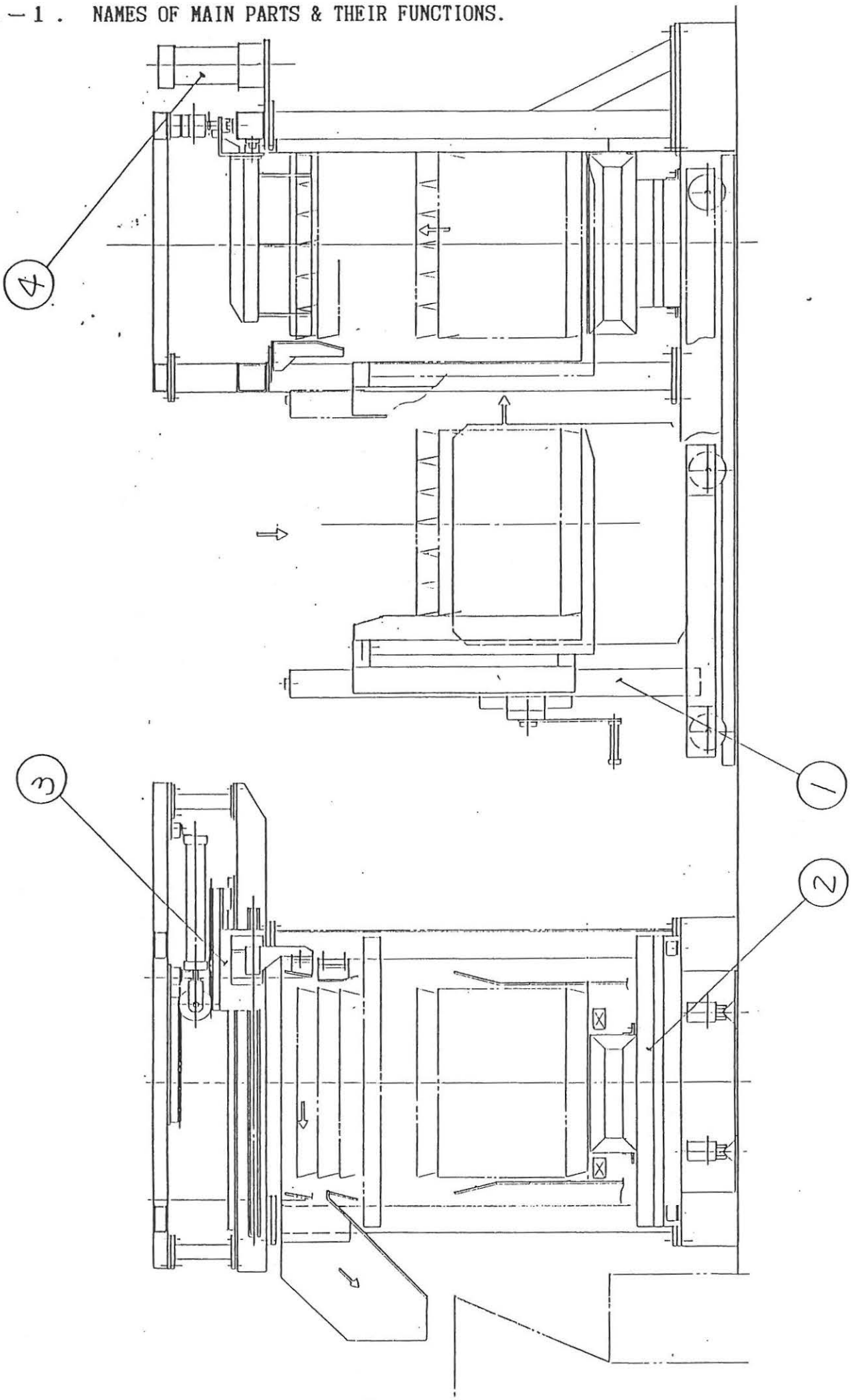
INGOT CHARGER INSTRUCTION MANUAL

C O N T E N T S

1－1．　NAMES OF MAIN PARTS & THEIR FUNCTIONS.



1-1-1. O U T L I N E

This equipment consists of four units as mentioned below.

① Part of hand lifter.

Ingot carried by hoist is received with two forks as it is,and transferred on the base of the upper part of lifter after removing binder.

② Part of scissors lifter.

Ingot is lifted up to the part of the pusher and sttoped at the detection of the top.

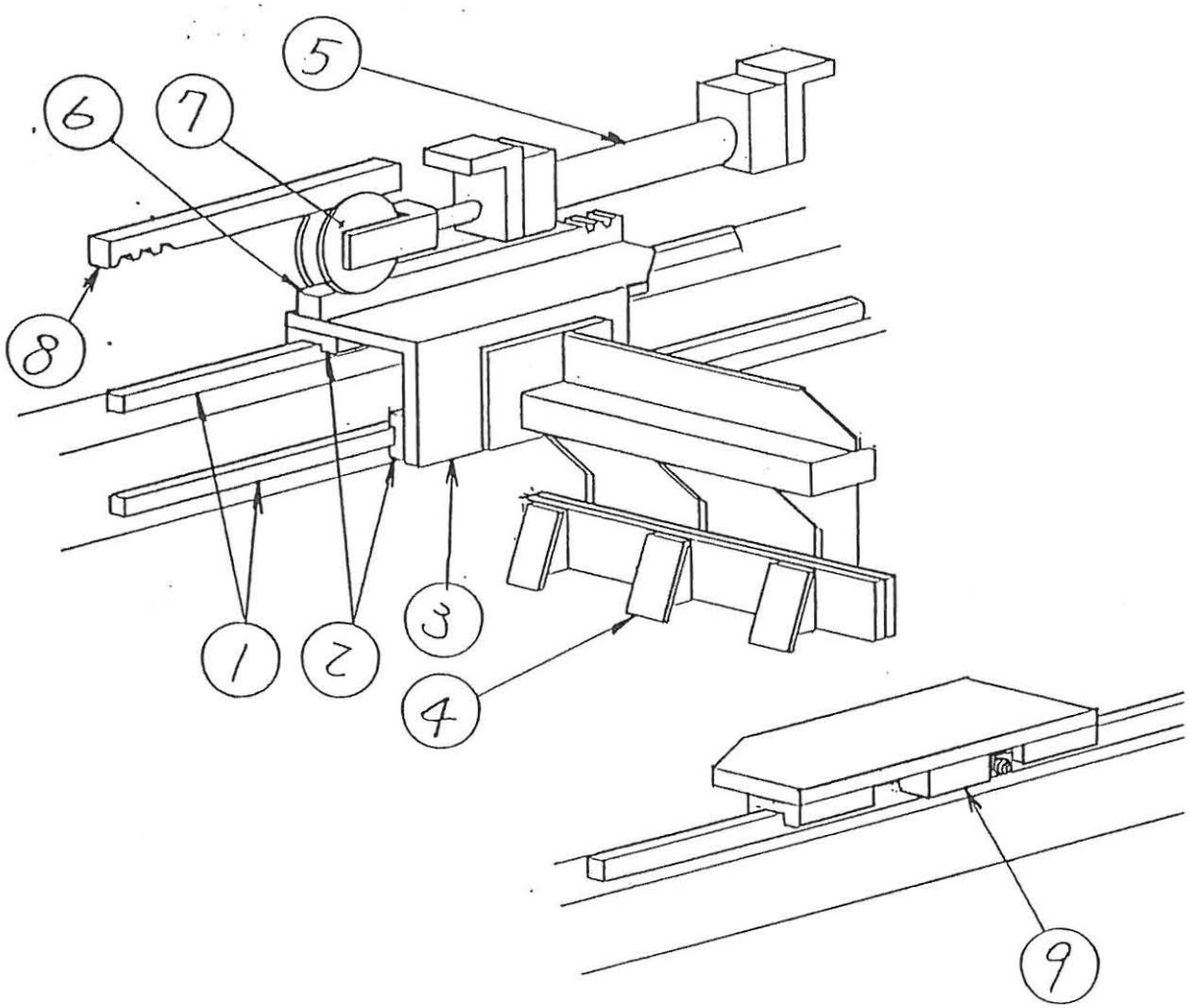
③ Part of pusher.

This unit consists of two linear rails and four bearings,and pushes out ingot gradually by double-speed mechanism with rack and pinion and drops on the shoot.

④ Part of air-hydraulic unit.

This unit converts air pressure into bydraulic pressure equivalent and controls advance of the pusher.
This is able to operate constant speed at the start and load change, and is adaptable to the emergency stop.

1-1-2. DETAILS OF THE PUSHER



Back figure

The pusher ④ is attached to the slider ③ forward consisted of two linear rails ① and four bearings ② , and operates by hydraulic pressure cylinder ⑤ into which converts air pressure to control advance.

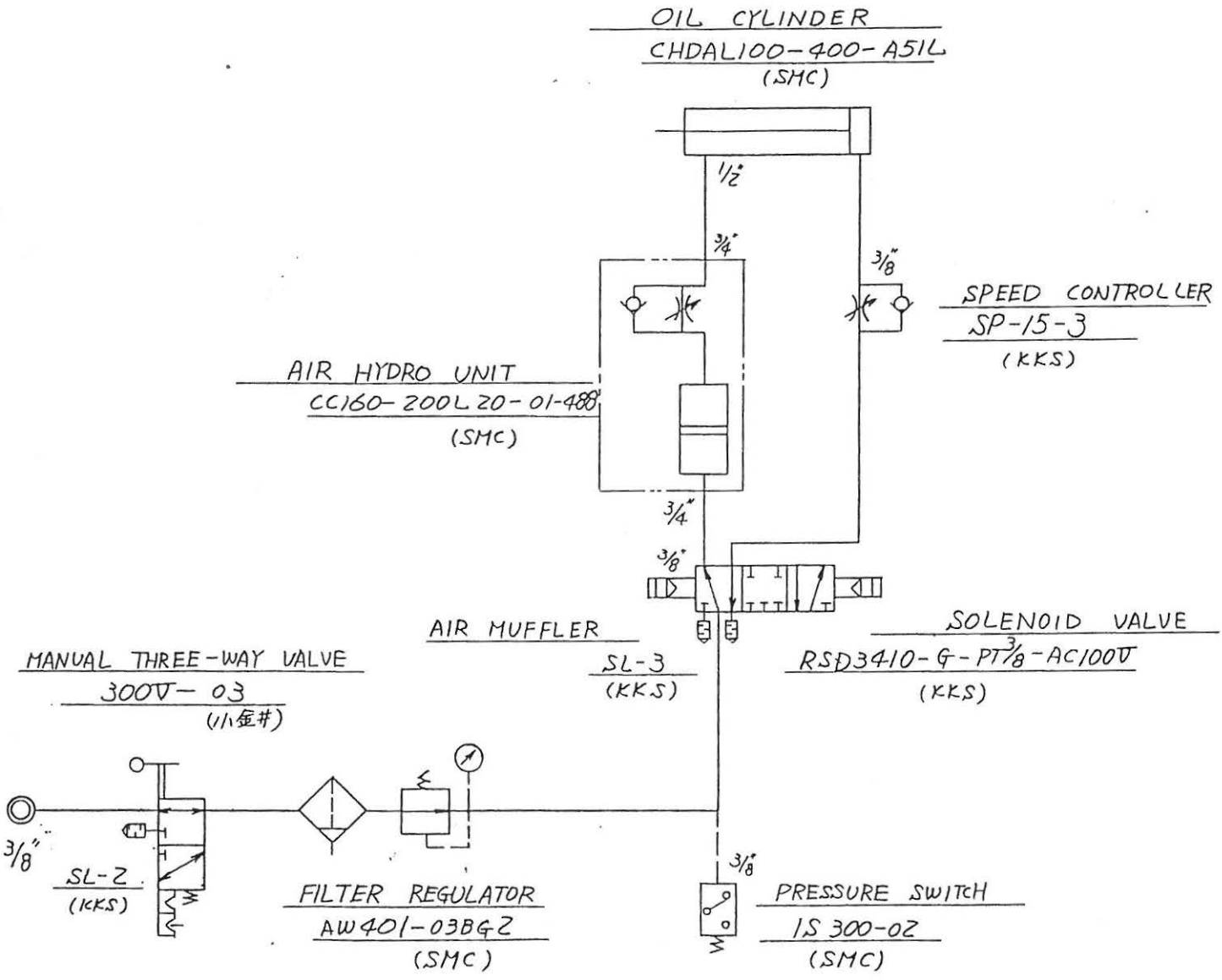
Fitting up rack ⑥ on the upper part, of the slider pinion ⑦ to the tip of hydraulic pressure cylinder, and setting the fixed rack ⑧ on that, double-speed mechanism performs.

Lubrication into linear bearings finishes at a time by centralized piping to the divider ⑨ attached to the back.

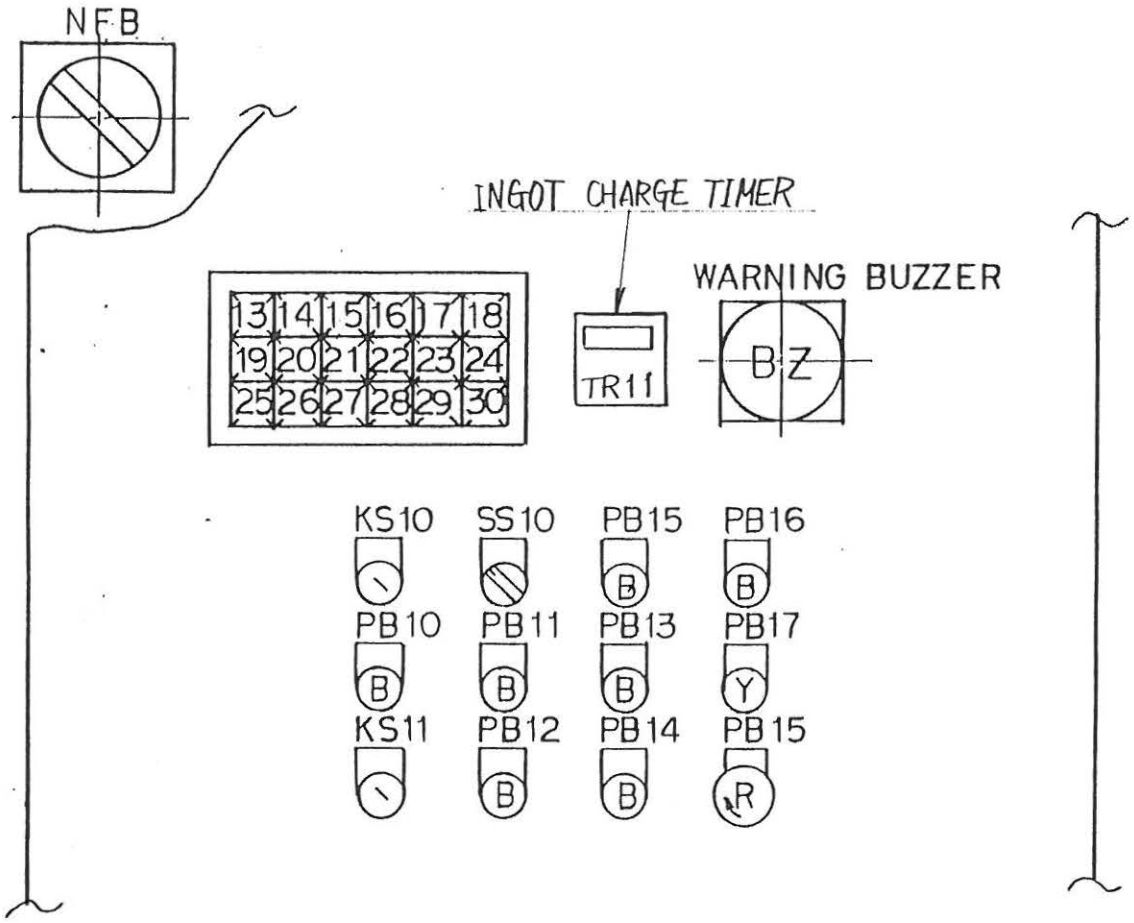
1-1-3. PARTS LIST

N A M E S	SPECIFICATIONS	M A K E R	QUAN-TITY	R E M A R K S
LINEAR GUIDE RAIL	LIN25-1180	NSK	1	
〃	LIN25-1300	〃	1	
LINEAR BEARING	LAN25-AL	〃	4	
SPECIAL PIPE FITTING	LF25	〃	2	
THRUST WASHER	SPW-2005	OIRESU	2	
SPUR GEAR	SS3-44	KHK	1	ADDTIONAL MACHINING DRAWING
RACK	SR3-450	〃	2	
BEARING	6004ZZ		2	
SCISSOR LIFT	2M-1009(0.4KW)	MEIKI	1	
OIL CYINDER	CHDAL100-400-A51L	SMC	1	
AIR HYDRO	CC160-200L20-01-488	〃	1	
FILTER REGULATOR	AW401-03BG2	〃	1	
SOLENOID VALVE	RSD3410-G-PT3/8-AC100V	KKS	1	
SPEED CONTROLLER	SP-15-3	〃	1	
AIR MUFFLER	SL-3	〃	2	
〃	SL-2	〃	1	
PRESSURE SWITCH	IS300-02	SMC	1	
MANUALTHREE-WAYVALVE	300V-03	KOGANEI	1	
BEARING	6204ZZ		8	
RETAINING RING	H47		8	HOLD USE
LIMIT SWITCH	WLCA2	OMRON	3	
PHOTO SWITCH	E3S-2E4	〃	1	

1-1-4. PIPING CHART



1－2．NAMES OPERATION SWITCH & THEIR FUNCTIONS



KS10 : OPE.POWER OFF-ON

KS11 : MANU. OFF-ON

PB10 : SYSTEM ON

PB11 : UP

PB12 : DOWN

PB13 : FWD.

PB14 : REV.

PB15 : AUTO. OPE. START

PB16 : OPE. START SIGNAL

PB17 : RESET

PB18 : EM.STOP

SS10 : MANU.AUTO.

- KS → KEY SWITCH
- PB → PRESS BUTTON SWITCH
- SS → SELECT SWITCH

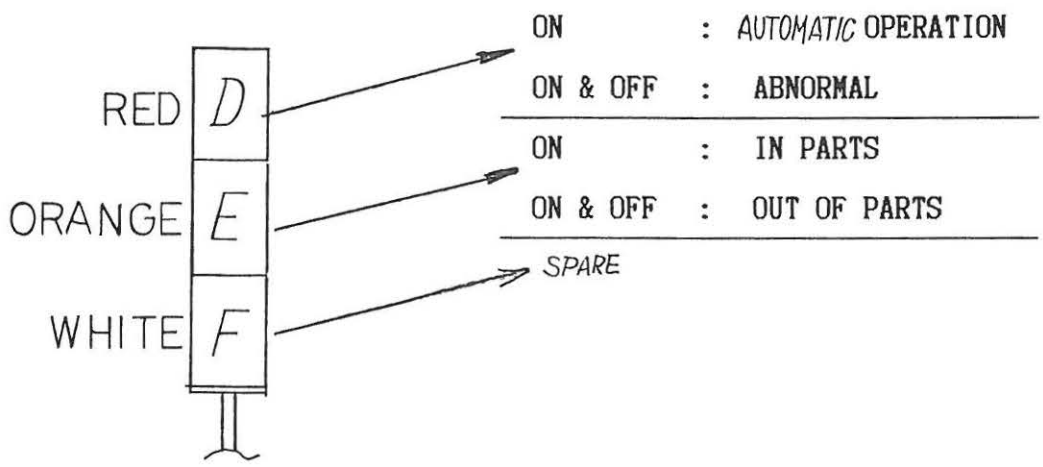
S Q U A R E L A M P

POWER	AIR PRESS OK	AUTO.	ALL UNIT ST.POS.	LIFTER ST. POS.	PUSH POS. HEIGHT
O P E . POWER	SYSTEM ON	AUTO.OPE START	UPLIMIT	F W D. LIMIT	A D D. PARTS
PC RUN	MANU.	CHARGE STOP	DOWN LIMIT	R E V. LIMIT	BATTERY ERROR

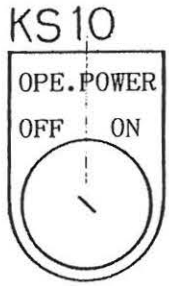
C O L O R

WHITE	WHITE	GREEN	GREEN	GREEN	GREEN
WHITE	WHITE	GREEN	RED	RED	YELLOW
WHITE	GREEN	RED	RED	GREEN	RED

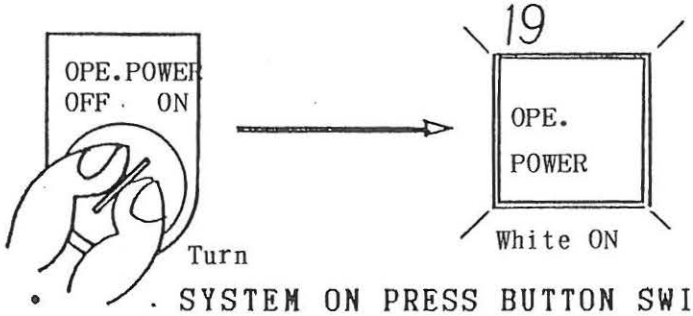
SIGNAL TOWER



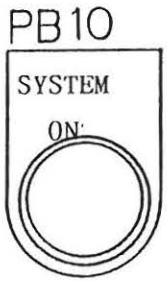
• OPE.POWER ON-OFF KEY SWITCH



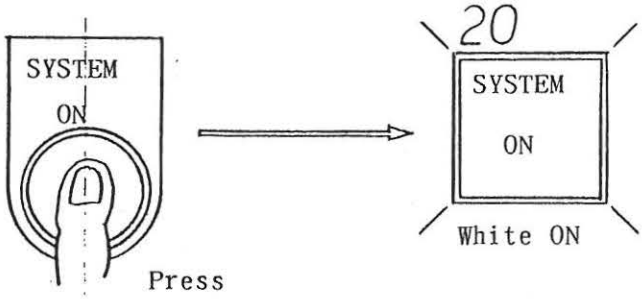
- Turn to ON, and light 19 ON .



• SYSTEM ON PRESS BUTTON SWITCH

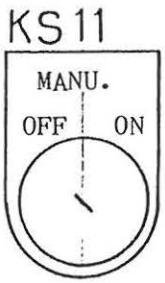


- Switch before start.
- Press button,and light 20 ON ready for start.



• MANU.ON-OFF KEY SWITCH

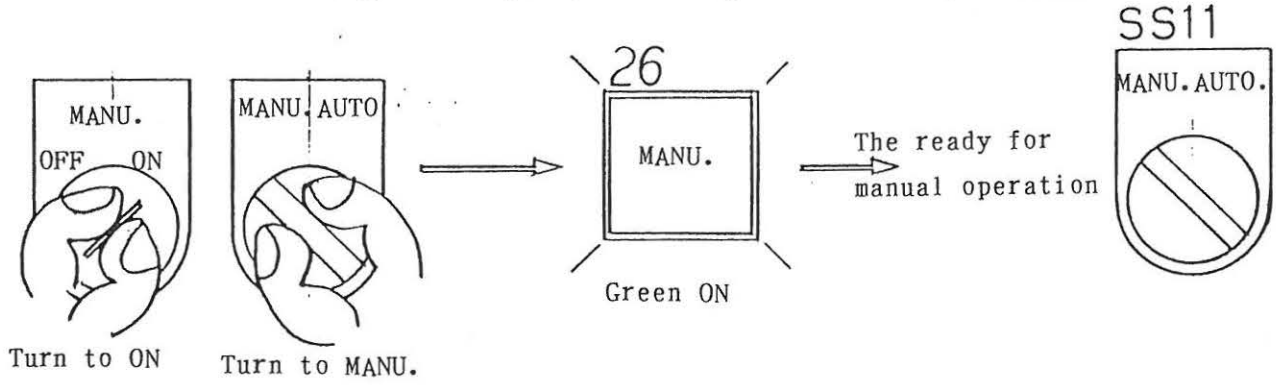
- Turn to ON, and ready for manual operation.



• MANU. AUTO. SELECT

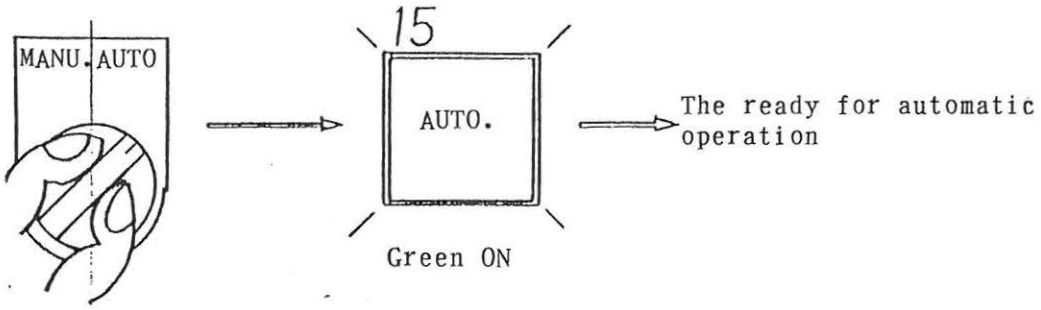
〈Manual operation〉

- In case of key switch 11 ON, and select switch 11 MANU. light 26 ON, and the ready for manual operation.



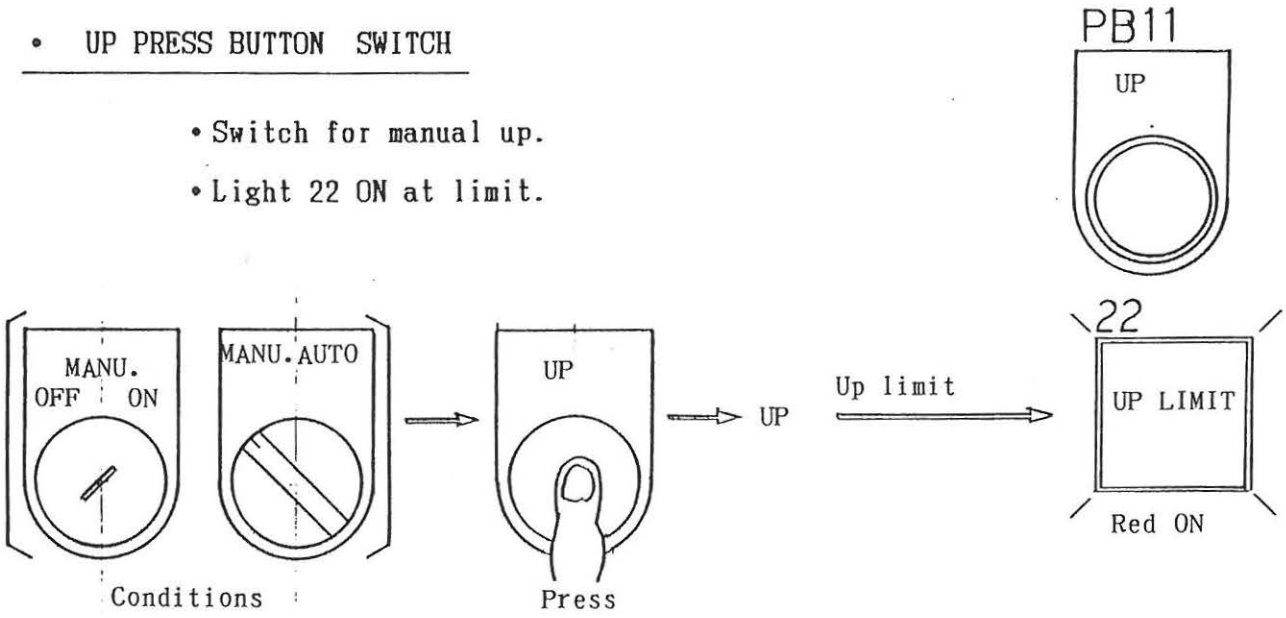
〈Automatic operation 〉

- In case of select switch 11 AUTO.
  Light 15 ON and the ready for automatic operation.



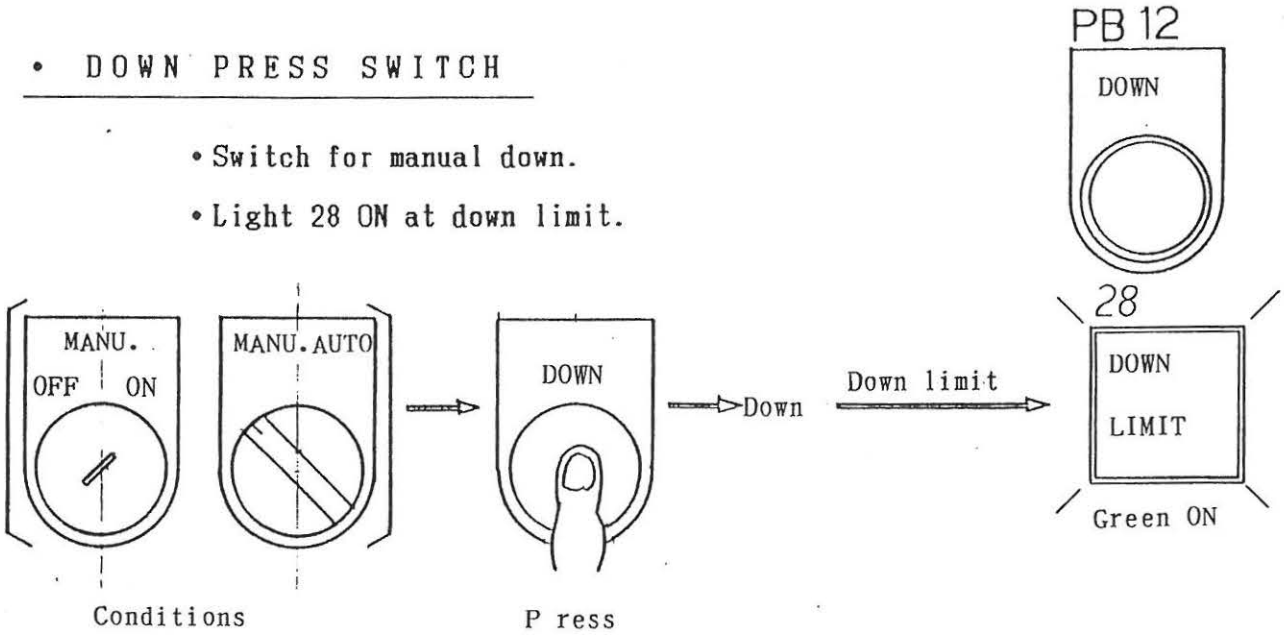
- UP PRESS BUTTON SWITCH

- Switch for manual up.
- Light 22 ON at limit.



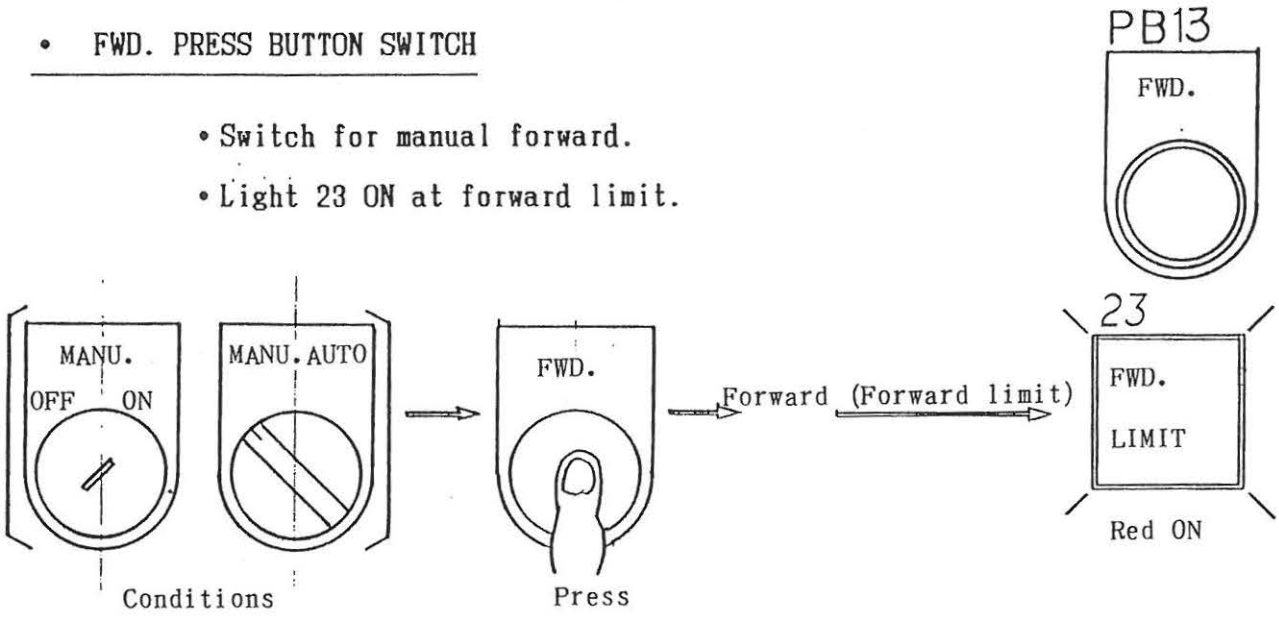
- DOWN PRESS SWITCH

- Switch for manual down.
- Light 28 ON at down limit.



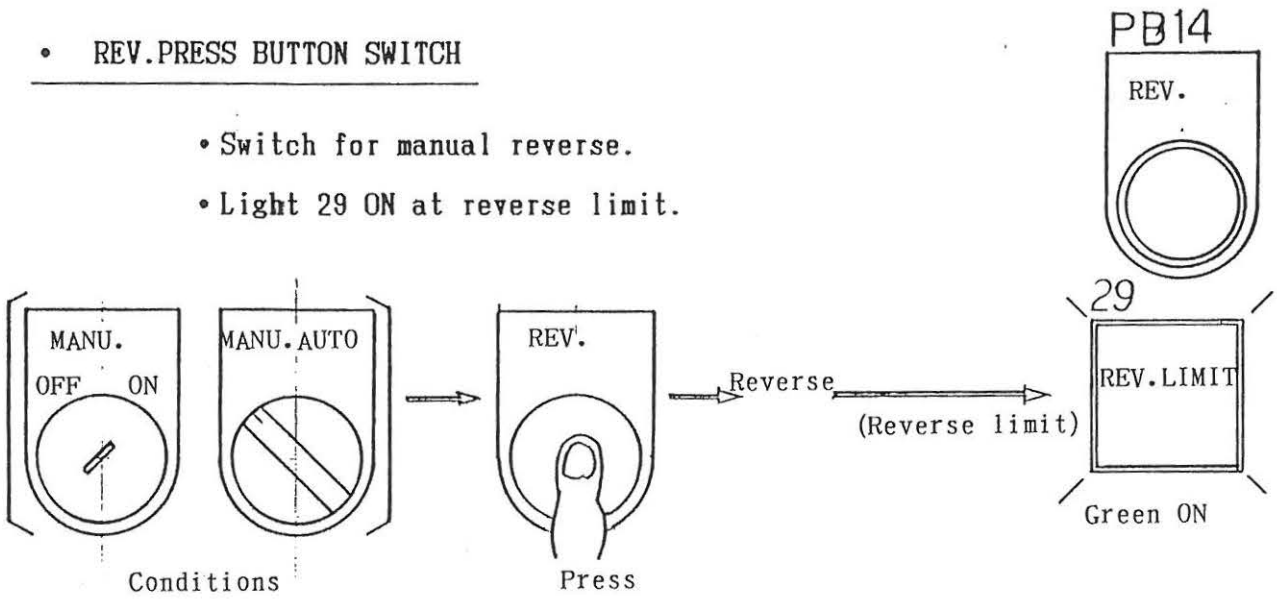
• FWD. PRESS BUTTON SWITCH

- Switch for manual forward.
- Light 23 ON at forward limit.



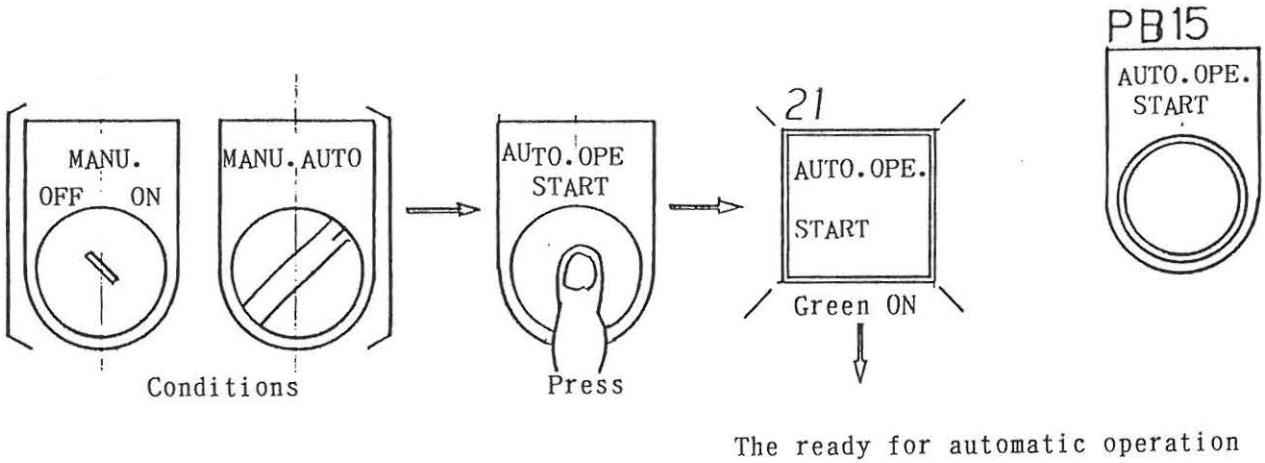
• REV.PRESS BUTTON SWITCH

- Switch for manual reverse.
- Light 29 ON at reverse limit.



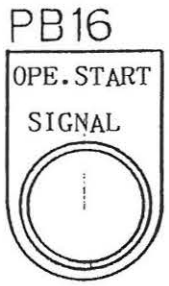
• AUTO.OPE.START PRESS BUTTON SWITCH

- Switch before automatic operation start.
- In case of key switch 11 OFF, and select switch 11 AUTO,press the switch,and light 21 ON, the ready for automatic operation.

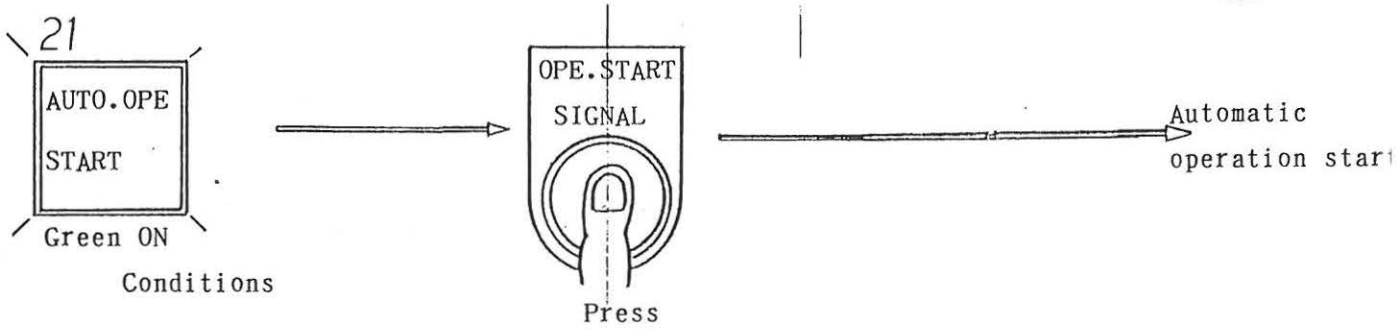


The ready for automatic operation

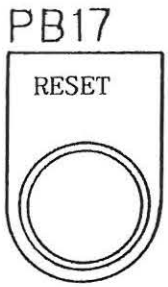
• OPE.START SIGNAL PRESS BUTTON SWITCH



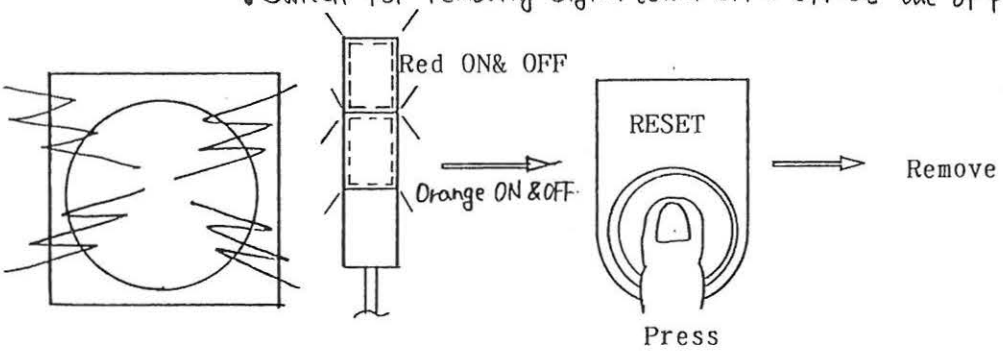
• Switch for automatic operation start.



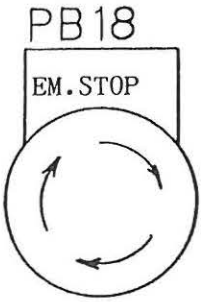
• RESET PRESS BUTTON SWITCH



• Switch for removing signal tower ON & OFF at emergency.
• Switch for removing signal tower ON & OFF at out of parts.

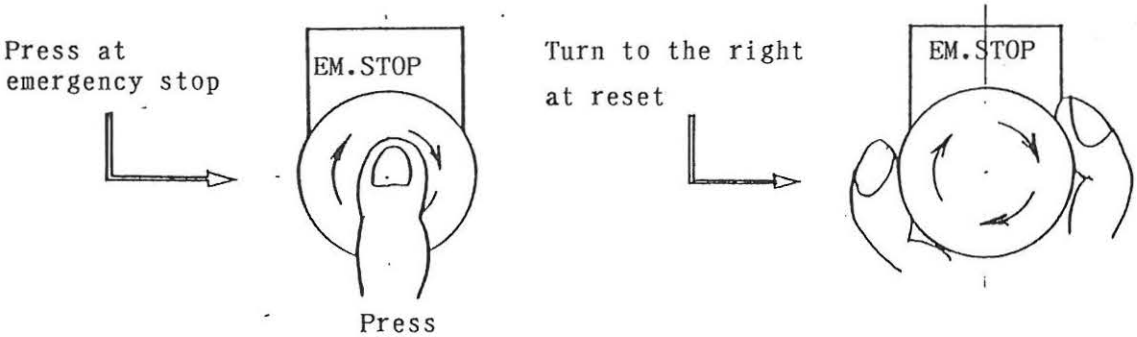


• EM.STOP PRESS BUTTON SWITCH



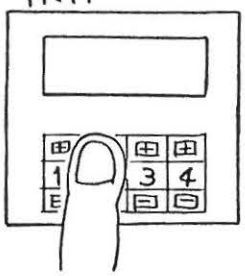
• Switch at emergency.

• Turn to the right at reset.
This type of switch is PUSH-LOCK and TURN-RESET.



• INGOT CHARGE TIMER

TR11



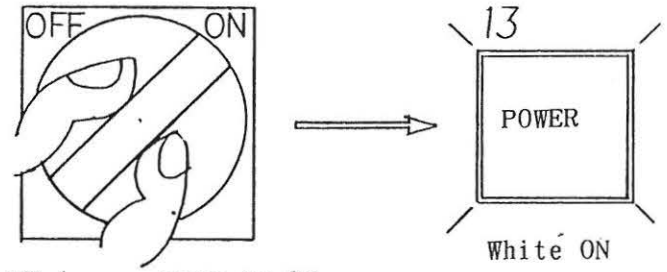
This is timer. It fixs ingot charging cycle at automatic operation.

The fixation is 0'00" ~ 99'59".

1－3．OPERATION PROCEDURE

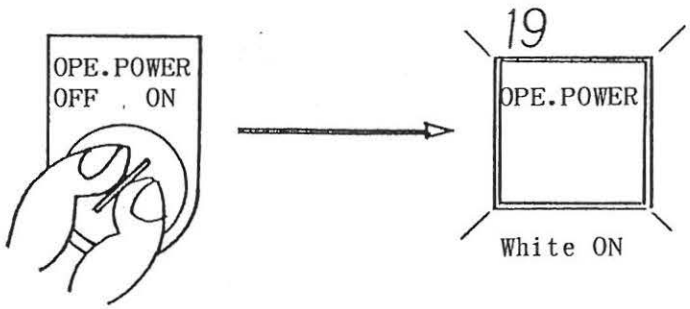
1-3-1. READY FOR OPERATION

① Power ON.



NF 1 Turn to ON

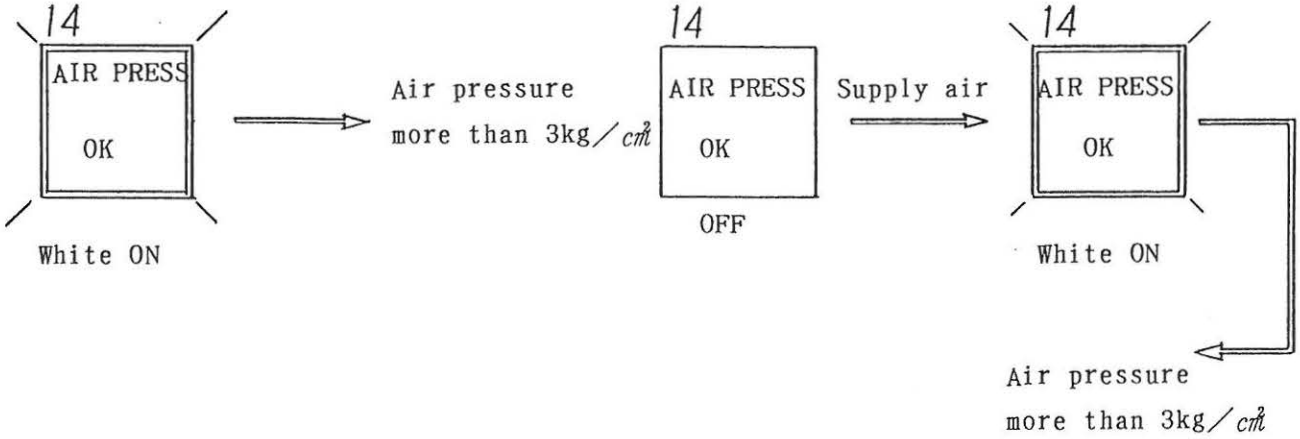
② Turn OPE.POWER key switch to ON.



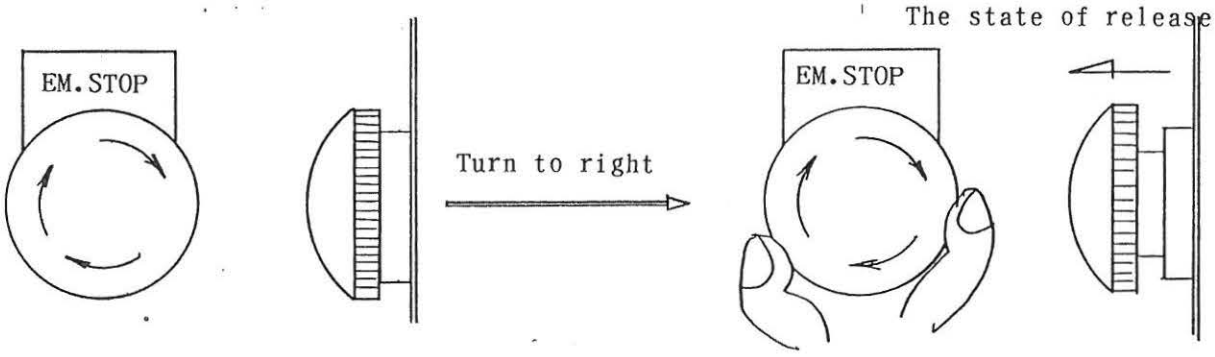
Turn to ON

③ Check [PC RUN] [AIR PRESS. OK] lamp ON.

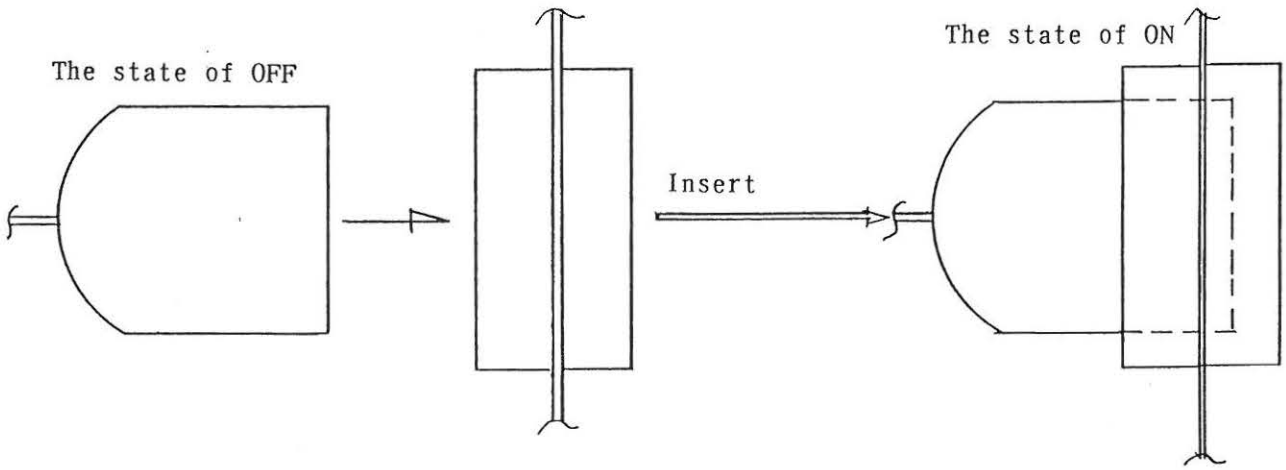
• Inspect PC in case of [PC RUN] lamp OFF.



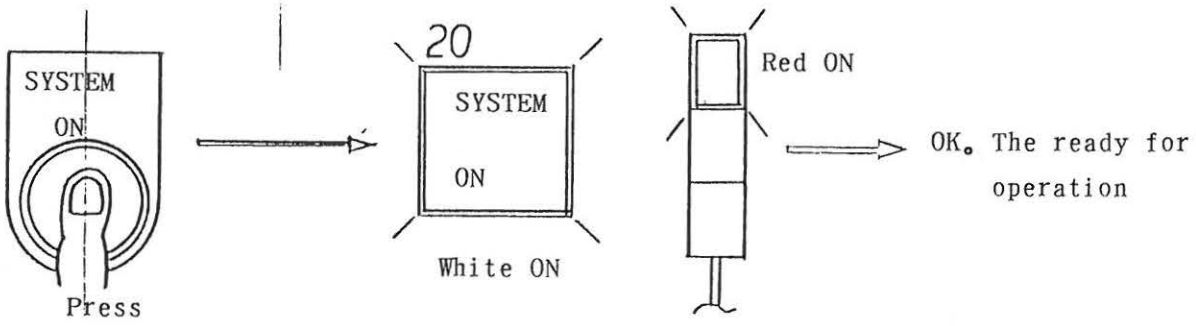
④ Check the release of EM. STOP switch.



⑤ Check safety plug ON.

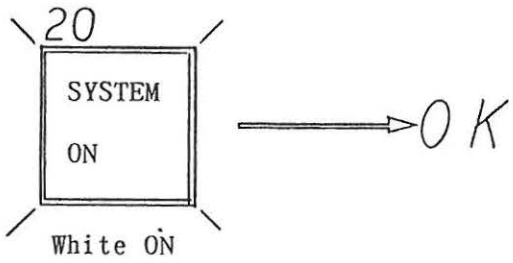


⑥ Press SYSTEM ON switch.



1-3-2. AUTOMATIC OPERATION PROCEDURE

① Check [SYSTEM ON] lamp ON.



② Check [ALL UNIT ST.POS.] [LIFTER ST. POS.] lamp ON.

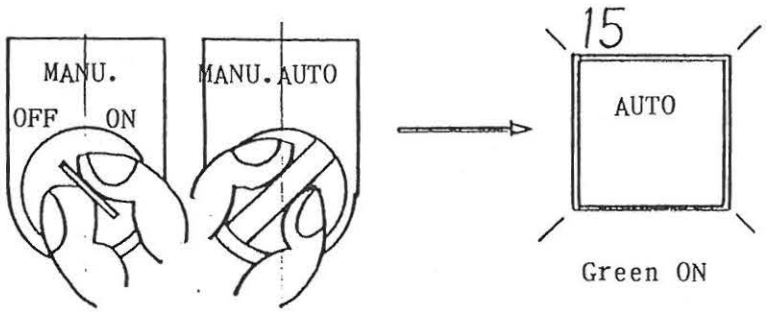
or

[PUSH POS. HEIGHT]

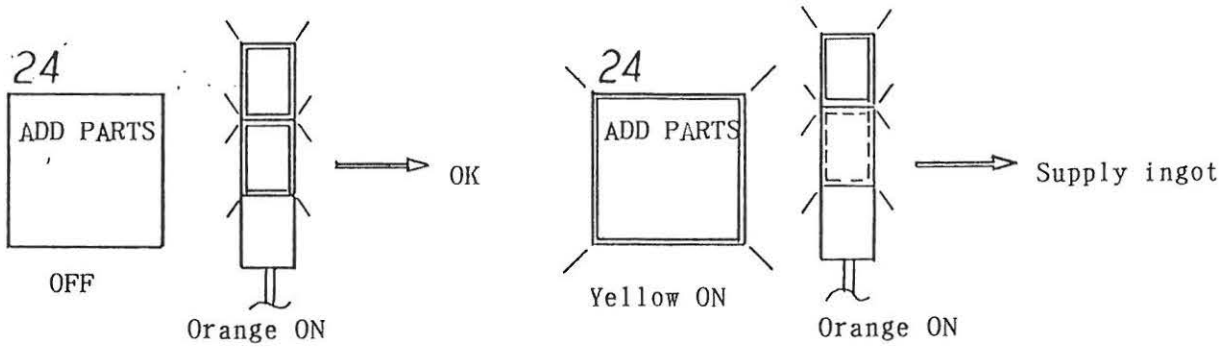
- Light 16,17 ON → OK
  or 17,18,29 ON
- Refer to original position return procedure in case of lamp OFF.

③ Turn to key switch 2 OFF and select switch AUTO.

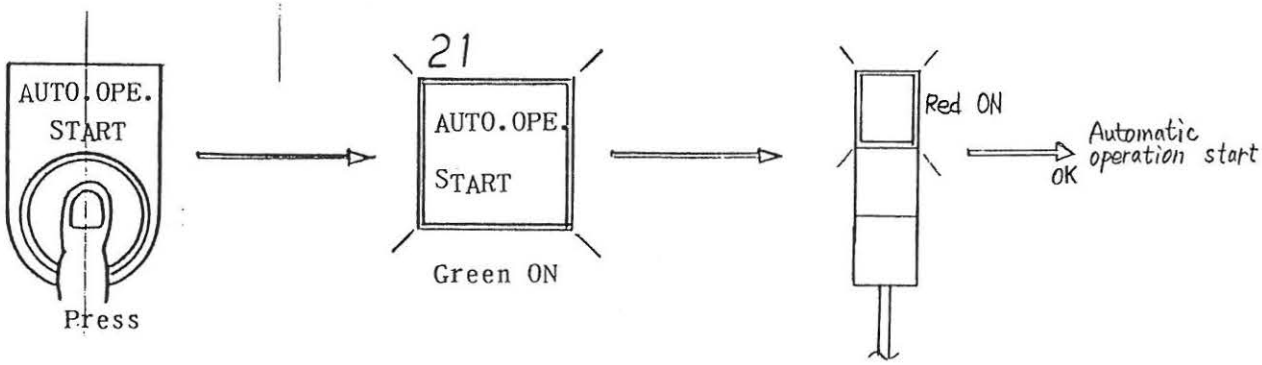
Check [AUTO] lamp ON.



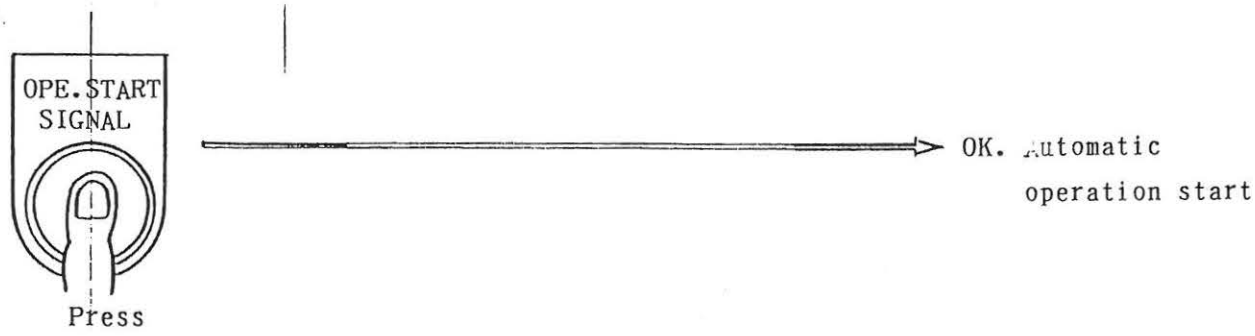
④ Check parts (ingot).



⑤ Press AUTO OPE. START switch.

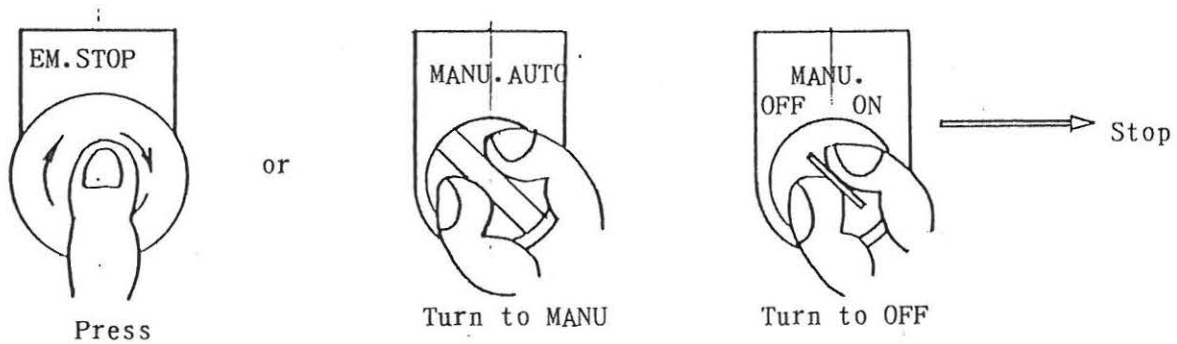


⑥ Press OPE.START SIGNAL switch.



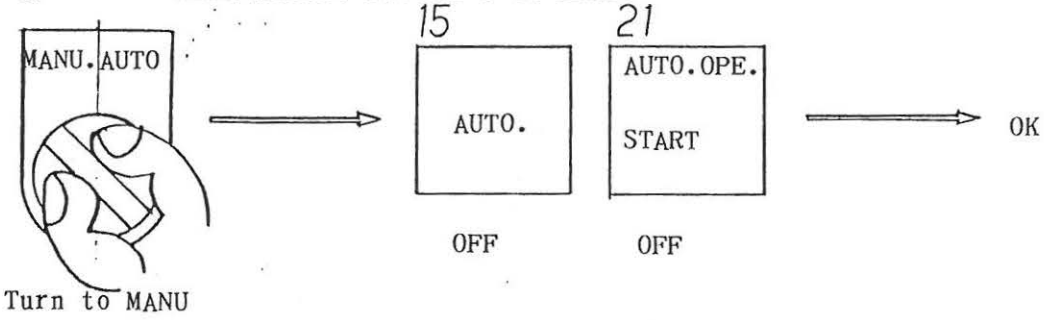
1-3-3. AUTOMATIC OPERATION STOP PROCEDURE

- Press EM.STOP switch or turn to manual operation.

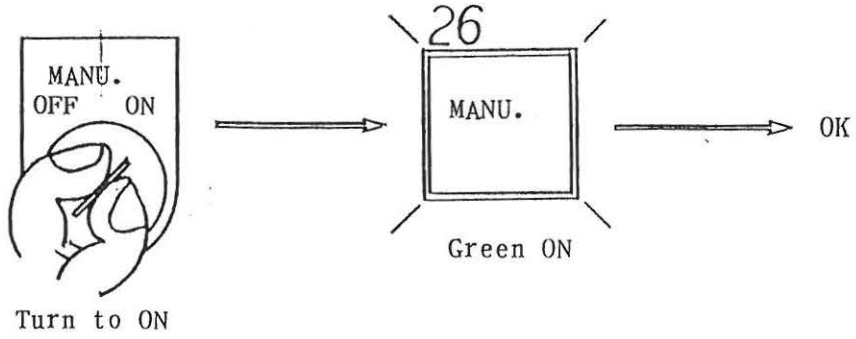


1-3-4. ORIGINAL POSITION RETURN PROCEDURE

① Turn select switch 1 to MANU.

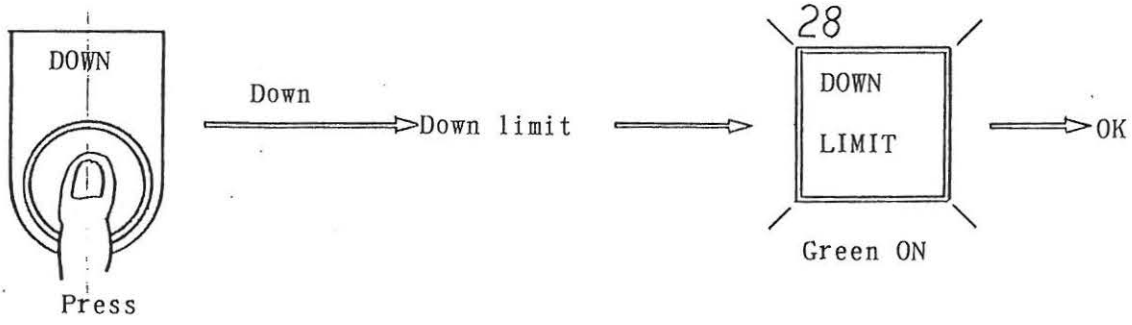


② Turn key switch 2 to ON.

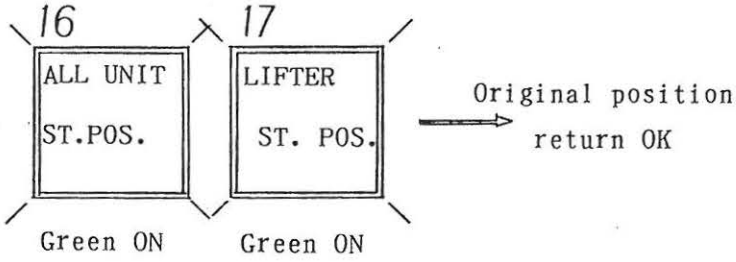


③ Press DOWN or REV button and return to the limit.

EX) Return hand lifter to the original position by hand.



• Retun handlifter to the original position and insert pin (By hand)



2－1．OPERATION PROCEDURE

2-1-1. WORK PROCEDURE

① Put ingot in the center(Fig.1)

Put in no clearance between ingot and lifter.(Fig.2)

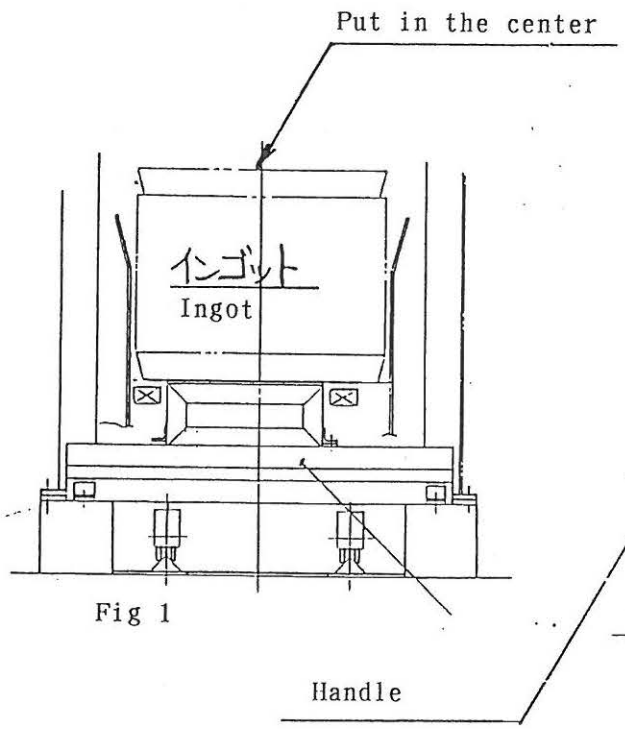


Fig 1

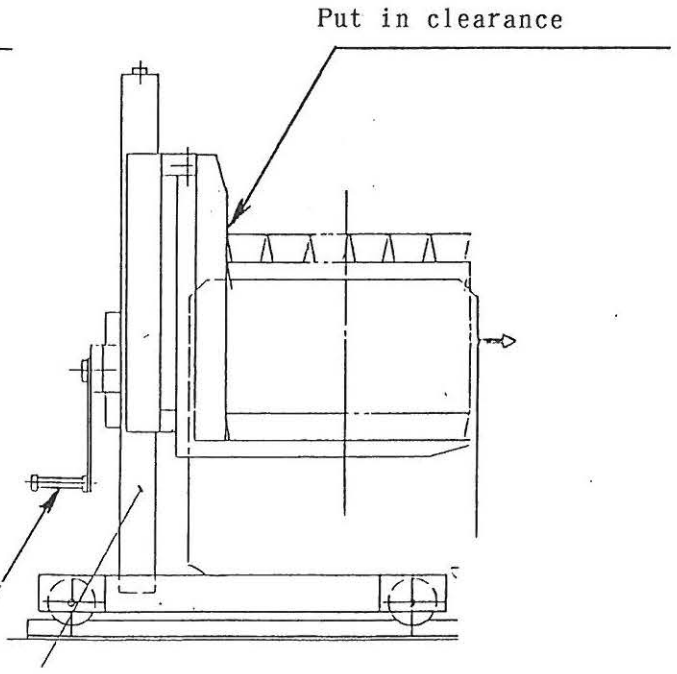
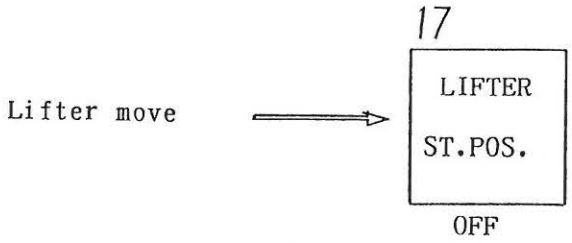


Fig.2

② Turn handle to the right till the lock and rise lifter.

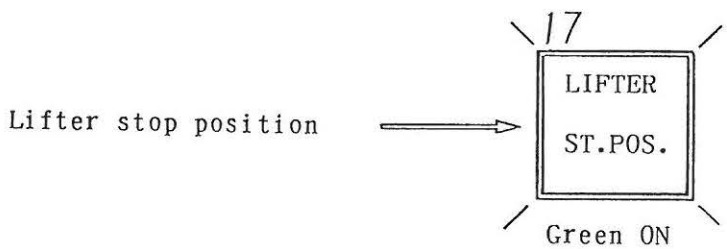
③ Pull out the lifter pin,and insert charger side by hand.

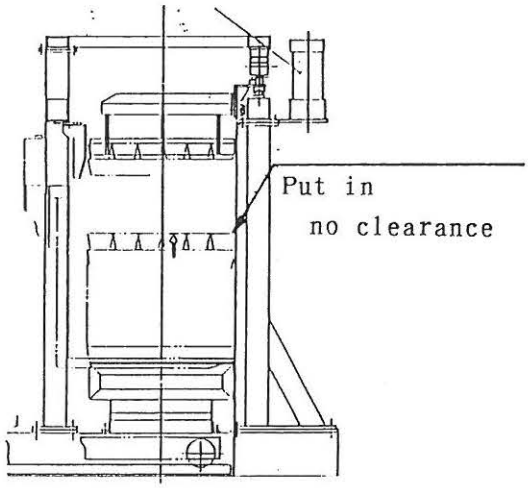


④ Put in no clearance between the wall of charger side.(Fig.3)

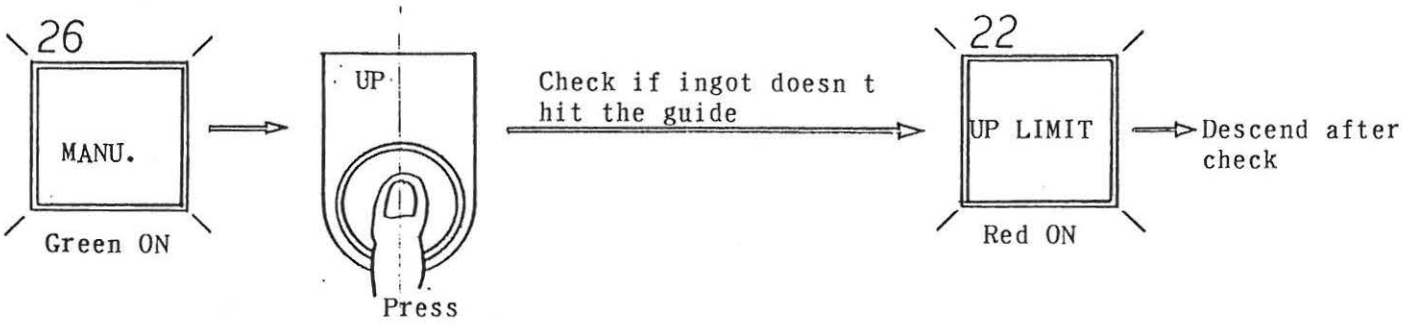
⑤ Turn handle to the left till the lock and put on the scissors lift.

⑥ Return lifter and insert pin.





⑦ Rise the lift to the up limit by manual operation.
Check if ingot doesn't hit the guide,and descend.



* In case of hit,stop operation and perform re-arrangement.

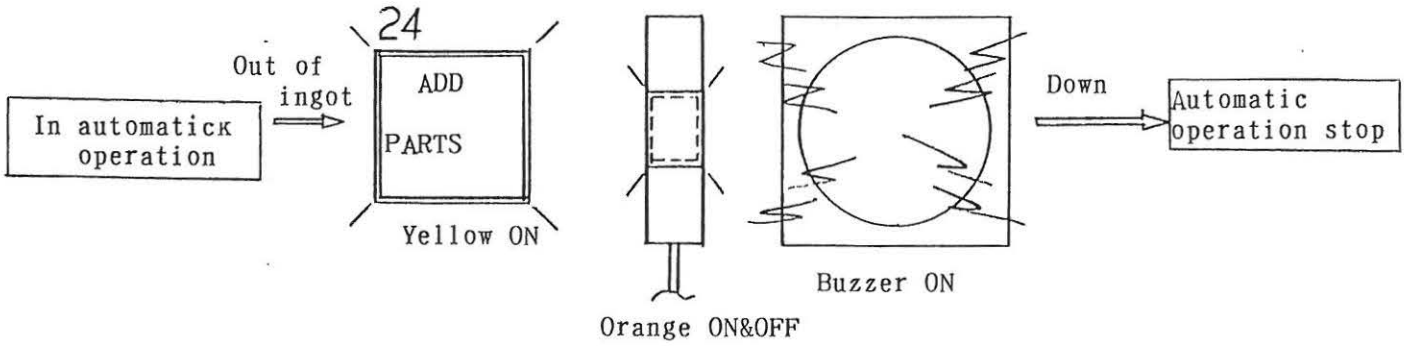
⑧ Open the charging door.

⑨ Check if metal level detector doesn't work after melting burner ON.

⑩ Start automatic operation referring to automatic operation procedure.

2-1-2. CAUSE OF TROUBLES & RECOVERY.

① In case of out of ingot.



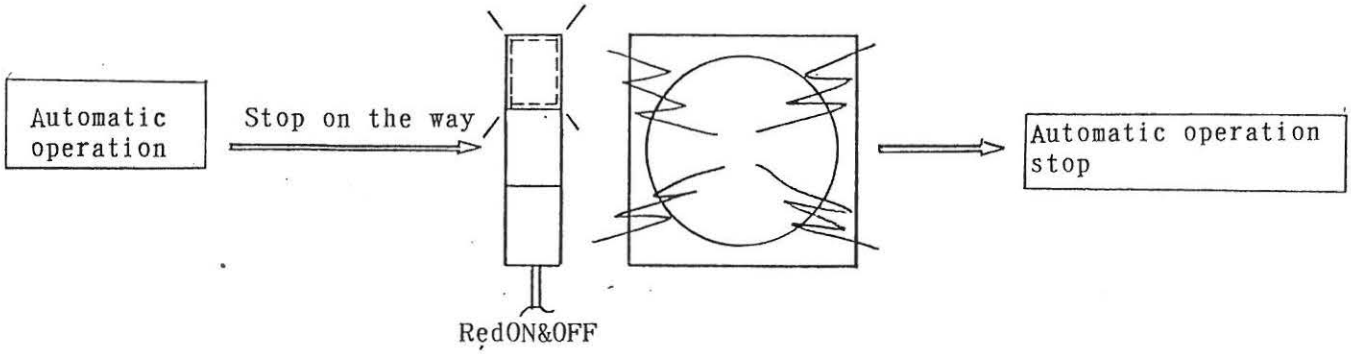
(1) Press the reset button if you want to stop the buzzer.

(2) Put in ingot after lifter down.

(3) Start automatic operation referring to automatic operation procedure.

② In case of the stop in automatic operation.

* In case of the stop of rise and pushing out in automatic operation, the alarm is set in ON.
(It push out till three time .)



(1) Press the reset button if you want to stop the buzzer ON.

(2) Grasp the cause of stop and recover.

(3) Return to the original position referring to return procedure.

(4) Start automatic operation referring to automatic opration procedure.

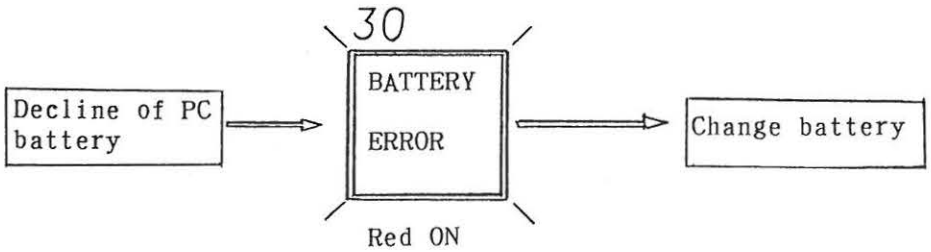
③ In case of the abnormal state of LS.

* In case two limit switches or auto- switches operate at a time, the alarm is set in ON.

* The alarm is ON & OFF of buzzer and signal tower.
Return procedure is the same as the stop in automatic operation.

④ In case of the abnormal state of buttery.

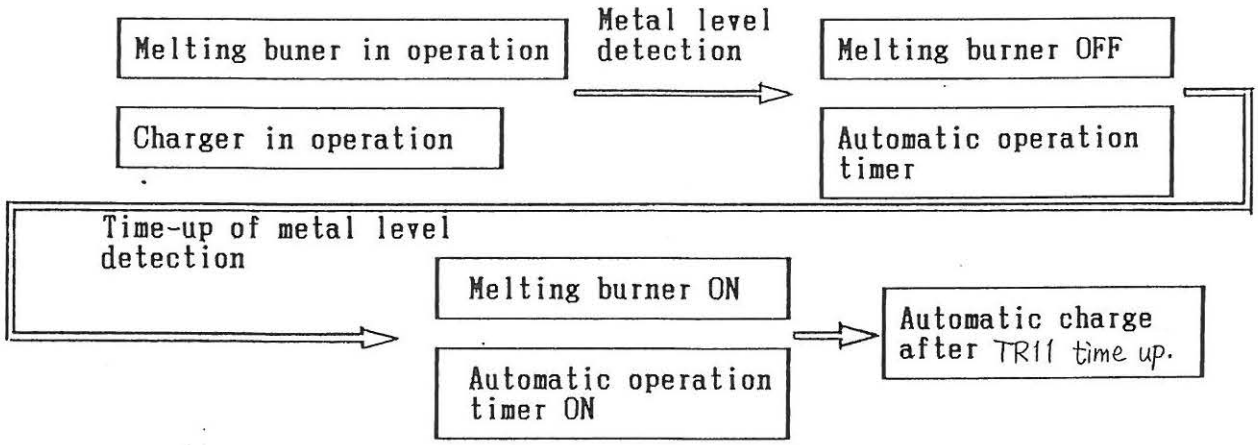
* The alarm at the decline of battery.



2-2. INTERLOCK IN AUTOMATIC OPERATION

* The top step of ingot is pushed out at start of automatic operation and waits at the position of pushing out for fixed time , and then the remaining ingot rises to the top position.

① The signal from metal level detector of furnace.

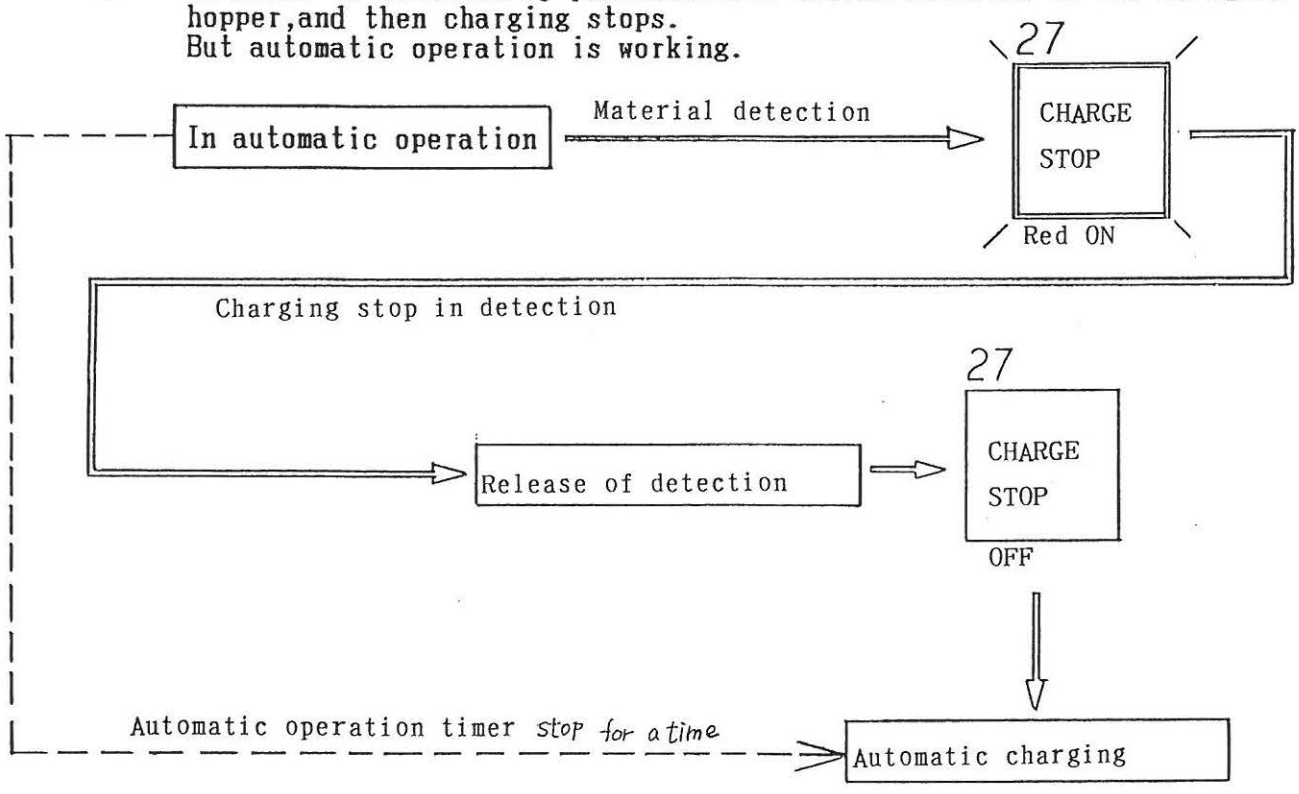


* In case metal level detector touches still the surface of metal after time-up of detection, charging is not performed.

In case metal level detecter is seperated from the surface of metal, charging is performed again after TR11 time up.

② Material detection signal

* Material is detected by photoelectric switch attached to the charging hopper,and then charging stops.
But automatic operation is working.



③ Signal for opening the charging door.

* Operation is possible only when the charging door is open.

④ Automatic operation timer is working only when melting burner is in operation.

2－3． THE OTHER CAUSIONS

① Don't enter the charger room during operation.

② Cut power at inspection and repairs,and work with the key switch.

③ Remove the remaining air pressure absolutely from valve at inspection and repairs because air pressure remains still after power OFF of charger.

The end.