

No. 688,893.

Patented Dec. 17, 1901.

A. SPRINGER.

SOUND BOARD OF STRINGED MUSICAL INSTRUMENTS.

(Application filed June 8, 1901.)

(No Model.)

Fig. 1.

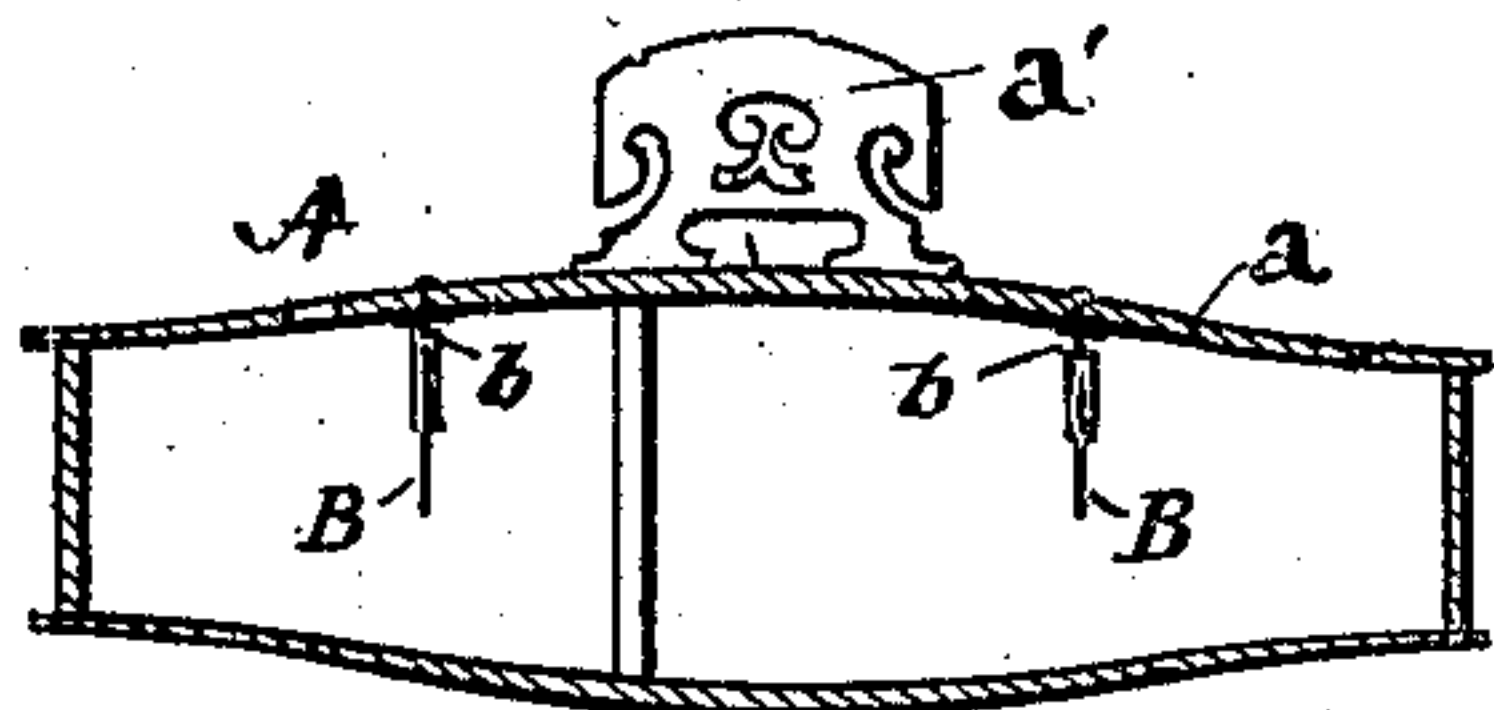


Fig. 2.

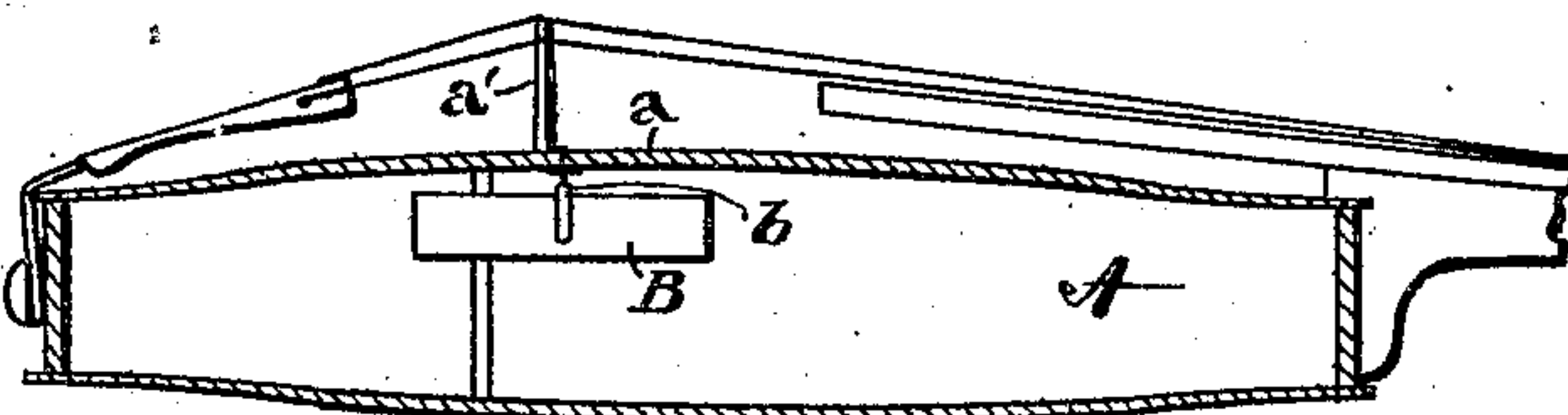


Fig. 3.

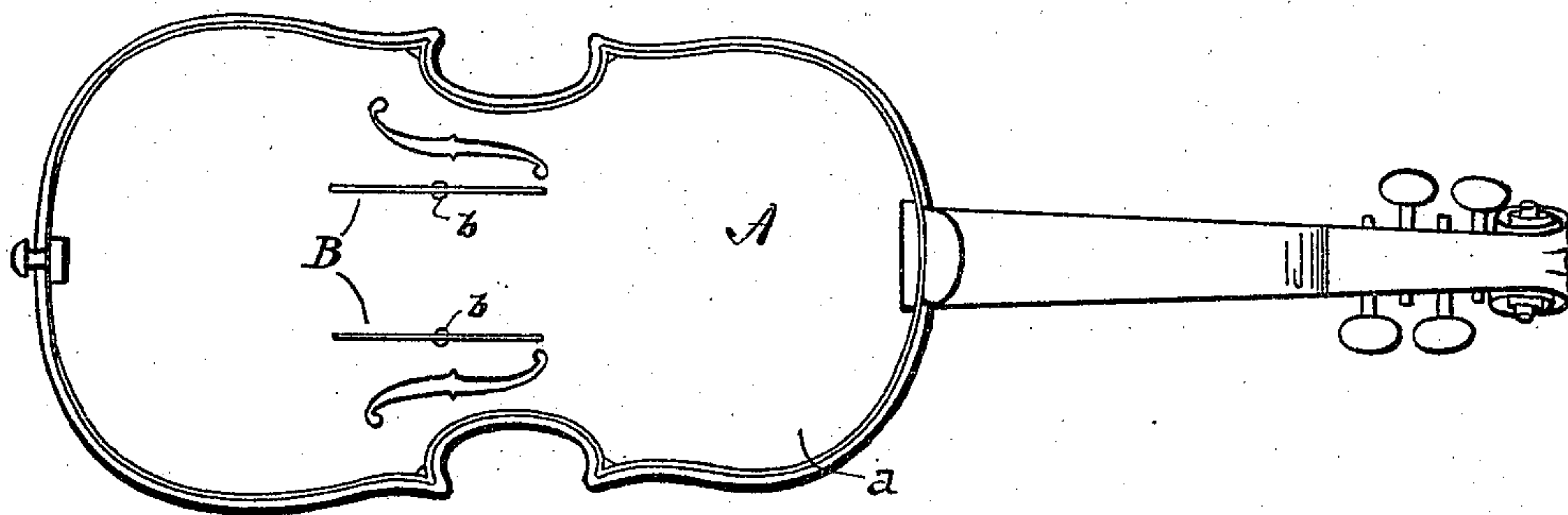
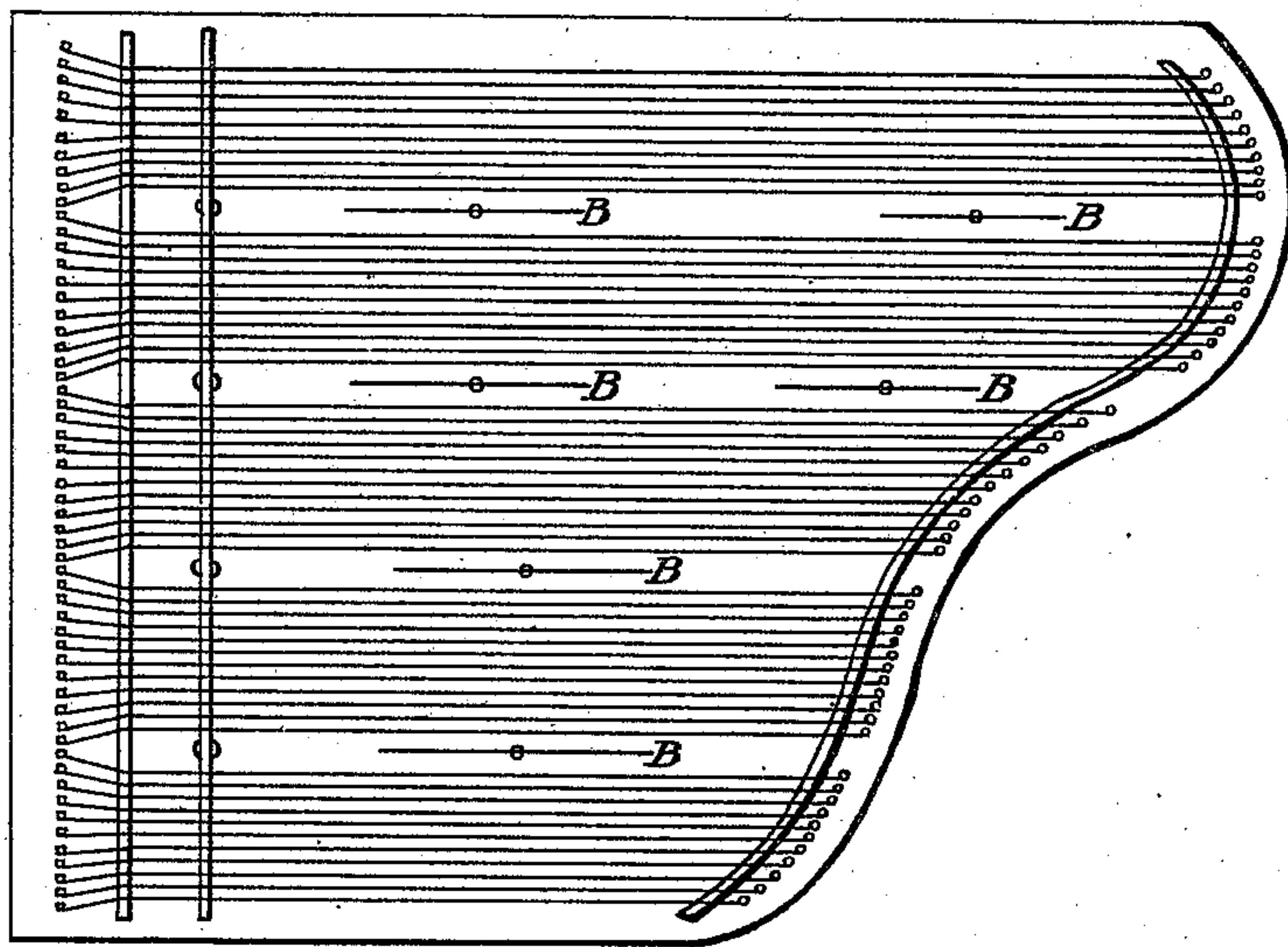


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

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SOUNDBOARD OF STRINGED MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 688,893, dated December 17, 1901.

Application filed June 8, 1901. Serial No. 63,378. (No model.)

To all whom it may concern:

Be it known that I, ALFRED SPRINGER, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in Soundboards of Stringed Musical Instruments, of which the following is a specification.

The object of my improvement is to reinforce vibrations in instruments of the soundboard type where the tone is produced by strings set in vibration upon or in connection with a sound board or boards. In instruments of this class—such, for example, as violins, pianos, &c.—the soundboard does not in some cases respond freely to the initial impulse of the strings as respects the upper partials, whereby the compound tone desired is lacking in fullness or completeness. This condition may not affect all the tones, but may be confined to certain tones or a certain range of tones. This is noticeable particularly in soundboards of aluminium, where the tone is so pure as to be almost flute-like in quality, owing to the overpowering prominence of the fundamental tone or to the relative insufficiency of the upper partials. This difficulty, which is not, however, confined to soundboards of this material, is obviated in my improvement by means of resilient attachments consisting of plates or other vibrant bodies attached by stems to the soundboard. These, being set in vibration by the soundboard through the medium of the stem, react upon the same or so modify its action as to reinforce the tone-producing function in the manner desired. These vibrators may be of various forms and may be used singly or in numbers. They may also be supported upright upon or pendent from or attached in any other direction to the soundboard and vary in weight, elasticity, or size, according to the conditions presented or the particular tone affected. A fixed rule cannot be given on these various points; but, the principle being understood, there will be no difficulty in making and applying the attachment in such manner as to attain the desired results and realizing the benefit of my improvement.

The accompanying drawings illustrate a preferred form and manner of applying the

tone-reinforcing attachments or “vibrators” in the case of violins and pianos.

Figure 1 is a longitudinal section, Fig. 2 a cross-section, and Fig. 3 an inverted horizontal cross-section, of a violin-body with my improvements; and Fig. 4, a plan view of a piano-soundboard with my improvements applied.

Referring to the drawings, A designates the body constituting the sound-box of a violin, of which the upper side *a* may be considered the soundboard proper, which is immediately acted upon by the vibration of the strings through the medium of the bridge *a'*.

A convenient application of my improvement consists in a flat plate B, attached to the under side of the soundboard *a* by a pendent supporting-stem *b*. The plate may be a thin bar or strip of elastic metal or wood and the stem of similar material securely attached both to the strip B and to the soundboard *a*. I attain the desired results most satisfactorily by attaching these vibrators as pendants about opposite to and near the *f*-holes, as indicated, and generally in violins one or two are sufficient. Thus placed the vibrators are concealed and do not interfere with the manipulations of the player and are protected from any injury or displacement; but the position is not in itself essential to the results *per se*, as the same would be attained by erecting the vibrators on the outer side of the soundboard. In a word, the position of the vibrators may be governed largely by structural and other considerations of convenience applicable also to the form of same. For instance, in a piano they could be of similar form, larger to correspond with the greater size and power of the soundboard and erected between the string groups extending longitudinally in the space thus afforded parallel to the strings, as indicated at B, Fig. 4.

The explanation of the functional action of the vibrators I take to be this, namely: The shorter vibrations—*i. e.*, wavelengths—of the soundboard are, owing to the relatively small size and resiliency of the vibrators, strongly reinforced as compared to the longer vibrations of the fundamental tone. The short vibrations of the vibrators are in turn communicated to the soundboard and together bring the upper partials to the proper relative

strength by assisting and continuing the vibrations producing them.

I claim and desire to secure by Letters Patent of the United States—

- 5 1. In combination with the soundboard of a stringed instrument, one or more "vibrators" depending edgewise from the under side and attached to the same by stems, for the purpose of modifying the vibrational action
10 of the soundboard and enriching the quality of tone produced, more particularly by reinforcing the upper partials.

2. An elastic vibrator consisting of a flat strip arranged edgewise and provided with a stem and attached thereby to the soundboard 15 of a stringed musical instrument substantially as set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ALFRED SPRINGER.

Witnesses:

L. M. HOSEA,

WALTER A. KNIGHT.