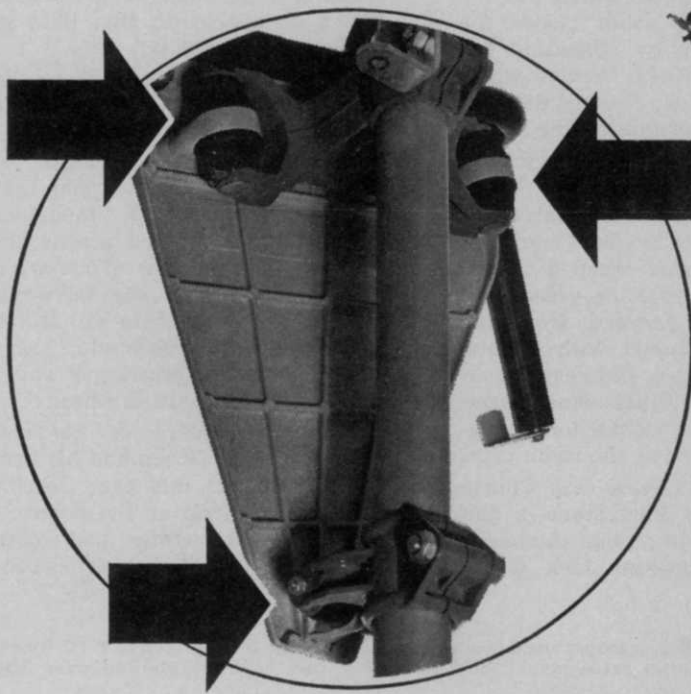


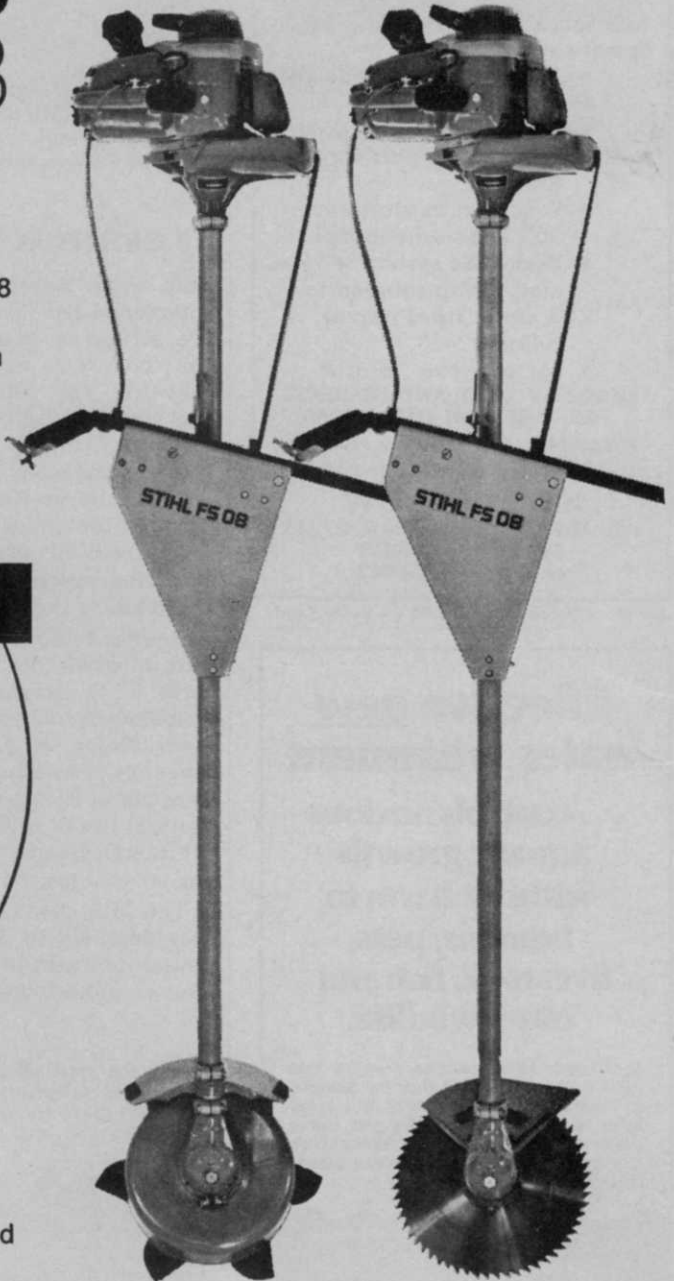
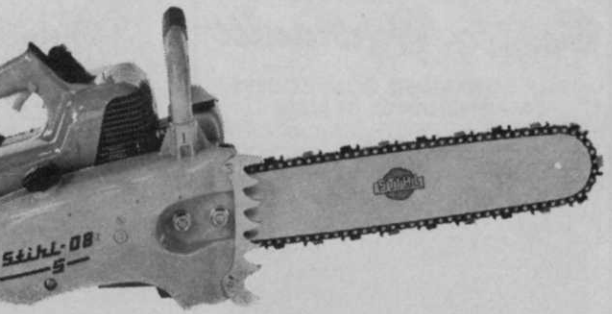
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The 15th (l) and 17th greens stay high and dry as nearly five feet of flood water covers fairways and rough.

18 GREENS IN THE AIR (from page 24)

both ways. Seven of the lakes are interconnected by drain pipe and are served by one valved outlet to the river. Two more form a similar network. The 10th is connected to the river by its own valve. As the river level rises, water floods the course gradually by spreading out from the lakes which receive water through the valves. During times of heavy rainfall, surface water drains from the course in reverse — from the lakes to the river. Clever. Yes.

Besides this system for controlling natural water, the course is equipped with an automatic electric irrigation system for watering greens and tees. Water is pumped from the river by two pumps with a total capacity of 695 gpm. Delivery is controlled by 8 satellite time clocks which can be overridden for syringing several greens at the same time.

The McFarland Park Golf Course was designed by Earl Stone, a golf course architect in Mobile, Alabama. Course superintendent Jack Green

made sure that Stone's plans were properly executed. In fact, he added a lot of touches of his own. Says Green, "I've been working on golf courses for 20 years and I've always wanted to build one and do it right. I had a chance to do that here in Florence. And I did it."

Green selected Tifdwarf Bermuda for his greens and tees because he believes it presents a smoother putting surface. But it also knits together to form a tougher sod that holds soil better — an important point since the elevated greens are vulnerable to erosion. Common Bermuda is used on the fairways. "Several people say this soil is too wet for common Bermuda," says Green. "But we're growing it and I don't see any difficulties ahead."

Although confident of his and Stone's planning, Green had his first anxious moments this past December. As with much of the country, the southeastern states had more than their share of rain. The Ten-

Here's the type of apparatus used to control water level on the course's 10 lakes. Two lakes separating fairways 11 and 12 and 9 and 11 have yielded over 300 balls put there by erring golfers.



nessee quickly rose to its highest level in 7 years and by December 10, the course was under water. The flooding lasted for two weeks. Some of the course was covered with as much as 5 feet of water for three weeks. A few days later, the area was sheathed in ice by an ice storm and hit by the coldest weather of the winter. "But," says Green, "everything passed the test, including our ryegrass winter greens."

Not noticed by golfers but of constant concern to Green and his 8-man crew, is the soil on which the course is built. Says Green, "It's been washing down this river for a long, long time. It's so acid that we have a tough time keeping the pH up. And it holds water so well that we have to wait about 3 days after a big rain before we can really do much on the course."

He adds: "Another thing. It's a mile from one end of the course to the other. But there's only 5 feet of fall. We use a transit every time we dig or fill an area because being off by just a few inches can create a big drainage problem."

Technically, the soil is a loamy silt with clay. And it's deep. Test borings show that there's no change in the soil for 8 feet. Below that



Jack Green, superintendent of the McFarland Park Golf Course, checks one of his elevated permanent greens protected by plastic during the winter.

there's blue clay.

Before planting, the course received the following fertilizer and lime: Greens and tees, 100 pounds of basic slag and 30 pounds of 8-8-8 per 1,000 square feet; fairways and green slopes, 2 tons of agricultural limestone per acre and 1,000 pounds of 8-8-8 per 1,000 square feet.

Clearly, the unique location of the course offers a real maintenance challenge. But the course itself is no pushover for the golfer, either. More

than 5,200 have played the course since it was dedicated last August 28. Many of them have learned to respect it.

Says course pro, Chip Enlow, "This is a sporty course. You've got to keep the ball in play and hit placement type shots. So far, we haven't worried too much about putting in the planned sand traps. With all that water, those trees, and every green in the air, we haven't missed 'em!" □



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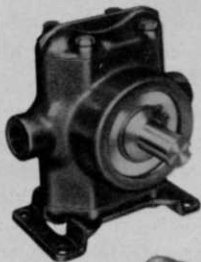
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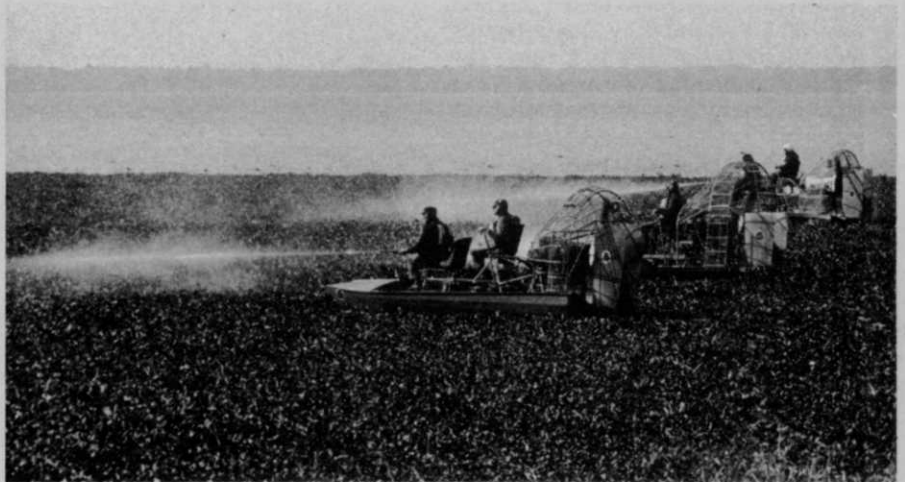
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These airboats, part of "Operation Clean Sweep" make headway on the St. Johns River at Riverdale, Fla. Note water hyacinths have practically covered the area adjacent to the shoreline.

OPERATION CLEAN SWEEP

Florida Hyacinth Problem Once Over Lightly

JACKSONVILLE — A two-year study by the U.S. Department of Interior's bureau of sport fisheries and wildlife shows conclusively that 2,4-D does not kill fish in concentrations which are used for hyacinth control and that even a ten-fold error in application rate would not decimate a fish population.

According to Donald P. Shultz, research chemist with the southeast fish control lab at Warm Springs, Ga., there was "no evidence of fish kill" in any of the ponds treated with the herbicide. His recently released scientific report also noted that the aquatic plant control chemical used the Army Corps of Engineers and the Game and Freshwater Fish Commission breaks down within a few

days after application.

Schultz' research showed that "there is little danger of the herbicide causing putative (supposed) effects on reproduction ascribed to the chlorinated hydrocarbons." The usual route for biomagnification of pesticides is through the food chain, and Schultz' report said the potential toxicity of the compounds was analyzed as a part of the research.

"Although fish can be killed with DMA-2,4-D, the median tolerance limit (of fish) is high enough that even a ten-fold error in application rate would not decimate a fish population," Schultz concluded.

During the two-year study, the bureau of sport fisheries and wild-



Water hyacinths have covered the east bank of the St. Johns River in this residential area.

life established experimental ponds in Florida, Georgia, and Missouri and sprayed the ponds at rates of two, four, and eight pounds per acre of acid equivalent. The normal rate of application for hyacinth control in Florida is two to four pounds per acre.

Field studies conducted by the Department of Interior at three Florida test ponds showed that 2,4-D residue dropped to barely detectable levels three days after use of the hyacinth control chemical. After 14 day, only a trace of the chemical could be found in the water.

Schultz also showed that seven days after spraying water hyacinths were brown and decomposing. In the tests, 98 percent of the plants were killed by the herbicide application. No fish mortality was noticed nor was there evidence of abnormal offspring from the reproduction of bluegills.

According to Julian J. Raynes, assistant chief, civil land planning section, environmental engineering branch of the U.S. Army Corps of Engineers, South Atlantic, a concentrated 60 day spraying drive against water hyacinths on the St. Johns River began in late February. The project, known as "Operation Clean Sweep," involved eight Army Engineer airboats, each capable of spraying up to 20 acres of hyacinths a day.

Raynes said that a draft environmental impact statement released in December showed that chemical spraying of water hyacinths and other unwanted aquatic plant in Florida is essential until continued research brings forth lower cost control methods.

Cost of mechanically harvesting hyacinths in the St. Johns River would exceed \$8 million per year compared with spraying costs of about \$228,400 annually. The hyacinth problem in the St. Johns River represents about 10 percent of the statewide aquatic weed problem.

The environmental report concedes that chemical control of hyacinths poses some environmental drawbacks because the sprayed plants sink to the bottom and contribute to the nutrient load.

However, until an economical use of the harvested hyacinth can be developed or some disposal method found, the chemical spraying program in Florida waterways appears to be the only "viable alternative," the environmental report concludes.

Raynes said the environmentalists last year filed an injunction against the use of 2,4-D in hyacinth control.

It was lifted, however, this year when the Corps filed the environmental impact statement showing the chemical control is essential to control weed growth.

The engineer pointed out that weather conditions are a big factor in chemical spraying of water hyacinths. For instance, spray crews are not allowed to operate when the water-level wind speed exceeds 10 miles an hour. Wind could cause drift of material to valuable plantings on the shoreline. Similarly, the spraying operation is halted during rainy weather, or whenever there is

a heavy dew, since the rain or dew dilute the effectiveness of the spray material.

Raynes related that one hot, new idea for hyacinth control is the use of the laser. Developed by Dr. Ralph A. Scott, Jr., a former Army Corps of Engineers scientist, the laser zaps target plants which wilt almost immediately after irradiation. Plant life is completely destroyed in 8 to 12 weeks. While use of the laser is still strictly in the experimental stage, it represents an entirely new dimension in weed control, heretofore untried. □

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Jeffery L. Pochop, vice president special products, Swift Chemical Company, Chicago, tells Par Ex distributors of the extension of the exclusive IBDU contract for Swift through June 1978. Mitsubishi Chemicals Ltd., manufacturer of IBDU has extended the distributing rights to Swift for another 5 years.

**Green Industry
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The First Lady, Mrs. Richard Nixon presented awards to thirteen business firms, three institutions and eight municipal governments for outstanding contributions to environmental improvement. Occasion was the 20th annual Landscape Awards Program of the American Association of Nurserymen.



This tractor was designed for heavy-duty Green Industry work. Called G1355, it is the first in a series of Minneapolis-Moline tractor models to be built in the company's Charles City, Ia., assembly line. Ready for a quality and performance check are Harold H. Berk, (l) White Farm Charles City plant manager, Robert E. Kidder, group vice president-farm, White Motor Corporation, and David A. Drewery, (r) director of manufacturing, White Motor Corporation.



This clever gimmick serves two purposes. It tells the curious public why this plastic container is attached to the tree. And it advertises the Guardian Tree Experts, Inc. tree care service. According to Walt Money, Guardian Tree Experts president, the vandalism rate has decreased — and the jobs have increased. Card is paper stock.



Roof Manufacturing Company management meets with leading distributors each year. At this year's two day session are: (l-r, bottom row) Richard Luckadoo, Morgan Bros., Asheville, N.C.; Earl Roof, president, Roof Manufacturing; Wayne Robinson, Yeomans Distributing, Peoria, Ill.; Ray Shoemaker, sales manager, Roof Manufacturing; (middle row) John Brue, vice president, engineering, Roof Manufacturing; Gerry Winterrowd, Yeomans Distributing, Peoria, Ill.; George Neice, Roof regional manager, Red Bank, N.J.; Dick Holliday, R. E. Jarvis Co., Fayville, Mass.; Louis Roof, vice president, Roof Manufacturing; (top row) Easy Whitley, Roof Regional manager, Atlanta, Ga.; Russell Carpenter, service manager, Roof; Jerry Wilson, Roof regional manager, Kankakee, Ill.; Roger Volzer, Supreme Garden Supply, Akron, Ohio; Virgil Arthur, Arthur's Electric Service, Richmond, Va.

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**WAKE UP, JOHN BEAN,
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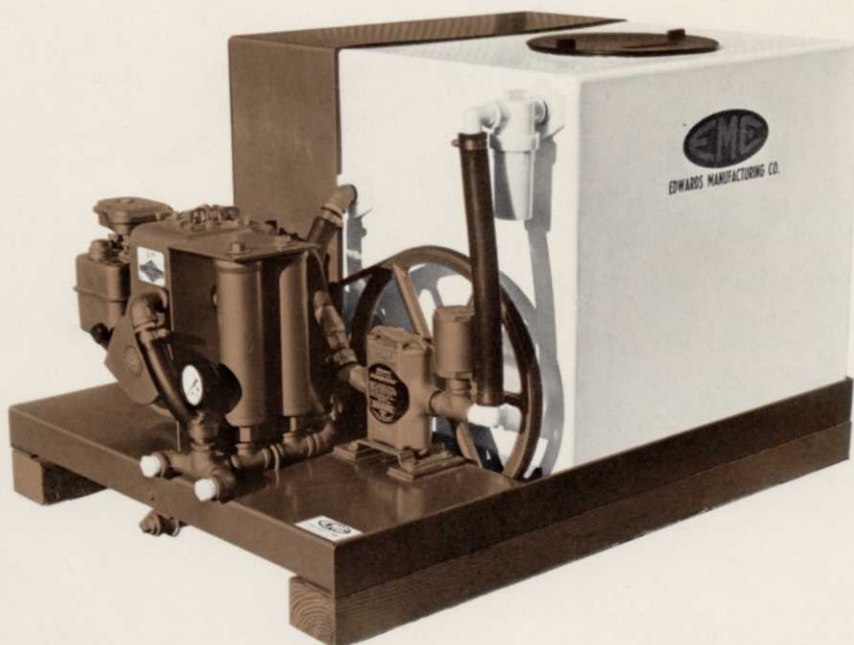
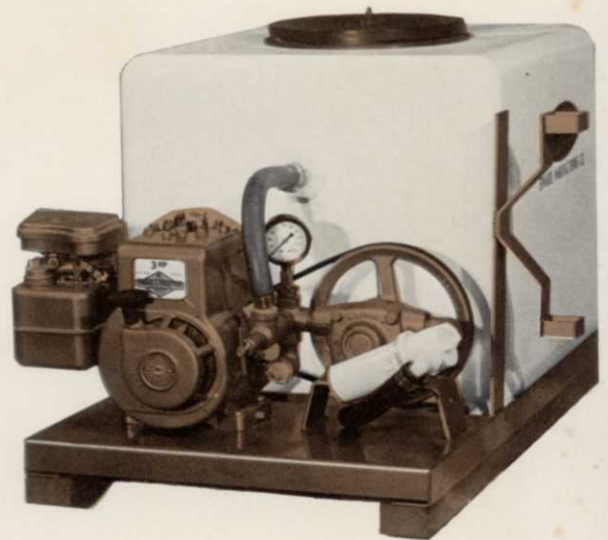
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The 5300 has a 2-cylinder piston pump which produces 3 GPM at 400 PSI.



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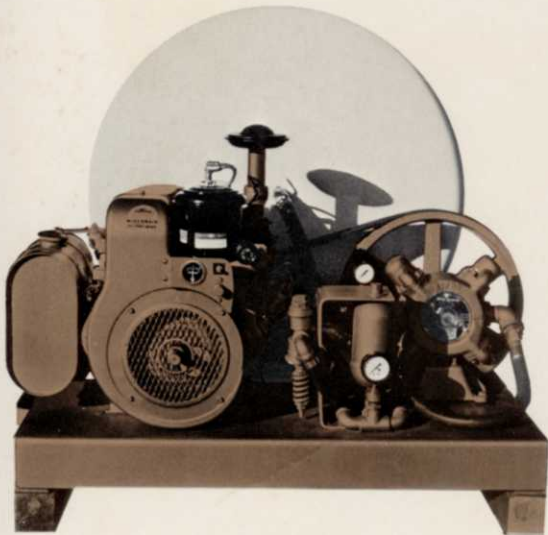
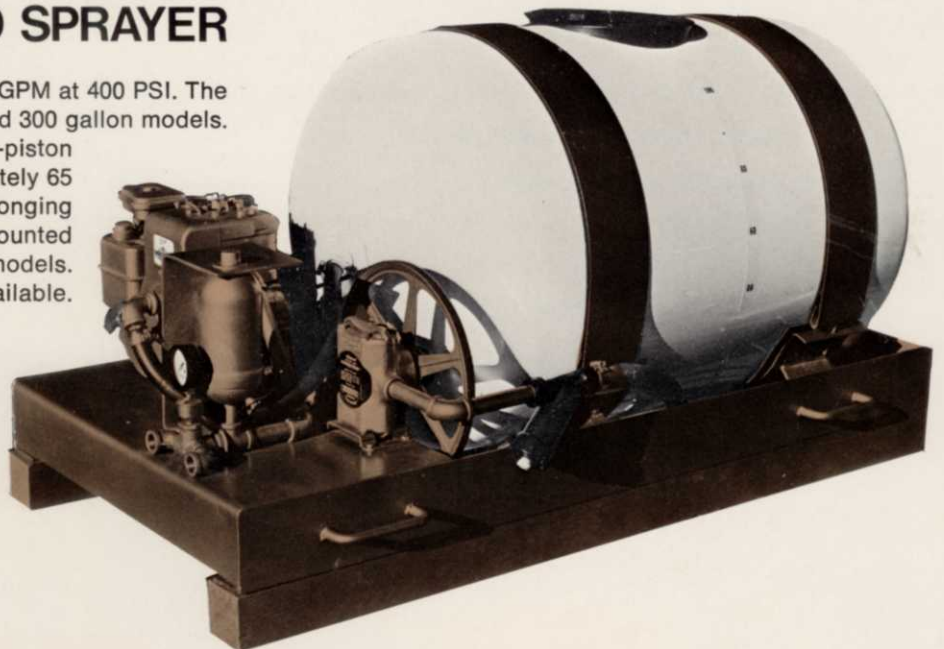


AND HERE TO STAY.

6700 SPRAYER

A medium-range model providing 7 GPM at 400 PSI. The 5-HP 6700 is available in 100, 200 and 300 gallon models.

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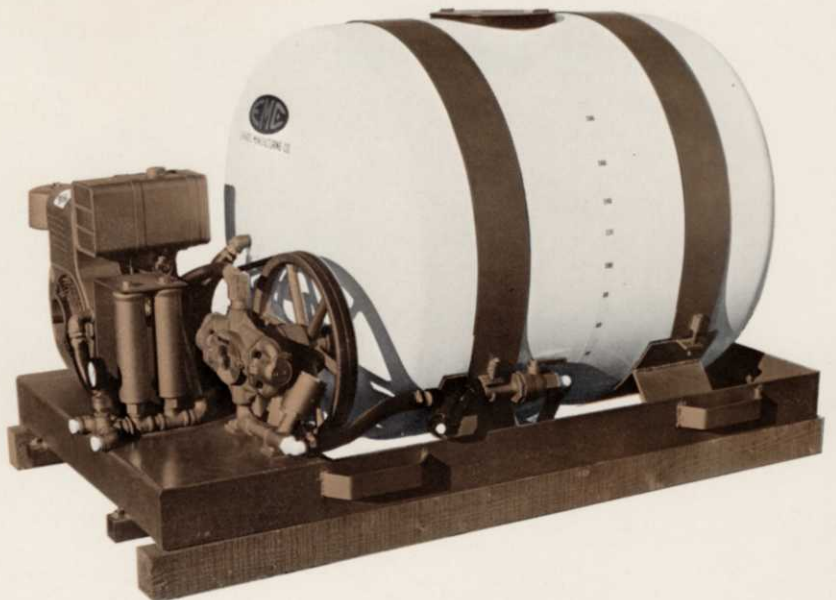


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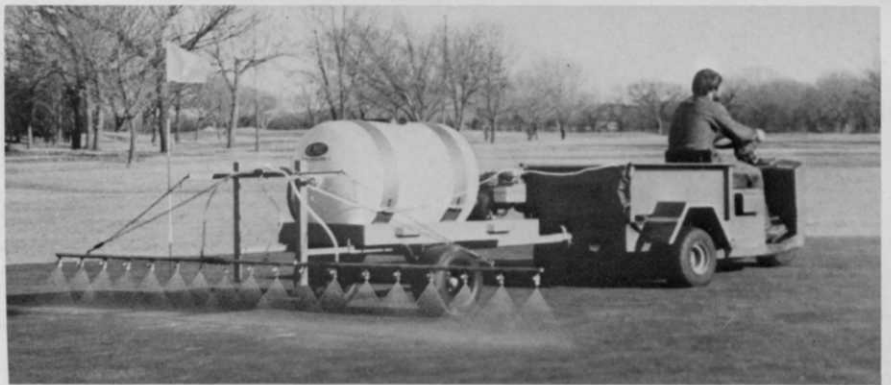
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