(No Model.)

J. B. DAYFOOT.

APPARATUS FOR TUNING PIANOS.

No. 602,499. Patented Apr. 19, 1898.

Fig. 1.

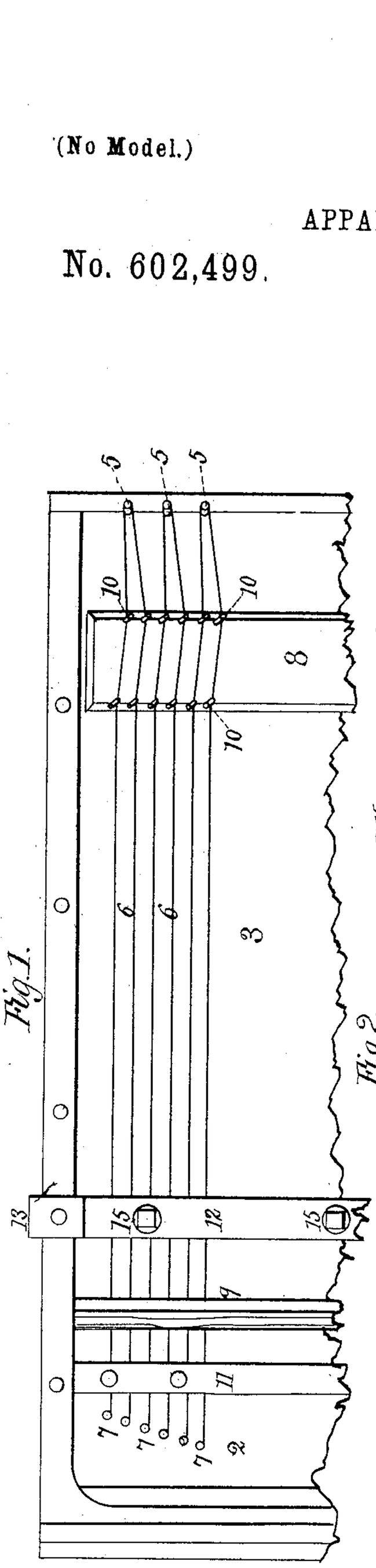


Fig. 2.

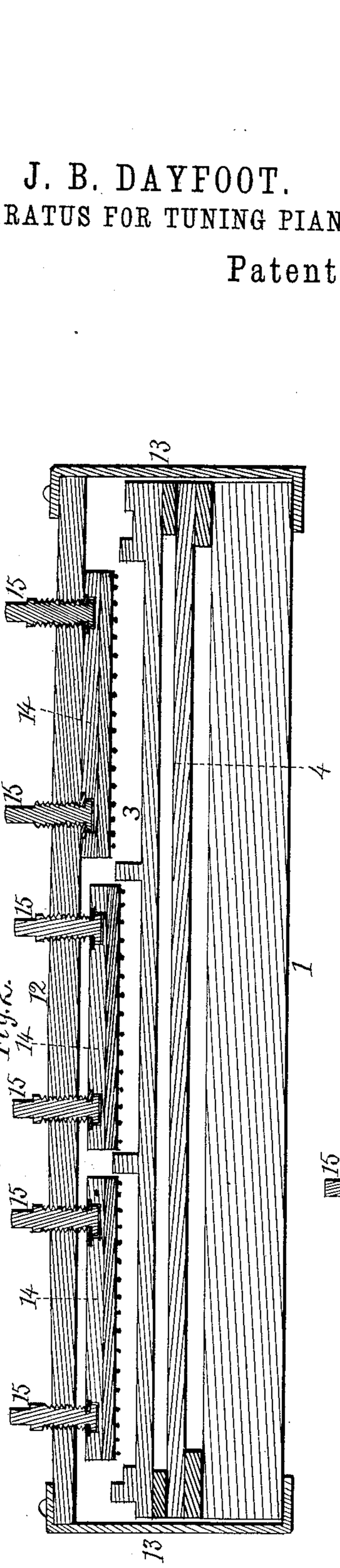
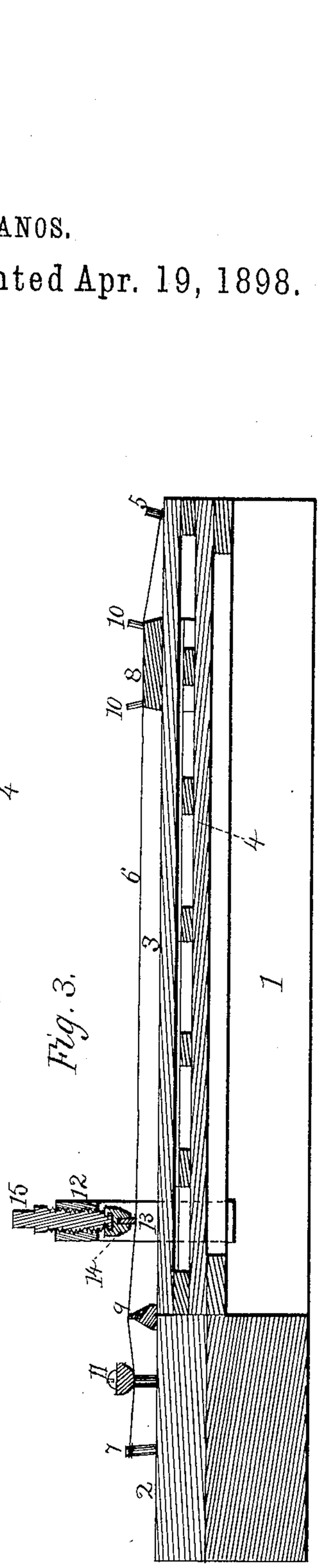


Fig. 3.



Witnesses.
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UNITED STATES PATENT OFFICE.

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APPARATUS FOR TUNING PIANOS.

SPECIFICATION forming part of Letters Patent No. 602,499, dated April 19, 1898.

Application filed September 25, 1897. Serial No. 652,968. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. DAYFOOT, a citizen of the United States, residing at Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful Method of Tuning Pianos, of which the following is a specification.

In the manufacture of pianos, especially those of high grade, the tuning is accomplished in two stages, the first being done in the "strung frame" and the second after the "action" and "case" have been added to the strung frame. In the first the tuner turns the tuning-wrench with one hand, while with the other he "snaps" the strings to sound them, gradually bringing the strings to the desired pitch and tuning them to the scale, at the same time bringing the three strings, which together make up the volume of each note, into unison. The strung frame is now laid aside for a considerable length of time, varying with circumstances from one to several weeks, until the various influences of temperature, the "spring" of the sounding-board, and the yielding or relaxing of other parts, as well as of the natural stretch of the strings themselves, throw the latter out of tune. The stretching and sounding of the strings is again gone through, as before, and this is repeated from time to time until the point is reached for the beginning of the second stage of tuning. To accomplish this latter, the action is added to the strung frame and the whole placed in the case of the piano. The tuning is now effected by stretching the strings by means of the tuning-pins, as before, but in lieu of the light snapping or picking of the string with a wooden picker in the tuner's fingers heavy blows are struck upon the strings by the hammers of the action in order to enable such strings to withstand any pounding action which may be imparted to them by a musician. This second tuning is repeated from time to time, with intervening lapses, until the piano is considered fit to be delivered.

In a word, the tuning of a piano in a manufactory consists in stretching the strings and bringing them to the desired pitch and allowing them afterward to gradually go out of tune in the course of time by the ordinary strain brought to bear by the process of bringing them to pitch.

Now the object of my present invention is to reduce to the lowest possible point the extent of the "waits" between the various tunings of the strings, and I accomplish this result by a method which consists in applying powerful pressure to the strings (in addition to the strain exerted by the tuning-pins) and between the two sets of bridges, preferably at the point of impact of the hammers, this additional pressure having the effect of accomplishing in a few hours results which have heretofore necessitated weeks of time to bring about. This economy of time is effected not only by the additional pressure upon the strings, but by the fact that in my method a large number of strings may be acted upon simultaneously—for instance, the whole of the bass in one division and of each section or possibly the whole of the treble in another division.

An approach toward accomplishing the result sought by my invention has heretofore been made by myself and others by exerting a temporary rubbing action upon the strings by means of a padded tool in the hands of a workman; but this has been done upon only a very few strings at a time, of the treble only, as the covering of the bass-strings prevents its being applied to them. This plan is crude, clumsy, and inefficient.

A mechanical device which, among others, I have employed in carrying my method into practice consists of one or more presser-bars carried by and made adjustable upon a suitable cross head or beam, by means of which the presser-bars are suspended immediately above the various strings of the bass and treble. Each presser-bar is raised and lowered with respect to the piano-strings by means of adjusting-screws which screw through the cross-head and are swiveled at their lower ends in the upper part of the bar. By means of the presser-bars and screws any desired amount of pressure may be exerted upon such a number of strings as practice may determine to be best. At present I am employing three presser-bars, one each to the bass and to the two divisions of the treble.

The drawings accompanying this specifica-

tion represent, in Figure 1, a plan, and in Figs. 2 and 3 opposite cross-sections, of a portion of the strings of a piano and the parts immediately connected therewith and with my pressure device applied thereto.

In the drawings, 1 represents the skeleton frame, of wood, which constitutes the general backing or frame of a piano, (in this instance of the "upright" variety,) while 2 denotes the pin-block thereof, and 3 the metal plate, which gives stiffness and strength to such frame. The sounding-board is shown at 4, the hitch-pins at 5 5, &c., and the strings at 6 6, &c., while the tuning-pins are shown at 7 7, &c. The lower or sounding-board bridge is shown at 8 and the upper bridge at 9, while the pins of the former are shown at 10 10, &c., and the agraffe at 11, the above parts constituting a portion of an upright piano as heretofore manufactured.

In carrying out the object of my invention in one form in which it may be accomplished, so far as mechanical agencies are concerned, I employ a cross head or beam 12, which is provided with end catches or ears 13 to grasp the back of the frame 1.

14 14 14 represent presser-bars situated below the beam 12 and connected with the latter by adjusting-screws 15 15, which screw through the beam and are at their lower ends swiveled to the upper part of each presser-bar, respectively. By means of the screws 15 15 the presser-bar may be forced upon or against the strings beneath it with any desired amount of pressure and allowed to remain until the strings are stretched or thrown out of tune, (which, as before premised, may occur in a few hours,) when the turning of the screws is to be repeated. Furthermore, by swiveling the screws to opposite ends of the presser-bars such bar may be tilted to a greater or less degree and the degree of pressure upon the various strings varied according to their length.

I do not confine myself to any given number of presser-bars, as these may vary according to circumstances or to pianos of different makes.

In using the above-described device the beam 12 is secured to the strung frame by means of the ears 13 and with the edges of the presser-bars immediately above or in front of the various strings. The presser-bars are now, by means of the screws, crowded upon or against the strings, (after the latter have been brought to the desired pitch and tuned to the scale,) such strings being by this pressure stretched or thrown out of tune in a very short time. The strings are again brought to the desired pitch and tuned to the scale and the presser-bars again crowded upon them, and these functions are repeated until the desired effect is obtained. The presser-bar device is now removed from the strung frame and applied to another and the operation repeated. The effect of the pressure upon the strings is such as to lessen, also, very materially the time required for the final tuning performed in connection with the hammers of the action, as the pressure upon the strings practically performs much of the labor heretofore done by such hammers. For this and other reasons a piano need not be finally completed until a short time before needed for shipment. Less floor-space is requisite for storing of instruments and materials and, incidentally, less capital is required.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is as follows:

A mechanical device for stretching the strings of a piano, composed of a support adapted to be temporarily attached to the string-frame of such piano—a pressure-bar capable of contact with a plurality of strings simultaneously and carried by said support, and adapted to rock or tilt transversely of said strings—and operating-screws or their equivalents, to vary the degree of pressure exerted by the bar upon the strings, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN B. DAYFOOT.

Witnesses:
GEORGE A. GIBSON,
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