

WAVES FLOW LIKE WATER THROUGH TUBE!

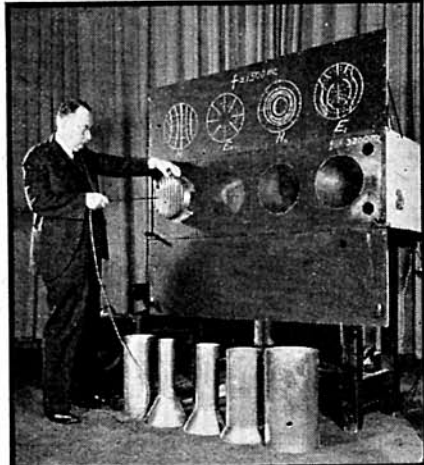


Fig. A. Dr. G. C. Southworth, of Bell Labs., shows how fins in proper plane pass waves.

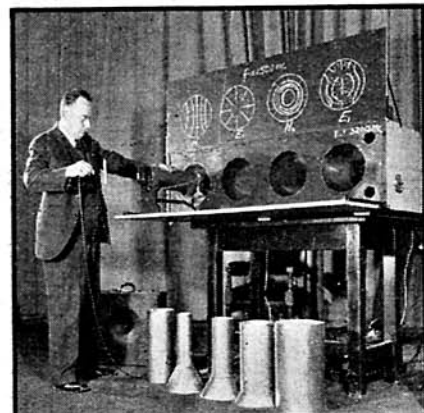


Fig. B. Then he illustrates how spiral partition makes same short waves rotate.

ELECTRIC WAVES that flow through pipes were demonstrated before the Institute of Radio Engineers last month by George C. Southworth, research engineer of Bell Telephone Laboratories. Holding a receiver at the end of a long flexible tube, Dr. Southworth showed that energy was flowing, regardless of how the tube was bent. But when the tube was interrupted, the tone from the receiver stopped, thus showing that the signal came through the tube and not through free space.

Standing in front of a blackboard, Dr. Southworth demonstrated by an electric probe that energy was coming through the blackboard at 4 different

points. By moving the probe he was able to delimit the energy-areas and by holding up a reflector a foot or so away from the blackboard, he was able to set up standing waves. Measurements made on the spot showed that the wavelength was about 20 centimeters, corresponding to a frequency of 15 hundred million cycles per second.

That the waves coming through the 4 different areas were not all alike was shown by two distinct methods. In the first of these, it was shown that certain of the waves would pass through relatively small pipes whereas others could be transmitted only through relatively large pipes. In the other
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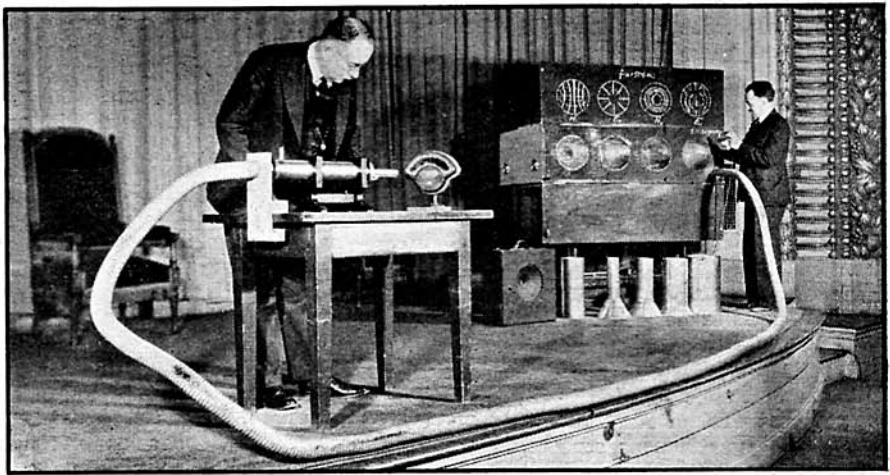


Fig. C. With an assistant, he demonstrates the passage of a 4-inch wave through a flexible metal pipe. This may be the answer to a major problem of television!

37 HOURS OF SOUND ON SINGLE 16 MM. REEL!

A REMARKABLE new sound recording and reproducing device, invented by J. Ripley Kiel, has been demonstrated in New York. Using 16 mm. unperforated film this device will record 40 sound tracks side by side and permit instant high-fidelity reproduction. The entire record of a court trial, political convention, complete

books, or the whole daily program of a broadcasting station can be given by this device without even the necessity of changing a reel of film. One reel will give 37 continuous hours of reproduction or any part thereof. Used in movie studios, it prevents costly delays because it will enable the directors to check up on the sound immediately,

without waiting for their regular film to be developed. The device causes the film to pass beneath a diamond-pointed stylus suspended on an axis in an electric field, which causes the sound waves picked up by a microphone to become indelibly pressed into the film. By the turn of a switch, another diamond-
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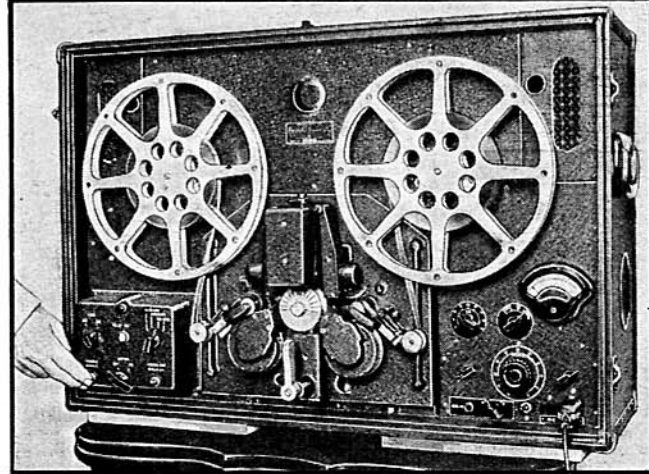


Fig. A. This recorder puts 40 sound tracks side by side on 16 mm. film, which plays 37 hours without change or rethreading!



Fig. B. No emulsion needed on this film.

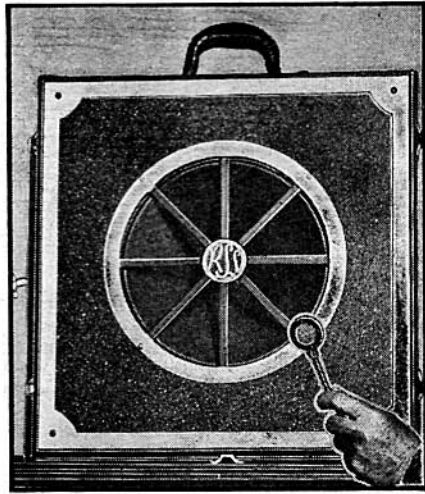


Fig. C. Reproducer and microphone. Note size; "mike" may easily be concealed.

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(While every precaution is taken to insure accuracy, we cannot guarantee against the possibility of an occasional change or omission in the preparation of this index.)

**BEGINNERS!—
BUILD THIS I-TUBE
LOOP RECEIVER**

(Continued from page 758)

the strength of the signal, which is then transformer-coupled (for further voltage gain) into the audio amplifying section of the type 19 tube.

If the diagrams are followed carefully and the batteries connected as shown in the pictorial diagram, then, the receiver will work "right off the bat." **Caution.**—At no time must the tube be permitted to get over 2 volts on the filament. A voltmeter will be useful to you.

Turn condenser C2 until you hear the purring sound which is characteristic of a regenerative receiver, or a whistle. If you hear a whistle turn the loop to such a position as to make the whistle loudest and then manipulate condenser C1 to bring in the whistle louder still. Now turn condenser C2 until the whistle just about disappears and your station will come in with amazing clarity.

LIST OF PARTS

- One variable condenser, midget type, 350 mmf., C1;
- One loop antenna (see text);
- One filament rheostat, 20 ohms, R2;
- One Meissner type 17028 trimmer-type (regeneration) condenser, 80-225 mmf., C2;
- One fixed mica condenser, 100 mmf., C3;
- One fixed paper condenser, 600 mmf., C4;
- One Meissner type 6846 R.F. choke, 80 mhy., R.F.C.;
- One Kenyon audio transformer, 3-to-1 ratio, A.T.;
- One I.R.C. carbon resistor, 2 meg., ½-W., R1;
- One filament on-off switch, Sw.;
- One 6-prong wafer socket;
- One single-circuit phone jack;
- One National Union type 19 tube;
- One Eveready "B" battery, No. 733, 45 V.;
- One Eveready "A" battery, No. 723, 3 V.;
- One metal box, any suitable size.

OPERATING NOTES

(Continued from page 747)

ceptible to oscillation due to feedback to the 2nd-detector.

RCA 125. Distortion in a number of cases may be found due to a leaking cathode bypass condenser on the 6B7 2nd-detector. This trouble is hard to identify and the condenser is hard to find. (See Fig. 4.) It is a 4-mf. electrolytic located between the resistor panel and chassis and may successfully be replaced with a 5-mf. electrolytic. The only indication of trouble in this case seems to be a slight lowering of plate voltage on the 6B7 2nd-detector.

Trav-Ler 50-A. Plays for about 5 minutes then fades slightly accompanied by distortion. The type 43 amplifier tube circuit goes into oscillation. The remedy is to reduce the screen-grid voltage on the 43 by inserting a 7,000-ohm resistor in the screen-grid lead. (See Fig. 5.) This will effectively block any tendency to oscillate.

Distortion and choked reproduction may also be due to failure of the audio coupling condenser C1, as described for the Grunow 7A receiver (see Fig. 2).

VICTOR I. DUDLEY,

**37 HOURS OF SOUND ON
SINGLE 16 MM. REEL!**

(Continued from page 728)

pointed stylus will instantly reproduce the recordings. After one sound track has been impressed on the film, the machine is so designed that the diamond stylus will move over slightly to cut the next track. This applies to the entire reel of 2,000 feet or any part of it. The recordings are practically indestructible, for after 1,000 renditions there is no appreciable wear or loss of quality of reproduction. A test strip of this sound film was first frozen, then heated to 160 deg. Fahrenheit, and then scrubbed with a stiff brush without causing any ill effects. The film has no photographic emulsion, is not perforated, and is a specially-prepared acetate cellulose base.

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