

RADIO



Showing Expert at the Laboratory of the Bureau of Standards Demonstrating Rejuvenation of Electron Tubes of Thoriated Tungsten Filament Type.

Radio tubes, like some of the older humans, eventually lose their "pep" under the strain of constant work and require a rest or need to be rejuvenated. This rejuvenating process, as applied to vacuum tubes, is not as serious an operation, however, as the one some humans undergo in the search for youth.

It is known as "reactivation" and is said by the bureau of standards radio experts to renew the sensitivity of electron tubes of the thoriated tungsten filament type.

Concerning this method of reactivation the bureau has issued the following report, so skilled listeners can "pep up" their tubes themselves:

"Electron tubes in radio receiving sets eventually lose their sensitivity. This sometimes progresses to the point where the receiving set operates very poorly or not at all, even though the tube filament is not burned out. The user of the set frequently confuses this condition with that due to an exhausted 'B' battery. If the tubes are of the thoriated tungsten (X-L) filament type they can usually be rejuvenated by a simple process, and made to serve as well as new tubes in the receiving set.

Two Cannot Be Reactivated.

"It happens that most of the tubes now used are of the thoriated tungsten type, and it therefore becomes of quite general interest for the public to know how to secure the full life of their electron tubes. The WD-11 and WD-12 types of tubes are the only ones extensively used which cannot be reactivated. In these tubes the source of the electrons is a coating of certain oxides on the surface of the filament, and when this has been used up no process can renew it.

"The thoriated tungsten filaments, however, used in most of the various other types of tubes, contain the oxide of thorium throughout the whole mass of the tungsten filament, this oxide having been originally put in incandescent lamps to keep the filaments from being too fragile. The filaments are given a treatment which produces a layer of atoms of thorium on the surface of the tungsten, and this thorium, which is radioactive, emits electrons much more copiously than the tungsten would. After long use, or after burning the filament too brightly, the layer of thorium atoms is evaporated off, and so few electrons are then emitted that the tube does not function properly. Reactivation is a process which boils additional thorium atoms out of the interior of the tungsten filament and forms a new layer of thorium atoms on the surface.

Method is Successful.

"The thoriated filament was developed by the General Electric company, which has also developed the methods of reactivating tubes of this type. The bureau of standards has found that the reactivation process is quite successful, and frequently makes a wonderful difference in the results obtained with a receiving set. The process is essentially the operation of the filament for a very brief interval at a specified high voltage (called 'flashing'), followed by a lower voltage for a longer time (called 'aging'), all of this with no grid or plate voltage. The flashing reduces some of the thorium and the aging forms the required surface layer. The following schedule of these operations is the result of extensive experience of the Radio Corporation of America.

FLASHING.		
Radiotron	Filament Voltage	Time
UX and UV 199	19 volts	30 sec.
UX and UV 201-A	15 volts	1 min.
UX-120	10 volts	1 min.
AGING.		
Radiotron	Filament Voltage	Time
UX and UV 199	4.5 volts	10 min.
UX and UV 201-A	7.5 volts	10 min.
UX-120	4.5 volts	10 min.

"Exactly the same procedures apply

for C and CX tubes as for the UX tubes of corresponding number. Thus, C and CX-200 correspond to U and UX-199, C and CX-301-A to U and UX-301-A and CX-220 to UX 120.

"In carrying out this schedule it is absolutely essential to have a voltmeter of a good degree of accuracy and to use a watch. No grid or plate voltages are used. Either alternating or direct current may be used for heating the filaments.

Tubes Need Treatment.

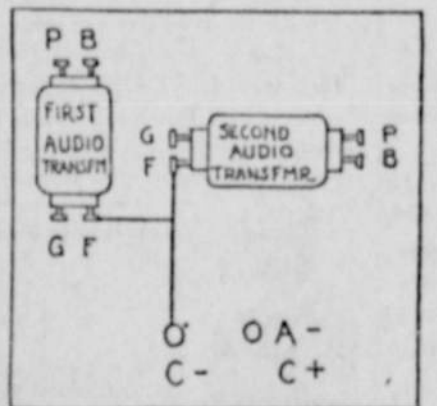
"It is important that reactivation not be attempted until the tube user has assured himself that the tubes actually need this treatment; that is, he should make certain that his batteries are not run down and that other parts of the receiving set are in proper order. The schedule above should be followed with great care. The process is useful only for the thoriated tungsten filament type of tubes.

"The apparatus necessary for carrying out the process is simple. The filament is connected to the necessary source of voltage, nothing being connected to the grid and plate. A voltmeter is connected across the filament terminals. If alternating current is available the source of voltage can be a small transformer, such as those for running doorbells or electric toys. The voltage tap nearest the voltage specified should be selected and a rheostat in series with the filament used to adjust to the exact voltage. The voltmeter must be one for alternating current.

"C" Battery Valuable in Audio Amplifier Unit

While most of the new radio set models employ the "C" battery unit in their radio amplifier units, a great many of the sets now being used by radio fans were built without this valuable unit. The use of a "C" battery will increase the efficiency of any receiver, and reduce the cost of its operation. It eliminates a great deal of distortion when a heavy "B" battery voltage is applied to the amplifier plates.

It is a very simple operation to install a "C" battery in any receiver. All that is necessary is to disconnect the filament terminals (usually marked



How to Connect "C" Battery in Audio Circuit of Receiver.

"F") of the transformers from the rest of the circuit. Then connect the two "F" terminals together and lead this to a binding post for the negative "C" battery terminal. This is shown in the accompanying diagram.

The positive terminal of the "C" battery can be connected to the regular "A-minus" post of the receiver as shown in the diagram.

For "B" battery voltages of from 45 to 67 use 4½-volt "C" battery. This may be procured in a small block at any of the local shops. For voltages above 67, at least 6 volts of "C" battery should be used.

"The "C" battery, which draws but very little current in its operation, will last a considerable length of time. It will probably be necessary to renew it but once a year.

The Valley of Voices

By GEORGE MARSH

Author of "Trailers of the Trail" and "The Whelps of the Wolf" (Copyright by the Penn Publishing Co.) (W. N. U. Service.)

CHAPTER VII—Continued

It was Lascelles' turn to laugh, for his word stung Steele like the lash of a whip. But unlike the Frenchman's, the face of the other reflected his thoughts solely in the swift hardening of the mouth and the glitter in the gray eyes.

"Then o, course, colonel," he countered savagely, "you cannot go. You French are such careful chaperons."

Lascelles openly scowled his disappointment as St. Onge retorted:

"Ob, naturally I shall stay; so I shall wish you bon voyage and all success, Monsieur Steele." And he shook his guest's hand. "We shall expect you again before you start south."

"Goodby, sir, and my deepest thanks for your hospitality. You will send a canoe, anyway, in two weeks to meet Michel at the Feather lakes?"

"Yes, ... revoir!"

Ignoring Lascelles, he stepped into the canoe, launched by Michel and David, then as if it were an afterthought, Steele called banteringly to the inspector: "And to you, six-pleasant stay at Walling River, and safe run to Albany, for I very much wish to meet you again."

With the lunge of three narrow blades, the canoe leaped upstream leaving two men on the shore—one with frank approval in the tired eyes which watched the broad back of Brent Steele as he followed the vicious stroke of the Iroquois in the bow; the other nervously stroking a black mustache which adorned features on which perplexity and hate were written large.

Three days later, when the canoe of Steele was far on its way to the Feather lakes in its search for the trail of the Windigo, Denise St. Onge sat in her living-room with the man who controlled her father's future with the Revillon Freres. For two days, all that sultry fervor and the plea of illness could avail to avoid being alone with him, she had made use of, but now that he was returning to Fort Albany, he would not be denied his hour.

"Mademoiselle," he was saying, "when a man travels as far as I have to visit his fiancee, is he not entitled to a somewhat warmer welcome—to a more frequent opportunity to enjoy her society than you have accorded me?"

"Monsieur Lascelles," replied the girl coldly, "I wrote you accepting the offer which you have made me many times in the last three years. In consideration that you kept my father in the employ of the company in charge of a first-class post, I agreed to marry you within a year. It was a contract of business, monsieur. The day of your arrival here you agreed to my terms."

Lascelles sidged under the calm, impersonal gaze of the girl's black eyes.

"It is true, mademoiselle," and he twisted his mustache in his chagrin, "but I am deeply in love with you, and it is most unusual, is it not, to be ignored—avoided? I have some rights."

"I have not promised to love you, monsieur, if that is what you mean," was her quiet answer.

"No," and the blood suddenly flushed his face, "but I have reason to believe that you have an interest in this American, Steele. Why has he stayed here two weeks? Why, except for the fact that Mademoiselle St. Onge is pretty and charming, eh?"

Denise St. Onge smiled wearily.

"Possibly, monsieur. It is not unlikely you will think so anyway. You are the type of man who always insists on the woman motive."

"Woman motive? Why not? In this case it is clear," he burst out, walking the floor, mad with jealousy, and helpless before the indifference of the woman whom he had traveled three hundred miles to see.

"Pardon me, but as a matter of fact, you are wrong. Monsieur Steele is an ethnologist and is deeply interested in this mystery which you make light of."

Lascelles snapped his fingers viciously. "You believe in this Windigo myth, too? Your father is imbecilic about it."

The dark face of the girl flamed with anger at the reference to her father. "You laugh at what has ruined this post, monsieur, because it suited your plan. Is it not so?"

He turned to her with a snarl. "Evidently you are as superstitious as the ignorant Indians."

"Possibly I am. I don't know what I believe," she said calmly. "I only know what I heard that terrible night—what the Indians believe—and where is the fur canoe? Where are your furs? Where are your men? Is that of no consequence?"

It was to the credit of the infatuated Lascelles, as he bade the woman who had promised to marry him, goodbye, that what was his of right he did not demand when he entered his canoe at the foot of the carry.

ering in volume until it climaxed in a scream.

"De Windigo!" With a leap, Michel had his rifle and was sliding the canoe into the water.

"Come on," cried Steele, "we'll separate and stalk that ridge from three directions."

They were half-way to the shore when the voice burst out anew in sobs and maddening mewling, and Steele pitied the terrified women and children of the fishing camp, facing the horror alone, with their men far in the caribou barrens.

Landing on the beach under the ridge, Steele left the others with the warning: "No wild firing, now! Remember the whistle! We'll meet here on this sand beach."

The canoe vanished in the shadows and the American started his stalk. Twice he stopped for a space to study the caterwauling on the brow beyond him. Blood-chilling, unearthly, the voice filled the calm night.

The danger of the hunters firing into each other was great, and he climbed cautiously, taking the cover of the down timber, ears alert for the staccato whistle of the yellow legs, their signal of identification.

At last, with skin and clothes torn by the brittle twig of the dead spruce, he reached the flat shoulder of the ridge. For some time the night had brooded, unmarred by the voice. Cocking his rifle he crept forward, searching the area of skeleton trees, ghostly in the pale light of the stars, for some movement. He was puzzled at the failure of the Indians, whose pace should have been faster than his to reach the brow of the ridge. If they had, perhaps even now, the roving eye of Michel already marked him out—was sighting down a rifle barrel, his crooked finger on the trigger, waiting to be sure of his target before he fired. At the thought Steele flattened out and whistled.

But the hoo-hoo of a gray owl, patrolling the green tinter of the lake shore below, was his only answer.

Minutes, which seemed interminable to the watcher, passed. Where were the Indians?

Then to his surprise an unspeakable mewling defied the night. In vain he strove to locate the position of the beast. But, as the mewling merged into the shrieks of a woman, the flash and report, flash and report, of two rifles cut it short off. Something thrashed through the timber out in front.

He swung his rifle in the direction of the sound, his eyes straining for a target. The starlight gave him a fleeting glimpse of a dark object crossing the bole of a skeleton spruce, and he fired twice. Then leaping down, he plunged through the tangle of dead spruce in the wake of David and Michel who had stalked their quarry, but evidently in the uncertain light, missed.

Down over the treacherous going of the slope of the ridge the sure-footed Indians hunted the thing their rifle shots had stamped. Tripping, falling, to rise and stumble on through the network of trunks and limbs, Steele struggled to keep at the heels of his men. But gradually the noise of the pursuit drew away from the white man, no match for those who, from childhood, had traveled the forests at night.

In an hour two grimy, battered half-breeds, bleeding from contact with the timber, appeared on the beach. "Well, it fooled us again," vouchsafed Steele, ruefully, "did you see it?"

"We nevalre see heem," muttered the disheartened Michel, squatting on his heels at the water's edge to bathe his face, and his shoulder from which the woolen shirt hung in ribbons.

"You did not see him when you fired?" demanded the surprised Steele. "I got a look at him for a second."

David grinned at his chief. "Dat was me yot shoot at. De bullet seeng close, too. Good shot!"

"What you were out in front of me! Why didn't you whistle?" protested the chagrined Steele. "I didn't know, until you fired, that you two had got up there. From the sound, what did he travel like, Michel?"

The half-breed lifted a grave face. "He travel lak a seek bear; but no bear holler lak a lynx."

(TO BE CONTINUED.)

Arrested Development

Betty lived in the city and it was not any too often that she saw even a horse. So perhaps it is not to be wondered at that she stopped one day in the park as a Shetland pony went by and exclaimed: "Look, mother!"

"Yes, dear," replied her mother, "what is it?"

"Don't you see?" continued Betty. "There's a horse that got discouraged and never grew up!"

When a man is in love he gives, when a woman is in love she forgives.