Remarkable Electrical Experiments.

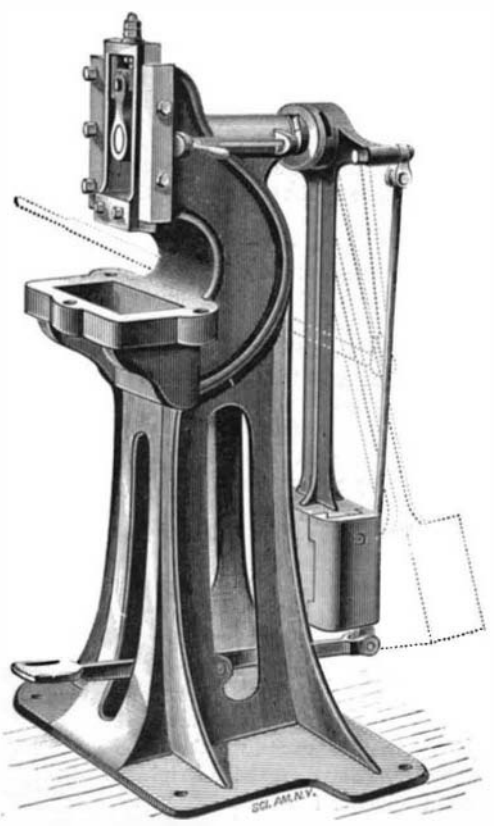
Some twenty years ago, says a writer in *Inter-Ocean*, Mr. Andrew Crosse, of Bloomfield, England, stood foremost in the grandeur of his experiments and investigations in electrical science, and his achievements ranked among the most splendid of his day, while his skill entitled him to high rank among the devoted investigators of scientific truth. Mr. Crosse collected the electricity from the atmosphere by means of a wire with points, supported on poles, fixed to the tallest of the magnificent trees which adorned his grounds. This conducting wire was carried into a room, where it terminated in a large brass ball. Near this was another similar ball, which was connected with a neighboring pond, down in the water, by means of a metal rod, and by means of an adjusting screw and large glass handle the electric discharge was easily directed into the earth by bringing the two balls together when not experimenting, or the charge was not too strong. Mr. Crosse had a Leyden battery, consisting of fifty-one gallon jars, containing seventy-three square feet of coated surface on each side, and with about 1,600 feet of his lightning rod wire, he has frequently collected sufficient lightning to charge and discharge this battery twenty times a minute, with reports as loud as a musket. The battery, when fully charged, would perfectly fuse into red hot drops thirty feet of iron wire in one length, the wire being 1-270 of an inch in diameter. When the battery was connected with 3,000 feet of rod during a thunderstorm, a constant stream of discharges took place between these balls. And if the center of a cloud was vertical over the points, the bursts of thunder and the crash of the accumulated fluid conspired to produce an appalling effect.

A NEW PRESS.

The press shown in the annexed engraving is quite novel in principle, and although a recent invention it is rapidly coming into notice. It is adapted to a great number of uses, such as the punching and shearing of metals and other materials, stamping, embossing, etc., by foot or hand. It accomplishes work that has heretofore been done only by power presses. It performs some astonishing feats; for example, a press like that shown in the engraving will easily shear one-half by two-inch wrought iron, and punch a ¾ inch hole through 5-16 inch iron by foot power alone, and it can do more when operated by hand.

This astonishing result is obtained by the employment of a weighted pendulum, swinging back and forth or describing a complete circle if necessary. The pendulum is used in connection with an automatic clutch, a shaft, and a slide. The pendulum is easily set in motion by the pressure of the foot upon the treadle; this revolves the shaft with the same results and performs the work with the same speed as in ordinary power presses.

The weight of the pendulum may be varied to suit the work in hand, a supplemental weight being fitted to each side of the pendulum, to be attached or removed as occasion may require. The press is provided with a foot pedal, which yields to upward pressure, preventing accidents to the feet of the workman, and also avoiding breakage in case an unyielding body should accidentally get under the pedal. When required the press is furnished with a hand lever, as indicated in dotted lines. It is thus capable of rapidly



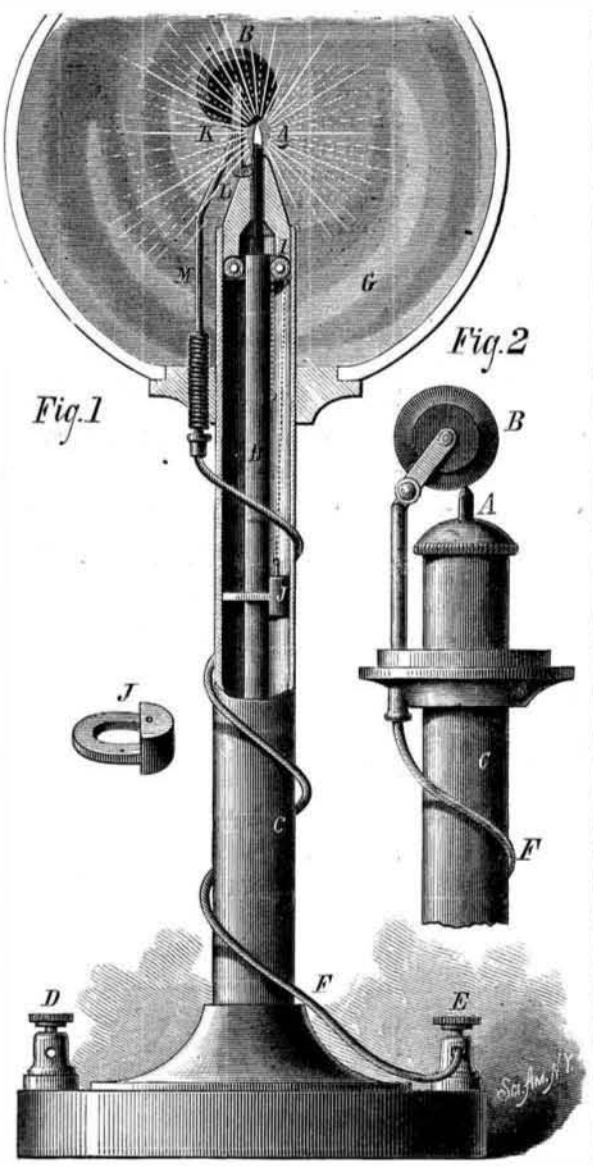
PEERLESS PUNCH AND SHEAR PRESS.

punching 1 inch holes through 5-16 iron. An ingenious stop is shown at the side of the press by which the punch may be brought into action at every oscillation of the pendulum or whenever required.

This press, and other styles on the same plan which we may hereafter describe, are made by the Peerless Punch and Shear Company, of 52 Dey street, New York city.

NEW FORM OF ELECTRIC LAMP.

The accompanying engraving represents an electric lamp (Reynier's system) designed by G. Cromé for domestic use. It is said that this lamp gives very good results when operated by six Bunsen elements. When a series of lamps is used the current should be supplied by a dynamo-electric machine. The carbons are inclosed either by a simple globe



IMPROVED ELECTRIC LAMP.

or by a bell filled with nitrogen or rarefied air, and the lamp may be used with safety in powder mills, in mines, and under water.

The carbon pencil, A, is a little less than $\frac{3}{16}$ inch in diameter. It is guided by the tube, H, and is pressed upward against the edge of the disk, B, by the weight, J, attached to a cord passing over the pulley, I. The carbon is in electrical communication with the binding post, D, and the carbon disk, B, is connected with the other binding post, E, by means of the wire, F.

The globe, G, rests upon the collar attached to the main standard of the lamp, and is entire throughout, except at the bottom. This globe may be replaced by a glass bell filled with nitrogen, which will retard the combustion of the carbons.

The disk, B, is supported by a lever, K, that is pivoted in the insulated standard, M. The lower end of this lever is bent at right angles, and is made to exert a slight lateral pressure on the carbon when the point of the carbon presses against the disk, B. The upward movement of the carbon causes the disk, B, to turn slightly, thus presenting a new surface to the action of the current.

The device shown in Fig. 2 is similar to that already described, the difference being that the regulating lever is omitted.

A Steam Rammer for Paving Streets.

The Philadelphia papers contain descriptions of a new and successful invention in use in that city for laying street pavements. According to the statements of our contemporaries it pounds granite blocks and cobble stones into place, making the surface, one paper says, as smooth as a billiard table, and promises to do away with the old style of paving the streets. The rammer, which looks like a locomotive at a distance, is operated on the same principle as a trip hammer, and can be so regulated as to make a stroke of one pound weight or 1,500 lb. This enables the operator to produce a level surface on every portion of the street it passes over, while the most expert man power cannot strike over two hundred pounds. Durability and solidity are the important features of paved streets, and while hand power can only force the stone into the earth three inches, the steam rammer sends them six inches with ease; thus making the stones compact and solid. It is claimed that the streets paved with this new invention will last until the stone is worn out. The machine weighs six and a half tons, and even that makes no rut or impression on the street which it has rammed. In repaving streets paved with cobble stones under the old system it is necessary to relay them, while, with the steam rammer, they can be driven to a level with perfect ease. It requires the services only of an engineer and a man to guide the rammer to work the machine. It consumes one fourth of a ton of coal per day. A number of streets in West Philadelphia bear splendid specimens of its work.

The Melodiograph.

Several contrivances have been invented to record the notes of melodies played on a piano, organ, or other key instrument, but were all more or less useless on account of their complexity, imperfectness, or expense.

Zigliani's melodiograph is very simple, usable, and cheap. A double flat spring placed under each key is connected with a battery and with a recording apparatus, which consists of a comb provided with insulated teeth gently resting on a copper cylinder. A strip of ruled and chemically prepared paper is drawn over this roller by a clock work, and receives the impressions or marks of the teeth of the comb. This clockwork can be regulated so as to cause the paper to move in conformity with the time kept by a person playing the instrument. Every time a key is depressed the circuit is closed, and the electricity, passing through one of the teeth of the comb, makes a mark corresponding to the key that has been depressed.

The Phosphorescence of the Sea.

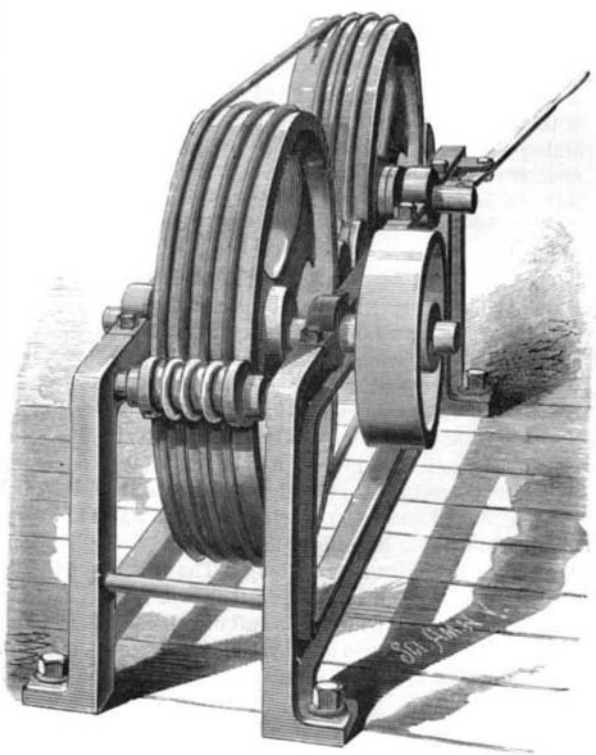
The illumination or phosphorescence of sea water at night, observable in this latitude in the summer, and at all times in tropical regions, is largely due to *Noctiluca miliaris*. It is a gelatinous little speck of a fellow, in shape like a peach, but only $\frac{1}{80}$ of an inch in diameter. The light, which is of a greenish hue, arises from scores of minute points. A glass of water taken where these creatures are present may contain myriads of them. Nets and ropes drawn through the sea pick up millions of Noctiluca; and the ropes and meshes are made luminous by them until they become dry.

NOVEL DEVICE FOR TRANSMITTING MOTION.

We give herewith an engraving of a new device for transmitting motion, invented by Messrs. Dennis, Samper & Valenzuela, of Bogota, United States of Colombia, South America. This device is intended for the transmission of power from one shaft to another, and it may be employed in transmitting continuous rotary motion or a reciprocating rotary motion.

It consists, as will be seen, by reference to the engraving, of two pulleys placed, one upon the driving shaft, the other upon the driven shaft, and connected by a belt, rope, or chain which passes several times around each pulley. When a continuous rotary motion is to be communicated from one shaft to the other the belt is endless, but when the motion is alternating the belt need not be endless; it may be wound several times upon the pulleys and have its ends attached to the pulley rims.

The belt is prevented from moving along laterally on the pulleys by the small grooved rollers journaled on diametrically opposite sides of the pulleys, and embracing the several convolutions of the belt. It is stated that the slight side pressure required to keep the coils of the belt in position on the pulleys amounts to nothing compared with the saving of power by avoiding the slipping of the belt.



DEVICE FOR TRANSMITTING MOTION.

The applications of this device are numerous. It may be used in transmitting power in place of the ordinary belt, and in most cases in place of cog gearing. It may be applied to hoisting machinery and to the transmission of power by wire ropes.

Further particulars may be obtained from Mr. Silvestre Samper, 262 President St., Brooklyn, N. Y.