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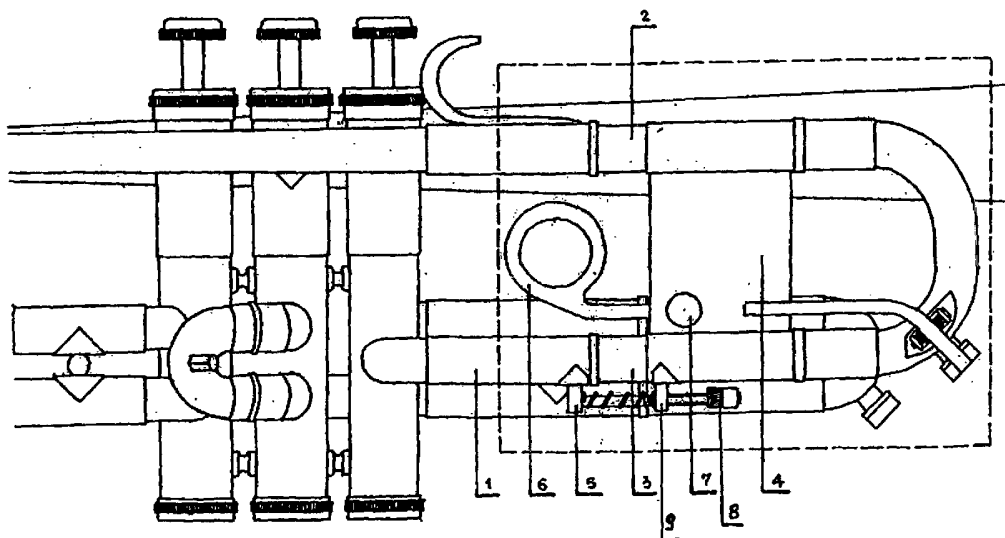
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(54) Title: THE CORRECTOR OF INTONATIONAL IMPERFECTIONS OF THE BRASSES



(57) Abstract: The corrector of intonation imperfections in 3 or 4 vlve brass instruments solves the intonation imperfections in all 3 or 4 valve brass instruments (f.e.: trumpet, French horn, ventile trombone, tube, tenor horn, bass tuba, fanfare) in the following way: by means of a compensation slide the adequate adjustments of the pipe length occur. The intonation imperfections in wind instruments are marked by the following: If using the 5th, 6th and 7th pipe length an insufficiency of the instrument's pipe length occurs. For that reason all three vertical sequences of tones, played at those lengths, are relatively too low. Of the 10 monstly used tones from the harmonics only the following are correct and have an intonation precision: 4 tones (1st, 2nd, 4th and 8th tone). Three tones are too high (3rd, 6th and 9th tone) and three tones are too low (5th, 7th and 10th tone). If, by means of a compensation slide, the basic pipe length is shortened, the intonation of the played tone raises. If, by means of a compensation slide, the basic pipe length is lengthened, the intonation of the played tone is decreased.



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THE CORRECTOR OF INTONATIONAL IMPERFECTIONS OF THE BRASSES

DESCRIPTION OF INVENTION

Engineering field

Acoustics, musical instruments, trumpet: G 10 K5/00; 7/00; 9/00.

Technical problem

The intonation imperfections in 3 or 4 valve brass instruments (trumpet, French horn, ventile trombone, tuba, tenor horn, bass tuba, fanfare) are eliminated.

Of the 10 mostly used tones from the harmonics

the 1st, 2nd, 4th and 8th tone are exact i.e. achieve an intonation precision,
the 3rd, 6th and 9th tone are too high
and the 5th, 7th and 10th are too low.

When using the 5th, 6th and 7th pipe length, an insufficiency of the instrument's pipe length occurs and for that reason all three of the vertical sequences of tones, played at the aforementioned lengths, are relatively too high.

Present level of technology

All brass instruments, that have been produced as yet, are imperfect as regards the intonation.

Presentation of the invention's substance

The corrector of intonation imperfections in 3 or 4 valve brass instruments is a compensation slide, fitted into the instrument's basic pipe length in such a way that the instrument's basic pipe length remains unchanged if the compensation slide is in the zero position. If one uses the compensation slide to shorten the basic pipe length, there is an increase in the intonation of the played tone. If one uses the compensation slide to lengthen the basic pipe length, the intonation of the played tone falls.

The compensation slide's length is $1/15$ (in writing: one fifteenth part) of the instrument's basic pipe length. One fifteenth part is the pipe length added by actuation of the second instrument's valve.

The zero position of the compensation slide is located on the spot representing one third of the distance from the end of the slide on which the instrument's basic pipe length is being shortened.

For an easier orientation as regards the zero position, it is possible to fit a spring reaching up to $1/3$ (in writing: one third) of the

compensation slide's length, measured from that side of the compensation slide in which direction the compensation slide is shortening the total pipe length.

By using the described corrector of intonation imperfection in 3 or 4 valve brass instruments the problem of intonation imperfections in all 3 or 4 valve brass instruments is being solved.

Minute description of the invention's implementation

The fitting of the compensation slide must observe a fine execution of work and given specific conditions in the field of anthropometry.

A fine execution of work includes:

- compliance with dimensions of the instrument into which the compensation slide is fitted and compliance of the instrument's length;
- use of top-quality materials;
- all solderings and other adjustments must be precise.

The compliance of given specific conditions in the field of anthropometry includes the following:

- the compensation slide must be fitted in such a way that a person can use it without any hindrance whatsoever;
- the instruments (subjected to the fitting into of the compensation slide) must be altered in the following way: change in the way of the pipe deflection, in order to make an easy handling of the compensation slide possible for a person; in order to enable the use without any hinderance whatsoever; in order to enable - by removal of the bordering screw of the max. lengthening of the compensation slide - an easy and simple disassembly and assembly of the compensation slide for the purpose of cleaning and lubrication.

List of used positive marks:

- 1 Part of the trumpet's basic pipe length, to be replaced by a compensation slide, length: 1/15 of the total trumpet's basic pipe length
- 2 Upper compensation slide guide
- 3 Lower compensation slide guide
- 4 Compensation slide
- 5 Upper compensation slide chock
- 6 Handle for adjustment of the handle's position in order to achieve a change in the slide's position
- 8 Bordering screw of the max. extension of the compensation slide
- 9 Indicator of the compensation slide's position; the drawing demonstrates the compensation slide in the zero position

Short description of drawings

The 1st drawing shows a trumpet (TRUMPET IN B).
The 2nd drawing shows the "A" detail, presented on the 1st drawing (COMPENSATION SLIDE FOR PITCH REGULATION)

The drawings in question are included in the description and are a part of the description of the invention. They illustrate the so far best thought way of implementation of the invention as regards a brass instrument (model: trumpet IN B) and they also help in explaining the basic principles of the invention.

Possibilities of an industrial application

Playing the 3 or 4 valve brass instruments (f.e. trumpet, French horn, ventile trombone, tuba, flugelhorn, tenor horn, bass tuba, fanfare) without a corrector of intonation imperfections in 3 or 4 valve brass instruments causes enormous and unsolvable intonation problems, particularly in extreme dynamics.

The innovation corrects the aforementioned imperfections and can be used for solving intonation imperfections in case of the aforementioned 3 or 4 valve brass instruments, in symphony orchestras, military brass bands and other orchestras.

The sales prospect is unsurprisingly great. A great number of instruments is produced in many countries, f.e.: Austria, Argentina, Australia, Belgium, Brazil, Canada, Switzerland, Columbia, the Czech Republic, Slovakia, Germany, Denmark, Spain, France, Greece, Hungary, Hong Kong, Israel, Italy, Japan, Korea, Luxembourg, Malta, Norwegen, The Netherlands, South Afrika, Russia, Sweden, Singapore, Slovenia, America. However, the brass instruments are also used worldwide. The numerousness of instruments, the geography of manufacturers and users reveal the possibility of a huge commercial success: sales prospect and profit.

PATENT REQUIREMENTS

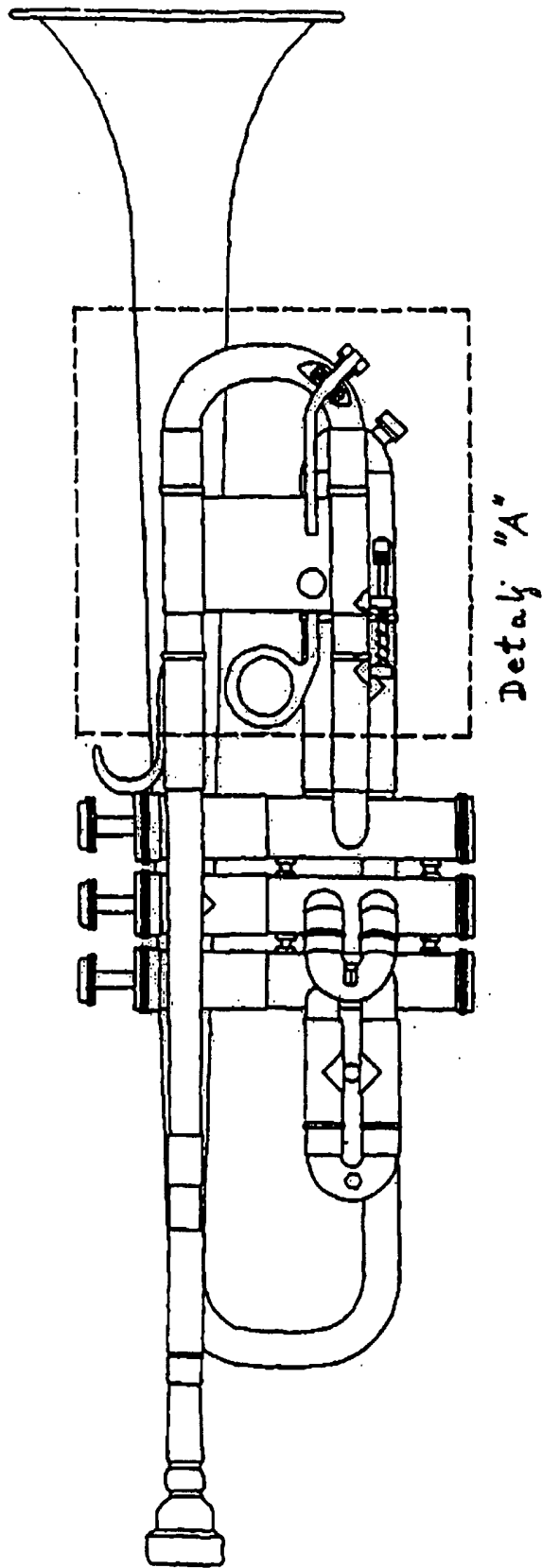
1. The corrector of intonation imperfections in 3 or 4 valve brass instruments is **marked** by the following: It solves on the very same principle the intonation imperfections in all 3 or 4 brass instruments (f.e. trumpet, French horn, ventile trombone, tuba, tenor horn, bass tuba, fanfare). The pipe length is adequately adjusted in the following way: The compensation slide is drawn near to the mouthpiece and the total instrument's pipe length is shortened as required (if the played tone - 5th, 7th and 10th harmonics - is too low) or the compensation slide is moved away from the mouthpiece and thus the total instrument's pipe length is extended as required (if the tone played - 3rd, 6th and 9th harmonics and the tones played at the 5th, 6th and 7th pipe length - are too high).

2. The corrector of intonation imperfections in 3 or 4 valve brass instruments as per 1st requirement is **marked** by the following: The corrector of intonation imperfections in brass instruments, having a length from $1/3$ to $1/30$ (and optimally: $1/15$) of the instrument's basic pipe length is fit into the instrument's basic pipe length - in such a way that the instrument's basic pipe length remains unaltered if the slide is in the zero position. If one shortenes, by means of the compensation slide, the basic pipe length, the intonation of the played tone raises. If one extends, by means of the compensation slide, the basic pipe line, the intonation of the played tone decreases.

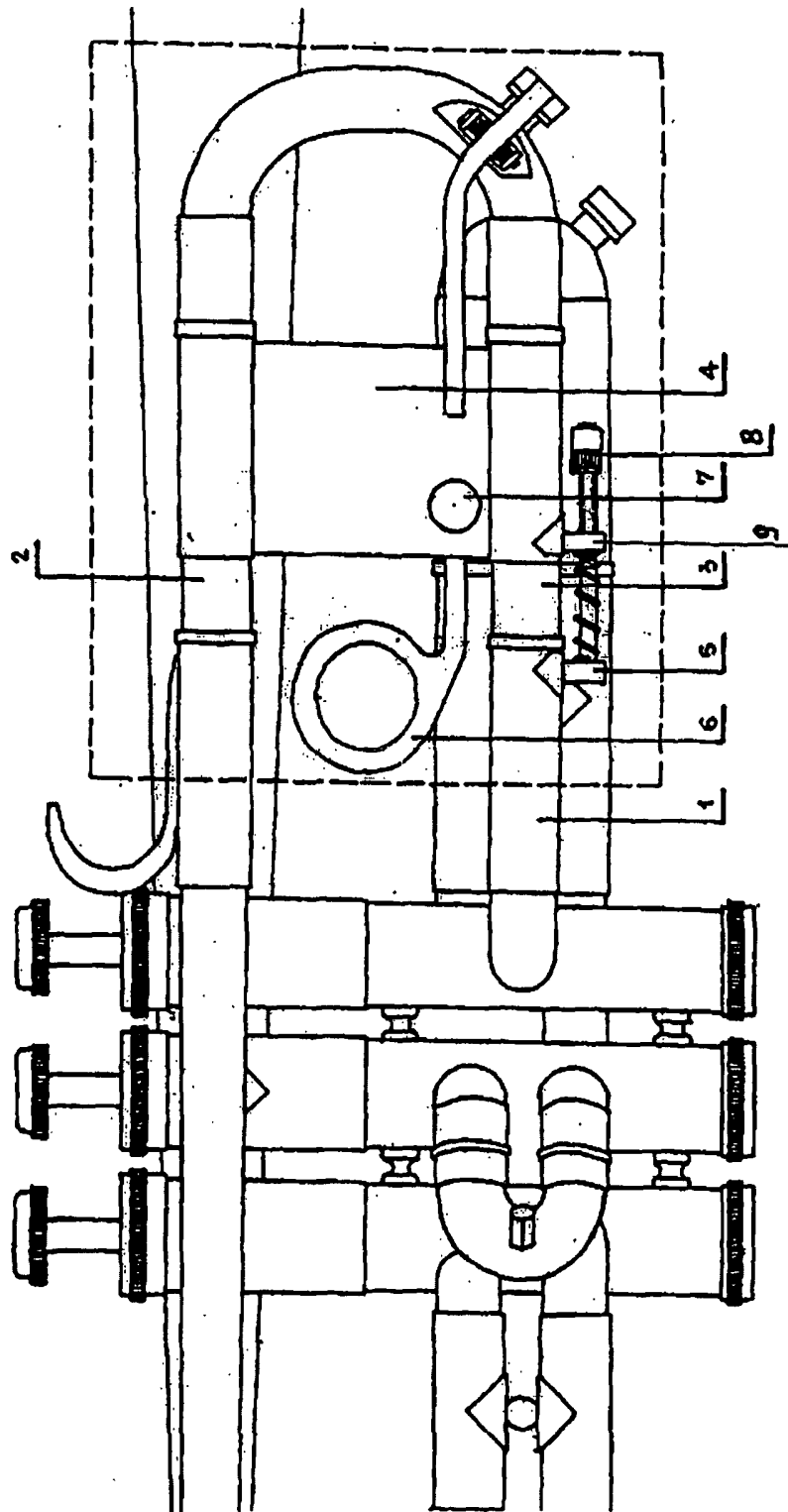
3. The corrector of intonation impefections in 3 or 4 valve brass instruments as per 2nd requirement is **marked** by the following: The zero position of the compensation slide is located on the spot representing $1/3$ to $1/30$ (and optimally $1/3$) of the distance, measured from the end of the compensation slide on the side where the insrument's basic pipe length is shortened.

4. The corrector of intonation imperfections in 3 or 4 valve brass instruments as per 3rd requirement is **marked** by the following: For an easier orientation as regards the zero position, it is possible to fit a spring reaching from $1/3$ to $1/30$ (and optimally $1/3$) of the compensation slide's length, measured on that side of the compensation slide in which direction the compensation slide is shortening the total pipe length.

5. The corrector of intonation imperfections in 3 or 4 valve brass instruments as per 4th requirement is **marked** as by the following: The fitting of the compensation slide must comply with the principle of a fine execution of work and especially of the dimensions of the instrument into which the compensation slide is fitted, the use of adequate materials, precise solderings and other adjustments, compliance with specific conditions in the field of anthropometry. That includes the installation of the compensation slide in such a way that a person can use it without any hinderance whatsoever. It is necessary to change the instruments (subjected to the fitting of the compensation slide) as regards the pipe deflection. In that way the compensation slide is easy for a person to handle, a person can use it without any hinderance whatsoever and an easy and simple dissassembly and assembly for clening and lubrication is guaranteed.



Slika 1



Слика 2