

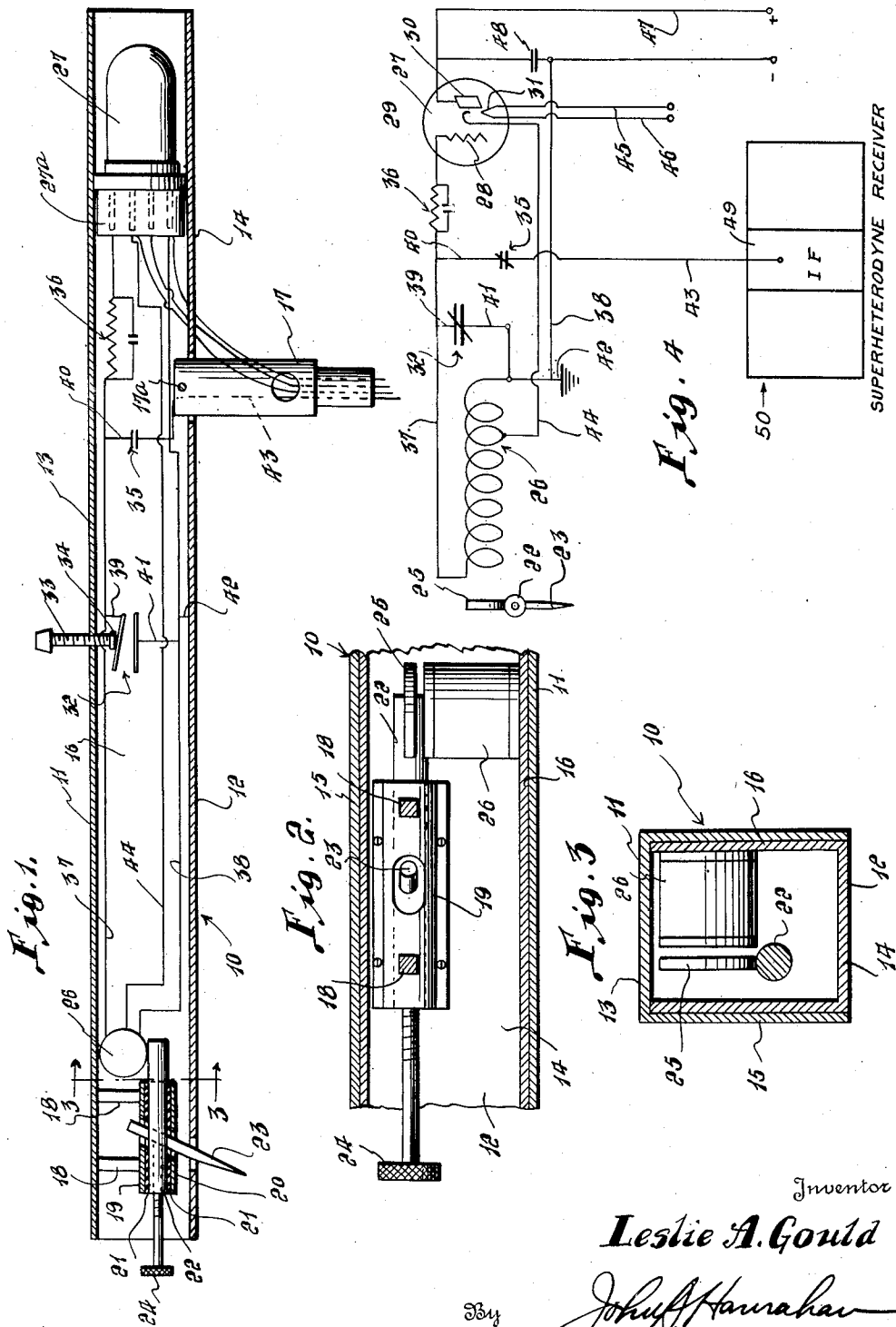
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L. A. GOULD

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FREQUENCY-MODULATION PHONOGRAPH PICKUP SYSTEM

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Inventor

Leslie A. Gould

John H. Haurahan

Attorney

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FREQUENCY-MODULATION PHONOGRAPH
PICKUP SYSTEM

Leslie A. Gould, Bridgeport, Conn., assignor, by
direct and mesne assignments, to Maguire In-
dustries, Incorporated, a corporation of New
York

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1 Claim. (Cl. 179—100.11)

1

This invention relates to new and useful im-
provements in sound reproducing apparatus and
has particular relation to a pick-up device for
use in the reproducing of sound from phono-
graph records.

The objects and advantages of the invention
will become apparent from a consideration of the
following detailed description taken in connec-
tion with the accompanying drawing wherein a
satisfactory embodiment of the invention is
shown. However, it is to be understood that the
invention is not limited to the details disclosed
but includes all such variations and modifications
as fall within the spirit of the invention and the
scope of the appended claim.

In the drawing—

Fig. 1 is a longitudinal sectional view through
a pivotally mounted arm of a pick-up and show-
ing the invention;

Fig. 2 is a view on a larger scale and taken as
looking downwardly on the forward portion of
the arm the top wall of the latter being omitted;

Fig. 3 is a transverse sectional view taken as
along the line 3—3 of Fig. 1 and on an enlarged
scale; and

Fig. 4 shows the wiring diagram.

The pick-up arrangement of the present in-
vention is adapted for use in connection with
radio receiving sets and while particularly adapt-
ed for use with a frequency modulated set may
also be used in connection with the usual am-
plitude modulated type of set. The device of the
invention may be wired to a receiving set or it
may be used to broadcast signals to such set for
reception and reproduction by the latter when
properly tuned.

Referring in detail to the accompanying draw-
ing at 10 is generally indicated the housing or
casing of the arm and the same functions as a
shield as will later more fully appear. Housing
10 includes an upper elongated but transversely
U-shaped sheet metal member and a somewhat
similarly shaped lower member designated 11 and
12 respectively.

These members are fitted together by dispos-
ing the open side of the bottom member 12 in the
open side of the top member 11 whereby the arm
or housing comprises top and bottom walls 13 and
14 respectively and double thickness side walls
15 and 16 respectively. Secured to the member
12 is a post 17 which depends from the arm or
housing and comprises a portion of a means by
which the arm may be pivotally mounted where-
by a stylus carried by the arm may follow the
sound groove of a record and be fed across the

2

record in the usual manner during reproduction.

A pivotal connection 17a provides for tilting of
the arm relative to the post whereby the forward
end of the arm may be raised off a record as will
be understood. Within the forward portion of
the arm 10 a pair of brackets 18 carried by the
arm member 11 support a clamp means com-
prising a pair of parts 19 and 20 which between
them mount rubber bearing means 21 support-
ing an oscillatory stylus bar 22. This bar and the
mentioned clamp including the plates 19 and 20
receive a reproducing stylus 23 and through the
outer end of the bar is a tapped opening thread-
edly receiving a clamping screw 24 by means of
which the stylus is clamped firmly in place and
which may be readily loosened to permit of re-
placement of a used stylus.

Stylus bar 22 projects rearwardly beyond the
clamping plates 19 and 20 and on its projecting
portion carries a closed coil 25 in the form of a
ring although it will be appreciated that instead
of the single turn shown the coil 25 might be of
two or more turns if so desired.

Ring 25 is located in alignment with an end of
a radio frequency coil 26. The ring is mounted
with one edge on the stylus bar and such edge
is so placed with respect to the coil 26 that as
the ring is rocked back and forth (as the stylus
bar is oscillated due to movement imparted to
the stylus by the record groove) the ring is
rocked bringing it more or less into the field of
the coil thereby varying its inductance and wave
length although not changing or varying the
amount of current passing through the coil.

Mounted in a socket 27a in the rear portion of
the arm 10, although not necessarily so mounted,
is a radio tube 27 shown more particularly in
Fig. 4 as including the grid 28, the cathode 29,
the plate 30 and the filament 31. Tube 27 being
mounted as described it may be conveniently re-
placed when that becomes necessary. Also in
the arm is a variable condenser 32 adapted to be
adjusted as by means of the screw 33 insulated
from the condenser by a knob 34. There is also
included a fixed or variable condenser 35 and a
combined grid leak and fixed condenser 36 the
purpose of which parts will be set forth.

Referring now to the wiring diagram of Fig. 4
as well as to Fig. 1 it is noted that the coil 26 is
placed in circuit with the variable condenser 32
as by the wires 37 and 38 of which the former is
tapped to the condenser by a connection 39 and
is also connected with the condenser 35 by a con-
nection 40 and with the grid leak and condenser
36 as well as the grid 28 of the tube 27. A tap

3

41 connects wire 38 with the fixed plate of condenser 32 and a tap 42 grounds said wire on the arm or housing 10.

Condenser 35 is located in the antenna wire 43 which may be used in broadcasting by the pick-up or which may be connected directly with the antenna connection of the radio receiving set with which the pick-up is used. A second wire 44 from the coil is connected with the cathode 23 and it will be seen in Fig. 4 that in this way a radio frequency reaction or oscillation is set up between the two portions of the radio frequency coil. Thus the structure shown is an electron coupled oscillator.

In the wiring diagram the leads from the tube filament are shown at 45 and 46 and the heavy B voltage is connected with the plate 30 through a lead 47 which through a radio frequency bypass condenser 48 is connected with the ground wire 38 and the negative side of the B voltage circuit.

In the operation of the device the condenser 32 is adjusted to tune the device for the particular receiving set being used. While the device is particularly adapted for use with frequency modulated receiving sets it may also be used with amplitude modulated sets in which latter case the set is tuned slight off of resonance. If desired the device of the invention may be wired directly to the receiving set in which case the antenna wire 43 is connected directly with the antenna connection of the set or with the intermediate radio frequency transformer 49 in a superheterodyne set 50 and the condenser 35 may be adjusted if necessary.

As the stylus bar 22 is oscillated due to move-

4

ment imparted to the stylus while operating in a sound groove the ring 25 is moved more into and out of the field of the coil 26 thereby varying its inductance and changing the wave length or frequency of the coil circuit. The movements of the ring do not result in any variation in the amount of current being passed.

Having thus set forth the nature of my invention, what I claim is:

- 10 A radio-phonograph comprising an impedance varying record pick-up, a superheterodyne radio circuit including a local oscillator having a tunable grid to cathode circuit, said tunable circuit including an inductance and a condenser and a circuit connecting the impedance varying pick-up in shunt to said condenser for effecting a frequency modulation of the oscillatory current of said oscillator upon variation in the impedance of said pick-up.

LESLIE A. GOULD.

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