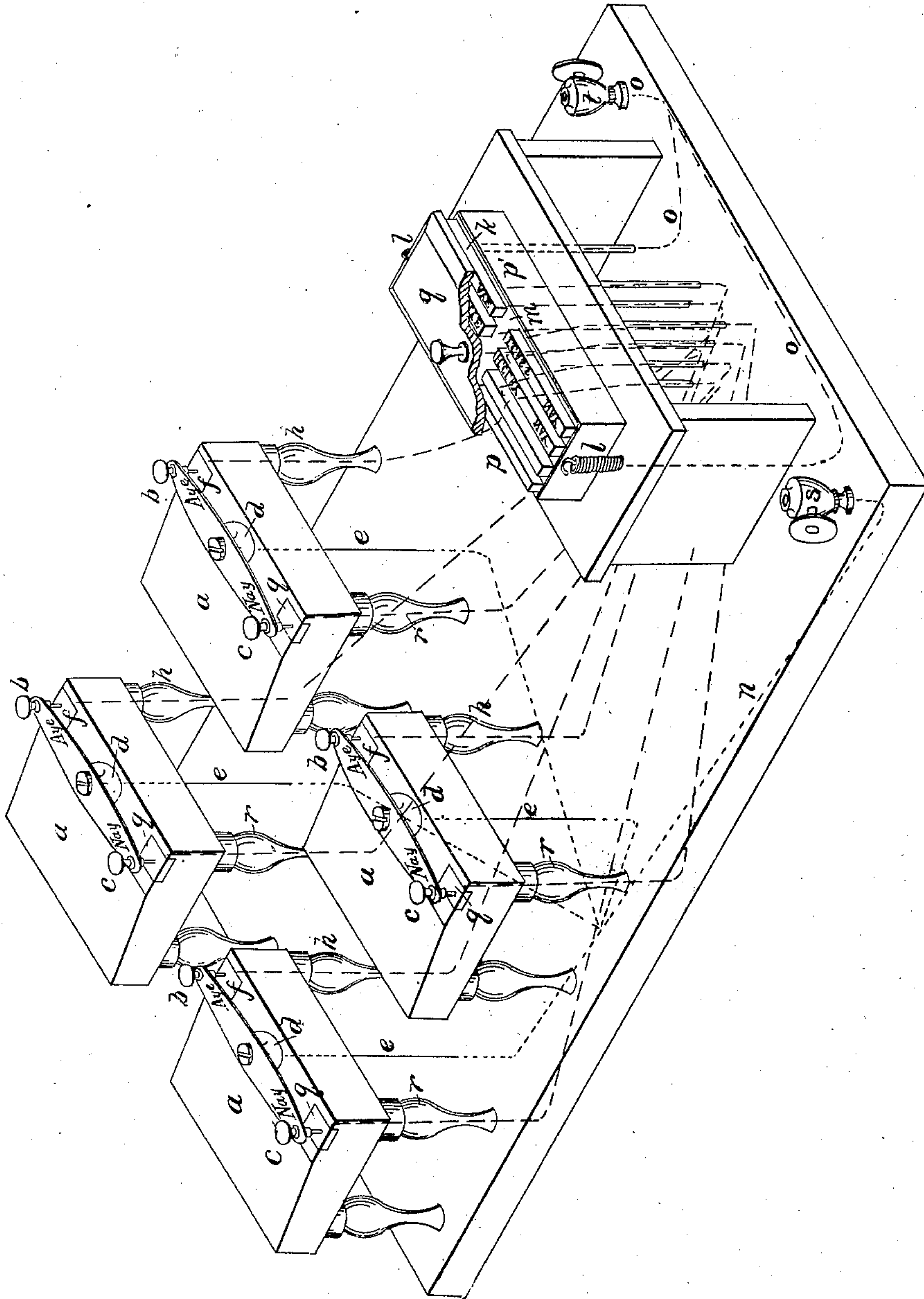


A. N. HENDERSON.  
AYE AND NAY APPARATUS.

No. 7,521

Patented July 22, 1850.





# UNITED STATES PATENT OFFICE.

A. N. HENDERSON, OF BUFFALO, NEW YORK.

## IMPROVEMENT IN THE APPLICATION OF ELECTRO-CHEMICAL PRINTING IN COLORS FOR TAKING AYES AND NOES.

Specification forming part of Letters Patent No. 7,521, dated July 22, 1850

*To all whom it may concern:*

Be it known that I, ALBERT N. HENDERSON, of Buffalo, in the county of Erie and State of New York, have invented certain Apparatus for Taking the Ayes and Noes by Galvanic Electricity; and I do hereby declare that the following is a full, clear, and exact description of the principle or character which distinguishes it from all other things before known, and of the usual manner of making, modifying, and using the same, reference being had to the accompanying drawing, which is a perspective view of the apparatus.

My invention consists of an apparatus by which words, signs, letters, &c., can be permanently printed on paper or other fibrous substance by a person or persons situated at a distance by means of the galvanic current.

When used for the purpose of taking the ayes and noes in a legislative assembly I employ metallic types having duplicate sets of the members' names, one set with the word "Aye" and the other with "Nay" attached to each name. On the desk of each member are a pair of keys, which strike on studs which communicate by wires with the types at the speaker's desk. Over the types is placed a piece of paper chemically prepared with some substance which is decomposed by the action of a current of electricity and becomes colored or discolored in the places where the current passes through, or it may be colored previously and be bleached by the action of the electricity.

The desks of the members are represented in the drawings by *a a*, having the keys *b* and *c* in a convenient situation. These keys are attached at *d* to the wire *e*, colored red, which leads to the battery, and by pressing on any one of the keys *b* a connection is made with a wire, *h*, colored blue, which leads from the member's desk to the types *p'* having the member's name with the word "Aye" annexed; or by pressing the other key, *c*, a connection is made in a similar manner with the name having the word "Nay" annexed.

The types are set in column, the names with "Aye" annexed to them in one and those with "Nay" annexed in the other, each name communicating by a wire with the proper stud on the member's desks. On the face of the types

is placed a piece of sensitive paper, and on it a metallic plate, *g*, the plate being connected with the opposite pole of the battery.

When it is required to take a vote a piece of the prepared paper is laid on the types and the plate placed over them. Each member then touches either the "Aye" or "Nay" key as he pleases to vote. If in the affirmative, he presses the key *b* down on the stud *f*, and thus forms a communication through the wire *h* with the types *k*, representing his name and the word "Aye" at the speaker's desk. The passage of the electricity through the paper from the types to the plate *g*, which is connected with the other pole of the battery, stains the paper and gives a perfect impression of the name with "Aye" annexed to it. If he touches the other key, *c*, the types in the other column are acted on by the current passing through the stud *q* and the wire *r*, colored green, and the name with "Nay" is printed on the paper. In this manner the votes of the whole can be taken simultaneously and the speaker have a printed list of the members with their votes annexed to their names.

The several wires *e* are joined to one main wire, *n*, which leads to the battery.

In order to make a perfect contact with the whole surface of the types *k* and *p* and the plate *g* with the paper interposed, I cause the plate to press on them by the springs *l*, which also serve to make the connection with the battery through the wires *o*. To do this more perfectly I also set the types *k* and *p* on an elastic bed of india-rubber or springs *m*.

*s* and *t* are screw-cups which connect the wires *n* and *o* with the battery.

The paper should be damp when used.

Among the various substances which may be used for preparing the paper for the above purposes are the following, viz: A saturated solution of cyanide of potassium in water, to every twenty parts of which add one part of sulphuric or nitric acid, which gives a green color when acted on by the electricity. The acid may be omitted, but the impression is not quite so permanent. A saturated solution of sulphate of copper gives a black impression. The same with the addition of cyanide of potassium until the liquid becomes clear, which gives a greenish impression. A strong solu



tion of cyanide of potassium with chloride of silver gives a green impression. All the above leave the paper white until acted upon by the galvanic current. About twenty parts of a weak solution of prussiate of potassa with one of sulphuric acid colors the paper slightly and gives a deep-blue impression by the electricity.

With paper saturated with the above solutions the changes are made which produce the alteration of color, according to the nature of the solution, entirely within the paper or other fabric without acting on the metal of the types or plate. To prevent such action I prefer to make them of platinum, gold, or other metal, which will resist corrosion by the substances employed to prepare the paper.

It is obvious that this invention can be applied to many other purposes besides that of taking ayes and nays, such as printing, telegraphing, &c.

Instead of using paper previously prepared by a chemical solution, I find that the paper can be used merely damp in the parts where the current is to pass through. This I do by placing over the dry paper, when laid on the types, a piece of thick card or similar substance saturated with moisture, and above this a metallic plate connected with the battery. The paper is then acted on by touching the keys, as before described, and the impression,

though invisible when the paper is taken out, becomes apparent upon applying a proper chemical solution.

Having thus fully described my invention, what I claim as new therein, and for which I desire to secure Letters Patent, is—

1. The mode, substantially as herein described, of imprinting words, letters, figures, &c., upon paper or other fibrous substances by placing the paper or other substance (either chemically prepared or not, as above set forth) between two surfaces of a metal which is not acted on by the substances employed, on one of which the letters or figures are raised by passing a current of galvanic electricity through the prepared material, substantially as above described.

2. Passing the electric current between metallic surfaces, as above described, through damp paper otherwise unprepared, and afterward applying a chemical solution, by which the effect of the electricity becomes visible whenever it has passed through the paper, for the purposes above described—telegraphing, &c.

ALBERT N. HENDERSON.

Witnesses:

EDWARD EVERETT,  
WM. GREENOUGH.