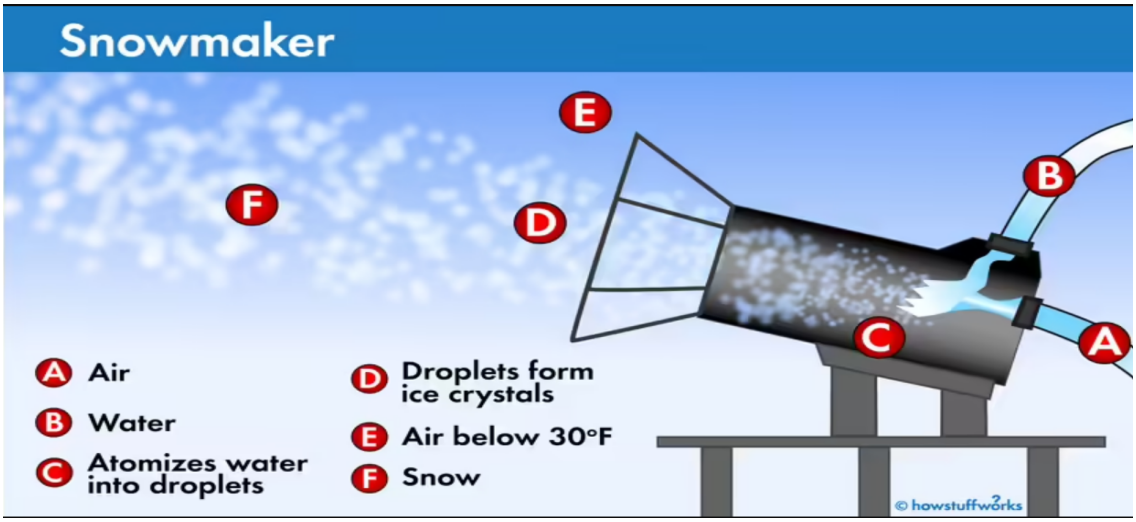
Basics of Snow Gun Design

The most important part of any snowmaking system is the snowmaking machine called a snow cannon or snow gun. Snow guns are positioned along the ski slopes and spray the area with artificial snow made from water and compressed air. A variety of snow gun designs exist, but most of them have these four parts in common: compressors, pumps, fans, and controls. The first commercially successful machines were developed in the1950s. Snow gun technology has advanced rapidly since winter sports have become so popular.



A central piece of the snowmaking machine is the fan assembly. This is where the air/water mixture is changed into tiny droplets and ice crystals and then blown out onto the slope. The fan is similar to a typical house fan as it has a rotating propeller blade attached to a motor for changing its speed. The snow fan assembly is contained in a long steel duct that is open on both ends. As the blades of the fan move, air is drawn in from one side of the duct. This side is covered with a screen to prevent foreign objects from entering the assembly. The other end of the fan duct is where the water spray, compressed air, and in some designs, a nucleating ingredient combine to form the snow. The nucleating component is a biodegradable protein that helps the water molecules to form into crystals.

The snow gun fan assembly is attached to hoses bringing in the water and air. The other end of the hoses are connected to a series of compressors and pumps that move air and water through pipes up the mountain. The snow gun fan assembly is mounted on an oscillating stand. Its ability to rotate allows snow to be spread over a greater area. Depending on the design, the placement of the snow gun can be just off the ground or attached to a high tower. A control box for the snow gun is typically located at its base and includes switches to operate things like the water flow, fan rotation, and oscillation speed. Improved technology allows some control boxes to be operated by a remote computer.

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