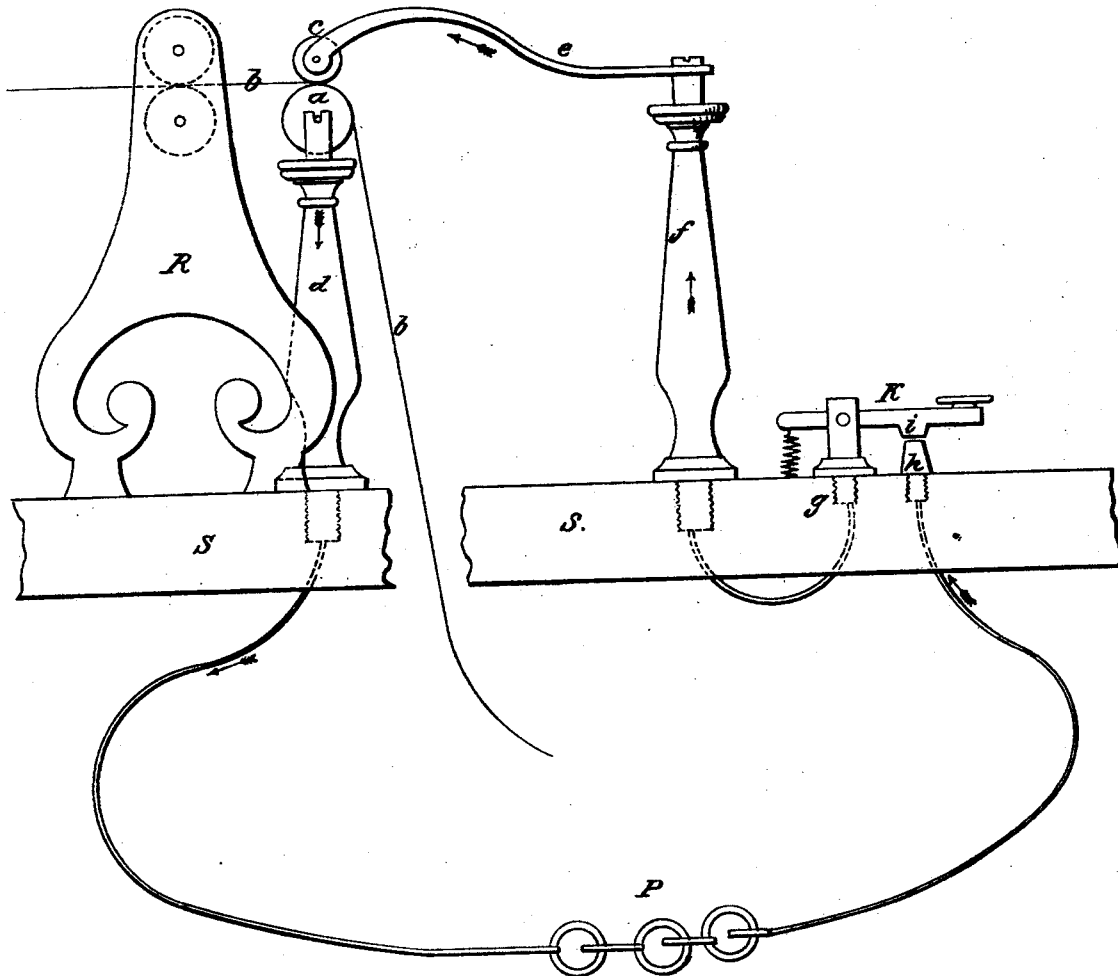


S. F. B. MORSE.

Telegraph.

Patented May 1, 1849.

No. 6,420.



UNITED STATES PATENT OFFICE.

S. F. B. MORSE, OF POUGHKEEPSIE, NEW YORK.

IMPROVEMENT IN ELECTRIC TELEGRAPHS.

Specification forming part of Letters Patent No. 6,420, dated May 1, 1849.

To all whom it may concern:

Whereas among my earliest conceptions of the telegraph, in October of the year 1832, on board the packet-ship "Sully," on her voyage from France to New York, I conceived the idea of marking the telegraphic signs I had invented (being dots and spaces to signify numerals) by electrical decomposition of certain salts and chemical compounds; and whereas the application of the proper means for producing a successful result of this thought was soon after superseded in my mind by another method, at the same time conceived, of marking the said signs, to wit, by magnetism, produced by electricity, which is the successful method now in use, and having recently secured to my original thought of applying decomposition by electricity through a single circuit of conductors, and discovered a means of successfully applying the same, as then conceived, to the marking of the aforesaid signs for numerals and letters, and of any desired characters, I will here describe the nature of my invention, and the method by which I obtain my results.

The nature of my invention consists, first, in the application of the decomposing effects of electricity, produced from any known generator of electricity, to the marking of the signs for numerals, or letters, or words, or sentences invented and arranged by me, and secured by patent bearing date June 20, 1840, reissued January 15, 1846, and again reissued June 13, 1848, or their equivalents, through a single circuit of electrical conductors; second, in the mode of applying this decomposition, and the machinery for that purpose; third, in the application of the bleaching qualities of electricity to the printing of any desired characters.

In applying the decomposing effects of electricity upon any known salts that leave a mark as the result of the said decomposition, I use—

Class A—a class of salts that produce a colored mark upon cloth, paper, thread, or other material, under the action of electricity: first, iodide of tin in solution; second, extract of nut-galls and sulphate of iron in solution, making an ink which colors white cambric cloth of a uniform gray; third, acetate of lead and nitrate of potash in solution; fourth, iodide of potassium in solution. Into either of these

I dip a strip of cloth or thread which is kept properly moistened. All these give a black mark upon the cloth, thread, or other material under the action of electricity.

Class B—a class of salts which color the cloth, paper, thread, or other material, and are bleached by the action of electricity: first, iodide of tin in solution; second, iodine dissolved in alcohol. Into either of these I dip a strip of cloth, paper, thread, or other material, and, (if in solution,) second, I also dip them into a solution of sulphate of soda. The cloth or other material in these cases becomes of a purple color more or less dark. The electricity in these cases, when a metallic point or type is pressed upon or comes in contact with the moist cloth or other material, bleaches it, and leaves the point or the type impressed in white characters upon the material.

Class C—a class of salts that produce a mark upon metal through the intervening cloth or other material, and not upon the material, under the action of electricity: first, sulphate of copper in solution; second, chloride of zinc diluted with water; third, sulphate of iron in solution. Into either of these solutions I dip the cloth, thread, or other material, and if into the third, I afterward dip it into muriate of lime in solution. The electricity in these cases causes a dark mark upon a bright metal plate beneath the moistened material, but not on the material itself.

The mode of applying this decomposition by electricity is by the use of so much of my machinery, previously described in the schedule referred to in the Letters Patent granted to me and bearing date June 13, 1848, being the reissue of the original patent of April 11, 1846, as is employed in regulating the motion of the paper, substituting, however, for the common paper therein used, the cloth, thread, metal, or other material chemically prepared, and which machinery is therein described in the words following, to wit:

The register consists of a series of wheels and pinions, and its object is to regulate the movement of paper or other material upon which to imprint telegraphic characters. A A, &c., Sheet I, II, Figs. 1 and 3, is the platform, of wood or other convenient material, upon which the machinery is erected; B B, &c., the stand-

ards for the reel of paper, and C the reel of paper upon which is to be printed the telegraph characters; D, one form of the arrangement of the wheels and pinions of the register; *d e*, rollers for drawing the paper in contact with the pen or marking-roller 2. (Seen also on Sheet III, Fig. 10.) * * * The frame D contains the train of wheels whose motion is caused by the weight *a*, or its equivalent. * * * The paper rollers *d*, *e*, and 2, Fig. 10, Sheet III, are so connected with the train of wheels that the paper drawn from the reels by passing between *d* and *e* is made to be in contact with the ——— cylinder, Fig. 2. The roller *e* is kept in contact with *d* by the forked spring in Fig. 10 bearing upon the ends of the journals, and regulated in its strength by the thumb-screws 8 and 9. The bearings or sockets for the ends of the shafts of *e* are not circular, but are slots to allow of a slight movement in a direction with and against the force of the spring, so that the spring shall act with proper power, tending to keep the cylinder *e* in contact with *d*."

Instead of a magnet, however, and lever and pen, I dispense altogether with both the receiving-magnet and the register-magnet of my former patents, and substitute therefor the following arrangement, as exhibited in the accompanying drawings and description.

In the accompanying drawings, R is so much of the register of my original patent, just quoted, as is used in drawing and regulating the motion of the paper, and is similarly used for drawing and regulating the chemically-prepared material for marking by electricity.

S S is the wooden platform for mounting the machinery.

a is a metallic cylinder, or drum, or piece of metal, mounted upon a metal standard, *d*, screwed into the platform.

b is the cloth or prepared material to be marked.

c is the thin-edged wheel, the periphery of which is platinum, held by a metal spring, *e*, also mounted on a metal standard, *f*, screwed into the platform.

K is the metal key of my previously patented telegraph machinery. One form of it consists of a short lever of metal, having its fulcrum at or near one end. At the other end is a finger-knob, the better to press it down. Between the fulcrum and the knob may be a protuberance or hammer, as at *i*, above a small anvil, as at *h*, from which the hammer is separated (when not pressed down) by a spring.

P is the battery. From the standard *d* a conductor proceeds to one pole of the battery.

From the standard *f* a conductor proceeds, connecting with the back of the key at *g*, which is screwed into the platform.

h is the metallic anvil, also screwed into platform, and insulated from the rest of key.

i is the hammer, attached to the upper part of the key.

From the anvil proceeds a conductor to other pole of the battery.

Operation: While the hammer *i* is separated from the anvil *h* no current can proceed from the battery; but the moment *i* and *h* are in contact the current of electricity takes the direction of the arrows and passes through a chemically-prepared material at *a*, decomposing the salt with which it is prepared, making a mark. Thus the characters of my conventional alphabet, and other characters, at pleasure made upon the prepared material.

I consider the discoloring process better than the bleaching process, and for the discoloring process I consider the iodide of potassium in solution as the best of the substances have mentioned for the preparation of the cloth paper, or other material.

I wish it to be understood that I do not confine myself to the use of the substances I have mentioned, but mean to comprehend the use of any known substance already proved to be easily decomposed by the electric current.

What I claim as of my own invention an improvement, and desire to secure by Letter Patent, is—

1. The use of a single circuit of conductor for the marking of my telegraphic signs, already patented, for numerals, letters, words or sentences, by means of the decomposing coloring, or bleaching effects of electricity acting upon any known salts that leave a mark as the result of the said decomposition, upon paper, cloth, metals, or other convenient and known markable material.

2. The combination of machinery, as herein substantially described, by which any two metallic points or other known conducting substance, broken parts of an electric or galvanic circuit, having the chemically-prepared material in contact with and between them, may be used for the purpose of marking my telegraphic characters, already patented in Letters Patent dated 20th of June, 1840, in the first reissue 15th January, 1846, and second reissue 13th June, 1848.

SAM. F. B. MORSE.

Witnesses:

EDMD. CLASBACK,
EDWD. GORDON.