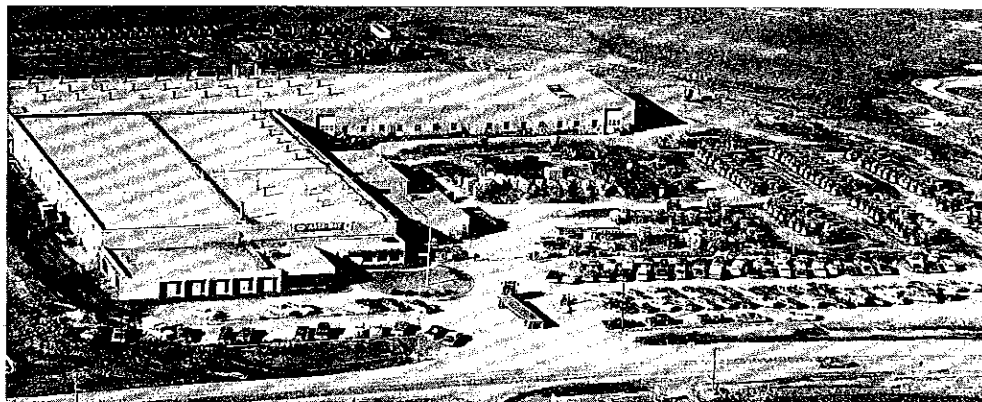
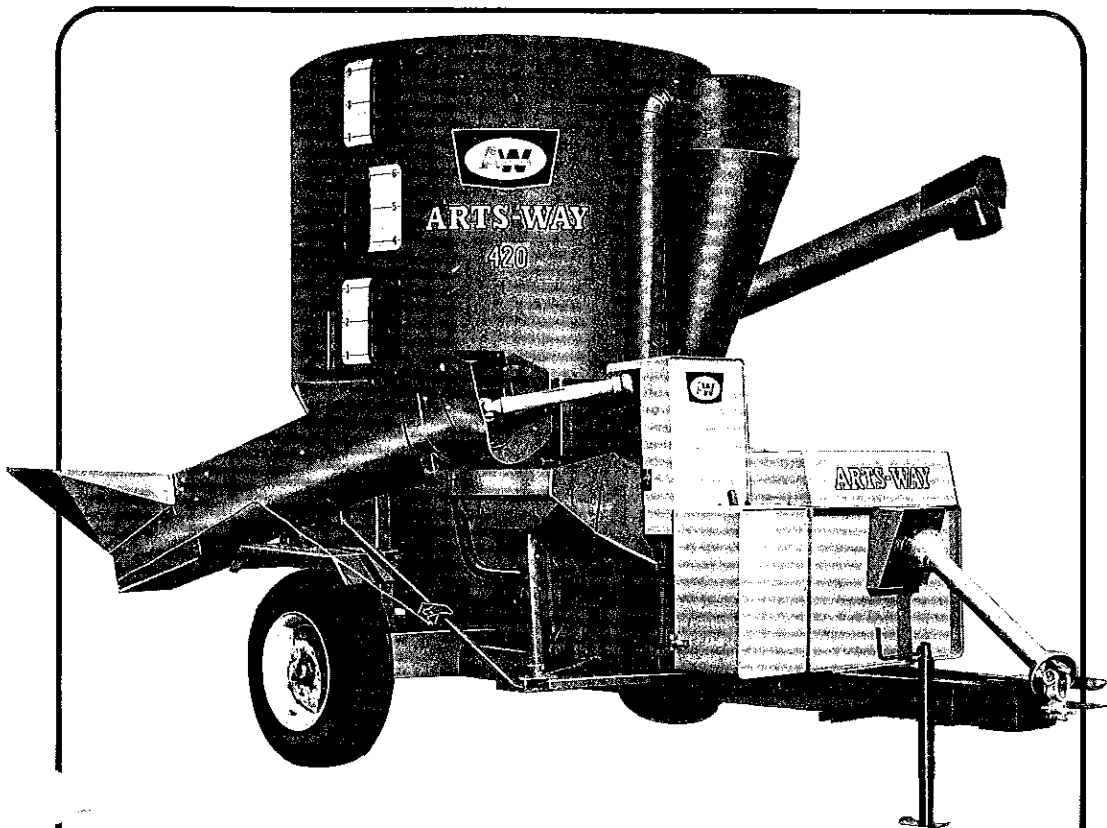


# OWNER'S GUIDEBOOK FOR THE

320 & 420 **ARTS-WAY** MODELS

## PORTABLE MIXER & MILL



**OPERATION**

**MAINTENANCE**

**LUBRICATION**

## INTRODUCTION

Your Arts-Way Portable Mixer and Mill is the finest made, and it is the purpose of this manual to assist you in realizing all the benefits you anticipated when you purchased it. Many people have contributed to the production of this product. All have an interest in its successful performance and have prepared this manual to give you the benefit of the experience they have gained through years of building and testing the Arts-Way Portable Mixer and Mill.

The way you operate this unit and the care you give it will have much to do with its successful performance. This operator's manual has been carefully prepared and illustrated to make operation as easy as possible for you. Keep this manual handy for reference. We will be glad to answer any questions you may have. For further information call or write Arts-Way Manufacturing Company, (712) 864-3131, Armstrong, Iowa.

# GENERAL CARE AND OPERATION



After you have read this manual and familiarized yourself with the operation of this machine, run ten bushels of corn cobs or other material through the mixer-mill to remove the protective oil coating from the mixer cone and any metal particles that may be in the machine. Do NOT feed this material.

The Arts-Way 320 and 420 Mixer-Mills are PTO driven by a 2 to 5-plow tractor. They are available for 540 RPM or 1000 RPM PTOs, and this speed should be maintained as the grinder performs best at 2,800 to 3,000 RPM (do not exceed 3,000 RPM).

#### NOTE:

Located in the auger between the

hammermill and the mixer is a bearing and bracket. After two full loads of feed have been ground and mixed, this bearing should be removed permanently. (Do not grind hay until this bearing is removed.) To take out bearing and bracket, remove two nuts and take the bearing and bracket out through the clean-out door. (See Illustration 1.)

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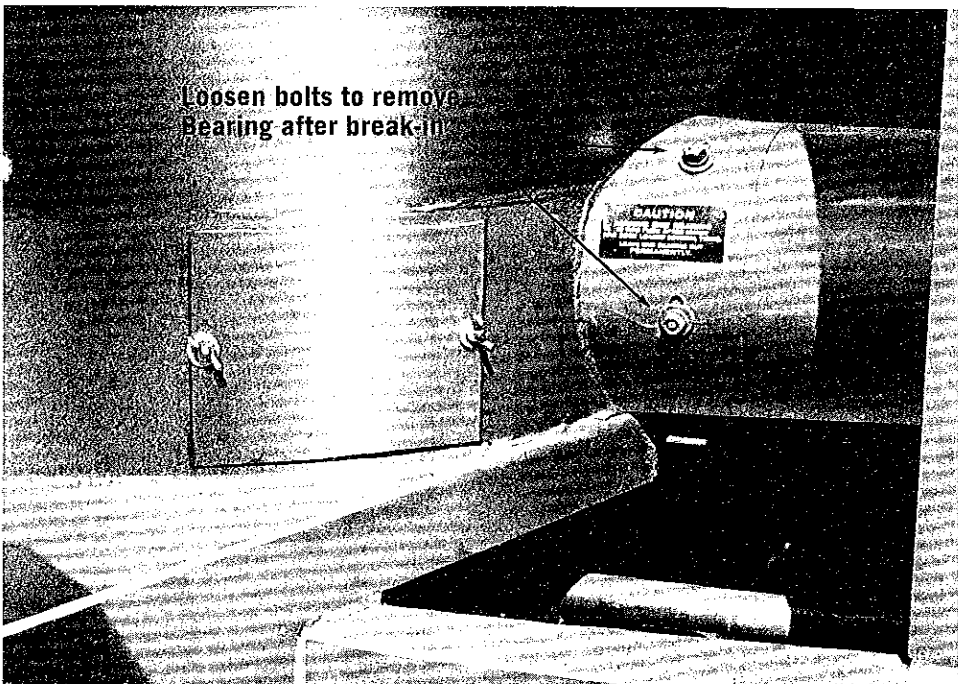
#### CAUTION:

Never put hands inside Mixer during operation.

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**SCREENS:** The screen size will be determined by the fineness desired. Screen sizes are available from 3/32 to 2 inch openings.

Illust. 1



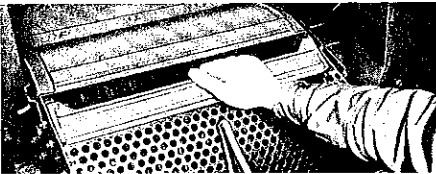
## TO INSTALL SCREEN

1. Open hammermill cover and remove screen bar. (See Illustration 2.)
2. Remove existing screen with wire hook provided. (See Illustration 3.)
3. Slide the new screen into the hammer side of the screen guides. (See Illustration 4.)
4. Replace screen bar and the hammermill cover.

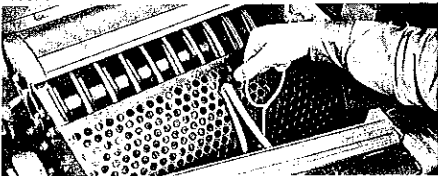
## BEFORE STARTING THE TRACTOR

1. Be sure unloading door is closed (and cone sacker door, if so equipped).
2. Disengage the unloading auger clutch by pulling the handle in a rearward direction until it is completely against the main frame.
3. Engage the hammermill by pushing the clutch pin in until it en-

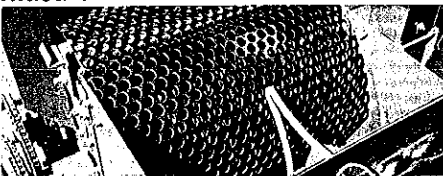
**Illust. 2**



**Illust. 3**



**Illust. 4**



gages the cogs of the flywheel. Turn right or left to lock. (See Illustration 5.)

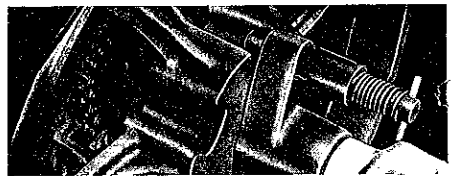
## AUGER DRAG (PTO DRIVEN) (OPTIONAL EQUIPMENT)

The auger drag swings out, and may be operated in any position from transport to 120 degrees from transport.

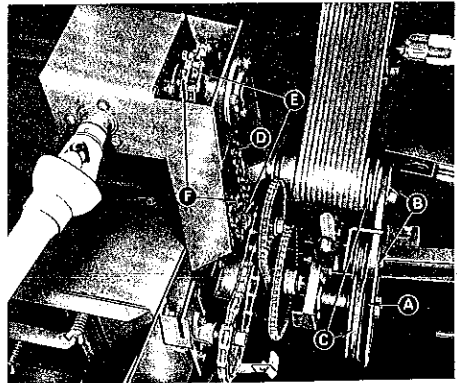
The tractor rated PTO speed must be maintained. Regulate auger speed to fit your tractor horsepower, screen size and material to be ground. Four auger speeds are obtainable. Two speed changes are made by changing belt "A" from pulleys "B" to pulleys "C" and two more by moving chain "D" from sprockets "E" to "F". The most rearward combination of pulleys and/or sprockets will provide the faster auger speeds. (See Illustration 6.)

## DO NOT TRY TO CHANGE SPEEDS DURING OPERATION.

**Illust. 5**



**Illust. 6**



To stop drag, push down handle "C"; to start, squeeze lever and handle together. (See Illustration 7.)

To increase tension on belt "A" loosen nut "B" and slide pulley upwards. (See Illustration 7.)

### HYDRAULIC DRIVEN AUGER DRAG (OPTIONAL EQUIPMENT)

To change the speed of the hydraulic drag, turn valve "A" right or left to increase or decrease speed. (See Illustration 8.)

### GOVERNOR ADJUSTMENT (OPTIONAL EQUIPMENT)

To increase the governor action, tighten wing nuts "A". To decrease its action, loosen these nuts. Tighten or loosen both nuts evenly. Clearance between plates "B" should

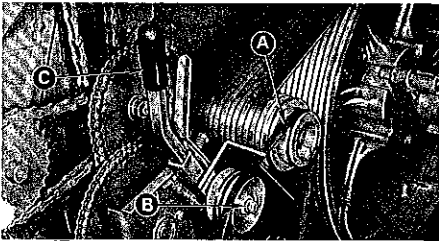
be approximately  $\frac{1}{16}$  inch. If the governor does not disengage by loosening or tightening spring-tension adjustment nuts, then loosen set screw "C" and increase or decrease adjustment nut "D". If the governor disengages too quickly, tighten the nut, decreasing the clearance between plates "B". Be sure to retighten the set screw after this adjustment is made. (See Illustration 9.)

To remove auger drag, remove pins "A" and "B" (See Illustration 10). Pull auger toward rear to separate the auger shaft at point "C".

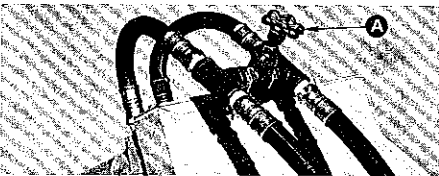
### ROLL FEED (OPTIONAL EQUIPMENT)

The roll feed will maintain uniform feeding, especially when grinding hay or ear corn. The roll feed may be locked in any position desired by turning crank "A". (See Illustration 11.)

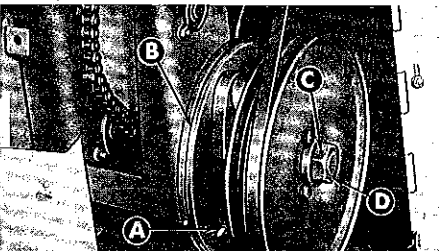
Illust. 7



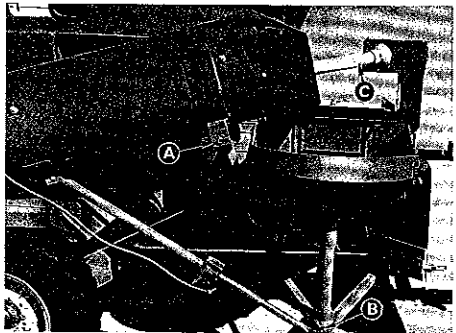
Illust. 8



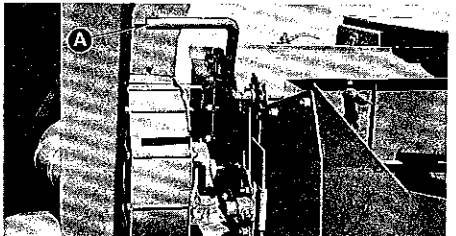
Illust. 9



Illust. 10



Illust. 11



## FILLING MIXER

Be sure unloading door is closed. As the mixer is filling, watch the ground feed through the mixer windows. The top window will gradually become completely covered. At this point, the mixer is not full (due to the flinging action of the mixing auger the feed has pyramided away from the top of the mixing auger). Continue to put material into the hammermill until the top window clears, and then until it is about one-fourth covered again. Stop the flow of feed to the mill; when the hammermill is clear, your mixer is full. Do NOT overload the mixer; overloading can cause damage to the machine. (See Illustration 12.)

## ADDING CONCENTRATE OR SUPPLEMENT

Concentrate or supplement should be added to the ground feed through the supplement hopper. For best results, add the concentrate or supplement at the beginning of the operation or within a minute or two after the grinding has begun to insure a thorough mixing. If micro-ingredients are to be added to the feed, the best results are obtained with a premix, or by adding the supplement and the micro-ingredients

simultaneously. If the micro-ingredients are desired without a premix or other supplement, remove the mixing tank lid and put the ingredients into the mixers. This should be done at the beginning of the operation. Be sure to close lid before starting. If strong additives are not wanted in the next batch, remove them through the clean-out door. After adding concentrates, always throw some feed into the hopper; this will assure that all concentrates are pushed through hopper neck and into mixer.

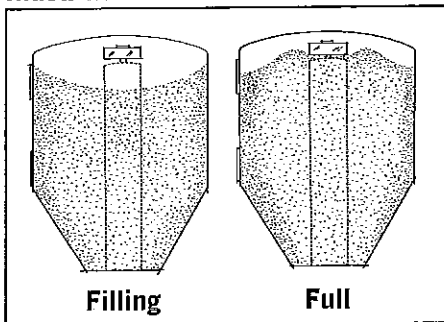
## MIXING

After hammermill is empty, stop the tractor and disengage mill clutch by reversing the process for engaging. Continue to run the mixer for several minutes to insure a thorough mixing of feed and supplements.

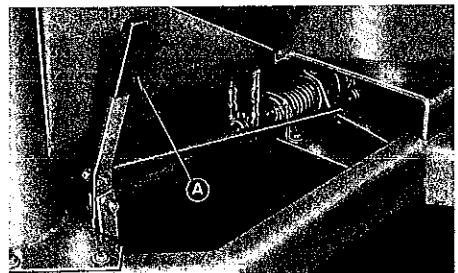
## UNLOADING

After mixing, the finished feed may be unloaded into storage bins, wagons or feeders. To unload, open unloading door so feed fills horizontal auger housing. Before starting tractor, quickly engage unloading auger clutch by moving handle "A" into upright position. PTO unloading speed should be at least 200 RPM. (See Illustration 13.)

Illust. 12



Illust. 13



## HERE ARE A FEW GENERAL RULES WHICH MAY BE HELPFUL:

1. Always have hammermill at rated RPM before starting to grind.
2. Always grind some grain before grinding hay.
3. Do not leave high moisture content feed in mixer. Keep mixer in dry place if possible.
4. Periodiocsally check all bolts and set screws, keep roller chains at proper tension and well oiled.

## ADJUSTMENTS

Chain: Lubricate with a good quality, light cylinder oil on the upper side of lower strand. Be sure sprockets are in line on shafts; faulty alignment causes excessive wear on both sprockets and chain.

The split end of the chain clip must face the direction opposite the chain travel. Be sure the clip is properly seated in the groove on the ends of the pin. (See Illustration 14.)

## MAIN DRIVE BELT TENSION

Tighten the multiple belt drive cautiously. All belts of the main drive must be at equal tension. This requires that the two main drive pulleys be aligned. (See Illustration 15.)

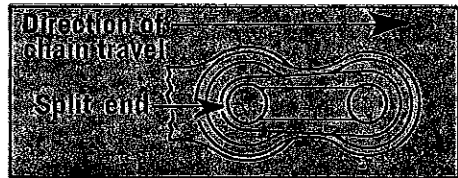
Belts on new machines have been properly adjusted at the factory. To re-tension the belts use the following procedure: Place a fish scale on a belt midway between the two pulleys. Five to six pounds pull on the scale should pull one belt  $\frac{3}{16}$  inch above the next belt. This is the proper tension for used belts on 540

and 1000 RPM drives. The tension should be increased to seven pounds if new belts are being adjusted. (See Illustration 16.)

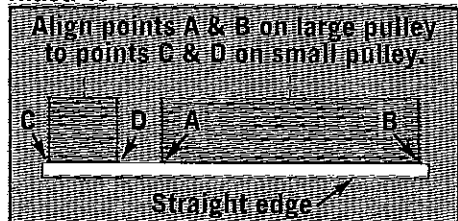
When re-tensioning the optional double V-Power Band belt, procedure is the same except pull on scale should read 12 to 14 pounds at  $\frac{1}{4}$  inch deflection.

Replacement belts should be tightened as follows: With a steel tape, measure the outside length of the two middle belts while they are still loose on the pulleys. Then tension the drive until the outside length is increased approximately  $\frac{7}{8}$  inch for 540 PRM drives and  $\frac{5}{8}$  inch for 1000 RPM drives.

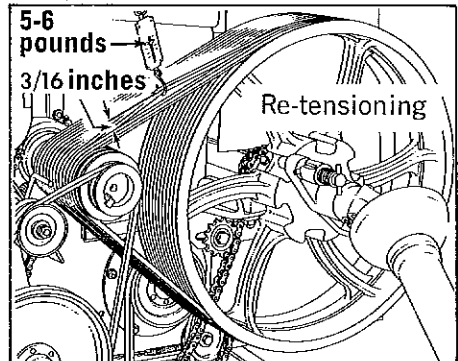
Illust. 14



Illust. 15



Illust. 16



Belts should be checked periodically for proper tension and alignment. Keep pulleys free of foreign matter to prevent belts from turning over in grooves.

## REVERSING THE HAMMERS

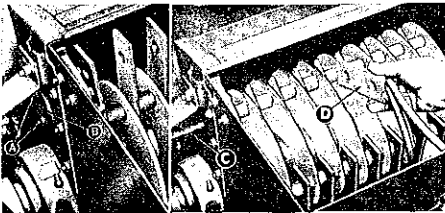
The hammers are reversible, but always replace hammers in exact sequence they were removed to preserve the balance of these specially-matched units.

To remove the hammers, remove the two bolts "A" from the side of the mill and plate "B". Pull rod "C" out, making sure that the hammers "D" are put back in the same place from which they were removed. Do NOT pull more than one rod at a time to avoid mix-up. Serious vibration will occur if hammers are replaced in wrong position. (See Illustrations 17 and 18.)

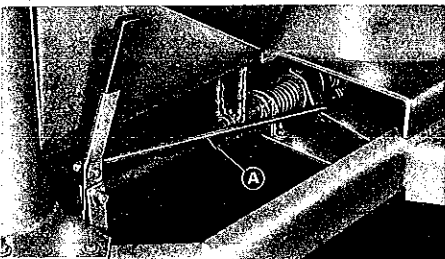
## REPLACEMENT OF DAMAGED HAMMERS

Hammers must be replaced in pairs to maintain balance. This is

Illust. 17



Illust. 19



done by replacing the hammers opposite each other (180 degrees apart) with a matched pair.

## AUGER CLUTCH ADJUSTMENT

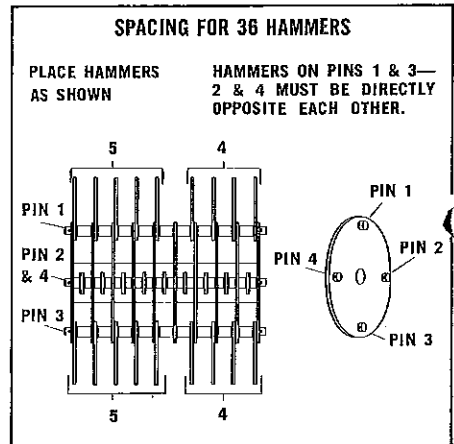
The unloading auger clutch may be adjusted with threaded rod "A" (See Illustration 19.)

## SHEAR BOLTS

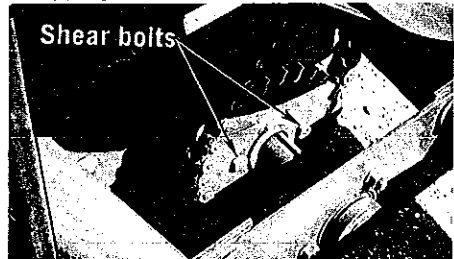
Shear bolts make a loud noise when they shear. This is your warning to stop the PTO immediately and determine the cause of the trouble.

When replacing shear bolts, always tighten them securely; they must not be loose. The shear bolts must be of the correct hardness to assure proper shearing. The correct bolts are 3/8" x 1" mild steel. (See Illustration 20.)

Illust. 18



Illust. 20





## MOLASSES ATTACHMENT (OPTIONAL EQUIPMENT)

Molasses can be mixed satisfactorily when mixer is one-third full of grain. Open valve "A" allowing molasses to flow into mill through mixer tube during the grinding process. (See Illustration 21.)

When adding molasses to hay, use a  $\frac{3}{4}$  inch screen and add 300 to 400 pounds of shelled corn and 5 to 7 gallons of molasses to the batch. This will prevent bridging and facilitate unloading.

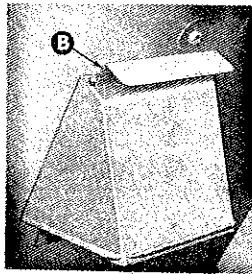
## TUBE SACKER ATTACHMENT (OPTIONAL EQUIPMENT)

The sacking of feed is easily accomplished with the Discharge Tube Sacker. To attach this unit, remove the unloading auger end section and attach the sacker in its place. Lever "A" will divert the feed to the outlet desired, permitting continuous filling. (See Illustration 22.)

Illust. 21



Illust. 23



## CONE SACKER ATTACHMENT (OPTIONAL EQUIPMENT)

(Factory Installation Only)

Feed may be drawn from the mixer tank by raising door "B" of the cone sacker. Keep this door closed when not in use. (See Illustration 23.)

## MAGNET ATTACHMENT (OPTIONAL EQUIPMENT)

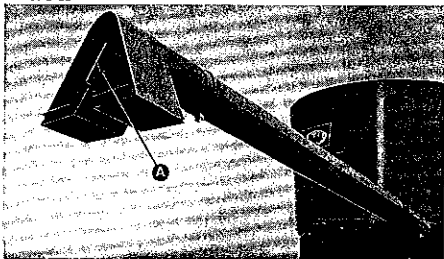
To protect livestock against metal particles such as bolts, wire, etc., from getting into the feed, magnets are available. Bolt magnet beneath the mill hopper as shown in Illustration 24.

## UNLOADING AUGER EXTENSIONS (OPTIONAL EQUIPMENT)

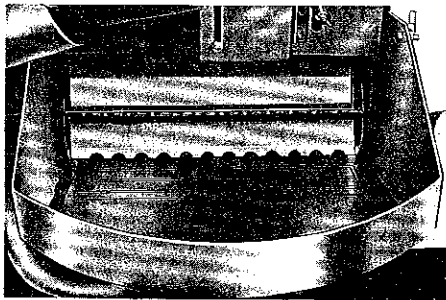
To install, remove unloading auger end section, slip extension auger on to main discharge auger and secure with set screws. (See Illustration 25.)

Slide extension tube over unloading tube and secure with clamp. Replace unloading auger end section.

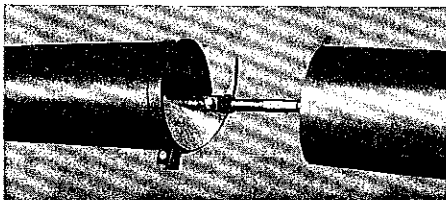
Illust. 22

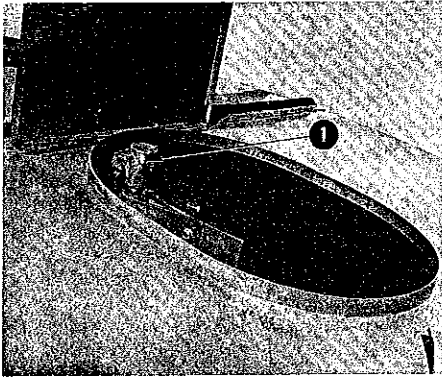


Illust. 24



Illust. 25





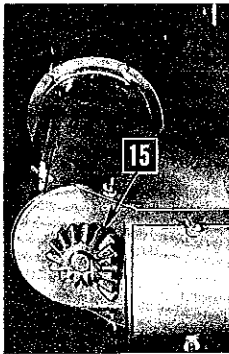
# LUBRICATION GUIDE



● Grease    ■ Oil

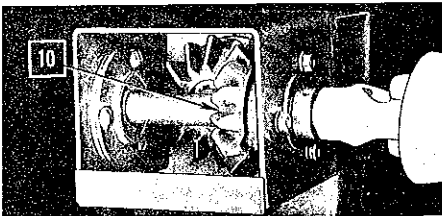
## Daily or After 10 Hours of Operation

1. Upper vertical mixer auger (1 fitting)
2. Roll feed drive shaft (2 fittings)
3. Auger drag drive sprocket (1 fitting)
4. Grinder driven shaft (2 fittings)



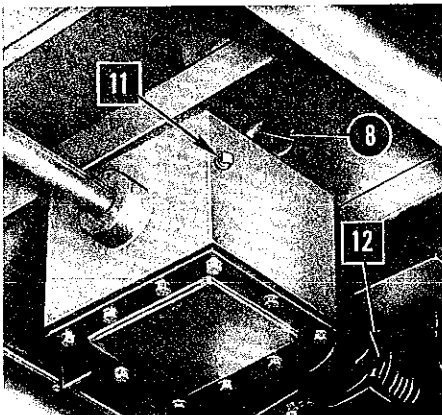
## Weekly or After 50 Hours of Operation

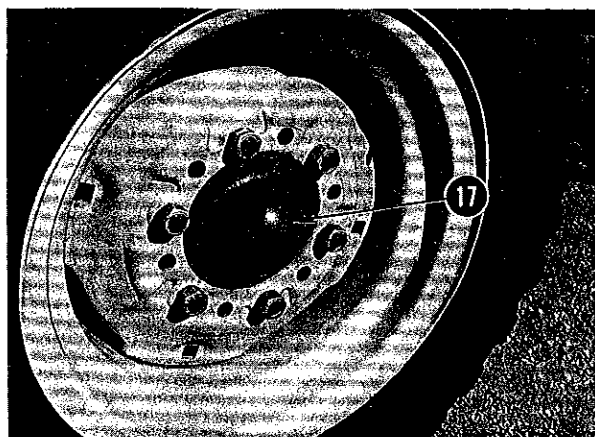
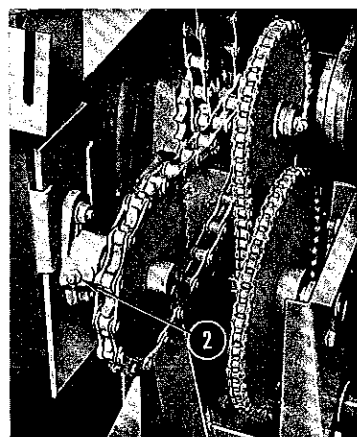
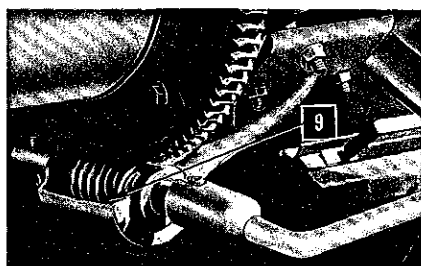
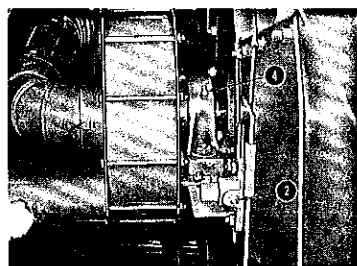
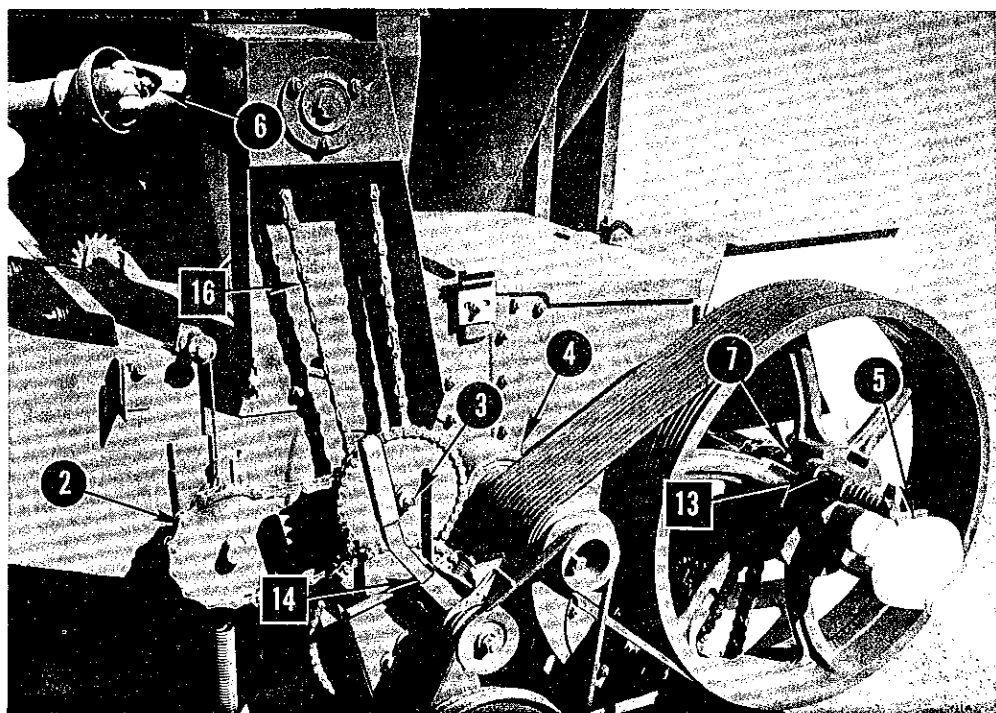
5. PTO shaft from tractor (2 fittings)
6. Auger drag drive shaft (2 fittings)
7. Grinder drive shaft (2 fittings)
8. Lower vertical mixer auger (1 fitting)



## Periodically

9. Keep unloading auger spout trough full of oil.
10. Lubricate gears in auger drag transfer box.
11. Check gear box every six months. Add oil (SAE 90) if necessary.
12. Lubricate unloading auger clutch.
13. Lubricate grinder engaging pin.
14. Lubricate auger drag clutch control lever.
15. Lubricate gears in unloading auger gear transfer points.
16. Lubricate chains.
17. Pack wheel roller bearings yearly if necessary.





**For Additional Information  
Contact the Factory Service Department  
Arts-Way Manufacturing Co.  
Armstrong, Iowa**

