employing smaller capacities. This in itself is a considerable saving as the cost of the condenser hardly equals that of the chokes alone.

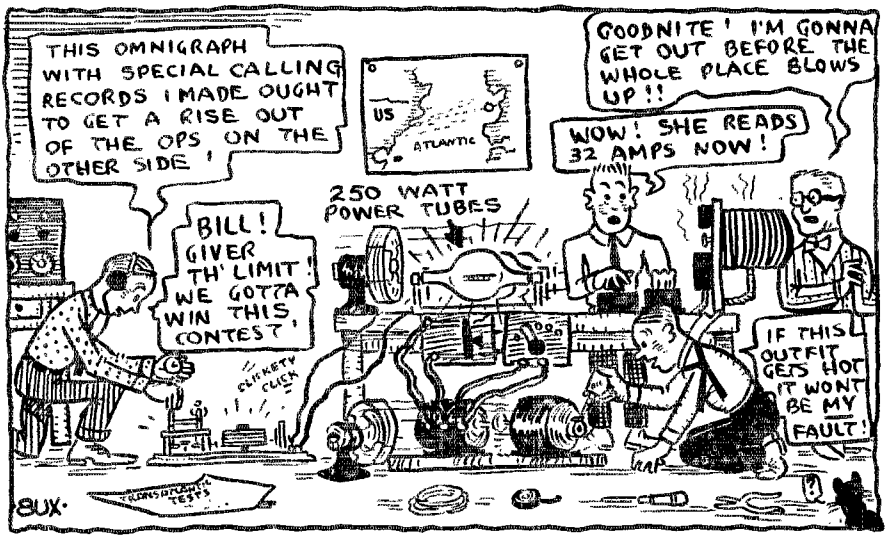
Condensers of this type having capacities of several thousand microfarads are now being used commercially for the correction of power factor on inductive loads, thus showing that they have been fully investigated and developed.

Figure 4 shows both rectifiers and condenser connected to a V.T. oscillator utilizigg 60 cycle a.c. with a transformer for both filament and plate supply. A modulator tube may be added for radio telephone use and of course the oscillator circuit may be modified for various types of feedback.

Godley to England to Copy Transatlantics

THE Traffic Manager came before our Board of Direction at its meeting at Chicago during the Convention and after announcing the plans for the second series of Transatlantic Tests this winter, proposed that the A.R.R.L. send a qualified American amateur overseas to listen for our stations on American apparatus, to supplement the efforts of the British amateurs. The Board thought the idea was a great one and that money so spent couldn't be put to better use in furthering this good old game of ours, and they voted to do it. The next question was who to send. Everybody was agreed that it ought to be the very best practical receiving man in the country, so that we would never feel that there was a better man we might have sent. It was agreed that Paul F. Godley, originator of the three-circuit tuner as far as amateur work is concerned, was the logical man; that in the opinion of the Board Mr. Godley was America's best authority and best operator in short wave receiving. Mr. Godley was asked if he would go to England under the direction of our Operating Department and has accepted the invitation. He sails on the Aquitania on November 15th!

Now doesn't that warm up your sporting blood? Talk about Transcons—we're having Transatlantics now, and WE'RE GOING TO GET OVER!! We have implicit faith in the ability of the British amateurs and in their equipment but the sending of Mr. Godley will instill even more confidence in us American and Canadian amateurs, will be both an inspiration and an urge to greater effort on the part of the British, and will enable the A.R.R.L. to make these tests a free-for-all in which everybody can participate. As originally planned they were to be confined to the more powerful stations who complied with certain preliminary requirements, this being necessary because the British are not such "Boiled Owls" as we North American hams and do not, as a class, relish staying up to all hours, and it was at first thought that the transmitting schedules would have to be limited. But



the sending of an American amateur changes this so that not only will the special stations have individual schedules but everybody else can enter who will. We want everybody to join in this and have some fun. Now is the best chance you will ever have to hang up a real distance record. Don't get the idea that the fellows on the Atlantic Coast are the only ones who have a chance. Inspect a globe and you will learn some mighty interesting things. The general direction of the British Isles from points in this country is *northeast*. Remember that signals travel along the arc of the great circle passing thru the points of origin and reception.

TRANSATLANTIC SCHEDULES BY DISTRICTS

For the Free-For-All Periods

Transmitting Period	Wed. 7th	Thur. 8th	Fri. 9th	Sat. 10th	Sun. 11th	Mon. 12th	Tues. 13th	Wed. 14th	Thur. 15th	Fri. 16th
7:00-7:15	1	2	3	4	5	6	7	8	9	C
7:15-7:30	2	3	4	5	6	7	8	9	C	1
7:30-7:15	3	4	5	6	7	8	9	C	1	2
7:45-8:00	4	5	6	7	8	9	C	1	2	3
8:00-8:15	5	6	7	8	9	C	1	2	3	4
8:15-8:30	6	7	8	9	C	1	2	3	4	5
8:30-8:45	7	8	9	C	1	2	3	4	5	6
8:45-9:00	8	9	C	1	2	3	4	5	6	7
9:00-9:15	9	C	1	2	3	4	5	6	7	8
9:15-9:30	C	1	2	3	4	5	6	7	8	9

Time periods are in Eastern Standard Time. Dates are in December, 1921. Numerals indicate radio inspection districts, the letter "C" standing for all Canadians, who for the purposes of these tests are grouped as one district.

Stretch a string along the shortest path between England and your location. You will see that signals from New England pass over the maritime provinces of Canada, while those from points west of Denver travel across Hudson Bay. The most remarkable thing is that the distance to England from the northwestern states does not seem to be over six or seven hundred miles farther than from our south Atlantic states, and Mr. Godley expresses the belief that because of better refraction and reflection inland stations have fully as good a chance of getting over as north Atlantic coast stations.

Here is the transmitting scheme: For six hours each night for ten successive nights, December 7th to 16th, inclusive, watch will be kept on the other side. Each six-hour schedule will be divided into two parts, the first one running from 7 p.m. Eastern Standard Time to 9:30 p.m., and the second from 9:30 p.m. to 1:00 a.m. The first section each night will be devoted to ten periods of 15 minutes each, and in each period all the amateurs of an inspection district that care to are invited to call England and sign. Instructions on procedure will be given in our next issue. The schedule appearing herewith gives the times for each district, all Canada being considered as one district because of the relatively small number of stations there. It will be noted that the schedule is "rotated" every night so that if one hour is better for transmission than another, every district will have an even chance. As to wave length there is no stipulation—stay where you are if that is desirable, but bear in mind that if you want to increase your chances a hundredfold, get on 200 meters where the British will be listening. We don't know much about the equipment Mr. Godley will take over but we have it from him that it will be sufficiently flexible to cover the usual amateur tunes, including "specials", from 150 to 425 meters. No registration is necessary to transmit in this period; simply open up and observe the schedule for your district. (The listening-hour schedules are suspended during these tests.) If you will imagine yourself a listener on the other side during these periods you will realize that this schedule will make conditions much as if our regular relay work were going on—a flock of stations in operation, some of which are going to come bumping thru and be copied. If you want to be one of them, climb in with us and follow the schedule. Sixth district stations especially invited! And, you spark men!—this is not a C.W. contest; you're wanted, and if you can show up the C.W., more power to you!

Now in the second section of the nightly schedule, from 9:30 to 1:00 a.m., individual schedules will be given to stations who qualify in the preliminary tests (1000 miles overland between Nov. 1st and 6th) as explained in September QST. Applications for this section will be accepted up to Oct. 12th. This 3½-hour section for the ten nights will be evenly divided among the qualifying stations, and cipher combinations assigned them to transmit. Schedules will be furnished them, and again the

transmitting periods of each station will be "rotated". Such stations are also invited to participate in the free-for-all period of their respective districts, as well.

Outside of our office the only copy of the matter to be transmitted will be in the hands of Mr. Philip R. Coursey, British 2JK, of London, who is in charge of reception arrangements in England. We are asking Mr. Coursey to arrange for witnesses to sit in with Mr. Godley to verify all reception, and records made on any of the special-schedule stations transmitting cipher combinations will be subject to verification by Mr. Coursey after checking with his copy. All Mr. Godley will have will be a schedule of hours and wave lengths—the same as the other listeners there.

Paul Forman Godley

A few words concerning the man we are sending overseas to represent us will be of interest. Paul Forman Godley, member of the A.R.R.L., I.R.E., R.C.A., and of our A.R.R.L. Advisory Technical Committee, was born at Garden City, Kansas, Sept. 25, 1889. He migrated eastward thru Missouri, Iowa, Illinois, Indiana, and finally at college age found himself in Ohio and very much interested in communication methods. He attended Defiance College at Defiance, Ohio, for five years, summers and an occasional odd term being devoted to telephone and telegraph work with railroads and commercial companies as lineman, operator, wire chief and train dispatcher. During this period he displayed great enthusiasm for radio but the available literature on the subject was not abundant ("Scientific American" articles and the E.I. catalog) and it was not until 1908 that the first specimen of a commercial wireless station was encountered, in Chicago. Mr. G. promptly attached himself to this outfit and began getting experience as a wireless operator and installation man. Early in the summer of 1909 he was placed in charge of the Grand Rapids station of the United Wireless Telegraph Co. and in the fall of that year concluded an agreement with Dodge's Institute of Telegraphy at Valparaiso, Ind., whereby a 1½ k.w. spark set was installed at that place and a course in wireless instituted under Mr. Godley's direction. The year of 1910 was spent in study at the University of Illinois, while the fall of 1911 found him directing installation of equipment and outlining a course of instruction for the Collegiate Institute at Port Arthur, Texas. During the greater part of 1912 the Postal company availed themselves of his services as wire chief at their main New York Office, while early 1913 found him on the Amazon River in connection with the institution of an "Amazon-to-the-Andes" radio service for the Brazilian government, and his experiences during this period were of great variety and value. He returned to the States in the summer of 1914 and began study and research work at his home in Leonia, N. J., where the short wave regenerative receiver with which all American amateurs are now familiar was developed. Station 2ZE was put into operation the following spring and captured all distance records, and traffic was handled with great consistency in daylight work from Albany to Leonia to Baltimore and Philadelphia.

The first real information of value to amateurs regarding the great possibilities of the audion was contained in his paper, "Applications of the Audion", which was read before the Radio Club of America, New York City, during the winter of 1915-16 and published in QST the following fall. We mean to say that Mr. Godley is the man who took the Armstrong circuits, theretofore considered impracticable for short-wave work, and adapted them to amateur work. The credit is his for making possible present day amateur reception, and he gave us amateurs our first short-wave regenerative receiver. In 1915 he became a member of the firm of Adams-Morgan Co., Upper Montclair, N. J., and fathered the development of "Paragon" radio apparatus. During the late war and subsequently he served as designing engineer at the Marconi factory at Aldene, N. J., in charge of receiver design, and apparatus which he developed during this period for Army and Navy use brought considerable credit to him, his Signal Corps

considerable credit to him, his Signal Corps receiving equipment being the only American-built apparatus mentioned in the report of the Chief Signal Officer to the Secretary of War. He has but recently completed important radio survey work for the Independent Wireless Telegraph Co. and is again to be found in Montclair with his own company which is making several worthy additions to the list of amateur radio equipment.

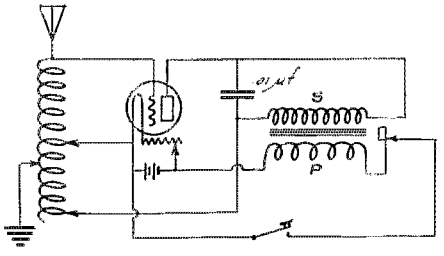
In October, 1918, Mr. Godley married Miss Elizabeth Harper Harold of Montclair, N. J., and we have just congratulated him upon the arrival of a second child, Paul Forman Godley, Jr.

To work, then, men! The A.R.R.L. is calling to every American and Canadian amateur to do his part to make these tests a success. We need help in two ways: first, listen for the stations in the preliminary tests, 7 p.m. to 3 a.m., Nov. 1st to 6th, and report everything heard for verification of their range; second, get in on the transmitting, per schedule. We want enough power radiated so that "Paragon Paul" will hear us. He is relying on us to do our part and we need not worry about him—he will do his part.

Spark Coil C.W.

3JJ, Washington, D. C., has a simple little C.W. set supplied by a one-inch spark coil, the circuit, being shown in the annexed diagram.

The inductance is an old home-made three-slide tuner wound with No. 22 bare wire. The condenser across the coil secondary is of copper-mica construction and about .01 mfd. capacity, enough load



to bring the voltage down far enough to prevent endangering the tube. A Western Electric "E" tube is used, and all the power is supplied by one 6-volt battery. Difficulty is experienced in getting enough current thru the coil secondary—it should be specially wound for lower voltage and higher current.

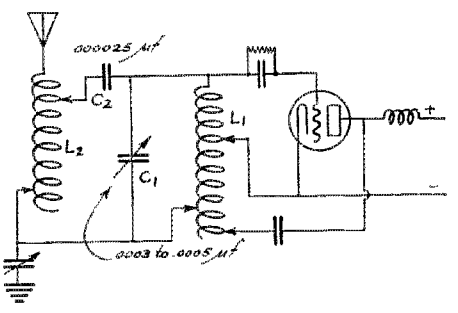
With a total input including filament of 20 watts, this set has worked 3HG in Baltimore, 40 miles. Considerable experimenting has been done with various vibrator frequencies and it was discovered that while, locally, a 500-cycle tone was just as strong as lower frequencies, a 60-cycle supply heterodyned more pleasingly and carried better at a distance. To get this low tone a chunk of solder is fastened to the end of the vibrator. No antenna current can be detected with the present set, the energy is so small, but the set can be tested for oscillations by listening on the receiving set. When oscillating it produces a smooth hum similar to a non-rectified C.W. set, but when not oscillating it has a rough scratchy sound.

Locally in Washington the spark-coil alone is fifty times as loud, but the C.W. carries many times as far.

Preventing C.W. Swinging

A NEW wrinkle, or rather a new application of an old idea, appears in the constant-frequency circuit recommended by the Radio Corporation in their new handbook on C.W.

It is well known that C.W. signals will swing violently when the transmitting an-



tenna is rocked in a hard wind, and heretofore the so-called "master oscillator" has been the only solution proposed. This scheme utilizes a low-powered tube, connected in a local circuit with concentrated inductances and capacities, as a generator of oscillations of the proper frequency, the power tubes then being used merely as power amplifiers, the output voltage of the master oscillator being applied to their input.

As an alternative, and saving the expense of additional tubes, etc., the circuit shown herewith is proposed. Any oscillating circuit may be used but in the one illustrated L_1 normally would be the antenna inductance, with antenna and ground connected to it. Now, however, it is shunted by an adjustable condenser C_1, variable in steps to simulate the capacity of the antenna, adjustment being made as with a phantom antenna. Then across

(*Concluded on page 34*)