

The Loftin-White Kit Modifications

OWING to space pressure we had to hold over the remaining portion of the L.W. description. Following is the conclusion to the article in our issue of September 5.

THIS variation of screen current will not result in distortion of any appreciable magnitude since it does not appear in the output circuit of the valve, that is the plate circuit. This little sidelight on the operation of the screen grid may be of interest when considering this type of valve in the role of detector, e.g., a varying signal voltage applied to the grid of a screen grid detector may cause variation of the screen current and a consequent variation of screen to cathode resistance. The plate current may therefore be modulated by this means and result in very efficient signal detection.

The Regulation Feature.

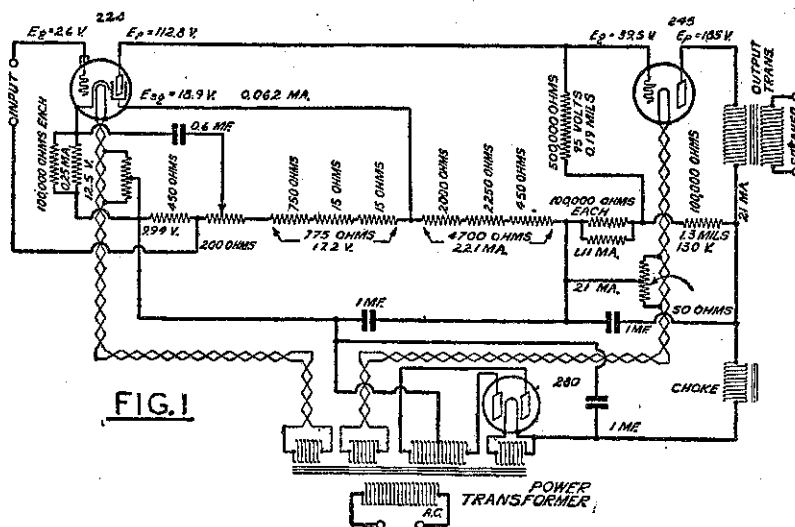
REFERRING to the circuit of Fig. 1, it will be seen that when, for any reason an increase occurs in the plate circuit current of the 224 tube, the bias on the 245 will increase automatically. This will cause a decrease of plate current in the 245. The 245 plate current constitutes the major portion of the current through the 450 ohm resistor, so that when this current decreases the bias on the 224 increases, tending to maintain the 224 plate current constant. This is the regulation feature of this circuit, about which much has been written. The circuit shown in Fig. 1, using the values given, has been found satisfactory as a gramophone reproducer.

In attempting to apply the Loftin-White system to the rectification and

amplification of signal voltages obtained from an R. F. amplifier, certain difficulties were encountered, which we must not fail to mention.

Aside from the fact, which has been brought out by other writers, that changing the grid leak detector of a receiver into a "C" bias detector (as is required of the first valve of Fig. 1)

R. F. voltage at the plate of a detector may be passed on and amplified, for the audio amplifier, resistance coupled as it is, may also act as an amplifier of R. F. voltages. This may cause a disturbance in the operating conditions of the 245 valve with consequent deleterious effects on the fidelity of reproduction.



regulation of the system, brought about by the opposing effects of the voltage across the bias resistor of the 224 and that across the 250 ohm resistor, will considerably reduce the efficiency of rectification.

Good Gramophone Amplifier.

WE have had, thus far, no success with the direct coupling system when using the first valve as a detector connected to an R. F. amplifier. We have, however, had sufficient success with the system as a simple amplifier to recommend it to those who are interested in the setting-up and the studying of new circuits. For example, if we use the usual detector in our radio receiver, follow it by a transformer or the usual resistance capacity coupling, and then follow this by the Loftin-White system, we have a very powerful system which will operate very satisfactorily. Or, if it is so desired, the Loftin-White amplifier can be built up as in Fig. 1 and used merely to operate on a gramophone pickup.

The layout (in September 5 issue) shown can be duplicated very easily, but must be shielded. The baseboard measures 9 x 14 inches, and is one inch thick.

Comprehensive List

Mr. Sellen's Record

A TRIBUTE to Mr. F. W. Sellens, the "Radio Record's" short-wave contributor, is paid by the Melbourne "Listener-In," which states that his list of overseas short-wave stations includes about 37 more than the 50 odd regular and semi-regular transmitters that journal knows. The "Listener-In" mentions that the 5 k.w. short-wave phone transmitter, recently installed on Tinakori Hill, Wellington, although it has been testing with Sydney, has not been heard by Melbourne short-wave listeners.

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will considerably change the stability conditions of the R. F. amplifier. It is well known that the low dynamic input impedance of the grid leak detector assists materially in stabilising the R. F. amplifier, because of the damping effect which it has upon the tuned circuit connected to it. An R. F. amplifier which has been stabilised for such a condition may no longer be stable when the detector is changed to a "C" bias detector without making proper changes in the R. F. amplifier.

A Difficulty.

BUT, aside from this, there is another difficulty which is far more serious: it is not possible to properly short-circuit the radio-frequency component of the detector plate current by means of a by-pass condenser from plate to cathode, which we are so accustomed to doing. The reason for this is apparent when we consider that such a condenser would be in parallel to the coupling resistor of ½ megohm; e.g., the reactance of a .001 mf. condenser at 1000 cycles is approximately 160,000 ohms. This consequently will act as a partial short circuit across the ½ megohm coupling resistor, and the high modulation frequencies will be lost. Without using such a by-pass in the plate circuit of a detector, large R. F. voltages will be passed through this valve and established in its place circuit. Three evils can result from this. If the impedance of the remainder of the system is sufficiently high, or, if a radio frequency choke is connected at the plate of the detector, the R. F. voltage developed there may be forced to feed back into the R. F. amplifier and result in a hopelessly unstable condition. Again, the

Another feature of the detector, which militates against the use of the power valve of the direct coupled system as a detector, is the very feature which tends to make the system stable as an amplifier. A change of plate current is required in a detector as it is by reason of this that the valve rectifies at all. Consequently, the self-

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