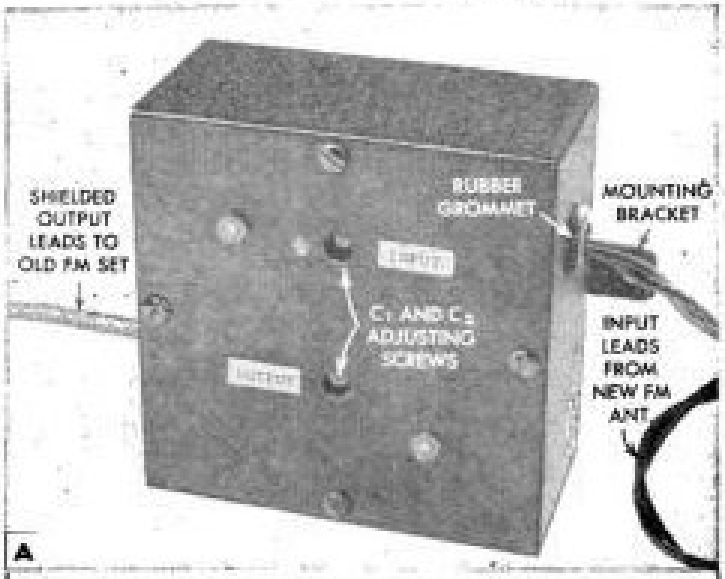
Converter Unit for the New FM Band

THIS tubeless converter unit was built from a circuit designed by Henry R. Kaiser, chief engineer for FM station WMOT in Pittsburgh. When station WMOT switched over to the new higher frequency FM band approximately 6000 owners of prewar FM receivers in the Pittsburgh area obviously could no longer receive their FM programs.

To solve the problem Mr. Kaiser and his associates experimented with several converters using a crystal-multiplier for mixing with the FM signal to provide an IF frequency which would fall on the old band. They finally developed a single-tube quartz-crystal-controlled converter using a type 6SH7 oscillator-multiplier and a Sylvania 1N34 germanium detector crystal as a mixer. While experimenting with this unit, the oscillator in the converter accidentally failed. Much to the operator's surprise he could pick up the station on 94.5 megacycles at another spot on the old receiver dial. As the crystal oscillator was no longer working, the part of the circuit remaining consisted merely of two tuned circuits and the 1N34 detector crystal. This became the converter.

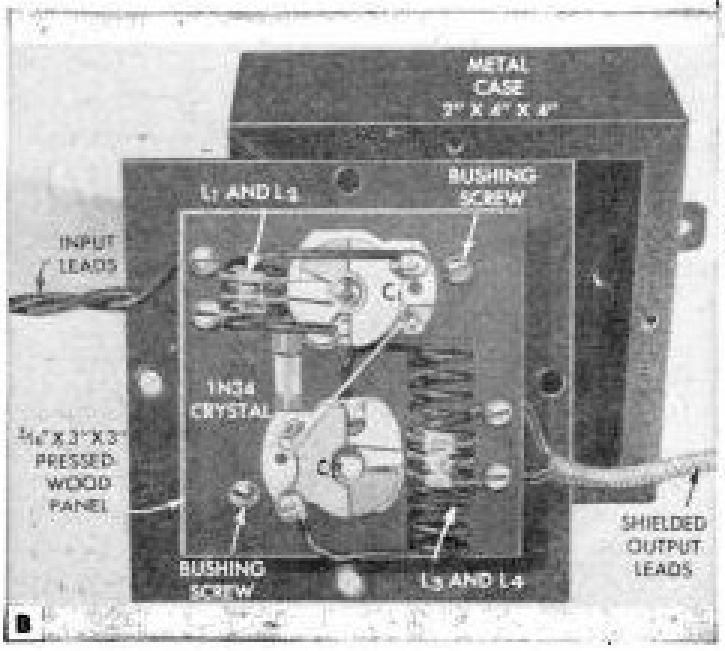
All construction details are given in diagrams Figs. 1 and 2 and photos A and B. The input frequency is tuned to the transmitter frequency and the output is tuned to a frequency in the old band. The coil dimensions given are for the low end of the new band. Merely spreading the turns on coil L2 should raise the frequency if required for your local FM stations.



COIL WINDING CHART

L1—2 turns of No. 18 insulated hookup wire (interwound with coil L2)
L2—4 turns of No. 12 enameled copper wire (space-wound and supported on C1)
L3—10 turns of No. 12 enameled copper wire (space wound and supported on C2)
L4—3 turns of No. 18 insulated hookup wire (interwound with coil L3)

Note—Coils L2 and L3 are space-wound about the diameter of the wire
All coils are wound on a ¼-in. form
2—"air trimmer" midget variable condensers (Hammarlund APC-25) or similar 7 or 8-plate "air trimmer" condensers C1 and C2



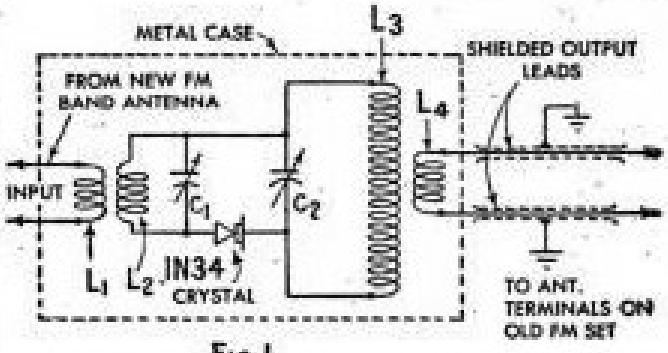
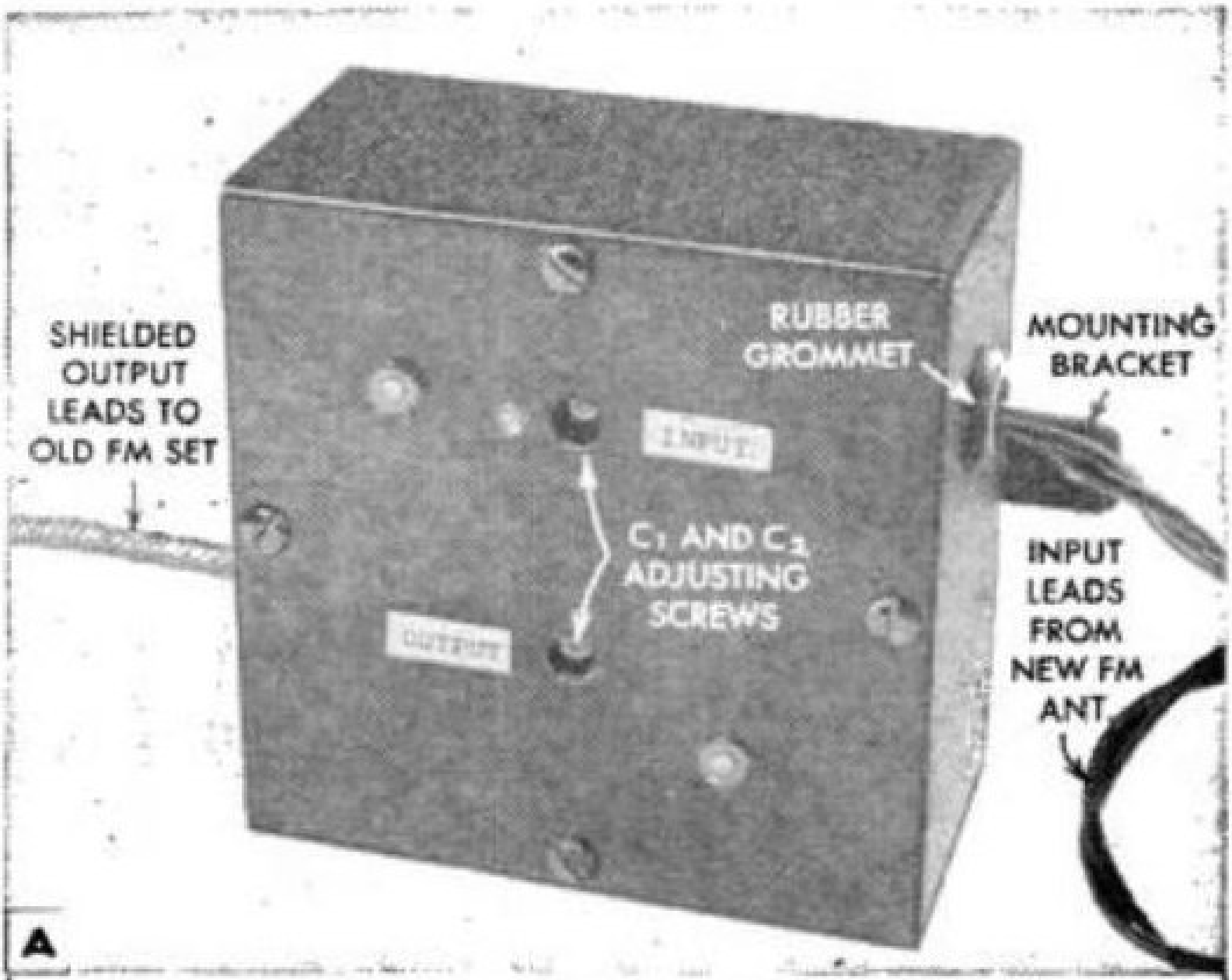


FIG. 1

FIG. 2



COIL WINDING CHART

L1—2 turns of No. 18 insulated hookup wire (interwound with coil L2)

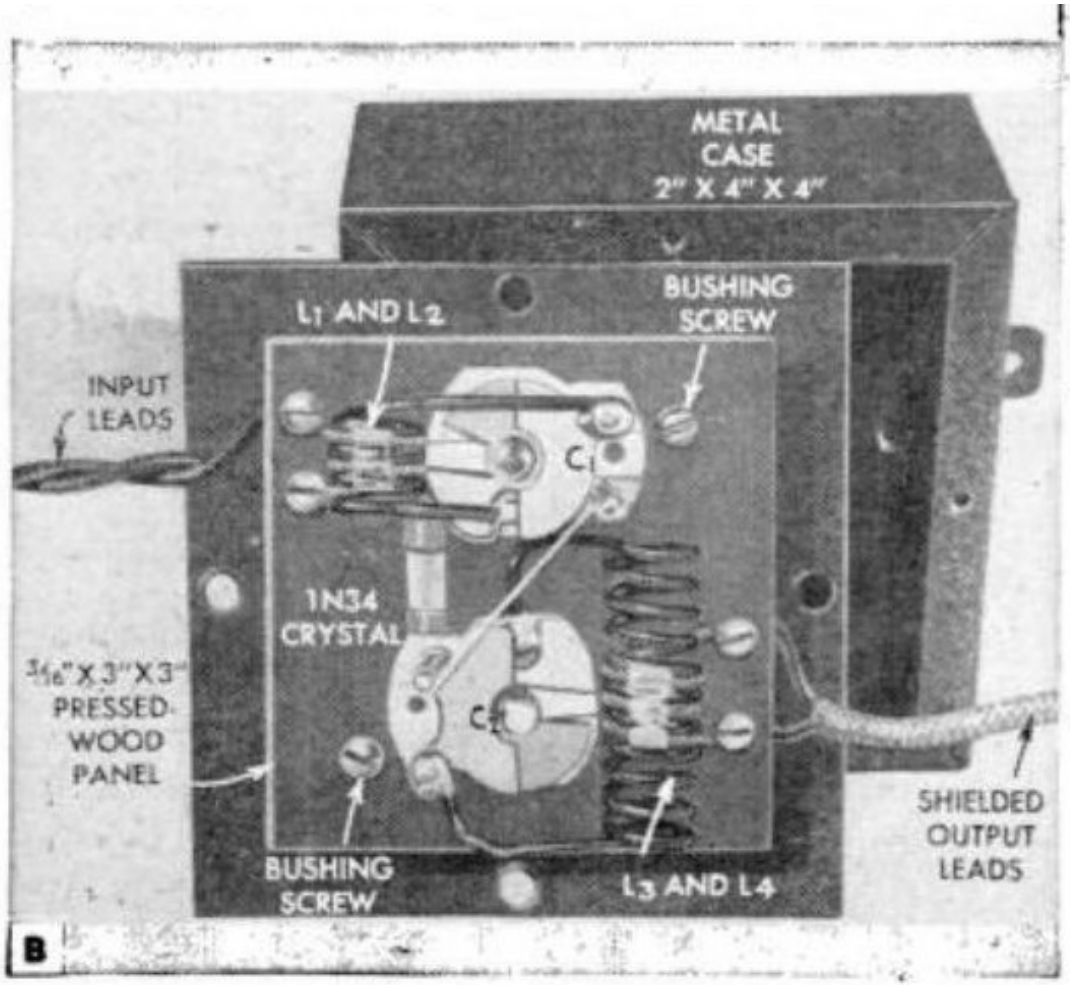
L2—4 turns of No. 12 enameled copper wire (space-wound and supported on C1)

L3—10 turns of No. 12 enameled copper wire (space wound and supported on C2)

L4—3 turns of No. 18 insulated hookup wire (interwound with coil L3)

Note—Coils L2 and L3 are space-wound about the diameter of the wire
All coils are wound on a $\frac{7}{16}$-in. form

2—"air trimmer" midget variable condensers (Hammarlund APC-25) or similar 7 or 8-plate "air trimmer" condensers C1 and C2


METAL CASE 2" X 4" X 4"
L1 AND L2
BUSHING SCREW
INPUT LEADS
C1
C2
1N34 CRYSTAL
3/16" X 3" X 3" PRESSED WOOD PANEL
BUSHING SCREW
L3 AND L4
SHIELDED OUTPUT LEADS
B

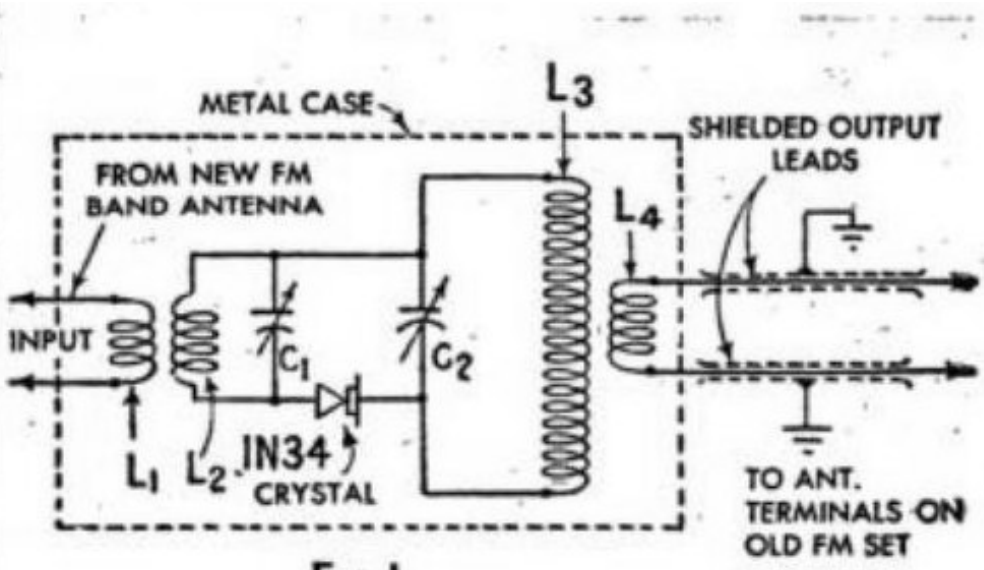

METAL CASE
L3
SHIELDED OUTPUT LEADS
FROM NEW FM BAND ANTENNA
L4
INPUT
C1
C2
L1
L2
1N34 CRYSTAL
TO ANT. TERMINALS ON OLD FM SET

FIG. 1

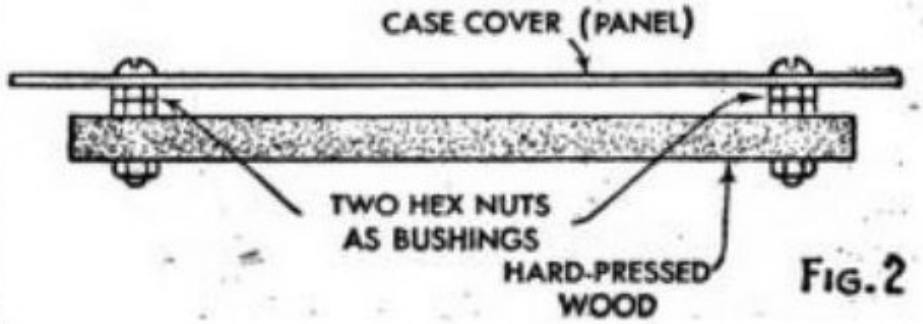

CASE COVER (PANEL)
TWO HEX NUTS AS BUSHINGS
HARD-PRESSED WOOD

FIG. 2