

# Pocket Gopher Control with the MECHANICAL BURROW BUILDER MACHINE

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## POCKET GOPHERS IN NORTH DAKOTA

Pocket gophers are seldom seen, since almost their entire time is spent underground. One pocket gopher to a runway is the rule, except in breeding season, or when young are being cared for.

The food of gophers consists mostly of roots of various plants, such as dandelion, alfalfa, grasses and trees. They regularly eat most tubers, and such green tops and available seeds as can be pulled down into the tunnels through root holes.

Dirt from runways is pushed to the surface to form characteristic circular mounds 8 to 18 or more inches in diameter. Mounds are at the ends of short lateral tunnels branched off the main runway. The surface opening through which dirt is pushed from the tunnel is finally plugged by pushing dirt into it, leaving a small horseshoe-like depression on one side of the mound.

Pocket gophers dig extensive tunnels or runways, up to 800 feet long and covering as much as an acre of ground. Burrows vary with the species from 2 to 4 or 5 inches in diameter. The runways serve as homes, storehouses and routes for underground hunting of food. The foraging tunnels may be from 4 to 8 inches below the surface. Food supplies and nests frequently are several feet deep.

### Control

Pocket gophers can be controlled by several methods. Previous to the mechanical burrow builder,

trapping and placement of poison bait into tunnels were the methods used. These methods are outlined and illustrated in North Dakota Extension Service circular No. 243, available from County Extension Agents.

Previous pocket gopher control techniques required hard manual labor. The operator had to probe for underground runways and place bait, all by hand. The burrow builder offers a mechanized method by which the operator constructs and baits an artificial gopher runway in one operation. This method allows the gopher to find the bait material.

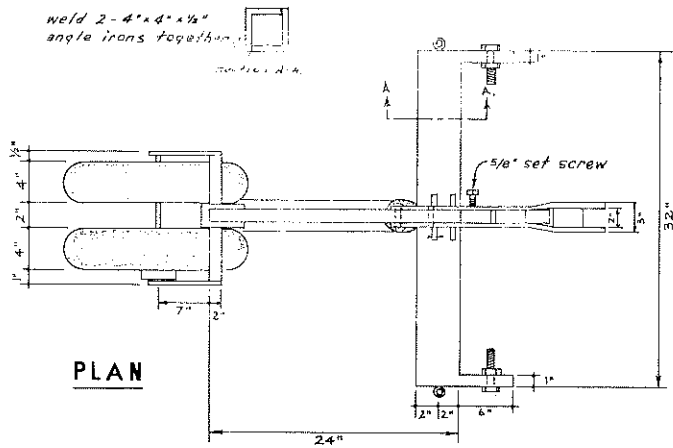
### Burrow Builder

Since the first mechanical burrow builder (a 3-point hitch machine), the principle now has been adapted to a 3-point hitch, 2-point hitch and 2-wheel plow-type machine. Available with this circular are plans for the 3-point hitch and 2-wheel plow-type machines. Most of the machines can be built from used machinery at low cost.

The machine consists of a corn-planter type feed mechanism with two rubber-tired wheelbarrow wheels as packer and power for feeding mechanism, coulter wheel and steel used to make frame, subsoiler, and torpedo. Readymade parts for a 3-point hitch may be purchased. The parts are similar to a Ford 32 inch by 4 inch by 4 inch model 108-1 tool carrier bar with one 24-inch subsoiler, subsoiler shank less chisel and boot, one corn planter can with standard bottom, one large whole center drop plate, equipped with one press wheel drive assembly less press wheel; and two wheel assemblies, including axles, spacers, cup, and two 4 inch by 8 inch tires and tubes.

The burrow builder can be used for control of gophers in any area where soil conditions and the physical condition of the land make it possible to

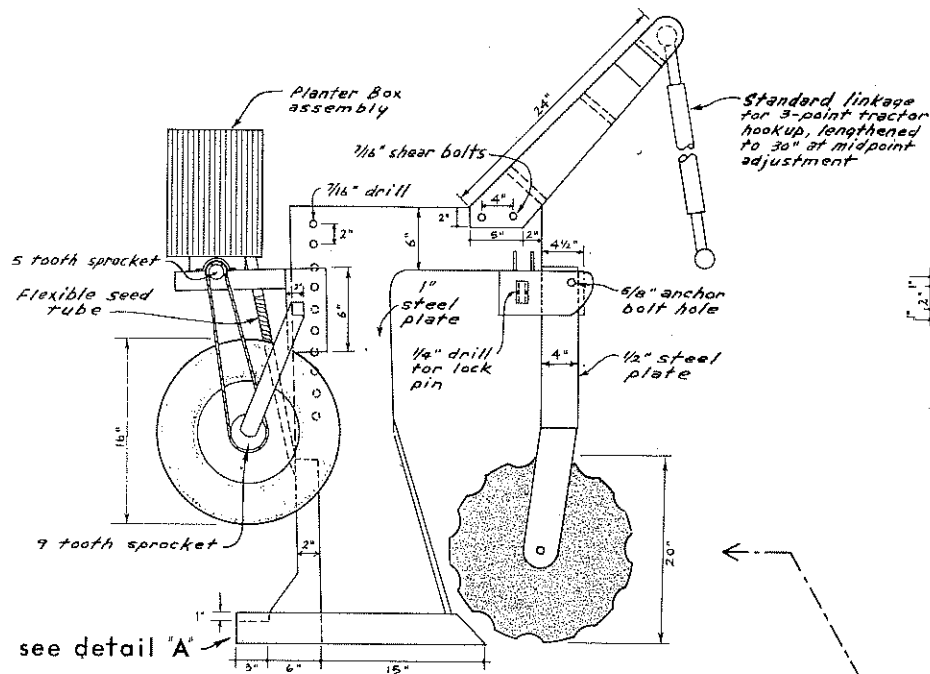
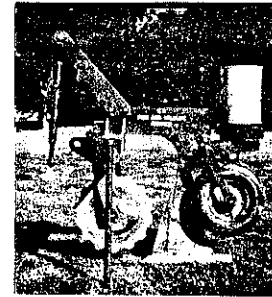
Weld 2-4"x4"x1/2"  
angle irons together



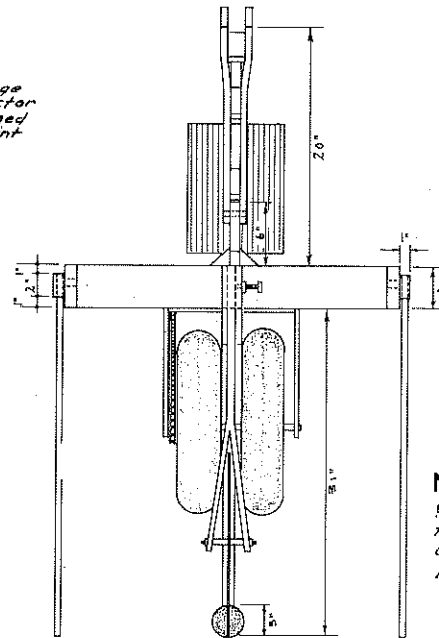
PLAN

CONSTRUCTION NOTES

1. The planter box assembly may be a common standard unit so long as the seed plate and plate speed can be adjusted to deliver 2-4 pounds of grain per 1,000 feet of burrow. Press wheels should be modified as shown in the drawings.
2. Grease fittings should be provided to lubricate the following points: Planter box feed shaft bearings, press wheel axle bearings, and coulters axle bearings.
3. The shear bolts which attach the hitch yoke to the top of the sub-soiler shank are designed to protect the machine against damage caused by striking solid obstructions.
4. The torpedo which forms the burrow should be hard surfaced to resist wear on the front end, which is sloped at a 60 degree angle. The leading edge of the sub-soiler shank and the top of the rear end of the torpedo should also be hard surfaced for longer wear.

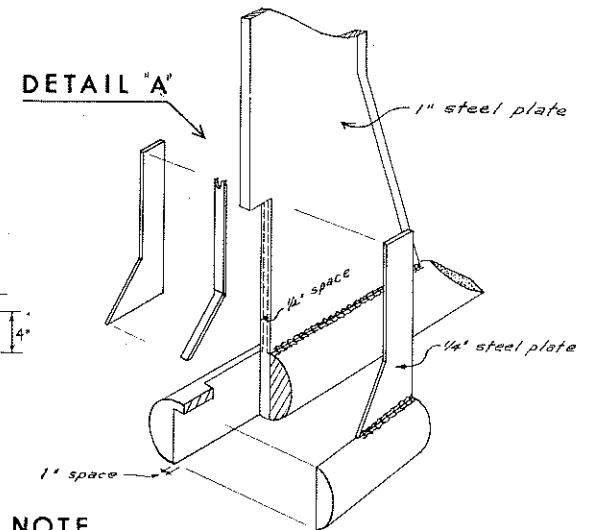


SIDE VIEW



FRONT VIEW

DETAIL 'A'



NOTE...  
See Detail "B", sheet 2  
for alternate detail  
of torpedo construction...

COOPERATIVE EXTENSION WORK IN  
AGRICULTURE AND HOME ECONOMICS  
STATE OF NORTH DAKOTA  
NORTH DAKOTA STATE UNIVERSITY  
OF AGRICULTURE AND APPLIED SCIENCE AND  
UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING

Gopher Burrow Builder

SHEET 1

CREDIT... U.S. Fish & Wildlife Service  
and Texas A & M College System

**CONSTRUCTION**

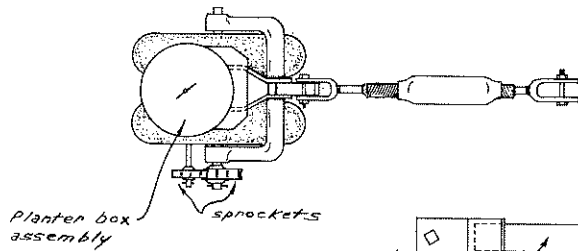
1. Any two bottom, either 14" or 16", pull type plow can be used to build this pull type pocket gopher burrow builder. Note both beams are cut off at the point of where the beams start

to curve. The plow needs very little further alteration except mounting the burrow building unit.

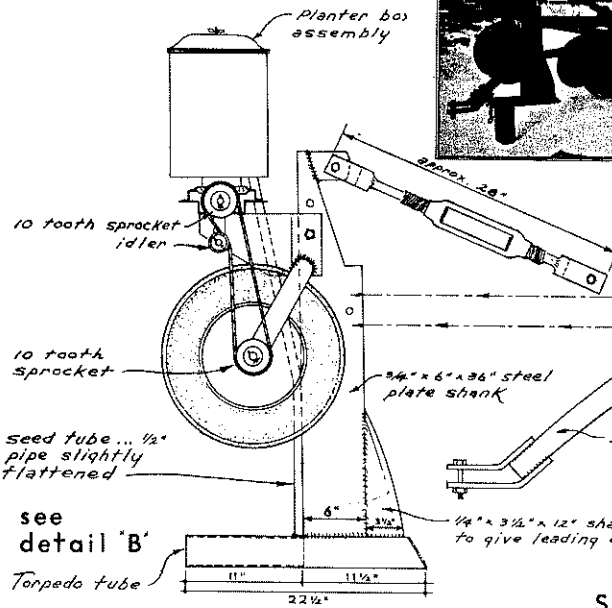
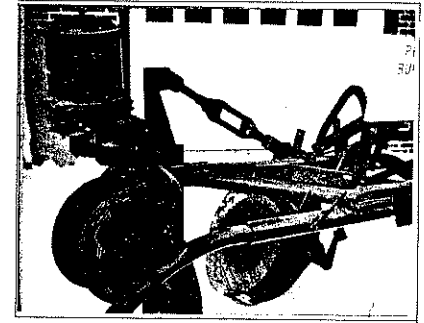
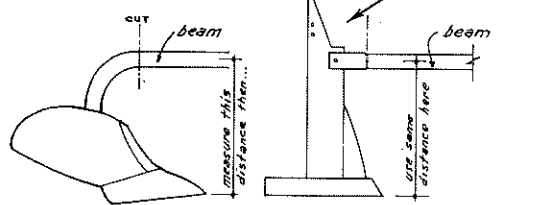
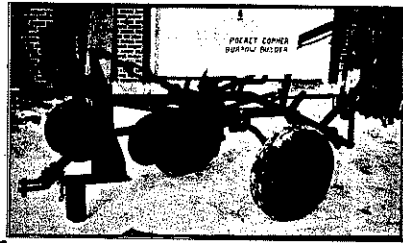
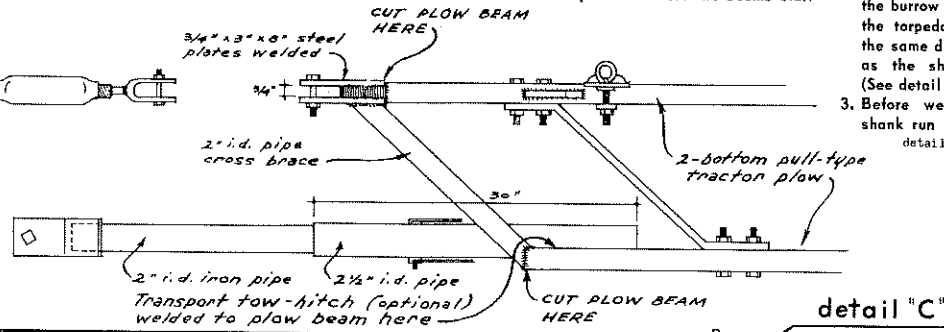
2. Before cutting off the plow beam measure from the plow share point to the center of the beam. Drill the shank on the burrow builder so that the point of the torpedo on the burrow builder is the same distance from the plow beam as the share point was originally. (See detail C).  
3. Before welding the torpedo to the shank run several beads of hard sur-

facing electrode on the front of the torpedo. Use an electrode that will produce a deposit having at least a Brinell 450 hardness.

4. The seed tube can be made from one-half inch black pipe. This can be flattened slightly to fit flush with the back edge of the shank.  
5. Depth adjustment is made by moving up or down on the shank where a series of holes are provided on the back side of the shank. Use a telescoping connection on the seeder tube connection.

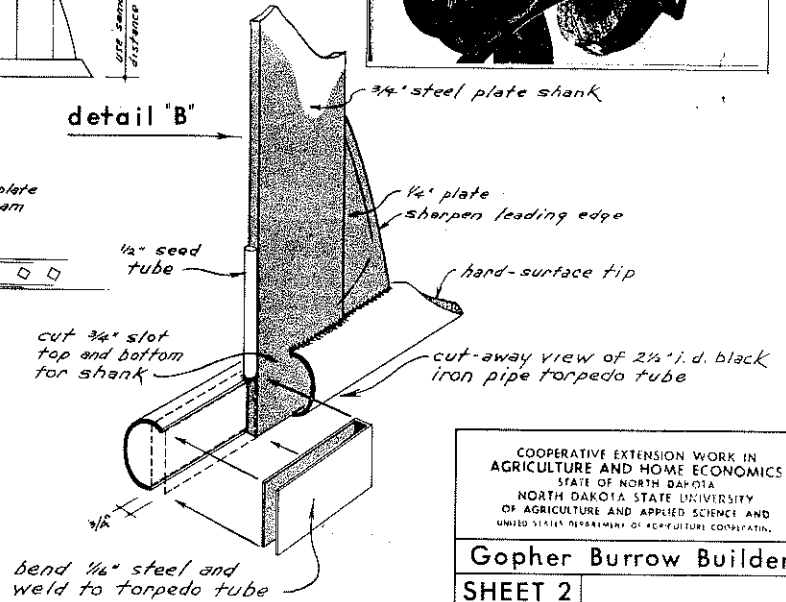


**PLAN**



**SIDE VIEW**

**detail "B"**



COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS  
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**Gopher Burrow Builder**

**SHEET 2**

CREDIT... U.S. Fish & Wildlife Service

drive over the area with a tractor and construct a good artificial burrow.

The condition of the soil has to be such that a good burrow can be made. This usually requires enough moisture in the soil to make it form into a pack when squeezed in the hand. In North Dakota, this condition usually can be found in the spring or fall of the year.

The effectiveness of the burrow builder depends upon the gophers finding the artificially-constructed runway and using it long enough to find the poisoned bait. To make this possible, the artificial burrows should be constructed at a depth and spaced so as to cut through the greatest number of natural gopher tunnels. This will vary with soil conditions and the species of gopher being controlled.

**Pocket Gopher Bait**

The bait used with good success is strychnine-treated barley. This bait is available through the U. S. Fish and Wildlife Service when ordered by the county or township for an organized control program. County agents have information on cost etc. It is possible to mix your own bait according to the following formula:

**Directions for preparing poison bait:**

- Clean, plump Barley - 14 lbs.    Gloss starch - 3/4 oz.
- Strychnine alkaloid - 1 oz.    Heavy corn sirup - 1 pint
- Baking soda - - - - - 1 oz.    Glycerine or
- Water - - - - - 1 pt.    mineral oil - 1 tbsp.

1. Dissolve starch in a little cold water.
2. Add boiling water until starch thickens (cooks).
3. Mix sirup with the remainder of the water.
4. Add starch mixture to sirup mixture, stir well, heat to near boiling but keep below the boiling point.
5. Add strychnine alkaloid stirring until thoroughly mixed.
6. Add mineral oil and glycerine, stirring constantly. (Be sure step 6 follows step 5.)
7. Add soda slowly and mix constantly. (Too much at one time will foam over the container.)
8. Pour solution over 14 pounds of barley and mix thoroughly. Dry grain for 24 hours.

9. Destroy all residue or spillage by burning or burial. Store bait in safe place. Label it POISON. Keep bait away from poultry, livestock and irresponsible persons.

**Applying Bait**

Bait is applied to the infested area. Artificial burrows usually are made at 20-foot intervals. For example, in case of an infested field, apply bait on a grid system, running the machine at approximate 20-foot intervals up and down the field. Application rate of bait should vary from 1/2 pound to 1,000 feet of artificial burrow (or 1 pound per acre) to approximately 1 pound per 1,000 feet of burrow (or 2 pounds per acre). The rate of bait application should depend on the population of pocket gophers.

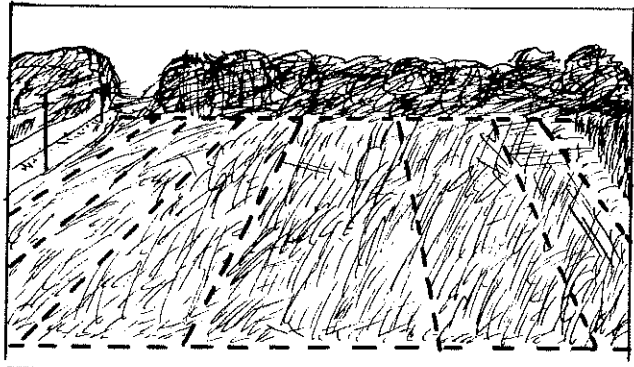
**Manufacturers of Burrow Builders**

- Rue R. Elston Company, Inc.    Everett B. Johnson  
815 East 79th. Street          Hancock Road  
Minneapolis, Minnesota 55420    Santa Maria, California
- Schneidmiller Industries        Star Prairie Welding,  
334 East Mountain              Star Prairie, Wisconsin  
Fort Collins, Colorado
- Blackwelder Manufacturing Co.  
Rio Vista, California

"The information given herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no indorsement by the Cooperative Extension Service is implied."

The manufactured machines and the machines built from these plans have been tested and will work, providing soil and moisture conditions are right. Adjustments for draft are made on the burrow builder through the use of levers and turnbuckles much the same as for plows, cultivators and other implements.

Additional information on pocket gopher control with the mechanical burrow builder machine may be secured from the Extension Service, NDSU, Fargo, or the U. S. Fish and Wildlife Service, Box 1814, Bismarck, North Dakota.



Alfalfa field poisoned with the "Burrow-BUILDER". Broken lines indicate where the artificial burrows were made.