

No. 625,957.

Patented May 30, 1899.

T. S. PARVIN.
GRAMOPHONE.

(Application filed Dec. 20, 1897.)

(No Model.)

Fig. 1.

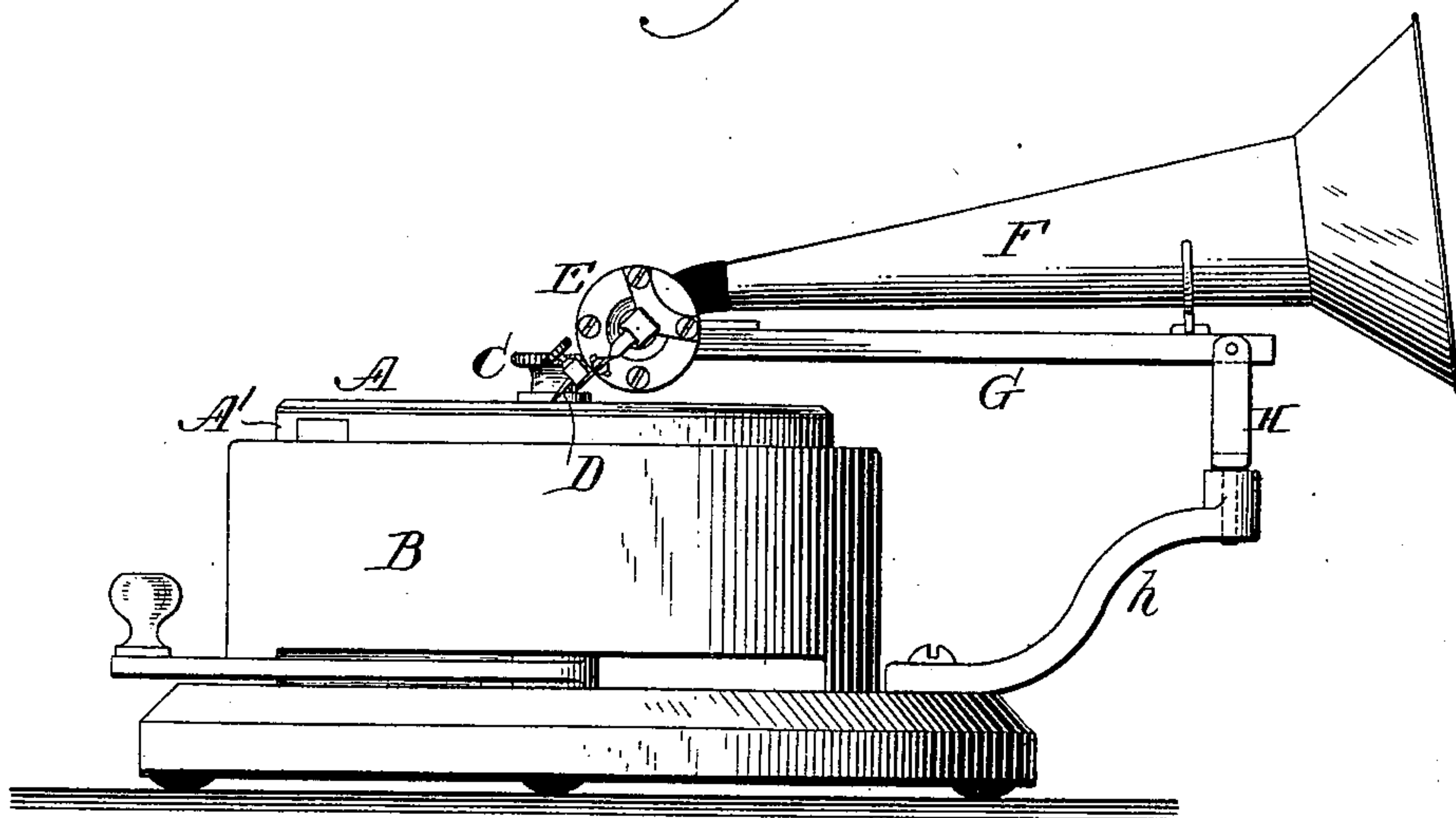


Fig. 2.

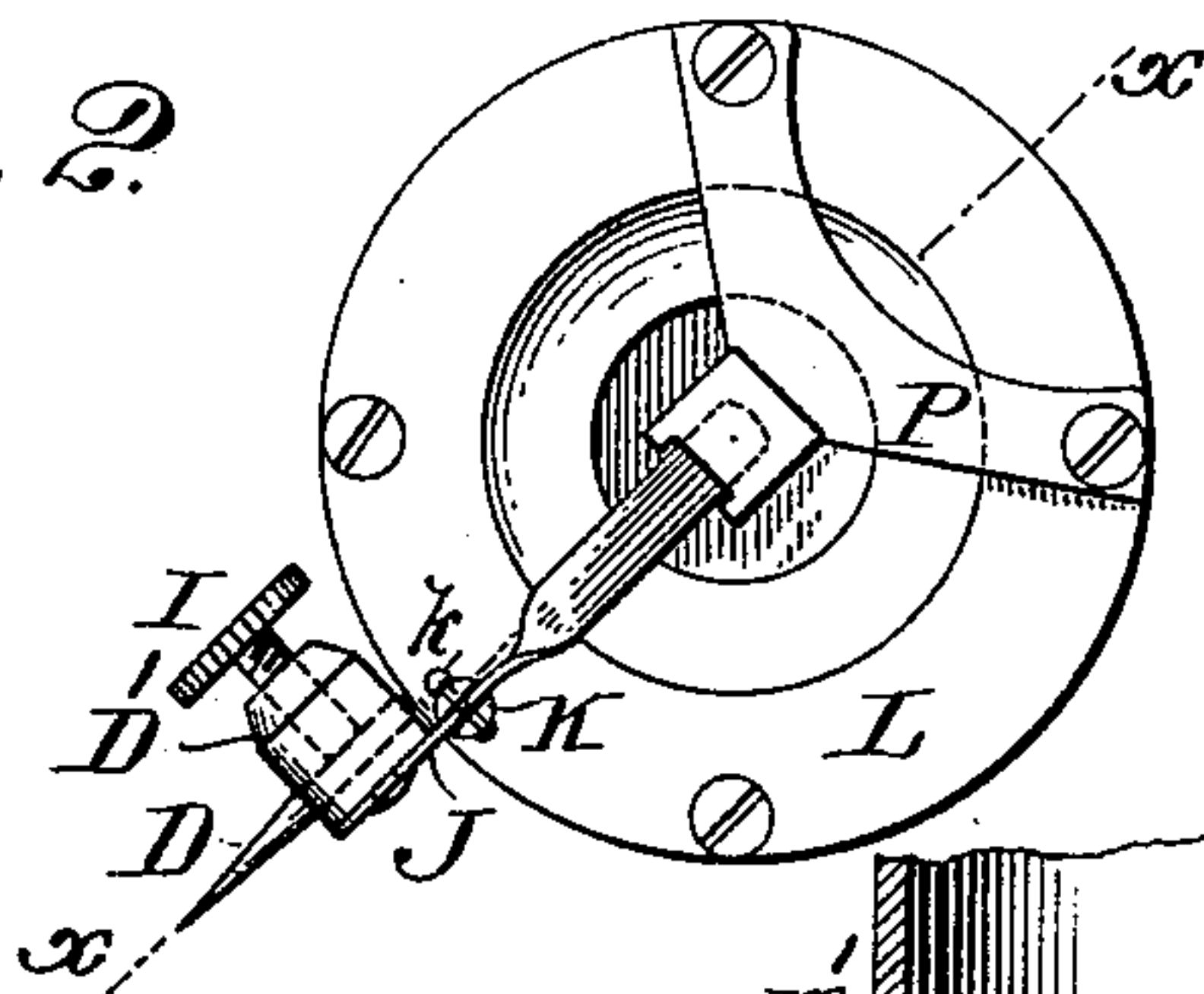


Fig. 3.

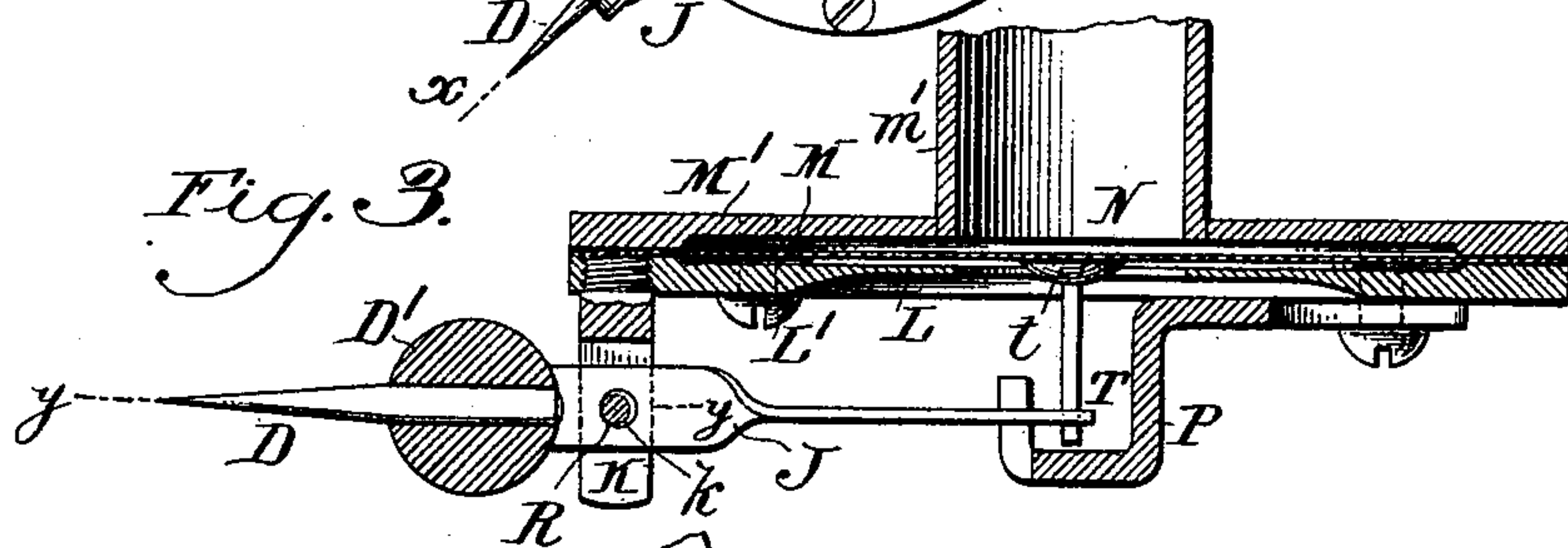
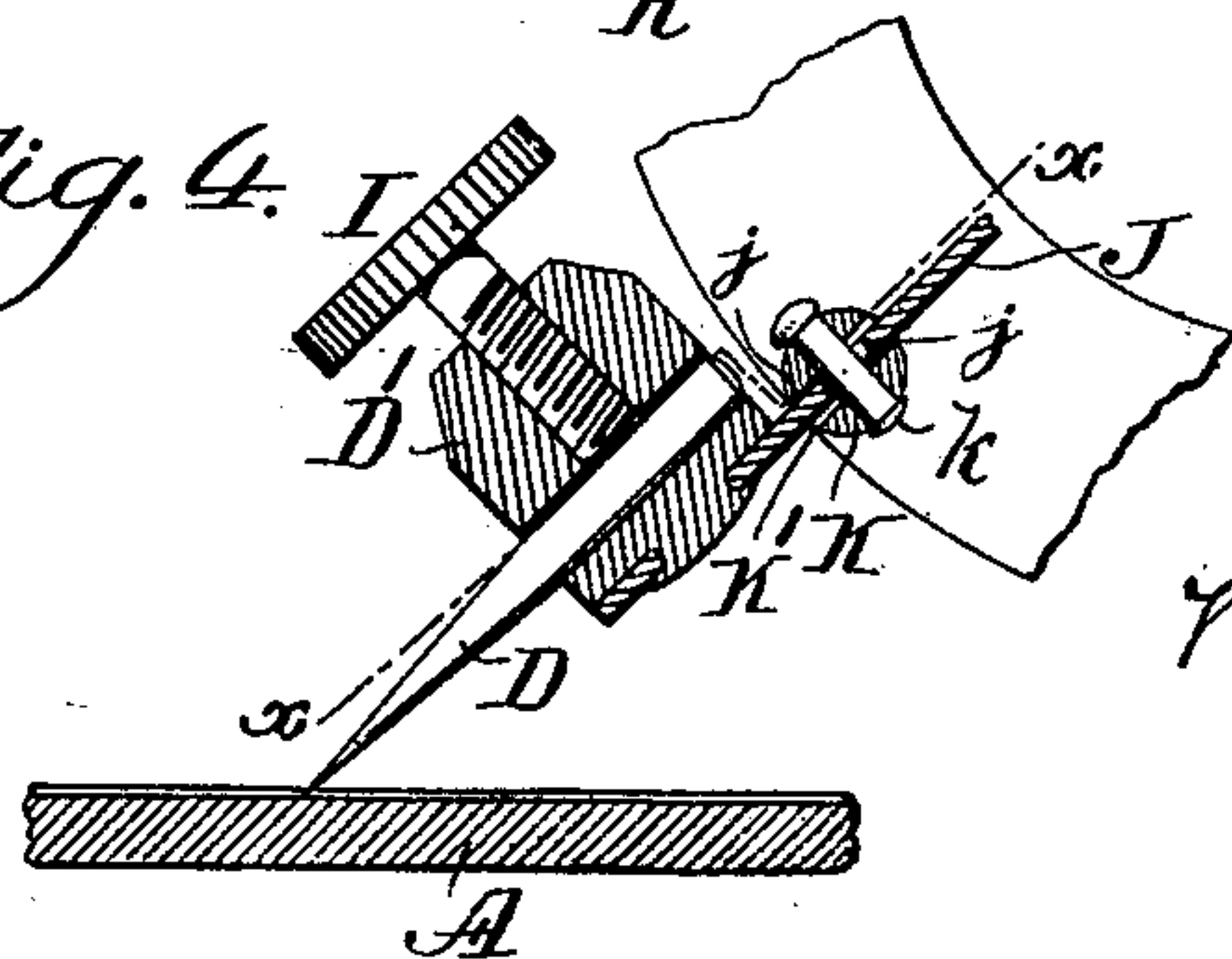


Fig. 4.



Witnesses.

Harry Dwyer
C. M. Kelly.

Inventor.

Thomas S. Parvin
By his atty

J. M. M. S. P.

Attorney.

UNITED STATES PATENT OFFICE.

THOMAS S. PARVIN, OF PHILADELPHIA, PENNSYLVANIA.

GRAMOPHONE.

SPECIFICATION forming part of Letters Patent No. 625,957, dated May 30, 1899.

Application filed December 20, 1897. Serial No. 662,537. (No model.)

To all whom it may concern:

Be it known that I, THOMAS S. PARVIN, of the city and county of Philadelphia, State of Pennsylvania, have invented an Improvement in Gramophones, of which the following is a specification.

My invention has reference to improvements in gramophones; and it consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawings, which form a part thereof.

The object of my invention is to provide a construction for sounding-boxes for producing vibrations of the air in accordance with the irregular grooves of the transmitting-plate which shall be exceedingly simple in construction, cheap to manufacture, and at the same time be exceedingly sensitive to the smallest variation in the grooves of the moving plate or disk containing the sound tracings or grooves. My construction is such that the smallest movement imparted to the needle or point is quickly transmitted to the diaphragm, causing it to respond with great rapidity and accuracy.

In carrying out my improvements I arrange a diaphragm between two plates of a sound-box constituted so as to form a thin air-space upon each side of the said diaphragm, one of said plates being formed with a sound-tube, to which the horn or ear-tube is connected by means of a piece of flexible tubing. The other of said plates of the sound-box is formed with a central aperture, through which a transmitting-pin extends from the diaphragm to the needle-carrying lever, which is jointed to the head with provision for universal movement and in such manner as to be free to move in all directions, but preferably with a tendency to centralizing itself when not under vibration. In this manner I am enabled to employ a transmitting structure between the moving plate and the diaphragm which shall be exceedingly sensitive and at the same time simple in construction and not liable to get out of order.

My invention will be better understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a gramophone embodying my improvements. Fig. 2 is an

elevation of the sound-box. Fig. 3 is a sectional view on line *x x* of Fig. 2; and Fig. 4 is a sectional elevation on line *y y* of Fig. 3, showing the needle or point and its support.

A is the revolving disk or plate upon which the sound tracings or grooves are formed. This plate is clamped in position at C upon a suitable revolving plate A', driven by a power mechanism contained within the box B.

E is the sound-box and is carried on the end of a frame or arm G, connected by a universal joint H with a bracket or support *h*. The sound-box E is provided with a needle-point D, which rests in the grooves of the disk A and is vibrated laterally thereby for the purpose of imparting vibrations to the diaphragm M of the said sound-box. The sound-box is connected by a flexible tube with the horn or trumpet F, which is also sustained by the universal-jointed arm G. It is evident that in place of the horn ordinary ear-tubes may be employed.

I will now refer more particularly to the details of construction of the sound-box.

M' is a plate having the central aperture *m'*, which connects with the horn or trumpet F and from which the sound-waves are transmitted. The plate M' is provided with an annular offset to form a shallow air-space between the diaphragm M and the surface of said plate M'. The diaphragm is clamped between the rim of the plate M' and the rim of an annular plate L, also having a central aperture, and further provided with an annular offset to form a second shallow air-space L' upon the opposite side of the diaphragm. In this manner the diaphragm is free to vibrate except at its extreme rim, and by properly proportioning the air-spaces the clearness of the sound-waves transmitted is largely dependent. Secured to the annular plate L and projecting therefrom is a post K, having formed therein a radial or oblique slot K'. The post is so constructed that the sides of the slot preferably present one or more straight edges.

J is a pivoted bar preferably formed of a twisted piece of flat metal presenting two flattened surfaces at right angles to each other. One of these flattened surfaces loosely fits in the slot K' of the post K and, furthermore, is provided with an aperture R, through which a

pin *k*, carried by the post, extends, so as to loosely confine the lever *J* within the slot of the post. Also secured upon the outer end of the lever *J* is a clamp *D'*, containing a hole for receiving a needle-point *D* and also provided with a clamping-screw *I* for detachably holding the needle or point in the clamp. The other or inner end of the lever is provided with a pin *T*, which is preferably soldered or otherwise secured to the lever. The other end of the pin *T* is attached to the center of the diaphragm *M* in any suitable manner, but preferably by means of a wax joint *t*, since this enables a direct connection between the metal pin and diaphragm, but unites the two in a manner to constitute a more or less flexible joint. The diaphragm may be formed of this sheet metal, mica, celluloid, or other suitable material.

To prevent accidental detachment of the pin *T* from the diaphragm by any sudden jar on the needle, I provide a guard *P*, which is fastened by screws to the head and overhangs the end of the lever *J* immediately below the pin *T*. This construction gives sufficient clearance to permit the free movement of the lever *J*, but at the same time acts as an abutment thereto in case of accidental and excessive movement, so as to prevent any abnormal strain being put upon the wax joint, which might rupture it. While the lever *J* is shown as made fairly light, it is not necessarily flexible and is made in the particular shape shown on account of cheapness and lightness. It will be observed that as the lever *J* extends obliquely downward, as shown in Figs. 1, 2, and 4, it passes through the slot *K'* of the post *K* in such a manner as to rest against the two diagonally opposite edges *j j* of the slot, the said edges acting, in effect, as loose supports. The pin *k*, which acts as the pivot for holding the lever *J* in position, passes through the hole *R* in the lever *J*, which latter is of larger diameter. As the needle or point *D* is supported upon the plate *A*, it is seen that the sound-box and its pin *k* are moved so that the pin rests upon the top curved edge of lower curved side of the aperture *R*, as indicated clearly in Figs. 3 and 4. The effect of this is to permit the most easy lateral oscillation of the lever *J*, since the contact of the pin *k* with said lever is upon a point or line. The friction, however, of the lever *J* upon the edges *j* of the post acts as a damper to prevent undue vibration of the lever *J* and cause it to respond only to the action of the irregularities of the curves in the grooves of the plate *A*. It is thus seen that the lateral vibration of the lever *J* is amply provided for and that the size of the aperture *R* being in excess of the diameter of the pin *K* and the junction *t* with the diaphragm being formed of a flexible material, such as wax, the free movement of the diaphragm is permitted under the action of the needle in every direction without binding upon the lever *J*. In view of this freedom of movement without loose-

ness in operation the instrument is exceedingly sensitive and responds to the finest irregularities in the tracings on the revolving disk.

While I prefer the construction shown, I do not limit myself to the minor details thereof, as these may be modified without departing from the spirit of my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a gramophone sound-box, the combination of a diaphragm, a box inclosing said diaphragm and supporting it with provision for vibration, a lever connected at one end with the center of the diaphragm by a cemented joint and at the other end provided with a clamp, a loose pivoted connection wholly of metal between the sound-box and the lever intermediate of its ends, a detachable needle or point held in the clamp, and an abutment secured to the sound-box extending over the end of the lever adjacent to the center of the diaphragm but without contact therewith to limit the possible vibration of said lever.

2. In a gramophone, a sound-box consisting of a suspended box structure containing a diaphragm free to vibrate, in combination with a post arranged near the periphery of the diaphragm and supported by the box provided with an oblique slot arranged at substantially right angles to the diaphragm, a transverse pin or pivot extending through the post and at right angles to the slot therein, a lever loosely arranged in the slot of the post so as to rest against diagonally opposite edges of the slot thereof and having an aperture through which the pin passes of considerably larger size than the pin to form a loose joint with contact at only one side of the pin and hole, a joint connection between one end of the lever and the center of the diaphragm, a clamp secured to the other end of the lever, and a needle or point held in said clamp, the construction being such that the weight of the sound-box is transmitted to the lever through the diametrically opposite edges of the slotted post.

3. In a gramophone, a sound-box consisting of a box structure containing a diaphragm free to vibrate, in combination with a post arranged near the periphery of the diaphragm and supported by the box provided with an oblique slot arranged at substantially right angles to the diaphragm, a transverse pin or pivot extending through the post and at right angles to the slot therein, a lever loosely arranged in the slot of the post and having an aperture through which the pin passes of considerably larger size than the pin to form a loose joint with contact at only one side of the pin and hole, a connection between one end of the lever and the center of the diaphragm, a clamp secured to the other end of the lever, a needle-point held in said clamp, and an abutment secured to the sound-box extending over the end of the lever adjacent to the

center of the diaphragm but without contact therewith except under abnormal movements of said lever whereby its possible vibration is restricted.

- 5 4. In a gramophone, the combination of a diaphragm, a suspended sound-box inclosing said diaphragm by annular walls, a slotted post extending from the sound-box near the periphery of the diaphragm, a lever arranged
10 obliquely to a horizontal plane carrying the weight of the sound-box and loosely pivoted in the slot of said post so as to put no torsional strain upon the diaphragm, a pivot-pin passing through the said post and lever
15 arranged substantially parallel to the plane of the diaphragm, a pin secured to the end of

the lever and extending toward the center of the diaphragm, a flexible connection between the end of said last-mentioned pin and the center of the diaphragm, a clamp secured to 20 the opposite end of the lever, a needle-point held in the clamp, and a sound-receiving tube opening from the sound-box on the side of the diaphragm opposite to its connection with the pivoted lever. 25

In testimony of which invention I hereunto set my hand.

THOS. S. PARVIN.

Witnesses:

EDWARD WINNEMORE,
HENRY K. SMITH.