

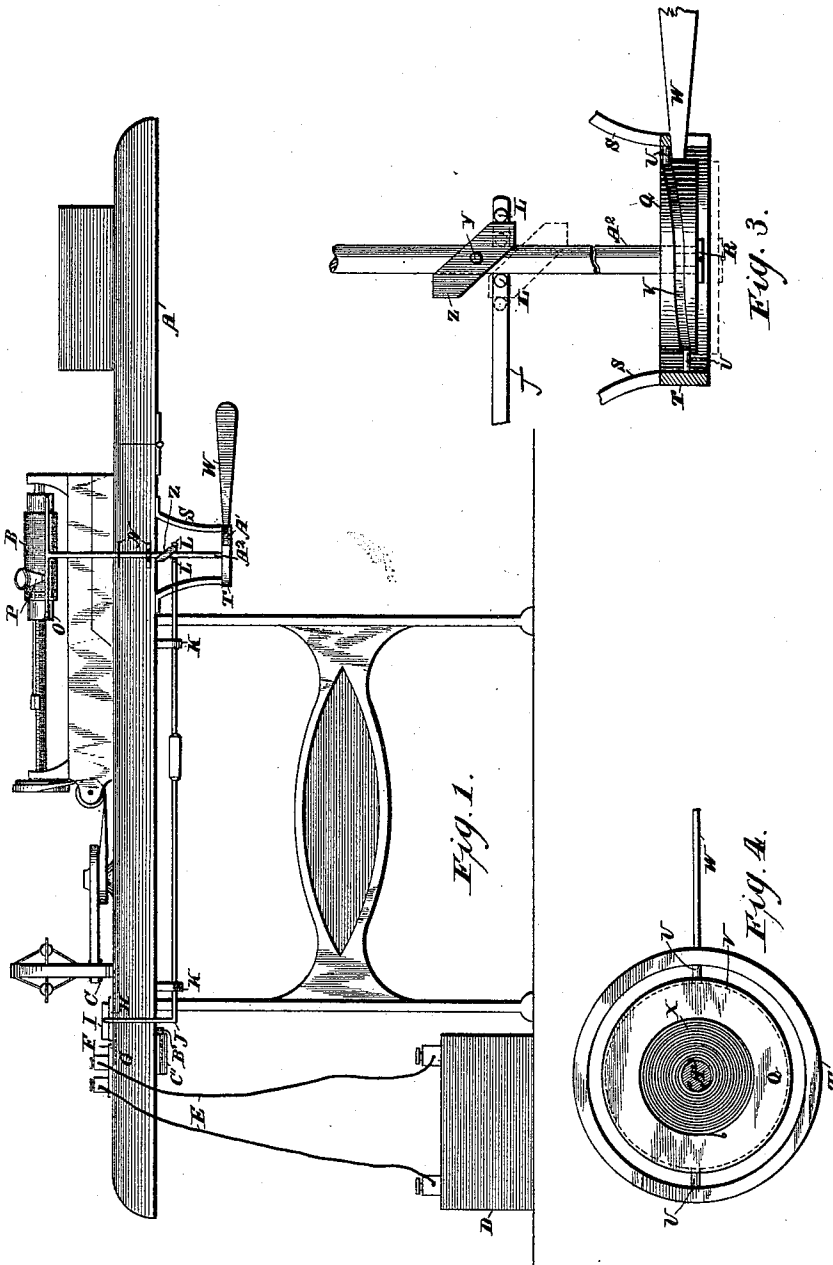
(No Model.)

2 Sheets—Sheet 1.

H. T. HOLTZ.
PHONOGRAPH.

No. 463,989.

Patented Nov. 24, 1891.



Witnesses

Louis E. Julian.

C. P. Howell

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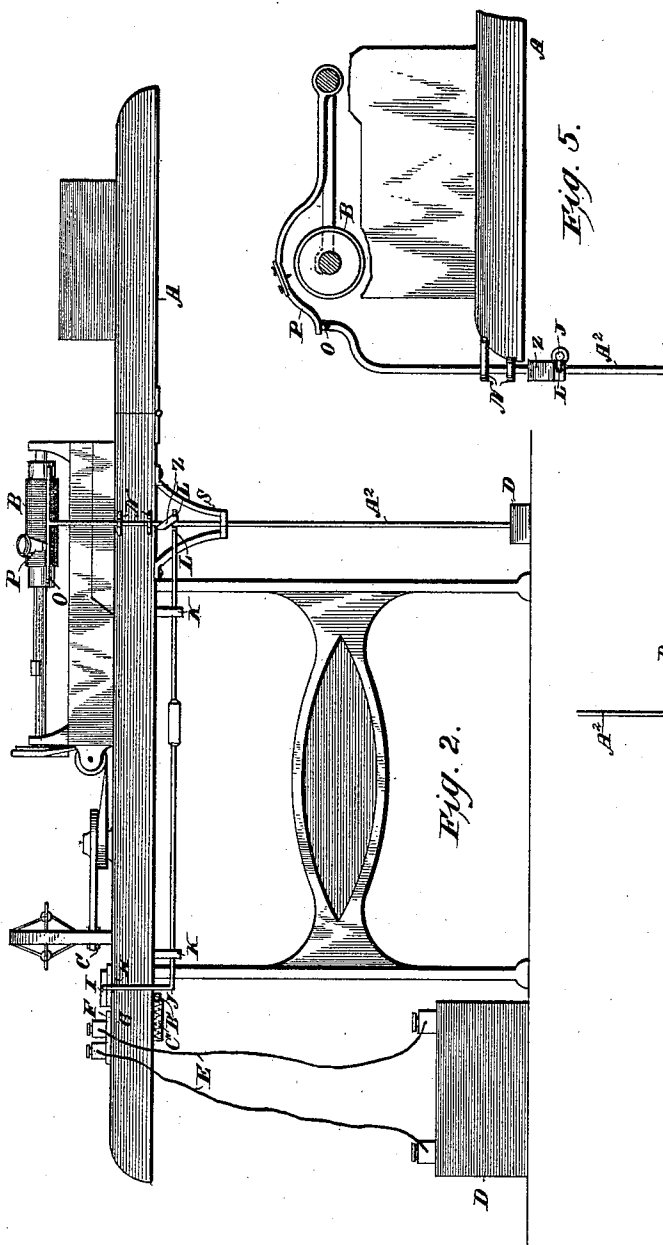


Fig. 5.



Fig. 6.

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UNITED STATES PATENT OFFICE.

HENRY T. HOLTZ, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR OF ONE-HALF TO WILLIAM MAURICE LERCH, OF BALTIMORE, MARYLAND.

PHONOGRAPH.

SPECIFICATION forming part of Letters Patent No. 463,989, dated November 24, 1891.

Application filed April 23, 1891. Serial No. 390,161. (No model.)

To all whom it may concern:

Be it known that I, HENRY T. HOLTZ, of the city of Washington, District of Columbia, have invented certain new and useful Improvements in Phonographs, of which the following is a specification, reference being had to the accompanying drawings.

One object of my invention is to produce a start-and-stop device for phonographs or talking-machines in which there shall be a movable part that I will call a "prime mover," adapted by its operation to start and stop the motor and the machine and connect and disconnect the diaphragm-pin with the cylinder, so that an operator may have ample time to transcribe a sentence or a part of a sentence, or can allow any period of time to elapse between the time of making transcriptions, and while he is transcribing or during such period of time the machine will be at rest.

Another object of my invention is to produce a start-and-stop device for phonographs operated by electricity, whereby the labor of transcribing recorded speech is facilitated and the machine is operated at a considerable saving of the electric current. Phonographs, although adapted to be run by any suitable motive power, are to a large extent operated by electric motors. The source of electricity employed is in many cases a portable pile or battery which has a limited capacity—that is, it may produce a required energy for a limited number of hours, after which it has to be renewed. It is the practice at present in transcribing the records of a phonograph to take a sentence from dictation, as it were, and after the machine has repeated that sentence to interrupt its feed and transcribe its record. This is usually done by raising a lever by hand or by some species of clutch mechanism by which the motor is disengaged from the feeding mechanism of the phonograph. The motor, however, continues in motion and the electric energy is wasted. One reason for the motor being allowed to run uninterruptedly has been that its velocity must always be equal or nearly equal in repeating speech to that which was employed in recording it. A difficulty, therefore, has

been in attempting to prevent the waste of the electric current and at the same time produce the best effects that the velocity would in the beginning be too greatly diminished and part of the record would after each interruption be obscured or lost. By my invention I provide for starting the motor so far in advance of lowering the needle against the face of the revolving cylinder that the motor shall have first attained the requisite speed before the machine begins to speak. By this means I secure the most perfect practical results in the operation of the phonograph itself, am able to save about one-half the electric current ordinarily used in operating it, and consequently am able to run the machine at one-half the ordinary cost. In addition to the advantages above recited, by employing mechanical means for lifting the needle from the face of the revolving cylinder and returning it thereto I insure the return of the needle after each interruption to the same place from which it was raised. The needle, being secured to a disk which is hung upon a pivoted lever, cuts into the surface of the cylinder in lines about one one-hundredths of an inch apart. It is therefore necessary, in order to reproduce speech, for the needle to follow evenly in the groove as originally cut. When, therefore, the machine is in operation and the needle is raised away from the face of the cylinder for the purpose of transcribing a sentence which has been repeated, it is necessary, when the needle is again let down, that it should strike exactly in the same groove. This may be done by hand; but a slight pull to one side or the other will throw the needle out of place. This possibility, as above suggested, is entirely avoided by my invention.

In the accompanying drawings, Figure 1 is a front elevation of a phonograph with motor equipped with my device. Fig. 2 is a similar view showing a modification of the same. Fig. 3 is an elevation of a portion of my device, showing the cam-frame in section. Fig. 4 is a top plan view of the cam. Fig. 5 is an end view of the cylinder of the phonograph and its adjacent parts, showing the relation of my

raising and lowering device to the diaphragm. Fig. 6 is a detail view of a portion of the modification shown in Fig. 2.

Referring to the letters on the drawings, A indicates the table of an ordinary phonograph.

B indicates the recording-cylinder of the machine, which is operated through mechanism of such well-known construction as not to require particular description here. It is driven by a motor C, communicating with the source of electricity D by means of the wires E through the electric switch F, which may be of any ordinary construction—such, for instance, as fixed plates G and H, insulated from each other, and a sliding plate I, adapted to slip over the surfaces of the fixed plates and make connection between them. To the sliding plate is fastened a rod J by any suitable means, preferably so as to be insulated from it. This rod should be bent or constructed so that its main portion may run parallel with the lower edge of the table and preferably a little below it.

K indicates bearings of any suitable sort for supporting the rod and should be adapted to allow it to move freely through them.

L indicates pins fixed to the free end of the rod and projecting from it a suitable distance, between which is the vertically-movable lifting-bar A², which is firmly carried in suitable bearings N against the face of the table. The lifting-bar is provided across its upper end with a horizontal lifting-piece O, which extends the entire length of the cylinder of the phonograph and immediately beneath the path of the disk-lever P. (Clearly shown in Fig. 5 of the drawings.) The location of this lifting-piece is such that it will engage with and lift the disk-lever at any point of the travel of the cylinder. It will with equal certainty lower the disk-lever in place when desired. The lifting-piece, when the machine is in operation, is separated from the disk-lever, so that it offers no impediment to the free working of the machine. Upon the lower end the lifting-bar is provided with a cam-disk Q, secured thereto by means of the screw R.

S indicates a frame secured to the lower side of the table and provided at its lower end with a band T, which encircles the cam and carries the fixed pins U, that enter the groove V in the side of the cam.

W indicates a lever, which in this instance is the prime mover, secured at one end to the cam, by means of which the cam may be turned upon its axis through the slot A' in the band, and the lifting-bar thereby raised or lowered. The normal position of the horizontal lifting-piece is in engagement with the disk-lever, and consequently I provide within the top of the cam-disk a volute spring X, fastened at its inner end to the lifting-bar as an arbor and at its outer end to the wall of the disk. To rotate the disk, therefore, it is necessary to overcome the resistance of this

spring, which, when pressure is relieved, returns the cam to the normal position. Between the pins L of the rod J, I fasten by a set-screw Y or other suitable means to the lifting-bar a cam-collar Z, so located that when the lifting-bar is raised or lowered one or the other of the faces of the cam-collar strikes against one or the other of the pins L and moves the rod J horizontally one way or the other, thereby operating the electric switch to make or break contact. This collar must be located with reference to the horizontal lifting-piece O, so that it will begin to operate the electric switch as soon as the slightest motion is imparted to the lifting-bar and somewhat in advance of the disengagement of the horizontal lifting-piece from the disk-lever. Consequently when the lifting-bar shall have been operated by the lever W the electric switch will have first been operated to set the motor in motion and time will have been allowed it to reach the required velocity before the machine begins to speak.

In order to interrupt the free motion of the horizontal rod J after the operation of the electric switch, a spring-actuated plunger B' may be provided. This plunger is fixed in a case C' to the bottom of the table in the path of the rod, so that the rod, after having operated the switch, will strike it and be impeded by it.

In Fig. 2 a modification is shown by which the cam mechanism for raising and lowering the lifting-bar may be dispensed with. In that figure the lifting-bar is shown as prolonged and fastened to a spring-actuated pedal D', that may be fastened to the floor and operated by foot.

The operation of my invention is as follows: Assuming that a record has been made upon the cylinder in the machine and that the operator is engaged in transcribing it, we will suppose that he has written out a sentence and desires to take up the record where he left off. The machine being in its normal condition of rest, he will with the knee touch the lever W and swing the cam-disk around, whereupon connection is made at the electric switch and the motor set in motion. Sufficient velocity will have been attained by the time the continued rotation of the cam-disk lowers the horizontal lifting-piece enough to bring the needle carried by the diaphragm in contact with the cylinder, so that as soon as this occurs the machine begins to speak clearly and distinctly. It will continue so to speak until its operation is interrupted by the release of the lever W, when the machine immediately returns to rest and all flow of electric current is interrupted.

I do not desire to confine myself to the details of construction herein described, because they may be varied in many ways without departing from the scope of my invention.

What I claim, broadly, is—

1. In a phonograph or talking-machine, the combination of a prime mover, a motor connected therewith so as to be started and stopped by the motion of the prime mover, the cylinder, and a diaphragm and needle also connected with the prime mover so as to be lowered and raised into and out of contact with the cylinder by the motion of the prime mover, substantially as set forth.

2. In a phonograph or talking-machine, the combination of a revoluble cylinder, a prime mover, an electric circuit, one member of which is connected with the prime mover so as to be thrown into and out of circuit thereby, and a diaphragm and needle, also connected with the prime mover so as to be thrown into and out of operative connection with the cylinder thereby, these elements being so arranged that a slight or partial movement of the prime mover will complete the electric circuit and a further movement will connect the diaphragm-needle with the cylinder, substantially as set forth.

3. The combination, with a phonograph provided with an electric motor and a source of electrical supply, of a switch interposed between the latter and the motor, a lifting-piece adapted to raise and lower the diaphragm of the phonograph, and connecting mechanism between the switch and the lift-

ing-piece, whereby they may be operated, substantially as set forth.

4. The combination, with a phonograph provided with an electric motor and a source of electrical supply, of an electric switch interposed between the latter and the motor, a lifting-piece adapted to raise and lower the diaphragm of the phonograph, and mechanism connecting the switch with the lifting-piece and arranged so as to operate the switch before operating the lifting-piece, substantially as and for the purpose specified.

5. The combination, with a phonograph and its table provided with an electric motor and a source of electrical supply, of a switch interposed between the latter and the motor, a lifting-piece adapted to operate the diaphragm of the phonograph, a lifting-bar secured to the lifting-piece and moving in fixed bearings upon the table, a cam secured to the lifting-bar, a rod connecting the switch thereto and adapted to be operated by the cam, and means for raising and lowering the lifting-bar, substantially as set forth.

In testimony of all of which I have hereunto subscribed my name.

HENRY T. HOLTZ.

Witnesses:

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S. G. HOPKINS.