Nov. 17, 1936. C. M. AU-MILLER 2,061,244

UNITENSIONED DRUM

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Fig. 1.

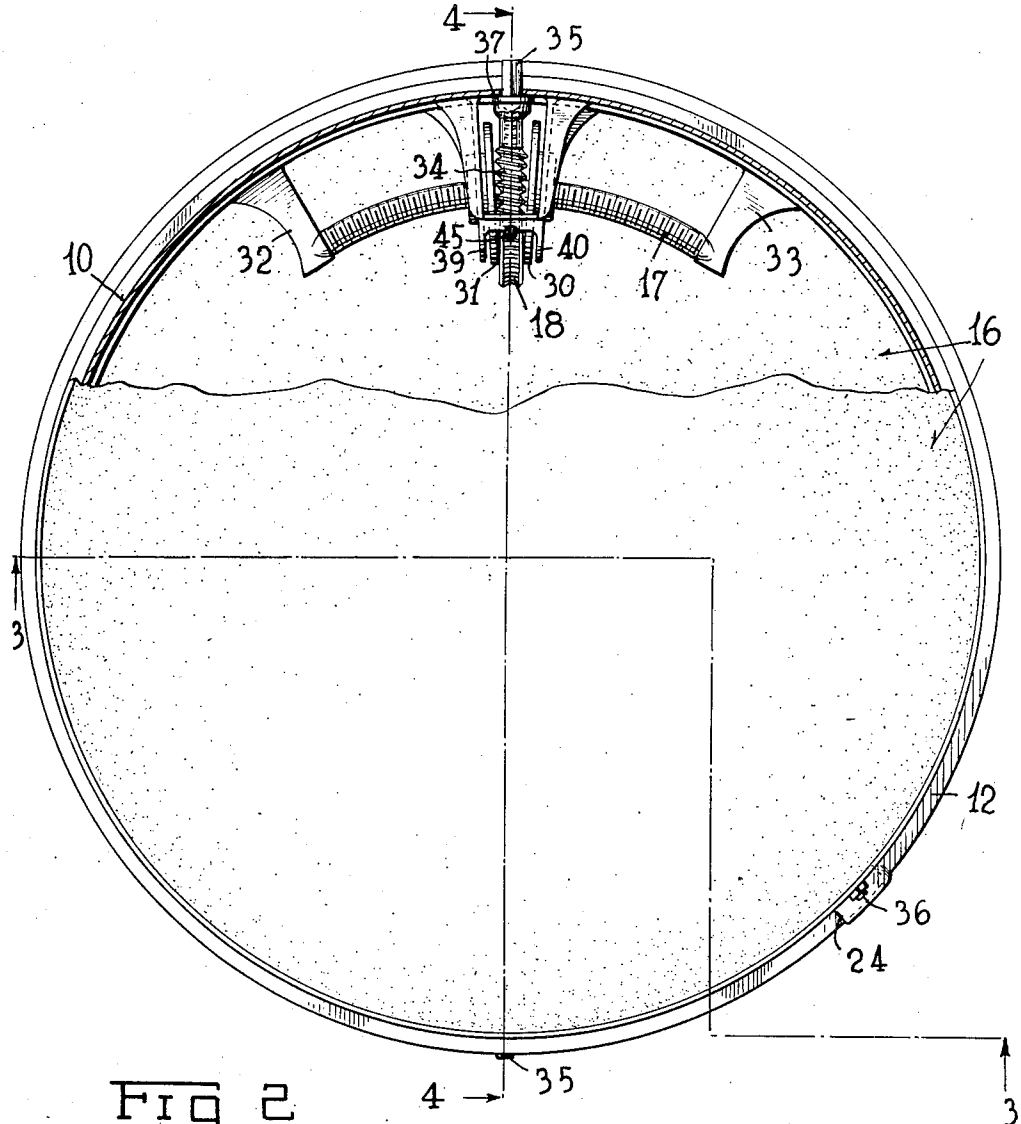
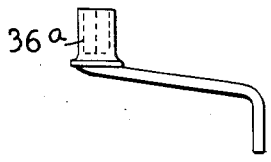


Fig 2.



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FIG. 3.

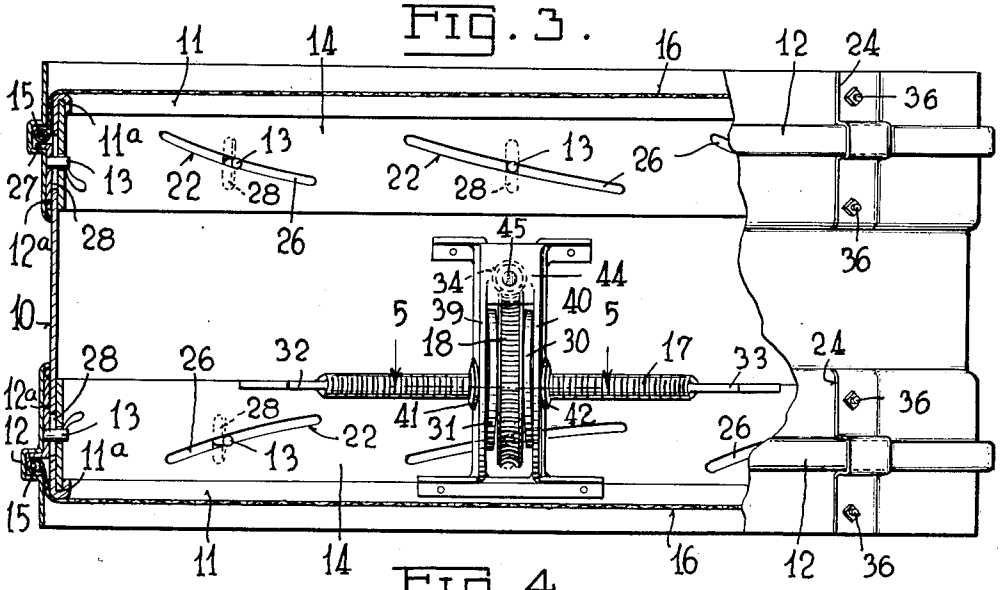


FIG. 4.

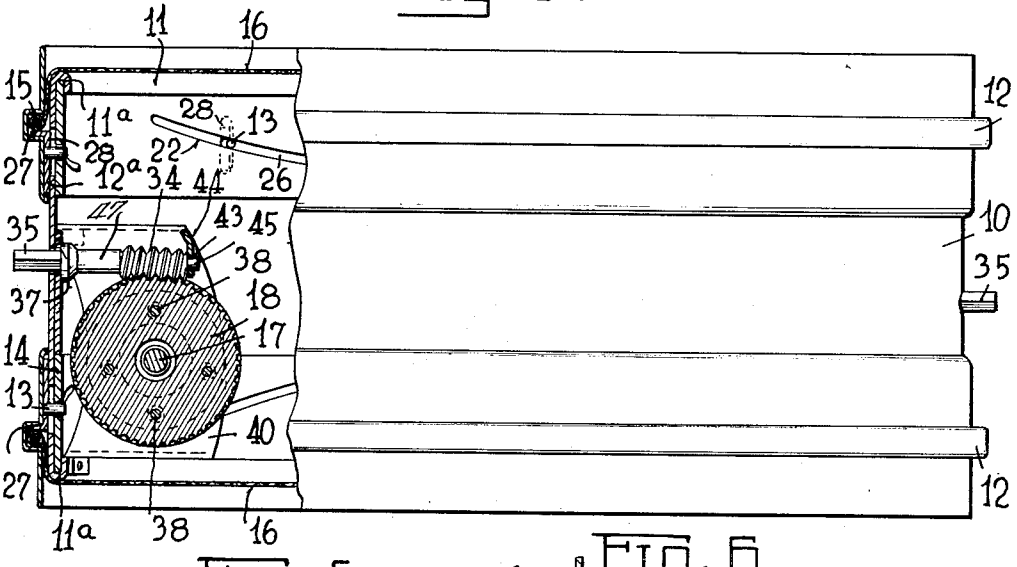


FIG. 5

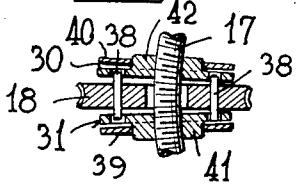
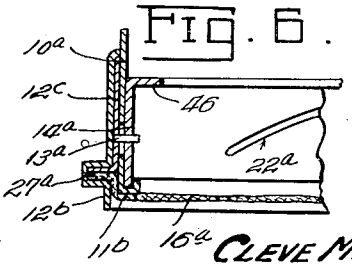


FIG. 6.



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UNITENSIONED DRUM

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Application April 29, 1935, Serial No. 18,900

7 Claims. (Cl. 84—411)

This invention relates to musical instruments, and more particularly to improvements in instruments of the type embodying a vibratory head or heads, such as drums, banjos, tomtoms, kettle drums or the like. This is a further improvement over my co-pending application Ser. No. 751,641, filed Nov. 5, 1934.

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.

My invention is illustrated in the accompanying drawings, in which,

Figure 1 is a plan view of a drum, part in elevation to show the head tensioning mechanism as it appears from the top.

Figure 2 is a perspective of the key or crank for operation of the head tensioning mechanism.

Figure 3 is a cross sectional view along the line 3—3 of Figure 1.

Figure 4 is a cross sectional view along the line 4—4 of Figure 1.

Figure 5 is a view in transverse cross section of the operating mechanism.

Figure 6 is a fragmentary view in cross section of a modification of my invention.

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 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 11*a*. The groove 11*a* 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 11*a* of the turned in portion 11 by pins 13 which are fastened to a band 12*a* fitting on the outside of the drum shell or barrel 10. The band 12*a* has a bent over portion 27 around its upper periphery adapted to project within the groove of a grooved annulus 12 stamped from one piece of metal and fitting around the band 12*a* mounted on the outside of the drum shell or barrel 10. The bent over portion 27 of the band 12*a* is engaged within the groove of the said grooved annulus 12 and held comparatively snug within the groove of the annulus 12 by means of a flesh hoop 15. The flesh hoop 15 besides serving to hold the drum vellum 16 serves to wedge against the top of bent over portion 27 and against the opposite inner side of the groove of grooved annulus 12. This snug engagement of the hoop 15 within the groove of the annulus 12 permits movement to be transmitted without undesirable play from the band 12*a* to the grooved annulus 12. This transmitted movement is obviously made possible by means of the bent over portion 27 of band 12*a* engaged within the groove of annulus 12 and contacting

a side of the flesh hoop 15 for upward movement and by contacting a side of the groove of annulus 12 for downward movement. By this arrangement the grooved annulus 12 and the band 12a move together practically as one unit. The band 12a carries pins 13 that project through longitudinal slots 28 in the drum shell 10 and into elongated arc shaped slots 26 cut into the sliding ring 14 at an angle so as to provide curved cam surfaces 22. The sliding ring 14 is substantially opposite the band 12a and the grooved annulus 12 so as to provide for uniform movement of the pins 13 and the bands 12 and 12a.

Fitted snugly within the groove of the annulus 12 with the turned over portion 27 of band 12a is a flesh hoop 15, which tensions the drum vellum wound thereon by the movement transmitted thereto from the slide ring 14 to the pins 13 engaged within the arc-shaped slots 26 of ring 14 and the band 12a to the grooved annulus which holds the flesh hoop 15.

The grooved annulus 12 is split transversely at 24 with fastening means or bolts 36 on each side of the split to hold the annulus 12 in operating position, as shown in Figure 3, to permit ready removal and replacement of a flesh hoop 15 and the drum skin 16 which is fastened thereto.

Figure 6 illustrates a modification of the slide ring 14. The slide ring 14a as shown in the modification is for the purpose of making the said slide ring stronger and more rigid whereby to permit the use of lighter materials by turning the inner end of the ring 14a inwardly of the drum shell 10a at substantially right angles to form a flange 46. The slide ring 14a operates in identically the same manner as the slide ring 14 in Figures 1, 2, 3, and 4. The only difference being the addition of flange 46. As is indicated, the modified slide ring 14a is guided by groove 11b when sliding movement is transmitted thereto through the pins 13a secured to the band 12a, said pins being in engagement with the arcuate shaped slots 22a. The band 12c also transmits movement to the grooved annulus 12b through bent over portion 27a, whereby the drum vellum 16a is tensioned. It is to be noted that in describing Figure 6, I have for the purpose of clearness attempted to use the same numerals as far as possible with letter additions. The flange 46 must not project too far inward of the drum shell 10 so as to interfere with the operating mechanism shown in Figures 1, 3, 4, and 5.

The operating mechanism which causes the slide ring 14 to slide around within the shell 10, guided by track 11a, consists of a gear wheel 18, with discs 30 and 31 mounted on each side of gear wheel 18. The discs 30 and 31 are threaded to fit a threaded curved rod 17 and carry the gear wheel 18 along the rod. The gear 18 and the discs 30 and 31 are fastened together by small pins 38 and mounted between brackets 39 and 40 so that the gear will move and the discs will thread along the curved rod 17 supported by braces 32 and 33 together. The discs 30 and 31 are mounted in sockets or holes in each bracket, 39 and 40, by means of hub like portions 41 and 42 formed on one side of each disc to act as the turning point or axle for the gear and the attached thereto, as shown in Figure 5. The pins 38 beside holding the three parts together also hold the hubs 41 and 42 of the discs in place in the brackets 39 and 40.

Fitted through the thickness of the drum shell 10 is a shaft 47, hereinafter called the worm drive, having a worm gear 34 on one end to mesh with the gear 18 and a square shank 35 on the other end for crank socket 36a. The shaft 47 is further provided with shoulder 37 which rests against the inner side of shell 10, and a reduced portion 45 at its other end fitted in socket 43 formed in cross piece 44 as a part of brackets 39 and 40 to permit the worm drive to be freely turned by crank 36a.

In operation the crank socket 36a is placed over the shank 35 and turned, say to tighten the drum head. This results in the rotation of the worm drive which meshes with the teeth of gear 18, thereby causing it to rotate together with the discs 30 and 31 and thread the curved rod 17 fastened to the slide ring 14 in one direction. As the two discs 30 and 31 and gear 18 feed the rod 17 around in the drum shell, ring 14 is caused to slide around within the drum shell. The slide ring 14 which is caused to slide around the interior of the drum shell 10 by threaded rod 17 has arc shaped slots 26 cut through its thickness at an angle or diagonal its width into which fit the pins 13 that are fastened to band 12a. These slots will present a curved surface to the pins 13 and as the ring 14 slides in a fixed path around the drum shell will cam against the pins and force them downward. The result is the transmission of like downward motion to the band 12a, and the grooved annulus 12 which carries the flesh hoop 15 and drum skin 16, for they are all linked together for uniform movement and thus the drum skin becomes tightened. To loosen the drum skin the crank is turned in the opposite direction.

While I have described and shown a drum in the drawings, I wish it understood that my invention will apply equally as well to any other type of vibratory instrument and I claim the right thereto accordingly.

What I claim is:

1. A drum comprising a slotted shell, a drum head mounted on the shell, a hoop to hold the drum head, a guide formed from the shell at an end of said shell, a band mounted outside the shell near an end of the shell, a grooved annulus engaging the said band and the said hoop, pins carried by the said band projecting inwardly through the said shell, a slide ring loosely mounted within the said shell with an edge thereof bent inwardly and the other edge engaging the guide at an end of the shell, cam surfaces formed in the said slide ring, said pins engaging the said cam surfaces and means inside the shell to move the slide ring around within the shell to move the said pins, whereby the elements on the outside of the shell are moved to tension the drum head.

2. A vibratory instrument comprising a shell, a vibratory head on an end of the shell, a hoop for said vibratory head, a grooved annulus engaging the hoop, a head tension band adapted to engage the grooved annulus, pins formed inwardly of the head tension band, a slide ring with arc-shaped slots therein mounted inside of said shell, said pins engaging the arc-shaped slots of the slide ring and means mounted inside the shell to transmit movement to said slide ring, whereby to transmit movement to the said head tension band and grooved annulus to tension the vibratory head.

3. A drum comprising a drum shell, a vibratory head on an end of the shell, a hoop for said vibratory head, a grooved annulus engaging the hoop, a head tension band adapted to engage the grooved annulus, pins formed inwardly of the

head tension band, a slide ring with arc-shaped slots therein mounted inside of said shell, said pins engaging the arc-shaped slots of the slide ring and a worm drive mounted inside the shell engaging the slide ring operating means mounted on the said slide ring, whereby movement is transmitted to said slide ring and the head tension band to tension the drum head.

4. A vibratory instrument comprising in combination a drum shell with longitudinal slots formed therein and a guide around its rim, a drum head mounted on the shell, a slide ring with cut out curved cam surfaces mounted within the drum shell engaging the said guide, a grooved annulus loosely mounted outside the said shell, a band mounted outside the said shell opposite the slide ring mounted within said grooved annulus, a flesh hoop carried by the groove of the grooved annulus, said band having pins projecting inwardly through said longitudinal slots of the drum shell to cooperate with the curved cam surfaces of the said slide ring, a curved threaded rod carried by said slide ring, a gear wheel mounted within the drum shell, discs mounted on each side of the gear wheel, pins projecting through the said gear wheel and discs, said gear wheel and discs being rotatably mounted between brackets within the said shell on said curved threaded rod, braces inside the drum shell to support the curved rod, said discs each having hub-like portions engaging the brackets, a shaft extending through the shell, a worm gear on one end of the shaft in mesh with said gear wheel carried by the discs and means on the other end of said shaft to rotate the same, whereby motion is transmitted from one element to the other to tension the drum head.

5. A drum comprising a slotted drum shell rounded at an edge to form a guide, a drum head mounted over the rounded edge portion of the drum shell on a flesh hoop, a head tension band mounted outside the shell, an outwardly bent over portion around the upper periphery of said band, a grooved annulus mounted around the said head tension band engaging the said bent over portion of the head tension band and the said flesh hoop, pins mounted on the inner diameter of the head tension band adapted to protrude through the drum shell, a slide ring mounted inside the drum shell engaging the said guide opposite the head tension band, curved cam surfaces formed from the said slide ring contacting the said pins and a rod carried by said slide ring, a worm drive having a portion thereof projecting outside the drum shell for engagement with a crank and in engagement with said rod, whereby sliding movement may be transmitted to the slide ring to move the elements mounted outside the drum shell to tension a drum head mounted on the drum shell.

6. A drum comprising a drum shell, a drum head mounted on the shell, a loosely mounted head tension band, a loosely mounted grooved annulus, a hoop for the drum head engaged by the grooved annulus, pins mounted on the head tension band to engage a slide ring inside the drum shell, said slide ring having a portion bent inwardly along an edge for rigidity, cam slots formed in said slide ring in engagement with the pins mounted on the head tension band and means mounted on the slide ring for engagement with means mounted inside the drum shell adapted to move the said slide ring around within the shell, whereby movement is transmitted to the loosely mounted elements to tension the drum head.

7. A drum comprising a slotted shell, a drum head mounted on the shell, a hoop to hold the drum head, a guide formed from the shell at an end of said shell, a head tension band mounted outside the shell near an end of the shell, a grooved annulus engaging the said head tension band and the said hoop, pins carried by the said head tension band projecting inwardly through the slots of the shell, a cam slotted slide ring loosely mounted within the said shell and guided by the shell, said pins engaging the cam slots of the said slide ring to support the said slide ring and means inside the shell to move the slotted slide ring around within the said shell to move the pins vertically, whereby the elements on the outside of the slotted shell are moved vertically with the pins to tension the drum head.

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