J. METZGER.

PIANO ATTACHMENT FOR GIVING MANDOLIN EFFECTS.

APPLICATION FILED NOV. 1, 1909.

960,665.

Patented June 7, 1910.

2 SHEETS—SHEET 1.

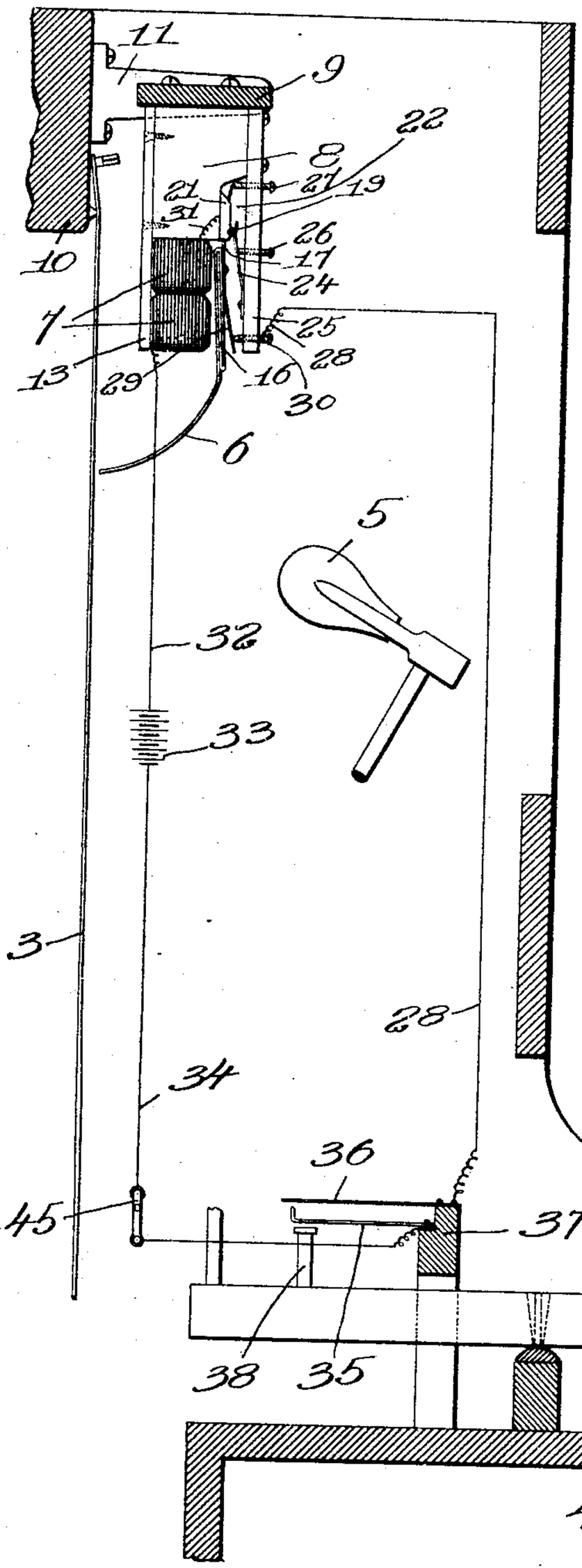

Fig. 1.

Fig. 2.

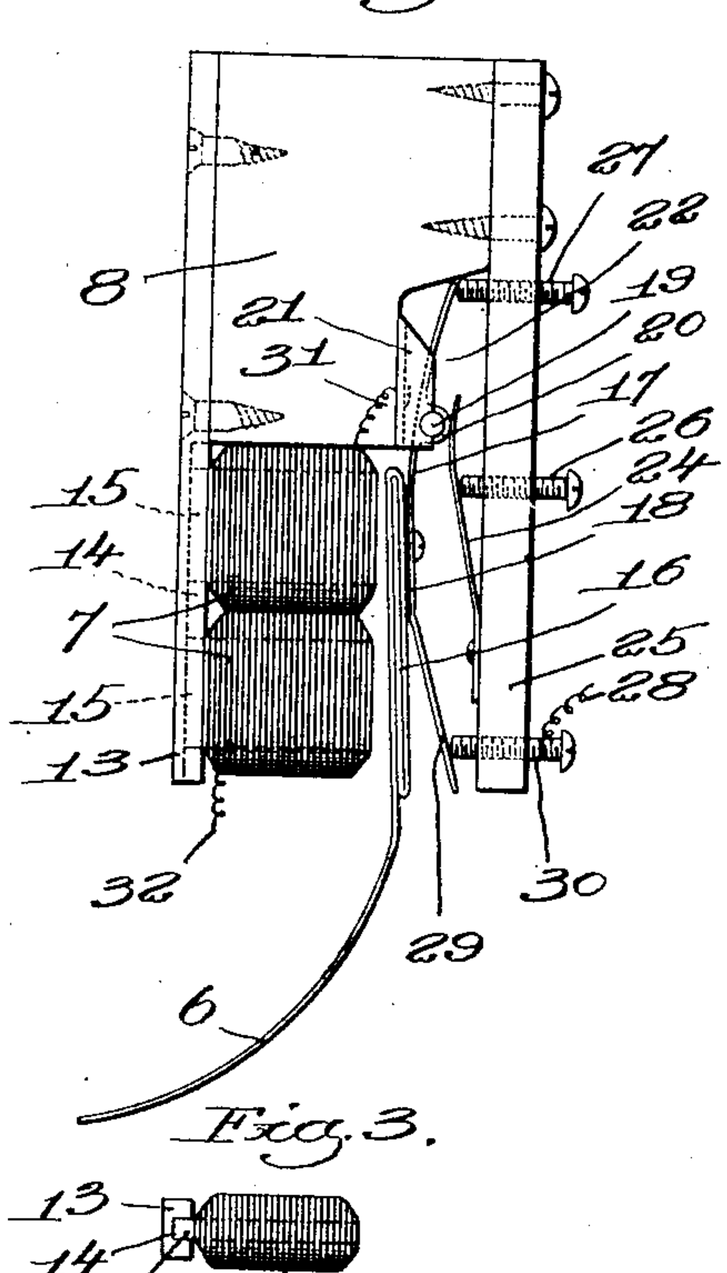

Fig. 3.

Fig. 4.

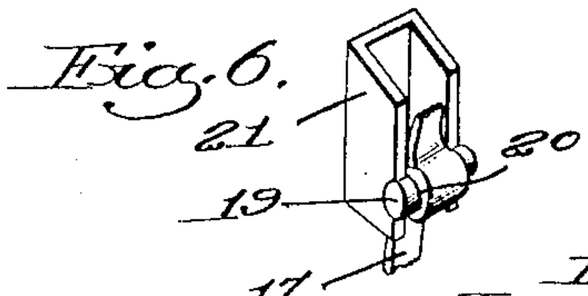

Fig. 6.

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Joseph M. Ward.

Inventor,
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2 SHEETS—SHEET 2.

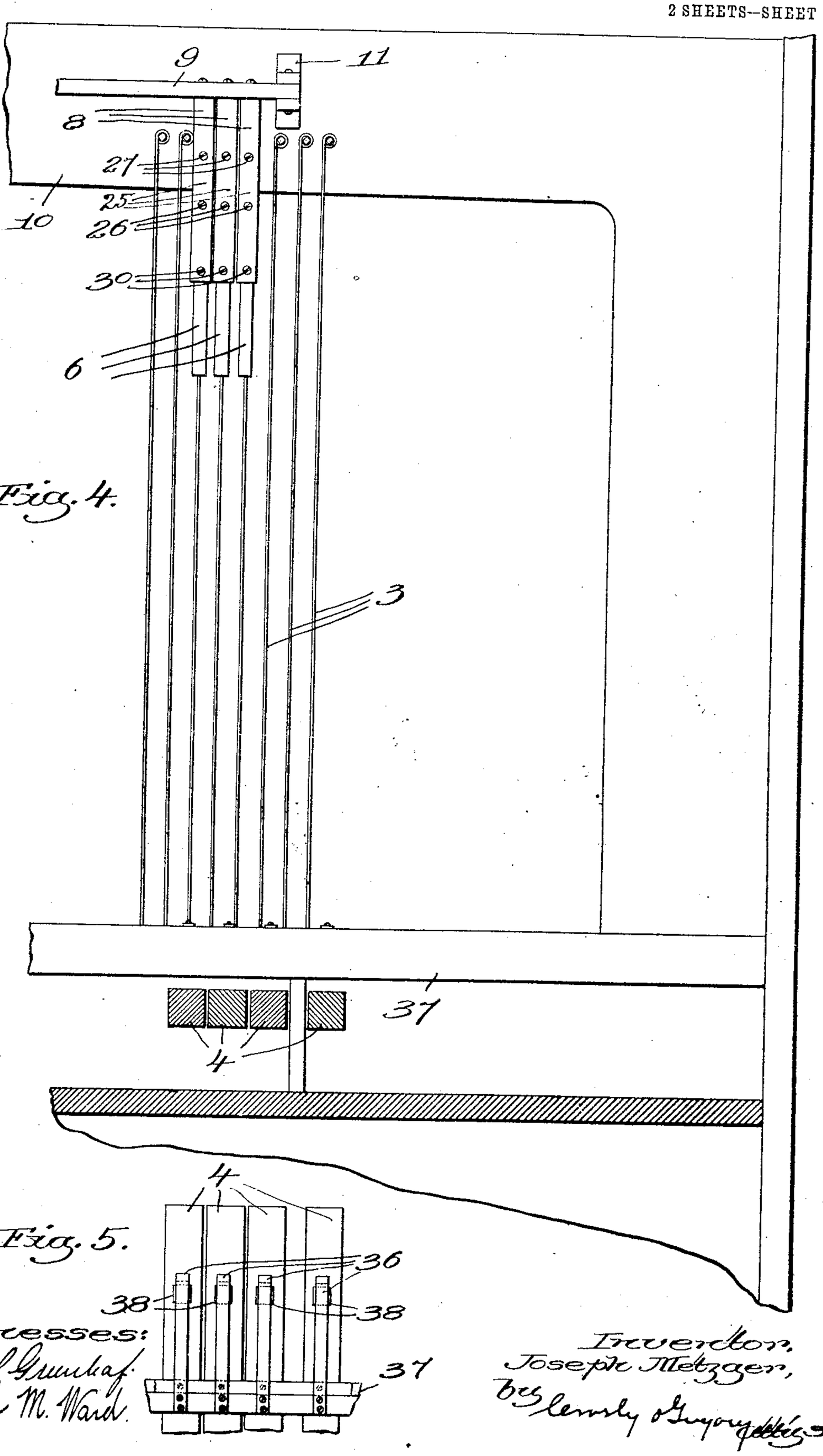

Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE.

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PIANO ATTACHMENT FOR GIVING MANDOLIN EFFECTS.

960,665. Specification of Letters Patent. **Patented June 7, 1910.**

Application filed November 1, 1909. Serial No. 525,617.

To all whom it may concern:

Be it known that I, JOSEPH METZGER, a citizen of the United States, residing at Cambridge, county of Middlesex, and State of Massachusetts, have invented an Improvement in Piano Attachments for Giving Mandolin Effects, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention has for its object to provide a novel attachment which can be applied to pianos and which is adapted to give a mandolin effect. The device comprises a plurality of auxiliary hammers and means, preferably electrical means, for causing the auxiliary hammers to strike the strings repeatedly in rapid succession whenever the keys are depressed.

I will first describe a selected embodiment of my invention and then point out the novel features thereof in the appended claims.

In the drawings, Figure 1 is a sectional view showing a portion of an upright piano provided with my attachment; Fig. 2 is an enlarged view of the auxiliary hammer and its actuating mechanism detached; Fig. 3 is an end view of the magnet for operating the hammer; Fig. 4 is a partial front view of the piano strings with the mandolin attachment; Fig. 5 is a detail of the contact device hereinafter referred to; Fig. 6 is a detail perspective view of the shoe for supporting the auxiliary hammer.

I have not deemed it necessary to show much of the piano action as this forms no part of the present invention and may be of any suitable or usual type. I have, however, shown at 3 a piano string and at 4 the key for operating the usual hammer 5, the action itself being omitted in the interests of clearness.

My improved attachment comprises a plurality of auxiliary hammers 6, one for each of the strings 3, which auxiliary hammers are preferably situated above the ordinary hammers 5 and are normally just out of contact with the strings. Each hammer is arranged to be actuated by a magnet 7 which is provided with a make-and-break device so that when the circuit is closed, the magnet will be energized and deënergized in rapid succession and the hammer 6 will strike the string 3 a plurality of rapidly succeeding blows. Each hammer 6 and its magnet 7 are preferably sustained by a separate holder 8 and these holders may all be secured to a bar 9 that is supported in any convenient way above the strings and may conveniently be secured to the pin block 10 by means of brackets 11.

While it is within my invention to make the magnets 7 and hammers 6 of a variety of shapes, I prefer that herein shown because of its compactness. The holder 8 will preferably have its body formed of wood or other insulating material and as herein shown is provided with an arm or extension 13 of iron which is provided with a groove 14. Each coil of the magnet 7 is provided with a core which extends beyond the coil at one end, as at 15, and is adapted to enter the groove 14, thus holding the magnet in place. This makes a very simple and inexpensive way of supporting the magnet.

Each hammer 6 is preferably made of a strip of metal bent to the proper shape, and the shank of the hammer is bent upon itself as at 16 to form the armature for the magnet. This armature portion of the hammer has secured thereto a spring arm 17 which is insulated from the armature as at 18. The spring arm is provided with an eye 20 through which extends a pin 19 that rests in recesses formed in the side walls of a shoe 21 that is received in a recess 22 formed in the body and is secured thereto. The spring arm 17 is held in its position on the shoe by a retainer 24 in the nature of a resilient arm that is secured at one end to the extension 25 of the holder and at its other end rests on the eye 20. The pressure of this retainer on the eye is controlled by the set-screw 26. The end of the spring arm 17 is engaged by a regulating screw 27 by which the action of the hammer 6 may be regulated, as will be presently described. The other end 29 of the arm 17 forms a contact member which normally engages a contact screw 30 carried by the extension 25 and forming a terminal of the circuit 28. The winding of the magnet is connected by a wire 31 with the shoe 21 and by another wire 32 to the battery 33, the latter being connected by a wire 34 to

one member 35 of a key-operated contact. The other member 36 of said contact is connected to the wire 28 which leads to the terminal 30. The contacts 35, 36 are normally broken but are adapted to be closed whenever the key 4 is depressed. While this may be accomplished in a variety of ways, I have herein shown both of said contacts as being made in the form of resilient arms which are fastened at one end to the support 37 of wood or other insulating material. The key 4 is provided with a post 38 which is adapted to engage the contact 35 when said key is depressed and thus close said contact against the contact 36.

The operation of the device will be apparent from the foregoing and may be briefly described as follows: Whenever the key 4 is depressed the contacts 35, 36 are closed together, thus closing the circuit through the magnet 7 and energizing the latter, it being understood that when the hammer is in normal position, the circuit is closed from the wire 31 to the terminal 30 through the shoe 21 and arm 17. As soon as the magnet 7 is energized, however, the armature 16 will be drawn down, thus causing the hammer to strike the string, and this movement will separate the end 29 of the arm 17 from the terminal 30, thus breaking the circuit through the magnet and permitting the latter to be deënergized. As soon as the circuit is broken, the resiliency of the arm 17 will restore the parts to their initial position and again close the circuit, and this make-and-break operation will be repeated so long as the key is depressed. By means of my attachment it is possible to produce a sustained tone and also to give a very correct imitation of a mandolin.

The attachment can be readily removed whenever it is necessary to tune the piano by simply disconnecting the brackets 11 from the pin block, and by placing the attachment above the ordinary hammers 5 it is entirely out of the way and does not interfere with the ordinary use of the piano.

I would here remark that the circuit including the battery 33 will preferably be provided with a switch 45 so that said circuit may be permanently opened whenever it is not desired to use the mandolin attachment.

The device may be made more or less sensitive by adjusting the screw 27, for when said screw is turned down the resilient arm 17 will be placed under greater tension and a stronger pull on the magnet will be necessary to cause the hammer to strike the strings.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a piano, the combination with a pin block, of piano strings secured thereto, piano hammers, a bar detachably secured to the pin block, a plurality of hammer holders sustained by the bar, an auxiliary hammer carried by each holder and situated above said piano hammers, and means to cause each auxiliary hammer to strike its string a series of rapidly-succeeding blows.

2. In a piano, the combination with a pin block, strings, hammers and keys for operating the hammers, of a bar removably secured to the pin block, a plurality of hammer holders sustained by the bar, an auxiliary hammer carried by each holder, means operated by the depression of any key to cause the corresponding auxiliary hammer to strike the string a series of rapidly-succeeding blows.

3. In a piano, the combination with piano strings and hammers therefor, of a bar sustained above the piano strings, a plurality of hammer holders carried by the bar, an auxiliary hammer carried by each holder, said auxiliary hammers being situated above the main hammers, means to cause each auxiliary hammer to strike its string a series of rapidly-succeeding blows, and means to sustain said bar so that it with the hammer holders may be removed bodily from the piano without disturbing the action of the main hammers.

4. In a piano, the combination with piano strings and main hammers therefor, of a plurality of hammer holders supported above the main hammers and each comprising a block 8 with two separated arms or extensions 13, 25, a magnet carried by each arm 13 and situated between the arms, an auxiliary hammer pivoted to the hammer holder and provided with an armature for said magnet, and a make-and-break for each magnet comprising one contact carried by the arm 25 of each holder and another contact carried by the armature.

5. In a piano, the combination with piano strings and main hammers therefor, of a hammer holder for each string and situated above the main hammers and provided with two opposed arms, a thin flat magnet sustained by one arm of each holder, an auxiliary hammer pivoted to each holder and provided with an armature for the magnet, and means to energize and deënergize the magnet rapidly, said means including a make-and-break device.

6. In a piano, the combination with piano strings and main hammers therefor, of a hammer holder for each string and situated above the main hammers and provided with two opposed arms, a thin flat magnet sustained by one arm of each holder, an auxiliary hammer pivoted to each holder and provided with an armature for the magnet, means to energize and deënergize the mag-

net rapidly, said means including a make-and-break device, and means to detachably secure all of said hammer holders to the piano above the strings whereby they may be readily removed without disturbing the piano mechanism.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JOSEPH METZGER.

Witnesses:
LOUIS C. SMITH,
FREDERICK S. GREENLEAF.