Sept. 18, 1951 W. F. LUDWIG 2,568,504

TONE INDICATING MECHANISM FOR KETTLE DRUMS

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Fig. 1.

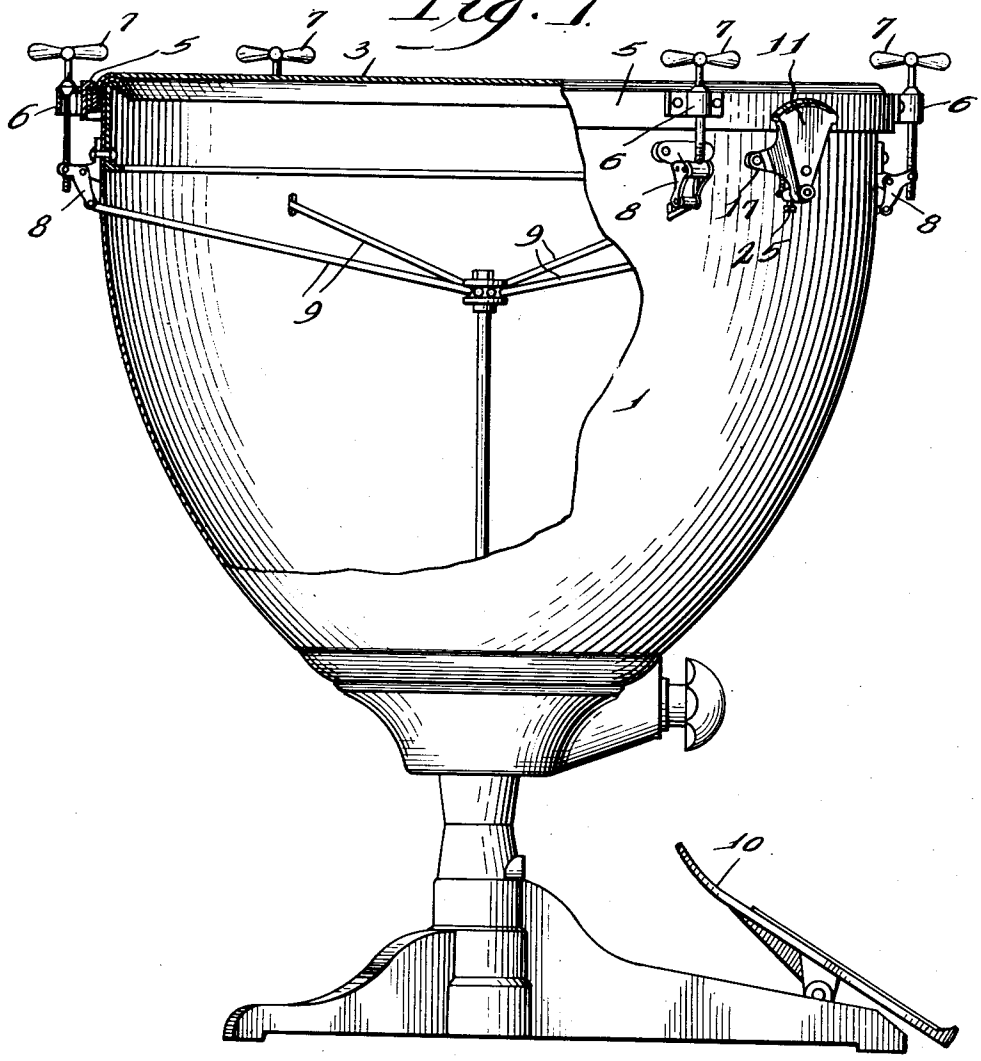
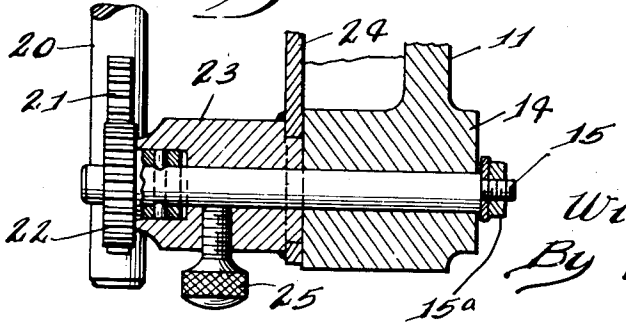


Fig. 5.



Inventor:
William F. Ludwig.
By Rudolph Wm. Lotz
Attorney.

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Fig. 2.

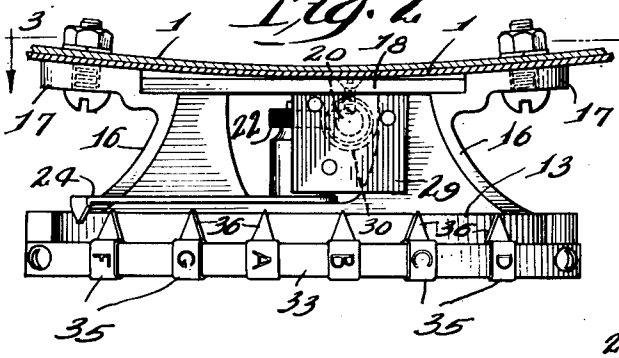


Fig. 4.

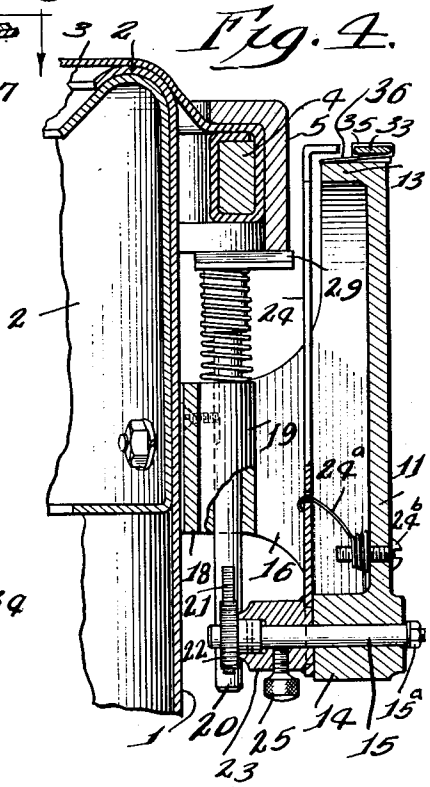


Fig. 3.

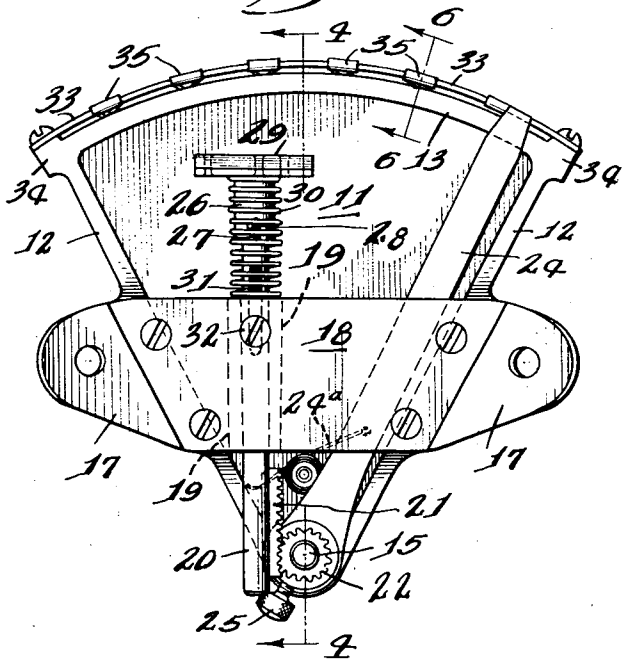


Fig. 7.

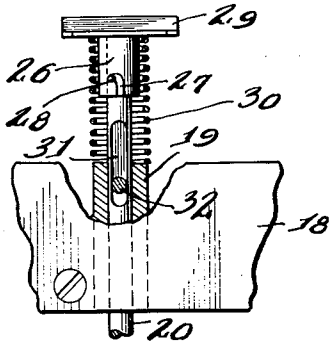
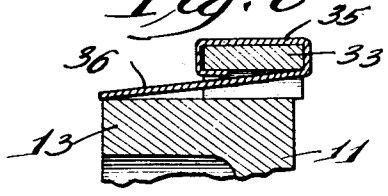


Fig. 6.



Inventor:
William F. Ludwig
By Rudolph Wm. Lotz.
Attorney

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2,568,504

TONE INDICATING MECHANISM FOR KETTLEDRUMS

William F. Ludwig, River Forest, Ill.

Application March 2, 1950, Serial No. 147,298

4 Claims. (Cl. 84—419)

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This invention relates to a tone gauge or tone indicating mechanism for kettle drums, which constitutes, more particularly, an attachment for a kettle drum which may be mounted upon the kettle of any kettle drum regardless of what particular type of drum head tension control mechanism the instrument may be equipped with.

Said mechanisms include rod or cable linkage with parts operatively associated with the hand operated drum head tension control means of the instrument, which comprise what are termed the flesh hoops of the instrument in the terminology of the art.

Probably every kettle drum used today is equipped with a foot-pedal actuated drum head tension control mechanism, and it is one object of this invention to provide a tone indicating attachment which is actuated only by the flesh hoop of the drum as opposed to being connected with the foot pedal or any other element which effects reciprocable movements of said flesh hoop.

In the vernacular of the art, the kettle drum, in its entirety, is sometimes referred to as a "tympanum."

Heretofore, as far as I am informed, the tone gauge or tone indicating devices of kettle drums, have been and are connected directly with said foot pedal actuated mechanisms, and because of the lost motion aforesaid and, therefore, lacked accuracy.

The main object of this invention is, therefore, to overcome these inaccuracies very simply by means of simple mechanism which is easily mountable upon all kettle drum bodies and is actuated only by the flesh-hoops of the instrument responsively to up and down movements of the said flesh-hoops of the same which control the variations in tone of the instrument which respond to the variations in tension of the tympani or velum of the instrument.

An exemplary embodiment of this invention is illustrated in the accompanying drawings wherein

Fig. 1 is a side elevation, partly in diametric section, of a kettle drum equipped with a tympani such as is fully illustrated and described in applicant's pending application, Serial No. 124,437 filed October 29, 1949, the latter being merely exemplary of a drum to which the instant mechanism may be added easily.

Fig. 2 is a plan sectional view, on an enlarged scale, taken on the line 2—2 of Fig. 1.

Fig. 3 is a view in elevation of the structure shown in Fig. 2 seen from the plane of the section line 3—3 of Fig. 2, with bolts intersected by said plane being omitted.

Fig. 4 is a vertical, longitudinal, sectional view in the radial plane of the drum indicated by the line 4—4 of Fig. 3.

Fig. 5 is a fragmentary, detail, sectional view,

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on a larger scale than Fig. 4, also taken on the line 4—4 of Fig. 3 and showing the lowermost end portion of Fig. 4.

Fig. 6 is a fragmentary, detail, sectional view, on an enlarged scale, taken on the line 6—6 of Fig. 3 and showing an arcuate sheet metal member mounted upon the upper end of the casing of the mechanism shown in Figs. 2, 3 and 4, and one of the indicia bearing members of said mechanism slidable along said sheet metal member.

Fig. 7 is a fragmentary, detail, vertical, sectional view taken on the line 7—7 of Fig. 3.

With respect to reference hereinbelow to conventional kettle drums and parts thereof, reference is had to Patent No. 1,561,790 and to my pending application, Serial No. 124,437.

In Fig. 1 of the drawings, the kettle 1 may be of any shape and size, and, as shown in Fig. 4, is equipped at its upper edge with an arcuate inturned conventional flange 2, upon which the drum skin 3 bears, the latter being secured to the wooden flesh-hoop 4.

The metal flesh-hoop 5 is of greater depth than the flesh-hoop 4 and is equipped with an upper inwardly turned flange which bears upon the flesh-hoop 4.

The hoop 5 is equipped with the conventional projections 6 with which the hand screws 7 have universal joint connections.

Pivotally mounted upon the drum kettle 1, are bell crank lever 8 which have conventional thread and pivotal connection with the hand screws 7 at the ends of their short arms, and are also connected conventionally with the radial rods 9 of the foot pedal actuated drum head tensioning mechanism of the drum, to cause the hoop 5 to be drawn downwardly as the foot lever 10 of the said mechanism is depressed, and moves upwardly as drum head tension is relieved.

The tone indicating mechanism (Figs. 3 and 4) comprises a casing or frame member 11 which is shaped substantially like a segment of a circle, and comprises a flat outer wall which is equipped with inwardly projecting side flanges 12 and an upper arcuate flange 13 which is concentric with the axis of the bearing 14 of the rock shaft 15, said axis being disposed in a vertical radial plane of the kettle, which preferably intersects the foot lever or pedal 10, the axis of said rock shaft 15 and the middle of the member 11 and its flange 13.

The rock shaft 15 is threaded at one end to engage in a nut 15a and receive a washer, as shown in Fig. 4, to hold it against longitudinal movement relative to the bearing 14.

As shown in Figs. 2 and 3, the side flanges 12 are equipped with convergent flanges 16 between their ends, which terminate in perforated flanges 17 which are secured to the kettle 1 by bolts, as shown in Fig. 2 and between which a plate 18 is disposed and secured to the flanges 16.

Plate 18 is equipped with a bearing 19 on its inner face, for the reciprocable vertical cylindrical plunger 20 which carries a rack bar 21 in its lower end portion. The latter meshes with a spur gear pinion 22.

The pinion 22 is rigid with the shaft 15, which also carries a rotatable sleeve 23 to which an indicating hand 24 is secured, the sleeve 23 being rendered non-rotatable relative to the shaft 15 by means of a set screw 25.

The hand 24 is maintained yieldingly in the position of Figs. 2, 3 and 4, by a coiled spring secured at one end to and coiled about a projection (Figs 3 and 4) on the inner face of the wall 11 and at its other end to said hand 24, the purpose of this being set forth later herein.

The plunger 20 is composed of two separable parts (Fig. 7) the upper end portion of which is a sleeve 26 which receives the upper end portion of the plunger 20 telescopically and rotatably, and is equipped with a bayonet slot 27 which receives a pin 28 mounted in the upper end portion of the plunger 20.

The sleeve 26 carries a head plate or flange 29 against which one end of a partially compressed compression spring 30 bears, the latter bearing at its lower end upon the bearing 19.

The plunger 20, which, in the instance illustrated, is cylindrical, is provided, between its ends, with a short key way 31 of length greater than the maximum stroke of said plunger, and into which the inner end of a screw 32 (Figs. 3 and 7) projects to render the plunger 20 non-rotatable.

In the instance illustrated, the rack bar 21 is removable from the plunger 20 and is mounted in a socket of the plunger 20, said rack bar being held in place by the pinion 22.

Mounted upon the casing or frame member 11 in concentric relation to but spaced from the upper surface of the arcuate flange 13, is a strip 33 of resilient sheet metal which is secured detachably at its ends to projections 34 at the ends of the flange 13 (Fig. 3) and which operate as stops for indicia bearing resilient sheet metal members 35 which are slidably mounted upon the strip 33 in the manner shown in Fig. 6. Each said member 35 terminates in a tongue 36 which is equipped with an N-shaped end portion which bears upon the flange 13 to yieldingly hold the member 36 in any position to which it is moved digitally.

It is well known to those skilled in the art to which this invention relates, that drum skins are greatly affected by atmospheric conditions, and by age also.

Atmospheric humidity increases the degree to which the said drum head (or velum) may be stretched, and this is true, also, of temperature changes, so that in hot, humid weather, they will stretch to the greatest degree, while in cold, dry weather, they stretch least. Also, during long use, they become more or less permanently stretched.

Consequently, in tuning a kettle drum before a musical performance begins, it may be found that in cold, dry weather, the drum head, if old, may become tensioned to the degree required to produce the highest note of the scale to be covered, during a very short downward movement of the flesh-hoop 5, which bears upon the plate or flange 29 of the plunger 20, and thus the downstroke of the latter may be no more than approximately a small fraction of an inch, whereas in hot, humid weather, the same skin would attain the last-named degree of tension only via an appreciably longer downstroke of the plunger 20, and thus the arc of swing of the indicating hand 24 would be appreciably longer to indicate the same higher tone, and in such event, the members 35 would be adjusted to become spaced greater distances apart than in instances wherein downstroke of the plunger 20 and the arc of swing of the indicating hand is less to attain the higher notes of the said scale.

The members 35 are removable from the strip 33 by removing one of the fastening screws of the latter.

Also, the member 35 at left-hand end of the series, may be disposed spaced appreciably from the left-hand projection 34 (Fig. 2) as may be determined in the tuning of the drum, by effecting adjustment of the hand 24 to determine its left-hand limit of movement, the latter being the right hand limit in Fig. 2.

When tuning is started, the drum head is in what may be termed completely relaxed condition, and the foot lever is at the upper limit of its movement, the first step in tuning may be to operate the hand screws 7 to effect tensioning of the drum head to the primary degree required to sound the lowest tone of the scale, and during this operation, the plunger 20 will be moved downwardly and the hand 24 thus swung to the right of the position shown in Fig. 2. The member 35, bearing the lowest note indicator, is then adjusted to the position indicated by the end of the hand 24, and as tuning progresses, the remaining members 35 are adjusted to positions indicated successively by said hand 24, whether or no, the latter may have been adjusted previously to change its left-hand limit of movement as described above.

Obviously, if the drum is equipped with the mechanism of the instant mechanism, the above described first step in the tuning of the drum may be eliminated and effected by merely depressing the foot lever 10 to the required degree to tension the tympani to the required degree to sound the lowest note of the scale and left in that position while adjustment of the left-hand indicia member is adjusted to required position, since the plunger 20 and hand 24 respond to the slightest movement of the hoop 5 with absolute accuracy.

As kettle drums are used both in and outside of buildings, the tuning may be required to be modified during a performance in the event of sudden change of atmospheric conditions and are usually effected by varying the degree to which the foot pedal is moved by the drummer until, in a pause, he can operate the hand screws 7, and effect necessary readjustments of the members 35.

I claim as my invention:

1. A structure of the type described comprising a frame member mounted upon the drum kettle adjacent its upper edge, a bearing in said frame member, a horizontal rock shaft disposed radially of said kettle in said bearing and equipped with a spur gear pinion, and indicating hand equipped with a hub rotatably mounted upon said shaft, a set screw mounted in said hub for engagement with said shaft, a vertical bearing in said frame member disposed above said first-named bearing, a vertically reciprocable plunger non-rotatably mounted in said bearing and equipped at its lower end with a rack bar meshing with said pinion, and at its upper end with a head, a compression spring interposed between said vertical bearing and said head to maintain the latter engaged with the lower edge of the drum head tensioning means of the drum, an arcuate member

concentric with said shaft mounted upon the top of the frame member, a series of indicia bearing members slidably and manually adjustably mounted upon said arcuate member and associated with said hand, and a spring engaged with said frame member and said hand to maintain the latter yieldingly at one limit of its movement.

2. A structure, according to claim 1, wherein the frame member is equipped with an arcuate top flange concentric with and spaced from said arcuate indicia carrying member, and wherein the indicia bearing members are equipped with resilient projections bearing upon the concave surface of said arcuate member.

3. A tone indicating attachment for a kettle drum, comprising a frame member adapted to be detachably mounted upon the kettle of the drum below the flesh hoop thereof, a rock shaft mounted in the lower end portion of said member, a spring-held reciprocable plunger mounted in said member and operatively associated with said rock shaft and said flesh hoop to actuate said rock

shaft responsively to reciprocations of said hoop, an indicating hand disposed for actuation by said rock shaft, and a series of tone indicating indicia disposed upon said frame member in cooperative relation to said hand.

4. A structure, according to claim 3, wherein the said indicating hand is adjustable arcuately relative to the said rock shaft, and wherein the said indicia are borne by members mounted adjustably and removably upon the said frame member.

WILLIAM F. LUDWIG.

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