SERVICE MANUAL

KINNEAR®

DIVISION OF HARSCO CORPORATION

Model FH-A

AKBAR Rolling Fire Door

Face-of-Wall Mounted Chain Hoist Operation

Class A-labeled

includes:

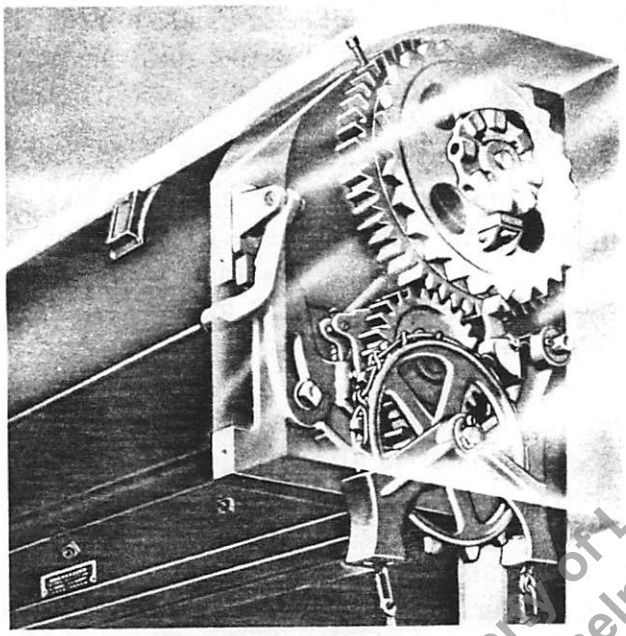
Kinnear Corporation & Subsidiaries • Columbus, Ohio 43216

BULLETIN No. 141

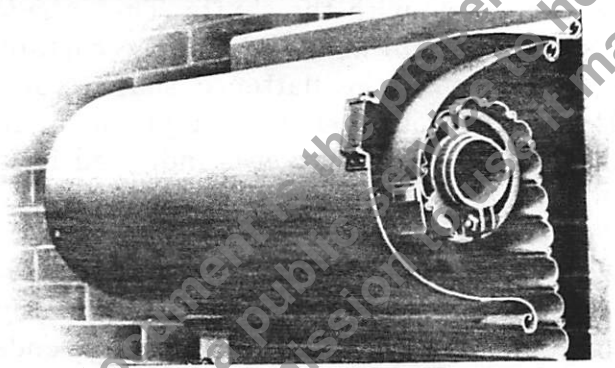
AKBAR

Exclusively a KINNEAR PRODUCT featuring an auxiliary push-down spring for positive automatic closing without disturbing counterbalance, thus enabling a person to raise the door for emergency egress.

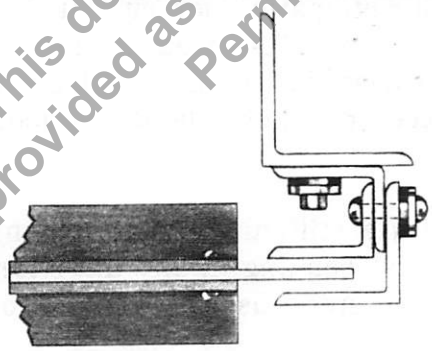
other AKBAR features



Although built for automatic closure in case of fire, AKBAR Doors are also equipped with a chain hoist operator for regular service door operation. As the illustration at the left shows, the operator is composed of a rugged, heavy-duty reduction gearing operated by a hand chain.



The AKBAR auxiliary hood drops over the curtain coil when the fusible link melts under dangerous heat, forming a baffle against smoke and hot gases that would otherwise pass over the top of the curtain.



To provide for expansion caused by heat, there is ample clearance between the curtain's slat ends and the back of the guide. Also, heat destructible washers are used beneath bolts and rivets in the guide assembly.

A KINNEAR Original

SECTION I

DESCRIPTION OF DOOR PARTS

1. **Guides:** The door guides are composed of three structural angles, an outer guide angle (L-1), an inner guide angle (L-2), and a mounting or wall, angle (L-3). These are assembled together, by bolts and zinc coated washers, to form a groove to guide and retain the door curtain. The guide angles L-1 and L-2 are provided with slots to permit expansion under high thermal conditions. Melting of the zinc coating on the assembly washers provides the clearance required for expansion. The wall angle is also provided with slots for the jamb mounting bolts, and extends above the guide section to receive the coil end brackets. See Fig. 1, Item 1, Page 3.

2. **Tension Bracket:** Two cast iron brackets support the door coil and are mounted to the wall angle (L-3). The tension bracket is provided with a lug for the insertion of a locking pin into the tension adjusting wheel to retain the counterbalance spring tension. A rim on the outside supports the door coil hood. See Figs. 1, 3 and 5 (Item 2, Page 3.)

3. **Automatic Bracket:** The automatic bracket mounts the automatic mechanism required for the automatic closing of the door curtain. A governor is also provided to control the rate of closure. See Figs. 1 and 7 (Item 3, Page 3.)

4. **Barrel:** The door barrel consists of a steel pipe containing the counterbalance spring, the automatic closing spring together with the spring support plugs and shafts. End plugs enclose the pipe ends and hold the pipe concentric with the shafts. The outside of the pipe is equipped with malleable iron spiral rings to hold and coil the curtain. Counterbalance spring tension is applied to the end with the flattened shaft. Automatic spring tension is applied to the end with the round shaft and pin hole. In erecting right or left hand doors, the right hand end of the barrel is indicated by a red colored sticker. See Figs. 1 and 5 (Item 4, Page 3.) Also Fig. 9, Page 13.

5. **Curtain:** The curtain is composed of slats with interlocking beads to provide a hinging action for coiling on the barrel. The ends of the slats are held in alignment by endlocks riveted to the slats, the lugs, or ears, of the endlock bearing against the ends of the slats to prevent sidewise motion. Each slat of an automatic door curtain has endlocks on both ends, thus making a continuous row of endlocks in each guide to prevent the passage of flames through the guide. The overlapping of the interlocking beads permits the watershed, or weather side, to be placed on either side of the door. See Fig. 1 (Item 5, Page 3), also Fig. 4, Page 14.

6. **Bottom Bar:** The bottom of the curtain is reinforced with a stiffening member, composed of a bottom slat and two angle flanges so as to resist bending in any direction. The angles and slat are bolted through slots with bolts and zinc washers to allow for expansion. See Fig. 1, Item 6, Page 3.

7. **Guide Mouths:** The guide mouths are cast iron curved pieces bolted to each side of both guides at the top to lead the curtain from the coil into the guides. See Fig. 1, Item 7, Page 3.

8. **Adjusting Wheel:** The automatic door has two adjusting wheels. The larger wheel is used for applying and retaining the counterbalance spring tension and has a hole shaped to fit the flattened shaft of the barrel. See Fig. 1, Item 8. The smaller wheel is pinned to the round shaft end of the barrel and is used to apply and retain the automatic push down spring tension. See Fig. 8, (Item 15, Page 7.)

9. **Hoods:** The front hood is a sheet metal enclosure formed to fit the bracket rims and completely shrouds the door coil. Mounted inside the hood is a curved sheet metal baffle, hinged at the top and supported at the bottom, by fusible hood releases, in such a manner as to clear the door coil. Melting of the fusible release drops the baffle plate against the door coil to prevent the passage of flame over the door coil. See Fig. 1, (Items 9, 10, 11, 12 and 13), also Fig. 5, Page 14.

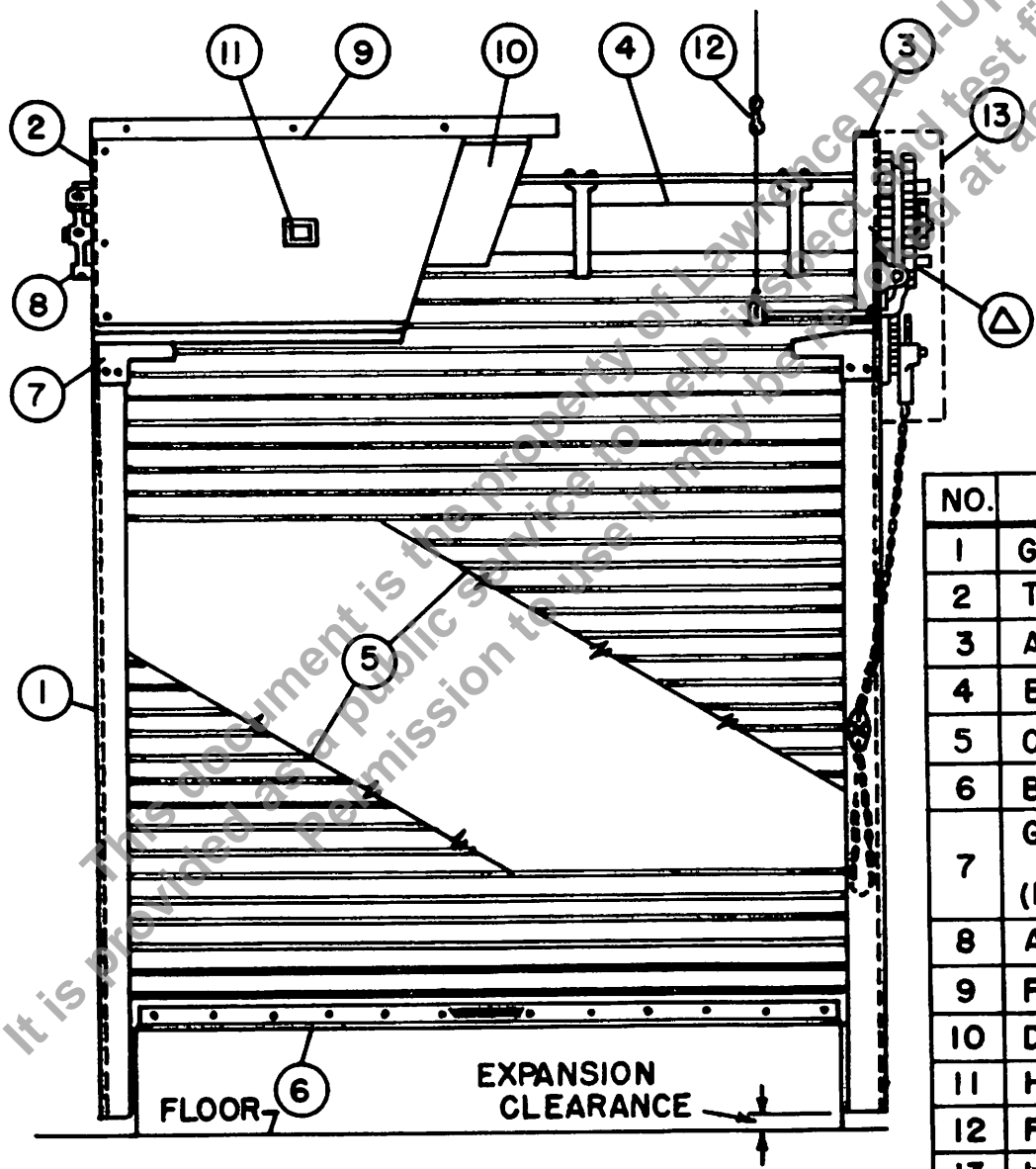


FIG. 1

NO.	ITEM
1	GUIDE
2	TENSION BRACKET
3	AUTOMATIC BRACKET
4	BARREL
5	CURTAIN
6	BOTTOM BAR
7	GUIDE MOUTHS (TWO PIECE) (NEAR SIDE & FAR SIDE)
8	ADJUSTING WHEEL
9	FRONT HOOD
10	DROP HOOD
11	HOOD RELEASE
12	FUSIBLE LINK
13	HOUSING
△	FOR ASSEMBLY SEE FIG.8

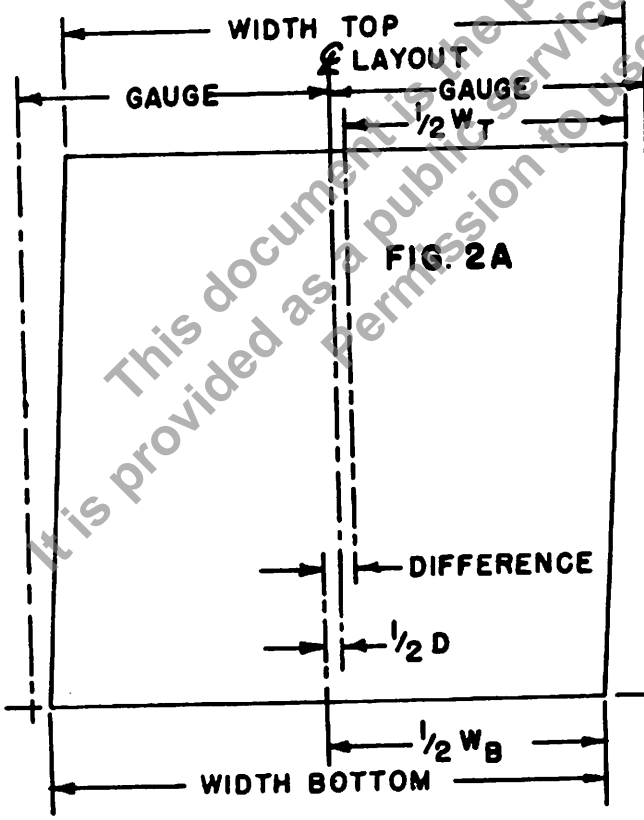
SECTION II

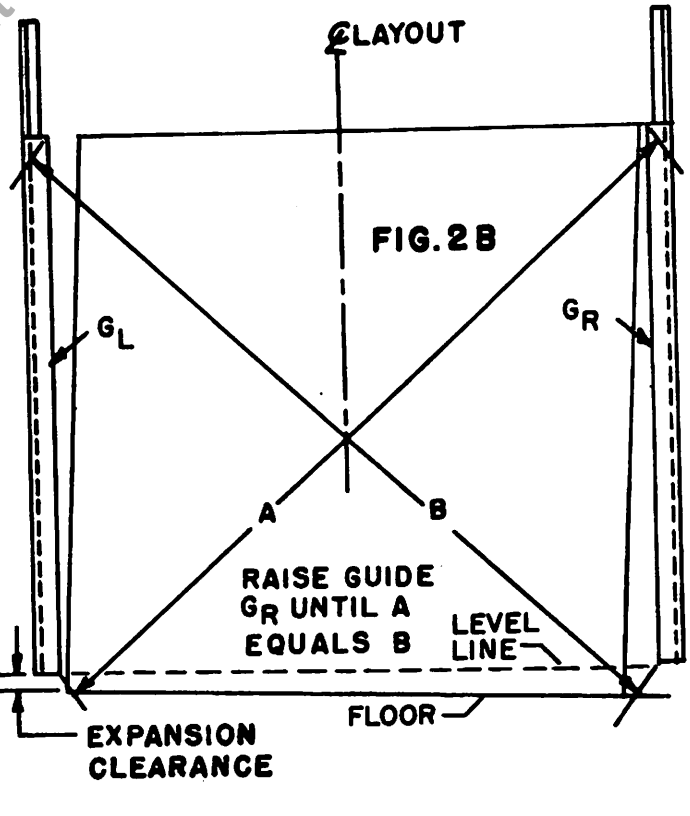
PREPARING TO INSTALL DOOR

1. **List of Material:** Contained in the instruction envelope are the following items: (a) Material Packing List, (b) Bolt List and Instructions, and (c) Erection Drawing. With the erection drawing as a reference, the received material should be identified and checked with the packing list. The bolt kit should be checked with the bolt list. Any damage or missing material should be reported promptly to The Kinnear Manufacturing Company.

2. The erection drawing should be studied carefully to be familiar with the various components and their relation to each other. For detailed instructions, See Section III.

3. **Preparation of Opening:** Before beginning erection, the opening should be carefully measured to determine the actual size and slope, if any, of the jambs and/or floor line. To locate the gauge lines for the guide mounting bolts, measure the opening width at the top and locate the center of the lintel. From this center, drop a plumb line to the floor and mark location on floor. Measure opening at the bottom and locate center. If the plumb line mark coincides with the bottom center, the top center may be used for lay out purposes. If the plumb line mark does NOT coincide with the bottom center mark, then divide the difference in half and move the TOP center this half difference toward the bottom center. Mark this new line on lintel and floor. All mounting holes should be laid out from this new line. See Figs. 2-A and 2-B and erection drawing.





SECTION III

ERECTION INSTRUCTIONS

1. **Guides:** Having measured the opening in accordance with the instructions "Preparing to Install," lay off the distance from the door centerline to the guide gauge line; and with plumb bob and chalk line, mark gauge lines on door jambs. Bolt guide mouths, Item 7, to farside of guides. On high side of floor at jamb, if any, set one guide, Item 1, centering the mounting slots on gauge line and **block guide off the floor the clearance distance shown on the erection drawing.** Mark off mounting slots and holes on gauge line and remove guide. NOTE: (Drill all round holes on center. For all slotted holes, drill for wall bolts ¾" BELOW center of slots to allow for expansion.) Mount guide, install and tighten mounting bolts using shims between wall and guide, if required, to keep guide straight. Repeat with opposite guide, blocking up bottom until tops of guides are level before marking and drilling. See Fig. 2-B, Page 4. After mounting both guides, check top of guides to make certain they are level and that the guides are plumb and correct distance apart at top and bottom. Any spaces between mounting angle and wall should be filled with grout.

2. **Brackets:** Raise tension bracket, Item 2, and bolt to outside of guide mounting angle as shown on erection drawing. Tighten bolts. Assemble automatic bracket, Item 3, to round shaft end of barrel, sliding ball bearing onto end plug; and raise into place on guide, sliding flattened shaft end of barrel into tension bracket. Bolt automatic bracket to guide and tighten bolts. Push barrel into automatic bracket until end plug seats against ball bearing. Check brackets. Brackets should be parallel, and square with the barrel. Note spring revolutions marked on colored barrel sticker and erection drawing for later adjustments. Check barrel rings to see that low side of spiral faces direction curtain will uncoil. Place adjusting wheel, Item 8, on flattened shaft and insert locking pin in bracket lug and wheel. Do **NOT** assemble automatic mechanism on bracket.

3. **Drop Hoist Mechanism:** Study carefully the automatic mechanism, Fig. 8, Page 7, noting the assembly position of each item and the item identification as listed on the illustration. All automatic item names and numbers refer to Fig. 8. The completed assembly is shown in Fig. 7, Page 14. Assemble main gear, Item 12, to drive plug on barrel and insert key flush with off-set on plug. Assemble link drop lever, Item 4, to bracket. Raise hoist support, Item 2, and latch in position with link drop lever. Tie up lever, in position shown, with temporary cord or wire. Do **NOT** assemble automatic mechanism on bracket. Install chain lock on guide as shown on the erection drawing.

4. **Curtain:** With curtains shipped in sections, assemble the first two (No. 1 and 2) sections of Item 5 together. Note that on each section the endlocks are bolted to the bottom slat. With slats faced hollowed side up, unbolt and remove one endlock from the bottom slat of Section 1, and slide the top slat of Section 2 into the bottom slat of Section 1. See Fig. 6, Page 14. Replace endlock and tighten bolts. Peen bolts to prevent loosening. Raise the slats with slotted slat at the top and feed slats up into brackets between wall and barrel. (Caution: Slats must be turned so that concave or hollow side of slat will contact barrel rings.) Pull slats up over top of barrel and attach

hollow side of slotted slat to curved wedging block on rings with bolts provided. Center slats between the brackets before tightening bolts.

With two rods (½″ dia. x 24″ lg.) inserted into adjusting wheel, remove locking pin and apply enough tension to counterbalance the two sections of slats. Replace locking pin. Remove top endlock from Section 3, and keeping barrel from rotating, pull curtain away from guides and slide Section 3 into place. See Fig. 6, Page 14. Replace endlock and apply tension as before, coiling Section 1 onto barrel by means of hoist chains. Continue adding sections and coiling until all sections are assembled. Tighten all endlock bolts. Slide bottom bar, Item 6, onto curtain and install endlocks. Coil curtain until bottom bar clears top of guides, then feed bottom bar into guides and pull curtain down until bottom bar is just below brackets. Install guide mouths, Item 7 (near side), and tighten bolts. Raise curtain until bottom bar contacts guide mouth stops and block door in position.

5. **Applying Tension:** Remove locking pin; and with rods, remove tension from counterbalance spring. By hand, rotate adjusting wheel in both directions to determine the point of no tension, or neutral point. Mark hole on wheel nearest to lug on tension bracket and place directly under hole in lug. Insert the two rods and turn adjusting wheel in the proper direction (See Fig. 6, Page 14) the number of initial turns marked on barrel and bracket. (**WARNING:** Always seat rods firmly when applying tension, and never allow spring tension to "Run Off" uncontrolled. Failure to exercise proper care could result in personal injury or damage to the equipment. All adjustments to counterbalance should be made with the door in the "OPEN" position.)

   Remove curtain blocking and operate door with the hoist chains. If door runs down and hits the floor, raise curtain to full open position and increase tension as outlined above. If door rises off the floor when closed, raise door and decrease tension. When adjusted correctly, door should stay up at the lintel when open, and rest lightly on the floor when closed.

6. **Automatic Mechanism:** Assemble clutch rings, Item 13, Fig. 8, Page 7, to inner hub of retaining disc, Item 14, and assemble both items on shaft making certain outer ring enters into main gear. Check freedom of clutch rings by revolving retaining disc. Disc should rotate smoothly and without binds. Remove retaining pins, Item 17, and cotter pins, Item 18, from retaining disc and install adjusting wheel, Item 15, on shaft. Secure with adjusting wheel pin, Item 16, driving pin flush with adjusting wheel hub. Remove temporary tie from link drop lever and install fusible link, using "S" hooks and wire chain provided and secure to building structure. With door in the full OPEN position, rotate disc, Item 14, in the direction indicated by the arrow, Fig. 8, Page 7, until all lugs on rings are in contact with lug on main gear. Maintain disc in this position while applying tension to automatic spring.

7. **Applying Tension:** With door curtain in FULL OPEN position, apply tension to Item 15, Fig. 8, Page 7 (also see Fig. 7, Page 14) revolving adjusting wheel the number of turns shown on the barrel sticker and on erection drawing. Insert locking pins, Item 17, through retaining wheel into adjusting wheel and secure with cotter pins, Item 18.

   Clear opening in line with door of all erection equipment and raise curtain to full height. **WARNING:** Curtain must **ALWAYS** be in FULL OPEN position for automatic operation. Disengage fusible link from drop lever and release lever. Door will now

NO.	ITEM	NO.	ITEM
1	AUTO. BRACKET	10	GOVERNOR GEAR
2	HOIST SUPPORT	11.	BALL BRG. & SNAP RING
3	RATCHET PAWL	12.	MAIN GEAR
4	LINK DROP LEVER	13.	CLUTCH RINGS (6)
5	GOVERNOR	14.	RETAINING DISC
6	CHAIN GUARD	15.	ADJUSTING WHEEL
7	PINION SHAFT	16.	ADJ. WHEEL PIN
8	HOIST SPROCKET	17.	RETAINING PINS
9	HOIST PINION	18.	COTTER PINS

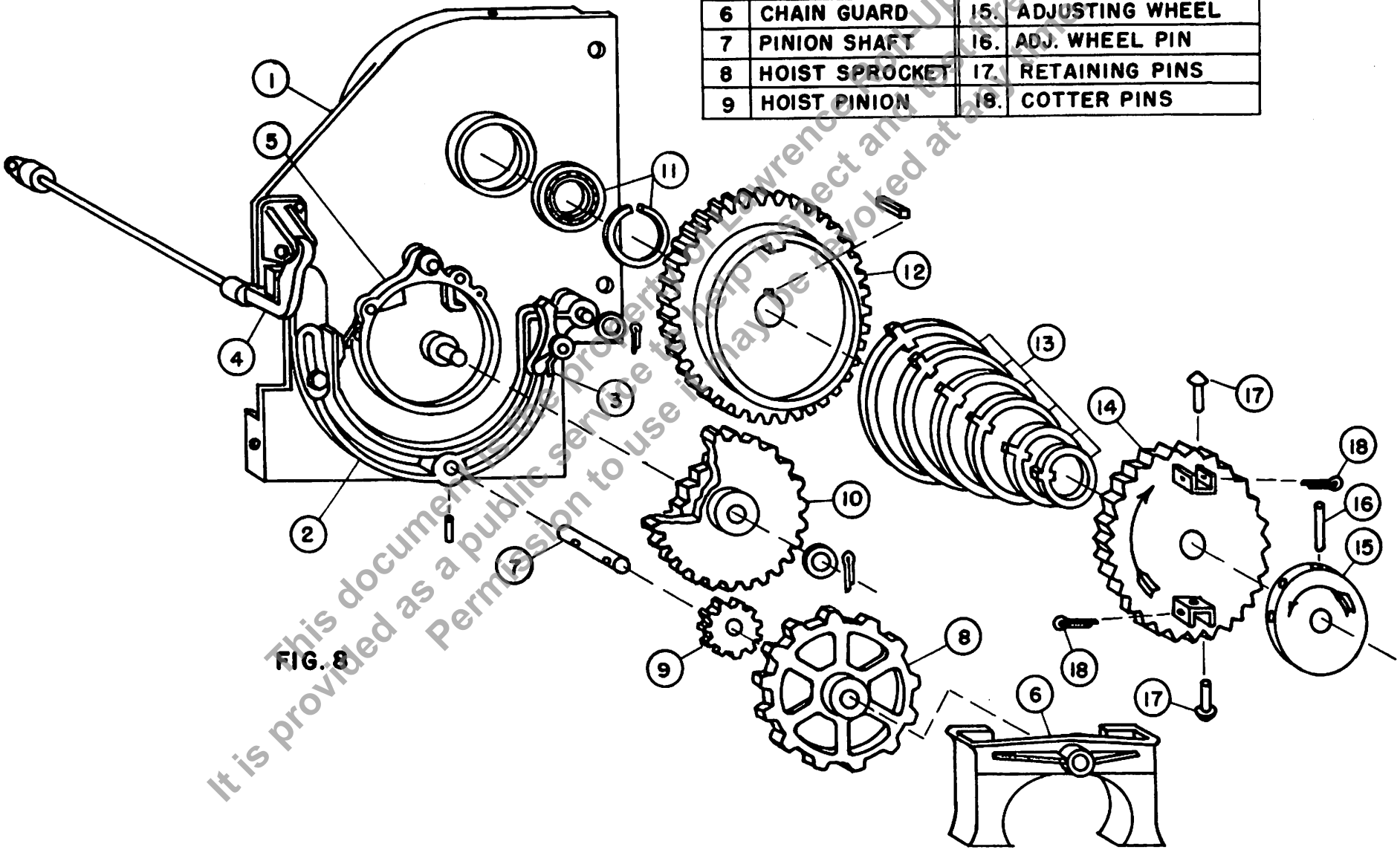


FIG. 8

go into automatic operation. If door does not close to floor, increase automatic tension. If door closes too hard, decrease automatic tension. See Fig. 7, Page 14. Door should close to a few inches from the floor until the automatic spring drives door to floor level. Changes to automatic tension should be made with the door fully closed.

NOTE: When both counterbalance spring and automatic spring systems are charged, changes to the automatic spring tension may be made without affecting the counterbalance of the door. However, any change to the counterbalance spring tension affects the automatic spring in the reverse direction. Increasing the counterbalance tension, decreases the automatic tension; decreasing the counterbalance tension increases the automatic tension. For this reason, all adjustments to the counterbalance spring should be made before assembling automatic mechanism on shaft.

8. **Resetting Mechanism:** After automatic operation the mechanism may be reset by the following procedure. Thru the bottom of the housing reach up and depress the front pawl of the governor, Item 5, Fig. 8, Page 7, allowing the governor to swing toward the wall. Hold the pawl depressed and raise the hoist support, Item 2, Fig. 8, into operating position as shown, making sure the pinion gear, Item 9, meshes with governor gear, Item 10, Fig. 8. Ratchet pawl, Item 3, should engage with retaining disc, Item 14. (NOTE: Front governor pawl must be held depressed by ramp on hoist support.) With hoist support in fully raised position, swing link lever, Item 4 to horizontal and attach to fusible link. See Fig. 7, Page 14. By means of the hand chain raise door to full open position, thus resetting the tension on the automatic closing string. Door is now reset and ready for normal operation.

9. **Hood and Housing:** On both brackets, make a small mark on the outside corner of the bracket opposite the centerline of the hood screw holes. Measure distance from the outside of bracket to the centerline of holes. Raise hood and fit over brackets, aligning the ends even with the outside of the brackets. Set top tight against the wall with both ends even with or equidistant from the wall (in case of bulging wall). By means of the marks on the bracket corner and the gauge distance previously measured, lay off the centers of the hood screw holes on the hood. Insert a block of wood between hood and bracket and drill hood with ¼″ diameter drill. Raise automatic mechanism housing and, repeating the above process, drill housing. Assemble hood and housing to brackets with self-tapping screws provided. Fasten top flange to wall with masonry nails (not provided) for masonry wall or ¼″ self-tapping screws (provided) for self-mounting. Through the fusible link housing, Item 11, Fig. 5, Page 14, thread a loop of cord or wire under the retaining hook of the drop hood, Item 10. Pull loop tight and remove temporary metal strip from housing. Install fusible hood release, making sure hook engages into fusible release. Remove wire loop and push fusible release all the way over hook.

SECTION IV

MAINTENANCE

1. **Inspection:** Visual inspection for general cleanliness and ease of operation on a periodic basis of about two week intervals will eliminate possible future repairs. Guides, Guide Mouths, Curtain and Hood should be inspected for wear or accidental damage. Check and tighten bolts on brackets, guides and guide mouths.

2. **Cleaning:** The rolling door has no specific cleaning requirements. Clean as needed in accordance with good housekeeping practices. Clean accumulated grease and dirt from guides and debris from bottom of guides.

3. **Painting:** All parts should be thoroughly cleaned with commercial solvents before painting. When painting the curtain, the paint should be well brushed out where the slat beads overlap to prevent accumulated paint from interfering with the articulation of the slats.

   Caution: Allow paint to dry thoroughly when door is in closed position. Do not coil curtain while paint is wet or tacky.

4. **Lubrication:** The automatic mechanism should be lubricated with a thin film of grease at assembly. No further lubrication is required until necessary to overhaul or repair door or mechanism. Periodically, when required, the operating gears should be cleaned of accumulated dirt and grime and regreased. Gear and hoist shafts should be lubricated with machine oil.

SECTION V

TROUBLE-SHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
Door raises hard, closes easily	Insufficient counterbalance	Increase spring tension. See Fig. 6, Page 14.
Door closes hard, raises easily	Too much counterbalance	Decrease spring tension. See Fig. 6, Page 14.
Door jumps up from floor	Too much counterbalance	Decrease spring tension. See Fig. 6, Page 14.
Curtain runs to one side	Broken endlocks	Check and replace.
	Barrel not level	Check and level barrel.
Door sticks when closing	Bent guides	Inspect for bent or kinked guides. Straighten guides and check guide width.
Door coil makes cracking sounds	Bent slats	Inspect, remove and straighten or replace.
Door squeaks when operating	Tight guides	Check alignment and distance between guides.
		Check clearance of slats in guides.
	Dirty guides	Inspect and clean inside of guides. Lubricate with thin film of grease.
Door difficult to raise, will not stay open	Broken spring	Remove door barrel and replace spring.
Door does not close to floor when tripped	Insufficient tension on auto. spring	Increase automatic spring tension. See Fig. 7, Page 14.
	Too much tension on counterbalance spring	Decrease counterbalance tension. See Fig. 6, Page 14.
Door does not move when tripped	Auto. spring tension applied backwards	Release automatic spring tension and apply tension in correct direction. See Fig. 7, Page 14.
	Binds in auto. mechanism	Release automatic spring tension and remove binds. Apply correct tension.
	Auto. spring broken	Check and replace spring. See Fig. 9, Page 13.

SECTION VI

REPAIRS

1. **Guides:** When a guide is bent or kinked by accidental impact it may be restored by removing the assembly bolts and straightening the bent angles. Place bent angle on the two firm supports or blocks about 18″ apart. If angle bows upward, strike top edge of upstanding leg between the blocks, Fig. A, using a heavy hammer. If the angle bows side ways, strike horizontal leg directly over blocks, Fig. B.

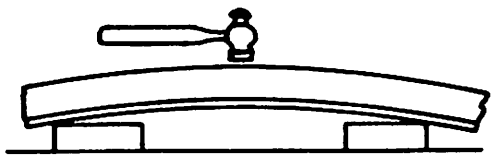


FIG. A

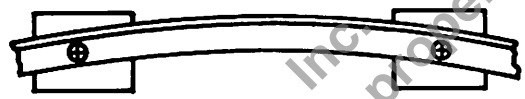


FIG. B

With angles straightened, reassemble guide, making certain that the guide width is ¾″ between angles. Sharply kinked angle may require the use of an acetylene torch to remove the kink.

2. **Bottom Bar:** Bent bottom bars may be straightened in the same manner as guides.

3. **Curtain:** When damaged curtain slats must be replaced and sideroom permits, the defective slats may be removed in the reverse manner in which they were assembled. Note: (Sideroom must be equal to the curtain width.) Raise door to open position and remove all four guide mouths. Pull curtain down until damaged slats are at working height. On side opposite to sideroom bend out endlock at top of damaged slats using wrench and screwdriver as shown in Fig. 13, Page 14. Pull lower part of curtain side ways about one foot. By means of clamps fasten upper part of curtain to guide so counterbalance spring will not recoil curtain when weight of lower section is removed. With clamps secured, remove lower section. Remove damaged slats from lower section (by bending endlock out as above) and install new slats. At the joining slat, support the slat bead at the endlock and hammer the endlock down until endlock covers end of beads. Slide lower section onto upper section and release clamps. Align slat ends and again bend endlock into alignment. Raise curtain and feed bottom bar into guides and replace guide mouths. Check door operation.

4. **Hood:** Remove hood screws and damaged hood. Place hood on smooth surface. Hammer out dents, using a rubber or rawhide mallet. A steel hammer should not be used on sheet metal to remove large dents but may be used in final finishing. After straightening replace hood and tighten hood screws.

5. **Barrel:** Repairs to the counterbalance spring involves almost total disassembly of door and is to be accomplished as follows: Remove hood and close door. If tension is remaining in barrel, use two ½″ diameter rods by two feet long to remove all tension by seating rods in adjusting wheel and then remove locking pin. When all springs are broken no tension will be in the barrel.

   With all tension removed, take off adjusting wheel and release curtain from barrel by removing top slat screws. Pull top of curtain down behind barrel and allow slats to

hang over front guide mouth. While supporting the barrel, remove one bracket from guide and slide bracket off shaft. Remove barrel from opposite bracket and lower to working area.

To remove tension rod from barrel remove plug pins by driving pins through plugs using a pin punch. See Fig. 9, Page 13. **Note:** Remove pins starting at flattened end of shaft. Pull tension rod out of pipe as shown. If required hammer pipe over end plug to peen pipe slightly to release end plug.

With tension rod removed, an acetylene torch is used to heat the spring tang on the dished side of the head plug. With tongs or pry bar straighten spring tang and slide spring off tension rod. **Note:** Tip pipe with open end down to reclaim plug pins from head plug.

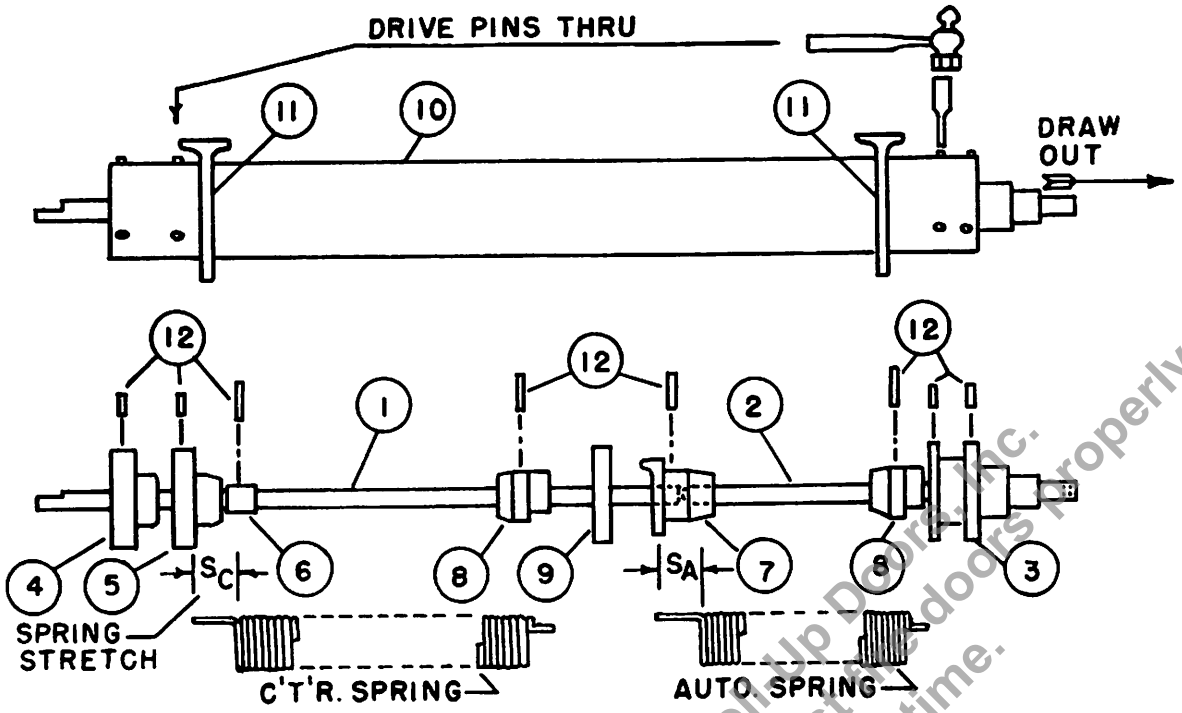
To install new spring, slide straight tang end over shaft until pigtail end is seated in the groove in the tailplug. Stretch spring until coils are firmly against face of head plug and with acetylene torch heat straight tang until red and bend into head plug as shown in Fig. 10, Page 13. Tang should be bent so as to clear tension rod.

Slide repaired tension rod into pipe entering round end of shaft into end plug on opposite end. Rotate shaft to align holes in head plug with holes in pipe and install pins.

Align holes in end plug in end of pipe and slide plug into pipe. Replace plug pins. End plug bearings may be replaced as shown in Fig. 11, Page 13.

Door may be assembled by reversing the procedure as outlined in the first two paragraphs.

6. **Repair Parts:** When ordering spare or replacement parts, always refer to part name or number and Kinnear job number and door mark stamped on plate on bottom bar. When ordering springs, state number of coils and whether right or left hand wound. See Fig. 12, Page 13.



1	TENSION SHAFT	7	AUTO. SPRING PLUG
2	AUTO. SHAFT	8	TAIL PLUGS
3	AUTO. DRIVE PLUG	9	IDLER PLUG
4	END PLUG	10	BARREL PIPE
5	HEAD PLUG	11	SPIRAL RINGS
6	COLLAR PLUG	12	PINS

FIG. 9

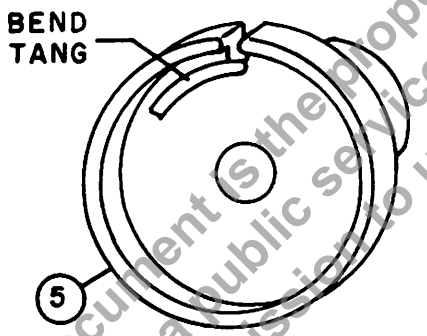


FIG. 10

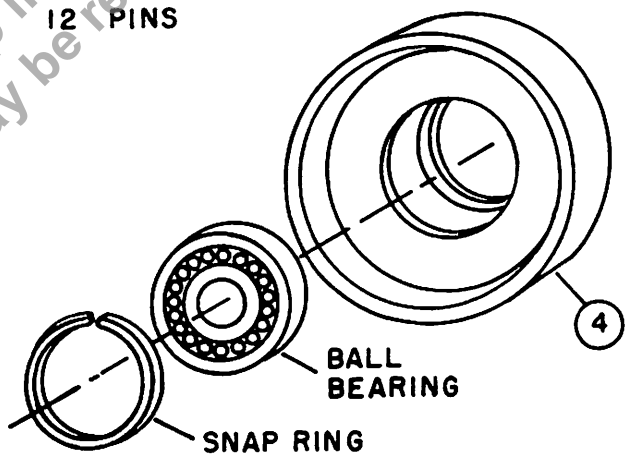


FIG. 11

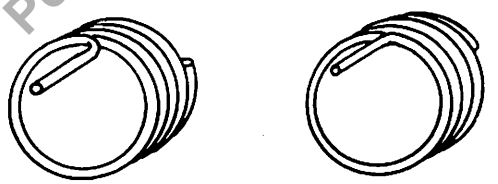


FIG. 12

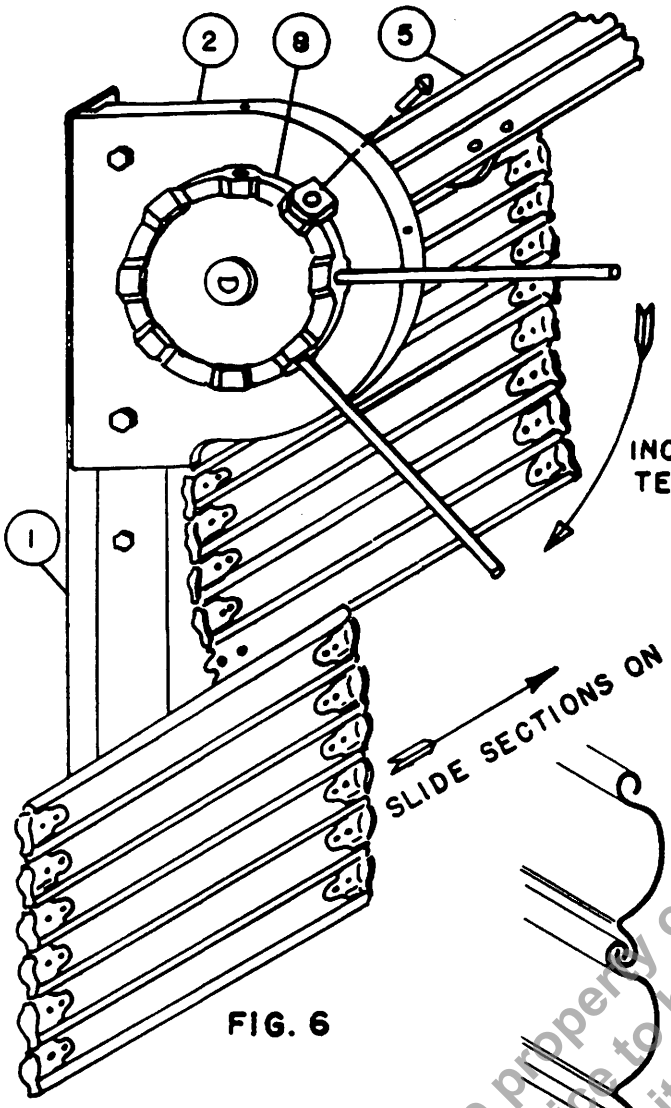


FIG. 6

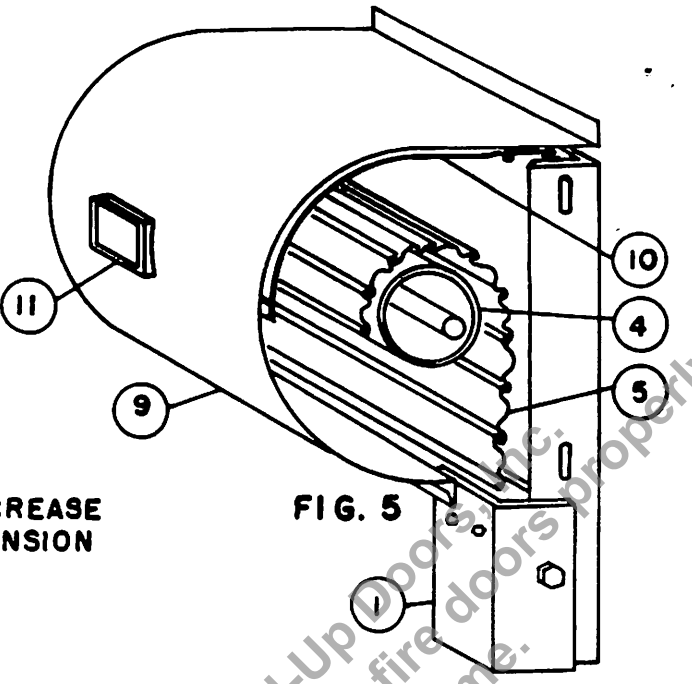


FIG. 5

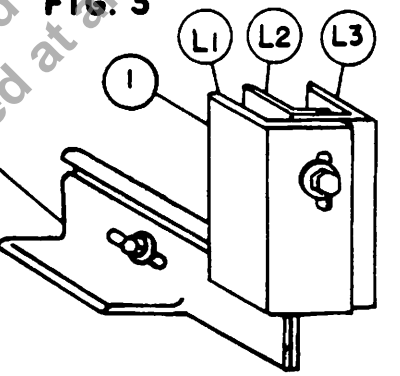


FIG. 3

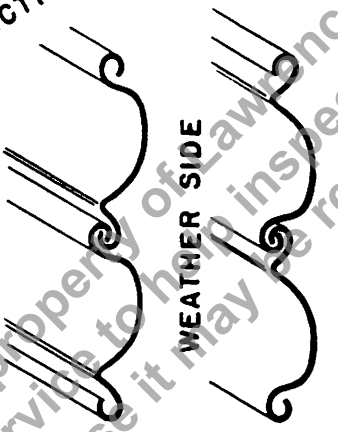


FIG. 4

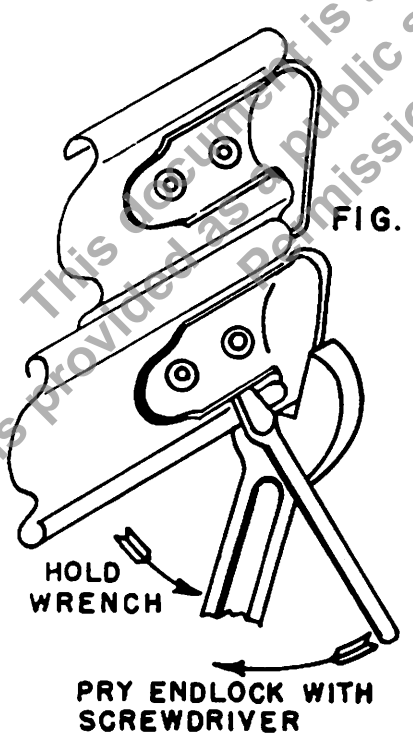


FIG. 13

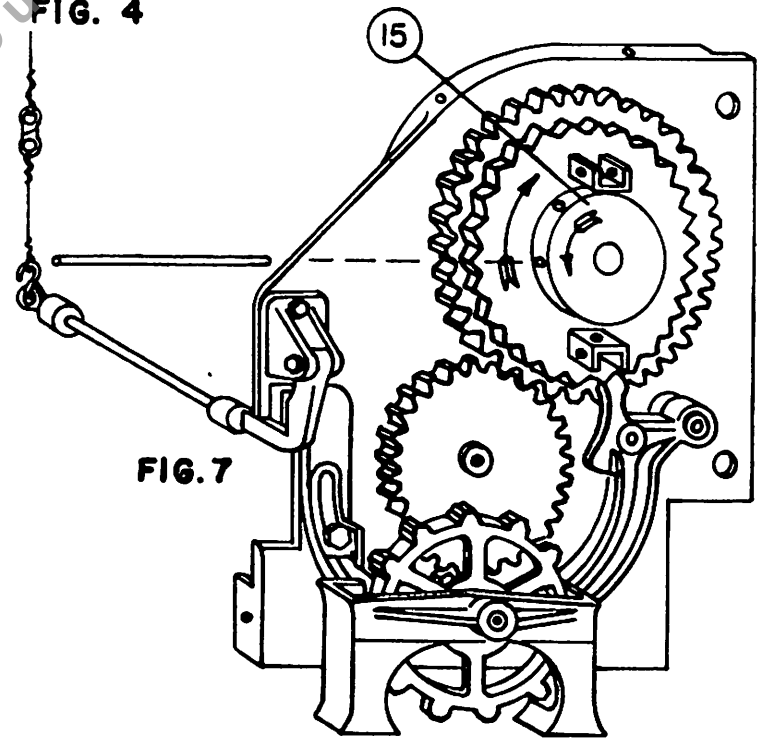


FIG. 7

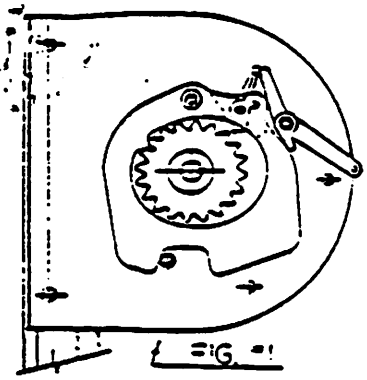


FIG. #1

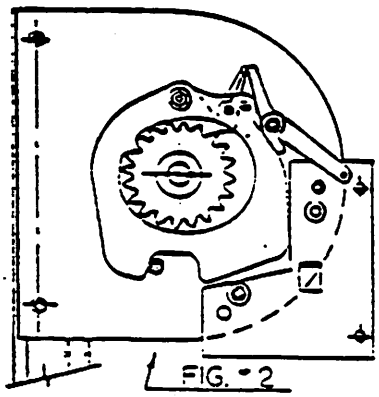


FIG. #2

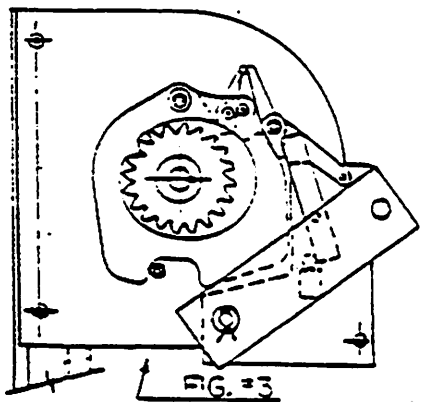


FIG. #3

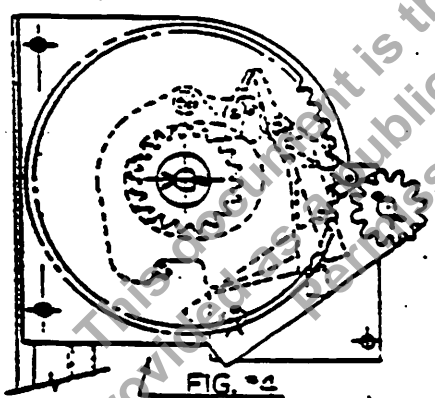


FIG. #4

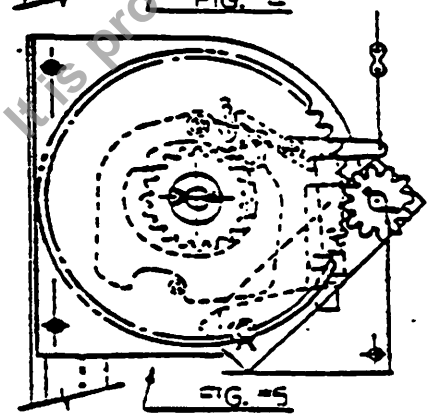


FIG. #5

AKBAR 39 RELEASE MECHANISM INSTALLATION INSTRUCTIONS

FIG. #1 - Operating bracket as assembled to barrel end and guides, shown with governor pawl in the released position. Key Retaining Wheel (R.W.) to barrel shaft using large washers for proper spacing and alignment with governor. The R.W. should not rub side of bracket when operating.

FIG. #2 - Disassemble 'Hoist Mounting' Plate, remove two arms. Bolt 'Hoist Mounting' Plate to side of bracket using 3/8 & 1/2" button socket head screws, nuts, and washers. Do not tighten screws in place yet, allowing for adjustment. The governor should swing free of the "Hoist Mounting" Plate.

FIG. #3 - Reassemble the Support Arm into bushed hole in 'Hoist Mounting' Plate, push all the way in to stop. Reassemble Pivot Arm over extended shaft using washers and cotter pin. Both the Support Arm and Pivot Arm to be positioned as shown in FIG. #3, and must operate freely.

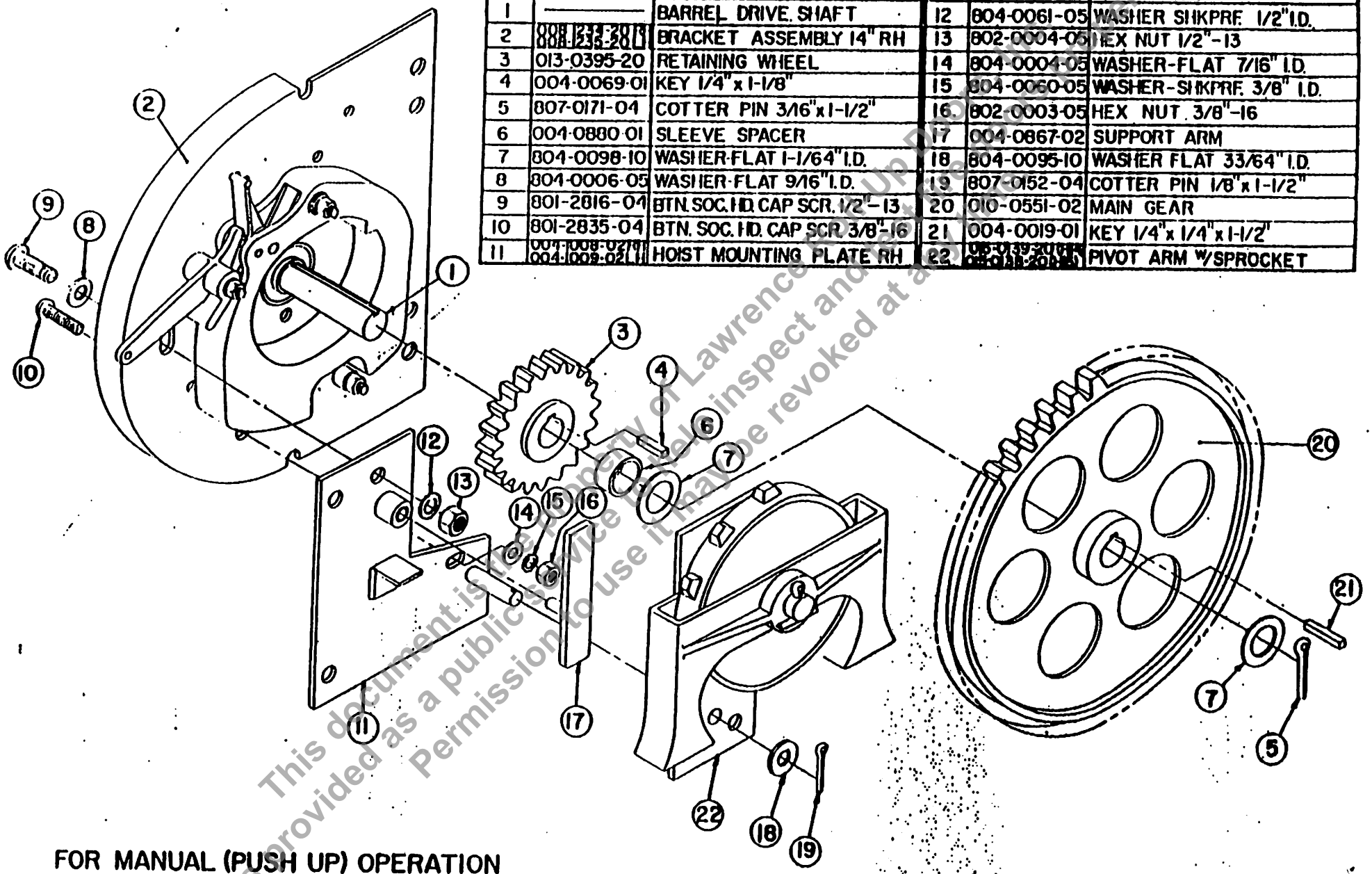
FIG. #4 - Install Main Gear to barrel shaft using spacer and washers as required, secure in place with key and cotter pin. If a chain hoist is required with this door remove it from the Pivot Arm before installing the Main Gear, after the Main Gear is in place reassemble the chain hoist.

FIG. #5 - Engage gears by lifting the Pivot Arm and to secure in place by raising the governor pawl and connect cable with fusible link. Make necessary adjustments by using the slot in 'Hoist Mounting' Plate to properly engage teeth on the gears and also put the governor in the operating position. Now tighten screws to secure the "Hoist Mounting" Plate to the bracket.

For Power Unit Assembly:

Bolt securley the Power Unit Mounting Plate with 1/2" button socket head screws, nuts, and washers to 'Hoist Mounting' Plate. Position the Power Unit on the Power Unit Mounting Plate and secure in place with 3/8" hex. head cap. screws, nuts, and washers. Assemble roller chain in place and adjust sprockets for alignment and slide the Power Unit in the slots for proper tension on the roller chain, do this with the gears properly engaged.

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	———	BARREL DRIVE SHAFT	12	804-0061-05	WASHER SHKPRF. 1/2" I.D.
2	008-1235-20R 008-1235-20L	BRACKET ASSEMBLY 14" RH	13	802-0004-05	HEX NUT 1/2"-13
3	013-0395-20	RETAINING WHEEL	14	804-0004-05	WASHER-FLAT 7/16" I.D.
4	004-0069-01	KEY 1/4" x 1-1/8"	15	804-0060-05	WASHER-SHKPRF. 3/8" I.D.
5	807-0171-04	COTTER PIN 3/16" x 1-1/2"	16	802-0003-05	HEX NUT 3/8"-16
6	004-0880-01	SLEEVE SPACER	17	004-0867-02	SUPPORT ARM
7	804-0098-10	WASHER-FLAT 1-1/64" I.D.	18	804-0095-10	WASHER FLAT 33/64" I.D.
8	804-0006-05	WASHER-FLAT 9/16" I.D.	19	807-0152-04	COTTER PIN 1/8" x 1-1/2"
9	801-2816-04	BTN.SOC.HD.CAP SCR. 1/2"-13	20	010-0551-02	MAIN GEAR
10	801-2835-04	BTN. SOC. HD. CAP SCR. 3/8"-16	21	004-0019-01	KEY 1/4" x 1/4" x 1-1/2"
11	004-008-02R 004-009-02L	HOIST MOUNTING PLATE RH	22	008-0139-20R 008-0139-20L	PIVOT ARM W/SPROCKET



FOR MANUAL (PUSH UP) OPERATION
ONLY ITEMS 1 THRU 5 ARE FURNISHED