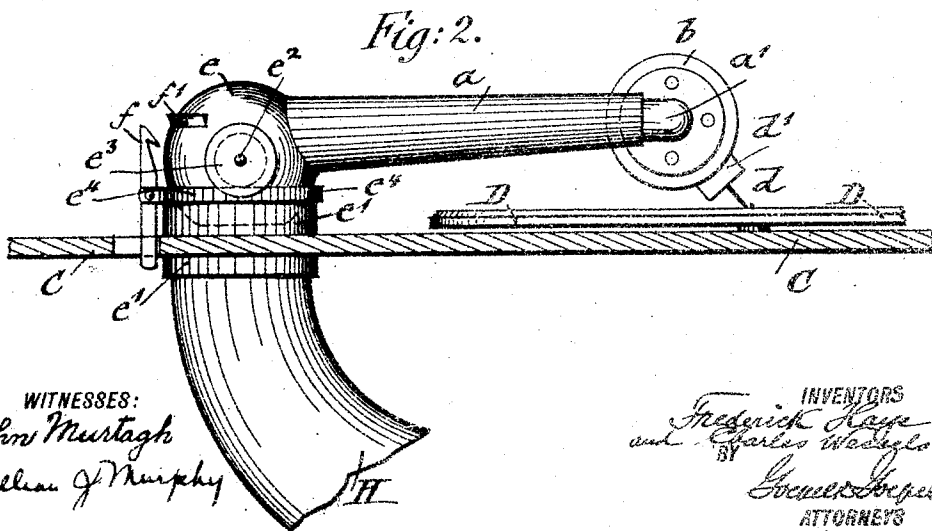
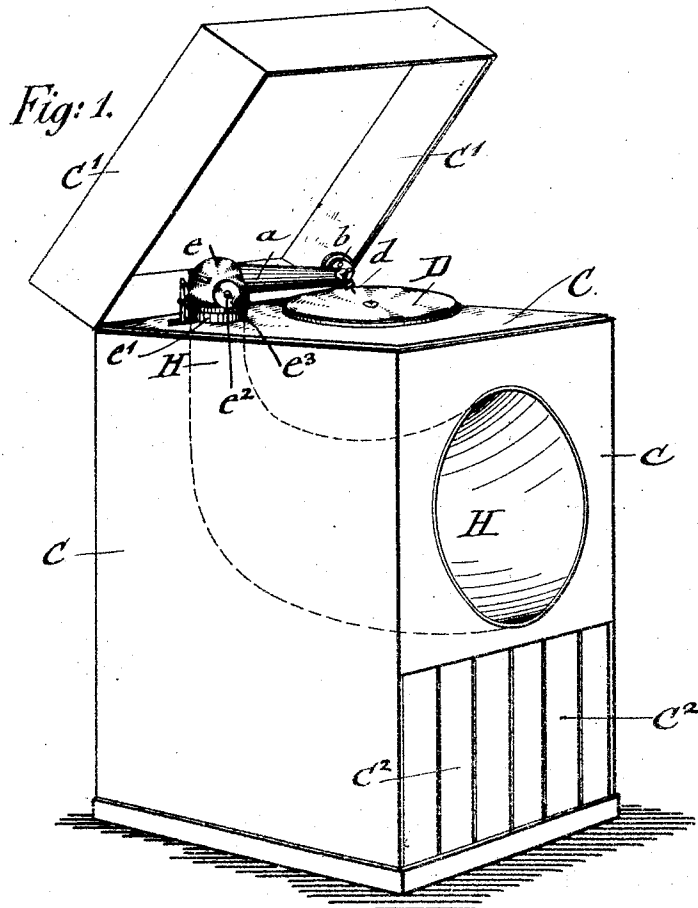


F. HAYE & C. WESSELS.
GRAMOPHONE.
APPLICATION FILED JAN. 24, 1910.

962,833.

Patented June 28, 1910.

2 SHEETS—SHEET 1.



WITNESSES:
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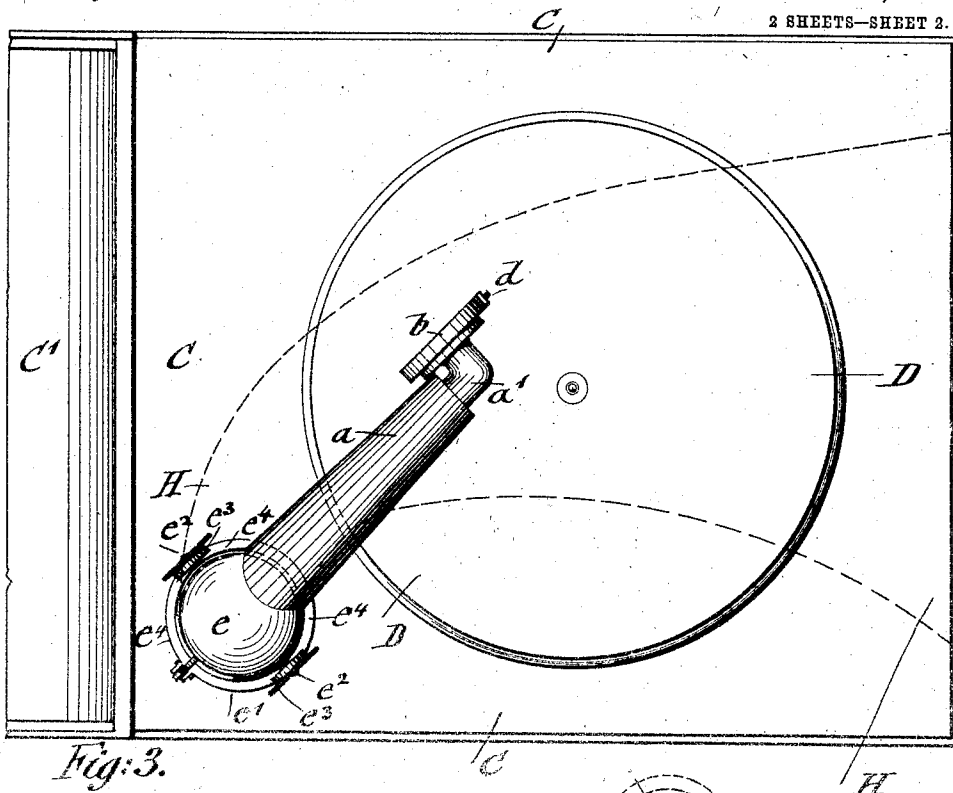


Fig. 3.

Fig. 4.

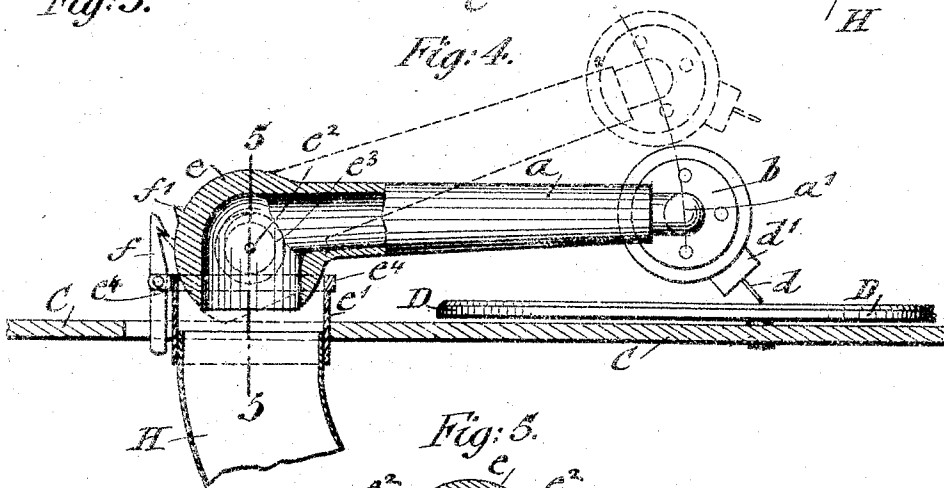
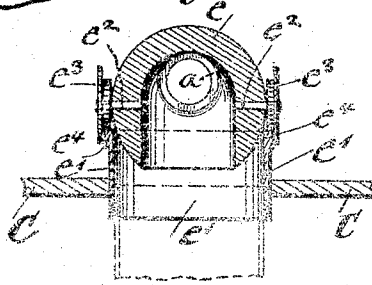


Fig. 5.



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UNITED STATES PATENT OFFICE.

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GRAMOPHONE.

962,833.

Specification of Letters Patent. Patented June 28, 1910.

Application filed January 24, 1910. Serial No. 539,666.

To all whom it may concern:

Be it known that we, FREDERICK HAYE and CHARLES WESSELS, citizens of the United States of America, residing in Woodhaven, in the county of Queens and State of New York, have invented certain new and useful Improvements in Gramophones, of which the following is a specification.

This invention relates to an improved gramophone of that type in which no separate and detachable horn is used, but in which the horn is permanently located in a casing below the record-carrying disk and its actuating motor.

The separate and detachable horns used in phonographic apparatus heretofore, are objectionable for the reason that they render the apparatus cumbersome, as the horn takes up a great deal of space, and as it impairs to some extent the clearness of the delivery of the phonographic records. By dispensing with the separate horn and its supporting stand, the entire apparatus becomes handier, more conveniently transportable and more easily storable when not required for use.

This invention is designed to furnish a phonographic apparatus in which the horn is arranged in a supporting casing below the record-carrying disk and connected with a tubular tone-arm carrying the diaphragm-box by a universal joint provided with means for holding the tubular arm and diaphragm-box in raised position.

The invention consists further of certain details of construction which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a perspective view of our improved phonograph, Fig. 2 is a detail side-elevation of the tubular tone-arm carrying the diaphragm-box and showing the universal joint connection with the inner end of the horn, drawn on a larger scale, Fig. 3 is a plan-view of Fig. 2, and Figs. 4 and 5 are respectively a sectional side-elevation of the tone-arm and a vertical transverse-section of the same on line 5, 5, Fig. 4.

Similar letters of reference indicate corresponding parts throughout the several figures.

Referring to the drawings, C represents the casing of our improved phonographic apparatus. The casing C is made of rectangular

shape and of a sufficient size to permit the placing in the upper part of the same of a sound-delivering horn H and other accessories, such as the record-carrying disk or turntable D and the motor for the same (not shown). To the upper rear-end of the casing C is applied a hinged cover C' so that the record-carrying disk or turntable D and the tone-arm a with the diaphragm-box b at its front-end and the universal joint connection with the horn H can be protected against dust and meddling when not required for use.

The front-end of the tubular tone-arm a is connected by a curved tube a' with the diaphragm-box b in the usual manner. The diaphragm-box b carries a socket d' for receiving the stylus d in the usual well-known manner. The tubular tone-arm a is made tapering and increasing in diameter from the front toward the rear-end and provided at its rear-end with a hollow spherical portion e which is cut off at its lower portion so as to form at its interior a smooth rounded off continuation of the tubular tone-arm. The lower portion of the spherical portion e extends into and opens into a tubular socket e' that is seated in the top-plate of the casing at the rear of the disk D.

The spherical portion e of the tone-arm a is fitted into the upper end of the socket e, so that the tone-arm can be moved up and down in following the motion of the stylus in the grooves or depressions of the record. The lower open part of the spherical portion e extends to some extent into the socket e' so as to transmit the sound-waves into the inner or rear-end of the horn H connected therewith as shown in Fig. 4. The spherical portion e is preferably made of aluminum or other light metal so as to offer as little resistance as possible to the up and down motion of the tone-arm a. The upper end of the socket e' is provided at diametrically opposite sides on an axis at right angles to the longitudinal axis of the tone-arm and spherical portion with short fixed shafts e'' on which are mounted flanged disks e'' which move over the shouldered circumference or rim e' of the upper edge of the tubular socket e', while the flanges of the disks move along the outer edge of the shouldered rim of the socket, as shown clearly in Figs. 2 and 5.

The weight of the inner end of the tone-

arm and its spherical portion e rests by the shouldered disks e^3 , on the upper rim e^4 of the socket and permits the easy swinging of the tone-arm in up and down, as well as in lateral direction, while the circumferential flanges of the disks act as guard-flanges for keeping the spherical portion on the upper end of the socket e^1 . The spherical portion e of the tone-arm a in connection with the shouldered rim e^4 and the flanged disks e^3 moving over the rim form a kind of universal joint for permitting the free and easy movement of the tone-arm together with the diaphragm-box and stylus at the front-end of the same in following the depressions of the record, without exerting any strain on the needle or stylus. The diaphragm-box and its needle-holder are made in the usual approved manner.

The universal joint between the tone-arm and the socket at the inner end of the horn follows the motion of the needle or stylus in the grooves of the phonographic record, so that the sound-waves embodied in the grooves are transmitted to the enlarged outer end of the horn.

The lower part of the case C is preferably utilized for the storage of records in the spaces formed between vertical partitions C^2 . The outlet-opening of the horn and the partitioned space at the lower part of the casing may be closed by means of hinged doors in the usual manner, so as to permit the closing of the casing and prevent the entrance of dust into the horn and the partitions C^2 in the lower part of the casing.

When it is desired, to replace a record by a new one, the tone-arm a is raised and retained in raised position by a hook f which is fulcrumed to the shouldered rim e^4 of the socket e^1 , which hook engages a segmental shoulder f^1 at the rear of the spherical portion e , as shown in dotted lines in Fig. 4. The hook f is weighted or spring-actuated at its lower end. When the new record is placed in position on the disk D, the hook is released from the shoulder f^1 and the tone-arm and diaphragm-box are returned into lowered or normal position, the stylus being then placed into contact with the outermost groove of the record in the usual manner.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:

1. In a phonographic apparatus, the combination, with a casing, of a tubular tone-arm carrying a diaphragm-box and stylus at its front-end, of a curved horn supported in said casing, a universal joint connecting the rear-end of the tone-arm with the inner end

of the horn, and a pair of rollers for supporting the inner end of the tone-arm.

2. In a phonographic apparatus, the combination, with a casing, of a record-carrying disk or turntable, a tubular tone-arm, a diaphragm-box provided with a stylus or needle applied to the front-end of the tone-arm, a stationary socket in said casing and provided with an annular shoulder, a horn connected at its inner end with the lower end of said socket, a universal joint between said socket and the opposite end of the tubular tone-arm, and a pair of disks rotatably mounted on the inner end of the tone-arm and bearing on said shoulder.

3. In a phonographic apparatus, the combination, with a casing, of a rotary record carrying disk, a horn located in said casing, a tubular socket member supported on the top of the casing and communicating with the inner end of the horn, a tubular tone-arm having a spherical portion fitted into the upper end of the socket member, rollers rotatably supported on said spherical portion and adapted to roll on the upper edge of the socket member, an upwardly disposed horizontally extending segmental shoulder on the rear part of said spherical portion, a pair of ears at the rear of the socket member, a hook pivoted between said ears and adapted to engage said shoulder and having a downward weighted extension and a diaphragm box on said tone arm.

4. In a phonographic apparatus, the combination, with the casing, of a rotary record-carrying disk or turn-table at the upper part of said casing, a curved horn located in said casing and opening in the front-wall of the same, a stationary socket having a shouldered rim at its upper end and located in the top of the casing and connected at its lower end with the inner end of the horn, a tone-arm provided with a spherical portion fitted into the upper end of the socket, a pair of flanged disks rotatably mounted at diametrically-opposite points of the spherical portion and engaging and moving over the rim of the socket, and a diaphragm-box at the front-end of the tone-arm and provided with a needle or stylus, the lower open end of the spherical portion of the tone-arm extending to some distance into said socket.

In testimony, that we claim the foregoing as our invention, we have signed our names in presence of two subscribing witnesses.

FREDERICK HAYE.
CHARLES WESSELS.

Witnesses:

PAUL GOEPFEL,
JOHN MURTAGH.