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# Oregon Agricultural College Extension Service

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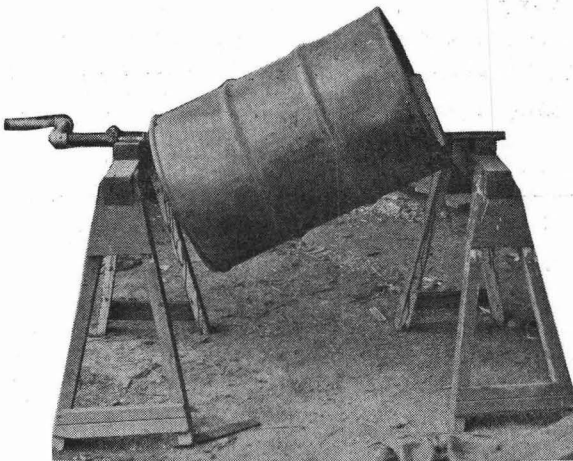
Cooperative Extension Work in Agriculture and Home Economics  
Oregon Agricultural College and United States Department of Agriculture, Cooperating  
Printed and distributed in furtherance of the Acts of Congress of  
May 8 and June 30, 1914

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## The O. A. C. Diagonal Axle Dusting Machine for Treating Wheat for Smut

By GEO. W. KABLE,

Extension Specialist in Agricultural Engineering



CORVALLIS, OREGON

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The regular bulletins of the Extension Service are sent to the residents of Oregon  
who request them.

### SOME ADVANTAGES OF THIS MACHINE

Turns easily compared with other hand-operated machines.

Throws and rolls the wheat, causing it to be thoroughly coated with copper carbonate with a minimum of effort.

Easy to fill and empty.

Can be built easily on the farm.

Costs very little.

Will treat 20 to 30 bushels per hour.

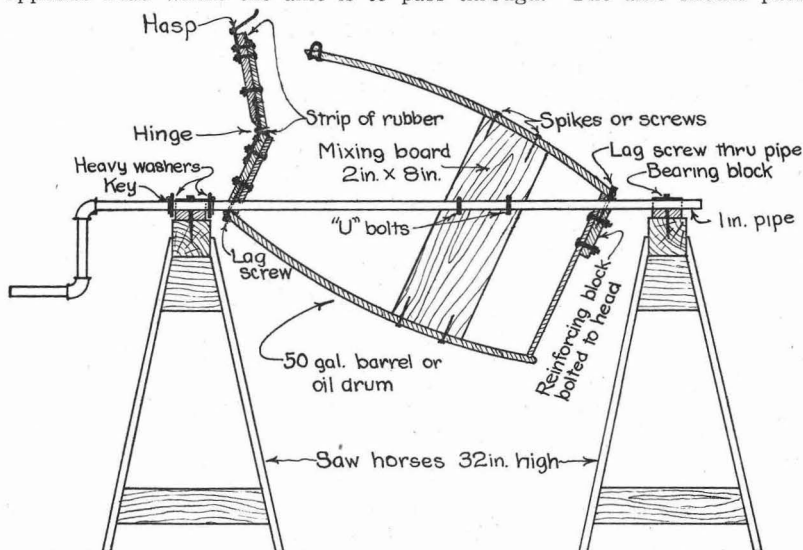
Drum or barrel may be lifted off and saw-horses used for other purposes.

# The O. A. C. Diagonal Axle Dusting Machine for Treating Wheat for Smut

By GEO. W. KABLE,  
Extension Specialist in Agricultural Engineering

## DIRECTIONS FOR BUILDING

**Drum or barrel.** Use an old steel oil drum or a 50-gallon barrel. Cut out half of one head. Make a wooden head for this end, hinging it in the center so one half will open. Bolt or screw the other half to the barrel so it will make a dust tight joint. Bolt a two-inch reinforcing block to the opposite head where the axle is to pass through. The axle should pass



SECTION THRU CENTER OF WHEAT DUSTING MACHINE

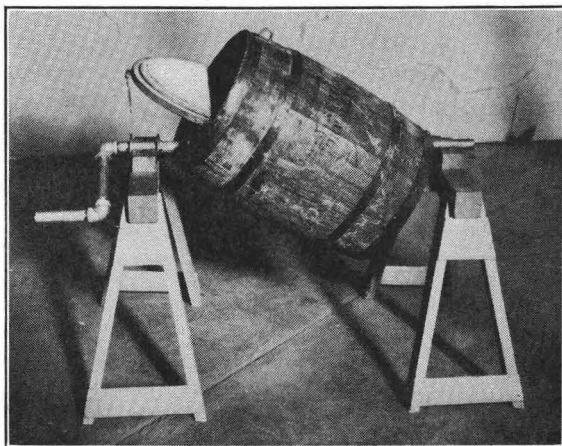
Diagram 1

diagonally through the heads as shown in the illustrations. The barrel or drum is anchored to the axle by two  $\frac{3}{8}$ -inch lag screws, six inches long, screwed into the false heads through holes drilled through the barrel and axle.

**Making the drum dust tight.** Should the copper carbonate dust escape around the door, tack a strip of old inner automobile tubing around the edge as indicated in Diagram 1. Use a hinged hasp to hold the door shut, and attach it so that the door will be forced against the barrel when it is closed.

**Baffle board.** In order to give the grain a tumbling motion a 2-inch by 8-inch board is spiked or screwed across the inside of the drum about two-thirds of the way back from the door. The board should extend up and down in the drum when the machine is in the filling position. This board is essential to the operation of the duster.

**Axle.** The axle and crank are made from one-inch pipe and two elbows. Large washers are placed over the axle at the crank end to keep it from sliding in the bearings. The washers fit against either side of the bearing block and are held in place by cotter keys passing through holes drilled in the axle. These thrust washers are needed at one bearing only.



Treating Machine Made from Barrel  
(Note construction of door and thrust washers on axle)

**Bearings.** Secure an oak or other hardwood block 4 inches by 5 inches and 8 inches long. Bore a hole just large enough for the axle through the center of the block, starting in the center of the 5-inch face. Saw the block in half lengthwise so you will have two pieces, each  $2\frac{1}{2}$  inches thick, 4 inches wide, and 8 inches long, and each having a half-round bearing surface for the axle across its face. Bolt one of these halves to each saw-horse. No top half is needed on the bearings as the weight of the machine will hold it in place. Cup grease may be applied directly to the bearings for lubrication.

**Saw-horses.** The saw-horses should be 32 inches high for ease in turning the machine.

#### Materials needed.

Empty oil drum or 50-gallon barrel. (Drums and barrels can be purchased from most garages or service stations.)

#### Axle and crank.

- 1 piece 1-inch pipe 54 inches long, threaded one end.
- 1 piece 1-inch pipe 8 inches long, threaded one end.
- 1 piece 1-inch pipe 10 inches long, threaded both ends.
- 2 1-inch elbows.
- 2  $1\frac{3}{8}$ -inch iron washers.
- 2  $\frac{3}{8}$ -inch by 6-inch lag screws.

**Door and reinforcing block.**

1 semi-circular piece 1 inch thick and 2 inches larger in diameter than barrel head for door.

1 circular piece to fit into end of barrel (barrel head will do). To be cut in two and half used for door.

2-inch block to reinforce head where axle passes through.

1 pair 6-inch strap hinges.

1 6-inch hinged hasp.

12  $\frac{1}{4}$ -inch carriage bolts to fasten door and head pieces together.

**Baffle board.**

1 piece 2x8 24 inches long.

**Bearings.**

Oak block 4 inches by 5 inches by 8 inches.

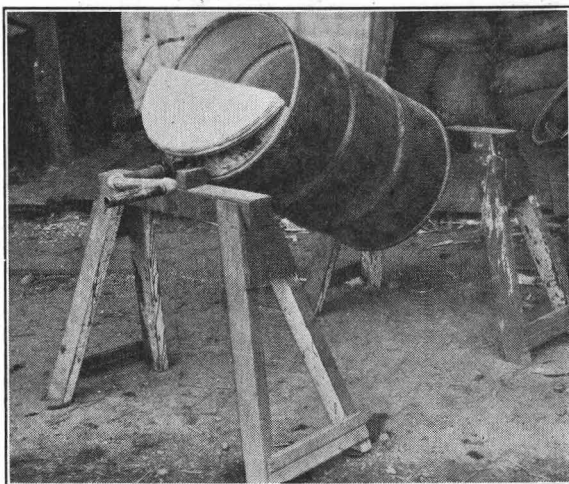
4  $\frac{3}{8}$ -inch by 5-inch lag screws.

**Saw-horses.**

2 pieces 4x4 30 inches long.

24 ft. 2x4 for legs.

12 ft. 1x4 for braces.



Machine in Filling Position

## HOW TO TREAT WHEAT

This machine is large enough to treat two bushels at a time. Two bushels when treated will just about fill a grain sack. Put the wheat into the machine and spread over the surface two ounces of copper carbonate per bushel. Close and fasten the door and turn the crank 40 revolutions. The best speed is 30 revolutions per minute. If turned faster than 50 revolutions per minute, the grain will not be treated. When ready to empty, unfasten the door and turn the drum to the emptying position.

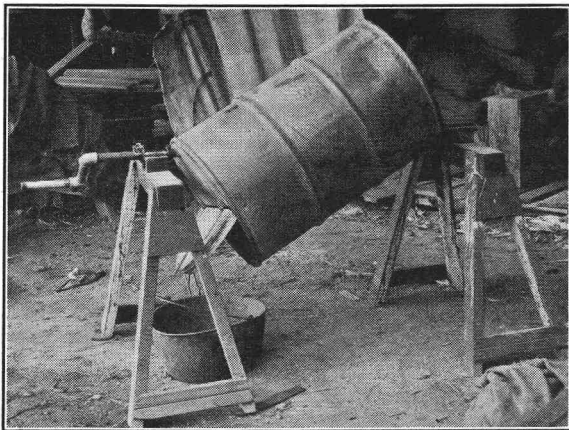
Where less than thirty or forty bushels is to be treated, the machine may be emptied into a tub or box and the wheat poured into sacks; or the charge may be dumped onto the floor and scooped into sacks. Time and labor will be saved in treating larger quantities by providing an elevated platform and dumping directly through a hopper and chute into the sacks. See Diagram 2.

**Capacity of the machine.** The machine will treat two bushels of wheat at one charge. When the grain is dumped on the floor or in a box and

must be rehandled for sacking, the rate of treating is about 15 bushels per hour. When a hopper is provided for emptying directly into sacks, 30 to 40 bushels per hour can be treated.

**Do not breathe copper carbonate.** Copper carbonate is poison. When inhaled, it irritates the membranes of the nose and throat, and it causes some people to become very sick. When treating grain wear a mask made by binding a moist sponge over the nose and mouth, or use one of the masks which are sold for the purpose.

Do not use copper carbonate in a closed building. It is best to treat wheat in the open or in a shed or building where there is a cross draft. Stand on the windward side when dumping the machine or when sacking or handling the treated grain.



Machine in Position to Empty

### THE COPPER CARBONATE TREATMENT

Copper carbonate is a chemical which, when applied as a dust coating on wheat, will kill the spores of common smut or bunt. It cannot be applied to the wheat effectively without using some special treating machine or device. It cannot be applied by shoveling into the grain.

This method of treating is now an established practice on the large wheat farms of Eastern Oregon, Eastern Washington, and California. Its superiority over other methods has been so clearly demonstrated that it is also being rapidly adopted in other sections where wheat is grown.

**Amount and kind of copper carbonate to use.** Two ounces of copper carbonate should be used to each bushel of wheat, and no more. If more is used, the powder will accumulate in the drill and cut out the gears, or set like cement and cause something to break.

There are many brands of copper carbonate. Look on the label for the active ingredients. It should contain 50 percent or more of copper. It should also be fine enough so that most of it will pass through a 200-mesh sieve, or in other words be about as fine as Portland cement.

**Advantages of the copper carbonate treatment.** Copper carbonate kills the smut spores on wheat without injuring the germ of the seed. Smut spores cannot be killed by the wet treatment without seriously injuring the germination and vigor of the seed.

Twenty-five percent less seed can be used than when treating by the wet process.

The wheat plants get a quicker start and grow more vigorously.

The seed is protected from smut spores in the soil by the coating of copper carbonate which it carries.

The seed will not deteriorate after treatment. It may be treated at any time when convenient in advance of planting.

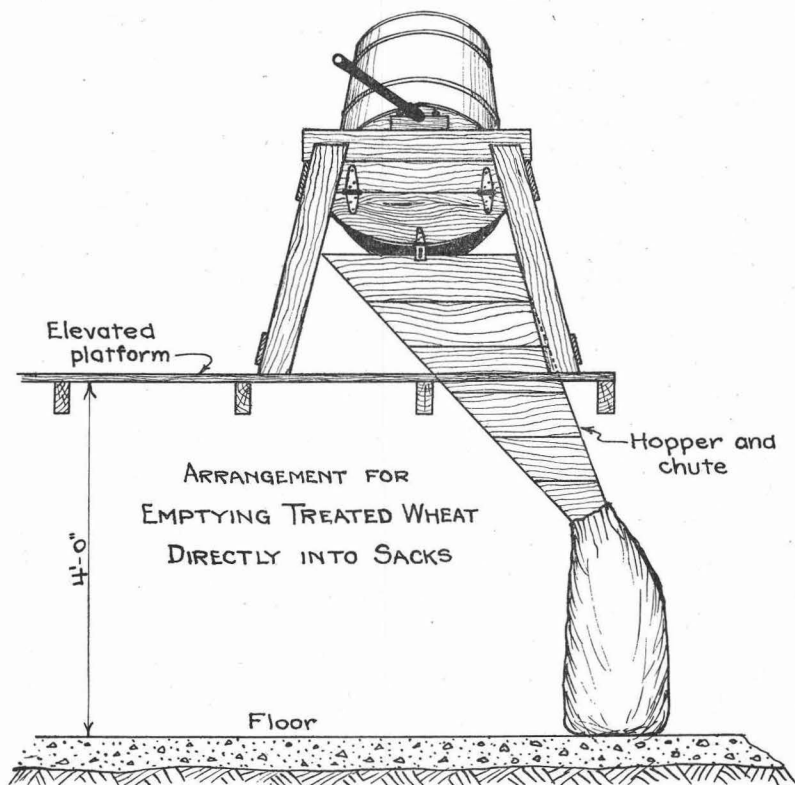


Diagram 2

**Acknowledgment.** Information in this bulletin regarding the copper carbonate treatment was furnished by the departments of Botany, Farm Crops, and Chemistry, and by E. R. Jackman, Extension Crop Specialist. Tests of the treating machine were conducted cooperatively.

