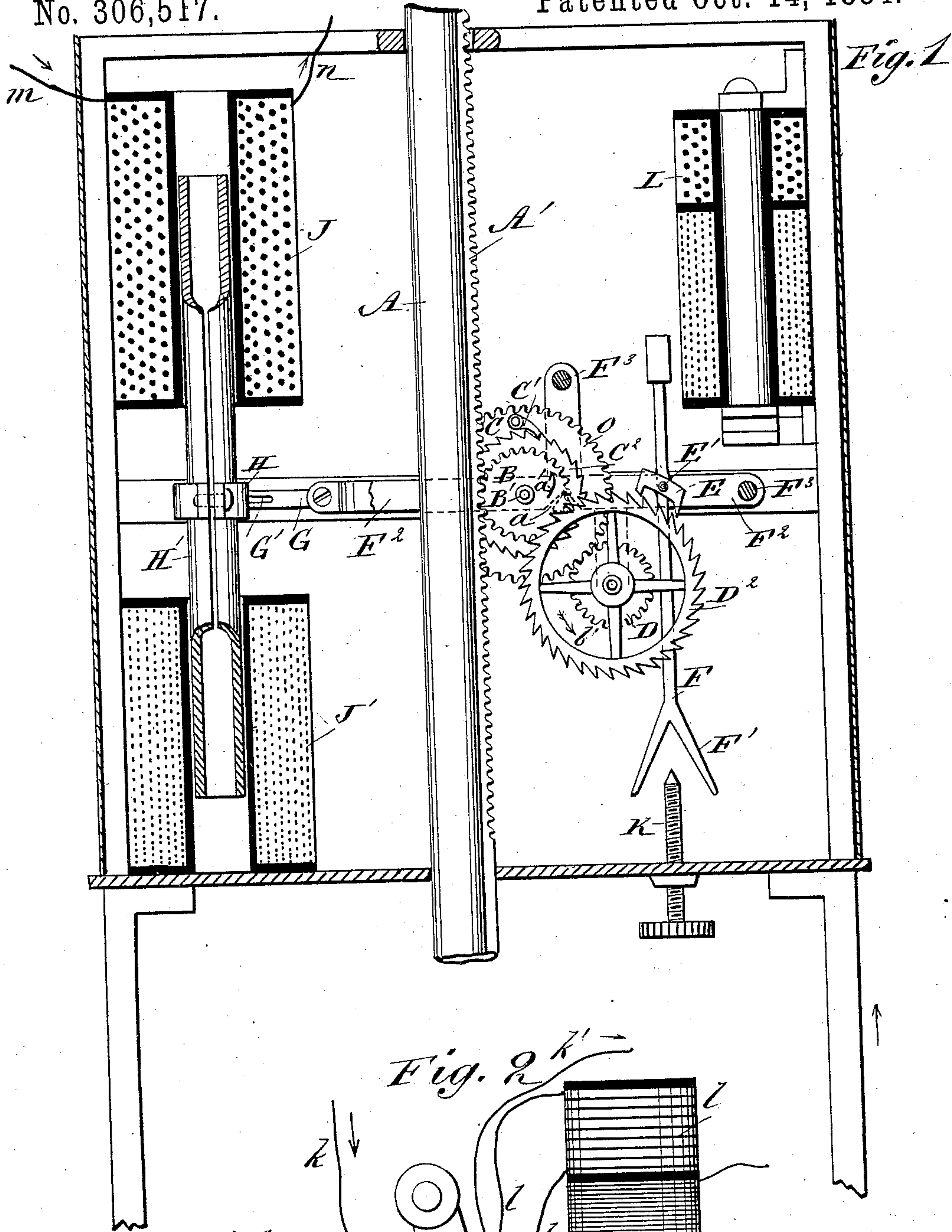
(No Model.)

2 Sheets—Sheet 1.

E. PICKERING.
ELECTRIC ARC LAMP.

No. 306,517.

Patented Oct. 14, 1884.



WITNESSES:

C. Neveu
C. Sedgwick

INVENTOR:

E. Pickering
BY *Munn & Co*
ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 5 Patented Oct. 14, 1884.

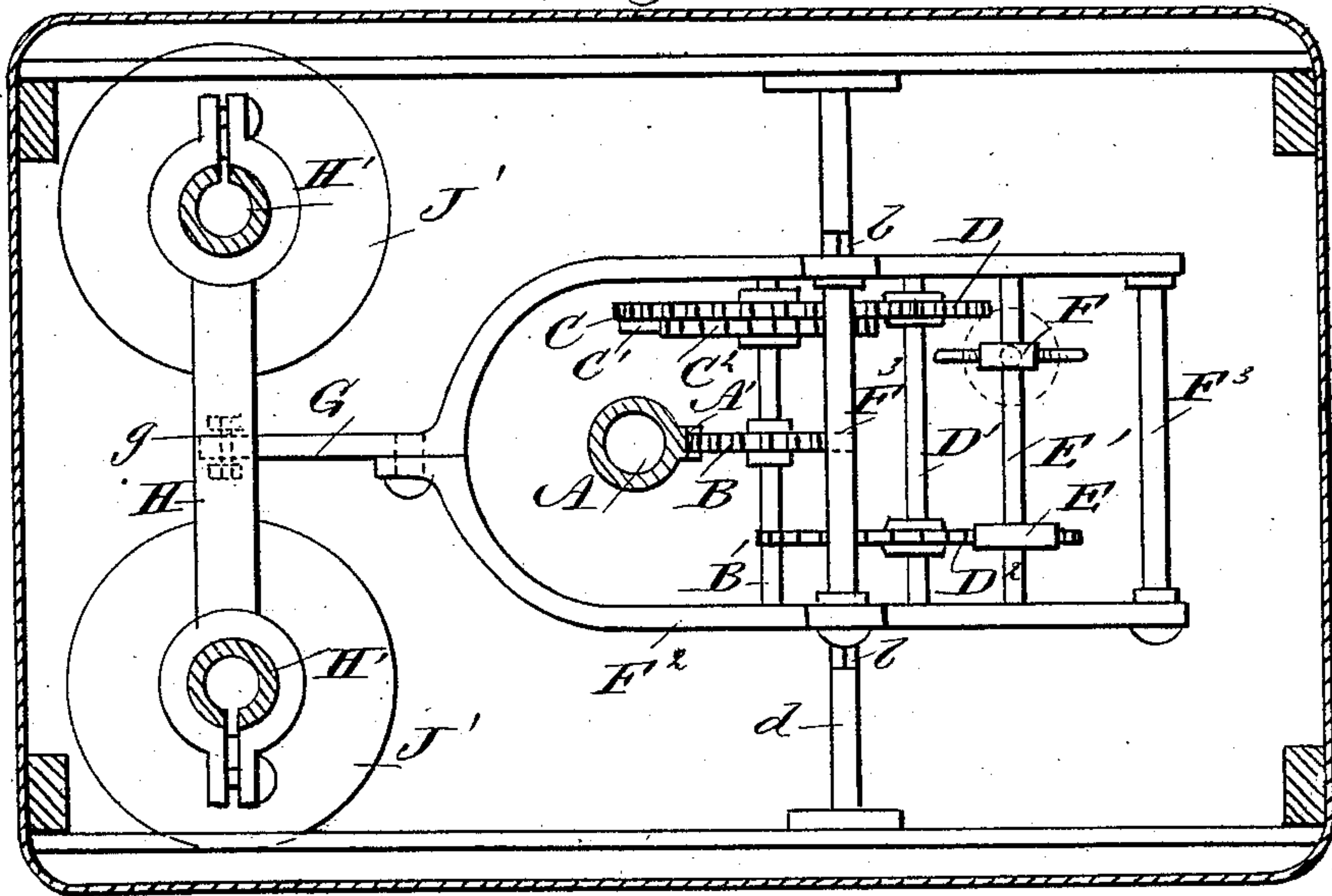


Fig. 5

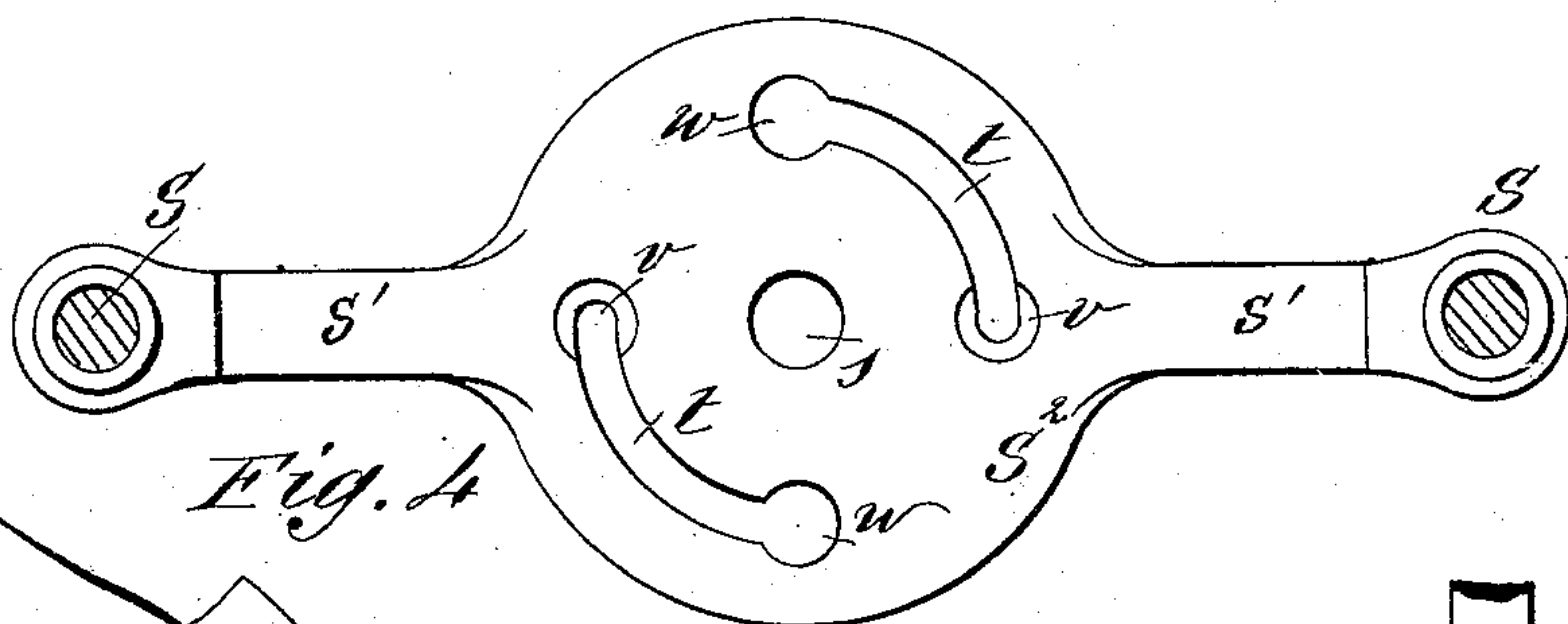
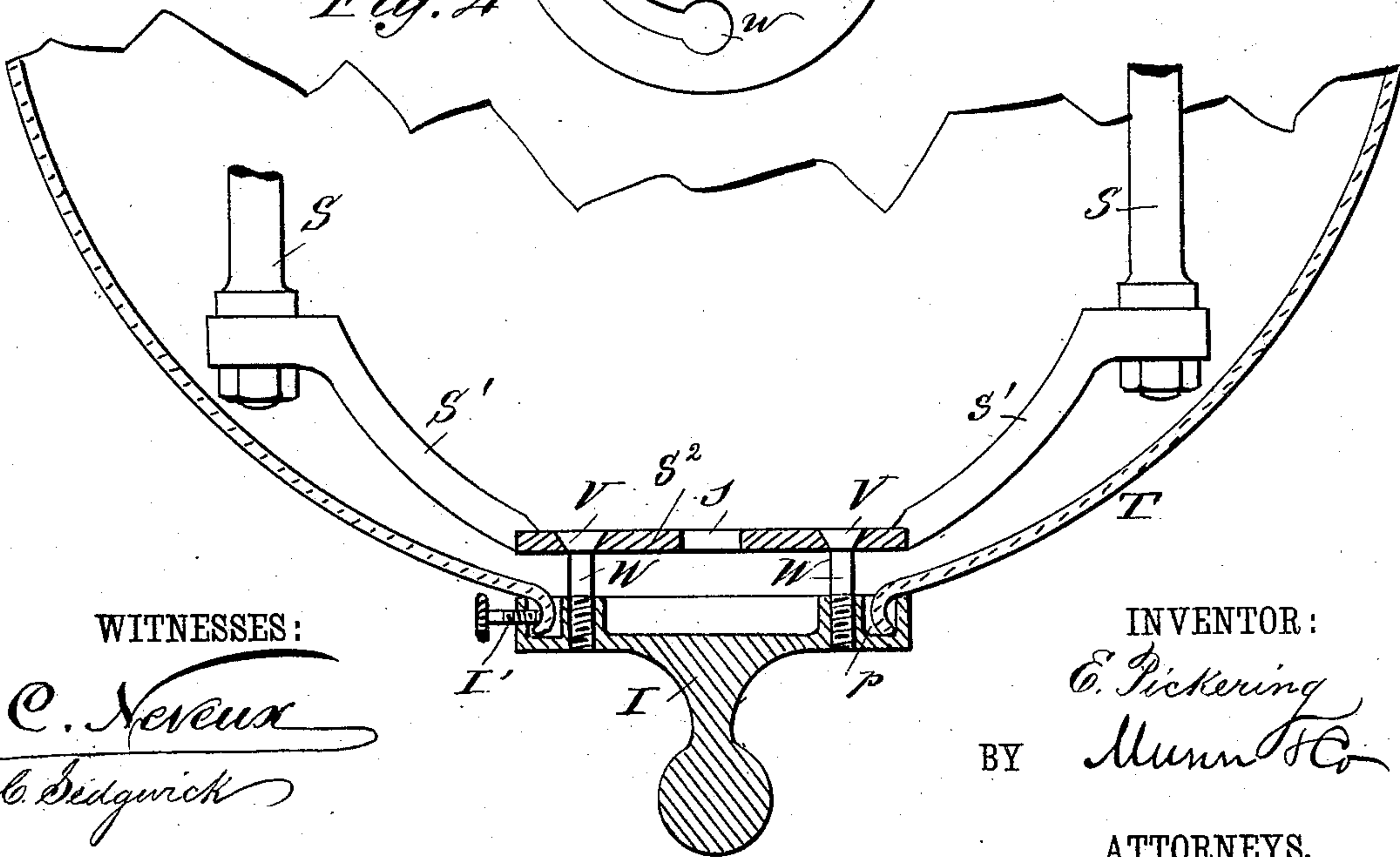


Fig. 4



WITNESSES:

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UNITED STATES PATENT OFFICE.

EDWARD PICKERING, OF BROOKLYN, NEW YORK, ASSIGNOR TO MAURICE J. HART, OF NEW ORLEANS, LOUISIANA.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 306,517, dated October 14, 1884.

Application filed February 15, 1884. (No model.)

To all whom it may concern:

Be it known that I, EDWARD PICKERING, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Electric Lamp, of which the following is a full, clear, and exact description.

The object of my invention is to provide certain new and useful improvements in the devices for regulating the carbon sticks in electric lamps; also, to provide certain new and useful improvements for automatically cutting out any lamp when desired, and also to provide a new and useful improvement for holding the globe on the lamp-frame.

The invention consists in the peculiar construction and arrangement of parts, as hereinafter fully described, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal sectional elevation of the box containing the regulating mechanism of the lamp, part of the said regulating mechanism being shown in elevation and part in section. Fig. 2 is a side view of the switch mechanism for automatically cutting out the lamp. Fig. 3 is a sectional plan view of the lamp-regulating mechanism. Fig. 4 is a longitudinal sectional elevation of the globe-holder. Fig. 5 is a sectional plan view of the same.

The upper carbon is secured to the lower end of a vertically-movable rod, A, suitably guided in the lamp-frame, which rod is provided with a rack, A'. The said rack engages with a cog-wheel, B, mounted on a shaft, B', on which is loosely mounted a cog-wheel, C, to which a pawl, C', is pivoted, which rests on the toothed edge of a ratchet-wheel, C², mounted rigidly on the shaft B'. The cog-wheel C engages with a cog-wheel, D, mounted on the shaft D', carrying a toothed wheel, D², the teeth of which engage with a pallet, E, secured on a shaft, E', on which a pendulum-bar, F, is mounted, the said pendulum-bar having its lower end, F', forked. The shafts B' D' E' are journaled in the side pieces of a U-shaped or other frame, F², the sides of which are united by suitable cross-pieces, F³. Each side bar of the frame F² is provided at or near the middle

with a V-shaped notch, a, in the bottom edge, into which notches the knife-edges b, formed on a transverse bar, d, of the frame of the lamp, pass. From one end of the frame F² an arm, G, projects, which is provided with a longitudinal slot, G', through which a transverse pin, g, passes, which unites two downwardly-projecting lugs of a cross-bar, H, on each end of which a magnet-core, H', is clamped, the upper ends of the cores H' passing into the central longitudinal apertures of magnets J, and the lower ends of the said magnet-cores H' passing into the longitudinal central apertures of magnets J', which are wound with finer wire than the magnets J, and are in shunt-circuits of the magnets J. A screw, K, held in the bottom of the frame projects upward between the shanks of the forked end F' of the pendulum-bar F. A magnet, L, is held on the side of the frame, and is wound with coarse wire l and with fine wire l'. The part wound with the wire l is in the main circuit when the lamp is cut out, and the part wound with the fine wire l' is in a derived circuit from the spools J.

On a plate, M, of insulating material the armature N of the magnet L is pivoted, and on the said plate M two metal contact-plates, O and O', are held, which are separated from each other. A contact-spring, P, secured to the bottom edge of the metal plate O, projects under the bottom edge of the metal plate O', and a contact-spring, P', secured to a button, Q, projects under the bottom edge of the plate O' and over the free edge of the contact-spring P. A forked switch-lever, R, is pivoted above the plates O and O' in such a manner that the two prongs of the said lever can rest, respectively, on the said plates O and O'. The metal plate O is connected with the line-wire k, and the plate O' is connected with one end of the wire forming the coils of the magnets J by a wire, m. The other end of the wire, forming the coils of the magnets J, is connected by a wire, n, with the plate O', to which plate O' the other line-wire, k', is connected. The opposite ends of the wire l of the magnet L are connected with the plate O' and with the button Q, respectively.

To the lower ends of the side bars or rods, S, of the lamp-frame a cross-piece, S', is fastened, which is provided with a central plate,

5 S^2 , having a central aperture, s , through which
 the lower carbon passes, and with two or three
 quadrant-slots, t , the said slots terminating at
 the diametrically-opposite ends in circular ap-
 10 ertures w , and having countersunk circular re-
 cesses v at the opposite ends. The curved bot-
 tom rim of the globe T is held in an annular
 groove, p , of a plate, I , by screws I' . The
 said plate I is provided with two upwardly-
 15 projecting pins, W , arranged diametrically
 opposite each other, each pin being provided
 at its upper end with a beveled head, V . The
 globe is held on the plate I , and if it is to be
 fastened to the frame of the lamp the plate I
 20 is held in such a manner that the heads V of
 the screws W can be passed through the aper-
 tures w at the ends of the slots t . After the
 said pins W have been passed through the
 apertures w , the plate I is given a quarter-
 25 turn, whereby the pins W will pass to those
 ends of the slots t provided with the counter-
 sunk recesses v . If, then, the plate I is re-
 leased, it will move downward until the heads
 V of the pins W rest in the countersunk re-
 30 cesses v at the ends of the slots t , thereby hold-
 ing the globe on the lamp-frame. The mag-
 net-cores H' are made hollow, and each pro-
 vided with a longitudinal slot, and are filled
 with chips of iron wire, whereby they are
 made more sensitive.

The operation of the lamp-regulating mech-
 anism is as follows: If the tension of the cur-
 rent in the lamp is too great, the shunt-mag-
 nets J will be excited, and will draw the mag-
 35 net-cores H' downward, thereby moving the
 corresponding end of the frame F^2 downward
 and the opposite end upward. The weight of
 the upper-carbon holder A revolves the wheel
 B in the direction of the arrow a' , and, by means
 40 of the pawl C' , the wheel C is revolved in a like
 manner, and revolves the wheel D in the direc-
 tion of the arrow b' . As the frame carrying the
 pendulum-bar F is raised, the forked end F'
 45 of the pendulum-bar will be raised above the
 screw K , thus permitting the said pendulum-
 bar to swing. The said pendulum-bar, in swing-
 ing, permits the ratchet-wheel D to revolve the
 distance of one or more teeth, thus allowing
 50 the carbon-holder A to descend, the carbon
 points are brought together, the tension is de-
 creased, and the magnets J become excited
 and swing upward the frame F^2 , whereby the
 end carrying the pendulum-bar is lowered,
 55 whereby the point of the screw K will pass in
 between the shanks of the forked end of the
 said pendulum-lever, thus preventing the pend-
 ulum-lever from rocking. If the pendulum-
 lever cannot rock, it prevents the wheel D^2
 60 from revolving, and thereby locks the other
 wheels in place, and thus holds the carbons in
 place. If the points of the carbons are again
 consumed, the strength of the current in the
 derived circuit increases, and the above opera-
 tion is repeated. The screw K can be adjusted
 65 to act sooner or later on the fork F' of the
 pendulum-rod F . If the resistance in the
 lamp is very great, for some reason or other,

the magnet L becomes excited and its arma-
 ture N is attracted, and the spring P is pressed
 against the spring P' , thereby cutting out the
 70 lamp, as the circuit will then be from the line-
 wire k through the plate O , the springs P and
 P' , the contact-button Q' , the wire l , the plate
 O , and the line-wire k' . If the resistance is
 removed, the lamp will be cut in circuit again,
 75 as then the armature N is released, the con-
 tact of the springs P and P' is broken, and the
 circuit will be as follows: from the line-wire
 k to the plate O , the wire m , the coil J , the
 wire n , the plate O' , and the line-wire k' . If
 80 it is desired to cut out any lamp and to keep
 it cut out, the switch-lever R is turned in
 such a manner that the prongs of its fork rest
 on the plates O and O' . The line-wire will
 then be short-circuited through the plates O
 85 and O' and the forked switch-lever R .

I am aware that a carbon-holder has been
 operated by a train of gearing in a pivoted
 frame, and therefore do not claim such in-
 90 vention.

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

1. In an electric lamp, the combination, with
 a carbon-holder provided with a rack, of a
 95 cog-wheel engaging with the rack, which cog-
 wheel is mounted on a swinging frame to which
 the magnet-cores for regulating the lamp are
 fastened, a ratchet-wheel mounted in the
 swinging frame, a pendulum pivoted in the
 100 swinging frame, and provided with a pallet
 engaging with the ratchet-wheel, which pend-
 ulum has its lower end forked, and of a screw
 projecting upward between the shanks of the
 forked end of the pendulum, which screw
 105 serves to regulate the oscillations of the pend-
 ulum, substantially as herein shown and de-
 scribed.

2. In an electric lamp, the combination, with
 a plate for receiving and holding the lower end
 110 of the globe, of two studs projecting up from
 the said plate and provided with heads at
 their upper ends, and of a plate held in the
 lamp-frame and provided with two quadrant-
 slots of such size that the heads on the studs
 115 cannot pass through them, the said slots ter-
 minating at their diametrically-opposite ends
 with enlargements of sufficient size to admit
 the heads on the studs of the plate on which
 the globe is held to pass, substantially as here-
 120 in shown and described.

3. In an electric lamp, the combination, with
 the plate I , adapted to receive and hold the
 bottom of the lamp-globe, of the headed studs
 W , projecting upward from the plate I , the
 125 plate S^2 , held on the bottom of the lamp-frame,
 and provided with two quadrant-slots, t , ter-
 minating at their diametrically-opposite ends
 in apertures w and at their other ends in
 countersunk recesses v , substantially as here-
 130 in shown and described.

Witnesses: EDWARD PICKERING.
 OSCAR F. GUNZ,
 C. SEDGWICK.