Fitting Air Conditioning to Golf Club Needs

By D. E. FEINBERG

The general public has become more conscious of water shortages recently than ever before and golf clubs, often with course watering problems and expenses, are aware that water is an asset to be handled with judgment. Cities all over the country have found and are finding that water is not the inexhaustable resource many thought it to be. Water tables, which were assumed to be maintaining their levels, were found to be dropping alarmingly and, in many cases, disappearing completely. A few farsighted individuals realized at the beginning that unlimited exploitation would lead to only one thing — depletion of precious water resources. Not until fairly recently was it realized that those who cried conservation spoke prophetically — for the truth of their words was brought home forcibly, and in some cases, with dramatic suddeness. As a result, with water resources fast diminishing, cities and even states began legislating conservation. Laws and regulations are coming into effect limiting the use of water. Large sources of water waste are being found and stopped. Installations using large amounts of water are being curtailed.

Naturally this affects air conditioning, which is a large user of water. In the past numberless gallons of water have flowed over condensing coils and into the sewer; passed through cooling coils and into the waste system. Being such a huge water consumer, air conditioning is the target of many of the new rules and regulations against water waste, and rightly so. Of course, all this affects you who were going to put in an air conditioning system to cool your clubhouse. The question naturally arises in your mind: "Since I am limited in the use of water, what kind of air conditioning will I be able to put in?"

First of all, the prime requisite of your air conditioning system, whatever it is, will be to save water. Since water is almost universally used to cool the refrigerant in a refrigeration system, and to cool the air in an evaporative system, water saving can be quite an item.

How Refrigeration Works

In a refrigeration system, the cold refrigerant extracts heat from the air, if it is a direct expansion system; or extracts it from water which in turn extracts it from air, if it is an indirect system. After the refrigerant passes through the coils and cools the water or air passing over the outside of the coil, its heat content has been increased by the amount of the heat it extracted. If this heat can be taken out, the refrigerant can be used over again. Cooling the refrigerant, or condensing as it is called, is almost universally done with water in air conditioning work. With an unlimited water supply it is a simple matter to pass the water over the condensing coils, extract the heat from the refrigerant, and waste the hot water into the drain. But the whole object now is to save water, so the condensing water cannot be wasted. Somehow it must be cooled so that it may be used over and over again to do its job of condensing the refrigerant.

One of the most popular methods of cooling this hot condensing water is by use of an evaporative condenser. In the evaporative condenser, water passes over coils through which the hot refrigerant gas is flowing and, by means of a blower, air is blown upwards counter to the flow of water. This stream of air causes a small amount of water to evaporate. As you know, having had water evaporate from your hand and experiencing the resulting coolness, evaporating water extracts heat. In the evaporative condenser, the water evaporated from the coils extracts heat from the refrigerant gas and condenses it back to a cold liquid, ready for another cycle of cooling. Only a small amount of evaporated water is needed to do the job of extracting the necessary heat. The water that is not evaporated is recirculated. The water lost is the small amount evaporated and carried away by the air flow, and represents the amount that must be made up from a fresh water supply. The evaporative condenser saves over 95% of the water normally used in a water cooled condenser which wastes its cooling water to the drain. Initial cost is, of course, higher than for a water cooled condenser, but this cost is quickly made up in the water it saves.

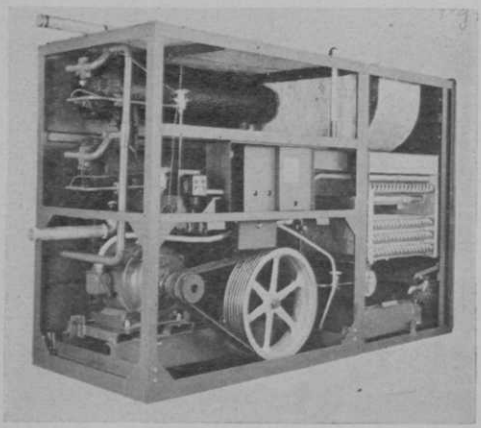
An evaporative condenser is either integrated with refrigeration equipment or is a separate unit by itself. Most modern refrigerated air conditioning systems employ packaged refrigerating units, containing the refrigerating system, water or air cooling and circulating system, and condensing system. The evaporative condenser

is integrated as a unit into the "package" where specified. Otherwise a water cooled condenser is used.

If an existing refrigeration system uses a water cooled condenser and it is desired to switch to an evaporative condenser for water conservation or cost reasons, a separate evaporative condensing unit can easily be hooked into the refrigeration system in place of the water cooled condenser.

Cooling Tower Use

Another method of saving condensing water is the cooling tower. The cooling tower is used instead of the evaporative condenser for two main reasons: (1) if there is a problem in disposing of the hot air from an evaporative condenser, and



Refrigerated air conditioning unit containing refrigerating system, air or water cooling and circulating system, and condensing system.

(2) if there are several condensing units it is usually easier to take care of all of them with one cooling tower than use a separate evaporative condenser with each.

A system using a cooling tower depends upon water already cooled, rather than upon water in the process of evaporation, to remove heat from the refrigerant gas. Water colder than the gas to be condensed is passed over coils carrying the refrigerant. After removing the heat from the gas and condensing it the now warm water is pumped to the top of a tower and sprayed or dripped through an air stream. The heat is removed from the water and carried away by the air stream, and the cooled water is ready for another condensing cycle. Again, as with the evaporative condenser, the only makeup water needed is that lost by evaporation. The tower is as effective as the evaporative condenser in saving water. The cooling tower can be located inside or outside the building.

The packaged refrigeration equipment used with the cooling tower uses a water cooled condenser in place of the evaporative condenser, with cooling water supplied by the tower made for that purpose.

In general, the evaporative condenser is slightly more efficient than the cooling tower, but considerations which indicate the use of a cooling tower may far outweigh this reduction in efficiency. Each installation should be considered separately as to the advisability of using a cooling tower or evaporative condenser. Just because an installation at another club or in the city has one type is no sign that such a type is suitable for the installation under consideration. Each installation must be judged in its own light.

A popular method of comfort cooling, especially in dry, hot climates, is evaporative cooling. This system is not air conditioning in the strict technical sense of the word but it does extract heat from air and circulates the cooled air through the area to be cooled. It operates by drawing air through water soaked mats. The evaporating water removes heat from the air, and the blowers circulate the cooled air through the area to be cooled. In water-restricted areas the water used to soak the mats cannot be wasted to the drain after using. It must be collected and used over again. This is done by means of a circulating pump which pumps the water that has collected in the drain to the top of the evaporative cooler, ready for re-use. The pump and piping mean extra expense, of course, but this generally can be made up by the savings in water effected.

The two general methods of air conditioning associated with refrigeration equipment are those using unit air conditioners and those using packaged air conditioners.

Unit air conditioners are located away from the central refrigeration system and contain only filters, cooling coils, and blowers. A unit of this type for conditioning a large area can be placed on the floor but ceiling suspended types are also available. A unit air conditioner for conditioning small or average size rooms takes up little room and also is available in a suspended type if desired. Piping brings in the heat transfer medium, usually water, which has been cooled by the refrigerant, to the unit air conditioner, where it is passed through the cooling coils. Blowers pass air over the cooling coils which extract heat from the air, and the cooled air is circulated over the area to be conditioned. One central refrigeration system serves a number of these units, which are used where it is desired to condition many separate rooms or areas. The only connections needed are the two pipes carrying the cooling medium to and from the unit, and the drain connecting to the drainage system. Connecting to the electrical system brings power in to the blower motors. This system is popular, especially since it eliminates the use of ductwork that is often awkward or impossible to install in old

buildings, and that takes up valuable space in new. Another advantage is that each unit can be controlled independently of all others in the same system. This means that occupants of each room can control temperature, circulation, and amount of fresh and recirculated air to suit themselves.

Packaged air conditioners contain the refrigeration equipment, the condensing equipment, and air cooling and circulating equipment in one unit or "package". A small unit is generally placed directly in the room to be conditioned, but also may be placed in the basement or separate room and connected to the room by ductwork through which the cooled air is blown. A large packaged refrigeration unit is always connected by ductwork to the room or rooms for which it is furnishing conditioned air.

Relax Now, Boys, Here's the Junior Story Correction

Ralph E. Miller, chmn., Junior Golf Assn. of California, unjustly raps Joey Rey for a statement in an article on junior golf in May GOLFDOM, for which GOLFDOM's editor in editing the Rey material alone was responsible.

Miller advises GOLFDOM:

"Our Junior Golf Association was formed jointly by the three associations representing organized golf in Southern California. It was not proposed by either of them, and in fact was proposed to them by persons who are strictly amateurs.

"However no one individual claims or asserts any greater credit than any other, and certainly no one association claims greater credit, and in the interest of co-operation none would presume to make such claim.

"The statements of Mr. Rey were not only incorrect but were known by him to have been incorrect, and were extremely ill-advised.

"Our Junior Association is a splendid organization and is on a sound basis. It was used as a pattern by Northern California Golf, and has been recommended as a model by the USGA. Its progress requires the full co-operation of everyone concerned. The Board of Directors does not recommend any action or claims by any one association or individual which might tend to create misunderstanding among us, and certainly mis-statements of fact are not condoned."

Miller's letter to Rey, sent "pursuant to the unanimous direction of the board of directors" (of the Junior Golf Association of Southern California) makes regrettable charges that, in all calmness and justice, call for an apology to Rey as cheerful and as complete as the one we hereby make to the irate directors.

Rey, not a PGA member, but nevertheless an earnest and competent promoter of junior golf and active in other matters in which PGA members and amateurs of all ages receive direct and indirect benefit, had nothing to do specifically with writing the offending paragraph in which the California PGA sections were given credit for the junior association idea. In his letter, sent GOLFDOM in answer to a request after hearing from golf salesmen, newspapermen and parents, about his successful junior work, Rey paid high tribute to PGA members for their great work in teaching and otherwise helping the juniors. Our misinterpretation of this commendation, based on our observation of a tremendous amount of work the Southern and Northern California PGA sections do in helping develop junior golf, caused the H-bomb explosion in the teapot.

It's all our fault, so shoot if you must this old gray head, but spare the Juniors' flag, he said.

Incidentally, just to make the case one for a good laugh all around, Rey had sent the check we'd mailed him for the story material, to the Cerebral Palsy drive, before he learned that he was blamed for our ghastly error.

So sorry, boys.

PAT'S PRIDES REPEAT

Pat Markovich, pro-mgr., Richmond (Calif.) GC coached this squad to repeat its 1951 win of the regional high school championship. The majority of the kids are products of junior class instruction at the Richmond GC; others are caddies. Four of the lads are seniors and will have to be replaced for the 1953 campaign. They play a 5-man team. The boys get a chance to play the Richmond course during vacation and get coaching during the scheduled season. They are (L to R): Elmo Bradley, George Starn, Ed Smith, Sonny Townsley, Larry Gerhard, Jr.; Bob Snelling, Jr.; Bob Schaefer and Red Martin. Snelling was the squad's star and won the Richmond City Junior.