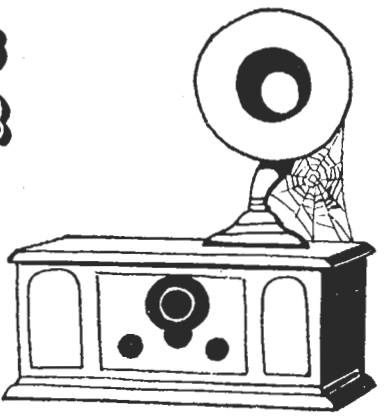
ANTIQUE RADIO CORNER

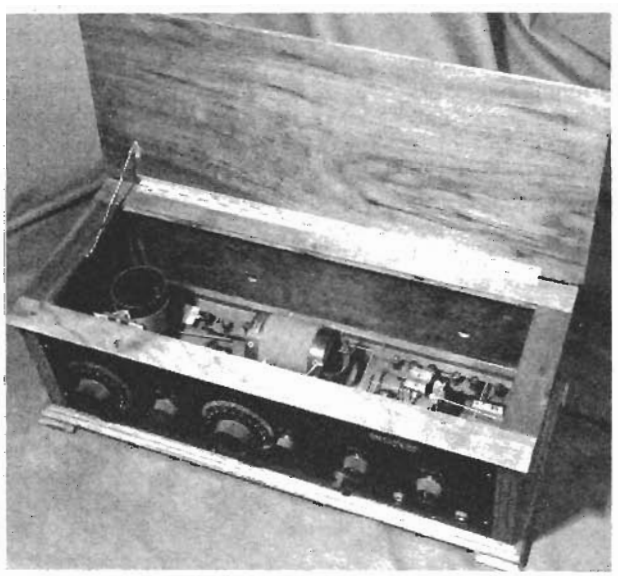


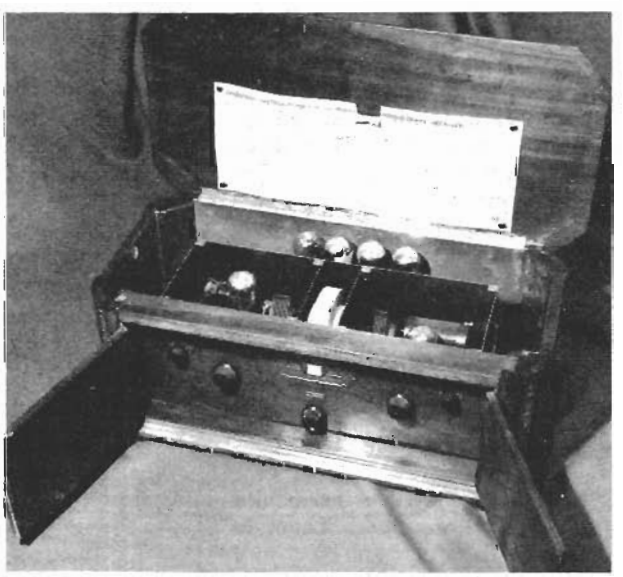
by James A. Fred

☐ Hello, out there in Radioland! We are in the middle of winter and I'll bet you are restoring some of the radio sets you found last summer. It is amazing to talk to collectors and find out how many really old radios, speakers, and tubes keep turning up. I hear from many would-be collectors who claim that there are no radios in the communities where they live. Except for a very few places in the United States you should have no trouble finding radios. In 1975 I visited collectors in Iowa, Nebraska, North Carolina, Virginia, and Indiana and also received many letters from other collectors. Invariably I found collectors who had added 10 to 25 sets, speakers and many vacuum tubes to their collections during 1975. Atwater Kent breadboards are turning up, Crosley Pups are coming out of hiding, and many crystal sets are being found. You just have to talk radios to your friends, look in newspapers, and haunt flea markets and antique shows if you want to find radios. Never give up and your collection will grow steadily.

Browning Labs. Since we are all interested in collecting radios made in the 20s I want to go back for our history lesson to the Browning-Drake Company. Glenn H. Browning and Fred H. Drake were engineering students at Harvard University when they met, and ultimately they founded the Browning-Drake Company.

The radios in use in 1923 usually consisted of a detector and one or more stages of audio amplification. As a result it was difficult to separate local stations and nearly impossible to receive distant stations. Browning and Drake believed that a radio frequency amplifier ahead of the detector would improve a radio receiver more than anything else. They attacked the problem together and soon developed circuits and test methods that enabled them to predict the gain, selectivity, and sensitivity of an RF amplifier. They developed new designs for RF coils that reduced the coupling between primary and secondary. Browning and Drake were able to wind the primary of the RF coils with very fine wire in a narrow winding while the secondary was wound with larger wire over a longer space. They started by selling kits for home-built radios using coils made to their design by the National Company. These early kit radios were built on a wooden board very much like the breadboards used by Atwater Kent. This proved to be unpopular with housewives since it was difficult to dust and clean a breadboard receiver. So, like Atwater Kent, they began to manufacture radios in table cabinets. One of the photographs shows the Browning-Drake Regenaformer receiver made in 1923. It consisted of an RF amplifier,





This Browning-Drake Regenaformer receiver was built in 1923 and the one at the right is a Browning-Drake Hetrodyne receiver.

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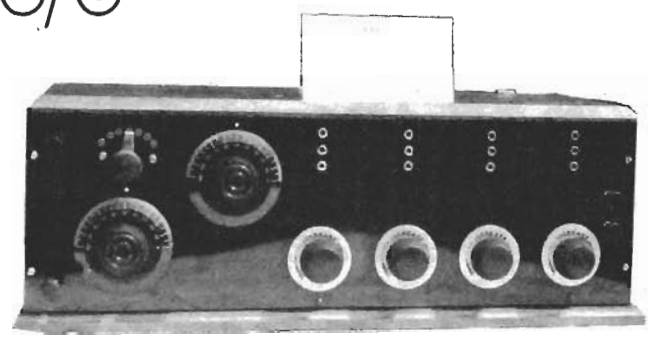
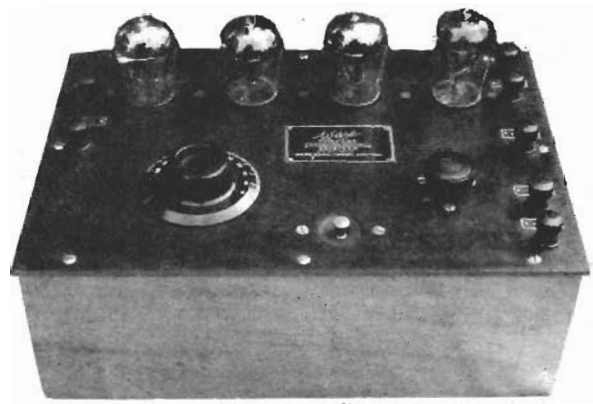


This Miracle 4-tube TRF radio belong to George Hausske, Wheaton, Illinois.



Quite rare, this Ware Radio Corp. AD2 4-tube receiver is also owned by George Hausske.

regenerative detector, and one or two audio amplifier stages. Another photo shows a 1927 model Browning-Drake Heterodyne receiver.

In November 1937 Browning Laboratories was incorporated by Glenn H. Browning and Ralph L. Purrington. Early products were a short-wave receiver, a preselector, a frequency meter, and short wave converters. About this time the 42 to 50 megacycle Frequency Modulation broadcast band was authorized by the FCC, and Browning Laboratories, Inc. offered the first FM tuner for this band. Many other electronic products, particularly test instruments, were manufactured prior to 1958 when the Citizens Band service was authorized by the FCC. It has been a long time between 1923 and the present, but here is one company that was able to survive by meeting the radio and electronic needs of the American people.

Another pioneer. Another man who contributed to the early development of radio was Nathan B. Stubblefield. You are going to say you never heard of him. I had heard of him, but this information was supplied in a very interesting story sent to me by W. A. Rudolph of Memphis, Tennessee.

Stubblefield is believed to have demonstrated wireless transmission of voices at Murray, Kentucky in 1892. If this is true he predated the Canadian Reginald Fessenden. He refused to act on a suggestion made by a lawyer friend to apply for a patent on the device. In 1902 he demonstrated radiophone transmission before 1000 witnesses, again in Murray. At that time his son, Bernard played a harmonica over the radio transmitter. Later in 1902 he took his equipment on a tour of Washington, Philadelphia, and New York. In a patent application dated April 5, 1907 he sketched a proposal for radio-telephone communication to and from moving trains.

One of the reasons very little is known about Stubblefield is that he was not a scientist. He was a farmer who was able to make mechanical parts and repair his own machinery. Businesswise he wasn't very smart and so he was taken in by a fast talking swindler who caused Stubblefield to lose everything he had including his radio apparatus and his home. He was found dead, in a little shack he had constructed from lumber scraps and tin, on March 28, 1928.

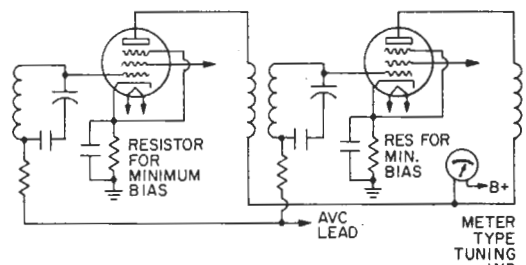
The Stubblefield story is kept alive by the Murray Chamber of Commerce and by accounts like this, quoted from the *Commercial Appeal* published in Memphis, Tenn.

In the next issue of *Elementary Electronics* I will have a story about Dr. Mahlon Loomis, a denist in Philadelphia. He is supposed to have transmitted radio signals in 1872 from an antenna held aloft by a kite.

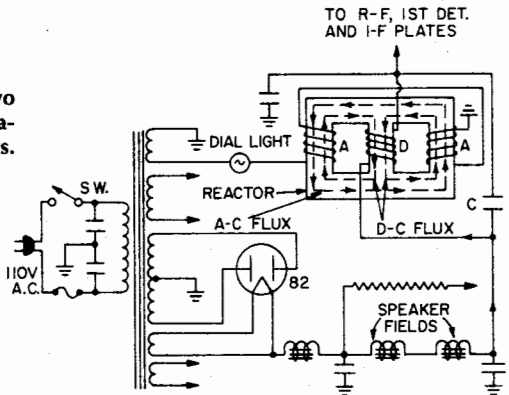
More tuning indicators. To continue with our discussion on tuning indicators we will consider the tuning meter and the dial light resonance indicator.

From our previous discussions we know that on a strong signal the grid bias on the RF amplifier and other tubes is increased by the AVC action and their amplification factors are decreased. When this happens the plate current of these tubes also decreases. An ordinary moving coil milliameter is connected in the plate circuit of one of these AVC-controlled tubes. The current through the meter will be small on loud signals and large on weak signals. This meter is called an "S" meter (Signal Strength) on communications receivers. On a broadcast receiver it is called the tuning indicator. The meter is usually one that has the pointer at rest on the right-hand side, or a conventional zero-left reading meter can be used if it is turned upside down. The pointer stays at the extreme right on strong signals, and swings to the left when there is no signal received.

Some receivers, including several Majestic sets, used the regular dial lamp in the set to indicate when it was tuned to resonance with the incoming signal. A saturable-core reactor having three legs on the core and three windings (one on each leg) was used to accomplish this. The circuit diagram helps explain how it works. The basic idea is to make the changes in DC plate current of the AVC-controlled tubes control the flow of AC through the dial lamp, making it brighter and dimmer as the station was tuned in and out of resonance. As shown in the drawing, two AC coils having an equal number of turns are



Meter-type tuning indicator was used in the plate circuits of AVC-controlled tubes in early receivers.



Saturable-core reactor with two windings operated tuning indicator dial light in other early sets.

mounted on the outer legs of the reactor core. They are connected in series with the dial lamp which obtains its operating voltage from a secondary winding on the power transformer. The center leg winding is connected in series with the plate circuits of all the AVC-controlled tubes, so that it carries the total plate current of these tubes.

When the receiver is not tuned to a station high DC plate current flows through winding "D". The reactor is so designed that the DC magnetizes the iron core beyond its saturation point. Hence the dial lamp current flowing through coils A-A produces no change in the magnetization of the iron core. As a result the reactance of these coils is low, and full current flows through the circuit, lighting the dial lamp to full brightness. When the receiver is tuned exactly to the station frequency, the negative bias placed on the AVC-controlled tubes reduces the plate current of these tubes. Since this current flows through center leg coil "D", it reduces the strength of the magnetism in the core when the station is tuned in correctly. This greatly increases the reactance (impedance) of coils A-A, thereby limiting the dial lamp current flowing through them, and causing the lamp to glow dimly. The closer the receiver is tuned to resonance with the station the dimmer the dial lamp gets. Thus the dial lamp serves as a visual indicator of how well the station is tuned in.

New history of radio. A new history of radio is being written and published by W. M. Dalton in England which will consist of eight volumes. Being written by an Englishman it gives one a different viewpoint on the development of radio communication than the one commonly accepted in the United States. Volume 1, "How Radio Began," and Volume 2, "Everyone an Amateur," have been received. Volume 3, "The World Starts to Listen," will be available soon.

Volume 4, "Radio Becomes a Profession," Volume 5, "The Birth of TV," Volume 6, "The Pressbutton Age," Volume 7, "WWII and After," and Volume 8, "Transistor Radio," will follow along over the next year or two.

I have just finished reading Volume 1 and am very much impressed with the vast amount of information, written concisely and to the point, about wireless and radio development up to WWI. There are four chapters in this book: 1, Magnetism and Electricity; 2, Electrical Engineering; 3, Wireless-telegraphy, and 4, The Thermionic Valve. Very little math is included, and it is non-technical reading at its best. I am sure that anyone who has any interest at all in radio and wireless will find it fascinating reading. The price of each of the first two volumes is 4.5 English pounds which at the present rate of exchange is a little over $9.00. The book is well printed on good quality paper, and is handsomely bound in hard covers for lasting service. If there is enough reader interest I will find out where it can be purchased.

I have received several letters regarding restoration of wood and plastic cabinets. I touched lightly on this subject in the book, "Budget Electronics," published by Davis Publications. Because of the interest in patching veneer, refinishing cabinets, and other cabinet repairs I will devote a whole column to this subject very soon.

So long for now. I'll be back with you in the next issue with more news, technical information, and restoration tips on antique radios and collecting.■