

**983,703.**

Inventor:—  
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# UNITED STATES PATENT OFFICE.

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ELECTRICAL WRITING APPARATUS.

983,703.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, DINSHAH PESTANJI FRAMJI GHADIALI, a citizen of Great Britain, residing at the city of Surat, British India, have invented certain new and useful Improvements in Electrical Writing Apparatus, of which the following is a specification.

This invention relates to pens generally, and particularly to that class in which high tension electric currents are employed for carbonizing the paper.

The principal object of this invention is to provide a novel device of this character which will prevent the tampering with ink written documents. Heretofore, when ink has been employed for writing purposes, the said writing could be easily changed as desired, but with the employment of my invention the writing will be carbonized and perforated simultaneously in the paper and it will therefore be impossible to make any changes whatsoever without immediate detection thereof.

Another object of the invention is to provide a device of this character which will be free from danger and which will make no mark except when the same is pressed upon the paper or other object.

A still further object of the invention is to provide a construction in which a writing desk forms one contact with a circuit, and a pen the other contact thereof, the said pen having a resilient point which when engaged with the paper for writing purposes or the like is depressed within the pen-holder to close the circuit.

With these and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawings and pointed out in the claims herewith appended; it being understood that various changes in the form, proportion, size and minor details of construction within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawing, the figure shows a view partly diagrammatical and partly in section of the various elements and connections of the entire device.

Referring to the drawing, it will be seen that my invention comprises an accumulator or other source of electric energy A. A rheostat R and main switch M are arranged

in circuit with one pole of the accumulator, the switch being preferably arranged intermediate of the two.

The invention further comprises an induction coil Z having primary connections P and P', and secondary connections S and S', one of the primary connections being connected to the said rheostat R. The other primary contact P' is connected to a circuit breaker C. A condenser PC is connected to the said circuit breaker C in the well known manner. A vacuum tube V is arranged in circuit with the secondary terminals and is adapted to indicate the conditions of the device, to preserve a certain definite load on the instrument when working and to act as a safety to the coil's insulation for the operation while working. A condenser SC is connected to the secondary terminals and is adapted to intensify the caloric power of the spark hereinafter described.

The invention further comprises a writing desk D which is provided with an insulating top U. This desk is preferably made of aluminum and is in circuit with one end of the vacuum tube V. Extending from the accumulator A and the condenser PC is a pair of wires Y which are respectively connected to binding posts E and B, arranged within the pen-holder N. This pen is preferably provided with a removable cap W to protect the said binding posts B and E. A glass tube G containing an enlargement or bulb H is arranged longitudinally within the pen-holder. Wires F and I are respectively arranged longitudinally in spaced relation within the tube, the latter wire being directly connected to the binding post E. A quantity of mercury is arranged within the glass tube and is adapted when the pen is in a horizontal position to be seated within the bulb thereof. When the pen is raised, however, the mercury will run down the tube and form a metallic contact between the spaced wires F and I, as will be readily seen. A piston or needle O is arranged at one end to move longitudinally against the tension of a coil spring L which surrounds the inner end of said needle. When the said needle is forced inwardly, due to the pressure exerted upon the pen-holder proper, it will close a circuit by contacting with a lug K arranged in rear of the same. A wire connects the said lug K and the connection B.

In operation, the pen is held vertically,



the mercury H moves down the tube and closes the circuit between the wires F and I, thereby bringing into circuit both the primary and secondary coils. The moment the needle O is pressed on the paper to write, the spring T is pushed back and the contacts L and K are brought together thereby completing the primary circuit. In this manner, the high tension sparks formed between the desk D and the needle O, carbonize and perforate the paper placed on the said desk.

By the aid of the secondary condenser SC, the current is condensed so that the spark is given greater intensity of heat in order to better carbonize the paper. It will furthermore be seen that when the pen is temporarily raised from the paper between words, figures and the like, the release of pressure upon the needle O breaks the primary circuit. In this manner, a waste of electric energy is prevented, as the pen ceases to be effective while the operator pauses from time to time. It will furthermore be seen that this arrangement prevents any unnecessary carbonization of the paper.

What I claim:—

1. An apparatus of the class described comprising a normally open circuit including a source of electrical energy, a writing desk connected to one pole of the said source of energy and forming one contact element of the circuit, and a pen having one end connected to the other pole of the said source of energy and the other end provided with a needle and forming the other contact element of the circuit.

2. An apparatus comprising a normally open circuit, including a source of electrical energy, an induction coil having primary and secondary terminals, a circuit breaker, a condenser for the primary coil, a condenser for the secondary coil, a connection including a rheostat between one of the primary terminals and one pole of the source of energy, a writing desk forming one contact element of the circuit connected with the secondary coil, and a pen forming the other contact element of the circuit and having connections respectively with the primary condenser and circuit breaker, and with the other pole of the source of energy.

3. An apparatus of the class described, comprising a normally open circuit, including a source of electrical energy, an induction coil having primary and secondary terminals, a circuit breaker, a condenser for the primary coil, a condenser for the secondary coil, a connection including a rheostat between one of the primary terminals and one pole of the source of energy, a writing desk forming one contact element of the circuit connected with the secondary coil, a vacuum indicator arranged parallel with the secondary con-

denser and the said contact element, and a pen forming the other contact element of the circuit and having connections respectively with the primary condenser and circuit breaker, and with the other pole of the source of energy.

4. An apparatus of the class described, comprising the combination with a normally open circuit including a source of electrical energy, of a writing desk connected to one pole of the said source of energy and forming one contact element, and a pen having one end connected to the other pole of the said source of energy and the other end provided with a needle and forming the other contact element, said pen having an open circuit connecting the needle and the first-mentioned end and means for closing the same upon certain positions of the pen.

5. An apparatus of the class described, comprising a normally open circuit including a source of electrical energy, a writing desk connected to one pole of the said source of energy and forming one contact element of the circuit, and a pen connected to the other pole of the said source of energy and forming the other contact element of the circuit, the said pen comprising a casing, a longitudinal tube formed therein and provided with an enlargement adapted to receive mercury, spaced wires arranged longitudinally within the tube and adapted to be connected by the mercury upon certain positions of the pen, a contact lug arranged near the front end of the pen, a wire connecting the latter and extending rearwardly, binding posts respectively connecting one of the first-mentioned wires and the last-mentioned wire, and a needle resiliently secured in the front end and adapted through pressure upon the needle to make contact with the said lug.

6. A pen of the class described, comprising a casing, a longitudinal tube formed therein and provided with an enlargement adapted to receive mercury, wires arranged longitudinally within the tube and spaced apart at a point away from the said enlargement, said wires being adapted to be connected by the mercury upon certain positions of the pen, a contact lug arranged near the front end of the pen, a wire connecting the latter and extending rearwardly, binding posts respectively connecting one of the first-mentioned wires and the last-mentioned wire, and a needle resiliently secured in the front end and adapted through pressure upon the needle to make contact with the said lug.

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Witnesses:

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