(No Model.)

B. BRADBURY.

BANJO.

No. 262,564. Patented Aug. 15, 1882.

Fig. 1.

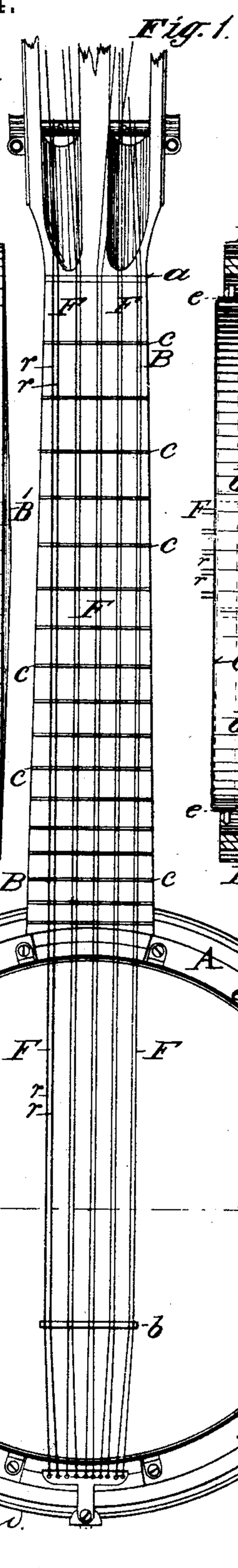


Fig. 3.

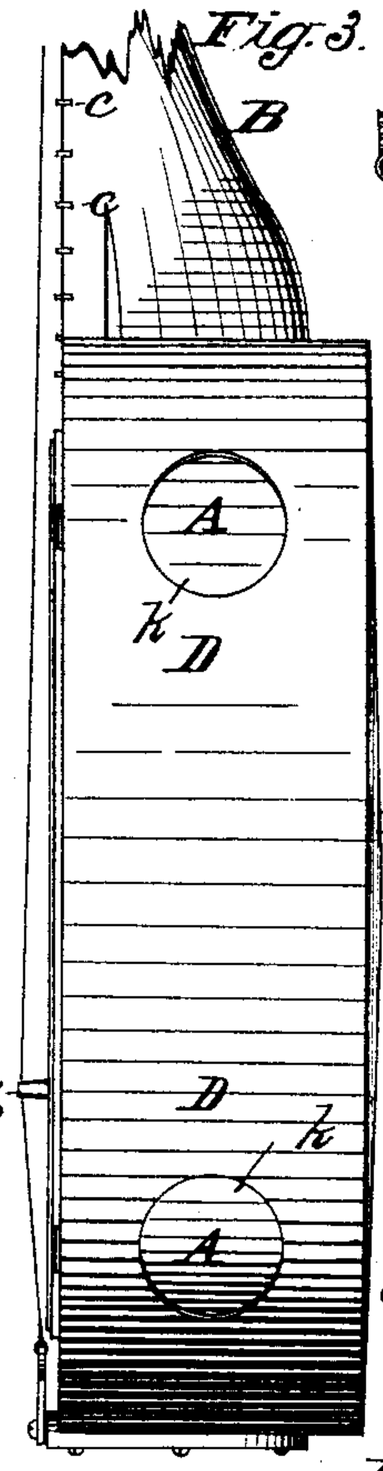


Fig. 4.

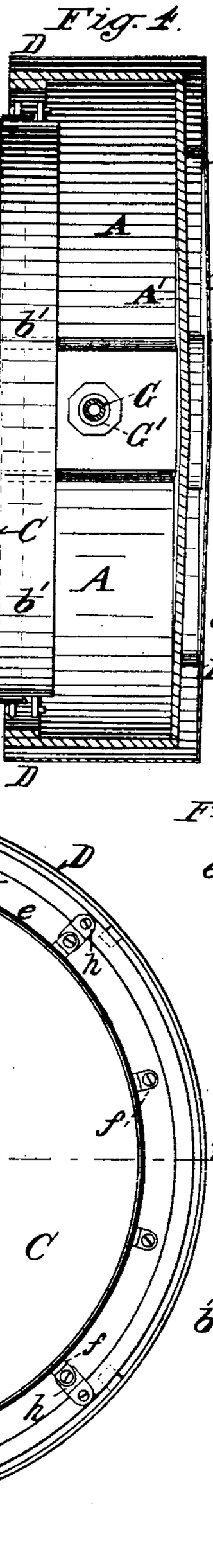


Fig. 2.

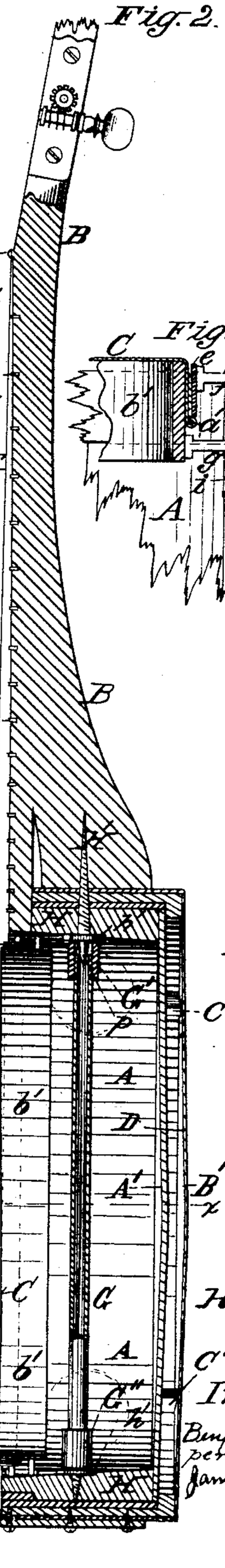
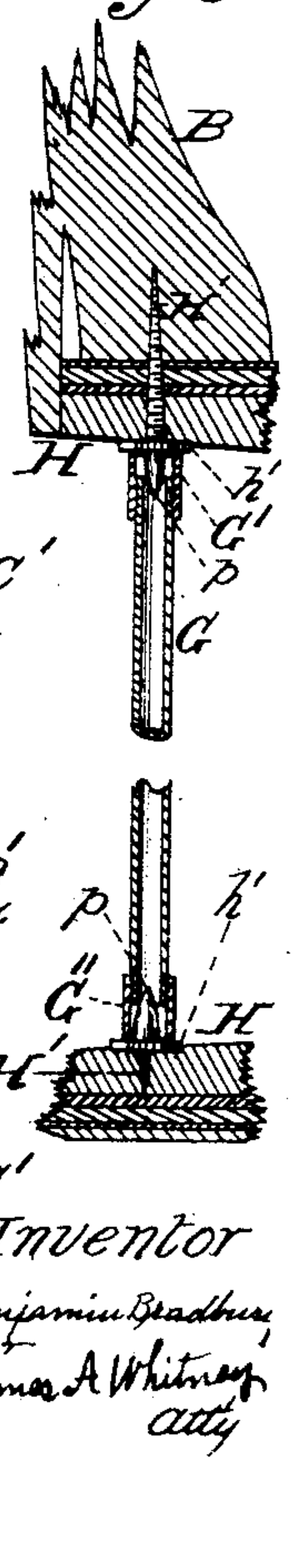


Fig. 5.

Fig. 6



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UNITED STATES PATENT OFFICE.

BENJAMIN BRADBURY, OF BROOKLYN, NEW YORK.

BANJO.

SPECIFICATION forming part of Letters Patent No. 262,564, dated August 15, 1882.

Application filed March 17, 1882. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN BRADBURY, of the city of Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Musical Instruments, of which the following is a specification.

The object of this invention is to give to the banjo a softness and purity of tone resembling and approximating to that of the violin, and also to so reduce the length and diameter of the staff that the strings may be manipulated with the fingers of the left hand throughout the whole range of octaves usual in the instrument, thereby enabling the latter to be used in the production of substantially the same range and class of music as the violin itself, this having been impossible with the banjo as hitherto constructed.

The invention is also designed to enable the banjo to be set or tuned at the same concert-pitch with the piano, the violin, &c., and played in unison therewith, it being a serious defect in the ordinary banjo that this cannot be done, inasmuch as in practice it is always necessary to tune the banjo either above or below the accompanying instruments in order that the same may approximate unity of sound therewith. These objects I secure by a novel proportion and relative ratio of length and breadth in certain essential portions of the instrument, all as hereinafter explained.

My invention also comprises certain other novel combinations of parts whereby the contact of the shell of the banjo with the person of the player is prevented from diminishing the volume or quality of the tone; also, whereby the box and the staff are so strengthened in relation with each other that the strings, instead of being sprung to a considerable distance from the face of the staff, are retained close to but not in contact with the said face, and are thereby much more easily operated by the fingers of the left hand than with the banjo of ordinary construction, in which the strain of the strings tends to spring them away from the face of the staff; also, whereby the hoops which sustain the parchment-head of the instrument are suspended within the box and at suitable distance therefrom by very simple, strong, and effective devices.

The most prominent feature of my invention lies in the proportion of the distance between the bridge upon the parchment and the nut of the staff, the latter being provided with the usual frets with reference to the diameter of the parchment, by which means, as has been discovered, greater volume and purity of tone is given to the instrument, the staff is shortened, and the distance between the frets is so reduced that the octaves are brought within the reach of the fingers of the left hand without materially moving the thumb or bearing of the hand upon the staff. This enables the instrument to be played by the relatively small hands of women and children with a compass substantially equal to that of the violin and for substantially the same reason—namely, that the different octaves can be reached by the fingers without the waste of time necessarily incurred when the whole hand is moved from its contact or bearing upon the staff; also, whereby the power of the instrument is increased and the tones of its strings are advantageously modified to give a softer and more impressive sound.

Figure 1 is a plan view. Fig. 2 is a central longitudinal sectional view. Fig. 3 is a side view of one part of my said invention. Fig. 4 is a cross-section taken in the line *x x* of Figs. 1 and 2. Fig. 5 is a detail view on an enlarged scale of one portion thereof, and Fig. 6 is a longitudinal sectional view, showing one detail of my said invention, Figs. 1 to 4, inclusive, being drawn to a scale exactly one-half the dimensions of a working instrument.

A is the usual box, and B is the inner portion or essential part of the staff of the instrument, the drawings representing the outer end of the staff as broken away.

At *a* is what is technically termed the "nut" of the staff, this being the support which operates, in conjunction with the bridge *b*, in determining the active or vibrating length of the strings.

In the upper surface of the staff B are the frets *c*, which are fixed to the staff in the usual manner, but which have the relative distance apart represented in the drawings, Figs. 1 and 2, the said figures having one-half the dimensions of a working instrument, although said dimensions, but not the proportions of the parts, may be changed within certain limits.

The parchment C is strained upon the inner hoop, *b'*, by means of the outer hoop, *c*, which

bears upon the rim *a'* of the parchment. Upon the outer hoop, *e*, are radial lugs *f*, which are coincident with similar lugs, *g*, on the inner hoop, *b'*, the said inner hoop being of greater width or depth than the other, so that its lower edge projects below the rim of the parchment.

Provided to the inner circumference of the box A are ears *h*, coincident in position with the lugs *f* and *g*. To each set of lugs *f* and *g* and ear *h* is a screw, *i*, the head *b''* of which bears upon the upper surface of the lugs *f*, and the threaded portion of which is screwed into a nut formed in the coincident lugs *g*, while the lower extremity of said screw is screwed into a nut provided in the adjacent ear *h*. Each screw *i* therefore serves the double purpose of assisting to strain the parchment by tending to draw inward the outer hoop, *e*, and at the same time affords a connection between the two hoops *e* and *b'* and the ear affixed to the interior of the box A, as aforesaid.

Several sets of the parts just described may be placed at intervals around the inner circumference of the box, to sustain the parchment within and concentric with the said circumference of the box and at any requisite distance therefrom. Where not required for the attachment, as aforesaid, of the parchment to the box, the combination of the lugs and ears with the screw may be dispensed with, and the screw may be used in connection with the lugs of the two hoops to aid simply in stretching the parchment.

The box A may have the usual bottom or back, A'. Outside of this is placed a shell, D, the circumference of which is concentric with the box A and with a space of, say, one-eighth of an inch between its inner circumference and the outer circumference of the said box. This shell D is also provided with a bottom or back, B', between which and the bottom of the box A should be a space of, say, one-quarter of an inch. This outer shell is attached to the box A by studs or blocks C', interposed between the backs or bottoms of the two parts and cemented or otherwise secured in place. When the instrument is in use the outer shell is brought in contact with the person of the player, and thereby protects the box A against such contact and against the deterioration in sound and tone which ordinarily occurs when the box A is itself brought in contact with an external object. The outer shell should be provided with any desired number of openings K, by which the said shell is prevented from muffling the resonance of the box.

The strings F, of the usual or any suitable number, are in duplicate—that is to say, each string is composed of two ordinary strings, separately indicated by the reference-letter *r*. These two parts *r* of each string F are tuned in unison, so that the said two parts act together; but, as I have ascertained in practice, the vibration of the two parts constitute, by their unity of tone, a single string producing a more melodious, stronger, and softer tone than when the string is composed of but one wire or catgut, as the case may be.

As before remarked, the drawings represent the essential parts of the instrument as having one-half the dimensions in every direction of an instrument constructed for and capable of use. So far as concerns a leading feature of my said invention, the matter of proportion between the parts is one of vital importance. Thus, for example, the distance between the inner edge of the nut *a* and the coincident inner edge of the bridge *b* in the working instrument from which Figs. 1 and 2 are taken is sixteen inches and three-sixteenths of an inch, and the actual diameter of the circular parchment is seven inches and five-eighths of an inch. The distance between the several frets *c* is in practice twice the measurement (for an instrument having the distance between the nut and bridge herein set forth) shown in the drawings, Figs. 1 and 2, the twelfth fret, counting from the nut *a*, being midway between the said nut and the bridge, the bridge furthermore, measuring from its inner side, being situate two inches and three-sixteenths of an inch from that edge of the parchment most remote from the nut. I have found by actual trial that these proportions secure to the instrument an unusual depth and delicacy of tone, and enable that portion of the staff between the nut *a* and the box A to be made so short that in playing all the usual octaves of an instrument of this character can be controlled by the fingers of the left hand (ordinarily used for this purpose) without materially moving the thumb from its stationary place upon the staff, thereby permitting a rapidity of execution never hitherto obtained with this class of musical instruments, inasmuch as with those hitherto made the staff has necessarily been of such length that a considerable movement of the hand is necessary for any manipulation of the strings between the limits of the octaves usual with such instruments, this movement of the hand necessarily occupying an appreciable length of time, and thereby limiting the capabilities of the instrument.

Within the box A, below the parchment C thereof, is a tubular metallic brace, G, upon each end of which is respectively secured a hollow nut, G' and G''. The position of this brace is substantially parallel with the longitudinal axis of the instrument.

Provided to the inner side of the box A at each end of the said brace G is a boss or buttress-piece, H, into which is screwed a screw, H', provided with an octagonal head, *h'*, by which it may be turned into place, and with a rounded projection or bulb, *p*, which fits into the adjacent end of the nut G' or G'', as the case may be, and thereby retains the same against lateral displacement. The nuts form broad bearings for the ends of the brace, and by turning one of them—preferably the nut G'—the available length of the said brace may be increased or diminished. When increased its tendency is to throw downward the outer end

of the staff with reference to the plane of the parchment, and vice versa, this of course changing the relative position of the fretted surface of the staff with reference to the strings F passed along the same, the brace also serving to give greater strength and rigidity to the instrument, and, by the adjustment just hereinbefore described, enabling the distance between the strings and the staff to be adjusted at will at a slight distance when a comparatively light tone is desired and when the hand of the player is comparatively slender or weak, as in the case of women and children. When a strong tone is desired, or when the instrument is to be adapted to the use of a player having strong and firm fingers, the distance between the strings and the adjacent surface of the staff is increased by expanding the length of the brace by turning the brace as aforesaid. By making the brace G tubular, as shown, sufficient strength and stiffness are secured without the inordinate weight which would be incurred if the said brace were made of solid metal. It is of course to be understood that so far as concerns the diameters of the strings these are matters of judgment in their selection, it being impossible to correctly indicate such minute diameters in the drawings.

What I claim as my invention is—

1. A banjo or musical instrument having the following size and proportions, to wit: sixteen inches and three-sixteenths from the inner edge of the nut *a* to the coincident edge of the bridge *b*, seven inches and five-eighths across the parchment, and the relative distances between the frets herein specifically described, these special proportions in this particular size of instrument producing the advantageous results herein more particularly set forth.

2. A banjo-head constructed with the inner or usual box, A, and an outer shell, B, with an open space, *a*, between the said box and shell and extending around the sides and back or bottom thereof, and studs or blocks C′, interposed at intervals between the box and shell to retain the former out of contact with the latter and to prevent the transmission of sound from the former to the latter, all substantially as and for the purpose herein set forth.

3. The tubular metallic brace G, placed within the box A underneath the parchment C and strings F, and in relation with the end of the staff B, and a nut, substantially as described, for longitudinally adjusting the said brace, the whole combined to adjust the position of the staff with reference to the box and strings, substantially as and for the purpose herein set forth.

4. The combination of the lugs *g* of the hoop *b′*, screws *i*, passing through nuts formed in the said lugs, the lugs *f* of the hoop *e*, having their outer ends underneath the heads of the screws *i*, the brackets *h* of the box A, said brackets having nuts receiving the threads of the screws *i* coincident with the nuts of the lugs *g*, and the parchment C, attached to the hoop *e* and strained over the hoop *b′*, the whole constructed, combined, and arranged to attach the hoops *b′* and *e* and parchment C to the box of the instrument by means of the same screws that serve to strain the parchment upon the hoop *b′*, substantially as and for the purpose herein set forth.

5. The combination of the screws H′, having bulbs *p*, with the brace G, having nuts G′ and G″, and the buttresses H, within the box A, having the staff B, all substantially as and for the purpose herein set forth.

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