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PACIFIC RADIO NEWS

APRIL 1917 TEN CENTS

IN THIS ISSUE

First and only Pacific Coast Publication devoted to Radio Communication

Pacific Radio News

50 MAIN ST., SAN FRANCISCO

Volume I. H. W. Dickow, Editor No. 4

Contents for April, 1917

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PACIFIC RADIO PUBLISHING COMPANY

PUBLISHERS

50 MAIN STREET **SAN FRANCISCO, CAL.**

"OVER HIS HEAD"

Pacific Radio News
50 MAIN STREET, SAN FRANCISCO

Vol. I. APRIL, 1917 No. 4

The United Fruit Company's Radio Installations

The United Fruit Company of New York, U. S. A., maintains one of the finest and most efficient of radio systems to be found anywhere in the United States.

The New Orleans Station, situated opposite the City Park, is one of the neatest and most efficient of this company's installations. It covers an area of twenty acres. The antenna is supported by four tubular steel masts set on a rectangle three hundred by six hundred feet. The strength of these towers has been demonstrated on the occasion of two severe hurricanes which the station withstood without the slightest material damage.

The ensemble of buildings shown in the photograph of the station represent a model of architectural perfection for an installation of this kind. The underground wires, for power, light, telephone and telegraph lines, are carried in conduit and are conspicuous for their absence from the eye of the observer. Not only does this enhance the beauty of the station and grounds, but greater efficiency is secured, inasmuch as all these lines being carried underground and in metal conduit are free from the harmful effects of induction. It has been found so often that overhead unprotected wires are sometimes so strongly affected by induced high voltage, high frequency currents from the transmitter, that they are rendered inoperative. All of the buildings, with the exception of the power house, are made of concrete blocks with asbestos shingle roofs.

The power house shown in the photo is of first-class steel frame and concrete construction thruout, not one piece of wood having been used in its construction. The inside dimensions of this building are forty-five by sixty feet. This allows ample space for the testing of apparatus and for the installation of new and larger equipment, such as high frequency alternators or arc sets. All apparatus purchased by the United Fruit Company for installation on shipboard or at tropical land stations is first tested out at this station.

The transmitting set, shown in another photograph, is of the two-unit type and is operated from the city mains on 220 volt three phase 60 cycle current. In the foreground are the two motors and the two 500 cycle generators; each unit carrying a synchronized rotary gap disc on the generator shaft. Each unit is of forty kilowatt capacity. They are so arranged as to run singly or together. When running only one machine one gap is used, and when both machines are run both gaps are used in series. The transmitting apparatus is all au-

tomatically controlled from the operator's table by solenoid switches so the operator can start or stop either or both machines without leaving his seat.

The emergency set is a five-kilowatt non-synchronous spark set using sixty-cycle current. In addition to this emergency set there is an auxiliary set of five kilowatt capacity using a quenched spark.

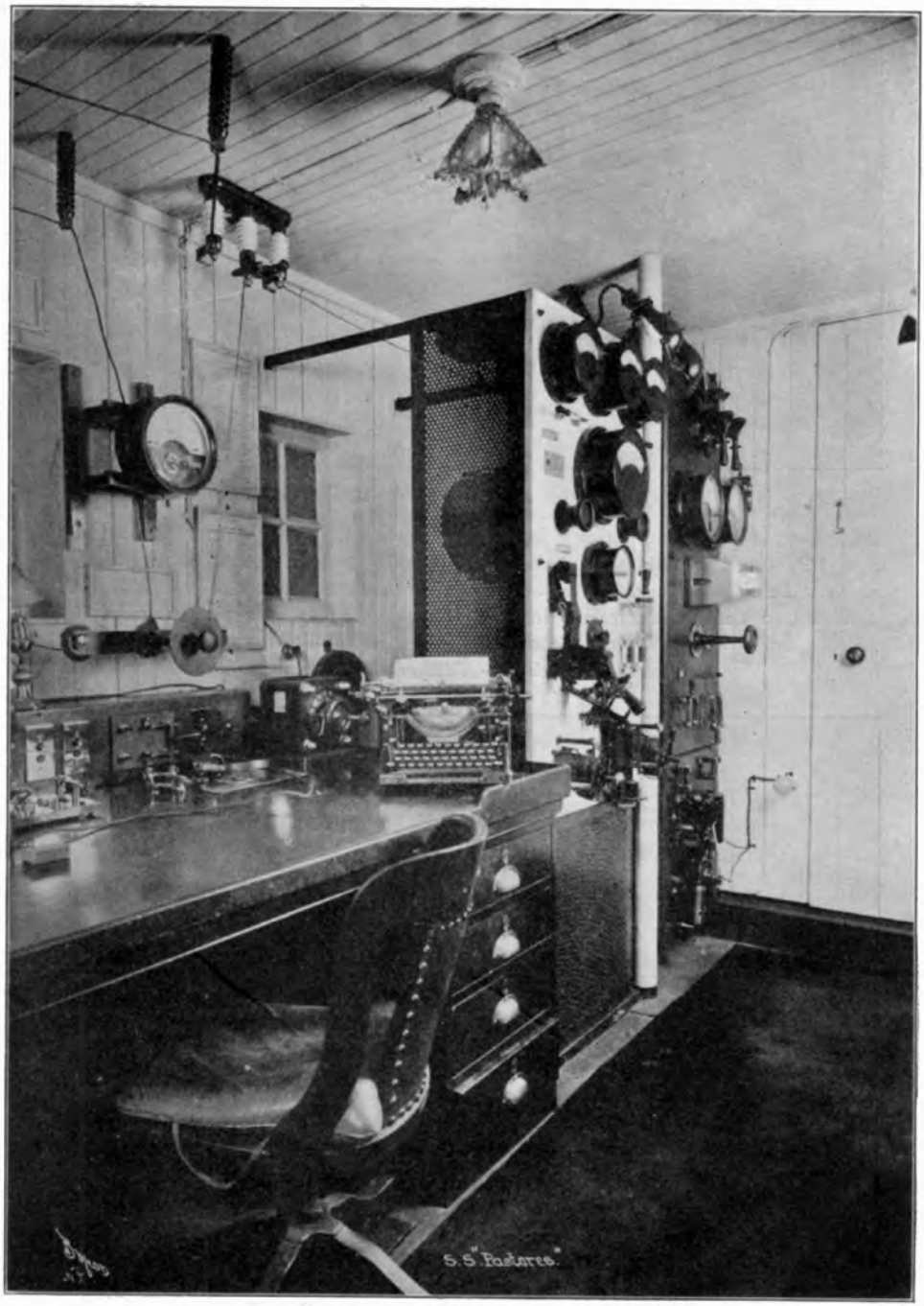
The emergency power supply is obtained from a twelve horsepower Fairbanks Morse Type R. E. Oil Engine direct connected to a seven and one-half kilowatt one hundred and ten volt direct current generator. The need of this emergency power supply was vividly shown when during the severe hurricanes the city power service was interrupted and other radio stations were put out of commission, and the United Fruit Company's Radio Plant was the only means of communication with the outside world.

The receiver is of the Marconi "Valve" type, supplied by the Marconi Wireless Telegraph Company of America. The extreme sensitiveness of this receiver was easily proven by the fact that signals have been received from Japan, Honolulu, San Francisco, Sayville, Arlington, Tuckerton, Nauen, Elvise and Carnarvon. The transmitter is in itself another example of efficiency, having been heard as far as Alexandria and Port Said, Egypt.

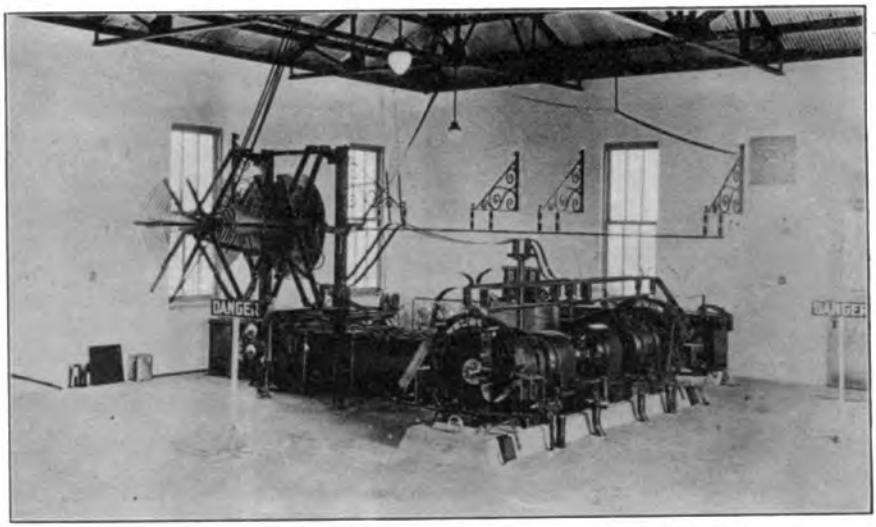
The hours of service of the New Orleans Station are continuous and are maintained by a staff of thirteen men, consisting of one chief operator, three trick operators, one rigger and mechanic, six laborers, one watchman and one porter. Operators' salaries range from $90 to $150 per month.

THE STATION BUILDINGS AT NEW ORLEANS

Communication is carried on with the land stations at Burrwood, La., (southwest pass, mouth of the Mississippi River), ninety miles distant; Swan Island, Caribbean Sea, eight hundred and fifty miles distant, and Tela, Honduras, one thousand miles distant. Communication is also carried on with ships at sea. One of these ships, belonging to the United Fruit Company and carrying one of

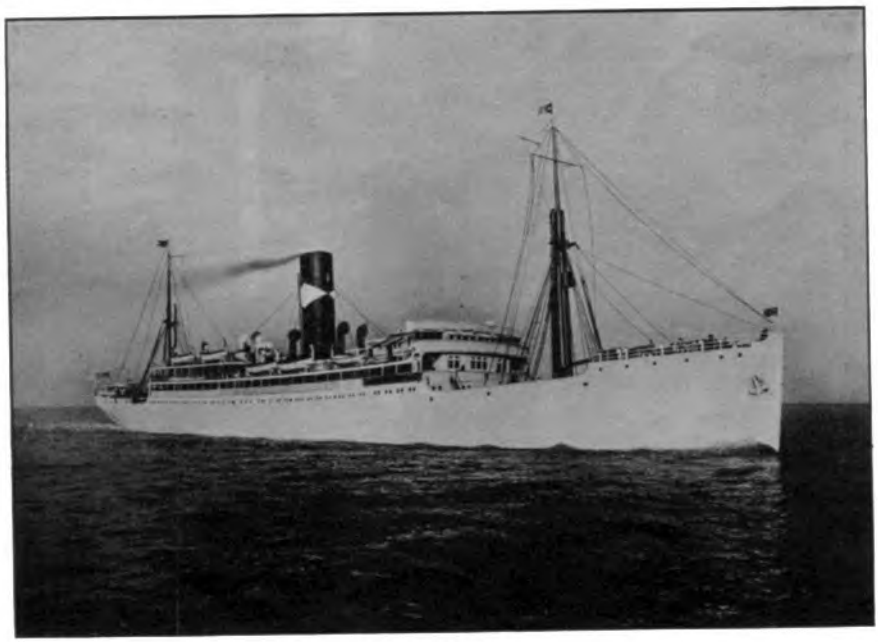


OPERATING ROOM, S.S. PASTORES



THE TRANSMITTERS AT THE NEW ORLEANS STATION

their typical ship installations, is the S. S. "Pastores." This ship, like the S. Ss. "Tenadores" and "Calamares," carries two complete wireless installations, one a 2 K. W. and the other a 1 K. W. set. These are both arranged so that either the ship's dynamo or the set of storage cells will operate the set. The 2 K. W. transmitter has an actual range of 600 miles in daylight and the 1 K. W. transmitter a range of 400 miles in



S.S. PASTORES

daylight. These ranges are under normal atmospheric conditions and in the tropics.

The storage battery installation on the S. S. "Pastores" is one that deserves mention. Altho the installation of such an elaborate equipment was not necessary to comply with the letter of the law, the United Fruit Company's broad policy of leaving nothing undone and with a view to promoting the safety and convenience of the passengers and crew of the ships was responsible for the installation. There are installed two types of storage batteries—a 225-ampere hour type Edison Wireless-Special for the operation of the 2 K. W. set, and a 150-ampere hour type Edison Wireless-Special for the operation of the 1 K. W. set. In addition to the operation of the radio apparatus, the batteries and switchboards are arranged for operating an emergency lighting system. This emergency lighting system is divided into four circuits, which are controlled from the switchboard in the radio cabin. These circuits cover the Morse signaling device, running lights, masthead lights, binnacle lights, deck lights in the vicinity of all lifeboats, on the boat deck, the promenade deck and all stateroom passageways. Tests on the A-6 Edison Wireless-Special 225 ampere hour battery show that they are under-rated by the manufacturers and in practice will give 255 ampere hours. The tests show that this is sufficient current to operate the 2 K. W. apparatus for handling the average radio traffic over a distance varying from 100 to 600 miles during daylight, over a period of 12 days. The actual time the radio apparatus was in use during this period of testing was eight hours and fifty minutes; the number of words transmitted 6,344; the generator was started 64 times, taking 45 amperes for about fifteen seconds each time. The wireless apparatus was worked at full power throughout the test and communicated over very great distances in daylight.

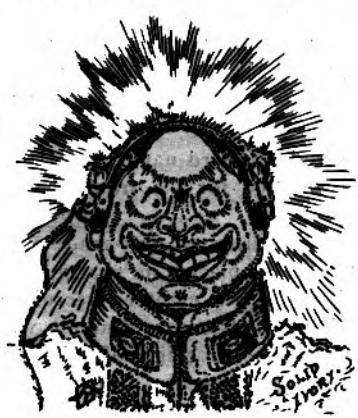
Tests on the 150 ampere hour battery also of the Edison Wireless-Special type, developed the fact that in the majority of cases these batteries are also under-rated about 20 per cent. Tests showed that this was sufficient current to operate the 1 K. W. sets for the average radio traffic over a period of 17 days, working the radio apparatus at full power over distances of from 100 to 300 miles daylight.

"TEISHINSHO" SYSTEM

Though most of us know that the Japanese system of radio telegraphy is called the "Teishinsho" system, few really know that the Japanese word "Teishinsho", literally translated, means "Ministry of Communications". The Japanese system of radio telegraphy has been developed under the direction of this department of the government of Japan and thus bears its name.

HAVE YOU SEEN THIS MAGAZINE ON NEWS STANDS?

It should be sold by all dealers in the United States. If you have experienced trouble in obtaining copies from your dealer, please notify us promptly and we will make arrangements with your news dealer for the sale of copies.



"LACONIA" OPERATORS LAST TO LEAVE DOOMED SHIP

(From the S. F. Examiner.)

According to survivors from the torpedoed Cunard liner "Laconia" comes a report that Radio Operators Taylor and Donnes were the last to leave the ship. While the angry seas were flooding the wireless room the operators quietly and persistently sent the S O S call—their teeth set with grim determination, their eyes calmly gazing out of the window, where fear-haunted faces passed by like shadows, they stuck to their jobs. Captain Irvine stepped into the last boat to leave the ship, while the operators calmly stood on the deck waving their hats to those in the lifeboats. As the angry sea engulfed the giant liner the operators jumped from the ship and were later rescued by a British patrol boat.

POWERFUL EQUIPMENT FOR NAVAL MILITIA

Dr. B. N. Burglund of the S. F. Naval Militia has recently completed the installation of a 5 K. W. rotary impulse excitation transmitter at the Armory of the Naval Militia at Fourteenth and Mission Streets, in San Francisco.

A nine-wire aerial two hundred feet in length is to be used for transmitting, while a two-wire aerial eight hundred feet in length is to be used for receiving. Special arrangements have been made to establish communication on two hundred meters with amateur stations in the vicinity of San Francisco, while the regulation and standard naval wave lengths will be used for the transmission of navy traffic.

The five licensed first-grade operators will be placed in charge of the equipment, and eighteen recruits are receiving instruction pending vacancies in the operating staff of the station.

The equipment, which was manufactured by the Electric Supply and Repair Company of San Francisco, is so arranged as to allow access to various parts for demonstrating purposes.

The receiving set described in our March issue by Dr. Burglund has already been installed at the Armory, and the O. U. I. and P. O. Z. Stations can be heard with remarkable distinctness during the early hours of the evening.

Is your name on the subscription list of "Pacific Radio News?" It should be.

THE FIRST TRANS-CONTINENTAL RELAY MESSAGE

The first trans-continental relay message was sent by the Seefred Brothers' Station (6EA) at Los Angeles, to Hiram Percy Maxim, President of the American Radio Relay League (1ZM) at 1:30 a. m., January 28, 1917.

The amateur feat accomplished on the 6th of February, 1917, can be considered even a greater achievement. On this night the first relay message was successful in being sent from the East to the West and being answered during the course of the same night. It came about that 9ABD in Jefferson City, Mo., called 8JZ at Cleveland, Ohio, telling him that there was a good opportunity for a Trans-continental Relay, as he could work 9ZF in Denver, Colorado, who in turn could work 6EA at Los Angeles, California. In the meantime Cleveland advised New York, (2PM) of this news. A message was accordingly sent from New York to Cleveland, thence to Jefferson City, continuing to Denver, and finally to Los Angeles, California. The Seefred Brothers (6EA) then sent an answer to New York, which arrived there exactly two hours after the original message left New York.

'Lectricity Bob and the Assistant Radio Inspector

By V. G. Mathison

Author of "The Radio Development Association of Hamsville."

CHAPTER I.

Apparently something out of the ordinary run of unnoteworthy events was creating a great deal of agitation among the worthy inhabitants of Hamsville. An undefinable spirit of excitement seemed to prevade the atmosphere vaguely suggesting that some weighty event was about to occur in the village.

Hamsville, as some of the readers of "The Pacific Radio News" perhaps are aware, is a sheep rancher's village of no great size or importance hidden away somewhere up in the vast sparsely settled foothills of Northern California, and it is so well hidden, in fact, that the bewhiskered inhabitants thereof could undoubtedly boast with truth the distinction of being residents in about the most remote and generally unknown little apology for a town that exists in the entire state of California.

Perhaps the most tangible evidence of the village's afore mentioned excitement was noticeable around Henry Brown's Corner Grocery, a typical country store, which was daily decorated with the usual half-dozen or so old mossbacked town venerables, who sat around on miscellaneous boxes, barrels and three-leged broken backed chairs from which points of vantage they munched Henry Brown's soda crackers as they wisely reviewed and criticised the doings of the world in general.

Today this sagacious gathering of rheumatic old cronies had become swelled to twice its normal size and the members thereof were, each in turn, emphatically delivering their indisputable opinions on some question which, judging by the amount of discussion it was creating, was of extreme importance to the immediate neighborhood. These oratorical outbursts on the part of the ex-wool growers were almost invariably accompanied with much wiggling of goatees and flopping of arms whereby the speakers attempted to lend impressiveness to their impassioned declarations. The earnestness of these gentlemen was indeed so tremendous that a casual observer would probably have jumped to the conclusion that they were each and all personally connected with the matter under consideration.

But such was not the case. For, while these illustrious relics seem admirably capable of advising and criticising others not possessed of such great wisdom as themselves, nevertheless they are not usually noticed taking any active part in the matters concerning which they have so much advice to offer.

Upon realizing this the observer would naturally turn his eyes elsewhere, should he be desirous of searching out the radiating point of the mysterious excitement, and he would soon have located it were he to leave Henry Brown's store and walk a short distance along a dusty road known by the painfully truthful name of "Main Street."

About a quarter of a mile from Henry Brown's Corner Grocery Main

Street executes an abrupt turn to the left in order to avoid entering the front door of one of the most pretentious residences of Hamsville, which, unfortunately, had been erected in a place where—as was sadly discovered some years late—the middle of Main Street should have been. Upon being confronted with this grievous fact, the City Fathers had adjudged it easier to move Main Street than the house, which had undeniable claims of priority anyhow.

Herein reside Silas Morrison and family, well known and highly respected people in the community. In fact, Silas is a veritable sheep king of the region, owning various herds of these four-footed wool suppliers to the clothing trade.

Although never ordinarily so, everything in and about the abode of Silas Morrison now apeared to be in a state of disorder and confusion. It was quite obvious that the methodical daily system of conducting the affairs of the household had in some manner become disarranged.

Mrs. Morrison, instead of sitting out on the porch calmly darning a couple of socks for Silas or attending to her other household duties, was at present engaged in a vigorous attempt to jam an astounding layout of shirts, suspenders, and shoestrings into a half-grown pasteboard suitcase. At the same time the usually phlegmatic Silas was to be seen steering an erratic course about the back yard, with his eyes fixed on space and his goatee standing out stiffly from his chin, which was known to be an infallible sign that he was indulging in some very deep thinking.

Ever and anon he would cease his perambulating and gaze doubtfully towards a small chicken house situated at the rear of the house, from the interior of which was emanating a terrific series of sounds of such nature as to indicate that much violent pounding, prying and other equally effective noise-producing operations were being carried on within. The total aggregation of discordant din was appropriately garnished with a generous number of uncomplimentary adjectives, and altogether it was really quite certain that neither the mental nor physical gymnastics of the chicken house's lone occupant were of an especially peaceful nature.

That this dilapidated shack served to shelter some sort of a wireless station would have immediately been evident to any wireless fiend, for there was a large, crude-looking aerial strung from the roof to a tall tree a short distance away. Any remaining doubt as to the genuineness of the station would be immediately dispelled by the sign, "Hamsville Wireless Plant," which, together with a number of other mysterious looking words, uncomprehensible to the uninitiated, had been painted across the door of the shack in rough black letters.

Indeed, this undistinguished looking structure had, for three years, contained a most extraordinary sort of a wireless outfit, and the perspiring pounding individual who occupied the shack at present was none other than 'Lectricity Bob, son of Silas Morrison, and sole owner of the "Plant."

'Lectricity Bob was a sturdy youth of eighteen years whom the inhabitants of Hamsville quite universally looked upon as the most marvellous electrical genius of modern times. And it must be admitted that, in comparison to the rest of Hamsville's population, he was an electrical genius indeed!

He had also attained considerable notoriety among his immediate followers as the originator of divers brilliant projects of which he seemed to have an inexhaustible supply. It was an unfortunate fact, however,

that Bob's enthusiastic endeavors to present the aforesaid projects to an eager world were usually forestalled by the more conservative Silas, who was exasperatingly indifferent to their great value. It might be well to explain, however, that the worthy Silas had once been compelled to settle a damage suit as the immediate result of his son's attempt to carry out one of his magnificent schemes, and he had wrathfully avowed by all the saints in the calendar and out of it that such an occurrence was not going to be repeated.

This had happened two years ago when Bob together with four fellow amateurs had transported a collection of crude home-made wireless apparatus to a neighboring town and, after setting it up in the village hall, had essayed to give a "Wireless Show" in conjunction with one of the big dances held weekly in that village.

After a few preliminary difficulties with overloaded fuses had been remedied, the show had progressed smoothly and given promise of proving a huge success, the villagers eagerly parting with a quarter for the privilege of looking at the rotary gap with its blinding, shrieking spark. And they had been further impressed when they listened to the "Signals from Honolulu," which for some peculiar reason or another were heard quite plainly in the series connection of discarded seventy-five ohm telephone receivers.

Very sad to relate, just when the success of the show was reaching its climax, a pair of thoroughly experienced amateur station owners arrived on the scene and lost no time in discovering that one of the youthful showmen was stationed outside in the darkness, producing the "Signals from Honolulu" with the aid of a couple of batteries and a secretly wired muffled buzzer. The two amateurs had promptly denounced the whole thing as a fake and exposed the secret of the long-distance receiving to the spectators, who became highly enraged forthwith. Whereupon Bob had instantly realized that his four confederates and himself stood a fair chance of next becoming star performers in a tarring and feathering exhibition unless they succeeded in getting away without delay.

With this end in view, he frightened the angry mob from the room with threats of wireless electrocution from the deadly rotary gap, and then the five young fakirs dashed out through a rear door into the darkness, taking the ticket window receipts and the greater part of their precious apparatus with them. As they had providentially hitched up their team beforehand, they successfully evaded the clutches of the outraged citizens and left everything behind them in a state of total wreck.

The mischievous youths had been inclined to be jubilant over their adventure, but a few days afterwards they each and all experienced certain exceedingly painful demonstrations in the form of vigorous application of hickory sticks wielded in the hands of indignant and wrathful parents called upon to answer for their offsprings' scandalous actions.

This incident had served to dissipate their golden dreams of a world-wide wireless exhibition business. But 'Lectricity Bob's wireless plant had continued to exist and, as time passed, he had steadily become more proficient in the radio art.

And now had come Bob's latest and greatest idea—an idea which would be productive of great and far-reaching consequences if carried out. Indeed, it was such a weighty project that all of Bob's former amazing schemes seemed to dwindle down to the size of an atom with a hole bored in it in comparison. It amounted to nothing more nor less than a

sudden decision to immediately procure a government radio license and go to sea as a commercial wireless operator.

This ambitious plan, unlike the majority of its predecessors, had not exactly jumped into his cerebellum from nowhere; on the contrary, it had been gradually developing during the entire three years of his amateur experimentations. Even when he had assembled his first little set on a soapbox in his bedroom he had thought of this enticing possibility, but had attempted to dismiss it from his mind as something practically unattainable. But the idea had refused to be dismissed and, in time, grew into the conviction that he was really going to become a commercial operator at some vague future date.

Bob's acquirement of telegraphic skill had not been rapid in any sense of the word. Silas had incessantly called upon him for assistance in handling the steadily growing sheep business and, for this reason, he had often been compelled to postpone his practicing and radio-researching for long periods of time. Nevertheless, he had eventually attained a fair degree of proficiency and one day he surprised himself by making the afore-mentioned decision that the time was ripe for tackling the wireless game in earnest.

Therefore, one evening after the supper dishes had been cleared away and all was at peace in the household, Bob had cautiously broached the idea to his father, who promptly expressed strong disapproval.

"You'd better stay here in Hamsville an' learn the sheep ranchin' bizness, I reckon," he tartly opined when Bob attempted to show him the great desirability of a wireless operator's career. "Shucks! You don't know when you're well off, you don't," he added with feeling, lighting his corncob pipe and disposing himself comfortably in his rocking chair before the fire, preparatory to giving the pestiferous Bob a convincing lecture on the respective merits of wireless operating and sheep ranching.

"Them there ships goes clear outa sight of land sometimes," he began impressively, after puffing vigorously on the corncob for a few moments. "An' they have a turrible heft of wind an' storms too, I kin tell ye," he added in a tone which suggested that he was replete with experience on the briny deep, although, as a matter of fact, all the ocean that he had ever seen in his life was that printed between the covers of an "Atlas of the World," which he had received gratis with a subscription to a farmer's monthly paper, "Pumpkins for Profit."

"Why, here jist a while back Mr. Ezry Perkins wuz a-telin' me about a storm that they had out on the ocean once an' he was a sayin' as how the wind was so gol-durned strong thet a lot of the ships got blewed clean outa the water!"

"Well, what does ol' Perkins know about it?" demanded Bob. "He never saw nothin' bigger'n a frog pond in his whole life. He wouldn't know what the ocean was if he saw it."

"You don't know what you're a-talkin' about' young feller," retorted Silas irritably. "Perkins hez told me that a friend of one of his friends used to know a man thet saw the ocean with his own eyes un time an' that proves that Perkins knows what he's talkin' about, I reckon."

"An' what's furthermore," he continued, before Bob had an opportunity to make a reply, "a considerable sprinklin' of them ships runs slambang into icebergs, or else they git shot in the keel by them turribul German subberines, an' when they do—well, it's 'Down goes McGinty tew the bottom of th' sea' 'fore you could jump outa bed an' git your pants on!"

Here Silas paused and expelled an

immense cloud of smoke as he strove to recollect other terrifying perils which confront those who are so reckless as to venture forth on the briny deep.

"But the ships don't sink very often nowadays, Pa," demurred the determined Bob.

"They don't, hay! Well, you don't need to get sunk mor'n about once to get drownded, I reckon!" retorted Silas, disgusted at his son's ignorance.

"But I kin swim," Bob reminded him.

"Swim! Where in th' Sam Hill are you a-goin' to swim to? S'posin' you was sunk way out in the middle of the ocean, up'ards of forty miles from land! What could ye do? You'd git et up by the whales afore you could swim as fur as from here to th' woodshed! An' s'posin' you did manage to swim to some one of them deserted islands out there! You'd only git made into some cannibal's beef stew, anyway!"

But Bob was not to be intimidated by the blood-curdling dangers thus pictured as awaiting him should he attempt a career on the ocean. On the contrary, he became, if anything, more eager to go than before, and after many further arguments, covering a period of three weeks, Silas finally became disgusted and informed his son that he could go ahead and make "whale-food" out of himself, for all of him.

Having persuaded his father to fall in with his plan, Bob experienced no difficulty in also securing the permission of his mother, for she always fondly allowed him to do exactly as he liked so far as she was concerned.

Having thus obtained the consent of both his parents, Bob lost no time in informing his four brother amateurs of the village that he was going to take his departure from Hamsville in a couple of weeks and go to the distant city of San Francisco, where he would attend the Marconi Wireless Instruction School, preparatory to taking an examination for a first-grade commercial license.

The startling news spread through the village like a prairie fire. Hamsville was shaken to its very foundations. Many and diversified were the opinions which were aired in regard to the latest scheme of Hamsville's Edison. The congregation of gray-bearded wiseacres at Henry Brown's Corner Grocery excitedly argued the matter from every side, and for a time the store looked like the violent ward in a madhouse.

The inhabitants of Hamsville had never heard very much about wireless operators, but what little they had heard had invariably consisted principally of thrilling tales of heroic deeds, and while they each and all frankly admitted that 'Lectricity Bob was an electrical wizard and a wireless wonder, yet the majority were inclined to be a little doubtful about whether he would ever be able to qualify himself to take a position so far exalted above common humanity as that of a wireless operator on a great ocean liner.

Everything was topsy-turvy at the Morrison abode. Mrs. Morrison had dropped everything and began packing up for her son's departure; Silas was wandering around the place like a lost soul, wondering what was going to happen next; while Bob, who had promised to divide up the apparatus comprising his famous wireless plant among his four fellow radio experimenters, was at present encamped in the chicken house, battling savagely in a determined attempt to separate the various parts of his set. Since two by fours and twenty-penny nails had been largely used when the various instruments were originally constructed, the task of dissembling

the station was proving to be anything but an easy one.

But eventually the last bottle-condenser and the last battery switch had been removed from the once great plant; the last pair of socks had been crammed into an almost bursting suitcase; and one fine morning almost the entire population of Hamsville might have been seen assembled in the Morrisons' front yard, whither they had come to say goodbye and Godspeed to the brave young man who was about to leave their midst and venture forth into the vast unknown of the outside world.

After taking an affectionate leave of his mother, and shaking hands with nearly every one present, Bob sprang into the spring wagon and took his seat beside his father, who was to drive him to the nearest railway station, twenty miles away.

Silas clucked to the horses, and our hero's journey cityward commenced amid a chorus of "Goodbyes" from the asembled crowd.

CHAPTER II.

It was six o'clock in the evening, two days later, when Bob arrived in San Francisco, the city which was to be the scene of his future projects and endeavors.

As the train had sped swiftly on towards the famous city of the Golden Gate, and the miles between our hero and Hamsville had steadily increased in number, his at first tremendously high spirits had suffered a corresponding tapering off, and now, as he walked down the gangplank of the Sausalito-San Francisco ferry-boat, the dazzling possibilities of his bold venture had all faded away, leaving him intimidated and disheartened.

His very small remaining amount of enthusiasm suddenly took wings unto itself and flew away when he reached the Ferry building exit at the foot of Market Street, where he stopped dead in his tracks and dropped his valise from a nerveless right hand as he stared with fear and trembling upon the unearthly scene which unexpectedly greeted his rustic gaze.

Never before in his whole eighteen years of conscious existence had Bob been in a town of any greater proportions than his native and beloved Hamsville, and he was now overwhelmingly astonished and dismayed by the roaring, traffic-congested streets which confronted him. He stood spellbound, gaping incredulously at the unending strings of jerking, bumping street cars that went clanging past, the innumerable automobiles and jitney buses swiftly threading their way through the heavier traffic; and, above all, the great surging throngs of human beings who went hurrying by, looking neither to right nor left, intent on nothing but their own particular destination.

Although only six o'clock, a grimy cloak of darkness was already beginning to envelop the city. Market Street was a resplendent blaze of light, while in every direction gorgeously colored electric signs were glowing and blinking as though composed of thousands of brilliant-hued captive stars.

Bob was deafened by the chorusing yells of dozens of leather-lunged hotel runners and baggage men, as well as by the shouting and screeching of innumerable ragged urchins and hideous hunchbacks selling their newspapers. But all this local din seemed subdued and insignificant as compared to the mighty, sullen roar of the great city which, to Bob's countryfied ears, was as the voice of some monster impatiently waiting to swallow him up.

He picked up his valise and moved forward uncertainly, becoming confused and irritated by the numerous

collisions occurring between himself and various speeding commuters, who fell all over Bob and his suitcase in their frantic endeavors to catch some ferry-boat about to start on its trip across the bay to Oakland.

After crossing the Embarcadero, our hero hesitatingly started up Market Street, but, before he had progressed more than a couple of blocks, his terror of his strange surroundings had increased to such a point that he again came to a halt, not daring to move an inch further. As he stood looking about him helplessly, his eyes chanced to be attracted by an electric sign of a comparatively modest type on the opposite side of the street, which was intermittently flashing out the words "SUNSET HOTEL. ROOMS 50 CENTS."

To the thoroughly frightened Bob the sign seemed to be blinking a friendly welcome as though it was desirous of offering him protection from the dreadful dangers by which he imagined himself surrounded. With a gasp of relief, he picked up his grip and made his way towards the sign. Upon reaching the hotel entrance beneath the sign he again paused dubiously for a moment. Then, mustering up all the courage he could command, he marched into the lobby.

After being persuaded by the astonished clerk that it was positively necessary for him to place his signature in the big book on the counter, and next undergoing a hair-raising journey skyward in an elevator which left him with his knees shaking and his heart in his mouth, Bob finally came to anchor in a plain but clean little room facing an inner court.

Before retiring he opened the single window of the room and gloomily contemplated the immense distance that he was going to have to either fall or jump in the event of a fire or earthquake occurring. And as he considered these fearful possibilities he mentally agreed with himself that, although he might now be safe from the perils of the streets, nevertheless his position was indeed a precarious one.

After locking and bolting the door he dragged a bureau across it for further protection from the various villains by whom, according to the statements of Silas, city hotels are invariably infested. Having thus reduced the possibility of an invasion to a minimum, he began to prepare for bed.

Fifteen minutes later he was fast asleep, with his pocketbook and dollar watch carefully concealed beneath his pillow and his valise safely moored nearby by means of a piece of string attached to his toe.

* * * * * *

We will not bore the reader by attempting to portray the countless difficulties which our hero encountered during the first few days following his arrival in the city. It will suffice to say that he ultimately succeeded in locating the offices of the local wireless company and was duly enrolled as a member of the instruction school.

Bob rapidly became accustomed to his new suroundings and his countrified mannerisms, which were, at first, productive of huge amusement amongst his fellow students, soon commenced to disappear. He also became able to scoot across a busy thoroughfare without having several hairbreadth escapes from being run down by an automobile or street car, which was a great improvement over his first day in the city when he experienced not less than three dozen narrow escapes from meeting an untimely death at the hands, or rather at the wheels, of sundry wicked chauffeurs and street car motormen.

In the course of time he learned the way out to the ocean beach, and it became his favorite pastime on

Sunday afternoon to recline comfortably in the warm sand at the seashore and dreamily contemplate the mighty ocean which lay before him. And he experienced in fullest measure the thrilling, soul-stirring call of the deep as he gazed upon the vast expanse of gently heaving water which stretched on and on to the horizon, where it met the sky in a perpetual kiss.

Sometimes he saw the swift ocean greyhounds, leaving their long, graceful trails of smoke behind as they steadily forged ahead towards and beyond the horizon. And his heart would beat faster when he saw them, for he realized that possibly he himself might some day be on one of those wonderful ships and journey westward to strange lands far across the seas.

The days at the wireless school passed swiftly, and Bob, who applied himself more assiduously to the practice tables than any of his fellow students, was beginning to show the makings of a really expert operator. In fact, he made such great progress that, after he had attended the school for only four weeks, he began to seriously consider attempting the government examination for a commercial first-grade license. Although he daily felt more certain that he was sufficiently prepared, yet he kept postponing the attempt, fearing that by some possible mischance he might fail to pass the tests.

The distressing thought Bob had of possibly failing to pass the examination was one which he felt must be, in some manner, removed. Were he to fail in his first attempt to secure a license he would be compelled to wait three long months before he would be eligible for a second trial, according to the government rules. Now, Bob could not for a moment entertain the idea of waiting an additional three months for his license, since such a delay would have a disastrous effect on his limited and fast diminishing funds. This probably would not have particularly disturbed his peace of mind but for his knowledge of the fact that his father would refuse to replenish the aforesaid funds when they were exhausted. Silas had vehemently declared himself to that effect before Bob had taken his departure from Hamsville.

Bob strove with might and main to figure out some way of determining positively whether or not he could pass the government examination, but while our hero's mental powers were admittedly marvellous along electrical and radio lines at least, they seemed quite incapable of successfully coping with the type of difficulty now at hand. In fact, the harder he thought, and the more he plotted and schemed, the more impossible of solution did the vexing problem appear to be. He was offered much conflicting advice by his fellow students, which only left him more perplexed than before. He took several "test examinations" from the instructor of the school, which he passed easily—so easily that he was convinced that they were not equal to the genuine, although the instructor stubbornly insisted they were.

In the course of a few days the exasperating matter had assumed the proportions of a mountain, in Bob's estimation, and he went about with a most lugubrious expression on his usually smiling countenance. He became taciturn and even began to lose in weight, so unceasingly did he brood over his immense trouble.

Being in this somewhat disturbed mental condition, it was really small wonder that he lent an attentive ear to a certain preposterous scheme which was solemnly suggested to him by some of his mischievous fellow students as offering him a way out of his difficulty. The youths had jok-

ingly hatched up the scheme between themselves, but, nevertheless, they informed the credulous Bob with the utmost gravity that it was a *modus operandi* that had been well tested by time and invariably found successful, although requiring a little nerve. But the idea was so far-fetched and extremely ridiculous that Bob, although really greatly impressed, pretended to scoff at it.

That evening, in the privacy of his room, he thought the matter over at great length. He admitted to himself that the thing looked a little dubious, but he recollected the serious manner in which his fellows had tendered him the suggestion and the earnestness with which they had assured him that the scheme had been found "O K." He also recollected that when he had asked them why they did not make use of the scheme themselves, they had unanimously declared they would do so, only they lacked the nerve to carry out the plan.

After considerable deliberation Bob finally decided that he would attempt to carry out the scheme on the following morning. It should be distinctly understood, however, that had he been in a less mentally upset state, caused by continued worrying, he would never have made such an insane decision.

(To be concluded in May issue)

Why not subscribe now?

SECRET SERVICE AGENTS MISLED

It is not easy to shut the European War from our minds; it is constantly brought before us that this wholesale slaughtering is still going on. Here is one incident that does not allow us to forget it.

In San Francisco, 365 feet high, 600 feet long, three bright copper wires hung in graceful curve between two high buildings. A lead terminated in the German Democrat Building. Aha! GERMAN Demokrat! Local Federal authorities were immediately notified, with the result that secret service men were quickly dispatched on what apeared to be a real exciting case. Yes, there they were, the three aerial wires, well insulated from the buildings to which they were fastened and with a lead in thru the German Demokrat Building. So that was how the news came from Germany and went out to various German raiders! Investigation was in order; with revolvers loaded and in a tense condition of mind the men entered the building and knocked cautiously at the door of the German news pirate—maybe!

"How do you do?" said Mr. Moorhead of the Moorhead Laboratories. "Come in. What can I do for you?"

After a bit of explanation Mr. Moorhead convinced the "gum-shoe men" that there was no cause for alarm, as he had just erected the antenna for testing out his Electron Relay Tubes. The "gum-shoe men" retreated in disorder.

An interesting incident is connected with the erection of this aerial. Mrs. Moorhead was at the time standing on the roof of the Call Building. A crowd of spectators gathered and rumors went around that everybody was waiting for the beautiful young lady to walk from the Call Building to the German Demokrat Building. After a few hours of impatient waiting the crowd dispersed quite disappointed.

A STOUT WIRELESS

(From the S. F. Examiner)

E. A. Christenson yesterday received the following telegram from Capt. Charles B. Foster, who took the wrecker Greenwood down to salve the Raymond, ashore eight miles south of Point Sur Light: "Arrived five forty P. M., Feb. 28. Laying moorings. Raymond is on rocky beach. Rudder and rudderpost are gone. There are holes in bottom along starboard side. Weather clear. Everything looks favorable."

It will be noted that the above message came by telegram and not by wireless. It seems that Capt. Whitelaw, respectfully known as the "Bay Coroner," and owner of the Greenwood, recently purchased a wireless outfit for $500, which he had installed on the Greenwood.

Later developments showed that the outfit was a condemned Navy outfit which had been sold at public auction for $10. Then, when they tried to use it the outfit made so much aerial commotion with static waves that it interfered with regular commercial work.

So the wireless inspectors took a hand and ordered that the outfit be fixed or remain silent. Yesterday on the floor of the Merchants Exchange Captain Whitelaw made the following excuse:

"The wireless outfit was so powerful that the Navy Department ordered me not to use it. When the Greenwood reached the scene of the Raymond wreck it was under the lee of the high rock at Point Sur and the wireless messages could not dodge around a corner. So the outfit could not be used."

STEALING YOUR OWN AERIAL

About three months ago Howard A. Cookson, a wireless experimenter, obtained permission to put a wire for an aerial on the Chancellor Hotel in San Francisco. As he was working

for the telephone company at the time he told the owner of the building that the wire was for telephone use. That was fine enough; Cookson ran the wire from the Chancellor over to the hotel in which he was living.

Lately, however, Cookson moved and decided that owing to the "High Cost of Copper" he would take the aerial with him. Accordingly he called at the Chancellor Hotel again and found a new owner whom he asked "to take a telephone wire off the roof." The new owner demanded a permit from him which, of course, Cookson could not show. Cookson meditated. One evening some time later he and a friend casually sauntered into the lobby of the Chancellor in their "fish" clothes (full dress) and after smoking a couple of good cigars took the elevator to the tenth floor. They then walked up six stories to the roof, where Cookson snipped off the aerial which he later pulled in from his own hotel.

SNIP, SNIP

PIONEER RADIO OPERATOR NOW RADIO INSPECTOR

Harold D. Hayes, who has temporarily been filling the office of Assistant Radio Inspector in San Francisco, was recently permanently appointed Assistant Radio Inspector of the local district. For a time he was director of the wireless school in the Y. M. C. A. at Los Angeles and prior to that time he served at sea as operator on the turbiner Harvard.

LONG DISTANCE TRANSMITTING

During the month of January, the station 6 E A at Los Angeles was in direct communication with the station 9 Z F at Denver, Colorado (850 miles), and with 7 Z N at Vancouver, Washington (875 miles).

The following long distance stations heard and copied station 6 E A in the month of January:

WRD (Str. D. G. Scofield) 20 miles north of Seattle at Point Wells (approximately 1,080 miles).

7DJ (Hoquiam, Washington), 975 miles.

KIY (Colorado Springs, Colorado), 850 miles.

7LF)
7AF) (Portland, Oregon), 850
7DQ) miles.
7PD)

THREE GERMAN RADIO STATIONS ON PACIFIC COAST

That there are three wireless stations being operated by German Army Officers along the lower California coast, and that German officers in clothes of civilians are making their headquarters at Tia Juana, Mexico, a few miles south of San Diego, California, was the substance of a report made on March second by Don Stewart, city treasurer and senior officer of the naval militia.

WHAT DOES YOUR PRIVATE AMATEUR SET LOOK LIKE?

If you have a good photo of your amateur station and you would like other amateurs to see it, send it, together with a complete description, to the editor of the Pacific Radio News. We are inaugurating a new department and several photos and descriptions of stations will be published in the next issue. If you haven't a photo why not take one? Send it in and see how your station compares with that of the other fellow's.

The Electron Relay

By O. B. Moorhead

During the month of April in the year 1915, two local men, one a glassblower, the other an ardent follower of the radio art, prepared a rival for the Audion, with its attending gaseous medium and all the idiosyncrasy that went with it.

It was in the latter part of March of the above mentioned year that the humble writer of this article had a vision of a device more sensitive than the Audion and which could be sold without having the usual strings attached commonly known as R. J. 4 sets. A mental conception of a device which could be shipped unsealed and guaranteed to operate at least five dollars' worth and his responsibility not cease when he dropped it into the nearest mail box, a dream of a device within the reach of all, even the poorest amateur, was this vision. The writer took this vision in the form of a model of excellence to the aforementioned glassblower and after several weeks of their combined efforts the Electron Relay type of tube resulted.

This tube was successful in bringing the sacred Audion to terms as even that exalted device can now be obtained without the purchase of the "little red box". We are to be everlastingly thanked by the appreciative amateur and even some commercial companies for this service, for we even were successful in perfecting a device that exceeded the Audion in sensitiveness and condemned the gaseous medium and Hudson filament bulb to the happy hunting grounds of good but obsolete wireless instruments.

De Forest with great foresight perceived the handwriting on the wall and a few months after the appearance of the Electron Relay brought suit against us, claiming infringement of numerous patents and claims. In his complaint he included several people that had never heard of an Audion. He then proceeded to bring out a longer tube, an Electron Relay, under the name of Tubular Audion using our familiar aluminum plate, copper grid and stream line filament. And lastly, De Forest has applied for a patent, claiming the cylindrical plate, helical grid and stream line filament as his own invention!

This, dear reader, is overstepping the bounds of legerdemain that even the lax radio patent situation permits, and I protest. Could two people evolve the idea of using aluminum plates and copper helical grids when no theory exists that explains their peculiar suitability except the rather unknown and unapplied theory of photo electric phenomena? I would say that it is highly improbable. We selected these metals from the electro-chemical series because they were eighteen metals apart and in line from the tungsten filament and also because we could procure these metals with ease on the Pacific Coast. Again, the advent of the Tubular Audion was several months behind the first appearance of the Electron Relay. Even if the Electron Relay did infringe on the De Forest gaseous medium patents, we should have been at least credited with an improvement on the old Audion. This improvement is so great that one is inclined to think that the mode of operation is entirely different.

I do not claim that the Audion that De Forest manufactures at the present time differs greatly from the Electron Relay. It does not, because, since the appearance of the Electron Relay De Forest has increased the vacuua in his bulbs to a point where the gaseous medium plays no essential part in the opera-

tion of the detector but is rather a drawback. If De Forest built the type of bulb protected by his patents and exhausted to one thousandth part of an atmosphere the average life of the device would be forty hours. But he does not do this, he exhausts his bulbs to one-twenty-fifth of a millimeter and the gaseous medium, which he sets forth at great length in his patents, is no longer essential but on the contrary is detrimental to the action of the bulb. The evacuation of the Electron Relay is carried on to an even higher point and we strive to remove the residual gases completely and depend upon the electronic emission from the tungsten filament modified by a variation of the grid potential for the operation of the tube. In the De Forest Bulb the modification of the internal action by ionization of the intervening gas atoms is depended on for the successful operation.

From the above you may see that the word "Audion" when applied to the vacuum detectors now being manufactured is a misleading one, for when we eliminate the gaseous medium we have also left the phenomena of audible ions thereby making the word "Audion" a name of a device manufuctured in the past. As soon as the gaseous medium is deserted we separate ourselves from all the troubles of producing the desired result.

We can, with a fair degree of certainty, reproduce Electron Relays in any number that will all possess the same operating characteristics. This cannot be done with the nickel element Audion as any user can testify. A very simple test may be made as follows to show the decided difference in the two devices. Take a real De Forest Audion that actually contains a sensitive gaseous medium and hold a terminal of the grid or plate to one terminal of a spark coil. Notice the beautiful luminous glow inside the bulb due to the presence of the gas. This glow varies in color with different bulbs even as does the sensitiveness of the device. Now take an Electron Relay and hold the terminal of the grid to the coil and you will not perceive the glow; that is because there is no gas present. When a tube does show even the slightest trace of color the tube is invariably very insensitive. Furthermore test an Electron Relay against a sensitive gaseous medium Audion and note the difference in sensitiveness and the wide range of "B" battery over which the Electron Relay will operate. This is due to an entirely different mode of operation which is basic in its action.

At the present time De Forest manufactures the Electron Relay under the name of Tubular Audion and evacuates the bulbs to a high degree for power generation on small telephone sets. We did this some time ago and De Forest certainly cannot claim that there is a gaseous medium in this purely Electron operated device, yet he asserts that we infringe his Bunsen burner and gaseous medium patents.

De Forest now claims that the degree of vacuua in his bulbs is comparable to one twenty-fifth of a millimeter but that does not disclose any important facts as the vacuua may fall after the bulb is removed from the pumps and used for a certain length of time and this is bound to happen unless efforts are made to remove the gases occluded in the metals during exhaustion. In the manufacture of the Electron Relay exhaustion is carried on to one millionth of a millimeter and every precaution is taken to remove the slightest traces of residual gas. We have perfected a device that employs the electronic emission and it would be no more than just that De Forest cohere to his original mode of manufacture, using a vacuua not high enough to remove

(Continued on page 183)

IT'S BEST TO BE A DRY LAND SAILOR AFTER ALL

To sea I'll go as "wireless,"
Of which I've heard romantic lore;
I'll work all kinds of distances,
As they have never heard before.

I'll save the life of some rich maid,
When with distress our ship will meet;
My name all o'er the world will spread;
I'll wed her for this wond'rous feat.

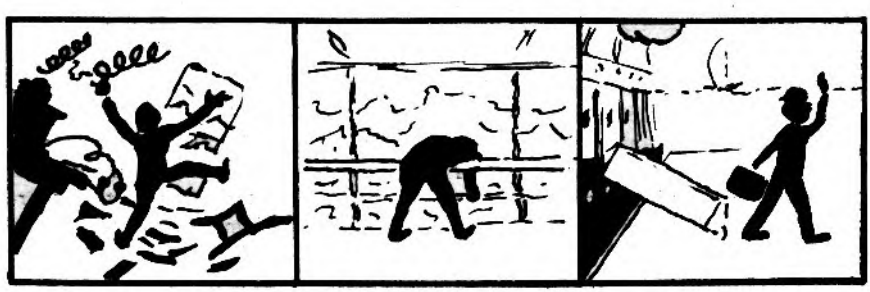
To my appointed job I went,
Arriving with most pompous pride,
For was I not on venture bent
If fate should thus for me decide?

BUT—

Was that my ship, to me assigned?
That hulk with lumber to the rail?
I did not think that was the kind
Upon which wealthy maids would sail.

My spirits low, we sailed the sea,
My thoughts went back to home, sweet home,
As couplers, helix, chair, and key
In tumult fell upon my dome.

When we arrived at our home port
They asked me if I would remain;
I gave the Captain my report,
"No, Sir." said I. "Never, never again."



HAVE YOU RECEIVED THE GENERAL CALL?

HEARD OVER THE AIR

1st Ham—What's the difference between a wireless pole and a dog in the ice box?

2nd Ham—Dunno.

1st Ham—The difference is in the pronunciation, one is per-pendic-u-lar while the other is perp-en-di-cular.

MARCONI COMPANY VACATES OLD QUARTERS

The main offices of the Pacific Coast Division of the Marconi Wireless Telegraph Company of America in San Francisco, and formerly located in the Merchants Exchange Building of that city, are now located in smaller quarters in the Insurance Exchange Building.

The construction department has also been moved from 50 Main street to 109 Steuart street, San Francisco. This location has been selected as an ideal one owing to its close proximity to the water front and allows the construction gang to rush supplies to ships in a very short time in case of emergency need.

Send your dollar to 50 Main St., and Pacific Radio News will do the rest.

THE CHARGE OF THE HAM BRIGADE

Half an inch, half an inch,
Half a K, and onward,
Those are the sparks they hear
Up on "six hundred".
Oh! What a noise we've made,
Oh! For a rest, they've said,
Seems all the hams have strayed
Up on "six hundred".

Sparks to the right of them,
Gaps to the left of them,
Coils to the front of them,
Volleyed and thundered.
Seems from the hour of eight,
All commercial bix must wait,
Small boys and ships sedate,
All on "six hundred".

Why does their hair turn gray,
Grouchy from day to day,
Wishing all hams would stay,
Down on "two hundred".
Oh! how they fume and rage,
If they only were of age,
Oh! what a war they wage,
Up on "six hundred".

RADIO TORIAL

By the Editor

The fourth issue of "PACIFIC RADIO NEWS" appears. Letters of praise have reached us, in truth, from the four quarters of the globe commending us for the fruit of our efforts. Here is the April issue. It brings to you, whether you are a subscriber, a casual reader, an advertiser, or an interested layman, an appeal; the earnestness of which we cannot impress too strongly. We appeal to you for criticisms—harsh, cold, matter-of-fact criticisms. We appeal particularly to those who have not as yet subscribed to our magazine. Our ultimate success depends upon our knowing the opinions of those who read our magazine. We entreat you to write us a letter telling us what you disapprove of in "PACIFIC RADIO NEWS." Treat this editorial as you would a verbal appeal from one in dire need. Would you deny a starving man food? We are starving from lack of criticisms from non-subscribers—men who throw aside our little publication with a feeling of dissatisfaction and disinterest. We need their opinions, their reasons for their dissatisfaction and their suggestions for improvement. How small a matter it would be to spend a few moments to fulfill our request—and how much we would appreciate it. The idea brought to us in one letter might mean our final and established success—and that letter might be YOURS. "PACIFIC RADIO NEWS" will never forget YOU. Believe us when we say that the time you spend to write a few good, befitting criticisms will never be termed as wasted. Time will prove this statement.

It has been brought to our attention that the columns of "Pacific Radio News" do not contain enough news for the amateur radio operator and experimenter. While it has been our intention for some time to devote more space to the amateurs' viewpoint and interest we have been unable to carry out our plans on account of the large amount of other interesting news at hand. In this issue we have made a few changes, and with them comes the section for the amateurs exclusively. We intend to publish photographs and descriptions of amateur stations every month. We wish to have it understood that this section is not only for the amateurs who own powerful and costly stations, but also for those who have smaller stations. It is often found that the smaller radio installations do much more efficient work than the larger and more powerful contemporaries. If you would like to see your station pictured in "Pacific Radio News" take a few good, clear photographs of it and write a short but complete description of the apparatus and send it to the editor. If you do not care to send in any photographs or if it is not convenient for you to take them at present you might send in some little news items or articles about some points in the operation or construction of your set which might prove valuable to your "brother" amateurs.

From the standpoint of the radio experimenter and amateur radio operator "War IS ———" and Sherman's oft-quoted statement certainly can bear repetition here. What can one

do when one must have No. 20 double silk covered wire and cannot buy it at any price? In San Francisco it is impossible to buy that particular size and type of wire at $10 per pound. It is simply impossible to get it. Not only in that size either; there is a scarcity of other sizes as well. Copper has advanced slightly more than 100% in base price during the past two years. That, of course, applies to sizes in wire which are available. Other materials which are used so extensively in the making of wireless apparatus have also gone up about on an average of 100% in price. This applies to sheet brass, aluminum, zinc, copper and the same metals in the form of rods, tubes, etc. And WHY? Oh! WHY? Must we not supply the English and French with good copper and brass cartridge shells? For otherwise how could they shoot soldiers? Must not the Allies have perfectly good copper wire for their wireles stations, their field telegraph lines and electrical war apparatus so that they can communicate the positions of thousands of strong, able-bodied men, and then knowing their position murder and massacre them? You see, in this war there is no such a word as HONOR. But wait—yes, there is; it has a different meaning, tho. Don't you see that HONOR is what they are all fighting for? Hasn't Micky Flannigan, who was engaged in farming near Dublin, and who never was bothered by the worries of the outside world before the war, got to uphold the HONOR of the great demi-god who sits in the carved chair in London? And Hans Schmidt of Thuringen, Germany. Didn't he hear of the crown prince of Austria, or something like that, once, when he was a boy? Well, of course he must uphold this nobleman's HONOR, too, just like thousands of other poor unfortunates are doing. Oh! and Gordon Wilson of Kent! He was formerly an enthusiast in wireless telegraphing. Whereas he once used sheet brass to make his tuner's sliding contact he is now using it to help Germans make a sliding contact with the ground. Whereas he once used copper wire aerials for catching messages, he has now fallen to a lower plane, where he strings barbed wire "antennae" for catching Teutons.

Well, it seems that all of humanity has sunken to a lower plane. Rather than have peace, men hunger for war, paying outrageously high prices for war materials, a great part being the brass and capper we are trying to buy for our apparatus at fair prices. Yes, "War is ———."

FIRST DANCE OF RADIO OPERATORS IN THE WORLD HELD IN SAN FRANCISCO

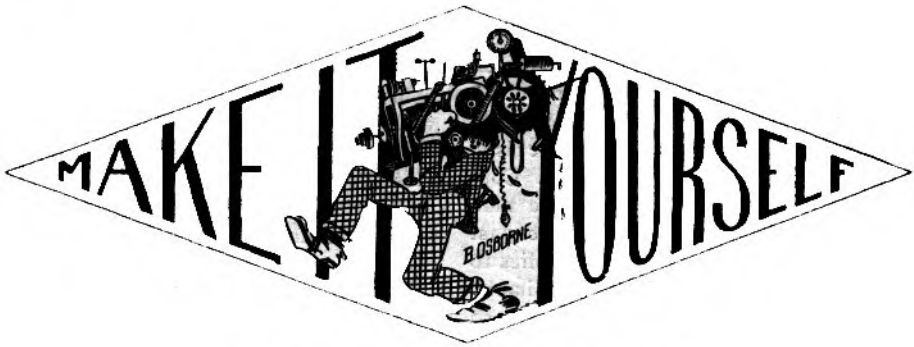
San Francisco bears the distinction that it was the first city in the world to have a Radio Operators' Dance and the San Francisco Radio Club bears the distinction of being the first radio organization to give a Radio Operators' Dance.

The evening of the 23rd of February was set for the dance which was held at the hall of the San Francisco Radio Club. There were about thirty couple present; just about the right number for the size of the hall. The music was by the club orchestra. Mr. C. P. Altland, piano; Mr. N. Heuter, violin; Mr. C. Hidden, flute, and Mr. Nielson, drums, were the constituents of the orchestra that made the evening of dancing a pleasant one.

An innovation in the form of punch was served by Mr. C. M. Heaney and was declared to be 100% alcohol. It was called Radio Punch.

The dance programs were original inasmuch as they were "hand made" so to speak. One of the club members had made a drawing of an antenna into which the lettering was

(Continued on Page 177)



A COMPRESSED AIR SPARK GAP

Efficient, and Low in Cost

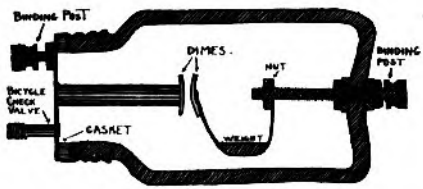
The everlasting problem confronting the amateur is the efficiency of his transmitter. Many amateurs do not realize the importance of a properly designed and efficient spark gap in the sending circuit, especially those who use sixty cycle alternating current. Although the rotary spark discharger represents a decided step in advance of the old straight gap, the straight gap, if the medium in which it operates is changed in pressure, will prove far more efficient than the rotary gap. The factor neglected in the ordinary straight gap is the pressure of the medium in which the spark takes place, namely, the air. It seems to be taken for granted that the air at the ordinary pressure of about fifteen pounds to the square inch is the ideal pressure for the operation of a spark gap. This is not so. Both by actual tests and in practical use it has been proven that air under a pressure of from twenty to forty pounds per square inch is markedly more efficient than even a rotary spark discharger or a quenched gap when used on a sixty cycle current (primary). If the amateur can forget the beautiful (?) tone produced by his rotary gap and put the highest efficiency of his transmitter first in his mind he will be satisfied with the tone of a sixty cycle straight spark using a compressed air spark gap as described in this article.

In order to gain extreme simplicity in the construction of this spark gap and to cut cost, it is described using such materials which are easily obtained and not of much value. The first thing is to procure a glass jar with a screw top. This jar must be as thick as possible in order to withstand a good air pressure. The screw top should be of such a type that it will by the use of a rubber gasket be absolutely airtight. A jar about three inches in diameter or about three inches square by four inches is a good size to use. As a rule a Mason jar is not quite satisfactory inasmuch as the top is usually made of zinc which is so soft that it will be forced out of position by the inside air pressure. If a sheet iron top can be found to fit a Mason jar it will be satisfactory.

The first operation is to drill or grind a hole in the center of the bottom of the jar. To those never having tried to drill into glass this may seem rather difficult. It is not, however, if properly done. The quickest way is to use a small triangular file the size of the hole wanted. The file

is gripped in the jaws of an ordinary brace, as if it was a bit, and used in the same manner. To procure a sharp edge the end of the file is broken off and from time to time as the drilling progresses the file may be broken again to insure a sharp edge at all times. Turpentine is used to lubricate the drilling and the glass powder mixing with the turpentine seems to form a paste which aids the cutting power of the file. The hole should be of such a size to admit a threaded brass rod. A three-sixteenths inch rod threaded with a ten-twenty-four die is a good size to use. This rod supports one of the electrodes of the gap and is fastened in position with two nuts and two fibre washers as shown in the sectional drawing. It is well to use a little thick shellac to make the joint between the fibre washers and the glass airtight. The screw top is the next point to consider. This metal top supports both the brass rod for the other electrode of the gap and the air valve. The air check valve is of the bicycle type. It may be procured from an old bicycle tire or motorcycle tube. After cleaning all the old rubber away from around the base of the valve and removing the valve inside (use the tip of the valve cap for doing this) drill or punch a hole in the screw top and solder the valve in place. Great care should be taken to prevent any air bubbles from forming in the solder around the valve otherwise the jar will leak at this point. As seen in the drawing the valve is placed a little to one side of the center, then the rod supporting an electrode is soldered to the top in the center.

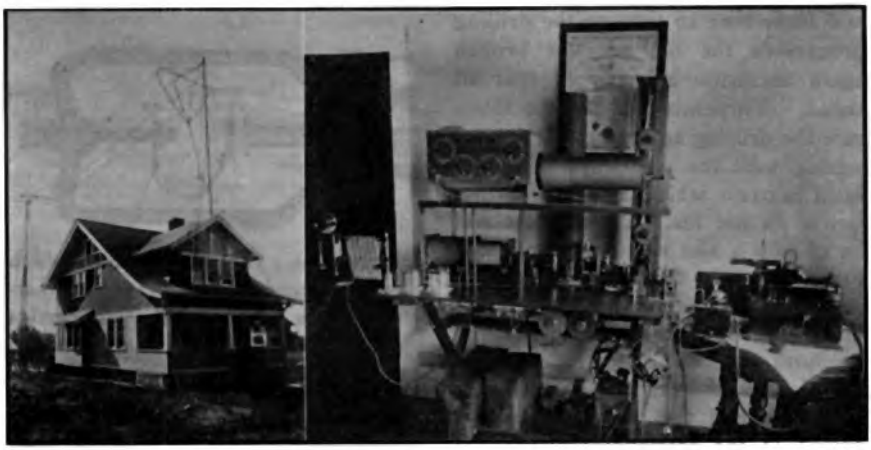
The last point to consider is the mechanism for adjusting the gap. A little thought will show that any method of adjustment which is operated from outside the gap directly is impractical since the jar cannot then be made airtight. The idea described in this article to adjust the gap overcomes the difficulty and gives a wider adjustment of any compressed air gap on the market today. The drawing



clearly shows the idea. A nut, which fits the thread on the brass rod fastened to the bottom of the jar, carries the electrode at the end of a U-shaped arm. A weight, preferably of lead, is soldered or fastened with a screw to the bottom of the U arm. This weight will tend to hang down while the whole jar is rotated, thus either winding up or unwinding the nut on the threaded rod until the gap is adjusted to suit the amateur's needs. It is worth the while to use silver electrodes. Dimes make good ones. These are both efficient from a standpoint of electrical efficiency and because they rapidly conduct away any heat generated at the point where the spark jumps. Silver electrodes also do not leave any deposit in the inside of the jar during operation as zinc, for example, would do.

In the use of this gap great care must be taken not to pump too much air into the jar. It cannot be emphasized to strongly that the explosion of a glass jar would be an accident of an exceedingly dangerous nature. It might be well to construct a wooden case for a gap of this kind with a heavy glass sight to permit of easy adjustment and to facilitate observance of the gap in action.

Privately Owned Stations of Distinction



AMATEUR STATION OF HARVEY L. GAMER AND WILBUR L. GAMER

The accompanying photographs show the station of Harvey L. and Wilbur L. Gamer of 5023 Cuming St., Omaha, Nebraska. The receiver is an undamped wave type and the stations O U I (Hanover, Germany), P. O. Z (Nauen, Germany), and K H. L. (Honolulu, T. H.), are easily read.

The Tuckerton station (W G G) when using their Goldschmidt Alternator comes in so loud that wax records have been made on the special recorder, shown in the photograph. The amplification feature is obtained by the use of inductances and capacity in the wing circuit of an Audio Tron, then a further amplification with two ordinary Audions and their respective coils and circuits as well as a microphone arrangement leading to the recording machine.

The station tunes to waves as long as 15,000 meters.

STATION OF HOWARD A. COOKSON IN SAN FRANCISCO

We print herewith from the photograph of Howard A. Cookson's amateur radio installation. The receiver is arranged to receive both undamped and damped oscillations. The largest cabinet is a Radio Apparatus Company's one step amplifier set. The smaller cabinet is one made by the Haller Cunningham Electric Company, and has two tubes and two B batteries. The large cabinet tunes as high as 10,000 meters with the aid of loading coils. Three tube detectors are used for the amplification of the oscillations received by the first bulb. Mr. Cookson says that the intensity of the signals received at the first bulb are amplified 100 times at the third amplification. The aerial used is 45 feet high and 450 feet long. Some of the work this station has done follows. Using the undamped wave receiver Nauen and Elvise, Germany, and Tuckerton and Sayville,

have been easily copied. On the damped wave receiver the following stations have been heard: Guantanamo, Cuba (N A W); Colon, Panama (N A X); Key West, Florida (N A R); Arlington, Virginia (N A A); Choshi, Japan (J C C), and S. S. Standard Arrow (K S V), 2300 miles west of Honolulu (4000 miles from San Francisco). During the Washington's Birthday amateur relay from New York the message was copied directly from Denver, Colorado (9 Z F); Dallas, Texas (5 D U), and Phoenix, Ariona (6 D M).

RELAY TEST MESSAGES

All relay test messages sent out by Seefred Brothers (6EA) will be sent out at 10:15 p. m. instead of 8:15 p. m. and every Thursday and Sunday night hereafter. It was found that at 8:15 p. m. there has been entirely too much "QRM" for these tests. This applies to all relay stations appointed on Trunk Lines "B" and "F".

ARMY TRANSPORT SAILS WELL EQUIPPED

The U. S. Army Transport Sheridan for the first time in history has left San Francisco well equipped for receiving distant stations. It has been long known amongst amateur and commercial operators that, altho at times long distances have been covered by the various U. S. Army Transports on the Pacific, as a general thing their service is maintained with difficulty, the difficulty usually being due to interference, together with only mediumly sensitive and selective receiving apparatus which these ships heretofore carried.

It is a well-known fact that the bulb and tube detectors, such as the Audion, Electron Relay, Audio Tron, etc., when used in the receiving circuit provide a means of tuning unsurpassed by any other known detector, in addition to the increased sensitiveness of these detectors. The Sheridan sailed on March 5th for the Philippine Islands equipped with a Moorhead Receiving Set which, of course, included an Electron Relay detector. There is no doubt that the radio service of the U. S. A. T. on the Pacific will be decidedly more efficient. The Sherman has also been equipped with a Moorhead installation, and between the two ships communication will probably be carried on when they are upwards of 5,000 miles distant from one another; in fact, stations were copied within a radius of 6,000 miles.

The apparatus was constructed by H. R. Sprado of the Moorhead Laboratories. It will be interesting to "listen in" and observe the improvement in the efficiency of these ship stations.

THE TALK OF THE TOWN

Is the man who represents the "Pacific Radio News". He is turning his spare time into dollars, is receiving a beneficial education and is working toward the mutual interest of both himself and the publisher.

The commission that our representatives receive is very liberal and as we need a representative in every city and town in the United States, we request that you write at once for full details. Get busy now; don't let the other fellow beat you to it.

RADIO ORGANIZATIONS

SAN FRANCISCO RADIO CLUB

At the last meeting ot the San Francisco Radio Club, held on March 2nd, it was decided to have a meeting on a Monday in order to settle the differences of opinion as to which evening, Friday or Monday, was the most suitable for meetings. Further business transacted was that regarding the initiation fee for new members. It was the general opinion that $2.50 was too high an initiation fee, so it was decided to lower it to $1.00 for a period of thirty days with the option of extending the time limit to sixty days if the lower fee brought in more members. The matter of club pins was again left over for the next meeting.

The club's radio installation has made rapid progress during the past month. A 400 foot seven strand phosphor bronze antenna has been erected and this, with the Wireless Specialty Company's variable condenser and Blitzen tuner given by Mr. Ellery W. Stone, Audio Tron tube given by Mr. E. T. Cunningham, Bakelite panel set given by Mr. Moorhead, loading coil given by Mr. E. D. Stevens, phones given by Mr. H. C. Brown, crystal detector given by Mr. J. Spatafore, Massie helix given by Mr. H. R. Sprado, and various other apparatus will be together to make quite a presentable station. When this installation is completed it is expected to have the club rooms open every evening.

A speed test on the code was held March 7th and wireless men were put to tests at speeds ranging from 5 words per minute, hand sending, to 40 words per minute, automatic key sending.

At the last meeting Mr. P. R. Fenner gave an educational lecture on the elementary principles of wave telegraphy. Mr. Edwin D. Radford will present a paper on the construction of bulb and tube detectors at the next meeting.

The membership of the club is now ninety and it will shortly be increased to one hundred.

INTERESTING DISCUSSION ON INSTITUTE OF RADIO ENGINEERS' PAPER

The fourth meeting of the San Francisco Section of the Institute of Radio Engineers was held on the evening of February 20th, 1917. Chairman Hanscom read the paper on Engineering Precautions in Radio Installations, written by Mr. R. H. Marriot. Mr. E. W. Stone followed with a long discussion on the effects of induction and "kick-backs" experienced with amateur stations in the vicinity of Oakland, Cal. An interesting general discussion then followed and many lantern slides were shown in relation with the subject at hand. About thirty-two members were present.

The Section Dinner is now being held on the mezzanine floor of the Mechanics' Institute Building.

YES. YOU CAN BUY IT AT NEWS STANDS

News stands in all important cities of the United States have received copies of "Pacific Radio News" and if you experience trouble in obtaining copies from your nearest news stand kindly send us the dealer's name and address and we will do the rest.

THE AMERICAN RADIO RELAY LEAGUE GETS MESSAGE FROM NEW YORK TO LOS ANGELES

The efficiency of the American Radio Relay League was tested on February 24th when Mayor John P. Mitchel of New York sent the following message to Mayor Frederic T. Woodman of Los Angeles:

"To the Mayors of Los Angeles and Seattle, greetings. On behalf of the City of New York I send cordial greetings to Los Angeles and Seattle. Best wishes for the success of the Radio System."

The message was relayed from New York City via Davenport, Iowa, Denver, Colorado and thence to Los Angeles. With all delays the message only took three hours to come through from New York.

It was due to the interference of local operators that the message did not reach Seattle. Several of the interefering operators will be interviewed by the Federal Radio Inspectors it is said.

The message was received at Los Angeles by H. C. and L. F. Seefred at 343 S. Fremont Street, and the following night they sent the answer from Mayor Woodman of Los Angeles.

DEVELOPMENT OF HALLER CUNNINGHAM COMPANY IS RAPID

With its manufacturing department working to capacity and with new ship contracts constantly coming in, the Haller Cunningham Electric Company of San Francisco is expanding at a rapid rate. Mr. G. Haller recently returned from an eastern tour and is now working on plans for the many new contracts on the east coast. Four standard 2 K. W. marine panel sets are under construction in the factory of this company besides the new and novel devices used for radio apparatus which are constantly being developed.

The Str. Florence Olson, owned by the Oliver J. Olson Steamship Company of San Francisco, will be equipped with a 2 K. W. Halcun panel transmitter within the course of two weeks and the ship will be ready for lumber carrying on the Pacific Coast in a months' time. The "Florence Olson" has a carrying capacity of 250,000 feet of lumber.

The following assignments have been made by the Haller Cunningham Company: Beule to the "Thordis," R. Phair to the "Regulus," A. Dezardo to the "Talbot," Parachini and Dodge to the "Costa Rica," and Lindsay to the "Governor Forbes" as second operator with Connoly as first.

Although the Haller Cunningham Electric Company does not employ as many operators as other wireless companies it has the distinction of paying operators higher salaries.

Being a Pacific Coast corporation and desirous of employing Pacific Coast radio operators at land and ship stations those interested in obtaining employment with this company will do well by communicating with Mr. S. N. Peterson, Haller Cunningham Electric Company, 428 Market Street, San Francisco.

RADIO OPERATORS' DANCE

(Continued from page 171)

worked in an effective manner; this was then reproduced on the programs.

Mr. Edwin Radford was on the committee and ably handled the position of official announcer.

The evening was enjoyed by all and was generally declared an entire success.

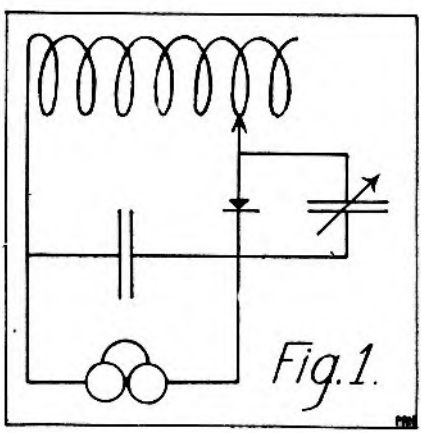
The San Francisco Radio Club intends giving another dance at some future date and it is stated that the affair will be on somewhat of a larger scale than the first one.

Experiments With Ground Antennae

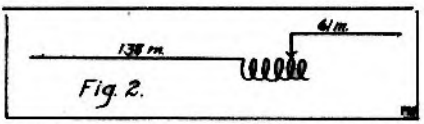
Experimenting with ground antennae presents a wide and interesting field for research in the art and science of Radio Communication. These experiments are easily performed and the apparatus is within the reach of the average amateur and experimenter interested in this art and science.

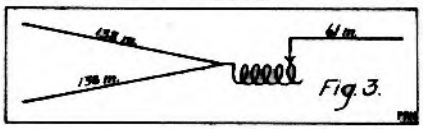
This article serves to guide or possibly inspire further work in this direction, but it does not prepossess to give complete data as to further possibilities in this line.

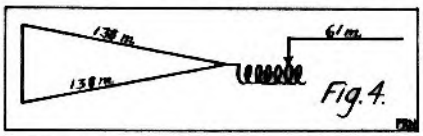
In all of the tests No. 18 copper wire was used and was merely laid along the ground without regard for insulation. It was found that the signals were not in the least affected by moisture on the ground for at times the ground was thoroughly wet from recent rains. The receiver was of a simple type and the "hook-up" for the tuner is shown in Fig. 1. It will be

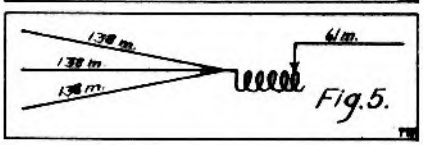


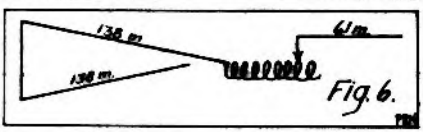
noticed in the tests that the wire used for aerial and counterpoise ground were of 138 and 61 meter lengths respectively. These lengths were found to be of good proportions for good results. The plan shown in Fig. 2 was used as a standard of comparison. Signals were heard from

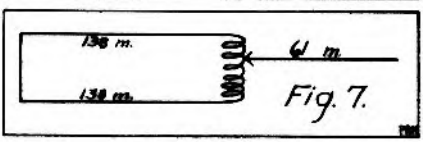












several distant stations, about five to six hundred miles away, with this "hook-up". The second plan, shown in Fig. 3, with two wires running out from the receiving apparatus, was a considerable improvement over Fig. 2. When this same connection was used but with the ends of the antenna connected together still better results were obtained. This plan is shown in Fig. 4. Three wires were next strung out from the apparatus as shown in Fig. 5, with another increase in strength of signals. The fifth plan was to open one of the connections of the antenna wires at the receiving apparatus end and connect the ends of the antenna wires together as drawn in Fig. 6. This "hook-up" gave

no results whatsoever, that is, no signals were heard. A loop connection was also tried out, as in Fig. 7, but the signals were very weak. Fig. 8

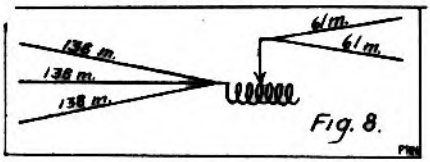


Fig. 8.

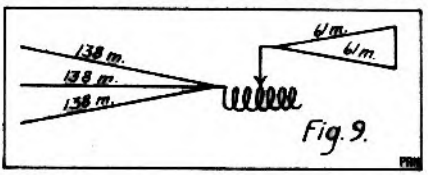


Fig. 9.

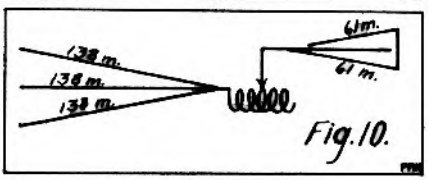


Fig. 10.

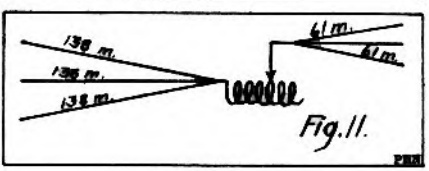


Fig. 11.

shows the plan used with two ground wires. This was productive of very good results and stations were heard close to one thousand miles away. Connecting the counterpoise ground wires together as in Fig. 9 did not improve results. Another type of connection used is shown in Fig. 10 with only fair results. The last plan used was with three antenna wires and three counterpoise ground wires. This plan was the best of any and it certainly produced results that were gratifying considering the fact that only a galena detector was used in the tests. It was also found in using this last connection, shown in Fig. 11, that the tuning was extremely sharp. Strange to say, when a ground connection was made in the bed of a near by stream and connected to the ground, connection of the receiving tuner signals did not increase in strength to the least noticeable degree. Further experiments are in order to investigate these types of ground antenna and the latest developments will appear in this magazine.

(The Editor will be pleased to receive communications regarding the subject of the above article).

STORAGE BATTERIES.

One of the most common yet most abused pieces of apparatus in the average station is the storage battery, which is usually used for lighting the filament of the audion, running spark coils, or what not. In spite of the number in use there is very little really dependable information available on the subject of taking care of these batteries.

In the first place, in almost all instances the battery is of the so-called portable type. In this type cells are placed in a self-contained case, which may be lifted up and carried around as a unit. This is all very well if proper precautions are taken, but in very few instances are any special pains taken towards handling the battery carefully, on the supposition that it is "portable" and, due to careless handling of the active material, is quickly jarred loose from the plates, causing a partial short circuit, and as a result the battery is condemned because it would not hold its charge. The plates of the average portable type of battery are placed in very close proximity to each other, separated as a rule by thin sheets of hard rubber, often of a thickness of not more than a thirty-second of an inch, and when the active material is shaken loose from the plates it lodges in these small openings and the trouble that will result is very evident, for the active material is partially conductive and slowly the charge in the battery is lost, tho the battery is on open cir-

cuit, by the conduction of the material in the separators.

A very prolific cause of trouble is the sulphating of the battery. This takes place when an insoluble white sulphate of lead forms on the surface of the plates. The effect of this sulphate is to decrease the active surface of the plate exposed to the action of the electrolyte and, as this sulphate is a fair insulator and cannot be dissolved by the acid solution, materially decreases the capacity of the battery. The causes of sulphating are overdischarging, too high specific gravity of electrolyte, and the most common of all leaving the battery in an uncharged condition for long periods. The remedy for the first cause is self evident; never discharge a battery when the voltage is below 1.8 per cell or, in the case of a three cell (six volt) battery never discharge below 5.4 volts. It is well to bear in mind that open circuit readings are of no value; while taking voltage readings connect a resistance across the battery that will draw an ampere or so. The second cause of sulphation, that of too high a specific gravity of the electrolyte in the battery is overcome by adding DISTILLED water. A hydrometer is used to ascertain the specific gravity of the electrolyte. A hydrometer is made of an elongated glass bulb so weighted at the lower end that it sinks in the electrolyte to the depth corresponding to the specific gravity of the liquid. A scale on the upper end of the glass tube shows, by reading the scale at the point which is at the level of the electrolyte, the specific gravity of the solution. When the cells are completely charged the specific gravity of the electrolyte should be 1.24 to 1.30. In some makes of cells the specific gravity may not run quite so high, but it is safe to say the specific gravity should never run below 1.2 at full charge. The final specific gravity at the end of discharging should be no lower than 1.185 or 1.19. In the event the specific gravity goes too low before the charge is all drawn, a little chemically pure sulphuric acid should be added to the electrolyte. The best acid to use is that not manufactured from pyrites but rather that which is made from sulphur or brimstone. The last mentioned cause for sulphating, namely, leaving the battery in an uncharged condition for long periods without attention is one which plays certain havoc with any storage battery. If it is necessary to leave a battery without using for any length of time it should first be fully charged, then the electrolyte should be drawn out (this is usually done by siphon) into clean bottles or jars. Immediately after withdrawing the acid solution distilled water should be poured into the cells until it covers the plates one-half inch or so. The cells then should be discharged until the voltage falls off to one volt or below. The water is then withdrawn and the battery may be left without internal injury. When the battery is to be placed into commission again the acid is again poured in to replace the water and then the battery is charged. The charge should be given at a slow rate and take about thirty hours.

The best current for charging storage batteries is a low voltage direct current. This, as a rule, is not available. It is very common practice to use a rectifier although these are not very satisfactory as a general thing. The vibration rectifier, although good, is nearly always far beyond the experimenter's pocketbook. One type* of rectifier which has appeared on the market a short time ago is as near perfection as it could be and yet is within the range of the average amateur's bank account. In connecting a battery for charging, the positive pole of the supply always goes to the posi-

tive terminal of the battery and the negative to the negative. If the voltage of the supply is too high, a resistance must be connected in series with the battery to limit the amount of current entering the battery; 32 C. P. carbon lamps make very serviceable resistances.

One point which is often the cause for many storage battery troubles is the so-called "flashing" of the battery. This term is applied to the operation of short circuiting the battery for a moment with a short piece of wire. To be sure, this is a good indication whether there is a current there or not, but it does not do the battery any good. On a dead short circuit of this kind as much as one to two hundred amperes pass through the short which causes violent chemical reaction to take place in the battery, buckling of the plates and various other harmful effects.

*The new Tungar Rectifier.

THE ELECTRON RELAY

(Continued from page 167)

all gases from within the bulb, thus conforming to the claims set forth in his patents of an Audion using a gaseous medium.

In a recent article by Dr. Lee De Forest in a certain publication he claims to have discovered the external grid type of device several years ago and he remarks that if the grid works outside the bulb it would naturally work better inside between the plate and filament. But Dr. De Forest does not seem to be aware that the ideal type of bulb would be one with a zero grid current; and what is better than a purely electro static control? The General Electric Company in the Pliotron specifies that the wires which constitute the grid should be of as small a cross-section as possible so that the current which flows to the grid may be extremely small.

De Forest may have discovered the outside grid years ago and his assumption that the grid must be intervening between the plate and filament may have been correct for the sensitive gaseous medium, but this does not apply to a device using the electronic emission. It is certain that the controlling member should intervene between the anode and cathode to exert maximum control of the emission, but it is also certain that the grid should control the stream by a purely electrostatic potential.

When a device is developed that is arranged geometrically so that the grid is outside the tube and yet is in a position to exert full control upon the electron stream, we will have a perfect vacuum tube, as then the grid current will be nil.

ARE YOU A SUBSCRIBER?

If you are not already a subscriber to "Pacific Radio News" you are missing something valuable.

Classified Advertisements

Advertisements in this section are 2 cents per word net.

Remittance, in form of currency, money order or stamps must accompany copy.

Advertisements for the March issue must reach us no later than February 1st in order to insure classification.

In counting words, count name and address.

Figures count five to the word in one group.

The "PACIFIC RADIO NEWS" being the first and only wireless magazine published on the Pacific Coast on radio engineering and operating subjects and not being connected with any wireless company or corporation, which might influence in any way its editorial policy, enjoys a select circulation, exceeding that of any other publication of its kind.

It will pay you to try an advertisement in this section.

PACIFIC RADIO PUBLISHING CO., 50 Main St., San Francisco, Cal.

WIRELESS

DOUBLE FILAMENT IMPROVED ELECTRON RELAY BULBS $4.00 each prepaid! All new and guaranteed! Immediate shipments! Brainerd Stratton, Oneida, New York.

NEW AUDION PANEL with tube and B battery, $8.00. 1½ K.W. closed core step up transformer made by Pacific Engineering Co. $20. New Audion Cabinet, two audions, one for detector, other oscillating. $25.00. Quenched gap, $3.00. H. Cookson, care Pacific Radio News.

20 CENTS will pay for a ten word advertisement in these columns. FORMS FOR THE MAY ISSUE CLOSE APRIL 5. Get busy today.

AERIAL FOR SALE—2 Poles, 50 and 75 feet, 320 feet No. 14 hard drawn copper wire, 2 strain insulators, $15.00. Can be seen at 5247 Locksley Ave., Oakland. Communicate with S. C. Houston, King George Hotel, San Francisco.

STOP! LOOK! LISTEN! SOMETHING NEW IN DETECTORS—"TUBIPHOR"—Ultra sensitive. An improvement of an old principle. Brass, hard rubber and glass are the materials used in construction. A detector of distinction. Will be sent prepaid to any address upon receipt of $2.00. The Tubiphor Co., 5 Parsons St., San Francisco.

SPECIAL—50c Storage Battery Plates, 4½x5½ inches. Positives or Negatives 25c each. Postage extra. Goodman Laboratory, 418 W. Court St., Flint, Mich.

GREAT BARGAIN—Closed core 1½ K. W. transformer, perfect condition, 2 power variations, $20.00. H. Fish, 328 Baker St., San Francisco, Cal.

YOU ARE MISSING THE CHANCE OF YOUR LIFE if you fail to turn to page 146 and carefully read the Vacuum Tube Panel Ad. It's the greatest offer ever made. Don't let it pass by. Electron Agencies Co., 4608 18th St., San Francisco, Cal.

FREE WIRELESS SETS—Don't cost you a cent—Make money in an easy way by representing the Pacific Radio Publishing Co., in your localify and you will soon be able to purchase a good wireless set from the commission that you realize on securing subscriptions for us. Write Business Manager, Pacific Radio News. Don't let the other fellow beat you to it.

YES—THE RADIO BARGAIN HOUSE IS STILL IN EXISTENCE and we have some real wireless bargains on hand. We build apparatus to order, construct long undamped wave apparatus, give you specifications on special apparatus and carry a stock of good tested galena which we retail at 20 cents per ounce. Every crystal fully guaranteed—money back if not satisfied. RADIO BARGAIN HOUSE, 1247 47th Ave., San Francisco, Cal.

BARGAIN — Holtzer-Cabot induction motor, type 02, 1-6 H. P., speed 1330, 110 volts, 133 cycles. Excellent condition; sell cheap or exchange for 60 cycle induction motor. K. B. Warner, Cairo, Ill.

THE BEST OFFER IN AMERICA—Shoemaker round bottom condenser jars, brand new, never used, copper coated, in excellent condition and .0015 M. F. capacity. Have very limited number of these jars on hand. 2 inches diameter, 13 inches long. Can be used for any transmitting set. Will sell for 75 cents each while they last. Postage and insurance extra. CALIFORNIA CONDENSER CO., 82 Downey St. Phone Park 6285. San Francisco, Cal.

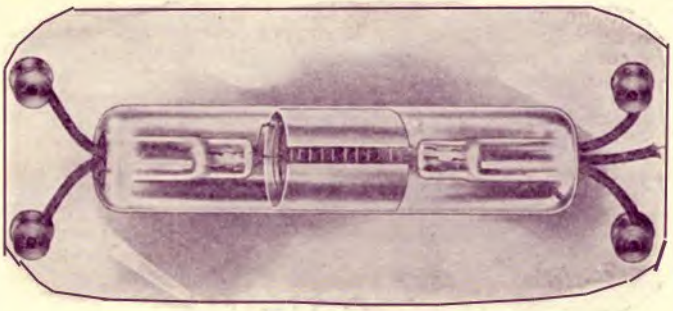
500 WIRELESS OPERATORS WANTED to read our good books on electricity and qualify for better positions in the radio field. Send for circular. Pacific Radio Publishing Co.

GAS ENGINES

BARGAIN—Fine new two-cylinder four cycle ten horsepower Marine Engine, reverse gear, propeller, couplings, large tank, complete $65.00. Wireless apparatus acceptable part payment. V. Mathison, Str. Whittier, Oleum, Cal.

AUDIO TRON

The Only Original and Genuine Tubular Vacuum Detector — Amplifier — Oscillator



Patent Applied For

The Audiotron has smashed all records—Seattle copies OUI in daytime with one tube. Your receiving range will be more than doubled if you equip your station with the genuine AudioTron—not imitations.

The internal action or mode of operation, not the mechanical structure, determines the quality and sensitiveness. The AudioTron differs from all other bulb or tubular detectors since it utilizes the variations, produced by the impressed grid potentials, in a pure electron flow from negative incandescent tungsten to a cold positive plate. Its operation, in no way, utilizes a sensitive gaseous medium.

The genuine electron operated AudioTron is not a "so-called AudioTron", Radiotron or other form of tubular detector. The genuine AudiTron bears that name. Do not be misled.

Double Filament Audiotron . . . $5.25

Guaranteed super-sensitive as a detector-amplifier-oscillator

Delivered free by express when cash accompanies order

Send for catalog of vacuum detector panels and accessories

Biggest Values Ever Offered

AudioTron Sales Co.

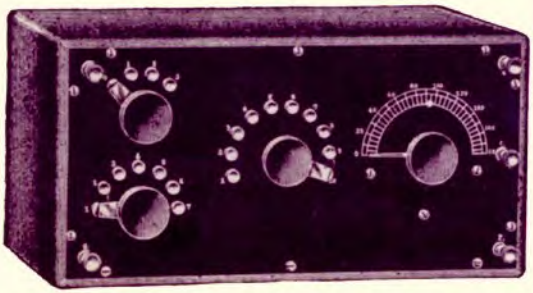
315 Lick Building **San Francisco, Cal.**

Mesco Short Wave Regenerative Receiver

This short wave regenerative receiver or receiver set is particularly recommended for long distance relay work on wave lengths approximating 180 to 450 meters. It is possible, however, to receive wave lengths up to nearly 1,000 meters efficiently with reduced amplification.

The circuit employed is of the well known Armstrong regenerative type with constants accurately calculated for the wave lengths referred to above when employed in conjunction with any of the audion detectors described in this manual.

With this set it is possible to receive undamped and damped waves. When listening to the latter, although the tone of the incoming spark signal is somewhat changed, it is amplified many times when adjusted properly.



List No. 8467 Mesco Short Wave Regenerative Receiver
PRICE, $32.50

It is possible then, under these circumstances, to hear and read stations that would be totally inaudible with ordinary receiving sets. It will increase the receiving range of any station over 100 times.

The receiver is complete in every detail and ready for operation when connected to an aerial, ground, audion detector and telephone receivers. The cabinet is made of weathered oak having all connections brought out on a genuine hard rubber panel which decreases insulation losses.

A blue print of connections with detailed instructions for setting up and operating this receiver is supplied with each instrument. Both tube and round type audion detectors can be used successfully with it.

The metal parts are of brass, nickel polished.

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