Jan. 8, 1963 C. B. SCHMERTZ 3,072,898

ELECTRONIC GAVEL

Filed Aug. 22, 1961

FIG. 2

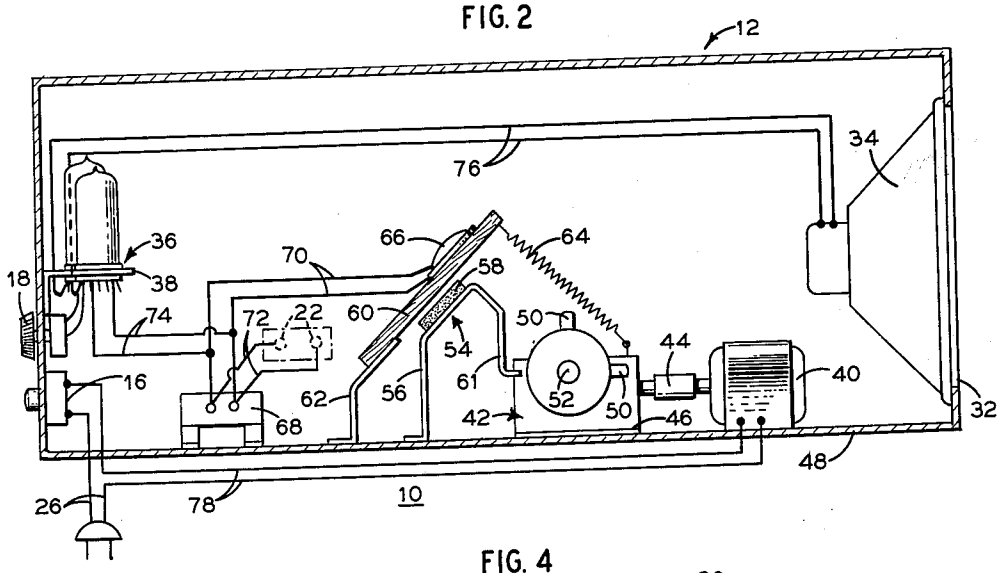


FIG. 4

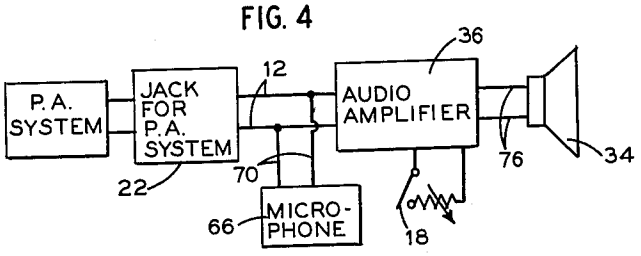
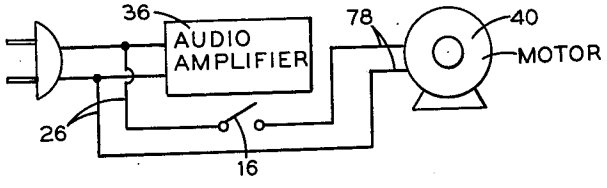


FIG. 3



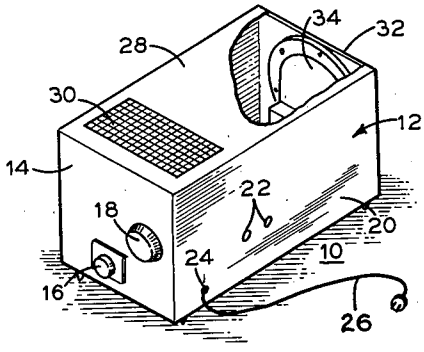


FIG. 1

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United States Patent Office 3,072,898 Patented Jan. 8, 1963

3,072,898

ELECTRONIC GAVEL

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Filed Aug. 22, 1961, Ser. No. 133,246
6 Claims. (Cl. 340—384)

This invention pertains to sound generating and amplifying means and more particularly to an electronic gavel.

Conventional gavels comprising a hammer and a sounding board can generate a sound of limited amplitude. While it is true the sound volume can be increased by more violently striking the sounding board with the hammer, there is still an upper limit to the volume of sound. In assembly rooms of large volume or in groups having a high noise level, conventional gavels are often ineffective. Even though there have been attempts to place a speakers microphone close to a conventional gavel, such makeshift combinations are generally unreliable since the speaker usually moves the microphone away from the gavel and toward his mouth.

It is therefore an object of the invention to provide a gavel which requires a minimum physical exertion by the user.

It is a further object of the invention to provide a gavel which can generate any desired volume of sound.

It is another object of the invention to provide a gavel which is audible in noisy assembly halls and still requires a minimum of exertion by the user.

Briefly, in accordance with the invention, a gavel is provided comprising a motor driven hammer means whose operation is controlled by a switching means. A sounding board means is placed opposite the hammer means so that when the hammer means is operated it strikes the sounding board means. An electromechanical transducer such as a pick-up is fixed in such a position with respect to the sounding board to pick up the sound generated when the hammer means strikes the sounding board means. The pick-up may be connected via a signal amplifying means to a speaker or to a public address system.

It should be noted that such a gavel is ideally suited for court rooms, conventions, legislative assemblies and all places where judicial, legislative and corporate business is administered.

Other objects, features and advantages of the invention will be apparent from the following detailed description of the invention when read with the accompanying drawings wherein:

FIGURE 1 shows an external view of the gavel of the invention;

FIGURE 2 is a view of the gavel of FIG. 1 wherein portions of the housing have been deleted to reveal the components of said gavel;

FIGURE 3 shows the power circuit diagram of the gavel; and

FIGURE 4 shows the signal circuit diagram of the gavel.

Referring to FIGURE 1, an external view of the gavel **10** is shown enclosed by a housing **12**. Passing through the front wall **14** of housing **12** is a spring-return push-button switch **16** and an amplifier volume control and on-off switch **18**. Disposed in the right side wall **20** are output jacks **22** to permit the plugging in of a public address system input cable, and an entry port **24** for a power cable **26**. A heat escape grille **30** is disposed in the top wall **28**. Connected to back wall **32** is a conventional speaker **34** which is shown via the broken away portion of top wall **28** for convenience. In general, with the power cable **26** plugged into a conventional A.C. outlet and switch **18** in the on position, and a user pushes switch **16**, a gavel sound is transmitted by speaker **34** and an electrical signal representing the gavel sound is available.

It should be noted that as long as power cable **26** is plugged into a conventional A.C. outlet an electrical signal representing a gavel sound will be transmittable from jacks **22** whenever push-button switch **16** is depressed. Switch **18** only controls the transmission of sound by speaker **34**.

The gavel **10** will now be described in greater detail with reference to FIGURE 2. Disposed on the inner side of front wall **14** is a conventional audio amplifier **36** shown employing vacuum tubes. It should be noted that transistors could be conveniently employed. The remaining components of the audio amplifier **36** such as the resistors and capacitors are disposed on the underside of chassis **38**. Disposed on a cork mat **46** which is fixed to bottom wall **48** is motor **40** and gear box **42**. Gear box **42** connected to motor **40** by shaft **44** provides speed reduction and change of direction of rotary motion which is applied to cams **50** coupled to shaft **52** of gear box **42**. Gear box **42** may also include a one revolution clutch. A hammer means **54** is also disposed on bottom wall **48**. Hammer means **54** includes a resilient portion **56**, a hammer head **58** and a cam follower arm **61** which is so disposed so as to be engaged by cams **50** during a portion of the rotation cycle of shaft **52**. Sounding board **60** is fixed adjacent hammer means **54** by virtue of standoff **62** which is screwed to bottom wall **48**. Spring **64** which connects sounding board **60** to gear box **42** is provided to minimize vibration on sounding board **60** and hammer **58** when they hit. Pick-up **66** is fixed to sounding board **60**. Barrier strip **68** may be provided to facilitate the connection of the signal leads **70** of pick-up **66** to the output jacks **22** and audio amplifier **36**.

The operation of the gavel **10** will now be described in detail. When power cable **26** is plugged into an A.C. outlet, power is supplied to audio amplifier **36** and via switch **16** which normally open to motor **40**. See FIG. 3. When switch **16** is closed the A.C. power energizes motor **40**, causing shaft **44** (FIG. 2) to rotate. This rotation causes gear box **42** to drive shaft **52** in a counter-clockwise direction. During a portion of the cycle of rotation, cam **50** engages cam follower arm **61** drawing hammer head **58** away from sounding board **60**. As cam follower arm **61** drops off cam **50** tne resilient portion **56** drives hammer head **58** to strike sounding board **60**. The resulting sound is transduced by pick-up **66** to an electrical signal which is fed via lines **70** to outlet jacks **22** by lines **72** and to audio amplifier **36** by lines **74** (see also FIG. 4). If switch **18** is in the on position, the signal is amplified and fed via lines **76** to speaker **34** where it is transduced to an audibly perceptive sound whose volume is controlled by the potentiometer portion of switch **18**.

There has been shown an improved gavel which by employing an electrically operated hammer which strikes a sounding board upon which is mounted a pick-up that is connected to amplifying means which permits the generation of any level of sound with a minimum of physical effort by the user.

There will now be obvious to those skilled in the art, many modifications and variations which satisfy many or all of the objects and which gain many of the advantages but which do not depart from the spirit of the invention as defined by the appended claims.

What is claimed is:

1. A gavel comprising a source of electrical power, an electrically operated rotary power generator including a shaft, a manually operated switch for connecting said source of power to said electrically operated rotary power generator, a cam coupled to said shaft, a hammer means having a resilient portion, a hammer head and a cam follower arm, said cam follower arm being positioned for

engagement with said cam so that as said cam rotates said cam follower arm engages said cam and withdraws said hammer head whereby a stress is created in said resilient portion and when said cam follower disengages said cam the stress created in said resilient portion propels said hammer head, a sounding board fixed opposite said hammer head and so positioned to be struck when said hammer head is propelled, a pick-up means fixed in close proximity to said sounding board, signal amplifying means connected to said pick-up means, and a speaker connected to said signal amplifying means.

2. The gavel of claim 1 wherein said pick-up means is mechanically connected to said sounding board.

3. A gavel comprising a source of electrical power an electrical motor, a manually operated switch for connecting said source of power to said electrical motor, a gear box having a shaft, means for mechanically coupling said gear box to said electrical motor, a cam coupled to said shaft, a spring biased cam operated hammer means positioned with respect to said cam so that as said cam rotates said spring biased cam operated hammer means is retracted under stress and then released, a sounding board resiliently mounted opposite said spring biased cam operated hammer means and so positioned to be struck when said spring biased cam operated hammer means is released after having been retracted, damping means for damping said resiliently mounted sounding board after having been struck, a pick-up means fixed in close proximity to said sounding board, signal amplifying means connected to said pick-up means, and a speaker connected to said signal amplifying means.

4. The gavel in claim 3 wherein said pick-up means is mechanically connected to said sounding board.

5. A gavel comprising a source of electrical power, an electrical motor, a manually operated switch for connecting said source of power to said electrical motor, a one revolution gear box having a shaft, means for mechanically coupling said gear box to said electrical motor, a cam coupled to said shaft, a hammer means having a blade type resilient portion, a hammer head and a cam follower arm, said cam follower arm being positioned for engagement with cam so that as said cam rotates said cam follower arm first withdraws said hammer head to exert a stress by flexure on said blade type resilient portion and upon disengagement said blade type resilient portion propels said hammer head, a sounding board resiliently mounted opposite said hammer head and so positioned to be struck when said hammer head is propelled by said blade type resilient portion, a spring including one fixed end, means for connecting the other end to said sounding board whereby vibrations in said sounding board are damped after having been struck by said propelled hammer head, a pick-up means fixed to said sounding board, signal amplifying means connected to said pick-up means, and a speaker connected to said signal amplifying means.

6. The gavel of claim 5 including means to connect said pick-up means to an external public-address system.

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