

**MIX**

**MILL®**

**AUTOMATIC FEED PROCESSING SYSTEMS**

1248 SO. MAIN ST. • BLUFFTON, INDIANA • 46714

WARRANTY

A new MIX-MILL, having been purchased from one of its authorized representatives, MIX-MILL, INC., warrants for a period of (90) days from the date the MIX-MILL is put into operation, all such parts and workmanship thereof; except such products not manufactured by MIX-MILL, INC., that are used to make MIX-MILL, which, under normal use and service, shall appear to MIX-MILL, INC., to have been defective.

The warranty is limited to shipment to the purchaser without charge, except for transportation costs of the part, or parts, returned for inspection, and parts intended to replace those acknowledged by MIX-MILL, INC., to be defective.

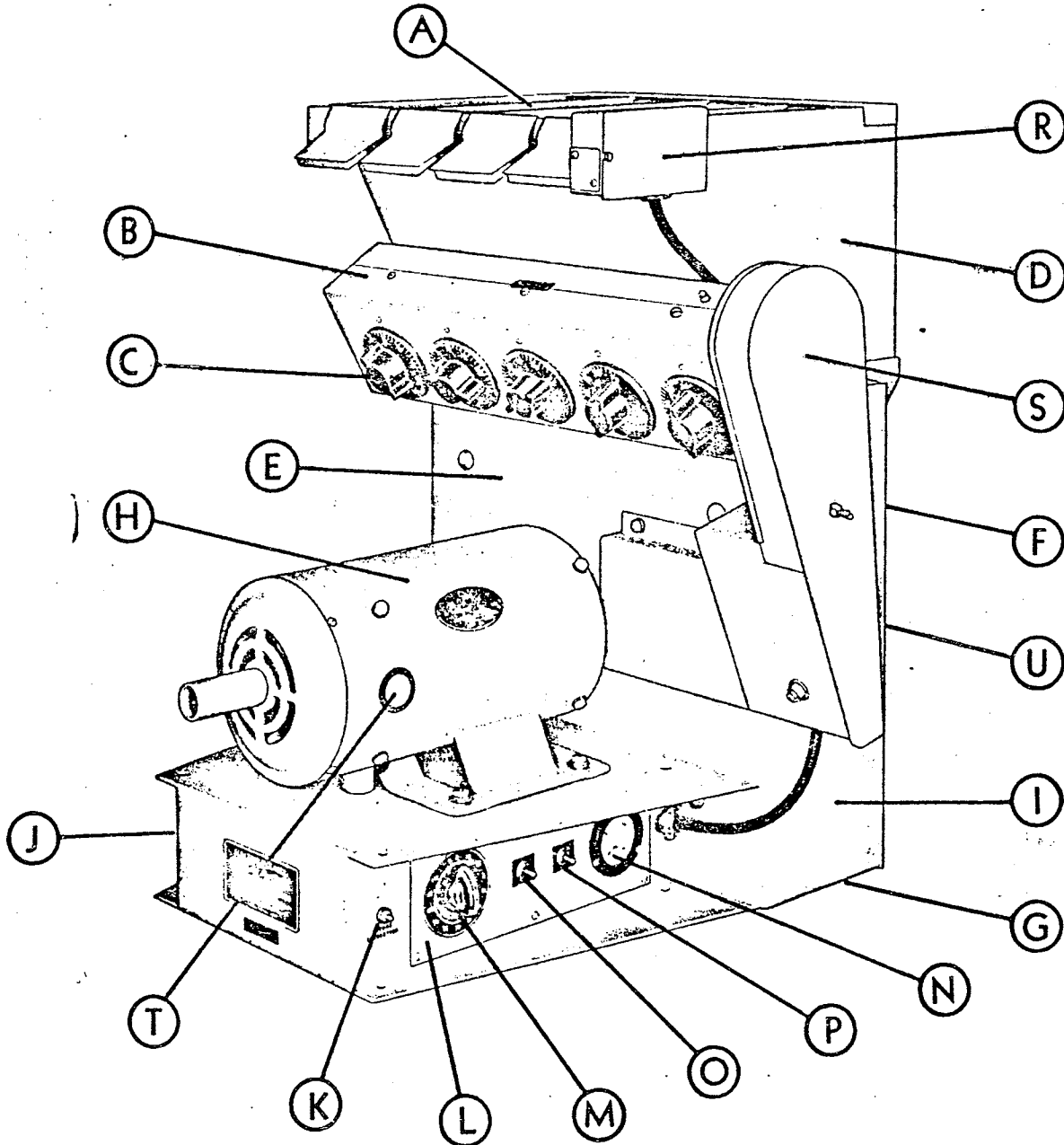
This warranty will not apply, and shall be void, under the following conditions:

1. If any part of the MIX-MILL has been altered, outside of its own factory or authorization.
2. If attachments or devices unsuitable to the machine have been in use.
3. If the machine is used, handled, or serviced contrary to the MIX-MILL Instruction Book.
4. Any representation or warranty other than that herein expressed, is not the responsibility of MIX-MILL, INC.

MIX-MILL, INC., reserves the right to make changes in design or improvements in this machine without the obligation upon it to install the same upon any MIX-MILL theretofore manufactured.

# MIX- MILL®

AUTOMATIC FEED PROCESSING SYSTEMS  
BLUFFTON, INDIANA



## GRAVITY MIX MILL

- 2 HP MODEL 234A1 CAPACITY TO 2000 LBS. PER HOUR
- 3 HP MODEL 334A1 CAPACITY TO 3500 LBS. PER HOUR
- 5 HP MODEL 534A1 CAPACITY TO 6000 LBS. PER HOUR

Accurately measures, mixes and grinds 3 grains and a supplement simultaneously delivering fresh feed daily. Operates without attention of an operator and shuts off automatically. Capacity to 6000 pounds per hour.

Gravity Fed from overhead bins, complete with totally enclosed fan cooled dustproof motor with built in manually reset overload protection; Control Panel for automatic operation; separate power circuit for operation of auger motors which are automatically energized when the Mill is running; two automatic-off-manual selector switches for separate power circuit and for the Mill; Safety Switch shuts down the Mill if the flow of any feed ingredient is interrupted for any reason; Magnetic Separator for removal of tramp iron; Shear Pin for protection of the proportioner.

# GRAVITY MIX-MILL

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GRAVITY FED FROM OVERHEAD BINS. Catalogue number includes: totally enclosed dustproof Motor with oversize ball bearings and built in manually reset overload protection; Power Circuit for auger motors or other electrical loads which are automatically turned on when the Mix-Mill is running; Control Panel for automatic operation with Timer, Load Meter, and two auto-off-manual Selector Switches, one for auger motors and one for mill motor; Safety Switch which shuts down the mill and associated equipment if the flow of any feed ingredient is interrupted for any reason; Magnet for removal of tramp iron; one installed in the mill plus two additional screens;

CATALOGUE						
TIMER HOURS MAXIMUM	BY PASS	SMALL QUANTITY GEARS	2 HP SINGLE PHASE	3 HP SINGLE PHASE	5 HP SINGLE PHASE	5 HP THREE PHASE
			SHIPPING WT. 237 LBS.	SHIPPING WT. 229 LBS.	SHIPPING WT. 305 LBS.	SHIPPING WT. 300 LBS.
2	NO	NO	A234A1	A334A1	A534A1	A544A1
2	NO	YES	A234B1	A334B1	A534B1	A544B1
2	YES	NO	A234C1	A334C1	A534C1	A544C1
2	YES	YES	A234D1	A334D1	A534D1	A544D1
5	NO	NO	A234E1	A334E1	A534E1	A544E1
5	NO	YES	A234F1	A334F1	A534F1	A544F1
5	YES	NO	A234H1	A334H1	A534H1	A544H1
5	YES	YES	A234J1	A334J1	A534J1	A544J1

**SMALL QUANTITY GEARS.** The left hand compartment of the proportioner (farthest from the drive pulley) can be arranged to feed at 1/4 the standard rate. The left hand compartment is the only one that can be so equipped. The smallest amount of an ingredient which can be fed into the ration with a standard proportioner is 80 lbs. per ton. With Small Quantity Gears the least is 20 lbs. per ton. When less than 20 lbs. per ton is required, see Technical Bulletin No. 19.

**BY PASS, WITH VALVE.** Either the right hand or the left hand compartment of the proportioner is equipped with a by pass with valve so that the ingredients can be directed into the hammer mill section or it can be by passed,

**TIMER.** Two hour and five hour Timers are available. The mounting dimensions are identical, therefore they can be interchanged.

C S A approved models for use in Canada are available and are designated by the prefix "M" instead of "A".

## GRAVITY MIX-MILL FEATURES

- A** - Hopper; four compartments, into which grain and concentrate are fed thru conductor pipes by gravity from overhead bins.
- B** - Proportioner; which measures and feeds ingredients to the hammer mill.
- C** - Proportioner dials; four dials control amount of each ingredient, fifth dial controls rate of grinding.
- D** - Proportioner augers; (installed behind proportioner dials) four augers feed grain from four hoppers to hammer mill. Rate of rotation of each auger is controlled by a proportioner dial. Amount of each feed ingredient is thus controlled by the corresponding proportioner dial.
- E** - Hammer mill; 15 swinging heat treated hammers operate at 3450 RPM inside a screen which completely surrounds the hammers. Screens 1/16" to 3/4".
- F** - Mill back; at rear of mill removable for changing screens.
- G** - Feed delivery port; the measured, mixed and ground ration leaves the mill thru a 5" x 16" delivery port. Auger base to receive ground ration is available.
- H** - Electric motor; totally enclosed, fan cooled, dust tight with oversize ball bearing on hammer end. Hammers are mounted on motor shaft. Two, three and five HP motors are available.
- I** - Mill frame; 12 ga. welded steel, dust tight. Gaskets are provided where needed.
- J** - Terminal box; (at rear of motor base) in which electrical connections are made to:
  1. Incoming power line.
  2. Motors which are controlled by the Mix-Mill.
  3. Control devices such as bin level switches, time clocks, etc., which will control the Mix Mill and all associated equipment.
- K** - Grounding terminal; connects to a water pipe or other adequate ground for safety
- L** - Control panel; consists of a timer, load meter, two control switches and two power relays for controlling the mill motor and, as a group, the auger and other associated motors.
- M** - Timer; 0 to 2 hour is standard, 0 to 5 hour is available, controls the length of time the Mix-Mill operates.
- N** - Load Meter; indicates motor load which is controlled by the fifth proportioner dial.
- O** - Mill Motor Switch; has "Auto-off-Manual" positions. When on "auto" position, Mill is controlled by the timer, bin level switch, or other automatic devices. Mill motor operates continually when on "Manual" position.
- P** - Auger Motor Switch; when on "Auto" position, auger motor and other electrical loads operate when mill is running and are shut down when mill "Manual" position allows continuous operation.

## SAFETY FEATURES

MIX-MILL IS DESIGNED TO OPERATE AUTOMATICALLY AND ENTIRELY UNATTENDED, WHICH IS MADE POSSIBLE BY THE FOLLOWING AUTOMATIC SAFETY DEVICES:

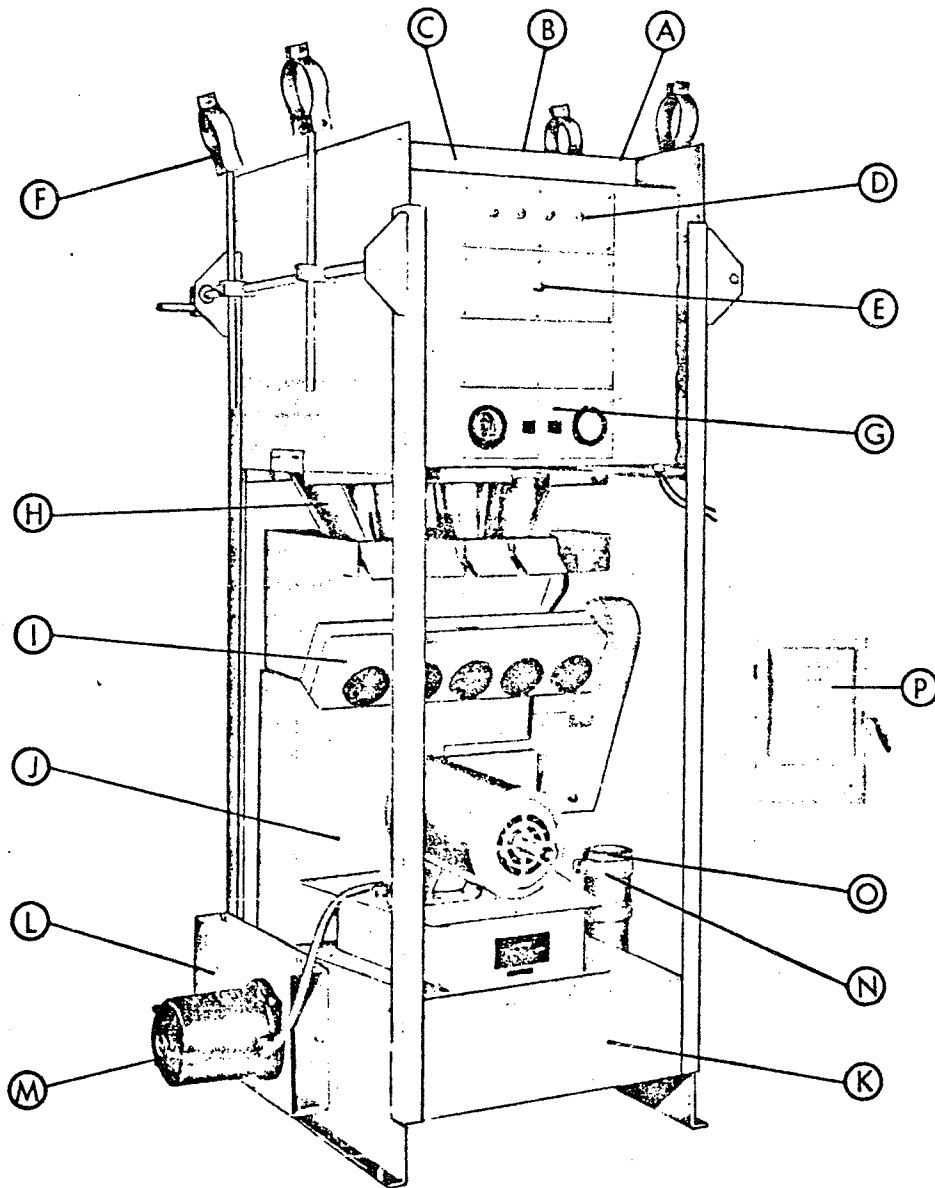
- R** - Safety Switch; which stops all equipment if the flow of any feed ingredient is interrupted for any reason.
- S** - Shear Pin; (mounted under removable belt cover) stops the proportioner if the proportioner auger becomes jammed with corn husks or other foreign material.
- T** - Overload protection relay; manually reset, mounted inside the motor and shuts off the motor should it become overheated for any reason.
- U** - Magnet; mounted on a hinged door (at back of Mill) removes tramp iron.

MIX-

MILL®

AUTOMATIC FEED PROCESSING SYSTEMS

BLUFFTON, INDIANA



## GROUND LEVEL MIX-MILL

2 HP MODEL M600A	CAPACITY TO 2000 LBS. PER HOUR
3 HP MODEL M800A	CAPACITY TO 3500 LBS. PER HOUR
5 HP MODEL M801A	CAPACITY TO 6000 LBS. PER HOUR

Accurately measures, mixes and grinds 3 grains and a supplement simultaneously delivering fresh feed daily. Operates without attention of an operator and shuts off automatically.

Self Feeding from Ground Level Bins; four Grain Level Switches in Control Panel automatically control four filling auger motors which bring grain to four hoppers from storage bins at any location or elevation; grain flows by gravity from the four hoppers to the Mill; built in manually controlled Bin Gates shuts off supply of any grain between hopper and Mill; Auger Base with power driven cross auger and Force Fed Tee for connection to standard Mix-Mill vertical auger (vertical auger is not included); 60 amp Fused Switch; 2 HP, 3 HP or 5 HP totally enclosed fan cooled dustproof ball bearing Mill Motor and 1/4 HP or 1/2 HP totally enclosed cross auger motor. All motors are single phase (5 HP optional single or three phase) and have built in manually reset overload protection. Control Panel for automatic operation; Two separate power circuits, one for operation of auxiliary auger motors and one for the four filling auger motors. Both are automatically energized when the Mill is running; Three automatic-off-manual selector switches for separate control of power circuits and for the Mill; four on-off switches for individual control of filling auger motors. Safety Switch shuts down the Mill if the flow of any feed ingredient is interrupted for any reason; Magnetic Separator for removal of tramp iron; Shear Pin for protection of the proportioner.

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## GROUND LEVEL MIX-MILL

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**MIX-MILL** — See Gravity Mix-Mill bulletin P-141 for description of mill and equipment included.

**HOPPER** — Four compartments each equipped with a Grain Level Switch which controls four filling augers (one each hopper). Grain can be taken automatically from any bin at any elevation which can be reached with a filling auger. (Filling augers are not included in catalogue number).

**CONTROL PANEL** — Includes Timer, Load Meter and auto-off-manual Selector Switch for controlling the mill motor (same as Gravity Mix-Mill, see P-141). In addition, two controlled power circuits are provided, each controlled by an auto-off-manual Selector Switch, one for auxiliary augers as a group or other electrical loads and one for four filling auger motors. Four on-off switches are also supplied for controlling each auger motor individually. All power circuits are automatically shut down when mill is off.

**AUGER BASE** — Complete with cross auger, 1/4 HP totally enclosed, dustproof motor with built in overload protection (1/2 HP on 5 HP Mix-Mill) drive kit and Force Fed Tee. (Delivery Auger is not included in catalogue number).

**AUGER SUPPORTS** — Four, for supporting Filling Augers.

**BIN GATES** — Four, manually operated to shut off grain between hopper on mill.

**FUSED SWITCH** — 60 amp. for remote mounting.

			CATALOGUE			
TIMER HOURS MAXIMUM	BY PASS	SMALL QUANTITY GEARS	2 HP SINGLE PHASE	3 HP SINGLE PHASE	5 HP SINGLE PHASE	5 HP THREE PHASE
			SHIPPING WT. 497 LBS.	SHIPPING WT. 505 LBS.	SHIPPING WT. 575 LBS.	SHIPPING WT. 570 LBS.
2	NO	NO	A600A	A800A	A801A	A802A
2	NO	YES	A600B	A800B	A801B	A802B
2	YES	NO	A600C	A800C	A801C	A802C
2	YES	YES	A600D	A800D	A801D	A802D
5	NO	NO	A600E	A800E	A801E	A802E
5	NO	YES	A600F	A800F	A801F	A802F
5	YES	NO	A600H	A800H	A801H	A802H
5	YES	YES	A600J	A800J	A801J	A802J

C S A approved models for use in Canada are available and are designated by the prefix "M" instead of "A".  
For a description of Small Quantity Gears, By Pass with Valve and Timer, see Gravity Mix-Mill bulletin P141.

### GROUND LEVEL MIX-MILL FEATURES

- A** — Hopper; four compartments, each equipped with a grain level switch which controls a filling auger. Grain flows by gravity from hopper to Mix-Mill where it is measured, mixed and ground automatically.
- B** — Grain Level Switch; (mounted inside hopper) starts a filling auger when level in hopper lowers and stops filling auger when hopper is full. (filling auger is not shown.)
- C** — Electrical Junction Box; where electrical connections are made to four filling auger motors.
- D** — Switches; four, controls filling auger motors individually.
- E** — Switch; controls all four filling auger motors as a group.
- F** — Auger Supports, adjustable, for mounting filling augers which bring grain and concentrate from ground level bins.
- G** — Control Panel; consists of a timer, load meter, two control switches for controlling the mill motor and, as a group, all auger and other associated motors.
- H** — Conductor Pipe; through which ingredients flow to Mix-Mill.
- I** — Proportioner; measures and feeds ingredients to the hammer mill where it is mixed and ground.
- J** — Mix-Mill; where ingredients are measured mixed and ground automatically. For Mix-Mill features see P141.
- K** — Auger Base; collects ground ration from Mix-Mill; cross feed auger takes it to the force fed tee.
- L** — Cross Auger; (mounted inside auger base) runs width of auger base under mill delivery port.
- M** — Cross Auger Motor; 1/4 HP totally enclosed dust proof with built in overload protection.
- N** — Force Fed Tee; delivery auger (not supplied as part of Mix-Mill) takes ration from cross auger and delivers it to the delivery auger.
- O** — Connection for Delivery Auger; delivery auger and tee can be rotated around cross auger for ration delivery at any angle, including vertical.
- P** — Entrance Switch; 60 amp fused switch, for remote mounting.

Suggestions which will improve the operation of your new Mix Mill  
Automatic Feed Preparation System

- DO provide an electrical wiring system of sufficient capacity so that adequate electrical power will be supplied to the Mill. Trying to "get by" with a cheap wiring job is very poor economy as unreliable operation will surely result.
- DO make sure a neutral conductor runs all the way from the source of electrical power to the Mill. Connecting the neutral terminal on the Mill to a ground rod only is not sufficient.
- DO use totally enclosed motors for dust protection and with built in overload relays to prevent burnouts.
- DO check the voltage connections at the motor terminal box. Some 1/3 and 1/2 HP and all 3/4 and 1 HP motors are dual voltage, that is, they can be operated at either 115 or 230 volts. But the connections to the motor are different for the two voltages. The motor nameplate will say if the motor is single or dual voltage; the connection diagram in the terminal box will give the connections for the different voltages.
- DO operate 3/4 and 1 HP motors at 230 volts which is four times better than 115 volts.
- DO connect additional electrical loads (such as auger motors) to the terminal wires provided on Mix Mill only. To connect such loads directly to the control panel will only result in faulty operation.
- DO provide a holding bin for ground feed of sufficient capacity to supply feed until emergency service can be obtained. If service is available within 12 hours, no holding bin is necessary. If with 24 hours, a one day supply of feed should be available; if 48 hours, a two day supply is advantageous, etc.
- DO make the grain and supplement bins large enough so that they will not have to be filled too often.
- DO make the supplement bin at least 1-1/4 times as large as the minimum bulk delivery tonnage.
- DO provide a way to clean out a ground feed auger system if it delivers two or more different feeds to different locations if one type of feed is detrimental if it is delivered to the wrong livestock. If this point is serious enough, independent auger systems may be justified.
- DO position augers which deliver grain or supplement to a Ground Level Mix Mill so that the material is discharged vertically downward and in the center of the hopper.
- DO position a "take away" auger installed in a drop box under the Mill so that the end of the auger tube is directly below the center of the Mix Mill motor shaft.
- DO keep outdoor augers water tight. Don't let water run down the auger tube into the collector box under the Mill. Use a rubber sleeve (inner tube), clamping one end to the auger tube with a hose clamp and the other under a metal ring. Calk if necessary to make a water tight joint.
- DO use the auger elbow with the auger base only. The auger elbow is built to handle ground feed as it comes from Mix Mill. It will not handle the volume carried by an auger taking grain from a bin.
- DO use clean grain by keeping foreign material out of the storage bins. If necessary pass grain through a 5/8 x 5/8 hardware cloth screen to remove large pieces of cob, metal, wood and stones, before the grain is stored.
- DON'T move grain or feed more times or a greater distance than is absolutely necessary.
- DON'T run a ground feed auger system any faster than is necessary to take the feed away from the Mill. A speed of 390 RPM is usually high enough. Slower speed reduces auger wear and reduces the size of the motor and the power bill.
- DON'T install an auger so it cannot be removed or replaced. A General Purpose Auger plus an Extension Auger are often better than one long auger when it comes to installation and removal.
- DON'T install a Gravity fed auger in a vertical position and expect ground feed to feed into it. Free flowing grains will feed, ground feed will not. If a vertical auger handling ground feed is necessary, use an M650 Auger Base.
- DON'T try to make ground feed slide down a pipe or through a fitting at an angle less than 45°. Drop it straight down, if at all possible.
- DON'T allow soy bean oil meal to stand in a bin or tank for a long period of time (3 weeks) without drawing off or augering out some of it to prevent it getting solid.

DON'T try to make materials such as : Bran  
Some meal type supplements  
High fat supplements  
Alfalfa meal  
Cotton seed hulls  
Dried brewer grains

flow down pipes into the Mill hoppers. These materials bridge very badly and it is very difficult to use them in an automatic feed system.

DON'T neglect to measure the voltage with a reliable voltmeter with the Mill grinding at full capacity. The voltage must be between 200 volts and 260 volts. Incorrect voltage (most often low voltage) is one of the most frequent causes of poor Mill performance.

DON'T connect additional loads to the wiring system unless the voltage stays above 200 volts with all the electrical apparatus operating at full capacity.

DON'T install motors in hot places (100° F or more) if it can be avoided. If an auger motor, for example, must be installed in the peak of the roof of a barn, use the next larger motor. The high temperature causes the motor to overheat and the overload relay is liable to trip.

DON'T expect to reset an overload relay just after it trips. Usually, the motor is thoroughly hot before the relay trips and the button cannot be reset until the motor has cooled off a certain amount. The cooling off period may be as long as 15 or 20 minutes.

DON'T operate the Mill with the pointer of the load meter in the red part of the scale.

DON'T worry about motors getting too hot if they are equipped with built in thermal overload relays, as all motors supplied by MIX-MILL, INC. are equipped. The overload relay will shut off the motor before it gets hot enough to cause any damage. The temperature of the motor might seem high to the touch, but the overload relay is a better measure of a dangerous temperature than is the touch.

DON'T worry about mounting motors in other than a horizontal position. The ball bearing motors supplied by MIX-MILL, INC. will operate successfully in any position.

DON'T file relay contact points. It only decreases contact life by removing valuable silver. Light scraping with a knife blade is much better if the contacts really need cleaning. Note: Contacts are usually cleaned far more than is necessary.

DON'T use ordinary household fuses in switches which supply motors. Always use "time lag" fuses and make sure the screw sockets or clips are clean and tight. If the fuse box gets very warm, the fuses will blow below their normal rating.

DON'T take a Franklin Electric motor supplied by MIX-MILL, INC. anywhere for service except to an Authorized Franklin Electric Service Station.

DON'T forget to look for blown fuses, tripped overload relays, tripped flow switches etc., if the Mill fails to run.

DON'T adjust the belts on the Mill or auger too tight or premature belt failure will result.

DON'T operate the Mill with worn out screens or hammers. No damage will result, but the capacity of the Mill will be reduced and the power cost increased.

DON'T neglect to clean the tramp iron off the magnets at frequent intervals.

DON'T move the hammers except in groups of three, otherwise unbalance and vibration may result.

DON'T hammer on the end of the Mill shaft when removing or installing the beater hub. Even a light blow is liable to damage the ball bearings which will result in the early failure of the ball bearing. The same remarks apply to MIX-MILL augers which are equipped with sealed ball bearings.

DON'T fail to remove the socket head set screw in the beater hub before attempting to remove it. The set screw is located in the hub which slides on the motor shaft.

DON'T fail to weigh the feed ingredients before setting the dials. The accuracy of the finished ground feed cannot be any greater than the accuracy of the weights of the ingredients.

DON'T fail to take precautions when handling feed which has been ground from "wet" corn. Such feed bridges more easily than feed ground from dried corn and is, therefore, much more difficult to handle.

DON'T nurse the Mill but, rather, operate it at full capacity.

- DON'T try to use meal type supplement after it has been found to bridge over in the automatic feed system. When troublesome bridging takes place, be realistic and purchase the supplement in pelleted form. Some meal type supplements will flow freely but some will not.
- DON'T use a nail as a safety clutch pin in the gear box.
- DON'T replace a clutch safety pin and restart the Mill but check each of the four compartments for husks, wood, cob or other foreign material. Check the Mill back (under the magnet) to see if the grain chute is plugged.
- DON'T remove dials when removing the front cover of the gear box; the dials come off with the front cover. The dials are adjusted at the factory and the setting must not be changed.
- DON'T try to replace the front cover of the gear box except with all five dials set on 25. With this setting, turning the gear box drive shaft (in the right direction) will allow the cover to slip into place.
- DON'T fail to lubricate the gear box. Frequent lubrication (every 10 hours of operating time) is much better than a larger quantity of lubricant at longer intervals. The gear box requires both oil and grease and it is so constructed that there is no danger of over lubrication, therefore, there is no reason to spare either oil or grease.
- DON'T use any but recommended grease (Mobilgrease Special with Moly) especially in areas where the temperature gets below zero in the wintertime.
- DON'T try to lubricate Franklin Motors supplied by MIX-MILL. These bearings are sealed and contain a supply of grease which is adequate for the life of the bearing. Therefore, the motor is not supplied with grease fittings. The same remarks apply to MIX-MILL augers.
- DON'T try to grind oats with smaller than 1/8" screen. The holes on smaller screens will prevent oat hulls from passing thru, the screen will become plugged and the grinding capacity will be very small- about 180 pounds per hour.

The capacity of the Mill depends upon the horsepower that is available from the Mill motor and the available horsepower varies considerably by the voltage of the power supply. The following tabulation shows how the horsepower changes with voltage:

Voltage of Power Supply	Output of 2 HP Mill Motor HP	Mill Grinding Capacity in percent
180 volts	1.7	77%
200 volts	1.9	87%
220 volts	2.1	95%
240 volts (normal or 100%)	2.2	100%
260 volts	2.0	91%
280 volts	1.4	64%

Operation of 3 HP and 5 HP Mill Motors are comparable.

#### How To Change The Belt

##### All Models

##### To Remove Vee Belt:

1. Loosen belt tension by moving adjustable idler to top of adjusting slot.
2. Remove gear box pulley by loosening socket head setscrew in gear box shaft end and removing drive wire.
3. Take belt off idlers.
4. Disconnect three motor lead wires from panel.
5. Remove motor mounting bolts, making note of the location and number of any flat washers under the motor which are used to align motor shaft in housing.
6. Lift motor and pull lead wires out of base.
7. Lift motor and slide vee belt out under motor.



#### To Replace Vee Belt:

1. Proceed in reverse order.
2. Before bolting motor down to mill base replace any flat washers used for shims. Align motor shaft in center of housing, so that the distance from the shaft to the screen ring is the same.

#### Adjusting Belt Tension:

Excessive belt tension will cause the worm shaft bushings to wear rapidly and to fail prematurely. The belt tension required to drive the gear box is very light, as the power required is less than that of a 100 watt electric light bulb.

1. With the adjustable idler pulley at the top of the adjusting slot, push mounting belt down until the belt has sufficient tension to drive the gear box pulley. This is all the tension required.
2. Another check is to pinch the belt strands together using your thumb and fore finger. If the belt strands will come within  $3/4$  inches of each other without excessive pressure, the tension is correct.

### MANUALLY RESET OVERLOAD PROTECTORS ON AUGER MOTORS

Overload protectors are, of course, used to prevent motors burning out because of excessive temperatures due to overload. Auger motors particularly require overload protection as augers will jam and clog and will almost always burn out the motor necessitating an expensive emergency rewind job.

Fuses, if selected carefully and if a separate fused circuit is provided for each motor, will give some protection, but as neither of these conditions is usually met, built in overload protectors are by far the least expensive and best way to provide motor protection.

Overload protectors are reset in two ways, automatically and manually. Automatic reset protectors are not safe when used on augers. For example, an auger might jam and the protector will trip. The operator will see that the motor is stopped and he is liable to assume that it will stay shut off. He might put his hand into the auger in order to clean it out just as the protector resets automatically, resulting in a serious injury.

This danger is not present with manually reset protectors as the motor will not restart until the red button is pushed.

After the protector trips, it cannot be restarted by pushing the red button until the motor cools off. This may take from 5 to 20 minutes. The button can be reset by hand and there is no use pushing on it with a tool in an attempt to make it reset quicker. Far too many motors are returned with broken overload protectors and with the red button chewed up showing clearly that someone had been working on them with a screw driver and maybe a hammer.

Motors are also received with the cover missing to the built in terminal box in the cast iron end bell. Removing this cover destroys the dust proof feature of the motors and will surely cause early failure.

Motors with broken overload protectors and with built in terminal box covers missing are not covered by Franklin Electric's warranty, regardless of the age of the motor.

**AUTOMATIC FEED PROCESSING SYSTEMS**

BLUFFTON, INDIANA

How To Set The Dials

1. The feed formula usually is in pounds per ton. Change the formula into pounds per ton if it is expressed some other way.
2. Since MIX-MILL works on volume, change the formula to bushels per ton. Use a set of scales to get actual weight of each ingredient. Some feed ingredients, particularly mash type concentrates, will settle to a substantial degree. On the other hand, as materials of this type are delivered by the proportioner, they are not settled at all but are very fluffy.

In order to avoid this situation it is only necessary to "fluff up" any materials before it is weighed - that is, to make the quantity of ingredient weigh as little as possible. Under no conditions should the ingredients be vibrated or settled as this is not the condition in which they are discharged from the proportioner.

3. The bushels per ton of each ingredient is the dial setting for the knob feeding that ingredient. If small quantity gears are used, the dial setting will be four times greater.

EXAMPLE

1. The feed formula is:
 

Concentrate	300 lbs.
Oats	600 lbs.
Shelled corn	1100 lbs.

2. For this example, say the concentrate has been put on the scales and has been found to weigh 41 pounds per bushel when it is fluffed up. The feed formula calls for 300 pounds per ton. Dividing 300 pounds by 41 pounds results in 7.3 bushels per ton being required.

In the same way it is found that 18.8 bushels of oats and 19.6 bushels of shelled corn are required for each ton of finished feed.

The formula for each ton of finished feed is:

Concentrate	7.3 bushels
Oats	18.8 bushels
Shelled Corn	19.6 bushels

3. The dials are then set at:
 

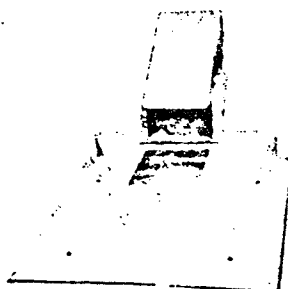
Concentrate	7
Oats	19
Corn	20

4. The above settings are entirely correct, however, if somewhat greater accuracy is desired, particularly on concentrate, divide all the settings by the concentrate setting and then multiply all the settings by a number which makes the highest setting (usually corn) less than but as near to 25 as possible. Taking the above settings as an example:

Concentrate	$7.3 \div 7.3 = 1.00$	$1.00 \times 9 = 9.0$	the setting would be 9
Oats	$18.8 \div 7.3 = 2.58$	$2.58 \times 9 = 23.2$	the setting would be 23
Shelled Corn	$19.6 \div 7.3 = 2.68$	$2.68 \times 9 = 24.2$	the setting would be 24

5. After setting the dials, it is ESSENTIAL that the settings be checked, to make sure that the weights of the ingredients are correct. This is done by using Cat. 4091 By Pass Chute as follows:

**CAT. 4091 BY PASS CHUTE FOR CHECKING DIAL SETTINGS**



**CAUTION: PULL (OPEN) MAIN LINE FUSED SWITCH BEFORE INSTALLING THE BY PASS CHUTE**

- a. To install the chute, turn mill motor off, raise the magnet door and hook the 7/16" flange to the top of door opening. The chute will be held in position by the magnet. Close the magnet door and feel up through the chute to make sure that it is in line with the deflector trough.
- b. Set the load dial (on far right) on 10 and leave it there.
- c. Set one ingredient dial on the setting for your formula; all other ingredient dials on zero.

Form: A20-1203  
Date: 31 August 1964  
Replaces: 10 March 1964

- d. Start the mill motor and with grain flowing, push box under chute to catch grain. Catch for exactly two minutes and pull out.
- e. Weigh and deduct box weight.
- f. Repeat for each grain (or concentrate) with dial setting for your formula and with other ingredient dials on zero.
- g. Find total net weight of all ingredients delivered, by adding net weights.
- h. Multiply the total net weight by the necessary number to equal 2000. (Or divide 2000 by total net weight of all ingredients delivered).
- i. Multiply the amount of each separate ingredient by the number determined in h. This is the amount per ton of the ingredient being delivered.

Reset dials to obtain amount of ingredient desired, if necessary.

EXAMPLE: The feed formula is:

Concentrate	300 lbs.
Oats	600 lbs.
Shelled corn	1100 lbs.

The dial settings are:

Concentrate	9
Oats	23
Shelled Corn	24

The load dial is on 10, the concentrate dial on 9 and all other dials, on zero. In exactly two minutes, 10.0 lbs. net weight of concentrate was caught from the By-Pass Chute.

With the load dial remaining on 10, the oats dial on 23 and all other dials on zero, 20 lbs. net weight of oats was caught.

With the load dial still on 10, the corn dial on 24 and all other dials on zero, 37 pounds net weight of corn was caught.

To find net weight of all ingredients, add 10 lbs. plus 20 lbs. plus 37 pounds which equals 67 pounds. To find the required number in (h) divide 2000 by 67 = 30.

Then the amount of each ingredient per ton being delivered is:

Concentrate	10 x 30 = 300
Oats	20 x 30 = 600
Corn	37 x 30 = 1110

This is the original formula, therefore, it is not necessary to reset the dials.

If this result does not agree with the original feed formula, it means that the ingredients were not weighed correctly and the dials should be changed to get the desired amount of each ingredient.

#### FEEDING MICRO-NUTRIENTS AND ANTIBIOTICS

Antibiotics are sometimes used in the feed formula, usually in rather small quantities. When any ingredient is used in quantities of less than 80 pounds (20 pounds with small quantity gears) per ton a premix of that ingredient and ground complete feed is needed.

MIX-MILL, INC. has again investigated methods for feeding small quantities of material (20 lbs. per ton down to oz. per ton) into the ration and continues to recommend the use of a "premix" or "bulking up" method.

Without criticizing any competitive method or equipment, MIX-MILL, INC., has satisfied itself that the only satisfactory method, in its' opinion, is to premix the micro-nutrient with ground ration, so that a substantial "bulking up" to about 100 lbs. per ton is obtained. The premix is then fed into the ration through one of the compartments of the proportioner.

The bulking up for medium to small quantities of ration can be done by a hand powered plaster mixer, or concrete mixer or a tumbling barrel in which case a H-2203 Premixer Hopper will be useful. For larger quantities a M603 Premixer is justified. Do not use corn, oats or other granular grains for the premix as the antibiotic is liable to settle out after mixing.

When a premix is to be used, proceed as follows:

Do not change the ingredient dial settings.

Add all the ingredient dial settings. Do not include the main dial on the right or any empty proportioner compartments.

Divide 2000 by the sum (total) of the ingredient dial settings. This is the average pounds per ton of finished feed fed by a single dial point.

MIX-MILL, INC.

4. Thoroughly mix the amount of antibiotic wanted per ton with two times the number of pounds of finished feed dial point found in Item 3.
5. Set the premix dial on 2 (on standard proportioners). With small quantity gears, set dial on 8.

EXAMPLE

Suppose that 1/2 lb. per ton of an antibiotic is to be fed into the ration previously used as an example.

	<u>The Ration</u>	<u>The Dial Setting</u>
Concentrate	300 lbs.	7
Oats	600 lbs.	19
Corn	1100 lbs.	20

1. The dial settings for the ingredients will not be changed.
2. The sum of the dial settings is  $7 + 19 + 20 = 46$ .
3. The average pounds per ton fed by a dial setting of one is  $2000 \div 46 = 43.5$  lbs.
4. One-half pound of antibiotic is thoroughly mixed with  $43.5 \times 2 = 87$  pounds of complete feed
5. The premix dial will be set on 2.

The complete dial setting will be:

Premix	2*	* With small quantity gears, the setting would be 8
Concentrate	7	
Oats	19	
Corn	20	

If one pound per ton of antibiotic is desired, one pound would be mixed with 87 lbs. of complete feed and the premix dial setting would be 2. If 1/4 lb. of antibiotic (per ton) is needed, the premix would consist of 87 lbs. of complete feed and 1/4 lb. of antibiotic with the dial setting remaining 2. Any other quantity of antibiotic can be fed in the same manner by premixing it with the proper quantity of complete feed (87 lbs. in this example).

**MIX**

**MILL®**

**AUTOMATIC FEED PROCESSING SYSTEMS**

1248 SO. MAIN ST. • BLUFFTON, INDIANA • 46714

September 11, 1965

**TECHNICAL BULLETIN #28**

Manually Reset Overload Protectors on Auger Motors

Overload protectors are, of course, used to prevent motors burning out because of excessive temperatures due to overload. Auger motors particularly require overload protection as augers will jam and clog and will almost always burn out the motor necessitating an expensive emergency rewind job unless suitable protection is provided.

Fuses, if selected carefully and if a separate fused circuit is provided for each motor, will give some protection, but as neither of these conditions is usually met, built in overload protectors are by far the least expensive and best way to provide motor protection.

Overload protectors are reset in two ways, automatically and manually. Automatic reset protectors are not safe when used on augers. For example, an auger might jam and the protector will trip. The operator will see that the motor is stopped and he is liable to assume that it will stay shut off. He might put his hand into the auger in order to clean it out just as the protector resets automatically, resulting in a serious injury.

This danger is not present with manually reset protectors as the motor will not restart until the red button is pushed.

After the protector trips, it cannot be restarted by pushing the red button until the motor cools off. This may take from 5 to 20 minutes or even longer. The button can be reset by hand and there is no use pushing on it with a tool in an attempt to make it reset quicker. Far too many motors are returned with broken overload protectors and with the red button chewed up showing clearly that someone had been working on them with a screw driver and maybe a hammer.

Motors are also received with the cover missing to the built in terminal box in the cast iron and bell. Removing this cover destroys the dust proof feature of the motors and will surely cause early failure.

Motors with broken overload protectors and with built in terminal box covers missing are not covered by the warranty, regardless of the age of the motor.

MIX

MILL®

AUTOMATIC FEED PROCESSING SYSTEMS

BLUFFTON, INDIANA

March 16, 1959

Technical Bulletin #12

Capacity of Mix Mill When Operated at Low Voltage

Question The Mill was grinding about 1100 pounds per hour when originally installed. A central electrical distribution pole was installed after which the capacity was 1400 pounds per hour. Why did the capacity increase so much?

Answer The new distribution pole put the transformer much closer to the Mill than it had been previously. The short line increased the voltage to the Mill which increased its capacity.

Remarks The capacity of the Mill depends upon the horsepower that is available from the Mill motor and the available horsepower varies considerable by the voltage of the power supply. The following tabulation shows how the horsepower changes with voltage:

Voltage of Power Supply	Output of Mill Motor HP	Mill Grinding Capacity in percent
180 volts	1.7	77%
200 volts	1.9	87%
220 volts	2.1	95%
240 volts (normal or 100%)	2.2	100%
260 volts	2.0	91%
280 volts	1.4	64%

From this it can be seen that if the voltage falls to 180 volts the Mill will grind only  $3/4$  of what it would normally grind. If the voltage goes as high as 280 volts, it will grind only  $2/3$  of normal.

The effect of high voltage is just as bad as low voltage, but when the voltage is not right it is much more often low than high.

The normal voltage for most power companies is 240 volts and they should stay within 10% of normal. If the power company does this the voltage will be between 216 volts and 264 volts, and the capacity of the Mill will be very close to 100%.

## AUTOMATIC FEED PROCESSING SYSTEMS

### BLUFFTON, INDIANA

February 18, 1964

#### SINGLE PHASE ELECTRIC MOTORS AND ELECTRICAL SYSTEMS FOR AUTOMATIC FARM FEEDING SYSTEMS

#### 1. FUSES BLOW IMMEDIATELY BEFORE THE MOTORS COME UP TO SPEED.

##### A. THE FUSES MAY BE TOO SMALL.

It is sometimes necessary to increase the size of the switch in order to use a fuse large enough to hold the starting load. This is particularly true when the mill, with a number of auger motors, are automatically started all at the same time.

##### B. THE FUSES ARE NOT LAG TYPE, SUCH AS FUSETRONS.

##### C. A FAULT (GROUND OR SHORT CIRCUIT) IS SOMEWHERE IN THE WIRING OR IN A MOTOR OR SOME OTHER DEVICE.

Remove all fuses except the one which is blowing. If it still blows when the switch is closed, the fault is a ground; that is, a hot wire is touching a grounded steel part such as the mill or motor frame, conduit, switch box, etc. If the fuse blows only when more than one fuse is present, the fault is a short circuit; that is, one hot wire is touching another hot wire or a motor is burned out. Grounds are most often, but not always, in the wiring; shorts most often in the motor.

Disconnect the equipment one piece at a time, closing the fused switch each time. When the fuse does not blow, the fault has, of course, been located.

If the fault has been located in a motor, inspect the connections in the motor terminal box and at the capacitors for wires touching the frame or each other. In mill motors, inspect the motor leads where they go through the mill base.

Smell the motor. A burned out motor gives out a definite burned smell. If it smells burned out and there is no trouble in leads, change the motor.

If the trouble has been located in the wiring, progressively disconnect parts of the wiring system closing the switch each time, so that the fault can be located in the smallest area possible, then carefully inspect the wiring in the switch and junction boxes, particularly where the wires enter the conduit. These faults are hard to find; there will be no burned smell and only a tiny mark.

#### 2. FUSES BLOW AFTER A PERIOD OF OPERATION

##### A. THE FUSE IS TOO SMALL FOR THE TOTAL LOAD.

The fuse should be approximately 25% greater than the normal maximum operating load. Do not increase the fuse size without regard to the size of the wire being protected.

##### B. THERE IS A POOR CONNECTION IN THE FUSE BOX.

Poor connections will get hot, will raise the temperature of the fuse and will cause it to blow well below its rating. The poor connection can be a loose terminal screw, low pressure between the switch blades and clips, plug fuse not screwed in tight, low pressure between cartridge fuse and clips or dirty contact surface.

Switch and cartridge fuse clips lose their spring tension after they once have been hot and auxiliary clamps must be used or the switch replaced.

##### C. TEMPORARY GROUND OR SHORT

It is possible but not very likely, for a temporary fault to come and go. This happens so infrequently that it probably can be ignored.

#### 3. OVERLOAD TRIPS BEFORE THE MILL GETS UP TO SPEED

This is caused by too much grain being on the screen when the mill starts. Before restarting the mill, pull the main line switch, remove the mill back and remove the grain from the screen.

#### 4. OVERLOAD TRIPS AFTER A PERIOD OF OPERATION

Motor is overloaded.

Load meter is incorrect.

Fan or fan blades are missing.

Air ducts (2 and 3 HP mill motors) between inner and outer shell are plugged.

Bearings are worn out and rotor is dragging on the stator - makes a loud noise.

Defective (shorted) motor: A motor with a small short circuit in the winding could trip the overload without blowing the fuse. However, a small short circuit will result in a burned out motor after operating for a few hours.

A burned out motor will have a distinct burnt smell, it will glow when energized, will not start at all, or if it does, will not come up to speed. Such a motor must be replaced.

A burned out motor is always shorted and sometimes it is also grounded.

## 5. MOTOR CONNECTIONS

Mill motors are for operation on 230 volts only, are not reversible, do not have a terminal box and only two leads come out.

Auger motors have terminal boxes with 8 leads which can be connected for 230 or 115 volts and either direction of rotation. The diagram of connections is pasted on the cover of the terminal box. Follow the diagram exactly. Do not make connections by trial and error. The motor will appear to operate normally when the overload or one half of the motor winding is not in the circuit. Always operate motors on 230 volt whenever possible. they have one-fourth the line drop of motors operating from a 115 volt line.

All motors are shipped connected for 230 volts and CCW rotation (counter clockwise when viewed from the end opposite the shaft). Motors which must frequently operate in either direction can be equipped with a reversing switch.

If a motor connected for 230 volts is connected to a 115 volt line, the motor will have only 25% output.

If connected for 115 volts and connected to a 230 volt line, the overload will usually burn out.

## 6. THE MOTOR WILL NOT START

Turn the rotor by hand to make sure it is free.

### A. IF THE MOTOR DOES NOT HUM:

There is no power to the motor. Check for voltage at the motor leads with a test light or voltmeter.

The overload protector is tripped.

Motor leads are loose at the panel terminal board.

Motor connections are not made correctly.

Defective (open circuit) motor. Check from one lead L1 to the other L2 with an ohmmeter. A high reading (more than 100) indicates a defective motor.

### B. IF THE MOTOR HUMS BUT DOES NOT START

If there is a loud growl, the motor winding is short circuited and is, or soon will be burned out. The motor must be replaced.

If there is a normal sounding hum it probably means the start circuit is open. The open circuit could be caused by an open motor winding, broken lead wire in the motor, a defective capacitor, but it is most likely to be an open starting switch on the motor.

The starting switch may not be making contact (open) because the contacts are dirty or burned, but the most likely cause is that the centrifugal mechanism is stuck in the open position. A sharp rap to the motor with a mallet will sometimes return the mechanism to the start position. If the mechanism continues to stick, the motor would have to be changed.

When a motor fails to start because the start winding is open, the overload will trip. This is normal.

## 7. NOISY BEARINGS

There is no need to replace a motor because of noisy bearings until there is noticeable end play in the shaft.

Ball bearings eventually wear out, but their life is seriously reduced by operating the motor overloaded or in a hot area, (high temperature operation causes the grease to leak out of the bearings) or hammering on the motor shaft.

When bearings are to be replaced it is recommended that the motor be returned to Bluffton so that the bearings can be replaced by the motor manufacturer.

## 8. LOW OUTPUT FROM THE MILL

The complaint is "The mill formerly operated with a load dial setting of 20 but now it cannot be set higher than 15. What is the matter with the motor?"

There is nothing wrong with the motor. There is almost nothing that can happen to a motor which will cause it to lose power. Dozens of motors have been returned for this reason and in every case, the motor has been found to be in perfect condition. The reduced output could be caused by:

Worn screen or hammers

Low voltage

Motor leads connected for 230 volts but connected to a 115 volt line

Change in feed formula (less concentrate)

Incorrect load meter

Most likely it is a change in the condition of the grain which may change the capacity by 20%. See A10.160



## 9. LINE VOLTAGE

Motors are built to operate at 10% over or under the nameplate voltage rating. If the voltage is off more than 10%, (usually under) performance suffers.

This is of first importance. No motor will give good service unless it is supplied with good voltage.

The voltage available during starting is also important and special attention should be given to this condition because the heavy starting current (amps) inrush pulls the voltage down far more than when the motor is running.

This is especially important for mill motors. Every new mill (and those which sometimes trip their overload during starting) should have the voltage measured during starting. With the mill stopped, place two or three handfuls of grain on the screen. Set the dials normally, start the mill and read the voltage as soon as the voltmeter stops swinging and before the motor comes up to full speed. There should be at least 180 volts right at the mill.

## 10. BURNED LEAD INSULATION

Occasionally a panel will have two or three inches of insulation burned off. This is almost always the result of heat caused by a poor connection at a terminal screw.

The worst insulation burning will be close to the screw and will get progressively less farther away. The other end of the wire may not be damaged.

Installing a new wire fixes things for awhile, but the terminal screw will be dirty (copper oxide formed by the heat) and it starts heating as it did before and eventually a new wire will fail just like the old one.

If possible, install a new screw and clean all parts of the connection clear down to the metal. If the terminal is plated steel, the plating will be gone and nothing will do much good except to install new plated parts.

## 11. GROUNDING ELECTRICAL EQUIPMENT FOR SAFETY

All electrical equipment must be grounded, not only to the neutral of the power supply, but also to a substantial ground right at the mill installation or in the livestock house. Refer to the wiring diagram and local electrical code.

A water pipe ground is best IF metallic water pipe goes all the way to and down into the well. but watch out for plastic pipe because the water in the pipe is not a good enough conductor and besides, the pipe might be empty when a ground is needed most.

If a driven ground is used, it should be driven into permanently moist undisturbed earth. A ground rod driven into fill might not be effective.

Make sure all motors, augers, hoppers, etc., are connected permanently and solidly to the ground. If it is not easy to connect to the existing ground, drive another ground rod in the hog house.

## 12. MOTOR WARRANTY

Motors are warranted in normal service against defects in materials and workmanship for a period of one year after installation or two years after the date they were built, whichever is first. See A10.804.

Some things which void the warranty are:

1. Motor has obviously been banded around
2. Motor was damaged in shipment
3. Motor has been dis-assembled
4. Motor has been wet
5. Overload is burned out
6. Overload is broken

#4 and #6 happen most frequently. Auger motors mounted outside without protection will have a reduced life and the motor manufacturer can tell they have been wet when they are taken apart.

It is particularly important not to mount motors outdoors upside down. The capacitor cover will fill with water and ground the capacitor after the first rain.

The overloads must have been broken by pushing on the reset button with a tool because it is virtually impossible to push the mechanism out the back of the overload with a finger.

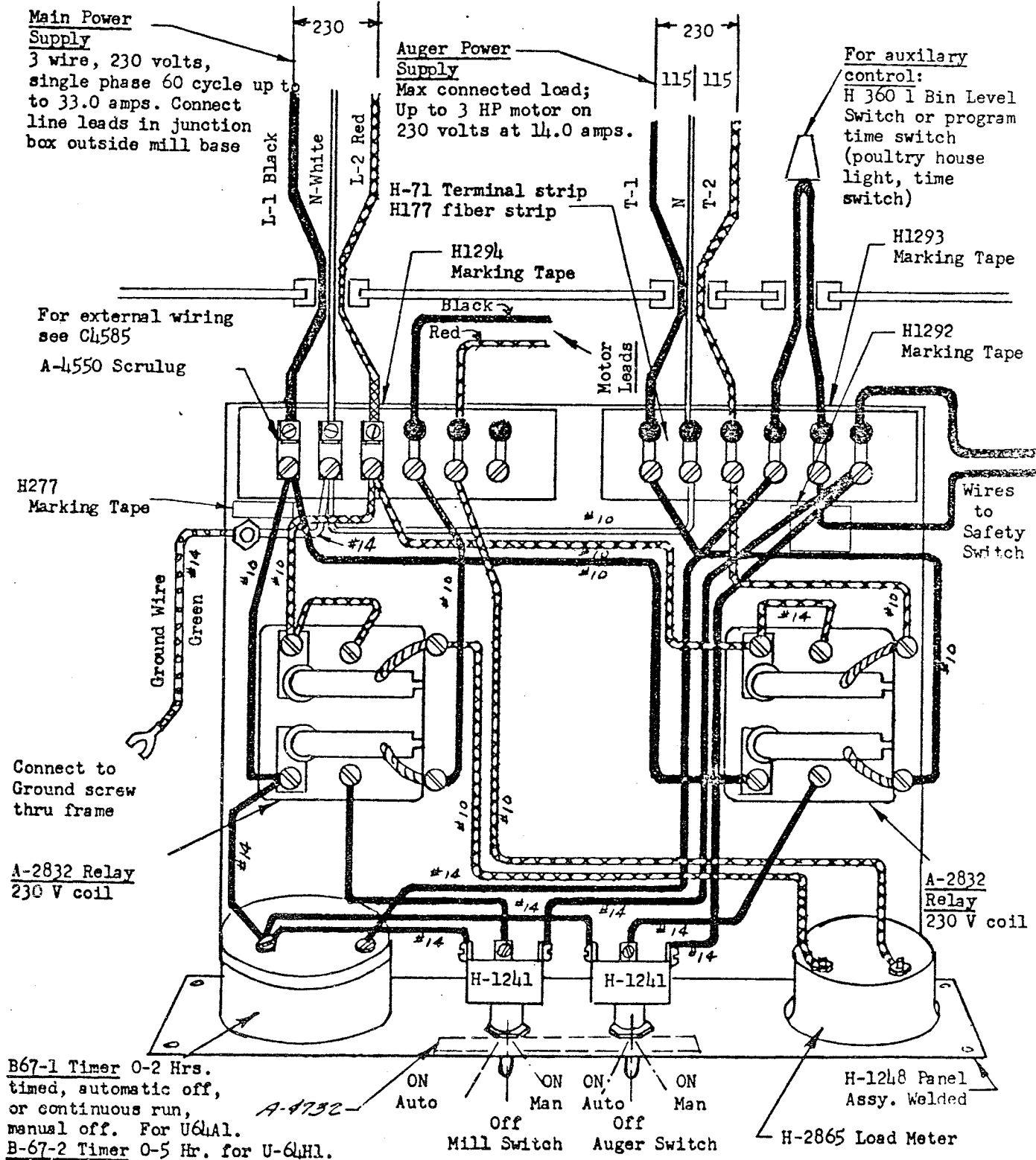
AUTOMATIC FEED PROCESSING SYSTEMS

BLUFFTON, INDIANA

U64A-1 & U64-H1

PANEL WIRING DIAGRAM

2HP Mix-Mill Model 234 - 3HP Mix-Mill Model 334



# MIX-MILL®

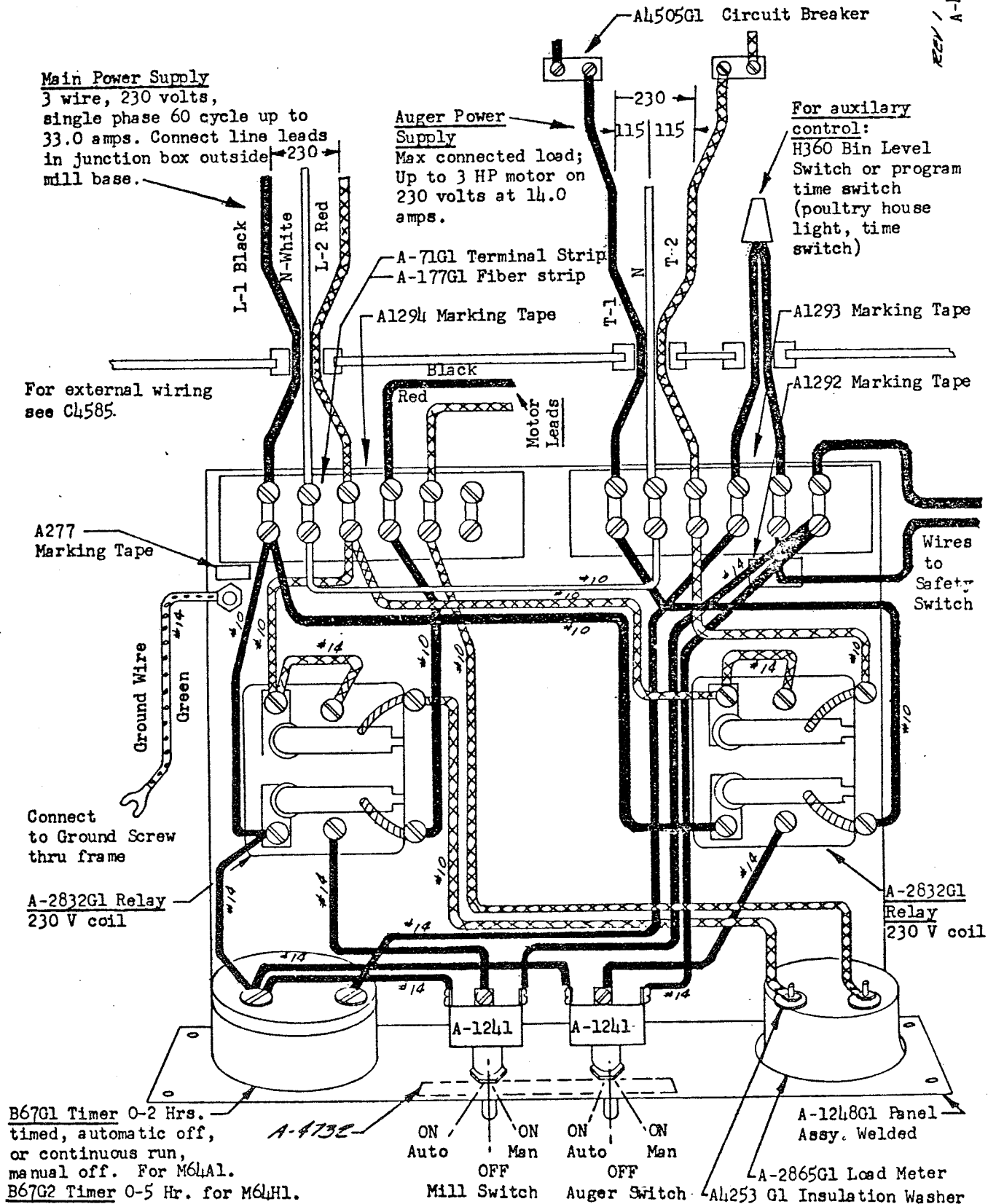
## AUTOMATIC FEED PROCESSING SYSTEMS

BLUFFTON, INDIANA

PANEL WIRING DIAGRAM  
PANELS M64A1 & M64H1

CANADIAN 2 HP MODEL M234 AND 3 HP MODEL M334 MIX-MILLS

REV 1 12-12-63  
A-1075



NOTE 1: FOR VOLTAGE AND ROTATION CONNECTIONS OF ALL AUGER MOTORS SEE WIRING INSTRUCTIONS IN MOTOR JUNCTION BOX.

NOTE 2: SEE P-2861 FOR PANEL WIRING OTHER THAN C-5A. SEE P-4075 FOR PANEL WIRING OF C-5A MODELS.

WHEN BIN LEVEL SWITCH IS USED REMOVE THE WIRE NUT JOINING THESE 2 LEADS IN MILL FRAME JUNCTION BOX AND CONNECT BIN LEVEL SWITCH LEADS AS SHOWN DOTTED IN MILL FRAME JUNCTION BOX.

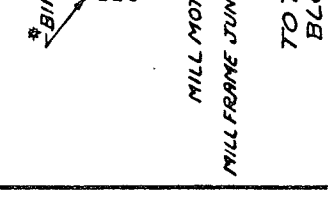
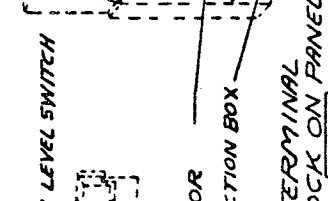
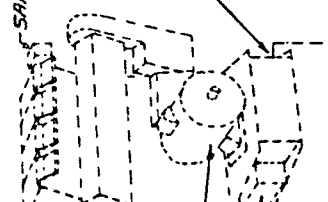
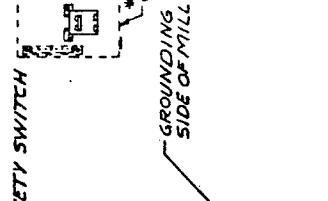
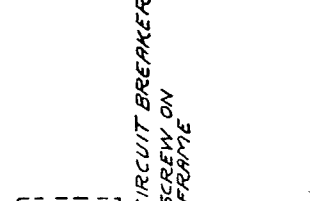
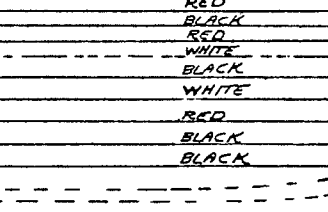
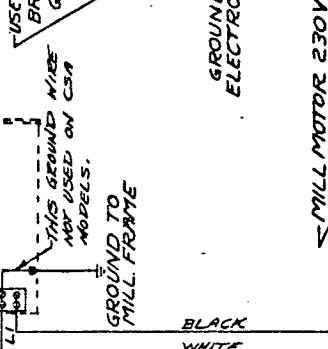
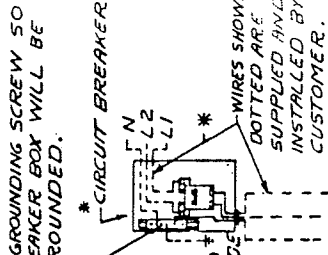
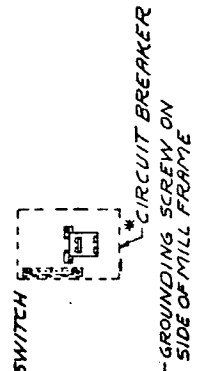
USE GROUNDING SCREW SO BREAKER BOX WILL BE GROUNDED.

\* BIN LEVEL SWITCH IF USED.

\* THIS GROUND WIRE MAY BE USED ON C-5A MODELS.

\* GROUND TO MILL FRAME

TOP VIEW OF PANEL



GROUND FEED AUGER MOTOR 230V WHEN USED

GROUND FEED AUGER MOTORS 115V WHEN USED. USE ALL MOTORS ON 230V WHENEVER POSSIBLE.

GROUND FEED AUGER MOTOR (230V)

GROUND FEED AUGER MOTOR (115V)

GROUND FEED AUGER MOTOR (115V)

GROUND FEED AUGER MOTOR (115V)

GROUND FEED AUGER MOTOR (115V)

GROUND FEED AUGER MOTOR (115V)

GROUND FEED AUGER MOTOR (115V)

GROUND FEED AUGER MOTOR (115V)

PAGE 30.102  
DATE JAN-31-1964  
REPLACES OCT-31-63  
ENGR. DWG. C-4585

MIX-MILL, INC. BLUFFTON, INDIANA, U.S.A.	
TOLERANCES UNLESS NOTED AS FOLLOWS:	SCALE NONE
DECIMALS	FRACTIONS
1/16	1/32
1/32	1/64
1/64	1/128
1/128	1/256
1/256	1/512
1/512	1/1024
1/1024	1/2048
1/2048	1/4096
1/4096	1/8192
1/8192	1/16384
1/16384	1/32768
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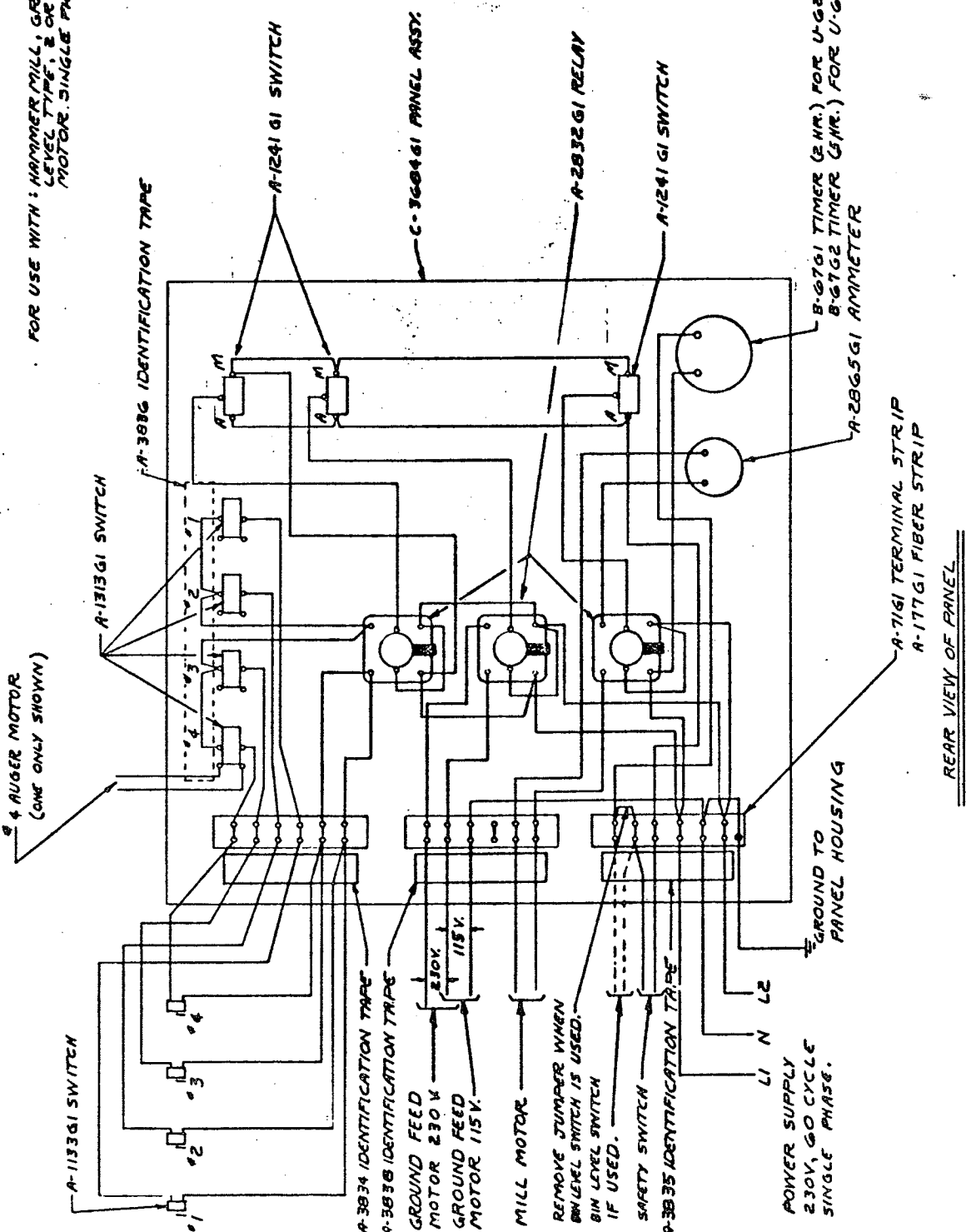
PANEL WIRING DIAGRAM.  
2 AND 3 HP. SINGLE PHASE. GROUND LEVEL MILL  
U.S.A.

PAGE A 30. 330  
DATE-DEC. 14-1963  
REPLACES MAY-2-1963  
ENG. DWG. C-3636

DATE	BY	REVISION

TOLERANCES (UNLESS OTHERWISE SPECIFIED)	MIX-MILLS INC. BLUFFTON, INDIANA, U.S.A.
DESIGNER	BY CLARK
CHECKED	DATE
TITLE	NO. OF SHEETS
WIRING DIAG. (U-G-271 PANEL)	21
DATE	U-G-271 PANEL
10-29-63	C-3636

FOR USE WITH: HAMMER MILL, GROUND  
LEVEL TYPE 2 OR 3 HP  
MOTOR. SINGLE PHASE



SEE C-4500 FOR EXTERNAL WIRING

PRINTED IN U.S.A.

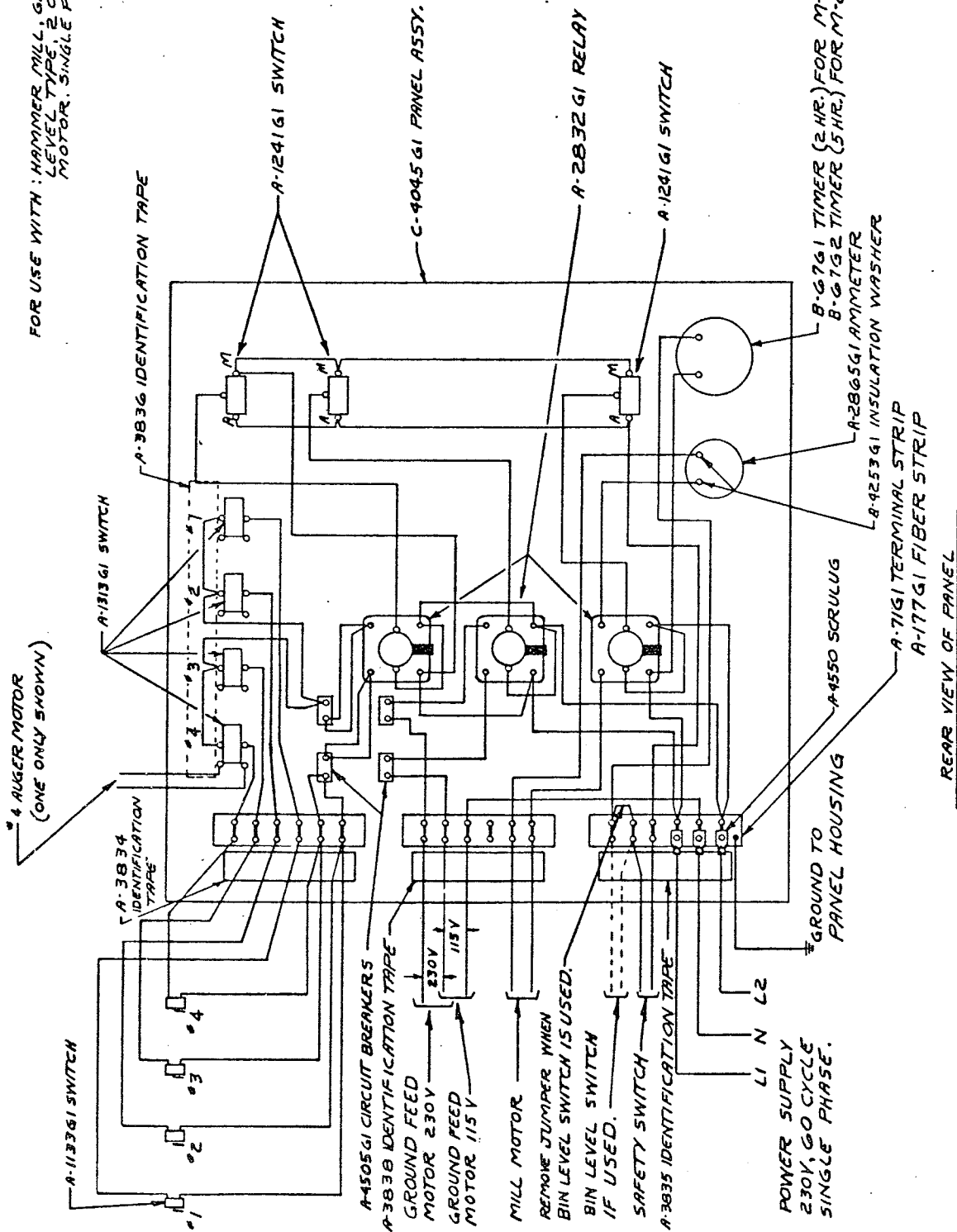
COPY TO: FACTORY - FIRE FILE - ENCL. FILE

PANEL WIRING DIAGRAM.  
2 AND 3 HR. SINGLE PHASE GROUND LEVEL  
CANADA

PAGE A 50 420  
DATE DEC-14-1963  
REPLACES NOV-12-1962  
ENG. DWG. C-4079

DATE	BY	REVISION	OR	CD
10-28-63	W. J. G.	1		
		2		
		3		
		4		
		5		
		6		

FOR USE WITH: HAMMER MILL, GROUND  
LEVEL TYPE 2 OR 3 HR.  
MOTOR, SINGLE PHASE



TOLERANCES AS NOTED	MIX-MILL <sup>®</sup> INC. BLUFFTON, INDIANA, U.S.A.	SCALE	DRAWN BY B. CLARK
ORIGINAL			
FACTORY			
DATE	10-28-63	TITLE	WIRING DIAG. (M-627A1 PANEL)
ANNUAL		DATE	10-28-63
		DRAWING NUMBER	C-4079

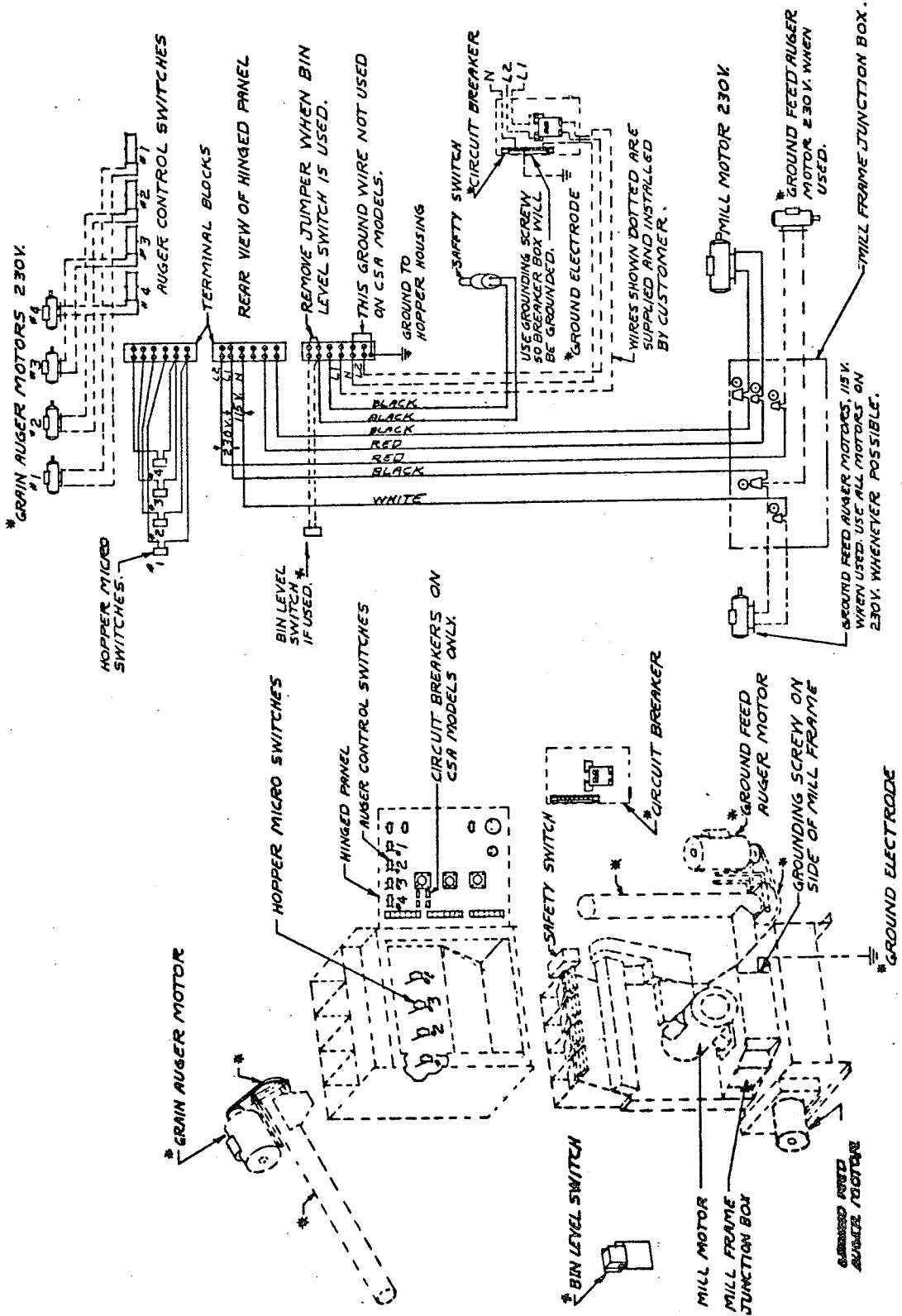
PRINTED IN U.S.A.

COPY TO FACTORY-FINE FILE-ENG. FILE

REV	DATE	BY	REVISION
1			
2			
3			
4			
5			

PAGE A 30. 430  
 DATE DEC-14-1963  
 REPLACED AUG-12-1963  
 ENG. DWG. C-4500

EXTERNAL WIRING DIAGRAM  
 2 AND 3 HP SINGLE PHASE GROUND LEVEL  
 U.S.A. AND CANADA



\* NOT SUPPLIED WITH BASIC MODEL, WIRING BY CUSTOMER.  
 \* ALL CONNECTIONS IDENTIFIED BY ○ ARE MADE IN MILL FRAME JUNCTION BOX.  
 NOTE 1: FOR VOLTAGE AND ROTATION CONNECTIONS OF ALL AUGER MOTORS SEE WIRING INSTRUCTIONS IN MOTOR JUNCTION BOX.  
 NOTE 2: SEE C-3636 FOR PANEL WIRING OTHER THAN C.S.A.. SEE C-4079 FOR PANEL WIRING FOR CSA MODELS

TOLERANCES (UNLESS OTHERWISE SPECIFIED)	MIX-MIL INC.		
DIMENSIONAL	FRONT	SCALE	BLUFFTON, INDIANA, U.S.A.
FUNCTIONAL	DATE	TITLE	EXTERNAL WIRING DIAGRAM
APPROVALS	DATE	BY	C-4500





DATE	3/1/64
BY	WJH
CHECKED	WJH
APPROVED	WJH

NOTE #1- USED ONLY ON GRAVITY TYPE MIX MILL.  
NOTE #2- SCREEN SIZE AND QUANTITY MUST BE SPECIFIED.  
NOTE #3- ORDER BY SUPPLYING COMPLETE MOTOR NAME  
PLATE DATA.  
NOTE #4- THE "QTY." LISTED UNDER REPLACEMENT PART  
NUMBERS REFERS TO THE TOTAL NUMBER OF  
COMPONENT PARTS NEEDED TO MAKE ONE  
COMPLETE MIX MILL

MIX-MILL INC.  
BLUFFTON, INDIANA, U.S.A.

SCALE: DRAWN BY: 3.1.64  
APPROVED BY: WJH

TITLE: GRAVITY TYPE MIX MILL  
REPLACEMENT PARTS

DATE: 3.1.64  
DRAWING NUMBER: C-4891

REFERENCE NUMBER	REPLACEMENT PART DESCRIPTION	REPLACEMENT PART NUMBERS							
		ENP (10)	QTY	5HP (10)	QTY	5HP (10)	QTY	5HP (10)	QTY
1	GEAR BOX SPARE PARTS	SEE 20.200	-	SEE 20.200	-	SEE 20.200	-	SEE 20.200	-
2	PANHEL SPARE PARTS (SEE NOTE #1)	SEE 20.170	-	SEE 20.170	-	SEE 20.170	-	SEE 20.170	-
3	MOTOR	M9963	1	M9703	1	M9364	1	M9228	1
4	GUARD-MOTOR SWIFT	M114	1	NOT USED	-	NOT USED	-	NOT USED	-
5	HOUSING ASSY.-WELDED	M10091	1	M10091	1	M9469	1	M3089	1
6	PROPORTIONER HOPPER ASSY.-WELDED	M12191	1	M12191	1	M12191	1	M12191	1
7	COVER-SAFETY SWITCH BOX	M1506	1	M1506	1	M1506	1	M1506	1
8	TRIP END ASSY.-INTERVAL TYPE	M561	1	M561	1	M561	1	M561	1
9	SWITCH PADDLE ASSY.	M236	4	M236	4	M236	4	M236	4
10	BELT GUARD SPARE PARTS	SEE 20.110	-	SEE 20.110	-	SEE 20.110	-	SEE 20.110	-
11	BEATER ASSY SPARE PARTS	SEE 20.050	-	SEE 20.050	-	SEE 20.050	-	SEE 20.050	-
12	MILL BACK SPARE PARTS	SEE 20.080	-	SEE 20.080	-	SEE 20.080	-	SEE 20.080	-
13	JUNCTION BOX (WITHOUT HOLES FOR CIRCUIT BREAKERS)	A555	1	A555	1	A555	1	A555	1
14	JUNCTION BOX (WITH HOLES FOR CIRCUIT BREAKERS)	M81061	1	M81061	1	M81061	1	M81061	1
15	CIRCUIT BREAKER	M3505	2	M3505	2	M3505	2	M3505	2
16	PULLEY 6"Ø D. (INCLUDES SET SCREW)	M33368	1	M33368	1	M33368	1	M33368	1
17	WEE BELT SWITCH (LAMP)	M232	1	M232	1	M232	1	M232	1
18	MERCURY SWITCH (LAMP)	M10661	1	M10661	1	M10661	1	M10661	1
19	WIRE WIRENESS (INCLUDES LEADS)	NOT USED	-	NOT USED	-	M35291	1	M35291	1
20	WIRE WIRENESS (INCLUDES LEADS)	M138	1	M138	1	M138	1	M138	1
21	SHEAR PIN-PULLEY	M1065	1	M1065	1	M1065	1	M1065	1
22	CLAMP-MERCURY SWITCH	M267	1	M267	1	M267	1	M267	1
23	CLAMP-CORD	M331761	1	M331761	1	M331761	1	M331761	1
24	PULLEY-SPECIAL	M8168	1	M8168	1	M8168	1	M8168	1
25	INSULATION-SWITCH BOX SIDES	M41961	1	M41961	1	M41961	1	M41961	1
26	INSULATION-SWITCH BOX BACK	M41962	1	M41962	1	M41962	1	M41962	1
27	INSULATION-SWITCH BOX COVER	NOT USED	-	M300064	1	NOT USED	-	NOT USED	-
28	WIRE WIRENESS (INCLUDES LEADS)	NOT USED	-	M1290	1	M1290	1	M1290	1
29	GEAR MET (Ø 1 1/2)	M4860	3	M4860	3	M4860	3	M4860	3
30	SPLICE-ELECTRIC WIRE	NOT USED	-	NOT USED	-	M3455	1	M3455	1
31	HOPPER UP EXTENSION ASSY.	NOT USED	-	M2143	3	M2143	3	M2143	3
32	WIRE NUT	M1065	3	M1065	3	M1065	3	M1065	3
33	WIRE NUT	M21861	1	M21861	1	M21861	1	M21861	1
34	WRENCH-HEX (SEE SECTION BOX SHIRT)	A125	1	A125	1	A125	1	A125	1
35	OPERATING INSTRUCTIONS	M1061	2	M1061	2	M1061	2	M1061	2
36	SNAP IN BLANK	M875	2	M875	2	M875	2	M875	2
37	WASHER LOCK (3/16")	M385	2	M385	2	M385	2	M385	2
38	WASHER LOCK (3/16")	M338	3	M338	3	M338	3	M338	3
39	WASHER FLAT (3/16")	M388	2	M388	2	M388	2	M388	2
40	WASHER FLAT (3/16")	M388	2	M388	2	M388	2	M388	2
41	NUT-HEX (3/8")	M327	18	M327	18	M327	18	M327	18
42	WASHER LOCK (3/16")	M327	2	M327	2	M327	2	M327	2
43	WASHER LOCK (3/16")	M33961	2	M33961	2	M33961	2	M33961	2
44	WASHER FLAT (3/16")	M388	2	M388	2	M388	2	M388	2
45	WASHER FLAT (3/16")	M388	2	M388	2	M388	2	M388	2
46	WASHER FLAT (3/16")	M388	2	M388	2	M388	2	M388	2
47	WASHER FLAT (3/16")	M388	2	M388	2	M388	2	M388	2
48	WASHER FLAT (3/16")	M388	2	M388	2	M388	2	M388	2
49	WASHER FLAT (3/16")	M388	2	M388	2	M388	2	M388	2
50	WASHER FLAT (3/16")	M388	2	M388	2	M388	2	M388	2
51	MOTOR-7 1/2 HP-TICKS AND SPEEDS	M8935	1	M8935	1	M8935	1	M8935	1
52	CABLE CONNECTOR	M8935	1	M8935	1	M8935	1	M8935	1

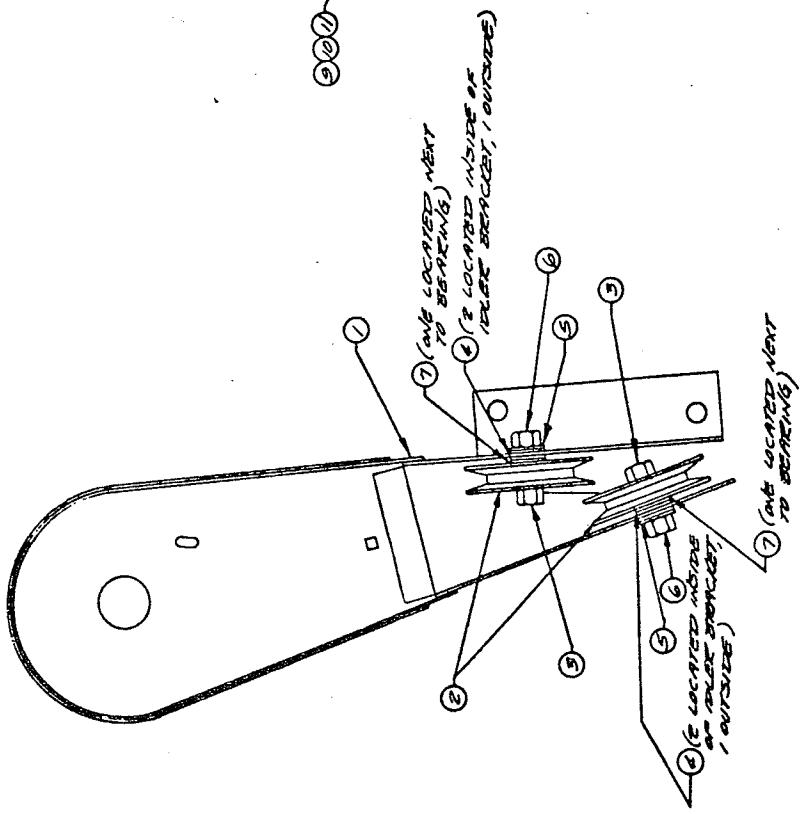
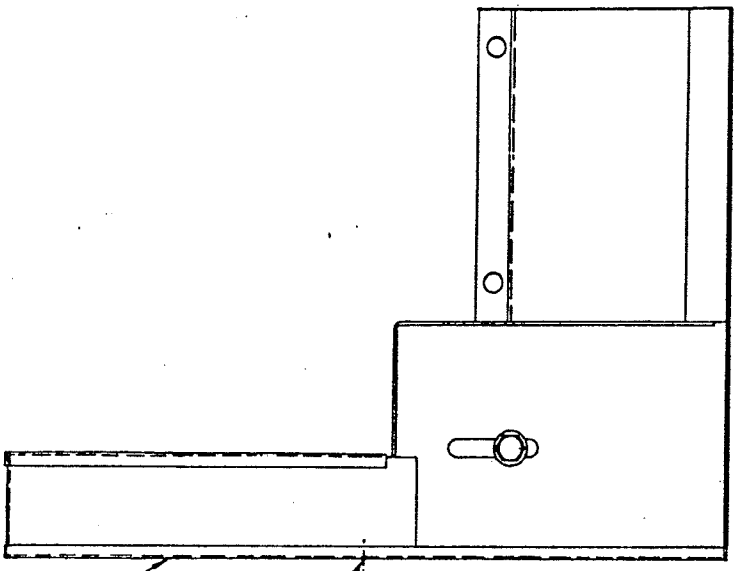
\* USED ON STANDARD GRAVITY TYPE MIX MILL.  
\*\* USED ON CSA APPROVED GRAVITY TYPE MIX MILL.

PRINTED IN THE U.S.A.





DATE	BY	DESCRIPTION	REV

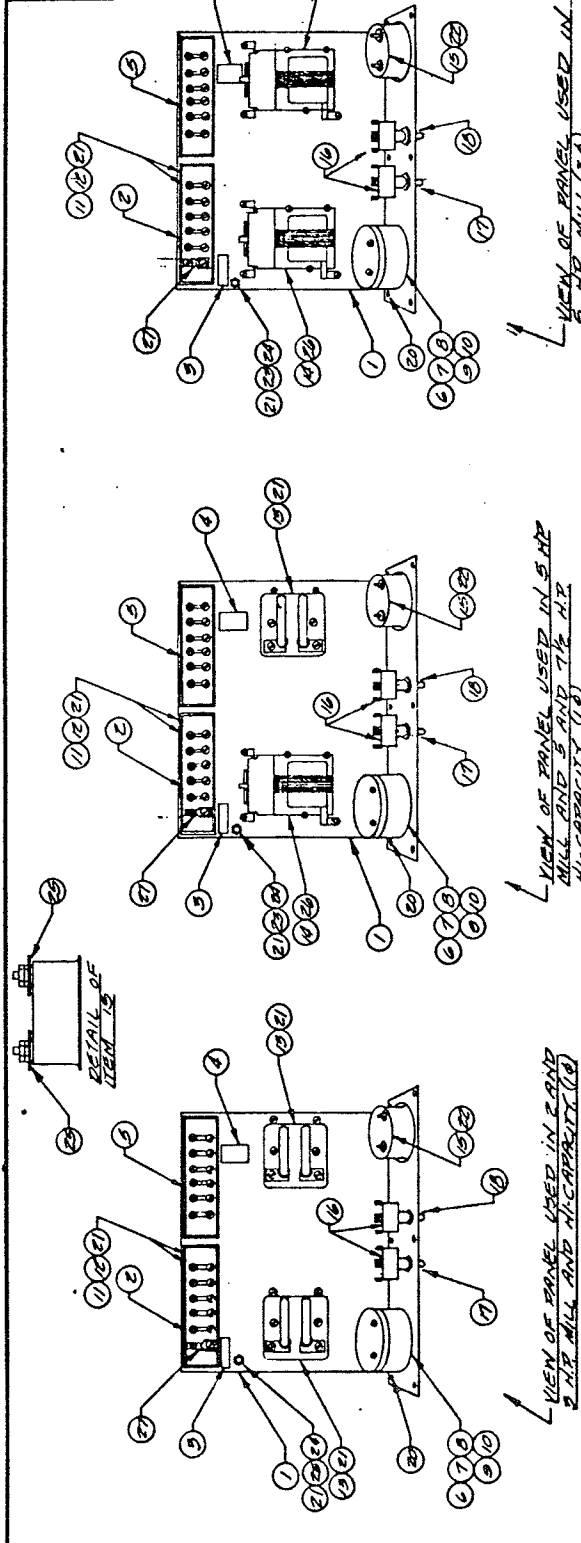


COMPONENT NUMBER	REPLACEMENT PART DESCRIPTION	REPLACEMENT PART NUMBER
1	BELT GUARD AND IDLER BEARING ASSY	M1103
2	ROLLER BALL BEARING	M1103
3	CAP SCREW - 1/4" (30)	M1509
4	WASHER - FLAT (30)	M1581
5	WASHER - LOCK (30)	M1586
6	NUT - NYL (30)	M1557
7	WASHER - FLAT (1/2") (SPECIAL)	M1584
8	COVER BELT GUARD	M126
9	WASHER - FLAT (1/2") (SPECIAL)	M1584
10	WASHER - LOCK (1/2")	M1586
11	NUT - NYL (1/2")	M1557

NOTE: FOR COMPLETE #3 AND BELT GUARD AND IDLER ROLLER ASSY (LESS COVER AND HARDWARE NEEDED TO MOUNT IT), ORDER M1103G

TOLERANCES (UNLESS OTHERWISE SPECIFIED)	MIX-MILL, INC.	
DIMENSIONAL	BLUFFTON, INDIANA, U.S.A.	
FRACTIONAL	SCALE	DRAWN BY
DECIMAL	1" = 1"	DEBARGE
ANGULAR	DATE	
	9-23-64	
	C-4880	

DATE	BY	REVISION NUMBER



TERMINAL NUMBER	REPLACEMENT PART DESCRIPTION	REPLACEMENT PART NUMBER	QUANTITY	UNIT
1	PANEL-STEEL FRAME	M2761	1	EA
2	IDENTIFICATION TAPE	M2761	1	EA
3	CABLE-GROUND CONNECTION	M2761	1	EA
4	IDENTIFICATION TAPE-PLAIN SWITCH WHITE"	M2761	1	EA
5	IDENTIFICATION TAPE-PLAIN SWITCH CONTROL CIRCUT, ETC."	M2761	1	EA
6	TIMER-2 HOUR WITH WINDMATE	M2761	1	EA
7	TIMER-5 HOUR WITH WINDMATE	M2761	1	EA
8	TIMER-8 HOUR WITH WINDMATE	M2761	1	EA
9	DIAL-2 HOUR TIMER	M2761	1	EA
10	DIAL-5 HOUR TIMER	M2761	1	EA
11	5-1/2" SQUARE TERMINAL	M2761	1	EA
12	FLAT TERMINAL (1/2" TERMINAL BLACK)	M2761	1	EA
13	FLAT TERMINAL	M2761	1	EA
14	CONTACTOR	M2761	1	EA
15	CONTACTOR	M2761	1	EA
16	CONTACTOR	M2761	1	EA
17	CONTACTOR (CENTER OFF)	M2761	1	EA
18	CONTACTOR	M2761	1	EA
19	CONTACTOR	M2761	1	EA
20	CONTACTOR	M2761	1	EA
21	CONTACTOR	M2761	1	EA
22	CONTACTOR	M2761	1	EA
23	CONTACTOR	M2761	1	EA
24	CONTACTOR	M2761	1	EA
25	CONTACTOR	M2761	1	EA
26	CONTACTOR	M2761	1	EA
27	CONTACTOR	M2761	1	EA

NOTE: TIMERS LOADMETERS, CAPACITORS, POWER RELAYS, AND CONTACTORS CANNOT BE REPAIRED ECONOMICALLY. WHEN REPAIRS ARE REQUIRED, THE ENTIRE DEVICE SHOULD BE REPLACED

NOTE: IF COMPLETE PANEL ASSY. (WITH COMPONENTS AND COMPLETELY WIRED) FOR A MILL IS DESIRED, ORDER BY MILL MODEL NO. AND SERIAL NO. FROM MILL NAME PLATE. IF HI-CAPACITY PANEL IS DESIRED, ORDER BY MODEL NO. AND SERIAL NUMBER FROM NAME PLATE ON DRIVE UNIT HOUSING OF HI-CAPACITY.

\* THIS SYMBOL DENOTES PHASE

TOLERANCES (UNLESS AS NOTED)	DATE	SCALE	APPROVED
DRAWING NUMBER	DATE	SCALE	APPROVED
FRACTIONAL	DATE	SCALE	APPROVED
ANGULAR	DATE	SCALE	APPROVED

MIX-MILLS, INC.  
 BLUFFTON, INDIANA, U.S.A.

TITLE: REPLACE PARTS FOR GEARITY MILL AND HI-CAPACITY PANELS

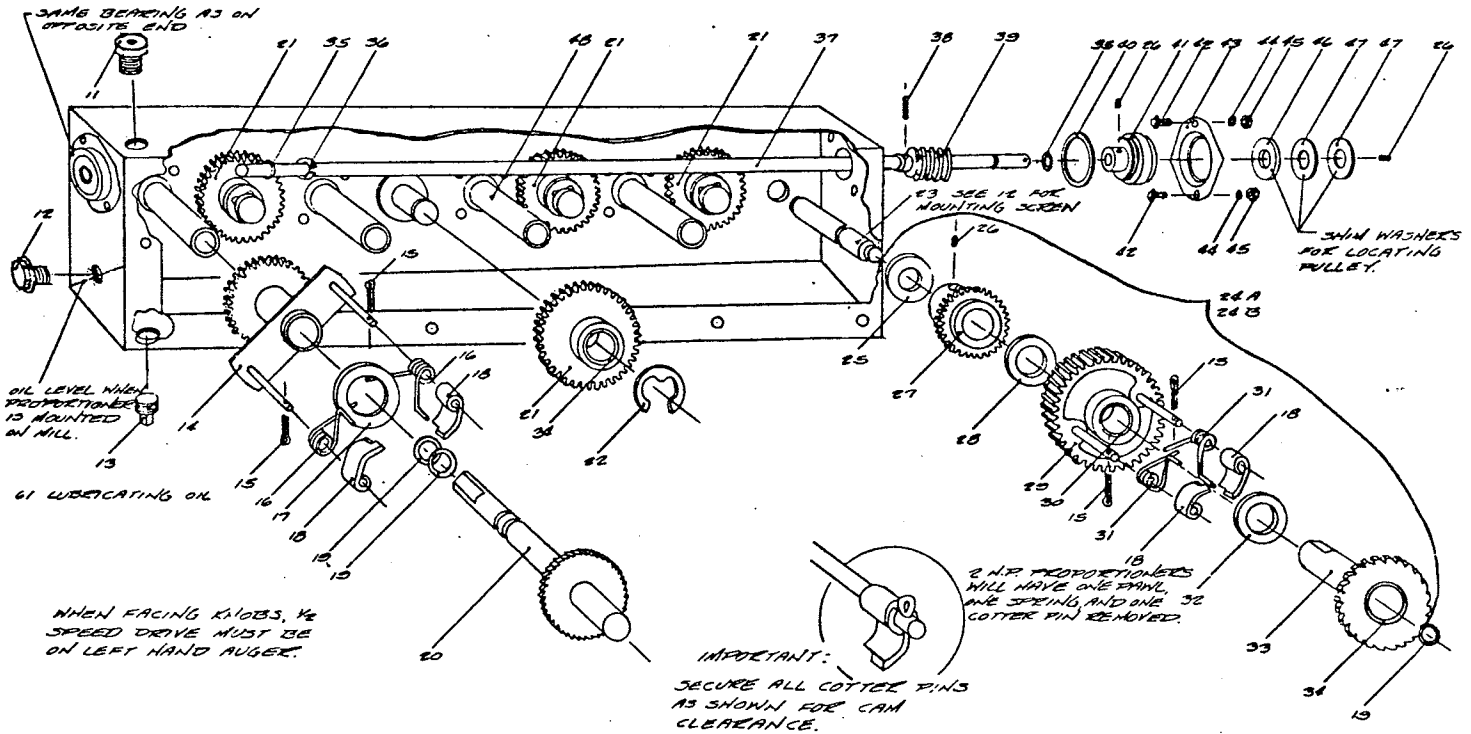
DATE: 7-22-63

DRAWING NUMBER: C-4499

AUTOMATIC FEED PROCESSING SYSTEMS

BLUFFTON, INDIANA

**SERVICE INSTRUCTIONS AND PARTS  
FOR MIX-MILL OIL LUBRICATED PROPORTIONER**



**SPARE PARTS – OIL FILLED PROPORTIONER**

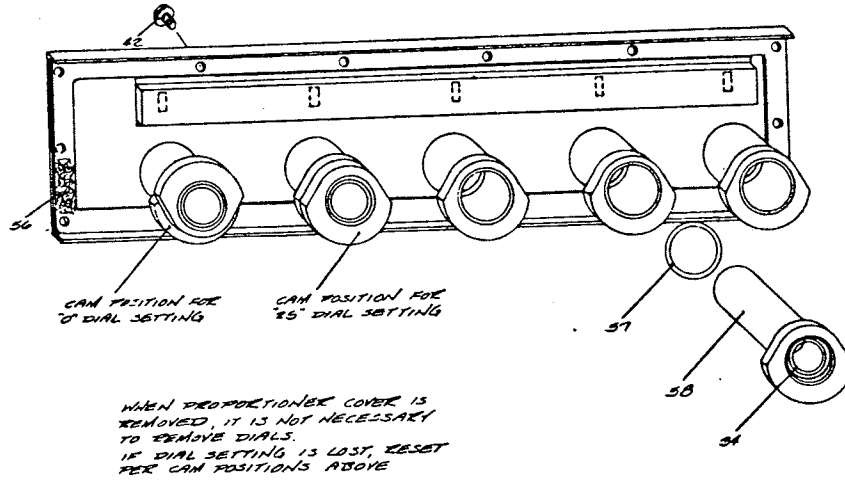
REFERENCE CATALOG				REFERENCE CATALOG			
No.	No.	DESCRIPTION	QUANTITY	No.	No.	DESCRIPTION	QUANTITY
11	A3720	BREATHER PLUG (1/4 – 18 NPTF)	1	36	A1028	RETAINING RING	1
12	A1833	BIN BOLT ASSY. (5/16 – 18 x 3/4)	2	37	A3777	SHAFT – WORM	1
13	A3451	PIPE PLUG (1/4" NPT)	1	38	A314	SPRING PIN	1
14	A3755	CARRIER ASSY. – PAWL	4	39	A4914	WORM (DOUBLE THREAD)	1
15	A313	COPPER PIN	10	40	A5795	GASKET – BEARING (WORM SHAFT)	2
16	A4922	SPRING – DRIVE PAWL (AUGER SHAFT)	8	41	A5797	BEARING ASSY. (WORM SHAFT)	2
17	A49G1	THRUST WASHER (5/8 x 1 x 1/8)	8	42	A5711	SCREW – HEX (1/4 – 20 x 1/2 SWAGE FORM S.T.)	34
18	A120	DRIVE PAWL	10	43	A3648	RETAINER – BALL BEARING	2
19	A3771	O RING	9	44	A344	WASHER – LOCK (1/4)	4
20	A3769	AUGER SHAFT & RATCHET ASSY.	4	45	A367	NUT – HEX (1/4 – 20)	4
21	A1017	IDLER GEAR ASSY. (INCLUDES BUSHING)	4	46	A356G2	WASHER – FLAT (1/2)	1
22	A253	RETAINING RING	4	47	A356G3	WASHER – FLAT (1/2)	2
23	A3669	SHAFT – WORM WHEEL	1	48	A3681	BEARING – AUGER SHAFT	4
24A	A1113G3	WORM WHEEL – SUB. ASSY. (3 & 5 HP)	1	49	A3452	DRIVE ASSY. – 4th AUGER	1
24B	A1113G4	WORM WHEEL – SUB. ASSY. (2 HP)	1	50	A2291	IDLER ASSY. – 2 SPEED GEAR BOX (INCL. BUSH.)	1
25	A1124	THRUST WASHER (5/8 x 1-1/4 x 1/8)	1	51	A4738	SET SCREW (No. 10 – 32 x 1/4)	4
26	A336	SET SCREW (1/4 – 20 x 1/4)	12	52	A5631	SET COLLAR (5/8 x 1 x 5/16)	4
27	A1047G1	GEAR ASSY. – WELDED (MAIN DRIVE)	1	53	A5633	AUGER & TUBE ASSY.	4
28	A133	THRUST WASHER (1 x 1-1/2 x 1/8)	1	54	A3758	GASKET – BEARING (AUGER SHAFT)	8
29	A5677	WORM WHEEL ASSY. (INCLUDES BUSHING)	1	55	A4924	BEARING CAP ASSY.	4
30	A47	BUSHING (1 x 1-1/8 x 1)	1	56	B4920	GASKET – GEAR BOX COVER	1
31	A28	SPRING – DRIVE PAWL	2	57	A3735	O RING	5
32	A3422	THRUST WASHER (1 x 1-1/2 x 1/16)	1	58	A3683	CAM & SLEEVE ASSY. (INCLUDES BUSHING)	5
33	A5741	RATCHET & TUBE ASSY. (INCLUDES BUSHING)	1	59	A138G3	BALL – STEEL (7/32" DIA.)	5
34	A259	BUSHING (.631 x 3/4 x 3/4)	11	60	B1	KNOB	5
35	A3757	O RING	2	61	A5630	OIL – TEXACO REGAL "A" (1 QT. IN CONT.)	1

Use only oil recommended by Mix-Mill Inc. because it is safe for livestock. The additives in most lubricating oils are harmful. To substitute oil is dangerous because an oil leak could develop which would contaminate the ground feed. See reverse of this page for lubricating instructions. PRINTED IN U.S.A.

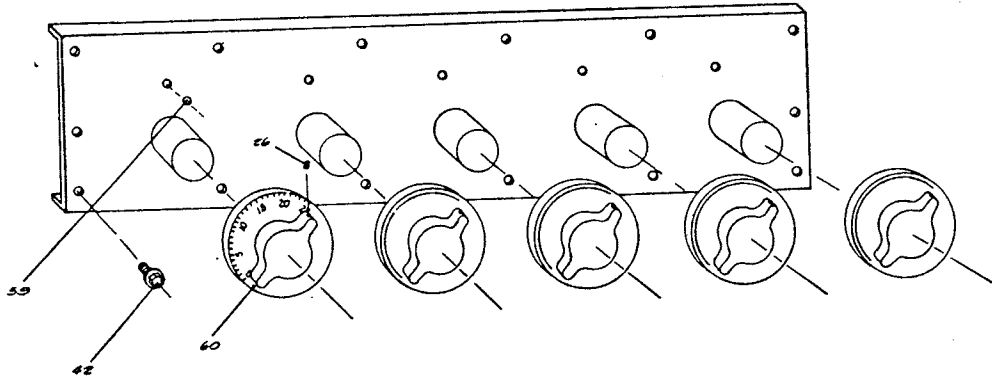
# MIX-MILL®

AUTOMATIC FEED PROCESSING SYSTEMS  
 BLUFFTON, INDIANA

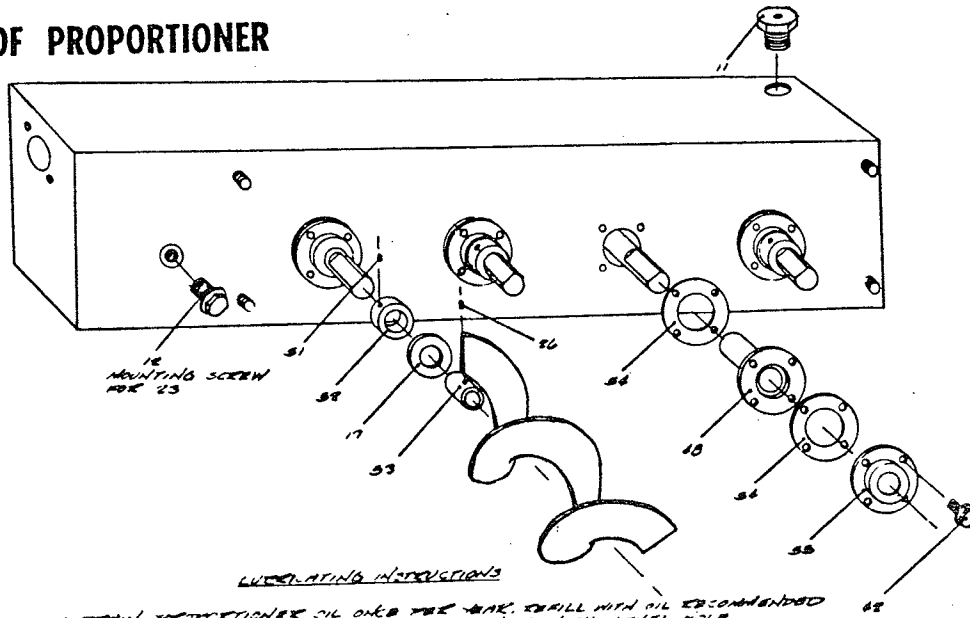
## INSIDE VIEW OF PROPORTIONER COVER



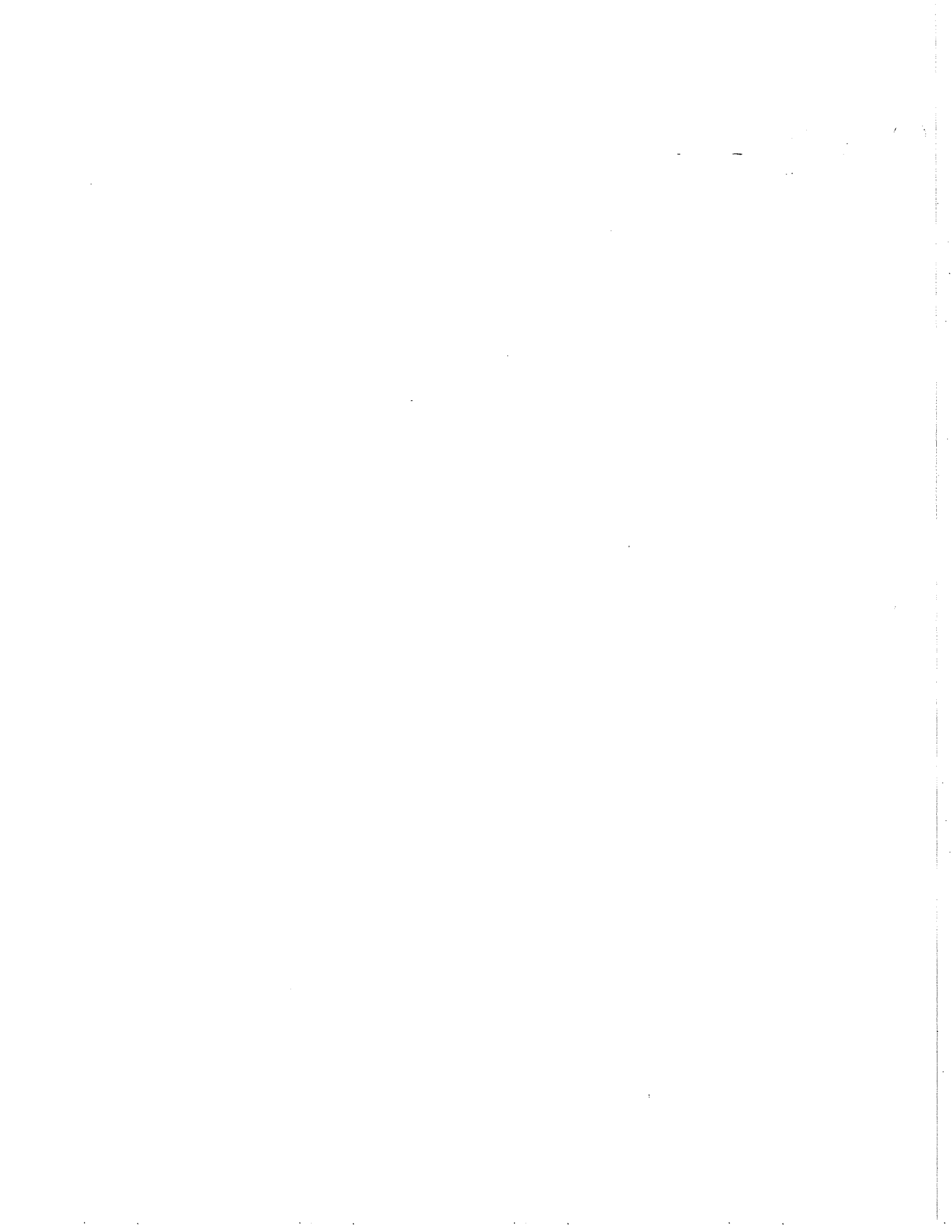
## FRONT VIEW OF PROPORTIONER COVER



## BACK VIEW OF PROPORTIONER



1. DRAIN PROPORTIONER OIL ONCE PER YEAR. FILL WITH OIL RECOMMENDED BY MIX-MILL® OIL. UNTIL OIL LEVEL IS EQUAL WITH OIL LEVEL HOLD. 2. THE OIL CONTAINS 2% OF A SOLUBLE "ZD" TYPE INHIBITORS. DO NOT KEEP HEAVY FEEDING PROPORTIONER HEATED TO ABOVE -25° F OR COMMUNICATE WITH FACTORY. 3. DO NOT MIX MINERAL OIL WITH ANY LEFT OVER OIL. MAY BE SUBSTITUTED WITH AN OIL WHICH CONTAINS AN INHIBITING OIL AS SOON AS





MIX-

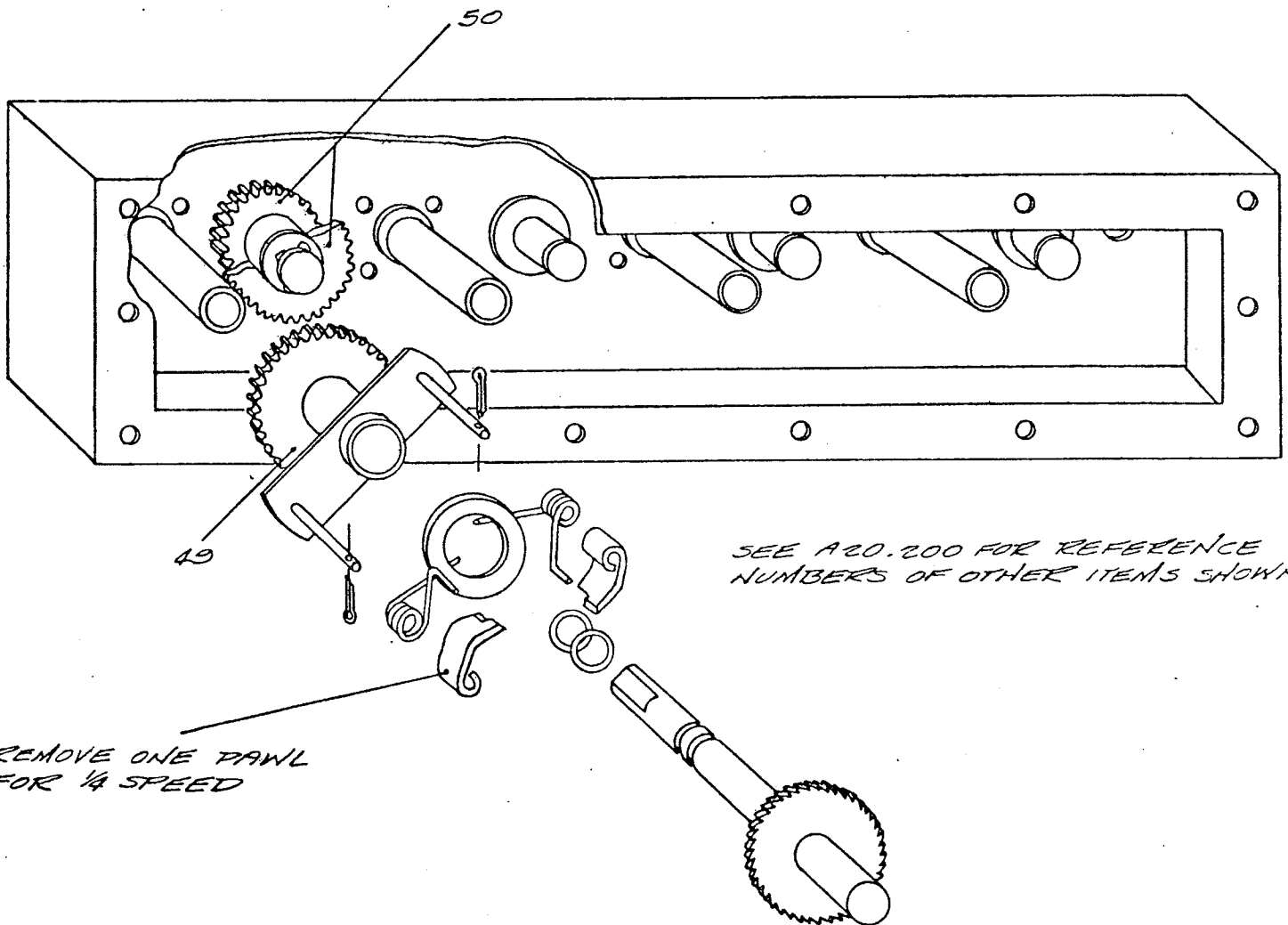
PAGE 20.224  
DATE 1 FEB 1965  
REPLACES NEW

MILL®

AUTOMATIC FEED PROCESSING SYSTEMS

BLUFFTON, INDIANA

VIEW OF 1/2 AND 1/4 SPEED AUGERS



REMOVE ONE PAWL  
FOR 1/4 SPEED

SEE A20.200 FOR REFERENCE  
NUMBERS OF OTHER ITEMS SHOWN.

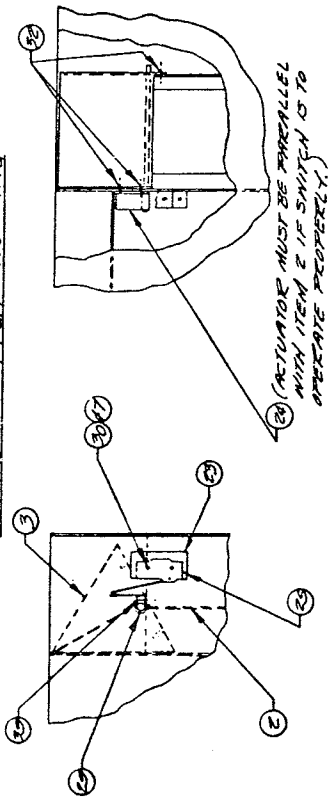
REFERENCE No.	CATALOG No.	DESCRIPTION	QUANTITY
49	A3452	DRIVE ASSY. - 4th AUGER	1
50	A2291	IDLER ASSY. - 2 SPEED GEAR BOX	1

DATE APRIL 2, 1964  
 REPLACES MAY 2, 1963  
 ENGR. DWG. C-4355

DATE	BY	REVISION RECORD
4-2-64	REZBERGIAN	

TOLERANCES (EXCEPT AS NOTED)	MIX-MILL, INC. BLUFFTON, INDIANA, U.S.A.
DECIMAL	SCALE
FRACTIONAL	8-1
ANGULAR	APPROVED BY
	DATE
	4-2-64
	DRAWING NUMBER
	C-4355

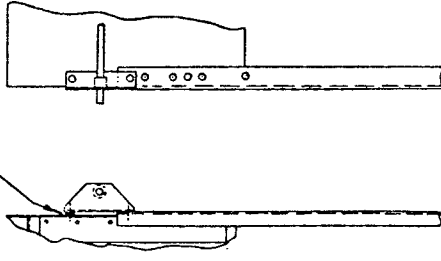
DETAIL OF SWITCH MOUNTING



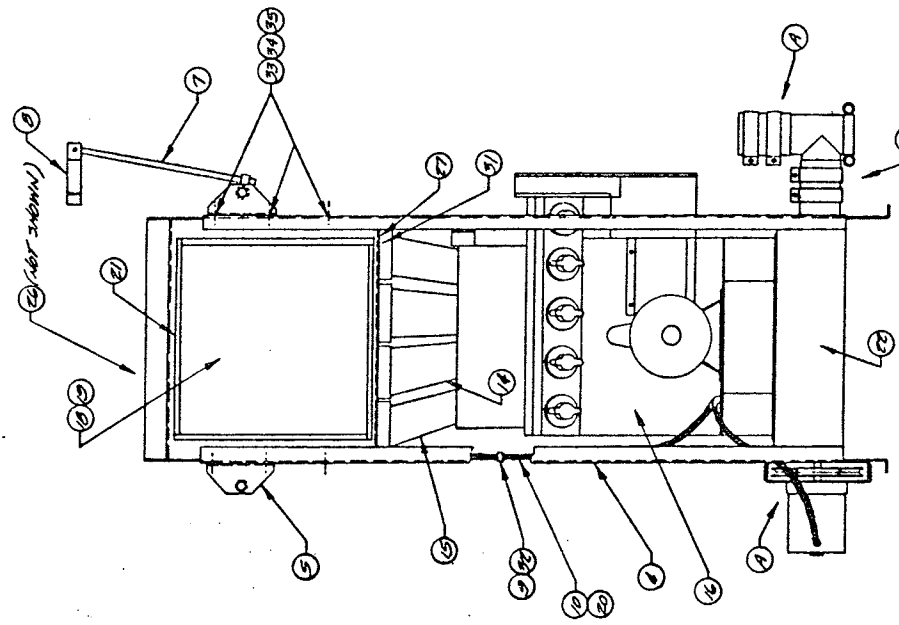
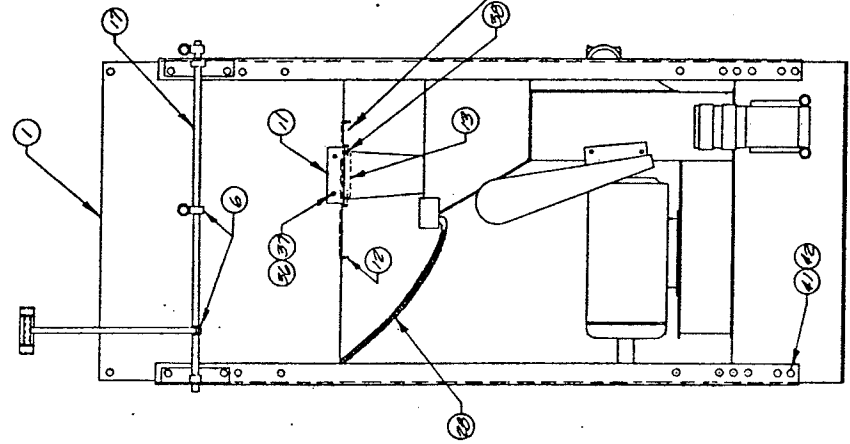
(ACTUATOR MUST BE PARALLEL WITH ITEM 2 IF SWITCH IS TO OPERATE PROPERLY.)

FOR S&P GROUND LEVEL MILL ASSEMBLY  
 LEG ANGLES AS SHOWN BELOW.

USE TWO M8X1 WASHERS AS SPACERS FOR BRACKET ASSY.



HOLE THIS END OF SLIDE



FOR NUMBERS OF ITEMS DENOTED BY LETTER "A", REFER TO ITEM 22.

DATE	BY	APPROVED
1/24/64	REBECCA	

MIX-MILL INC. BLUFFTON, INDIANA, U.S.A.		SCALE	
MATERIAL	PRICE	DATE	BY
FUNCTIONAL		TITLE	
ANALYSIS		DATE	
TOLERANCES (GROUP of PARTS)		DRAWN BY	
REVISIONS		CHECKED BY	
APPROVED BY		DATE	
PROJECT NUMBER		DRAWING NUMBER	
C-4892		C-4892	

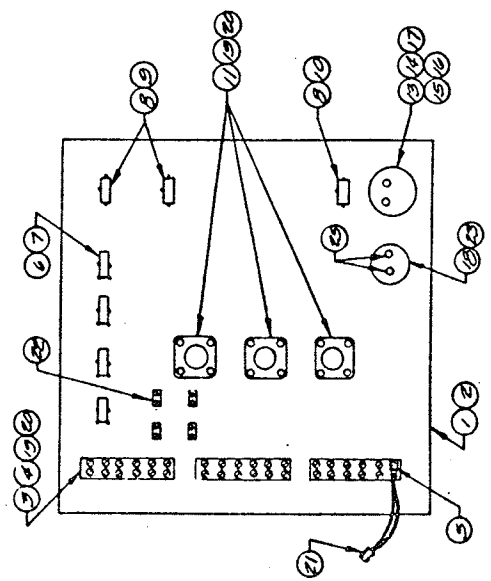
REFERENCE NUMBER	REPLACEMENT PART DESCRIPTION	REPLACEMENT PART NUMBER	QTY
1	HOPPER ASSY - WELDED	M128061	1
2	PADDLE ASSY	M1282	2
3	BAFFLE	M12868	2
4	LEG ANGLE	M12360	2
5	BRACKET ASSY	M129761	2
6	CLAMP BLOCK	M123981	6
7	VERTICAL SUPPORT END ASSY	M1181	2
8	CLAMP ASSY	M12861	2
9	CLAMP GREENFIELD	M13376	2
10	WIRE HAIRNESS (SEE NOTE #1)	M120061	1
11	BUN BOTTOM	M1101	1
12	HOPPER SLIDE	M1102	2
13	COLLAR FOR BUN CUT-OFF	M1207	2
14	GRAIN TUBE (INSIDE)	M1120	2
15	GRAIN TUBE (OUTSIDE)	M1130	2
16	GRAVITY FEED MIX MILL SPARE PARTS	SEE 20.020	-
17	SUPPORT END (HORIZONTAL)	M1180	3
18	PANEL ASSY (HINGED) SPARE PARTS	SEE 20.340	-
19	SHIM FOR NINGE	M1213	2
20	WIRE HAIRNESS (SEE NOTE #2)	M120062	1
21	TAPE ADHESIVE BACKING	M126661	2
22	MILL BASE SPARE PARTS	SEE 20.351	-
23	INSULATION SWITCH	M12846	2
24	ACTUATOR MICRO SWITCH	M12845	2
25	MICRO SWITCH	M1173	2
26	COVER ASSY FOR G.L. HOPPER (OPTIONAL EQUIPMENT)	M122561	1
27	CABLE CONNECTOR	M12835	1
28	WIRE HAIRNESS	M120067	1
29	WASHER-FLAT (3/16")	M1338	2
30	SCREEN-ED. HD. S.T. (4'-32x1")	M127362	2
31	SHIM IN BLANK	M1261	6
32	MACH SCREEN - HEX HD. S.T. (4'-32x1/4")	M129761	12
33	CAT SCREEN - HEX HD. (3/4-12x1/4")	M123982	12
34	NUT-HEX (3/8-16)	M1357	12
35	WASHER-LOCK (3/8")	M1376	12
36	MACH SCREEN - HEX HD. S.T. (4'-20x1/4")	M1227**	7
37	WASHER-LOCK (1/4")	M1344*	10
38	SCREEN SHEET METAL (24x36")	M12409	2
39	SCREEN-PAN HD. S.T. (4'-32x3/4")	M1324	2
40	WASHER-FLAT (3/8")	M1341	2
41	MACH SCREEN - HEX HD. S.T. (4'-12x3/8")	M1275	2
42	WASHER-LOCK (3/8")	M1345	2
43	WIRING DIAGRAM TO FIND	SEE 20.050	-
44	WASHER-FLAT (1/4")	M1339**	3
45	MACH SCREEN - HEX HD. S.T. (4'-20x3/4")	M1227*	6
46	NUT-HEX (3/8-20)	M1367*	6
47	WASHER-FLAT (1/4")	M1288	2

NOTE #1 - USED ONLY ON 213 HP GROUND LEVEL HAMMER MILL.  
 NOTE #2 - USED ONLY ON 5 HP GROUND LEVEL HAMMER MILL.  
 NOTE #3 - QTY REFERS TO THE TOTAL NUMBER OF COMPONENT PARTS NEEDED TO MAKE ONE COMPLETE GROUND LEVEL MIX MILL.  
 \*NOTE #4 - SIX OF EACH USED TO SECURE PANEL NINGES TO HOPPER.  
 \*\*NOTE #5 - THREE OF EACH USED TO SECURE PANEL TO HOPPER.

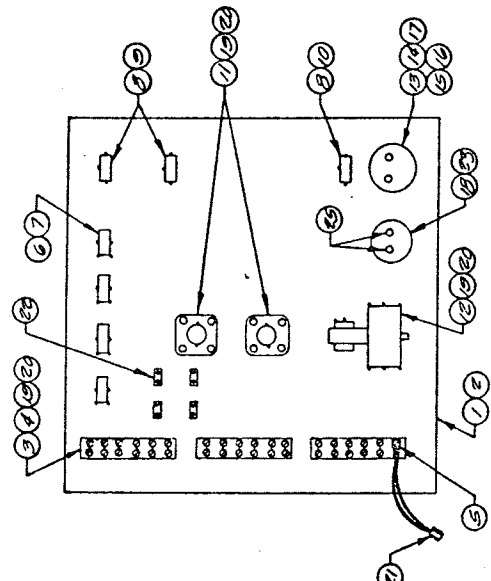
PRINTED IN U.S.A.

COPY TO FACTORY - FIRE FILE - ENG. FILE

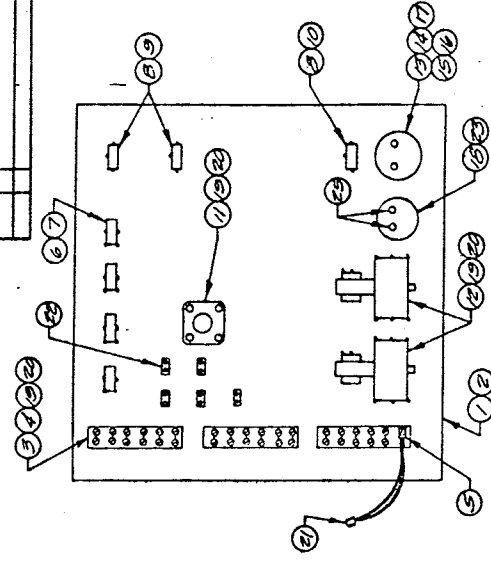
REV.	DATE	BY	REVISION
1	11/17/63	ZEZEMAN	
2			
3			
4			



REAR VIEW OF PANEL USED IN S.A.P. (18) GROUND LEVEL MILL.



REAR VIEW OF PANEL USED IN S.A.P. (19) GROUND LEVEL MILL.



REAR VIEW OF PANEL USED IN S.A.P. (20) GROUND LEVEL MILL.

NOTE: BY WHAT REPLACEMENT PART NUMBER REFERS TO THE TOTAL NUMBER OF COMPONENT PARTS NEEDED TO MAKE AN COMPLETE PANEL.

NOTE: ITEMS REFERRED ON CSA APPROVED PANELS ONLY.

NOTE: IF COMPLETE PANEL ASSY (WITH COMPONENTS AND DESIRED ORDER BY MILL MODEL NO. AND SERIAL NO. FROM MILL NAME PLATE.

ABBREVIATION CODE  
 S.I. INDICATES SELF TRIPPING SCREEN  
 D.S.I. INDICATES DOUBLE PULL SINGLE PULSON SWITCH  
 S.P.S.I. INDICATES SINGLE PULL DOUBLE TRIPON SWITCH  
 B. INDICATES PHASE

NOTE: TIMERS, CO-METERS, CAPACITORS, POWER RELAYS, CONTACTORS, AND CIRCUIT BREAKERS CANNOT BE REPAIRED ECONOMICALLY. WHEN REPAIRS ARE REQUIRED THE ENTIRE COMPONENT SHOULD BE REPLACED

REPLACEMENT NUMBER	REPLACEMENT PART DESCRIPTION	REPLACEMENT PART NUMBER
1	PANEL ASSY (LESS COMPONENTS)	A3684
2	PANEL ASSY (LESS COMPONENTS)	A3684
3	RELAYS	A1777
4	RELAYS	A1777
5	RELAYS	A1777
6	RELAYS	A1777
7	RELAYS	A1777
8	RELAYS	A1777
9	RELAYS	A1777
10	RELAYS	A1777
11	RELAYS	A1777
12	RELAYS	A1777
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21	RELAYS	A1777
22	RELAYS	A1777
23	RELAYS	A1777
24	RELAYS	A1777
25	RELAYS	A1777

TOLERANCES UNLESS NOTED AS SHOWN	MIX-MILLS INC. BLUFFTON, INDIANA, U.S.A.
DRAWING NUMBER	C-4356
DATE	4-8-64
DESIGNED BY	ZEZEMAN
CHECKED BY	
TITLE	(GROUND LEVEL PANELS) REPLACEMENT PARTS
SCALE	





## SEALED BEARING ASSEMBLY

### View 1

shows the exploded view of ball bearing H2290 (at present a Fafnir bearing). There is a hub on either side, one of which is "concentric" and the other is "eccentric" or off center. The H1686 felt seal goes on the concentric hub and is toward the grain: the shaft collar (shown on the right of View 1) goes on the eccentric hub and is to the side of the bearing which is away from the grain.

### View 2

shows the first step in assembling the bearing.

### View 3

shows that the felt washer is put over the bearing hub first.

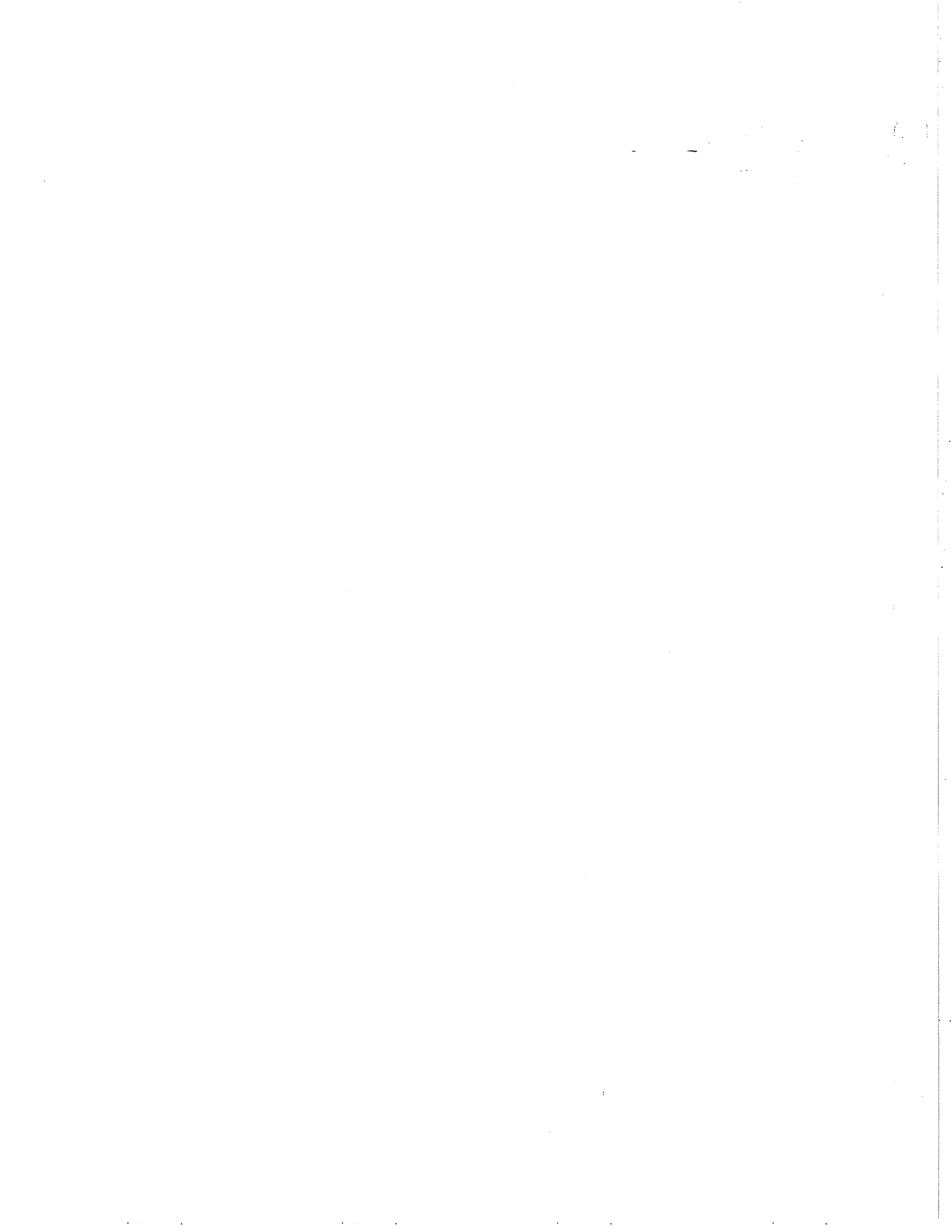
### View 4

Then: The H1936 retaining cup is pushed over the felt washer.

The bearing is now ready for installation on the shaft. Slip thrust washer H49 and the assembled bearing over the auger shaft. The bearing flanges are fastened to the auger by three self tapping screws which are  $\frac{3}{4}$ " long.

The shaft collar is slipped over the auger shaft and the auger shaft is positioned. The auger shaft is locked in the bearing bore by turning the shaft collar in opposite direction of the shaft rotation until it is tight. The set screw in the shaft collar is then tightened.

The bearing is dismantled in the same way except that when the shaft collar is removed and before the assembled bearing is pulled off the auger shaft... it might be necessary to smooth out with emery cloth the mark made on the shaft by the set screw.





AUTOMATIC FEED PROCESSING SYSTEMS  
BLUFFTON, INDIANA

# INSTRUCTIONS for installing an H2290 sealed and shielded ball bearing.

These bearings are used where there is a pressure of grain on the bearing such as at the lower bearing of the vertical drive unit of a Hi-Capacity Auger System, in the Power Elbow of a Premixer, etc. They are not needed nor are they used in a top driven auger.

