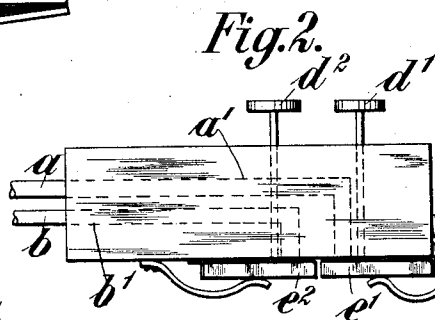
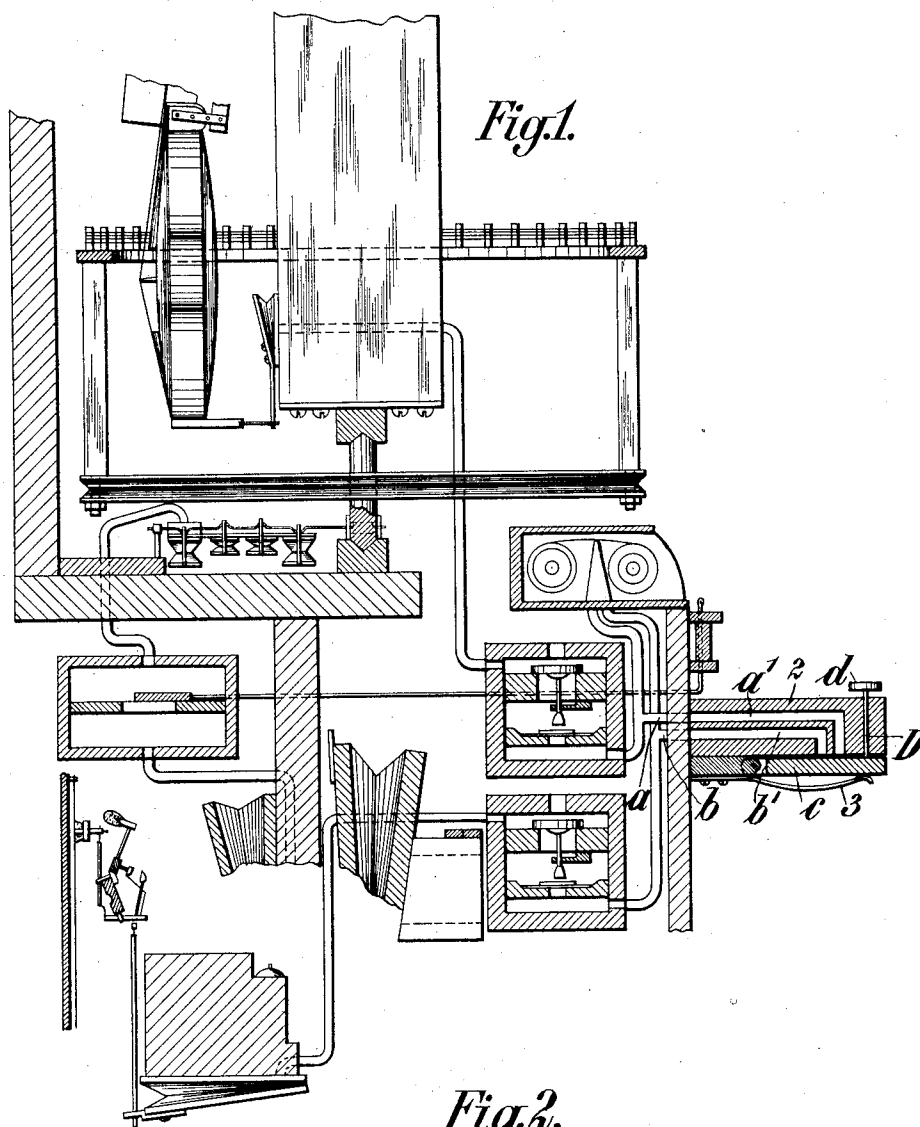


G. K. HENNIG.
 MEANS TO ASSIST TUNING PNEUMATICALLY OPERATED MUSICAL INSTRUMENTS.
 APPLICATION FILED APR. 1, 1911.

1,038,581.

Patented Sept. 17, 1912.

2 SHEETS—SHEET 1.



Witnesses.
 W. Rommers.
 Elizabeth Leckert.

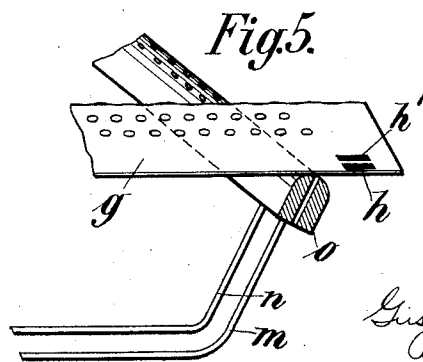
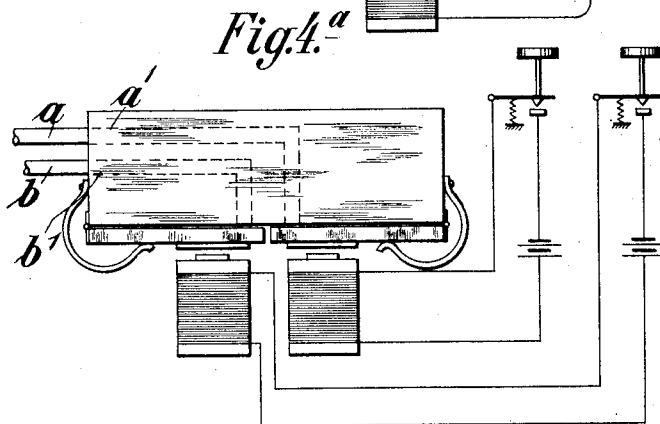
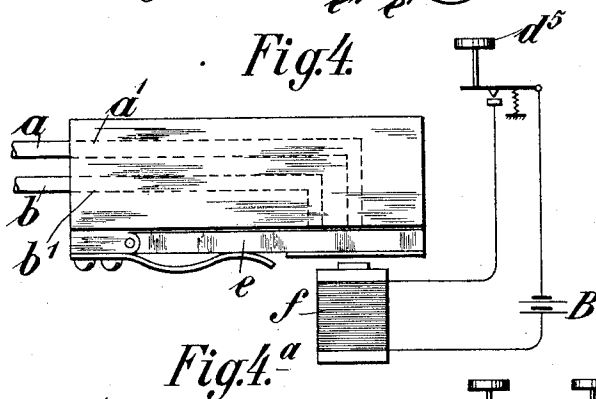
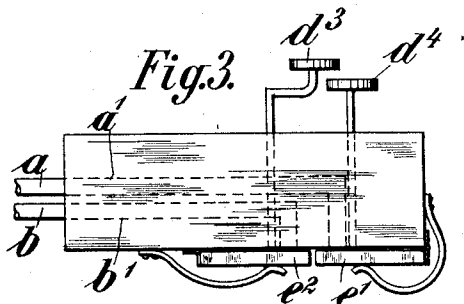
Inventor
 Gustav K. Hennig
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2 SHEETS—SHEET 2.



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 Elizabeth Leckert.

Inventor.
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UNITED STATES PATENT OFFICE.

GUSTAV KARL HENNIG, OF WAHREN, NEAR LEIPZIG, GERMANY, ASSIGNOR TO LUDWIG HUPFELD AKTIENGESellschaft, OF LEIPZIG, GERMANY.

MEANS TO ASSIST TUNING PNEUMATICALLY-OPERATED MUSICAL INSTRUMENTS.

1,038,581.

Specification of Letters Patent.

Patented Sept. 17, 1912.

Application filed April 1, 1911. Serial No. 618,413.

To all whom it may concern:

Be it known that I, GUSTAV KARL HENNIG, a subject of the King of Saxony, residing at Wahren, near Leipzig, Germany, have invented certain new and useful Improvements in Means to Assist Tuning Pneumatically-Operated Musical Instruments; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to devices to assist the tuning automatically played musical instruments especially such instruments as employ in their structure vibrating strings either bowed or struck to set them in vibration. To this end my improvement is so made that the string to be tuned, is sounded simultaneously with the same note of another musical device, be it piano string, reed or pipe whose tone is less subject to alteration, by means of a valve device an electric contact mechanism or the like. In this manner the strings of the violin type instruments may be accurately tuned to the same note of other types of instrument whose tone is more stable, for example a piano string, a reed or a pipe. This mechanism can be so constructed that the two tones of different timbre to be compared are sounded simultaneously or successively, or the more sustained or standard tone be produced ahead of the one of shorter duration to be tuned thereto. Or it may be that one tone may be repeated independently of the other sustained tone.

In illustrating my invention I have chosen to show it as applied to pneumatically actuated automatic players, as most such players are now so operated. In such pneumatic instruments the sounding of a note is customarily effected by setting free an opening in the tracker bar by the music sheet to admit atmospheric air to the valve that controls the operating pneumatic for the string, reed or pipe.

Referring to the drawings in which like parts are similarly designated:—Figure 1 is a side elevation partly in section of a port block and key for simultaneously sounding two like notes to be compared. The figure

shows further the general arrangement. Fig. 2 is a side elevation of a like block showing means for independently sounding the two comparison tones. Fig. 3 is a view similar to Fig. 2 showing how the sustained tone may be sounded slightly in advance for the tone of shorter duration. Fig. 4 is a port block similar to Fig. 1 electromagnetically controlled. Fig. 4^a is a port block similar to Fig. 2 electromagnetically controlled. Fig. 5 shows two like tones sounded from the note sheet.

In Fig. 1, the tuning mechanism comprises a port block 2 from which an air conduit *b* leads to the actuating device, valve or pneumatic of the standard tone, as a piano string, which may be substituted by a reed or pipe and to which the string of a violin is to be tuned. A similar conduit *a* leads to the mechanism for sounding the string to be tuned. These two conduits are connected to the ports *b'* and *a'* respectively of the port lock 2 which ports are simultaneously controlled by hinged or flap valve *c* urged to closed position by a spring 3. A key *d* whose pin *D* passes through the block 2 serves to depress the spring urged valve *c* and vent the ports to the atmosphere. The two notes being sounded the string is tuned by means of its pertaining key, tuning pin or the equivalent.

In lieu of the key *d*, a lever or electromagnet may be used for operating the valve.

The note sheet itself may be used to effect the simultaneous sounding of pairs of like tones to which end the note sheet is provided either ahead of or at the end of a piece to be played with pairs of openings for sounding the tones to be compared.

In electrically played instruments a pair of contacts or the like is used in order to sound both tones simultaneously, Fig. 4^a.

The tuning is facilitated when one or both tones may be stopped or produced at will, for example when one is sustained and the other repeated, for example repeat the violin tone while sustaining the same piano tone. Fig. 2 shows means for doing this where each part *a'*, *b'*, of a pair of ports is controlled by separate valves *e'* and *e''* actuated by separate keys *d'* and *d''* so that the valves may be simultaneously or independently operated.

In Fig. 3, I have shown the key *d*³ for the sustained comparison or standard tone over-

lapping and somewhat longer than the one d^4 , so that the sustained tone, as piano tone, will be sounded in advance of the one to be tuned or violin tone and yet each can be independently operated.

When the mechanism is to be electrically operated, a contact d^5 is depressed to close a circuit of a battery B through an electromagnet f whose armature is secured to the valve e controlling the ports in the port block.

Fig. 5 illustrates a portion of a note sheet g having a pair of perforations h, h' venting two conduits m and n connected to the tracker bar o at one end and sounding devices or the equivalent at the other end of two like tones.

I claim:

1. A musical instrument comprising two independent sets of sounding bodies, pneumatic playing mechanism for causing the sounding of said bodies at will and under all usual conditions of playing of said instrument; in combination with a port block having ports therein arranged in pairs, each port of a pair having pneumatic connection with the pneumatic playing mechanism of a sounding body in a set, and means to control said pairs of ports to cause two of said bodies, one in each set, to sound together for the purpose of tuning.

2. A musical instrument comprising two independent sets of sounding bodies, playing means for causing the sounding of said bodies at will and under all usual conditions of playing of said instrument; in combination with a port block having ports therein arranged in pairs, one port of a pair having operative pneumatic connection with said playing means for a body of one set and the other port having operative pneumatic connection with the playing means for a body of the other set, and means for simultaneously opening the ports of a pair.

3. A musical instrument comprising two independent sets of sounding bodies, play-

ing means for causing the sounding of said bodies at will and under all usual conditions of playing of said instrument; in combination with a port block having ports therein arranged in pairs, one port of a pair having operative pneumatic connection with said playing means for a body of one set and the other port having operative pneumatic connection with the playing means for a body of the other set, and means for simultaneously or independently opening the ports of a pair.

4. A musical instrument comprising two independent sets of sounding bodies, playing means for causing the sounding of said bodies at will and under all usual conditions of playing of said instrument; in combination with a port block having ports therein arranged in pairs, one port of a pair being behind the other port of said pair and each port having operative pneumatic connection with the playing means of a body of a set, a valve controlling each port, a key for operating each valve, the key of one valve overlapping the key of the other valve, whereby said bodies may be caused to sound simultaneously or independently and the standard tone be sounded in advance of a similar tone to be tuned thereto.

5. A musical instrument comprising two independent sets of sounding bodies and means for causing the sounding of said bodies at will under all usual conditions of playing of said instrument; in combination with means additional to the aforesaid means and operable independently thereof for causing the sounding of a single body of each set to assist the tuning of one of said bodies with respect to the other.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

GUSTAV KARL HENNIG.

Witnesses:

EMIL GENDFUER,
RUDOLPH FRICKE.