courses on its catalogue's pages is falling in with a popular fad. I do not say the fad is wrong, but like all fads it is capable of abuse, and unless each of the courses is conducted at least as well as the course in Xenophon or geometry, requiring as much real work by the pupil and with the same definite results, the course is worse than a sham. Let the school authorities face the fact that in science, as in all other activities, good results can only be produced by skilled workers, and the skilled workman is more expensive than the untrained novice. Either the best or not at all should be the policy of every school that contemplates adding a course in science to its list of studies, if that course is to be anything but a bait for the children of unsophisticated parents, and a diversion more or less demoralizing to the pupil.

HENRY A. PERKINS,
Professor of Physics, Trinity College.
Hartford, Conn., October 2, 1905.

A Chance for Inventors.

To the Editor of the SCIENTIFIC AMERICAN:

As at present the price of heniquen is declining in the American market, the imperious necessity makes itself felt of increasing the acreage devoted to the production of this fiber and of realizing savings in its management from the planting to the baling. With the extension of the plantations which is already in actual progress at present, although not to the extent to which it should be carried, there will be secured a material increase in the quantity of fiber produced, and this increase in production will make up in part for the loss that follows the decline in price which began some time ago and which decline in price can be entirely overcome by the economies or superior methods of exploitation which may be introduced into the industry. It is evidently most pressing that these economies be undertaken at once, and this is possible in two directions: First, that of utilizing, in some manner, the refuse which results from the threshing or breaking of the textile, and second, some mechanical method of drying the fiber. In both these directions there is now a real waste of time, of labor, and of money. In respect to the former, there is a great waste in carrying to the place for threshing a great quantity and a great weight of leaves of heniquen, which, reduced in small part, by the operation, must then be transported again, with still greater labor, to the place chosen for deposit to rot. But this is not the only drawback. This place is at once converted into a fearful source of infection which poisons the atmosphere and the water which the plantation must use, and from which contamination is developed disease in various forms to such an extent that plantations that were noted previously for their salubrity have become converted into homes of disease.

Moreover, feeding this refuse to cattle, which is done generally when it is in a rotting condition, makes the milk poisonous and develops also in the calves and young stock different diseases, one of the most common of which is dysentery, as experience teaches us, thus demonstrating the error of the popular belief that this refuse can be used as a good food for cattle.

In order to overcome these obstacles and to diminish as much as possible the cost of production of heniquen, it has occurred to us that, by means of a mechanism invented for the purpose, this refuse might be utilized as a combustible, or for some similar purpose, obviating a waste and producing instead an actual profit to the planter.

The spreading of the fiber in order to dry it in the sun is an operation quite primitive, and which is certainly behind the time, in view of the scientific progress of the age. To do this work requires a considerable force of laborers who must carry the fiber to the place selected for drying, there spread it, then turn it and gather it in, as it may appear to be dried, and finally transport it to the press. This operation, besides being costly, has several drawbacks that make it objectionable. Among these drawbacks it appears to us that the chief are: the loss of fiber that results from spreading and transporting it, as a considerable quantity must necessarily be lost either on the wires, on the grass of the route back and forth, and even on the very ground of the drying place; the deterioration of the fiber by the fall of sudden rains, and finally the loss of time which results in the rainy season, because as the rains are constant during sometimes many days in succession, the planter finds himself obliged to suspend the cutting and the separation of the fiber of the heniquen by reason of having his drying space already overflowing with fiber.

The strong winds which prevail during the fall are equally prejudicial, as the fiber is thus blown from the wires and scattered, some of it carried even beyond the limits of the place for drying.

In order to overcome these inconveniences and others that we have not mentioned because of the necessity of keeping our article within reasonable limits, there might be invented a mechanical dryer, into which the bundles of fiber might be thrown when delivered from the threshing machine, and be delivered by the new mechanism dry and ready for baling.

The points which we have referred to so briefly are so important for the state in general that, in our opinion, they are very well deserving of the special attention of the Heniquen Planters' Union, which should adopt means suitable to attain the object which we have indicated. This union might, without any delay, call a special meeting in order to consider this very important subject. A petition might be formulated to be sent to the governor, who is so firm a friend of progress in our state, requesting that he recommend to the legislature that a prize be provided, to be bestowed upon the inventor of any successful machine contrived for the purpose as explained above. This Heniquen Producers' Union might also do something which, in our opinion, would be the best possible thing to be done, and that is to try to raise by voluntary subscription among the heniquen planters a sum sufficient to provide the prizes referred to for donation to the inventors of the machinery in question, which fund should be used solely for the purpose of rewarding successful attempts to provide such machinery. If this course should be taken or adopted by the union, the writer of this article holds himself ready to provide five hundred dollars toward each prize. VICENTE SOLIS.

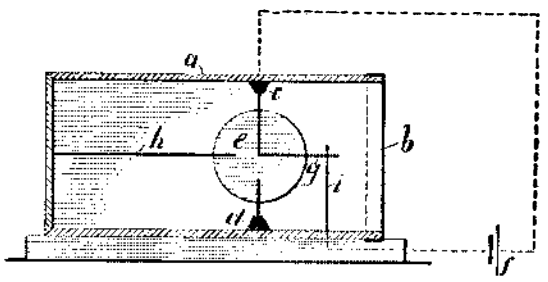
Merida, Yucatan, Mexico.

A NOVEL PROCESS FOR DISENGAGING FORCES BY MEANS OF SOUND.

BY OUR BERLIN CORRESPONDENT.

It is a well-known fact that bodies capable of emitting sounds (membranes, cords, etc.) are caused to vibrate intensely by any outside body placed in their neighborhood and sounding the same note, while a vibration of less intensity is observed in the case of sounds of different pitch. A striking phenomenon based on the fundamental notes of resonators is described by Mr. H. Michel in a recent issue of Prometheus.

If a light disk be arranged within a resonator or sounding-box so that it can be readily rotated upon its axis and the fundamental note of the resonator be given off by any acoustical source in the neighborhood, the disk will be set rotating and will continue to do



A NOVEL PROCESS FOR DISENGAGING FORCES BY MEANS OF SOUND.

so until the sound is discontinued, provided it be adjusted at an oblique angle to the longitudinal axis of the resonator. No effect is observed if the sound be different from the fundamental note of the resonator. Mr. Michel suggests using this effect for disengaging forces by means of sounds of a given pitch. The rotation of the disk can, for instance, be utilized to throw in or out, weaken or reinforce electric currents that might be used to start any special motor.

An arrangement suitable for this purpose is illustrated in the accompanying engraving. *a* is the longitudinal section of a resonator, closed by the membrane, *b*. A light disk, *e*, carrying a lever, *g*, connected with the cell, *f*, is pivoted in the cups, *c*, *d*. The rotation of this disk is limited by the prongs of a fork, *h*, fixed to the bottom of the resonator. An extremely feeble tension due to a weak spring, a magnet, or the like, presses the disk against one of the prongs of this fork, so that the disk is adjusted in a position of rest at an oblique angle to the longitudinal axis of the resonator.

If, now, any instrument, e. g., a piano, be played in the neighborhood of the resonator, the disk will remain at rest until the fundamental note of the resonator is given off. At that very moment it will start to rotate, trying to adjust its surface at right angles to the longitudinal axis of the resonator, and will throw the lever, *g*, against the metal bar, *i*, which is connected to the other terminal of the cell, *f*, thus closing the circuit. As the contact between the lever, *g*, and the bar, *i*, is maintained as long as the sound is continued, the current, being completed throughout this time, will be able to perform some given operation. The effect of the fundamental note of the resonator on the disk is reinforced considerably by means of an acoustic funnel arranged in front of the membrane. In this case the rotation of the disk begins nearly instantaneously and rather energetically, as soon as the note is struck. This novel process would seem to be capable of many practical applications.

A vine now standing in California, which is considered the largest in the world, was planted in 1842 by a Spanish woman. Beneath its spreading branches, which cover nearly half an acre, 800 persons could find protection from the sun's heat. The first election in Santa Barbara County under American rule was held beneath its ripening fruit. The vine is of the Mission variety. In 1893 it bore 8 tons of grapes, and in 1895 over 10 tons. The trunk of the vine is 7 feet 8 inches in circumference. It is now owned by Jacob Wilson, of Carpinteria, Cal.

Electrical Notes.

A novel wireless telephone apparatus has been patented by M. Blondlot, of Paris. The transmitting antenna is excited by the effect of a closed circuit where continuous vibrations of very high frequency are produced by the stepwise discharge of a direct current or alternate current generator connected in parallel to a condenser battery, while the receiving antenna acts on a telephone with or without the use of syntonically vibrating local currents and wave detectors. The sounds to be transmitted act on the closed vibratory circuit by means of a manometric flame or a transformer, the primary coil of which is fed by a strong microphone, a singing arc, or any similar device.

A special wireless telegraph corps has been established for some time past in the German army, where the previous wireless telegraph battalion originally connected with the aeronautical battalion has been attached to the telegraph corps as an independent body, though it be intimately related to aeronautics in so far as captive balloons are required to suspend the sending antennæ. The importance of wireless telegraphy for the signaling service has been illustrated in the Russo-Japanese war and is being evidenced also in connection with the military operations carried out by German troops in Southwest Africa. Wireless telegraphy, while ready to work at a moment's notice, is less liable to be observed or interfered with by the enemy than any other means of communication, quite apart from its other advantages. It may be said messages have been sent for 250 miles in South Africa.

The utilization of electric energy for power purposes in the spinning mills of the Marquess of Larios at La Aurora and La Industria mills at Malaga, in Spain, recently installed, has been attended with some remarkable results. At La Aurora mills, the substitution of steam engines driving gear and belting, by electric motors driving direct on to the line shafts, has reduced the power consumption by 40 per cent. Furthermore, the steadier drive obtained from the motors has increased the yarn production by 20 per cent, owing to the avoidance of yarn breakages. The mills at Malaga are equipped with 72 motors aggregating 2,350 horse-power for three-phase current, and range in power from 15 to 150 horse-power. The average efficiency is 91.1 per cent, and the average power factor 88.1 per cent. The electrical energy is transmitted a distance of some 20 miles at a pressure of 25,000 volts.

Experiments on a new type of telephone cable are said to have been made in Sweden with extremely favorable results. In manufacturing these cables, the intention had been to reduce their capacity to a minimum by passing the bare copper wires through perforated disks of insulating material and introducing the cable thus formed into an iron tube. The distance of the two conductors of the same line is 17 millimeters, that of two lines 28 millimeters, and the distance of the conductor and iron sheath in the most unfavorable case 5 millimeters. By this arrangement the capacity of the internal conductors of 2 millimeters diameter was reduced to 0.00985 microfarad for 1 kilometer and that of the outer conductors to 0.0182 microfarad per kilometer. The copper wires are of course wound helicoidally to avoid induction effects. If the above distances be increased to 20, 36.5, and 10 millimeters respectively, the capacity will be 0.00935 and 0.0125 microfarad. Excellent results have been obtained in connection with the experiments made on these cables, especially those relating to the insulating resistances.

The Current Supplement.

The maple sugar industry is thoroughly described and illustrated in the opening article of the current SUPPLEMENT, No. 1555. A possible source of future fuel is to be found in the vast peat bogs in some sections of the world. How this peat may be commercially utilized, is explained. A full description of Sir Oliver Lodge's fog-dispelling apparatus is given. Mr. Walter P. White describes a new form of cell. Mr. Edward F. Chandler describes in a practical way the construction of a hydrometer. Dr. A. F. Cuzner writes on the origin and control of yellow fever. Exceedingly interesting is a well-illustrated article on jelly fishes. The agricultural application of the gasoline automobile is made the subject of an instructive article by the English correspondent of the SCIENTIFIC AMERICAN. Mr. J. H. Morrison, the author of "American Steam Navigation," gives a splendid historical summary of iron and steel hull steam vessels of the United States. Of practical interest is an article on a folding Malay kite. An excellent paper by Prof. Albert Granger on the manufacture of Sèvres ware is presented.