

Solar dryer to help India's farmers

CORT COLLINS, Col. — A Colorado State University engineer has begun work on a project designed to help village farmers in India become more productive by using solar energy to dry their crops.

Charles Smith, a civil engineer at the university's Solar Energy Applications Laboratory, is developing plans for a multi-purpose solar grain dryer in cooperation with a colleague at Annamalai University in southern India.

The project is financed with a \$200,000 grant from the U.S. Agency for International Development.

Scientists at Annamalai University are active in solar energy and rural development. Smith said CSU was selected to participate because of its experience in solar energy and developing-countries' technologies.

Smith said he expects to help

develop a solar dryer that with few modifications also might be used to heat water and serve as storage and housing space as well.

He said the project goal is a cheap, easy-to-build solar dryer that would require no electrical back-up system.

"A farmer in India might be able to increase productivity by as much as 30 percent with on-farm drying and storage of such crops as rice and various spices.

"One spice, cardamom, can bring a very good price, but its value as a cash crop is highly dependent on proper drying," Smith said.

He pointed out that rice, spices and other crops in India often are dried inefficiently. On his last visit to India, Smith said, he noted that rice often is dried simply by spreading it on roads.

"Obviously, the loss, damage and hygiene problems associated with this practice are numerous," Smith said.

Smith is active in research and development of solar devices for American farmers, but he stressed that developing a solar grain dryer Indian farmers can use will require a different approach.

"In the United States, we're mainly trying to develop energy-saving devices. They don't use much fuel in rural India, so the emphasis there will be on improving the conditions without introducing dependence on an expensive energy source," he said.

"One assumption of our study is that electricity is too costly or not available in rural Indian villages where solar devices might be placed. Thus, solar functions must be assisted by gravity flow of air and water, wind, or by muscle power," Smith said.

One purpose of the study is to determine the proper size and configuration of a solar drying unit, but the engineer said he foresees a 200- to 300-square-foot structure that could be built for

between \$200 and \$500.

The solar grain-drying structure would be multi-purpose because a dryer alone would be in operation only at harvests, about 30 to 60 days per year, depending upon the crop and number of harvests, Smith said.

A multi-purpose structure could be used at other times for storage, housing, or other types of shelter. In addition, Smith said, solar energy available during non-drying periods might be used to heat water, thus improving living standards and lowering dependence upon firewood.

Smith pointed out that firewood is becoming scarce in many areas of the Third World, including India, where it is the main fuel used for cooking and for heating water and homes.

Smith said he is optimistic that what he and his colleagues discover in India may be of interest to solar scientists in the United States, especially in-

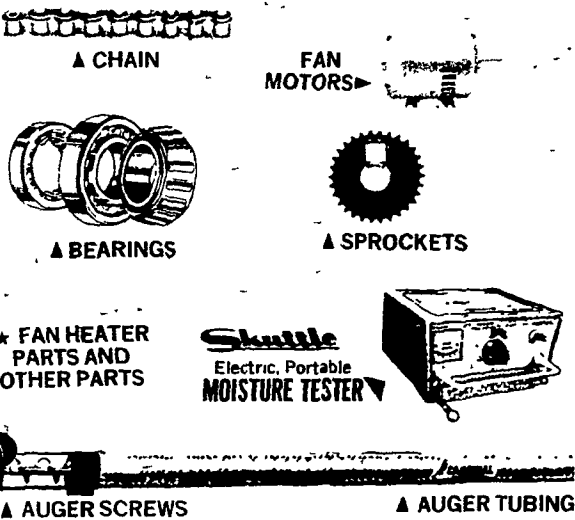
formation on how certain materials hold up in various weather conditions, how they react to sunlight and their durability.

But, Smith said any solar grain-drying structure developed in India probably would not be widely usable in this country.

He explained that solar devices in American agriculture currently are limited to a few special cases because it takes from 10 to 25 years for agricultural solar equipment to pay for itself.

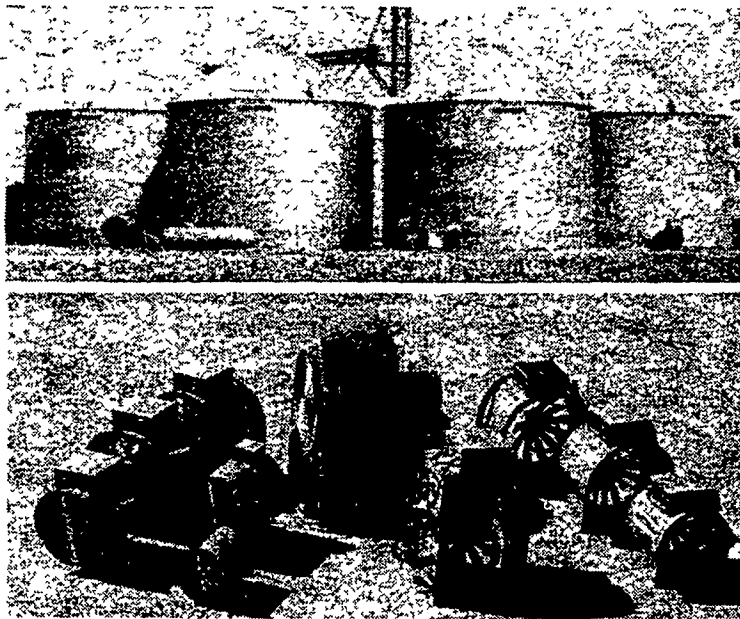
"Before solar energy is widely used on American farms, cheaper and better solar equipment will have to be developed, oil prices will have to go considerably higher, or farmers will have to be given tax credits similar to those the federal government and some states offer homeowners to help defray the cost of installing solar equipment," Smith said.

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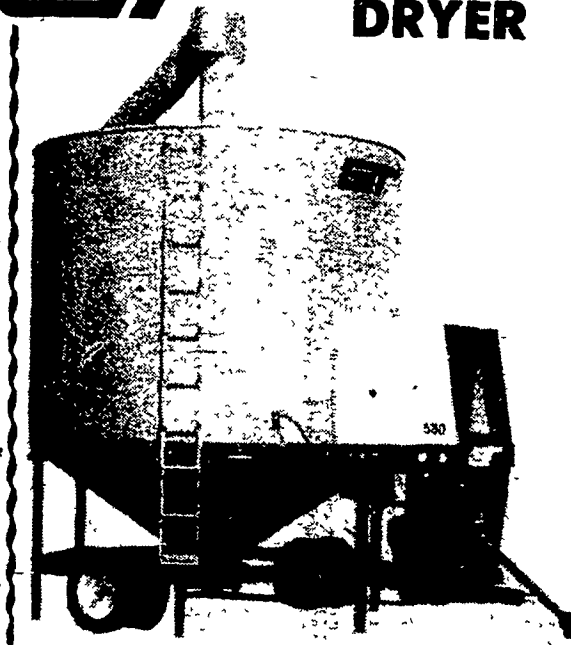
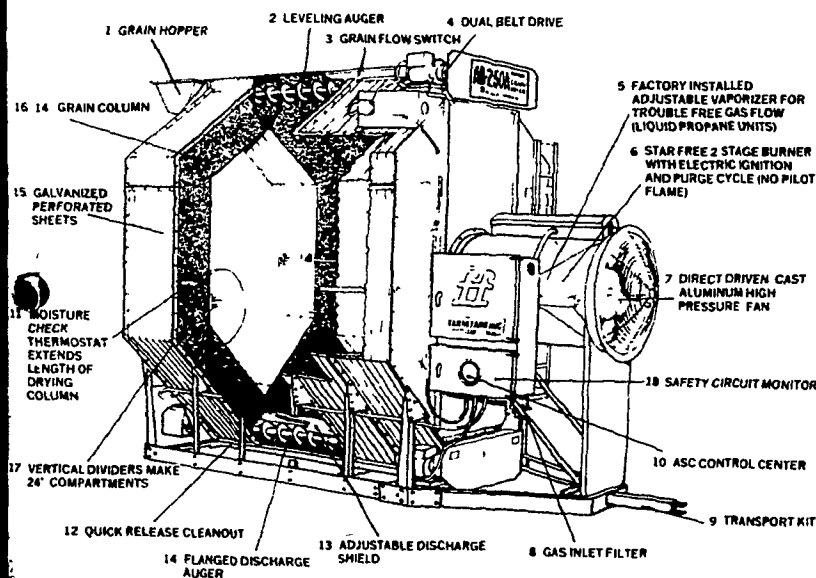
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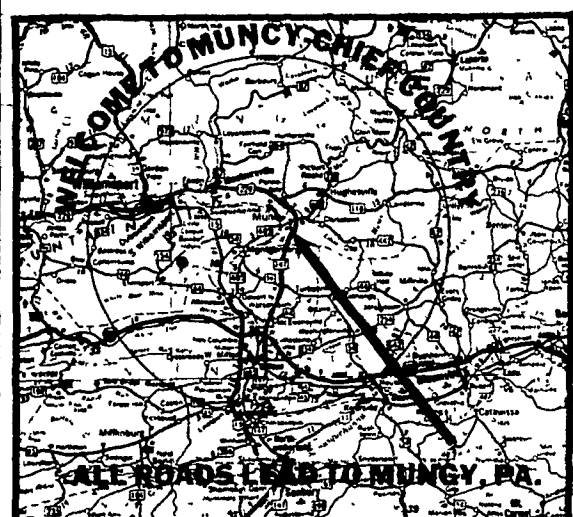
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