

### The Clashing of Atoms.

Professor John Tyndall, one of the highest authorities on matters of natural philosophy, says of this: "It is to the clashing together of the oxygen of the air and the constituents of our gas and candles that the light and heat of our flames are due. When steel filings are scattered in this Bunsen's flame, you see the star-like scintillations produced by the combustion of the steel. Here the steel is first heated till the attraction between it and the oxygen of the air becomes sufficiently strong to cause them to combine, and these rocket-like flashes are the result of their collision. It is the impact of atoms of oxygen against atoms of sulphur which produces the heat and flame observed when sulphur is burned in oxygen or in the air; to the collision of the same atoms against phosphorus are due the intense heat and dazzling light which result from the combustion of phosphorus in oxygen gas. It is the collision of chlorine and antimony which produces the light and heat observed when these bodies are mixed together; and it is the clashing of sulphur and copper which produces incandescence when these substances are heated together in a Florence flask. In short, all cases of combustion are to be ascribed to the collision of atoms which have been urged together by their mutual attractions."

### AN IMPROVED ICE PLOW.

The ice plow shown in the illustration is very simple and durable in construction, and designed to be very effective in operation. It has been patented by Mr. Hamilton Pray, of Clove, N. Y. Its frame consists of two parallel longitudinal beams, connected by suitable transverse beams, two U shaped runners of different length being held adjustably on the front and rear ends of each longitudinal beam, while cutting blades of different length are held adjustably on the beams between the runners, extending below the lower ends of the front runners. In beginning to cut an ice field, a first cut is made to serve as a guide for the runners and cutters of the second longitudinal beam, and thereafter the plow is made to travel in grooves already formed, the advance to a new cut being made with



PRAY'S ICE PLOW.

the runners and cutters of one beam in a groove already formed, so that the animal is prevented from dragging the plow out of its grooves by a sidewise pull. All the runners and blades are adjustable, so that the plow may be arranged to cut at regular depths at all times, and can be drawn over the ice field with a steady, uniform pull. This plow has been in practical use for two seasons and is said to have given great satisfaction as a thoroughly efficient ice cutter.

### No Scale Wanted in California.

On March 1, in Los Angeles, Judge McKinley decided that 325,000 orange trees, which were imported from Tahiti infected with eight different kinds of pests, were to be destroyed. Insecticides were used which destroyed seven of the pests, but the eighth was not killed; hence the decision.

This scale is called the *Chinaspis biclavus*, a pest hitherto unknown in California, a scale that all efforts to eradicate were unavailing.

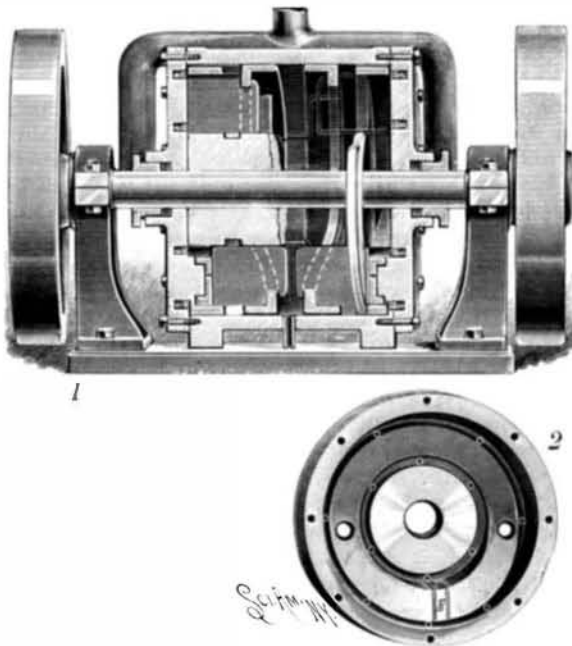
The decision was of very great interest to all fruit growers in the State, as it is the first of its kind ever rendered. It is of interest to Eastern nurserymen also, as they are at the present time trying to get admitted into the State several car loads of infected fruit trees.

R. E. S.

THE U. S. Treasury Department has decided that machinery imported to the Exposition from foreign countries, either wholly as an exhibit or to be shown in connection with the illustration of some manufacturing process, shall be admitted free of duty. Any raw material imported for use in such process must pay regular duty, however.

### AN IMPROVED ROTARY ENGINE.

The engine shown in the accompanying illustration is designed to be very effective in operation, utilizing the steam to the greatest advantage, while it is adapted to be run at a high rate of speed. It is constructed of but few parts, so that it is not liable to get out of



LYCAN'S ROTARY ENGINE.

order, and friction is reduced to a minimum. The invention has been patented by Mr. William S. Lycan, of Marshall, Ill. Fig. 1 represents a longitudinal section of the engine, and Fig. 2 is an inner face view of one of the cylinder heads. The heads are each provided with a double wedge-shaped abutment extending inwardly into the cylinder, while a piston mounted to turn in the cylinder has flanged wheels forming a steam space at the heads, the piston also having slotted projections, gates sliding longitudinally in the webs of the flanged wheels and slotted projections. The steam inlet pipes lead into the steam space near the ends of the abutments, and exhaust pipes lead from this space oppositely, close to the other ends of the abutments. The driving shaft passes centrally through the cylinder heads and cylinder, the hub of the piston being secured on the shaft, while fixed annular cams have their peripheries fitting the inner face of the cylinder between the wheels of the piston, the inner edges of the cams engaging notches in the gates or valves. In a practical trial this engine is said to have developed great power and shown a very high rate of speed.

### Strychnia in Snake Bite.

Dr. Wolfgang Hunt, of the Toowoomba Hospital, Queensland, gives an interesting account in the *Australasia Medical Gazette* of a case which had come under his care. The patient was a child aged sixteen months. An elder sister, while playing with her a little way from home, heard her scream, and saw a snake clinging to her hand. Running to the house she quickly fetched her mother and an uncle, who found the child crying and holding the third finger of the left hand, on which was a small punctured wound. The snake was killed as it was making off, and found to be a "death adder." The child was taken to the house, and the end of the finger removed, the stump being sucked and drenched with ammonia and ligatures applied to the arm. She was then brought to Toowoomba for the nearest medical aid, ammonia being applied to the hand meantime. An attempt was made to give stimulants by the mouth, but vomiting immediately followed their administration. On admission to the hospital, three hours after the accident, the child was almost comatose, the body and the extremities cold, pupils dilated and insensitive to light, the pulse rapid and irregular. The child was at once wrapped in hot flannels and heat applied to the limbs, while four minims of liquor strychnia were administered hypodermically, and a strong faradaic current applied to the nape of the neck and along the spine. Fifteen minutes later another four minims of liquor strychnia were injected, and almost at once a change began to manifest itself in all the symptoms, and in a short time the

child recognized and played with its parents. With the exception of a few slight muscular twitchings, recovery was uninterrupted, and the child was discharged the next day in apparently perfect health and none the worse, except for the loss of her finger. The case is very important, especially with reference to the means used for procuring recovery, viz., the hypodermic injection of strychnia, and Dr. Hunt is to be congratulated on his success in this case, as well as in that of another patient whom he mentions as having been admitted in a similar condition after being bitten by a brown snake, and in whom also recovery followed the hypodermic injection of strychnia.—*The Lancet*.

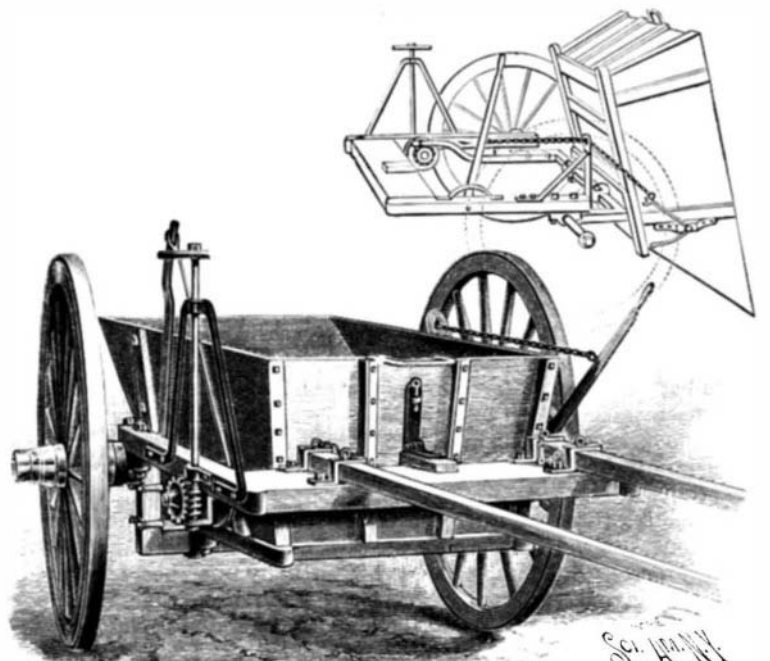
### A Fortunate Use of the Microphone.

Prof. D. E. Hughes, F.R.S., writes to the *Electrical Engineer*, London: "Having been engaged for many years experimenting with my microphone for the detection of sounds too feeble for the unaided human ear, I am pleased to notice by the following paragraph in the *Daily Telegraph* of February 25 that it has been successfully applied in St. Petersburg to the saving of human life."

The paragraph says: "Some particulars of a remarkable case of revival from apparent death have come to hand from St. Petersburg. A lady who had been suffering from a violent nervous attack sank into a state of syncope, and after a time ceased, as it seemed, to breathe. The doctor who was attending her certified that death had resulted from paralysis of the heart. For some reason, which is not explained, another medical man, Dr. Loukhmanow, saw the body, and having been informed that the lady had suffered from attacks of hysteria and catalepsy, thought it worth while to make a thorough examination. After trying various other means he applied the microphone to the region of the heart, and was enabled by this instrument to hear a faint beating, which proved that life was not extinct. Everything was done to resuscitate the patient, who, shortly afterward, recovered consciousness."

### AN IMPROVED DUMP CART.

The illustration represents a cart which is low and easily filled, and at the same time may be easily dumped. The first point is attained by using a crank axle, which brings the bottom of the body to within 6 or 8 inches from the ground. The body is pivoted upon the axle, and when the latter is in the usual position a comparatively slight tipping brings the rear of the cart in contact with the ground. At this point, when a portion of the load has been discharged, the crank of the axle is made to revolve backward and upward, thus lifting and tipping the body more and more until all of the load is dumped. In this movement the axle turns in the hubs, the arms acting as pivots. This is effected by means of a windlass operated by a worm gear and connected by means of a wire rope to a lever projecting upward from the axle. Sometimes, as in dumping over the string piece of a wharf, it may be desirable to raise the body somewhat before dumping. In this case it is kept steady during the lifting by means of a bar having a parallel action with the crank. The body is pulled back into position after dumping by means of a lever and chain. All the operation of dumping and of returning the body into position is effected by the driver without getting down from his place in front. The great advantage of this cart is the extreme facility with which it is loaded. A saving of a foot and a half in the distance through which every shovelful is lifted means a great deal in the course of a day. It is also especially adapted for removing ashes and garbage. Further particulars relative to this improvement may be obtained by addressing the patentee, Mr. A. H. Smith, Station F, New York City.



SMITH'S DUMP CART.