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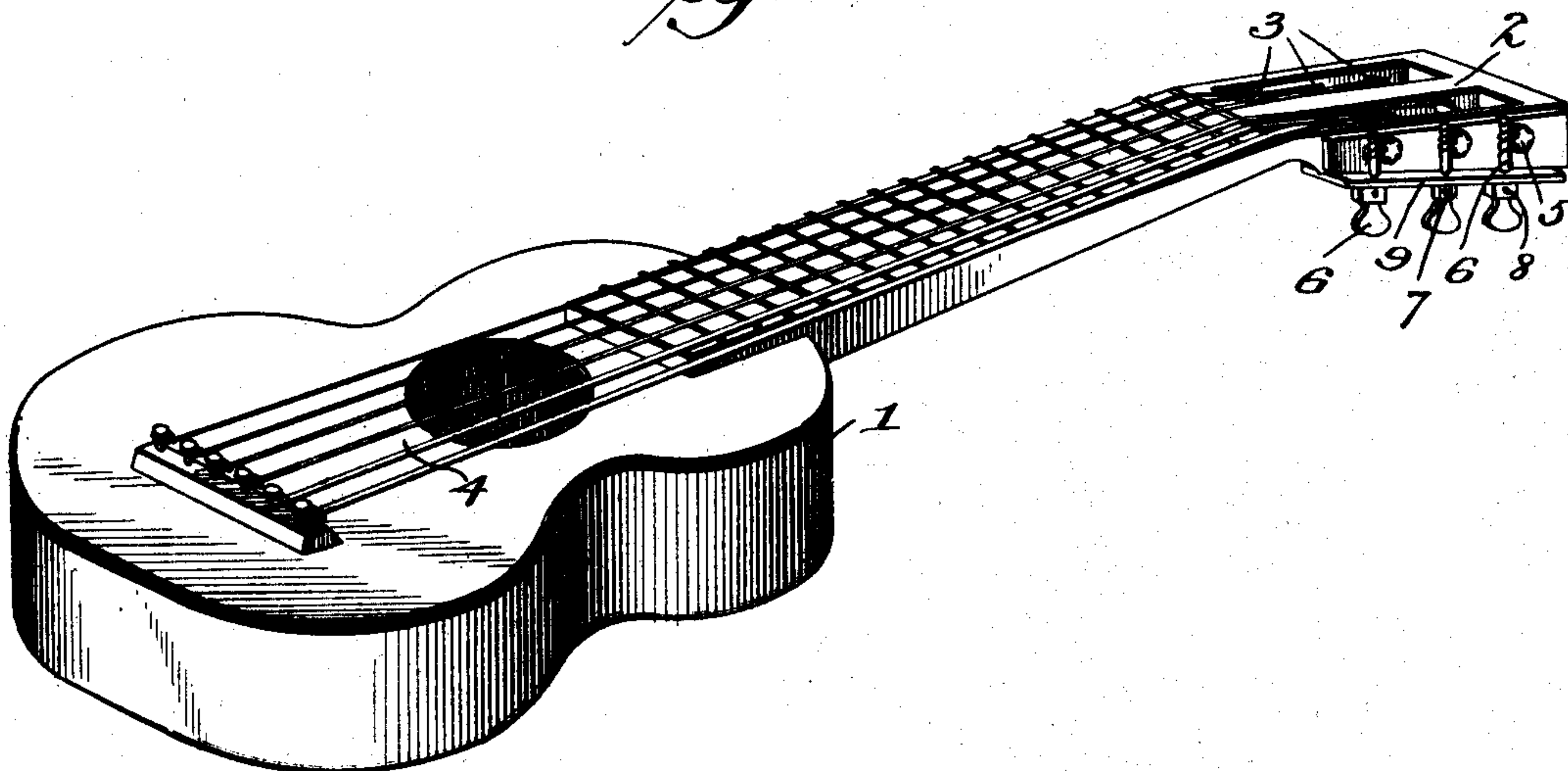
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TUNING DEVICE FOR STRINGED MUSICAL INSTRUMENTS.

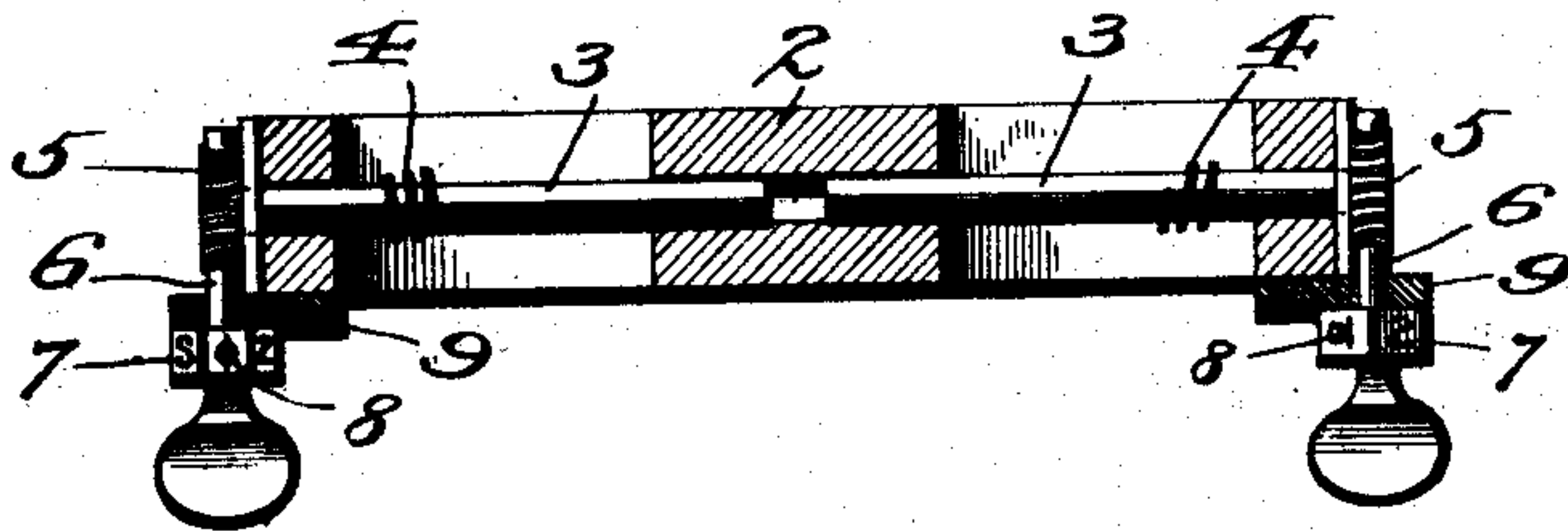
(Application filed Aug. 3, 1900.)

(No Model.)

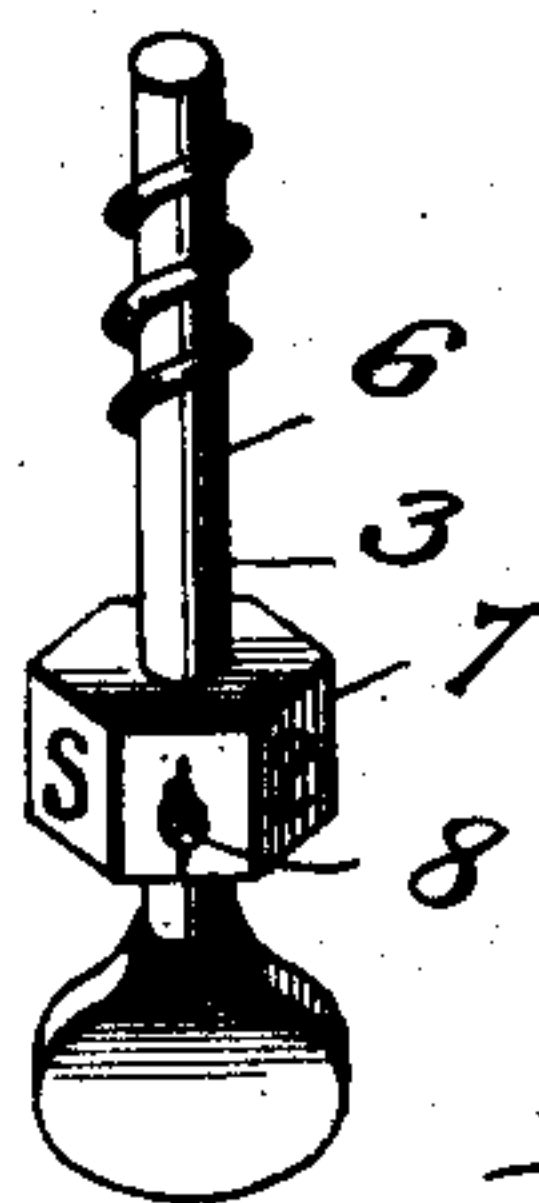
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



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# UNITED STATES PATENT OFFICE.

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## TUNING DEVICE FOR STRINGED MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 668,138, dated February 12, 1901.

Application filed August 3, 1900. Serial No. 25,794. (No model.)

*To all whom it may concern:*

Be it known that I, EUGENE B. BRANDON, a citizen of the United States, residing at Elkins, in the county of Randolph and State of West Virginia, have invented a new and useful Tuning Device for Stringed Musical Instruments, of which the following is a specification.

My invention relates to musical instruments, and more particularly to means for changing the pitch or tone of the instrument after it has been properly tuned in any given pitch; and it consists in the improved construction and novel arrangement of parts of the same, as will be hereinafter more fully set forth.

In the accompanying drawings, in which the same reference-numerals indicate corresponding parts in each of the views in which they occur, Figure 1 is a perspective view of an instrument provided with my improved tuning mechanism. Fig. 2 is a transverse sectional view of the same through the head or tuning portion, and Fig. 3 is an enlarged detail view of one of my tuning attachments.

Referring more particularly to the drawings, 1 indicates a musical instrument, preferably a guitar, the head 2 of which is provided with the usual axles 3, upon which the strings 4 are wound in the usual manner. Each axle is provided with the usual worm-wheel 5, which is operated by the key or stem 6, said stem being provided with a worm to correspond therewith. By rotating the keys the axles may be turned so as to wind the strings thereon or unwind them therefrom to secure the proper tension to produce the desired tone when the string is vibrated. After the instrument has been tuned to any desired pitch by means of the usual tuning instrument it is impossible to change the pitch of the instrument to another key without retuning the instrument, owing to the differences in size and vibration of the different strings.

To avoid the necessity of retuning the instrument for every change of pitch, I have provided each key or stem with an angular block 7, which I shall call a "tuning-indicator." These blocks fit loosely upon the stems and are adapted to be rigidly secured thereto by means of a set-screw 8. They are prefer-

ably rectangular or four-sided, as shown in the drawings, although it is evident that they may be hexagonal or may be provided with any desired number of faces and angles. The head of the instrument is provided upon each side with a strip 9, which I shall call a "guide" and which is perforated for the passage of the stems or keys 6. The indicators are adapted to be secured to the stems adjacent to the under sides of the guides in such position that the faces of the indicators are adapted to be brought into alinement with the outer faces of the guides, and thereby indicate the proper position for the key to occupy to produce the desired tone of the string in changing the pitch of the instrument. Instead of having the faces of the indicators and of the guides to register the guides might be provided with lines or marks with which the angles or faces of the indicators could register to indicate the position of the key.

As all of the blocks are to be made of the same size, it is necessary that means be provided whereby the same amount of rotation of the different keys will produce a different amount of tension upon the different strings. I accomplish this by varying the size of the worm-wheels upon the ends of the axles or by varying the pitch of the screw-threads that engage therewith, or both. I prefer to effect the change by varying the pitch of the threads, which necessarily requires a difference in the number of teeth upon the wheels, as indicated in the drawings. The different faces of the indicators are provided with different characters, as letters or numerals, to indicate the different pitches to which the instrument may be tuned, one face of each indicator being marked with the letter "S" to indicate the position the different keys should occupy to tune the instrument by what is known as the "Spanish" method.

With an instrument provided with my improved tuning attachment as above described the indicators are loosened upon the stems and the instrument is tuned to any desired pitch in the usual manner. The indicators are then rigidly secured to the different keys with the characters for that pitch registering with the guides. After the indicators have been thus adjusted upon the different stems



the instrument can be quickly changed to any other desired pitch by simply rotating the different keys until the faces or angles for the desired pitch register with the guide, when, 5 owing to the variation in the rotation of the axles of the different strings by the same amount of rotation of the keys, the different strings will be placed under the proper amount of tension to produce the desired tones according to the change of pitch. 10

If at any time any of the keys need to be turned to change the tension of any of the strings to bring it back into tune it will be necessary to loosen its indicator and reset it 15 before the change of the pitch of the instrument be attempted.

If desired, the guides and the keys and axles may be constructed independently of the head, so that they can be applied to instruments now in use, although I prefer to provide the head of the instrument with my attachment when it is being made. 20

Having thus fully described my invention, what I claim as new, and desire to secure by 25 Letters Patent, is—

1. In an attachment for musical instruments, the combination, with a frame pro-

vided with axles, of stems for rotating said axles, means for giving a different amount of rotation to the different axles for the same 30 amount of rotation of the different stems, and indicators for the different stems, substantially as described.

2. In an attachment for musical instruments, the combination, with a frame provided with axles, of a worm-wheel for each 35 axle, the teeth of the different wheels being different from each other, a stem for each wheel provided with a worm to correspond with the teeth of said wheel, and an indicator 40 for each stem, substantially as described.

3. In a musical instrument, the combination, with the head, of axles journaled therein, each of which is provided with a worm-wheel, the teeth of each wheel differing from the 45 teeth of the other wheels, a stem for each wheel, provided with a worm to correspond with the teeth of its wheel, a guide secured to the head, and an indicator upon each stem, substantially as described.

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