

## Fifteen Minutes of Radio Each Day

By EDWARD N. DAVIS

Formerly Technical Electrician, Expert for U. S. Government  
(Copyright 1922, by United Feature Syndicate)

## Radio Fans' Attention

The Radio Editor would like to hear from the radio fans of Tulsa and vicinity about the daily radio features, "Fifteen Minutes of Radio" that appears in The World daily. Space is so valuable that The World does not want to publish anything that the fans are not interested in.

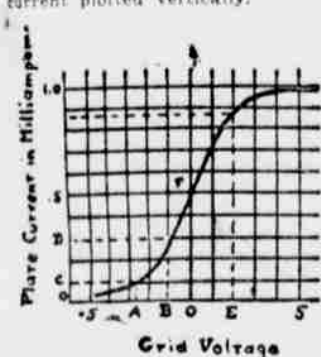
## LESSON No. 106.

## Characteristics of the Three-Element Tube.

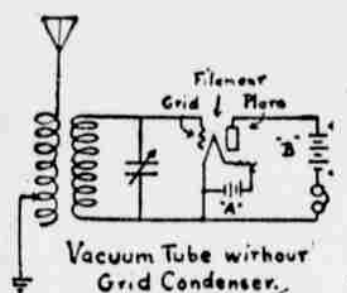
In a vacuum tube each of the three elements, namely the filament, grid and plate, have important functions to perform and those functions are so closely related that any change in the operation of one of the elements invariably produces changes in the condition of the other two.

Several different groups of characteristic curves may be constructed which demonstrate the various relations existing between the three elements of the tube. For example, a group of curves may be developed which show the resultant plate current due to changes in the plate voltage, these curves being dependent upon the temperature of the filament as is also the grid-voltage to grid-current group of curves.

The ability of small amounts of energy on the grid to control comparatively large amounts of energy in the plate circuit is an important property of the tube and the following diagram shows the action of the grid in controlling the plate current. In this diagram values of grid potential are laid off horizontally with the corresponding amount of plate current plotted vertically.



Characteristic Curve of Vacuum Tube



From this grid it will be seen that if the grid has a comparatively high negative potential, a small decrease of this potential causes a large increase of plate current; for example, when the grid voltage decreases from (A) to (B) the plate current increases from (C) to (D). If the grid voltage is increased negatively, however, by the same amount, their relative decrease of the plate current is much smaller. Therefore, if the grid voltage is adjusted to the value (A) it is apparent from the curve that any increase of the grid potential to the more negative side causes an increase in the plate current much larger in value than the decrease produced by an equal reduction of the grid voltage.

On the upper bend of the curve the reverse condition takes place, that is, if the potential of the grid

is adjusted to a value (E) on the curve, a small increase in the plate current while an equal decrease of the grid voltage produces a decrease in the plate current of a much larger value. If the grid potential, therefore, is adjusted to a value on the upper or lower bend of the curve, the action of incoming oscillations upon the grid results in what amounts to a rectified current, in the plate circuit, this current producing audible sounds in the receiving telephone.

Along the straight line portion of the curve, for example, at point (F) an equal increase or decrease of the grid voltage produces an equal increase and decrease of the plate current, which renders the tube in proper adjustment for amplification by impressing equal changes of plate current upon a second tube.

It is important to note therefore that when no grid condenser is employed in conjunction with the vacuum tube that rectification is occasioned either by an increase or decrease of the plate current depending on whether this rectification takes place at the upper or lower bend of the grid voltage-plate current curve.

## WOMEN AFTER M'CORMICK

They Haven't Forgotten Slight to Sex Made by Senator During Address.

Special to The World.  
WASHINGTON, July 20.—Women's organizations are after the scalp of Senator Medill McCormick, chairman of the republican senatorial campaign committee. Members of the National Woman's party accuse McCormick of deliberately insulting women. McCormick's offense consists of his recent statement that:

"Persons might vote for a woman for superintendent of schools or for the town council or for other little jobs like that, but when it comes to the senate of the United States they will not do it."

McCormick made his statement in discussing the candidacies of Mrs. Annie Olson and Mrs. R. G. Hooper. Mrs. Olson is the nominee of the democratic party for senator from Minnesota. Mrs. Hooper is the nominee of the democratic party for senator from Missouri.

Women leaders say that unless McCormick corrects his statement it will cost the republican party thousands of women's votes.

One-tenth of the lead produced in the United States is used in the telephone industry.

## EVERY PENNY

of the invested funds of this association is in first mortgage loans on

## TULSA REAL ESTATE

That fact makes this savings institution the logical place for your funds, because if this means added safety we pay 6 to 8 1/2 % on every dollar you save here.

**Tulsa Building & Loan Association**  
SINCLAIR BUILDING



## UNABLE TO WALK DOWN TOWN

After Two Months' Treatment Had Perfect Use of Herself.

The following from Mrs. Burns, who is one of the best known and most respected ladies of Pryor, Oklahoma, should interest any sufferer from serious chronic disease:

"Pryor, Okla.  
"I had been suffering for more than three years from a condition that many women are afflicted with. For more than a year I had been unable to walk down town, only a matter of four blocks. There seemed to be nothing left for me but to submit to a most dangerous operation, as I could get no help. Two months ago I began treatment with the Inter-State Doctors. What they have done for me has been truly wonderful. I go any place and everywhere just as I once did. I feel that I would not be doing my duty to other sufferers unless I told what has been done for me and I write this trusting that it will be the means of helping others back to health."

"MRS. M. BURNS."

The diseases treated by the Inter-State Doctors are all chronic diseases of the blood, nerves, kidneys, liver and stomach, including catarrh, rheumatism, indigestion, constipation, nervousness, loss of nerve force, goitre, gall stones, diseases of women and diseases of men.

Not the least of their success is due to their facilities for examination and correct diagnosis. Thousands of men have been relieved from the embarrassment of some hidden disease. Many hopeless mothers have escaped the surgeon's knife through their methods of treatment.

They are prepared to administer the French 214 to a limited number of patients.

The Tulsa offices are at 218-219 Security building corner Second and Main streets. Consultation and examination is free.

Office hours are: Week days, 9 to 5; evenings, 7 to 8; Sundays 10 to 12 noon.—Advertisement.

Use Mrs. Tucker's Shortening for your next steak and note the improvement.



**Mrs. Tucker's Shortening**  
100% PURELY VEGETABLE

SINCE 1904



It Starts This Morning

## Bigger Discounts on All Two and Three-Piece Suits

Every Palace, Stein-Bloch and Society Brand Two and Three-Piece Suit at

**33 1/3 Per Cent Discount**

This includes all medium weight suits, suitable for fall wear.

Here's Your Chance to Buy Your Fall Weight Suit at a Big Discount

\$18.00 Values	\$12.00	\$39.50 Values	\$26.35
\$18.50 Values	\$12.35	\$42.50 Values	\$28.35
\$19.50 Values	\$13.00	\$45.00 Values	\$30.00
\$22.50 Values	\$15.00	\$47.50 Values	\$31.65
\$25.00 Values	\$16.65	\$48.50 Values	\$32.35
\$26.50 Values	\$17.65	\$50.00 Values	\$33.35
\$29.50 Values	\$19.65	\$55.00 Values	\$36.65
\$35.00 Values	\$23.35	\$60.00 Values	\$40.00
\$37.50 Values	\$25.00	\$65.00 Values	\$43.35
\$38.50 Values	\$25.65	\$75.00 Values	\$50.00

## Great Values in

## Odd Trousers

All suiting patterns made in the finest woolsens. \$7.50, \$8.50 and \$9 values.

**\$5.75**

## Boys' Suits

With two pairs trousers

Including all Hart Schaffner & Marx and Sampeck makes and all wash suits at

**25 Per Cent Discount**

## All Straw Hats 1/2 Price

All One-Piece Bathing Suits At 25% Discount

Forty dozen of the finest 100-100 Count Percale Shirts \$2.25 values at **\$1.65**

Shoe Dept. All Palace, Hanan and Banister Oxfords at **25 Per Cent Discount**

\$7, \$7.50, \$8.50 and \$9 White Oxfords **\$5.25**

Every Item Advertised During This Sale Will Be Sold for Cash Only

**Palace CLOTHIERS**  
On Main at Fourth

## Midsummer Clean-Up Prices Make Buying Attractive Today —at Vandevors

## Final Clean-Up on Mid-Season Dress Stock at Half Price.

Grouped on Sale Racks for Your Convenient Selection

Good, reasonable models in cotton crepes, foulards, satins, georgette crepes, tricolettes and woolsens are represented in this lot. All sizes, from 14 to 44 are to be had in one or more dresses. Former prices \$25 to \$85. Now just half price.

Another group of most attractive frocks in organdy, hand-made voile, dotted swiss and raitine, in pleasing shades that add from \$15 to \$25, now reduced one-half. All sizes are to be found in this group also. Every one was a good value at the regular price.



Special Purchase Lot of

## Fine Fiber Silk Sweaters

On Sale Friday and Saturday

**\$6.95**

A particularly charming group of tuxedo sweaters, these, displaying charms and vivacity that will endear them instantly. Each one bears the "Keetch" brand, a guarantee of quality and style. They are exceptionally well made of a fine grade of fiber silk in plain and fancy weaves. They are fashioned to fit nicely. A narrow braided or knitted belt adorns each. Colors, blue, honey dew, black, navy, henna, brown and red. Sizes 36 to 44. See Window Display.

## Bandeau Hip Confiners, \$2.50

Made with elastic hip girths, bodice top, 4 hose supporters. Fits well, both front and back. Lightly boned across abdomen. Very satisfactory for sports wear and swimming, as well as general wear. All sizes. Moderately priced at \$2.50. Third Floor



## PACIFIC Package Outfits

Autumn and Winter 1922

new models include infants' and children's dresses, rompers, women's gowns, teddies, negligees, kimono and aprons. These garments are all made of good materials and stamped in appropriate designs for pretty hand work. All reasonable prices.

Closing Out Spring and Summer

Finished Models **\$1.98**

Fancy Straw

Needlework Bags **69c**

Silk Specials

—32-in. Sweet Briar Kimono, in a good line of colors and patterns. Used for blouses, dresses, monos, in a good line of and kimono. Regular price \$3.25. Special **\$2.59**

—40-in. baronette satin, in a good line of colors, black and white excepted. Reduced from \$2.75 per yard to **\$1.49**

—36-in. silk falls in green, blue, brown, black; also a few shades in crepe knit and some fancy striped materials for sport skirts. Special, yard, at **\$2.59**

**Vandevors**  
102-111 So. MAIN



**Hyldewood Face Powder**  
Instantly refreshes outdoor complexion

The Hazards of motoring, swimming, golf, tennis or dancing are delightfully overcome with this unusual face powder. Exquisitely fine and delicate it blends instantly with the tone of the skin. One of four tints is precisely yours. A pretty box; liberal in size; luxurious in contents and only 80c. At your druggists.

ALEXANDER DRUG CO.



## OK Portland Cement

"Used on All the Big Jobs"

Nine thousand (9,000) barrels of OK Portland Cement will be used by Gibson and Mitchell in building the new Federal Aid road at Ponca City, Oklahoma.

## Oklahoma Portland Cement Company

An Oklahoma Industry

411-418 Trademans National Bank Building

OKLAHOMA CITY