

Aug. 18, 1936.

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2,051,671

UNI-TENSION DRUM

Filed Nov. 5, 1934

2 Sheets-Sheet 1

FIG. 1 .

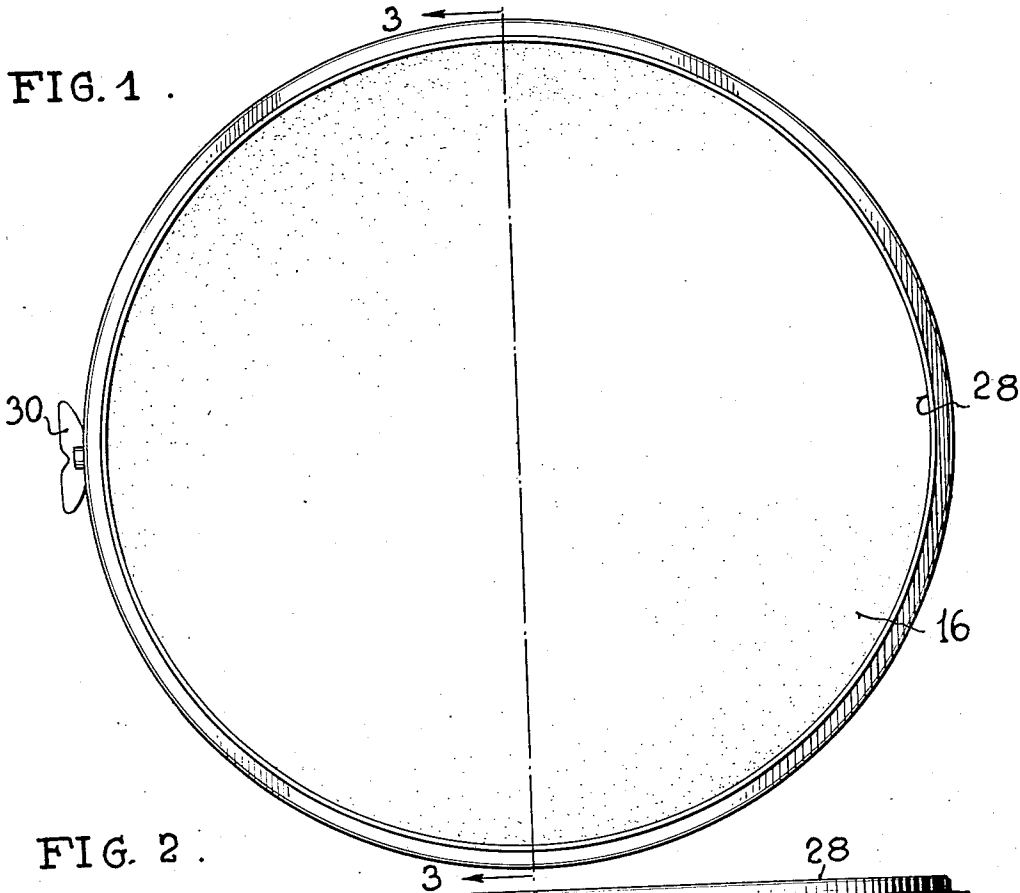
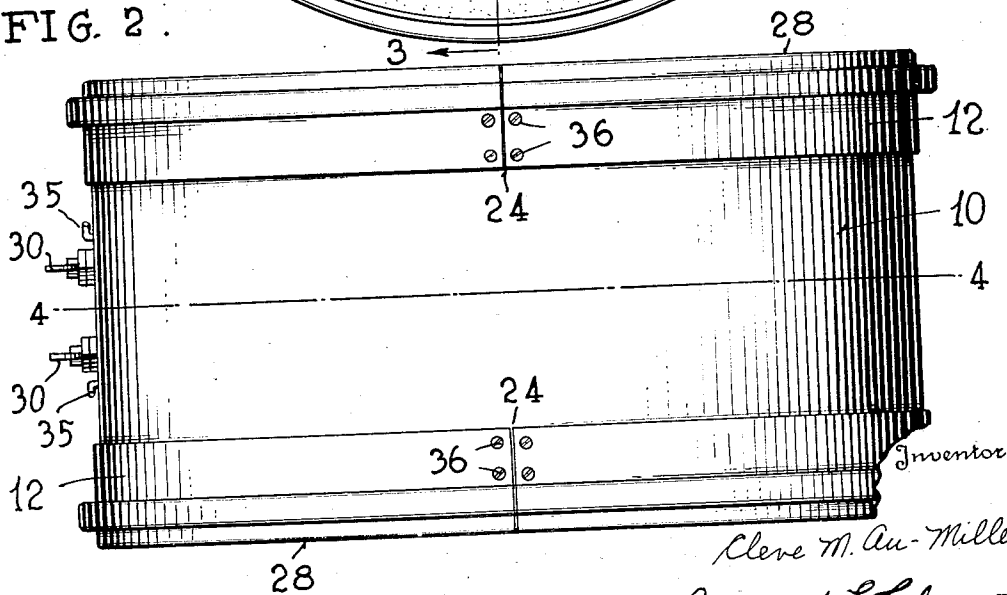


FIG. 2 .



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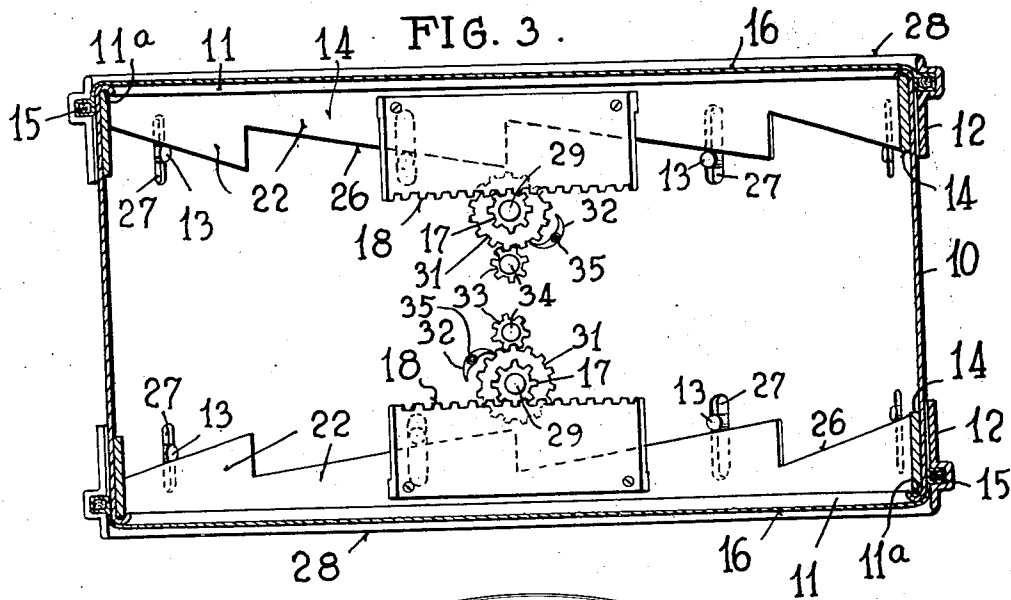
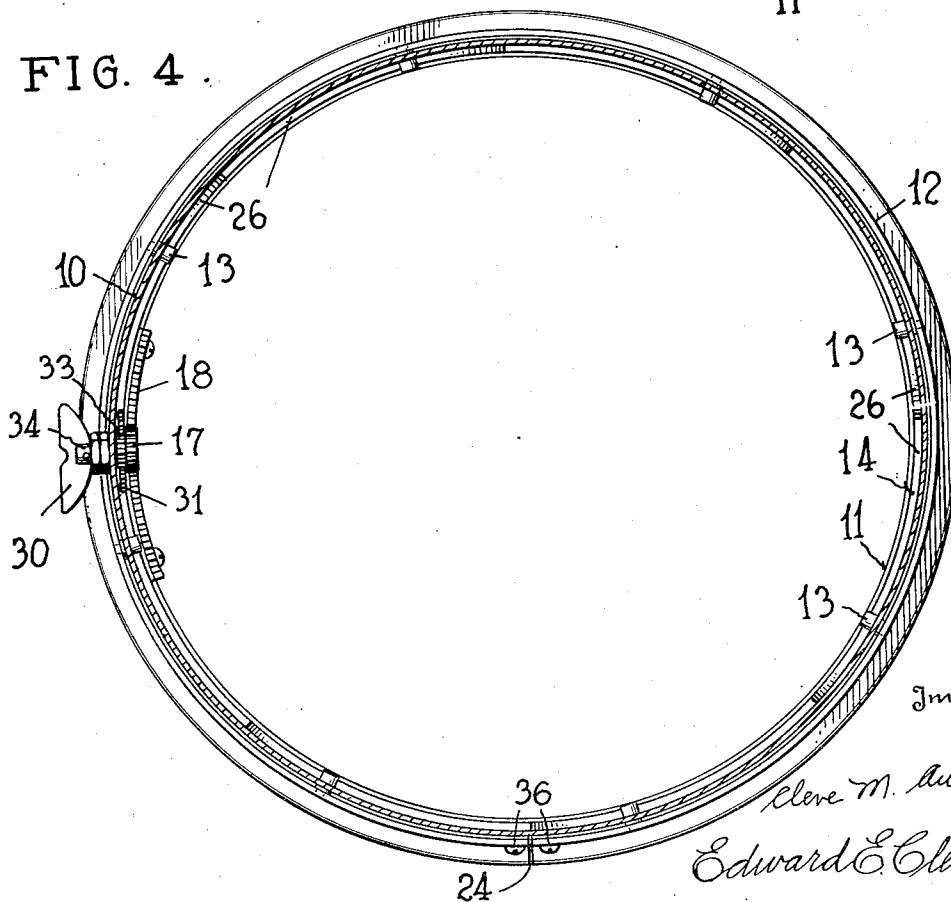


FIG. 4.



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UNI-TENSION DRUM

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5 Claims. (Cl. 84-411)

This invention relates to musical instruments, and more particularly to instruments of the type embodying a vibratory head or heads, such as drums, banjos, tomtoms, kettle drums or the like.

An object of this invention is to provide in a musical instrument of this type a single operating means whereby the vibratory head or vellum may be adjusted as to tension.

Another object of this invention is to provide a tensioning means of this kind which is contained substantially entirely within the instrument, the tensioning means being of such a character as not to affect the tonal qualities of the instrument.

A further object of this invention is to provide a tensioning means of this type which is exceedingly simple in construction so as not only to permit the manufacture and assembly of the instrument at a relatively small cost, but also to provide a means which will not get out of order during the playing of the instrument and which will also not unduly add weight to the instrument, the tensioning means being in fact of such simple construction as to lighten the weight of the instrument.

A still further object of this invention is to provide a tensioning means of this kind whereby substantially all of the usual projecting head tensioning members may be eliminated and the exterior of the instrument may thereby be made relatively smooth, as well as to provide for a trimmer and neater appearance.

Still another object of the invention is to provide for an improved means for attaching and holding the flesh hoop or ring of a drum or similar instrument to facilitate the removal and replacement of the skin or vellum fastened or held by the flesh hoop which forms the head of the drum.

Yet still another object of this invention is to provide a head tensioning means which is so constructed that the head of the instrument may be quickly mounted or removed thereby making it possible for a player to carry an extra head which in the event of damage to one head, or the head on the instrument, may be quickly substituted with but a very slight loss of time, as where the head of the instrument breaks during the playing thereof and which in ordinary instruments would require a considerable amount of time to replace and subsequently tension.

A more complete description will disclose other objects of the invention as follows:

Fig. 1 is a plan view of the end of the drum.

Fig. 2 is a side elevation of a drum as it will appear with my invention.

Fig. 3 is a cross-section view of same on the line 3-3 of Fig. 1.

Fig. 4 is a horizontal section on the line 4-4 of Fig. 2.

For the purpose of illustrating my invention I shall describe the invention as applied to the drum shown in the drawings, it of course being understood that it may be applied to other like instruments.

Referring more specifically to the drawings and as my invention is the same construction at both ends, a description of one end will suffice. It consists of a drum with a head 16, a drum shell 10 or barrel 10 having its rims at each end turned over inwardly at 11 so as to form a rounded or enlarged portion over which to stretch the skin or vellum or drum head 16 to prevent cutting of the skin and forming a groove or track 11a around the inside of the end of the shell 10, so as to permit the tension slide ring 14 to slide within the groove or track 11a. The groove 11a acts as a track or guide for the upper or outside edge portion of the sliding ring 14. The sliding ring 14 is held within the groove 11a of the turned in portion 11 by pins 13 which are fastened to a grooved annulus or head tension band 12 stamped from one piece of metal and fitting on the outside of the drum shell or barrel 10 and extending beyond the ends of the drum shell 10 to protect the drum head 16 as shown at 28 in Fig. 3. The grooved annulus or head tension band 12 in addition to protecting the drum skin 16 by the projection 28 is also reinforced and made more rigid itself by the said extension or projecting portion 28. The head tension band or grooved annulus 12 is disposed substantially opposite the tension slide ring 14 on the inside of the drum shell 10 with which it coacts to tension or tune the drum skin or vellum 16. The grooved annulus 12 is also split transversely at 24 with fastening means or screws 36 on each side of the split to hold the band 12 in operating position, as shown in Fig. 2 to permit its ready removal and replacement of a flesh hoop 15 and the drum skin which is fastened thereto. The flesh hoop 15 fits snugly within the groove of the grooved annulus 12 for movement therewith away from and toward the ends of the drum shell 10 as desired for tuning the drum head skin 16. The drum shell 10 is provided with elongated slots 27, shown in Fig. 3, through which the pins 13 protrude far enough so as to act as supports for the slide ring 14 at its inside portion and to coact

with the wedges or cam-segments 22, which form an integral part of the tension slide ring 14 at its lower or inside edge portion.

Referring further to Fig. 3, the slide ring 14 is caused to slide around within the drum shell 10, guided by the track 11a, by means of a segmental rack 18 of an equal length to one of the cam-surfaces 26, and a pinion 17 in mesh with the rack 18 so as to permit movement for the length of one of the cam-surfaces 26 of the cam-segments 22 only. This will eliminate the need of stops at each end of the rack 18 to prevent the pins 13 from feeding too far so as to slide off of the cam-surfaces 26 of the cam-segments 22 and causing the jamming of the mechanism.

The pinion 17 is loosely mounted on a small shaft 29 fixed in the shell 10 and projecting inwardly at right angles thereto to act as an axle for the pinion 17 to turn on. Mounted on the same shaft in the same manner and fixed to the pinion 17 is a larger gear 31 which rotates in unison with the pinion 17. The gear 31 is so placed as to extend to a point just below the inside edge of the sliding ring 14 so as not to contact therewith and fitting freely between the rack segment 18, which extends beyond the edge of the cam-segments 22 of the sliding ring 14, and the drum shell 10 so as to permit unrestricted rotation of said large gear 31. The gear 31 is engaged by a double acting dog 32 and a smaller gear 33. The smaller gear 33 is a driving gear for the large gear 31 and the pinion 17. The small gear 33 is driven by means of a small shaft 34 extending from the point inside of the shell 10 at which the gear 33 is fixed thereto, to a point outside of the shell 10, far enough to provide for the attachment of a handle or means for turning the shaft 34, which in turn will rotate the gear 33 for operating the entire unit.

The double acting dog 32 engaging the larger gear 31 permits the locking of the operating mechanism and also the turning of the large gear 31 and the pinion 17 in either direction for tightening or loosening the drum skin 16 at will. The double acting dog 32 is fixed to a small shaft 35 extending through the casing of the drum shell 10 from its inside where it is joined to the dog 32 to a point outside the casing of the drum shell 10 sufficiently far to permit the ready turning thereof by hand. The shaft 35 is mounted loosely in the casing of the shell 10 so as to be revolvable in order to swing the dog 32 into engagement with the gear 31 as required.

Upon turning the operating means the cam-segments or wedges 22 engage the pins 13 at their cam-surfaces 26 and when turned in one direction serve to wedge or force the pins 13 downwardly in the elongated slots 27 in the shell 10. The pins 13 being fastened to the inner circumference of the grooved annulus 12 will cause the said grooved annulus to move inwardly of the ends of the drum shell 10 and will pull or carry the flesh hoop 15 mounted in the groove of the annulus 12 in the same direction as though it were a part of the said grooved annulus 12.

Fastened around the flesh hoop 15 is the drum head skin 16 and as the grooved annulus, which acts as a keeper for the flesh hoop 15 and the skin wrapped or fastened around it, is moved inwardly of the end of the drum shell 10 by the action of the slide ring 14, the drum head skin 16 is stretched or tightened by the downward pull of the grooved annulus or head tension band

12. It can therefore be seen that as the drum head skin is tensioned there will be a stress upon that portion of the skin or vellum especially at the line of contact that the skin has with the rim or edge of the drum shell 10. To lessen the shearing stress at this point, I have turned the rim or edge of the shell 10 over inwardly to provide a rounded or smooth surface of contact for the drum skin and thereby prolong its life by preventing any shearing or cutting action as would be the case if the shell rim was sharp.

The operation of the tensioning device of my invention I will now describe in order to summarize the foregoing and eliminate any possibility of misunderstanding, as follows:

The shaft 35 is turned to adjust the double acting dog 32 to the proper position for tightening or tensioning the drum skin or vellum 16. The handle 30 is then turned in the proper direction for increasing the tension of the said drum skin which will cause the shaft 34 to turn in its mounting in the shell 10 and the small gear 33 to turn in mesh with the large gear 31. The large gear 31 is permitted to turn in one direction only by reason of the double acting dog 32 which has been previously set. As the large gear 31 turns on the axle pin 29, fixed to the shell 10, the pinion gear 17 being fixed as a part of the large gear 31 turns with it. As pinion gear 17 turns or rotates in mesh with the teeth of the rack 18 the rack is moved horizontally in one direction, to the left, and as it is carried by the slide ring 14, it therefore slides the said ring around in the groove 11a in a horizontal plane. As the slide ring 14 is slid around the shell 10 in the track or guide 11a, the inner edge of the slide ring 14 which carries the cam-segments 22 contacts the pins 13 along the cam-surfaces 26 which force the pins 13 downward in the slots 27 of the shell 10. Each cam-segment is provided with a pin for uniform action. The pins 13 as they are wedged downward in the slots 27 being fastened to the grooved annulus or head tension band 12, cause the said grooved annulus to be moved inwardly of the ends of the drum shell 10. This downward or inward movement of the grooved annulus from the end of the drum shell will cause a downward pull on the flesh hoop 15 around which the drum head skin 16 is wrapped or fastened. The downward pull on the flesh hoop and the skin or vellum is due to the fact that the said hoop with the skin fastened thereto is fitted snugly within the groove of the grooved annulus 12, and hence it must follow that the flesh hoop 15 and the drum skin will move as the said grooved annulus moves. Thus the drum skin as it is drawn over the turned in portion 11 of the drum shell 10 will tighten or have an increased tension. Should the drum head skin 16 be too tight the mechanism is turned in the reverse direction by simply changing the position of the double acting dog 32, by means of the small shaft 35 and turning the handle 30.

There is no fixed or set amount of cam sections or engaging pins, and no particular pitch or degree necessary upon cam sections. This is to be determined by the combination that gives best results in manufacturing, and if necessary pins can be made with rollers provided at point of contact with cam ring to reduce friction and increase tension with lessened effort.

What I claim as new and desire to secure by Letters Patent is—

1. A vibratory instrument comprising a shell, a vibratory head on an end of the shell, having an enlarged peripheral portion, a head tension band loosely engaging the exterior of the shell enclosing the enlarged portion of the head, a movable means within the shell, coacting means carried by said head tension band and said movable means to tension the head, said movable means being loosely supported within the shell on said coacting means carried by the head tension band and operating means for said movable means disposed within the shell and having a portion thereof projecting through the shell for operation.

2. A drum comprising a drum shell with elongated slots formed therein, a drum head mounted at an end of the said shell, a grooved annulus with inwardly projecting pins mounted outside the shell at an end, said pins protruding through the elongated slots formed in the drum shell, a cam-ring mounted inside the drum shell supported by said pins and means carried by said cam-ring and operating means adapted to engage said first named means to feed the cam-ring around within the drum shell, whereby the said elements cooperate to tension the drum head.

3. A drum comprising an annular shell with elongated slots having its edges turned inwardly at each end to form guides, a head tension band loosely mounted outside the shell on each end, a flesh hoop for a drum head carried by the said head tension band, pins fastened to the head tension band, said pins protruding through the shell and a slide ring mounted inside the said shell engaging the said guides formed in the shell at one edge and the pins at the other edge and operating means adapted to feed the said slide ring around the shell within the guides, whereby to force the said pins mounted on the head tension band downwardly to tension a drum head on the shell.

4. A drum comprising a slotted shell, a head across an end of the shell in engagement with a flesh hoop, a grooved annulus inclosing said hoop mounted outside the said shell, pins projecting inwardly through the slotted shell fastened to the said annulus, a sliding ring mounted inside the shell opposite the grooved annulus, cam-segments formed from the sliding ring engaging the inwardly projecting portion of the said pins, a rack fastened to the sliding ring inside the shell, a pinion gear engaging the rack and a shaft extending outside the shell to transmit rotary movement to the said pinion gear engaging the rack, whereby the sliding ring is moved within the shell to tighten a head across an end of the drum shell.

5. A drum comprising a slotted shell, a head across an end of the shell in engagement with a flesh hoop, a grooved annulus inclosing said hoop mounted outside the said shell, pins projecting inwardly through the slotted shell fastened to the said annulus, a sliding ring mounted inside the said shell opposite the grooved annulus, cam-segments formed from the sliding ring engaging the inwardly projecting portion of the said pins, a rack fastened to the sliding ring inside the shell, a pinion gear engaging the rack rotatably mounted on an axle pin supported by the said shell, a large gear mounted behind said pinion gear on said axle pin, a double acting dog engaging the large gear and a second pinion gear carried by an operating shaft extending from inside the said shell to a point outside of the said shell adapted to be turned to rotate the second pinion gear, whereby movement is transmitted from said second pinion gear to the large gear and first pinion gear to move the remaining movable elements to tension the head.

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