

Static Induction Produced by Means of Ruhmkorff's Coil.

The author finds that if the current of a battery, alternately interrupted and re established, is made to pass through the thick wire of a Ruhmkorff's coil, two induced currents in contrary directions appear in the fine wire, and for a certain explosible distance there seems to be only one current produced. This current is direct, and the sparks given by it have quite the appearance of sparks of static electricity. Reciprocally, if a series of sparks of static electricity are passed through the fine wire, we receive in the thick wire

Interesting Experiments upon the Suspension of Clay in Water.

In a paper read before the Royal Physical Society, Edinburgh, by William Durham, F.R.S.E., he says: "It has been long known that pure water has the power of holding clay in suspension for an indefinite time, and also that salts of lime when added, even in small quantity, to water, destroy this power. I have made a considerable number of experiments on this subject, and the results appear to me extremely interesting.

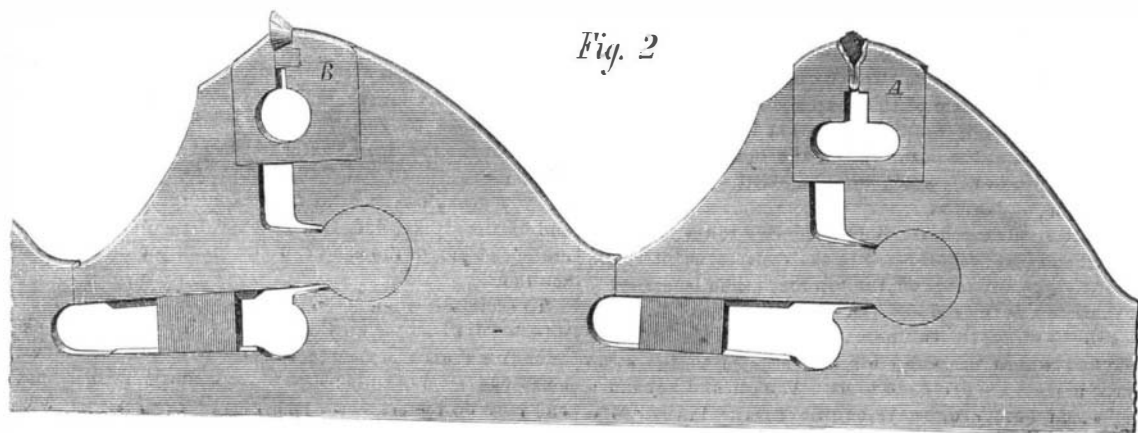
The power which water possesses of sustaining clay is

opaque for three days, while water only was seen through in about a day and a half

In solutions of sodium carbonate of varying strengths (and most probably in all alkaline solutions), the greater part of the clay sunk to the bottom, and the liquid cleared in the inverse order of the specific gravities of the solutions, so that the densest liquid settled and cleared first.

Water whose power of sustaining clay had been destroyed by an acid had this power restored, in great measure, to it by the addition of any of the alkalies.

On substituting finely powdered white silica for clay, the



EMERSON'S DIAMOND HOLDERS, AS INSERTED IN CIRCULAR SAWS. See page 159.)

currents quite analogous to those given by the battery. On examining these currents by means of a voltmeter, there appears to be merely one current in an inverse direction.—*M. E. Bichat.*

Leaf and Flower Impressions.

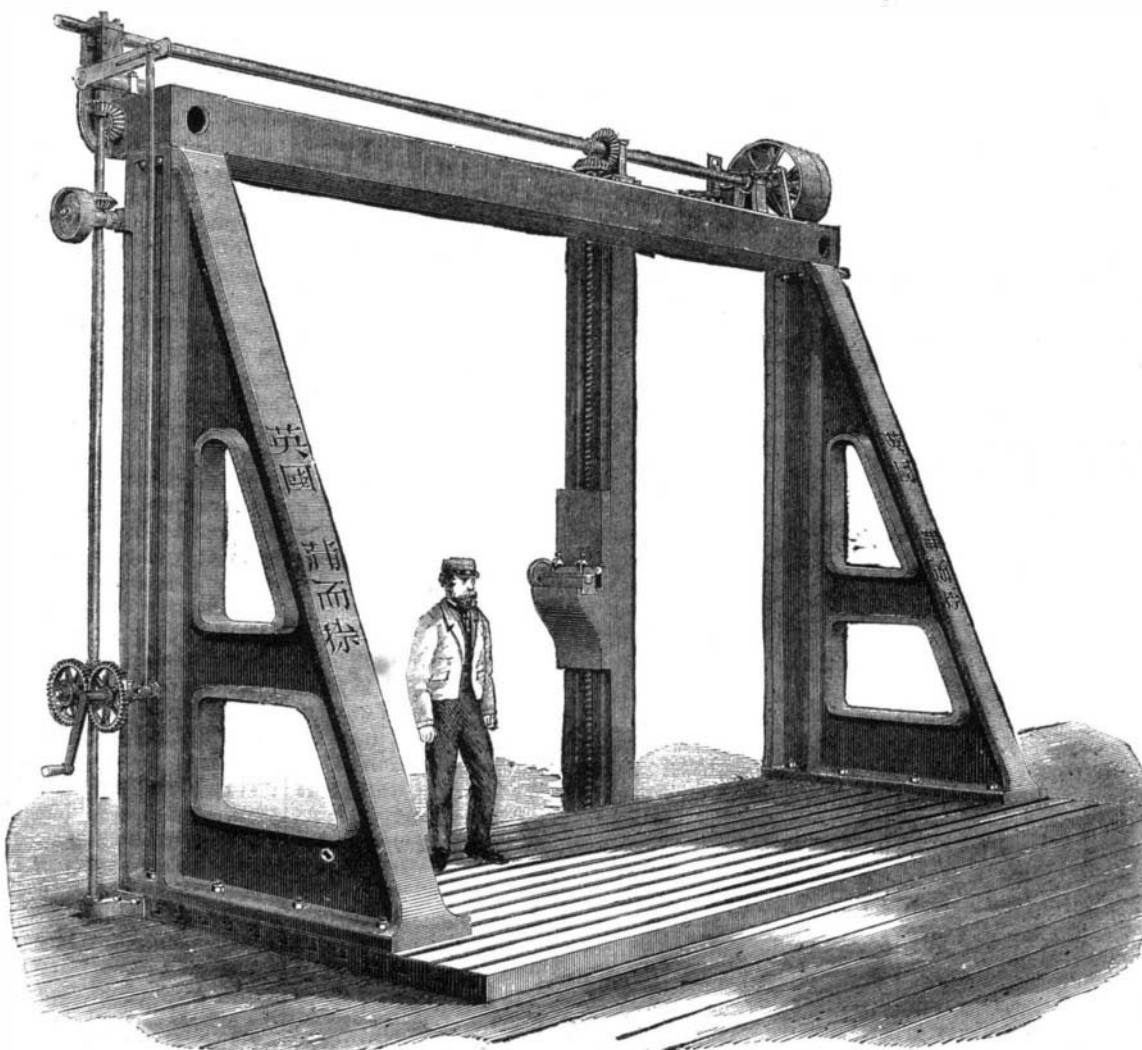
Oil a piece of white paper on one side; hold the side that is oiled over a lamp or pine knot smoke till quite black; place the leaf on the black surface, as the veins and fibers of the leaves show plainer on the under part; now press it on all parts of the leaf with the fingers; then take up the leaf and put the black oiled sides on the page of a book (made for leaf impressions) with an extra piece of nice paper on the top to prevent smutting the opposite page; press it a few moments; then remove the green leaf, and the impression will be left on the page as beautiful as an engraving. Flowers of single corolla can be pressed in like manner. Many of the geranium leaves make beautiful impressions. The impression book can be made still more interesting by giving botanical classifications of each leaf and flower.

IMPROVED VERTICAL PLANING MACHINE.

Vertical planing machines are now becoming pretty general in engineering workshops of the first class. The Chinese Government have lately established arsenals and dockyards on the European system at several of their principal ports, and among the tools sent out from this country by Messrs. John Bourne & Co., to furnish these establishments, there is a type of vertical planing machine which offers several features of advantage. Of this machine we give an illustration, for which we are indebted to *The Engineer*.

Upon a planed base of cast iron formed with grooves fitted with T headed bolts, for the attachment of the object to be operated upon, two strong standards are erected which carry planed cross pieces at the top and bottom, along which is drawn, by means of screws, a great upright bar, which carries the cutting tool. The tool holder with the tool, or, if desired, three tools, is made to travel up and down upon the vertical bar by means of a screw—shown in the engraving—and after each cut the vertical bar is drawn sideways by the top and bottom screws through a suitable distance, whereby an action resembling that of an ordinary planing machine is maintained, except that the cut is vertical. The foundations in many parts of China being precarious, the tool is so constructed as to be independent of walls or buildings. The vertical travel is 12 feet, and the horizontal 16 feet.

The cutting tool travels up at twice the speed that it travels down, and, as will be seen by a reference to the engraving, the design is one which combines strength with simplicity. The base plate is formed in two parts bolted together laterally for facility of shipment. Only about one third of its depth is shown above the floor. At the back of the machine there is a pit about 3 feet deep in which the attendant stands when the machine is at work.



VERTICAL PLANING MACHINE FOR THE CHINESE GOVERNMENT.

of the jar, and the liquid became clear in the order of the specific gravities of the solutions, so that the densest liquid settled and cleared last. This effect was more decided in the acid than in the salt solutions.

The power which water possesses of sustaining clay in suspension is gradually increased by the addition of small quantities of the alkalies, or their carbonates, and lime. Thus water having 3 grains of sodium carbonate in it was quite

same general results were obtained, but in a much modified form as to the time of clearing, the silica settling much more rapidly in every case than the clay.

These remarkably contrasted actions of acids and alkalies have not been noticed before, so far as I know, and, besides being of much scientific interest, may be of practical importance. I have not been able as yet to discover the cause of these phenomena, but it appears to me extremely probable that the clay, in falling through the water, generates, by friction, electricity; and as water is a bad conductor, the difference in potential between the clay and the water continues for some time, hence they are mutually attracted; but, when acid or salt is added, the liquid becomes a good conductor, the potentials are equalized, and the clay falls. With the alkali, on the other hand, although the liquid does become a better conductor, it at the same time becomes a better generator of electricity; and it is only when, by adding a considerable quantity of alkali, the conducting exceeds the generating power that the potentials are equalized and the clay falls. I hope to be able shortly to put this idea to the test of experiment."

Dealing with Workmen.

In a recent address to the British Association of Gas Managers, Mr. Geo. T. Livesey, the president, made the following observations, which apply not only to gas men, but to workmen of every class and profession:

"A source of great anxiety has been, and is still, the difficulty of dealing efficiently with their workmen. Undoubtedly the advance of wages so universally applied for, or expected, has been founded on circumstances that must be admitted in many cases to be a justification for the claim. When such grounds exist for an advance, I hold it to be to the interest of the manager, as well as his duty, to be the first to move in the matter, for I have found that men in regular constant employ, being generally steady, honest workmen, do not often make a request for an increase unless they have fair reasons for doing so, and it is a mistake to wait until they make the application. I have felt, when this has been the case on the part of a good servant, that I had done him an injustice in not giving him the advance unsolicited. I would further say, "Do not put a man off with excuses. Consider the matter at once, and give him an answer. If he is already sufficiently paid, tell him so; but, if not, remember that 'he gives twice who gives quickly'; and from that day let the extra pay be granted." So small a sum as 3d. or 6d. a day may make all the difference between a contented and a discontented workman; while the one may be worth, in the value of the work done, twice or four times that amount more than the other.

It is all very well to say that the price of labor, like that of coal or iron, is regulated by the inexorable law of supply and demand; but this law, though perfect in its application to the purchase of materials, has only a partial application where a man's labor is concerned."