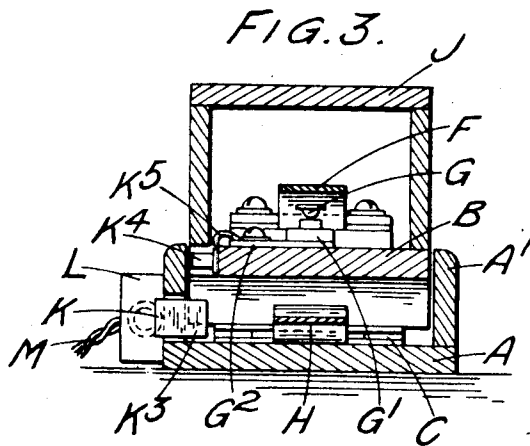
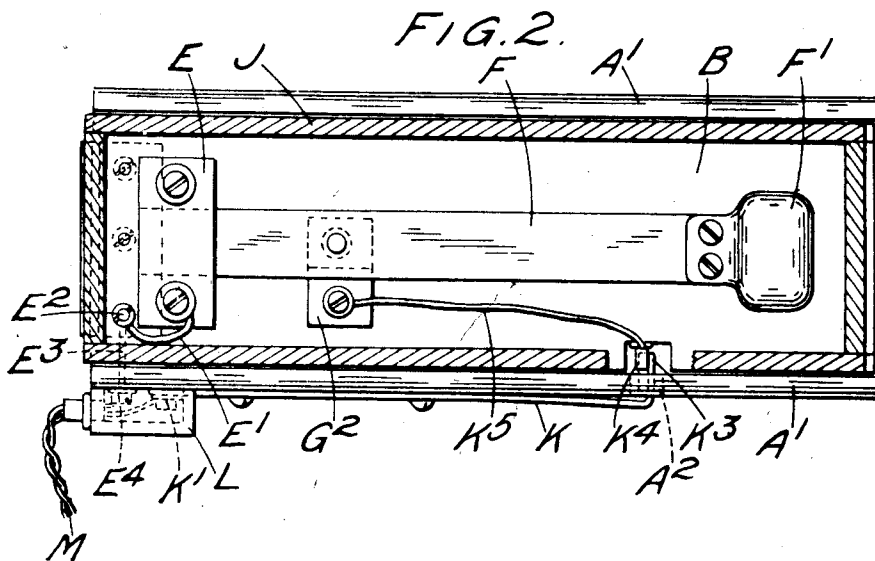
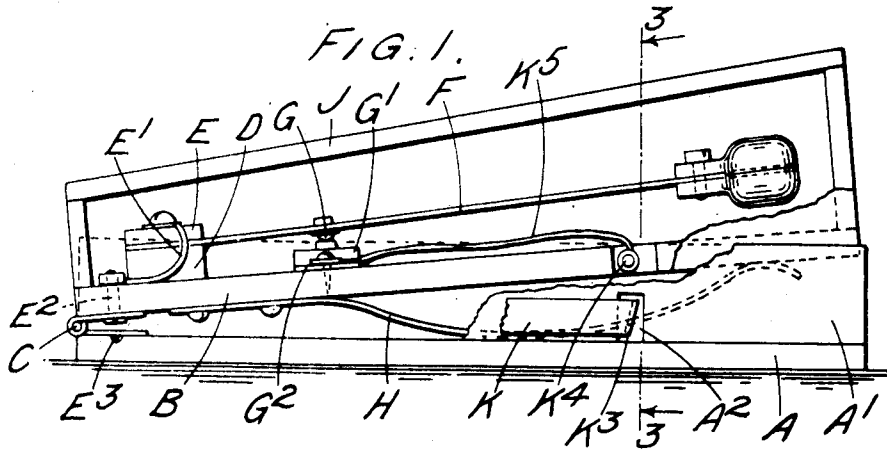


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 APPARATUS FOR DELIVERING ELECTRIC IMPULSES
 FROM A SOURCE OF CURRENT SUPPLY
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APPARATUS FOR DELIVERING ELECTRIC IMPULSES FROM A SOURCE OF CURRENT SUPPLY

Application filed December 9, 1930, Serial No. 501,157, and in Great Britain December 18, 1929.

This invention relates to apparatus for delivering electric impulses from a source of current supply of the kind comprising a freely vibrating member which alternately closes and opens a circuit. The object of the invention is to provide an improved apparatus of this type, more particularly intended for use where the current impulses are not required continuously for long periods, which will be of simple and inexpensive construction, reliable in action and readily brought into and out of operation.

To this end apparatus according to the present invention for delivering electric impulses from a source of current supply comprises, in addition to a make-and-break device comprising a freely vibrating member which alternately closes and opens a gap in a circuit, a switch arranged in series with the make-and-break device so as to control the circuit in which the make-and-break device is included, and means whereby movement actuating the said current controlling switch will mechanically set in motion the vibratory member of the make-and-break device.

The vibratory member of the make-and-break device conveniently comprises a springy arm held rigidly at one end and, as stated, so mounted on the movable part of the switch or circuit-closing device controlling the main flow of current through the circuit in which the make-and-break device is included as to be caused to vibrate whenever such part of the switch is moved to close the circuit. Thus in one convenient arrangement the circuit-closing device or switch controlling the main flow of current in the circuit in which the make-and-break device is included has two relatively movable parts of which that one which is normally moved to close the circuit, carries a springy arm constituting the vibratory member of the make-and-break device so that vibration of such vibratory member will be caused owing to the inertia of the free part of the arm when such switch part is moved to close the circuit.

For example the apparatus may comprise a base having hinged thereto a support to which one end of the springy arm is rigidly

connected, the other end of the arm preferably being weighted. An electric contact on the arm is adapted alternately to make and break contact with a second contact as the arm vibrates and a switch is provided controlling the circuit through the contacts and operated by movement of the hinged support relatively to the base. Thus the movement of the hinged support to close the switch causes an initial vibration to be imparted to the vibratory spring by reason of the inertia of the weighted end thereof. Preferably the hinged support is acted on by a spring which tends to separate it from the base, the closing of the switch to complete the circuit through the contacts and to impart an initial vibration to the vibratory member being effected by moving the hinged support towards the base.

The invention is particularly applicable to apparatus for delivering a series of electric current impulses to a dental or surgical chisel of the kind described in the specification of the present applicant's copending application for Letters Patent of the United States of America No. 384,699, and in this case the apparatus is conveniently adapted to be foot-operated, the hinged support being provided for example with a lid or cover which is acted upon by the foot so as to depress it together with the support to close the switch and impart the desired initial vibration to the vibratory arm.

With such apparatus the contact carried by the vibratory arm is if desired arranged on the upper face of this arm so as to engage its cooperating stationary contact when the arm rises, the arrangement being such that the apparatus can be inverted and when so inverted the weighted end of the arm will cause the two contacts to be brought into continuous engagement so that closing of the switch by depressing what is normally the base of the apparatus will then complete the circuit so as to deliver a single electric impulse.

The invention may be carried into practice in various ways but one construction according to this invention is illustrated by way of

example in the accompanying drawings, in which

Figure 1 is a side elevation partly broken away,

5 Figure 2 is a sectional plan, and

Figure 3 a section on the line 3—3 of Figure 1.

In the construction illustrated the apparatus comprises a base A adapted to rest upon the floor and a platform, B, hereinafter termed the hinged support, hinged at C at one end to the adjacent end of the base A. The hinged support B carries an insulating block D secured thereto and clamped between the upper face of this block and the lower face of a metal plate E is a leaf spring F carrying a weight F¹ at its free end. Mounted on the leaf spring F at a point intermediate in its length is an electric contact G adapted to cooperate with a stationary and preferably adjustable contact G¹ which is carried by a metal plate G² secured to the hinged support B. The arrangement is such that as the leaf spring F vibrates the two contacts G, G¹ alternately make and break contact.

Arranged between the upper face of the base A and the under face of the hinged support B is a bowed leaf spring H the under surface of the centre part of which engages the base A while its ends extend upwards to engage the under face of the hinged support so as normally to maintain this hinged support in the position shown in Figures 1 and 3.

The hinged support B is provided with a lid J which rests thereon and encloses the vibrating leaf spring F and its associated mechanism, while the base A is provided with side members A¹ which act as guides to prevent lateral movement of the hinged support B relatively to the base A and to prevent entry of the flexible lead wire which would hold up the downward movement of the hinged member.

Extending along the outer face of one of the side members A¹ is a metal leaf K one end of which is connected to an electric contact K¹ within a junction box L, while its other end extends through a slot A² in the side member A¹ as indicated at K³ to form one contact of a switch the other contact of which is constituted by a pin K⁴ mounted in a recess in the adjacent side of the hinged support B so that when this support is depressed against the action of the leaf spring H the two contacts K³, K⁴ are brought into engagement. Alternatively, instead of the leaf spring, a spring-loaded gun-metal ball and socket may be used so that in either case a rubbing contact is obtained, thus ensuring that any sparking which may take place is completed before the foot is fully pressed down.

The contact K⁴ is connected to the metal plate G² by a conductor K⁵ while the metal plate E is connected by a conductor E¹ to a

stud E² constituting one of the securing screws for one half of the hinge C. The other half of the hinge C which is secured to the base A is connected by a further conductor E³ to a second contact E⁴ in the junction box L. From the two contacts E⁴ and K¹ respectively lead flexible conductors constituting a twin cable M.

It will be seen that with the arrangement above described, when the lid J, and hence the hinged support B, is depressed, for example by the foot, the contacts K³, K⁴ will be brought into engagement and, at the same time, owing to the inertia of the weight F¹, the depressing of the hinged support will cause the leaf spring F and member F¹ to oscillate so as alternately to make and break contact between the contacts G and G¹. Thus in operation when the hinged support B is depressed to close the contacts K³, K⁴ the leaf spring F will be set in oscillation to close intermittently the circuit through the whole apparatus from one of the conductors M by way of the contact K¹, metal strip K, contacts K³, K⁴, conductor K⁵, metal plate G², contacts G¹, G, spring F, metal plate E, conductor E¹, hinge C and contact E⁴ to the other conductor M, whereby a series of electric impulses will be transmitted. As soon, however, as the hinged support B is released it will move upwards under the action of the spring H so as to break connection between the contacts K³, K⁴ and thus open the circuit.

If desired the weight F¹ may be adjustable along the spring F so as to vary the period of oscillation of this spring while, further, in some cases the fixed contact G¹ may be arranged above the leaf spring F so that by inverting the device the weight of the member F¹ will cause the contacts G, G¹ to come into continuous engagement whereupon by depressing the base A the circuit can be closed so as to deliver a single electric impulse.

It is to be understood that the constructions described above are given by way of example only and that the arrangement of the vibratory member and the switch whereby the apparatus is rendered inoperative and brought into operation as well as other details of construction may be varied without departing from this invention.

What I claim as my invention and desire to secure by Letter Patent is:—

1. Apparatus for controlling the delivery of electric impulses from a source of current supply, including in combination a make-and-break device comprising a freely vibrating member, a movable contact operatively connected to the vibrating member and a relatively fixed contact with which the movable contact cooperates, a switch including a movable member arranged in series with the make-and-break device, and means whereby movement actuating the switch will me-

chanically set in motion the vibrating member of the make-and-break device.

2. Apparatus for controlling the delivery of electric impulses from a source of current supply including in combination a make-and-break device comprising a movable supporting member, an arm of a springy nature, means for securing one end of the arm to the supporting member, a weight on the other end of the arm, a contact on the arm and a fixed contact cooperating with the contact on the arm, a switch arranged in series with the make-and-break device, and means whereby movement of the supporting member actuates the switch and simultaneously sets in motion the springy arm by reason of the inertia of the weight.

3. Apparatus for controlling the delivery of electric impulses from a source of current supply including in combination a switch comprising a movable and a fixed part, and a make-and-break device in series with the switch comprising a springy arm, means for securing one end of the springy arm rigidly to the movable part of the switch, a weight at the other end of the springy arm, one contact on the arm and another contact cooperating with the contact on the arm.

4. Apparatus for controlling the delivery of electric impulses from a source of current supply including in combination a switch comprising a movable and a fixed part, a make-and-break device in series with the switch and comprising a freely vibrating member carried by the movable part of the switch, a movable contact operatively connected to the vibrating member and a fixed contact which is carried by the movable part of the switch and with which the movable contact cooperates, so that movement of the movable part of the switch to close this switch mechanically sets in motion the vibrating member of the make-and-break device.

5. Apparatus for controlling the delivery of electric impulses from a source of current supply including in combination a base, a support hinged to the base, a switch which is automatically closed when the hinged support is moved towards the base, and a make-and-break device arranged in series with the switch and comprising a freely vibrating member carried by the support, a movable contact operatively connected to the vibrating member and a fixed contact carried by the hinged support with which the movable contact cooperates whereby movement of the hinged support towards the base, in addition to closing the switch sets in motion mechanically the vibrating member.

6. Apparatus for controlling the delivery of electric impulses from a source of current supply including in combination a base, a support hinged to the base, a switch comprising a contact on the hinged support and a cooperating contact on the base, a spring

tending to move the hinged support away from the base, and a make-and-break device arranged in series with the switch and comprising an arm of a springy nature, means for securing one end of the arm rigidly to the hinged support, a weight at the other end of the arm, a contact on the arm and a fixed contact on the hinged support cooperating with the contact on the arm.

In testimony whereof I have signed my name to this specification.

WILTON THEW.

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