J. C. DEAGAN.

SOUND PRODUCING DEVICE.

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1,301,916.

Patented Apr. 29, 1919.

Fig. 1.

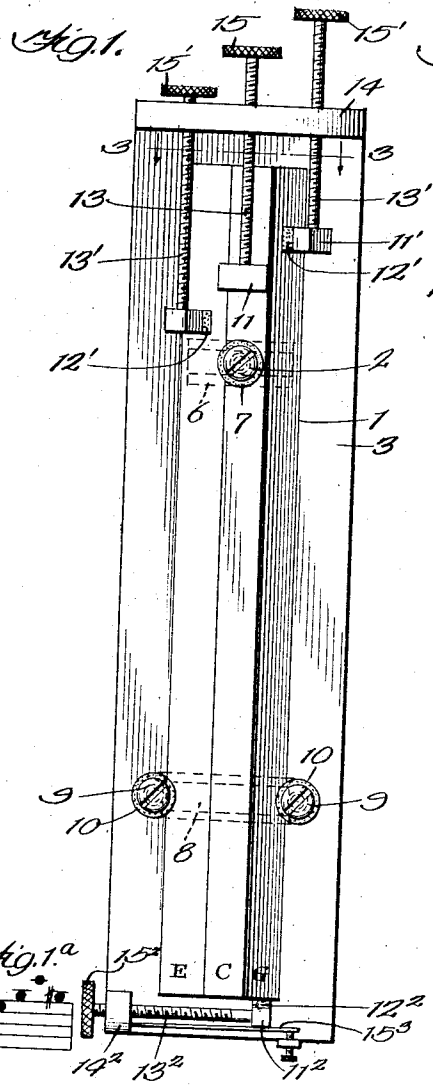


Fig. 2.

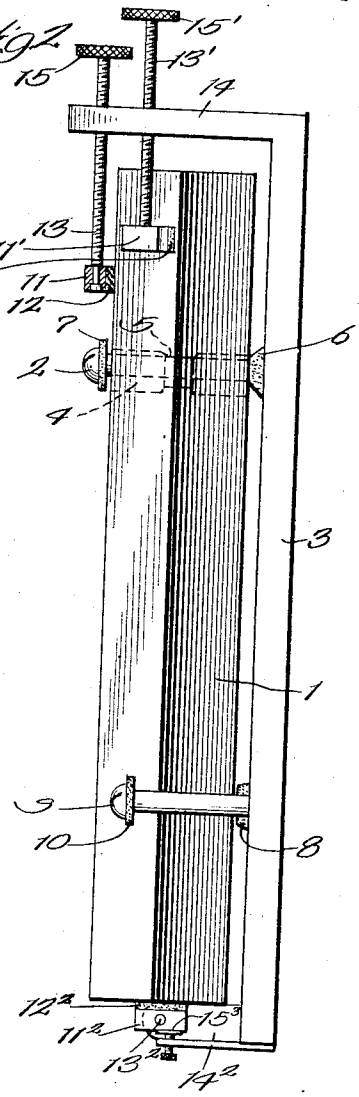


Fig. 1ª

Fig. 3.

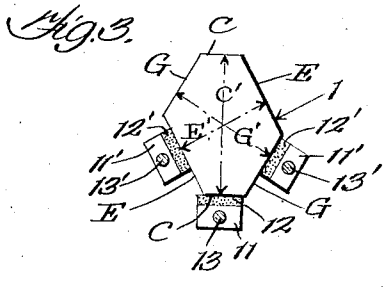


Fig. 4.

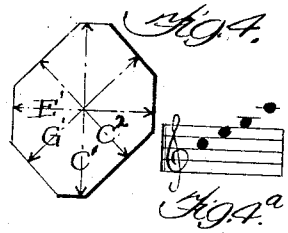


Fig. 4ª

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SOUND-PRODUCING DEVICE.

1,301,916. Specification of Letters Patent. Patented Apr. 29, 1919.

Application filed October 24, 1917. Serial No. 198,270.

To all whom it may concern:

Be it known that I, JEFFERSON CLAUDE DEAGAN, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Sound-Producing Devices, of which the following is a full, clear, concise, and exact description.

My invention relates to sound producing devices and has for one of its general objects the construction of a sound producing bar capable of producing a musical tone and an accompanying overtone or overtones, the number of additional overtones produced by the bar being selected according to the sound which is to be produced by the composite sound produced by the bar. To carry out this object of my invention the bar is prismoidal having consecutive faces meeting at an obtuse angle. These faces are preferably of unequal width and where there are three or more such faces the obtuse angles between adjacent faces of the series are then substantially equal.

In the preferred embodiment of the invention the prismoid has three or more pairs of such faces with the faces of each pair opposite each other and preferably substantially parallel. The spacing between the faces of each pair of faces is unequal to the spacings between the faces of the other pairs of faces, the bar thus having as many differing thicknesses as there are such pairs of faces, each thickness corresponding to a tone or its overtone. The principal tone produced may be that which results from striking any one face of the bar and would be due to the thickness of the bar between this face and the opposite face parallel thereto. The accompanying overtones are mainly due to the portions of the bar intervening between the faces of the remaining pairs. The number of well defined overtones accompanying a dominant tone depends upon the number of additional faces or additional pairs of faces to those that pertain to the dominant tone. For example, a hexagonal prismoid may be employed to produce a dominant tone and two well defined overtones. An octagonal prismoid would produce a dominant tone and three well defined overtones.

My invention has for another object the provision of a sound damper movable longitudinally upon a side face of a sound producing bar toward and from a nodal point of such bar to regulate the amplitude of the vibrations set up by the bar thereby to regulate the intensity or loudness of the tone. This feature of my invention is not to be limited to employment with bars of prismoidal form but may be employed to advantage in connection therewith, in which event each of two or more faces of the bar is preferably provided with a sound damper. The dampers that are applied to the same bar are relatively adjustable so that the amplitudes of the vibrations which produce a tone and overtones may be adjusted relatively to regulate the intensities of such tone and its overtones. These dampers that are adjustable along the bars serve to modulate the principal tone and overtones that are determined by the thicknesses of the bars.

In accordance with another object of my invention I employ another sound damper movable upon an end face of the bar to modulate the overtone that is due to the length of the bar.

A musical instrument may be constructed with bars made and equipped in accordance with my invention, these bars being arranged to enable them to produce principal tones of a musical scale with accompanying overtones of such tones. By means of the dampers the sounding bars may be adjusted to differ widely in their musical characteristics as compared with the musical characteristics of similar sounding bars unprovided with the dampers.

I will explain my invention more fully by reference to the accompanying drawing in which Figure 1 is a view in front elevation of a sound producing bar equipped with sound dampers; Fig. 1ª is a musical notation of the principal dominant tone and prominent overtones producible by striking the foremost face of the bar; Fig. 2 is a side view of the structure shown in Fig. 1; Fig. 3 is a view on line 3—3 of Fig. 1; Fig. 4 is a diagrammatic view of another form of bar; and Fig. 4ª is a musical notation of the principal tone and overtones producible by the bar illustrated in Fig. 4.

Like parts are indicated by similar characters of reference throughout the different figures.

In each of Figs. 1 and 2 of the drawing there is illustrated but one sound-producing bar 1 capable of producing a tone of a musical scale and accompanying overtones, it being understood that a set of such bars,

capable of producing different tones of a musical scale and accompanying overtones, may be employed in the formation of a complete musical instrument.

The prismoidal bar 1 shown in Fig. 1 is hexagonal in cross section. It is vertically suspended at a nodal point upon a screw or post 2 secured to and projecting forwardly from a mounting board 3. An opening 4 is provided in the bar through which the post 2 passes. The opening is reduced in diameter at its mid-portion to form an internal shoulder 5, in the opening, that bears upon the post which is elsewhere clear of engagement with the bar. A felt backing 6, secured to the front face of the board 3 at the upper nodal point of the bar, prevents the upper portion of the bar from striking the mounting board 3 while the felt washer 7 at the front end of the post prevents the bar from striking the post head. This post head is shown as being in the form of a screw head inasmuch as the post is in the form of a screw that is screwed in the mounting board 3. Another felt backing 8 is provided upon the front face of the board 3 and is located at a lower nodal point of the bar 1 to prevent the lower end of the bar, as it swings, from striking the board. The lower end of the bar is disposed between two posts 9, located in line with the aforesaid lower nodal point, to limit the extent to which the bar may swing sidewise.

In the form of the invention illustrated in Figs. 1, 2 and 3 the prismoidal sounding bar has two pairs of opposite parallel side faces E, two pairs of opposite parallel side faces G, and two pairs of opposite parallel side faces C. The faces of each pair differ in width from the faces of each of the other pairs. The bar shown in Figs. 1, 2 and 3 is tuned to produce the tones *e*, *g* and *c*. By this construction the thickness E^1 between the faces E, E will, when the bar is set into vibration, give rise to the tone *e*, noted in Fig. 1^a. The thickness G^1 between the faces G, G will give rise to the tone *g*, also noted in Fig. 1^a. The thickness C^1 between the faces C, C, will give rise to the tone upper *c*. If a face C is struck the tone upper *c* would be the principal tone and the tones *e* and *g* would be sounded overtones of such tone. If a face G is struck the tone *g* would be the principal tone and the tones *e* and *c* would be sounded overtones of such tone. If a face E is struck the tone *e* would be the principal tone and the tones *c* and *g* would be sounded overtones of such tone. The octagonal prismoidal bar illustrated in Fig. 4 is capable of producing the tones *e*, *g* and upper *c*, the thicknesses of the bar shown in Fig. 4 that produce these tones being indicated at E^1, G^1, C^1. The thinnest portion of this bar is indicated at C^2 to cause the tone *c* an octave below the tone upper *c*. These tones also are principal tones with overtones according to the face of the bar which is struck.

The loudness or intensity of the tone upper *c* (whether such tone be principal or overtone) is regulable by means of a damper 11 engaging the foremost side face C of the bar and movable longitudinally of the bar toward and from the nodal point 5. By adjusting this damper 11 lengthwise of the bar the amplitude of the sound producing vibrations that produce the tone upper *c* may be adjusted to adjust the intensity of the sound of such tone. This damper 11 is inclusive of a felt facing 12 that directly engages the bar. The metal portion of the damper that carries the facing 12 may be mounted in any suitable way to render the damper adjustable longitudinally of the bar. I have shown a screw 13 in swivel connection with the damper and in threaded connection with a bracket extension 14 of the mounting board. By turning the head 15 of the screw 13 the screw is caused to move longitudinally of itself and longitudinally of the bar to adjust the position of the damper on the bar. This feature of my invention is of utility whether or not the bar has the novel formation for producing principal and overtones.

As the form of the invention illustrated in Figs. 1 and 2 is capable of producing a principal tone and two overtones, the bar has three dampers each engaging a side face of the bar and individual to a tone for adjusting it. I will not describe these additional dampers in detail as the description given of the elements 11, 12, 13 and 14 will apply. Parts of the additional dampers corresponding in function and construction to the dampers specifically described are given characters of reference similar to those applied to such specifically described dampers but with added prime exponents.

I also provide a damper 11^2 for adjusting the overtone that is due to the length of the bar. This damper is inclusive of a felt facing 12^2 that directly engages one end face of the bar, preferably the lower end face thereof. The metal portion of the damper 11^2 that carries the facing 12^2 is in swivel connection with the screw 13^2. This screw is in threaded connection with the bracket extension 14^2 of the mounting board 3. By turning the head 15^2 of the screw 13 the screw is caused to move longitudinally of itself and transversely of the bar to adjust the position of the damper on the lower end face of the bar. This position is selected suitably to modify the partial that is due to the length of the bar. An adjustable spring 15^3 regulates the pressure of damper 12^2 upon the bar. If desired each damper 12^1 may be so equipped.

Having thus described my invention I

claim as new and desire to secure by Letters Patent the following:—

1. A sound producing bar having different portions tuned to cause the bar to produce different principal tones of a musical scale, in combination with dampers engaging side faces of said portions and adjustable longitudinally of the bar and with respect to each other.

2. A sound producing bar having different portions tuned to cause the bar to produce different principal tones of a musical scale, in combination with dampers engaging side faces of said portions and adjustable longitudinally of the bar.

3. A sound producing bar having different portions tuned to cause the bar to produce different principal tones of a musical scale, in combination with dampers engaging side faces of said portions, a damper being adjustable longitudinally of the bar.

4. A sound producing bar having different portions tuned to cause the bar to produce different principal tones of a musical scale, in combination with a damper engaging a side face of one of said portions and adjustable longitudinally of the bar.

5. A sound producing bar in combination with a damper in engagement with a side face thereof and adjustable longitudinally of said face.

In witness whereof, I hereunto subscribe my name this twenty fifth day of September, A. D. 1917.

JEFFERSON CLAUDE DEAGAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."