

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 | for C and CX tubes as for the UX nated. This rejuvenating process, as 201-A and CX-220 to UX 120. applied to vacuum tubes, is not as serious an operation, however, as the one absolutely essential to have a voltsome humans undergo in the search | meter of a good degree of accuracy and for youth.

is said by the bureau of standards ra- direct current may be used for heating die experts to renew the sensitivity of the filaments. electron tubes of the thoristed 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 sten filament type of tubes. user of the set frequently confuses this condition with that due to an exbausted "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.

now used are of the thoriated tung- voltage tap nearest the voltage specisten type, and it therefore becomes fied should be selected and a rheostat of quite general interest for the pub- in series with the filament used to ad-He to know how to secure the full life just to the exact voltage. The voltof their electron tubes. The WD-11 meter must be one for alternating curand WD-12 types of tubes are the only rent. 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 radio fans were built without this 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 | tery voltage is applied to the amplifier a layer of atoms of thorium on the plates. surface of the tungsten, and this thorlum, which is radioactive, emits electrons much more coplously than the All that is necessary is to disconnect tungsten would. After long use, or the filament terminals (usually marked 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 boffs 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 thoristed 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. Filament Voltage Radiotron UX and UV 199 UX and UV 201-A...15 volts AGING.

Filament Voltage Radiotron C and UV 199... 4.5 volts C and UV 201-A. 7.5 volts C-120 4.5 volts UX-120 "Exactly the same procedures apply new it but once a year.

humans, eventually lose their "pep" tubes of corresponding number. Thus, under the strain of constant work and C and CX-200 correspond to U and require a rest or need to be rejuve- UX-199, C and CX-301-A to U and UX-

"In carrying out this schedule it is to use a watch. No grid or plate volt-It is known as "reactivation" and ages are used. Either alternating or

Tubes Need Treatment,

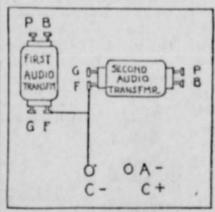
"It is important that reactivation not be attempted until the tube user has assured himself that the tubes actually need this treatment; that is, he should make certain that his batteries are not run down and that other parts of the receiving set are in proper order. The schedule above should be followed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

"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 "It happens that most of the tubes running doorbells or electric toys. The

"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 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" bat-

It is a very simple operation to install a "C" battery in any receiver.



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 teminal 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 41/2-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. 10 min. It will probably be necessary to re-

The Valley of Voices

It was Lascelles' turn to laugh, for his word stung Steele like the lash of a whip. But unlike the Frenchman'; 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. Lascelle: openly scowled his disap-

pointment as St. Onge retorted: "Ob, naturally I shall stay; so I shall wish you bon voyage and all success, Mondeur 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 canoo, 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 Wailing River, and safe run to Albany, for I very much wish to meet you again."

With the lunge of three narrow blades, the cance leaped upstream leaving two men on the shore-one with frank approval n 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 sufterfuge and the pleaof 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

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

"Monsten: Lascelles," replied the girl coldly, "I wrote you accepting the offer which you have made my 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 The day of your arrival here you agreed to my terms.

Luscelles fidgeted under the calm, impersonal gaze of the girl's black

"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

"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, ch?"

Denise St. Onge smiled wearily.

"Possibly, monsleur. 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? this case it is clear," he burst out, lake?" walking the floor, mad with jealousy. and helpless before the indifference of the woman whom he had traveled reply. three hundred miles to see.

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

Lascelles snapped his fingers victous-"You believe in this Windigo that questioning would only drive him myth, too? Your father is imbecilic into a deeper silence. 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 snari. Evidently you are as superstitious as the ignorant Indians."

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 drifted the mating call, that of no consequence?

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

Tollers of the Trail" he Whelps of the Wolf"

(Copyright by the Penn Publishing Co.)

"Au revoir!" he said, taking her band and kissing it. "You will write by the Christmas mail?" And the man who had journeyed up the Albany and the Walling, exulting in his bargain with a desperate girl, returned, heaten, mystified and consumed with jealousy.

CHAPTER VIII

Driven by three iron-hard backs and pairs of arms, Steele's cance nosed a wide ripple on the smoldering surface of Big Feather lake, which opened out before them in mile upon mile of sleeping water.

A group of women, children and dogs awaited the canoe's landing at the fishing camp of the Ojibwaya

"Bo'-jo', bo'-jo'!" And Michel, kicking his way through the snarling huskies, shook hands with the surprised women, curious to learn what had brought the headman at Walling River to the Feather lakes in September.

"So the Windigo cries no longer at night on the burnt ridge?" he began, in Ojibway.

To his surprise the women stared at him in amazement, which changed to fear at the thought of the possibility of the presence of a demon so dreaded, in the Feather Lake country.

"No Windigo has cried here," replied an old woman, excitedly. "We would not stay! Our men are away in the muskegs, hunting caribou. They would not leave us here to be eaten by a

Michel looked at Steele. "She say no Windigo bin here. Why did Pierre lie to us?

"Queer for him to bring that tale to Walling River," muttered Steele,

"Pierre, who left you to trade at Ogoke last spring," continued Michel. 'Has he camped here this summer?" "No, we have not seen his family since the moon of flowers. They went

o Ogoke,' Michel nodded, as if satisfied.

"Well, Michel, it looks as if we were n a wild goose chase." The small eyes of the Iroquois gilttered. "I t'ink we ketch dis goose jes

de same." "What d'you mean?"

be cum to Wallin' Riviere to mak' talk wid Tete-Boule. Now Pierre an' Tete-Boule try mak' some trouble ovair dees Windigo. We'n I go back Tete-Boule target. The starlight gave him weel tell me w'at Pierre say to fleeting glimpse of a dark object crossheem." And the lean face of Michel ing the bole of a skeleton spruce, and took on a flerceness which caused the he fired twice. Then leaping down, squaws instinctively to draw back. he plunged through the tangle of dead

What motive Pierre could have had in the tale of the Windigo at Feather lake, other than the needless agitation of the post Indians, was an enigma to Steele, but it was evident that Michel had an idea of its nature which he would divulge only when ready to talk.

"Michel," Steele asked, as the three men sat by their fire smoking aftersupper pipes, "what's in the back of your head regarding this Pierre? You think he knew of the dead Indian at Stooping river when he came to the post, yet made no mention of that but old this wild tale of the Feather lake Windigo scare. Why should be lie about the one and conceal the other?" The Iroquois slowly exhaled a col-

umn of smoke before replying. "Dees Pierre I know for long time. He alway mak' trouble. When I see heem, he tell me somet'ing or he nevaire mak' more trouble on dees riv-

lere," was the unresponsive answer. "But what is he driving at? Why shouldn't he report the killing of that Indian at Stooping river as well as the Windigo scare that existed at Feather

Michel shook his head. "Eet ees queer t'ing, for sure," was the laconic

Steele's eyes sought David's impassive face, but the Ojibway seemed deep in a problem of his own. It was irritating to a degree, but Steele knew his Indians-knew that Michel would

"How many Indians trap the Portage Lake country?" Steele asked.

talk in his own time and not before-

"Good manee hunt dat valley, good manee ovaire on de Little Current." "We'll start tomorrow. It looks as if Monsieur Windigo was not going to

pay this country-" From the ridges of the mainland the moaning beliew of a cow moose slow-"Possibly I am. I don't know what | 1y rose and died on the frosty night.

"Dut cow holler ver' strange," said heads, ears straining.

"Huh!" muttered Michel, "dat Injun

poor caller." Rigid, the three listened to the voice in the night, and in the mind of each slowly took shape the same surmise.

Then from the burnt ridge of the

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

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

They were half-way to the shore when the voice burst out anew in sobs and maudlin mewing, and Steele pitied the terrifled 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 cance 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 sholuder of the ridge. For some time the night had brooded, unmarred by the voice. Cocking his rifle be crept forward, searching the area of skeleton trees, ghostly in the pale light of the s'ars, 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, patroling the green timter of the lake shore below, was his only answer.

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

Then to his surprise an unspeakable mewing defiled the night. In vain he strove to locate the position of the beast. But, as the mewing merged into the shricks of a woman, the flash and report, flash and report, of two rifles cut it short off. Something "Wal, we know Pierre is a liar and thrashed through the timber out in front.

He swung his rifle in the direction of the sound, his eyes straining for a 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 stampeded. Tripping, falling, to rise and stumble on through the network of trunks and limbs, Steele struggled to keep at the hoels 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

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

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

David grinned at his chief, "Dat was me you 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 kno-, until you fired, that you two had get up there. From the sound, what did

he travel like, Michel?" The half-treed lifted a grave fact. "He travel lak' a seek bear; but no bear holler lak' a lynx."

(TO HE 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 won-David, as the three sat with tilted dered at that she stopped one day in the park as a Shetland pony went by Again out across the still lake and exclaimed: "Look, mother!"

"Yes, dear," repiled her mother, "what is it?" "Don't you see?" continued Betty. "There's a borse that got discouraged

When a man is in love he gives, opposite shore lifted a low wall, gath- when a woman is in love she forgives.

and never grew up!"