(No Model.)

G. CHARD & D. S. LITTLEFIELD.

STRINGING PIANO FORTES.

No. 267,150. Patented Nov. 7, 1882.

Fig 1

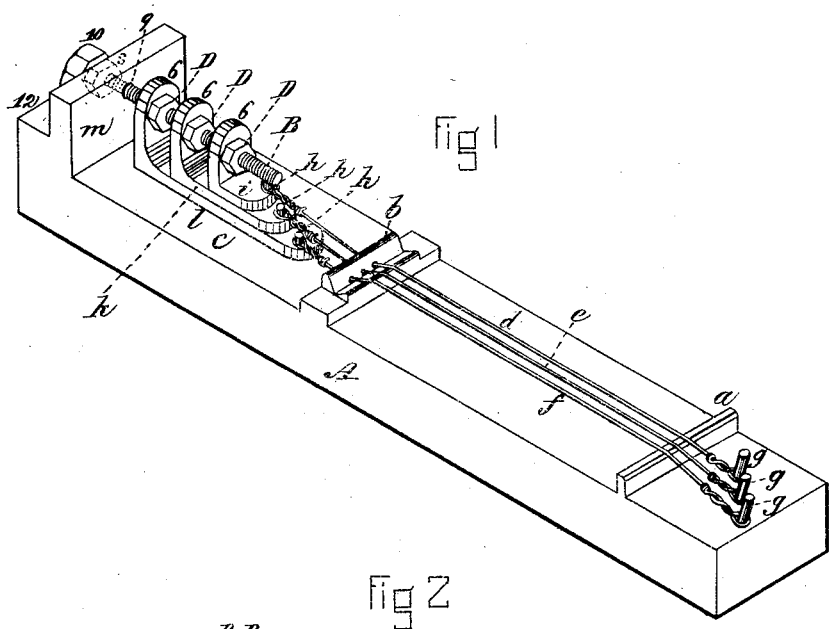


Fig 2

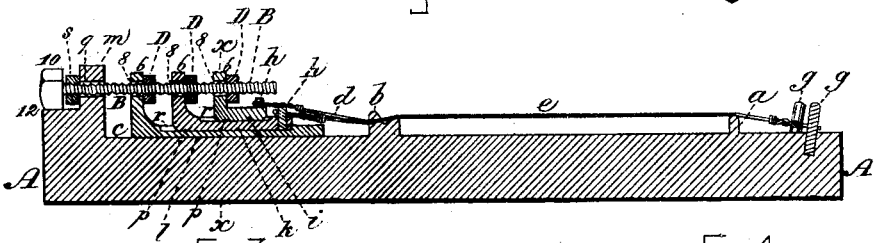


Fig 3

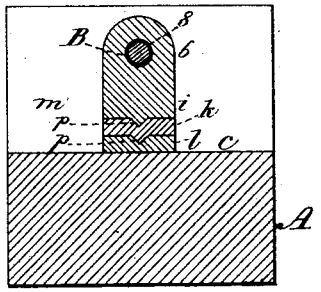
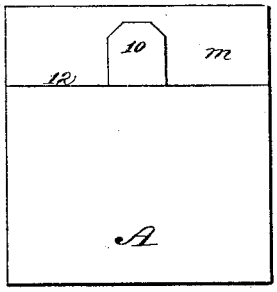


Fig 4



WITNESSES

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UNITED STATES PATENT OFFICE.

GRANVILLE CHARD, OF CHELSEA, AND DEPENDENCE S. LITTLEFIELD, OF CAMBRIDGEPORT, ASSIGNORS TO THE MASON & HAMLIN ORGAN AND PIANO COMPANY, OF BOSTON, MASSACHUSETTS.

STRINGING PIANO-FORTES.

SPECIFICATION forming part of Letters Patent No. 267,150, dated November 7, 1882.

Application filed August 4, 1882. (No model.)

To all whom it may concern:

Be it known that we, GRANVILLE CHARD, of Chelsea, in the County of Suffolk and State of Massachusetts, and DEPENDENCE S. LITTLEFIELD, of Cambridgeport, in the county of Middlesex and State aforesaid, have invented certain Improvements in Stringing and Tuning Piano-Fortes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of a portion of the string-frame of a piano-forte having our improved device applied thereto. Fig. 2 is a longitudinal vertical section through the center of the same Fig. 3 is an enlarged transverse vertical section on the line *x x* of Fig. 2. Fig. 4 is an end elevation enlarged.

Our invention has for its object to provide a simple and effective device for stringing and tuning piano-fortes, whereby they can be kept in perfect tune for a much longer period of time than where the strings pass around metal wrest or tuning-pins inserted into a wooden wrest-plate, which latter method is objectionable, for the reason that the atmospheric changes so effect the wooden wrest-plate as to cause the strings to become slackened, which necessitates the frequent retuning of the instrument.

To this end our invention consists in a compound tension device composed of a series of sliding plates or blocks, to each of which one end of a string is secured, these sliding plates or blocks being all arranged upon a single screw-shaft and adapted to be moved simultaneously by a screw-nut or equivalent device to produce a tension upon the strings, while each slide is made adjustable by means of a separate device, independently of the other slides, by which construction the separate strings of each note may be readily tightened independently of each other to bring them into unison, and all of the strings of the note also tightened simultaneously without affecting or disturbing the unison, in order to vary the pitch of the note as may be desired; and our invention also consists in certain details of construction, as hereinafter set forth and specifically claimed.

In the said drawings, A represents the metallic string-frame of a piano-forte, which is provided, as usual, with the bridge *a*, agraffe *b*, and wrest-plate *c* cast integral therewith.

d e f are the strings of one note, each string being secured at one end to a hitch-pin, *g*, whence it passes over the bridge *a* and agraffe *b* to a fastening-pin, *h*, upon one of a series of sliding plates or blocks, *i k l*, the lower or larger one, *l*, of which rests directly upon the wrest-plate *c*. Each of these slides is provided at its inner end with a perpendicular standard or projection, 6, having a smooth aperture, 8, therein, and through these apertures, which are in line with each other, passes a long screw-shaft, B, which also passes through a smooth hole, 9, in a vertical flange, *m*, projecting up from the string-frame A, this screw being provided with a polygonal head, 10, one face of which is in contact with the shoulder 12 of the flange *m*, whereby the screw is prevented from rotating upon its axis. Each of the slides is made independently adjustable upon the screw B in the direction of its length by means of a screw-nut, D, which rests against the outer face of the projection 6 of the slide, and each of the slides *i k* is provided on its under side with a longitudinal guide or projecting rib, *p*, of V shape in cross-section, which slides in a correspondingly-shaped groove, *r*, in the upper surface of the slide next below, by which device the slides are steadied and kept in their proper position as they are moved upon each other.

Upon the screw B, between its head 10 and the flange *m*, is placed a screw-nut, *s*, by turning which the screw can be drawn in the direction of its length for the purpose of moving all three of the slides simultaneously an equal amount, for the purpose of producing more or less tension upon the strings *d e f;* and to produce an even draft upon the slides and equalize the strain the pins *h* are preferably arranged as shown, that of the slide *i* being on one side of the center, that of the slide *k* in line with the center, and that of the slide *l* on the side of the center opposite to that on which the pin of the slide *i* is located.

In the operation of tuning when it is desired

to tighten the strings *d e f* it is simply necessary to turn the screw-nuts D in the proper direction by means of a suitable wrench in order to produce the exact degree of tension upon each string of the note to bring them all into unison, which can thus be effected in a very simple and convenient manner, and after this operation has been completed, when it is desired to vary the pitch of the note, it is merely necessary to apply the wrench to the nut *s* and turn it in the proper direction in order to simultaneously draw forward the screw B, and with it all three of the slides *i k l*, and by this means all three of the strings of the note can be simultaneously and equally tightened to vary the pitch without disturbing or affecting the unison—a desideratum heretofore unattained in any other stringing and tuning device with which we are acquainted; and by thus providing a piano-forte with a device by means of which each string of a note can be adjusted separately and independently to bring it into unison with the other strings of the same note, and the whole then tightened simultaneously to bring the note to the desired pitch, the operation of tuning is greatly facilitated, while with our improved device a piano-forte will remain in tune for a much greater length of time than where the ordinary method of stringing is employed. If, through carelessness or from other cause, the strings of a note should not be found in unison after being strained to the required pitch by the nut *s*, it is simply necessary to turn one or more of the nuts D in the proper direction to produce the desired result.

If the note has two strings only instead of three, as shown, the upper slide, *i*, and its nut D would be dispensed with, and for bass-notes having a single string only the lower slide, *l*, and its nut D only would be retained.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. A compound tension device for the strings of piano-fortes, consisting of a series of slides placed one upon the other, and each having means of adjustment whereby they may be independently adjusted to bring the several strings of a note which are attached thereto into unison, and a separate means of adjustment whereby they may be moved simultaneously by a separate nut or screw to vary the pitch of the note, substantially as described.

2. In a device for stringing and tuning piano-fortes, the combination, with the string-frame, of a series of slides provided with means for attaching thereto the separate strings of a note, and arranged one upon the other on a single screw-shaft, B, and having the screw-nuts D, whereby they may be adjusted thereon independently of each other to bring the strings in unison, and having a separate and independent actuating device for straining or tightening all of the strings simultaneously and equally for the purpose of varying the pitch of the note, substantially as set forth.

3. In a device for stringing and tuning piano-fortes, the string-frame A, provided with a series of slides, each provided with means for attaching thereto one of the strings of a note, and arranged one upon the other on the screw-shaft B, and having screw-nuts D for independently adjusting them thereon in the direction of their length to bring the strings connected therewith into unison, in combination with the screw-nut *s* upon the screw-shaft B, arranged between the flange *m* of the string-frame and the head 10 of the screw, whereby the screw may be moved in the direction of its length for the purpose of simultaneously moving all of the slides longitudinally, and thereby varying the pitch of the note without affecting or disturbing the unison of the strings thereof, substantially as described.

4. In a device for stringing and tuning piano-fortes, the slides *i k l*, with their adjusting-nuts D, arranged as described, in combination with the screw-shaft B, passing through the flange *m* of the string-frame and provided with head 10, whereby the screw is prevented from rotating by the contact of one side of the head with the shoulder 12 or equivalent device, and the screw-nut *s* upon the screw-shaft B, arranged between its head 10 and the flange *m* of the string-frame, all constructed to operate substantially in the manner and for the purpose set forth.

5. In a device for stringing and tuning piano-fortes, the combination, with the screw-shaft B, of a series of slides provided with means for attaching thereto the strings of a note, and having adjusting-nuts D, whereby they may be moved one upon the other along the shaft B, and provided with longitudinal guides or projections *p*, fitting into grooves *r*, substantially as and for the purpose described.

Witness our hands this 2d day of August, A. D. 1882.

GRANVILLE CHARD.
DEPENDENCE S. LITTLEFIELD.

In presence of—
P. E. TESCHEMACHER,
W. J. CAMBRIDGE.