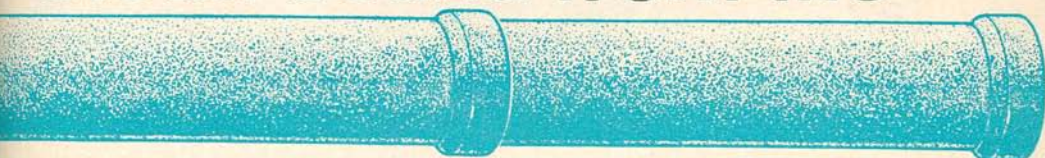


**Want to build a low-cost,  
vibration-free speaker system?  
Just take a single 8" speaker,  
house it in (of all things!)  
a 3-foot section of sewer pipe,  
then sit back and enjoy . . .**

## Clean sound from the



# DRAINPIPE 8

**F**ROM the many articles and books written by G. A. Briggs, Britain's famed authority on speakers, it is evident that he seeks the kind of solidity in speaker enclosures ordinarily found in his country's Rolls-Royce cars. When I first read of Mr. Briggs' sand-filled and brick baffles, I admired his thoroughness and uncompromising dedication to the art. However, still the victim of old habits, I then went out and bought some plywood.

The plywood made a very good "box," but the thought of Mr. Briggs' inflexible brick "walls" continued to obsess me. Every time I sat before a fireplace or crouched over the coals of a brick barbecue, I wondered how a hi-fi speaker would sound in them. I thought the fireplace idea had some merit, but stereo came in, and there just didn't seem to be many houses with twin fireplaces!

Considering how much I had been impressed with the possibilities of brick, it's remarkable how long I overlooked a good substitute—sewer pipe! After I

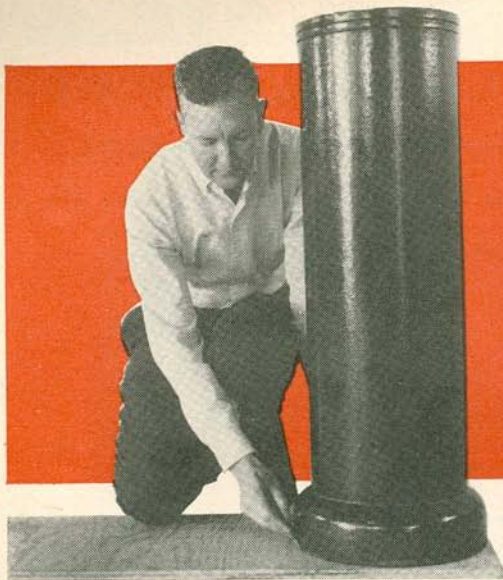
By **DAVID WEEMS**

got over the initial "shock" of my idea (a sewer pipe is a rather unlikely candidate for a speaker baffle, needless to say), I visited the local lumberyard. Sewer pipes were there all right, not displayed as prominently as the plywood, but definitely available.

The pipes, for your information, come in two kinds: smooth tile, and a rough concrete that they almost pay you to haul out. I chose the tile. And here, after some paper work, a number of trials, and quite a few errors, is the result—a speaker enclosure to satisfy even the proverbial "purist," and at a cost of less than \$10.00.

**Materials and Dimensions.** After experimenting with two sizes of pipe and various speakers, I fixed the inside diameter of the pipe at 10 inches, which happens to be a standard dimension. The "Drainpipe 8" was designed to accommo-





date an 8" speaker, so don't try to squeeze in a 10-incher—you'd probably be disappointed. And in case you're eyeing the dimensions and wondering if the internal volume is sufficient (as I did at first), don't give it a second thought. In spite of its small physical size, this enclosure *sounds* "big!"

Materials should be no problem. For the pipe, check with the nearest lumberyards or, if they don't have any, with distributors of concrete products. The polyurethane foam plastic can be obtained from many sources, but I got mine from an upholstery supplier for only \$1.25. The "Art Foam" that serves as gasket material is carried by many "dime" stores. Picking up the other materials should be routine procedure.

The dimensions for the various parts are listed in the Bill of Materials, but you may have to make minor changes due to variations in the pipe.

**Marking and Cutting.** A good fit can be insured by using the pipe as a pattern for marking out Parts A and C (the "end plugs" for the pipe—see photo at left, above, and the drawings on page 62). Although Part D (the plywood ring which forms the top) doesn't have to fit the pipe, it's best to make it perfectly round with a diameter equal to that of Part C.

Part B, the acoustic filter, should then

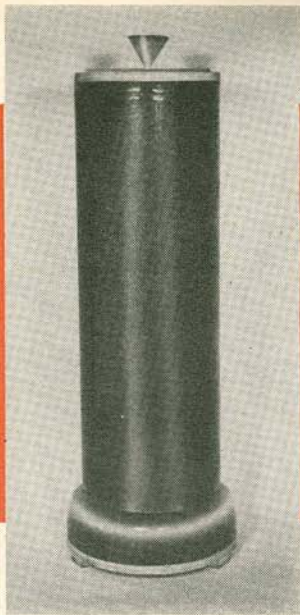
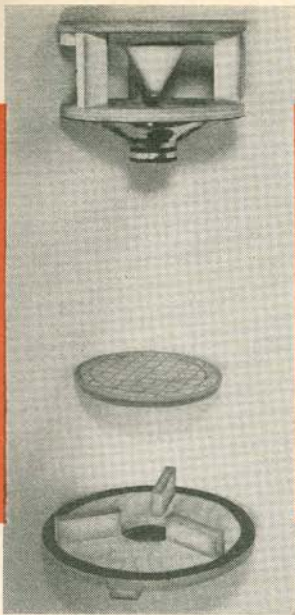
be marked on a radius of  $4\frac{7}{8}$ " from the center of Part D. If you don't have a saw that makes its own opening, you can drill a small hole just inside the boundary line for Part B and plug the hole later. The acoustic filter, incidentally, is purposely cut smaller than the pipe's inside diameter. This allows the weather stripping to make the snug fit required to prevent unwanted air leakage and hold the part firmly in position.

After Part B has been cut from Part D, mark out the pattern for the 49 quarter-inch holes in Part B by first drawing two diameters at right angles to each other. Then draw lines parallel to each diameter at 1" intervals. Finally, using a 4" radius, draw another circle and drill at each cross-point that lies inside the circle or touches its boundary. When the weather stripping is attached, the filter can be placed into position in the pipe.

The base (Part A) should be prepared as shown; the 4"-diameter hole in its center serves as the bass-reflex port. For extra solidity, the short lengths of  $\frac{3}{4}$ " x  $1\frac{1}{2}$ " material (Part E) should be screwed as well as glued in place.

Note that the pieces used on the top of the base are set on edge to act as "ribs" or stiffeners as well as to locate the pipe on its base. They may have to be trimmed slightly with some kinds of





Because it requires a minimum of woodworking skills, the "Drainpipe 8" should be a pleasure to build.

To insure a proper fit for the top and bottom end plugs for the pipe, it's best to use the pipe as a pattern (see photo on page 60, left); the acoustic filter, Part B, should then be prepared exactly as described in text (see photo on page 60, right). Photos on this page show (1) various parts, minus pipe, as they appear in relation to one another, and (2) an open-top model without the top ring.

pipe, so check the fit before you mount them permanently. The bottom "feet" are turned on their sides to provide  $\frac{3}{4}$ " clearance from the floor and spaced equally between each top rib; the edge and bottom of the base can be painted to match the color of the tile if you wish.

There is no mandatory plan for the top of the enclosure as there is for the bottom. After Part C has been cut out, you are ready to finish off the top as you like. For best results, you should use some kind of treble diffuser, such as the funnel shown in the photos.

**Treble Diffuser.** The simplest plan is to mount a 3" or 4" funnel on a narrow strip of wood over the speaker. This is done by cutting off the funnel neck at the bottom of its conical section, and screwing the funnel in place with a wood screw and a washer large enough to prevent the head of the screw from going through the funnel neck. Then mix enough plaster of Paris to fill the funnel. If you wish, you can also use some plaster of Paris to fill in any chips or unevenness in the pipe.

To improve the appearance of the enclosure, the ring (Part D) may be used, with the area between Parts C and D as well as the opening in Part D covered with grille cloth and trimmed with "wood tape." Part D is held at the correct

height by three of the nine pieces of  $\frac{3}{4}$ " x  $1\frac{1}{2}$ " material specified in the Bill of Materials.

A round piece of grille cloth may be cut and tacked under the ring (Part D), and a piece of the  $\frac{3}{4}$ " x  $1\frac{1}{2}$ " wood about 11" long (Part F) glued and screwed across the bottom of Part D. The funnel, in this case, can be fastened to the cross-piece with small nails in a position that will place it over the center of the speaker, or over the tweeter if you use a co-axial speaker.

It's possible that some kinds of pipe will require more than a 36" length of grille cloth. Of course, if the enclosure is to be set in a corner or against a wall, a slight gap will be no problem. But if all sides are to be visible, you may either have to buy a longer strip of grille cloth or use a vertical strip of wood tape to camouflage the gap.

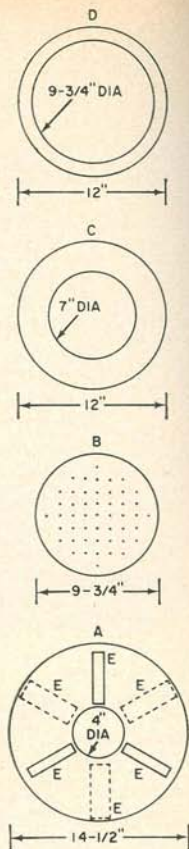
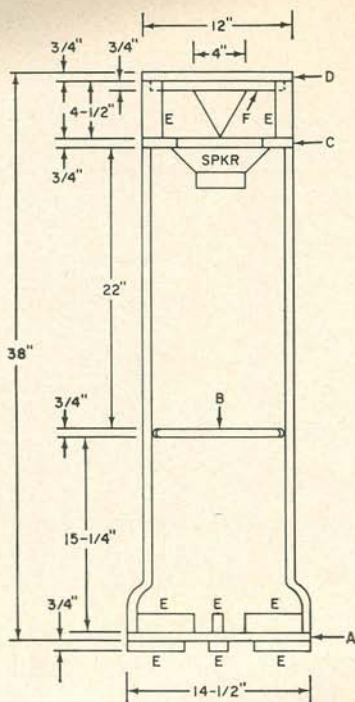
Wood tape is very easily attached around the top ring (Part D) and the speaker board (Part C) because of its almost paper thinness and complete flexibility; small brads and glue should do the job nicely.

**Finishing Touches.** Before final assembly, the "Art Foam" which serves as a gasket for the speaker board (Part C) and the base (Part A) will have to be cut and glued in place. In the case of



## BILL OF MATERIALS

- 1—3' section of 10"-i.d. sewer pipe, concrete or glazed tile
- 1—15" x 42" sheet of 3/4" plywood (for Parts A, B, C, and D)
- 9—1 1/2" x 4 3/4" pieces of 3/4" pine (for parts labeled E)
- 1—1 1/2" x 11" piece of 3/4" pine (for junnel holder F)
- 1—22" x 30" sheet of 1" polyurethane foam plastic (for lining above filter)
- 1—15" x 30" sheet of 1" polyurethane foam plastic (for lining below filter)
- 1—12" x 36" sheet of 1/8" foam plastic, known as "Art Foam" (for gaskets)
- 1—3' length of vinyl-covered foam plastic weather-stripping (for filter gasket)
- 1—5 1/2" x 36" length of grille cloth (for side grille)
- 1—11" diameter round piece of grille cloth (for top grille)
- 1—Package of "wood tape" (for top trim)
- 1—4" or 5" plastic funnel (for treble diffuser)
- 1—Small lead swivel casting sinker or other conical plug (for use with junnel)
- 1—8" PM speaker
- Misc.—Plaster of Paris, glue, wood screws, tacks, brads, additional material for padding, etc. (see text)



These drawings show sizes and placement of all parts in the "Drainpipe 8." Speaker can be almost any high-quality 8" unit.

the speaker board, the art foam may be cut to the same diameter as the board and first glued to the entire surface, then trimmed away from the speaker opening. Used this way, it forms an extra gasket for the speaker itself as well as a gasket between the pipe and the board.

The walls of the pipe should be lined with the polyurethane foam plastic both above and below the acoustic filter; it isn't necessary to use glue here unless desired. When the glue has dried on the gasket material, set the pipe on its base, mount your speaker, and you're ready to listen.

A mismatch between your speaker and the enclosure is unlikely, because most good 8" speakers have similar fundamental resonances. If a mismatch should occur, however, there is an easy cure. Simply fill the entire pipe, above and below the filter, with some kind of padding. This will cut down on the efficiency somewhat, of course, but it will also

broaden the "Q" or tuning of the enclosure. Another solution is to tune the pipe as you would any bass-reflex enclosure by covering part of the hole in the base.

Actually, the shape of any enclosure will affect the sound, and the "Drainpipe 8" is no different than any other enclosure in this respect. The acoustic filter does much to eliminate any effects of the round "organ pipe" shape, which in itself is admittedly not ideal. Some people will prefer more padding—just remember to use the minimum amount of padding (except for the walls) that will remove peaks in the response, and you won't suffer any unnecessary loss in efficiency.

Bouquets and superlatives for this neat little system are hardly called for if you keep one fact in mind. Once you get used to listening to this vibration-free setup—as I have, you'll never again be satisfied with makeshift wooden "boxes."