

PATENT SPECIFICATION

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694,679



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COMPLETE SPECIFICATION

Acoustic Delay Lines

We, NATIONAL RESEARCH DEVELOPMENT CORPORATION, a British corporation established by Statute, of 1, Tilney Street, London, W.1, do hereby declare the invention, for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

5 This invention relates to acoustic delay lines such as are used, for example, as information storage devices in electrical computing engines. These delay lines in general comprise a piezoelectric crystal in contact with a liquid column (generally mercury) and arranged to be set in vibration by applied electrical impulses. In this way compressional waves, usually of ultrasonic frequency, are directed through the liquid and impinge on another piezoelectric crystal and generate electrical impulses which, after suitable shaping and amplification, are again applied to the input crystal.

25 In these devices, a difficulty is sometimes experienced in that the compressional waves are reflected from the receiving piezoelectric crystal and travel up and down the line. These multiple reflections are highly undesirable and it is an object of the present invention wholly, or in part, to overcome this disadvantage.

35 According to the present invention there is provided an acoustic delay line comprising a metallic grid for attenuating waves generated in the liquid medium of the line, the grid being arranged so that it is not perpendicular to the direction of propagation of the waves. The grid damps the forward and backward travelling waves and prevents the building up of standing waves, although permitting the required excitation of the receiving piezoelectric crystal.

45 According to a preferred embodiment of the present invention, the attenuating means comprises a metallic grid arranged

at an angle of about 45° to the direction of propagation of the waves.

One embodiment of the present invention will be described by way of example with reference to the drawings filed with the provisional specification in which:—

Figure 1 shows an elevation in section of an acoustic delay line according to the invention, and

Figure 2 shows a side elevation of Figure 1 sectioned in the plane II—II.

In these drawings, 1 is stainless steel tube containing a filling 2 of mercury. Compressional waves are generated in the mercury filling 2 by a piezoelectric crystal 3 excited into oscillation at a very high frequency by electric means, not shown in the picture. These compressional waves travel through the mercury 2 and excite a further piezoelectric crystal 4 in well-known manner.

According to the invention there is inserted in the path of the compressional waves, a grid 5 of stainless steel wire. This may conveniently be mounted in two cylindrical portions 6 and 7 arranged to be held together by pins 8 and 9. The grid should not be perpendicular to the direction of propagation of the waves and a grid arranged at an angle of 45° has been found to work. In one embodiment, the grid 5 had a mesh of 20 wires to the inch. The wires were 27 S.W.G. (0.0164 inch diameter). As is usual in these delay lines, all metallic parts coming in contact with the mercury should be a material which does not form an amalgam with mercury. We prefer to use stainless steel.

What we claim is:—

(1). An acoustic delay line comprising a metallic grid for attenuating waves generated in the liquid medium of the line, the grid being arranged so that it is not perpendicular to the direction of propagation of the waves.

(2). An acoustic delay line comprising a plane metallic grid for attenuating waves generated in the liquid medium of

the line and arranged at an angle of about 45° to the direction of propagation of the waves.

(3). An acoustic delay line according to claim 1 or 2 and in which the metallic grid is made of stainless steel.

(4). An acoustic delay line substantially as hereinbefore described with reference to the drawings filed with the provisional 10 specification.

E. E. WRIGHT,
Agent for the Applicants.

PROVISIONAL SPECIFICATION

Acoustic Delay Lines

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According to the present invention there is provided an acoustic delay line comprising means for attenuating waves in the liquid medium of the line. The attenuating means damps the forward and backward travelling waves and prevents the building up of standing waves, although permitting the required excitation of the receiving piezoelectric crystal.

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PROVISIONAL SPECIFICATION

I SHEET

This drawing is a reproduction of
the Original on a reduced scale.

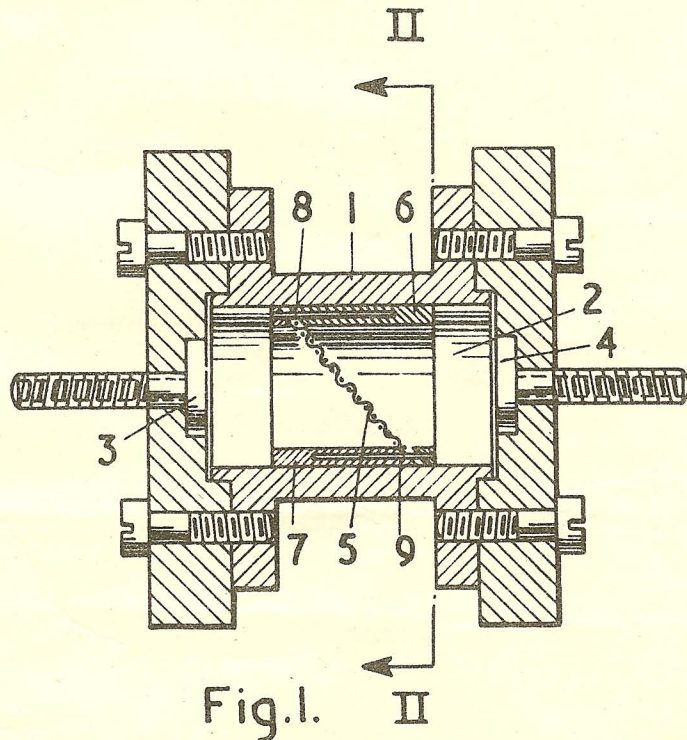


Fig. 1.

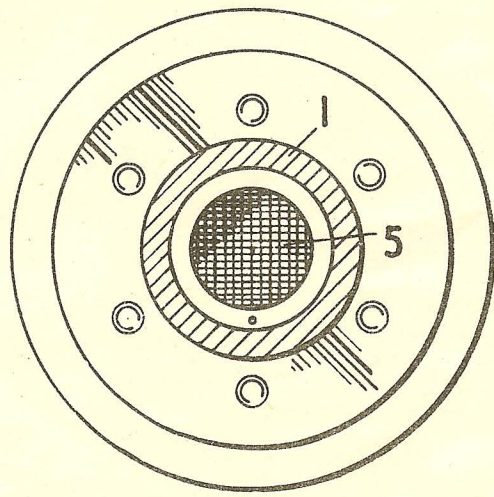


Fig. 2.