

No. 692,363.

Patented Feb. 4, 1902.

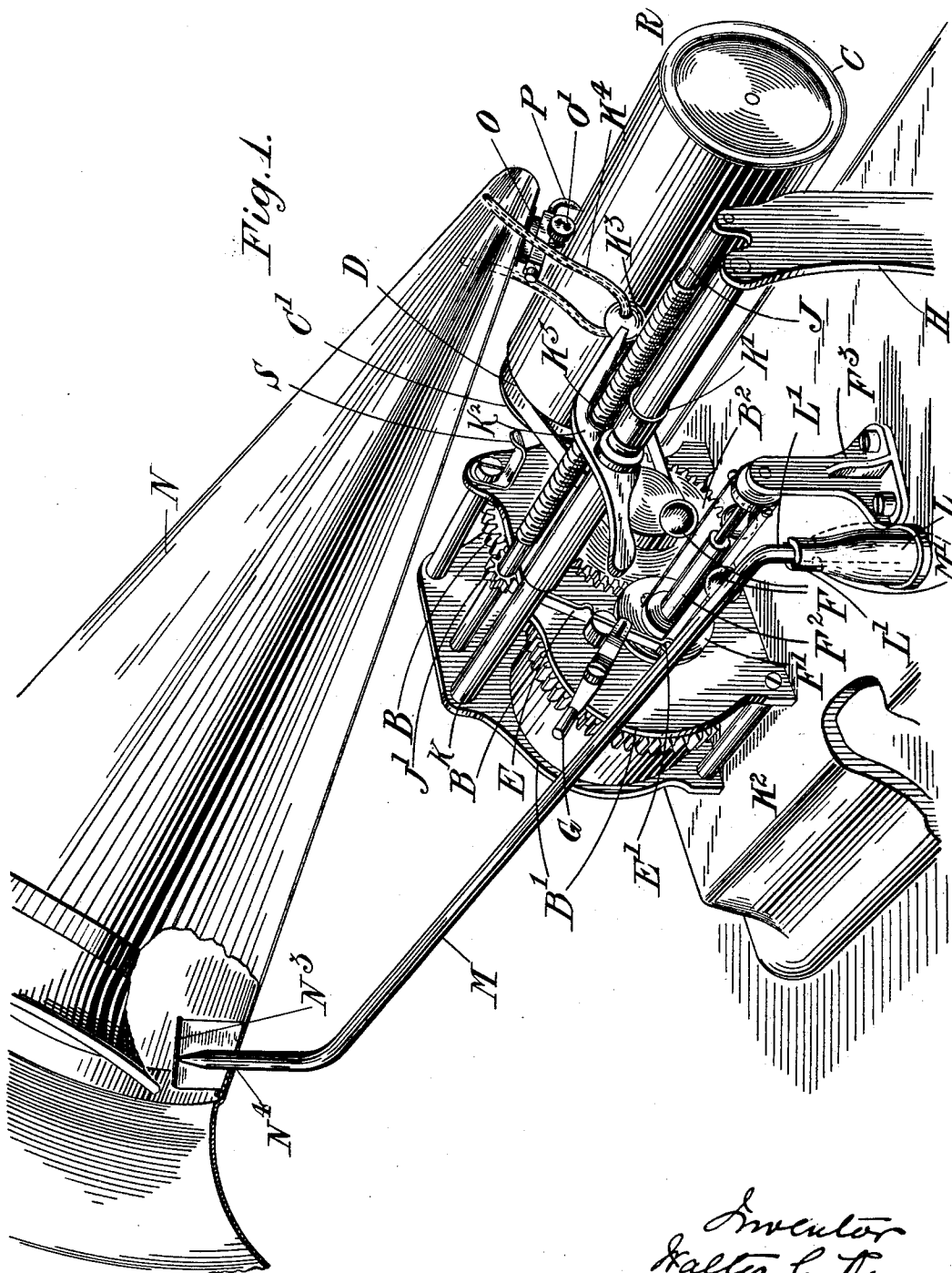
W. C. RUNGE.

GRAPHOPHONE, PHONOGRAPH, OR THE LIKE.

(Application filed June 3, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses  
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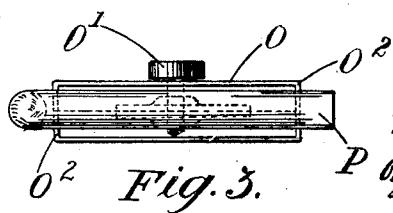
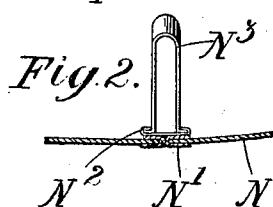
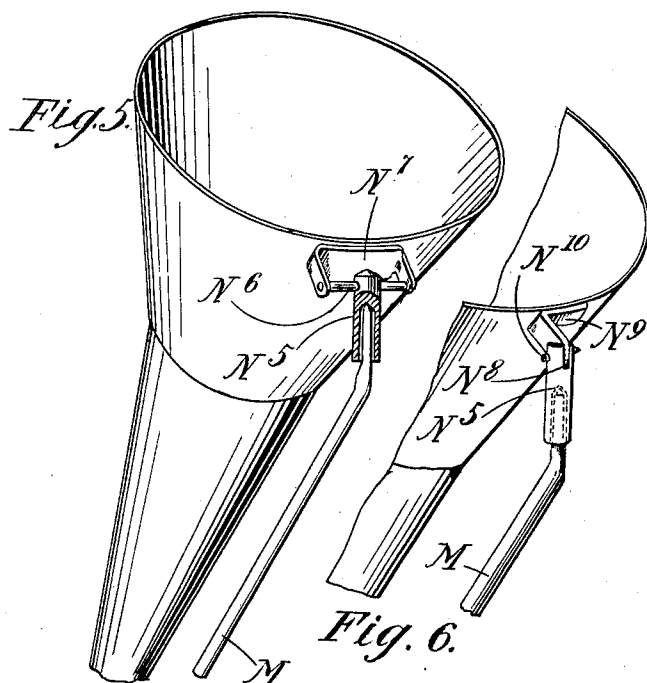
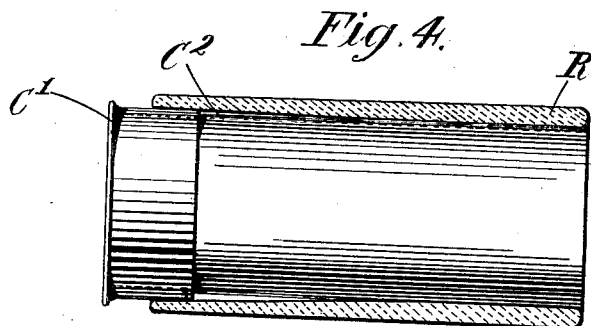
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(No Model.)

2 Sheets—Sheet 2.



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# UNITED STATES PATENT OFFICE.

WALTER C. RUNGE, OF LONDON, ENGLAND.

## GRAPHOPHONE, PHONOGRAPH, OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 692,363, dated February 4, 1902.

Application filed June 3, 1901. Serial No. 62,991. (No model.)

*To all whom it may concern:*

Be it known that I, WALTER C. RUNGE, a citizen of the United States of America, residing at London, England, have invented certain new and useful Improvements in or Relating to Graphophones, Phonographs, or the Like, (for which application has been made in Great Britain under No. 9,727, dated May 10, 1901,) of which the following is a specification.

This invention relates to graphophones, phonographs, and other like instruments for reproducing sounds from records, its object being the construction of an instrument which, while thoroughly efficient in operation, is simple and cheap to manufacture.

The improvements are primarily applicable to instruments which are not provided with a diaphragm at the small end of the trumpet, but have a stylus of hardened material attached to some part of the trumpet, the point of this stylus following the channels or grooves of the record in the well-known way. It is, however, to be understood that the improvements are not necessarily restricted to this particular type of instrument.

In the accompanying drawings, Figure 1 is a perspective view of one construction of graphophone embodying the improvements according to this invention. Figs. 2, 3, and 4 are detailed views showing portions of the instrument separately, and Figs. 5 and 6 are perspective views showing alternative constructions of another portion of the instrument.

Like letters indicate like parts throughout the drawings.

With reference first to Fig. 1, A is a base-plate, preferably of cast metal of considerable thickness, so that it may be heavy and rigid. Upon this base is fixed a motor, comprising in the example illustrated a train of wheels B, mounted between two plates B', one member B<sup>2</sup> of the train being preferably of hard fiber or other non-metallic material. From this motor a record-carrying mandrel C is driven by means of a belt D and a pulley C'. The train of wheels forming the motor is driven from a spring coiled in a barrel B<sup>3</sup> and wound up when necessary, and the rate of rotation of the record-mandrel C may be regulated by a lever E, controlled by a screwed

rod or other mechanism. (Not shown in the drawings.) One end of this lever E is furnished with a brake-block E'—say of leather—which presses against a disk F', connected to governors F, the action of the governors being to draw the disk F' away from the plate B' along a rod F<sup>2</sup>, supported between that plate and a standard F<sup>3</sup>, secured to the base A. A lever G is provided, by means of which the motor may be started and stopped.

Mounted free to turn between the outer plate B' and a standard H is a fine-threaded screw J, provided with a pinion J', which is driven from one of the wheels B. Parallel to this screw J and also held between the plate B' and the standard H is a rod K, which forms a guide upon which a sleeve K' can travel and turn. This sleeve K' forms part of a pivoted guide-carrier comprising also a lever K<sup>2</sup>, a head K<sup>3</sup>, and a guide-fork K<sup>4</sup>, the arms of the latter being covered with rubber tubing or other soft or yielding material. Normally the guide-carrier K<sup>2</sup> K<sup>3</sup> lies upon the fine-threaded screw J, as shown in Fig. 1, and it is provided with a knife-edge K<sup>5</sup> or otherwise adapted to engage with the thread of the screw J, so that when the latter rotates the guide-carrier may be caused to travel along the bar K.

Upon the base-plate A is a socket L, having a central vertical hole which accommodates the end of a rod M, the pointed extremity of which serves as a pivot to support the larger end of a sound-trumpet N. Slots L' are provided in the socket L, and pins M' upon the rod M engage with these slots when the rod M is in the socket, thus securing a definite position for the pivot of the sound-trumpet.

The sound-trumpet N may be made of any suitable material, preferably non-metallic—such, for instance, as tough paper, thin fiber, or celluloid. When sheet material, such as celluloid, is employed, the trumpet is conveniently made by providing the edges of the sheet with metal strips or grips, as shown at N' in Fig. 2, these strips being joined by soldering. In some constructions only one strip is used, its edges being turned over, so as to grip the edges of the sheet material of which the trumpet is formed. To the strips N' inside the larger end of the trumpet is at-

tached a small clip N<sup>2</sup>, forming a slide, into which the edges of a U-shaped piece of metal N<sup>3</sup> are inserted. The pointed end of the rod M passes through a hole N<sup>4</sup> and rests against the inside of the curved portion of the U-shaped piece N<sup>3</sup>. This U-shaped member is preferably formed so that the longitudinal portion which rests upon the point of the rod M is approximately horizontal, thus obviating the danger of any binding action taking place.

Near the smaller end of the trumpet N a socket O is provided to accommodate the stylus P, which may be of any hard material—say, for instance, glass rod or tubing. The socket O is preferably formed of spring metal and provided with a screw O', so that the stylus may be securely gripped. In the construction shown in detail in Fig. 3 the ends of the socket are turned in, as at O<sup>2</sup>, so that the stylus is gripped by each end of the socket, the clamping-screw O' being in the middle.

In operation the larger end of the trumpet is pivoted, as above described, on its supporting-rod M, the smaller end passes between the arms of the fork K<sup>4</sup> of the pivoted carrier, and the point of the stylus P rests upon a record-cylinder R, which is mounted friction-tight upon the mandrel C. This mandrel may be made, as shown in Fig. 4, of a piece of light tubing C<sup>2</sup>, the diameter of which corresponds to that of the smaller end of the coned interior of the record R. At one end the tube C<sup>2</sup> is secured to a ring which fits the inside diameter of the larger end of the record R and conveniently forms part of the pulley C'. This ring may, if desired, be slightly coned in order to fit the adjacent portion of the interior of the record.

It is to be understood that the apparatus is so constructed that the point of the stylus P rests with a slight amount of pressure upon the record R. The guide-carrier K<sup>2</sup> K<sup>3</sup> and fork K<sup>4</sup> are not intended to take the weight of the trumpet, their function being primarily to act as a guide for the smaller end of the trumpet and prevent any danger of the point of the stylus quitting the grooves or channels in the record.

In order that the point of the stylus P may be withdrawn from contact with the record R or any adjacent part of the mechanism when the instrument is not in use, a small safety catch or bracket S is provided, attached to one of the plates B'. By depressing the back end of the carrier-lever K<sup>2</sup> the knife-edge K<sup>5</sup> is disengaged from the screw J and the lower end of the trumpet, with the stylus P, is lifted in the guide-fork K<sup>4</sup>, and the head K<sup>3</sup> is then allowed to rest in the catch S, in which position the stylus is out of contact with adjacent portions of the instrument.

The rest or catch is not necessarily in the form of the bracket S. It may, for example, be formed by causing the arms of the fork K<sup>4</sup> to approach one another in a V shape below the portion receiving the trumpet, so that

when the back end of the lever K<sup>2</sup> is depressed this contracted or V-shaped part of the fork engages with, say, the back of the stylus-clip and lifts it, with the trumpet, clear of the record.

Figs. 5 and 6 show portions of sound-trumpets made according to an alternative construction of this invention. In each of these forms a pivoted socket N<sup>5</sup> is provided, which accommodates the pointed end of the rod M. In Fig. 5 this socket is shown provided with a cross-arm N<sup>6</sup>, which is journaled in the downturned ends of a plate N<sup>7</sup>, attached to the trumpet. In the form shown in Fig. 6 the socket N<sup>5</sup> is slotted, as at N<sup>8</sup>, and in this slot is a lug N<sup>9</sup>, secured to the trumpet, the lug and the slotted socket being pivotally connected by a pin N<sup>10</sup>.

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

1. In a graphophone, the combination with the mandrel and record, of means for rotating the mandrel, a sound-trumpet and pivotal means for supporting its larger end, means for supporting its smaller end, a pivoted guide for the smaller end of the trumpet, means for feeding said guide, and means for rocking said guide on its pivot, substantially as described.

2. In a graphophone, the combination with the mandrel and record, of means for rotating the mandrel, a sound-trumpet and pivotal means for supporting its larger end, an adjustable socket attached to the smaller end of the trumpet, a stylus secured in said socket and adapted to rest upon the record and support the smaller end of the trumpet, a screw and means for rotating the same, a rod arranged parallel to said screw, a pivoted guide-carrier slidably mounted upon said rod and adapted to engage said screw, a fork carried by said guide-carrier and arranged to guide the smaller end of the trumpet, means for rocking said guide-carrier on its pivot to lift the smaller end of the trumpet and the stylus clear of the record, and means for holding the stylus out of contact with adjacent parts of the mechanism when the instrument is out of operation, substantially as described.

3. In a graphophone, the combination with the mandrel and record, of means for rotating the mandrel, a sound-trumpet and pivotal means for supporting the larger end of the same, a stylus connected to the trumpet and adapted to rest upon the record and support the smaller end of the trumpet, a pivoted guide for the smaller end of the trumpet, means for feeding said guide, and means for rocking it on its pivot to lift the stylus from the record, substantially as described.

4. In a graphophone, the combination with the mandrel and record, of means for rotating the mandrel, a sound-trumpet and pivotal means for supporting the larger end of the same, a stylus connected to the trumpet and adapted to rest upon the record and support the smaller end of the trumpet, a pivoted, slidably-mounted guide-carrier supporting a

guide for the trumpet, means for feeding said guide-carrier, and means for rocking it upon its pivot to lift the stylus from the record, substantially as described.

5 5. In a graphophone, the combination with the mandrel and record, of means for rotating the mandrel, a sound-trumpet, means for supporting the smaller end of the trumpet, and means for pivotally supporting the larger  
10 end of the trumpet, consisting of a vertical socket provided with vertical slots, a bent rod supported in said socket and provided with pins engaging said slots and also provided with a pointed extremity entering a  
15 hole in the side of the larger end of the trumpet, and a U-shaped piece over said hole within the larger end of the trumpet and arranged with a substantially horizontal longitudinal portion resting upon the point of the  
20 bent rod, substantially as described.

6. In a graphophone, the combination with the mandrel and record, of means for rotating the mandrel, a sound-trumpet, and means for supporting its larger end, consisting of a  
25 vertical socket provided with slots, a bent rod supported in said socket and provided with pins engaging said slots, said rod being also provided with a pointed extremity entering a hole in the side of the larger end of the  
30 trumpet, and a U-shaped piece over said hole within the larger end of the trumpet and arranged with a substantially horizontal longitudinal portion resting upon the point of the rod, an adjustable socket attached to the  
35 smaller end of the trumpet, a stylus secured therein and adapted to rest upon the record and support the smaller end of the trumpet, a screw rotatably mounted parallel to the axis of the record, means for rotating the same, a

pivoted guide-carrier slidably mounted upon a rod and adapted to engage said screw, a fork  
40 carried by said guide-carrier and arranged to guide the smaller end of the trumpet, means for rocking said guide-carrier on its pivot to lift the smaller end of the trumpet and the  
45 stylus clear of the record, and means for holding the stylus out of contact with adjacent parts of the mechanism when the instrument is out of operation, substantially as described.

7. In a graphophone, the combination with  
50 the mandrel and record, of means for rotating the mandrel, a sound-trumpet, means for supporting the larger end thereof, consisting of a socket provided with slots, a rod supported in said socket and engaging the slots  
55 said rod being provided with a pointed extremity entering a hole in the side of the larger portion of the trumpet, and a U-shaped piece within the trumpet having an approximately horizontal longitudinal portion resting  
60 upon the point of the rod, a stylus connected to the trumpet adapted to rest upon the record and support the smaller end of the trumpet, a screw, means for rotating the  
65 same, a pivoted, slidably-mounted guide-carrier adapted to engage said screw and provided with a fork to guide the smaller end of the trumpet, and means for rocking said carrier on its pivot to lift the stylus from the  
70 record, substantially as described.

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

WALTER C. RUNGE.

Witnesses:

HAROLD WADE,  
HARRY B. BRIDGE.