

J. C. ENGLISH.
TONE ARM FOR TALKING MACHINES.
APPLICATION FILED MAR. 24, 1911.

1,049,348.

Patented Jan. 7, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

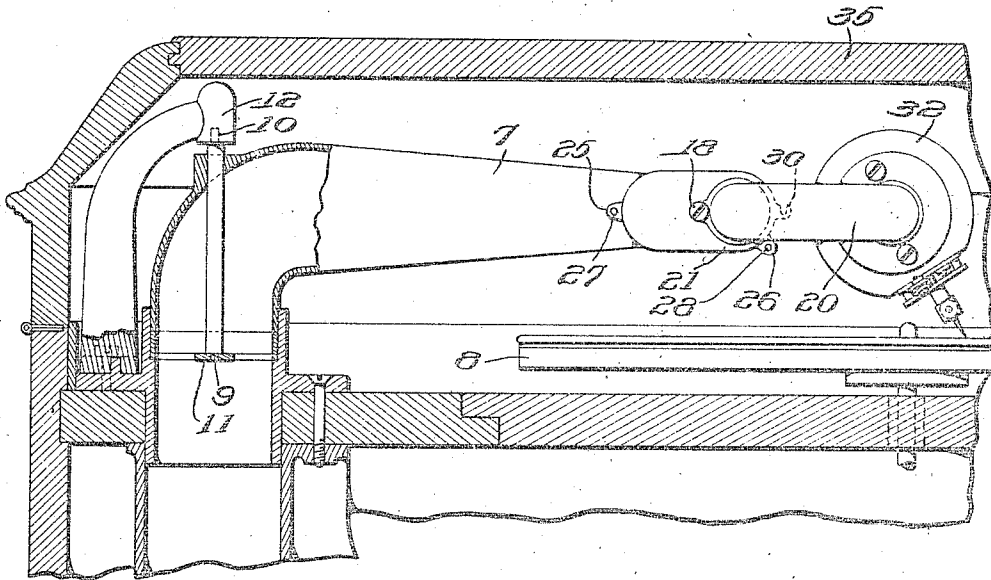
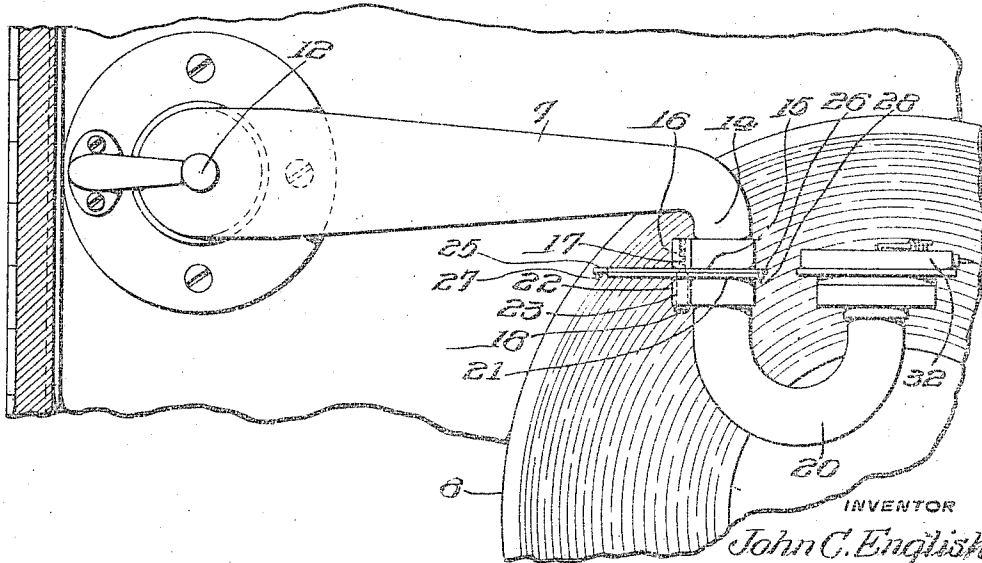


Fig. 2.



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2 SHEETS-SHEET 2.

Fig. 3.

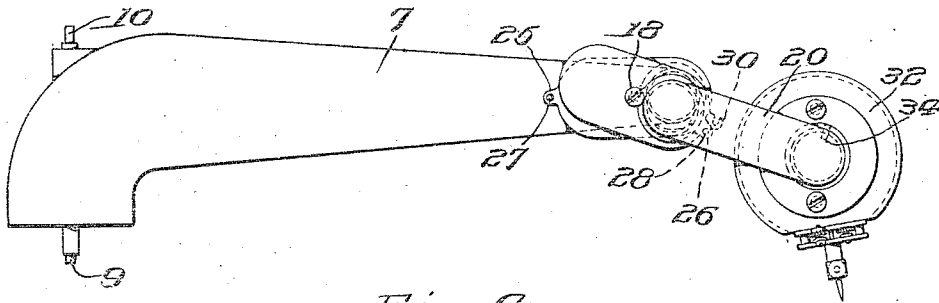


Fig. 4.

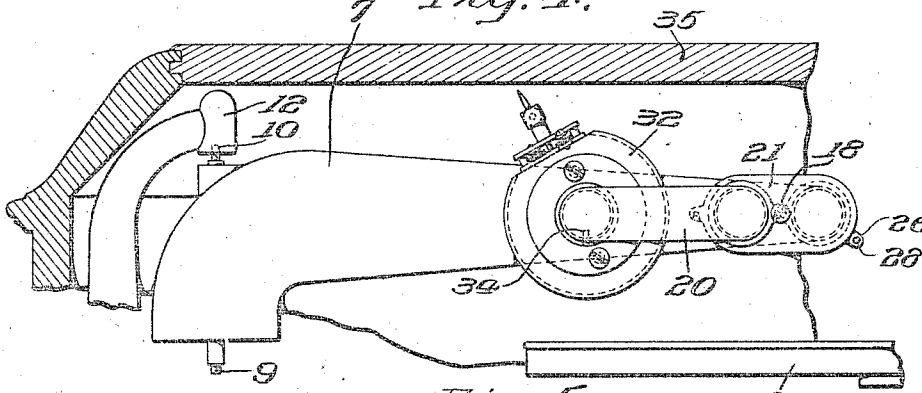


Fig. 5.

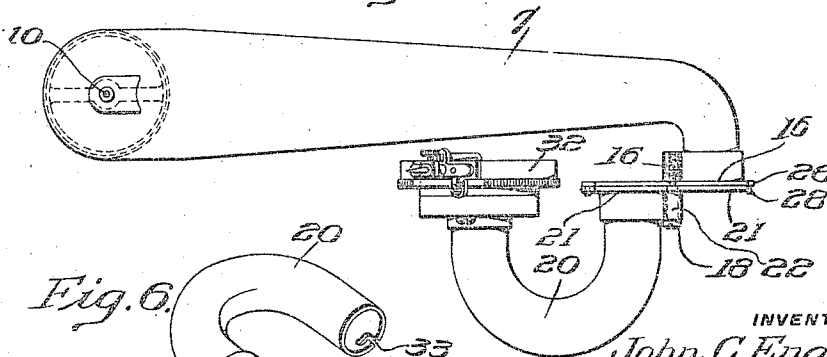
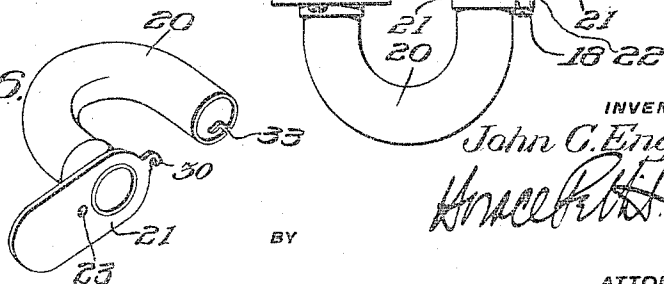


Fig. 6.



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1.049,348. TONE-ARM FOR TALKING-MACHINES.

Specification of Letters Patent.

Patented Jan. 7, 1913.

Application filed March 24, 1911. Serial No. 616,667.

To all whom it may concern:

Be it known that I, JOHN C. ENGLISH, a citizen of the United States, and a resident of Camden, in the county of Camden and State of New Jersey, have invented certain new and useful Improvements in Tone-Arms for Talking-Machines, whereof the following is a specification, reference being had to the accompanying drawings.

10 This invention particularly relates to the means for connecting a sound reproducer with the swinging tone arm of a talking machine.

The principal objects of this invention are, to provide a simple and efficient mounting for connecting the tone arm and sound reproducer, which is coöperative with said arm when said reproducer is in operative position to afford a smooth, uninterrupted, continuous conduit for the free passage of sound waves; and to provide a compact structure which when in inoperative position may be inclosed in a minimum space.

Further objects of this invention are to provide such a pivoted connection between said tone arm and sound reproducer as to permit the free movement of said reproducer relative to said arm, effected by possible slight irregularities in the record disk, and to permit the movement of said reproducer from said record to its inoperative position; to provide means carried by said arm to support said reproducer in an approximately operative position, independently of the turn-table of said talking machine; to provide means to support said sound reproducer in its inoperative position at the side of said arm, and extending below the top thereof; and to provide means to automatically close said conduit when said sound reproducer is disposed in its inoperative position.

The form of the invention hereinafter described provides a hollow tapered tone arm suitably mounted to swing on a substantially vertical axis, and having its free end curved laterally and terminating in a flanged collar, to which is pivoted a similar flanged collar on the tubular mounting, upon the free end of which the sound reproducer is removably attached. The flange of the mounting is provided with a lug or hook operative to engage suitably disposed lugs on the flange of said arm, and respec-

tively arranged to support the sound repro- 55 ducer in approximately operative position, and in its inoperative position.

This invention further includes all of the various novel features of construction and arrangement hereinafter more definitely 60 specified.

In the accompanying drawings, Figure 1 is a fragmentary sectional elevation of a talking machine, showing the tone arm carrying a sound reproducer in operative relation to a sound record disk; Fig. 2 is a fragmentary plan sectional view of the structure shown in Fig. 1; Fig. 3 is a side elevational view of said tone arm support- 65 ing the reproducer in an approximately operative position, independently of the sound record disk; Fig. 4 is a fragmentary view similar to Fig. 3, but showing the sound reproducer inverted to its inoperative position; Fig. 5 is a plan view of the structure 70 as shown in Fig. 4, exclusive of the casing; and Fig. 6 is a perspective view of the sound reproducer mounting *per se*.

In said figures, the tone arm 7 is mounted to swing in a plane substantially parallel 80 with the turn-table 8, upon the trunnions 9 and 10, which are respectively supported in bearings 11 and 12 in a well-known manner. Said tone arm 7 is preferably tapered throughout its extent and has its free end 85 14 curved laterally, and terminating in a flanged collar 15, which is provided with a boss 16, having a threaded aperture 17 disposed at one side of the end of the tone arm, arranged to receive the pivot pin 18, upon 90 which the sound reproducer mounting 20 is swiveled. Said mounting 20 is preferably provided with a flanged collar 21, which is similar to collar 15 on the tone arm 7, and which is provided with a boss 22 having an 95 aperture 23 through which the pivot pin 18 extends.

As best shown in Figs. 1, 3 and 4, the flanges 15 and 21 each have an imperforate extension, eccentric to the respective open- 100 ings therethrough, and the flange 15 is provided with suitably disposed peripheral lugs 25 and 26, which are respectively provided with projections 27 and 28, extending from the face of said plate and arranged to be en- 105 gaged by a peripheral hook or lug 30 on the flange 21.

As best shown in Figs. 4 and 5, the pro

jection 27 is arranged to support the sound reproducer 32 in its inoperative position, spaced from the side of the intermediate portion of the tone arm 7 and in close proximity to the turn-table 8, so as to be supported substantially below the upward extension of the tone arm support, the axis of said sound reproducer 32 being disposed substantially in a plane with the axis of the straight intermediate portion of the tone arm 7. The projection 28 is arranged to support said sound reproducer 32 in an approximately operative position, independently of a sound record disk 31, or its supporting turn-table 8, as shown in Fig. 3.

The sound reproducer 32 may be suitably connected in removable relation with the mounting 20 in any well-known manner; for instance, by the usual means including the bayonet slot 33, as best shown in Fig. 6, which is cooperative with the projecting pin 34, as shown in Fig. 3.

As best shown in Fig. 2, the conduit formed by the cooperation of the sound reproducer mounting 20 with the tone arm 7, when in registry, provides a smooth, regular passageway, substantially in the form of an ogee curve, free from pockets or other eddy-producing obstructions.

Referring again to Fig. 2, it will be seen that by the construction contemplated, the sound reproducer 32, when inverted to its inoperative position, may be swung to such a lateral position with respect to the tone arm 7, that its upwardly extending extremities are substantially below or on a level with the supporting members of said tone arm. Thus it will be seen that the mechanism may be inclosed in a smaller space than when the sound reproducer rests upon the tone arm when in its inoperative position. Therefore, it will also be obvious that the lid or cover 35 may be disposed in closer relation to the turn-table 8 of the machine than in machines heretofore constructed, whereby the height of the machine may be materially reduced.

Referring to Figs. 4 and 5, it will be noted that the conduit formed by the cooperation of the mounting 20 and the tone arm 7 is closed by the imperforate eccentric portions of the respective flanges 15 and 23, when the sound reproducer is disposed in its inoperative position, so as to prevent the entrance of dust into said conduit.

It is not desired to limit this invention to the precise details of construction and arrangement herein set forth, as it is obvious that various modifications may be made therein without departing from the essential features of the invention as defined in the appended claims.

Having thus described my invention, I claim:

1. The combination with a hollow tone arm

having an open longitudinally curved free end, of an elongated tubular mounting for a sound reproducer, arranged to swing into and out of alinement with said curved free end, and cooperative therewith to form a continuous smooth conduit for uninterruptedly conveying sound waves.

2. The combination with a tone arm having a laterally directed free end, of a sound box mounting pivoted for oscillation relatively to said end on a laterally disposed axis, said mounting being arranged to oscillate into and out of registry with said end, and having means to close said end when out of registry.

3. The combination with a tone arm mounted to swing on a vertical axis and having a laterally curved free end terminating in a flange, of a curved mounting for a sound reproducer, provided with a similar flange, means to pivotally connect said flanges whereby the axes of said arm and mounting are arranged to register when said sound reproducer is disposed in operative position, and are thrown out of registry when said sound reproducer is disposed in an inoperative position.

4. The combination with a tone arm mounted to swing on a vertical axis, and having a laterally curved free end terminating in an eccentric flange, of a curved mounting for a sound reproducer provided with a flange, means to pivotally connect said flanges, the axes of said arm and mounting being arranged to register when said sound reproducer is disposed in operative position, and being thrown out of registry when said sound reproducer is disposed in inoperative position, and said flanges being arranged to open and close the conduit formed by said arm and mounting.

5. The combination with a tone arm mounted to swing on a vertical axis, and having a laterally curved free end terminating in an eccentric flange, of a curved mounting for a sound reproducer, comprising a hollow sound conveyer provided with a similar flange, means to pivotally connect said flanges, whereby the axes of said arm and mounting are maintained in registry when said sound reproducer is disposed in operative position, and are thrown out of registry when said sound reproducer is disposed in an inoperative position, the eccentric portions of said flanges being operative to automatically close the conduit formed in said arm and mounting.

6. The combination with a tone arm having a laterally curved free end terminating in an eccentric flange, of a curved mounting for a sound reproducer, comprising a hollow sound conveyer, provided with a similar flange, and cooperative with said arm to form a continuous, uninterrupted conduit when in registry therewith, the flanges on

said arm and mounting being respectively operative to close said conduit when in inoperative position.

7. A tone arm comprising relatively movable sections abutted in alinement when in operative position, each terminating in opposed eccentric flanges, means pivotally connecting said flanges and forming an axis upon which one of said sections may oscillate, the eccentric portions of said flanges being respectively operative to close the opening in the opposed flange when said sections are in inoperative position.

8. The combination with a hollow tone arm terminating in a transverse flange provided with a projection, of a hollow mounting for a sound reproducer, comprising a sound conveyer coöperative with said arm to form a sound conduit, and terminating in a flange opposed to the flange on said arm, and having a projection arranged to engage the projection on the flange of said arm to support the sound reproducer in an inoperative position at the side of and below the top of said arm, said flanges being utilized to close said conduit.

9. The combination with a tone arm having a laterally curved free end, terminating in a flange having projections, of a curved mounting for a sound reproducer, comprising a tubular sound conveyer, coöperative with said arm to form a sound conduit, and having a flange opposed to the flange on said arm, and provided with a projection operative to engage the respective projections on the flange on said arm, to support said sound reproducer in an approximately operative position, and in an inoperative position.

10. The combination with a tone arm having a laterally curved free end terminating in an eccentric flange having projections, of a curved mounting for a sound reproducer comprising a tubular sound conveyer provided with an eccentric flange, having a projection operative to engage the respective projections on the flange on said arm, and a pivotal connection engaging said flanges, whereby said mounting may oscillate into and out of alinement with the end of said arm, the projection on the flange of said mounting being operative to engage one of the projections on the flange of said arm to support the sound reproducer in an approximately operative position, and arranged to engage the other projection to support said sound reproducer in an inoperative position with its axis, substantially in a plane with the axis of said arm.

11. The combination with a tone arm having a laterally curved free end terminating in an elongated flange, of a mounting for a sound reproducer terminating in a flange substantially conforming to the flange on said tone arm, and means extending cen-

trally through said flanges arranged to pivotally support their faces in contact, and to movably support said tone arm and mounting in alinement when in operative position, the respective flanges being operative to close the respective openings in the tone arm and mounting when in an inoperative position.

12. In a talking machine, the combination with a tubular tone arm having a free open end projecting transversely and laterally from the main portion of said arm, of a longitudinally curved elongated tubular mounting for a sound reproducer eccentrically connected to said free end and coöperating therewith to form a conduit for sound waves.

13. In a talking machine, the combination with a tubular tone arm having a free open end projecting transversely and laterally from the main portion of said arm, of a longitudinally curved elongated tubular mounting for a sound reproducer eccentrically connected to said free end upon an axis substantially parallel to the longitudinal axis of said end and coöperating therewith to form a conduit for sound waves.

14. In a talking machine, the combination with a tubular tone arm curved adjacent to its free end at right angles to the major portion of its longitudinal axis and provided with an inlet in its free end, of elongated longitudinally curved means movably connected to said arm and having a flat wall arranged to open and close said inlet, and a sound reproducer carried by said means and arranged to be thrown thereby into and out of communication with said inlet.

15. In a talking machine, the combination with a tubular tone arm curved adjacent to its free end at right angles to the major portion of its longitudinal axis and having its said free end open, of elongated longitudinally curved means connected in abutted relation to said arm and mounted to oscillate about an axis eccentric to, but substantially parallel with the longitudinal axis of said open end and arranged to open and close said open end, and a sound reproducer carried by said means and movable into and out of communication with said open end.

16. In a talking machine, the combination with a tubular tone arm having a free open end projecting transversely from the main portion of the said arm, means carried by said arm and mounted to oscillate with respect thereto to open and close said open end, an elongated tubular mounting for a sound reproducer carried by said means and arranged to swing thereon into and out of communication with said open end, and a sound reproducer carried by and communicating with said mounting.

17. In a talking machine, the combination with a tubular tone arm having a free open

end projecting transversely and laterally
from the main portion of the said arm,
means carried by said arm and mounted to
oscillate with respect thereto to open and
close said open end, an elongated longitudi-
nally curved substantially U-shaped tubu-
lar mounting for a sound reproducer carried
by said means and arranged to swing there-
on into and out of communication with said

open end, and a sound reproducer carried by 10
and communicating with said mounting.

In witness whereof, I have hereunto set
my hand this 17th day of March, A. D.,
1911.

JOHN C. ENGLISH.

Witnesses:

FRANK B. MIDDLETON, Jr.,
CHARLES F. WILLARD.