

939,692.

Patented Nov. 9, 1909.

Fig. 2.

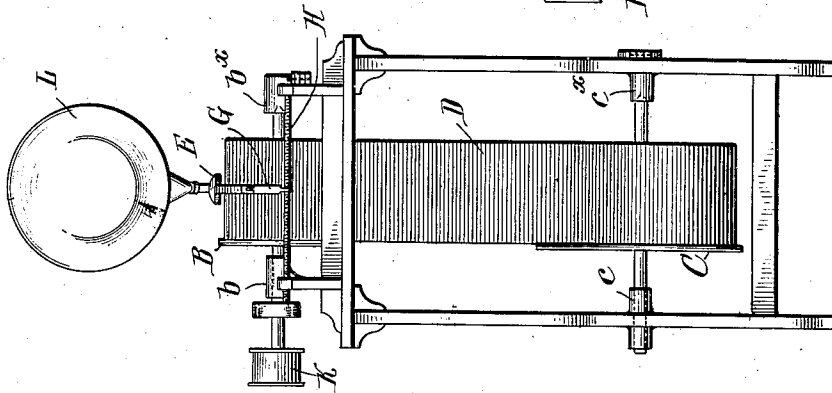


Fig. 1.

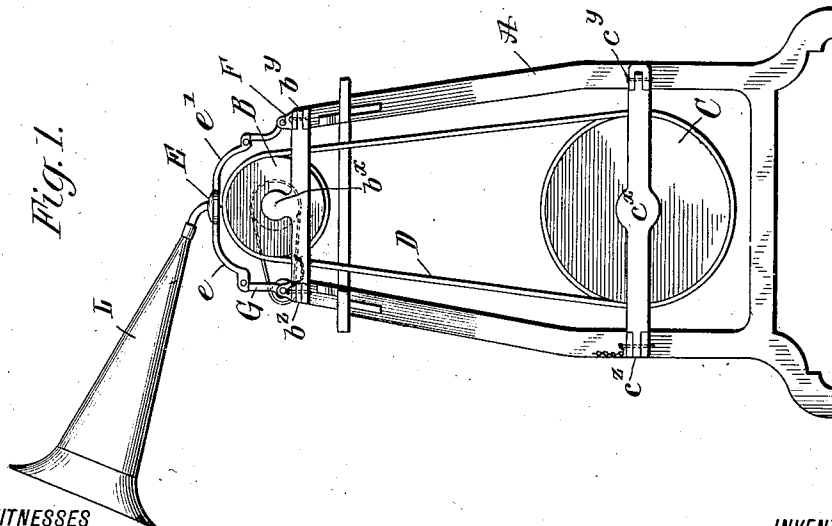
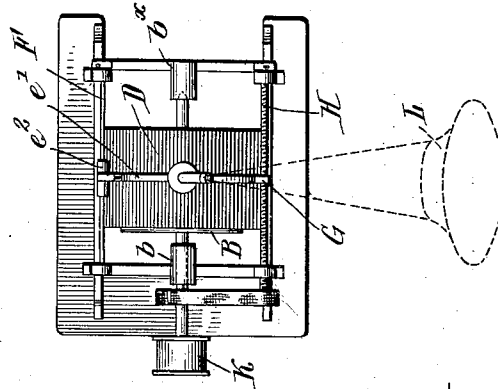


Fig. 3.



WITNESSES

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PHONOGRAPH.

939,692.

Specification of Letters Patent.

Patented Nov. 9, 1909.

Application filed December 22, 1908. Serial No. 468,815.

To all whom it may concern:

Be it known that I, FRANK E. HOLMAN, a citizen of the United States, and a resident of Silverton, in the county of Marion and State of Oregon, have made certain new and useful Improvements in Phonographs, of which the following is a specification.

My invention relates to improvements in means for increasing the available recording surface in phonographs, and it consists in the constructions, combinations and arrangements hereinafter described and claimed.

An object of my invention is to provide a phonograph in which a record surface of a flexible nature and having a relatively great length may be inserted, or removed, and in which the bearing members for the cylinder are pivoted to admit the removal or replacement of the record.

A further object of my invention is to provide a record applicable to a cylinder type, in which the virtual diameter of the record is greatly increased, while the actual diameter is not.

Other objects and advantages will appear in the following specification and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 shows an end view of a phonograph containing one embodiment of my invention. Fig. 2 shows a side view thereof, and Fig. 3 is a plan view.

In carrying out my invention I provide a frame A in which is supported the upper feed roller B having a flange b^x on one end and a lower roller C, having a similar flange c^x . These rollers are journaled in the bearings b and b^x and c and c^x , respectively, carried by the uprights of the frame A. The bearings b and c are elongated as shown in Fig. 2 in order to support their respective shafts when the cone bearings B^x and C^x are removed from the ends of the shaft. The cone bearings b^x and c^x are hinged to one of the uprights of the frame A at b^y and c^y , respectively, and may be locked at the opposite ends b^z and c^z , as clearly shown in Fig. 1. This construction is for the purpose of enabling the assembling of these cylinders and also for slipping on the flexible record D.

The flexible record D is preferably an endless band composed of any suitable material

which will permit a bending of the band or belt, such as the films of moving picture machines. A belt may be coated with a composition which will permit the making and keeping of the phonographic record. The belt may be made of any size and of a length corresponding to the height of the frame A. A longer belt would be used with a correspondingly higher frame, thus giving a greater record surface. The belt may be of any width, but in practice I find it preferable to use a belt with a virtual diameter of thirty-six inches and a width of six inches on a feed cylinder of approximately five inches in diameter. After the belt is slipped on, the slack may be adjusted to the proper degree by a movement of the upper part of the frame relatively to the lower or by a movement of the bearings of one of the rollers. The roller C may be of any convenient diameter and serves merely as an idler.

The diaphragm E may be any standard diaphragm and is preferably supported by means of the arms e and e' . The arm e' is provided with a guide sleeve e^2 arranged to travel back and forth on the guide rod F. The arm e on the opposite side is provided with a feed member G arranged to cooperate with a feed screw H. The feed roller B may be driven by means of a belt (not shown) running over a drive pulley K, by any suitable power. The diaphragm may be provided with the usual horn or sound intensifier L.

From the foregoing description of the various parts of the device the operation thereof may be readily understood. When the machine is assembled in the manner already indicated and the needle is placed at one edge of the continuous band, the rotation of the feed cylinder $\tilde{s}$ will cause the belt to move under the needle and the action of the feed screw will cause the needle to be shifted longitudinally of the belt. It will thus be seen that with a feed cylinder, say of five inches diameter, the effect of an endless belt traveling over said cylinder will be that of a cylinder of a virtual diameter equaling that of the belt, thereby giving a much larger record surface without much increase in the feed cylinder. Of course the feed screw H may be made to advance the needle transversely of the belt, *i. e.* longitudinally of the feed cylinder at any predetermined rate. By using a record belt of a virtual diameter

of thirty-six inches with ninety-six threads upon the feed screw for every inch in length of the feed cylinder (or width of the belt), we will obtain a record having a length approximately sixteen times the length of the ordinary cylinder record. Used at the same record speed of the ordinary cylinder machine, it will require nearly fifty-eight minutes time to reproduce this record.

10 In the effort to make phonographs of comparatively small size but with large record surface for use in connection with motion pictures, it will be at once apparent that this device furnishes a means for overcoming the
15 obstacles in connection with the recording, or rather reproduction, of long speeches to correspond with, or accompany, the actions of the characters in the motion pictures. So also an opera of considerable length may be
20 recorded by means of a machine equipped with my invention.

While I have shown this device as consisting of a frame of a special form, it will be understood that any frame suitable for the
25 purpose may be used and that it may be made of iron or wood or other appropriate material. I am also aware that other forms of the device based upon the same general idea might be made but I consider as my
30 own and desire to claim all such modifications as fairly fall within the spirit and scope of the invention.

I claim—

1. In a phonograph, a frame, a feed roller
35 arranged in one end of said frame, an idler

arranged in the other end of said frame, hinged bearings for said feed roller and said idler, a flexible recording surface carried by said feed roller and said idler, said recording surface consisting of an endless belt arranged to run on both of said rollers, and a stylus arranged to engage said recording surface.

2. In a phonograph, a frame provided with upper and lower stationary bearings, a feed roller mounted in said upper bearings, an idler mounted in said lower bearings, upper and lower hinged bearings carried by said frame and arranged to swing into alignment with the respective upper and lower
50 stationary bearings and a flexible recording surface carried by said rollers.

3. In a phonograph, a frame provided with upper and lower stationary bearings, a shaft having a guide flange on the end of the roller adjacent the stationary bearing, a
55 lower shaft journaled in said lower stationary bearing, an idler carried by said lower shaft and provided with a flange on the end adjacent the stationary bearing, and upper
60 and lower hinged bearings carried by said frame and arranged to swing into alignment with their respective stationary bearings and adapted to engage the ends of the upper and lower shafts respectively.

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Witnesses:

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