

Fig. 803.—Thomson's Siphon Recorder.

# ELECTRICITY

In the Service of Man:

*A Popular and Practical Treatise on the Applications of Electricity  
in Modern Life.*

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speed of signaling.

**The Siphon Recorder.**—Fig. 803 represents an ingenious and interesting instrument called the siphon recorder, invented by Sir William Thomson.

The arms of a powerful magnet, consisting of a number of steel plates, *Sch*, are furnished with pole-pieces *N* and *s*: the wire coils *R R* are suspended between these, and joined to the leads at *x* and *y* (Fig. 804). To make the magnetic field, in which this frame is suspended, more powerful, a piece of soft iron *s N* is placed inside the frame. The coils are fastened to the cocoon thread *a*, and the cocoon threads *b b* serve to maintain them in a certain position by means of the little weights *g* (Fig. 803). When a current flows through the coils the frame will be turned in one or other direction, according to the direction of the current. This motion will

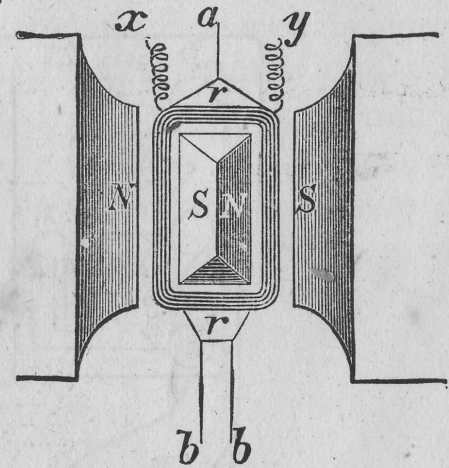


Fig. 804.

be transmitted by means of the cocoon threads and a lever to the writing arrangement, which consists of the glass siphon *s i*, whose upper arm dips into the ink vessel *F*; while its other arm, which terminates in a point, marks the strip of paper that is slowly moved past it. A straight line is produced on the paper while the siphon is at rest, but when it is influenced by the electric current, by means

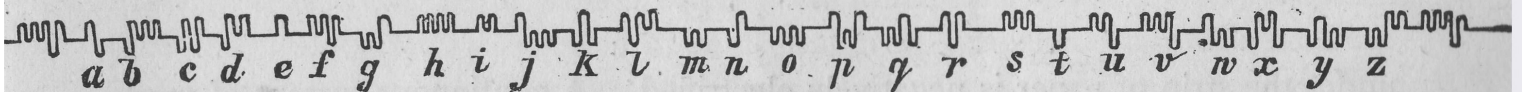


Fig. 805.—Siphon Writing.

of the wire frame, zigzag lines are traced on the paper, which correspond to the direction of the currents which have been sent through. An alphabet has been constructed of these lines, as shown in Fig. 805; before *a* and after *z* are signs which signify "All right," "Understood."

In order to produce distinct marks on the paper, the point of the siphon is made so fine that the ink does not flow from it by capillary attraction alone, but has to be electrified before it can be used; this is managed by means of a so-called mill, which consists of an electro-magnetic motor of the simplest construction, combined with an induction machine. Upon the gutta-percha disc of the latter are metal spokes arranged radially, which have pieces of iron attached to their ends; underneath this wheel is an electro-

branches : one branch flows from  $m$  to  $T_3$ , the other to  $T_1$ , where it again divides into two branches, one of which flows through the coil  $s_1$ , while the other flows over the varying resistance of  $T_1$ ,  $T_2$ , to the condenser  $C_1$ . As the resistance of these two branch currents is considerably greater than the resistance which the branch current encounters at  $T_3$ , a current flows through  $s_1$ , which is only just strong enough for recording the telegram to be sent, while the main current flows to the condenser. Between  $C_1$  and  $C_2$  the same phenomena happen as were considered in connection with Fig. 802. A positive current arrives at station II and flows through the coil  $s_2$  over  $T_1$ ,  $U'$  and the contact 1 of  $m'$  into the double keys, and thus to earth at  $E'$ , that is to say, a positive current flowing through the coil  $s_2$  deflects the coil in a certain direction, and traces a certain curve on the paper by means of the siphon. When the upper key of station I is depressed, the positive pole of battery B is connected with earth at E, and a current is enabled to flow from the negative pole, over contact 3 to  $n$ , and so on to the condenser  $C_1$ . A negative current will flow from the condenser  $C_2$  through the coil  $s_2$ , which will then be deflected in a direction opposite to its former direction, and thus cause the siphon to trace a curve in the opposite direction also.