

May 6, 1924.

1,493,014

J. J. BOYLE

ELECTRICAL PERFORATOR

Filed May 17, 1922

Fig. 1.

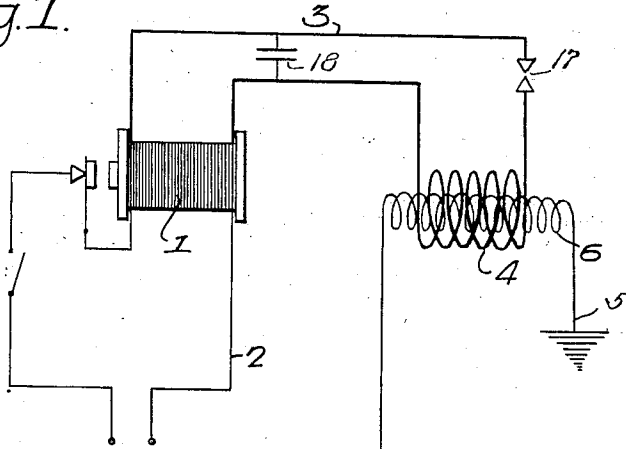


Fig. 4.

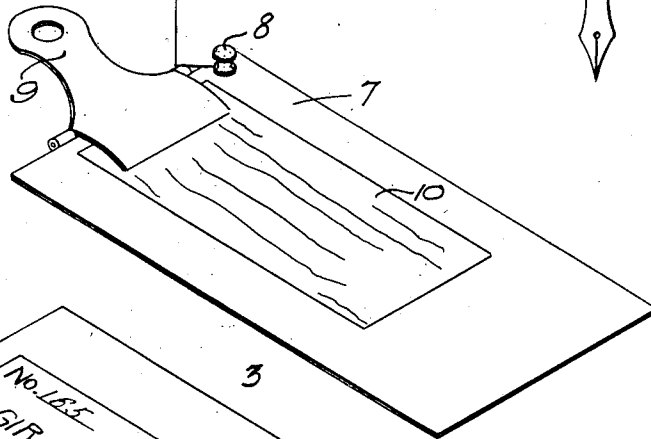
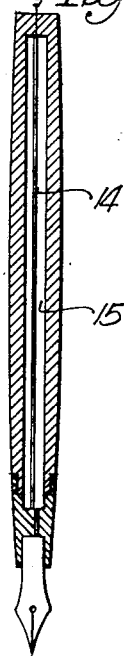


Fig. 2.

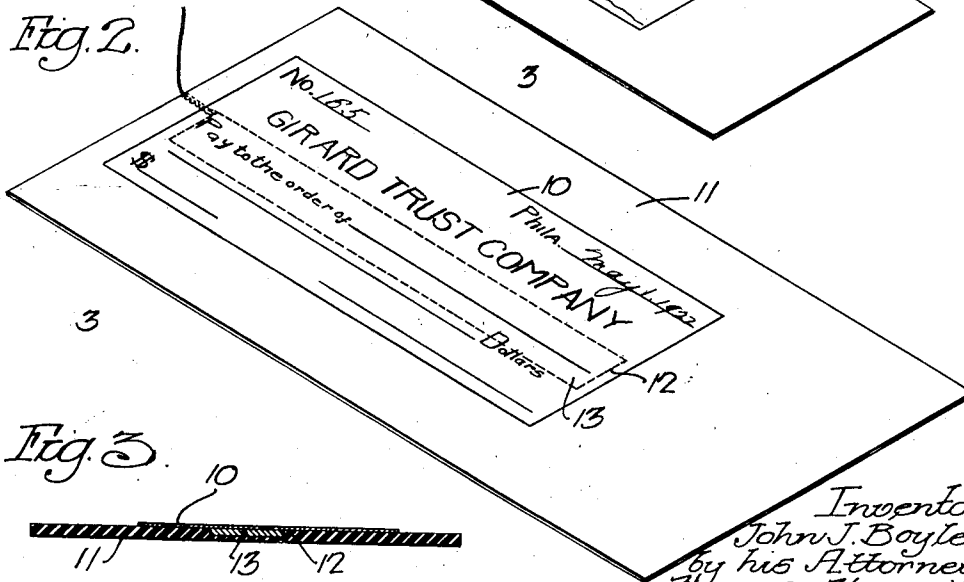
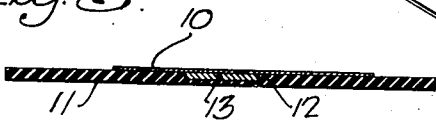


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN J. BOYLE, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRICAL PERFORATOR.

Application filed May 17, 1922. Serial No. 561,712.

To all whom it may concern:

Be it known that I, JOHN J. BOYLE, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented an Electrical Perforator, of which the following is a specification.

The object of this invention is to provide simple and efficient means for check protection.

In the attached drawing:

Figure 1, is a view in diagram of apparatus made in accordance with my invention;

Fig. 2, is a view in perspective of a modification within the scope of the invention;

Fig. 3, is a section on the line 3—3, Fig. 2, and

Fig. 4, is a sectional view of a further modification.

Numerous methods and mechanical devices have been developed for lacerating and perforating checks to prevent alteration and fraud. It has also been proposed to perforate the paper by electricity, and this latter method possesses numerous advantages over the known mechanical means. The latter, however, have gone into general use due to certain fundamental faults which hitherto have rendered the use of electricity for this purpose impracticable.

I have discovered means whereby electricity with all its attendant advantages may be used with entire satisfaction and with a total elimination of all the objectionable features which hitherto have disqualified it for commercial usefulness.

In practicing my invention, I prefer to employ apparatus of the type employed in the so-called "violet ray" machines for producing an electric current of high frequency, although other types of high frequency apparatus may be employed where found desirable. Such a machine I have shown diagrammatically in Fig. 1 of the drawings, it consisting of an induction coil 1, the primary circuit 2 of which may be connected to any suitable source of current (not shown), and the secondary 3 of which is connected with the primary 4 of a Tesla coil. This secondary circuit of the induction coil, which includes the primary winding of the Tesla coil, also includes a series spark gap 17 and a condenser 18 in parallel with the coils. One terminal 5 of the secondary 6 of this Tesla coil is grounded, while the

other terminal is connected in the present instance to a metal plate 7, a binding post 8 being provided on this plate for that purpose. In the present case also I have provided the plate 7 with a spring clip 9 at one side which is adapted to hold a check or other paper form 10 to the plate during the writing operation.

In apparatus of this, it is only necessary to write the check in the usual manner, it being possible to use a pen of the ordinary form. As the point of the pen contacts with the material of the check, minute discharges of electricity will pass from the charge plate 7 through the material to the point of the pen, these discharges perforating the check and causing the ink to flow through the perforations and into the body of the paper. These discharges from plate to pen point continue as the pen is moved across the paper, with the result that the latter is perforated thoroughly along the line of the writing.

In order to prevent the hand of the writer coming into direct contact with the charged plate, a device such as that illustrated in Fig. 2 may be employed, this consisting of a plate 11 of suitable insulating material having a slot or opening 12 in which is established a metal strip or plate 13, which latter is connected in the manner previously described to the high frequency apparatus. In this case, the check is placed upon the plate 11 in such position that the line upon which the marks are to be made overlies the metal strip 13, the paper being perforated when the point of the pen comes in contact with the paper. In this case, however, the hand of the writer will rest upon the plate 11 and need not come in contact with the metal plate.

It will be apparent that equally satisfactory results may be obtained by using a pen the point of which is connected to the high frequency apparatus instead of the metal plate upon which the check is laid. A suitable pen for this purpose is shown in Fig. 3, and may be of the ordinary fountain type having an electrode or conductor 14 extending into the well 15 of the pen in such manner as to be continually in contact with the ink carried therein, the electrode 14 being electrically connected by means of a wire 16 to the secondary 6 of the high frequency apparatus. In this case as be-

fore, the check is laid upon a metal plate and the writing done in the usual manner, the discharges passing from the point of the pen through the paper to the metal plate beneath. The latter device, however, is subject to one of the main faults of the previously developed electrical perforating means, in that a special pen is required having the wire attached thereto, this wire preventing entire freedom in the manipulation of the pen.

In the apparatus illustrated in Figs. 1 and 2, however, and as previously stated, any ordinary writing pen may be employed, it being unnecessary to include the pen in the electric circuit, and it being accordingly given the entire freedom which is found in any ordinary writing operation. A further considerable advantage over the prior forms of electric perforating apparatus is also found in the fact that although the discharges are sufficiently strong to insure a thorough perforation of the paper, the character of the discharge is such as in no way seriously to affect the operator if his hand should come in contact with the plate 7, and it is accordingly unnecessary to exercise any extraordinary care in the use of this apparatus to prevent electric shock.

The apparatus will accordingly find universal use by all, and does not require special construction or expert handling such as is required in the previously developed forms of electric perforating devices.

The apparatus is a simple one and is comparatively cheap, and lends itself to a variety of modifications and refinements to suit any conditions of use.

I claim:

1. A marking device comprising spaced electrodes adapted to be energized by high frequency electrical energy and by their motion relative to an interposed article to define in perforations a line on said article of desired configuration.

2. A marking device comprising spaced electrodes, a source of high frequency electrical energy adapted to energize said electrodes and to create electrical discharges therebetween, and means for effecting a relative movement between said electrodes and an interposed sheet to thereby form by reason of said discharges a series of perforations in said sheet defining a line of desired configuration.

3. In combination, a source of high frequency electrical energy, a circuit adapted to be energized from said source and including therein spaced terminals adapted by their motion to form in an interposed sheet a series of perforations defining a line of desired configuration.

4. In combination, a source of high frequency electrical energy, a circuit adapted to be energized thereby and including

spaced terminals adapted to have inserted therebetween an article to be perforated by electrical discharge between the terminals, and means providing for movement of the terminals with respect to the article to thereby form in the article a line of perforations of desired configuration.

5. In combination, a source of high frequency electrical energy, a circuit adapted to be energized thereby and including a terminal member having an extended surface, and a second terminal member adapted to be moved over and adjacent the said extended surface of the first member.

6. An electric perforator comprising in combination a source of high frequency electrical energy, and a circuit adapted to be energized thereby and including spaced terminals constituting a spark gap.

7. A check protector comprising a source of high frequency electrical energy, a pen, and a circuit including said pen and adapted to be energized from said source.

8. A check protector comprising a source of high frequency electrical energy, a pen, a circuit including said pen and adapted to be energized from said source, and a member constituting a second terminal for said circuit and a support for an article to be marked by the pen.

9. A check protector comprising a source of high frequency electrical energy, a pen, a grounded circuit including the pen and adapted to be energized from said source, and a member constituting a second terminal for said circuit and a support for an article to be marked by the pen.

10. An electric perforator comprising a source of high frequency electrical energy, a stylus, a circuit adapted to be energized from the said source and including the stylus, and a terminal adapted with the stylus to form a spark gap in the circuit for insertion of an article to be perforated.

11. A check protector comprising spaced electrodes constituting a spark gap, a source of high frequency electrical energy adapted to energize said electrodes, and means for directing the electrical discharges at will to form in a check a series of perforations defining a line of desired configuration.

12. In a check protector, the combination with a source of high frequency electrical energy, of a circuit energized from said source and including a spark gap, and means for directing the spark through the body of a check to form a series of perforations defining a line of desired configuration.

13. The method of indelible marking, which consists in directing the electrical discharge between spaced electrodes energized from a source of high frequency electrical energy through an article to be

marked, and moving the electrodes with respect to the article to define by said perforations a desired marking.

14. The method of indelible marking, which consists in directing the electrical discharge between spaced electrodes energized from a source of high frequency electrical energy through an article to be marked, and simultaneously applying to the article at the points of said perforations a writing fluid.

15. The method of indelible marking, which consists in forming an electrical circuit including spaced terminals one of which is constituted by a fluid bearing stylus, energizing the circuit from a source of high frequency electrical energy, placing an article to be marked intermediate the terminals, and moving the terminals with respect to the article to form in the article a series of perforations marked by the fluid from the stylus.

16. In an electric marking device, the combination with a circuit including means for establishing a current of high frequency, of a grounded circuit operatively associated with the first mentioned circuit and including a metallic body having a flat surface.

17. In an electric marking device, the combination with a circuit including means for establishing a current of high frequency,

of a circuit operatively associated with the first mentioned circuit and comprising a grounded conductor having connection with a metal plate.

18. In an electric marking device, the combination with a circuit including means for establishing a current of high frequency, of a circuit operatively associated with the first mentioned circuit and including a smooth metallic plate.

19. In an electric marking device, the combination with a circuit including means for establishing a current of high frequency, of a conductor operatively associated with the first mentioned circuit and having connection with a metal plate.

20. In an electric marking device, the combination with a circuit including means for establishing a current of high frequency, of a grounded conductor operatively associated with the first mentioned circuit and having connection with a metal plate.

21. In an electric marking device, the combination with a circuit including means for establishing a current of high frequency, of a circuit operatively associated with the first mentioned circuit and comprising a smooth metallic plate and a stylus movable with respect to said plate.

JOHN J. BOYLE.