

RADIO

THIRD ELEMENT IN THE VACUUM TUBE

Grid Added to Fleming Valve by Dr. Lee DeForest Was a Big Improvement.

Any device which will pass electricity in one direction and will wholly or partially obstruct the flow in the opposite direction is termed a rectifier, because when connected in the path of an alternating current it will suppress one-half of each cycle and therefore the circuit will be traversed by pulsating direct current. A rectifier also is said to possess unidirectional conductivity, meaning, of course, that it will conduct electricity in one di-

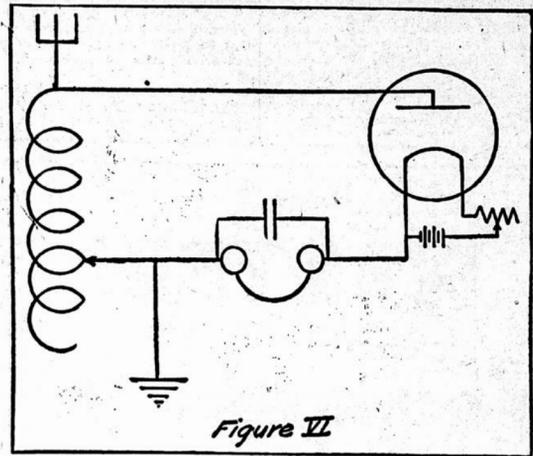


Figure VI

rection only. Its ability to rectify currents of extremely high frequency determines its application in radio.

Due to its ability to rectify high frequency alternating currents the two-element (filament and plate) vacuum tube can be used in a radio receiver as a detector.

Fig. VI is a simple radio receiving circuit employing this type of two-element vacuum tube in place of a crystal detector.

Dr. J. A. Fleming of London, England, was the first to use a two-element tube of the type just described as a medium of rectifying high frequency radio currents. Fleming called his product a valve because it would let current flow in one direction but not in the other direction. The Fleming valve as a forerunner of the vacu-

dition of the grid circuit I-J-K-L. The battery in the grid circuit is called the "C" battery.

As a start let us suppose that "C" battery voltage is zero. The operation of the three-electrode tube would then be exactly like that of a two-electrode tube, just as though there were no grid. Like a two-electrode tube when the filament C-D is brought to incandescence by the "A" battery a steady stream of electrons will be given off, which will be drawn over to the plate E. Plate E is maintained at a positive potential with respect to the filament by the "B" battery.

Now if the grid is made positive with respect to the filament, it is possible to accelerate the flow of the electron stream from the filament to the plate; if the grid is made negative with respect to the filament, the flow of the electron stream from the filament to the plate will be retarded. Or in other words, by making the grid positive or negative with respect to the filament, it is possible to increase or counteract the space charge. The third electrode or grid thus offers a means of controlling the current in the

plate circuit without changing the plate potential or the filament temperature.

The characteristic curve of a three electrode vacuum tube is shown in Fig. VIII. This diagram shows the relation of grid potential to plate current, assuming that the filament temperature and plate voltage remain constant.

It can be seen from the curve that by applying a negative potential of value E to the grid, the plate current can be reduced to zero. The negative charge on the grid will have the effect of a negative potential E with respect to the filament, making the negative charge so strong around the filament that the electrons cannot leave it. On the other hand, if a positive potential of value F be applied

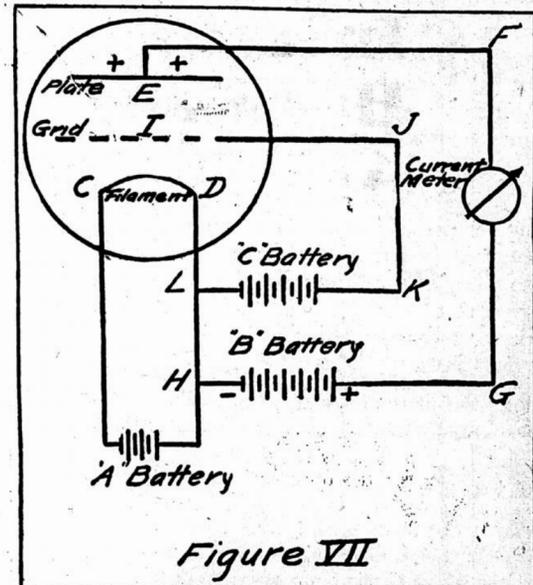


Figure VII

um tube of today marked a very important step in the progress of the radio art. The Fleming valve, however, in its original form was not much better than other forms of rectifiers then in use and, owing to the greater ruggedness and ease of manipulation of the latter, did not come into general use as a detector.

Dr. Lee DeForest, an American, greatly improved the Fleming valve by adding a third electrode called the grid, which served the function of a control element and thus made it possible to utilize the feeble incoming signal currents to control more powerful local currents. The three-electrode vacuum tube of DeForest is the tube used so extensively today.

The third element which is called a grid and from which the three-electrode vacuum tube derives its name was placed by DeForest between the filament and the plate in the path of the electrons. The grid is a perforated plate or mesh of fine wire through the openings of which the electrons must pass in their journey from the filament to the plate.

Fig. VII is a diagrammatical sketch of the circuits of a three-electrode vacuum tube and is identically the same as the sketch in Fig. III for a two-element vacuum tube with the ad-

dition of the grid with respect to the filament, the maximum or saturation current will flow in the plate circuit. Applying a greater positive potential than F to the grid with respect to the filament will not cause an increase in the

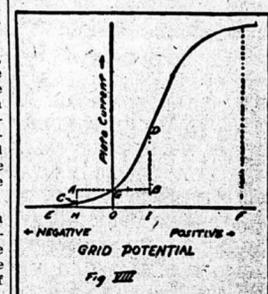


Fig. VIII

plate current because the electrons given off are being attracted to the plate and grid.

When the grid is maintained positive with respect to the filament, a small current will flow in the grid circuit. Because of its being positive it will attract the electrons and have a charge given up to it by them.

THIS WEEK'S BAND CONCERT PROGRAM

Free Open Air Concert Program at Courthouse Tomorrow Evening, July 13th

The regular open air free concert by the Willmar Municipal Band will be held tomorrow evening at the courthouse grounds. Band director Clarence Granoski had prepared the following program for tomorrow evening. The concert will begin at 8 o'clock.

March, American Honor, Crosby. Selection, Operatic Mingle, Berry. Waltz, Swanee River Moon, Clark. Selection, Water Lilies, Clair. March, The Huntress, King. Overture, Diana, Morris. Movelette, Tell Her at Twilight, Donaldson.

Fox Trot, Meet Me Next Sunday. Selection, Faust, Hayes. March, Washington Post, Sousa. If the above program fails to occupy the hour, additional numbers will be rendered.

SALEM

July 10—Mrs. P. Marker of Minneapolis is visiting relatives and with friends here.

Miss Frances Magnuson of Minneapolis spent the Fourth with relatives at this place.

Mr. and Mrs. Albin Broberg were Willmar callers on Monday.

Miss Elsie Holmgren returned home Monday after a months visit at Minneapolis and Bethel.

Mrs. John Strom and son Gordon of Marinette, Wis., visited at Rev. C. G. Strom's from Wednesday until on Friday.

Mr. and Mrs. Axel Valentine and family returned to Minneapolis on Wednesday morning.

Albin Broberg's entertained some relatives and friends Saturday evening.

A few young people spent Tuesday evening at Lake Andrew.

The Beckman, Valentine, Charley and Adolph Johnson families visited at H. Johnson's Tuesday evening.

Miss Edna Henning and Clifford Johnson visited at Albert Carlson's on Friday evening.

Just So.

During a discussion with his wife touching things domestic, Grouchelegh delivered himself of the following "Marie, I have observed that she who makes a good pudding in silence is of greater worth than she who makes a tart reply."—Wayside Tales.

Didn't Notice Her.

"I'll bet that traffic officer is sorry he stopped me."
"Why?"
"He didn't see my wife in the back of the car, and she told him what she thought of him all right."

The Story of Our States

By JONATHAN BRACE XLVI.—NEW MEXICO

AS IT IS name implies, New Mexico's history is closely allied with Old Mexico.

It was the Spanish who were its first explorers, De Yaca visiting this region in 1536 and Coronado four years later. The natives were the Pueblo Indians, although they are sometimes erroneously reputed to have been Aztecs as they were well advanced in the arts and had a comparatively high civilization. These Indians were conquered in 1598 by Juan de Onate and became subject to Spanish rule, being forced to work the mines and pay tribute. Missions were established and Santa Fe was founded about 1605.

Except for a period of ten years when the Indians revolted and maintained their independence, New Mexico remained under Spanish control until in 1821 Mexico gained its independence from Spain and New Mexico became a province of Mexico. Thus it remained until the outbreak of the Mexican war, when in 1846 Colonel Kearny marched from Fort Leavenworth with his troops, occupied Santa Fe and declared this region a part of the United States. By the Treaty with Mexico in 1848, the upper part of the state was formally ceded to the United States and the Territory of Mexico was organized in 1851, which reached from Texas to California.

Arizona was set off from New Mexico in 1863 and a few years later a portion was contributed to Colorado. Application for admission as a state started in 1850, but it was not until 1910 that New Mexico became the forty-seventh state.

New Mexico ranks fourth in size among the states with an area of 122,634 square miles, but is sparsely populated and accordingly has only three electoral votes for President.

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WILLING WORKERS

The Willing Workers of the Swedish Mission church will give an ice cream social Tuesday evening, July 18, at the Chas. Gustafson home, 3 miles southeast of Willmar.

The following program will be rendered:

Scripture reading and prayer, Rev. Youngstrom.
Vocal solo, Olga Elkjer.
Recitation, Ruth Gustafson.
Violin solo, Pearl Elkjer.
Vocal duet, Adeline and Austin Sundberg.

Vocal solo, Wallace Johnson.
Piano solo, Nettie Peterson.
Vocal duet, Ellen Olin and Esther Larson.

Refreshments will be served by the Chas. Gustafson, Edwin Larson and Olin families and David Johnson.

RETURNS TO BATTLESHIP

Sigvard Ostensoe returned Monday afternoon to the battleship Nevada at Norfolk, Va., after enjoying a 20-days furlough with his parents, Mr. and Mrs. Nils Ostensoe. He has made two trips to Peru, South America. Sigvard spent the past winter on the coast of California. He has served 3 1/2 years and has now six months left to serve.

W. C. T. U. PICNIC

The annual picnic and election of the W. C. T. U. will be held at the home of Mrs. M. T. Sandbo, 800 7th St. N. Tuesday afternoon, July 18th. Members please bring plate, cup and spoon. Visitors will be provided for. The public is very cordially invited.

CHILD BAPTIZED

Mr. and Mrs. C. T. Birkeland had their infant daughter baptized last Friday afternoon. She received the name of Marjorie Lucille. Rev. N. Nilsen and family, Christ Sandbo and family and Mr. and Mrs. John Skattos were the guests. A three course dinner was served in the evening.

FORMERLY OF WHITEFIELD

Mrs. Robert Lind, wife of Robert Lind, who was killed in an accident with his brother, Roger, is a daughter of Mr. and Mrs. L. J. Peterson, formerly of Whitefield township, but now residing in St. Paul. Mrs. Lind and baby were along at the time of the accident but escaped from serious injury.

BROTHER MARRIED

Mr. Clayton Landberg, son of Mr. and Mrs. O. F. Landberg of Milaca, and brother of L. H. Landberg of this city, was united in marriage to Miss Evaline Lundholm, also of Milaca. The ceremony was performed at Minneapolis on July 1st. They will reside in Minneapolis.

"TEX" VISITS CITY

"Tex" Nevett, who played third base for Willmar last year, was a visitor in this city over the week end. He came from Mayville, N. D., where he has played ball the fore part of this season. Mayville has won 21 out of 27 games. He left Monday for Sheldon, Ia., where he will play ball the remainder of the season.

—The Hearststone Club is entertained this afternoon by Mrs. A. P. Bergeson at 411 Second St. W.

STORIES OF GREAT INDIANS

By Elmo Scott Watson

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CAPTAIN JACK, THE MARTYR OF THE MODOCS

THEY were preparing to hang Captain Jack (Kintpuash), the Modoc chief. There was a harsh clanking of iron as he rose to speak for himself and his people. "Let me die like a man, not like a dog," he said. "I am not afraid to die, but I am ashamed to go this way, with my hands tied behind me."

As he stood on the scaffold at Fort Klamath, Ore., a zealous minister tried to comfort him. "You must not be afraid to die," he said. "You are going to a beautiful land where you will never want for anything." "Preacher," replied Jack, "this country right here is good enough for me. You say the other is a fine place and I suppose you want to go there. I'll give you 25 ponies if you will take my place. I don't want to go right now." The minister declined.

Captain Jack's death marked the end of a war that had cost the United States more than half a million dollars and 100 lives, white and red. Who was most responsible? No man can say. Captain Jack and his warriors murdered General Canby and Doctor Thomas, peace commissioners, who had come into the Indian camp under a flag of truce. Twenty years before a Californian named Ben Wright had massacred nearly 50 Modocs under a white flag and had become a popular hero for the deed. Among these was Captain Jack's father.

Captain Jack was hanged, but other Modocs with blacker records went free because they deserted him and joined the soldiers in hunting him down. At first he had protested at the plot to murder the peace commissioners. Then some of his warriors placed a squaw's hat on his head, a shawl about his shoulders and threw him to the ground. "Coward! Squaw!" they jeered at him. "You are not a Modoc. You will not die with a soldier's bullet. We will save the soldier that trouble. Springing to his feet he shouted: "I will do your coward's work even though it cost me my life and the lives of all my people."

The white man's history records Captain Jack only as a treacherous murderer. Had he been a white man, perhaps it would have pronounced him a martyr. Forced into an act which he abhorred; waging a war which he knew was hopeless; betrayed by his own men; walking in chains to the Indian's most disgraceful death—small wonder that he cried bitterly: "What chance for justice does the Indian have with you white men and your white man's law? None!"

Those Happy Men.

A happy man
Is Hiram Hutch,
The dentist didn't
Hurt him much.

Likes a Moralist.

"You say your laundry woman reminds you of a good preacher?"
"Yes. She's always bringing things home to me that I never saw before."

BACK FROM NORTH DAKOTA

Mrs. N. N. Abrahamson returned on Friday from a seven weeks visit with her daughter, Mrs. A. W. Walstead at Forman, N. D., and with her sons, J. B. and Eddie at Gwinner, N. D.

BETHEL LUTHERAN

Jesper Holmquist, pastor Services next Sunday in the Swedish language at 10:30.

—Paul L. Hedin spent last week in Duluth.

—Rayburn Larson left Tuesday for a visit in Minneapolis.

—Dr. I. S. Benson made a call at Montevideo last Sunday.

—Miss Pearl Hintz of Raymond was a Willmar visitor last Saturday.

—Otto Eckholm left Tuesday for an auto trip to the state of Iowa.

—Mr. and Mrs. Joe Hyden and son Stanley of Atwater were Willmar visitors today.

—Mrs. Joslin of Little Falls is at present visiting her parents, Mr. and Mrs. Lewis Johnson.

—Mr. and Mrs. Blomquist returned on Tuesday evening from a couple of days trip to Minneapolis.

—Mr. and Mrs. Wm. Johnson of Raymond are spending a few days at the Lewis Johnson cottage at Eagle Lake.

—John O. Gray of Atwater and Miss Mildred Gray of Minneapolis were visitors today at the home of Mr. and Mrs. A. H. Okerman.

—FOR RENT—Four rooms on Littlefield Ave. Hildar Hoaglund. Tel. 156-J or 210.

ISSUED MARRIAGE LICENSE

Clerk of Court Hayden French at Ortonville issued a marriage license last week to Newton A. Russell of Kandiyohi and Lorette Christenson of Beardsley.

GUEST FROM CHICAGO

Miss Esthoy V. Nelson of Chicago left last Saturday for Litchfield after a couple of days' visit at the Emil C. Lundquist home. She is a sister of Mrs. Lundquist.

ENTERTAINED AT SVEA

Mr. and Mrs. Erick Moline entertained about one hundred guests at their home at a six o'clock dinner on last Sunday evening. A large number of the visitors were people from Willmar.

RETURNED TO KANSAS CITY

Mrs. Earl Phelps and daughter Geneve returned to Kansas City, Mo., on Monday afternoon after a six weeks visit with relatives and friends.

LEFT FOR NORTH DAKOTA

Mr. and Mrs. D. F. Dugan left Monday afternoon for Northwood, N. D., to consult Dr. Kirby about the latter's health. Mr. and Mrs. John Nygaard left for the same place on Monday evening.

MOVED TO PIPESTONE

Mrs. V. E. Swendsen and two children left Saturday for Pipestone where they will reside. Mr. Swendsen and children have resided in this city the past two months.

KANDIYOHI COUNTY BANK

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Transacts a general banking business and solicits all desirable accounts, offering courteous service from experienced officials.

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GEO. H. OTTERBERG, Vice President
N. H. TALLAKSON, Cashier.
A. STRUKNESS, A. E. NORDSTROM,
Assistant Cashiers
L. B. Noren, Auditor

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