Feb. 2, 1943. A. C. RADTKE ET AL 2,309,714

REED FOR MUSICAL INSTRUMENTS

Filed April 29, 1940

Fig. 1

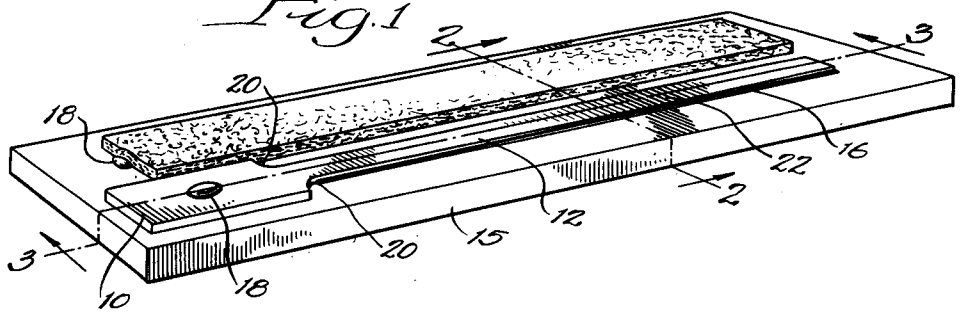


Fig. 2

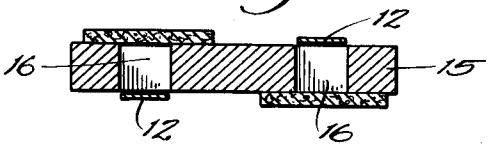


Fig. 3

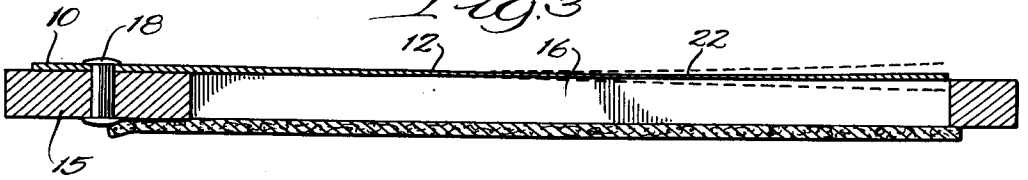
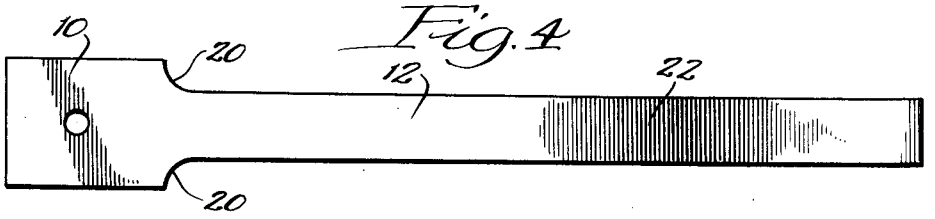


Fig. 4



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UNITED STATES PATENT OFFICE

2,309,714

REED FOR MUSICAL INSTRUMENTS

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Application April 29, 1940, Serial No. 332,410

3 Claims. (Cl. 84—363)

Our invention relates to musical instruments and has to do more particularly with an improved reed which is applicable to a large variety of wind instruments, such as accordions, harmonicas, pipe organs, etc., etc.

In the past, reeds of the type referred to have been usually made of steel or brass, which, up to now, has been considered the most satisfactory material. However, steel is subject to a number of objections in this connection. Thus, it is subject to corrosion and, of course, after it has corroded even slightly, the element will have lost its tonal properties. Furthermore, the best steels and brasses are subject to fatigue and this, again, destroys the tonal value of the reed.

An object of our invention is to provide a reed of material that will be substantially stable, i. e., incorrodible and also which will be substantially fatigueless within its elastic limits, said limits being sufficiently great for all of the purposes required.

Another object of our invention is to provide an improved reed of such design that the strains produced by vibration will be distributed over a larger area than in reeds of previous designs, so that our improved reeds will be of longer life.

Various other objects and advantages will become apparent as the description proceeds.

Referring to the drawing forming a part of this application and illustrating a preferred embodiment of our invention:

Fig. 1 is a perspective view illustrating our invention.

Fig. 2 is a sectional view on the line 2—2 of Fig. 1.

Fig. 3 is a sectional view taken as indicated by the line 3—3 in Fig. 1; and

Fig. 4 is a top plan view of a reed embodying our invention.

Our improved reed comprises a base portion 10 having formed integrally therewith a leaf portion 12. The base portion according to standard practice, may be secured to a block 15 having an air passage 16 therein (reference is made here particularly to accordion construction, although the invention is equally applicable to other reed instruments). A rivet 18 extending through an aperture in the base 10 serves to secure the reed to the block 15.

The leaf portion 12 is connected to the base 10 by means of a tapered connecting portion 20, said tapered portion preferably being curved as shown in Fig. 1. By this means, the leaf portion will vibrate along a shifting transverse axis rather than along a sharply defined axis, as in ordinary reeds where the leaf portion makes a sharp angle with the base. Hence, reeds according to our construction will not be subject to failure, as so frequently happens in reeds of standard design due to repeated vibration about a definitely positioned axis.

We preferably form our improved reed from a beryllium-copper alloy. We do not claim to be the originators of the alloy, but employ a beryllium-copper sheet material which has been especially treated to impart a high degree of hardness and resilience. This alloy consists of approximately 96–97% copper, and approximately 2% beryllium. A relatively small percentage of nickel may be included, if desired. We do not consider ourselves limited to this specific composition, however, since these proportions may vary a few per cent. either up or down. This alloy is cold rolled into sheets, imparting a preliminary hardness thereto, and is then hardened at a relatively low temperature, say about 175° C. for approximately one hour and then allowed to air cool. This treatment is designed to produce maximum hardness.

Reeds formed of the material described above have many improved properties as compared with the previously known reeds. Thus, the material is substantially fatigueless within its elastic limits. For this reason, the tone of the reed will remain absolutely true at all times regardless of how long the instrument may be used. By reason of its extreme hardness and freedom from fatigue, the reed will last practically forever and will not be subject to replacement, contrary to the ordinary reed.

Our improved reed furthermore is not subject to corrosion, even in moist atmosphere, as is the case with steel.

We have found that reeds embodying our invention also have improved tonal properties as compared with other reeds. Thus, our improved reeds produce a louder tone than a reed of the same shape and size formed of other materials and, furthermore, the tone produced from our improved reed has a finer quality than other reeds. This quality is of an indescribable silvery nature, possibly due to the presence of added overtones.

According to our invention, reeds of the same pitch may be stamped out of a sheet of material such as described above, and the stamping dies may be so formed as to produce a reed having a leaf portion of reduced thickness, as shown at 22, so that if, in order to obtain the true pitch, it is necessary to remove some of the material, a

relatively slight amount of grinding or filing will be required. On the other hand, if material must be added, this can be readily done. Or, the sheet metal may be rolled to the desired thickness and strips stamped out and filed or ground, or added to, as the case may be. The reeds can be formed from the annealed stock and then heat treated to the proper hardness. This is considered a substantial improvement over the present method whereby the reeds are formed with a uniform gage or thickness of metal and are then hand worked in order to tune them. The amount of hand-work, according to the present practice, is so great that the cost of an instrument at the present time to a large extent represents the value of hand labor involved. It will thus be seen that by greatly reducing the amount of manual labor according to our invention, the cost of an instrument will be very substantially reduced.

Various changes coming within the spirit of our invention may suggest themselves to those skilled in the art and, hence, we do not wish to be limited to the specific forms shown and described or uses mentioned, except to the extent indicated in the appended claims.

We claim:

1. A reed for musical instruments formed of a hardened alloy composed of a preponderant proportion of copper and a minor proportion of beryllium.

2. A reed for a musical instrument having a base attaching portion, an integral vibratory leaf portion of reduced width as compared with the base portion, and an intermediate portion, said reed having side edges with a continuous curve between the side edges of the base portion and those of the leaf portion, so that the width of the reed increases gradually rather than abruptly between the leaf portion and the base portion, said reed being formed of an alloy composed of a predominant proportion of copper and a minor proportion of beryllium.

3. A reed for a musical instrument having a base portion and an integral vibratory leaf portion and having a portion connecting the leaf portion with the base portion, said connecting portion having continuous curved concave edges in continuation of the side edges of the leaf portion, so that the leaf will vibrate about a shifting axis, said reed being formed of a hardened alloy composed of a preponderant proportion of copper and a minor proportin of beryllium.

ADELBERT C. RADTKE.
DAN T. FERNANDEZ.

CERTIFICATE OF CORRECTION.

Patent No. 2,309,714. February 2, 1943.

ADELBERT C. RADTKE, ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows; Page 1, second column, line 21, for "175°" read --275°--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of March, A. D. 1943.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.