

WHAT MIGHT HAVE BEEN

(© by D. J. Walsh.)

MYRA LANE crossed the threshold and sat down mute before the question in her husband's eyes. Finally he spoke. "Well?" She shook her head. "He says he cannot wait any longer. He says the mortgage is long past due, both on the house and on the furniture. He says the only sensible thing for us to do is to go and live with our children. Our children!" bitterly.

The old man smote his hands together in despair. "If it had not been for my sickness we might have managed. Oh, God! It is awful to be old and sick and poor."

"Strange you didn't get any word from Will or Nellie when you told 'em we were going to be turned out?" She said nothing, and he studied her face. "Mother, did you hear from the children?" A spasm of pain swept her face. "Mathew, I just couldn't bear to tell you, and I guess you'll have to know. Our children have no room for us."

The old man stared at her in shocked incredulity. "Myra! Our children said that?" The look on her face convinced him, and his head sank on his breast. He raised pathetic eyes to hers. "Mother, I wished we might have died before we knew that. Our Will and Nellie! I knew they were selfish, but I never thought they'd do that." He covered his face with trembling hands.

"Oh, Mathew, don't take it so hard. Of course they each had reasons, and expected the other to take us. Nellie said that with such a houseful of young people as she had she thought Will should take us, and Will's wife wrote that their apartment was so small, and Nellie having a big house, she thought we had better go there." She hesitated for a moment, then with her habit of facing things squarely she went on. "I'll have to tell you, Mathew. We have used our last dollar and there is no food in the house, even if Morley had let us keep the house longer. I am—I am afraid we will have to go to the poorhouse, or—" She stopped, afraid to say what was in her mind, but he spoke with unaccustomed resolution. "We won't go to the poorhouse, Myra. We have always tried to do what was right and bore our troubles without complaining, and I know the Lord won't hold it against us if we refuse that cup. We are so old that it could not be for long anyway, and no Lane ever went to the poorhouse." His wife's face brightened. "I hoped you'd feel that way, Mathew. It cannot be so very wrong. If young Matt were here things would be different." The old man sighed. "Yes, he was always a good boy, but a rover. I wish we might have seen him again."

In the morning Myra rose, bathed and dressed herself in her best. She then aroused Mathew and assisted him to bathe and dress himself in his decent black suit. This done she made a cup of tea and toasted a little bread, all she had, and they ate their breakfast together. She put the house in order, then stood in thought, her gaze fixed on the picture of her children, which hung on the wall. She took it down, wrapped it carefully, then sat down and wrote a letter.

"Dear Will and Nellie," she wrote. "We have to give the house up today; so we are going away. Do not worry about us, for we are going to a kind friend who will let us need for nothing. If your brother Mathew comes back, give him our dear love, and tell him we thought of him always."

"You, Loving Father and Mother." This she addressed and sealed, and put in plain sight. Her preparations completed, Myra brought Mathew's hat and cane, put on her own cloak and hat, took up the picture she had wrapped, and assisted Mathew to rise. Outside, she locked the door, put the key under the mat where every one knew where to find it, took her husband's arm in a quaint, ceremonious fashion, and the two walked slowly down the village street to the shore of the lake.

At the water's edge they got into Mathew's old boat in which he used to go fishing.

A neighbor who was working on a boat nearby greeted them. "Well, Mr. Lane! It is good to see you out again," he called cheerily. "Going fishing?" Mathew shook his head gently. "No; just for a little boat ride, John." The neighbor came up to them. "Let me push the boat off, Mrs. Lane. It is too heavy for you."

She thanked him courteously, took the oars, and with steady, resolute strokes pulled away across the water.

As the noon train slowed into the little lakeside village an eager-faced young man sprang down the steps.

With quick nods to the loungers who gazed at him in surprise Matt Lane hurried along the street. As he went up the path that led to his childhood's home his heart sank. It looked too quiet. He tried the door, and finding it locked, searched for the key in the old hiding place. He went from room to room, but with sinking hopes. He noticed the letter on the table, and disregarding that it was addressed to his brother and sister he opened and read the brief farewell. Lying beside it were the letters from Will and Nellie, and he read them.

"The ingrates! The cold-blooded ingrates! I never dreamed that they would look after them till I came home. I must find out where they have gone." As he hurried down the street he almost collided with John Harris, the neighbor who had spoken to his father that morning.

"Well, if it ain't young Matt Lane, and looking like a million dollars. He shook the man's hand heartily. "Guess you're looking for your pa and ma? They went for a boat ride this morning, and I guess they ain't back yet."

"Mr. Harris," said Matt anxiously. "I just found this note. What friend do they mean they are going to live with? We have no relatives that I know of." Harris read the letter, glanced quickly at the young man's face, then read it again.

"Guess we'd better take my power boat and try and locate 'em," he said quietly, and without waiting for the younger man's assent made off with long strides to the lake. As the boat sped through the water he asked: "How come you came home just now? Grace said you were planning to come next month and surprise the old folks."

With worried eyes scanning the water the other explained: "I had a telegram from Grace telling me that I had better come at once. I had told her not to let on to them that she knew where I was, but she was worried about them, and wired me. I have traveled night and day. I am doing well in the West, Mr. Harris, and have a fine home built. It will be ready to take Grace and mother and dad back with me. Of course Grace told you, but I was planning a big surprise for them. That is why I didn't write, but I had no idea they were—" He stopped and turned his face away.

Back and forth Harris drove the powerful little boat. They saw row boats, canoes, motor boats, but no glimpse of the old flat-bottomed punt they knew so well. At length Harris put the fear of both of them into words. "You know, Matt, that boat was good, and they couldn't sink it. Don't seem as if they were strong enough to row very far."

They moved slowly along, anxiously scanning the shore for a drifting shabby old boat. Then, as they rounded a point, they saw it. It was pulled up on the beach, and sitting on the sand in the scanty shade of a clump of cedars was the forlorn old couple. Myra had spread her cloak for her husband, and he lay asleep. She had unwrapped the picture of her children and held it in trembling hands.

When the motor boat shot toward the shore she looked at it dully. Then as she recognized the tall figure running across the sand she rose to her feet. At the realization of what might have been she put her hands to her eyes and swayed weakly. But her son's strong arms caught her and crushed her to him. Harris came up, grinning cheerfully.

"I just couldn't make this youngster wait till you got home, Mrs. Lane, so we thought we'd come and find you. Talk about a best girl! He couldn't even wait to see Grace." He gave Matt a warning glance and bent over the old man. "Come, wake up, Mr. Lane. I've got a surprise for you." Matthew Lane sat up, bewildered. Then, recognizing his "baby," as he always called him, he raised his hands to heaven. "Now, Lord, I thank Thee, and I ask Thy pardon for my sinful doubts." Matt picked his father up and held him close.

That night as they again laid themselves down to rest in the home which was really their own now, Mathew said: "Tell me, mother, why did you decide to put it off till tonight? Did you have a sort of a—a—warning?" "No, Mathew, I waited because it would be dark then, and I could not see your face." His hand sought hers, and then with hands clasped they slept like two tired children.

Alundum

Alundum is an electrically fused alumina of exceptional purity and great power of resistance to heat, which has been produced for use in making furnaces and other objects in which a material able to withstand excessive temperature is required. It is made by calcining bauxite and fusing it in a water-cooled electric furnace. The less pure products are used for abrasive purposes. Alundum comes from the furnaces in pigs of five tons each, which are crushed and molded with a refractory bond of a ceramic nature. Attempts to make articles of cast alundum have been only partially successful.

Flow of Current in Vacuum Tube

Electrons Move From Negative to Positive, Expert Explains.

By RADCLIFFE PARKER

In Radio World.

The meaning of electric current has undergone a change during the last 25 years. It was formerly assumed that something flowed in the conductor and that that something moved from the positive to the negative poles of a battery or generator. Inside the battery or generator the flow was, of course, in the same direction but from the negative to the positive. Now an electric current is known to be a stream of electrons moving in the wire or other conductor. This stream does not move from positive to negative, but in the reverse direction. It would be logical to re-define the poles of a battery or generator so that the electrons would move from positive to negative, but this change would necessitate a complete revision of electrical conventions. Now an electron is negatively charged; it would be necessary to call it positive.

Any extensive change in conventions would introduce endless confusion for a long time, and rather than to pay such a heavy price to correct a mistake it is more convenient to distinguish between an electric current and a stream of electrons. We still retain the old definition of an electric current and say that it flows from positive to negative. Then we say that the electrons move in a stream in a direction opposite to that of the current, that is, they move against the current like a school of fish swimming upstream. Yet the electrons constitute all of the current. This way of looking at it does not necessitate changing any of the old conventions about current and accompanying phenomena, and everybody knows what is meant. Thus "current" is purely a fictitious conception but it is very convenient to talk and read about the fiction.

The Filament Battery

When a battery is connected across the filament of a vacuum tube the current flows through the filament in the direction shown by the arrows in Fig. 1, that is from the positive pole to the battery to the negative. Inside the battery the current flows from negative to positive to complete the circuit.

Around the heated or incandescent portion of the conductor in the evacuated space there are many free electrons. These electrons shoot out from the filament to a certain distance and then return again. The hotter the filament, the more electrons shoot out from it and the farther they go before they return. No doubt as they shoot out and fall back they also drift toward the positive end of the filament under the influence of the filament battery. That is, they do a hop, skip and jump act from the negative to the positive ends.

Now suppose that a plate battery be inserted in the circuit as shown in

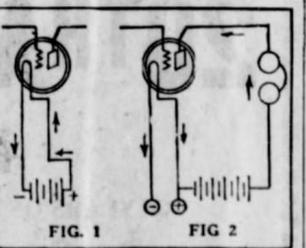


FIG. 1. The filament current (left) flows from negative to positive inside the battery, but otherwise outside the battery. The same is true of the plate battery current (right). The circuit is completed for the B current through the vacuum in the tube and this flow is known as the "space current."

Fig. 2. The plate of the tube becomes a positive pole, while the filament as a whole is a negative pole. The electrons around the heated filament now come under the influence of the plate. They are attracted to it. Those which venture too far away from the filament get caught by the plate and cannot return. The higher the plate voltage is the more the free electrons attracted to the plate. Billions of them reach the plate every second. This stream of caught electrons constitutes the plate convection current, or simply the plate current. This current flows from the plate to the filament, according to the old convention. The arrows in Fig. 2 show the direction.

How Current Divides.

Part of the current goes down the positive leg and part down the negative leg of the filament. However, much more of it goes down the negative leg due to the fact that the voltage between the negative leg and the plate is greater than the voltage be-

tween the positive leg and the plate.

It will be observed that that part of the current which flows down the negative leg is added to the filament current and that which flows down the positive leg is subtracted from it. Therefore, when the plate battery is turned on the negative end of the filament gets hotter than the positive end. It would seem that the average change in the filament temperature should be nil, but, actually, the effect of the application of the plate battery is to decrease the total effective filament current by an amount that will visually change the filament temperature. There is very little difference between the cases where the negative of B is connected to the positive A and where the negative of B is connected to the negative A.

There is never any alternating current in the plate circuit of a vacuum tube: the current is always in one direction, from the plate to the filament inside the tube and from the filament to the plate outside the tube. There may be an alternating component of the plate current, which merely means that the direct current rises and falls at a certain rate, like the tides in the ocean. When one speaks of the alternating current in the plate circuit of a tube one means the variation in the level of the direct current. This is known as pulsating or fluctuating D.C.

D C and A C Readings.

For example, if the direct current in the plate varies regularly between 11 and 1 milliamperes about the mean value of 6 milliamperes, then the al-

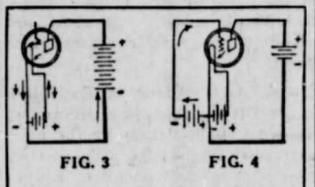


Diagram illustrating the flow of current in the filament and plate circuits (left). In the vacuum space the plate current flows from plate to filament. At right is diagram illustrating the flow of grid current. When the grid is positive the current flows from filament to grid in the external circuit and in the vacuum space it flows from the grid to the filament.

ternating component of the plate current has an amplitude of 5 milliamperes and its effective value when its form is regular is about 3.5 milliamperes.

If the frequency of the variation in the direct plate current is large, say over 20 vibrations per second, then a direct current meter placed in the plate circuit would give an indication of 6 milliamperes, or the mean value of the varying plate current. If an alternating current meter is placed in the plate circuit the indication will be about 7 milliamperes. That is the heating effect of the entire fluctuating but direct plate current. That would be the important thing in choosing transformer and loudspeaker conductors, because they would have to carry this current continuously without undue heating of the insulation or of the wire itself.

The important thing from the point of view of drain on the "B" battery is the 6-milliamperes direct current or mean value of the plate current. The important thing from the point of view of output in the loudspeaker is the 5-milliamperes direct current. That alone is effective in producing a sound.

Three-Plate Currents.

Thus in the plate circuit of a tube we have to distinguish three different currents: First, the mean value of the fluctuating current, which determines the rate of discharge of the "B" battery; second, the root mean square of the total plate current, which determines the heating of the load conductors; third, the alternating current component of the plate current, which determines the sound output power. But the plate current in a tube is never alternating as a whole. It always flows in the same direction.

Under certain conditions there may also be a grid current flowing. This is exactly the same as the plate current and is produced in the same manner. When the grid goes positive with respect to the filament, the grid becomes a miniature plate and it attracts electrons. This causes a grid current to flow from the filament to the grid outside the tube and in the reverse direction in the vacuum space. When the grid becomes very much positive it robs the plate of some of its electrons and, consequently, the plate current decreases while the grid current increases.

Charging the Battery

The size of a battery will determine how often it must be charged, but it is a good plan to charge it at least once a week and regularly. The best time to charge a battery is in the day or after midnight, so as to interfere as little as possible with neighbors. In case the type of charger is employer that bothers them.

IN DAYS OF OUR FOREFATHERS

Women Prepared Their Own Medicines

The wise pioneer women learned to gather, in woods and fields, the remedies the Indians used. From the rafters of colonial houses, hung great bunches of dried roots and herbs.



From these, in times of sickness, the busy mother brewed simple and powerful remedies. From roots and herbs, Lydia E. Pinkham, a descendant of these sturdy pioneers, made her Vegetable Compound. The beneficial effects of this dependable medicine are vouched for by hundreds of women. Mrs. Wm. Kraft of 2833 Vinewood Ave., Detroit, Mich., saw a Pinkham advertisement in the "News" one day and made up her mind that she would give the Compound a trial. At that time she was very weak. "After the first bottle," she writes, "I began to feel better and like a new woman after taking six bottles. I recommend it to others and always keep a bottle in the house." Mrs. Gust Green of 401 Lincoln Park Boulevard, Rockford, Illinois, found herself in a condition similar to that of Mrs. Kraft. "I was weak and run-down," she writes, "but the Vegetable Compound has helped me and I feel better now. I recommend it to all women who need more strength."

Another Infant Prodigy

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Freaks in Currency

The United States treasury has some startling examples of "inflated" and "deflated" currency. In the redemption division is one bill which was "deflated" to nearly half its regular size when accidentally dropped into a mill. Another was "inflated" about 50 per cent—in size—when it passed through heavy rollers in a mill.

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