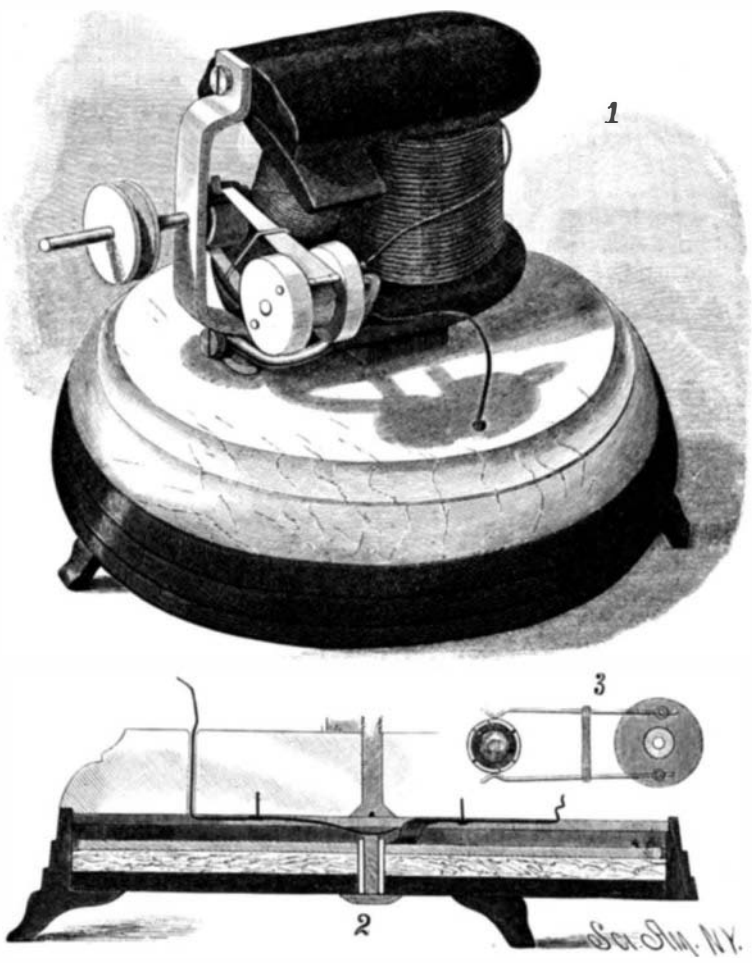
## INEXPENSIVE ELECTRIC MOTORS.

We are pleased to notice that there is one concern in this country having sufficient enterprise, and confidence in an appreciative public, to construct a line of small electric motors which are electrically correct, mechanically perfect, and well worth the price asked for them. One style sells for $1, another for $1.50. Both are complete with battery and chemicals for charging the same.

Fig. 1 shows the dollar motor, the battery being inclosed in the base; Fig. 2 shows the dollar and fifty cents motor, which is provided with two cells of battery in the base. Both of these motors are furnished with Siemens H-armatures, with adjustable commutator brushes, and with field magnets regularly wound and connected up in series with the armature.

In the motor shown in Fig. 1, the field magnet consists of a pair of polar projections formed integrally with the magnet core and a single bobbin formed of 27 feet No. 18 wire, A. M. W. G., wound on the core. The armature is 1½ inches in diameter, and the end pieces or polar extremities are ⅝ of an inch wide and ⅞ inch long. The portions on opposite sides of the armature shaft which receive the armature winding are $\frac{1}{32}$ inch in diameter and $\frac{7}{16}$ inch long. The winding of the armature consists of 15 feet of No. 22 wire, which is wound on the core after the manner of a straight electro-magnet, and the extremities of the wire are connected with a two-part commutator mounted on the armature shaft. The commutator is formed of a cylindrical wooden core with two semicircular pieces of copper attached to opposite sides thereof by clips projecting from the edges of the copper pieces and bent into the concaved ends of the wooden core. The commutator brushes consist of two copper springs looped at their outer ends and pivoted on wires running through the spool, the springs being pressed toward each other and into contact with the commutator cylinder by a rubber band surrounding both of the springs.

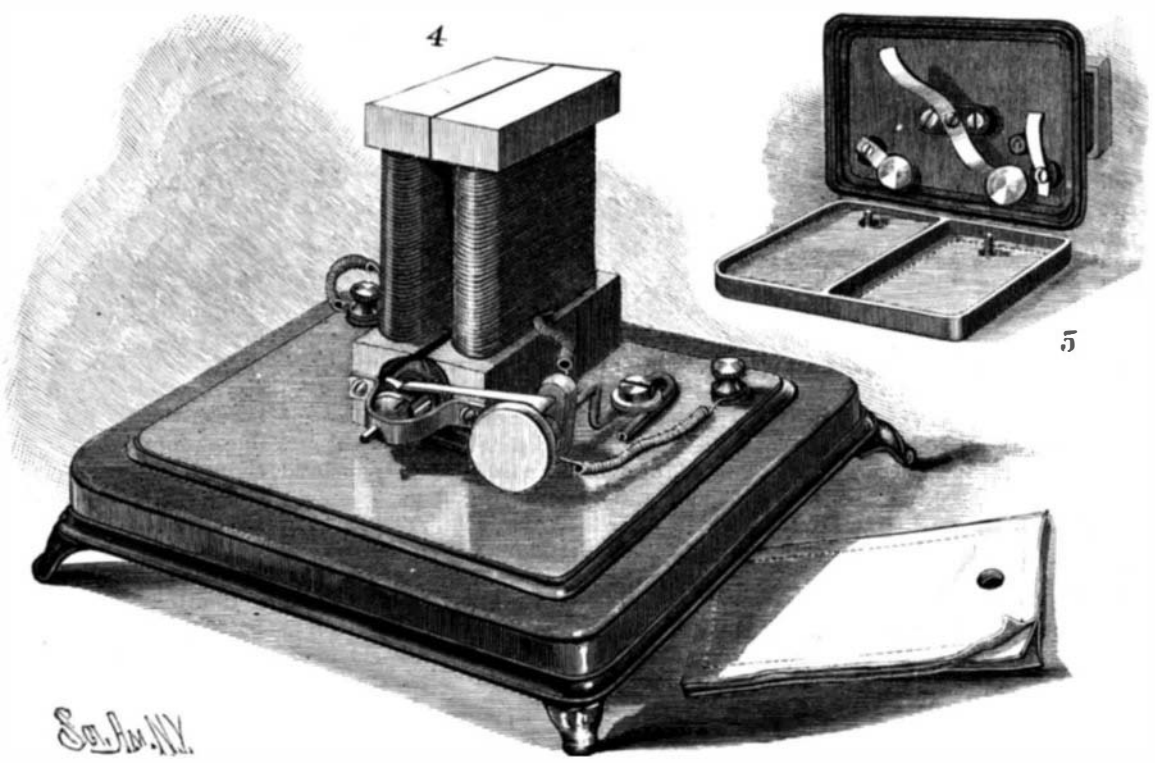
The battery in the base of the motor consists of a copper pan provided with a central rivet extending upwardly and surrounded by a piece of rubber tubing, a piece of thick loose felt and a zinc disk resting upon the felt, but out of contact with the pan and central rivet. To the bottom of the wooden base which forms the cover of the battery are attached two copper springs, one of which rests upon the zinc plate and the other upon the end of the rivet, thus establishing an electric connection between the two poles of the battery. One of these springs is connected with one terminal of the field magnet, the other terminal of which is connected with one of the pivotal wires of the commutator spring; the other pivotal wire is connected with the other spring. The battery is charged by placing under the felt some powdered sulphate of copper and upon the top of the felt a little sulphate of zinc, then filling the cell up with water so as to immerse the zinc. The battery thus charged is sufficient to run the motor for two or three hours. The motor, however, is capable of withstanding the current of a much larger battery, and if connected with such a battery it might do a considerable amount of useful work.




ONE DOLLAR ELECTRIC MOTOR.

The motor shown in Figs. 4, 5 and 6 has a field magnet with double arms which are oblong in cross section and are wound in the regular way. The armature is of the Siemens H pattern, of small diameter but of considerable length. The commutator is like that already described. The field magnet is wound with 64 feet of No. 25 magnet wire, 32 feet being wound on each arm of the magnet. The armature winding consists of 29 feet of No. 31 magnet wire, forming 100 convolutions. The central part or core of the armature is $\frac{5}{16}$ inch wide, 1½ inch long and $\frac{11}{16}$ inch thick. The battery is a double one, and the under surface of the base of the motor (which is of insulating material) carries a spring which connects a copper plate at the bottom of one of the cells with a zinc plate at the top of the other cell, and other springs are provided for establishing connection between the copper and zinc plates with the binding posts on the motor base, the latter being connected with the armature and field magnet as in the other case. The double cells in which the electrodes are placed is made of insulating acid-proof material, and the copper plate which lies at the bottom of each cell is furnished with an insulated rivet extending upward through a hole in the zinc plate.

The exciting material is carried in a blotting paper pad, shown in Fig. 6, one such pad being placed in each cell between the copper and zinc plates. The pad consists of three thicknesses of blotting paper fastened together by a row of stitching near the outer edge. The space between the middle and lower pieces of blotting paper is filled with pulverized copper sulphate, the space between the middle and the upper pieces of blotting paper is filled with zinc sulphate.




INEXPENSIVE SIEMENS ELECTRIC MOTOR.

All that is necessary to start the battery is to place these pads in the cells and pour in sufficient water to saturate them and effect a partial solution of the salts contained in the pad. A dozen or so of such pads accompany each motor and an extra supply can be purchased for a small price.

These little machines are safe and convenient, they illustrate many electrical principles and will serve a useful purpose in every family where young people and those that are older are to be instructed and amused. These motors could be used to considerable advantage in every school, however small or obscure, and certainly the price would be no bar to the establishment of an electrical plant in any school without regard to the condition of the treasury. These little motors are made by the Electro Novelty Company, of Boston.

### Isatine.

*Isatine*, called also *artificial indigo*, is a dark blue violet liquid; it is destined, on account of its low price and the ease with which it is used, to play a very important part in dyeing vegetable fibers.

Isatine can replace advantageously those colors which have been used to top natural indigo upon piece goods and yarns, and will give more or less heavy shades as desired. The shades thus obtained resist the action of the light, also alkalies and acids, and are remarkable for the ease with which they can be fixed upon vegetable fibers. The color can be diluted with more or less hot water, according to the depth of shade required. The liquid can be applied without mordant; it is, however, preferable to add a little alum or other alumina salt, in order that the shade may be faster and more regular.

For topping vat blues upon pieces or yarn the dye stuff may be used to great advantage. In its use the material is first dyed in a vat, is next treated with a mordant of alum or acetate of alumina and nitrate of iron, and finally dyed in a more or less concentrated color bath, varying also the temperature according to the shade desired. The color fixes better upon the fiber if the yarn or pieces bottomed with indigo are treated directly with a mordant of alum and nitrate of iron instead of souring with an acid. The strength of the mordant should be regulated according to the depth of the vat blue. In fact, the lime should be neutralized by the mordant; if the latter is too strong, the color is fixed too slowly, and there is a loss of coloring matter, but if too weak, the color goes on too rapidly and unevenly. To avoid these two difficulties it is very important to observe exact proportions, especially for light shades. For dyeing cotton and linen yarns, after boiling them out, they should be put in a lukewarm and weak color bath for light shades, or hot and strong bath for dark shades, and to the bath should be added alum or acetate of alumina in the proportion of 1 pound of alum for 200 pounds of yarn; finally rinse with water.

The nitrate and the pyrolignite of iron are the proper mordants for dark shades; these shades can be blued with soda, potash, soap, etc. Sumach can be placed advantageously on the bottom. Verdigris added to the color bath gives a more intense blue, which darkens at the end of the dyeing by contact with the air. An addition of aniline violet or fuchsine gives beautiful shades of dark violet, which are fast. A large use for the color is for dyeing fast blacks. Logwood and quercitron can then be used in connection with the color.—*Industrie Textile; Textile Record.*

### Treatment of Erysipelas.

Schneider (*Centralblatt fur Chirurgie*, No. 1518, 1892) states that he has employed Sachs' treatment for erysipelas with almost invariable success. This consists in applying beyond the involved areas a ten per cent ichthyol collodion mixture. If the extremity is involved, this collodion is spread around the limb above the limit of the disease, forming a band about twice the breadth of the hand. It should be put on in a layer so thick that after drying it presents an appearance as though the limb were encircled with a broad bandage. In nearly all cases, when the inflammation reached the border of this collodion layer, it ceases to spread.

Improvement follows in two or three days, the temperature drops, and symptoms rapidly subside.

Schneider believes that collodion without ichthyol is as efficacious as the mixture suggested by Sachs,