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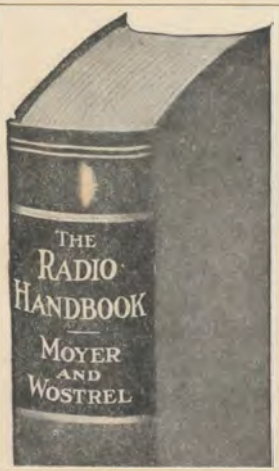

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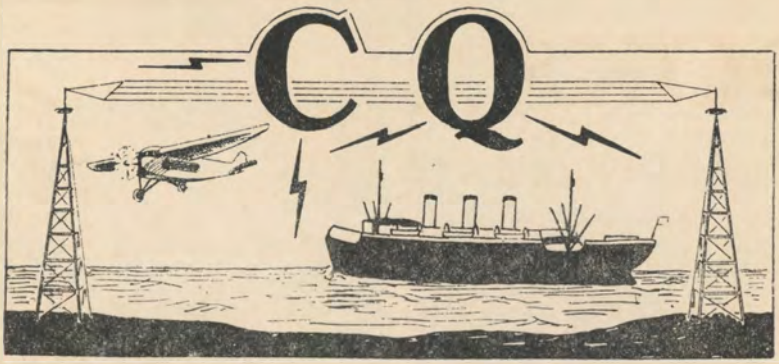

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VOL. II **JANUARY, 1933** **No. 5**

OUR GREAT ACHIEVEMENT

Those of us who have seen the beginning and the end of several organizations of radio operators view the progress of the American Radio Telegraphists' Association with mounting pride and increasing confidence in its stability. It is a comparatively easy matter to bring some enthusiastic men together to establish an organization and by the employment of well paid organizers to increase its membership, but this has been the cause of failure of many organizations, that is the recruiting of half interested members who pay their dues but take no active interest in the welfare of the organization, believing that by the payment of their dues they have done what is expected of them. This is where the A. R. T. A. has shown itself superior to other organizations. Its members are vitally interested in its welfare, which is shown by the flood of letters, containing suggestions of merit, received at headquarters with every mail. This interest inspires confidence which has not been shown in the previous cases of organization, and which carries it through these difficult times with an ever increasing momentum. The sceptics of a year ago have vanished and we have ample reason to celebrate the VICTORY, the most difficult battle against the sceptics is behind us and the A. R. T. A. travels toward its aims which are not to be denied.

Where are those weak spined radio operators of whom we have heard so much in the recent years? Indeed! There are none.

The inactivity of the radio operators in the past years—we come to realize—was not the lack of spirit. We are a happy go lucky, easy going race who will endure a great amount of abuse before aroused to action. This happened to us. It was difficult to arouse us from our complacency, but once aroused we proceed with irresistible force.

The new year begins and we look forward to new victories for the A. R. T. A. to win.

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LETTER TO THE EDITOR

Editor CQ:

Just a word as to conditions on the airlines. The new aeronautical class license has thrown about forty airline operators out of work.

Transcontinental and Western Air are doing away with CW and making their mechanics do the radiofone work. They seem to think that any one can be a radio operator as long as he can use (?) a mike.

United Airlines is also cutting down on the radio personnel, as their clerks and mechanics have the aeronautical tickets.

I know of a few cases where two operators have been with the company five years or more and have been kicked out without a moment's notice.

American Airways are not quite so bad, as the operators are only being given more work, such as handling mail and passengers, instead of being fired. Of course there have been wage cuts. Some of the men with aeronautical tickets are doing all this work and are only paid $110 a month. And there is a uniform to be bought.

The question is: How much longer are we going to let them get away with using green operators that don't even know how to change tubes?

I believe Congress ought to know that government mail, to say nothing of the lives of passengers and pilots, is being endangered by inexperienced men who are utterly unable to understand the radio end of things.

Why is it that the companies will take green men with no experience as weather observers or as aeronautical operators? It must be because they value money more than human life.

And another thing, if it wasn't for these half ass radio schools that advertise "Make sixty dollars a week in radio after three weeks' training," there might be jobs for experienced men with families to support. Of course, as long as they can get kids with no one to support and nothing to do but see the world, they will use them.

It seems to me that a man who has a number of years of experience should be a better man to have in charge of expensive equipment, especially if he has spent as much time studying as a man has to do.

We should have as strong a union as the movie house projectionists. It should give exams to see if a man is fit to handle radio equipment and should be powerful enough in Washington to make it interesting for any one trying to put through underhand legislation pertaining to licensing.

The lives of persons traveling through the air and over the seas are being jeopardized by the policy of making a radio man leave his receiver to do odd jobs. If a ship calls him and his receiver is a sharp tuning one, he will miss the call even if a loudspeaker is used. It's a devilish policy, that of placing the almighty dollar before the safety of life at sea and in the air and it ought to be brought to the attention of the travelling public.

Well, now that's off my chest, I feel better, and I hope these so-called "men" will have guts enough to back a union before all their jobs are overboard. What sa? NAB

RADIOMARINE REPORTS 1,189 SHIPS NOW

The Radiomarine Corporation recently announced that the total number of boats under contract was 1,189 and that in 1932 a total of 129 vessels had changed from a rental basis to purchasing their equipment from the firm.

Charles J. Pannill, executive vice president of the Radiomarine Corporation, considers this in the opinion of the ship owners as significant that the apparatus has been improved to such an extent as to not become obsolete in the near future, which would lead them to make direct purchase. Almost five times as many equipments were purchased outright in 1932 as in 1931.

The Matson Line, United Fruit, Columbian Line, Grace Panama, and Eastern Steamship Line are among the year's customers for equipments from the Corporation.

Obsolete spark transmitters have, in many cases, been replaced with vacuum tube transmitters although many of the merchant vessels are still using the old spark equipment.

The Corporation reports that an automatic alarm system for distress signals is being perfected for boats where a twenty-four hour watch is not being maintained on freighters and smaller craft. The sale of direction finders for the year 1932 seems to have fallen short of the 1931 figure and is of course much less than the total for other equipment to ships.

R. C. A. COMMUNICATIONS DOING WELL

Forty-five direct circuits in the network of the R. C. A. Communications, Inc., are given as the total by the firm through W. A. Winterbottom, vice president and general manager of the organization.

The most recent additions, as is well known, are the New York to Port au Prince, New York to Berne, New York to Mexico City, San Juan to Ensenada, and San Francisco to Mukden. The diversity or multiple antenna, by which three antenna spaced at 300 or more yards are tuned by one central receiver is in general practice. This allows for a signal not coming in well on one antenna being well defined on another of the three so that good reception is possible at all times.

ROBERTSON KNEW HIS DUTY

Three survivors, all that were known from the S. S. Nevada, which recently sank in the North Pacific, add new laurels to radio operating as a profession in their story of the disaster.

William R. Robertson, of Redondo Beach, Cal., the radio operator of the ship, locked himself in the "shack" and valiantly continued to send out distress signals until the apparatus was broken, from the ship pounding on the shore. He then stood at his post working to the end to repair the damaged instrument. Many of the crew were lost in trying to launch lifeboats, the captain and third mate leaped into sea rather than chance it with the ship, as did many of the crew on the boat. The only passengers reported on the Nevada were seven Chinese.

The "Oregon Maru" and the "President Madison" responded to Robertson's distress calls, but were so far off when they heard the signals that few were saved.

HOW ABOUT YOUR "MODULATION"?

By J. P. TAYLOR

How about your modulation, Mr. Broadcaster? Yes, we know your transmitter is designed for 100 per cent modulation—but how fully do you utilize that capability? Do your peaks of modulation fall short at 80 or 85 per cent or do they reach 100 per cent as they should—or do they perhaps spill over to 125 per cent or more? Are you sure—what kind of a modulation indicator do you rely on? We hope, Mr. Broadcaster, you don't depend entirely on that sluggish little meter on your transmitter panel. Surely you find it difficult to read accurately that swinging little needle—and how do you manage to see it from your seat at the control desk? We've tried it—and frankly we don't see how you do it.

There is a better monitoring system, Mr. Broadcaster—it makes **use of an oscillograph as a modulation indicator.** Yes, we know you have heard of this use before. But we imagine you have been inclined to regard the oscillograph as an instrument limited by complexity of construction and operation to laboratory applications. Certainly instruments of past design with their arc lamps and complicated driving and timing mechanisms did much to justify this accusation. However, what you perhaps do not know, Mr. Broadcaster, is that the growth of this broadcasting business has accelerated the development of an oscillograph having none of these disadvantages. An oscillograph in which ruggedness and portability are featured. Using this oscillograph, radio engineers have developed the technic of observing and photographing the modulated output of a transmitter to the point where they can recommend that you make it a routine operation at your transmitter.

As you know, the oscillograph is essentially an instrument for visualizing audio frequency currents. Briefly, an input audio frequency flowing through vibrator elements located in

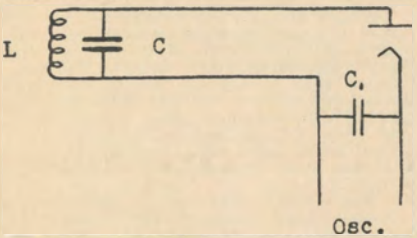

FIG. 1 OSCILLOGRAPH RECTIFIER CIRCUIT

the field of a permanent magnet causes these elements to oscillate in a rotational direction. A tiny mirror mounted on these elements vibrates with them. A fine beam of light reflected by this mirror traces, when the mirror is caused to vibrate, a path which is an accurate picture of the wave form of the current exciting the elements.

It is not possible with this oscillograph to observe the actual radio frequency waves produced by the transmitter. However, in studying modulation, it is the envelope of these waves that we are interested in and this is readily depicted by the oscillograph. As the vibrator elements will not follow radio frequencies, you will need in addition a small linear rectifier. Quite probably you have such a rectifier already—driving your present m.i. or a monitoring speaker. If you have, you can use it—if you haven't, one can be easily made.

The circuit of the pickup coil and rectifier tube making up a representative linear rectifier

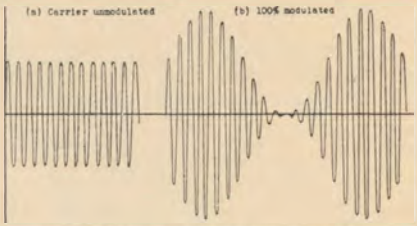

FIG. 2 RADIO FREQUENCY CURRENT IN PICKUP COIL

for this purpose is indicated in Fig. 1. Pickup coil L—broadly tuned to the carrier frequency by a small fixed or variable condenser C—is mounted in proximity to the power amplifier tank circuit. A small amount of radio frequency energy induced in this tuned circuit is rectified by the tube and furnished to the oscillograph as an audio frequency current which is equivalent to the envelope of the modulated carrier. Capacitor C, by-passes the r.f. current around the oscillograph. A variable

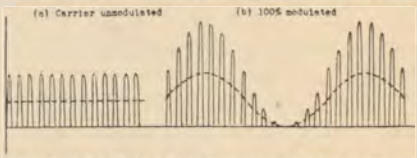

FIG 3 RECTIFIED CURRENT IN OSCILLOGRAPH ELEMENT (DOTTED)

resistance R allows adjustment of the oscillograph current. In some instances, r.f. chokes in the oscillograph leads may be desirable. While a UX-281 Radiotron will furnish sufficient current to excite the oscillograph, it is recommended that a UV-217-C Radiotron be used. If

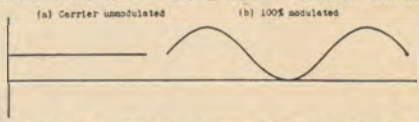

FIG. 4 PATH OF BEAM REFLECTED BY VIBRATOR MIRROR

this is done, a loudspeaker, a relay, or both may be operated in addition to the oscillograph. It should be noted that mercury vapor rectifier tubes are not suitable for use in this rectifier.

Interpretation of the results obtained when an oscillograph is used as a modulation indicator requires just a brief consideration of the phenomena of modulation. Referring to Figure 2, when the transmitted carrier is unmodulated, the radio frequency current which is induced in the pickup coil is a sine wave whose peaks are of constant amplitude as indicated in Figure 2

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New Vacuum Valves and Their Applications

By DR. A. W. HULL

Assistant Director, Research Laboratory, General Electric Company

The new valves described in this article are the latest product of the Research Laboratories of the General Electric Company. Some of them are still in the laboratory stage, others have already found important applications. Some of the larger ones, which have graduated from the laboratory, are waiting for their apprenticeship in industry, there to refine their frailties and complete their preparation as electrical servants. The career that awaits them, though dimly foreseen, appears fascinating. And as surely as history repeats itself, scenes still more romantic, now beyond the horizon, will unfold as we approach them. This is the romance of science.

Counting Electrons

Let the smallest tube lead the march of review. It is a special Pliotron tube designed to measure currents smaller than any yet detected. This miniature tube—miniature in performance rather than size—is the size of an ordinary radio receiving tube. Its appearance has nothing distinctive, except the quartz beads above and below the plate, which support the grid. They minimize insulation leakage.

In principle, this tube is like any grid-controlled high-vacuum electron tube; but in structure and operating characteristics it is entirely special. An extra "space-charge" grid, maintained at three volts positive with respect to the filament, holds back the small but pernicious current of positive ions emitted by the filament; the normal plate voltage is six volts; grid bias, three volts; thoriated-tungsten filament temperature, 1700 deg. K.; plate current, 40 microamp. These conditions are essential to the avoidance of grid-currents, which may consist not only of insulation leakage and positive ions from the hot filament and from residual gases, but of high-speed electrons from the filament, photo emission from the grid due to the light of the filament, and electron emission caused by x-rays generated by the impact of electrons on the plate.

The present sensitivity of this new tube is slightly better than that of the most sensitive electrometer, over which it has an enormous advantage in sturdiness. In amperes this sensitivity—that is, the smallest current that can be measured by it—is one-one quintillioneth amp. The ampere is evidently an inconveniently large unit for the purpose. In terms of the smallest known unit, the electron, the sensitivity is approximately six electrons per second.

This microtube has the distinction of being entirely impractical for ordinary uses. Its applications, present and future, as far as eye can see, are purely scientific. It counts cosmic rays. It measures, in co-operation with a phototube, the light from distant stars, being able at present to detect the light from a star of the 14th magnitude. It records the fragments—neutrons, protons, and alpha particles—of atomic nuclei smashed by high-speed ions. The structure of these atomic nuclei, the 92 hitherto indivisible elements of atoms, appears to be the next objective of scientific research, the next nature-fortress which science aspires to storm. Perhaps our diminutive tube may be the sling with which some scientific David shall make this conquest.

Measuring Nerve Messages

Next in review comes another seemingly impractical tube, likewise diminutive in function and ordinary in appearance. It measures voltages ten times smaller than could be detected before. It, too, is a device of most ordinary structure and form; a simple three-element tube of standard size and construction. Its special feature is good vacuum—naturally invisible.

Good vacuum is a relative term. The vacuum of 1880, used by Hittorf and Crooks, was about one-one thousandth atmospheric pressure. It was sufficient to reduce the sparking potential between electrodes one centimeter apart from 30,000 volts to about 300 volts. At this pressure electrons have long free paths, and easily attain speeds at which they ionize the atoms they strike; and ions and electrons play about equal roles in carrying the "glow-discharge" current. Such glow-discharges have found many applications: for rectification, relays, illumination, television.

The "good vacuum" of 1900 was one thousand times better; that is, about one-one millionth atmospheric pressure. Electrons in such a vacuum only occasionally meet atoms and the ions formed by these encounters contribute only a fraction of a per cent to the current. The current through the vacuum might be called a pure electron current, since at least 99 44/100 per cent of it consisted of electrons. This vacuum was good enough to enable Lenard and others to solve the mysteries of photoelectric emission, J. J. Thomson to discover and identify the electron, and O. W. Richardson to discover the laws of thermionic emission. It enabled Fleming to invent the Fleming valve, and de Forest the audion.

Langmuir, in 1912, made a new discovery. The so-called pure electron currents of Richardson and others had always been limited by the electron emission of the filaments, the only known limiting factor. Langmuir, having a new and better filament material, tungsten, to play with, decided to test this limitation to the limit. He tried a tungsten filament with an emission of 100 amp. and obtained a current of only one-one hundredth amp. Why? He had discovered a new limitation, which he found to be caused by the mutual repulsion of the electrons in the vacuous space, and which he termed space-charge limitation. Briefly stated, electrons repel each other, according to Coulomb's law for charges of like sign. Hence they march across the vacuum in very open array, far enough apart to see with the naked eye if they were visible[1]. But, Langmuir discovered, this space-charge condition is present only in a Langmuir-pure electron discharge, 100 times purer than that of Richardson. For it is the electron-attracting effect of the presence of positive ions, not the current they carry, that is important for space-charge. A vacuum so good as to give a negligible positive ion current, for example, a positive ion current less than ¼ of 1 per cent of the electron current, may have as many ions present as there are electrons, since the ions move several hundred times more slowly than electrons. In such a vacuum the space-charge limitation, due to elec-

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[1]The average distance apart of electrons in an ordinary receiving tube is about one-one hundredth mm., which is the diameter of the filament in a standard 15-watt Mazda lamp.

PIONEER RADIO OPERATORS

By DR. LEE DE FOREST

I found the new station at Kansas City already in operation under the zealous efficiency of Billy Fennel, who greeted me with this Aerogram from our St. Louis headquarters: "Wallace wires as follows. Nottingham (Cleveland) reading Kansas City perfectly. Can you have K. C. send for Buffalo. Wire when. Congratulations."

J. H. Wallace was still in the old shack on the frozen shores of Bay View, near Buffalo. And Elmer Bucher was still faithfully plugging away on the lonely shore of Lake Erie at Nottingham. Fennel got my message off to Buffalo, nearly a thousand miles overland—a new world's record, and Wallace was a happy op. as he pulled it in. And all through the winter wireless traffic was brisk between Chicago, East St. Louis and Kansas City. Every operator we had was keen to break a record, to receive a "wireless" further than his rivals. And thus new records were an almost weekly occurrence. Bucher, on January 10, 1905, picked up in Cleveland the Mallory S. S. Denver 10 miles south of the Diamond Shoals Light Ship, 533 miles in direct line, and the "Bermudian" when 200 miles from New York.

"On January 21st the 'Philadelphia' reporting to 42 Broadway when 130 miles out was picked up by the de Forest operator at Port Huron, Mich., some 600 miles away.

"These performances merit attention when it is considered that all the boats are equipped with 1 K. W. apparatus and with very short masts." I am quoting from no less an authority than the London "Electrician," which august journal considered such then unheard-of feats as well worth the chronicling. Today's hams who with 20 watts wig-wag to New Zealand never felt greater thrills than did our pioneer operators of 1904-05, in establishing such records as these. Then a wireless message from the mayor of Cleveland to the mayor of St. Louis was front-page, every time, hailed as a "Triumph of Science"!

I think it was on my next trip South that in New Orleans I first met Operator Baskerville on one of the earliest of the United Fruit boats installed, whose mellow Dixie dialect, flowing like one of the Louisiana bayous, has been lazy music to my ears—unmistakable ever since. Baskerville and "Wiahless" have remained close companions for lo these "mightynye thirty yeahs."

Feb. 9, 1905. "And again Key West. I left Kansas City with the thermometer hugging the zero mark. Today I have been wandering about in my lightest clothes beneath a sky of the sunniest turquoise, drinking deep draughts of sweet mild air, wafted from off sub-tropic seas, laden with the perfume of flowers and luscious fruits." * * *

"This is indeed an 'Island of the Blest,' a Harbor for beauty-loving souls buffeted by northern blizzards, a gem from tropical realms. It will be with regret that I leave this Isle of Delight, so long desired.

"The Big Station is practically complete. Last night I made the first test of sending. Certainly her voice should be heard in far distant parts of this land of ours, and over many hundred leagues of sea.

"Friday night we heard Hatteras with great clearness, and even **Kansas City!** And last night we listened to the Coamo 150 miles from New York, and even caught 42's answer to the ship!

"For comfort, sheer ecstacy of healthy revelling in an ideality of external surroundings, an atmosphere of Arcady, a Lotus-eater's realm, give me this little Island of Indolence, resting gem-like among these southern seas."

Thus did early wireless in warm waters awaken romance and poetry in our souls.

"Often have I gazed, fascinated, at the three gaunt masts of this Wireless Station, with their mazes of slender guys, the yet finer antennae wires, threaded against the pale saffron of sunset skies. Or again, when the great moon, in the calm stillness of night paints the white towers with silvered gleam, and the wires hover far above me, dim and shadowy in heaven.

"Fascinated I stand and watch, seeking to fathom its significance, the great weird mystery of it all, these shining pillars holding aloft an invisible vault of etheric echoes; this strangely figured mouth-piece of silent voices whose echoes nevertheless resound over a thousand miles. Strangely fashioned listening things that harken silently, by night, by day, and hear the inaudible calling from distant cities across the sea!

"And many times, in reverent mood, at varied places, by far distant waters, I have lain upon the ground and looked aloft into the blue sky at the strings of my antennae wires, and wondered what and why they were; or by what mystery those simple lines had power to vibrate to the unseen waves, to send out, even to the ends of the earth, those strident yet all inaudible messengers.

"And oh the wonder as one hears their voices in the responder—some loudly distinct, although a thousand miles away; and some so faint, so dim, as scarcely realized as sound shadows on the wind!

"Nor is it strange as I stand by these white masts here in this glorified land that thoughts great and deep and gratifying come to me as I watch; or that by night I seem to see the very stars entangled in those lofty wires. Truly I may say, following the counsel of the Sage of Concord, I have 'hitched my wagon to a star'."

Thus I wrote, in the spirit of the Young Wireless, in my diary of 1904-05. Surely none can say that Science and Romance were never near related!

Down at the little commercial station in Key West, at Las Brisas, I found Horton instructing our new civilian operator, Curtis—soon to be selected to superintend the installation of the fifth big Navy installation at Colon, Isthmus of Panama. Curtis learned his power stuff from the Navy Station at Key West, and thus became amply qualified for that last big job, where Goethal and Gorgas, under "T. R's." stimulation, were already digging the big ditch, and stamping out Yellow Jack.

But just now the little shack at Las Brisas was making wireless history. For the Key West City current was of a bastard frequency of 133 cycles. Why, godonly knew. But that little spark of Key West, Jr., had a sweet little singing note, when Curtis set the spark balls close together, which while apparently feeble could be distinguished through static over dis-

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NEW VACUUM VALVES AND THEIR APPLICATIONS

(Continued from Page 6)

tron repulsions, is entirely lacking. It is just this vacuum, and its freedom from space-charge limitations, that is utilized in the Thyratron tube.

The importance of this distinction, between the mere presence of ions and the current they carry, lies in the fact that the whole foundation of amplifying action rests on space-charge. As long as tubes were merely rectifiers, like the Fleming valve, pure current was a sufficient specification of vacuum. With the advent of amplifiers, pure space-charge became the fundamental criterion.

All this is old history. The vacuum tube of today may say of Langmuir's vacuum specifications, "All these things have I done from my youth up. What lack I yet?" The answer is, still more purity. When we amplify enough—the sky is the limit with cascaded screen-grid tubes—we soon begin to hear the tube itself. A steady hiss, of no particular frequency, is what it sounds like in telephones. A milliammeter in place of telephones tells the same story; the needle dances irregularly, wildly. Part of this "tube noise" we now understand and recognize as fundamental. It is due to the graininess of electricity. It is obviously impossible to have a smooth flow of anything that is made up of finite grains, like electrons. This so-called "shot-effect," the irregularity of the patter of electrons on the plate, can be calculated and measured, electrically. It is equivalent, in an ordinary amplifying tube, to an input signal of about one microvolt. We must accept this as a fundamental limit to the smallness of signal that is worth amplifying, since anything smaller will be hissed down by the shot-effect.

But there are other tube noises, which are particularly evident at frequencies below 1000 cycles, that are 100 to 1000 times larger than the shot-effect. These—the worst of them, at any rate—have now been traced to bad vacuum, to ions produced in the still-residual gas of ordinary amplifying tubes. The cure was more vacuum, another stage of vacuum perfection. The result is a tube with a low-frequency input noise level of less than ½ microvolt (practically all shot-effect) as compared to about 10 times this value for the best tube previously available.

No one knows what new thing will be done with this modest addition to the tube family. The possibility of amplifying and observing things ten times smaller than before suggests new discoveries; perhaps in the field of physiology, by measuring heart-beats, nerve impulses, thought waves.

Power Pliotron Tubes

Radio transmission has made available a group of power Pliotron tubes of ratings from five watts up to 500 kw. But the field has been too small for quantity production, with its simplifications and economies. There is now appearing on the horizon a need for power Pliotron tubes in industry. High-frequency heating of metals; high-frequency heating of people, at present for producing benign fevers that have been found effective in the treatment of paresis and arthritis—eventually, perhaps, in lieu of coal; sterilization of milk, grain, fruit, bulbs; production of ozone; these are possible applications.

Chemical Analysis

X-ray chemical analysis has many unique features. As a qualitative analysis it is infallible; that is, the presence or absence of the characteristic lines of an element in the spectrum is absolute proof that the element is or is not present to the extent of a fraction of a per-cent. It supplements chemical analysis, being especially applicable to elements of high atomic weight, from aluminum to uranium, which are least easily analyzed by other methods; for some of the rare elements it is the only reliable method; and the results are easily interpreted, since the number of lines in the x-ray spectrum is so small that they are readily identified.

But the technique of this analysis has been tedious. There has been no satisfactory way to obtain x-rays from the specimen except to put it inside the x-ray tube.

The problem has been solved by the new cathode-ray tube, which makes it possible to produce x-rays in air. This tube is shown in

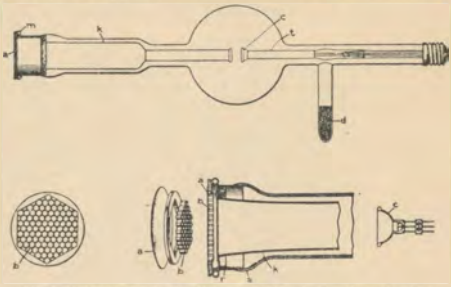

Fig. 1 Cathode-ray Tube. Below, at left, window through which the electrons emerge into the air, at right, cathode

a: Window or anode
b: Hexagonal supporting grid
c: Cathode cup
d: Charcoal gas trap
e: Copper anode shield
m: Water-cooling coil around anode
r: Invar anode sleeve
s: Invar-to-glass seal
t: Cathode shield

Fig. 1. A cathode, similar to that in an x-ray tube, focuses a beam of electrons on an aluminum window that closes the tube. Parts of the window (a, Fig. 1) are stamped very thin so that the electrons pass through without appreciable resistance, into the air, and travel several inches in air before they are stopped. The substance to be analyzed is placed near the window (Fig. 2), which is grounded. Electrons emerging from the window strike the sample and excite its characteristic x-rays. These are resolved into a spectrum by the x-ray spectroscope, and the characteristic x-ray spectral lines are photographed, or are measured electrically by a Pliotron tube.

Electric Eyes

The photoelectric cell is old—middle-aged, one might say, since it has passed its fortieth birthday. During the past five years, however, it has done most of its growing, stimulated by the small but important application in talking movies. The result is the caesium phototube, 100 times more sensitive than previous cells, with the important property of being able to see red—for there is much more red light than blue in the world.

The special importance of this new electric eye is as a team-mate for the Thyratron tube. By itself, the phototube is scarcely able to do any useful work. It gives a response of only 40 microamp. at best, when illuminated with one lumen of electric light, which is about the amount it receives from a 50-watt lamp at a distance of six inches. This current is too small to operate reliable relays, even slow ones. But it is ample for the grid of the Thyratron tube, its giant mate. Together they are a high-speed, high-power team, ready to contract for any type of electric service where reliable, quick action is required in response to light signals.

The Thyratron

The Thyratron tube is a grid-controlled arc discharge device. Like the Pliotron tube, it is a "three-element tube in which the flow of electrons between cathode and anode is controlled

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THE STOVE

TALES OF THE OLD TIMER

By WILLARD BLISS

They were seated in the "static" room of the big corporation—the usual crowd of job-seekers. Hard times had beset these spend-thrift, wilful vagabonds, the modern contribution of science to that "old Debbil Sea." They were Jacks home from the sea; but, Jacks without any jack in their pockets. With the insouciance of their youthful calling some of them did not greatly mind these days of financial embarrassment, the great corporation would take care paternally of its wireless operators. Many of the boys, but more of the older men (some of whom were gray-haired from sea service), were on the bread-line of the company, receiving their daily meal ticket to be used at the cafeteria in the building.

The unemployed wireless operators spent most of their day in this room waiting and waiting, for the call from the "Big Guy," to go out to sea once again. The table in the little room was surrounded by the inveterate bridge players, over whose shoulders leaned the kibitzers telling the players how they should have led this trick, or, not played that card this way.

In chairs tilted on their hind-legs against the walls sat non-players, or those operators not interested in kibitzing. Some were reading their Saturday Evening Posts or other five cent magazines. Some were deep in a green covered magazine. Others, of a more radical bent, were intent on a newspaper that excited their antagonism against the present economic situation that prevented them from going to sea.

Off in the corner by the window tilted back in his chair was the "Old Timer," who had seen twenty years of service in the wireless shack. He had started with magnetic detectors, cohorers, crystals, and had seen wireless practice progress to its present state of efficiency. His hair was partially gray, his face was lined with the years of experience he had in the seaports of the world. He had been here; and, he had been there. Name some little known outplace of the world; give him time to search back in his memory; surround it with the romance of reminiscence and he could, if so inclined at the time, tell a pretty little tale of the strange named place.

At present a youngster, shined and polished as he came from his home, where he was sure of his three squares and a flop that Dad provided while his son sought opportunity to start at his new profession, was enthralled by the "Old Timer's" talk. It was for this high spirit of adventure, romance—the beach at Waikiki—the Bund at Shanghai—the minarets of Istanbul—that he had eagerly toiled in the labor of securing his license. With this license—that he had received last week—now safe in his pocket, he thought of himself as a wireless operator, along with these other romantics of the sea. No wonder he was engrossed in the tale of the "Old Timer."

"Storms at sea, son," said the Old Timer. "Well . . . I suppose I have had my share of storms. China Sea typhoons, West Indian hurricanes, Western Ocean gales and that reminds me of a crossing I made one time when the Western Ocean was a little rough.

"Now let me see . . . ," he squirmed further into his chair, then relaxed limply so as to extract all the lazy comfort his position could give him, while he romanced of past times. He puffed at a cigarette, that the youngster had given him, while he gathered his thoughts.

"Yes . . . we sailed from Norfolk if I remember right sometime in February or March. She was a little old cutter that the Navy had discarded. Huh, her name? What difference does that make—her name. She's at the bottom of the sea now. As I was saying, she was little and when I say little I mean little. Why that tub was only a thousand tons deadweight at the very most, likely she was smaller than that. How she could roll and pitch.

"We put out from the pier and while we were going down the bay I got a flock of storm warnings. Storm warnings had been up on the coast for the last couple of days. We slid out past Cape Charles and we got it as soon as we were outside the capes. Then she started to roll and then she started to pitch. That sort of thing kept up for the eighteen or nineteen days that it took us to get across to the U. K. The particular incident that I am thinking of now happened when we were about halfway across.

"We had been getting our grub pretty much as usual—what the cook could manage to keep on the galley-stove and it was a tough job to do any cooking on that squirming packet. Well . . . this morning just about 11:00 o'clock, I was down in the captain's room, which was underneath my shack. I was sitting on the deck—that was the only comfortable place to sit on that blasted ballyhoo, with my back against the foremast that went through the skipper's room—while the 'Old Man' was telling me something or other, when the Chinese cook pulled open the door and ran in.

"The cook, he yells, 'Cappy! Cappy! Make quick the galley. She all hell.'

"The Old Man, he don't bother to ask the cook what's up but beats it for the galley with me after him. We ran down that slippery, slanting deck with the seas breaking over the rail and wetting us. We got to the galley and Cookey was right, 'Hell was to pay.' The cook had been busy preparing the lunch, so that he had the galley-stove piled with his soup pot and other pans. Well . . . all over that galley deck was soup and beans and stew and potatoes and what the hell not. All the pots and pans had skidded off the stove when the stove shore off its holding-down bolts and started sliding around the galley.

"There it was, a long, heavy, iron cook-stove loose. As the ship rolled, the stove would skid downhill toward the iron housing, then when the ship rolled the other way, it skittered back. The pots and pans were clattering back and forth so that it sounded like a blacksmith shop or some boiler factory going wild. The smoke-stack had been wrenched off the stove and smoke billowed from the stove filling the galley. The stove shook its fire out onto the deck so that live coals were all about. Chaos and then some.

"The Old Man got busy right away. He

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OHM'S LAW EXTENDED

By E. H. RIETZKE

President, Capitol Radio Engineering Institute, Member, The Institute of Radio Engineers

A short time ago the organization with which the writer is connected sent out a specially prepared series of practical radio engineering problems, covering some work in almost every branch of radio, to about 2000 professional radiomen throughout the United States and other countries. The problems were followed after several days by an answer sheet in order that these radiomen could test their own ability in handling practical problems. As was expected, very few were able to work a large variety of problems as few men had extensive practical experience out of their own branch of radio. One problem, however, caught a high percentage of all radiomen and, curiously enough, this was the problem with which all should be fairly familiar—a simple voltage divider network. This particular voltage divider is for use in a low power transmitter. With lower values of current and voltage it could be used in a receiver although most modern receiver networks are much more complex.

The problem is illustrated in Diagram 1. In this problem we have given the currents in the several vacuum tube circuits, the total current in the main line, and the voltage drop across each vacuum tube circuit. The problem is to calculate the value of each resistor in the network. Several radiomen wrote in and said the problem could not be done with only the values given. Others said that the answers given were positively incorrect! In all of the latter cases the writers had attempted to prove the answers simply by the use of Ohm's Law in a series circuit.

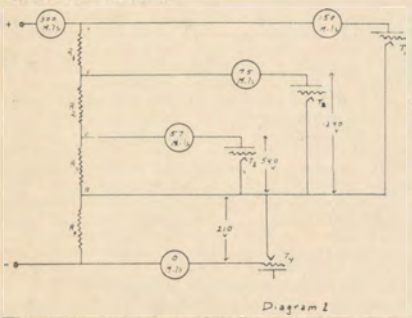

Diagram 1

There is only one simple method of handling this problem, a method that can be used without difficulty in the most complex voltage divider networks. This method employs a combination of Ohm's Law and one of Kirchoff's Laws which states, "The sum of all the currents flowing away from any point in a circuit must equal the sum of all the currents flowing to that point." This is a very simple law; it is obvious; but it gives us the method by which we can attack the most complex networks.

Upon examining the circuit in Diagram 1 we see that the total current in the main line is 300 mils. The load currents in T_1, T_2, and T_3, respectively are 150 mils, 75 mils and 57 mils, a total of 282 mils. Since all of the 300 mils must flow through the network it can be seen that the difference, 18 mils, must flow through the bleeder resistor, R_3. This gives us a point from which to work.

The voltage across T_3, which must also be the voltage drop across R_3, is given as 540 volts. The bleeder current through R_3 has been determined as 18 mils. Then R_3 must equal E/I, 540/.018 or 30,000 ohms.

Next we must determine the values of R_2. Away from point Z there is a current flow of 18 mils through R_3, and 57 mils through T_3, a total of 75 mils. The voltage drop across R_2 is 1290 — 540 or 750 volts. This can be seen from inspection of the Diagram. Thus, R_2 must equal 750/.075 or 10,000 ohms.

The current flowing away from point Y is the 75 mils through R_2, made up of the bleeder current and the current through T_3, plus the load current of T_2, a total of 150 mils. This current must flow through R_1 toward point y. The voltage drop across R_1 is equal to 2790 — 1290 or 1500 volts. The resistance of R_1, E/I, must be 1500/.15 or 10,000 ohms. Adding the current through R_1, 150 mils, to the current through T_1, 150 mils, we obtain the total line current of 300 mils.

Inspection of Diagram 1 shows that all of the individual currents again come together at point A and flow through R_4, the drop across this resistor being used to supply the negative bias for T_4. The voltage drop across R_4 is given as 210 volts. The resistance must be 210/.3 or 700 ohms.

The accuracy of this calculation can be checked by first determining the individual tube resistances and then combining these with the divider resistors to form an equivalent network as shown in Diagram 2 and solving as a complex series-parallel combination.

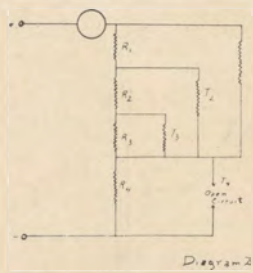

Diagram 2

After being given the resistance values of R_1, R_2, R_3 and R_4 the average radioman adds them up, getting a total of 50,700 ohms, divides this into the total voltage, 3000 volts, and obtains a current of slightly less than 60 mils. He then states that the values of resistance as determined are incorrect and that the bleeder current should be 60 mils instead of 18 mils. He uses the (supposed) bleeder current of 60 mils, multiplies by the values of R and discovers that the values of voltage obtained at points A, Z and Y do not equal the values given. If the tubes were removed or their circuits opened the voltages as measured at these points would not be the voltages as shown in the problem. (In the design of a voltage di-

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COURT ACTION ON RADIO CORPORATION

By L. D. McGEADY

On November 21, 1932, two of the great minds of our country today must have heard with mixed interest the consent decree of Judge John P. Shields, of the Federal District Court at Wilmington, Del.

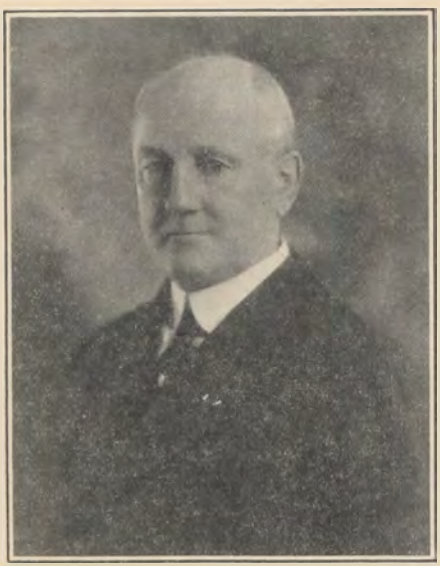
It affected the Radio Corporation of America along with other defendants, and was the outcome of an anti-trust suit by the government instituted on May 13, 1930. For one year and six months the government attorneys on the one hand had fought for a conviction, and the defendant attorneys on the other hand had fought for the best possible terms out of the suit.

On March 29, 1919, Owen D. Young, then vice president of the General Electric Company, wrote to the then assistant secretary of the Navy, Franklin D. Roosevelt:

"We believe that it is not the desire of the Navy department to request us to do anything which would be inimical to our commercial interests.

". . . and at the same time to retain a reasonable protection of the commercial interests of the General Electric Company.

"If this suggestion meets with your approval and you will kindly name me an appointment,



General James G. Harbord, Chairman Board of Directors, Radio Corp. of America

I shall be pleased to go to Washington with other representatives of the General Electric Company to discuss this matter. . . . ."

Mr. Roosevelt replied as follows:

"Navy Department,
"Washington, April 4, 1919.

"Sir:

"The department appreciates the spirit of your letter of March 29, dealing with the purchase by the government of your numerous excellent devices . . ." and set a time for the conference suggested by Mr. Young.

This was probably the first written intimation of the formation of what was later known as the Radio Corporation of America. Since that time both men had risen to the highest position possible in their respective branches, Mr. Young, the chairman of the board of directors of the General Electric Company, as well as chairman of the executive committee of the Radio Corporation of America, and Mr. Roosevelt, president elect of the United States.

Strange to say, that while political considerations do not enter into these matters, the government instrument was issued during a Republican administration with which neither of these men appeared to have much sympathy, as Mr. Young was a strong supporter of Mr. Roosevelt for the presidency.

The four principal agreements objected to by the court, and undoubtedly the foundation work of all the following points which lead to the decision, were:

1. The agreement between the Radio Corporation of America and the General Electric Company dated November 20, 1919.

2. The agreement between General Electric Company and American Telephone and Telegraph Company, dated July 1, 1920.

3. The agreement between the Radio Corporation of America and United Fruit Company, dated March 7, 1921.

4. The agreement between the Westinghouse Electric and Manufacturing Company and the International Radio Telegraph Company, dated June 29, 1921.

The court stated: "The court has jurisdiction of the subject matter hereof and of all the parties hereto and has full power and authority to enter this decree and the allegations of the petition state a cause of action against the defendants under the provisions of the Act of Congress of July 2, 1890, entitled 'An act to protect trade and commerce against unlawful restraints and monopolies' and acts amendatory thereof and supplemental or additional thereto, known as the Federal Anti-Trust Laws."

At the time of the decision Mr. Owen D. Young was chairman of the executive committee of the Radio Corporation of America, and chairman of the board of directors of the General Electric Company. He had seen the child of his creation, the Radio Corporation of America, grow from December 31, 1920, when the total assets were $25,112,945.18 to October 31, 1932 when its total assets were $108,922,709.

Mr. Young had seen the time from 1920 when as chairman of the board of directors of the Radio Corporation of America, the company proudly stated:

"The negotiations with foreign governments have had the support and assistance of the United States government, which is regularly represented at the meetings of your board of directors by Admiral W. H. G. Bullard, Director of Communications, United States Navy. The State and Commerce departments have actively co-operated with your officers in their dealings with foreign governments and have rendered invaluable aid."

To the time in 1932 when with former U. S. Army General James G. Harbord, as chairman of the board of directors, the company was to be publicly censured by court.

But, on the other hand Mr. Young as repre-

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NEW VACUUM VALVES AND THEIR APPLICATIONS

(Continued from Page 8)

by voltage applied to a grid." But it differs from this tube in two important respects. The first is "purity." The electron current in the Pliotron tube must be very pure; the presence of a few positive ions spoils the space-charge-limiting repulsions on which its whole action depends. The electron current in the Thyratron tube, on the other hand, must be 100 per cent impure; that is, it must have as many positive ions as it has electrons. Electron repulsions are so completely neutralized by the presence of the positive ions that 10,000 times as many electrons can be crowded into the space; there are between 10^{12} and 10^{13} electrons per cubic centimeter in the current stream of the Thyratron tube, compared with about 10^{9} in the Pliotron tube. Hence the Thyratron tube can carry larger currents with lower voltage drop—amperes instead of milliamperes, with a few volts, from 10 to 18, between anode and cathode, instead of hundreds of volts.

The second fundamental difference between the Thyratron tube and Pliotron tube is that the grid of the Thyratron tube only partially controls the current flow. It can control the starting of the current. After the current has started, the grid is nearly powerless; under ordinary circumstances it neither controls the magnitude of the current, nor stops it. But if the current stops, the grid can prevent it from restarting, or allow it to restart, at will. Inability to control the magnitude of the current is not a limitation, for this control must necessarily be sacrificed to obtain efficiency—the two are mutually exclusive. Inability to stop the current is a limitation, though not a serious one, since the rectifying action stops the current whenever the anode voltage reverses. Such reversal takes place periodically in many circuits as, for example, when alternating voltage is used for the anode; and when it does not, can always be made to take place by starting another Thyratron tube.

The reason that a negative grid ordinarily cannot stop or control the discharge is that it attracts to its neighborhood enough positive ions to neutralize exactly its own negative charge, so that its negative influence extends only a short distance. It will always insulate itself in this way if there are positive ions in the space, but cannot if there are no positive ions. Hence, in order to regain control, the discharge must be stopped only long enough to allow the ions to diffuse to the walls. This time varies, according to grid mesh and vapor pressure, from about 50 to 200 microseconds.

Typical Thyratron tubes have an oxide-coated filament, like the ordinary Pliotron tube, but its grid is larger and farther removed from the filament. The reason for this is two-fold. First, closeness is less necessary than in the Pliotron tube, because the current is not limited by electron space charge. Second, distance is desirable in order that the grid should remain cool enough not to emit electrons; since electron emission by the grid is both more serious than in the Pliotron tube, and more likely to happen, because of the larger current. The tube is designed to furnish and control an average current of ½ ampere, at any voltage up to 2500. The gas needed for the positive ions is furnished in this, and in the other Thyratron tubes shown, by a drop of mercury located in a cool place at the bottom of the tube, giving a vapor pressure between 0.005 mm. and 0.020 mm. Thyratron tubes containing argon at 0.500 mm. pressure are available for low-voltage applications.

Other Thyratron tubes embody a new feature, the cellular cathode. This cathode takes full advantage of the low resistance of electron flow in ionized gas, by not only removing the electron-emitting surface far from the anode, but also by locating it on the inside of long, narrow cavities. Electrons easily escape from these cavities, with the help of positive ions, but only a small amount of heat escapes, as compared with that radiated by a filament of equal area. Hence these cathodes are more than ten times as efficient as filament. They require about one watt of heat per ampere of emission, to keep them at operating temperature.

A smaller Thyratron tube furnishes a current of 15 amp. maximum, or 2.5 amp. average, at any voltage up to 1000. The larger is rated 75 amp. maximum, 12.5 amp. average, 15,000 volts maximum.

The largest hot-cathode Thyratron tube available has a cellular cathode of slightly different form. It is rated 600 amp. maximum, 100 amp. average, 1500 volts maximum.

The largest Thyratron tube available, Fig. 3, is of the mercury-arc type, with a pool of mercury as cathode. The anodes and grids are placed in side arms, with shields and baffles to protect them from mercury spray and from each other. Each of the 12 anodes is capable of carrying 4000 amp. maximum, and the whole tank has a continuous current rating of 5000 amp. d-c., with overload capacity up to 14,400 amp. for one minute, at d-c. voltages up to 1500.

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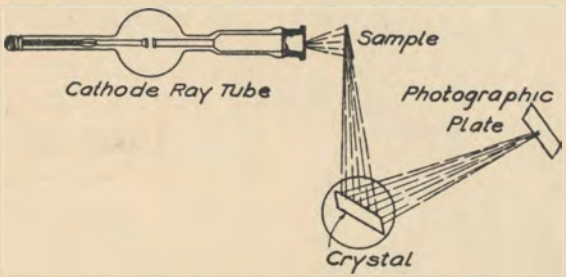

Fig. 2 Diagram of Apparatus for X-ray Chemical Analysis, Using a Cathode-ray Tube to Excite the X-rays

T: Cathode-ray tube *Sp:* Specimen to be analyzed
C: Calcite crystal *S:* Slit *P:* Photographic plate

New York Notes

G. E. Fitzsimmons and Charlie Porter are in the SS George Washington (Eastern Steamship Company).

* * *

Joe Perlman grabbed the New London trawler Kingfisher.

* * *

P. A. Scambler left the tug Susan A. Moran and is now on the beach at New York. Jorgenson relieved him.

* * *

R. Sheppard has the Brooks Scanlon, relieving H. Wynne Edwards.

* * *

Gordon Rabbits went out in the Santa Barbara as chief.

* * *

Simon Golden got in a few weeks in the Stephen R. Jones, relieving Frank Grosser who returned to the ship after a short illness. Golden then relieved Joe Belleza in the Caracas. He is thinking seriously of looking over the Alaska area next season and has his pockets full of Department of Commerce pamphlets on the subject.

* * *

Abraham Goldweitz went out for a trip in the Ancon as junior with Dudley Anderson.

* * *

S. Hendleman is once again in the Siboney of the Ward Line.

* * *

Arthur Finch took a trip off from the Maurice Tracy and has succeeded in getting his final citizenship papers. Likewise, Duncan Currie, who some time ago left the American Farmer for the same reason, was made a citizen of these great United States on December 19th. A very nice Christmas present, indeed.

* * *

Enrique Gorbia is back on his old ship, the Gatun.

* * *

Joe Cohen was assigned to the Craigsmere of the Tracy line for a relief trip.

* * *

John A. Curran went out last trip in the American Banker.

* * *

Joseph P. de la Hunt, who recently returned from a trip to Colombia, after turning over a vessel to that government for war purposes, was assigned to the Elizabeth Kellogg.

* * *

Gordon R. McCallum, after a short stay on the beach, went out in another Standard shipping tanker, this time the E. T. Bedford.

* * *

Hugh B. Thomas relieved A. Finch for a trip in the Maurice Tracy.

* * *

Walter W. Koch, who took a trip or so off from the Leviathan to get married, is back in the big ship once more.

* * *

It seems the marriage fever is overtaking the boys in this district. Gus Anderson took a trip off the Ponce and did the stunt some time ago. He is back with his ship again.

* * *

Mike de Martino got another crack at the cableship Edouard Jeramec. This time the vessel is not so well favored with weather and he may perhaps have a good job for several months. Rittman went out with him.

* * *

Bill Kirchhoff, after four years more or less on the beach, went out in the Sea Thrush for an intercoastal trip. It seems the wagon fetched up on the bar off Astoria, Ore., and Bill made his way homeward, overland. True to tradition, the operator was the last to leave the ship. It seems Bill tripped in his rush for the lifeboat. The crew had to pay their own transportation home. Little Willie made out very well, however. With his usual resourcefulness, he hocked his watch and arrived in New York with three dollars to spare. Max Schaeffer, of Los Angeles, who foolishly loaned him a fine short wave set, will have to make a trip with the salvage gang if he wishes to recover it.

* * *

John Dudor, late of the Scannpenn and the Munargo, was assigned to the Baracoa of the Columbian Line.

* * *

Herbert W. Martin was assigned to the Dixie Arrow of the Standard Transportation Company.

* * *

Dick Cuthbert was relieved on the American Banker and has sailed again. Ship unknown.

* * *

Willie Eppler's pipe got a little too strong for the men at 75 Varick and a collection was taken up to buy him a new one on the promise that he would destroy the one that has wrought havoc for the past few years. Mr. Duffy said had he known a collection was being taken up for this purpose, he would gladly have donated fifty cents. By the way, if you never got a whiff of the old one you certainly missed something. Good as a quart of Scotch, they say.

* * *

The new Matson liner "Lurline" leaves New York on January 12, 1933, for the West Coast with "Tiny" Nelson in charge of the radioroom. He will be ably assisted by Bill Bowen, who has been pining away in San Francisco for years and years thinking of the islands. The Lurline equipment consists of a R. C. A. ET 3674R Intermediate and Short Wave Transmisser, an AR 1496 Short Wave Receiver. A IP 501 A Receiver is also installed to maintain continuous watch on both 600 and short wave.

Boston Notes

December finds things in Boston better than they have been for many months. A goodly proportion of the laid-up fishing fleet has returned to service, the coal trade is busy, and many of the operators who spent the summer on the beach are back pounding and polishing brass. But the beach is not deserted, by any means. Additions have been made to it during the past few months, and there is always, of course, that sturdy background of newly licensed men.

* * *

There have been a few changes in the Eastern Steamship winter line-up. Gordon Glenn, chief of the Boston, resigned from RMCA service to assume duty at Cleveland for the Dept. of Commerce Airways. S. R. ("Sink") Elliott, former RMCA inspector, relieved Glenn and is now chief of the Saint John which replaced the Boston on the Boston-New York run. . . . Kenneth Mooers went back to his old home, the Evangeline, after spending the summer on the Acadia.

* * *

The association has been fortunate in securing the services of Charles W. Marsh as a Boston delegate. Marsh, for many years a brasspounder in the Savannah and Eastern Steamship Lines and one of the most popular operators working out of Boston, will co-operate with Dick Golden in making Boston 100 per cent A. R. T. A. Charlie is going after those

bashful boys in the you-know-what line.

* * *

Sam Parsons returned to the Maltran of the Mallory Line, and when last heard from was in the highly romantic business of hauling potatoes from the grand old town of Bucksport, Maine to New Jersey.

* * *

Boston, of course, has always been known as the City of Culture, the Hub of the Universe, and the home of people worth knowing. It remained for our secretary, with a perfect sense of the fitness of things, to issue to this district A. R. T. A. membership cards bearing seried numbers in the four hundreds. Our district shall henceforth be known as The Boston Four Hundred, and pardon our lorgnettes.

* * *

Your correspondent recalls with pleasure a visit to New York during the Thanksgiving holidays and an enjoyable stay at the Lynmore. He urges Boston brothers to make the Lynmore their home while in New York and to utilize the comfortable quarters of the association.

* * *

Harold Stanley, of the Standard Fruit Company's Virginia, recently suffered a terrible loss when his beautiful call, VS, was changed to something with a lot of H's in it. Honduras is becoming civilized, alas.

* * *

We wonder how much truth there is in the story going the rounds here that one skipper, when he saw his operator's new license form, promptly ruled that the radio officer no longer rated a seat in the saloon. Anyway, we hope it reaches the ears of the uninspired fellow who devised the darn scrap of paper.

* * *

Harding Hull transferred to the trawler Breeze when the Maine tied up for repairs, and Bob Miller shifted over to the trawler Wave. . . . Carl Lundquist took out the trawler Georgetown. . . . Cyril Hemingway was assigned to the Spray. . . . R. Theodore Hemmes is becoming intimately acquainted with codfish and haddock on the trawler Ripple.

Northwest Notes

Robert Palmer still runs the Marine Radio Service business of Palmer and West in the Maritime Building.

* * *

KPE is still manned by Underwood, Gordon, Belling and Connell.

* * *

Lew Greenway, formerly of KPE, is now at KJR as studio manager. The Xmitter of this station is kept in shape by Rudesill, Huntley and Coontz.

* * *

The Globe Wireless station at Edmonds, Washington, keeps Bob West, Murray Hammond and Ralph Golnik busy. Bob West, in addition to working a shift at the station, keeps the sets of the American Mail and Tacoma Oriental ships in working order.

* * *

Walter Tease has been chief of the SS Alaska so long now they couldn't run the ship without him.

* * *

The jobs in Alaska stations are getting fewer and fewer each year. The majority of the canneries are operated by four companies who have bought up all the smaller canneries and have closed them. Wages are much less also, and the seasons shorter.

* * *

Our correspondent understands that the Portland station KPK is not paying salaries any longer. The two operators are splitting the station profits between them.

* * *

Everett, Washington, KFT, is still on the air eight hours a day, operated by Ray Tingstad and Charlie Hampton by remote control from their radio store up town.

* * *

The Fishermen's Packing Corporation of Everett has three fish tally scows out in the Sound during the salmon season, with radio equipment aboard. Radio is not their only work, however.

* * *

Neil Brown, late of the Dollar Lines, is in charge of the Northern Electric Company's radio business in Seattle. They manufacture marine and other radio equipment.

Great Lakes Notes

With December 12th set as the expiration of insurance on lake freighters, it was expected that but few vessels would be in operation after that date. The car-ferries however on Lake Michigan generally run thruout the year and the sole car-ferry on Lake Erie keeps moving as long as possible, depending upon ice conditions. A small percentage of lake craft that remains in operation are radio-equipped, operators either homeward bound and some heading for Atlantic and gulf ports when their vessels lay up.

A few steamship companies this season had their radio equipment dismantled as a step towards economy, but it is expected that by the start of the 1933 season, they will again have replaced radio-equipment and personnel. Shipping men are optimistic in this area and look for better business on the Great Lakes in 1933. Word from an official source indicates orders for the movement of 28 millions of tons of iron ore from the mines in the Lake Superior district to lower lake ports where it is reshipped to the interior furnaces.

Gulf Notes

Friends of Fritz Albrecht will most surely be pleased to learn that by taking a trip to Fort Worth (Cow Town) he became a full fledged citizen. Welcome to America, Fritz!

* * *

"My goodness," squeaked the high-pitched voice of Madison Monroe, "I'll surely have to brush the cobwebs off my books now that the license requirements are actually advancing Well, I, for one, am heartily in favor of the move for higher standards."

* * *

Things are looking favorable for the Gulf Refining Company again. Four hundred men were employed in the Port Arthur Refinery this month and five ships (jobs) were brought out.

* * *

Dwight Williams has left the SS Gulfpride to enter the newspaper advertising game. Here's wishing you success, "DOC."

* * *

Ben Frey of the Tug Sabine welcomed the arrival of a fine seven-pound baby girl in time to enjoy Christmas. Better luck next time, "BF."

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COURT ACTION ON RADIO CORPORATION

(Continued from Page 11)

senting the General Electric Company had been consoled by the fact that, whereas, in the early days of the Radio Corporation the General Electric Company owned only 1,875,000 shares of the common stock of the Radio Corporation, in 1932 the General Electric Company owned 5,188,755 shares of the common stock of the Radio Corporation, with many melons of preferred stocks given in between times to the General Electric Company for "considerations."

Also, he had seen the Radio Corporation of America start from an infant of more or less problematical value in the early days of radio, with no subsidiary interests to a point where it claimed ownership in the R. C. A. Communications, Inc., Radiomarine Corp. of America, R. C. A. Photophone, Inc., Radio-Keith-Orpheum, National Broadcasting Co., R. C. A. Institute, Inc., E. T. Cunningham, Inc., R. C. A. Radiotron Co., R. C. A.-Victor Co., as well as licensee to 36 radio set manufacturers, and li-

David Sarnoff, President Radio Corporation of America

censee to 19 radio tube manufacturing firms. It was also able to make for a stock rights claim a $2,000,000 loan to the National Union Radio Corp., which was a consolidation of several independent radio tube manufacturing concerns.

Mr. Young's Work Reflected

It is only fair to say that Radio Corporation of America had at no time been Mr. Owen D. Young's exclusive interest. Two points stand out clearly in his life. His unusual success in a law sense, since he originally devoted all his time to this branch of the General Electric Company, and his later success in things financial. These two departments of the Radio Corporation of America as a going concern seem also to stand out most clearly. It may be said, to such an extent as to well believe that Mr. Young while at no time taking the limelight, must have had a great deal to do with the workings of the two departments of the corporation.

After association with the General Electric Company's legal department, Mr. Young was made vice president of the company. This evidently was a reward for his work and success in the legal activities of the firm. As vice president of the firm he was in charge of the activity of the firm's interest which brought about the organization of the Radio Corporation. This was for the most part an exchange of stock interests for patent rights. His later success in the handling of the financial structure of the General Electric Company, as well as the supervision of the financial structure of the Radio Corporation led to his well known mission to Europe, along with former Vice President Dawes to straighten out the financial muddle there.

Almost since the time of inception the Radio Corporation of America began its almost endless legal tangles. Practically every firm doing business in the radio business has at one time or another locked horns with the legal department of the Radio Corporation of America. For the most part these actions were on aggression by the corporation. Often actions were taken in the names of one or the other of the large combines, General Electric, Westinghouse, or American Telephone; but, invariably carried on by the legal department of the Radio Corporation. The long record of success in this department, unquestionably justified the new form of organization generally termed "patent monopoly."

The pyramiding financial structure of the Radio Corporation in which little in the way of cash was given, but usually preference stocks, is little short of phenomenal. It brought to the Radio Corporation a complete engineering department highly developed by both General Electric and Westinghouse. It brought to the corporation standard completely organized manufacturing units in the radio tube field, the radio set field, the music field, and the manufacture of radio transmitting units. It also brought to the firm the very beginning and main units of its broadcast station chain, organized under the name of the National Broadcasting Company, Inc., and the complete Keith-Albee-Orpheum Theatrical Unit.

Little Profit to Common Share Owners

But, all of this brought to the common stockholder little or nothing. There were on June 30, 1932 just 108,833 stockholders, mainly owners of common shares. An individual owner say of 100 shares of the originally organized Radio Corporation of America of 1919, would find if offering his shares for sale in 1933 after in the meantime first turning in his several shares for one share, and later getting back in a stock split up his several shares for one, little the better off for his original investment. Never during that time had a dividend been paid on the common shares of the corporation. True it is that the preferred shares given to both General Electric Company and Westinghouse Electric and Manufacturing Company had paid dividends at times, but the original vehicle that made the structure possible, the common stock holder, had only seen during that time his stock holding "market value" rise to unusual proportions, only to fall again to a point hardly allowing fair interest for the use of his money, during those years. As to the time when the common stockholder may have sold at a profit to himself, we quote from the New York American of May 21, 1932:

That Radio Pool

Well, we know a little more NOW about Wall Street pools—the spirit of deception in which they are conceived, the methods of public deception in their operation and their results—

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NEW VACUUM VALVES AND THEIR APPLICATIONS

(Continued from Page 12)

Industrial Applications of Thyratron Tubes

The largest field of application for Thyratron tubes, at the present time, is as power amplifiers for controlling mechanical operations. For this purpose the anode is fed with alternating voltage, and the grid controlled by either direct or alternating voltage, according to the type of operation desired. When alternating voltage is used for the grid, if the grid voltage is in phase with the anode voltage the current starts at the beginning of every cycle, as soon as the anode voltage becomes positive, and stops at the end of the half cycle when the anode voltage reverses. These half-cycle pulses of current are full value, limited only by the load resistance. If the grid voltage becomes positive 90 deg., or ¼ cycle, later than the anode voltage, the current starts at the middle of each cycle and has only ¼ cycle to flow. The average value of these quarter-cycle pulses of current is obviously only half as great as that of the half-cycle pulses. If the phase of the grid voltage is still further retarded, the pulses become shorter and shorter, reaching zero when the grid voltage lags 180 deg. behind the anode voltage. Thus by varying the phase of the grid voltage a smooth variation of average current is obtained, from maximum value to zero.

This phase-control method is used, for example, in the dimming of theatre lights. The master's hand turns the knob of a small phase-shifting Selsyn device, or of a rheostat, and the lights dim, fade, and blend at his will. In this case the Thyratron tube current controls the lamps by saturating reactors in series with the lamps, thus varying the impedance in the lamp circuits, and hence the current through the lamps. The lighting in the Chicago Civic Opera House, in the Casino Theatre in New York, and in several RKO theatres, is thus controlled.

Spot-welding illustrates the "on-or-off" type of Thyratron tube operation. For this purpose the magnitude of the grid voltage is varied, rather than the phase. A synchronous timing device applies voltage to the grids according to an exact schedule, say three cycles on, seven cycles off; and the Thyratron tubes pass current for the whole of each cycle in which the grid voltage is on, but no current when it is off. The passing of current acts as a short circuit on one winding of a series transformer, thus varying the impedance of the other winding, which is in series with the primary of the welding transformer.

The Thyratron tubes in this welding application simply perform the service of a contactor, but a contactor of unprecedented quality, inertialess, accurate, powerful but controllable by minute power, wearless. It is like the replacement of horse power with motors. Those who can still remember horses must sense a peculiar thrill in the quiet purr of the motor, in place of the sympathy-arousing perspiration of straining muscles. There is much the same contrast between the sputtering of contactors and the noiseless commutation of the Thyratron tube.

These two types of control, namely, control of the phase of grid voltage, when smooth variation of average output current is desired, and control of the sign or amplitude of grid voltage for on-and-off operation, are the basis of most of the industrial service applications of Thyratron tubes. The list of these applications is already long, and includes: wire-drawing, where the Thyratron tube controls the speed of re-reeling so as to maintain constant tension; synchronizing conveyors in the processing of sheet rubber; counting automobiles, theatre patrons, refrigerators coming from production; opening dining-room doors at the approach of a waitress; piling bags and other production articles; conveying products to predetermined destinations; dispatching mail and parcels; turning on and off lights in response to daylight conditions; cutting white-hot steel bars to exact lengths; folding paper napkins; cutting printed wrappers in register, for automatic high-speed package-wrapping; sorting beans, at the rate of 40,000 lbs. per day, automatically throwing out all that are imperfect or discolored. In many of these applications the phototube acts as the brains, giving orders, in the form of grid voltage, to its power team-mate, the Thyratron tube.

Power Applications of Thyratron Tubes

In another field Thyratron tubes promise new services, more spectacular, because more radical and in larger units, though not necessarily more important, than the small-scale but numerous industrial control applications. This field is power conversion. Thyratron tubes cannot generate electric power, but they have inherent characteristics which ideally adapt them to the task of converting it from one form to another, which they accomplish without motion, noise, or wear. These transformations include: changing direct current to alternating (inverter operation); alternating current to direct (rectifier); direct current at one voltage to direct current at another voltage, higher or lower (d-c. transformer); alternating current at one frequency

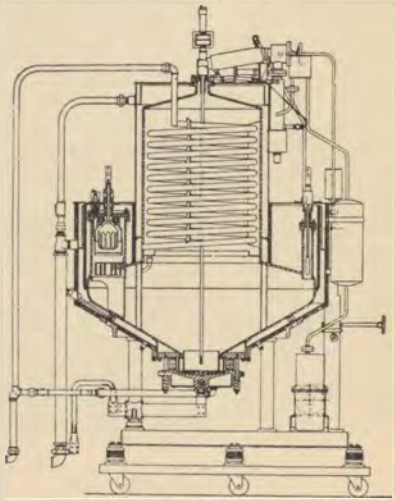

Fig. 3 Mercury-cathode Thyratron, Rated at 5000 Amp. Average, 1500 Volts Maximum

to another frequency, such as, 60 cycles to 25 cycles or vice versa (frequency changer); correcting power-factor (static synchronous condenser); and replacing commutators on motors. In the last named application, Thyratron tubes not only offer an ideal solution of the commutator problems of over-commutation, speed limitation, arcing, and wear, but also offer new motor characteristics, since the Thyratron commutators can be made conducting or nonconducting at will by controlling their grids.

These power applications, involving large and expensive units, are necessarily slow in development. The only installations thus far are of a laboratory nature. They include: a 400-kw. rectifier and inverter, taking power from an 11-kv. 40-cycle a-c. line, rectifying it to 12,500

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CORRESPONDENCE SECTION

Boston, Mass.

Dear Sir:

Now is the time for all men to—write letters. The fact that Congress soon convenes makes us think seriously of following up with renewed vigor the communications that we have been sending to our Congressmen. As one of the men who started writing to Congressmen and other interested parties when the C. R. P. A. was in its infancy I have a few suggestions to offer.

The main difficulty is to persuade all the members to write to their Congressmen. The association has been advocating through CQ a continuance of the letter writing campaign that was so effectively carried out in the past by the C. R. P. A. and later by the A. R. T. A. Samples of letters written or to be written have been published in CQ. If the association expects to continue the success of the past by following the present line of attack alone we may be disappointed in the results actually obtained as compared with those actually possible. A lot of the effectiveness of Rathborne's campaign was gained from the bulletins which he sent to members of the C. R. P. A. even after the publishing of CQ. It is possible that because of the expense involved the association does not at present see its way clear to follow up this policy. It would be rather expensive to communicate with every member of the association in this manner since the membership has increased so markedly. Yet we should have a more effective liaison between the members and the association than is at present provided. One alternative is to maintain active contact with certain members of the association through such bulletins. These members would include the authorized representatives of the association and they could designate additional members who, through their contacts or individual initiative, can pass on to a goodly number of the members the information which they receive. These men could also help materially in keeping the members conscious of the importance of their constantly communicating with Congressmen and other interested parties. Such a plan would be especially useful until such a time as when local chapters can be formed and placed in working condition. If some such method of keeping the members awake to the importance of their communications is not adopted many of the members may simply neglect to do their part. We are faced by the fact that some of the members now being enrolled in the association are not drawn to join by an active conviction that they must help improve their condition but have joined because they hope to see their condition improved by the association. The importance of their individual efforts is not fully appreciated. Many of these members have a latent interest in the association that will be extremely helpful if it is fully developped.

The idea of publishing in CQ a list of the minimum effort each member should make in helping to have the present bill passed by Congress might be a good one. Some of us have been writing reams of letters while others write few if any. Such a list would supply a goal for each member to attain. Example:

1 letter to your Representative in Congress.
1 letter to your Senator in Congress.
1 letter to the Chairman of the Committees on Merchant Marine, Radio & Fisheries, etc.

This would partly take the place of bulletins. Since it is not possible to say individually to each member, "We think that to do this is best, you should do likewise," we must keep the member aware of the necessity that he cooperate. We can do this by constantly placing before him an attainable goal.

Regarding the radio bill to be presented to Congress: This bill has my approval except for the one suggested addition listed below. I am particularly pleased with the manner in which the subject of the apprentice class license is eliminated. If we did have an apprentice class license made available and the present bill was passed by Congress the vessel operators would employ apprentice men for the positions other than that required to be held by a first class licensed man. Our job now is to prevent the insertion of an apprentice license requirement into this bill. In fact, the sooner we discontinue the use of the term "apprentice-license" when referring to the Merchant Marine requirements the better off we will be. For once the vessel operators get it into their minds that the insertion of an apprentice requirement will save them money they will attempt such an insertion. To my mind the whole apprenticeship matter is admirably taken care of in this present bill. The proposed addition is as follows: 7. Any vessel coming under the requirements of articles 2 and 3 and engaged in the international service must carry a second operator who holds a radiotelegraph first class license. (Reason obvious)

I favor the resumption of the publishing of an up-to-date list showing schedules of importance to marine operators. Rathborne published such a list for short waves up to 0300 GCT. After completion of a 24 hour list additions and corrections may be published as is now done. An all wave schedule would be more preferable than one limited to short waves. Some of us who are not at present on runs where some of the schedules are used do not become aware of the changes although we do desire to keep our schedule book up to date.

I have noted that reference to 5 meter transmitters for police work appeared in the late issue of CQ. The Boston Police Department has completed tests with such apparatus (using REL equipment I believe) and the tests are reported as having been satisfactory. The system tested maintains two way voice communication between the police car and the fixed station. In the tests recently completed a vertical radiator was mounted on a rear fender of the car. During the tests the police car traveled from the center of the city to the city limits and was manouvered beneath elevated structures and through streets occupied by buildings of metal structure.

Broadcast station WHDH, formerly of Gloucester, Mass., has completed construction of a new station and now enters the ranks of stations in this country equipped with vertical radiators. The new transmitter station and vertical radiator are located at Saugus, Mass., near Boston, and came on the air from the new location for the first time Sunday, October 30th. This station, while not widely known to the BCLS of this country, is viewed by the Federal Radio Commission as one of the most deserving stations in the country because of the services which it renders to the fishermen of the Atlantic. This station is operated by the Matheson Radio Co., Inc., and has for years

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COURT ACTION ON RADIO CORPORATION

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both to the insiders and to those less fortunate, the outsiders and victims.

In exposing the radio pool which was formed in 1929 the Senate Banking and Currency Committee has revealed the typical devices used by professional operators to transfer to their own pockets the money of the credulous and confiding public.

The process is pure jugglery, not different from three-card monte or the ancient shell game, except that the Wall Street pool juggles the price of a stock instead of a pea or a playing card.

Among the players in the radio pool some well-known names appear. Some $44,000 SHARES of radio stock were bought and sold within SEVEN DAYS. The brokers acting for the pool bought stock as they deemed it necessary to support quotations and contrived by the rapid mingling of buying and selling to steadily DISTRIBUTE MORE STOCK THAN THEY PURCHASED.

The buying was merely to work the price upward. The objective of the pool was to distribute the stock to the unwary as it moved up. When distribution had been effected—in other words, when the stock was securely in the possession of buyers to whom fate had assigned the unhappy lot of holding the bag—the mission of the pool was fulfilled. Its work was done. Nothing remained but to count and distribute the profits.

The profits amounted to $4,924,078, and it required but SEVEN DAYS to roll up this huge sum.

With the closing out of the pool and the appeasement of its appetite, the stock began to settle down to a natural and unmanipulated quotation. This process has gone on without interruption. From a high of 109¼, reached three days before the pool ceased operating, radio stock has gone steadily down until at present it is quoted at 4.

GREAT WAS THE FALL THEREOF. But the fall was not alone in the price of the stock.

It is such operations as this which explain the FALL OF WALL STREET in general confidence and respect.

THE STOVE

(Continued from Page 9)

yelled for the mate and who ever was loose to come and bear a hand. We threw in some water and drowned the fire. We skipped in and out rescuing pots and pans that had not been battered by the malicious stove. We had to watch our step for that stove was alive. When we stepped into the galley the damn thing seemed to stop and think and then make a plunge for us. We'd grab up a pot and then jump back over the raised door-sill to safety with that rampaging, iron monster galloping after us. Quick work we made of hopping in and out.

"The old Man, he says to me, 'Well, Sparks, this is a pretty mess. Isn't it? No grub for us today.'

"That was just like him all right. A good guy, but he did like that little pot-belly of his, so the first thing he naturally thinks of was grub. Of course, I like my feed also but what I was thinking of was that goddamned stove sliding around like it was, would put a hole into the ship, if we didn't stop it, toot sweet. So I says to him, 'Yeah, no grub, but how about stopping that damned thing?'

"He says, confidently-like, 'Oh . . . I'll stop it.' He turned and yelled to a sailor, 'Hey, you, run up for'ard and bring back some crowbars.'

"The Chink sailor, he stands there with his mouth open flabbergasted and stares at the skipper. The Old Man, he lets out his boot and sort of exasperated-like he lets that Chink have a swift kick right in the set-down. Then the Old Man runs forward himself and brings back the crowbars.

"He gave me and the mate, each a crowbar, while he kept one for himself. He watched his chance and when the stove slid toward us and stopped in the corner, he ran in past the stove. He shoved his bar under the stove and tried to stop it as it started to slide toward him. Hell, he couldn't stop that stove. It slid right up the bar at him. He dropped the bar and dodged out of the way. Then he yells and curses at us. 'What the hell are you numskulls standing out there for? Jump in here and bear a hand with me.'

"Me! Jump in there with that stove? Well . . . brother, I thought fast and I looks at that stove, and I thought faster. But it was either that stove or the Old Man. And I want to tell you that that little son of a tarter was a terror when he got mad and he was getting madder all the time, so I chose the stove.

"In I goes into the galley with the mate after me. Then we had a merry devilish dance with that black fiend of a stove for a partner. First it would retreat coyly from us and gathering courage we would run to it and try to get the bars beneath it. Just as we were getting the bars beneath it, it would change its mind and charge with a ferocious rush at us. We would drop bars and run for our lives out of that galley with the Old Man's maddened curses for a musical refrain to our dance.

"In we'd go again and then out we'd go again. The Old Man, though, he stayed in the galley with the stove, dodging it as best he could. He couldn't run free from it as we could do because the door on the other side of the galley was jammed up, so that he couldn't escape. He had to stay with it.

"This is the time I'm thinking about. The three of us had almost caught the stove. The mate and I had our bars underneath it on our side and the captain was just getting his bar slid under it good when the ship rolled again and the stove started to slide up the bar at the captain. He was so damn mad by now that he wouldn't leave go of the bar, but held on. The stove went at him and the captain retreated. The stove chased him and the captain ran back. He ran into a corner with the stove hotly after him. It had him now. It would finish and break this little fellow now. Malignly the black snouted monster set its teeth to grind down the man. Smash! It ran into the housing, right against the captain.

"We figured he was done for, but when the stove backed him in the corner, its ends fitted into the spot at such an angle that it simply squeezed in the skipper's little pot-belly.

"It was funny. Even at that time, scared and frightened as I was, I had to laugh at the expression on the captain's face as the damned thing pushed in his belly. Just so far and no further could it go at the angle it had caught in the corner. If it had sideslipped a couple of inches more, so that it would have slid along the side of the galley, then the stove would have caught the captain and broken him.

"His luck was with him that day. As soon as the ship rolled the other way so that the stove slid and freed him, the captain rushed past and out to us. He sighed with relief when he joined us, believe me."

The speaker lapsed into silence. The youngster, unsatisfied, nudged him. "Say, finish it. What happened to the stove?"

"Oh, what would you think happened. We

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NEW VACUUM VALVES AND THEIR APPLICATIONS

(Continued from Page 16)

volts d.c., and inverting this d.c. to 60-cycle a.c., which is used to run a 400-kw. synchronous converter; a 500-kv-a. rectifier-inverter unit operating at zero power-factor on a 4000-volt a-c. line, acting as a synchronous condenser; a 3000-kw. mercury-cathode Thyratron tube, taking 3000-volt, 60-cycle power and converting it into 25-cycle power; and a 400-horsepower synchronous motor operating at variable speed, with Thyratron commutators.

The Phanotron Tube

There are two types of gas-filled arc-discharge rectifiers, whose electron emission is furnished by a hot cathode. One is the well-known Tungar rectifier; the other the new Phanotron tube.

In the Tungar rectifier the large tungsten filament, used as cathode, is made to yield an abnormally high electron emission, about ten times as much as in high-vacuum tubes, per unit of area, by heating it to an excessive temperature. Enough argon gas is added to prevent evaporation of the filament at this high temperature. It is found that the gas pressure needed to give this protection is above one millimeter of mercury, and that the life of the filament improves with increase of pressure up to about five centimeters, which is the pressure used in the Tungar rectifier.

This high pressure imposes two limitations; the voltage that can be rectified is low, because

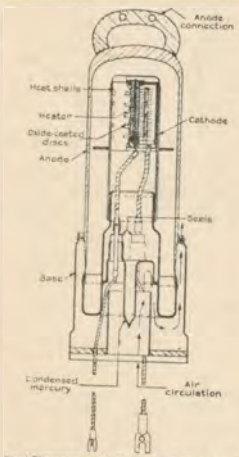

Fig. 4 Phanotron FG-52, Designed to Rectify Current on 600 Amp. Maximum, or 100 Amp. Average, at Any Voltage up to 1500

the sparking potential of argon at these pressures is only 200 volts; and the current is limited by the concentration of the arc, which tends to overheat the filament. These limitations apply to the whole range of useful pressures, from one millimeter to ten centimeters.

Both of these limitations are absent at very low gas pressures, between 0.005 mm. and 0.05 mm., and this amount of gas is found to be sufficient to furnish the required positive ions, which are needed to neutralize the electron space-charge. The life of the cathode, however is very short at these low pressures, if it is operated at Tungar rectifier temperature; and if operated at normal temperature its efficiency is unsatisfactory.

This problem has been solved, in the Phanotron tube, by providing a cathode of ample size, so that it can be operated at "normal" temperature and still furnish the required emission; and by so constructing it that its heat loss is small, taking advantage of the fact that electrons in an arc-discharge can go around corners, while heat-radiation must go in straight lines.

This combination of heat-shielded cathode and low-pressure gas appears to give the four desired characteristics of a rectifier, that is: high voltage, large current capacity, efficiency, long life. Two examples will serve to illustrate these characteristics.

The first is the Phanotron tube. Its cathode, which is similar in structure to another of the tubes, is heated indirectly by a tungsten filament, operated at 5 volts, 37 amp. This tube is rated to withstand 20,000 volts peak inverse voltage, and to deliver a maximum current of 40 amp. or a continuous average of 10 amp. The internal voltage drop is approximately 10 volts.

An important application of this Phanotron tube is furnishing 20,000 volts d-c. power for the 100-kw. Pliotron tube.

The second typical Phanotron tube is a metal tube, similar in external appearance to the Thyratron tube. Its internal structure is shown in Fig. 4. It consists of a multicellular cathode closely surrounded by a copper anode, which forms the envelope. This tube requires approximately 300 watts to maintain the cathode temperature, and is rated at 600 amp. maximum output, 100 amp. average, at any inverse voltage up to 1500. The internal voltage drop, at full load and a mercury temperature of 60 deg. C., is about 6.5 volts.

An interesting application of this tube is as a rectifier at 250 volts d.c., to furnish power for electro-chemical plants, Edison three-wire networks, etc. This is a field which rectifiers have been unable to serve heretofore, the mercury-arc rectifier because of its poor efficiency, the Tungar rectifier because of its low-voltage rating and small current.

Both the Phanotron and the Thyratron tubes are capable of larger current and higher voltage. Their life will not be known until more tubes have been in service. The present "expectation" is one year, with the theoretical limit many times this value. The optimum life will probably be determined, as in lamps, by the balance between efficiency and renewal cost.

SEND YOUR COIN AND BE D——!

A certain radio school, located in the Middle West, is using in a current four-page flyer sent to prospects of the school some pretty wild testimonials. This school has in the past received plenty of ridicule from us, but merely for the amusement of our readers, we are reprinting some of the fun.

No. 1 Convulsion. "I am now making $350.00 a month in this important work on board ship, for which . . . trained me, and also rate a bonus of $500 each year."

Spasm No. 2. "Received your most welcome letter and was glad to hear from the school that has given me my success. I have landed a good job with pay starting at $300.00 per month."

Laughter No. 3. "After I returned from . . . I was made a foreman at $68.00 a week, and since then I have been increased to $71.00. No doubt other graduates are making more, but my employers tell me that if I keep going $71.00 is not the limit."

Many of the men are now writing this firm to get the literature instead of subscribing to humor magazines. It's pretty tough on the school, but it's their own fault for putting out that kind of literature at a time like this, when there are so many first grade old time operators trying their best to get landed at any price.

Members of Congress With Washington Addresses So You Can Write to Them

THE HOUSE OF REPRESENTATIVES

Speaker—John N. Garner, Democrat, Texas

Clerk—William Tyler Page, Republican, Maryland

ALABAMA

John McDuffie Dem. 2311 Connecticut Ave.
Listor Hill Dem. 2540 Massachusetts Ave.
Henry B. Steagall Dem.
Lamar Jeffers Dem. The Chastleton
L. L. Patterson Dem. George Washington Inn
William B. Oliver Dem. 1827 Wyoming Ave.
Miles C. Allgood Dem. 222 First St. S. E.
Edward B. Almon Dem. George Washington Inn
George Huddleston Dem. 904 Massachusetts Ave.
William B. Bankhead Dem. Meridian Mansions

ARIZONA

Lewis W. Douglas Dem. 3257 N St.

ARKANSAS

William J. Driver Dem. Army & Navy Apts.
John E. Miller Dem. 3511 Davenport St.
Claude A. Fuller Dem. The Army & Navy Hotel
Effiegene Wingo Dem. The Kenesaw
Heartsil Regon Dem. 110 Maryland Ave. N. E.
D. D. Glover Dem. 230 First St. S. E.
Tilman B. Parks Dem. 1609 Varnum St.

CALIFORNIA

Clarence F. Lea Dem. 110 Maryland Ave. N. E.
Harry L. Englebright Rep. The Roosevelt
Charles F. Curry Rep. The Embassy Apt.
Florence P. Kahn Rep. The Mayflower
Richard J. Welch Rep. The Roosevelt
Albert E. Carter Rep. The Mayflower
Henry E. Barbour Rep. The Shoreham
Arthur M. Free Rep. 3024 Tilden St.
W. E. Evans Rep. The Wardman Park
Joe Crail Rep. The Washington
Phil D. Swing Rep. 2931 Cathedral Ave.

COLORADO

William R. Eaton Rep. The Wardman Park
Chas. B. Timberlake Rep. 1801 16th St.
Guy U. Hardy Rep. 2017 Belmont Road
Edward T. Taylor Dem. The Roosevelt

CONNECTICUT

Augustine Lonorgan Dem. 1806 R St.
Richard P. Freeman Rep. The Fairfax
John Q. Tilson Rep. The Mayflower
William L. Tierney Dem. The Wardman Park
Edward W. Goss Rep. 2633 16th St.

DELAWARE

Robert G. Houston Rep. The Roosevelt

FLORIDA

Herbert J. Drane Dem. 100 Maryland Ave. N. E.
R. A. Green Dem. The Willard
Tom A. Yon Dem. The Burlington
Ruth Bryan Owen Dem. 100 Maryland Ave. N. E.

GEORGIA

Homer C. Parker Dem. 436 New Jersey Ave. S. E.
E. E. Cox Dem. 2400 16th St.
Charles R. Crisp Dem. The Highland Apts.
William C. Wright Dem. 110 Maryland Ave. N. E.
Robert Ramspeck Dem. 1809 Varnum St.
Samuel Rutherford Dem. The Hamilton
Malcolm C. Tarver Dem. 100 Maryland Ave. N. E.
Charles H. Brand Dem. The Shoreham
John S. Wood Dem. The Willard
Carl Vinsen Dem. 4 Primrose St., Chevy Chase, Md.
William C. Lankford Dem. 211 Fourth St. S. E.
William W. Larsen Dem. The Raleigh

IDAHO

Burton L. French Rep. 3817 Cathedral Ave.
Addison T. Smith Rep. The Roosevelt

ILLINOIS

Oscar DePriest Rep. 410 U St.
Morton D. Hull Rep. 3061 W St.
Edward A. Kelly Dem. The Hamilton
Harry P. Beam Dem. The Hamilton
Adolph J. Sabath Dem. The Washington
James T. Igoe Dem. The Shoreham
Leonard W. Schuetz Dem. The Hamilton
Peter C. Granata Rep. Army & Navy Apts.
Fred A. Britton Rep. 2253 Sheridan Circle
Carl R. Chindblom Rep. 2101 New Hampshire Ave.
Frank R. Ried Rep. The Mayflower
John T. Buckbee Rep. The Continental
William R. Johnson Rep. 1430 Fairmont St.
John C. Allen Rep. The Washington
B. M. Chipperfield Rep. The Lafayette
William E. Hull Rep. The Wardman Park
Homer W. Hall Rep. The Roosevelt
William P. Holaday Rep. 2138 California St.
Charles Adkins Rep. The Continental
Henry T. Rainey Dem. 2001 16th St.
J. Earl Major Dem. 1650 Harvard St.
Charles A. Karch Dem. The Cavalier
William W. Arnold Dem. The Washington
Claude V. Parsons Dem. The Washington
Kent E. Keller Dem. 1616 16th St.

AT LARGE

Richard Yates Rep. The Kennedy-Warren
William H. Dieterich Dem. The Roosevelt

INDIANA

John W. Boehne, Jr. Dem. 6311 Georgia St., Chevy Chase, Md.
Arthur H. Greenwood Dem. 2719 Thirty-sixth Place
Eugene B. Crowe Dem. The Washington
Harry C. Canfield Dem. George Washington Inn
Courtland C. Gillen Dem. The Roosevelt
William H. Larrabee Dem. The Roosevelt
Louis Ludlow Dem. 1822 H St.
Albert H. Vestal Rep. The Roosevelt
Fred S. Purnell Rep. The Mayflower
William R. Wood Rep. George Washington Inn
Glenn Griswold Dem. Alban Towers
David Hogg Rep. The Roosevelt
Samuel B. Pottengill Dem. 1400 New Hampshire Ave.

IOWA

W. F. Kapp Rep.
B. M. Jacobson Dem. The Dodge
T. J. B. Robinson Rep. The Willard
Gilbert N. Haugen Rep. The Willard
Cyrenus Cole Rep. The Wardman Park
C. William Ramseyer Rep. 2831 29th St.
Cassius C. Dowell Rep. The Roosevelt
Lloyd Thurston Rep.
Charles E. Swanson Rep. 3009 34th St.
Fred C. Gilchrist Rep. The Roosevelt
Ed H. Campbell Rep. The Roosevelt

KANSAS

W. P. Lambertson Rep. 2410 20th St.
U. S. Guyer Rep. George Washington Inn
Harold McGugin Rep. 2100 Massachusetts Ave.

Homer Hoch Rep. 110 Maryland Ave. N. E.
James G. Strong Rep. 3724 McKinley St.
Charles I. Sparks Rep. 644 Massachusetts Ave. N. E.
Clifford R. Hope Rep. Cathedral Mansions South
William A. Ayres Dem. The Broadmoor

KENTUCKY

W. V. Gregory Dem. The Hamilton
Glover H. Cary Dem. The Roosevelt
John W. Moore Dem. The Cordova
Cap R. Carden Dem. 2230 California St.
Maurice H. Thatcher Rep. George Washington Inn
Brent Spence Dem. The Roosevelt
Virgil Chapman Dem. The Washington
Ralph Gilbert Dem. Woodley Park Towers
Fred M. Vinson Dem.
A. J. May Dem. The Roosevelt
Charles Finley Rep. 131 B St. S. E.

LOUISIANA

Joachim O. Fernandez Dem. 101 Maryland Ave. N. E.
Paul H. Maloney Dem. The Carlton
Numa F. Montet Dem. 2400 16th St.
John N. Sandlin Dem. 110 Maryland Ave. N. E.
Riley J. Wilson Dem. 3109 Garfield St.
Bolivar E. Kemp Dem. The Washington
Rene L. DeRouen Dem. George Washington Inn
John H. Overton Dem. The Wardman Park

MAINE

Carroll L. Boody Rep. 2311 Connecticut Ave.
Donald B. Partridge Rep. 1443 Belmont St.
John E. Nelson Rep. The Roosevelt
Donald F. Snow Rep. The Wardman Park

MARYLAND

T. Alan Goldsborough Dem. The Driscoll
William P. Cole, Jr. Dem. Towson, Md.
Vincent L. Palmisano Dem. Baltimore, Md.
J. Charles Linthicum Dem. The Roosevelt
Stephen W. Gambrill Dem. The Shoreham
David J. Lewis Dem.

MASSACHUSETTS

Allen T. Treadway Rep. 2490 Tracy Place
William J. Granfield Dem. The Shoreham
Frank H. Foss Rep. The Roosevelt
Pehr G. Holmes Rep. The Roosevelt
Edith Mourse Rogers Rep. 1155 16th St.
A. Piatt Andrew Rep. The Racquet Club
Wm. P. Connery, Jr. Dem.
Fred W. Dallinger Rep. Alban Towers
Chas. L. Underhill Rep. The Roosevelt
John J. Douglass Dem.
Geo. Holden Tinkham Rep. The Arlington
John W. McCormack Dem. The Washington
Robert Luce Rep. 1520 H St.
R. B. Wigglesworth Rep. 2017 F St.
Joseph W. Martin, Jr. Rep. The Racquet Club
Charles L. Clifford Rep. The Roosevelt

MICHIGAN

Robert H. Clancy Rep. The Wardman Park
Earl C. Michener Rep. The Roosevelt
Joseph L. Hooper Rep. The Carlton
John C. Ketcham Rep. 3314 Ross Place
Carl E. Mapes Rep. 2818 Connecticut Ave.
Seymour H. Person Rep. 642 Lexington Place
Jesse P. Wolcott Rep. The Hamilton
Michael J. Hart Dem. The Washington
James C. McLaughlin Rep. George Washington Inn
Roy O. Woodruff Rep. 1801 16th St.
Frank P. Bohn Rep. The Cairo
W. Frank James Rep. 3125 Adams Mill Road
Clarence J. McLeod Rep. The Wardman Park

MINNESOTA

Voctor Christgau Rep. The Westchester
Frank Clague Rep. 1026 16th St.
August H. Andresen Rep. The Kennedy-Warren
Melvin J. Mass Rep. The Fairfax
W. I. Nolan Rep. The Alban Towers
Harold Knutson Rep. 1330 Mass. Ave. S. E.
Paul J. Kvale F.-L. The Cavalier
William A. Pittenger Rep. The Cavalier
Conrad G. Selvig Rep. 1028 Connecticut Ave.
Godfrey G. Goodwin Rep. 127 West Bradley Lane, Chevy Chase

MISSISSIPPI

John E. Rankin Dem. 100 Maryland Ave. N. E.
Wall Doxey Dem. The Driscoll
W. M. Whittington Dem. The Washington
Jeff Busby Dem. 2836 Allendale St.
Ross A. Collins Dem. 2205 Wisconsin Ave.
Robert S. Hall Dem. 3728 Veazey St.
Percy E. Quinn Dem. 2647 Woodley Road
James W. Collier Dem. The George Washington Inn

MISSOURI

M. A. Romjue Dem. The George Washington Inn
Ralph F. Lozier Dem. The Chastleton
Jacob L. Milligan Dem. The Westchester
David Hopkins Rep. The Cavalier
Joseph B. Shannon Dem. The Washington
C. C. Dickinson Dem. The Washington
Robert D. Johnson Dem. The Alban Towers
William L. Nelson Dem.
Clarence Cannon Dem.
H F. Niedringhaus Rep. The Roosevelt
John J. Cochran Dem. The Shoreham
Leonidas C. Dyer Rep. 3226 Woodley Road
Clyde Williams Dem. 1650 Harvard St.
James F. Fulbright Dem. The George Washington Inn
Joe J. Manlove Rep. The Roosevelt
William E. Barton Dem. George Washington Inn

MONTANA

John M. Evans Dem. The Woodley
Scott Leavitt Rep. 110 Maryland Ave N. E.

NEBRASKA

John H. Morehead Dem. 111 C St. S. E.
Malcolm B. Baldrige Rep. Meridian Mansions
Edgar Howard Dem. George Washington Inn
J. N. Norton Dem. 100 Maryland Ave. N. E.
A. C. Shallenberger Dem. The Hamilton
Robert G. Simmons Rep. 1315 Farragut St.

NEVADA

Samuel S. Arentz Rep. Alban Towers

NEW HAMPSHIRE

Vacancy
Edward H. Wason Rep. The Hamilton

NEW JERSEY

Charles A. Wolverton Rep. The Shoreham
Isaac Bacharach Rep. The Mayflower
William H. Sutphin Dem.
Charles A. Eaton Rep.
Percy H. Stewart Dem. 2200 Kalorama Road
Randulph Perkins Rep. 1609 Buchanan St.
George N. Seger Rep. The Chastleton
Fred A. Hartley, Jr. Rep.
Peter A. Cavicchia Rep. The Raleigh
Frederick R. Lehlbach Rep. The Shoreham
O. L. Auf der Heide Dem. The Hay-Adams
Mary T. Norton Dem. The Mayflower

NEW MEXICO

Dennis Chavez Dem. 1539 44th St.

NEW YORK

Robert L. Bacon Rep. 1801 F St.
William F. Brunner Dem. The Shoreham
George W. Lindsay Dem.
Thomas H. Cullen Dem. The Shoreham
Loring M. Black, Jr. Dem. The Powhatan
Andrew L. Somers Dem. The Carlton
John J. Delaney Dem. The Hamilton
Patrick J. Carley Dem. The Wardman Park
Stephen A. Rudd Dem. The Raleigh
Emanuel Collier Dem. The Mayflower
Anning S. Prall Dem. The Shoreham
Samuel Dickstein Dem. The Washington
C. D. Sullivan Dem. The Raleigh
William I. Sirovich Dem. The Mayflower
John J. Boylan Dem. The Hay-Adams
John J. O'Conner Dem. The Shoreham
Ruth Pratt Rep.
Martin J. Kennedy Dem. The Carlton
Sol Bloom Dem. 1222 16th St.
F. H. LaGuardia Rep. Potomac Park Apts.
Joseph A. Gavagan Dem. The Shoreham
Anthony J. Griffen Dem. The Wardman Park
Frank Oliver Dem. The Driscoll
Charles M. Fitzpatrick Dem. The Roosevelt

Charles B. Millard Rep. The Wardman Park
Hamilton Fish, Jr. Rep. 2319 Ashmead Place
Harcourt J. Pratt Rep. The Mayflower
Parker Corning Dem. 1539 29th St.
James S. Parker Rep. 2100 16th St.
Frank Crowther Rep. 110 Maryland Ave. N. E.
Bertrand H. Snell Rep. 2400 16th St.
Francis D. Culkin Rep. The Fairfax
Fredk. M. Davenport Rep. The Shoreham
John D. Clarke Rep. The University Club
Clarence E. Handcock Rep. The Mayflower
John Tabor Rep. 3700 Massachusetts Ave.
Gale H. Stalder Rep. The Raleigh
James L. Whitley Rep. The Mayflower
Archie D. Sanders Rep. The Burlington
Walter G. Andrews Rep. 3304 N St.
Edmund F. Goode Rep. 100 West Linden St., Alexandria, Va.
James M. Mead Dem.
Daniel A. Reed Rep. The Cavalier

NORTH CAROLINA

Lindsay C. Warren Dem. The Washington
John H. Kerr Dem. The Hamilton
Charles L. Abernethy Dem. The Raleigh
Edward W. Pou Dem. The Wardman Park
Frank W. Hancock Dem. The Washington
J. Bayard Clark Dem. The Raleigh
Walter Lambeth Dem. The Washington
Robert L. Doughton Dem. 1461 Harvard St.
Alfred L. Bulwinkle Dem. The Lafayette
Zebulon Weaver Dem. The Hamilton

NORTH DAKOTA

Olger B. Burtness Rep. The Roosevelt
Thomas Hall Rep. The Broadmoor
James H. Sinclair Rep. 140 12th St. N. E.

OHIO

John B. Hollister Rep. The Metropolitan Club
William E. Hess Rep. The Shoreham
Byron B. Harlan Dem. Woodley Park Towers
John L. Cable Rep. 102 W. Woodbine St., Chevy Chase
Frank C. Kniffin Dem. 3300 McKinley St.
James G. Polk Dem. 1754 Kilbourne Place
Charles Brand Rep. The Shoreham
Grant E. Mouser, Jr. Rep. Park Towers
Wilbur M. White Rep. 3800 Windom Place
Thomas A. Jenkins Rep. The Chastleton
Mell G. Underwood Dem. 110 Maryland Ave. N. E.
Arthur P. Lamneck Dem. The Racquet Club
William L. Fiesinger Dem. The Willard
Francis Seiberling Rep. The Shoreham
C. Ellis Moore Rep. 110 Maryland Ave. N. E.
C. B. McClintock Rep. The Cavalier
Charles West Dem. The Westchester
Frank Murphy Rep. 1734 Poplar Lane
John G. Cooper Rep. The Driscoll
Martin L. Sweeney Dem. The Ambassador
Robert Crosser Dem. 2440 16th St.
Chester C. Bolton Rep. 2301 Wyoming Ave.

OKLAHOMA

Wesley E. Disney Dem. 4355 Kingley St.
William W. Hastings Dem. The Hamilton
Wilburn Cartwright Dem. 110 Maryland Ave. N. E.
Tom D. McKeown Dem. George Washington Inn
F. B. Swank Dem. George Washington Inn
Jed Johnson Dem. 701 F St. N. E.
James V. McClintic Dem. The Kennedy-Warren
M. C. Garber Rep. the Willard

OREGON

Willis C. Hawley Rep. The Woodley
Robert R. Butler Rep. The Continental
Charles H. Martin Dem. The Shoreham

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James M. Beck Rep. 1624 21st St.
Edward L. Stokes Rep. The Wardman Park
Harry C. Ransley Rep. the Mayflower
Benjamin M. Golder Rep.
James J. Connolly Rep.
George A. Welsh Rep. 17 Longfellow St.
George P. Darrow Rep. The Mayflower
James Wolfenden Rep. The Washington
Henry W. Watson Rep. 1765 Massachusetts Ave.
J. Roland Kinzer Rep. The Washington
Patrick J. Boland Dem. 4000 Cathedral Ave.
C. Murray Turpin Rep. George Washington Inn
George F. Brumm Rep. 1737 H St.
Norton Lichtenwalner Dem. The Shoreham
Louis T. McFadden Rep. The Mayflower
Robert F. Rich Rep. Alban Towers
Fred W. Magrady Rep. The Washington
Edward M. Beers Rep. The Roosevelt
I. H. Doutrich Rep. The Willard
J. Russel Leech Rep. The Washington
J. Banks Kurtz Rep. The Kennedy-Warren
Harry L. Haines Dem. The Cavalier
J. Mitchell Chase Rep.
Samuel A. Kendall Rep. The Shoreham
Henry W. Temple Rep. George Washington Inn
J. Howard Swick Rep. 1613 44th St.
Nathan L. Strong Rep. The Washington
Thomas C. Cochran Rep. 18 East Bradley Lane, Chevy Chase
Milton W. Shreve Rep. The Washington
William R. Coyle Rep. 1661 Crescent Place
Adam M. Wyant Rep. The Wardman Park
Edmund F. Erk Rep. 6310 Delaware St., Chevy Chase
Clyde Kelly Rep. 3730 McKinley St.
Patrick J. Sullivan Rep. The Washington
Harry A. Estep Rep. The Carlton
Guy E. Campbell Rep. 5611 14th St.

RHODE ISLAND

Clark Burdick Rep. The Burlington
Richard S. Aldrich Rep. The Anchorage
Francis B. Condon Dem. Army & Navy Apts.

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Butler B. Hare Dem. 100 Maryland Ave. N. E.
Frederick H. Dominick Dem. The Chastleton
John J. McSwain Dem. 4514 Connecticut Ave.
William F. Stevenson Dem. 1727 Lamont St.
Allard H. Gasque Dem. 2400 16th St.
Hampton R. Fulmer Dem. The Kennedy-Warren

SOUTH DAKOTA

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Royal C. Hohnson Rep. 1868 Columbia Road
William Williamson Rep. 1319 Farragut St.

TENNESSEE

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J. Will Taylor Rep. The Raleigh
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J. R. Mitchell Dem. The Raleigh
Edwin L. Davis Dem. The Hamilton
Joseph W. Byrns Dem. The Wardman Park
Edward E. Eslick Dem. The Washington
Gordon Browning Dem. 5119 38th St.
Jere Cooper Dem. The Washington
E. H. Crump Dem. The Wardman Park

TEXAS

Wright Patman Dem. 3218 19th St.
Martin Dies, Jr. Dem. 4200 18th St.
Morgan G. Sanders Dem. 3402 16th St.
Sam Rayburn Dem. The Anchorage
Hatton W. Sumners Dem. 3401 Macomb St.
Luther A. Johnson Dem. 2701 Connecticut Ave.
Clay Stone Briggs Dem. 2101 Connecticut Ave.
Daniel E. Garrett Dem. 2039 New Hampshire Ave.
Joseph J. Mansfield Dem. Wakefield Hall
Charles P. Buchanan Dem. George Washington Inn
O. H. Cross Dem. Army & Navy Apts.
Fritz G. Lanham Dem. The Washington
Guinn Williams Dem. 3510 Runnymede Place, Chevy Chase
Richard M. Kleberg Dem. The Anchorage
John N. Garner Dem. The Washington
R. Ewing Thomason Dem. The Roosevelt
Thomas L. Blanton Dem. 110 Maryland Ave. N. E.
Marvin Jones Dem. George Washington Inn

UTAH

Don B. Colton Rep. The Kennedy-Warren
Fred C. Loofbourow Rep. The LaSalle

VERMONT

John W. Weeks Rep. The Washington
Ernest W. Gibson Rep. Tilden Gardens

VIRGINIA

Schuyler O. Bland Dem. Woodward Apt. House

Menalcus Lankford Rep. 2101 Connecticut Ave.
Andrew J. Montague Dem. Chatham Courts
Patrick H. Drewry Dem. The Portland
Thomas G. Burch Dem. The Raleigh
Clifton A. Woodrun Dem. 3527 13th St.
John W. Fishburne Dem. The Raleigh
Howard W. Smith Dem.
John W. Flannagan, Jr. Dem. The Raleigh
Henry St. G. Tucker Dem. The Powhatan

WASHINGTON

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Lindley H. Hadley Rep. The Roosevelt
Albert Johnson Rep. The Kennedy-Warren
John W. Summers Rep. The Chastleton
Sam B. Hill Dem. The Cavalier

WEST VIRGINIA

Carl G. Bachmann Rep. 2913 Cathedral Ave.
Frank L. Bowman Rep. 2032 Belmont Road
Lynn S. Horner Dem. 1235 Massachusetts Ave.
Robert L. Hogg Rep. 3001 34th St.
Hugh Ike Shott Rep. The Burlington
Joe L. Smith Dem. The Shoreham

WISCONSIN

Thomas R. Amlie Rep. 624 E. Capitol St.
Charles A. Kading Rep. The Harrington
John M. Nelson Rep. 1355 Longfellow St.
John C. Schafer Rep. 800 North Carolina Ave. S. E.
William H. Stafford Rep. The Carlton
Michael K. Reilly Dem. George Washington Inn
Gardner R. Withrow Rep. The Cavalier
Gerald J. Boileau Rep. The Cavalier
George J. Schnieder Rep. The Harrington
James A. Frear Rep. The Shoreham
Hubert H. Peavey Rep. The Commodore

WYOMING

Vincent Carter Rep. 3416 Northampton St., Chevy Chase

ALASKA

James Wickersham Rep.

HAWAII

Victor S. K. Houston Rep.

PHILIPPINE ISLANDS

Camilo Osias Natl.
Pedro Guevara Natl.

PUERTO RICO

Felix Cordova Davila Union

THE UNITED STATES SENATE

ALABAMA

Hugo Black 3021 45th St. Dem. 1933*
John H. Bankhead The Mayflower Dem. 1937

ARIZONA

Henry F. Ashurst 1602 K St. Dem 1935
Carl Hayden Dem. 1933

ARKANSAS

Mrs. H. W. Caraway Calvert Manor, Riverdale, Md. Dem. 1933
J. T. Robinson 100 Maryland Ave. N. E. Dem. 1937

CALIFORNIA

Hiram W. Johnson 122 Maryland Ave. N. E. Rep. 1935
S. M. Shortridge Wardman Park Rep. 1933

COLORADO

E. P. Costigan The Kennedy-Warren Dem. 1937
C. W. Waterman The Wardman Park Rep. 1933

CONNECTICUT

F. C. Walcott The Shoreham Rep. 1935
Hiram Bingham 2633 16th St. Rep. 1933

DELAWARE

John G. Townsend Jr. The Shoreham Rep. 1935
Daniel O. Hastings The Kennedy-Warren Rep. 1937

FLORIDA

Park Trammell Dem. 1935
Duncan U. Fletcher 2101 Connecticut Ave. Dem. 1933

GEORGIA

Walter F. George 2230 California St. Dem. 1933
William J. Harris Dem. 1937

IDAHO

John Thomas The Wardman Park Rep. 1933
William E. Borah 2101 Connecticut Ave. Rep. 1937

ILLINOIS

J. Hamilton Lewis The Mayflower Dem. 1937
Otis Glenn 2435 California St. Rep. 1933

INDIANA

Arthur R. Robinson The Willard Rep. 1935
James E. Watson 2651 Connecticut Ave. Rep. 1933

IOWA

Smith W. Brookhart 15 Ralston Ave., Hyattsville, Md 1933
L. D. Dickinson 3601 Connecticut Ave. Rep. 1937

KANSAS

George McGill The Northumberland Dem. 1933
Arthur Capper The Mayflower Rep. 1937

KENTUCKY

M. M. Logan The Dupont Circle Dem. 1937
Alben W. Barkley 3102 Cleveland Ave. Dem. 1933

LOUISIANA

Edwin S. Broussard 1815 Mintwood Place Dem. 1933
Huey P. Long The Shoreham Dem. 1937

MAINE

Frederick Hale 1001 16th St. Rep. 1935
Wallace H. White, Jr. 2449 Tracy Place Rep. 1937

MARYLAND

P. L. Goldsborough Rep. 1935
Millard E. Tydings 1900 Q St. Dem. 1933

MASSACHUSETTS

Marcus A. Coolidge The Shoreham Dem. 1937
David I. Walsh The Carlton Dem. 1935

MICHIGAN

A. H. Vandenberg The Wardman Park Rep. 1935
James Couzens 2850 Woodland Drive Rep. 1937

MINNESOTA

Henrik Shipstead 1113 E. Capitol St. F.-L. 1935
Thomas D. Schall "Wyncrest," Berwyn, Md. Rep. 1937

MISSISSIPPI

Hubert D. Stephens The Driscoll Dem. 1935
Pat Harrison 2260 Cathederal Ave. Dem. 1937

MISSOURI

Roscoe C. Patterson The Burlington Rep. 1935
Harry B. Hawes 2548 Mass. Ave. Dem. 1933

MONTANA

Burton K. Wheeler 3757 Jocelyn St. Dem. 1935
Thomas J. Walsh 1661 Crescent Place Dem. 1937

NEBRASKA

Robert B. Howell 1868 Columbus Road Rep. 1935
George W. Norris Alban Towers Rep. 1937

NEVADA

Key Pittman Ridge Lands, Ridge Road Dem. 1935
Tasker L. Oddie 2123 LeRoy Place Rep. 1933

NEW HAMPSHIRE

Henry W. Keyes 3053 P St. Rep. 1937
George H. Moses 1901 Wyoming Ave. Rep. 1933

NEW JERSEY

Hamilton F. Kean 2300 S St. Rep. 1935
W. Warren Barbour 1929 Q St. Rep. 1932

NEW MEXICO

Bronson M. Cutting 2500 30th St. Rep. 1935
Sam G. Bratton 3041 Sedgewick St. Dem. 1937

NEW YORK

Royal S. Copeland The Shoreham Dem. 1935
Robert F. Wagner The Shoreham Dem. 1933

NORTH CAROLINA

Cameron Morrison The Metropolitan Club Dem. 1933
Josiah W. Bailey The Mayflower Dem. 1937

NORTH DAKOTA

Lynn J. Frazier 6629 First St. Takoma Park Rep. 1935
Gerald P. Nye 3802 Gramercy St. Rep. 1933

OHIO

Simeon D. Fess The Carlton Rep. 1935
Robert J. Bulkley 1661 Crescent Place Dem. 1933

OREGON

Charles L. McNary The Mayflower Rep. 1937
Frederick Steiwer 7825 Orchid St. Rep. 1933

(Continued on Page 26)

*Term of office

HOW IS YOUR "MODULATION"?

(Continued from Page 5)

(a). When this carrier is modulated with a constant tone, say 200 cycles, the current in the pickup circuit will be a radio frequency current, the amplitude of whose peaks varies from zero to twice the unmodulated value 200 times a second, as, Figure 2 (b).

The radio frequency current in the tuned circuit is rectified by the UV-217-C rectifier tube. The circuit (Figure 1) is that of a half-wave rectifier. The output of the rectifier tube is a current such as that of Figure 3 (a) when the carrier is unmodulated and Figure 3 (b) when the carrier is 100 per cent modulated. This current differs from that of Figure 2 in that the negative loops have been suppressed. It is made up of three components—a direct current, an audio frequency (200 cycles), and the carrier radio frequency. Since the radio frequency is by-passed, only the d.c. and audio frequency components are supplied to the oscillograph. The actual current in the vibrator elements is, therefore, the dotted curve of Figure 3 and it is this curve which is portrayed on the viewing mirrors as shown in Figure 4. Comparison of this curve with Figure 2 indicates that its frequency is the frequency of the envelope of the modulated radio frequency while its amplitude is proportional to the amplitude of this envelope. Hence the viewing mirrors accurately depict the envelope in which we are interested.

There remains, Mr. Broadcaster, only to adapt the above action for your particular needs. This is perhaps best done by setting up a Standard procedure for using the oscillograph

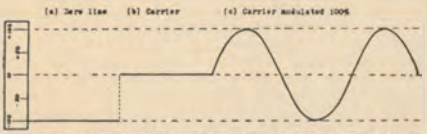

FIG. 5 ILLUSTRATION OF USE AS A PERCENTAGE MODULATION INDICATOR

as a modulation indicator. First, the scale of the oscillograph is marked —100 to +100, as in Figure 5. Second, with the transmitter off, the zero position of the light beam is adjusted to fall on —100, as Figure 5 (a). Third, with the transmitter on but the carrier unmodulated, the resistance in series with the vibrator element is varied until the carrier line falls on the zero of the scale, as Figure 5 (b). Now, when the carrier is modulated a wave such as Figure 5 (c) will be indicated in the viewing mirrors of the oscillograph. When the peaks of this wave fall on —100 and +100 the carrier is being 100 per cent modulated. Similarly, 85 per cent modulation will be indicated by peaks falling on —85 and +85, etc. Find—if you can, Mr. Broadcaster—a better modulation indicator.

In reality, however, this instrument when so used is more than a modulation indicator, for it also affords an excellent check on other adjustments of the transmitter. For instance, in the above analysis, it will be noted that the positive and negative peaks of modulation are of equal amplitude. If the transmitter is incorrectly adjusted, this will often not be true. In such cases, the oscillograph is an invaluable adjunct in facilitating correct adjustment of the transmitter. After a little experience, obvious mal-adjustments in bias and excitation voltages may quite easily be recognized. Other factors causing dissymetrical modulation, however, involve a consideration of tube characteristics, for which space is not at present available here.

Finally, in addition to all its technical advantages, the oscillograph is more conveniently mounted than any other type of modulation indicator. Not only may it be located anywhere in the control room but also it may be moved as often as desired, without fear of changing its calibration. If desired, it may be permanently installed on the control desk. When it is desired to make oscillograms, the viewing attachment consisting of the revolving mirrors is removed and the photographic attachment substituted. The operation requires but a few seconds. General Order No. 97 of the Federal Radio Commission is best fulfilled by making on one film three successive exposures showing the three conditions indicated in Figure 4. When submitted to the Commission, such oscillograms should be accompanied by data on the power output of the transmitter measured simultaneously with the taking of the oscillograms.

(Reprinted by courtesy of Broadcast News.)

Association News

Authorized representatives of the American Radio Telegraphists Association, Inc., 20 Irving Place, New York City, are as follows:

Boston, Richard J. Golden

New York, Pietro Rametta, 20 Irving Place

Baltimore, Christopher Kelley, 650 West Fayette Street

Miami, D. W. Scott, P. O. Box 2254

New Orleans, Forrest H. Flanders, Y. M. C. A., Box 314, 936 St. Charles at Lee Circle

Great Lakes, Arthur H. Freitag

Port Arthur, (Gulf representative), Hoyt S. Haddock

Baytown, Texas, Ralph E. Knudsen

Beaumont, Clyde B. Trevey

Those wishing to represent the organization in San Francisco, Los Angeles and San Diego should communicate with the secretary, 20 Irving Place, N. Y.

* * *

Committees have been appointed for various activities. The organization is stepping along in good fashion now. One new movement on foot is for the establishment of "get together" or static rooms at the out of town points where the organization is represented, as well as to get both representation and the same sort of quarters where the members can meet each other evenings in these ports. Any of the boys out of town or in other ports than New York should show this item to their hotel owners. It is a good move for the hotel owner as well as for the organization and men to have quarters centralized where they can meet and swap yarns.

Legislation work is being carried on as fast as possible. Letter writing should not let up for an instant. Remember if you consider your calling serious, and have your heart set in it, you are only helping yourself as well as others to keep after your representatives in Congress for better working conditions, by legislation.

NEW MACKAY STATION

The new Mackay station at Napeague Harbor, near Montauk, Long Island, will be the fifth of that concern's on the Atlantic coast for ship-to-shore communication. Design is for remote control operation of the transmitting station from the receiving station at Southampton, Long Island.

BULL-IEVE IT OR NOT?

By RAY D. OWE

Fifty-five dollars a week? Hooey! There ain't no jobs like that, or so I thought, people making that much jack sure roll in luck.

Eleven months ago I was just barely getting by—holes in my socks—newspapers on the inside of my shoes, working as a farmhand 'cause jobs were as scarce as sympathy in a bank and I want to tell you that once I begged a shell for my gun to shoot the wolf that was camping on our front porch. Well something had to be done; me and the wife and kids had to eat and all I had was the conventional little job paying a salary as small as the job.

If some one had told me that only a few short months later I would be making and rolling in the jack at the rate of $50, $75 and even $100 per week (never less than $50) I would have said: "Nerts, I don't believe in dreams."

But I'm placing the cart before the horse in my story. I'll tell you how the turning point in my life began. I sure was hard up not so many months ago, just because I had been fooling myself and now I know there was no need of that. I could have accepted a dole or become a charge of the Welfare society and besides how could an ordinary farmer boy get along unless he had a list of initials after his name, anyway the only ones I ever knew were C. O. D.

I'd been noticing these radio ads in nearly every magazine I picked up (they were my friends' magazines, I could not afford to buy them) offering to pick me up, stand me on my feet and give me a business all my own, a job and a little money while I was going to school in case I did not take the Home Study course, a diploma and an armored car to do my banking with and even a guarantee to give me lifetime employment service—well I wrote in and received that 86 page booklet and in those pages, my friend, was my salvation. Incidentally the night that I mailed the letter the wife and I saw our old friend, the wolf, slink away with his tail between his legs and we knew by this omen that I had done the right thing by sending for this book. Well, after reading it thru from cover to cover I decided to drop the plow handles and grab a couple of test prongs, so then and there I borrowed the necessary frogskins to take a home study course in Radio Servicing, Ship Operating, Broadcasting, Aircraft Radio, Television, Talking Movies and half a dozen other subjects. I had no idea which one I'd specialize in but when they were all offered for the same price why I'd decide as I went along, maybe even decide to be a specialist in ALL those branches.

Every day I went down to the post office to look for my lessons and one happy day they arrived; luckily it happened to be raining and all my inside chores were finished; so that afternoon I turned bookworm and eagerly devoured each page and I know I'm taxing your intelligence when I tell you that after reading the first few chapters on the fundamental principles such as Electrons, Atoms, Molecules (all that came as easy as using both my knife and fork to eat with when I'm in a hurry) and a couple of pages of "Servicing Radios," well I knew right then and there what was the matter with Farmer Brown's bran new Green Scrid receiver that he had just received from the mail order house.

All I received for fixing that set was his "Thanks," but I was not discouraged and then and there I decided that SERVICING would be my chosen field. That was inevitable (look how quickly I fixed that first set) and I knew I was destined to soar to the top with ambition and my textbooks as my helpmates.

I will not dwell on the different rungs of the Ladder of Success as I climbed them but TODAY, just eleven months later, it all seems too good to be true and as I look back and see how I was forced to move out of my modest little repair shop, how I was forced to move again and again, always crowded for room and then to realize that just yesterday I signed the contract for a building that will make the Empire State Building and Radio City crumble to ruins with envy, thousands of clerks on roller skates behind the counters, crushing crowds of bargain crazy customers fighting for standing space in the elevators that speed them to the different display rooms; a fleet of 700 service cars and in each car a graduate of the same school as I am. Yes, my friend, Dame Fortune has been kind to me since the day I heard OPPORTUNITY driving the wolf away and crashing in the panels on our front door.

I have entree in the most exclusive social circles both here and on the continent—Big Business often asks for my opinion on the future of the industry and the advisability of continued investments in this field. Just the other day a man known as one of the greatest minds in radio today (name withheld upon request) dropped into my office for a little friendly chat; this man reached the top via the long route as it took him about twenty-five years of tough grubbing to make the grade. He frequently mentions what a pity it was that the present "HOME STUDY" course of instruction was not available to him in the old days but he confided to me that he is reviewing the course to be more familiar with necessary things his practical experience did not include.

Sometimes I recall memories of how I used to disbelieve the possibility of making $50 or $75 per week and to think that I now spend that much on postage alone in ONE DAY, but all that is not really half so wonderful as the fact that you too can easily reach and probably surpass every advantage I now enjoy if you will only enroll for a course in Radio by the "HOME STUDY" method.

Where would I be today, my friend, if I had been content to follow a rut behind a plow, struggling along, satisfied with myself and the world in general? I want to ask you, my friend, would you be willing to sign a contract to stay where you are for the next 45 years at the present salary? Well then why not write in and get that little book. It will tell you radio created over 333,000 jobs (and all of them are filled). Television is sweeping the country (that portion or radius of (???) miles from the transmitting station) why not get in on the ground floor (the second and third floors too if you wish) sell your friends the idea and then sell them a set—it does not matter if you are in a remote locality far removed, or out of range of a television transmitter, if they are not satisfied after purchasing the set, why you should worry you have the money (time payments are a bad feature in this case). Then you can always tell them about Skip Distance, Local Con-

(Continued on Page 30)

V. W. O. A. Notes

President Muller issued a Holiday message to the membership in the December V. W. O. A. Bulletin, which should bring cheer and hope to our brothers handicapped by the economic conditions. As many of the radio industry are out of employment and otherwise affected by the slump President Muller's broadcast is most timely and appropriate.

The association has circulated voting ballots for officers and directors for 1933. Nominations are: F. Muller, A. R. Nilson, G. W. Johnstone for president; C. D. Guthrie, H. J. Hughes, J. W. Swanson for vice president; J. M. Keers, Wm. J. McGonigle, P. K. Trautwein for secretary; V. H. C. Eberlin, T. D. Haubner, Chas. E. Pearce for treasurer. Elections this year promise to be rather brisk as many good candidates are running for office.

Committeemen have been appointed for the coming annual "get-together" which will be in the form of a dinner-dance. A new idea in conducting the affair will be inaugurated for this year. This will be the eighth annual "shin-dig" of the V. W. O. A. and indications are that it will surpass all previous association rallies. The dinner will be held at some hotel near Times Square on the night of February 11th. Arrangements are being made for dancing and the evening will be the usual high light in radio society. The committee chairmen for the dinner-dance are: F. Muller, arrangements; G. W. Johnstone, entertainment; Paul Trautwein, tickets; J. F. Maher, publicity; C. W. Horn, reception; A. F. Wallis, year book and advertising. The committees are composed of other capable assistants who will lend their talents and ability towards making this a gala occasion. The master of ceremonies will be the inimitable genius George H. Clark, who has presided so splendidly in the past.

Members and their friends are urged to bring their wives or sweethearts as the dance portion of the evening is expected to be a welcome deviation from the usual banquet idea.

It is expected that the gold medal award will be made on the dinner night, to Ray E. Meyers, for services on board the Submarine Nautilus. Other awards of testimonials will also be made.

The association is in receipt of many interesting Holiday Greeting cards, from members near and far. Amusing ideas are displayed in these cards. One from the Navy radio at Peiping, China in pigeon English is a big laugh. Another from the Philippines, Navy Radio Los Banos, and others too numerous to mention.

A Year Book will be published by the association in conjunction with the dinner-dance and the arrangement is in the capable hands of A. F. Wallis, who has so efficiently edited this publication at the past several banquets.

The balloting this year created a live interest from the members at large. The response indicates a great dormant regard and faith in the association. Many members in arrears brought themselves up-to-date in order to avail themselves of voting privileges.

Several of the leading communication companies and radio concerns are supporting the 1933 Year Book by subscribing advertising, a co-operation for which the association is duly appreciative.

The entire membership will be advised later as to all details relative to the 1933 dinner-dance.

MEMBERS OF CONGRESS WITH WASHINGTON ADDRESSES

(Continued from Page 23)

OKLAHOMA

Thomas P. Gore 3930 Connecticut Ave. Dem. 1937
Elmer Thomas 1661 Crescent Place Dem. 1933

PENNSYLVANIA

David A. Reed 2222 S St. Rep. 1935
James J. Davis 3012 Mass. St. Rep. 1933

RHODE ISLAND

Felix Hebert The Wardman Park Rep. 1935
Jesse H. Metcalf Rep. 1937

SOUTH CAROLINA

Ellison D. Smith The Hamilton Dem. 1933
James F. Byrnes The Shoreham Dem. 1937

SOUTH DAKOTA

Peter Norbeck The Kennedy-Warren Rep. 1933
W. J. Bulow Harvard Hall Dem. 1937

TENNESSEE

Kenneth D. McKellar The Willard Dem. 1935
Cordell Hull The Lafayette Dem. 1937

TEXAS

Tom Connally The Highlands Dem. 1935
Morris Sheppard 1814 19th St. Dem. 1937

UTAH

William H. King The Winchester Dem. 1935
Reed Smoot 4500 Garfield St. Rep. 1933

VERMONT

Warren R. Austin The Mayflower Rep. 1935
Porter H. Dale 4331 Blagdon Ave. Rep. 1933

VIRGINIA

Claude A. Swanson 2136 R St. Dem. 1935
Carter Glass The Raleigh Dem. 1937

WASHINGTON

C. C. Dill The Presidential Dem. 1935
Wesley L. Jones The Roosevelt Rep. 1933

WEST VIRGINIA

Henry D. Hatfield The Continental Rep. 1935
M. M. Neely The Willard Dem. 1937

WISCONSIN

R. M. LaFollette, Jr. 2244 Cathedral Ave. Rep. 1935
John J. Blaine The Burlington Rep. 1933

WYOMING

John B. Kendrick 2400 16th St. Dem. 1935
Robert D. Carey 1752 Mass. Ave. Rep. 1937

"DORIS KELLOGG" GOES DOWN

The oil tanker "Doris Kellogg" caught fire off the North Carolina coast recently, and 35 of the crew were rescued by the steamer Delaware Sun. The Doris Kellogg was abandoned on captain's orders.

As is getting to be quite the usual thing, the wireless man, Robert McCarrick, of Norfolk, Va., carried off all honors. He stuck to his post until the equipment was burned from under him, sending out the S. O. S. that brought the rescue party. The Doris Kellogg carried 50,000 barrels of crude oil, and McCarrick admits it was a "hot job" while it lasted.

IT HAPPENED, WE'RE TOLD

Assume you have a new transmitter to test out. Should you test with an outbound ship or with an inbound ship? Compare your answer with the result given below.

The operator made a special broadcast to an outbound plane: "Station WOOP calling outbound TNT Plane. We are testing and request that you report on the quality of this broadcast when you . . . return to Tompkins Corners."

The plane was far out, and missed all but the end of the call, "Return to Tompkins Corners." So it came all the way back, inquired what was wanted, was far off schedule, and gave the passengers extra mileage. It has not happened again, . . . so far.

"CQ" CLASSIFIED ADVERTISING

CQ will accept classified advertising from licensed radio operators and persons employed in allied services at the special rate of five cents per word.

Remittance in full must accompany copy, closing date for classified advertisements is the first of the month preceding publication date. Provisions of paragraphs (1) and (2) apply to all advertising in this column, regardless of which rate may apply.

SENSATIONAL MICROPHONE VALUE—Universal Model "Y"—Experimenters single-button, watch model type. 200 ohms. Pure Gold Spot Center Diaphragm. Only $2.00, including valuable 1933 general catalog with diagrams. Universal Microphone Co., Ltd., Inglewood, California.

FOR SALE—Radio Model Vibroplex, heavy contacts, $10.50. Like new. Guaranteed. L. D., care CQ, 112 W. 13th St., N. Y. City.

SHORT WAVE TRANSMITTERS, receivers, portables. $7.00 up. Inquiries welcomed. Ernest Ruland, Natick, Mass.

WANTED—Real bargain in Marine long and short wave receiver, Omnigraph, transmitting tubes, meters, etc. J. Grigg, 80 Roanoke Ave., Phoenix, Arizona.

GULF NOTES

(Continued from Page 14)

J. W. Russell of the Virginia Sinclair is a member worthy of mention. Jim, you certainly save us some clerical work by paying your dues by the year in advance.

* * *

Carroll Avitable—SS Pennsylvania—evidently intends to enter the national pistol marksmanship contest, that is if the WPA staff will stop "practicing" away all his ammunition.

* * *

Harry Bell, who left the Gulfstream to obtain citizenship papers, has not been heard of in this section since. Come on "HB," are you now a citizen? We hope so.

* * *

Roy Miller, while waiting for an assignment, has decided to learn the touch system. He evidently doesn't want to become too proficient, as he hasn't had a manicure as yet.

* * *

I think that Old Santa made a great mistake in failing to bring "HO" a new typewriter.

New Orleans Notes

The Lykes Brothers Ripley Steamship Company, largest vessel operators at this port, recently announced a "Share-the-Work" program. Under the new system, the officer personnel will be relieved of duty for one voyage and the unlicensed members of the crew for 30 days. Approximately 700 unemployed will be given work by the inauguration of this plan. RMCA services the radio equipment for this company and, while it is left to their discretion as to whether this program shall extend among the radio operators, it is the general concensus of opinion that they too will fall in line.

* * *

While the above mentioned program will undoubtedly aid a few of the operators on the beach here it should not be understood to mean that there will be a general opening at this port for the unemployed of other cities. The "Romantic City" seems to have more than its share of unemployed who have long been casting hopeful eyes at the idle fleet . . . that daily sinks deeper in the sand.

* * *

Efforts are going forward to interest the boys on the river in the association. The results thus far have been quite encouraging. We hope to soon have the Mississippi Valley Barge Line 100 per cent ARTA.

* * *

Woodrow Pelham is making a trip to South America on the SS Afel. The vacancy at his old berth on the SS Comal is being cared for by Arthur Brown. Wonder why Woody liked the Comal's run to Tampa so well?

* * *

A few of the newcomers here have been making it a practice to seek out the steamship company officials and vessel captains in attempts to secure assignments in such a manner. This practice greatly disrupts the system of the local radio companies and makes it difficult for the man who is justly in line for an assignment from the radio office. Such practices are not being tolerated and their continuance is a sure method of committing "professional suicide."

* * *

The radio fraternity seems to have been well represented at the Marine Hospital of late. Operators Barnes, Hanson, Saunders, Edwards, and Flanders, have all had their name at the foot of a bed there. The vote was practically unanimous that the three squares a day were most welcome.

* * *

James Devenport is running in here on the SS El Almirante these days. Jimmy is one of the older old-timers and should be able to provide a few good yarns if one should catch him in a reminiscent mood.

* * *

Mackay Radio recently came in for a full column of very nice publicity in one of the local papers. All due credit for the success of the local branch was justly given the manager, Mr. Frank L. Pendergrass . . . who was in the radio game before a lot of operators were born. We learn that Mackay services the equipment on 70 vessels in the Gulf area.

* * *

The gang must have chuckled when they read one sentence of the newspaper article just described. We find a statement therein that Mackay is the maker of "Kilster Wireless Detection Fenders." This is a new piece of gear that is unfamiliar to most of us. We gather from the name that it might be some attachment for a receiver and calculated to prevent the detection of signals, or to act as a fender against reception. That man, "Kilster," must have been a lid that wanted to sleep through all of his watches.

* * *

Joe Senyck recently paid us a visit. He had just arrived here from the Lakes and was job-hunting but after looking the local situation over he took the next train out. Wise boy, that Joe!

* * *

A member of the shipping board, while inspecting this port, is said to have remarked that it was "discouraging that so little business was available to take advantages of the port facilities." We answer in our loudest tones, "Ain't it the truth!"

* * *

One of the boys came across an interesting note in a radio magazine, copied it, and showed it to us. We quote: "The Greek government has required wireless equipment on all passenger vessels of 300 or more tons dead weight capacity and on all cargo vessels of 1000 or more tons." Sounds quite progressive and like red hot news, eh? And so it was . . . but back in October, 1918. Fifteen years ago! . . . and even then "the Greeks had a word for it!"

* * *

Edward Warren still provides protection for the bananas and crew on the SS Wawa (Standard Fruit) with his wireless sending set.

* * *

Charles de la Garza, who has been on the beach for about three months, spends a large share of his time in delving into the art of cooking at his room. How about throwing a banquet for the gang, Charlie?

* * *

The SS Delmundo recently sailed for South American ports with the tickets of Paul Brown and James Clark, Jr., gracing the walls of the radio shack.

* * *

The representatives in Washington, from the state of Louisiana, have shown an unusual interest in our legislative aims and desires. Every operator sailing out of this port should do his duty by corresponding with these men when the House next convenes. Those who appear to be giving our requests the greatest study are Representatives Paul H Maloney, Riley J. Wilson, Bolivar E. Kemp, and J. O. Fernandez. Senator Huey P. Long has also promised to give the proposed changes in the radio laws his detailed study.

CORRESPONDENCE

(Continued from Page 17)

given the fishermen twice daily reports of the vessels arriving at Gloucester and Boston, the market prices, weather reports and storm warnings and, most important of all, transmits urgent messages to the fishermen at sea.

Reading about Jack Phillips (and it was a fine article) prompts me to ask—Where is Jack Binns?

73,

G. K. ASHENDEN

Gentlemen:

Just received the sample copy of your dandy l'il commercial operators' magazine "CQ" and I certainly want to congratulate you on this FB little paper. It's something the commercial fraternity have needed for a good many years and I do not recall any such paper being published since the good ole days of "Pacific Radio News," then a commercial op's paper published on the Pacific coast. Several other magazines since then have published news of the doings of the commercial boys such as the departments in "Radio Broadcast" years ago and later in "Radio News," a Pacific coast paper. However, the commercial men have always needed a real magazine where one can vent his feelings, read over what the other fellow is doing, and news of commercial activities in general.

I am not in the commercial game at present but not because I don't want to be. Like all the rest of us, where to get a job? I am, however, deeply interested in the welfare of the commercial radio operator and his profession, and hope some day to see him lifted out of the mire, where bad times and punk radio schools have put him in the eyes of the general public. I hope some day to see the radio man recognized as one who commands the respect which he is entitled to, that is of a man of specialized technical training and more than just ordinary ability. Personally, I graduated from the good ole school, that is back in 1912. Guess you all know it bumps and knocks. That was in the good old days of "wireless." I could not be considered an old timer compared to those mentioned in Dr. de Forest's article, but I have seen the game grow from its infancy to a great industry and also saw the broadcast and radio telephone history made.

I wish you boys the most success ever and trust that "CQ" will always continue to grow. I should not want to miss a copy from now on, so you will find enclosed my $1.50 for a year's interesting reading.

Sincerely yours,

ED. G. RASER

Radio since 1912

Dear Sir:

Allow me to congratulate you and your associates in the splendid work you have done with your organ "CQ" and the new American Radio Telegraphists Association.

Long has the American radio operator been looked down on, over worked and under paid. At last it seems that he, as a class, is beginning to show signs of life. Lord knows it is about time. Every type of work, or occupation, has long been organized into associations or unions for the protection and in the interests of those engaged in that particular line of endeavor. One of the few exceptions to this has been the Radio "Op." Well, more power to you fellows who finally took the bull by the horns. It is a much harder job to accomplish something of the sort which you are doing, when started under very adverse conditions than it is when those conditions simply appear on the horizon, as has been the case with most organizations of this sort.

As you point out, in the current issue of "CQ," the passage of the present measure before Congress will put the radio operator back to work, raise the standard of wages, and again create a demand for more (and worse) radio ops. By worse radio ops., I have reference to the type of graduates at present being turned out of the radio schools. One of the letters published in this issue indicates what I mean. I find that most of these fellows have a most misconceived idea of what radio operating at sea actually is like. The schools teach them the code, after a fashion, tell them what swell tube transmitters they are going to get to operate and the nice salaries they are going to pull down. They omit, however, to teach the prospective new operator anything about seagoing etiquette or any of the innumerable things which make life at sea different from that on shore. In other words, I am highly in favor of the apprenticeship idea, which seems to have gained considerable support in your pages.

Here is something I have been wondering about ever since the F. R. C. rescinded its regulation requiring all coastal broadcasting stations to maintain a 600 meter watch. Can you imagine some one trying to copy an S O S, from a weak spark transmitter, working from a decrepit busted down bank of storage batteries, through the B. C. QRM, anywhere north of Cape Hatteras? After all, the average type of ship's receiver is still as broad tuning an affair as ever. Furthermore what a fine time any of the commercial or Naval shore stations would have trying to get hold of the offending B C stations to shut them up. Of course they would have to resort to the Land Line but has any one ever thought of the precious time lost while all this is going on? I have often wondered why the radio communication companies or the steamship owners haven't objected to the rescinding of that order. In my humble estimation the revocation of that regulation was a very definite step backward, in an industry that is otherwise moving ahead very fast. I suppose, though, that the only thing that will make people see this point is to have a ship sink off Atlantic City, or thereabouts, with a large loss of life due to inability of getting through that blanket of BC QRM. I'd like to have the reaction of some of the gang on this subject. Furthermore look at the number of operators that lost their jobs because of that step.

With the best of luck to the A. R. T. A., I'll sign off with 73,

Very truly yours,

HUGO A. BONDY,

Asso. I. R. E.

Ex-KU6S, WADQ, KIN6, WKCJ, WPBQ, KDMD, Present-W2CMY, W2DGT.

PIONEER RADIO OPERATORS

(Continued from Page 7)

tances up and down the coast quite unequalled by any big jammer then extant in all the wireless world. It frequently happened that ships far at sea could read Las Brisas when the 60 cycle 25 K. W. of "KW" was just a big noise lost in the louder roar of static.

We learned there and then, for the first time, the value of the high-frequency spark—one approximately 400 per second; a fact which years later in a famous patent suit brought in New York under the Fessenden "high-frequency signal" patent was held by the U. S. federal judge to invalidate what would otherwise have dominated the entire wireless art for many years to come.

BULL-IEVE IT OR NOT?

(Continued from Page 25)

ditions, Atmospherics, or any of the good old time worn alibis that have been in existence since Columbus received a sprig of mistletoe—(or was it Noah on the Ark) which was a message to the effect that they were nearing land and that, my friend, was the first authentic record of the first WIRELESS message that was ever sent, but I'll not bother you with the history of radio (sometimes called wireless) when I know that your main interest is reaching a position that will pay you five, ten, twenty (or more) times the salary you are making at present.

Now take ship operating for instance, several of my friends have gone in for that. It used to pay up to $200 and $300 per month but lately these operators just get to enjoy life, their board and lodgings free (you can't carry enough in a dinner pail on a six months' trip, so they feed you) and get good pay besides. To make up for what you might think is a serious error when the pay check comes around—well you can console yourself to the fact that you are "seeing the world" and if you don't believe it just sit down and try and figure out just what it would cost you in cold cash if you had to pay for those trips. On this job after you come off watch you can walk out on deck, lean up against a lifeboat and watch the passengers parade past, then if a likely looking young lady passes, just link your arm thru hers and stroll along with her. If this grows tiresome you can offer to show her around the old wreck from top to bottom. It's the uniform, my friend—not what's inside—just the uniform, they can't resist gold braid and brass buttons. Of course you understand there is the possibility your first job might be as an operator on a trawler, maybe sailing out of Gloucester. In that case there are no women on the decks and even after you get ashore no woman would look at you until you have had a bath and a good airing. You can take the bath but the time for the necessary airing is very seldom accomplished as your ship will probably be going out again before you are completely aired—(Nope, bath salts don't help a bit.)

Send NOW, TODAY, for tomorrow may be too late for the book that tells you where radio's good jobs are (and if you find two I have a friend that would like the other) and so, my friend, one last word or two about the unlimited possibilities of broadcasting. Did you ever visit a studio and look thru those double plate glass windows (the reason they are double plate glass with an air space is to keep out drafts, but you will learn that in the advanced lessons)—where was I? Oh yes, when you looked thru the glass into the main control room did you see a young fellow at a desk that was loaded down with telephone switches, plugs and cords, different colored light bulbs, telegraph sounders, buzzers, a high speed telegraph bug and a couple of ordinary hand keys, a couple of telephones and—well if you saw that much that will be enough. There, my friend, is a job to make you WANT to send in for this 52½ page booklet. Wouldn't you like to have a position like that (I'm not positive, but I think that is one of those $5,000 (?) jobs). If you have never seen this fellow, by all means make it a point to visit a large broadcasting studio some day and see this "Operator"—don't be afraid to put both your hands on the glass and flatten your nose against it—you will unconsciously do this anyway as you gaze into your dream world. The janitors, (those poor misguided souls who never took a course in radio) don't mind it one bit; they laugh up their sleeves as they know you can't smear up the inner window.

Well friend, this testimonial contains nothing (?) but fragments or incidental events that have contributed in a small measure to my success. Don't fail to send for the book. It will take you out of the depths of depression and place you on the highest pinnacle of SUCCESS—look before you leap and if you look far enough you won't have to leap. Therefore, I'll leave you to your own thoughts and go down in the shipping room and personally supervise the packing of an order that just came in from one of the largest broadcasting stations in America, a one megohm gridleak.

THE STOVE

(Continued from Page 18)

went back into the galley again and the next time we did catch it and chain it down tight." The Old Timer let his chair come to the floor and rose. "Come on, kid. I'll let you take me downstairs and buy me a cup of coffee. I'll tell you some more later."

His young romantic satellite followed him.

OHM'S LAW EXTENDED

(Continued from Page 10)

vider where there is a possibility of the load being removed this point must be taken under consideration). For example, the difference of potential between points A and Y is given as 1290 volts. Unloaded, this voltage would measure a little less than 2400 volts and would vary in direct proportion with the resistance between these points.

Ohm's Law is unquestionably correct but Ohm's Law as applied to a simple series circuit cannot in itself be used as the solution of a circuit which consists of a series-parallel combination. For example, the resistance between points Z and A is not simply 30,000 ohms. It is $\frac{1}{\frac{1}{R_3}+\frac{1}{T_3}}$. The same condition applies to the resistance between any other two points in the circuit.

A consideration of this fact will show that the removal of any one of the tubes from the circuit, the loss of emission in any one tube, a partial short circuit, or any other factor affecting the current through any one of the branch circuits will affect the voltage reading at every point in the circuit. Therefore when checking the voltages in any receiver or transmitter circuit in which the power is supplied through a resistance network an improper voltage reading on one part of the circuit does not necessarily localize the trouble in that branch of the circuit. The source of trouble may be in an entirely different part of the circuit. For this reason there has lately been a radical change in the approved methods of diagnosing trouble in modern receivers. In most of the latest circuits the entire network is so complex that voltage readings are practically useless as far as locating trouble is concerned. The only practical method is to check the actual resistances between different points on the circuit with an accurate ohmeter or bridge, the latter, of course, being the more accurate.

Since Kirchoff's Laws are simply an extension of Ohm's Law, the radioman who expects to design, service, or study modern circuits should be thoroughly familiar with their applications.

In the explanation of the problem in Diagram 1 the writer has assumed for the purpose of simplicity that the current flow is from positive to negative. Actually of course it is in the reverse direction.