Sept. 18, 1923. 1,468,323

R. A. OLSON

MUSICAL INSTRUMENT STRING

Filed Feb. 6, 1922

*Fig. 1.*

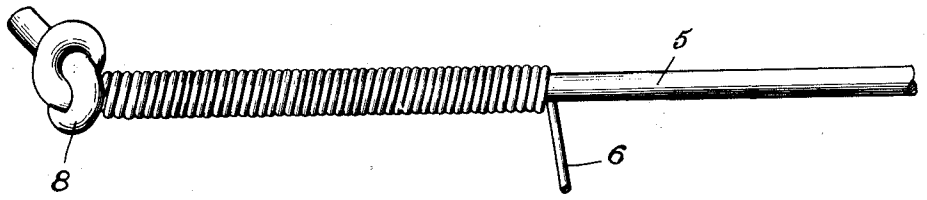
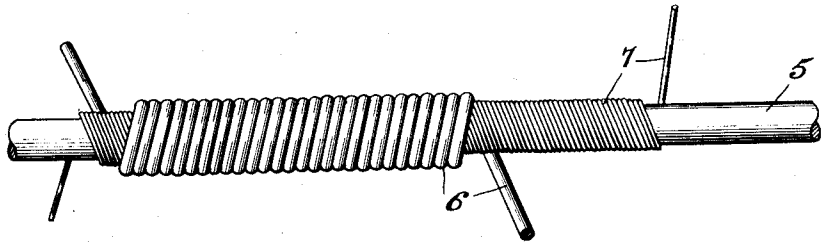



*Fig. 2.*




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Attys.

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# UNITED STATES PATENT OFFICE.

REUBEN A. OLSON, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO FREDERICK C. LEWIS, OF CHICAGO, ILLINOIS.

## MUSICAL-INSTRUMENT STRING.

Application filed February 6, 1922. Serial No. 534,375.

*To all whom it may concern:*

Be it known that I, REUBEN A. OLSON, a citizen of the United States, residing at 5853 Glenwood Avenue, Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Musical-Instrument Strings, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to improvements in musical instrument strings. The object of my invention is the production of a string of this character which will be capable of being placed under great tension or tensile strain without fear of breaking and which will, when in use, be capable of producing high pitch tones which are soft and mellow and at the same time of exceptional quality and purity.

Other objects will appear hereinafter.

The invention will be best understood by reference to the accompanying drawing forming a part of this specification and in which—

Fig. 1 is an enlarged fragmentary side elevation of a musical instrument string embodying my invention; and

Fig. 2 is an enlarged fragmentary side elevation of a string illustrating a slightly modified form of embodiment of my invention.

The preferred form of construction, as illustrated in the drawing, comprises a string which is formed of a cylindrical core 5, preferably of steel. Steel is especially adapted for this use because of the fact that the same is possessed of great tensile strength and is relatively hard.

Upon the core 5 a wire 6 is wound in close formation. The wire 6 is relatively fine and is preferably formed of aluminum or an aluminum alloy, this metal being used because of the fact that the same is very malleable and relatively very light in weight, that is, of low specific gravity.

In the use of a core of great tensile strength such as is possessed by steel, a string is produced which is very strong and not susceptible to ready breaking when the same is placed under high tension as would be the case with gut or a metal of limited tensile strength. The string of my construction, by reason of the strength thus possessed by it, is especially applicable for use as an A string on a violin which, as is known, is required to produce tones of high pitch. The hardness of the steel is of advantage in that it furnishes a solid foundation or core for the wire which is wound thereon.

Heretofore musical instrument strings have been made in which, for instance, copper or silver wire has been wound upon a steel core. But such a string is unsuited for the production of high pitch tones for the principal reason that copper and silver are of relatively high specific gravity. Because of this fact, where a copper or silver wire is used upon a steel core, a string relatively heavy in weight is produced and one in which, therefore, the effect of inertia is correspondingly relatively great. This makes it necessary, in the use of such a string, to place the same under a tremendous tensile strain in order to overcome this inertial effect and still obtain the high frequency of vibration in the string essential to the production of the high pitch tones desired. Such a string, when placed under this extraordinary tensile strain readily breaks and may even distort the instrument on which it is used. At the same time the tones produced, by reason of the extreme tension of this type of string, have been found to be harsh and metallic and consequently highly undesirable.

It is known also that metal-wound strings have been used in which a gut core has been employed. This combination has resulted in a string of light weight and from this standpoint has been satisfactory. But such a string has proved a failure for use in the production of high pitch tones for the reason that gut is too weak for use as the core of a metal wound string, that is, the same is not possessed of sufficient tensile strength to withstand the severe strain to which it is subjected in tuning the string up for high pitch work, such as required, for instance, of the A string on a violin. And accordingly such a string has been discarded for high pitch work because of its weakness or inability to stand up under the required tension.

With my string, however, where a wire formed of a metal of low specific gravity, such as aluminum, is used upon a steel core, the low specific gravity of the outer wire compensates for the high specific gravity of

the core and the finished string is one which is strong and yet relatively light in weight and one in which, therefore, the inertial effect is correspondingly relatively small, the same being reduced to a minimum. Accordingly, with such a string as I have produced, the requisite high frequency of vibration necessary to the production of the high pitch tones desired, may be secured by placing the string under a tension far below that of a string of greater weight such as one wound with copper or silver. It being unnecessary, therefore, with my string, to place the same under the excessively high tension of the prior art metal strings before mentioned in order to secure the desired high pitch tones, in the use of my string the tones obtained are soft and mellow and devoid of any harshness or metallic effect.

Of course this result, namely, the production of the highly desirable tone quality mentioned, is also contributed to by the malleability of the outer wire. This characteristic of the latter makes it possible to wind the same closely upon the core or into such close association therewith that, when the string is in use, the otherwise harsh and piercing tones which would be produced by the bare steel core are muffled and softened by the outer winding and instead mellow, clear, pleasing tones are produced. At the same time, a string of the construction set forth, it has been found, vibrates freely, producing great tone volume. It will respond quickly to the touch of the bow and is especially effective in the upper positions.

If desired, a layer of silk thread 7 may be wound upon the core 5 to separate the same from the wire 6. The use of a layer of silk thread is of advantage in that it provides a yielding cushion or union between the wire and core which will compensate for any expansion or contraction of the metals used, due to stretching of the string when in use or to changes in temperature or atmospheric conditions, and thus prevent the outer wire rattling or becoming loose as might otherwise result.

The string will be provided with a knot or loop 8 of any desired form for securing the same to the tail piece of the instrument upon which it is used.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I therefore do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A musical instrument string comprising a core of a metal of great tensile strength, and a wire wound upon said core, said wire being formed of a metal which is malleable and of low specific gravity.

2. A musical instrument string comprising a core of a metal which is relatively very hard and of great tensile strength, and a wire wound upon said core, said wire being formed of a metal which is malleable and of low specific gravity.

3. A musical instrument string comprising a steel core, and an aluminum wire wound upon said core.

4. A musical instrument string comprising a core of a metal of great tensile strength, a wire wound upon said core, said wire being formed of a metal which is malleable and of low specific gravity, and a layer of cushioning material wound upon said core and separating said wire and core.

5. A musical instrument string comprising a steel core, an aluminum wire wound upon said core, and a layer of cushioning material wound upon said core and separating said wire and core.

6. A musical instrument string comprising a core of a metal of great tensile strength and an outer covering of a metal which is malleable and of low specific gravity.

7. A musical instrument string comprising a steel core, and an outer covering of aluminum.

8. A musical instrument string comprising a core of a metal of great tensile strength, an outer covering of a metal which is malleable and of low specific gravity, and a layer of cushioning material interposed between said core and said outer covering.

9. A musical instrument string comprising a steel core, an aluminum outer covering, and a layer of cushioning material interposed between said core and outer covering.

In witness whereof, I have hereunto subscribed my name.

REUBEN A. OLSON.

Witnesses:
FRED JOHN DIEDRICH,
CARL J. NESPOR.