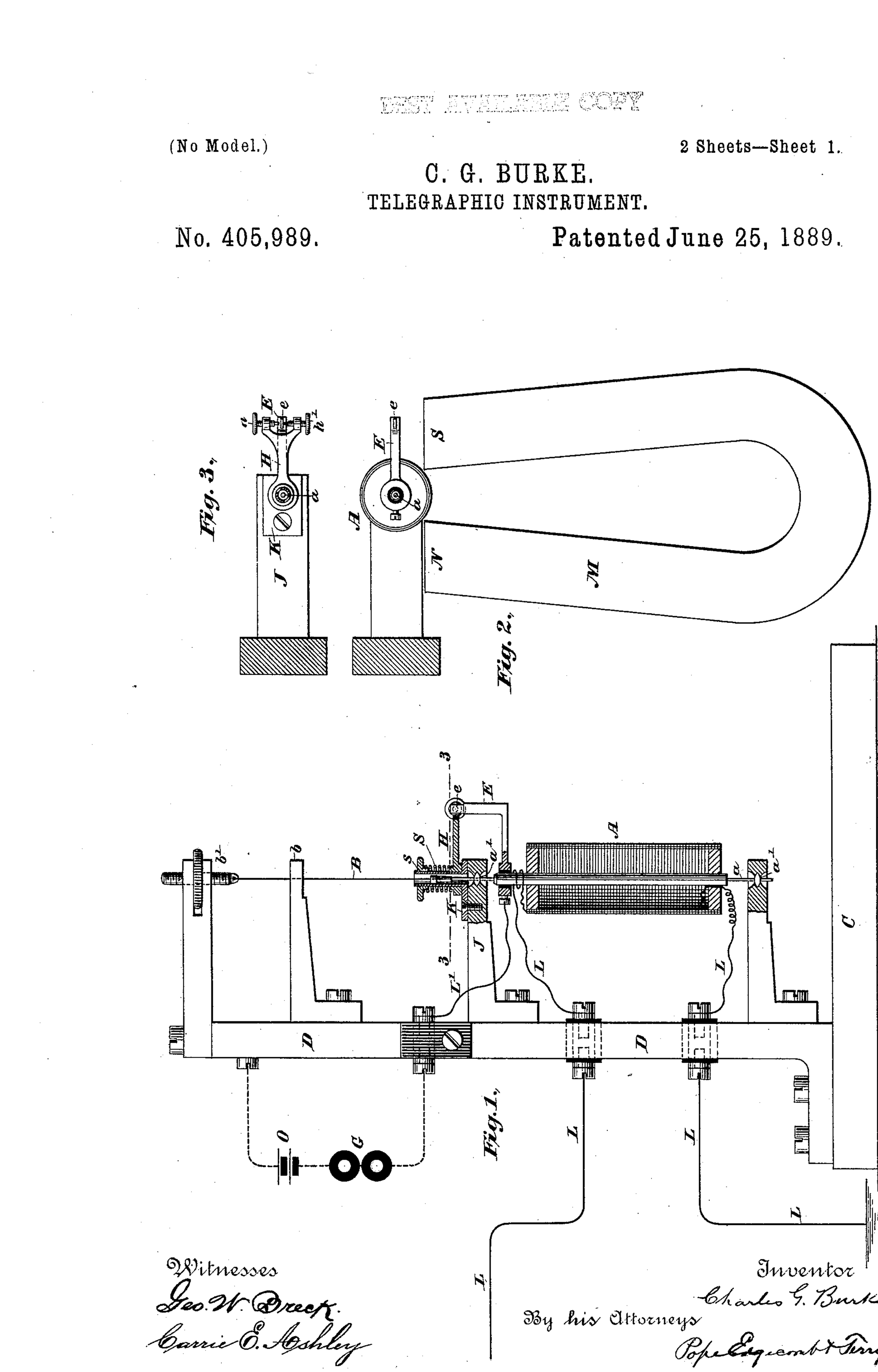
(No Model.) 2 Sheets—Sheet 1.

C. G. BURKE.

TELEGRAPHIC INSTRUMENT.

No. 405,989. Patented June 25, 1889.



Witnesses
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(No Model.) 2 Sheets—Sheet 2.

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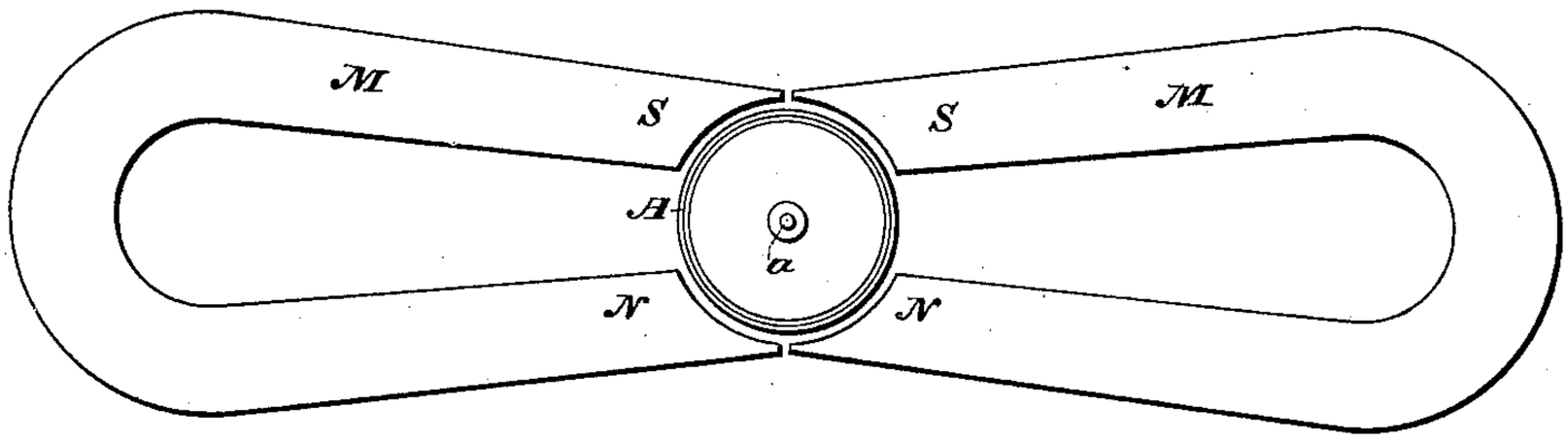
Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES G. BURKE, OF RICHMOND HILL, ASSIGNOR TO FREDERICK WOLFFE, TRUSTEE, OF NEW YORK, N. Y.

TELEGRAPHIC INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 405,989, dated June 25, 1889.

Application filed March 28, 1889. Serial No. 305,052. (No model.)

To all whom it may concern:

Be it known that I, CHARLES G. BURKE, a citizen of the United States, residing at Richmond Hill, in the county of Queens and State of New York, have invented certain new and useful Improvements in Telegraphic Instruments, of which the following is a specification.

The object of the invention is to provide a sensitive receiving telegraphic instrument suitable for cables and other lines where feeble currents are used.

The invention consists, generally, in a cylindrical coil of wire, which forms part of the main circuit, suspended perpendicularly within a field of force formed by one or more magnets, motion of the coil being caused by the currents passing over the main line, of which it forms a part. An important feature of this construction is that the suspended coil throughout the entire range of its motion will preserve the same relation to the faces of the poles of the field-magnets. Another important feature of the invention consists in the device for making and breaking a local circuit by means of the motion of the coil.

The invention will be readily understood by inspection of the accompanying drawings, in which—

Figure 1 is a side view, partly in section, of the coil and its attachments suspended upon a suitable frame, and showing the main and local circuits in diagram. Figs. 2 and 3 are top views of parts of the instrument, and Fig. 4 is also a top view of the coil with two magnets having their poles shaped to the coil.

Referring to the figures, the coil A is delicately suspended upon the axis *a*, having its bearings within the jeweled holes *a'*. The coil is suspended by the fine thread B, passing through the guide *b*, and attached to the adjusting-screw *b'*. The coil and its attachments are supported upon the base C, having the metallic standard D. The main line L includes the coil A, being connected thereto by its outer and inner terminals. The coil A being suspended within the field of force of the magnet M, on the passage of an electric current over the main line a disturbance is set up in the magnetic field which causes a tendency to move in the coil, one section of the coil being attracted and another section repelled. This mutual and simultaneous attraction and repulsion is exercised at a greater or less degree of angularity, and consequently with a greater or less intensity, and the coil is so pivoted that any movement communicated must be around its center, the direction of the motion depending upon the direction of the current and its relation to the magnetic field.

Upon the axis *a* of the coil is rigidly fixed an arm E, carrying the contact-point *e* at its extremity. One terminal of the local circuit L' is connected with the arm E. The other terminal of the local circuit, which includes the sounder D and battery O, is connected with the frame D, and through this with the forked arm H. This arm carries at its extremity the set-screws *h* and *h'*, one of them being insulated and the other in connection with the local battery.

Attached to the arm J of the standard D is the sleeve K, through which the cord B passes which supports the coil A. The arm H passes over this sleeve and is free to move thereon. The spring S and adjusting-nuts *s* maintain a suitable friction between the arm H and the sleeve K. The contact-point *e* plays between the two adjusting-stops *h* and *h'*, which are affixed at the free extremities or prongs of the forked arm H. Preferably the play of the contact-point *e* between these stops is made as close as practicable, and the extent of the play may be regulated by screwing one or both of these stops closer to or farther from one another. As the coil A is turned upon its axis by means of the currents passing over the main line, the rotation of the axis *a* will communicate motion to the arm H, which is rigid on it, and the contact-point *e* will be made to impinge on the stop *h* or *h'*, as the direction may be. If the electrical impulse through the coil be prolonged and the potential increases beyond the power of resistance exercised by the friction of forked arm A on the sleeve K, then the pressure of contact *e* against the stop to which it has been carried will overcome the friction, and the forked arm and its stops will be moved in the direction to which contact *e* tends, and will continue to move so long as the pressure of contact *e*

against the stop is in excess of the resistance of the friction; and as both contact *e* and its stop are describing the same circle the contact between the point *e* and its stop will not be interrupted or broken during the whole movement. When the potential on the line falls below the power of the frictional resistance of the forked arm N on its sleeve K, further motion will be arrested, and if the coil be then moved ever so little in a contrary direction contact *e* will immediately be separated from the stop against which it was resting. The forked arm and its stops having no tendency of their own to move in either direction, and being moved in the same circle with the arm by which they are moved, contact *e* and its stops *h* and *h'* will necessarily preserve the same relation to each other throughout the entire range of motion, and the local circuit will therefore be made or broken at any point within this range of motion so soon as the variations in line-potential will be sufficient to cause motion in the coil in a direction to effect a make or break. The local-circuit device herein shown is applicable, as will readily be seen, to any form of suspended coil.

In Fig. 4 is shown the arrangement of two magnets to produce the field of force, the pole-pieces being curved to correspond with the cylindrical coil A. By this means the field is intensified by the greater proximity of the poles of the magnet to the surface of the coil, and is an advantage especially pertaining to this shape.

I claim as my invention—

1. In a telegraphic instrument, a cylindrical coil of insulated wire forming part of the main circuit and suspended within a field of force formed by one or more magnets, both poles of the same magnet being presented to the same side of the coil.

2. In a telegraphic instrument, a cylindrical coil of insulated wire forming part of the main circuit, suspended upon an axis coincident with the axis of the cylinder within a field of force created by one or more magnets, both poles of each magnet being presented to the same side of the coil.

3. In a telegraphic instrument, a coil of insulated wire forming part of the main circuit, suspended within a field of force formed by one or more magnets, and a local-circuit-closing device consisting of an arm attached to the axis of the coil moving with said coil between stops carried by a second arm turning upon an axis coincident with the axis of the coil.

4. A telegraphic instrument consisting of the combination of a coil of wire forming part of the main circuit, suspended within a field of force formed by one or more magnets, an arm attached to said coil, a second arm turning upon a center coincident with the axis of motion of said coil, carrying stops between which said first arm plays, and a frictional support for said second arm, whereby it may follow the movements of said first arm, both of said arms forming part of the local circuit.

5. In a telegraphic receiving-instrument, a circuit-closing device consisting of two independent movable parts insulated from each other, both forming parts of a common local circuit, one having an independent motion upon its axis and the other a free motion around the axis of the other, both being equal radii of a given circle, the part turning on its axis having a suitable contact-point playing freely between an insulated stop and a contact-point carried by and forming a portion of the other part, said insulated stop and contact-point being adjustable, the movement of the part turning on its axis being effected by electrical impulses over the main line, the motion of the other being wholly dependent upon the pressure exercised against its stops by the part moved by said main-line currents, the local circuit being made at any point within the entire range of motion of said parts whenever the two contact-points are brought together by the movement of the part turning on its axis, and broken whenever the same are separated by a contrary motion of said part.

In testimony whereof I have hereunto subscribed my name this 27th day of March, A. D. 1889.

CHARLES G. BURKE.

Witnesses:
DANL. W. EDGECOMB,
CAROLINE E. DAVIDSON.