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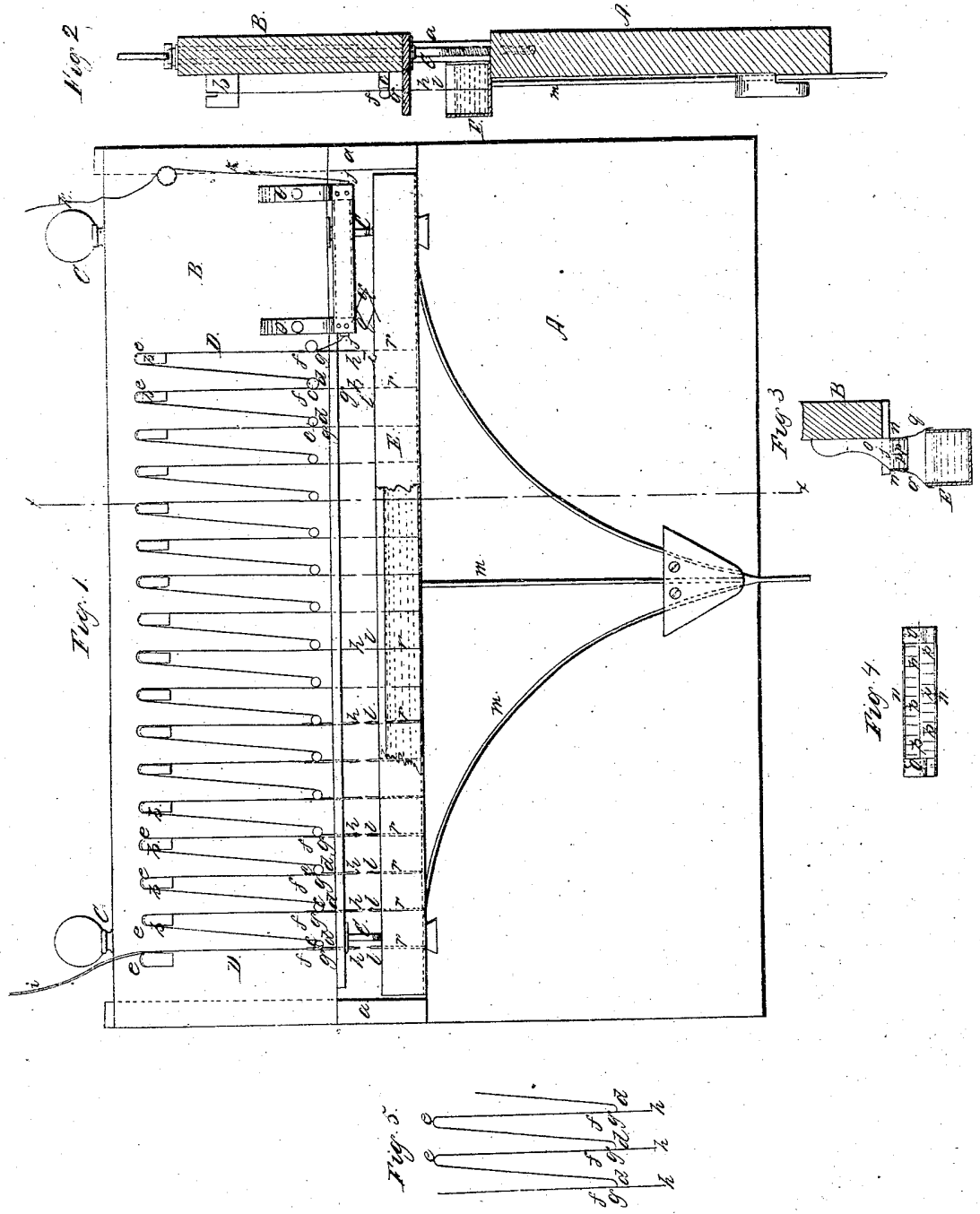
J. N. GAMEWELL.

APPARATUS FOR DISCHARGING ATMOSPHERIC ELECTRICITY FROM TELEGRAPH WIRES.



UNITED STATES PATENT OFFICE.

JOHN N. GAMEWELL, OF CAMDEN, SOUTH CAROLINA.

IMPROVEMENT IN APPARATUS FOR DISCHARGING ATMOSPHERIC ELECTRICITY FROM TELEGRAPH-WIRES.

Specification forming part of Letters Patent No. **13,389**, dated August 7, 1855.

To all whom it may concern:

Be it known that I, JOHN N. GAMEWELL, of Camden, in the district of Kershaw and State of South Carolina, have invented a new and useful Instrument for Relieving the Wires of the Electric Telegraph of Atmospheric Electricity; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front view of the instrument. Fig. 2 is a vertical transverse section of the same in the line *x x* of Fig. 1. Fig. 3 is a transverse section, and Fig. 4 a top view, of parts of the instrument. Fig. 5 is a detached view of a part of the train of wire through which the galvanic current passes.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in an instrument which is intended to connect the main wire of the telegraph with the receiving-magnet at every station, for the purpose of transmitting only the galvanic or writing current, and discharging into the earth, before it can arrive at the magnet, all atmospheric electricity with which the wires become surcharged when the atmosphere is in a highly electrical state, thereby obviating all danger of injury to the magnets or other apparatus, and enabling the telegraph to be operated during the severest thunder-storms.

The theory upon which this instrument is constructed is based mainly upon the established principle that atmospheric electricity will leap from one conductor to another, but that a galvanic current, such as used in the ordinary working of the telegraph, will not pass through the smallest space without a continuous conductor. Its construction and operation are as follows:

A B are two boards placed edgewise one above the other and made adjustable at different distances apart by screws C C, and kept in proper longitudinal relation to each other by dovetail-bars *a a*, which are attached to A and fit in dovetail-grooves in the ends of B. To the face of the upper board, B, are secured a number of studs, *b b c c*, of ivory or other insulating material, to support a train of wire, D D, which forms part of the main circuit and passes upward and downward in a serpentine form, bending rather suddenly, as shown in Figs. 1 and 5. This train of wire is composed of long pieces *d e f*, of some inferior conductor—as, for instance, platina or iron, (represented in blue color,) and short pieces *g*, of superior conductor, as, for instance, gold, silver, or copper, (represented in red color,) in alternate succession—each long piece *d e f* of inferior conductor starting at the lower bend, close to one of the lower studs, *c c*, passing over one of the upper studs, *b b*, and then passing downward to be soldered or otherwise connected with the end *d* of the next similar piece by means of one of the shorter pieces *g g* of superior conductor, which, after making the connection between *f* and *d*, descends to terminate in a point, *h*, below the bottom of the upper board, B. The reason for this extension to a point is that points, sharp angles, &c., are favorable to the discharge of electricity. The lengths of wire composing this train D D diminish gradually in size from one end to the other, the first being of about one-tenth of an inch and the last about one two-hundredth of an inch in thickness. The train is connected at the thickest end with the usual main wire *i*, which enters the office, and at the thinnest end with one end of a thin sheet of platina, *j*, from whose opposite end a fine platina wire, *k*, leads to the magnet.

In close proximity to the points *h h* are the points *l l* of a series of superior conducting-wires, *r r*, which are soldered or otherwise attached to the bottom of a copper trough, E, which rests upon the lower board, A. These points are for the purpose of receiving discharges of atmospheric electricity from *h h*, as will be hereinafter more fully explained.

The trough, which is shown with its front partly broken away in Fig. 1, contains water to moisten the atmosphere in the neighborhood of the points *h l*, to cause the electricity to be readily conducted from *h* to *l* and to prevent the fusion of the points, and to the bottom of the said trough are attached one or more wires, *m*, of copper, to enter the ground.

On opposite sides of and at a short distance from the platina plate *j* are placed two copper plates, *n n*, which are insulated by the brackets *o o*, which carry them and the platina plate and attach them to the board B. These copper plates *n n* are studded all over their inner faces with points *p p* of superior conducting metal, which are in close proximity to the platina plate *j*, (see section, Fig. 3, and plan, Fig. 4,)