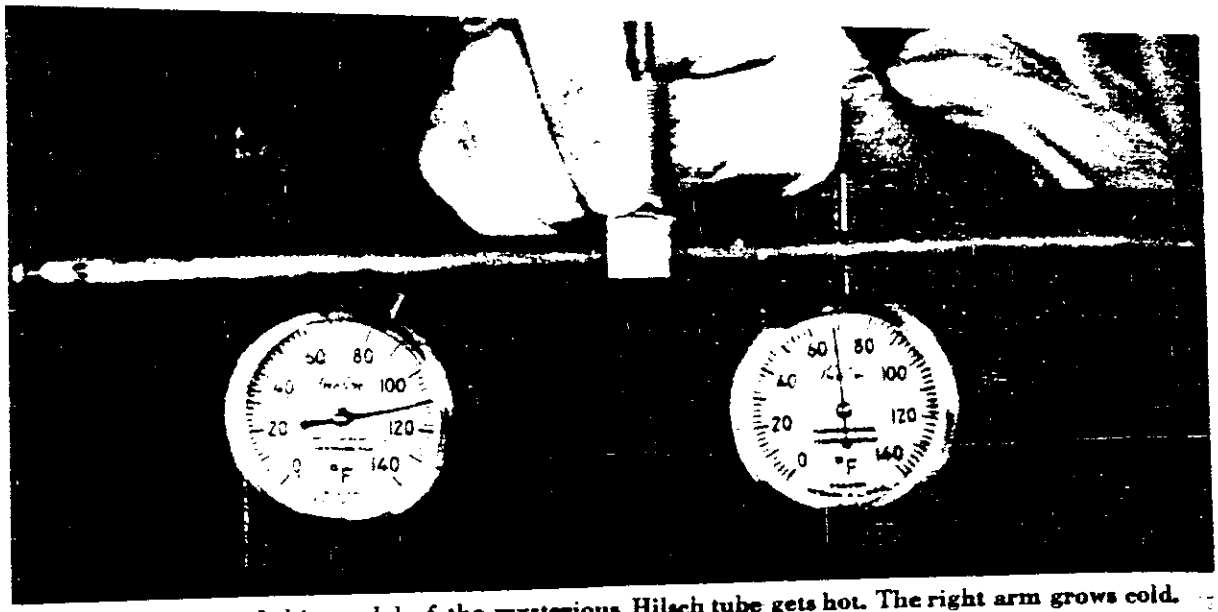
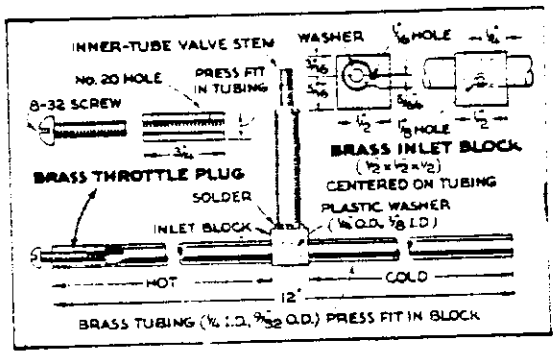


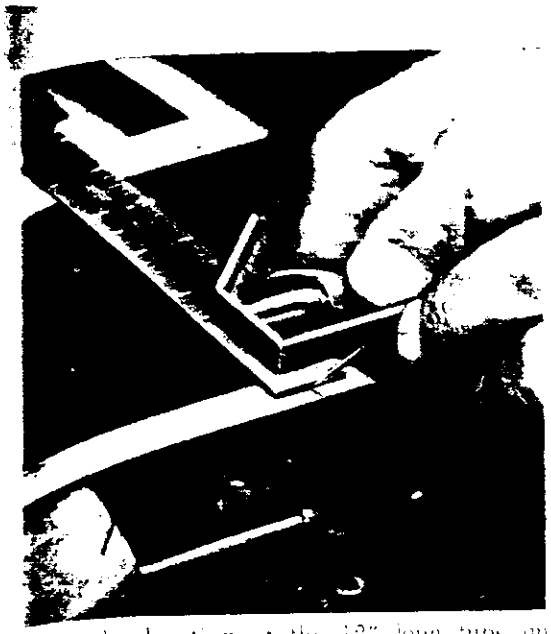
The left arm of this model of the mysterious Hilsch tube gets hot. The right arm grows cold.

Homemade "Maxwell's Demon" Blows Hot and Cold



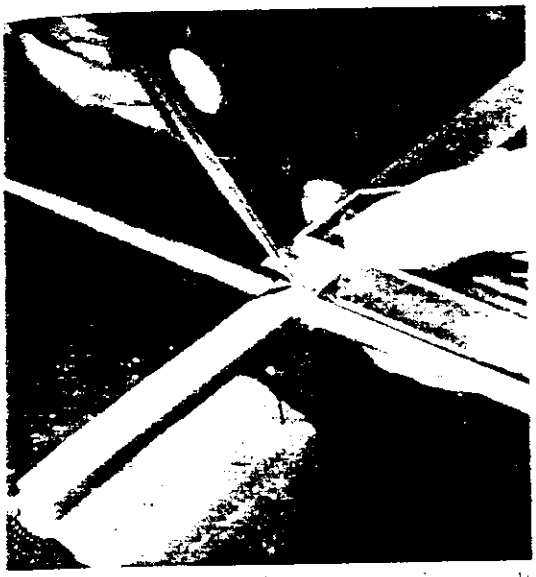
THE magic Hilsch tube that imitates Maxwell's imaginary demon by blowing hot and cold at the same time (PSM, May '47, p. 144) can be made at your own workbench and operated at the nearest gas station. A simplified version was designed for Popular Science readers at the RCA Transmitter Laboratory, Rocky Point, N. Y., where research on this curiosity of thermodynamics goes on.

PSM's Hilsch tube was made in a few

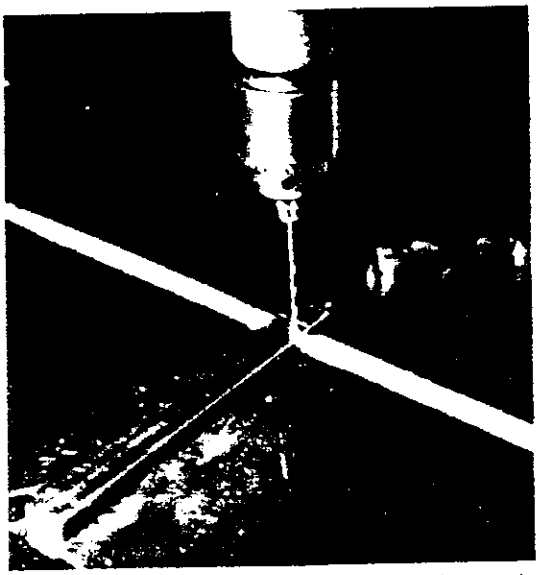


Mark the location of the 12" long tube on one ½" square brass stock upon which the inlet will be cut. At this point drill a hole that will be a press fit for the ½2" tubing.

Carefully drive the tube through the hole so that the two arms are approximately the same length on both sides of the inlet block. However don't cut the block off as yet.



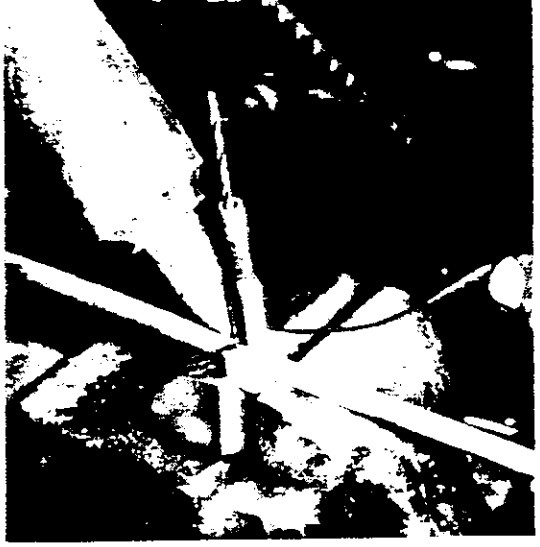
Locating the inlet hole is a crucial step. It must be tangent to the inner wall of the tube, 3/64" from the center of the first hole, to create the necessary whirlpool effect.



Drill a 1/16" hole straight down, but only just through the tube wall. Drilling across the tube may cause it not to work. Counterbore the inlet hole ⅜" to about half its depth.

minutes with simple tools. When it was hooked to a filling-station air hose, one arm became too hot to touch, while the other gathered frost. Connect your Hilsch tube to an air line having between 75 and 100 lb. pressure. With the throttle wide open, both arms will be at the same temperature. Close the throttle about half way, and the cold arm reaches its lowest temperature. Close it almost entirely, and the hot arm reaches its highest temperature.

What makes it work? Physicists can't agree on an answer, even though the inventor, Dr. Rudolph Hilsch, of Erlangen, Germany, has published his own explanation. But some practical applications have been suggested. C. W. Hansell, RCA engineer, thinks it might cool the cabins of supersonic planes, combating the tremendous heat generated by skin friction at high speeds. Since the inlet could be located on a leading wing edge, pressure, and therefore



Now saw off the inlet block. Remove the valve from an inner-tube stem and cut off the base. Push a 1/16" drill through to align it with the inlet hole and solder all around as above.

A plastic or wood washer (not metal) that will be a push fit in the tube is needed. The hole in it is about ¼". Make the washer, if necessary, from a dowel or slice it off a tube.

Insert the washer in the tube, marking the end from which you do so. This will be the cold arm. Stick a 1/16" rod through the inlet and push the washer against the rod as above.

Cut a piece ¾" long off some ¼" brass rod. Drill through lengthwise No. 28 and tap 8-32. Press this into the hot end of the tube. Drill a No. 20 hole right through both tube and rod.

the cooling effect would be automatically controlled by air speed and density, increasing as skin friction goes up, decreasing as it lessens.

Although most of the dimensions shown in the drawing aren't critical, the location of the air inlet must be tangent to the inner wall of the tube to set up the whirlpool effect necessary to operation. The 1/16" inlet hole must be drilled just far enough to break smoothly into the tube, but not so far as to nick the adjacent part of the wall. This might destroy the vortex effect desired.

If you can't find a suitable fiber washer or cut one off a fiber or plastic tube, drill a ¼" hole in a slice of ¾" wooden dowel.

The throttle is a short length of ¼" rod tapped for the throttle screw. It's inserted in the hot end of the tube without the screw, and a No. 20 drill is run right through both tube and throttle. If it's too loose a fit in the tube, coat it thinly with solder. END