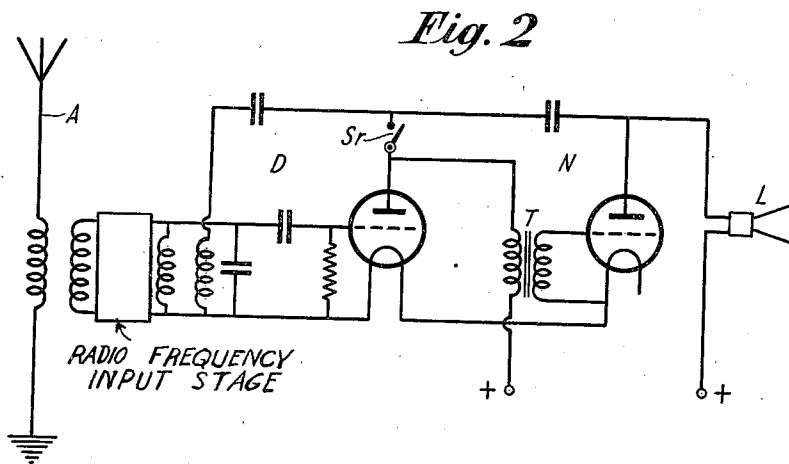
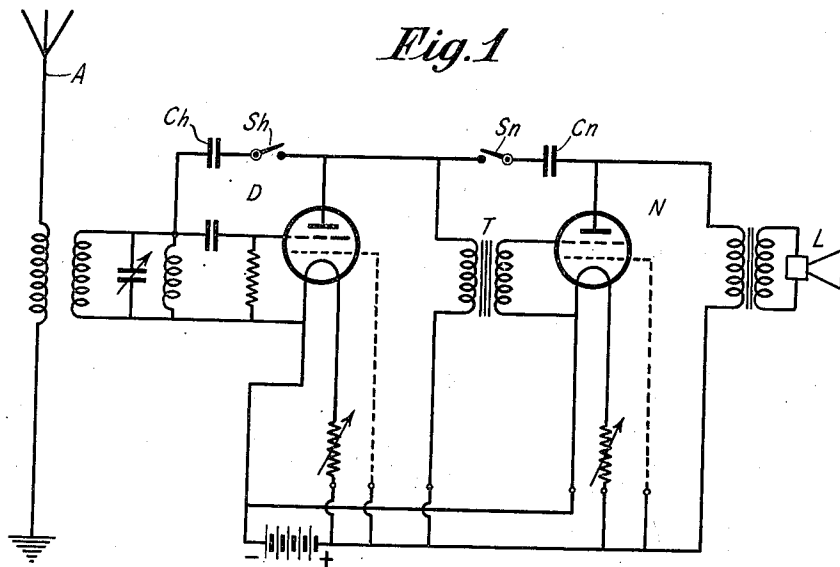


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AUTOMOBILE RADIO APPARATUS
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AUTOMOBILE RADIO APPARATUS

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6 Claims. (Cl. 250—13)

This invention relates to new and novel trans-
mitter-receiver apparatus, especially adapted for
automobile signal purposes.

The present invention is concerned with a
sending and receiving apparatus comprising
change over means which is fed directly from the
low voltage source of a vehicle and which is used
for signalling from the car and between cars
of similar kind.

It has been suggested in the prior art, for send-
ing a signal from a car about to "pass" a car
travelling ahead of it, to send signals by means
of electromagnetic waves. For this purpose,
each car must be fitted with a transmitter and a
receiver. In order to reduce the space require-
ments and cost, radio apparatus which contains
vacuum tubes having at least one radio frequency
and one audio frequency stage is provided. In
the simplest form, a two-tube outfit is used, the
first or input tube being connected when the ap-
paratus is set in the receiving position to act as
a detector and the second tube being employed
as an audio frequency amplifier. The filament
voltages are directly derived from the car battery
by a resistance voltage divider. The question of
supplying the plate with potential may be solved
in two different ways. Either the apparatus is
furnished with space-charge grid tubes, in which
case the voltage furnished from the ordinary car
battery of six to twelve volts will be sufficient,
or else the standard type tubes may be employed
in which case it will be necessary to produce a
high plate voltage by the aid of a direct current
converter. In actual practice, vibrators with
subsequent or simultaneous rectification have
proved satisfactory.

Now, the idea underlying the present invention
is to provide an arrangement for the detector
tube which by feedback may be de-attenuated to
a certain extent, an additional feedback whereby
the tube can be caused to generate radio fre-
quency oscillations. This additional feedback, if
one is to be provided, is rendered inoperative while
the switch is in the receiving position of the set.
Similarly, an audio frequency feedback is pro-
vided for the audio frequency amplifier which is
likewise disconnected by a switch during receiv-
ing intervals.

If signals are to be transmitted by the said
arrangement, both switches must be closed. The
detector tube is thus caused to act as a regenera-
tive transmitter, while the audio frequency
amplifier becomes a tonal oscillator adapted to
modulate the transmitter tube. By means of
another switch, simultaneously operated with the

change-over to "transmission", the loudspeaker
can be disconnected or be preferably short-cir-
cued. For if that is not done the transmitted
signal would be rendered audible in the loud-
speaker on the same car.

If desired, a tuned radio frequency stage could
be added to the said two tube outfit, said radio
frequency stage amplifying only the radio fre-
quency oscillations and being intended to shut
out disturbing noises and interfering actions hav-
ing their sources in the electrical equipment of
the car. In this enlarged outfit, the radio fre-
quency feedback serving in transmission must be
established from the plate of the detector circuit
to the circuit preceding the radio frequency
amplifier in order that also in this instance the
radio frequency oscillations will be modulated by
the tonal frequency.

Figures 1 and 2 show by way of example circuit
schemes adapted to practice the basic idea of this
invention. Referring to Figure 1, A is an antenna
which is used both for sending and receiving. D
is a demodulator stage whose input circuit is
tuned to the radio frequency carrier wave. CH
is a regenerative condenser which insures a feed-
back such that the demodulator stage will be
caused to become self-oscillatory. This feedback
is interrupted by a switch S_h whenever the outfit
is to be used for reception. Coupled with the same
demodulator stage D is an audio frequency ampli-
fier stage N by way of a transformer T. The out-
put of this audio frequency stage is connected, if
desired, by way of an output transformer with a
loudspeaker L. The audio frequency amplifier
is provided with a feedback condenser C_n by way
of which audio frequency feedback is establish-
able. The frequency of course, is a function of
the constants of the associated circuit elements,
but by additional means it may be caused to as-
sume any desired value. Also here a switch is
provided as indicated at S_n by the agency of
which the generation of tonal frequency is dis-
continued during receiving intervals.

Figure 2 shows a similar circuit scheme. The
two switches S_h and S_n are combined in one
switch S_r whose function is the same as in the
circuit scheme Figure 1. Fig. 2 also shows the
radio frequency input stage mentioned above.

I claim:

1. In a receiving and sending system compris-
ing in combination an input and output circuit,
a detector stage connected to said input circuit,
an audio frequency amplifier stage connected to
said detector stage, means for establishing a
feedback in both the detector and audio stages,

switching means to interrupt said feedback in the detector stage, a second switching means to interrupt the feedback in said audio frequency stage, said first and second switching means being closed in the sending position and open in the receiving position.

2. In a receiving and sending system comprising in combination an input and output circuit, a radio frequency input stage connected to said input circuit, a detector connected to said radio frequency input stage, an audio frequency amplifier stage connected to said detector stage, means for establishing a feedback in both the detector and audio stages, switching means to interrupt said feedback in the detector stage, a second switching means to interrupt the feedback in said audio frequency stage, said first and second switching means being closed in the sending position and open in the receiving position.

3. In a receiving and sending system comprising in combination an input and output circuit, a detector stage connected to said input circuit, an audio frequency amplifier stage connected to said detector stage, means for establishing a feedback in both the detector and audio stages, a switch to interrupt the feedback in both the detector and audio frequency stages, said switch being closed in the sending position and open in the receiving position.

4. In a receiving and sending system comprising in combination an input and output circuit, a detector stage connected to said input circuit, an audio frequency amplifier stage connected to

said detector stage, means for establishing a capacitive feedback in both the detector and audio stages, switching means to interrupt said feedback in the detector stage, a second switching means to interrupt the feedback in said audio frequency stage, said first and second switching means being closed in the sending position and open in the receiving position.

5. In a sending and receiving system comprising in combination a common antenna for both receiving and sending, a detector stage whose input circuit is tuned to a desired radio frequency carrier wave, an audio frequency amplifier stage connected to said detector stage, means for establishing a feedback in both the detector and audio stages, switching means to interrupt said feedback in the detector stage, a second switching means to interrupt the feedback in said audio frequency stage, said first and second switching means being closed in the sending position and open in the receiving position.

6. A receiving and sending system comprising an input and output circuit, a detector coupled to said input stage, an audio frequency stage coupled to said detector stage, capacitive feedback means connected to the output stage of both the detector and audio frequency stages, switching means to change said detector to a transmitting stage and said audio stage to an audio frequency generator to modulate said transmitter stage, said switching means being closed in the sending position and open in the receiving position.

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