

J. LOCKHART.  
 TONE CORRECTING MEANS FOR BRASS WIND INSTRUMENTS.  
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935,626.

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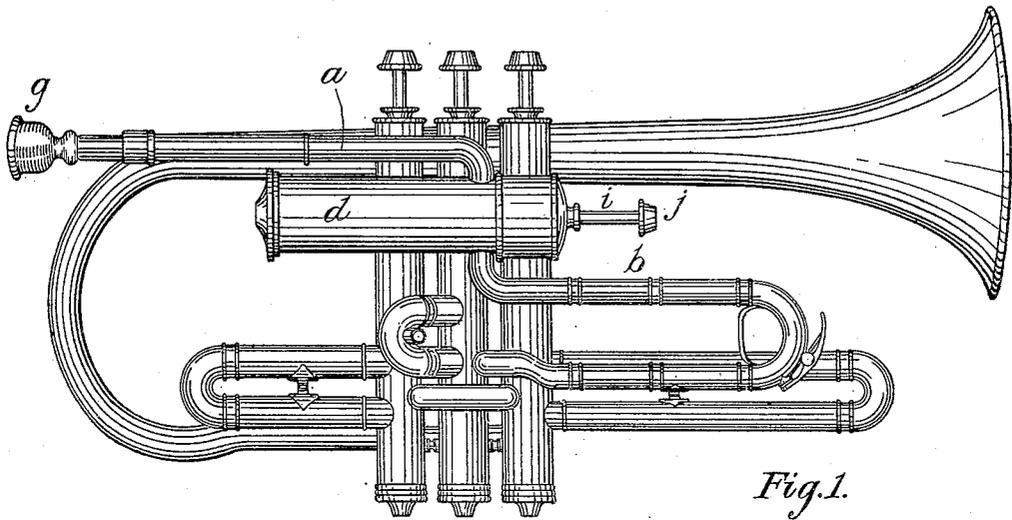


Fig. 1.

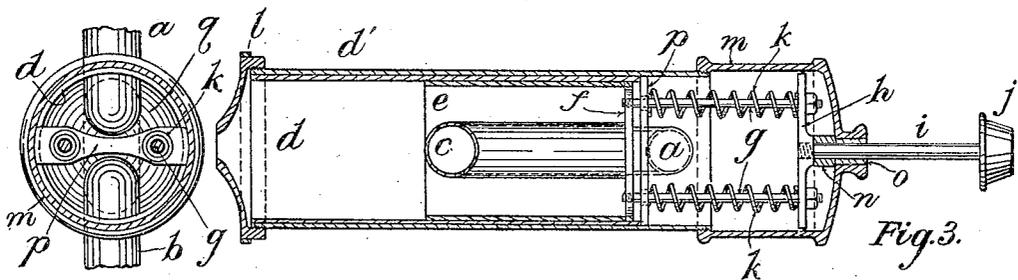


Fig. 3.

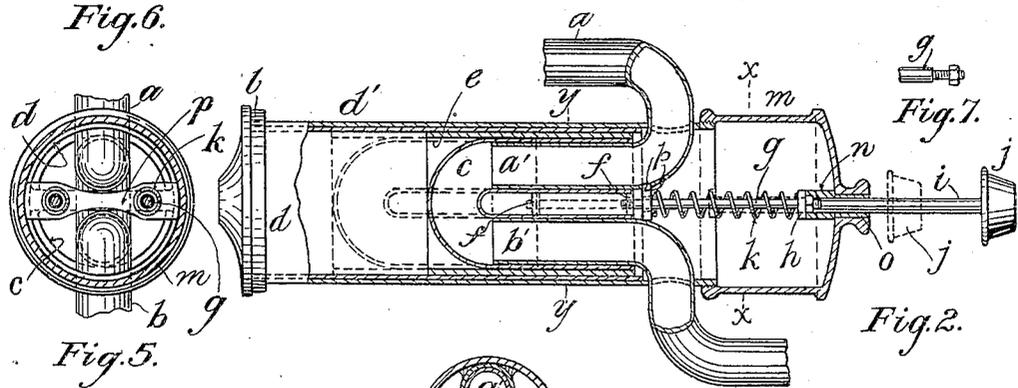


Fig. 2.

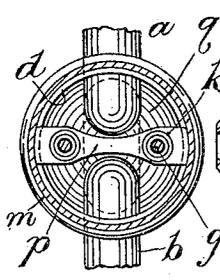


Fig. 6.

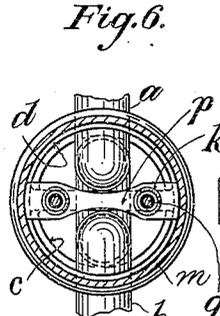


Fig. 5.

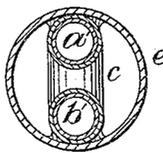


Fig. 4.

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# UNITED STATES PATENT OFFICE.

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TONE-CORRECTING MEANS FOR BRASS WIND INSTRUMENTS.

935,626.

Specification of Letters Patent. Patented Sept. 28, 1909.

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To all whom it may concern:

Be it known that I, JOHN LOCKHART, a citizen of the United States, and a resident of Portland, in the county of Multnomah and State of Oregon, have invented a new and useful Improvement in Tone-Correcting Means for Brass Wind Instruments, of which the following is a specification, reference being had to the accompanying drawings as constituting a part thereof.

This invention relates in general to brass wind instruments, and has for its object to correct the faulty tones of certain notes of such instruments. Take for example the cornet, it is well known that certain of the low, as well as certain of the upper notes of this instrument—generally the low D and D flat, and the upper F, F sharp, G and A—are so sharp as to be very much out of harmony with the rest of the register of the instrument. Consequently, when the cornet is played with accompanying instruments, such lower and upper register notes will sound so very much out of tune as to be discordant, and if sustained notes may have to be omitted by the player. The evil may sometimes be remedied by controlling the notes referred to by an extra exertion of the lips; but when the lips have become fatigued the player is helpless. To remedy these defects, attachments have heretofore been provided for brass-instruments, but the same, in my judgment, are not practical; and so this invention has for its object to provide simple means, incorporated within the instrument, controlled by a spring so as to be normally set to an initial pitch, and which means are operable by a finger of the hand not used in playing the valves of the instrument, to so adjust the length of the air-tube as to make the discordant tone sound in perfect harmony with the accompanying instrument.

To illustrate my invention, I have applied the same to a cornet of the usual type.

In the drawings, Figure 1 shows an elevation of a cornet embodying my invention; Fig. 2 is a longitudinal, vertical sectional detail, centrally taken, of the means invented by me by which the faulty pitch of certain notes is corrected; Fig. 3 is a horizontal section of the device shown in Fig. 2; Fig. 4 is a transverse section, approximately on a line  $y-y$  of Fig. 2, of the adjustable or sliding connecting tube-section, and the sleeve in which said tube-section is soldered; Fig.

5 is a section taken through the cap of the guide case on a line  $x-x$  of Fig. 2; Fig. 6 is a similar section to Fig. 5, showing, however, a certain modification of construction, fully described in the body of the specification; and Fig. 7 is a detail of construction.

The reference letters in the drawings designate the parts described.

All parts of the instrument not specifically described are understood to be of the common construction.

To apply my invention to a musical instrument of the type referred to, the main tubing is made of two disconnected sections  $a, b$ , so curved at their inner ends  $a', b'$  as to enable the arrangement thereof one above and parallel to the other, as shown in Fig. 2. On such aligned ends  $a, b$ , is slidably mounted a connecting U tube-section  $c$  (see Fig. 2). The described tube-sections  $a, b$  are made of such relative lengths that when the connecting tube-section  $c$  is moved inward to its initial point, which is for convenience called zero, the main tubing, as a whole, will be placed in the state of its shortest length, and the notes so produced will be played at their highest pitch; and consequently an outward movement of the tube-section  $c$  would relatively lengthen the main tubing, and cause a relative lowering of the tones played, while the main tubing remains in such lengthened state.

To so arrange the parts that the connecting tube-section  $c$  will easily slide on the tube-ends  $a', b'$ , I have provided a guide-case  $d$ , consisting of a cylindrical body  $d'$ , preferably made of two pieces of tubing inserted one within the other, to obtain greater rigidity. In such guide-case is slidably contained a sliding cylinder  $e$ , to the interior of which the connecting U tube-section  $c$  is rigidly soldered, as more readily seen in Figs. 2 and 4. The mouth ends of the connecting U tube-section  $c$  are connected by a bridge-piece  $f$ , in which are secured the lower ends of the rods  $g$ , the upper ends of which rods are shouldered, as represented in Fig. 7, so as to be adapted to be rigidly connected with a cross-head  $h$ , having a stem  $i$  and finger-disk  $j$ . On the rods  $g$  are mounted coil-springs  $k$ . As a matter of convenience, two rods  $g$  have been employed, but it is obvious that a single rod, arranged in other respects to operate as described, will answer. The cylindrical guide-case  $d$  is made with apertures in its walls to receive the curved

tubing sections *a*, *b*, and it is provided with screw-caps *l*, *m*, at its ends to close such ends of the case; and the cap *m* being also arranged to allow the adjustment and dis-  
 5 connecting of the parts described by which the movement of the sliding connecting tube-section *c* is controlled. The part *n* is a cork or felt washer, interposed to prevent the cross-head *h* from striking against the head of the cap *m*, and the part *o* is a cork  
 10 bushing. The bridge-piece *f* is made like the cross-piece *p*. The latter is perforated near its ends and serves both as a guide for the lower ends of the rods *g*, *g*, and a rest for the lower ends of the coil-springs *h*, *h*.  
 15 However, the bar-like bridge-piece *f* may be replaced by a disk-like bridge-piece *q*, shown in Fig. 6, the same being a circular plate covering the entire inner end of the sliding  
 20 sleeve *c*, excepting the open ends of the sliding tube-section *c*, contained in said sliding sleeve *c*. The modified construction just described of said bridge-piece is designed to give greater rigidity to the parts.

25 My device may be conveniently operated by the index finger of the left hand being placed on the disk *j* of the stem *i*; pressing on the disk *j* to the degree required to bring the note played, and sounding too, into  
 30 proper pitch. It will be noted that the described means for correcting the faulty pitch of a note is not arranged upon any arbitrary basis, but may be operated to suit the individual note, and according to the ear of the  
 35 player. It is also to be noted that the correcting means provided by me are equally serviceable for raising the pitch of notes which sound too flat. In this case the instrument as a whole could be so tuned to the  
 40 accompanying instruments, that when the connecting tube-section *c* is moved inward, to lengthen the main tubing, all the notes not requiring special correction, by the aid of my device, will be played as usual; the  
 45 sliding connecting tube-section *c* being held in its extended position by pressure of the finger on the disk *j*. And when those notes are to be played which would sound too flat without the aid of my correcting means, the  
 50 finger is released the degree required so as to allow the coil-springs *h* to act and shorten the relative length of the connecting tube-section *c*, thus raising the pitch of the note then played.

55 The described details of construction with respect to the movable connecting tube-section *c* are designed merely to provide for the sliding movement thereof, unimpeded by a binding of the parts. I do not confine  
 60 myself, however, to the exact details described in respect to the arrangement of the parts entering into the scheme of my invention, as self evidently such parts are subject to variation to meet the ideas of different  
 65 constructing mechanics. Also, the location

of the described tone correcting means must be in accordance with the particular model of the instrument to which it is applied, and so as to make the same convenient to operate  
 70 by a finger of the hand not used in playing the valves.

I claim:

1. In a brass wind instrument, the combination of a main air tube constructed in two  
 75 pieces having bent open ends arranged parallel with each other, a U-shaped tube slidably mounted over and connecting said open ends, means carrying said U-shaped slidably  
 80 mounted tube, a casing for said U-shaped slidably tube and a cylinder slidably contained within said casing, said casing having openings through which the bends of the main air tube pass.

2. In a brass wind instrument, the combination of a main air tube constructed in two  
 85 pieces having bent open ends arranged parallel with each other, a U-shaped tube slidably mounted over and connecting said open ends, means carrying said slidably tube, a casing for said U-shaped slidably tube having openings  
 90 through which the bends of the main air tube pass, and a spring-pressed stem connected with the carrier of said U-shaped tube for operation by the player.

3. In a brass wind instrument, a main air  
 95 tube constructed of two parts with their main portions extending in opposite directions with their ends bent and having open ended parallel portions, of a U-shaped tube slidably over the said open ends, means slidably  
 100 mounted and carrying said U-shaped tube, a casing within which said slidably means is guided, a cross bar connected with said slidably means, a cross head, rods connecting the cross head and cross bar, a guide  
 105 for said rods, springs interposed between the guide and cross head, and a stem connected with said cross head.

4. In a brass wind instrument, a main air  
 110 tube constructed of two parts with their main portions extending in opposite directions with their ends bent and having open ended parallel portions, of a U-shaped tube slidably over the said open ends, means slidably  
 115 mounted and carrying said U-shaped tube, a casing within which said slidably means is guided, a cross bar connected with said slidably means, a cross head, rods connecting the cross head and cross bar, a guide for said rods, springs interposed between the  
 120 guide and cross head, a stem connected with said cross head, and a cushion through which the stem slides and with which said cross head is adapted to engage.

5. In a brass wind instrument, a main air  
 125 tube constructed of two parts with their main portions extending in opposite directions with their ends bent and having open ended parallel portions, of a U-shaped tube slidably over the said open ends, means slid-  
 130

ably mounted and carrying said U-shaped  
tube, a casing within which said slidable  
means is guided, a cross bar connected with  
said slidable means, a cross head, rods con-  
5 necting the cross head and cross bar; a guide  
for said rods, springs interposed between  
the guide and cross head, a stem connected  
with said cross head, a cushion through  
which the stem slides and with which said

cross head is adapted to engage, and caps 10  
upon opposite ends of said casing, one of  
said caps having a bushed passage for the  
stem.

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