



MAHOGANITE Dials that match the set

Like all other distinctive products, Mahoganite has its imitators. But these imitations are on the surface only. Mahoganite is not a surface finish. The electrical values of RADION Mahoganite extend through the material.

The only way to assure yourself of genuine Mahoganite Panels, or Dials which match the panels, is to make sure that the RADION Trademark is on every one that you buy.

RADION

The Supreme Insulation

PANELS



Look for this stamp on every genuine RADION Panel. Beware of substitutes and imitations.

AMERICAN HARD RUBBER CO., 11 Mercer St., N. Y.

21 Stock Sizes Mahoganite and Black

6 x 7	7 x 14	8 x 26
6 x 10 1/2	7 x 18	9 x 14
6 x 14	7 x 21	10 x 12
6 x 21	7 x 24	12 x 14
7 x 9	7 x 26	12 x 21
7 x 10	7 x 30	14 x 18
7 x 12	7 x 48	20 x 24

Story of Reflex and Radio Frequency

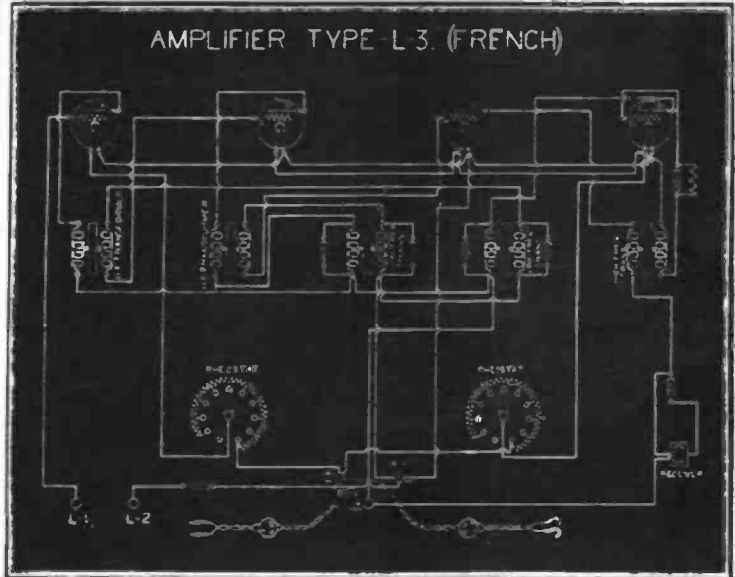
(Continued from Page 10)

many times have we seen the "So and So" reflex being described as the latest "Knock Out" set. Let's give credit where credit is due!

Along about the time that Schloemilch was working on this development, other discoveries were being made. Among these was the art of "cascade" connections—several tubes being used to give successive stages of amplification. The original reflex was a one-tube circuit. It remained for Marius La Tour, a French engineer,

granted patents Nos. 131,092 and 132,668. The first merely used a tube instead of a crystal for a detector and added one stage of straight radio frequency amplification ahead of the Schloemilch and Von Bronk reflex tube. The second patent, however, disclosed a cascade reflex, two tubes carrying both radio and audio.

The British patent, No. 132,668, is reproduced herewith, together with the drawing. Inasmuch as the reflex principle is a system of amplifier,



Above is the reflex diagram of the famous La Tour system and below the title page of the U. S. Army pamphlet describing it

AMPLIFIER TYPE L-3 (FRENCH)

FRENCH NAME :

Amplificateur L-3.

USE :

This amplifier is used principally for receiving on loops, though it may also be employed with an antenna and any ordinary receiver, working best in the range of wave-lengths between 200 and 1,000 meters. It makes use of 4 standard French amplifier lamps. The first 3 lamps act as high frequency amplifier and the fourth as audio amplifier.

to combine cascading with reflexing in what has since become known as the La Tour Circuit.

La Tour reasoned that if it were possible to reflex one tube, it would be possible to reflex several tubes in the cascade arrangement. After considerable experiment, he arrived at what he considered to be the best possible combination.

He made two filings in the French Patent Office—one in April and one in November in the year 1917. He also filed in England, where he was

La Tour has only shown the amplifying circuits. He has not shown the radio tuning circuit, merely indicating two connections at the extreme lower left of the drawing.

A careful study of this drawing will show you that La Tour has employed three stages of transformer coupled radio frequency amplification, a detector tube and two stages of audio amplification. His radio currents pass through tubes 1, 2, 3 and into the detector (tube 4). Here they are changed into audio currents and fed back into

For Radio Frequency

YOU MUST be able to get extremely loose coupling. The ordinary forms of coupler winding do not permit this. The

Simplex 180° Variocoupler

Solves the problem of efficient radio frequency for that set of yours. The special woven web form of rotor does it.

Simplex DX Tuner

Here is an instrument that is doing wonders. Let us tell you how to use it. Similar to the Variocoupler except that it is designed for the untuned primary.

1015 Ridge Ave. SIMPLEX RADIO CO. Philadelphia, Pa.

We repair the following RADIO TUBES and Guarantee Them

WD-11 \$3.00	DV-4 \$3.00	UV-201A \$3.00
WD-12 3.00	DV-1 3.00	C-301A 3.00
UV-200 2.75	DV-2 3.00	Marcioni 3.00
UV-201 3.00	DV-6A 3.00	Moorhead 3.00
C-300 2.75	UV-199 3.00	6 v. Plain Amp. 3.00
C-301 3.00	C-299 3.00	6 v. Plain Det. 2.75

Mail Orders solicited and promptly attended to. Dealers and Agents write for Special Discount

H. & H. RADIO CO.

P. O. BOX 25-K NEWARK, N. J. CLINTON HILL STA.



tube No. 2 and then out through tube No. 3 into the telephones. This is known as straight reflexing.

You will, no doubt, recognize this as the basis of the several commercial multi-tube reflexes on the market today. This circuit, like the Schloemilch and Von Bronk, has been taken as a ticket to success by several people who have not been willing to give credit where credit is due. So we have today several multi-tube reflexes, all bearing the names of their would-be discoverers—the circuits being nothing more nor less than the La Tour developments.

This brings the development up to the writer's own contribution in con-

not very new. It dates back to the war.

The wonder of the reflex is that it did not become generally known in this country long before now. Radio frequency and reflex have been the practice in Europe all during the time when regeneration was the "craze" in America. *It does not annoy the neighbors*; it delivers excellent quality and is fairly easy to construct.

It has its kinks and peculiarities, but once these are mastered, the experimenter will be rewarded for his efforts.

Perhaps the war brought reflex to this country by sending our radio engineers to Europe. The United States

**AMERICAN EXPEDITIONARY FORCES
OFFICE OF THE CHIEF SIGNAL OFFICER**

**Amplifier Type L-3
(French)**

When requisitioning radio equipment, use the name of the apparatus given in this bulletin, and when it is necessary to replace units or parts of this set, use the unit number or part designation given herein.

RADIO APPARATUS DESCRIPTIVE BULLETIN No. R-23

March 23, 1918

nection with reflexing, the story of which you have probably read before. It was while working in connection with the La Tour that he came to the discovery of the inverse duplex, a system of utilizing the vacuum tubes for both radio and audio wherein the three inherent disadvantages of the reflex are overcome. This has all been told before, so there is no need to repeat it here. It is sufficient to say that it is a decided improvement in three different respects over the straight reflex. And even the inverse duplex is

Army pamphlet, which was the radio leaven, as far as reflex was concerned, is shown here. This is the famous Bulletin No. R-23, describing Amplifier Type L-3 (French). This was the army set built upon La Tour's invention and was the source of inspiration that resulted in reflex development in America. It was also this army bulletin that led to the inverse duplex invention.

Unquestionably one of the important reasons for the rapid growth of radio during the last two years has



Q What voltage should a new dry B Battery show?

Q How long can it be used with satisfactory results?

Q Should it be discarded when no longer serviceable in the detector circuit?

Q When should storage B Batteries be re-charged?

**Can You Answer?
These Questions?**
IT'S EASY WITH THE

Sterling

**POCKET METER
No. 34C**

All these questions and many more can be easily answered if you have a Sterling "Right Resistance" Voltmeter.

These instruments are especially designed for the measurement of "B" Battery voltage. They may be used on either the dry cell or storage type of battery. The resistance of these meters, about 800 ohms, is such that they truly indicate the ability of the battery to deliver and sustain its voltage.




THE STERLING MFG. CO.,
2831-53 Prospect Ave., Cleveland, O.
Dept. J.


"Has the bulge on them all"

Panel Engraving

CAPACITY 5000 PANELS DAILY



We are supplying many of the largest set manufacturers with completely engraved, drilled and grained panels, at a cost lower than they, themselves, can manufacture them.



We also specialize in individual orders.

Best Grade Celeron Used
"A Bakelite Product"

Send us your specifications

CALVERT SPECIALTY CO., Inc.

1312 Callowhill St.
Phila., Pa.

WORKRITE NEUTRODYNE GRAND



(Licensed under Hazeltine Patents Nos. 1159989 and 1189728)

Coast-to-Coast on a Built-in Loud Speaker

Employing the famous five-tube Hazeltine circuit, this Workrite instrument will give the utmost enjoyment of radio reception. Simplicity of operation, clearness of reception and the ease with which the desired station can be picked up at any time, make the Workrite Neutrodyne Grand a most popular instrument.

Workrite Neutrodyne Sr. Grand, \$200.00
Workrite Neutrodyne Jr. Grand, \$140.00

Send for complete catalog of Workrite sets and parts

THE WORKRITE MFG. CO.
1834 East 30th St., Cleveland, Ohio
(Branch Office, 536 Lake Shore Drive, Chicago)

been the fact that the Schloemlich patent was owned by the government and was available to all. This has enabled many organizations to engage in radio manufacture, to the everlasting improvement of the art and greatly to the public's benefit. It has successfully checkmated any attempt to monopolize the field of radio reception and has opened it up to strong, healthy competition.

Most of the popular circuits of the day are based fundamentally on radio

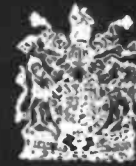
that the United States Navy owns the basic patent.

And even as we are writing, strong rumors are floating about that several combines have attempted and are attempting to obtain an exclusive license from the War Department on this important patent.

Patents are granted as a reward for accomplishment. We sometimes wonder what reward such a combine as mentioned above has coming to it for trying to "corner the market" at

132,668

PATENT



SPECIFICATION

Convention Date (France), Nov. 17, 1917.

Application Date (in the United Kingdom), Nov. 16, 1918. No. 18,836 1b

(Patent of Addition to No. 130,103. Convention Date (France), Apr. 15, 1916.

Complete Accepted, Sept. 25, 1919.

COMPLETE SPECIFICATION

Improvements in or relating to Audion or Lamp Relay or Amplifying Apparatus.

I, MARIUS LATOUR, of 10, rue Auber, Paris, in the Republic of France, Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement—

- This invention comprises an improvement in or modification of the invention claimed in my prior Application No. 3140 of 1918 in which is described in an amplifier with relay lamps wherein amplification is conducted in stages the use of a common source for supplying with current the plate-filament circuits of the lamps in various stages.
- In my prior Application No. 3140 of 1918 an amplifier is described in which the frequency of the amplified signal is

The first page of the British patent for the La Tour reflex system

amplification or reflexing and, as such, come under this patent. It will not expire until 1931. By great good fortune we have the benefit of this seven years ahead of its time. The result is the super-heterodyne, the super-dyne, the neutro-dyne, the reflex, the inverse duplex and several dozen other combinations. All of these would fall by the wayside were it not for the fact

the public's expense. It would be ridiculous if the oil lease scandals were not so recent.

The radio public is at the present time in grave danger and cannot be too wide awake in the matter. The time is coming when we will have to organize to accomplish desirable legislation for protecting the air and other things radio.

QRM! QRM!

If you could read the dots and dashes you would constantly hear this frantic call. In wireless parlance it means that signals cannot be received because of

INTERFERENCE

Interference! The bane of the listener-in! And it causes language that has to be expressed with more dashes than dots. QRM—QRM—Everywhere!

That's old fashioned now. Pfanstiehl has made interference as inexcusable as smallpox. Here's how:



PRICE \$8.00

The
Pfanstiehl
Silencer

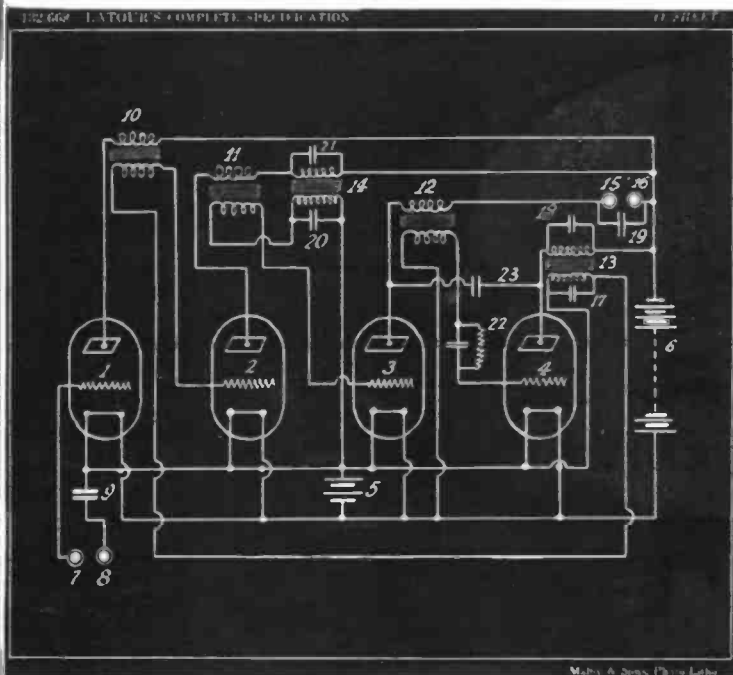
The Nineteenth Amendment to the Constitution of the United States—Prohibition of Interference. It doesn't require a law; it requires just one of these SILENCERS.

Pfanstiehl made and still makes:

- The original no-loss Reinartz coil.
- The original no-loss pure inductances.
- The original no-loss pure inductance universal

TUNING UNIT. And now
THE PFANSTIEHL SILENCER

PFANSTIEHL RADIO SERVICE CO.
Highland Park, Ill.



This Drawing is a reproduction of the Original on a reduced scale