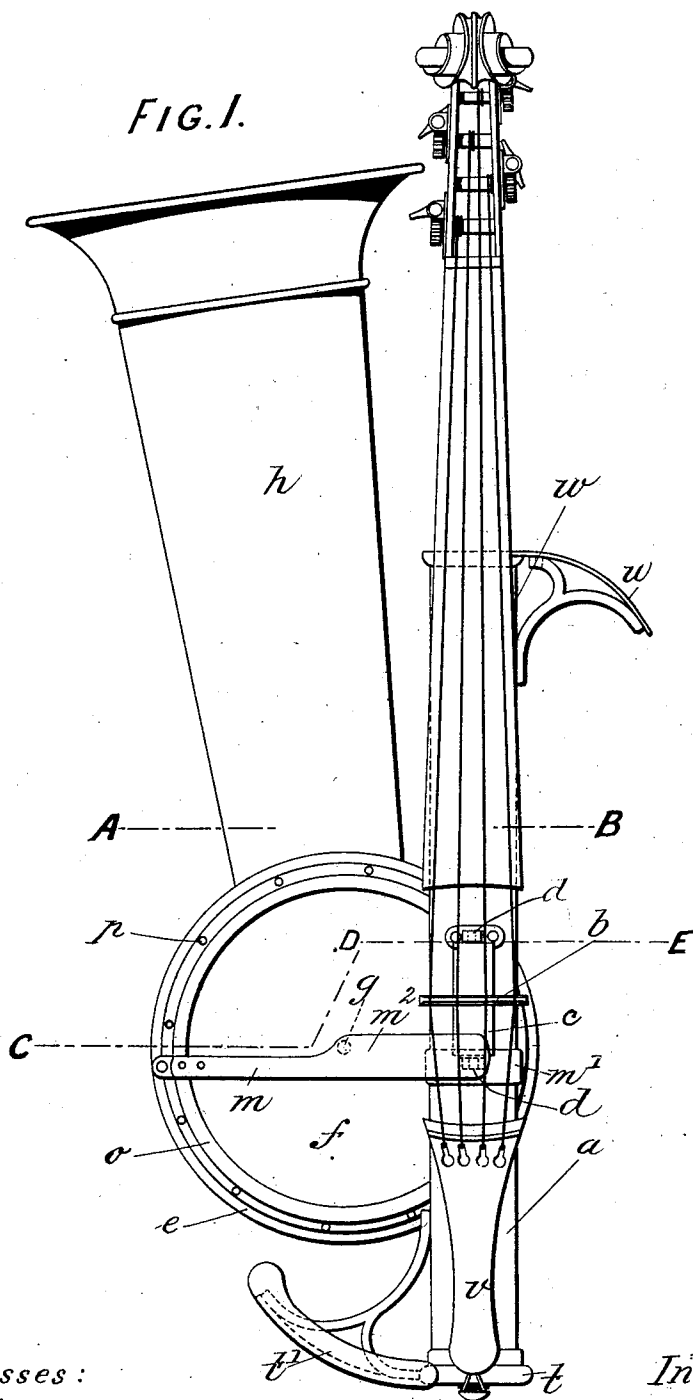


J. M. A. STROH.
VIOLIN OR OTHER STRINGED INSTRUMENT.

(Application filed Aug. 21, 1899.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:

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No. 644,695.

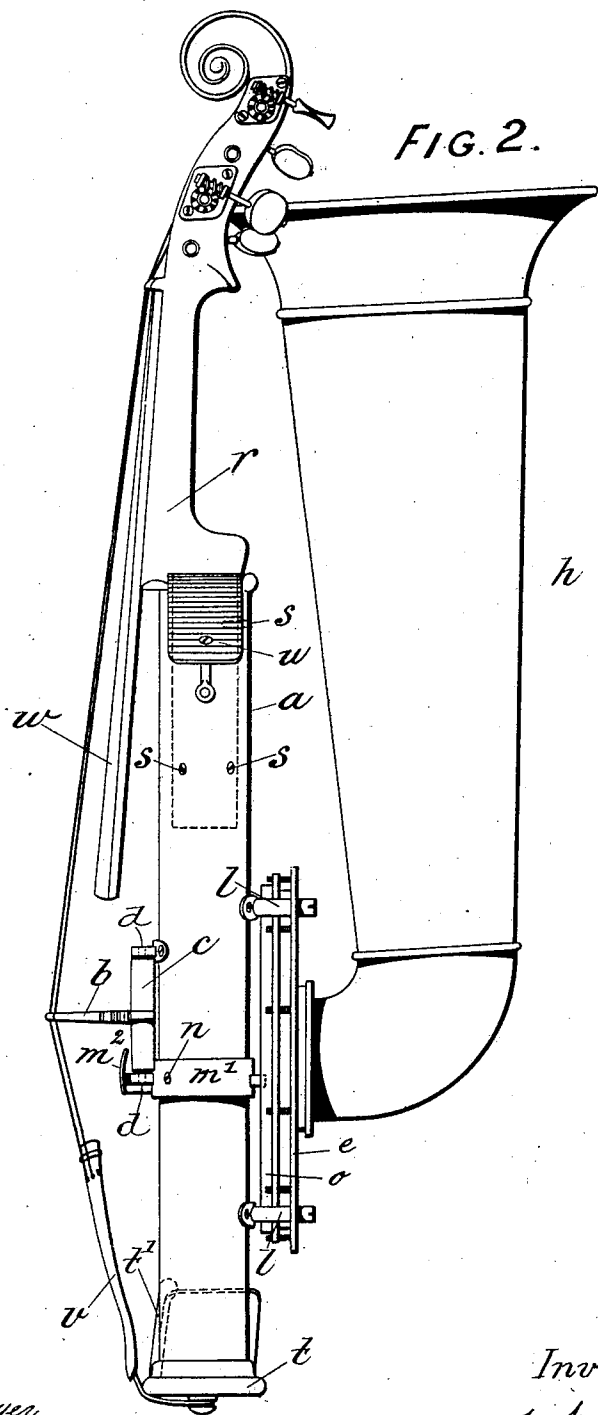
Patented Mar. 6, 1900.

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(No Model.)

3 Sheets—Sheet 2



Witnesses:

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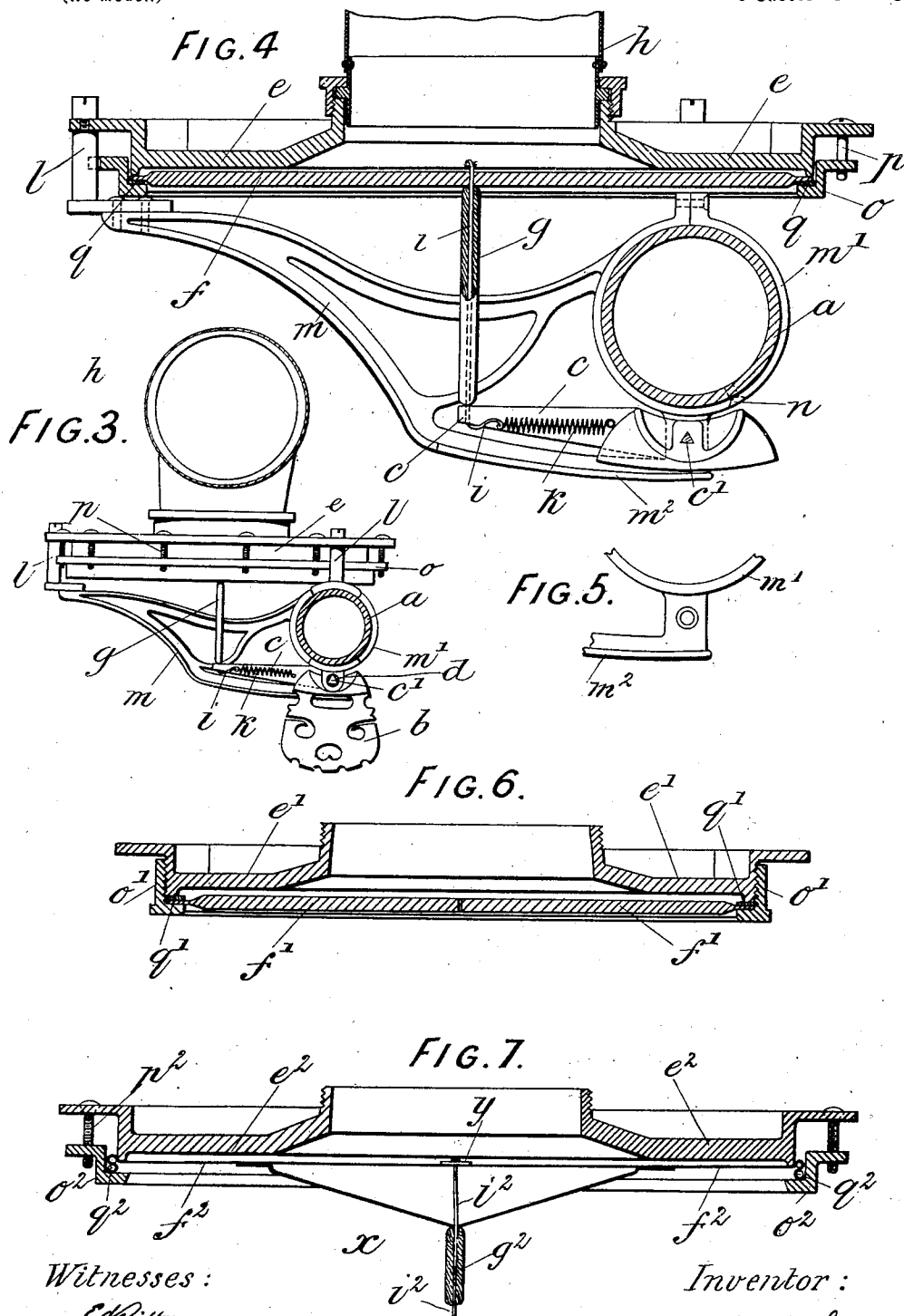
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(Application filed Aug. 21, 1899.)

(No Model.)

3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

JOHN M. A. STROH, OF LONDON, ENGLAND.

VIOLIN OR OTHER STRINGED INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 644,695, dated March 6, 1900.

Application filed August 21, 1899. Serial No. 728,038. (No model.)

To all whom it may concern:

Be it known that I, JOHN MATTHIAS AUGUSTUS STROH, a subject of the Queen of Great Britain, residing at London, England, have invented a certain new and useful Improvement in Violins or other Stringed Instruments, of which the following is a full, clear, and exact specification.

This invention relates, primarily, to a violin which has a diaphragm or membrane and a resonator instead of the ordinary violin-body or sounding-board; but it is applicable also to other stringed instruments.

In the accompanying drawings, Figure 1 is a front view of a violin embodying my invention. Fig. 2 is a side view of the same. Fig. 3 is a sectional plan along line A B of Fig. 1. Figs. 4 and 5 represent details of construction on a larger scale, Fig. 4 being a sectional plan along line C D E of Fig. 1; and Figs. 6 and 7 are horizontal sections representing modifications.

The strings, together with the bridge, finger-board, head, neck, and tailpiece, of the violin are mounted on a suitable tubular body portion *a*, made of aluminium, wood, or other suitable material, preferably in the shape of a tube of circular or square section. The bridge *b* is not directly attached to the said supporting-frame, but rests on a transverse rocking lever *c*, adapted to turn on knife-edges *c'*, the bearings *d* of which are rigidly fixed to the supporting-frame *a*, or the bridge and the rocking lever may be made of one piece.

Underneath the frame *a* and rigidly attached thereto is a circular frame or drum-head containing a diaphragm of wood, glass, or other rigid material or a stretched membrane of parchment or other flexible material.

Fig. 4 shows an example of a drum-head *e* with wooden diaphragm *f*; Fig. 6, another example; and Fig. 7 shows an example of a drum-head with a membrane *f'*, of parchment. Fig. 5 is an end view of one of the knife-edge bearings belonging to Fig. 4.

The center of the diaphragm or membrane is mechanically connected with one end of the rocking lever *c* by means of a link or other suitable transmitting device, so that the vibrations of the violin-strings when bowed will

be finally transmitted to the diaphragm *f*. The latter may be open to view on one side, while the other side is inclosed by a cover *e*, having in the center an opening against which is attached a resonator or tube *h* to augment and distribute the sounds emitted by the diaphragm—in other words, to receive and distribute the waves of air caused by the mechanical vibrations of the diaphragm. The said resonator has preferably the shape of a trumpet, as shown; but other suitable forms of resonators may be adopted.

The connection between the long arm of the rocking lever *c* and the diaphragm may be made in various ways; but I prefer to adopt the arrangement represented by Fig. 4 of the drawings—that is to say, the extremity of the rocking lever *c* is placed axially above the center of the diaphragm *f* and the transmitting device, mentioned above, has the shape of a tubular rod or link *g*, rounded at the ends, one end abutting against the center of the diaphragm and the other end against the rocking lever *c*. A piece of gut or other suitable cord *i* passes through the center of the diaphragm, through the link and perforated extremity of the rocking lever, and is attached at one end to the said lever through the intermediary of a helical spring *k*, while the other end is secured to the diaphragm by means of a knot. The spring *k* is so adjusted as to keep the cord *i* always at the required tension and to prevent any slackness between the rocking lever and the diaphragm.

In the construction represented by Figs. 3 and 4 the drum-head *e* is mounted on three screw-studs *l*, distributed over its circumference, two of these studs being attached directly to the tubular body portion *a*, while the third is attached to a long arm or open frame *m*, forming at one end a clamping-ring *m'*, which encircles the frame *a* and is fixed to the same by a screw *n*. As shown by Figs. 1 and 4, the open frame *m* extends above the rocking lever *c* and has a flange *m''*, which covers and protects the said lever, together with spring *k* and the upper end of the cord *i*. The edge of the diaphragm *f* is inclosed by a flanged ring or lid *o*, attached to the drum-head *e* and rendered adjustable by means of screws *p*. The edge of the drum-head or disk *e* which faces the diaphragm *f*

has a projecting rim adapted to support the edge of the diaphragm, which is held between the said rim and an india-rubber packing-ring *q*, resting on the flange of the lid *o*. The wooden diaphragm is preferably reduced in thickness at the edge, as shown.

The tubular body portion *a* is provided at one end with a hand-rest *u* and connected with the neck *r* of the violin, which extends into the tube or frame *a* and is fixed by screws *s*, while the other end of the frame is closed by a cap *t*, connected with the tailpiece *v* in the usual way and provided on one side with a chin-rest *t'*. *w* is an ordinary finger-board.

In the modification represented by Fig. 6 the flanged cover or ring *o'* is connected with the drum-head *e'* by a screw-joint instead of having screw-studs distributed on its circumference.

In the modification represented by Fig. 7 the vibrations are transmitted from the tubular link *g*² to a flexible membrane *f*² through the intermediary of a distributing-cone instead of passing directly into the membrane, the said stay *g*² being made shorter and resting with its lower end upon the apex of the cone, while the cord *i* passes through the apex of the cone and through the membrane.

The rocking lever, as well as the main frame *a*, the drum-head *e*, cover *o*, distributing-cone, and supporting-arm *m* are preferably made of aluminium or of any other suitable material.

If a bow be drawn across the strings, the vibrations of the latter will cause the bridge, together with the rocking lever, to oscillate on the knife-edges, and the oscillations of the lever will be transmitted through the link to the diaphragm. The top of the bridge is therefore an arc of a circle having its center in the axis of oscillation formed by the knife-edges, and the bridge is either made of one piece with the rocking lever or so connected with the same that all vibrations transverse to the strings will be transmitted to the lever.

It will be understood that the examples shown by the drawings represent special forms only of my invention, that the shape and arrangement of parts may be modified without departing from my invention, and that my improvements are applicable also to violoncellos, mandolins, guitars, and other stringed instruments.

What I claim is—

1. A stringed musical instrument, comprising in its construction a bridge supporting the strings, a rocking lever connected with the said bridge and supporting the same, a diaphragm held and supported at the edges and adapted to oscillate in the center, a transmitting device situated between the extremity of the rocking lever and the diaphragm and adapted to transmit oscillations from the said lever to the diaphragm, a resonator situated in proximity to the diaphragm and adapted to receive and distribute the waves of air caused by the vibrations of the diaphragm,

and a body portion adapted to support the rocking lever diaphragm and resonator and to connect these parts with the parts holding the ends of the strings, substantially as described.

2. In a stringed musical instrument, in which the bridge supporting the strings is mounted on a rocking lever and the vibrations of the latter are transmitted to a diaphragm, the combination of the rocking lever and the diaphragm, with a link interposed between the extremity of the rocking lever and the diaphragm, and a flexible cord attached at one end to the said rocking lever and at the other to the diaphragm, substantially as described.

3. In a stringed musical instrument, in which the bridge supporting the strings is mounted on a rocking lever and the vibrations of the latter are transmitted to a diaphragm, the combination of the rocking lever and the diaphragm, with a tubular link interposed between the extremity of the rocking lever and the diaphragm, and a flexible cord passing through the said tube, one end of the said cord being attached to the rocking lever and the other to the diaphragm, substantially as described.

4. In a stringed musical instrument, in which the bridge supporting the strings is mounted on a rocking lever and the vibrations of the latter are transmitted to the diaphragm, the combination of the rocking lever and diaphragm, with a link interposed between the same, so as to transmit vibrations, a spring mounted on the rocking lever and attached to the same, and a link attached with one end to the center of the diaphragm and at the other end to the said spring, substantially as described.

5. In a stringed musical instrument in which the bridge supporting the strings is mounted on a rocking lever and the vibrations of the latter are transmitted to a diaphragm, a rocking lever turning on knife-edges, substantially as described.

6. In a stringed musical instrument, in which the bridge supporting the strings is mounted on a rocking lever and the vibrations of the same are transmitted to a diaphragm, a circular diaphragm held and supported at the edge and connected in the center with the said rocking lever, substantially as described.

7. In a stringed musical instrument in which the bridge supporting the strings is mounted on a rocking lever and the vibrations of the latter are transmitted to a diaphragm, the combination of the said diaphragm with a trumpet-shaped resonator adapted to receive and distribute the sound-waves produced by the vibrations of the diaphragm, substantially as described.

8. The combination of bridge *b* and rocking lever *c* with main body portion *a*, a drum-head containing a circular diaphragm and supported by the main frame, a transmitting

device situated between the rocking lever and the center of the diaphragm, and a resonator adapted to receive and transmit the waves of sound caused by the vibrations of the diaphragm, substantially as described.

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10 9. The combination of the main body portion *a*, with bridge *b* and rocking lever *c*, a drum-head containing a diaphragm, a transmitting device, between the rocking lever and the diaphragm and an open frame *m* adapted

to connect the drum-head with the main body portion *a* and to protect the lever *c*, substantially as described.

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

J. M. A. STROH.

Witnesses:

J. WETTER,

WALTER E. ROCHE.