

ute and "keeps cool." Of course there is a great consumption of fuel. In 180 miles 12,000 pounds of coal are used up. The water tank contains 3,000 gallons, 400 more than is usually carried. Everything else is on a proportionately large scale. Only the delay in getting boilers sufficiently large has prevented the completion of two others of nearly the same pattern.

NOVEL CANDLESTICK.

The engraving shows a candlestick which has a candle receptacle formed of elastic fingers capable of fitting can-



NOVEL CANDLESTICK.

dles of different diameters, and it has a case for matches contained within a hollow pillar supporting the candle receptacle.

The hollow pillar bearing the candle receptacle is permanently fixed to a base plate, and the match case, which is entirely separate from the other parts, is introduced into the pillar through an opening in the base plate, and kept there by spring catches. It is readily removed to expose the matches.

This invention has been patented by Mr. M. Brassill, of Hartford, Conn.

NEW TELEPHONE TRANSMITTER.

We give an engraving of a new transmitting telephone, patented by Mr. E. Berliner, of Boston, Mass., and owned and made by the American Bell Telephone Company, of that city. Fig. 1 is a front view and Fig. 2 a perspective view showing internal parts.

The instrument is very simple and compact, and has the all important advantage of not being liable to disarrangement.

The principal feature of the invention is the disposition of the carbon contact surfaces, one being attached to the diaphragm, the other being supported by a metal socket attached to a hinged plate secured to an arm that projects from the back of the mouthpiece downward over the diaphragm. This arm serves the double purpose of supporting the free carbon electrode and clamping the diaphragm in its place against the back of the iron mouthpiece. The diaphragm is bound around the edges with soft rubber, and is separated from the mouthpiece by a ring of pasteboard. The iron mouthpiece is hinged to a casting fastened to the cir-

cular box which contains the induction coil and supports the binding screws for the battery, line, and ground wires. To the front of the induction coil is attached a plate connected with the battery wire, and carrying a spring having in its free end a screw which bears against a spring connected with the center of the diaphragm and acts as a dampener as well as a conductor, through which the current passes to the carbon electrode at the center of the diaphragm. The battery current enters at one of the binding screws, passes through the primary wire of the induction coil, through the

spring and carbon electrode at the center of the diaphragm, through the hinged electrode, metallic mouthpiece and its hinge, and back through a binding screw to the battery.

The variation of the current in the primary circuit occurs at the contact of the two carbon electrodes, the contact being varied by the vibration of the electrode attached to the diaphragm.

When the transmitter is used for long distance telephony, the pendent carbon electrode is made heavier, to reduce resistance in the local current and to amplify the electrical undulations.

The terminals of the secondary wire of the induction coil are connected with the two remaining binding screws, which are connected, one with the ground and the other with the line, in the usual way.

The accessory devices connected with this transmitter may be of the usual character. It will operate well with any of the well known forms of receiver, and is easily managed and thoroughly efficient. This transmitter has been well introduced, and large numbers of them are being used in Europe. They have been adopted on several of the leading German railways, and are extensively used in the German postal service.

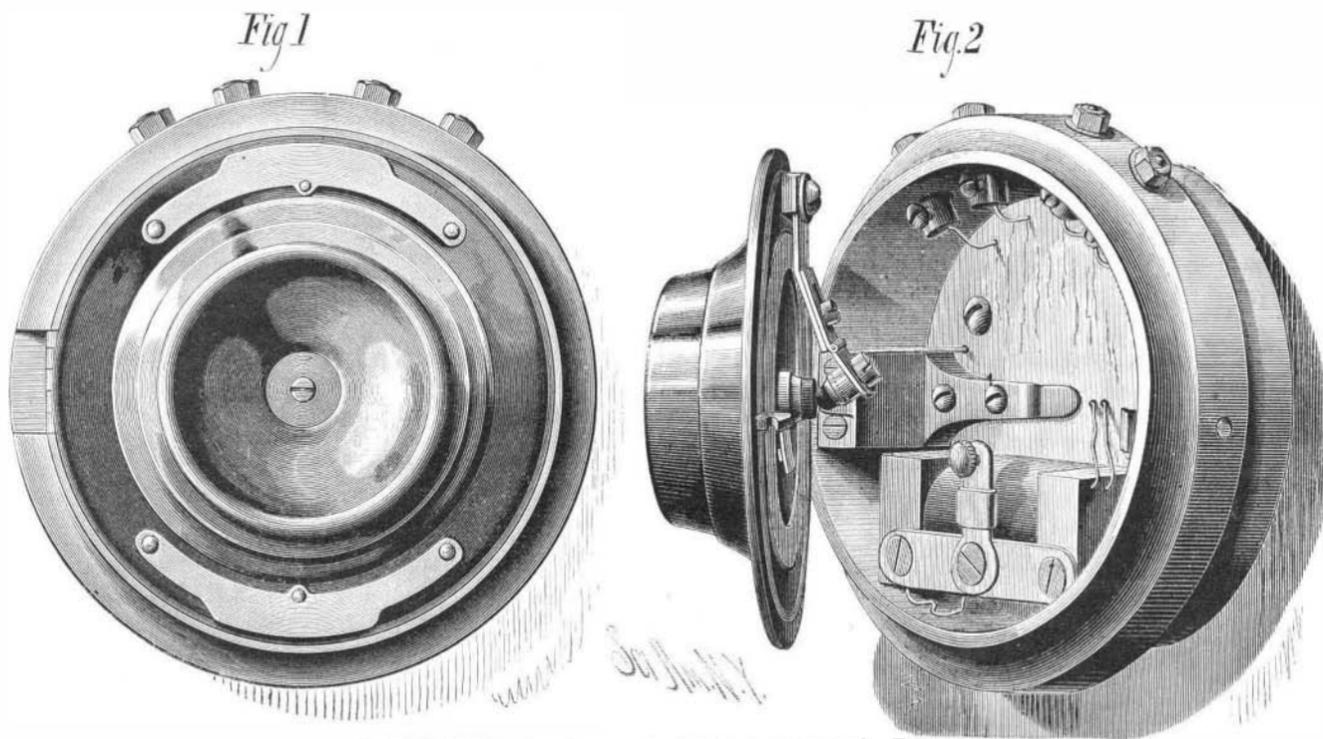
100,000 Buffalo Killed Last Winter.

It is estimated by competent authorities that 100,000 buffalo hides will be shipped out of the Yellowstone country this season. Two firms alone, says the *Sioux City Journal*, are negotiating for the transportation of 25,000 hides each. When to this is added the immense amount of skins and furs of other kinds—deer, elk, antelope, bear, beaver, etc.—some idea may be formed of the extent of the Yellowstone pelt and fur trade.

Most of our citizens saw the big load of buffalo hides that the C. K. Peck brought down last season, a load that hid everything about the boat below the hurricane deck roof. There were 10,000 hides in that load, and they were all brought out of the Yellowstone on one trip, and transferred to the C. K. Peck. How such a load could have been piled on the little Terry not even the men on the boat appear to know. It hid every part of the boat, barring only the pilot house and the smokestacks. But such a load will not be attempted again. For such boats as ply the Yellowstone there are at least fifteen full loads of buffalo hides and other pelts. Reckoning 1,000 hides to three car loads, and adding to this fifty cars for the other pelts, it will take at least three hundred and fifty box cars to carry this stupendous bulk of peltry East to market. These figures are not guesses, but estimates made by men whose business it is to know about the amount of hides and furs awaiting shipment.

Nothing like it has ever been known in the history of the fur trade. Last season the output of buffalo hides was above the average, and last year only about 30,000 hides came out of the Yellowstone country, or less than a third of what is there now awaiting shipment.

The past severe winter caused the buffalo to bunch themselves in a few valleys where there was pasturage, and there the slaughter went on all winter. There was no sport about it, simply shooting down the famine-tamed animals as cattle might be shot down in a barnyard.



BERLINER'S TRANSMITTING TELEPHONE.

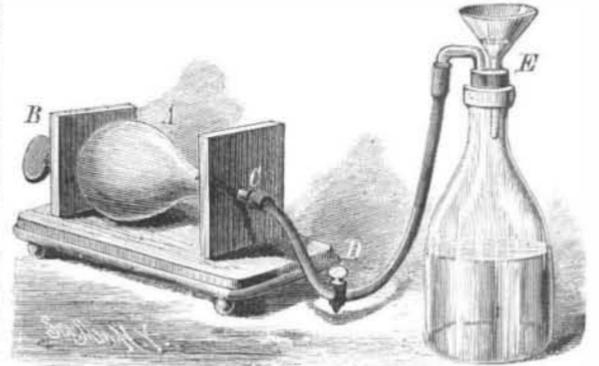
To the credit of the Indians it can be said that they killed no more than they could save the meat from. The greater part of the slaughter was done by white hunters, or butchers, rather, who followed the business of killing and skinning buffalo by the month, leaving the carcasses to rot. When the buffalo are all killed off, as they bid fair to be in a very few years at this rate, then everybody will wonder that the government did not do something to preserve this, the noblest of animal game, or at least prevent the killing of the buffalo for the hides alone.

A SIMPLE FILTER PUMP.

BY JOHN EITEL.

The engraving shows a simple device for accelerating the operation of filtering. It is intended to replace the Bunsen filter pump in many instances, and it consists of a collapsible rubber bulb, A, mounted between two standards and capable of being compressed by the thumbscrew, B. The mouth of the rubber bulb is connected with the filtering bottle by means of a flexible tube provided with a pinch cock, D. The filtering funnel is provided with a small platinum cone which prevents the filtering paper from being drawn downward with such force as to rupture it.

The exhaustion is effected by first expelling the air by turning the screw, B; the flexible tube is then connected and the screw retracted, to produce a partial vacuum. To ren-



A SIMPLE FILTER PUMP.

der the operation continuous the cock, D, is closed when it becomes necessary to again expel the air from the bulb.

The Uses of Mica.

The *Tradesman*, referring to the mica beds which have been recently discovered in East Tennessee, adds:

The mica chiefly met with in commerce is of that variety which is proof against acids and intense heat. Its toughness, elasticity, and close approach to transparency naturally led, at first, to its use for windows, and especially to its employment in lanterns. It is found in large quantities in North Carolina, where there are unmistakable evidences that some of the beds were worked a great many years ago. The finer sheets of tough mica are now used for such purposes as the dials of compasses, the lettering of fancy signs, covering photographs, constructing lamp shades, reflectors, etc. Of late, mica has been used in the soles of boots and shoes, as a protection against dampness. The invention consists of a sheet of mica embedded in thin coatings of cement and placed in the boot or shoe between the outer and inner sole, the upper leather lapping over its edges, and covering the upper space from the toe to the instep.

There are many other uses to which mica is put, and it is becoming more and more valuable as the arts and trades progress.

A Monster Cylinder.

There was cast at the Morgan Iron Works, in this city, the other day, what is said to be the largest steam cylinder ever cast. It is 16 feet 1½ inches long, 110 inches in diameter, and required for its casting 45 tons, or 90,000 pounds, of gun metal. It is intended to accommodate a piston stroke of 14 feet. The metal in the thinnest part is 1¾ inches thick, and the flanges at the top and bottom are 2½ inches thick by 5¾ inches wide. Under the top flange the cylinder has a belt 16 inches wide, another 6 inches wide above the bottom flange, and between these two, three more belts, each 6 inches in width. The thickness of the metal at the belts is 2½ inches. A nozzle for the upper steam chest is cast on the

cylinder, with an opening 14½ by 63 inches, the metal on the top of this nozzle being 1¾ inches in thickness, and on the sides and bottom 1½ inches.

The casting of this massive piece of work was done in a mould constructed of brick, and lined with loam, the outside being covered with heavy iron plates to prevent the matrix from bursting when the molten metal was poured in. The mould is constructed of one cylinder of brick and loam within another, the space between them being the required thickness of the casting, the flanges, belts, and other parts