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W. J. KAYSER  
RADIO RECEIVING SET

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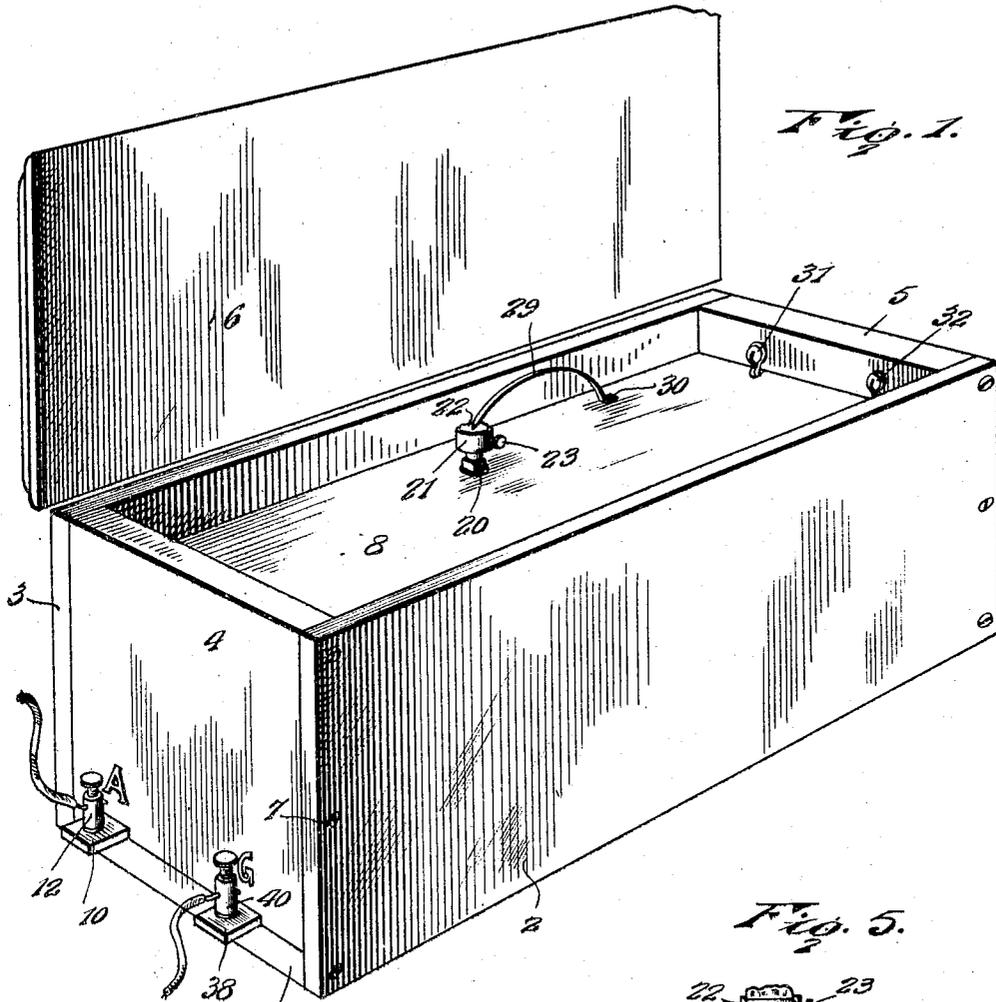


Fig. 1.

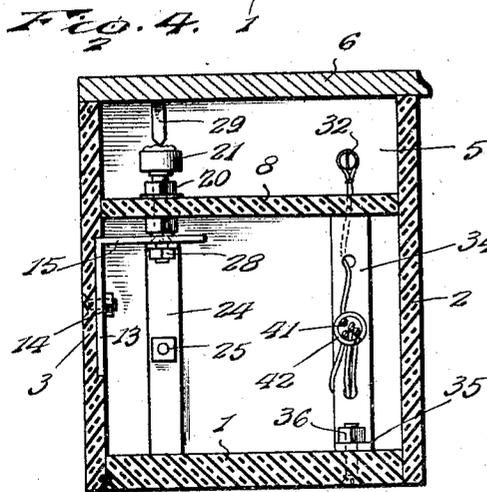


Fig. 4.

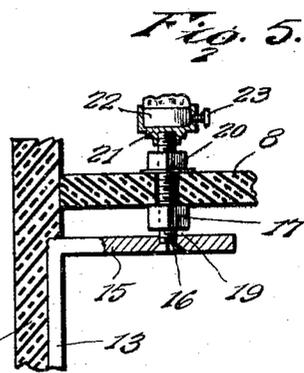


Fig. 5.

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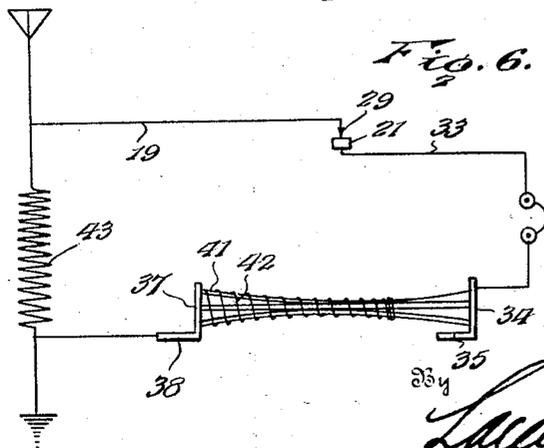
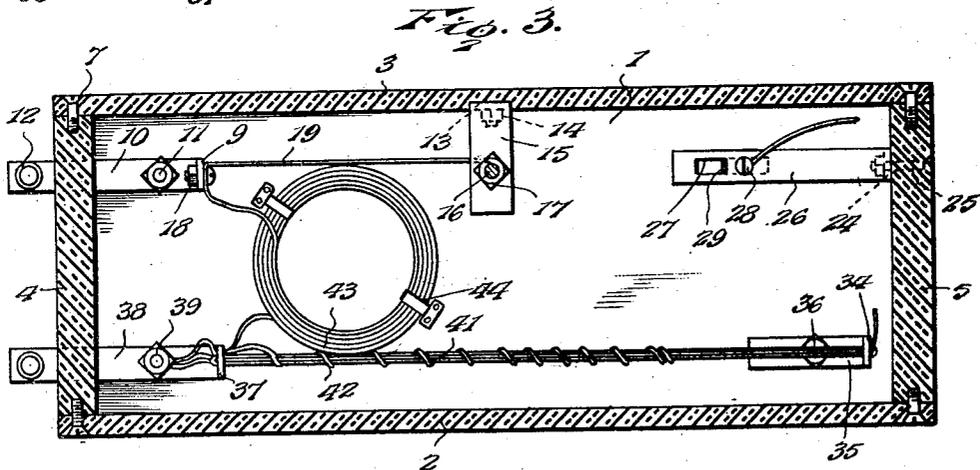
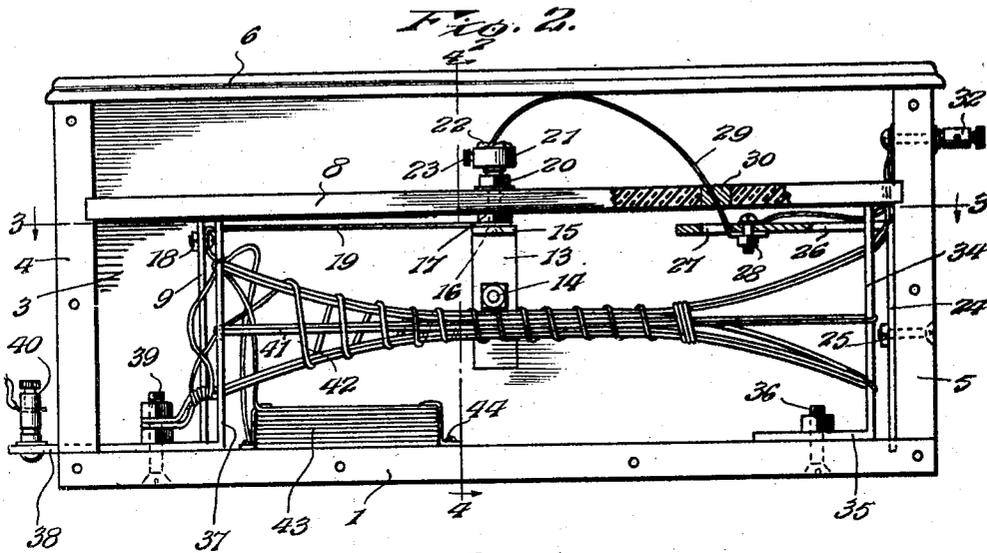
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2 Sheets-Sheet 2



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# UNITED STATES PATENT OFFICE

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## RADIO RECEIVING SET

Application filed November 13, 1929. Serial No. 406,920.

This invention relates to an improved crystal radio receiving set.

One object of the invention is to provide a receiving set of this character having certain peculiarities of structure whereby it is possible to receive signals from stations located at greater distances than has been possible with previous crystal sets.

Another object of the invention is to provide a set which will be characterized by simplicity throughout.

A further object of the invention is to provide a set wherein certain parts are employed to serve a dual function, thus obviating a duplication of parts and consequent complication of structure.

Other objects of the invention not specifically mentioned in the foregoing will be apparent during the course of the following description.

In the drawings:

Figure 1 is a perspective view of the set.

Figure 2 is a front elevation of the set with the front wall removed.

Figure 3 is a horizontal sectional view of the set on the line 3—3 of Figure 2, looking in the direction indicated by the arrows.

Figure 4 is a vertical sectional view of the set on the line 4—4 of Figure 2, looking in the direction indicated by the arrows.

Figure 5 is a fragmentary vertical sectional view showing the crystal detector and mounting employed.

Figure 6 is a diagrammatic view showing the circuit employed.

In carrying the invention into effect, I employ an oblong rectangular cabinet which is preferably formed of bakelite or other insulating material. The cabinet includes a bottom wall 1, front and rear walls 2 and 3, and end walls 4 and 5. Hinged to the rear wall 3 is a lid 6 normally closing the cabinet. The walls are held in proper relation by screws 7. The end walls 4 and 5 are mortised near their top edges and slidably fitting into said mortises is a panel or partition 8, said panel being held in place by the front wall 2.

Mounted on the bottom wall 1 at one end thereof and in close spaced relation to the

rear wall 3 is an antenna bracket having one leg 9 upstanding from the bottom wall and the other leg 10 secured to the bottom wall by means of a bolt 11. The leg 10 extends through the end wall 4. Removably secured to the free end portion of said leg 10 is a binding post 12 to accommodate an antenna lead.

As can be more clearly seen in Figure 4 of the drawings, the rear wall of the cabinet is provided with a medially disposed recess and mounted on said wall is a crystal bracket having one leg 13 snugly seated in the recess and held therein by a bolt 14. The other leg 15 of this bracket extends in horizontal spaced relation to the panel and is disposed therebeneath. Extending freely through the bracket 15 and the panel 8 is a bolt providing a crystal cup stem 16. Screwed on the stem is a nut 17 rigidly securing the stem upon the bracket. This nut is clamped between the leg 15 of the bracket and the panel to cooperate with said bracket in providing a medial support for the panel. Extending through the leg 10 of the antenna bracket is a bolt 18 and connected at one end to the antenna bracket by said bolt is a wire 19. The opposite end of the wire 19 is connected with the crystal bracket by the nut 17. Screwed on the stem and overlying the upper face of the panel 8 is a nut 20. The panel is clamped in position between the nuts 17 and 20 and screwed on the upper end portion of the stem is a crystal receiving cup 21. Carried in the cup is a crystal 22 which is clamped in said cup by a radial set screw 23.

Mounted on the end wall 5 of the cabinet in alignment with the antenna bracket is a cat-whisker bracket having one leg 24 secured to the end wall 5 by a bolt 25 and the other leg 26 extending in parallel spaced relation to the panel 8 therebeneath. Formed in the leg 26 of the bracket near its free end is an opening 27 and mounted on said leg inwardly of said opening is a bolt 28. Secured at one end by said bolt is a preferably flat resilient cat-whisker 29 which extends freely through said opening and upwardly through an opening in the panel 8. This

cat-whisker is bowed longitudinally and tapered toward its free end to form a point for engagement with the crystal 22. Tightly fitting in the opening in the panel is a plug 30 of insulating material which plug snugly surrounds the cat-whisker and provides a brace therefor. Mounted on the upper margin of the end wall 5 is a pair of binding posts 31 and 32, to which a pair of telephones may be connected. Electrically connecting the bolt 28 with the binding post 31 is a wire 33.

Mounted on the bottom wall 1 of the cabinet and near the front wall thereof, is a loop bracket having one leg 34 upstanding from said wall and the other leg 35 thereof secured to the bottom wall by a bolt 36. Mounted on the bottom wall in alignment with the loop bracket is a second loop bracket having a leg 37 upstanding from the bottom wall and a leg 38 secured to the bottom wall by a bolt 39, the leg 38 extending at its free end through the end wall 5. Removably fixed on the outer end portion of the leg 38 is a binding post 40 to receive a ground lead. Extending back and forth between the loop brackets through spaced openings in the legs 34 and 37 thereof are preferably copper wires forming a loop 41, corresponding ends of said wires being secured to the bolt 36 and opposite corresponding ends of said wires being secured to the binding post 32. The loop wires are bare and one of said wires is preferably tinned. Wrapped about said wires and secured at one end to the bolt 36 is a bare copper wire 42 securing the intermediate portions of the strands of the loop wires in bunched parallel relation, this wire being untinned. Resting on the bottom wall of the casing is an inductance coil 43 having one terminal secured to the bolt 36 of the loop bracket. Securing the coil 43 to the bottom wall 1 are clamps 44. As can be readily seen in Figure 6 of the drawings, the coil is connected across the terminals of the antenna bracket and the adjacent loop bracket.

As can be understood from a study of Figure 6 of the drawings, impulses received on the antenna are conveyed to the antenna post, thence through the wire 19 to the crystal, thence through the cat-whisker 29 to the terminal 31 of the telephones, thence through the telephones, the terminal 32, loop 41, terminal 39, bracket 37 and terminal 40 to the ground. The inductance coil includes a sufficient number of turns so that the usual broadcast range may be covered. As the loop wires 41 extend in close proximity to each other throughout their length, while the intermediate portions of the strands thereof are held by the wire 42 in bunched substantially parallel relation, a slight capacitive coupling is formed between the strands, thereby providing a small capacity in the

ground lead which has well known advantageous effects in that signals are strengthened and stations received that would not otherwise be received.

What is claimed is:

1. A radio receiving set including a cabinet, a panel mounted in said cabinet, a bracket mounted on a wall of the cabinet, a crystal cup stem carried by the bracket and extending through the panel, means securing the stem on the bracket and cooperating with the panel and bracket to provide a medial support for the panel, a cup mounted on said stem and adapted to receive a crystal, and circuit connections for said crystal.

2. A radio receiving set including a cabinet, a panel mounted in the cabinet, a crystal mounted at the upper side of the panel, a bracket mounted on a wall of the cabinet beneath the panel, a cat-whisker mounted on said bracket and extending through the panel to cooperate with the crystal, said panel and bracket cooperating to provide a rigid support for the cat-whisker, and circuit connections for the crystal and cat-whisker.

3. A radio receiving set including a cabinet, a panel carried in the cabinet and provided with an opening, a crystal mounted on the panel, a bracket mounted on a wall of the cabinet and having one leg projecting to lie beneath the opening, a cat whisker mounted on the bracket and projecting upwardly through the opening to coact with the crystal, a plug carried by the panel in the opening and surrounding the cat whisker at the panel, said panel and plug cooperating with the bracket for rigidly mounting the inner end portion of the cat whisker, and circuit connections for said crystal and cat whisker.

In testimony whereof I affix my signature.

WILLIAM J. KAYSER. [L. s.]