Our present system of amplifiers seem out of class for the control of pictures, that is, to give us the fine variation necessary. The transmitting station gives us current to begin with. We can increase the amplitude of that current by radio frequency. We can also rectify it.

Here is where my imagination comes in. When I listen to a local amateur I can set me receiver to oscillate. I heterodyne his signal. But I can still hear him without the set oscillating. When he presses the key I can hear the pull on the diaphragm from the rectified D.C. he sends into the phones. When he lifts the key, the pull is released. With audio amplifiers the effect is spoiled in regards to holding the diaphragm under tension. All we think of is heterodyning to get the "sound". And all we think of to amplify the sound is to use the A.C. method. The grid of the amplifier gets voltage. The plate varies the amperage which must again be converted into voltage to impress the next stage of audio or radio. If we use no transformers, we use condensers. In either one we depend on A.C.

I am going to describe an amplifier. I may have left out something important that may not permit the whole thing to work.

We will O.K. the r.f. amplifier with its transformers. We will assume that the transmitting station can control its output as we want it. We can later apply the same principals, that I want to explain about the receiver, to the transmitter. We

will rectify what voltage we get after it is increased by the
r.f. amplifier.

Now the detector tube will have its regular plate supply
and we will put a very high resistance in the plate lead. With
no load, the plate voltage will be approximately the B battery
voltage. When the carrier wave comes on it will tend to draw
plate current through its effect on the grid of the detector
tube. The current is limited to the resistance of the circuit.
The tube's internal resistance is reduced so the voltage be-
tween the plate and the filament (on account of the inserted re-
sistance) is varied according to the grid exitation (the strength
of the received carrier wave). The voltage is controlled just
like shunting an ammeter that has too small a scale. (A shunted
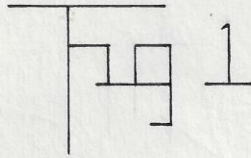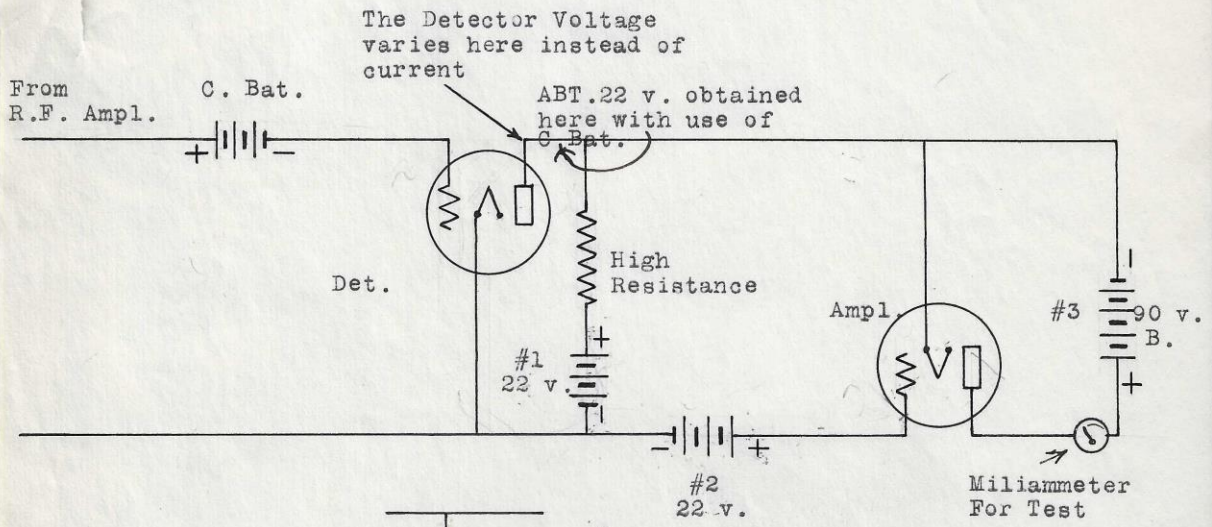ammeter is really a voltmeter).

We will assume that the plate voltage is 22 with no load.
With full load we will say it is 11. We can control the trans-
mitter in any way we wish to make this, say, 15 volts. All in
all, we change, or can vary from 22 volts pos. to 11 volts pos.
But when we increase the carrier current we expect to increase
the plate voltage in order to work the grid of the amplifier.
Instead we reverse and reduce it. Very good. Now I want to de-
scribe the amplifier to work with this voltage. The amplifier
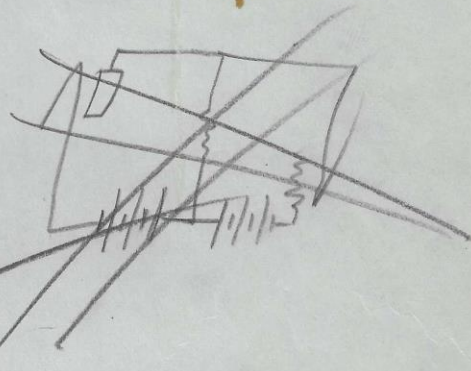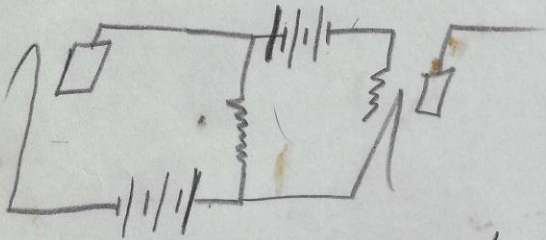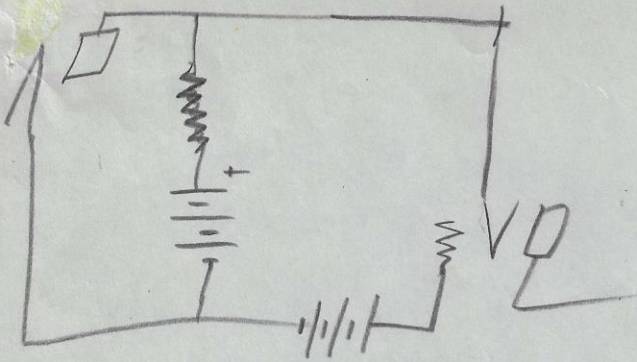will be turned upside down, as in Fig.1.

Without B bat. No.2 and with no load on the plate of the
detector there would be 22 volts negative on the grid of the

amplifier tube. With full load and a potential of 11 volts between the plate and filament of the detector tube the amplifier voltage (the grid to filament voltage to the amplifier) would be 11 volts with the grid still negative. You will notice that the detector plate and filament circuit is shunted with the grid and filament circuit of the "upside down" amplifier.
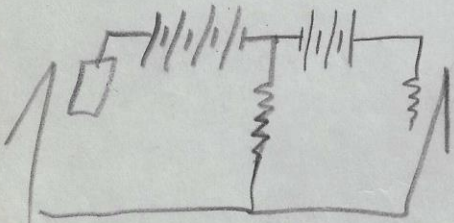
If the No.2 battery is added the grid will be just at 0 voltage. We have the battery a little larger and work on best curve of the amplifier tube. But for simplicity, leave it at 22. You may notice that this battery opposes the detector plate battery. This gives us the zero grid potential. Again the detector is put to work; the grid voltage now is 11 positive, just where we want it when we need it.

A second amplifier can be added to the first one, with separate batteries and the result would be that we could soon light our lamp or operate a controlling iris, or shutter., and all on a D.C. principal. And this amplifier should be used for the transmitter control as well.

The Detector Voltage
varies here instead of
current

From
R.F. Ampl.   C. Bat.   ABT.22 v. obtained
                                           here with use of
                                           C. Bat.

                                Det.   High
                                                            Resistance

                                                                        Ampl.   #3   90 v.
                                                                                            B.
                          #1
                          22 v.

                                           #2   Miliammeter
                                           22 v.   For Test

#1,129,943 - 1915
H.D. Arnold

#1,218,650
R.V.L. Hartley

JPD 4