patent for this improved harvester reel has been granted to Mr. Ben ami Selph, of Hillsboro, Ohio.

IMPROVED VENEER BASKET.

A patent has recently been granted to Mr. Edgar Aber, of Jacksonville, Tex., for an improved veneer-basket. The basket belongs to that class which is now extensively employed in the packaging and shipping of fruit, and the invention lies in an improved construction whereby the article is made much lighter and stronger and does not require as much veneer stuff in its manufacture. Provision is also made for the secure attachment of the handle without the

IMPROVED VENEER BASKET.

necessity of nailing or stapling the same in place, thus allowing the handles to be placed in the bottom of the baskets when it is desired to nest the baskets and stack them for shipment or transportation. This is shown in Fig. 3 of our illustrations. The body of the basket is formed of two sections each bent from a single section of veneer so as to produce the bottom and two sides. The bottom is further strengthened by a long piece of veneer extending the full length of the basket and bent up at each end. These end portions are slitted as indicated in Fig. 2 to form an upstanding splint and two tongues. End portions of the basket are secured by these slitted ends, being held between the splints on the outside and the tongues on the inside. The end portions, as shown, are curved to close the corners of the basket. The usual reinforcement bands around the top hold all parts securely. The handle portion, which is bent to the shape shown in Fig. 4, is provided with a groove on each leg. The width of these grooves is equal to that of the outer band on the edge of the basket, so that when it is desired to fix the handle in place, the legs which are sharpened at the ends, are forced in between this band and the body of the basket until the band snaps into the grooves on the handle as shown in Fig. 1. A cover is also shown in this view which may be employed when desired. This cover rests upon the top edge of the basket and is secured by metallic fasteners designed expressly for this purpose. From the foregoing description it will be readily seen that Mr. Aber has invented a basket of very strong construction which may be cheaply and easily made and which can be very conveniently stacked for shipment.

A SIMPLE AND EFFICIENT WIRELESS TELEGRAPH RECEIVER.

BY A. FREDERICK COLLINS.

It is not often true that the cheapest appliance is the best, or the simplest apparatus the most efficient, yet there never was anything to which this seeming paradox could be applied more literally than the receiver about to be described for wireless telegraphy.

There are at present two distinct types of receivers employed in translating electric waves impinging on the coherer into readable Morse. The first is by means of a relay wound to high resistance and placed in series with a dry cell, and having in the auxiliary circuit a tapper for decohering the filings and a Morse sounder or ink-writing register. The second type is the acme of simplicity, cheapness and sensitiveness, and inasmuch as Marconi used this form in receiving the letter S in his first Transatlantic cableless signals, it may prove interesting to those who are following the advance of the art, as well as to those experimentally engaged in it, to detail its construction. In a word, this receiver consists of three parts only, namely, a coherer, an ordinary telephone receiver and a dry cell; while supplementary to these are the vertical wire or antenna and the earthed connection.

In the SCIENTIFIC AMERICAN of September 14, 1901, the writer described an experimental coherer, one that is eminently adapted for this new type of receiver, but even the turned brass work of this coherer may be dispensed with and one substituted for it that may be constructed for a few cents.

The requirements are two binding posts, probably largest size, of the class known as double wood screw posts; these have two openings in each post, and are fitted with two set screws. A hardwood base, 3 inches wide, 4 inches long and ½ inch or ¾ inch thick should be provided, and the posts screwed into the surface at a distance of 1 inch from the ends. Two pieces of straight brass wire 2 inches in length and of such diameter that they will slide easily, yet not too loosely, through the apertures of the binding posts, are now provided. A piece of glass tubing 1 inch in length and having a bore of exactly the same diameter as the wires or coherer plugs, as they are termed, completes the coherer, with the exception of the powder or metal filings. Instead of silver or nickel filings, usually employed in coherers, carbon granules such as are found in telephone transmitters are used, or if these are not to be obtained easily a piece of arc light carbon may be powdered and this inserted in the tube. The amount required may be roughly estimated at 1-16 inch in length when compressed between the coherer plugs.

A carbon coherer has a great advantage over a metal filing coherer, in that it is seif-restoring, that is to say, no tapping is required to decohere the particles, but it assumes its normal high resistance the instant the incoming electric wave ceases to impinge upon it. Another point in favor of the carbon coherer is that the tube does not require exhaustion, since carbon does not oxidize in air like metals. Iron filings are also self-restoring to a certain degree and may be used if desired.

To increase the sensitiveness of the coherer the ends of the brass plugs that are inserted into the glass tubing may be immersed for a moment in sulphuric acid and then dipped in mercury, the ends thus being amalgamated, after which the ends should be wiped with a dry cloth. The thin film of mercury will prevent the oxidization of the ends of the plugs.

After the carbon is placed in the tube insert the plugs. Fig. 1 shows the coherer complete. A telephone receiver of any description may now be pressed into service. A very excellent type of a telephone receiver known as the "standard" may be had for a dollar or less, but in lieu of this a pony telephone receiver may be employed with good results; however, the higher the resistance of the receiver coils the greater the sensitiveness of the receiving apparatus as a whole.

Our next step is to connect the coherer and receiver with a dry cell. In the lower opening of each binding post insert a piece of insulated wire—flexible wire is the best. Then connect the free end of one wire to a binding post of the telephone receiver; to the negative element of the dry cell connect the terminal of the other wire leading to the second binding

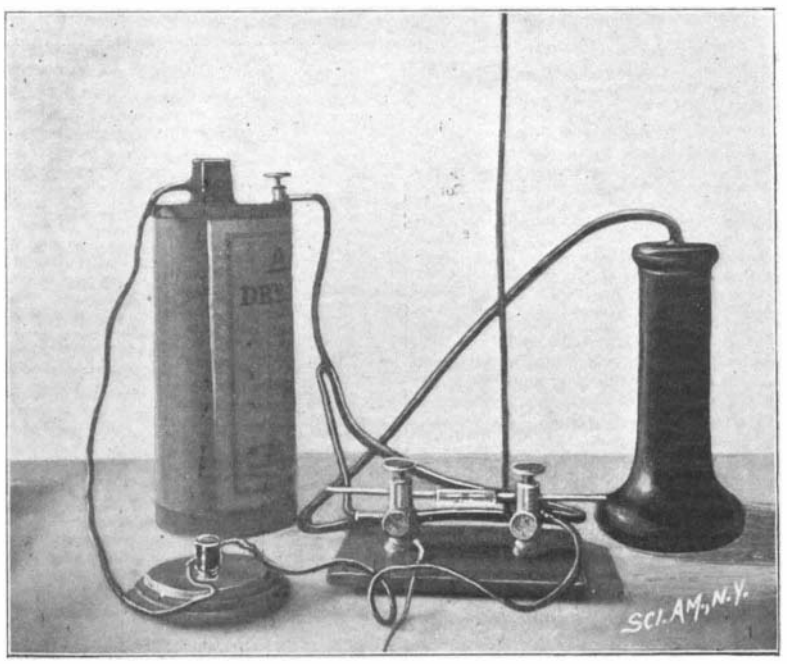

Fig. 1.—CHEAP WIRELESS TELEGRAPH RECEIVER.

post. The carbon of the cell is now connected with the other binding post of the telephone, or in other words, the coherer, dry cell and telephone receiver are connected in series as shown in the diagram, Fig. 2. A switch may be inserted in the circuit as shown, this saving time and trouble in throwing the current on or off. The antenna or vertical wire may be of No. 14 or 16 insulated, or bare wire or annunciator wire will answer the purpose admirably. This should be at least 30 feet in length and suspended outside the building from insulators either of glass or porcelain, and just as nearly vertical as possible until the level of the instrument is reached, when the wire may be bent at right angles and lead to the coherer. A wire of the same size leads to the ground and is soldered to a copper or zinc plate 12 inches x 12 inches, buried in the earth to a depth of a foot or two. A copper plate of the same size may be attached at the upper end of the vertical wire, exposing a greater surface for the reception of the waves.

This is the complete wireless telegraph receiver and only requires adjusting to be ready for immediate use. To obtain the maximum sensitiveness of the coherer withdraw one of the plugs from the granules until it barely touches them; now close the switch and place the telephone receiver to the ear, gradually slide the plug into contact with the carbon, giving it a turning motion to secure a finer adjustment. At first there

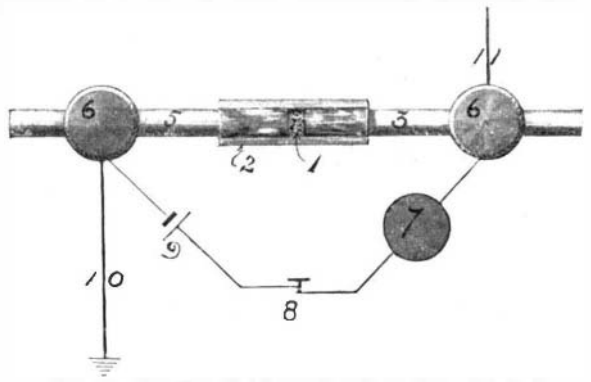

Fig. 2.—DIAGRAM OF WIRELESS TELEGRAPH RECEIVER.

will be no sound in the telephone receiver, but when the resistance of the granules is sufficiently reduced the current will commence to flow through the circuit and the varying degrees of contact caused by the current changes the resistance constantly and the telephone receiver responds accordingly. If the conductor plugs are forced in too tightly the carbon particles will become packed and the resistance lowered to such an extent that the current flows through the circuit without producing any audible effect; thus a value must be found between the maximum resistance when the conductor plugs are separated and the minimum resistance when they are forced tightly together. When the proper value has been ascertained the diaphragm of the telephone receiver will vibrate with a correspondingly great amplitude and the sounds will be the loudest; when this degree is obtained screw the conductor plug down firmly and open the switch.

To receive a message, simply place the receiver to the ear and close the circuit. When the waves are emitted from the distant station broken up into dots and dashes the telephone receiver will reproduce them by a series of rapid vibrations that are characteristic and easily differentiated by the listener.

There is another use to which this wireless receiver may be put, and this is the study of atmospheric electricity on the difference of potential between the strata of charged air through which the antenna passes and the earth immediately under it. For instance, if the air is charged positively the earth will be represented by a negative charge, and this difference will in equalizing in the coherer produce marked audible effects in the telephone receiver; to the trained observer storms may be determined with considerable accuracy, though they may be raging many miles away at the time.

In all of the portable wireless telegraph systems now in use in the different armies this form of receiver has been adopted, because of its compactness, lightness, sensitiveness, speed, permanency and ease of adjustment.

It has for practical wireless telegraph purposes one objectionable feature, and that is its aptitude for registering atmospheric disturbances and thus often confusing the operator who is interpreting the Morse code, by false jamming. Operators, however, become so thoroughly proficient in deciphering the messages that they are usually able to eliminate the false from the true wave impulse.

From Chicago comes the news that woman has conquered still another field, over which man formerly reigned supreme. She is now employed in the stockyards in Chicago, the last place in the world that one would expect to find her. To be sure, she does not actually slaughter the animals, but even that may come in time. In the packing and canning factories some thousands of women have taken the places of men; if the business grows, as it has done in the last three years, thousands more will find positions. The work is light, is technically called "kitchen work," and consists in the cutting of dried beef, packing of cans, stuffing of sausages, etc.