

No. 712,930.

Patented Nov. 4, 1902.

D. HIGHAM.

SOUND REPRODUCING APPARATUS.

(Application filed June 17, 1902.)

(No Model.)

Fig. 1

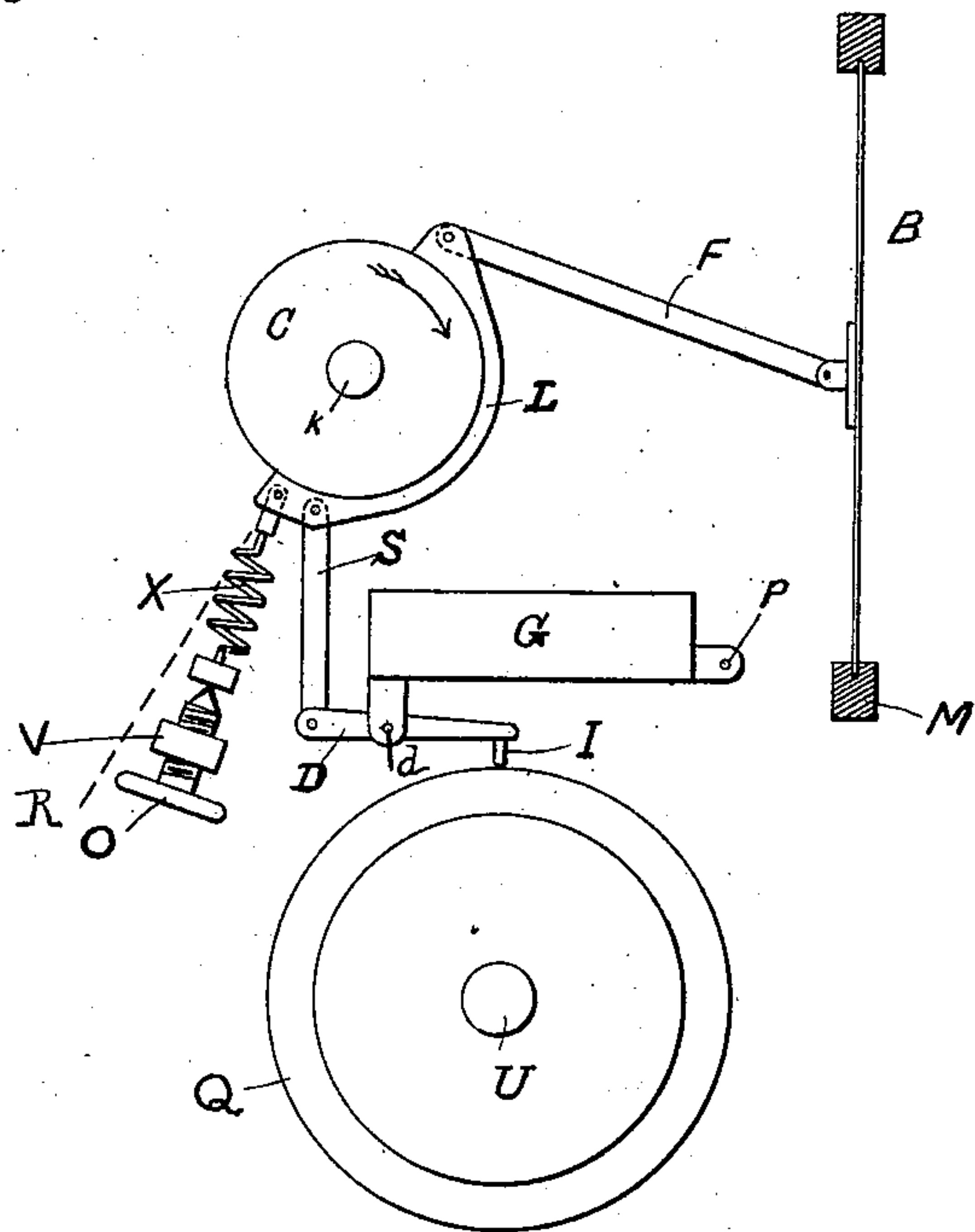
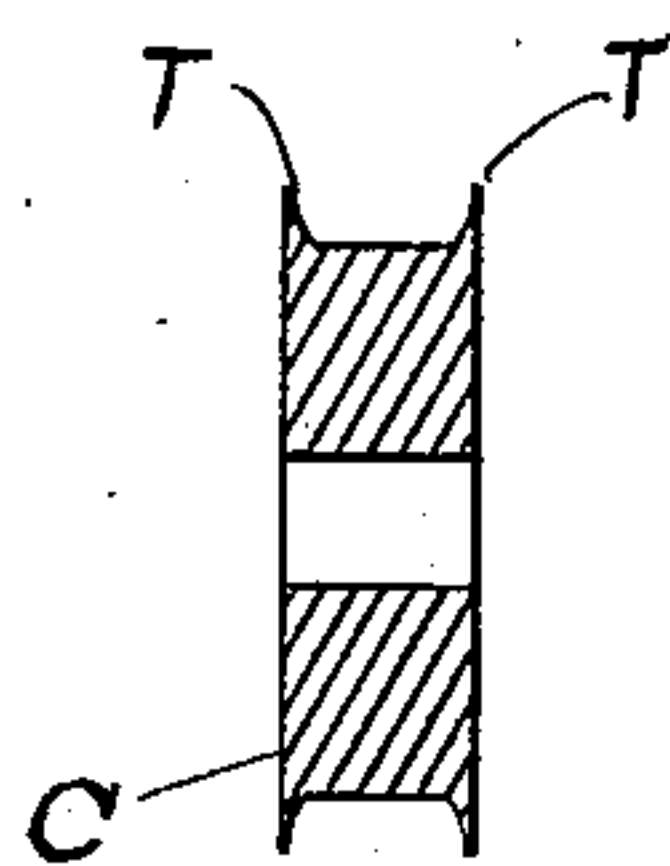


Fig. 2



WITNESSES:

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DANIEL HIGHAM, OF WINTHROP HIGHLANDS, MASSACHUSETTS.

SOUND-REPRODUCING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 712,930, dated November 4, 1902.

Application filed June 17, 1902. Serial No. 112,080. (No model.)

To all whom it may concern:

Be it known that I, DANIEL HIGHAM, a citizen of the United States of America, residing at Winthrop Highlands, in the county of Suffolk, in the State of Massachusetts, have invented Improved Sound-Reproducing Apparatus, of which the following is a specification.

This invention relates to that method of reproducing a vibrating energy corresponding to sound-waves with increased power which is described in my Letters Patent dated July 16, 1901, numbered 678,566. The phonic apparatus of my said patent comprises a "primary" vibrating means acting upon a frictional means to vibrate the pressure at the frictional contact and "secondary" vibrating means responding to the resultant vibrating frictional force exerted by the frictional means.

The object of the present invention is to produce a more effective construction and combination of parts for the frictional means, as will be clearly understood by reference to the accompanying drawings, in which—

Figure 1 is a diagrammatical illustration of my invention, and Fig. 2 is an illustration in cross-section.

In the example illustrated in Fig. 1, B is a diaphragm supported by a frame M. (Shown in cross-section.) C is a roll revolved from any suitable source of motive power around an axis k in the direction of the arrow. L is a shoe held in frictional contact with the roll C by a compression or push spring X, supported at V. O is a set-screw serving in the present instance for the adjustment of the spring X, and F is a link connecting the shoe L to the diaphragm B. Q is a recorded phonographic tablet revolved around an axis U and advanced by any usual or suitable means against a tracing-stylus I. This stylus is carried by a lever D, fulcrumed at d upon a weight G, which is hinged at a fixed point P. A link S connects the lever D to the shoe L.

In Fig. 2 a cross-section of the roll C is shown as provided with flange-like projections T, which will be desirable in practice to guide the shoe L.

The operation of the device as thus constructed is as follows: When the roll C and tablet Q are revolved, the spring X being ad-

justed to hold the shoe L in contact with the roll C and to sustain the weight G, which rests upon the lever D and link S, the weight G will act to hold the stylus I in contact with tablet Q, even if the tablet be slightly out of round, while relatively to the rapidity of the inscribed vibrations corresponding to sound-waves upon the rotating tablet the weight G will act as a substantially fixed fulcrum for the lever D, a fact well known in the phonographic art. The vibrating energy imparted to the lever D by the rotating tablet Q will therefore be transmitted through the link S to the shoe L and impart corresponding vibration to the pressure exerted by the spring X upon the frictional contact of the shoe L with the roll C, whereby the frictional force exerted by the rotating roll C through the shoe L and link F against the diaphragm B will receive corresponding vibrations, as will be readily understood in view of the art as disclosed in my said Letters Patent of July 16, 1901. In the present constructional arrangement, however, an elastic means or spring X acts to force the shoe L in the direction of rotation of roll C, while the tensional link S, connected to the lever D, acts to hold back the movement of the shoe L in relation to the rotation of roll C, whereas in the construction illustrated in my said Letters Patent the lever means acted to force the shoe in the direction of rotation of the roll and the retractile action of the secondary vibrating means was depended upon to pull the shoe backward in relation to the direction of rotation of the roll. The advantage of my present construction is that the to-and-fro vibrating movement of shoe L, corresponding to sound-waves, will be more accurately effected, since the shoe L will not be so sluggish in its backward movement relatively to the direction of rotation of the roll C and not so apt to move too far in the direction of rotation of the roll C, as is liable to be the case when the frictional coefficient is high at the frictional contact of the shoe L with the roll C. The angle of push of the spring X for best results should lean backward from the radial line R, passing from the axis of the roll C through the connection of the spring X with the shoe L—that is to say, backward in relation to the direction of rotation of roll C.

It will be understood that modifications of the precise construction or arrangement of parts could be made without departing from the scope of my invention, and I shall therefore refer in the claims which follow to the rotating recorded tablet Q and stylus I, which set up vibrating energy, as "primary vibrating means," to the diaphragm B, which responds to vibrating energy, as "secondary vibrating means," to the rotating roll C and shoe L as "frictional means," to the lever D and link S as "lever means," and to the spring X as "elastic means."

I claim as my invention—

1. In a sound-reproducing apparatus, the combination of primary vibrating means and secondary vibrating means, and frictional means controlling said secondary vibrating means, with elastic means acting to increase the pressure at the frictional contact of said frictional means, and with lever means, controlled by said primary means, acting to re-

duce the pressure at the frictional contact of said frictional means, substantially as and for the purpose described.

2. In a sound-reproducing apparatus, the combination of primary vibrating means and secondary vibrating means, and frictional means controlling said secondary vibrating means, said frictional means comprising a rotating roll and a shoe in frictional contact therewith, with elastic means acting to push said shoe in the direction of rotation of said roll, and lever means controlled by said primary vibrating means acting to pull back the said shoe relatively to the direction of rotation of said roll, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DANIEL HIGHAM.

Witnesses:

A. N. BONNEY,
B. W. WILLIAMS.