

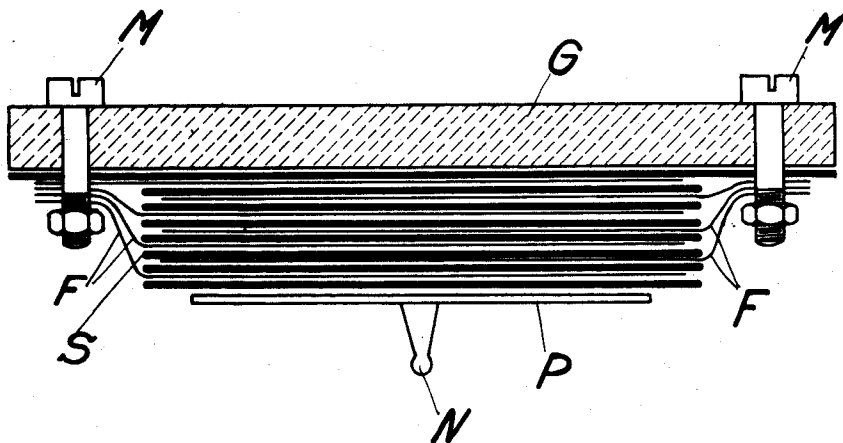
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W. GROENEBAUM

ELECTROSTATIC REPRODUCER FOR TALKING MACHINES AND THE LIKE

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UNITED STATES PATENT OFFICE.

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ELECTROSTATIC REPRODUCER FOR TALKING MACHINES AND THE LIKE

Application filed January 3, 1925. Serial No. 327.

To all whom it may concern:

Be it known that I, WILHELM GROENE-
BAUM, residing at Neu-Babelsberg, near Ber-
lin, Germany, have invented certain new and
5 useful Improvements in Electrostatic Re-
producers for Talking Machines and the
like, of which the following is a specifica-
tion.

This invention relates to electrostatic re-
10 producers for talking machines and similar
apparatus.

In the usual construction of electrostatic
sound boxes or reproducers, a variable con-
denser of the multiplate type is used, having
15 a plurality of rigid metal plates connected
together in spaced relation and a like num-
ber of similar plates connected together in
such manner that the plates of each set al-
ternate one above the other. These plates
20 are insulated from each other either by an
air gap or by sheets of a suitable dielectric
material. To vary the capacity of the con-
denser, one set of plates is rigidly attached
to an insulated support, and the other set
25 is mounted to vary the air gap between ad-
jacent plates.

The aforedescribed arrangement and the
fact that the gaps between the movable and
fixed plates must be made as small as possi-
30 ble, without establishing a metallic contact, in
order to obtain a high capacity, render it
necessary to exercise great care in the mak-
ing of the parts and in assembling them.

An object of the present invention is to
35 provide a novel electrostatic reproducer for
talking machine.

Another object is to provide a reproducer
comprising a variable condenser and a re-
cording stylus or needle.

40 A further object is to provide an im-
proved variable condenser consisting of
plates of metallic foil separated by an elas-
tic dielectric.

The invention is illustrated by way of ex-
45 ample in the drawing which shows a repro-
ducer in section.

The two sets of condenser plates each
consist of limp sheets of foil F, for example
aluminum foil, stacked in the same way as
50 in an ordinary paper condenser. That is to
say, the sheets of the one set alternate with
the sheets of the other. In distinction from
known arrangements, however, the sheets
are stacked loosely, so that they can easily

be pressed together by a reproducing stylus 55
N which is operatively connected in any ap-
proved manner with a rigid plate P. A di-
electric S is interposed between the adjacent
plates F of the condenser in the form of
comparatively thick sheets of elastic mate-
60 rial, such as rubber, and an additional sheet
is interposed between the outside plates and
both the support G and the stylus plate P.
Each set of plates is provided with exten-
sion members which are adapted to be se- 65
cured to a terminal connection M for sup-
porting the plates in suspended relation to
the support G and to serve as a means for
electrically connecting the plates of each
set together in parallel relation and to a 70
common terminal M. The force that returns
the reproducing stylus N to its normal po-
sition at each relaxation of its pressure is
supplied by the elasticity of the sheets S
which form the dielectric between the me- 75
tallie foils F.

In operation, when the reproducing stylus
N is set in vibrating motion, by following
the groove on a record (not shown) of a
phonograph for example, this motion is 80
transmitted to the plate P in contact with
the condenser. The variations in pressure
on the condenser plates F and interposed
dielectric sheets S, caused by the up and
down movement of the stylus, are sufficient 85
to move the said plates toward and away
from each other by virtue of the elasticity
of the dielectric, thus varying the capacity
of the condenser. If the terminals M of
the device are connected in circuit with 90
a source of electrical energy and a tele-
phone receiver or similar apparatus, the va-
riations in the capacity of the condenser will
cause variations in the current flowing
through the receiver. The receiver will then 95
reproduce the sound waves recorded on the
record of the talking machine without the
distortion inherent in the diaphragm of the
mechanical reproducer.

I claim:—

100 1. A reproducing device of the kind de-
scribed, comprising a stack of two sets of
thin substantially limp metallic sheets, the
sheets of one set being placed between the
sheets of the other set, elastic insulating 105
sheets interposed between adjacent metallic
sheets, insulating means at the ends of the
stack, a support, terminals mounted on said

support, means for mechanically and electrically connecting the sheets of each set to one of the terminals whereby said stack is suspended from said support, a stylus, 5 and means for transmitting movement of the stylus to said stack.

2. A reproducing device of the kind described, comprising a stack of two sets of thin substantially limp metallic sheets, the 10 sheets of one set being placed between the sheets of the other set, elastic insulating sheets interposed between adjacent metallic

sheets, a support carrying terminals, means for loosely suspending the respective sets of sheets to said terminals, and a stylus associated with said stack whereby movement of 15 the stylus varies the capacity of said device.

In testimony whereof I have affixed my signature in presence of two witnesses.

WILHELM GROENEBAUM.

Witnesses:

E. WURM,
L. HERBST.