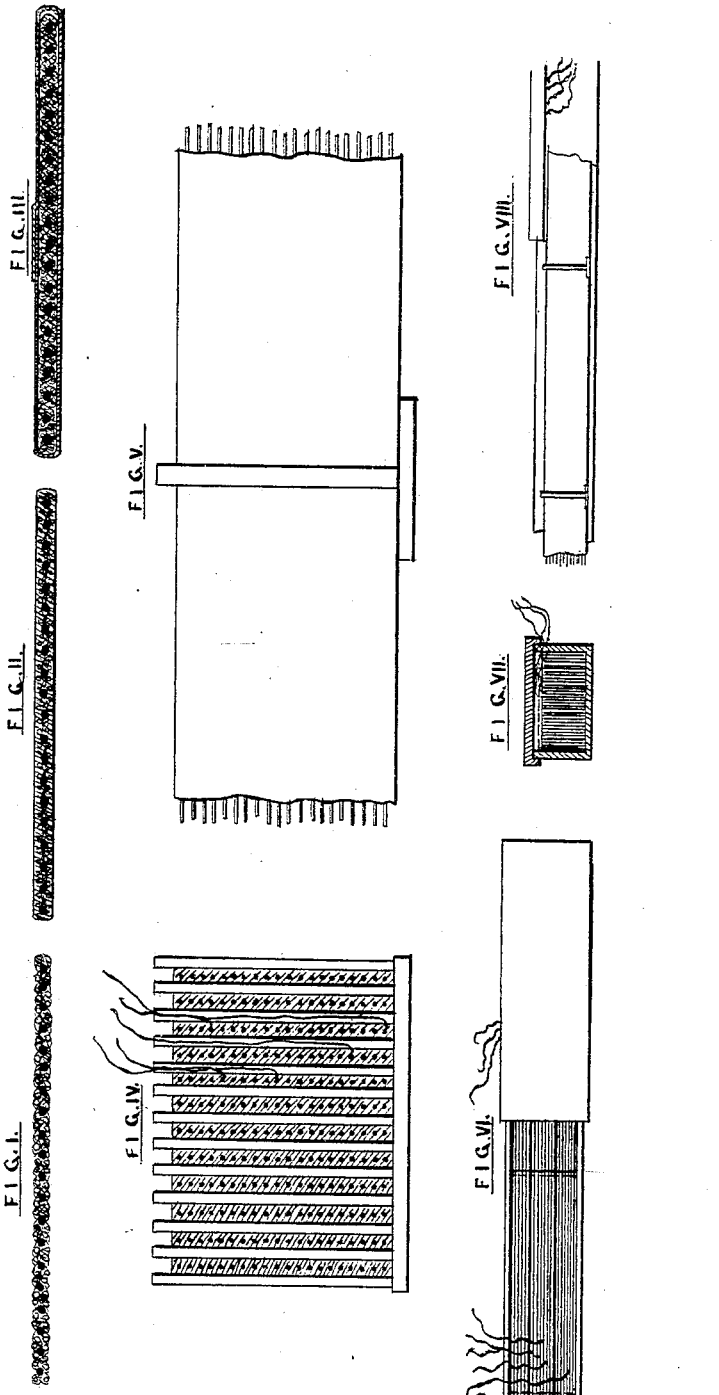
J. B. HYDE.

Underground Telegraph.

No. 202,442. Patented April 16, 1878.




Witnesses:

Daniel J. Kimball

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# UNITED STATES PATENT OFFICE.

J. BURROWS HYDE, OF NEW YORK, N. Y., ASSIGNOR TO ANNA HYDE, OF SAME PLACE.

## IMPROVEMENT IN UNDERGROUND TELEGRAPHS.

Specification forming part of Letters Patent No. **202,442**, dated April 16, 1878; application filed April 11, 1876.

*To all whom it may concern:*

Be it known that I, J. BURROWS HYDE, of the city, county, and State of New York, have invented an improved system for grouping, insulating, and training telegraphic wires under ground, of which the following is my specification:

The nature of my invention consists, first, in an improvement in the method of uniting a series of telegraphic wires, when woven or plaited, in a flat band, each wire being distinct, straight, and separated by non-conducting mediums of insulated threads and compositions, forming a ribbon-like combination of convenient width to be laid in the earth or otherwise, as may be required.

The objective feature of my invention is to so insulate and arrange telegraph-wires under ground in groups that, by a record kept thereof, the position and duty of each individual wire are defined, and the wire be readily found and raised at any time and replaced without disturbing the working of the train.

The plan is particularly designed for use in cities and towns, but not confined thereto. It may also be used for crossing rivers, or even may be elevated above the surface of the ground across bogs, swamps, and other places, where its use will be found efficient and economical.

I propose to use No. 16 copper wire, covered with thread, thin paper, or other convenient coating, and saturated with boiled linseed-oil or other adhesive insulating medium.

A series of such wires—say, ten or more—so separated as to form about six to the inch longitudinally with the band, are drawn in a loom with threads of cotton or other proper material, saturated with an insulating preparation, and then woven into band shape by transverse threads or filling, (see drawing, end section, Fig. I, and side elevation, Fig. V,) in such manner that the heddles of the loom act on the warp-threads only.

The bands, for convenience, may be made three and a half inches wide, and contain twenty wires. They should be next passed through a pair of rollers, one or both of which being grooved and connected with a bath of heated insulating composition, to saturate and coat the band to a thickness of about one-fourth of an inch. (See end section, Fig. II.) This coated band, as it passes from the composition-rolls, may be enveloped with thin and strong paper or cotton cloth, for more complete protection from injury. (See full size end section, Fig. III.)

I have successfully used a composition of asphaltum, caoutchouc, and boiled linseed-oil for insulating wires. Old vulcanized scrap is preferred. The asphalt may be melted, the rubber added, and the two tempered to a proper consistency by the boiled oil.

The wire and thread may be coated by drawing them through a bath of heated linseed-oil or proper compound, and then passed through a perforated plate to expel any excess coating from the surface, thence through a water-bath for cooling, and dried or hardened, as found most convenient or expedient.

Supporting frames or combs, of cast metal or other proper material, are prepared, consisting of vertical teeth about five inches long, one-eighth of an inch wide, and half an inch in transverse depth, with intervening space of fully one-fourth of an inch wide. A flange on each side, at the bottom, projecting at right angles half an inch, and one-fourth of an inch thick, constitutes the base or support of the comb. (See drawing, edge view, Fig. IV, and end view, Fig. V.) Such a comb, five inches long and six inches wide, will carry twelve bands of twenty distinct wires each, or two hundred and forty wires. The bands are placed vertically in the spaces between the comb-teeth, as shown in Figs. IV and V.

A carefully-prepared record is kept, with an arbitrary letter or letters to each band, as A B C &c., and a number assigned to each wire, as 1 2 3, &c., with its position in the comb and train, so that at any time, when the train is uncovered, the proper band may be directly raised and the required wire found and disclosed without error or delay, to be cut and united with an exterior train, and the insulation restored by fresh composition.

The branch wire is passed up the space between the bands formed by the width of the comb-tooth, as shown at Fig. IV and reduced plan view, Fig. VI.

The bands should be laid in the combs, placed transversely in wooden troughs deposited in trenches at proper depth in the earth. The trough is made from wood saturated with heated coal-tar or other effective preparations. They may be from six to fifteen inches wide, and not less than six inches deep. The cover should project an inch or more beyond the the sides, and the grain of the wood be transverse the length of the trough, the combs standing at intervals of ten feet or less apart. (See plan, Fig. VI, and side elevation, Fig. VIII.)

The several wires, united to lateral branches, are passed through holes bored in the side of the trough, as shown by Figs. VI and VIII and VII. A trough twelve inches wide and six inches deep will carry five hundred wires.

Turn-outs may be provided at convenient and requisite intervals by leading a branch or offset from the main trough, in which the train of bands are turned at right angles, and, when extended the necessary distance, bent around and returned to the main train, and thence continued on, as before. This arrangement is to facilitate connecting a number of attaching branches from one point of the line.

What I claim, and desire to secure by Letters Patent, is—

1. A series of straight and parallel wires for telegraphic uses, united by weaving together by spun or other threads of cotton or proper material, and saturated, and coated to constitute an insulated band-like form, the edges of said bands being enveloped or coated with paper or cloth to protect them against friction in handling.

2. A band of united insulated telegraph-wires, placed in a vertical position, so that it may be raised and replaced in its proper rest or seat without disturbing any other wire or wires except those combined in the band required.

3. The forked or comb-like rest for holding and securing bands of telegraphic wires in a vertical position, so that the band can be readily lifted and replaced, and the offset-wires be conducted up the spaces formed by the width of the teeth, as described.

J. BURROWS HYDE.

Witnesses:
DANIEL T. KIMBALL,
CHARLES B. MASON.