

RADIO

USE OF CHOKE COIL AND TRANSFORMERS.

Latter Provide the Most Practical Method of Coupling for the Amateur.

Figure XXVIII shows the actual circuit of a three-stage resistance coupled amplifier. The output of such a circuit is K times K times K the input or assuming the amplification factor of each tube to be 10, the output would be 1,000 times the input. The resistance R is the coupling resistance whose function it is to transform the plate current variation to potential drops to be applied to the grid of the next tube.

The capacity C is simply a means of allowing the potential variations across the coupling resistance R to be applied to the grid of the next tube, yet not allowing the "B" battery applied to the plate circuit of a tube to be applied to the grid of the next. Because of using the condenser to, what one might say, insulate the grid from the "B" battery potential, it is necessary to use a grid leak, to keep the charge which collects on the grid from becoming excessive and reducing the plate current to zero.

One of the chief disadvantages of the resistance coupled amplifier is that very high plate battery poten-

assigned for maximum power amplification, while at the same time the ratio of the transformer must be such as to deliver maximum potential to the grid circuit of the next tube.

The greatest advantages of the transformer method of coupling audio frequency amplifiers are the high degree of amplification, the relative simplicity of operation, and the low plate voltage required.

Chief among the disadvantages of the transformer coupled frequency amplifier is noise. Also the transformers amplify different frequencies to different degrees, which means that when this type of coupling is used for radiophone reception, the voice is distorted by the amplifying transformers. However, from a practical standpoint, the average amateur will have better results using transformer coupled audio frequency amplifiers than from any other method that can be used with the tubes and equipment now available.

GREAT BRITAIN VS. AMERICA

Radio Amateurs of Those Countries Pursuing Distinct Courses in Development of Receivers.

Two separate and distinct courses are being followed by the radio amateurs of this country and Great Britain in the development of receiving apparatus for continuous-wave telegraphy and wireless telephony. Both courses are of the utmost importance to the art, and each will exert a great influence on the future of radio communication and entertainment.

The American amateurs have gone along the lines of regeneration and amplification of audible signals, as well as development of long-distance

The Home-Coming

By JUSTIN WENTWOOD
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Amy was coming home. Adela March was standing at the farmhouse door, waiting for her. It was twelve years since the sisters had met, and both were elderly women.

Amy had married Tom Leecraft, and he had taken her West. He had done well. He had died. Amy was coming home.

As Adela waited for her, her mind went far back into the past. She was a girl of twenty-four again. Amy was two years younger. That had been thirty years ago, when their father, the old squire, was living. They had been the principal family of the village—now a town—inhabited by a miscellany of foreigners who worked in the mills. Everything had changed and that night had changed the whole future of each of the sisters.

They had both been in love with Tom Leecraft, and, as was the way in those dim times, which we now call the Victorian Era, each of them would rather have died than have admitted the fact of loving before being asked. Tom had a good practice as a lawyer in the village; he was a suitable match for either. At first he had seemed to prefer Adela; but then Amy came home, and everything was different.

Just as Adela had refused to let Tom know that she cared, when he was hot on the chase of her, so now she refused by any sign to show how much she suffered. She watched Tom and Amy sitting together at nights upon the porch. She would show no bitterness, but she withdrew into herself.

She tried her hardest not to let Tom know that she felt the change in him, but he knew. He acted differently toward her. They were embarrassed in each other's presence. Amy, too, who had at first confided her love in Adela, now grew strangely silent. It was like a lowering thunderstorm in the house. Thunderstorms break. Only the old squire knew nothing of it, absorbed as he was in his farm and crops, and local politics.

There came a certain night—a hot, thunderous summer night when the atmospheric conditions seemed reflected in their souls. The storm would break soon. It was pitch dark, so that Adela, from the lighted dining room, could hardly make out Tom's and Amy's forms as they sat on the porch together.

Adela went out. Amy had left Tom's side. Adela strolled in the garden, thinking bitterly that it was impossible to bear it much longer. Either Tom must ask Amy to be his wife or she must go away. The scent of the roses was heartbreaking.

Suddenly she saw Tom's dim figure in the way. He drew her into his arms. "I love you! I love you!" he was whispering. "Darling, will you marry me?"

She gathered all her strength and fell. She fled to Amy. She told her. "Tom asked me," she said. "He thought I was you. I ran away. You must go to him and tell him 'yes.' But first, swear to me that never, so long as you live, shall Tom know he asked me by mistake in the dark."

Amy sobbed on her sister's shoulder. She promised readily. Adela went to bed. In the morning Tom went into the squire's room and asked for Amy's hand.

And so—they were married. They went away West. Two or three times since then they had been home. They had prospered. Tom had died. It was a simple little story.

The fly was crawling up the hill. Adela waited. It drew up at the door. Amy stepped out—a middle-aged, wrinkled woman. The sisters clasped each other in their arms.

Over the coupling Adela said: "You must stay here for always, Amy. Your money and mine will keep us both nicely. And you're all I've got. I want you for the rest of my life. We've seen so little of each other."

Amy turned and faced her, a light of resolution on her face. "Adela, I must tell you something," she said in a choked voice. "After I've told you, you can decide whether you want me."

"Yes?" asked Adela calmly, though her heart was pulsing furiously. "It's about Tom?" she added.

Amy nodded. "I never knew, and I was not to blame. I learned it at the last, when he was delirious. He called for you all the time. He never knew he had told me."

Adela stirred the pot. "Go on," she said quietly.

"He—he loved you. You know that night in the garden? It was not a mistake. It was you all the time he wanted, not me at all.

"When I went to him next morning and made him think he had kissed me and asked me by mistake in the darkness, even then he kept control of himself. I did not guess that it was you. And he was very good to me all the years of our life together. It was only at the last I knew."

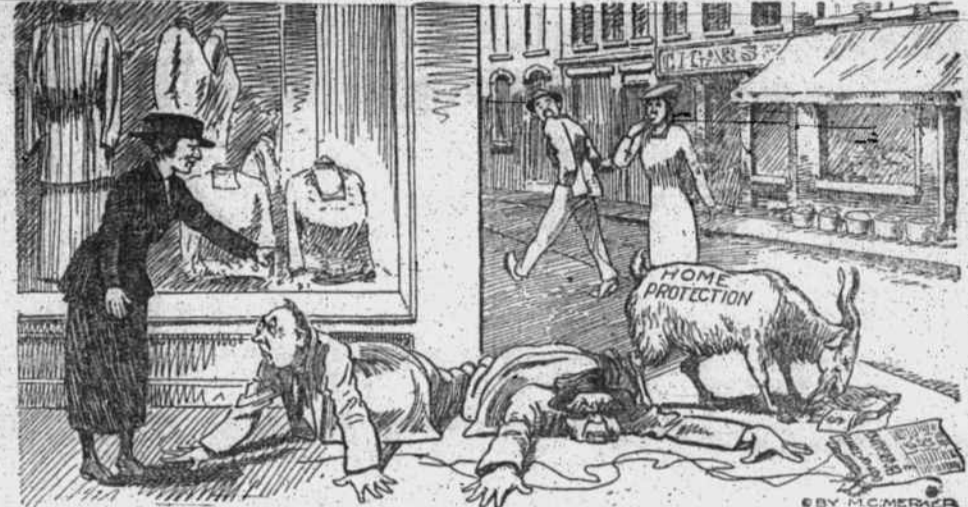
The hammering in her sister's pulses sounded like the spring of some internal mechanism that had caught her up and carried her away. "What might it have been? But everything was clear, and—and I was peaceful in the decline of life to know that her love had been answered.

"Well, it can't be helped," she answered briskly. "Let's go and have supper."

The first limacy laws in England were made in the reign of Edward III.



PEGGY: DECEIVING A DECEIVER WITH A BUMP IS NO CRIME.



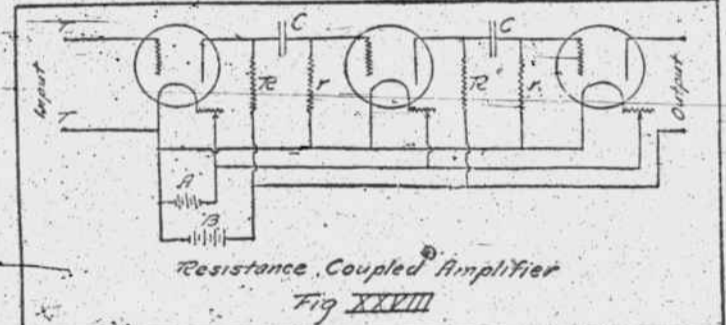
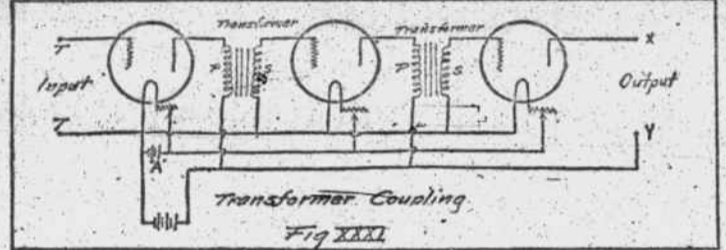
PEGGY: MEN ARE NEVER SO EASILY DECEIVED AS WHEN THEY ARE ENDEAVORING TO DECEIVE OTHERS.

BETTER

Keep your eye on Peggy

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tials are necessary. The amplification per tube of a resistance coupled amplifier is not as high as it is for some other methods but it is stable and does not distort the input as much as do some other methods used which give greater amplification per tube.

Resistance-coupled amplifying may be used to amplify either radio or audio frequency.

A method of transforming the change in plate current of a vacuum tube to differences in potential is by means of a choke coil. A choke coil consists of a number of turns of wire wound up in a multilayer coil and may or may not have an iron core. A coil of this kind offers a high impedance to the flow of alternating current, but has a relatively low direct current resistance.

The choke coil on account of having a low ohmic resistance, will have a smaller method of coupling, so that lower "B" battery potential can be used on choke coil coupled amplifiers and the batteries can be of smaller capacity.

The choke coil not only has inductance but a certain amount of distributed capacity. The distributed capacity of the coil plus the capacity of the plate with respect to the filament together with the inductance of the coil, give to the plate circuit a certain definite period. That is, the plate circuit is an oscillating circuit whose resonant frequency is determined by the inductance and inductance in the circuit.

The choke coil can be made variable. It will not only serve to transform the plate current variation with maximum plate potential variations, but it will also serve to tune out unwanted frequencies. When the plate circuit of the amplifier is tuned, the resonant frequency is amplified K times, but all other frequencies are amplified to a less degree.

Another and by far the most widely used method of coupling successive tubes in a cascade amplifier is by means of transformers. The transformer method of coupling amplifier tubes may be considered a development and a refinement of the simpler choke coil method. Coupling tubes by means of properly designed transformers will give a greater amplification per tube than any of the other methods.

Figure XXXI shows the diagram of a three-stage transformer coupled amplifier, where P and S are respectively the primaries and secondaries of the coupling transformers. The transformer as a whole is so designed as to convert the plate-current variations into maximum potential variations. The plate circuit of each tube which includes the primary winding of a coupling transformer must be

reception on short waves by the super-heterodyne principle.

On the other side of the Atlantic the British amateurs, restricted in their hobby by ultra-conservative government regulations, have turned their attention solely to radio-frequency amplification. This has given excellent results on all long and medium wave lengths, but its success on shorter wave lengths has depended solely upon the expert handling of the operator, who has been compelled to use tuned coupling circuits between each of the radio-frequency vacuum tubes.

It is too early yet to tell which of the two systems will ultimately triumph, but there is no doubt that the laurels at the present moment rest upon the American amateurs through the latest achievement of their leader, Armstrong, in the production of the super-regenerative system.

SHORT FLASHES

The enormous popularity of radio has started out a new crop of solicitors, offering the stock of fake companies, with alleged glittering prospects. A general warning is being broadcast for fans to be on the lookout for these smooth gentlemen.

A young radio sharp at Ogdensburg, N. Y., recently heard through his set: "Come home with the car, Howard; I have to go to the store." Who can say that a set in the pasture will not soon call the cows at milking time: "Come boss!"

In making a regenerative set employing two variometers and a variocoupler be careful not to get the instruments too close together. If they are, the set will howl. A set of this type should be mounted in a box not less than sixteen inches long.

Dr. John J. Carty, often referred to as "the wizard of the telephone," has had added to his many complimentary college degrees that of doctor of science, Yale university. Doctor Carty, who ranks as a brigadier general in the signal corps reserve, U. S. A., was given this last honor for being a radio expert.

Sir Arthur Conan Doyle predicts communication with the dead by radio within four years. Sir Arthur is firm in the belief that within that time "we will have the direct communication that Edison hoped for" and that those who have passed beyond will "have transmitters in the line of ether and all that we will need will be the receiver."

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