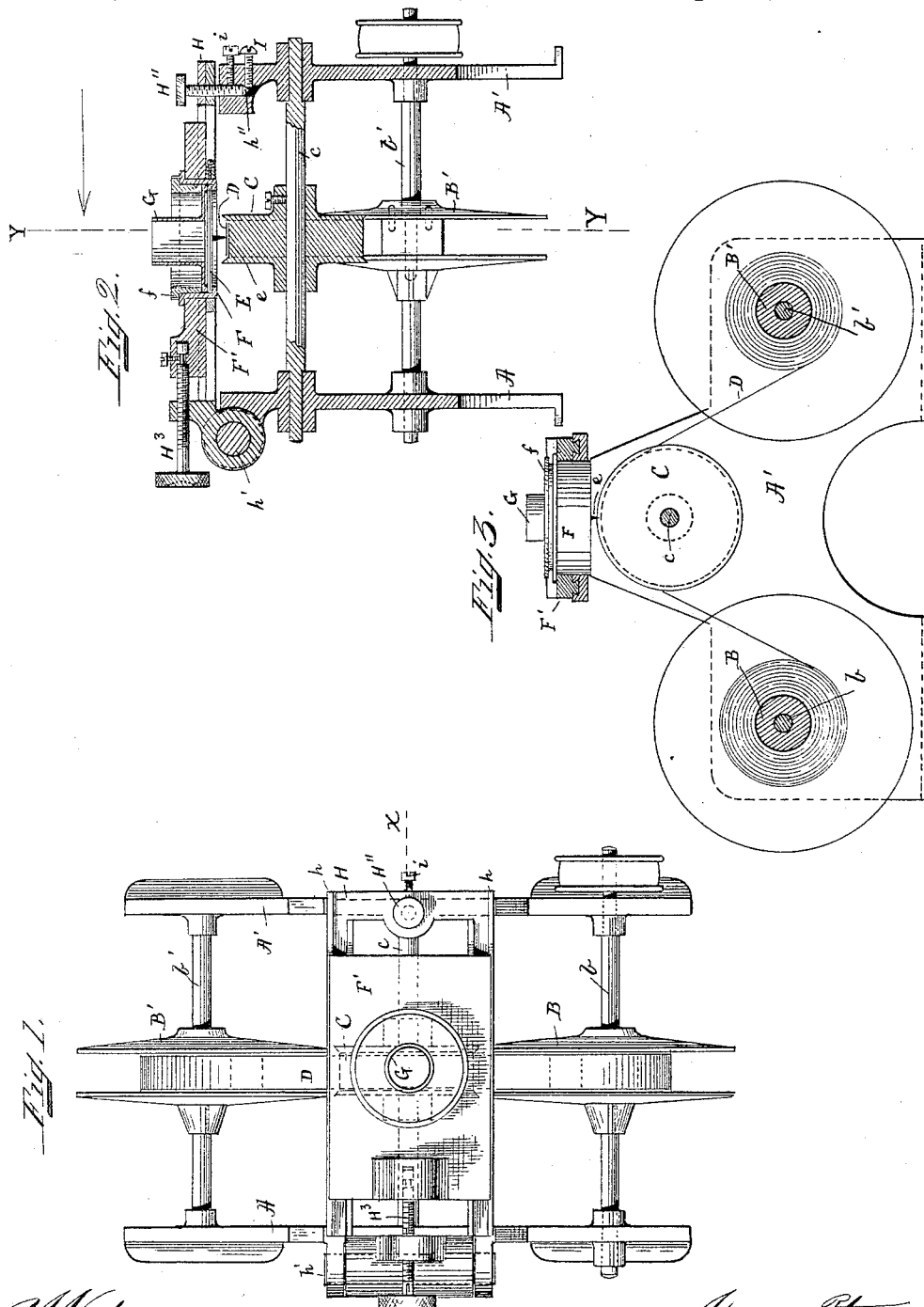


(No Model.)

E. OXLEY.
PHONOGRAPH.

No. 458,916.

Patented Sept. 1, 1891.



Witnesses:
Alice A. Perkins
Emma J. Smith

Inventor:
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UNITED STATES PATENT OFFICE.

EUSTACE OXLEY, OF BOSTON, MASSACHUSETTS.

PHONOGRAPH.

SPECIFICATION forming part of Letters Patent No. 458,916, dated September 1, 1891.

Application filed November 12, 1890. Serial No. 371,161. (No model.)

to all whom it may concern:

Be it known that I, EUSTACE OXLEY, a citizen of Great Britain, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Phonographs, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in phonographs or speaking-machines; and it is carried out as follows, reference being had to the accompanying drawings, wherein—

Figure 1 represents a plan view of the invention. Fig. 2 represents a vertical section in the line X X shown in Fig. 1, and Fig. 3 represents a cross-section on the line Y Y shown in Fig. 2.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

A and A' are frames preferably made of metal and secured together at a proper distance apart.

B and B' are reels secured to the respective shafts *b* and *b'*, journaled in the frames A and A', as shown.

C is a loosely-journaled guide-roller located on a shaft *c*, as shown in Figs. 2 and 3.

D is a tape or ribbon, which is guided and carried around a portion of the guide-roller C from the reel B to the reel B', or vice versa, during the operation of the phonograph. The said ribbon D is coated on its upper side with wax or suitable composition, or other ductile material, adapted to receive impressions from the stylus when the latter is agitated.

Above the guide-roller C is located the vibratory diaphragm E, having secured to its under side the usual stylus or needle *e*, or equivalent recording device. The said diaphragm is preferably secured within the case F by means of a screw-cap *f*, to which the speaking-tube G is connected, as is common in phonographic apparatus.

In practice I make the case F and its diaphragm E adjustable in a direction parallel with the guide-roller shaft *c*, so as to change the position of the stylus or needle *e* laterally in relation to the tape or ribbon D after a record has been made on the latter throughout its length, by which a series of parallel records may be made successively on the said

ribbon, thus causing its entire surface to be utilized for receiving indentures or impressions from the stylus or needle during the vibrating movement of the diaphragm caused by the operator speaking against it.

In the drawings I have shown the case F as attached to a plate F', which is adapted to slide in and between guide-ribs *h h* on the cover H, which latter is preferably hinged at *h'* to the frame A, and provided in its opposite end with a regulating-screw H'', screwed through said cover H and having its tapering lower end *h''* adapted to rest against the lateral adjustable screw I for the purpose of adjusting the position of the stylus or needle properly in relation to the ribbon D where it passes over the roller C, as shown.

i is a set-screw for securing the cover H in position after it has been adjusted for the purpose above mentioned.

H³ is a feed-screw for adjusting the position of the slide F' with its diaphragm and stylus relative to the ribbon D, for the purpose set forth.

The reels B and B' may be provided with suitable tension devices, so as to cause the ribbon or tape D to be held taut while passing around the guide-roller C, as it is being wound off from one reel and wound onto the other, during the use of the phonograph. Such tension device is, however, not shown in the drawings.

The reels B and B' may be set in motion by clock-work or other well-known automatic or other mechanism without departing from the essence of my invention, such mechanism being, however, not represented in the drawings.

The operation of the improved phonograph is as follows: We will suppose that the ribbon D is fed from one reel to the other and around a portion of the guide or guide-roller C. If during such movement of the ribbon the diaphragm E should be set in vibration by acoustic sound-waves, the human voice, or other sounds, the vibratory movements of the stylus or needle will be recorded on the plastic or ductile surface of the traveling ribbon D. After the entire length of the ribbon has thus been indented I adjust the position of the diaphragm-case, its diaphragm, and stylus relative to the guide-roller C, so as to bring a fresh portion of the said ribbon be-

low the said vibratory stylus, and so on until the entire length and width of the ribbon has been used for the purpose mentioned. By feeding the indented ribbon in contact with the stylus the diaphragm is caused to vibrate, and thereby to reproduce the original sound, as is the case in phonographs or speaking-machines generally.

The advantages of a tape or ribbon as a recording medium over the usual cylinders are as follows: The machine is very much simplified in its construction. The capacity of the recording medium is materially increased. The recording medium is much lighter, less bulky and fragile than the ordinary rolls, and is therefore preferable for transportation by mail or otherwise, and said recording medium is not affected by variations in temperature liable to make the ordinary rolls untrue and more or less inoperative and defective.

Having thus fully described the nature, construction, and operation of my invention, I wish to secure by Letters Patent and claim—

1. In a phonograph or speaking-machine, the combination, with a flexible ribbon having a ductile surface adapted to receive impressions from a stylus, reels for causing the ribbon to travel lengthwise, and a rotating support arranged under the ribbon between the reels, of a cover-plate hinged at one end and provided with a sliding plate, and having

a vibratory diaphragm and a stylus to act upon the ribbon, and means for adjusting the sliding plate on the hinged cover-plate for moving the diaphragm and stylus in a direction at right angles to the line of travel of the ribbon for recording sounds in parallel lines thereupon, substantially as described.

2. In a phonograph or speaking-machine, the combination of a frame, a pair of reels journaled in the frame, a flexible ribbon having a ductile surface and engaging the reels, a rotating ribbon-support between the reels, a cover-plate hinged at one extremity and provided at the opposite extremity with an adjusting-screw by which to adjust the cover-plate to and from the ribbon, a slide-plate mounted on the cover-plate and provided with a vibratory diaphragm having a stylus, and a set-screw for adjusting the sliding plate to move the diaphragm and stylus in a direction at right angles to the line of travel of the ribbon for recording sounds in parallel lines thereupon, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 3d day of November, A. D. 1890.

EUSTACE OXLEY.

Witnesses:

ALBAN ANDRÉN,
ALICE A. PERKINS.