(No Model.)

G. B. KELLY & E. H. SMITH.

METHOD OF TUNING ORGAN REEDS.

No. 256,704. Patented Apr. 18, 1882.

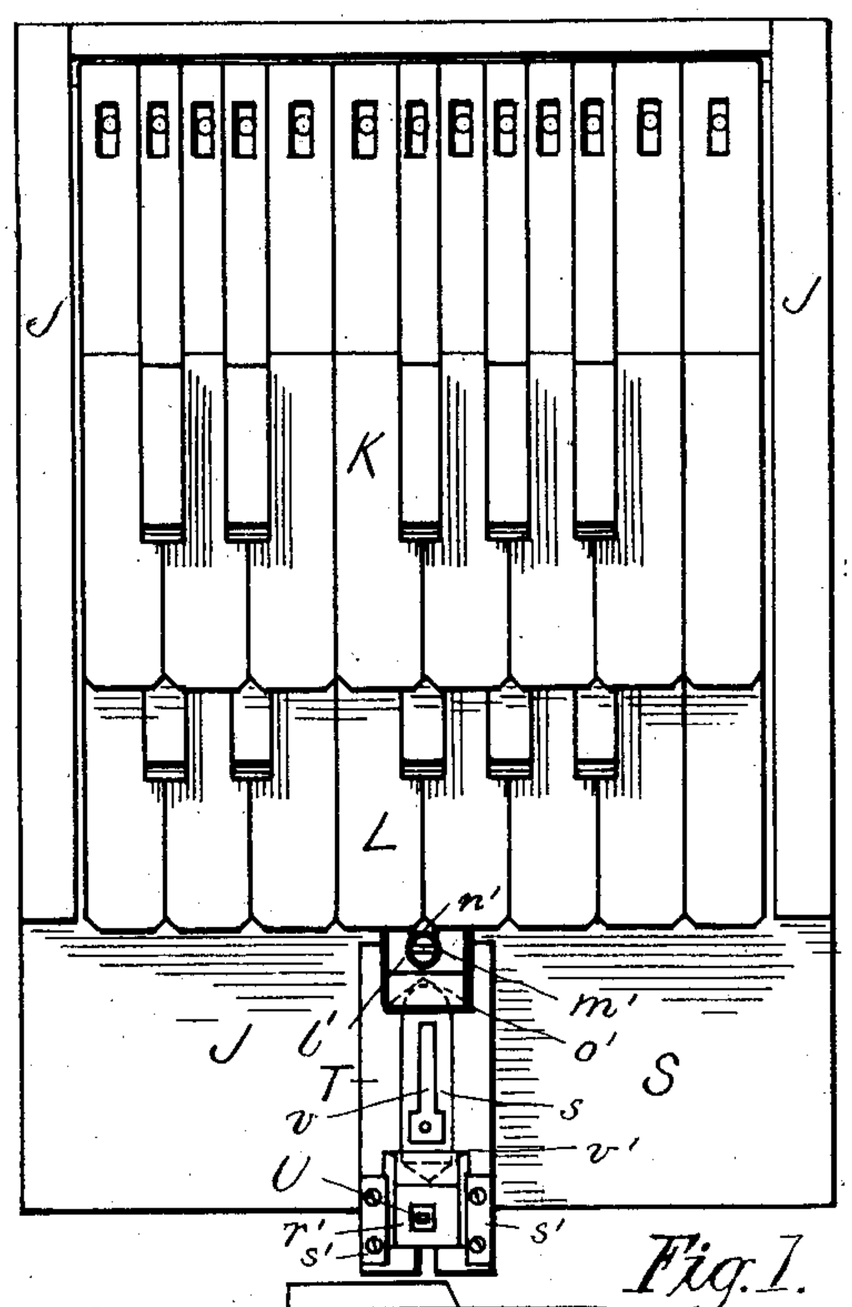

Fig. 1.

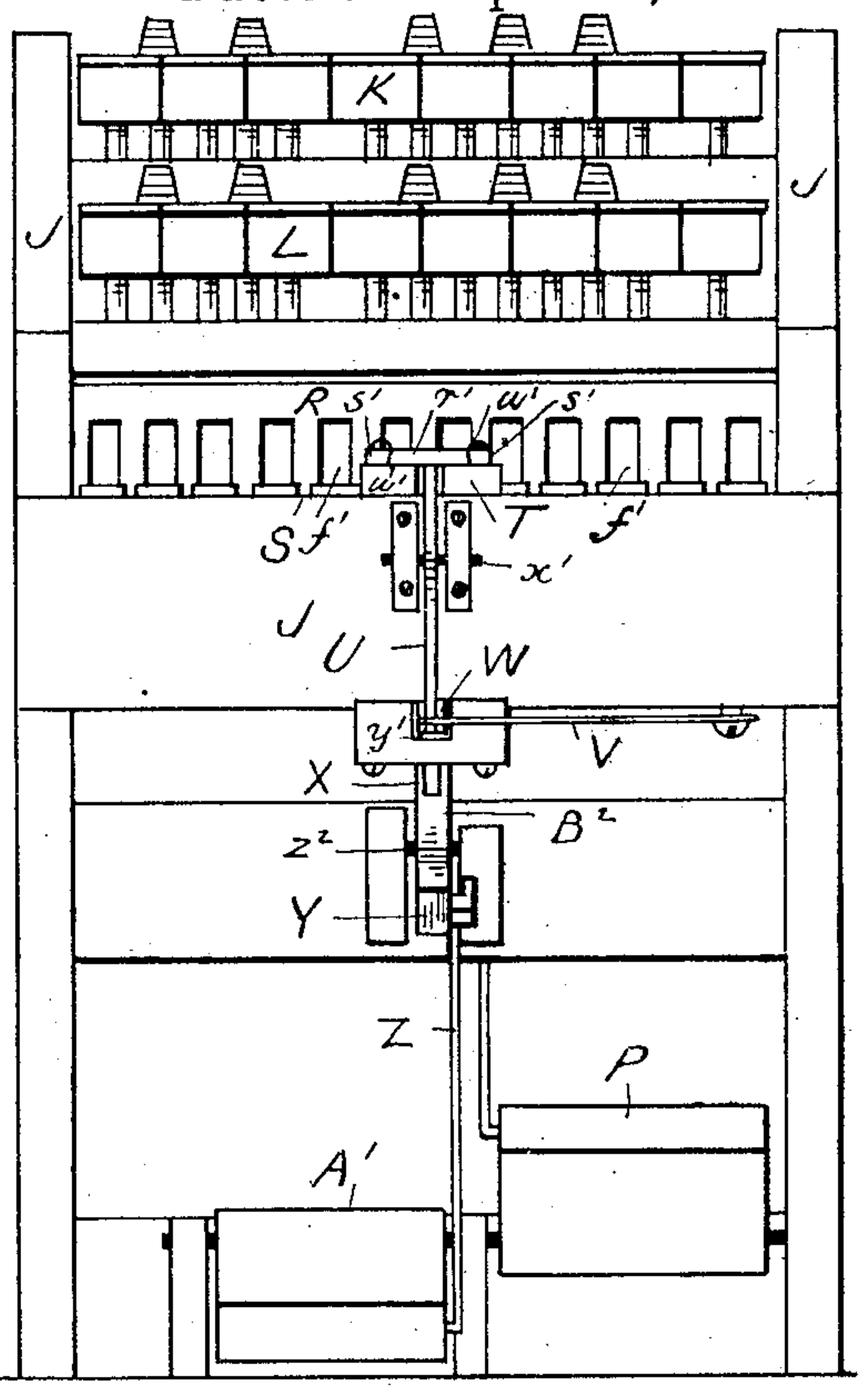

Fig. 2.

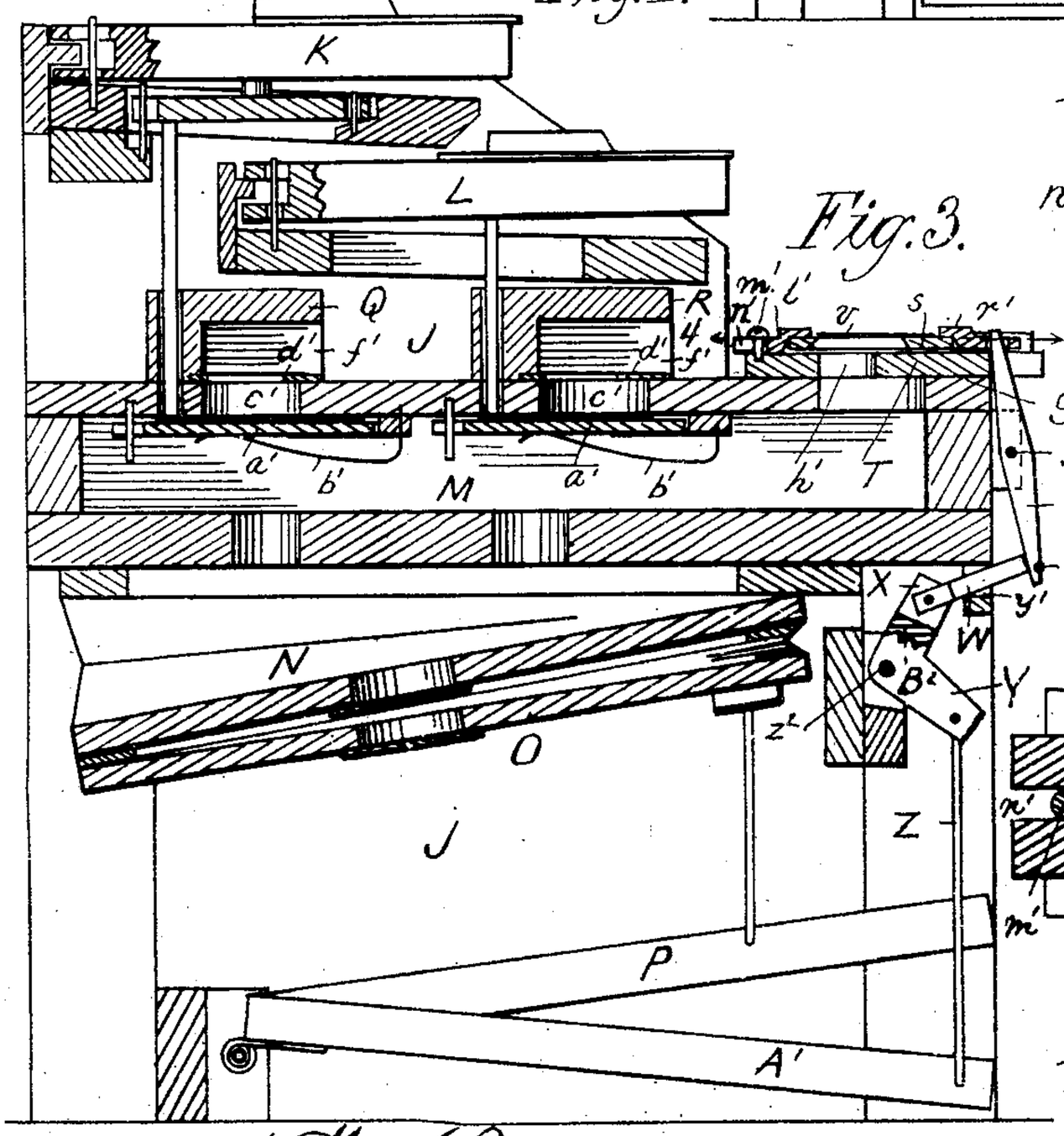

Fig. 3.

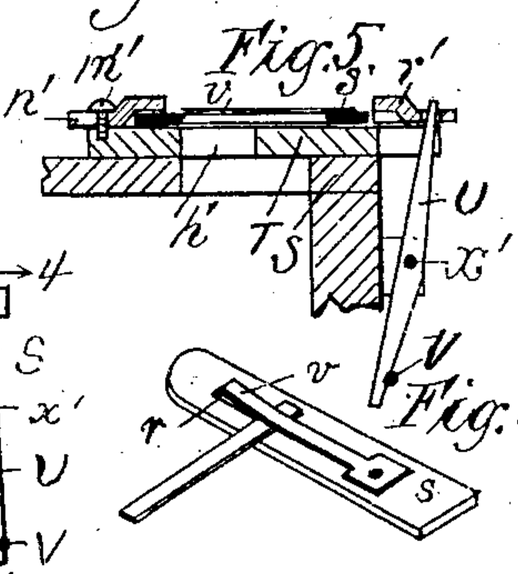

Fig. 5.

Fig. 6.

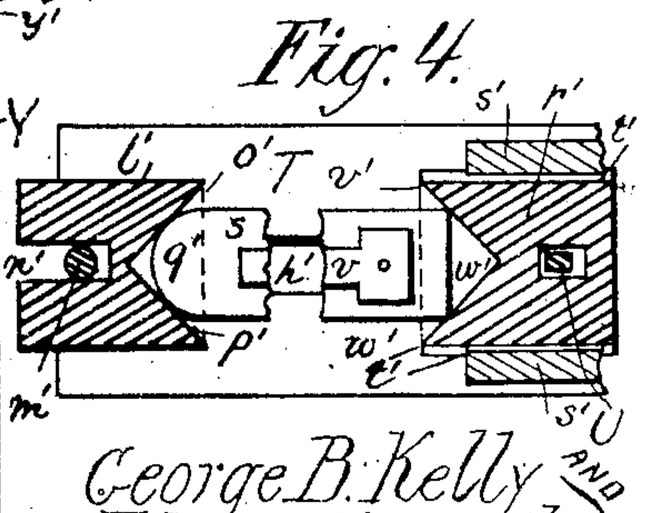

Fig. 4.

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UNITED STATES PATENT OFFICE.

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METHOD OF TUNING ORGAN-REEDS.

SPECIFICATION forming part of Letters Patent No. 256,704, dated April 18, 1882.

Application filed January 12, 1882. (No model.)

To all whom it may concern:

Be it known that we, GEORGE B. KELLY and ELWIN H. SMITH, respectively of Boston and Cambridge, in the counties of Suffolk and Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Methods of Tuning Organ-Reeds, of which the following is a full, clear, and exact description.

In preparing organ-reeds to be tuned the workman, to "bring a reed to pitch," as it is termed, places the reed in close proximity to his ear and snaps its tongue with his fingers, thus sounding it, while another reed of the pitch required for the reed being so manipulated is simultaneously sounded, and from this joint sounding of the two reeds the workman acts and proceeds, if necessary, first, of course, removing the reed from the ear, to file or scrape the tongue of the reed across its width and along its length, as in his judgment seems requisite, when, replacing the reed at the ear, he again snaps and sounds it as before, and so on until it is made correct as to pitch, when he proceeds in a similar manner with the next reed in the order of tuning, and so on through the whole set. When this is completed, to "voice" each reed, as it is termed, the workman bends its tongue with suitable hand-tools—such as pliers—so as to give it a slight in-and-out or ogee curve in its length and a twist at its free and vibrating end or point, all of which completes the preparation of the reeds for the tuner. These several operations of the reeds depend wholly upon the skill of the workman, and in any event are only preliminary, and are not nor are they in any respect considered as final, or, in other words, that the reeds are then of the proper voice, quality, and pitch, but that they are brought in close proximity to the same.

After the preliminary preparation above stated of the several reeds which are to make up an organ, and after having placed them in their proper places or chambers of the reed-board, they are then, substantially in a similar method of procedure to the tuning of the strings of piano-fortes, to bring them to the proper "pitch and temperament," as it is termed, each sounded, and if the reed sounded is then found not to have the proper tone and pitch it is removed from its position in the instrument and its tongue is filed or scraped or otherwise manipulated, as in the judgment and skill of the tuner may seem necessary, and again it is placed in the instrument and sounded, and if not then correct it is again removed and its tongue operated upon as to the tuner may seem best, when it is again inserted and sounded, and so on until it is made and found correct, after which the tuner proceeds to the next reed in order of tuning, and, working upon the same in a similar manner, brings that reed to tone and pitch, and so on through the whole series. In this mode of procedure, to tune the reed finally and to give it its proper temperament, all the then manipulations of or work upon the tongue of the reed are necessarily with the reed removed from its chamber of the reed-board and when silent or not sounding, and as a consequence such manipulations must be and are more or less a matter of speculation on the part of the tuner, based upon his remembrance of the previous sound of the reed, and at the time wholly without any then apparent or existing guide or direction, all of which necessitates frequent and repeated insertions and removals and soundings of the reed before it can be or is tuned and otherwise rendered suitable for use in the instrument. These necessary insertions and removals of the reed, as stated, are obviously difficulties and disadvantages which it is plain it would be desirable to avoid and remedy; and to that end this invention pertains, and, as will be seen from the description thereof hereinafter given, it completely overcomes them and reduces the tuning of reeds to a system and to a most easy and simple operation, and one capable of being practiced in a most economical and expeditious manner, and with a certainty as to satisfactory and perfect results heretofore unattainable in the method of tuning described and heretofore employed.

This invention, for the purpose stated, covers a new method or procedure in the tuning of reeds, and this method consists in sounding the reed to be tuned the same as it is sound-

ed when in its proper place in the instrument, except that the reed is free and open and unconfined in any chamber or compartment of a reed or other board, as it is when in the instrument or in practical use, and in simultaneously sounding a reed, to and by which it is to be tuned, which is located in a chamber or compartment of a reed or other board, as usual in the practical use of reeds, and differing only in that respect from the sounding of the reed to be tuned, and which has a pitch sufficiently higher than the pitch that the reed being tuned is to have when in its chamber or compartment for practical use, to secure to the reed being tuned, by bringing (with the usual filing, scraping, and other manipulations of the tongues of reeds to tune them, as heretofore practiced) it to such higher pitch, its proper pitch and temperament when it is in its place in the reed-board of an instrument, and is thus put to practical use. Under this method of tuning, as the reed being tuned is open and free, and is not confined in a chamber or compartment, as heretofore, it is plain that the tongue to the reed is at all times free to be filed, scraped, and otherwise manipulated from time to time, as may be necessary and proper, while in its position to be sounded, as stated, and therefore all removals of the reed for such operations or manipulations and reinsertions thereof to be sounded again, which have heretofore been necessary, are entirely obviated, it being of course plain that when the tuning is completed the reed is then to be removed to be put to practical use, as desired. Again, it is plain that this improved method of tuning organ-reeds is most easy and simple, efficacious and practical, economical and expeditious, and secures with certainty most satisfactory and perfect results, and enables, as practice has demonstrated, reeds as to any note or notes in the compass of the instruments manufactured to be tuned in quantities and gathered for use—a result never before practically attainable under any method of tuning reeds hitherto practiced.

For the practice of this improved method of tuning organ-reeds we have devised an apparatus, to be now described, but which forms the subject-matter of a separate application for Letters Patent of the United States of even date herewith, and is only made a part hereof for illustrating a means by which the method of tuning constituting the invention herein described can be most successfully and satisfactorily carried out.

In the accompanying plate of drawings the apparatus above referred to is illustrated, and Figure 1 is a plan view. Fig. 2 is a front elevation. Fig. 3 is a vertical section from front to rear. Fig. 4 is a horizontal section in detail on line 4 4, Fig. 3. Fig. 5 is a vertical sectional view, in detail, of mechanism for confining the reed which is to be tuned in place to be sounded and under the conditions for tuning hereinbefore specified. Fig. 6 is a view of the reed-block and reed.

In the drawings, J represents a cabinet or stand of suitable shape and construction to receive and support the several stationary and working parts and to allow of their operations, as will hereinafter fully appear.

K and L are two banks of organ-keys of any desired compass and scale. The banks of keys are located one bank above the other, and each key of each bank is arranged to open a valve, a', and to allow the same to close with a spring, b', and thus to open and close a passage, c', between a wind-chest, M, which is connected with a two-part operating exhaust-bellows, N O, worked by a treadle, P, and which is common to all of the valve-passages c' and an organ-reed, d', corresponding to such key in the scale of keys, which several reeds for the banks of keys are in reed-boards Q and R, respectively, having a separate chamber, f', for each reed, open at one end, and all as is common in reed-organs, and therefore needing no more particular description herein. Each reed of the upper bank of keys is of the proper tone and at the proper pitch for the scale and compass intended to be represented by such bank of keys, and the several reeds of the lower bank of keys are of the same tones, respectively, as those of the upper bank; but each has a pitch higher than the pitch of the corresponding reed of the upper bank when both are sounded as they are placed in their reed-chambers, but equal and corresponding to the pitch of the reed of the upper bank if such reed in the upper bank be sounded under the same conditions as before, but with it open and free and unconfined within the walls of a chamber or compartment—such, for instance, as a reed-chamber.

S is a table located in front of the lower bank of keys and provided with a block, T, which is fastened to the table and raised above, having a flat and horizontal upper surface.

h' is a vertical passage through the block T and table S, and opening at its lower end into the wind-chest M. This passage h' is of a rectangular shape in horizontal section, and particularly at the upper surface of the block, and its longer diameter is at right angles to the bank of keys, and otherwise its shape and size are such as to secure the correct sounding of any reed which may be properly placed over it as if in its place in the reed-board of an organ.

l' is a clamp-jaw placed on and at the rear or inner end of the upper side of the table-block S, and there secured by a headed screw, m', the shank of which passes loosely through a longitudinal slot, n', of the clamp and screws into the block on a line coincident with the longer axis of the passage h' through said block. The front edge, o', of the clamp l' has a recess, p', the shape of which is such as to receive the rounded end q' of the slotted reed-block s—that is, the end toward the free or vibrating end of the reed-tongue v—and when the reed-block is upon the table-block with the face along which the reed-tongue is located uppermost to hold the reed-block as to such end in

and closely to its position upon and in contact with the table-block, or, in other words, against rising therefrom.

r' is another clamp-jaw at the front end of the table-block, and there arranged to be moved freely forward and backward between parallel guide-rails s', that along their edges t' contiguous to the edges u' of the clamp, together with said edges of the clamp, are made of a dovetail shape to secure the clamp against lifting from the block as it is so moved, and are arranged in parallel lines and in a direction parallel to the longer axis of the passage h' through the table-block T, and the central line of such movement of the clamp is coincident with the central axial line of said passage. The rear edge, v'—that is, the edge of the sliding jaw or clamp r' toward the rear jaw or clamp, l', before described—has a recess, w', of a shape to receive the end of the reed-block opposite to that received in the recess of the clamp l', and when so placed in it to confine the reed-block as to such end closely to the surface of the table-block and against lifting therefrom, and thus between the two clamps, with the sliding clamp r' adjusted to bind the reed-block end to end between it and the stationary clamp l', secure the rigid confinement of the reed-block to the table-block, and all in a manner to place the reed-tongue in the line of the vertical passage h' of the table-block, and consequently under the operation of the exhaust-bellows N O and wind-chest M secure the sounding thereof the same as if such reed were in a reed-chamber of a reed-board of an organ. The sliding clamp r' is connected to the upper end of a vertical lever, U, of the first order, and arranged to work against a spring, V, in the swing of the lever on its fulcrum x' to move the sliding clamp toward the stationary clamp.

W is a push-rod moving through a guide-loop, y', and located to work at one end against the lower end of the lever U and in a direction against the spring of such lever, and at the other connected to one arm, X, of a vertical bell-crank, B^2, which turns upon a stationary fulcrum-pin, z^2, and has its other arm, Y, connected through a vertical pitman-rod, Z, to the front end of a treadle, A', hung at its rear end to the cabinet J. A depression of the treadle A' works through the mechanism described to move the sliding clamp r' toward the rear and stationary clamp l', and this movement of the clamp is against the spring V, which, on releasing the treadle, reacts and brings the sliding clamp back and at the same time the treadle and connecting parts to their respective normal positions. By this means a reed is confined between the jaws or clamps l' r', and this confinement may be maintained as long as may be desired by simply keeping the treadle depressed and made at the time rigid and firm, and again, on removal of the pressure upon the treadle, as the reaction of the spring V withdraws the sliding clamp r', the reed obviously is released, and is then free to be removed, if so desired, for another reed to be inserted.

The stationary clamp l' can be adjusted through its slot n' and the headed screw m' to place its front edge, o', at a greater or lesser distance from the sliding clamp r', and again the sliding clamp is to be given sufficient movement for a reed to be put in and taken out of the clamp-jaws, and two jaws arranged as described obviously will allow of the clamping of reeds of the varying lengths common to reed-organs.

In using the apparatus herein described, the reed to be tuned, having first been voiced or toned and brought approximately to the required pitch by bending and twisting and filing or scraping its tongue in the common and well-known manner hitherto practiced, or having been bent and twisted between dies in accordance with the invention embraced in an application for Letters Patent of the United States of even date herewith, is then placed, with its tongue uppermost on the table-block T and lengthwise between the clamps l' r', over the wind-passage h' through such block, and there clamped by depressing the treadle A', connected to the moving jaw r'. The wind mechanism is then put into operation through the treadle P, and thus the reed, clamped as aforesaid, is sounded. Now, while this clamped reed is sounding the valve to a reed in the lower bank of keys, having the pitch and temperament to and by which said clamped reed is to be tuned, is then opened for the sounding of its reed, and so maintained in its open position preferably by placing a weight upon the key to such valve. Thus the two reeds—to wit, the reed clamped and the reed in the lower bank of reeds to and by which the clamped reed is to be tuned—are simultaneously sounding, and as the tongue of the clamped reed or reed to be tuned is free and open to the tuner and unconfined in any chamber or compartment it is then worked upon by the tuner as may be necessary—as, for instance, by filing or scraping it across its width or along its length, or both, and otherwise, as is common and well known in tuning reeds in the method hitherto practiced, until brought to sound in unison as to pitch and tone with the sound of the reed in the lower bank of reeds, and when so brought to sound the tuning of the reed is completed, and, releasing the clamp-jaws, it is removed and another reed inserted and tuned as before, and so on.

Before filing or scraping the tongue of the clamped reed, as above stated, the tongue is raised and held out of the slot r in the reed-block s by running a thin plate of metal under and across it, as illustrated in Fig. 6 of the drawings.

It is plain that in the apparatus described the tongue of the reed to be tuned is in tuning it open and exposed at all times to be worked upon by the tuner as he may deem best and practically even while sounding, the advantages of which are obvious. As the reeds

to the upper bank of keys are of the tone and pitch desired for the reeds when in practical use, but which, as described, are tuned to the higher pitch of the reeds to the lower bank of keys, a convenient means is thus at hand in the tuning apparatus described to test the reeds so tuned, if it may be so desired. These upper reeds are therefore of importance in either combination with the tuning apparatus described, but otherwise than stated they form no part of the tuning apparatus.

To operate the sliding clamp r', obviously mechanism may be provided other than and different from the mechanism herein particularly described, and the same is true as to the mechanism for operating the exhaust-bellows, and for these bellows force-bellows are to be substituted if the reeds to be tuned are to be used in instruments having force-bellows to sound them. Again, the reed-clamp may be arranged either for the rear jaw, in lieu of the front jaw, or for both jaws to slide, and obviously the clamp for the reed may be arranged to clamp it at its opposite sides instead of at its opposite ends, as has been described, or to clamp it both at its opposite sides and ends.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

The improved method of tuning organ-reeds herein described, the same consisting in simultaneously sounding with the same or similar wind mechanism two reeds—to wit, a reed to be tuned, unconfined in any chamber or compartment, and a reed confined in a chamber or compartment and having a pitch higher than the pitch the reed being tuned is to have when in practical use in an organ—and then filing or scraping or otherwise manipulating the tongue of the reed to be tuned, bringing it in its said position to correspond in pitch and temperament to the reed of higher pitch, all substantially as and for the purposes specified.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

GEO. B. KELLY.
ELWIN H. SMITH.

Witnesses:
EDWIN W. BROWN,
WM. S. BELLOWS.