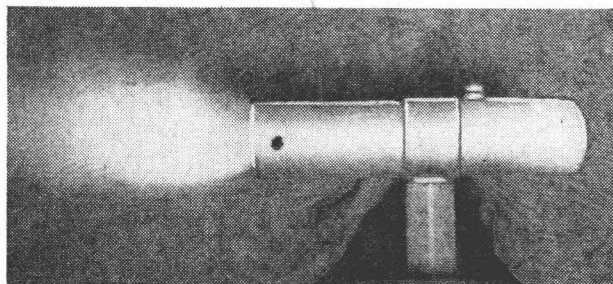


Jet Model Engine



Here's that neat little jet job you readers have been calling for



By PAUL NIKULKA

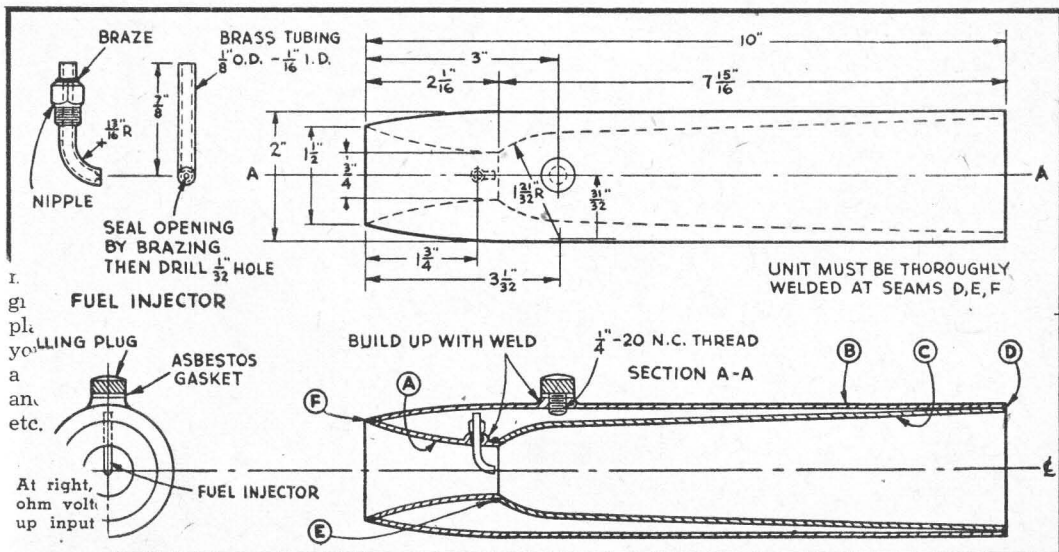
THIS ram-jet motor is presented here by special request of the hundreds of SCIENCE AND MECHANICS' readers who saw the photograph of it which appeared in the Readers' Round Table (p. 26, Oct. '48, S & M). It can be made from a few odd pieces of aluminum which you may obtain from a sheet metal shop or the nearest hobby center. Also the tools required are within the scope of most experimenters. All set? Let's go!

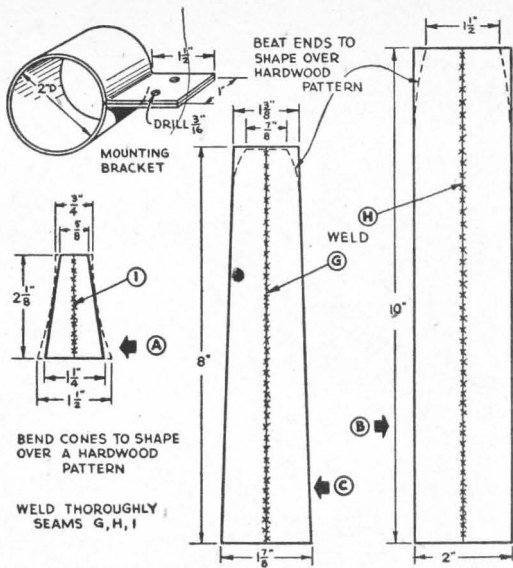
Make up the main sections (A-B-C in the drawings) from $\frac{1}{16}$ in. sheet aluminum if you have it. If not, $\frac{3}{64}$ in. sheet aluminum will do. First lay out the two cones A-C on a suitable piece of cardboard and then trace them onto the metal. Then carefully cut these out and roll them to required shape over a hardwood pattern, using a sheet metal roller or a wooden or plastic

faceted hammer or mallet. Now make up the main cylinder (B in drawings). This is a lot easier because it is a straight tube. When this is done, have the seams welded. Using a file and piece of emery cloth, smooth down the welded seams.

Now you are ready to form the curved shape of the three tubes (shown in dotted lines). This is done cold, as it is not necessary to heat the ends of the tubes. Place the hardwood patterns inside of the sections, making sure these are long enough so that one end may be held in a vise and the work can turn freely. Next beat the metal to its required shape with a mallet. When this is done you can weld the two sections (C-A) together; there is no need to dress this weld.

The next step is to make up the fuel injector (see detail drawing). The nipple is part of an elbow type grease fitting which may be bought





at any auto parts retailer. Since the nipple is hardened steel it must first be annealed before it can be shaped. Cut off the ball ends, and drill to required tubing size. It is not necessary to tap the hole into which injector is fitted through the intake throat, since the nipple has a pipe thread; make this hole a self threading affair. With the fuel injector snugly screwed into the intake throat we may begin work on the filler plug. The plug itself may be made up of a piece of bar aluminum stock and the hole in it is threaded using a $\frac{1}{4}$ -20 NC-tap.

Next begin to fit the internal and external sections together, and have the unit thoroughly welded at both ends. Then clean and dress the welds to the required shape. There must not be any leaks in these welds. Make up a mounting bracket as shown in the drawing and fasten it to the engine, but do not weld these two together, as this is a friction fit.

For the testing stand secure a 5 ft. arm made of aluminum tubing, or hardwood bar, and make a solid base on which this arm may freely rotate horizontally like a merry-go-round. Fasten your motor to one end, and a streamlined counter-balance at the opposite end. To make sure base of testing stand is not rickety, place 4 bricks on its base to be on the safe side.

To operate the engine, first fill the jet engine with wood alcohol (methyl hydrate). Then tighten filler so that it is snug but not too tight. Make sure filler plug is on top of the engine. Next, wire some alcohol soaked waste material to the end of a 3 ft. piece of wood stripping and ignite the torch. Place torch beneath jet engine until alcohol begins to boil. Then, when engine begins to hold its own flame, remove torch and stand clear. The model will gradually kindle and accelerate on its own. Remember always when you're working with inflammable material take the proper precautions. This engine is a toy!