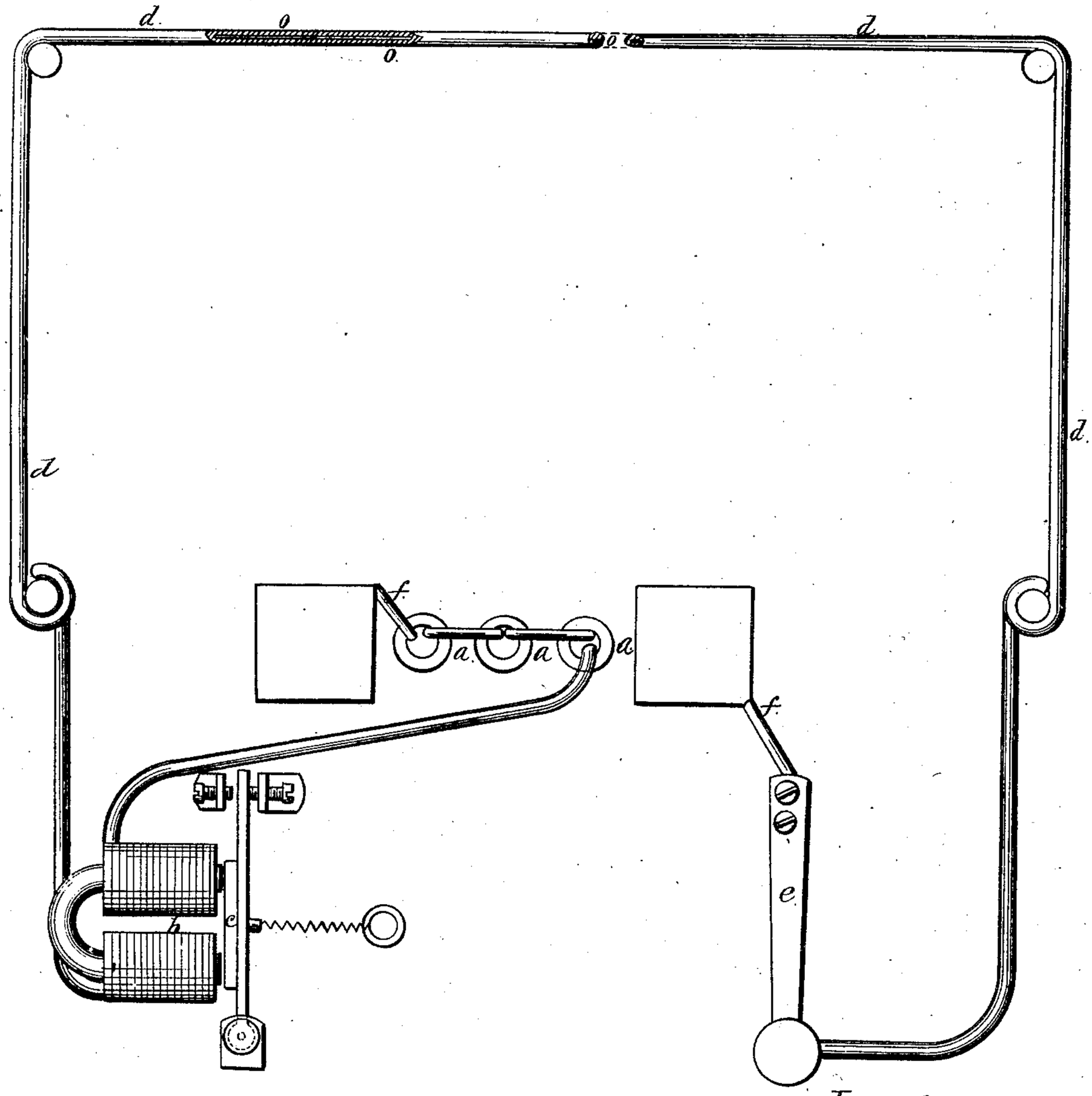
No. 59,763. PATENTED NOV. 20, 1866.

M. G. FARMER & G. F. MILLIKEN.

LINE WIRE FOR TELEGRAPHS.



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IMPROVEMENT IN LINE WIRES FOR TELEGRAPHS.

M. G. FARMER, OF SALEM, AND G. F. MILLIKEN, OF BOSTON, MASS.

Letters Patent No. 59,763, *dated November* 20, 1866.

SPECIFICATION.

TO ALL WHOM IT MAY CONCERN:

Be it known that we, MOSES G. FARMER, of Salem, Essex county, and GEORGE F. MILLIKEN, of Boston, Suffolk county, all in the State of Massachusetts, have invented an Improvement in Magnetic Telegraphs, and we do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of our invention sufficient to enable those skilled in the art to practise it:

Letters Patent No. 47,940, were granted to us on the 30th of May, 1865, for an improved telegraph wire made by drawing a compound rod of iron or steel and copper, the copper being cored or covered with the iron or steel.

Our present invention relates to the employment in a telegraph circuit of an iron wire covered with copper, (the copper being used for its superior conductivity and for lightness, and the iron or steel particularly for tensile strength,) whether the copper covering be formed by casting and drawing, or by chemical deposit, the copper being a coating sufficient in thickness for the purpose of conductivity, and not a mere wash on the surface of the iron wire to prevent corrosion. It is the combination, therefore, with instruments making up with the conducting wire a telegraph circuit or line, of a copper conducting wire having tensile strength imparted to it by an iron or steel wire, that constitutes our present invention. Such a circuit is represented in plan in the drawing. The parts forming the same need not be particularly described, as they are well known to all persons practically acquainted with the construction and operation of telegraph lines.

a denotes the battery or source of electricity; *b* the magnet; *c* the armature; *d* the conducting wire; *e* the finger key; *ff* the ground connections; the whole making up the circuit, as will be readily understood. The copper wire, *d*, is represented partly in section to show its iron or steel core, *o*. As before stated, the copper wire, *d*, may be formed upon the iron or steel wire, by the processes of casting and drawing, or by chemically depositing the copper upon the iron or steel.

The advantages to a line from the employment of a conductor of this nature will be obvious, for on account of the superior conductivity of copper, we may obtain in a compound wire, possessing an equal tensile strength with the common telegraph wire now in use, double the conductivity, the compound wire being at the same time very much lighter than the common wire; or we may obtain at an equal cost, and with equal conductivity, a compound wire weighing not more than half the common wire now in use.

We claim, in combination with the instruments making up with the conducting wire a telegraph circuit, a copper wire conductor strengthened with iron or steel, substantially as set forth.

MOSES G. FARMER,
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Witnesses:
F. GOULD,
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