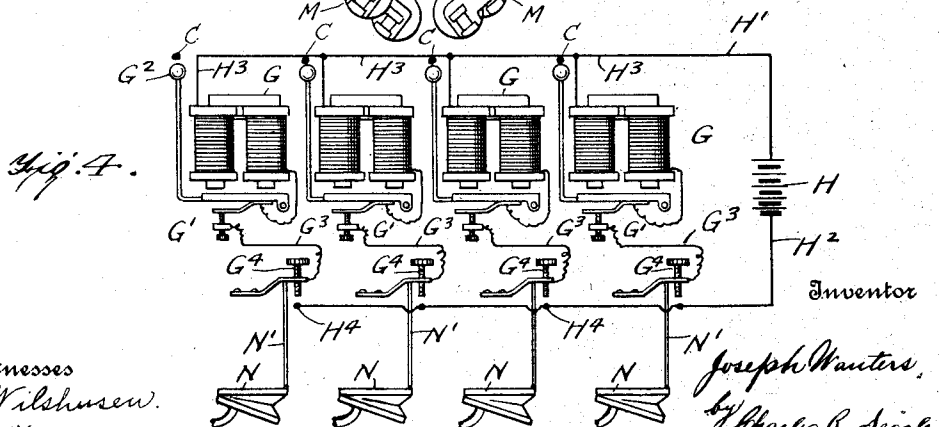
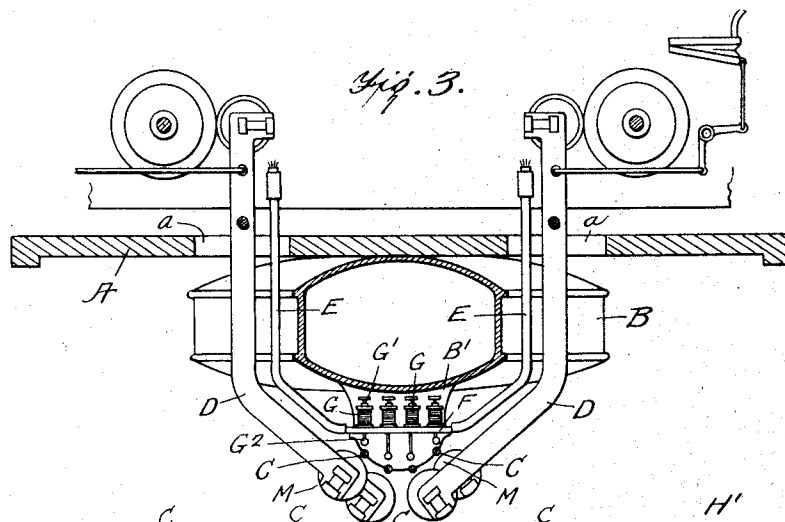
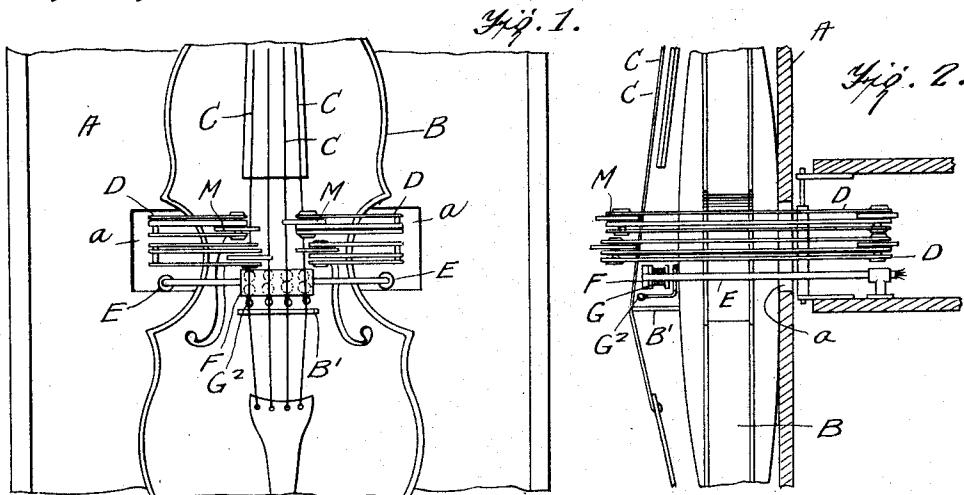


J. WAUTERS.
TONE MODIFYING DEVICE FOR AUTOMATIC VIOLINS.
APPLICATION FILED JULY 13, 1911.

1,042,513.

Patented Oct. 29, 1912.



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UNITED STATES PATENT OFFICE.

JOSEPH WAUTERS, OF NORTH TONAWANDA, NEW YORK, ASSIGNOR TO THE RUDOLPH WURLITZER MANUFACTURING COMPANY, OF NORTH TONAWANDA, NEW YORK, A CORPORATION OF NEW YORK.

1,042,513. TONE-MODIFYING DEVICE FOR AUTOMATIC VIOLINS.

Specification of Letters Patent.

Patented Oct. 29, 1912.

Application filed July 13, 1911. Serial No. 638,342.

To all whom it may concern:

Be it known that I, JOSEPH WAUTERS, a subject of the King of Belgium, residing at North Tonawanda, in the county of Niagara and State of New York, have invented a certain new and useful Improvement in Tone-Modifying Devices for Automatic Violins, of which the following is a specification.

The invention relates to mechanically-operated stringed instruments and more particularly to means for producing a tremble or throbbing of the tone, especially in instruments of the violin type, and analogous to what is sometimes termed "tremolo".

The object of the invention is to supply mechanically-operated means for successfully producing the desired pulsating or tremolo effect, similar to that produced in hand-playing by rocking the finger-end under which the string is held.

The invention consists in certain novel features and arrangements of parts by which the above object is attained, to be hereinafter described and pointed out in the claims.

The accompanying drawings form a part of this specification and show a preferred form of the invention.

Figure 1 is a front view of a portion of a violin and its support, equipped with the invention. Fig. 2 is a vertical section through the support, showing a portion of the violin, with a bowing means and the tremulo means in elevation. Fig. 3 is a corresponding horizontal section partly in plan view. Fig. 4 is a diagram showing an arrangement of electric circuits.

Similar letters of reference indicate the same parts in all the figures.

The invention is based on the discovery that by rapidly striking the string near one end, preferably near the bridge in instruments of the violin class, the effect of rapid alternate lengthening and shortening of the vibrating portion of the string may be produced.

The striking device or tappet may be actuated in various ways but for convenience of installation and operation with a mechanically played instrument I prefer an electric apparatus as shown in the drawings.

A is a board and B a violin held thereon

by any suitable means and which may be as usual. The strings C are stretched over a bridge B¹ and may be operated by any suitable "bowing" device; I have shown that portion of the apparatus as consisting of four circular disks M mounted in arms or levers D, with means for rotating the disks and presenting their peripheries to their respective strings in a manner described and illustrated in Letters Patent to me dated March 12, 1907, No. 846,883.

Through openings *a a* in the board A extend tubes E E, one on each side of the violin, carrying at their outer ends a narrow strip or platform F, preferably of hard-rubber or other insulating material, lying transversely of the violin beneath the strings and near the bridge. On this platform are secured four electro-magnets G, one for each string and each equipped with an armature G¹ and make-and-break contacts similar to those employed in the ordinary electric-bell construction and similarly operated to produce rapid oscillations of a tappet G² on each of the armatures. The tappets are preferably of soft non-resonant material, as soft-rubber or the like, and arranged to strike their respective strings on the inner faces of the latter and close to the bridge.

When one of the magnets is energized the corresponding tappet delivers a succession of rapid but slight blows upon its string, and if at the same time the string be bowed the desired throbbing or trembling of the tone will be produced.

The wires from the battery to the magnets are led through the supporting tubes E E, and the several magnets may be energized by completing the circuits thereto by any suitable means.

In Fig. 4 is shown diagrammatically a preferred arrangement of circuits adapted for operation by a series of pneumatics N actuated as usual by perforations in a music-sheet, not shown. H is a battery from which extends a wire H¹ having branches H³ each leading to the coils of its magnet G, and H² is a wire from the other pole of the battery and having fixed contact points H⁴ therein, one for each magnet. G⁴ G⁴ are movable contact-points connected each by a wire G³ to the automatic make-and-break mechanism of its magnet and arranged to complete the

circuit through its fixed contact H⁴ by a link from a pneumatic N.

The movement of either pneumatic will close its circuit, energize its magnet, and
 5 actuate the tappet thereof, or two or more may be energized at the same time, as determined by the arrangement of apertures in the music-sheet as will be understood.

Modifications may be made in the forms,
 10 proportions and locations of the parts without departing from the principle of the invention or sacrificing its advantages. The tappets may be operated otherwise than electrically, they may be of any suitable material,
 15 size and shape, and they may be arranged to strike the strings upon the outer faces of the latter instead of beneath.

Although I have described the invention as applied to a self-playing violin it will
 20 be understood that it will serve successfully with other stringed instruments of the violin or other class to which it may be adapted.

I claim:—

1. In an instrument of the character set
 25 forth, a string, means for bowing said string to produce a tone, a tappet independent of and operable simultaneously with said bowing means to deliver a series of blows upon said string while it is being
 30 bowed, to modify such tone, a pneumatic, and electric means controlled thereby for actuating said tappet.

2. In an instrument of the character set forth, a string, a bridge over which said
 35 string is stretched, means for bowing said string to produce a tone, a tappet independent of and operable simultaneously with said bowing means to modify such tone, said tappet being located between said bridge
 40 and bowing means, a pneumatic, and electrical devices controlled thereby for actuating the tappet.

3. In a device of the character described, a board, a violin mounted thereon, means for
 45 vibrating the strings of the violin, electromagnets, armatures therefor, tappets carried

by the armatures for contact with the strings, and pneumatics and connections between the pneumatics and the said magnets for controlling the energization of the magnets by the pneumatics whereby upon movement of the pneumatics said tappets deliver a succession of rapid blows upon the strings while the latter are being actuated by the vibrating device. 55

4. A board, a violin mounted thereon, a bowing device for the strings of said violin, a platform adjacent said strings, electromagnets carried by said platform, armatures for said magnets, tappets carried by the
 60 armatures, pneumatics, and connections between the pneumatics and the said magnets for controlling the energization of the magnets by the pneumatics whereby upon movement of the pneumatics said tappets impart a series of rapid blows to the strings while the latter are being operated upon by the bowing device. 65

5. A board, a violin mounted thereon, a bowing device for the strings of said violin, a platform adjacent said strings, electromagnets carried by said platform, armatures for said magnets, tappets carried by the
 75 armatures, pneumatics, connections between the pneumatics and the said magnets for controlling the energization of the magnets by the pneumatics whereby upon movement of the pneumatics said tappets impart a series of rapid blows to the strings while the latter are being operated upon by the bowing device, tubes extended through said board upon opposite sides of the violin and supporting said platform, and wires to said magnets passed through said tubes. 80

In testimony that I claim the invention above set forth I affix my signature, in presence of two witnesses. 85

JOSEPH WAUTERS.

Witnesses:

CHARLES R. SEARLE,
 CORA M. FREDERICKS.