

**NEW LIFE BOAT PLUG.**

From time to time we hear of disasters at sea where the chances for saving life have been greatly lessened by the loss or misplacement of the boat stopper or plug, thus rendering the life boat useless. So important a consideration has this liability to loss of life become, that various contrivances have been invented and adopted, but all seem to have weak points and are more or less liable to get out of order. This device, which is styled by the inventor the "Emergency Life Boat Plug," is the invention of George A. Leavitt, Jr., of Newburg, N. Y., a patent having been recently allowed for it. It is exceedingly simple, very easily worked, and seems entirely trustworthy.

Fig. 1 represents the life boat plug; Fig. 2 is a sectional drawing of plug, showing the details of its construction; Fig. 3 showing its position in boat. On launching boat the cap is screwed down tight on leather washer, thus closing slots and preventing the inflow of water. On raising boat to davits, the cap is unscrewed as far as possible, thus opening slots for the outflow of water. The cap cannot come off, its movement being arrested by the flange in tube coming in contact with shoulder in cap, so there is no danger of loss or misplacement. The plug is made of brass, and is stout enough to withstand any knock or hard treatment that it is liable to receive. The slots are made larger than the actual capacity of tube allowance, being made for partial stoppage by floating matter.

**Largest Fan in the World.**

The ventilating fan at the St. Hilda Colliery, South Shields, is the largest machine of the kind in the world, the diameter of the wheel being fifty feet. The fan can be driven at a speed of fifty revolutions per minute, at which velocity the outer extremities of the blades travel at the rate of a mile and a half a minute—a speed which is estimated to produce a movement of air equal to 200,000 cubic feet per minute. Much of the air moved by this fan must be drawn through over fourteen miles of narrow underground passages.

It is driven by a pair of high pressure engines, each cylinder of which is three feet six inches in diameter, with a three foot six inch stroke. Two completely equipped and perfectly distinct engines are provided for the working of the fan, so that, in the case of a break down on the part of one of them, the other can at once be brought into action.

**NEW ACOUSTIC TELEPHONE.**

We give an engraving of an improved acoustic telephone and telephone call signal, patented by Mr. John B. Bennett, of San Luis Obispo, Cal. This instrument may be placed in any desired position, and the line wire may extend in any required direction without making an angle at the instrument, and whichever way the instrument is turned the appearance will be the same. The great difficulty with other string telephones is that they are often incapable of being placed in the most convenient position. The curved speaking tube—which is also used for hearing—terminates flush with the front side of the case, and so constructed that any sound-wave entering its mouth is focused directly on the center of the diaphragm.

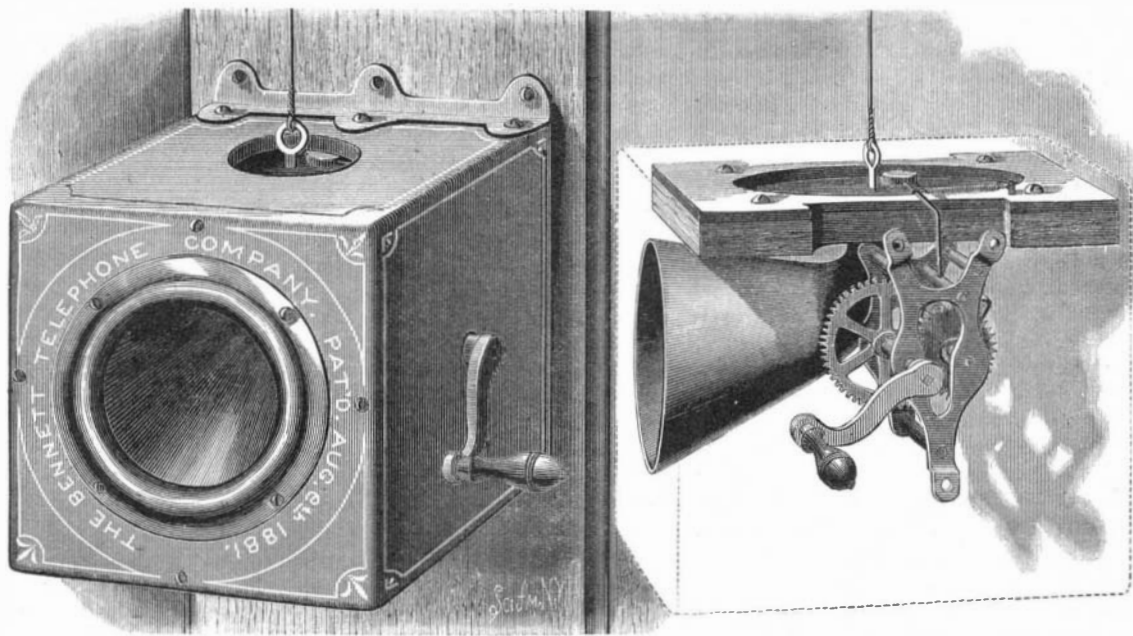
The instruments are furnished with a good and distinct automatic alarm, which is operated by turning a crank on the instrument, the operation being the same as that of operating a magneto bell. Turning the crank causes a hammer to strike rapidly and strongly against an eye in the diaphragm to which the line wire is attached, affording a loud and distinct alarm free from all the bother and expense of electricity. If wished for special purposes, a magneto call can be arranged within the case at slight expense in the place of the automatic call, and can be operated by the same crank.

These instruments are nicely finished, the mouth-piece, crank, and other parts being nickel plated. This telephone, for short distances less than a mile to a mile and a half, works clearly and satisfactorily. The inventor states that he has heard distinctly through a full mile and a half of line.

A new suspender has been devised by the same inventor by which the line is supported without interfering with its sound-conducting qualities. It is also capable of turning angles in the line without material loss of sound.

This telephone has the advantage of great simplicity, and transmits speech naturally and loudly without the application of electricity and without the troubles attendant on its use.

For further information address the inventor as above.



**BENNETT'S ACOUSTIC TELEPHONE.**

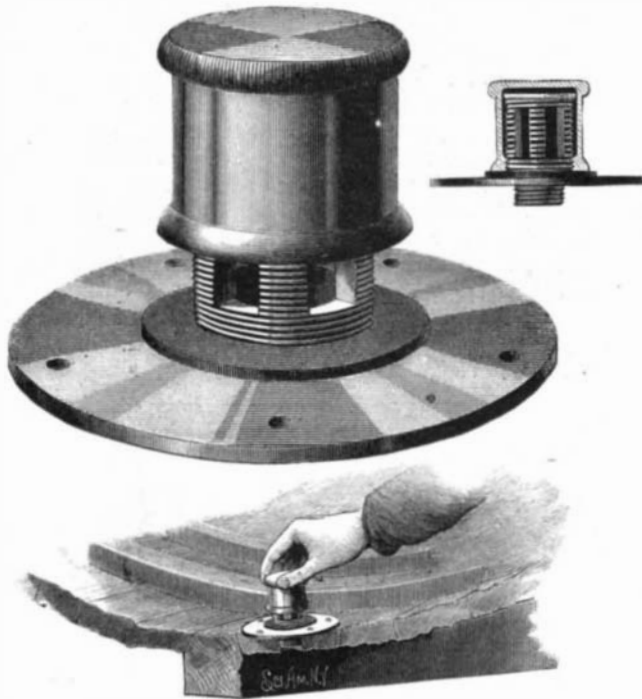
the Atlantic cables was also obstructed. At midnight (Valentia time) messages to the United States were three and a half hours behind time, and messages from this country six hours late. The wires between Chicago and St. Paul, Chicago and Milwaukee, and Chicago and Omaha were worked on the strength of atmospheric electricity without batteries.

**A Deer's Head with Fifty-eight Points.**

A head of the white tailed American deer, bearing fifty-eight points, was lately received in this city from San Antonio, Texas. This is three times as many as had been seen before in this part of the country. The deer was shot near the Banders range of mountains.

**The Aurora of April 16.**

The most brilliant auroral display since 1860 was that of Sunday night, April 16. The accompanying electric storm was uncommonly severe. The chief night operator in the Western Union Telegraph Company's building says that the wires began to be affected shortly after ten o'clock, and in half an hour all the wires, North, South, East, and West, were frequently interrupted. The greatest trouble was on the northern and western routes, but some of the wires on the other routes were also badly affected. The aurora would at one time rob the wires of the usual current, and at



**LEAVITT'S LIFE BOAT PLUG.**

another it would so increase it as to render the opening of the wire necessary to keep the instruments from burning. This change was in some cases rapidly made, but in others a wire would be charged from ten to fifteen minutes at a time from the auroral current, which would then forsake it.

From half-past eleven to twelve o'clock, while the electric storm was at its height, it was possible to work with Albany on a wire grounded at each end by means of the auroral current alone. A similar storm, but not as severe, was experienced about a year ago, during which a long special dispatch was sent from Albany on a wire without a battery. At one o'clock, on the Eastern and Southern routes, the wires were working better, but on those running West and North the interruption still continued. The interruption was the most continuous ever experienced. Business on

**The Sun's Fuel.**

What keeps the majestic ball hot and bright? This has greatly engaged physicists and astronomers, and various have been their theories. If the sun shone only by mere combustion of its own materials, the calculation is that its fire would not last five thousand years. It is very kind of Dr. Siemens to come forward with an entirely new theory, which holds out the hope that the men of science are all wrong with their dismal foreboding, and that the creation is not schemed on the poor footing of a German stove or a suburban gas company. The learned ironmaster and physicist believes that the sun may very well go on illuminating and warming our world and the family of sister planets for an indefinite, if not infinite, time. He supposes interstellar space to be filled with an extremely attenuated hydrogen, and interplanetary space with denser gas, albeit more rarefied than the atmosphere drawn round each world. The sun, he thinks, whirling on its axis, draws into its poles the thin hydrogen, hydrocarbon, and oxygen of our sphere, and these, being kindled, are projected outward at his equator into space. The accepted view is that the heat and light there developed and radiated perish, as far as we are concerned, except for the small portion arrested by each solar satellite; but Dr. Siemens argues that this heat and light do their chief work in decomposing the carbonic oxide and watery vapor which were produced by the kindling at the solar poles, so that the sun itself perpetually renews its own supplies, and restores by its energy the waste matter which has fed that energy. The theory is much too technical and complicated to be here discussed, and we should offer a bad compliment to its ingenious author even to attempt such a task. Dr. Siemens, however, has had great experience with the phenomena of radiated heat, and his applications of the new view to the nature of the zodiacal light and of comets is particularly striking. Of course it is startling to hear of something in our own system which closely resembles perpetual motion; and those who maintain that everything comes to an end, and that all mechanical energy must be gradually degraded and metamorphosed, will be slow to receive the new suggestion.—*London Telegraph.*

**Sound, Light, and Heat.**

Prof. Tyndall lately delivered the second lecture of his course at the Royal Institution. The explanations given by Huyghens of the phenomena of reflection and refraction, as well as of the properties of convergent and divergent lenses, had, he said, been fully verified by the progress of time and science. The lecturer showed that there are sound lenses also, and that the wave theory affords a no less adequate explanation of their properties. He demonstrated, by the test of the sensitive flame, that cotton net, because porous, transmits waves of sound, while the interposition of a non-porous body leaves the flame unaffected. Just as the passage of light was hindered by clouds, although the air and light of which these are made up were alike transparent, so acoustic clouds obstructed sound. Acoustic clouds consisted of layers of heated air with intermediate layers less heated. The lecturer formed an artificial cloud of the kind, which was shown to intercept sound; the sound was

thus struck back in miniature echoes. Another analogy between light and sound was brought out by comparing the solar spectrum with a scale of notes produced by striking a graduated series of tuning-forks. To illustrate Dr. Wollaston's observation, that certain sounds are inaudible to many ears, Professor Tyndall blew a small whistle, whose low though shrill note instantly agitated the sensitive flame, while full half of those present, as a scientist had predicted in conversation with the lecturer beforehand, heard nothing. Resemblances were also pointed out between the absorption of light and that of sound. On the sound struck from one tuning-fork being quenched, it was proved to have been not annihilated, but simply absorbed by an adjacent fork. In like manner the yellow ray in the solar spectrum was absorbed by sodium vapor as the metal passed under the eyes of the audience into that form, leaving the place of that color in the spectrum marked by a black band.

Professor Tyndall concluded with an eloquent and generous tribute to the memory of his predecessor in the chair of Natural Philosophy at the Royal Institution at the beginning of our century, Dr. Thomas Young, who not only put into Champollion's hands the key to the Egyptian hieroglyphics, but anticipated by a score of years Fresnel and Arago, as was urged in detail, in placing upon its true scientific basis the undulatory theory of light. The lecturer repeated Young's brilliant demonstration of the fact that the prismatic colors of the soap-bubble are in the exact ratio of the