(No Model.)

E. M. GERRY.

TUBULAR RESONATOR.

No. 527,488. Patented Oct. 16, 1894.

Fig. 1

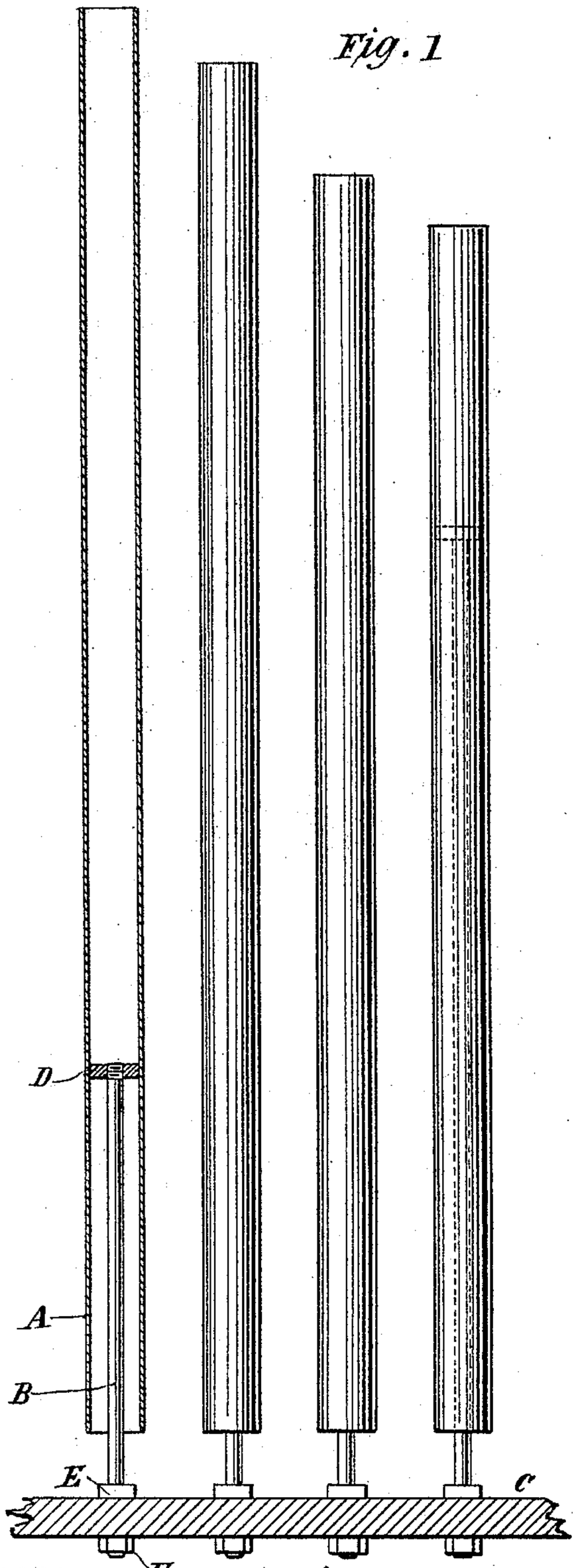
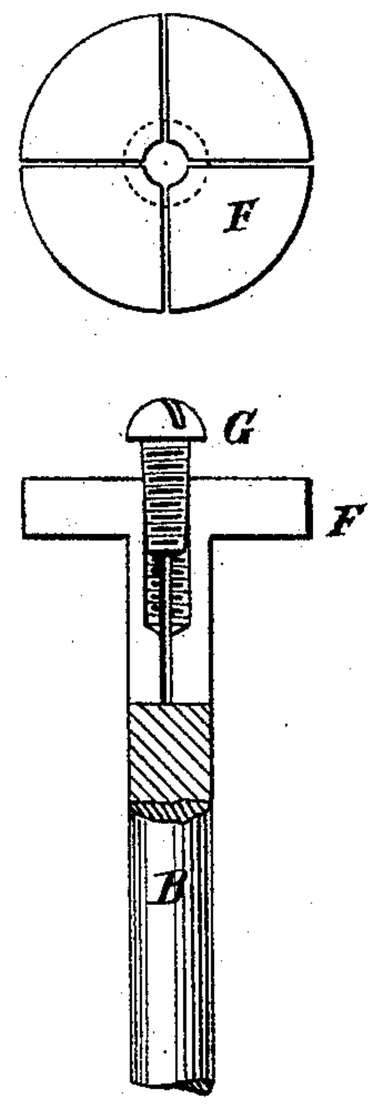


Fig. 2



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TUBULAR RESONATOR.

SPECIFICATION forming part of Letters Patent No. 527,488, dated October 16, 1894.

Application filed June 15, 1894. Serial No. 514,648. (No model.)

To all whom it may concern:

Be it known that I, EDWARD M. GERRY, a citizen of the United States, residing at the city of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Tubular Resonators, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

This invention relates to that kind of a musical resonator which consists of a metal tube or cylinder freely suspended or supported and so arranged that upon being properly struck it will emit a musical tone, which resonators are usually used in lieu of bells, for clock and tower chimes and as musical instruments. It has been common heretofore to support such a tube, or a series of such tubes, at its extreme end by a flexible thong or string, or other similar non-sonorous device. Such a support, however, prevents the resonator having its free and fullest vibration, and therefore interferes with the tone, as well as with its prolongation, purity and clearness.

It is the object of my invention to support such a tubular resonator so that it will be entirely free to vibrate without any checking or damping influence caused by the supporting device or devices. In this connection I would state that a rod or tube supported wholly at one end does not have the tonal effect under vibration that a similar tube or rod has when supported at a point, which may be termed a nodal point, intermediate of its ends, and the free ends of which have relative lengths corresponding to related harmonic or tonal values; also, it is desirable that the devices that support the tube be so constructed that its vibration will be in such harmonic consonance with the vibrations of the tube that the vibrations of the latter will be fully and uninterruptedly transmitted through the support—as to a sounding board, resonator, or other device upon or from which the tube may be borne or suspended.

My invention consists of a tube or cylinder capable of giving a musical note upon being properly struck, and of supporting devices for the said cylinder which engage the same at a nodal point.

Referring to the drawings, Figure 1 is an elevation view of a series of tubular bells, chimes, or resonators, vertically supported by devices illustrating one form of my invention. Fig. 2 is a detail view of a modified form of tubular resonator support.

Referring to the views in detail, A represents one of the resonators, which is preferably a metal cylinder of any suitable metal capable of giving a musical note. The length of this tube is to be such that it will produce a tone something lower than the desired tone, say for example one-fourth.

B represents a rod properly fixed to a support, as the sounding board C or other device upon which it is desired to mount the resonator. The upper end of this rod is threaded and is firmly screwed in the disk or nut D. This nut is of size to frictionally, but firmly and strongly, engage the tube on its inner surface. Preferably, this nut is first driven in the tube to the desired point, and then the supporting rod B is screwed in the nut. The supporting rod is adjustably fixed to its supports in any suitable way—as by nuts E threaded on the lower end of the same and clamping the board C. Instead of this rod being arranged to support the tubular resonator from below the tube, it may suspend the tube, and be fixed to a support above the upper end of the same; also, the tube may be held horizontally instead of vertically, as shown.

The position of the engaging nut of the supporting rod in the tube is to be that where a nodal point can occur, and, as is well understood, this point is one in the tube which, when the tube is vibrating, is practically quiescent. Thus, in Fig. 1 the supporting head is shown at a point one-fourth the length of the tube above the lower end of the same, and hence the portion of the tube extending below the nut of the supporting rod will have a tone higher than the portion above the nut, in accordance with the well-known laws governing vibrating rods. This arrangement of the tube may be variously modified and other combinations of tones be produced. By thus continuing the tube beyond the support thereof, the tube will have a better tone and one better sustained than in case where the support

is located at one end of the tube for, it will be seen, the tube is free to vibrate throughout its length without restraint or any influence tending to damp the vibrations. The length and size of the supporting rod is also preferably that which corresponds to its tonal or vibrational value, or that which is harmonious with the vibration of the tube when the rod is in position supporting or suspending the tube, whereby the vibrations transmitted to the supporting parts are not damped or otherwise interfered with. The nuts on this rod permit the adjustment of the rod so that the desired vibration thereof can be attained. By these means I am enabled to get from resonators of this kind their full tonal value, particularly in clearness and purity of sound and as to prolongation or endurance of the same. At the same time, truer combinations of tones can be more readily produced than by separate tubes for such combinations; also, this kind of support, within the tubes, permits the close arrangement of the tubes, as for chimes and the like.

In the right-hand tube of Fig. 1, I illustrate by dotted lines a supporting nut and rod engaging the tube nearer its upper than its lower end. In Fig. 2, I show another form of device for engaging the resonator tube, which consists of a split nut or disk F secured to the end of the supporting rod B, and capable of being spread peripherally, to engage the tube, by a wedging piece forced in the same, such as the conical screw G.

What is claimed as new is—

1. The combination with a tubular resonator, of mechanism for rigidly supporting the same and rigidly engaging the resonator at a single nodal point thereof, substantially as and for the purpose set forth.

2. In combination with a tubular resonator, mechanism for supporting the same arranged within the tube and engaging the inner face only of the walls of the same at a nodal point, substantially as and for the purpose set forth.

3. In combination with a tubular resonator, mechanism for supporting the same consisting of a rod arranged within the tube and provided with an engaging piece adapted to be forced against the inner walls of the tube for the purpose of engaging the same, for the purpose set forth.

4. In combination with a tubular resonator, mechanism for rigidly supporting the tube and engaging the inner face only of the walls of the same at a nodal point, and means for adjusting said mechanism whereby to secure a certain vibrational value thereof, for the purpose set forth.

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