

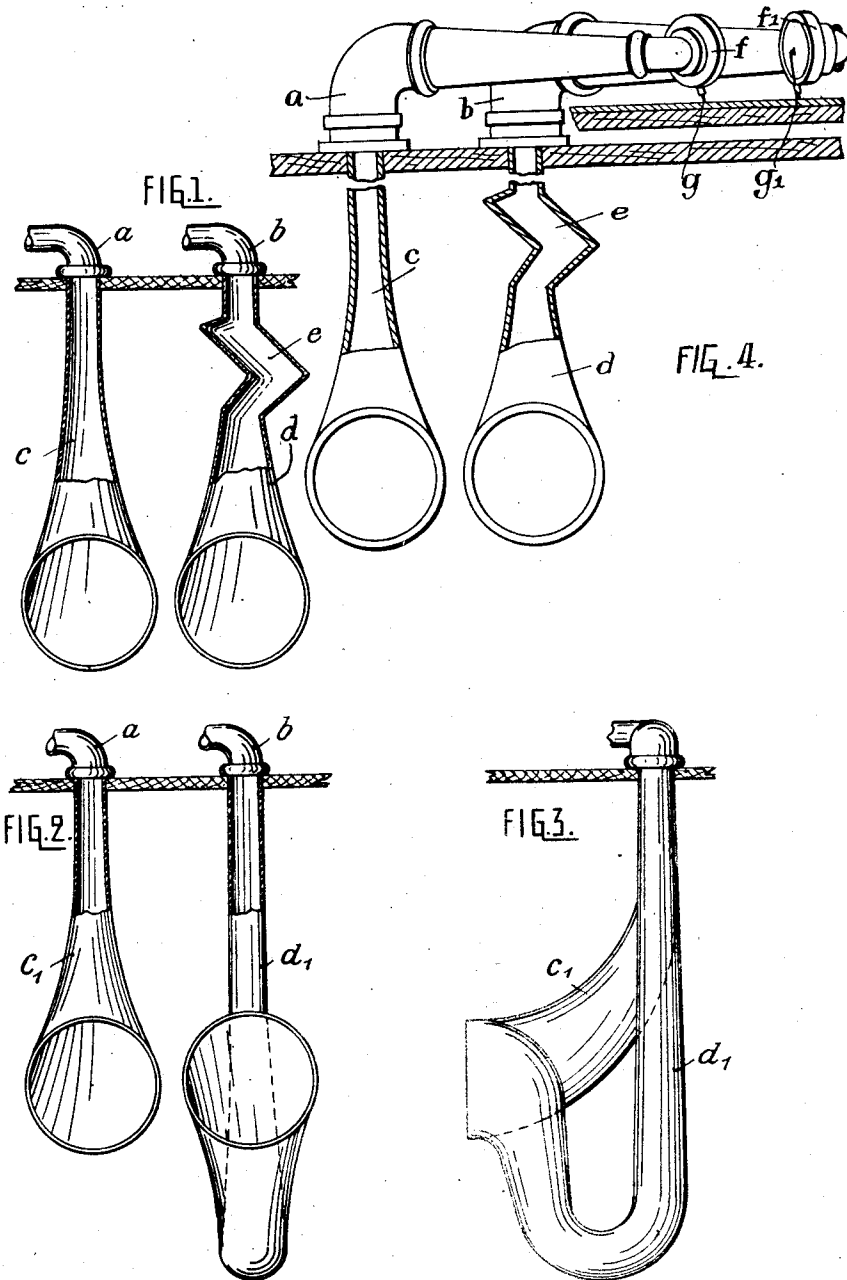
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SOUND REPRODUCING DEVICE

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UNITED STATES PATENT OFFICE

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SOUND REPRODUCING DEVICE

Application filed November 17, 1926, Serial No. 148,922, and in Germany December 1, 1925.

This invention relates to a sound reproducing device, talking machine or the like which is provided in a known manner with a plurality of sound-boxes, the needles of which pass in succession over the same sound record at such intervals of time as to produce an improvement in the tone, each sound-box having its separate passage for guiding the sound. Talking machines are also known the sound passages of which are different from one another as regards their dimensions, shape or material of their walls.

The object of the invention is to utilize the principles embodied in apparatus as hitherto proposed, in such a manner as to produce an improvement in the quality of the sound by tone "colouring".

This object is attained according to the present invention in talking machines of the kind first above referred to by making the walls of the two or more separate sound passages of different material in addition to making the said sound passages of different dimensions or of different form so that the length and nature of the individual sound passages shall differ from one another more or less considerably.

The accompanying drawings illustrate by way of example, different forms of construction of the sound passages according to the invention, Figure 1 illustrating in part sectional front elevation one form of construction and Figures 2 and 3 in part sectional front elevation and in side elevation respectively the second form of construction. Figure 4 shows in part sectional front elevation a talking machine having sound passages substantially similar in shape to those of Figure 1, differing from one another in material, shape and thickness.

Referring to Figure 1 the trumpet *c* which is connected to the usual tone arm *a* is constructed in a known manner. However, the second tone arm *b* leads to a trumpet *d* containing a chamber *e* of any desired shape, as regards its form and cross section, which chamber, owing to the sound pocket which it forms and by causing the sound to be reflected, blends the sounds passing through the trumpet *d*, thereby producing a different

character of tone in the said trumpet, which tone in its turn substantially influences the tone resulting from the combination of the trumpets *c* and *d*.

The space *e* may be made angular or be bent and may be adapted to the gradually conically increasing cross section of the trumpet, or be otherwise shaped so that the sound waves reach the opening of the trumpet partly by reflection and partly after having been pocketed.

Referring to the form of construction illustrated in Figures 2 and 3, the tone arm *a* is connected to the trumpet *c*, which is constructed in a known manner. The tone arm *b*, however, leads to the trumpet *d*, which is extended or constructed in a syphon-like fashion, thus forming a sound passage which is substantially longer and of different cross section. In consequence thereof, the tone of the sound reaching the ears will be substantially different, owing to its propagation being different from the propagation of the sound which comes from trumpet *c*. The two trumpets together produce a combined tone, the richness of which is ensured by the different constructions of the trumpets.

The dimensions required for individual cases are determined experimentally according to the particular practical conditions. The horns may be made of sheet metal, wood, or materials composed of borings or shavings mixed with a binding agent, such as artificial wood or cork wood which is made from plaster and wood chips and the like, or artificial horns, Galalith, artificial rubber and the like or combinations of any of these materials or combinations of parts made of the same material but having a different thickness and consequently a different resonance.

In Figure 4, *a* and *b* are the tone arms, and *c* and *d* the trumpets, as in Figure 1. This figure also shows two sound boxes *f* and *f*₁ carrying needles *g* and *g*₁ passing in succession over the same sound record *h*. The sound boxes *f* and *f*₁ are connected with the tone arms *a* and *b* respectively. The trumpet *c* is made of wood and is thicker than

the trumpet *d*, which is made of metal and has a sound pocket *e*.

What I claim is:—

1. A talking machine for reproducing
5 sound from a record, comprising a plurality
of sound-reproducing diaphragms so mount-
ed as to be operated simultaneously by suc-
cessive points on one and the same record,
and a plurality of sound passages entirely
10 independent of one another, one connected
with each diaphragm, the walls of one of
the sound passages differing constructionally
from the walls of another in such a way as
to affect the quality of the sound.
- 15 2. A talking machine for reproducing
sound from a record, comprising a plurality
of sound-reproducing diaphragms so mount-
ed as to be operated simultaneously by suc-
cessive points on one and the same record,
20 and a plurality of sound passages entirely
independent of one another, one connected
with each diaphragm, the walls of one of
the sound passages being made of a different
material from the walls of another.
- 25 3. A talking machine for reproducing
sound from a record, comprising a plurality
of sound-reproducing diaphragms so mount-
ed as to be operated simultaneously by suc-
cessive points on one and the same record,
30 and a plurality of sound passages entirely
independent of one another, one connected
with each diaphragm, one of the sound pas-
sages substantially differing in shape from
another.
- 35 4. A talking machine for reproducing
sound from a record, comprising a plurality
of sound-reproducing diaphragms so mount-
ed as to be operated simultaneously by suc-
cessive points on one and the same record,
40 and a plurality of sound passages entirely
independent of one another, one connected
with each diaphragm, the walls of one of
the sound passages differing in thickness
from those of another.
- 45 5. A talking machine for reproducing
sound from a record, comprising a plurality
of sound-reproducing diaphragms so mount-
ed as to be operated simultaneously by suc-
cessive points on one and the same record,
50 a plurality of sound passages entirely inde-
pendent of one another, one connected with
each diaphragm, and a sound pocket in one
only of the sound passages adapted to deflect
the sound waves.

55 In testimony whereof I have signed my
name to this specification.

HEINRICH KÜCHENMEISTER.