carbon disk is suspended by a silk thread from a spool formed on the inner end of a screw extending through the box cover, and capable of being turned so as to raise or lower the carbon disk, as may be required. The disk is slightly inclined from the perpendicular, and the line of contact between it and the carbon pencil is a little above the center of gravity of the disk. This arrangement of the two carbons prevents any marked break in the local circuit, as the disk tends to rock on the carbon pencil rather than fly from it when the diaphragm is set in vibration. The carbon disk has been saturated with melted paraffine in some instances with beneficial results.

The clamp which holds the carbon pencil is electrically connected with the lower hinge of the box. From the hinges the connections may be more easily traced in Fig. 5 than in the perspective views.

This diagram shows all of the connections for one end of the line, both ends being alike. The connections are shown in condition to call or receive a call. When a call is received the current passes from the line through the switch, E, button 2, key, bottom or outer contact of the key, bell-magnet, and ground wire, A, to the ground. When the key is depressed to call a distant station, the key touches the inner or top contact, on the battery wire, B, sending the current through the button 2, switch, E, and line to the bell and ground of the distant station. The current returns by the ground and wire A, to the battery. After calling, the switch E, is moved to button 1, and the switch F, being connected with the switch E, by an insulating connection, is at the same time moved to button 3, as shown in dotted lines. Now the line connection is through the switch E, button 1, wire G, secondary wire of the induction coil, and receiver to the ground. The switch F, when turned as described, completes the local circuit, the current passing from one cell of the battery through the wire D, switch F, button 3, transmitter, primary of the induction coil, ground wire A, and wire C. The connections are now correct for talking. The diagram shows the connections adapted to the class of transmitters employing but a single battery element, and to a line requiring several cells of battery to call. If a single cell of battery is sufficient to call, the posts of the wires B D, will be connected together.

The button which moves the switch extends through the side of the box below the hook upon which the receiving instrument is hung. This arrangement insures the readjustment of the switch after talking, as the receiver cannot be hung up until the witch is pushed in.

Three layers of No. 18 silk covered wire form the primary of the induction coil, and the secondary consists of some ten or twelve layers of No. 36 silk covered wire.

The receiver, shown in section in Fig. 4, has a diaphragm of the usual size mounted in a hard rubber case $2\frac{1}{8}$ inches in internal diameter and 1 inch deep. The bobbin of the usual style is placed on a soft iron core having a large convex head, and held in place by a screw extending through the bottom of the case. A soft rubber button is placed between the casing and the convex end of the core, and eight curved permanent magnets, one-eighth inch thick and one-quarter inch wide, touch the convex end of the bobbin core and are pressed upward into contact with the diaphragm by a rubber ring at the bottom of the case. The diaphragm at its points of contact with the magnets is freed from japan or oxide, and the ends of the magnets are let into notches cut in the case, so that when they press upon the diaphragm the latter is backed by the mouthpiece.

This receiver is very compact and light, and as to efficiency it is all that can be desired.

The transmitter works well, is perfectly simple, requires no particular care in its manufacture, and never gets out of adjustment.

Mining, Metallurgy, Mineralogy.

REDUCING ORES.

Levi Stevens, of Washington, D.C., who, it will be recollected, was in San Francisco some years ago with a patent furnace for smelting ores by petroleum, has devised another process of reducing ores. There was considerable excitement at the time of his visit here, on the subject of low grade ores, and he sold rights to use his furnace, for an aggregate sum of \$40,000 or \$50,000, though it never came to anything.

His new furnace is triple in its character, by which it performs the threefold office of smelting, matting and roasting in one continuous operation. The products of combustion, after performing their function of smelting the ores, operate further summarily to mat and roast them.

In connection with this furnace he has a process of reducing ores by forcing superheated steam together with air through incandescent coal in a gas generator, thereby producing rapidly a large quantity of gas of high heating quality. This inflamed gas is conveyed in its highly heated condition immediately onto the ore.

A hot air chamber is placed in the top of the gas generator, and in connection with an air jacket, covering, or partly covering, the top of the furnace. Through the air jacket is forced atmospheric air, which serves to absorb the heat that would otherwise be radiated from the top of the furnace, and conveys it to the hot air chamber, from which it is discharged in the form of a hot blast, to perfect the combustion of the gases as they pass the bridge wall. The body of the furnace is made in the form of an inclined shaft, comprising, in sequence, a smelting, a matting, and a roasting chamber. The bed of each of a series of shelves above the matting furnace is formed with openings, through which air is admitted, and through which, also, the ores can be moved from any shelf to the one below, and so on down, exposing the said ore to the action of the heat from within the furnace, and also to air drawn in through the openings, as they are moved from the upper to the lower shelves; and keeping each charge of ore separate from the more thoroughly roasted ore below, and the less thoroughly roasted ore above, until moved into the matting furnaces from the lowest shelf.

After the fire had been built in the gas generator or fire box, and the fuel is incandescent, ore is put in through a hopper. Superheated steam is injected into the ash-pit. This produces a powerful blast through certain parts, and the dry steam and air are forced up through the incandescent fuel. The steam is decomposed into its elements, thus aiding combustion. The hot products of combustion, at a turning point provided by the construction of the furnace, are met by a current of hot air. These joint currents, producing almost absolute combustion of the fuel, and multiplying the quantity of inflammable material by reason of the additional hydrogen, or carbureted hydrogen, derived from the injected steam, thereby, the inventor says, giving to the incandescent gases, which are finally deflected upon the matted ore on the bed of the melting chamber, an intensity of heat, which only the most refractory substances can resist.

The products of combustion, having thus operated to melt the ore, continue on through a chamber where they mat the ore still on its way to the melting chamber, and next through another chamber, where they encounter air entering through other openings, which serves to ignite them afresh, thus aiding the operation of roasting. This accomplished, the gases pass into the chimney and escape, the inventor having done about as much with them as could be expected.—*Mining and Scientific Press.*

THE ALASKA MINES.

DESCRIPTION OF THE NEWLY DISCOVERED DISTRICT.

While the southern Territories of the United States are just now attracting a large share of attention from the mining community, the northern Territory of Alaska is also putting forth its claims as a mining region; and it is probable that the coming summer will see many prospecting parties in the field. Last year there was considerable prospecting done, but the winter of course, stopped work generally. It has been somewhat difficult to get any reliable news from the various camps which are being opened, and reports have been somewhat conflicting. Mr. Geo. E. Bilz, who is now at Sitka, writes, however, to the *Mining and Scientific Press*, a letter in which he communicates considerable information of interest concerning the mines; and as he has evidently personal knowledge of the matter, his statements are more direct than any before received. Mr. Bilz's letter is as follows:

EDITOR *Press*:—I think it probable that as you have not heard for a long time from this part of the coast (Sitka), a few notes in regard to certain newspaper reports may be of advantage to the readers of the *Mining and Scientific Press*. During the past summer, feeling confident of the mineral wealth of Alaska, I fitted out seven different parties to prospect, each with six months' provisions and equipments. I also paid each party, which consisted of five or six men, regular wages; as otherwise I could not expect to have the prospecting of the country done to my own satisfaction.

The last of the seven parties returned in the latter part of