

(No Model.)

G. F. LYON.
CHROMATIC TIMBAL.

No. 586,503.

Patented July 13, 1897.

Fig. 1

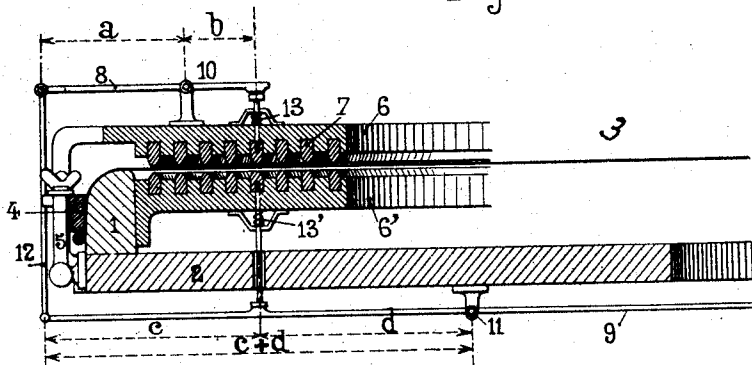
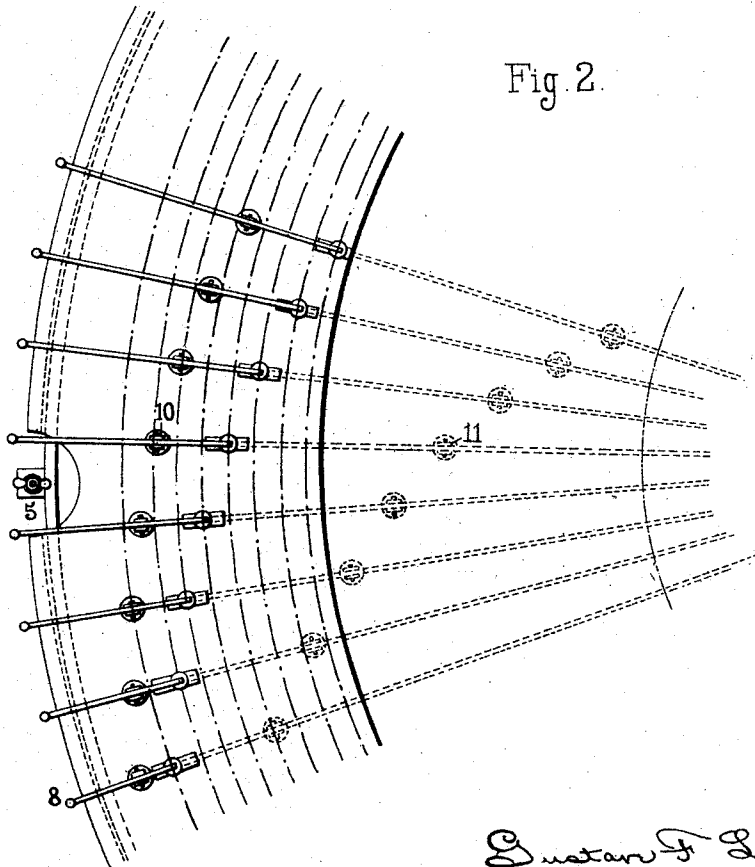


Fig. 2.



Witnesses

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GUSTAVE FRANTZ LYON, OF PARIS, FRANCE.

CHROMATIC TIMBAL.

SPECIFICATION forming part of Letters Patent No. 586,503, dated July 13, 1897.

Application filed March 23, 1897. Serial No. 628,886. (No model.)

To all whom it may concern:

Be it known that I, GUSTAVE FRANTZ LYON, a citizen of France, residing at Paris, in the Department of the Seine, France, have invented certain new and useful Improvements in Chromatic Timbals, of which the following is a specification.

My invention relates to an improved chromatic timbal or kettledrum, and has for its object to provide improved means for effecting variations in the extent or area of the vibrating surface of a single membrane or diaphragm of a kettledrum, a special feature being that these different areas may be circular in shape and at all times limited by cylindrical parts or rings arranged on either side of the parchment or the like diaphragm, which parts are adapted to be moved into contact with the same, in performing which movements they slide either along identical generating-lines or helically about the axis common to such cylinders, but so that the terminal sectional areas of the said cylinders always continue parallel both to each other and to the diaphragm which they are to hold between them.

In kettledrums as hitherto constructed the number of vibrations is varied by stretching the parchment more or less by means of screws, which, as a rule, are seven in number and arranged to act upon a stretching ring or hoop with the result that the parchment in consequence of its being stretched out along the outer surface of the timbal and of its bearing upon the edge of the said timbal has the degree of its tension raised to such an extent as to cause the number of vibrations of the parchment to increase.

Hitherto all the arrangements devised with a view to obtaining chromatic kettledrums have had for their object so to combine or connect the tension-screws as to enable them to be operated simultaneously either by the direct agency of the hand or through the medium of pedals; but it has been impossible to provide any strictly reliable indicator or gage exactly showing the notes corresponding to the various degrees of pressure applied through the medium of the screws, as it is a well-known fact that the tension of the vellum diaphragms is preëminently dependent upon atmospheric conditions and is apt to

vary within intervals of one-fourth or even one-fifth in the pitch to which the kettledrum has been attuned. The vellum is therefore in a constantly varying condition, owing to which but a minute fraction of a turn of the screws will at one time produce an effect equivalent to that which at other times it may take a number of complete turns to achieve. Hence it is that none of the existing kettledrums or timbals have so far yielded any satisfactory results.

Take the case of a timbal the diaphragm whereof, to simplify illustration, has been tuned to the second F on the piano by means of the screw arrangement now in use. By the well-known laws governing the relation between the varying area of the diaphragm-surface and the number of vibrations it suffices to reduce such area in a predetermined proportion to obtain the different notes required, provided the degree of tension of the diaphragm continues unaltered.

Now the main object of this invention is to insure compliance with the last-mentioned condition, the arrangement which enables this result to be obtained consisting of concentric cylindrical rings or hoops disposed above and below the diaphragm. The portions of the rings facing the diaphragm are slightly rounded off and the diameters of both rings of each pair are alike. Each pair of rings thus controls that portion of the diaphragm area which corresponds to a given note, and in order to produce this note it is only necessary, by the employment of any suitable mechanism, to move the two corresponding concentric rings close together, so as to bring them into contact with either side of the diaphragm at the same instant.

In order that my invention may be clearly understood, I shall now proceed to describe the same with reference to the accompanying drawings, in which the mechanism employed is represented by way of example only.

Figure 1 of the drawings is a diametrical vertical section of part of the timbal upon a line passing through one of the screws whereby the initial adjustment is effected, and Fig. 2 is a partial plan of the instrument.

In a frame 1 2 a diaphragm 3 is stretched by means of an iron ring or hoop 4 and a screw and nut 5. Above and below the said

frame there are fixed annular plates 6 6', of any suitable metal, such as aluminium, for example. These plates are provided with circular grooves in which the cylindrical rings or hoops 7 are embedded. In order to insure the simultaneous and uniform motion of the sets of hoops, two levers, such as are shown at 8 and 9, are employed, the said levers being pivoted at 10 and 11 and connected between them by the rod 12. Repelling-springs 13 13' serve to move such levers apart.

The kettledrum *a* has a symmetrical vertical axis passing through the center. For each one set or pair of hoops there are therefore two levers 9, capable of being operated by means of a single pedal, which may be arranged in any convenient manner and is not shown in the drawings.

In order that there may be perfect uniformity both in the upward movement of the lower hoop and in the downward movement of the upper hoop, there should be between the lever-arms a space denoted by the equation

$$\frac{a}{b} = \frac{d+c}{d},$$

the solution of which—viz., $a=2b, c=d$, is here adopted.

In the example just given it has been assumed that each hoop was supported or compressed only at two diametrically opposite points. There might, however, be three or more points of connection, if required, being all acted upon by one single pedal, and each pair of combined hoops should in all cases be located above and below the parchment, respectively.

As stated above, the invention is not dependent upon the arrangement employed in causing the hoops to rise and descend. Thus they might be drawn close together by the employment of pneumatic tubes placed above the upper rings and below the lower rings, such tubes being inflatable whenever required by injecting either air or any other fluid into them.

Accessories and details may vary without departure from the principle of the invention.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, I declare that what I claim is—

1. A chromatic timbal or kettledrum, having a vibratory diaphragm, two series of concentric hoops, one above and the other below the diaphragm, and means for simultaneously bringing one member of each series into contact with the diaphragm upon a line common to both members, substantially as described.

2. In a chromatic timbal or kettledrum, the combination with a vibratory diaphragm of an upper and lower series of hoops concentric with said diaphragm, a corresponding series of levers for each series having one end connected to the hoops in said series and the other end to the levers of the other series, and means for operating any pair of levers thus connected to bring one of the upper and one of the lower hoops into simultaneous contact with the corresponding faces of the diaphragm in the same concentric line, substantially as described.

3. In a chromatic timbal or kettledrum, the combination with a vibratory diaphragm of an upper and lower annular plate, hoops concentric with the diaphragm and arranged in grooves in each plate, a series of levers for each series of hoops connected at one end to said hoops and at the other end to the levers of the other series, and means for operating any pair of levers thus connected to bring an upper and a lower hoop simultaneously into contact with the diaphragm in the same circular line, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

GUSTAVE FRANTZ LYON.

Witnesses:

EDWARD P. MACLEAN,
HYPOLYTE JOSSEL.