shore. The young fish first appear in northerly waters in August, and at that time they are about five inches long. They grow with great rapidity, and by the following season have usually attained a length of from twelve to fifteen inches. Subsequently the increase in size is even more rapid, and it is said that bluefish weighing as much as twenty-five pounds have been caught off the Massachusetts coast, while eight and ten-pounders are not rare. The average weight of those taken in the coastal regions of New York, New Jersey, and New England is between three and five pounds. The fish is bluish or rather greenish in color, with a silvery underbody and a dark blotch at the base of the pectoral fin. It is one of the most voracious feeders upon other inhabitants of the sea, and represents an extremely important factor in fish mortality. Traveling rapidly in great schools, it ferociously attacks similar schools of other fish little inferior to it in size, often destroying many more of these than are required for its food, and it has been found that this excessive voracity characterizes the young as well as the old. They feed principally upon gregarious fishes, particularly the menhaden, upon squids, and upon certain kinds of marine annelids. They are sometimes found in large rivers, and, for instance, they are caught in the Hudson as far up the stream as the set of the tide is perceptible.

Between the eastern end of Long Island and Cape Cod, bluefish in great numbers are caught in weirs or pounds, and in still greater quantities in gill nets. Line fishing, especially along the New Jersey coast, is also employed, and this method is largely resorted to in supplying the New York market. When caught with rod and line the bluefish offers excellent sport to the fisherman, for not only is the prey intelligent and resourceful, but he is a game fighter as well. Hook and line for bluefishing are used in trolling, "chumming," or in heaving from the shore. A light rod with artificial minnow or shrimp bait is usually employed in catching young bluefish, or "snappers," as they are called in the South.

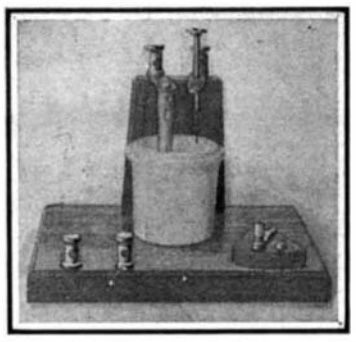
The accompanying illustrations are from photographs taken at a typical bluefishing hamlet on the Jersey coast, Galilee near Seabright. The method here in general use is known as "chumming," though a small number of bluefish is caught by means of seines together with flounders, mackerel, and other marine inhabitants. The fishermen, who are hard-working and intelligent, use heavy surfboats not unlike large dories with square sterns. Realizing the value of auxiliary motive power, the owners of these boats have generally installed in them four or five horse-power gasoline engines, discarding the oars, and thereby relieving themselves of considerable arduous labor, and consequently having more time to devote to the actual operation of fishing. The boats leave very early in the morning, and usually return by four o'clock in the afternoon. The catch is generally sold to wholesale dealers having warehouses at the landing place or in the village, though not infrequently the fishermen themselves pack and ship the bluefish to dealers in New York. As a rule, however, they prefer to sell to the middleman on the ground, thus avoiding the trouble of packing, icing, and freighting.

The bait used along the New Jersey coast is the mossbunker or menhaden, a gregarious fish about six or eight inches long, which is found in great schools off the coast. The bait is sold to the bluefishers by men whose sole occupation is the catching and selling of the mossbunker. The latter is obtained by means of seines set on the shallows off the shore, and a large power boat is employed for gathering and delivering the menhaden for the next day's bait to the fishermen late in the afternoon after their return from the day's work. The mossbunkers are cut into small pieces, and these are used for baiting the hooks. The bait is furthermore employed in a curious manner for attracting the prey to the vicinity of the boat. Each of the boats contains a meat grinding or chopping machine—a piece of apparatus hardly to be expected in a small fishing craft—and by means of this device a quantity of the menhaden is ground up into a thick oily paste, known as "chum." When the fishing boat has been anchored upon the banks which the bluefish frequent, a quantity of the "chum" is thrown overboard, and the tide or currents slowly float it along the surface in a great widening, oily streak, known as a "slick." This at once attracts the greedy bluefish, who rush at it in large numbers, gobbling down the floating fragments and eagerly seeking bits more generous in size. These they soon encounter, but as the larger pieces are unpleasantly associated with barbed hooks, the bluefish is soon flapping vigorously but ineffectually upon the bottom boards of the boat. The fishermen, of course, exercise great care to throw out their lines within the area of the "slick," and move about from time to time as circumstances require, their anchors being rather primitive affairs which are easily raised and lowered. At the end of the day's fishing the boats are run up on the beach, often upon short wooden rollers, and a quantity of sea water is thrown into the bottom of the craft. The fish are then cleaned and washed and tossed into two-wheeled carts, by means of which they are transported to the warehouses, to be shipped a few hours later to the neighboring cities, where they are consumed.

AN ELECTROLYTIC WIRELESS RECEIVER.

BY D. L. BEARDSLEY.

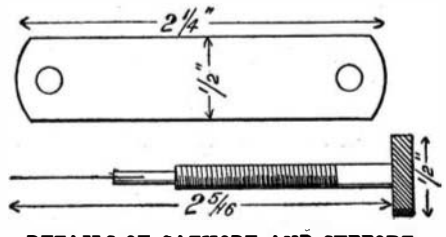
Most Hertzian wave detecters are more or less complicated, and few are very satisfactory. The writer has experimented with many kinds, and has at last evolved one which has given the utmost satisfaction, receiving the most distant messages very clearly and sharply. This detecter is electrolytic in its action, and it consists of a cell in which a zinc anode and a platinum cathode are used with an electrolyte of dilute sulphuric acid. An important advantage of this



AN ELECTROLYTIC WIRELESS RECEIVER.

receiver is the fact that it requires no battery, as it is a battery in itself.

The following are the instructions for making it: Prepare a base about 3 inches square of hardwood. At one side, parallel to the edge, erect a standard of hardwood, ½ inch thick, 2 inches wide at the bottom, tapered to 1½ inches at the top, and 3 inches high. Cut out two pieces of brass, 1¾ inches long, ½ inch wide, and 1-16 of an inch thick. One of these pieces, which will serve to support the anode, should have a 3-16-inch hole drilled at one end, and the other strip, which is to support the cathode, should be drilled and tapped for an 8 x 32 machine screw. These strips of brass are to be fastened to the top of the standard ½ inch apart by wood-screw binding posts, and should be provided with ¼-inch holes to receive the threaded shanks of the binding posts. Cut off a 2½-inch length of common battery zinc, and thoroughly amalgamate it. This may then be fastened to the untapped brass strip with an 8 x 32 machine screw, threaded into the end of the zinc. The depending end of the zinc should enter a small glass jar of about 1½ inches diameter and 2 inches high. For holding the cathode make an 8 x 32 machine screw of brass 1½ inches long with a knurled head. File down the end to a diameter of 3-32 inch, and split it with a fine jeweler's saw. Take a very fine piece of platinum wire (if Wollaston wire



DETAILS OF CATHODE AND SUPPORT.

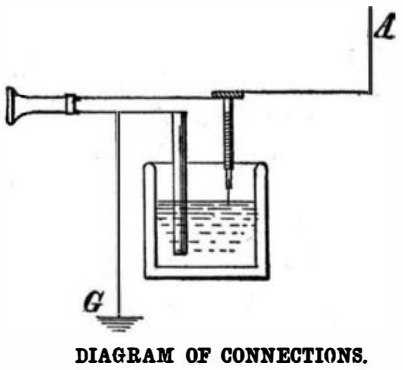


DIAGRAM OF CONNECTIONS.

can be obtained so much the better, but very fine platinum wire will do) about ¾ inch long, and place one end in the fine saw cut, after which close the kerf onto the wire by means of a vise. The screw may now be threaded into the tapped hole of the cathode-supporting strip, and screwed in far enough to bring the platinum wire within the cup. The cup should be filled with a ten per cent solution of sulphuric acid. The electrical connections may be made as shown in the diagram; the aerial being connected to the cathode supporting strip, the other strip being connected to the ground, and the two terminals of a telephone receiver being connected respectively to the two strips. Place the telephone to the ear, and feed the cathode down by turning the screw until a click is heard. This will indicate the position in which the detecter will work to the best advantage.

Tax-Freed Alcohol Assured.

The act removing the Internal Revenue tax on alcohol, passed recently by both houses of Congress, has been approved by the President and is now a law. It is expected large industries will be benefited by this legislation, and a way opened for the farmers in every section of the country to secure benefits of much utility and economy from their former waste products.

The act provides for the withdrawal from bond, tax free, of domestic alcohol when rendered unfit for beverage or liquid medicinal use by mixture with suitable denaturing materials, for use in the arts and industries, and for fuel, light, and power.

It also provides for the establishment of registered distilleries in which the denaturing of alcohol can be done, and regulations for rendering returns to the Commissioner of Internal Revenue. Penalties are provided for violations of the act. Manufacturers are privileged under certain regulations to recover the alcohol used in any process, for use in further manufacturing. The Commissioner of Internal Revenue may employ for a period of two years additional chemists, agents, inspectors, deputy collectors, clerks, laborers, and other assistants for the prompt and efficient operation and enforcement of the law, and without compliance with the conditions of the Civil Service law. Two hundred and fifty thousand dollars is appropriated to purchase the necessary instruments, etc., for carrying out the purposes of the act.

The Secretary of the Treasury is required to make a report of the appointments and regulations prescribed, at a succeeding session of Congress, and also upon the need of any additional legislation. The act is to go into effect on January 1, 1907.

It is proposed to denature or poison the alcohol with wood alcohol, and it is expected so much of the latter will be needed for this purpose, that its production will be greatly increased.

It is believed many new distilleries will be located in the agricultural sections of the country, conveniently accessible for the utilization of the surplus grain and other products, for purposes of alcohol extraction. In large manufacturing operations the new alcohol will be of great value and utility, especially in the hat industry, where the present use of wood alcohol has proven so detrimental to the health of the employes.

The extensive use of alcohol in Germany has proven to be of much benefit. For power purposes it is found to be more efficient than gasoline, and less dangerous, while its cheapness, only seventeen cents per gallon, makes it a highly economical power agent.

The manufacturers' committee organized to promote and bring about this legislation is deserving of much praise, in the practical way the matter was brought to the attention of and pushed through Congress.

The Current Supplement.

The current SUPPLEMENT, No. 1591, opens with a well-illustrated article on the "Lusitania," the new Cunarder, which has just been launched and which is the largest ship thus far designed. During the past twenty-five years engineers have applied internal-combustion motors to all manner of uses. They have adapted motors to the consumption of many different kinds of inflammable gases and vapor, and they have continually increased mechanical and thermal efficiencies, until at the present time the gas engine is competing with steam in almost every field. Dugald Clerk in a most exhaustive paper on internal-combustion motors discusses the various forms of engines which have contributed to this industrial advancement, and throws out some helpful suggestions for their improvement. How some waste materials may be utilized will be of interest to the manufacturer. The wastes treated are amber, paraffine, fur, parchment, paper, and mother-of-pearl. Stanley's new system of transmitting and utilizing low-frequency currents is described. The last installment of the article on "Canals: Ancient and Modern," is published. Among the minor articles of interest may be mentioned "Concrete as a Roofing Material," "Preparation of Modern Cereal Breakfast Foods," "Influence of Light and Heat on Germination," "The Collective Intelligence of Bees," "Photographs of Projectiles," and "Oolong Teas and Their Manufacture."

Two parts of aluminium and one part of zinc form an alloy to which has been given the name "alzene." It is equal in strength to good cast iron and superior to it in the matter of elastic limit. It takes a fine, smooth finish and does not readily oxidize. The color is white. It melts at a low red heat and is very fluid, running freely to the extremities of the mold and filling small or thin parts. Great care must be exercised in melting it, particularly when mixing the two metals, in order to preserve its smooth working qualities. It is somewhat brittle and hence unsuited to such pieces as require the toughness possessed by brass. The tensile strength is approximately 22,000 pounds per square inch and 3.3 is the specific gravity. —Iron Age.