introduce it in the institutions for the deaf and dumb, and the experiments made there and elsewhere have shown already that it has enabled some of the unfortunates in these institutions to hear and repeat words spoken to them. Those who have seen the results have given their endorsement, and there is no doubt but that the instrument will work a revolution in the ways of educating the deaf and dumb, by making most of them hear lectures, and enabling them to speak in place of having them always take recourse to writing on the slate.

MYSTERY IN MECHANICS.

The Boston *Journal of Commerce* justly observes that there is a class of mechanics who affect great mystery about their work, and appear to imagine they can convey the impression that there is something occult or hidden in the processes they use and the materials they employ. Inventors are peculiarly sensitive about making known what they intend to do or the way they intend to do it, as though the world stood agape, ready to wonder and admire as soon as the letters patent were issued. Perpetual motion mongers are justified in keeping secret their experiments—they usually keep secret the result. But in nine cases out of ten the inventor could obtain the money assistance he requires simply by trusting his proposed improvement in detail to judicious friends, and he might with safety and advantage take a brother mechanic into his confidence.

A short time ago a carpenter, in assisting to move some heavy machinery, had occasion to go into a room where the soldering of preserving cans was being done. He wanted to bore a hole through the floor through which to pass an eyebolt. He was refused admission until he solemnly promised not to notice the work which, with some handy appliances, was performed very rapidly. A visitor to a white lead manufactory was refused admission to a room where the pig lead was cast into sheets previous to being acted on by the acid. Yet there was absolutely no secret in it. The melted lead was simply thrown in small quantities on a sort of shovel of sheet iron, where it congealed to a thin film. The worsted braid used largely for the trimming of ladies' dresses a few years ago is as smooth as silk, without fuzziness, although the yarn is full of projecting fuzz. A certain company kept its process a great secret, but an examination of the braid under the microscope showed it was simply singed. Some temperers of steel profess a great secret in the preparation of their hardening pickle, a secret as patent as though described on a page.

There are very few manipulations or manufacturing processes which are truly secrets, and in many of these cases the secret consists in the quality of the material used, a material perhaps not readily obtainable otherwheres. If a secret process involves much mental calculation or expertness of handling, a chance visitor must have rare observing faculties if he can carry it away with him and reproduce it at will from his memory. The laws of the science of mechanics are open to all investigators, and what one man has learned of them may be learned by another man. It is an absurd and ridiculous pretension generally that assumes that one man knows alone what many are anxious to learn, that the finished article carries no suggestion of the processes through which it has passed, and that on one man's will and life depends the success of some important manufacture.

USES OF EUPHORBIA GUM.

The London *Times* says: Some few years since a survey was being carried out in Natal for the Colonial government, during which it was discovered by one of the officers engaged on the work, that when certain plants belonging to the natural order *Euphorbiaceæ* were cut with the clearing knives, the gum which exuded from the plants adhered firmly to the blades, and was very difficult to remove. It was, moreover, found that the knives so coated did not rust, and this led to further experiments being made with the view of utilizing the gum as a preservative material. Iron plates were coated with the gum and subjected to immersion in the waters of South Africa, which are stated to be proverbial for their foulness and for the rapidity of the growth of vegetation. The euphorbia in Natal grows in close contiguity to the sea-shore, so that there was ample opportunity for securely testing its value as a protective covering for iron against corrosion and marine growth. The experiments proving perfectly successful, it was then sought to put the discovery into a practical form. To this end the gum was dissolved in a preparation of spirits, and this was found to be a ready means of applying it as a coating for ships' bottoms and for ironwork generally requiring such protection, the spirits evaporating and the gum being left on the surface of the metal. With this preparation experiments were made a few years since by Sir Andrew Clarke, C. B., who had a sheet of iron coated with it and placed in the waters in her Majesty's dockyard at Chatham, where anything immersed becomes rapidly fouled. At the end of two years the sheet of iron was taken out and was found to be quite clean, and free from fouling and corrosion. The composition has also been successfully tested in Africa against the ravages of the white ant. This success is attributed to the circumstance that the gum of the euphorbia, which forms the base of the fluid, is of such an intensely bitter nature that it paralyzes the efforts of all insects to attach themselves to it, or to bore into any substance coated with it. These successes have led to its adoption in practice for the purposes above indicated, and it is now being introduced in England. We have examined several applications of this composition, which gives a glossy coating alike impervious to air or moisture, while, according to results, its own peculiar protective property remains unimpaired.

CEMENTS, MASTICS, AND CONCRETES.

Many of our readers have occasion to use cements or mastics, especially in putting down cellar floors or making old walls tight. They will find the following hints upon the subject valuable:

A cement of one part sand, two parts ashes and three parts clay, mixed with oil, makes a very hard and durable substance like stone, and is said to resist the weather almost as well as marble.

Damp brick walls are common, especially in houses in the country where they are exposed upon the north and east sides. So common is this, that in many places in the country a strong prejudice exists against brick houses on account of their constant dampness. Last year a gentleman having a brick house exposed on all sides, and suffering from dampness in the kitchen, which was in a wing upon the most exposed side, tried an experiment which has proved very satisfactory. A barrel of the best English Portland cement was purchased, and a common tin wash-basin used for mixing it. The cement was mixed with water until about the consistency of cream, and then applied thickly with a large paint brush. Of course the mixture had to be constantly stirred to prevent the cement from settling to the bottom; and on account of its very rapid settling it could only be mixed in very small quantities—half a gallon being about as large a quantity as can be readily handled at a time. When first dried it seemed somewhat of a failure, because it could be so easily brushed off, but after it had had 24 hours to harden it formed a strong and durable coating. The color is a neutral tint, something like Ohio stone. This coating kept the wall perfectly dry, and as it is inexpensive and does not require skilled labor in its application, ought to be extensively used. The gentleman who put on the cement suggests that a damp, foggy, or misty day is best for its application. The coating should be brushed into all the crevices and openings of the work, and it may be found desirable to apply two coats in order that all the openings may be completely closed.

Cement is much stronger than mortar, and can be used to great advantage in many places instead of lime, even in the face of the fact that it is much more costly than the latter. The usual proportions are 1 part of hydraulic lime to 5 of sand. In pointing, the proportion is sometimes as low as 3 parts sand to 1 of hydraulic lime or cement. Coarse clean sand—almost pebbles—can be used to the extent of 3 parts to 1 of cement. Some recommend mortar, to be allowed to set and then wet and worked again. This course will not answer with cement, which is generally injured by such a method of working. The greatest enemy of both mortar and cement is frost; the power with which the water expands at the freezing point is practically unlimited, and where it penetrates into the crevices and pores of mortar and freezes, or when wet mortar is allowed to freeze, its strength is destroyed.

For making floors, the following method is said to produce very desirable results: Four parts of coarse gravel or broken stone and sand, and one part each of lime and cement, are mixed in a shallow box, and well shovelled over from end to end. The sand, gravel and cement are mixed together dry; the lime is slaked separately and mixed with just enough mortar to cement it well together. Six or eight inches of the mixture is then put on the bottom, and when well set, another coating is put on, consisting of one part of cement and two of sand. This will answer for making the bottom of a cistern that is to be cemented up directly upon the ground without a lining of bricks; it will also form a very good cellar floor.—*Manufacturer and Builder.*