(No Model.)

G. H. HERRINGTON.

METHOD OF RECORDING SPEECH.

No. 397,856. Patented Feb. 12, 1889.

Fig 1

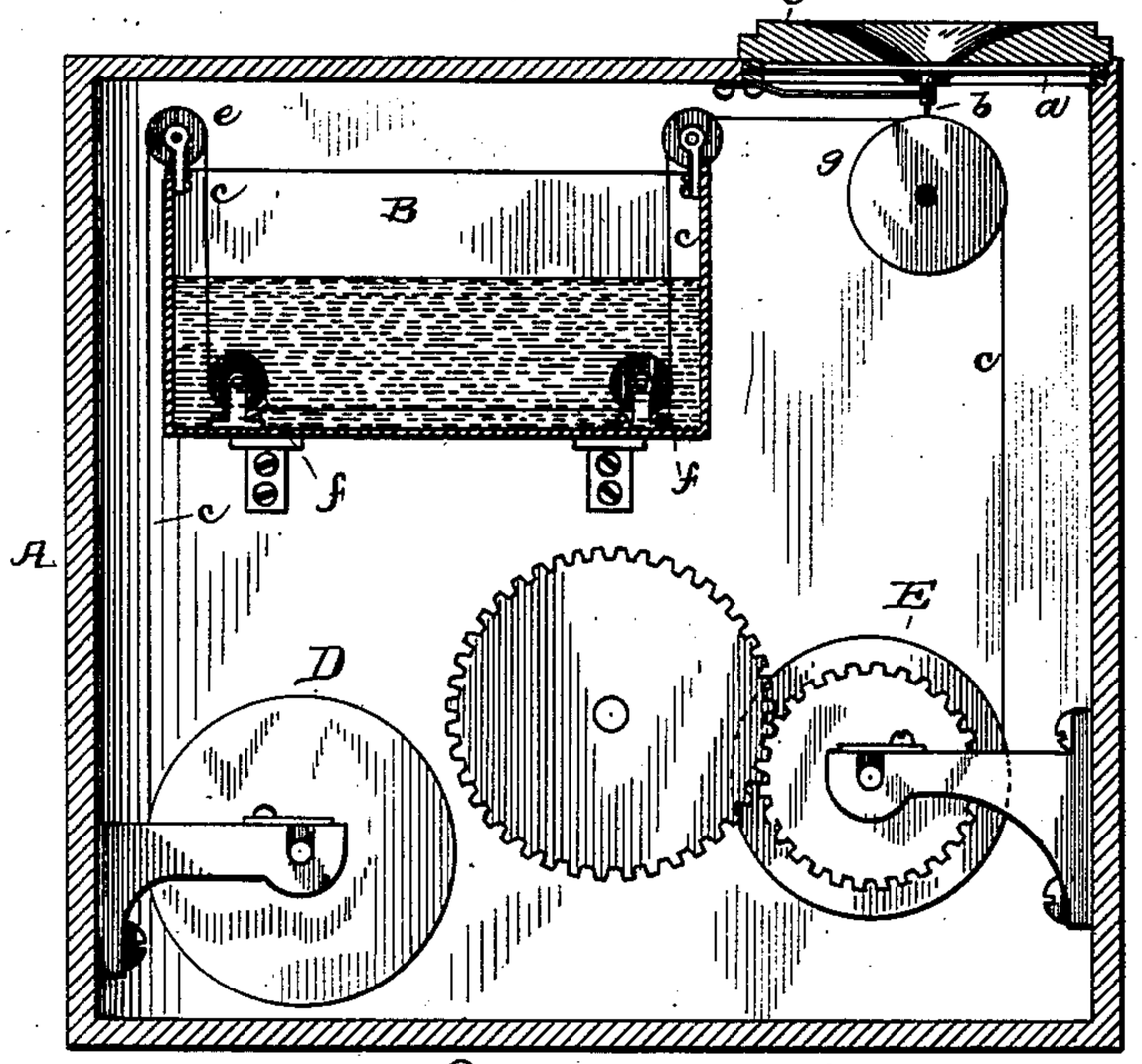

Fig. 2.

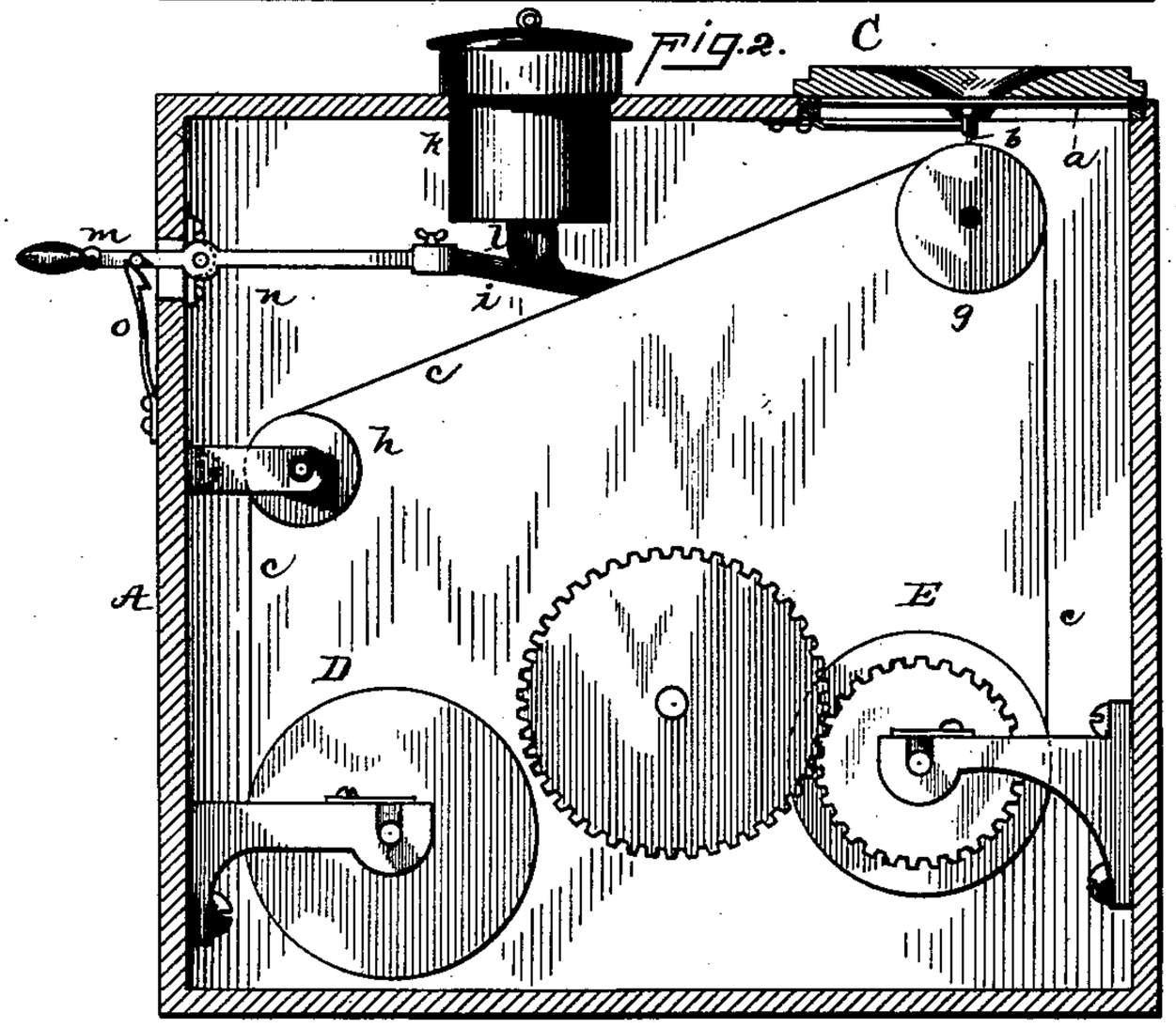

Fig. 3.

ATTEST:
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UNITED STATES PATENT OFFICE.

GEORGE H. HERRINGTON, OF WICHITA, KANSAS, ASSIGNOR TO HIMSELF, AND EDWARD H. JOHNSON, OF NEW YORK, N. Y.

METHOD OF RECORDING SPEECH.

SPECIFICATION forming part of Letters Patent No. 397,856, dated February 12, 1889.

Application filed June 18, 1887. Serial No. 241,795. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. HERRINGTON, of Wichita, in the county of Sedgwick and State of Kansas, have invented a certain new and useful Improvement in Phonographs, of which the following is a specification.

In my application filed September 11, 1886, is set forth a process of recording sound-vibrations by softening a material, passing it under the needle of a phonograph, and then allowing it to cool. In the application referred to I described the use as the recording medium of a material capable of being softened by heat and hardening when cooled.

My present invention relates to another specific process to the same end, one of whose advantages is that the appliances required for heating and cooling the material are dispensed with.

My improvement consists, mainly, in the employment as a recording medium of a material which is softened by a chemical solvent before passing under the vibrating needle, and afterward hardens as it dries.

I prefer to place the material upon the surface of a thin flexible strip, which is fed by suitable mechanism from a drum on one side of the apparatus to one on the other side, passing under the vibrating needle, and before reaching such needle coming in contact with the solvent. Suitable materials for the purpose are celluloid, glue, wax, molasses, pitch, asphalt, or various glutinous or resinous substances, or two or more of such substances in combination. A compound which I have found especially advantageous is one of celluloid mixed with a smaller quantity of molasses and beeswax, the celluloid and beeswax being dissolved with ether or other suitable solvents before mixing. This mixture I then spread evenly on a strip of paper or other suitable surface and allow it to dry hard, and then finish it with as smooth a surface as possible. Another combination which I have used to great advantage is one of glue, molasses, and wax, applied in a similar manner to that just described. This forms a particularly smooth and glossy surface, and prevents largely the harsh grating sound, which is an objection when tin-foil is used.

I employ solvents suitable for the particular material used. For instance, with celluloid I may use ether, with glue, and water, which may be heated, or with other materials alcohol, ammonia, or acetic acid, the proper solvent being employed for the material used, as will be readily understood.

Convenient apparatus for carrying my invention into effect is illustrated in the accompanying drawings.

Figure 1 illustrates a form of apparatus in which the strip is passed through a bath of the solvent. Fig. 2 illustrates a form in which the solvent is applied by means of a brush, and Fig. 3 is a view of a portion of the strip.

In Fig. 1, A represents a suitable inclosing box or case. B is a vessel containing the solvent. C is the mouth-piece or ear-piece, *a* the diaphragm, and *b* the vibrating point or needle. D is a spool or drum carrying the strip *c*, on which the sound-vibrations are to be recorded. This is a strip of paper or other suitable flexible material of sufficient strength for the purpose, and is covered with the soluble substance *d*, Fig. 3, such as above described. This strip passes over a roller, *e*, and then over the two rollers *f f* in the vessel B, under the surface of the liquid, then over the roller *g*, which brings it directly under the needle, and, finally, to the receiving drum or spool E, on which it is wound, this drum being revolved by a spring or any suitable motor, as indicated, so as to move the strip when in operation continuously along under the needle. As the strip passes through the solvent its surface is softened by the action thereof, so that it readily receives the impressions of the needle as it vibrates in accordance with sound-vibrations projected against the diaphragm. The drum E is placed at a sufficient distance, so that the surface dries before the strip is wound thereon. The surface of course hardens as it dries, so that the impressions remain permanently thereon.

The drums are preferably removable, so that the drum, with the record upon it, may be removed, and such record may be reproduced by placing the drum in a similar machine, of course with the solvent omitted, and passing it under the needle.

In the form shown in Fig. 2 the strip *c* passes from the spool D to the spool E under

the needle, as before. The vessel and the rollers therein are omitted, and the strip passes directly from a roller, *h*, supported on the side of the case to the roller *g* under the diaphragm. Between the rollers *h* and *g* a brush, *i*, rests lightly on the top of the strip. In this case this brush takes the place of the vessel of Fig. 1 as the receptacle for the solvent. A vessel, *k*, is supported by the top of the box, which vessel contains the solvent. From an aperture in the bottom of the vessel a porous body, *l*, which is preferably a mass of fibrous or spongy material—as wicking or sponge—hangs down and rests on the brush *i*, whereby the brush is kept constantly provided with the solvent. The traveling strip is therefore continually moistened with the liquid as it moves and reaches the needle, with its surface in the desired soft and impressible condition. I prefer to provide the brush with a handle, *m*, pivoted at *n* and passing through a slot in the side of the case, whereby when the machine is not in use, or when it is in use for reproducing sound, the strip may be removed from contact with the solvent by pressing down on the projecting handle. A spring-catch, *o*, is preferably provided for holding the brush away from the strip. The drum E is turned by a suitable motor, as before.

I do not claim herein the method of recording sounds by softening the recording medium, passing it through the recording-instrument while in such softened condition, and then allowing it to harden to set the impressions, since this is claimed in my prior application, filed September 11, 1886.

What I claim is—

1. The method herein described of making a permanent record of vibrations, which consists in softening a body of material by a chemical solvent, passing the same through the recording-instrument while it is in a softened condition, and then allowing it to harden.

2. The method of recording phonetic vibrations, which consists in covering a strip of material with a substance capable of being softened by a chemical solvent, subjecting said substance to the action of such solvent, passing it in its softened condition under the vibrating point of a phonograph, and afterward allowing it to harden to fix the phonogram, substantially as set forth.

This specification signed and witnessed this 13th day of June, 1887.

GEORGE H. HERRINGTON.

Witnesses:

RICHARD B. REILAY,

F. J. ARNOLD.

Correction in Letters Patent No. 397,856.

It is hereby certified that in Letters Patent No. 397,856, granted February 12, 1889, upon the application of George H. Herrington, of Wichita, Kansas, for an improvement in "Method of Recording Speech," an error appears in the printed specification requiring the following correction, viz: On page 1, in line 53, the word "and" should be stricken out; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 19th day of February, A. D. 1889.

[SEAL.]

D. L. HAWKINS,
Assistant Secretary of the Interior.

Countersigned:

BENTON J. HALL,
Commissioner of Patents.