Nov. 26, 1940. H. S. SMITH 2,223,190

BASS VIOL

Original Filed July 26, 1937

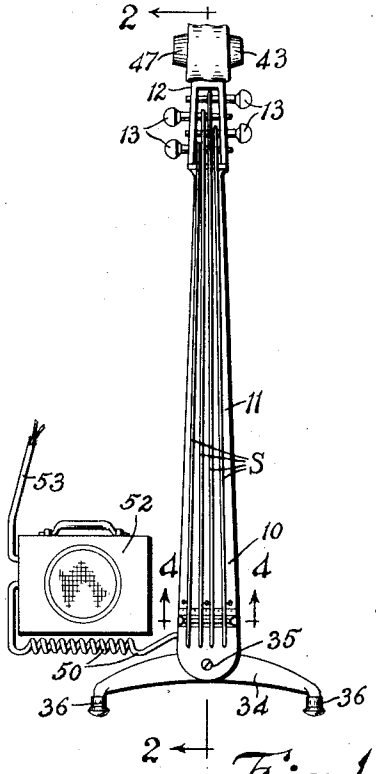


Fig. 1

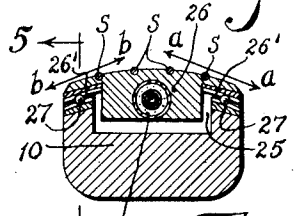


Fig. 4

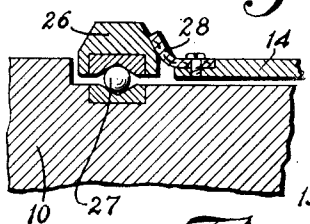


Fig. 5

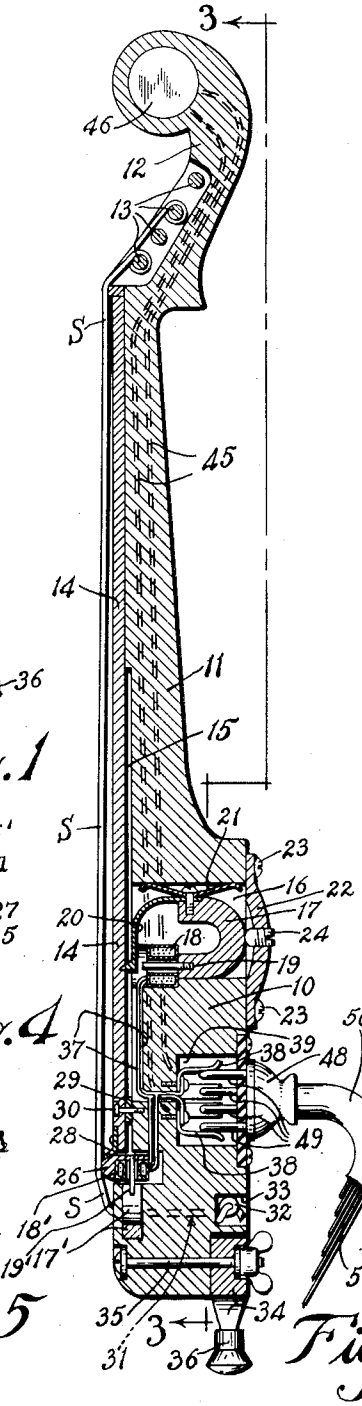


Fig. 2

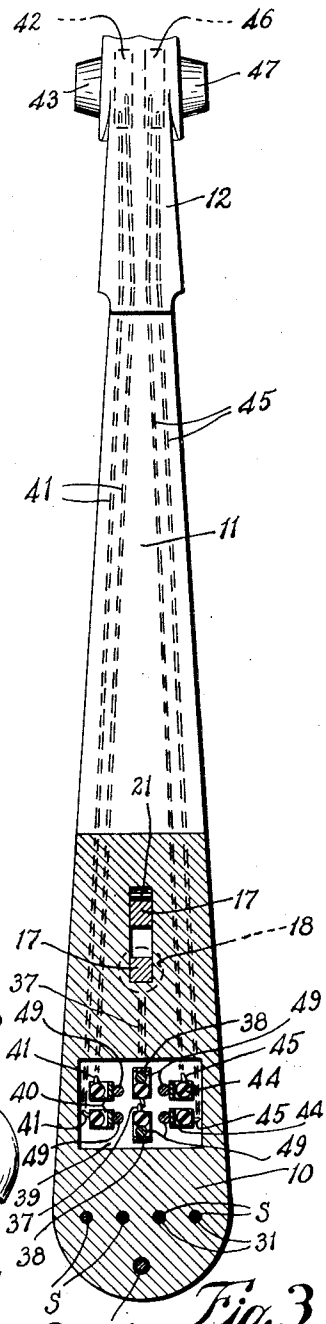


Fig. 3

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BASS VIOL

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12 Claims. (Cl. 84—1.16)

Among the salient objects of my invention are:

To provide a bass viol, or the like, which is less bulky than those in common use, and which will, by reason of my additions and improvements give greater volume and better tones, and which can be played while the player is sitting.

To provide in an instrument using strings across a bridge, a new mounting for such bridge whereby the bridge can vibrate in the direction of movement of the bow across the strings, thus making for a better quality of tone.

To provide in an instrument of the character referred to a finger board which is substantially the full length of the instrument, which makes for a better appearance, said instrument being without the large sounding box or body of the usual instrument.

To provide a mounting on the lower end of the instrument which prevents it from turning in the hand when being picked or bowed, whether the instrument is resting on the floor, or upon a chair or other support when the player desires to stand, and which will permit the instrument to be moved upon a pivot mounting, as may be desired.

To provide an improved means for attaching the ends of the strings to the bridge end of the instrument, such bridge and string mounting being such that the strings are closer to the finger board, thus requiring less effort to press them down upon the finger board.

To provide in an instrument of the character referred to an improved pick-up mechanism and amplifying means which results in greater volume and better tones, means being provided on the instrument for convenient control of both volume and tone.

Other objects and advantages of my invention will be referred to in connection with the following detailed description of one practical embodiment thereof, taken in connection with the accompanying sheet of drawings, which I will now describe.

Figure 1 is a front elevation of an instrument embodying my invention, shown in connection with a loud speaker;

Figure 2 is an enlarged, longitudinal sectional view thereof, taken on line 2—2 of Fig. 1;

Figure 3 is a longitudinal sectional view thereof taken on line 3—3 of Fig. 2;

Figure 4 is a cross sectional view taken on line 4—4 of Fig. 1; and

Figure 5 is a fragmentary sectional view taken on line 5—5 of Fig. 4, to show the bridge mounting.

Referring now in detail to the drawing, I will describe the embodiment of my invention here shown for illustrative purposes.

The body of the instrument is preferably made of wood, but can be made of any other suitable material, and as shown, is solid all the way through, except for cavities or pockets formed therein to receive operating parts.

The instrument as here shown consists of the body 10 of solid form and tapering gradually to form a part corresponding to the usual neck, as at 11, and terminating in a head 12, in which are mounted the usual string-tightening keys or pins 13, 13.

A finger board 14 is mounted along the top from the head to the bridge, substantially as indicated in Fig. 2, the body being cut away for a part of its length, as at 15, whereby a part of said finger board is free to vibrate.

Formed in the body 10 is a cavity or hole 16, in which is placed a permanent magnet 17, with a coil 18 and pole 19, and a spring armature element 20, having its end pointed and seated in the under side of the finger board 14, as seen in Fig. 2. A wall spring 21 is mounted in the hole 16 to hold the magnet in place, while the hole 16 is covered with a cap member 22, secured in place by means of screws 23, 23, and carries a centered adjustment screw 24 for adjusting the magnet unit.

The top of the body 10 is cut out as at 25, to form a holding pocket for the bridge 26, which at its opposite sides is of tapering form as at 26' and formed to receive balls 27, 27, therein, whereby said bridge can vibrate in the direction of the movement of the bow across the strings, as represented by the two lines *a*—*a* and *b*—*b*. A piece of felt 28, or other soft material is connected to the bridge end of the finger board and rests lightly upon the bridge to prevent rosin or other matter from getting down in the bridge pocket. Under the finger board 14, near the bridge, is placed a spacer 29, held in place by a screw 30, and this may also be adjusted to control tone and volume.

Said bridge 26 is also provided with a coil 18', indicated in Figs. 2 and 4, and with a pole 19', similar to the coil and pole 18 and 19, before described. A permanent magnet 17' is set in the body of the instrument, near the bridge cavity 25, as indicated in Fig. 2. The coil 18' is connected in series with the coil 18, by the wires 37, running from the terminal members 38, 38, in the cavity or pocket 39. Thus the vibrations of said bridge 26, set up by the use of a bow across

the strings, are amplified in the same manner that the vibrations of the finger board, set up by the slapping or snapping of the strings against said finger board, are amplified. These vibrations, it will be understood, excite the coils and induce a magnet current from the magnet in a well known manner.

The ends of the strings S, are passed through holes 31, bored through the body, and tied into knots 32, in suitable pockets 33, formed on the under side of the body 10, as indicated in Fig. 2.

The lower end of my instrument is pivotally connected with a supporting arm 34, as by means of a pivot connecting bolt 35, and said arm is provided at its end with rubber or other friction means 36, 36. This prevents the instrument from turning in the hands about a longitudinal axis, while permitting it to be moved laterally, as desired by the player.

Connected with the coil 18 are two wires 37, 37, which are also connected with two terminal members 38, 38, in the middle of a pocket 39, formed in the body 10, as seen in Figs. 2 and 3. The wires 37, 37 also connect with the coil 18', near the bridge 26, as before referred to.

In this same pocket 39 are two other terminal members 40, 40, from which run two wires 41, 41, which are extended to control mechanism 42, having the adjustment knob 43 for regulating the same.

Two other terminal members 44, 44, are also mounted in said pocket 39, with wires 45, 45, extending to other control mechanism 46, with adjustment knob 47. These wires may be carried through suitable means formed within the body or along the sides thereof, as may be desired.

The plug body, designated 48, is provided with contact pins 49, adapted to contact in pairs, with the pairs of terminal members 38, 38, 40, 40, and 44, 44, as indicated in Figs. 2 and 3, said plug body 48 having connecting conduit 50, within which six wires, all designated 51, but which are arranged and connected in pairs to the proper contact pins 49, which in turn engage with the proper terminals within said pocket 39, connected with the control mechanism of tone and volume at 42 and 46, in the usual manner. As these connections are made with the instrument, it will be convenient for the player to manipulate them as he does the strings of the instrument. The mechanism, of course, is known in the art and it is not believed that the details thereof need to be more fully shown or described. The loud speaker 52 is also known in the art and is connected with said conduit 50, and has its supply wires 53 therefrom.

Thus I have provided an improved bass viol in which it is possible to get a more satisfactory result in tone and volume. Most electric bass viols have a very poor tone when the strings are slapped or snapped against the finger board. With my improved arrangement the snapping or slapping of the strings against the finger board is amplified and sharp, giving a sharp resilient click, much desired by bass viol players who like tricky rhythms by slapping and snapping the strings against the finger board. This is accomplished in my improved instrument by providing a small space under the finger board far enough back to get the right tone, as the distance will vary in different instruments. It gives the finger board a springing effect in the middle portion thereof, and the spacer 29 near the bridge 26, can also be adjusted by its screw 30 to vary the tone and volume.

The vibrations of the finger board, being connected with the armature 20 of the permanent magnet 17, sets up induced current and the more vigorous the vibration the stronger the induced current. This is also true of the vibrations of the bridge 26, when the strings are bowed, as before described.

From this detailed description of my improved bass viol, taken with the drawing, it will be seen that I have provided an instrument of small compass, and yet with a construction and arrangement whereby the fingering of the strings and the use of a bow, or the snapping or slapping of the strings over the finger board, produce tones of quality and volume, through amplification, such as are not had under the present types of instruments.

I do not limit my invention to the details of construction and arrangement here shown and described for illustrative purposes, except as I may be limited by a broad interpretation of the claims hereto appended and made a part hereof.

I claim:

1. In a string instrument, a body, a bridge, a series of strings stretched over said bridge, a fingerboard upon said body under said strings, means providing a space between said fingerboard and said body for a part of its length, whereby to permit vibration of said fingerboard, a permanent magnet in said body, a coil, an armature connected with said magnet and with said fingerboard, and means for connecting an amplifier with said mechanism to amplify said vibrations.

2. In a stringed instrument, a body, a bridge, a series of strings stretched over said bridge, a fingerboard between said body and said strings, said fingerboard being spaced from said body for a part of its length whereby to vibrate relative thereto, a magnet set in said body, an armature associated with said magnet and connected with said fingerboard to be vibrated therewith, a coil connected with said magnet, and means for connecting said instrument with an amplifier.

3. In a stringed instrument, a body, a bridge, a series of strings stretched over said bridge, a fingerboard between said body and said strings, said fingerboard being spaced from said body for a part of its length whereby to vibrate relative thereto, a magnet set in said body, an armature associated with said magnet and connected with said fingerboard to be vibrated therewith, a coil connected with said magnet, and tone and volume control means on said instrument with electric terminals for connecting said instrument with an amplifier.

4. An instrument of the character referred to including a body of solid material having a cavity therein, a fingerboard on said body spaced therefrom over said cavity, a series of strings stretched over said fingerboard, a bridge over which said strings are stretched, said fingerboard being free to vibrate relative to said body, a permanent magnet set in said cavity in said body, a coil connected therewith, and an armature for said magnet connected directly with said fingerboard to be vibrated by said fingerboard.

5. The combination with a stringed instrument having a body and a bridge with strings stretched over said bridge, of a bridge for said strings movably supported to vibrate bodily transversely of said body, a flexible finger board spaced from

said body and adapted to vibrate relative to said body, a magnet set in said body, an armature associated with said magnet and connected with said finger board to be vibrated therewith, a coil connected with said magnet, a second coil set in said bridge, a second magnet set in said body adjacent said second coil, a core in said second coil and connected with said second magnet, and circuit connections for said coils.

6. A bass viol having a solid body, with cavities formed therein, a fingerboard mounted thereon with its middle portion over a cavity and free to vibrate, a bridge movably mounted on said body to vibrate transversely of said body, strings stretched over said fingerboard and said bridge, permanent magnets, set in said cavities, with coils and cores connected, respectively, to said fingerboard and said bridge, circuit connections for said coils, and tone and volume control means on said instrument, connected in said circuits for controlling the tone and volume produced by said instrument.

7. In a bass viol, a bridge movable supporting means therefor movable transversely of said instrument, strings stretched across said bridge, a permanent magnet set in said instrument adjacent said bridge, a coil with core set in said bridge, and electric wire connections for said coil.

8. A stringed instrument having a body, a series of strings stretched thereon, a bridge over which said strings are stretched and spaced, anti-friction means interposed between said body and said bridge and movable transversely of the instrument and of the strings, whereby to permit said bridge to have a bodily vibrating movement transversely on said anti-friction means, with the vibrations of the strings when said strings are made to vibrate.

9. A stringed instrument including a body, a series of strings stretched lengthwise on said body, a bridge member mounted on said body and over which said strings are stretched and spaced, means providing a runway between said body and said bridge, hard round elements in said runway, between said body and said bridge whereby said bridge vibrates transversely with the strings.

10. In a stringed instrument, the combination with a body, strings stretched over said body, and a bridge on said body and under said strings for holding the strings spaced apart and from the body, of ball bearing means interposed transversely between said body and said bridge, whereby to permit lateral vibratory movement of said bridge with said strings and relative to said body.

11. A stringed instrument including a solid body member, a series of strings stretched lengthwise on said body member, a bridge body, means movably supporting said bridge on said body member, said bridge supporting and spacing said strings intermediate their ends, a fingerboard on said body under said strings and having a part free to vibrate relative to said body, a permanent magnet with coil and pole set in said body under said fingerboard and connected with said fingerboard, a permanent magnet set in said body near said bridge body and a coil set within said bridge body with pole therein, circuit connections for said coils, and electric connections for connecting said instrument with an amplifier.

12. In an instrument having strings and a bridge therefor, of ball bearing means mounted on said instrument under said bridge for vibration transversely of said instrument, a permanent magnet set in said instrument adjacent said bridge, a coil and core set within said bridge body, and circuit connections including said coil for supplying current thereto, whereby vibration of said strings and said bridge and coil induce magnetic currents from said magnet.

HOUSTON S. SMITH.