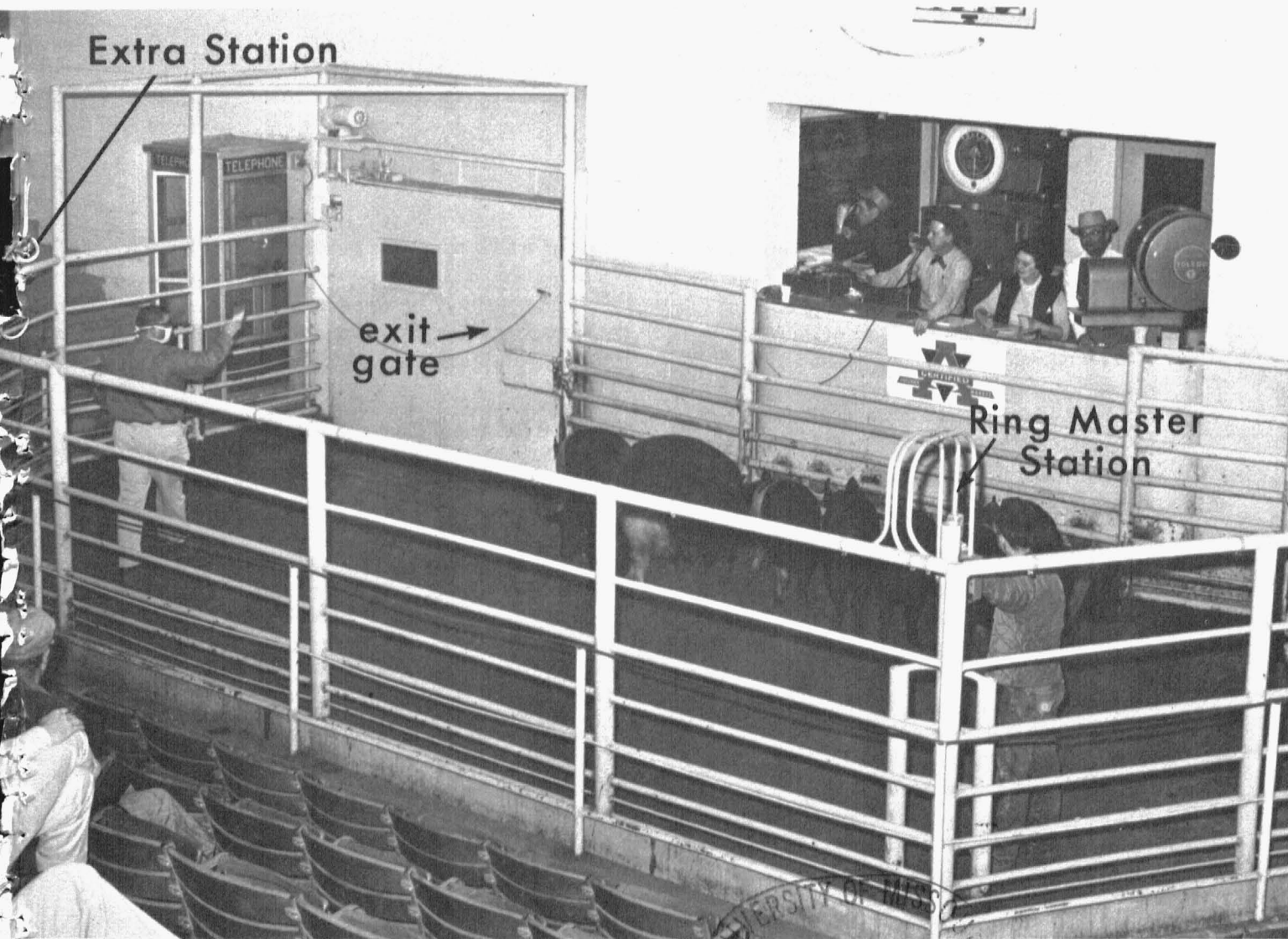


Electrically Operated

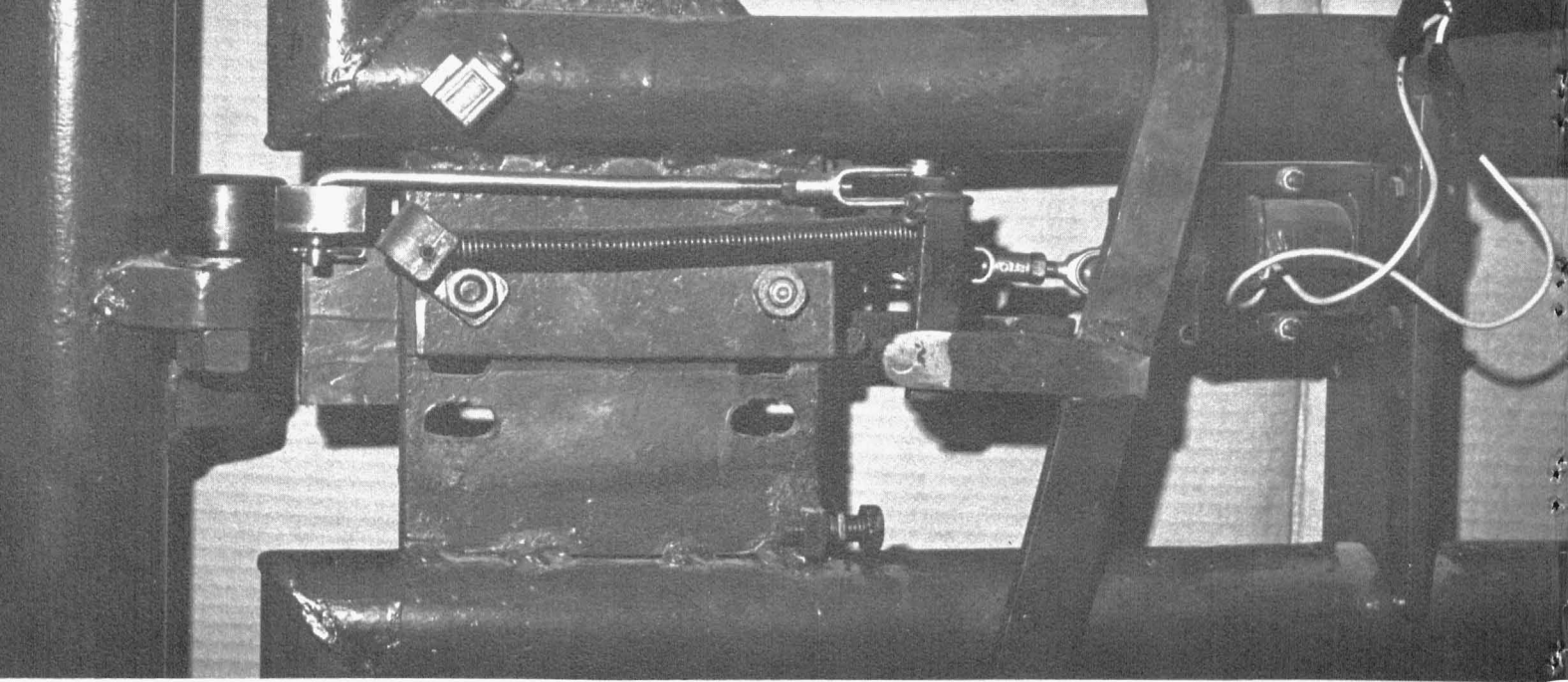
Automatic Livestock Gate

—J. S. McKibben, F. Obermiller, H. F. Mayes



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AGRICULTURAL EXPERIMENT STATION • UNIVERSITY OF MISSOURI • COLUMBIA



Automatic Livestock Gate

Gates electrically operated and controlled from remote locations, either manually or by program, will be useful in many types of livestock handling operations.

The design, construction and evaluation of the gate for which these plans are presented were carried out under a research cooperative agreement with the U. S. Department of Agriculture, Transportation and Facilities Research Division, Agricultural Research Service. Information pertaining to the design, operation and performance of the gate is presented in publication ARS 52-21 entitled "Electrically Operated Gates for Livestock Markets". This publication is available from the Agricultural Engineering Department, University of Missouri, or from the Superintendent of Documents, Washington 25, D. C.

This gate is designed to have characteristics that were considered important in the livestock auction sales ring. The gate is strong to take the abuse and constant operation demanded. It will latch positively, withstand heavy crowding, and even though heavily loaded, unlatch properly. The gate opens and closes quickly but is stopped by animals without injury when they are contacted. The gate closes and latches without heavy impact or the noise and disturbance associated with slamming when the limit switches are properly set. The gate is easily unlatched manually and pushed

open for traffic when the electric control station is unmanned or during power failure.

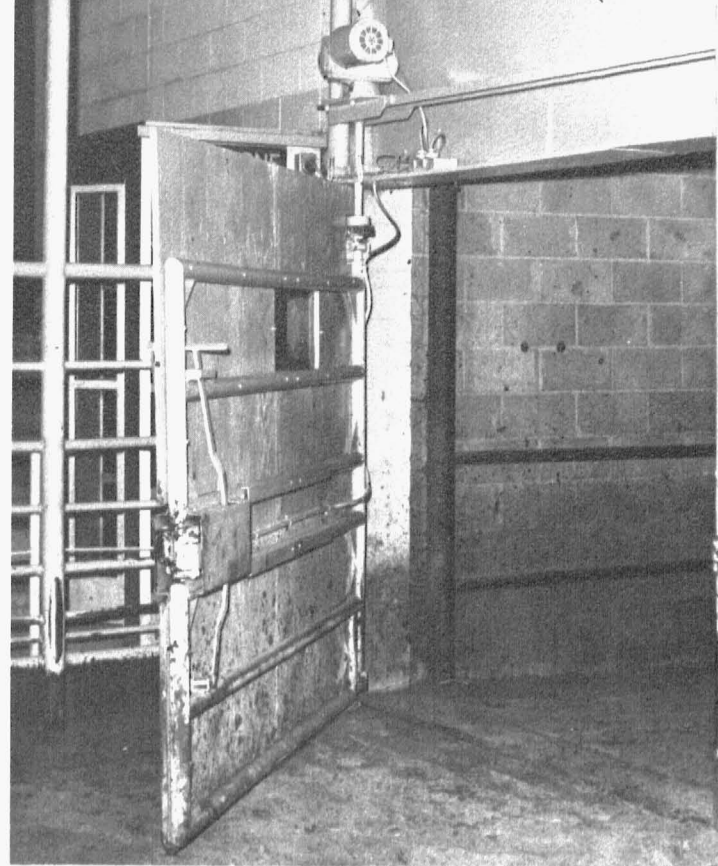
The gate may be opened into or out from the sales ring when equipped with a second latch and the appropriate extra electrical control wiring.

Electrical Components Used

All electrical components used to install the gates were purchased from a wholesale electrical supply firm. The parts used were all Square D, but any other manufacturer's make would suffice if the part would meet the same general specifications.

- 1 Class 8736 (Type BAA-4) 230-volt, 3-phase, 60-cycle Reversing Starter
- 4 Class 9050 (Type ADIE) 230-volt, 3-phase, 60-cycle Pneumatic Timing Relay
- 1 Class 8501 (Type BHG 20) 230-volt, 60-cycle, normally open, 15-amp. Machine Tool Relay
- 2 Class 9001 (Type TY3) Enclosure
- 2 Class 9001 (Type TRZA) Stop Button (red)
- 2 Class 9001 (Type TR3B) Forward Button and Contact (red mushroom)
- 2 Class 9001 (Type TR4B) Reverse Button and Contact (black mushroom)
- 4 Class 9007 (Type A W18HA1) Limit Switch with Arm
- 1 H85351 Master Switch

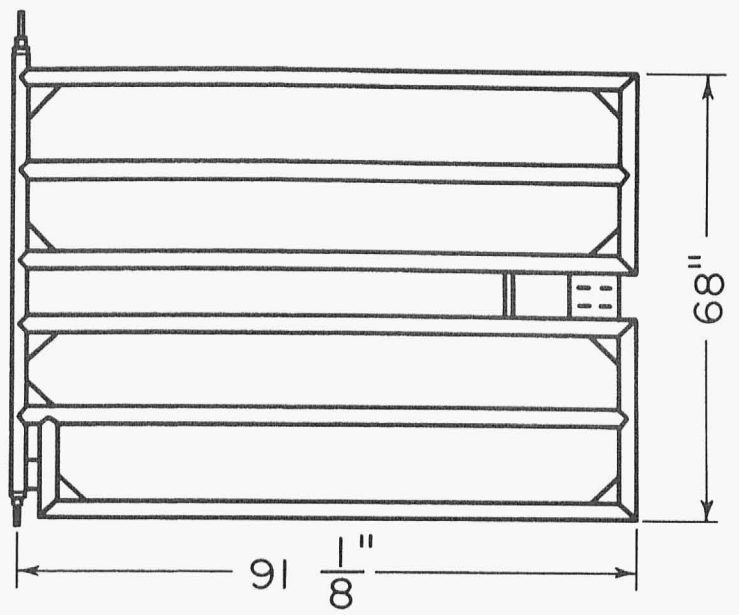
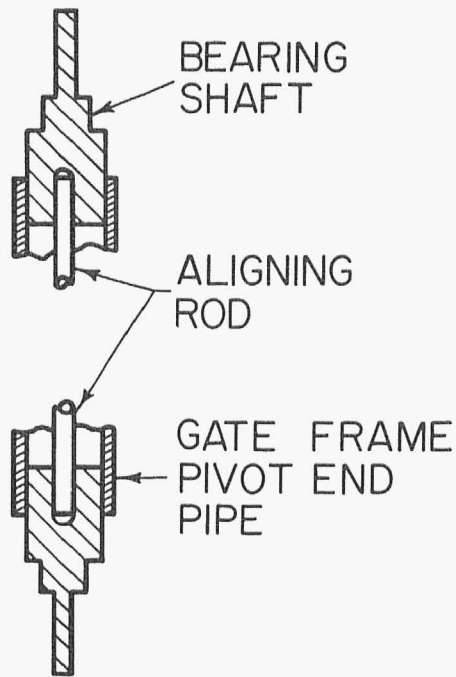
At left is a close-up of the latch assembly for a one-way gate. The two-way gate (pictured right) requires two identical latch assemblies and two rollers mounted on the stationary post. The latch assemblies for the two-way gate use the lock mount plate instead of the gate stop as used on the one-way gate.



Mechanical items required to construct the gate and a source of supply.

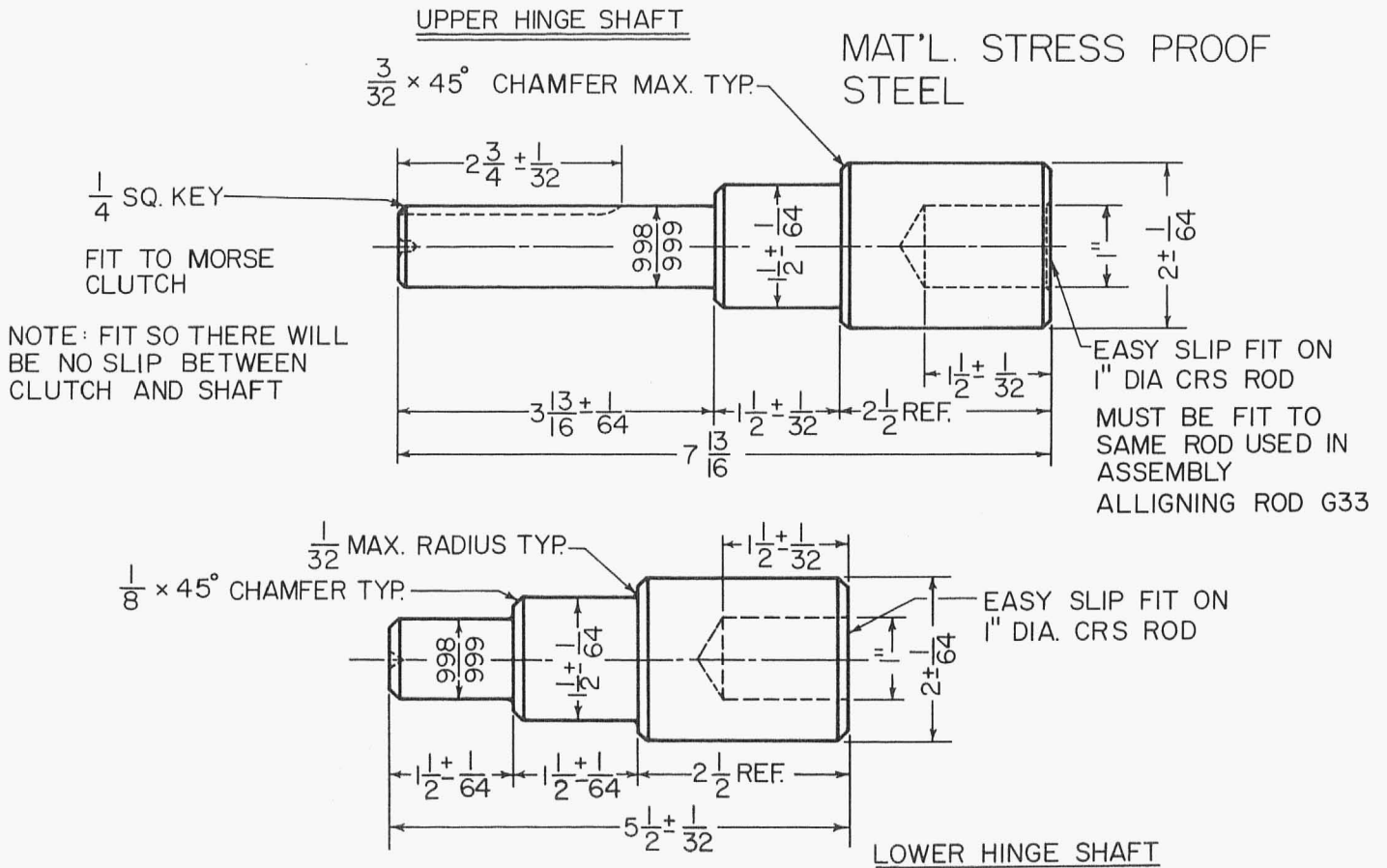
<i>Quantity</i>	<i>Description</i>	<i>Purchased From</i>
1*	Camrol Bearings (McGill CF25)	Nieman Bearing Company
2	Needle Bearings (Torrington GB128)	Nieman Bearing Company
2*	Bearing Seals (Victor 63185)	Nieman Bearing Company
1*	Ball Joint (TRE5 Spherco 5/16" Rod End)	Nieman Bearing Company
2*	Y3 Dorman Yoke 5/16"	Auto Supply Firm
2*	C2 Pins for Above Yoke	Auto Supply Firm
1*	Dorman Spring CS65	Auto Supply Firm
1	Gear Motor "AMI" MTG Boston Ratiomotor, 1/2 hp, 230v, 3-phase 5.8 RPM output VMW 132-300	Sligo, Inc. P. O. Box 177 St. Louis, Mo. 63166
1	350 2C Morse Torque Limiter Coupling, 100 ft. lb., bored for 1" diameter shaft with 1/4" sq. keyway	Bates Sales Company 1025 North 6th Street St. Louis, Missouri
2	P216 Pillow Block Bearing 1" diameter	Link Belt Company 220 South Belmont Avenue Indianapolis, Indiana
1*	Model 53-11 Solenoid 230-volt, AC, 60-cycle	Detroit Coil Company 2435 Hilton Road Ferndale, Michigan 48220

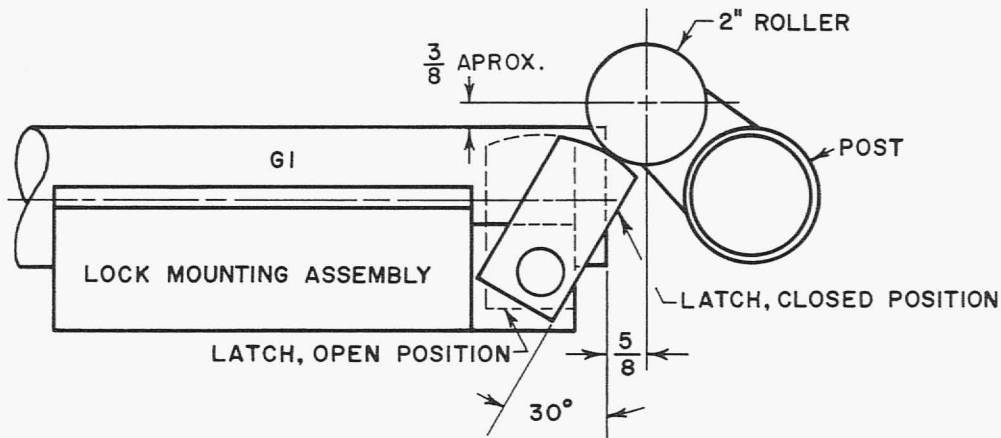
* An extra set of these items is required for a two-way gate.



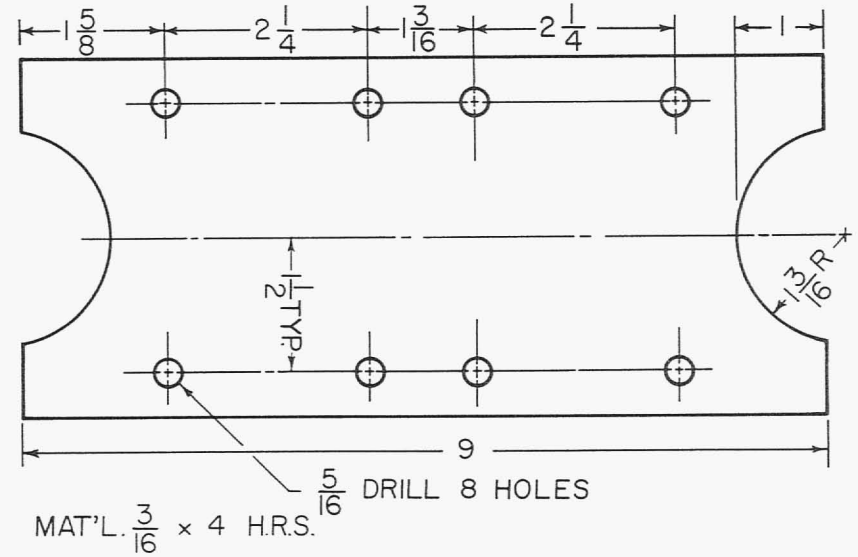
SECTIONAL DETAIL OF PIVOT END & BEARING SHAFT

GATE

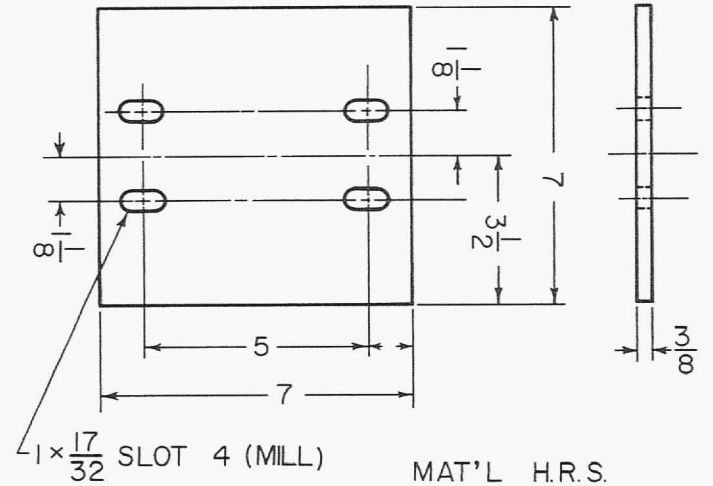
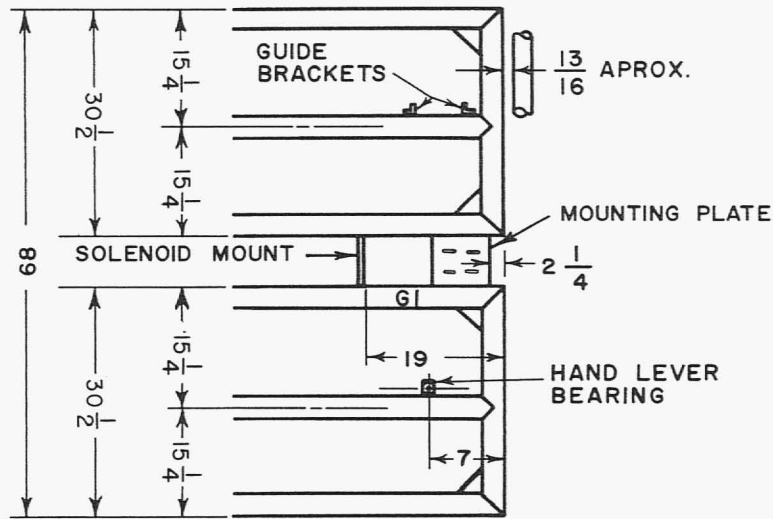




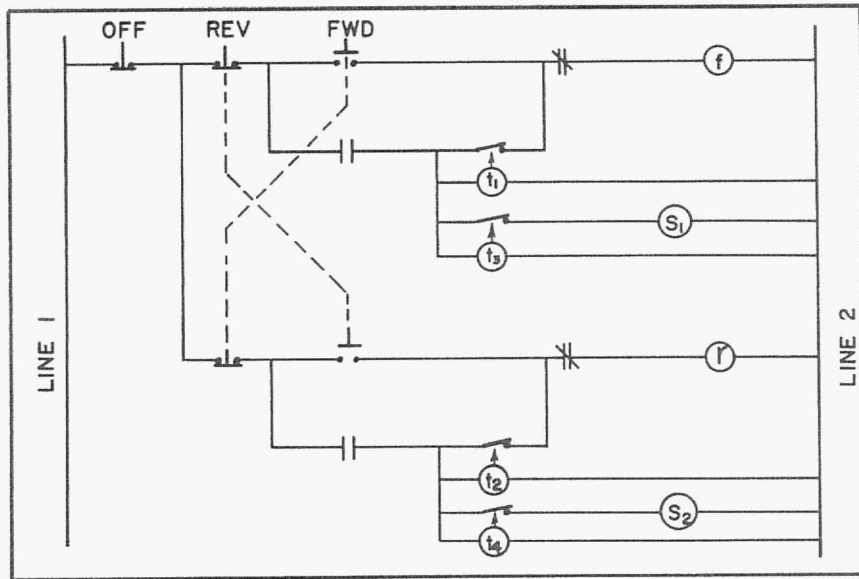
DO NOT ACCUMULATE TOL ON THESE DIMENSIONS



SOLENOID MOUNT

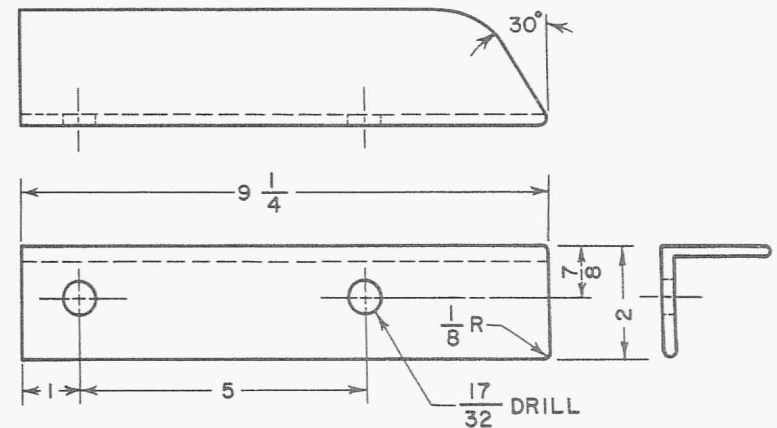
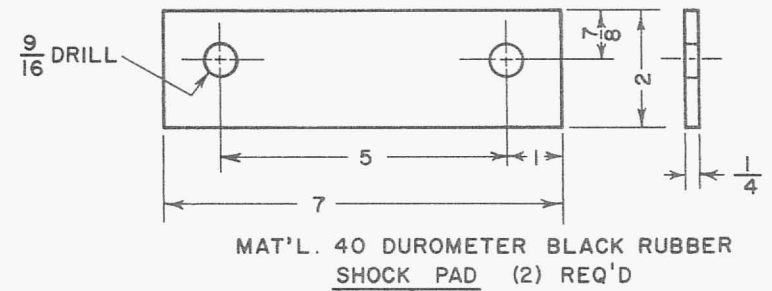
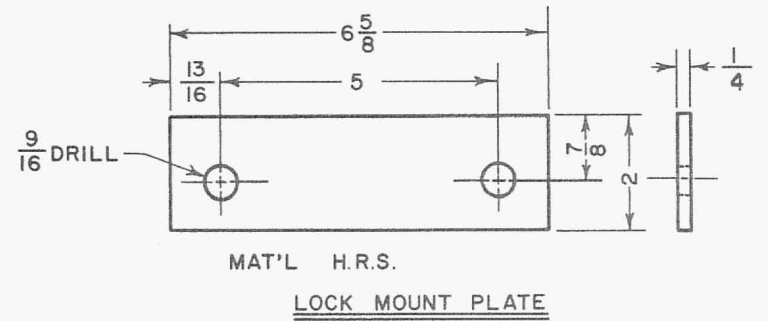


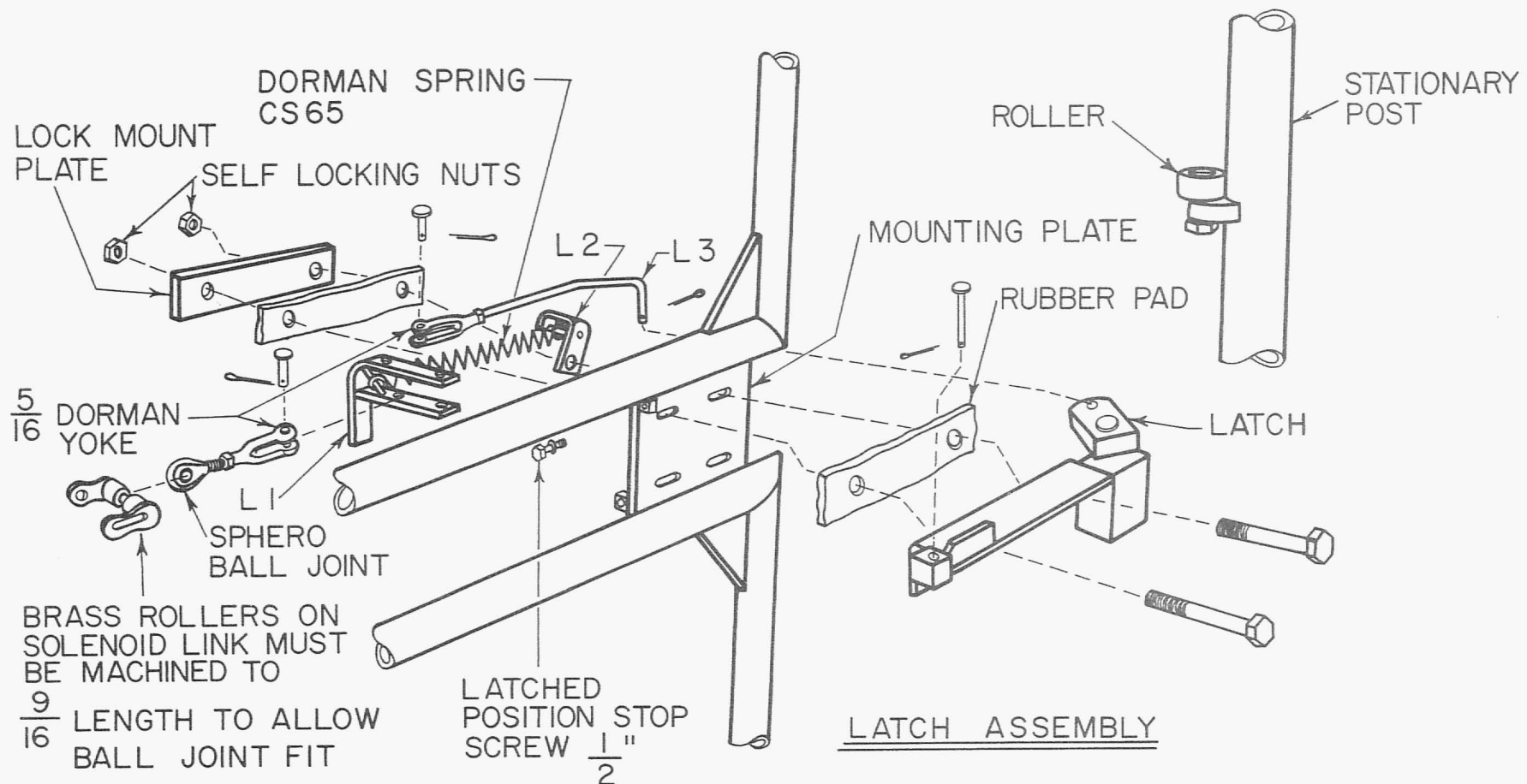
MOUNTING PLATE



- f. MAGNETIC SWITCH SOLENOID (FORWARD)
- r. MAGNETIC SWITCH SOLENOID (REVERSE)
- S₁. LATCH SOLENOID
- S₂. SOLENOID FOR SECOND LATCH (TWO WAY GATE). LIMIT SWITCHES MAY BE INSTALLED IN SERIES WITH t₁ & t₂ SWITCHES.
- t₁. TIMER FOR FORWARD GATE TRAVEL
- t₂. TIMER FOR REVERSE GATE TRAVEL
- t₃. TIMER FOR SOLENOID HOLD ON LATCH
- t₄. TIMER FOR SOLENOID HOLD ON LATCH (TWO WAY GATE)

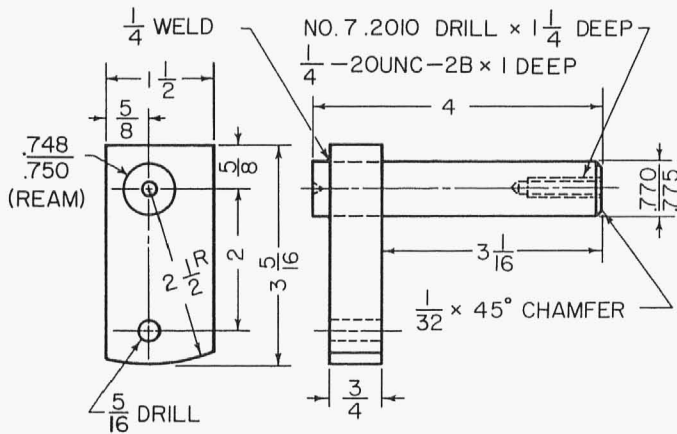
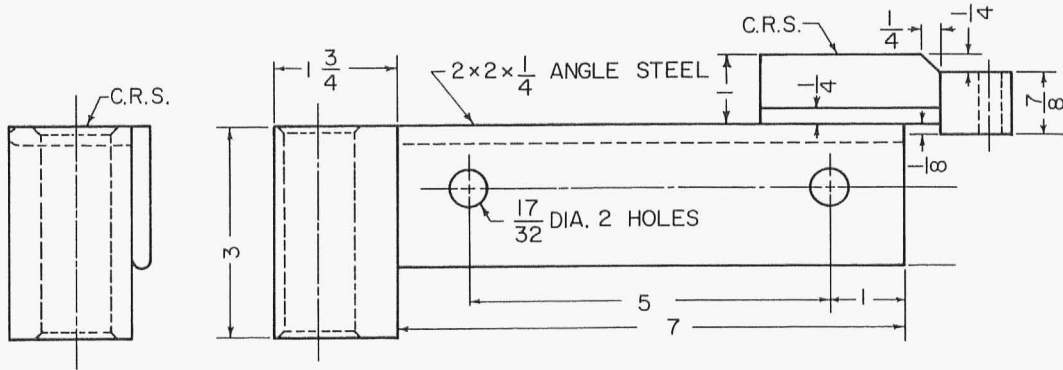
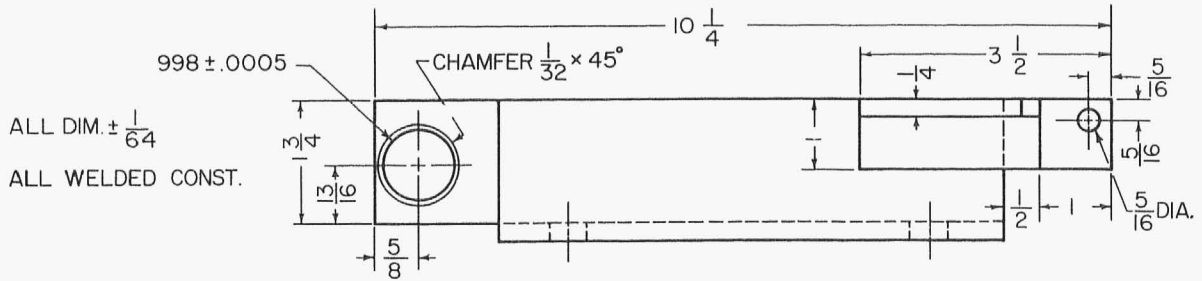
WIRING DIAGRAM



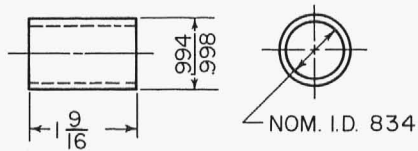


NOTE: ANOTHER LATCH CAN BE BOLTED ON THE LOWER HOLES ALLOWING GATE TO BE OPENED EITHER DIRECTION FROM CLOSED POSITION. THE SECOND LATCH IS BOLTED ON UPSIDE DOWN AND ON THE OPPOSITE SIDE FROM THE FIRST LATCH.

LOCK MOUNTING ASSEMBLY

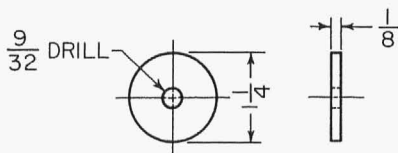


MAT'L STEEL
DOG ASSEMBLY

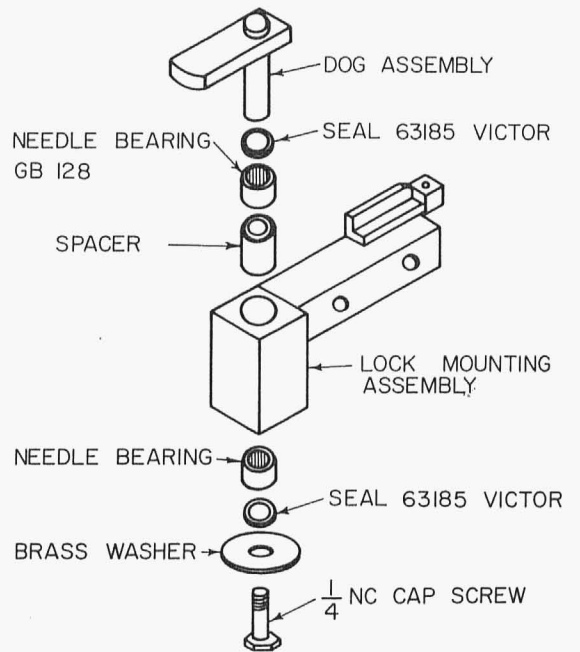


MAT'L 1" O.D. 14 GA. SEAMLESS TUBING
 (DO NOT SAW)

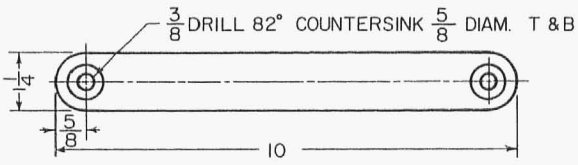
SPACER



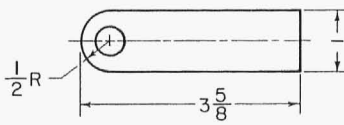
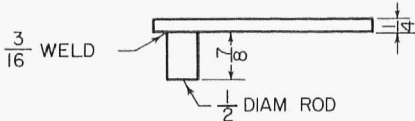
WASHER (BRASS)



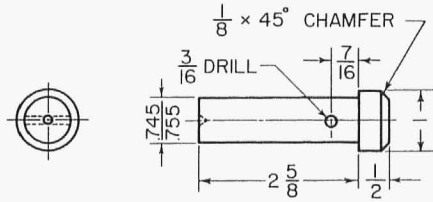
DOG BEARING ASSEMBLY



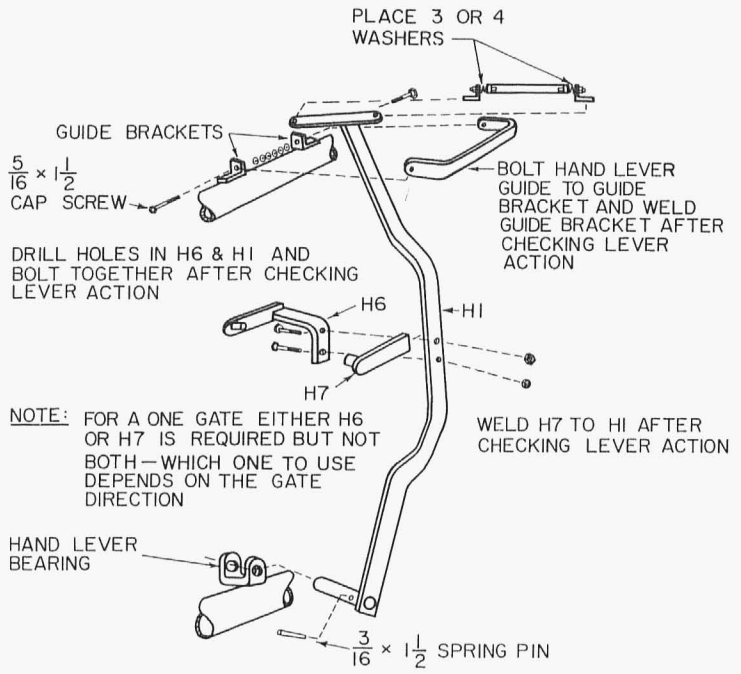
HAND HANDLE



H7

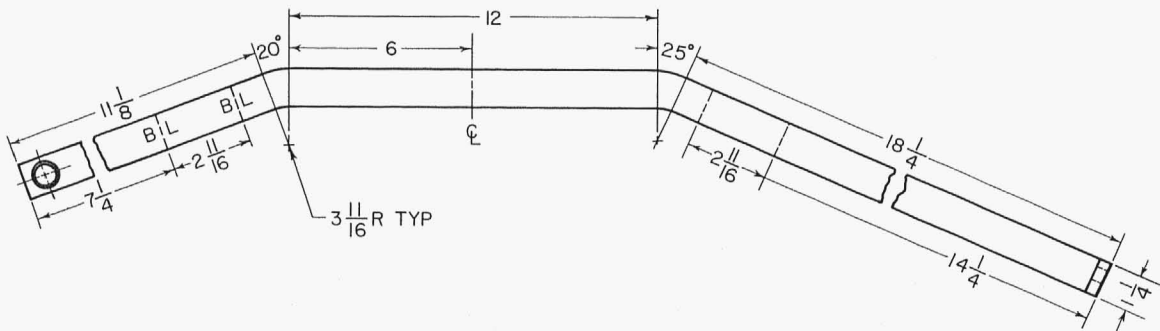
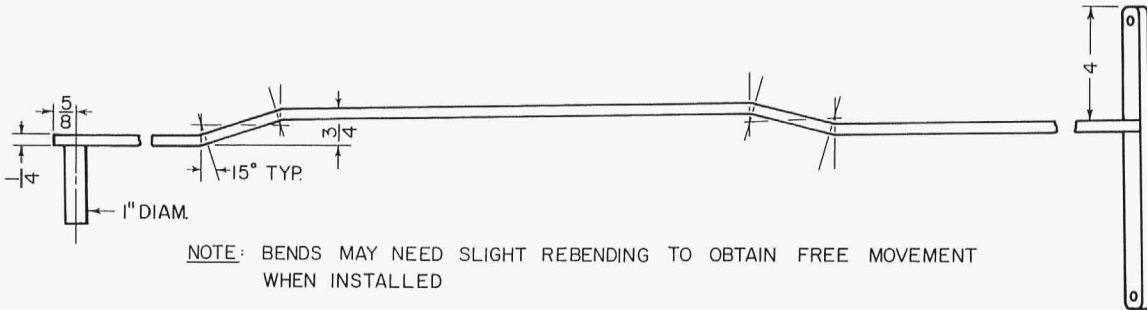


HANDLE SHAFT



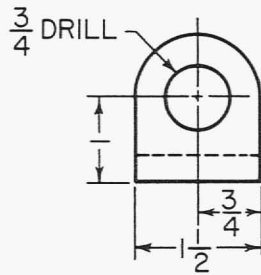
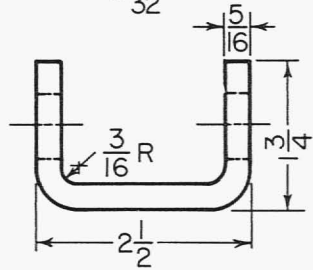
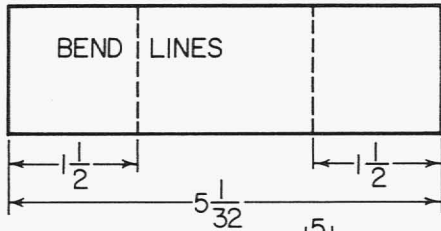
NOTE: FOR A ONE GATE EITHER H6 OR H7 IS REQUIRED BUT NOT BOTH—WHICH ONE TO USE DEPENDS ON THE GATE DIRECTION

INSTALLATION OF HAND LEVER ON TWO WAY GATE

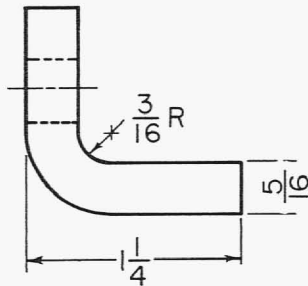
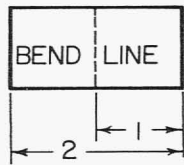
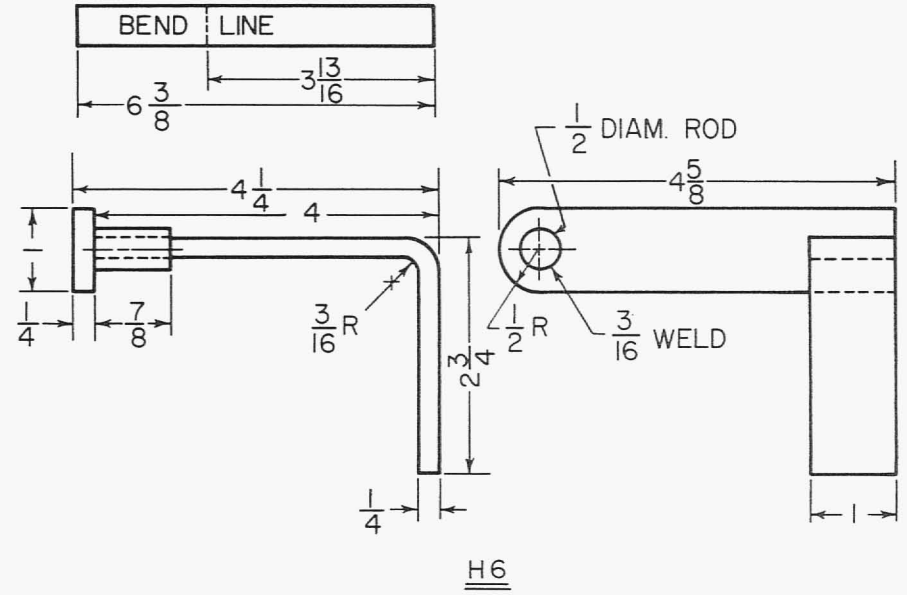


BLANK LENGTH $43 \frac{3}{16}$ " MAT'L H.R.S.

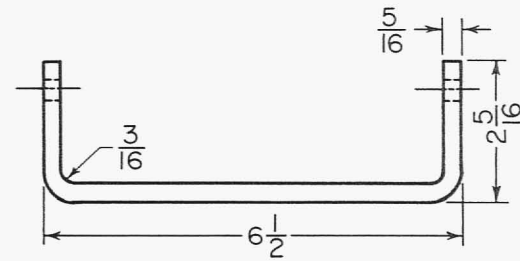
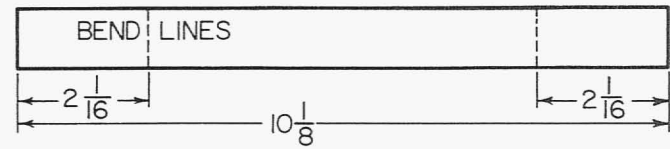
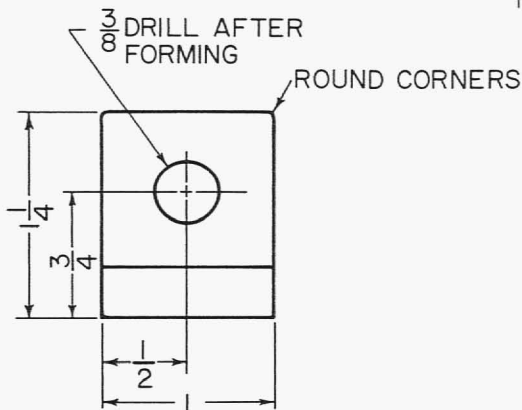
HAND LEVER



MAT'L H.R.S.
HAND LEVER BEARING



GUIDE BRACKET



HAND LEVER GUIDE

