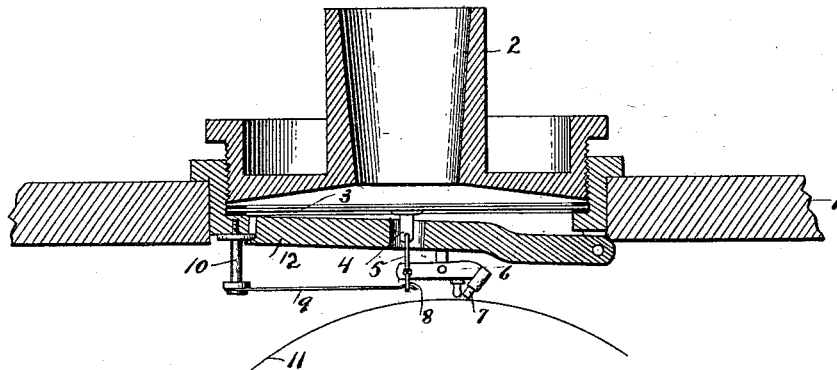


(No Model.)

T. A. EDISON.  
PHONOGRAPH.

No. 454,942.

Patented June 30, 1891.



Witnesses  
Norris A. Clark  
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# UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF LLEWELLYN PARK, NEW JERSEY.

## PHONOGRAPH.

SPECIFICATION forming part of Letters Patent No. 454,942, dated June 30, 1891.

Application filed July 30, 1890. Serial No. 360,346. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS A. EDISON, a citizen of the United States, residing at Llewellyn Park, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in Phonographs, (Case No. 866,) of which the following is a specification.

The object of the present invention is to provide a construction in which motion imparted to a phonograph-diaphragm by sound-waves shall be transmitted correctly and unimpaired to the recorder, and conversely in which all movements of the reproducer caused by the phonogram-record shall be transmitted to the diaphragm; and the invention consists in a tension-spring for the recorder and reproducer carrying arm, said arm being connected to the diaphragm, substantially as hereinafter described and claimed.

In the accompanying drawing, which illustrates the invention, the figure is a central section of a phonograph recorder or reproducer, with the operating-points and the means by which the same are connected to the diaphragm and the tension-spring shown in elevation.

1 is a section of the arm which carries the recorder and reproducer and which is usually sleeved on the guide-rod and connected through the sleeve to the guide or feeding arm, as is well understood in this class of instruments.

2 is a projecting tube, to which a speaking or hearing tube may be attached in the usual manner.

3 is a diaphragm, to the center of which is attached a post 4.

5 is a link or a wire having a hook at each end extending from a hole in post 4 to a hole near one end of lever 6, whose pivot is carried by the weight or retarding device 12, which carries the recorder 7 and the reproducer.

8 is a second link or similar device on the opposite side of the pivoted lever 6. In this link bears one end of a tension-spring 9, which is supported on the stationary post 10. It will be understood that the movement of weight 12 is limited in both directions by the projec-

tion at its outer end, which strikes against the flanges or heads of post 10.

11 is a phonogram-blank.

In using the apparatus above described the spring 9 serves to throw the lever 6 away from the diaphragm and to keep the loose or jointed connection between the diaphragm and lever firm and tight, thus preventing all lost motion between the diaphragm and recorder or between the reproducer and diaphragm and insuring a more perfect reproduction or record than could be otherwise obtained. It is found much more efficient to connect the spring to lever 6 by means of a link than to have it bear directly on the lever itself. With the latter arrangement there appears to be a rubbing action between the spring and lever, which is somewhat objectionable.

Having thus described the invention, what I claim is—

1. The combination, in a phonograph, of a pivoted operating-point, a yielding link connection between the point and the diaphragm, and a spring acting on the point, substantially as described.

2. The combination of a phonograph-diaphragm, a post on the diaphragm, a pivoted recorder or reproducer, a link forming a yielding connection between said post and recorder or reproducer, and a spring the tension of which moves the recorder or reproducer arm forward when the diaphragm moves forward, substantially as described.

3. The combination, in a phonograph, of an operating-point connected with a diaphragm by a loose or flexible connection, and a spring supported independently of the diaphragm, acting on said point and preventing lost motion, substantially as described.

4. The combination, in a phonograph, of a diaphragm, an operating-point supported on a weight and connected to the diaphragm, and a spring acting on the point to prevent lost motion, substantially as described.

5. The combination, in a phonograph, of an operating-point pivoted and connected to the diaphragm by a loose or jointed connection, the link or similar device and the spring acting on the operating-point through said

link and in opposition to the diaphragm, substantially as described.

6. The combination, in a phonograph, of an operating-point pivotally connected to the retarding plate or block and having a jointed  
5 connection with the diaphragm, and a spring supported on a fixed part of the apparatus and pressing against the operating-point

through a loose or yielding connection, substantially as described.

This specification signed and witnessed this  
5th day of July, 1890.

THOS. A. EDISON.

Witnesses:

T. E. COURAN,  
W. PELZER.