

United States Patent Office.

ANDREW PATTERSON, OF BIRMINGHAM, PENNSYLVANIA.

Letters Patent No. 71,322, dated November 26, 1867.

MODE OF TUNING BELLS, &c.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, ANDREW PATTERSON, of Birmingham, in the county of Allegheny, and State of Pennsylvania, have invented a new and useful Improvement in Tempering or Tuning Bells; and I do hereby declare the following to be a full, clear, and exact description thereof.

In preparing bells to be arranged in musical chimes, and, indeed, in finishing them for ordinary use separately, it is often desirable, not to say necessary, to modify or change the tone of one or more of the bells, and sometimes of a whole series of bells, after it or they are cast. This has heretofore been accomplished by turning off some portion of the body of the bell, more or less, at different points from its centre or apex to its rim or mouth, so as to change or modify its form and dimensions. In this way each bell is keyed, after being cast, to any desirable tone. The invention I am about to describe is designed to accomplish the same result by the process of tempering and annealing the bell after it is formed, whether it be formed by casting or pressing, so as to secure from it, when struck or rung, a higher or lower note, as may be desirable, and therein consists the nature of my invention.

To enable others skilled in the art to make use of my improvement, I will proceed to describe its operation and mode of application.

As already stated, I apply my improvement to tuning or changing the tone of bells, whether such bells be cast of bell-metal or steel by the ordinary method, or pressed from circular sheets or plates of steel, as described in certain Letters Patent already issued to me. If it be desired to give a higher tone to the bell, I harden it by the usual process of heating and plunging into oil, or other suitable fluid ordinarily used for such purposes; but if the tone of the bell is too high, I lower it by annealing it, or drawing the temper in the usual way, in doing which it is proper to try the tone occasionally, so as to ascertain the progress of the change, and the point at which it should be arrested, otherwise too great a change might be effected. By thus hardening or softening the material of the bell, I effect a change in its internal structure which to a corresponding extent changes the tone, and as the temper of the bell is thus permanently fixed, except as it may be affected by a like process, its tone is equally so. In this way I tone or tune bells to a higher or lower key at pleasure, so that each single bell, or each of a series or chime of bells, may have any desirable key, and the series or chime each have and preserve the proper musical interval.

While my invention is useful in its application to all kinds of bells, it is especially adapted for use with wrought-steel bells. Its advantages consist in the ease and simplicity of its application, its cheapness, and the entire absence of waste or loss, and the certainty and permanence of its results. By it bells can be tuned to any required degree of accuracy, and permanently kept in tune, or retuned at pleasure, at any subsequent time. This retuning may sometimes be necessary, particularly if, as is alleged by many who are skilled in that art, wrought steel, as well as other wrought metals, under the effect of continued or often-repeated vibration, undergoes a change of atomic structure, which change would of course affect the tone of the bell, and perhaps in many or all cases necessitate retuning. This, with the wrought-steel bells described in the Letters Patent above referred to, can easily be done, since, being of sheet metal, they are light, easily removed from their mountings, toned in the manner above set forth, and as readily remounted.

Having described my improvement, what I claim as my invention, and desire to secure by Letters Patent, is—

The manner, substantially as hereinbefore described, of tuning bells, so as to secure from them a higher or lower tone.

In testimony whereof, I, the said ANDREW PATTERSON, have hereunto set my hand.

ANDREW PATTERSON.

Witnesses:

G. H. CHRISTY,
A. S. NICHOLSON.