RUSTON–BUCYRUS

110-RB

INSTRUCTION MANUAL

	COUNTRY	USER	ORIGINAL DATE OF DELIVERY	MACHINE NO.
93	United Kingdom	Steetley Dolomite (Quarries) Ltd.	21. 8.64	28590 W.L.
94	Sierra Leone	Sierra Leone Development Co. Ltd.	11.11.64	28591 W.L.
95	United Kingdom	T.W. Ward Ltd.	15. 9.64	28592 W.L.
96	Belgium	Carrieres Unies de Porphyre	19. 2.64	28593 W.L.
97	South Africa	Northern Lime	8. 9.64	29230 W.L.
98	Sweden	Atomenergi	25.11.64	29231 W.L.
99	Spain	Compania de Azufre y Cobre de Tharsis CTDA.	23. 4.65	29232 W.L.
100	France	Djebel Onk	6. 1.65	29233 W.L.
101	South Africa	Iscor (Sishen)	15. 3.65	30150 W.L.
102	South Africa	Iscor (Sishen)	1. 4.65	30151 W.L.
103	Belgium	Carrieres Unies de Porphyre	21. 5.65	30152 W.L.
104	United Kingdom	London Brick	28. 6.65	30153 W.L.
105	Spain	Solvay & Cie.	24.12.65	31107 W.L.
106	France	Solvay & Cie.	17. 1.66	31108 W.L.
107	Zambia	Sir Lindsay Parkinson (Chambishi)	5. 2.66	31109 W.L.
108	United Kingdom	Steel Company of Wales	17. 2.66	31110 W.L.
109	Norway	A/C Rekefjord Verk	10. 6.66	31245 W.L.
110	Sierra Leone	Sierra Leone Development Co. Ltd.	7. 4.66	31246 W.L.
111	United Kingdom	London Brick	16. 5.66	31247 W.L.
112	Italy	Cementeria di Merone	5. 5.66	31248 W.L.
113	United Kingdom	T.W. Ward Ltd.	26. 9.66	31603 W.L.
114	Italy	Amiantifera di Balengero	24.10.66	31604 W.L.
115	Spain	Compania de Azufrey Codre de Tharsis	13.12.66	31605 W.L.
116	France	Roy & Fils	14. 2.67	31606 W.L.
117	Sweden	Skanska Cement A/B	31. 3.67	31988 W.L.

BI379872

RUSTON-BUCYRUS LIMITED

To..... From..... Date.....

L398-ZG & L400-ZG

52S1586 - Welded Guard } Drag Rope
400859 - Welded Support } Mud Guard
230916 - Welded Guard

5AT2451 Hoist Gear Guard - Pinion Guard

? 230259 Hoist Drum Guard

230338 Propel Clutch Guard

63T2119 Chain & Gear Guard (Boom Hoist)

55T2676 Arrgt. Wire Mesh Guards

110RB Shovel to Dragline

Guards as supplied S/O 231.008

Yarnell Portland Ltd.

RUSTON-BUCYRUS 110-RB EXCAVATOR

(Machines with Serial Number 27170 or later, excepting 28593)

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RUSTON-BUCYRUS 110-RB EXCAVATORS

DESCRIPTION OF MACHINERY

TRUCK FRAME AND PROPELLING MACHINERY

CAT MOUNTING

See Drawing Arrangement of Lower Works Fig. 6.

The truck frame is of all-welded steel construction. The truck frame is supported by cast-steel side frames having a heavy box section. These side frames are secured to the truck frame by hook connections at the bottom and fit bolts at the top.

The cat belts, made up of closely fitting treads, connected by specially heat-treated steel pins, run around the driving and idler tumblers of the side frames. The idler tumblers run on short extra large diameter shafts rigidly secured to the side frames. The driving tumblers, of cast alloy steel, are mounted on the keyed section of forged-steel shafts turning in bronze-bushed bearings in the side frames. These shafts also carry, on splined sections, the driving gears which mesh with the pinions on the transverse shaft. Both the gear and pinion are enclosed in an oil tight case.

On the upper surface of the truck frame is a large , circular, swing-rack casting which carries the roller track bars held by set screws in a machined groove in the swing-rack. Gears, shafts and clutches for steering and propelling are also contained in the truck frame.

MULTIPLE JAW CLUTCHES FOR STEERING

The transverse shaft on the driving tumbler end of the truck is made up of three sections. The centre section is carried on bronze-bushed bearings in the cast gear case bolted and chocked to the truck frame. On a splined portion of this section is a bevel gear meshing with the bevel pinion on the longitudinal propelling shaft. The two ends sections of the transverse shaft are connected to the centre section by multiple jaw clutches used for steering and acting as flexible couplings when propelling. The clutch female jaws are shifted by a collar sliding on guide bars.

FULL CIRCLE ROLLER FRAME

The turntable, composed of a complete ring of rollers which roll against both the revolving frame and truck frame tracks, provides wide distribution of the load of the revolving frame on the truck frame. The bushed steel rollers are mounted on large diameter pins, each of which is separately lubricated through pressure grease fittings tapped in the end pins. Brass thrust washers are fitted between the rollers and the outer frame member.

PROPEL BRAKE

The propel brake on the truck frame is at the take-up tumbler end an accesible position for easy adjustment. The propel brake housing is connected to the longitudinal propelling shaft by a spur gear reduction. The brake is spring-set and air-released. The brake is controlled from the operators cab by the switch

COMPRESSED AIR PLANT

Arrangement drawings of the piping and fittings Figs. 15/R1 to 18/R1 inclusive show all the pipe lines, fittings, and equipment required for shovel and drag-line. A schematic diagram Fig. 20/R2 shows the function of all the various units.

AIR COMPRESSOR FIGS. 23A & 23B

The compressed air for operating the clutches and brakes is taken from an air receiver supplied by an electrically driven single stage compressor.

The compressor can be run in either direction. If the desired rotation is such that the big end bearing throws the oil up towards the crankcase breather (4040C) the oil filter body (3466C14) carrying the breather should be changed with the door on the other side.

To fill crankcase, remove the crankcase breather (4040C) and pour in the correct grade of lubricating oil (approximately 8 pints or 4.5 litres) until the maximum level indicated on the dipstick (3464C67) is reached. After the first 50 hours running, drain all the oil and refill as indicated above. An automatic light load starting device is fitted with allows the compressor to start up in an off load condition. (See separate instruction).

LUBRICATING SYSTEM

The oil for lubricating the bearings of the compressor is supplied by a plunger type oil pump at a normal pressure of between 5 and 15 lbs. per square inch. If the oil pressure is not between the desired limits adjustment should be made as follows:

Unscrew the oil regulator locknut (3768A2) and turn the oil regulator screw (3464C25) in a clockwise direction to increase pressure and in the opposite direction to decrease pressure. When the desired pressure has been obtained retighten the locknut. If after final adjustment the pressure is below the minimum specified, investigation should be made as to the cause. The more normal causes are:

1. Dirty oil blocking the filter (3464C20)
2. Dirt on the valve seating of the oil regulator in the cylinder.
3. Insufficient oil in the crankcase.
   Note: The oil level must be kept between the minimum and maximum marks on the dipstick.
4. Worn oil pump plunger (3464C19A) or damaged ball valve seat.

It is advisable to check the oil filter and oil pipe for cleanliness and freedom from blockage at regular intervals.

THE OIL IN THE CRANKCASE SHOULD BE DRAINED AFTER EVERY 600 HOURS RUNNING, BY REMOVING THE CRANKCASE DRAIN PLUG (3764A2). REPLACE THE PLUG AND REFILL THE CRANKCASE WITH NEW OIL TO THE MAXIMUM LEVEL MARK ON THE DIPSTICK AS INDICATED ABOVE.

VALVES

The efficient working of the compressor depends very largly on the condition of the valves, and it is essential that these are examined at regular intervals of

off the supply of air to the hoist clutch and disengaging it. By moving the propel brake switch to the "OFF" position, the machine is ready to move.

The crowd clutch is engaged at all times as long as sufficient air pressure is available. The crowd air gauge should be checked daily to see that proper pressure is being obtained. Adjust pressure at regulator in crowd line in accordance with instructions shown on the instruction plate mounted near the gauge. The crowd clutch differs from the hoist and propel clutch in that a certain amount of slippage is permitted under heavy loads thus protecting the machinery from shocks encountered in hard digging.

The Airflex clutches require very little maintenance other than a daily visual inspection to insure proper working order. Air lines should be checked for leaks, clutch lining inspected for wear, clutch tubes for cracks or weak spots. Lubricants should not be allowed to get on clutch lining as it will cause wear and slipping.

STEERING CONTROL (POWER LOCKING) FROM OPERATOR'S POSITION.

(See Schematic Arrangement of Air Piping Fig. 20/R2 and Steering Machinery Drawing Fig. 6)

The following instruction applies to machines fitted with additional cylinders for operating steering clutches into lock position.

With full steering control, steering and individual locking of the cat belts is controlled from the operator's position with the revolving frame in any position. Track steer and lock positions are controlled by a five position semi-rotary switch located at the right hand of the operator's console having positions 'Straight', 'Steer Right','Lock Right', 'Steer Left', and'Lock Left'.

Air under pressure for operation of the clutch cylinders is obtained from the compressor mounted on the left side of the revolving frame. Pressure to the steering cylinders is at line pressure or at a reduced pressure of 35 P.S.I. (according to steering selected at the operator's position) and at line pressure only in the case of the propel brake. Three pipes, with a three-way swivel connection at the lower end (See Fig. 17) carry the air through the centre of rotation to the left-hand and right-hand clutch shifter cylinders and the digging-brake operating cylinder in the truck frame.

To turn to the left with driving tumblers to the rear, turn the switch to 'Steer Left'. This energises the left hand cylinder solenoid admitting air at a reduced pressure of 35 P.S.I. to the cylinders in the base which overcomes the spring sufficiently to move the clutch to the neutral or disengaged position. It may be necessary to move the machinery slightly with the controller in order to disengage the steering clutch. Moving the left hand steering clutch to the neutral position allows the left cat belt to idle when power is applied and a turn may be made.

To lock the left cat belt in order to obtain a 'sharp' turn to the left with the driving tumblers to the rear, turn the switch to 'Lock Left'. This energises both the cat lock solenoid and the left left hand cylinder solenoid admitting air at main line pressure to the cylinders in the base which fully overcomes the spring, moving the clutch to the extreme outside position, locking the left hand cat belt to the side frame. It may be necessary to move the machinery slightly in order that jaw clutch may engage fully with mating jaws on the cat frame. With left hand cat belt locked to the side frame, when power is applied to the right hand cat belt, a 'sharp' turn to the left may be made.

The first and second intermediate shafts are mounted in anti-friction bearings lubricated by the splash of the oil.

In order to ensure proper lubrication of the upper first intermediate shaft bearing an impellor pump is placed in the shaft. If necessary to disassemble shaft to be sure that ball check and spring are assembled correctly. The vertical swing shaft upper bearing is oil lubricated and the lower bearing is lubricated through a standard grease fitting brought out to a convenient location on the revolving frame deck.

Approximately 35 gallons of lubricant are required for each swing unit Consult charts for proper lubricant.

Note 3. Crowd All of the crowd gears are of the open type and should be inspected twice a shift and the teeth recoated with proper gear compound if necessary. The intermediate shafts are mounted on anti-friction bearings and should be lubricated once every five shifts.

Before placing machine in operation check to be sure that the clutch grease guard is in place. This guard protects the crowd clutch from lubricant accidentally getting on the clutch lining.

When checking gears be sure and lubricate the drum shaft bearings.

Note 4. Propel The propel chain case is totally enclosed and oil tight. It takes about 9 gallons of the proper oil to fill to the correct level. A sight gauge, drain plug and covered opening for filling are provided. Drain and refill once each six months or whenever temperature changes require. All of the bearing fittings for the propel gears above deck are brought out to a common 'header' on the right side frame and should be serviced twice each shift.

All of the propel gears on the deck are of the open type and should be checked daily and compound applied as required.

The anti-friction propel sprocket shaft bearings should be serviced sparingly once a week or every five shifts.

Note. Before placing machine in service or after 'field' service requiring the withdrawal and replacement of the vertical propel shaft it will be necessary to proceed as follows to ensure that the centre pintle lower bush is adequately lubricated:-
The cavity between vertical propel shaft and the centre pintle sleeve will hold approx $6\frac{1}{2}$ pints of lubricant. Therefore it will be necessary to measure and inject $7\frac{1}{2}$ pints of Shell Nerita Grease 2 in order to ensure that the cavity is filled and surplus grease is seen to emerge from the bottom of the centre pintle. (Inspection cover in truck frame is to be removed for this purpose).

Note 5. Air Compressor Use only a good grade of oil. Refer to line on the Lubrication Charts for recommended lubricants.
The oil level in the compressor should be checked at least once a day by removing the dip stick and observing the oil level. If the oil is not up to the required level, add sufficient oil to raise the oil level and replace

ADJUSTING INSTRUCTIONS

This section covers all ordinary adjustments required in normal service and no unit should be adjusted without carefully reading the instructions covering that unit and following the procedure described. Keep your wrenches and other tools clean and in good repair. Do not try to work with tools that are in poor condition.

Remember that a unit which is in correct adjustment will operate easier and wear less than one which has been allowed to get out of adjustment. For instance a clutch or brake which drags when released overheats and will not hold properly. It is much better to take out a few minutes to correct the adjustments than to try to "limp along" until the end of a shift.

Before changing the adjustments of any unit, check over the machinery and controls very carefully to make sure a bent reach rod, worn pins, grease or oil or water on the lining or housings, or binding of some part is not causing the trouble.

LOWER WORKS - SEE DRAWING CATERPILLAR MOUNTING FIG.6.

CAT BELTS

No definite rule can be given as to how tight or loose the tread belts should be as the correct adjustment depends on the type of ground over which the machine is to be moved. In general, the belts should be kept as loose as possible without losing proper tracking of the driving tumblers.

ADJUSTMENT OF CAT BELTS

Adjustment of the cat belts is made at the take-up tumbler end of the mounting. The take-up tumblers are bushed on a single forged axle which slides in guides formed in the cat frames. Chock bars, held in place by a retainer, hold the axle with the desired tension on the belts.

To adjust the cat belts, first remove the chock bar retainer from each side bolted on the take-up axle. Then place the jack furnished with the machine in position on one side between the truck frame and the take-up axle as shown on the drawing. Work the jack until the cat belt is just tight enough to insure proper tracking of the driving tumbler. Insert the necessary thickness of chock bars, back off the jack and replace chock bar retainer. Repeat this procedure on the other side, be sure to insert the same thickness of chock bars.

After the cat belts have been properly adjusted, store the jack where it will be readily available the next time it is needed.

ADJUSTMENT OF PROPEL BRAKE

The toggle spring "62" should first be adjusted by means of the "T"-head bolt "61" to a length of 3-9/16" in the released position.

The compression spring "71" should also be adjusted to 16" with the brake set by means of the reach rods and the spring rod.

The brake band is adjusted at the splice with adjusting bolt "45" with toggle links in the released position, so that when toggle is moved in set position toggle spring is not more than 3-1/2".

MAST TYPE SUSPENSION & ROPE REEVING FIG. 47

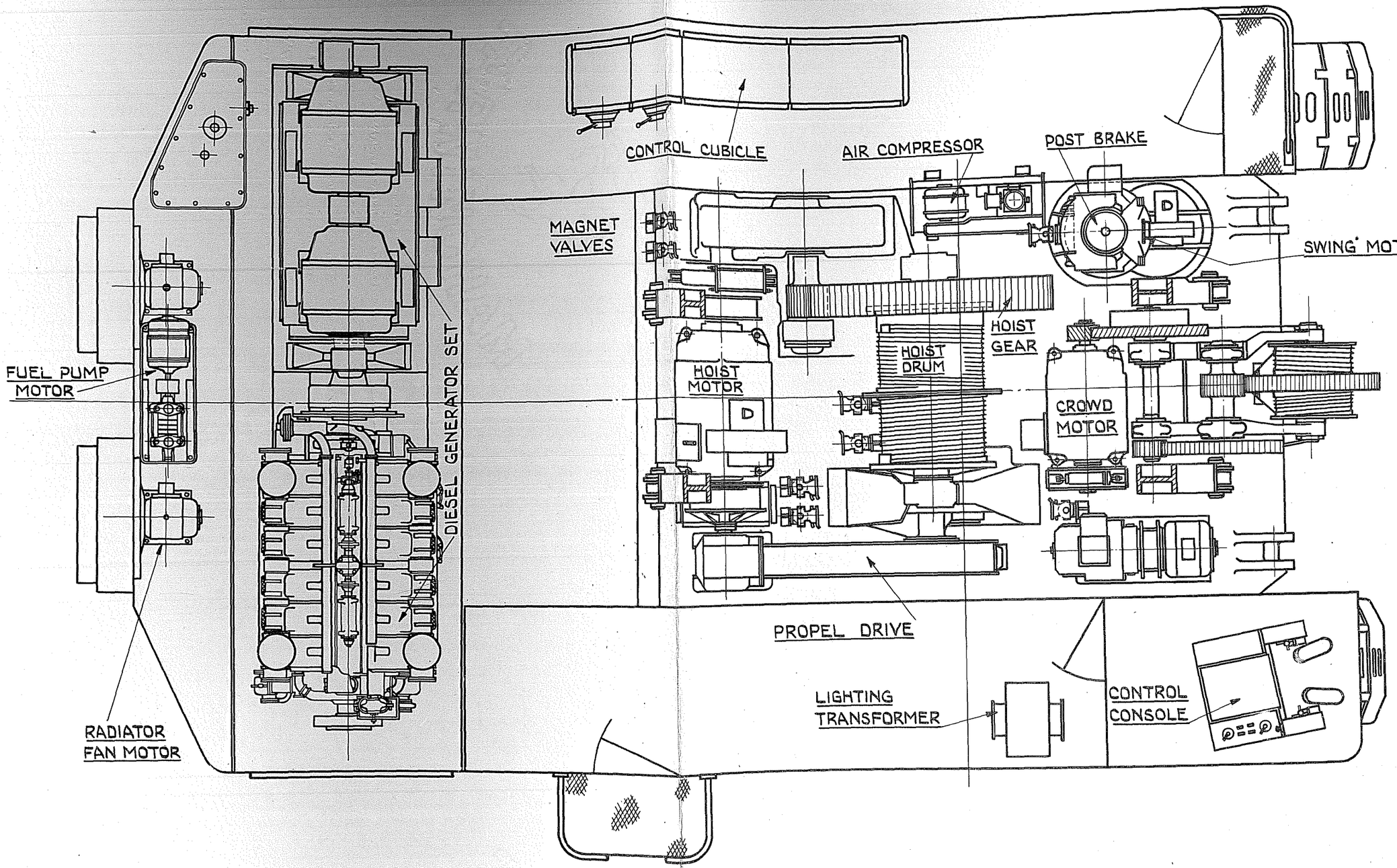
Booms of 90'0" length and over use mast type suspension, the boom being attached to the mast by two single guy ropes. The mast being raised by the boom hoist rope which is reeved 8 parts as shown on Fig.47.

Before hoisting or lowering the front end equipment it is important to ensure that all lubricating points shown on Fig. 47 together with ropes and rope grooves have been adequately coated with the recommended lubricant in accordance with "Lubrication Instructions".

DRAGLINE BOOM & BOOM POINTS FIGS. 47 & 48.

Dragline booms usually consist of the following units, boom lower section, boom upper section and boom point, together with a boom intermediate section of varying length which determines the total length of boom. Booms under 90'0" in length do not require mast type suspension, the reeving being taken to the boom point as shown on Fig. 47. The boom point sheave or sheaves, depending on whether 2 or 3 part hoist is used, are mounted on roller bearings and should be lubricated accordingly see Fig. 48.

Before hoisting or lowering boom it is important that all lubricating points shown on Fig. 48 together with ropes and rope grooves have been adequately coated with the recommended lubricant in accordance with "Lubrication Instructions".

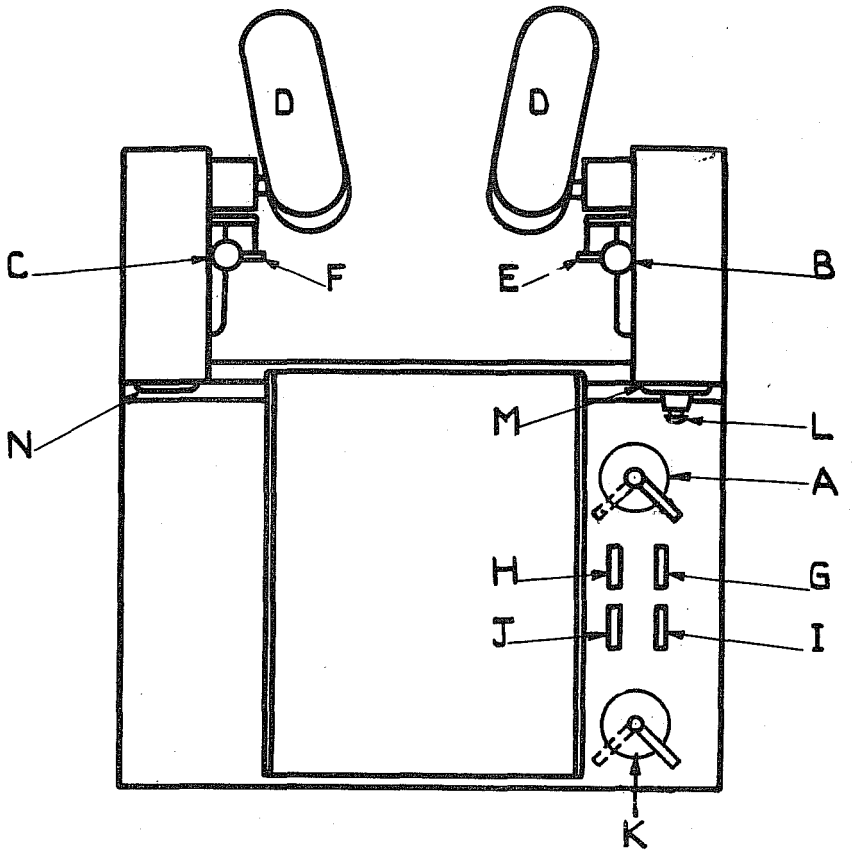


PLAN ARRANGEMENT

DIESEL/ELECTRIC CONVERTABLE SHOVEL

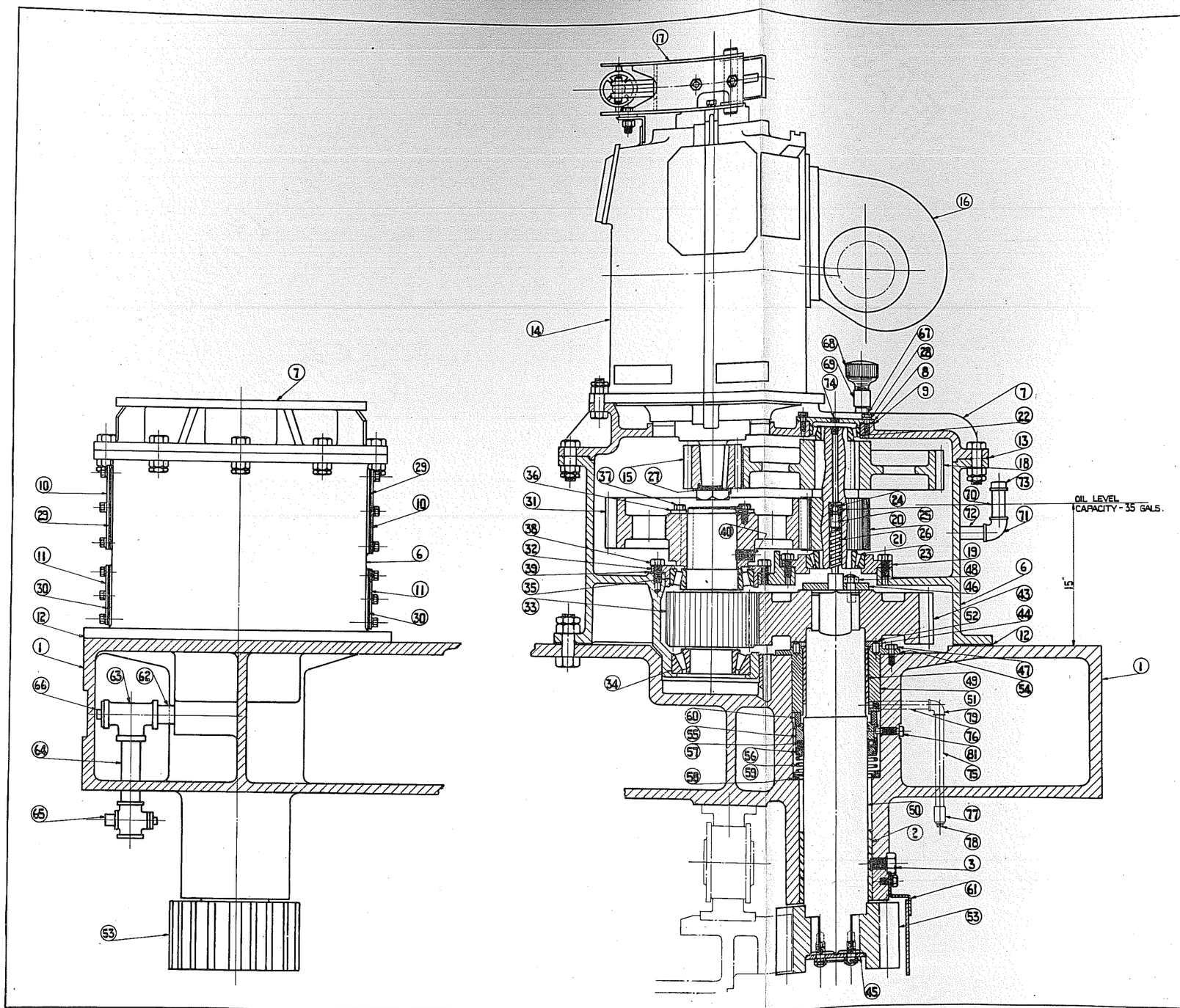
FIG. 1B.

OPERATORS CONSOLE CONTROLS.



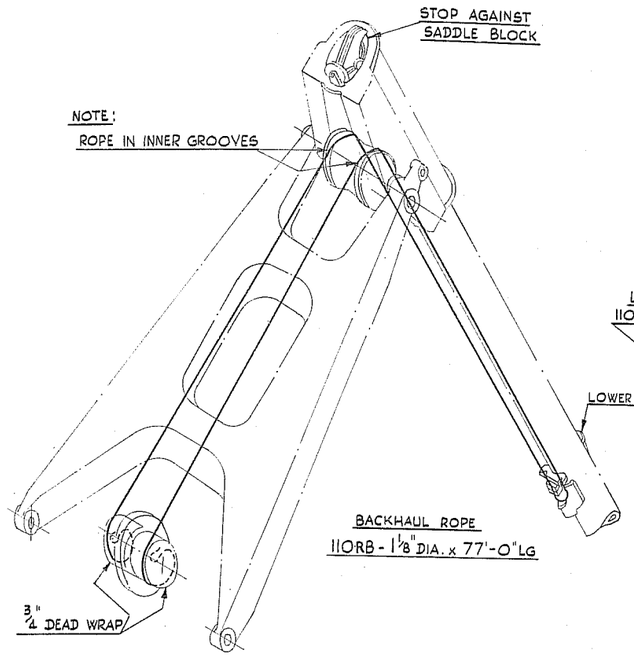
ITEM	SHOVEL	DRAGLINE
A	Dig/Propel Switch	Dig/Propel Switch
B	Hoist and Propel Controller	Hoist Controller
C	Crowd Controller	Drag and Propel Controller
D	Swing Pedals	Swing Pedals
E	Dipper Trip Latch	
F	Horn Latch	Horn Latch
G	Swing Brake Switch	Swing Brake Switch
H	Propel Brake Switch	Propel Brake Switch
I	Hoist Brake Switch	Drag Brake Switch
J	Crowd Brake Switch	Hoist Brake Switch
K	Track Steer Switch	Track Steer Switch
L	EMERGENCY Stop - Reset Button	EMERGENCY Stop - Reset Button
M	Start/Stop Buttons (Auxiliaries)	Start/Stop Buttons (Auxiliaries)
N	Exciter Voltmeter	Exciter Voltmeter

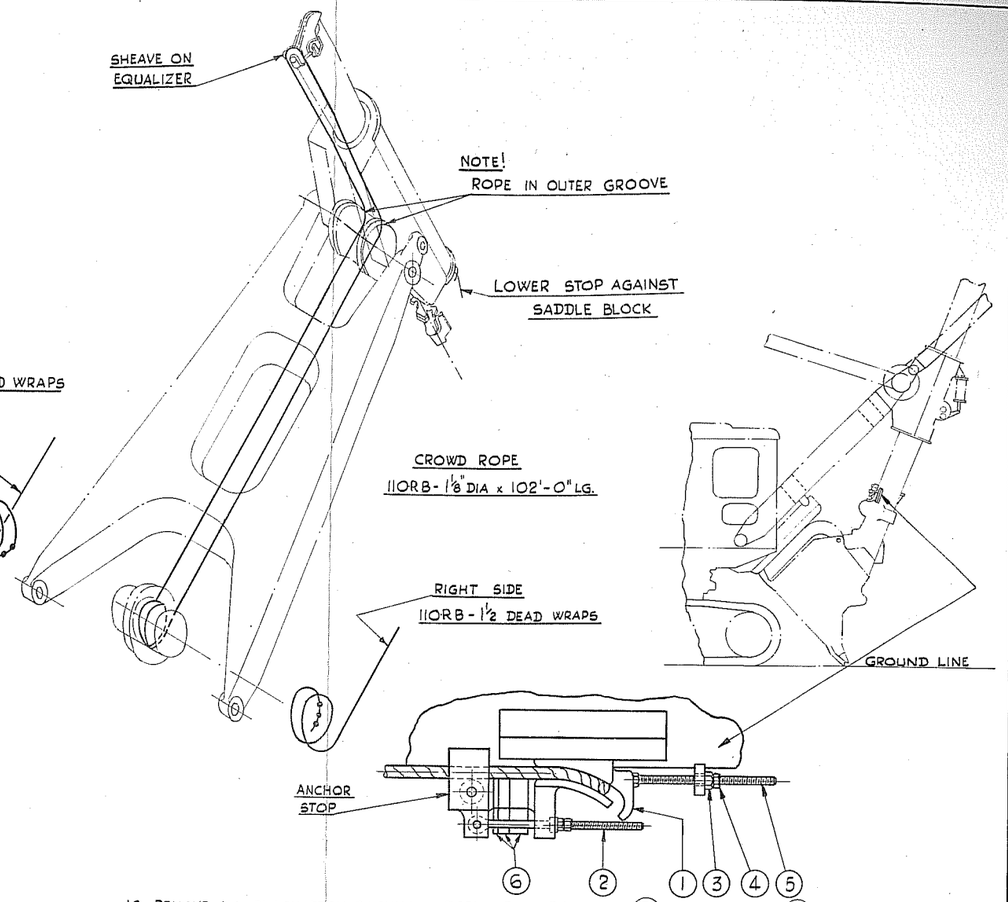
Fig. 4.



1 REVOLVING FRAME
2 BUSHING
3 DOWEL BOLT
6 GEAR CASE
7 GEAR CASE COVER
8 BEARING RETAINER
9 TIMKEN SHIMS
10 COVER PLATE
11 COVER PLATE
12 GASKET
13 GASKET
14 SWING MOTOR
15 MOTOR PINION
16 BLOWER
17 HYDRAULIC BRAKE
18 GEAR
19 BEARING HOUSING
20 OIL PUMP BALL CHECK SEAT
21 OIL PUMP IMPELLER
22 TIMKEN BRG. CONE 575 CUP
23 TIMKEN BRG. CONE 759 CUP
24 COMPRESSION SPRING
25 STEEL BALL $\frac{3}{4}$"
26 1ST. INTER: SHAFT & PINION
27 LOCK PLATE SUPPLIED
28 SETSCREW $\frac{1}{2}$"X1$\frac{1}{4}$"LG.LW.
29 GASKET
30 GASKET
31 GEAR
32 BEARING HOUSING
33 SHAFT & PINION
34 TIMKEN BRG. CONE 938 CUP
35 TIMKEN BRG. CONE 898 CUP
36 LOCK PLATE
37 SETSCREWS
38 SETSCREWS
39 SHIMS - TIMKEN PART NO.
40 HOLLOW CUP POINT SETSCREW
41
42
43 GEAR
44 THRUST WASHER
45 RET. WASHER
46 RETAINING WASHER
47 SETSCREW
48 SPEC. SETSCREW
49 BUSH
50 VERTICAL SHAFT
51 SLEEVE
52 DOWEL
53 RACK PINION
54 GASKET
55 OIL SEAL BODY
56 OIL SEAL HEAD
57 OIL SEAL 8$\frac{1}{2}$"OD.7"ID.$\frac{3}{4}$"THK.
58 SPRING WASHER
59 COMPRESSION SPRING
60 OIL SEAL PACKING RING
61 PINION GUARD
62 PIPE 1$\frac{1}{2}$"BSP X 3"LG.
63 TEE 1$\frac{1}{2}$"X1$\frac{1}{2}$"X1$\frac{1}{2}$".
64 PIPE 1$\frac{1}{2}$"BSP X 8"LG.
65 PLUG COCK 1$\frac{1}{2}$" BSP
66 C'SK PLUG 1$\frac{1}{2}$" BSP
67 1" BSP SOCKET
68 "VISCO" AIR FILTER
69 1" BSP 4" LG
70 PIPE 1" BSP 4" LG
71 1" BSP ELBOW
72 PIPE 1" BSP 5" LG
73 1" BS PIPE CAP
74 PIPE PLUG $\frac{1}{2}$" BSP
75 PIPE $\frac{1}{2}$" BSP 10"
76 PIPE $\frac{1}{2}$" BSP 5"
77 $\frac{1}{2}$" BSP COUPLING
78 PIPE PLUG $\frac{1}{2}$" BSP
79 ELBOW $\frac{1}{2}$" BSP

ARRANGEMENT – SWING MACHINERY.
FIG 7.



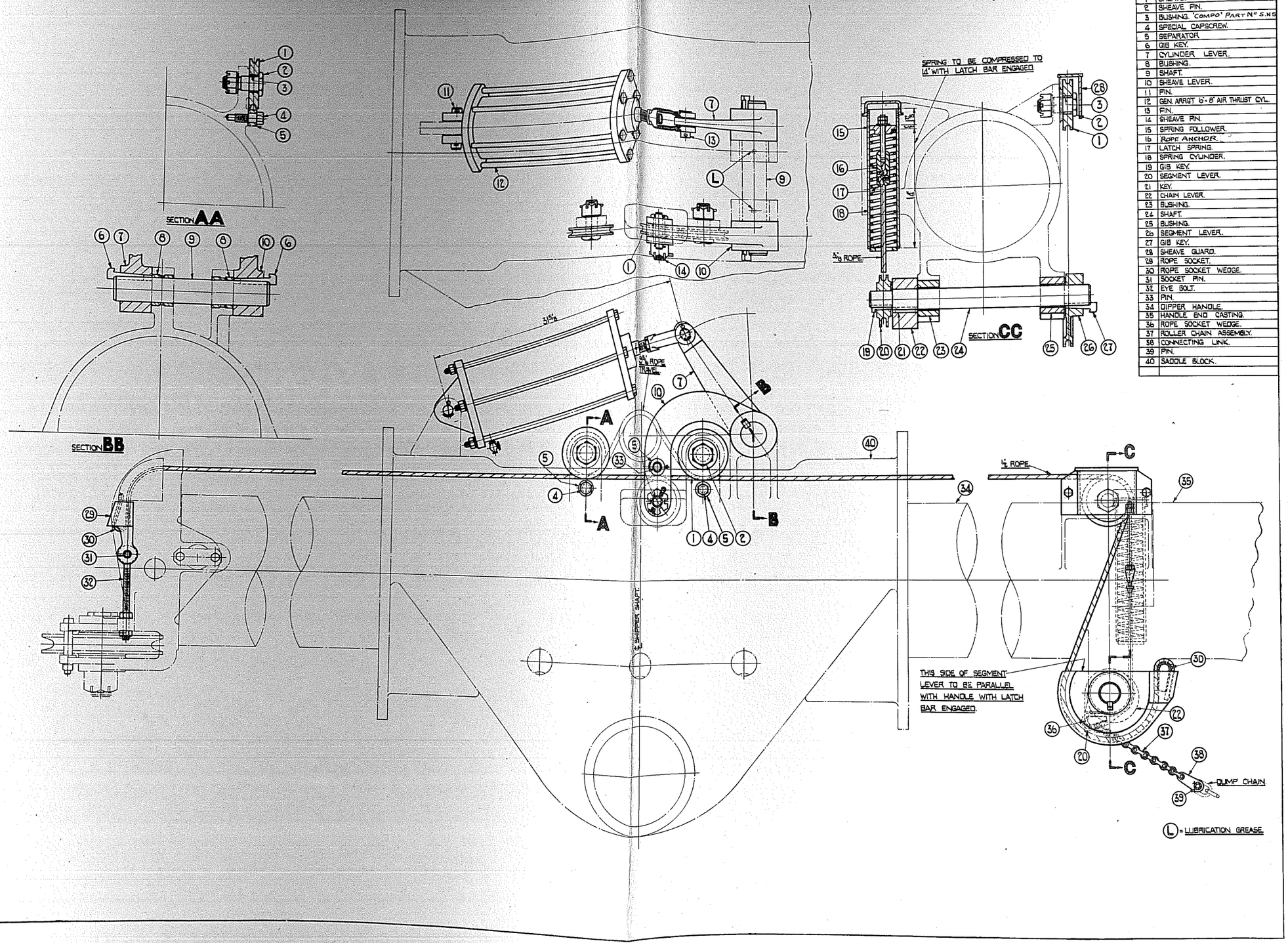


INSTRUCTIONS FOR REEVING CROWD & BACKHAUL ROPES
CHECK ROPE LENGTHS

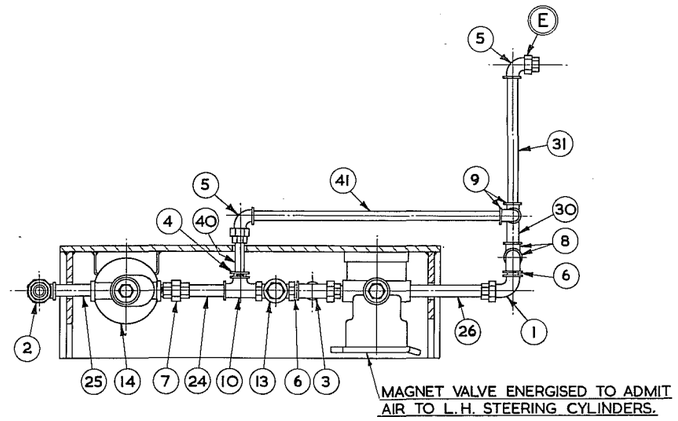
1. EXTEND THE DIPPER HANDLE UNTIL THE UPPER STOP RESTS AGAINST SADDLE BLOCK.
2. LAY THE MIDDLE OF THE BACKHAUL ROPE NEAR THE ℄ OF THE DIPPER.
3. FEED BOTH ENDS OF ROPE OVER SADDLE BLOCK ROLLER SO THAT ONE ROPE IS IN THE RIGHT HAND INNER GROOVE, AND THE OTHER IS IN THE LEFT HAND INNER GROOVE
4. CONNECT ROPE ENDS TO OUTER SOCKETS OF THE CROWD DRUM WITH SOCKETS IN HORIZONTAL POSITION.
5. PLACE MIDDLE OF BACKHAUL ROPE ROUND ANCHOR (1), WITH ROPE ANCHOR DRAWN TIGHT AGAINST ANCHOR STOP WITH EYE BOLTS (2). -USE NO SHIMS- NUT (3) AND LOCK NUT (4) ON ROD BOLT (5) MUST BE BACKED OFF TO THE END OF ROD BOLT BEFORE PULLING ANCHOR AGAINST ANCHOR STOP WITH EYE BOLTS (2)
6. LOOP CROWD ROPE AROUND SHEAVE AT END OF HANDLE. THREAD ENDS OF ROPE OVER LEFT HAND AND RIGHT HAND OUTER GROOVES ON SADDLE BLOCK ROLLER AND LET ENDS OF ROPE HANG TO THE GROUND.
7. WIND UP ALL THE BACKHAUL ROPE ON THE DRUM UNTIL LOWER HANDLE STOP IS AGAINST THE SADDLE BLOCK, AND HANDLE IS ABOUT PERPENDICULAR TO BOOM ℄
8. FASTEN CROWD ROPE ENDS TO DRUM WITH ANCHOR BOLTS, USING PROPER NUMBER OF DEAD WRAPS AS NOTED IN SKETCH. CROWD ROPE TO BE REEVED AS TIGHT AS POSSIBLE.
9. AFTER CROWD ROPE IS IN PLACE, LOWER DIPPER UNDER BOOM, SO THAT HINGES ARE NEAR OR CONTACT BUMPERS AND TEETH TOUCH THE GROUND. THIS POSITION MAKES IT POSSIBLE FOR MEN TO GET AT THE TAKE UP FROM THE LOWER BOOM. USE CROWD POWER TO TIGHTEN CROWD ROPES WHICH WILL PUT ALL THE SLACK INTO THE BACKHAUL ROPES.
10. REMOVE ALL SLACK FROM BACKHAUL ROPES BY TURNING NUT (3) ON ROD BOLT (5)
11. AFTER ALL SLACK IS REMOVED INSTALL REQUIRED AMOUNT OF SHIMS (6) BETWEEN ANCHOR STOP AND ROPE ANCHOR (1). CLAMP SHIMS TIGHT WITH EYE BOLTS (2)
12. NUT (3) ON ROD BOLT (5) TO BE BACKED OFF ABOUT ½" AND LOCKED WITH NUT (4). THIS MUST BE DONE TO RELIEVE ROD BOLT (5) FROM ANY POSSIBLE BACKHAUL ROPE PULL.
13. AFTER OPERATING FOR SOME TIME, SLACK WILL DEVELOP IN THE ROPES. TO TIGHTEN ROPES REPEAT ADJUSTMENT FOLLOWING INSTRUCTIONS Nos. 9, 10, 11 AND 12.
14. AFTER MAXIMUM TAKE-UP (12") IS USED UP AND ROPES NEED FURTHER ADJUSTMENT, IT WILL BE NECESSARY TO PROVIDE FOR MORE ADJUSTMENT BY SHORTENING THE CROWD ROPES AT THE ANCHOR BOLTS ON THE DRUM.
    A) WITH DIPPER UNDER BOOM AT BUMPERS, REMOVE ALL SHIMS AND BACK OFF NUTS (3) AND (4) TO THE END OF ROD BOLT (5)
    B) RAISE HANDLE WITH BACKHAUL ROPE SO THAT ROPE ANCHOR (1) CONTACTS ANCHOR STOP AND SET CROWD BRAKE
    C) REMOVE ALL SLACK FROM CROWD ROPES BY PULLING ROPE ENDS THROUGH ANCHOR BOLTS AT DRUM AND CUT OFF EXCESS LENGTH OF ROPE.
    D) LOWER DIPPER UNDER BOOM AND REPEAT ADJUSTMENT OF SLACK BY FOLLOWING INSTR. Nos. 9, 10, 11 AND 12

REEVING – CROWD ROPE.
FIG 11.

NO.	NAME.
1	SHEAVE.
2	SHEAVE PIN.
3	BUSHING. 'COMPO' PART Nº S.N.S
4	SPECIAL CAPSCREW.
5	SEPARATOR.
6	GIB KEY.
7	CYLINDER LEVER.
8	BUSHING.
9	SHAFT.
10	SHEAVE LEVER.
11	PIN.
12	GEN. ARRGT 6·8" AIR THRUST CYL.
13	PIN.
14	SHEAVE PIN.
15	SPRING FOLLOWER.
16	ROPE ANCHOR.
17	LATCH SPRING.
18	SPRING CYLINDER.
19	GIB KEY.
20	SEGMENT LEVER.
21	KEY.
22	CHAIN LEVER.
23	BUSHING.
24	SHAFT.
25	BUSHING.
26	SEGMENT LEVER.
27	GIB KEY.
28	SHEAVE GUARD.
29	ROPE SOCKET.
30	ROPE SOCKET WEDGE.
31	SOCKET PIN.
32	EYE BOLT.
33	PIN.
34	DIPPER HANDLE.
35	HANDLE END CASTING.
36	ROPE SOCKET WEDGE.
37	ROLLER CHAIN ASSEMBLY.
38	CONNECTING LINK.
39	PIN.
40	SADDLE BLOCK.

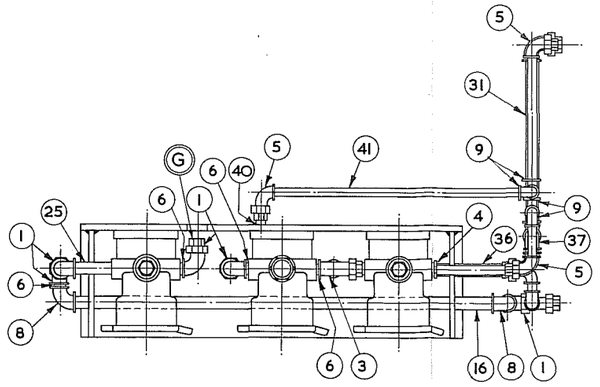


DIPPER TRIP.
FIG 14.



MAGNET VALVE ENERGISED TO ADMIT AIR TO L.H. STEERING CYLINDERS.

SECTION A.A.



PIPELINE REF. LETTER	FUNCTION
B	MAGNET VALVE TO PROPELLING BRAKE
C	MAGNET VALVE TO PROPELLING CLUTCH
D	MAGNET VALVE TO L.H. STEERING CYLINDERS
E	OUTLET PRESSURE REDUCING VALVE TO PRESSURE GAUGE (0/100 LBS)
F	MAGNET VALVE TO R.H. STEERING CYLINDERS
G	MAGNET VALVE TO DRAGLINE HOIST BRAKE
H	RING MAIN (110 LBS./SQ. IN.)

REF. Nº	DESCRIPTION
1	FEMALE UNION ELBOW
2	FEMALE UNION TEE
3	MALE AND FEMALE UNION TEE
4	HEXAGON BUSH
5	FEMALE UNION ELBOW
6	CLOSE NIPPLE
7	MALE AND FEMALE UNION
8	FEMALE ELBOW
9	FEMALE ELBOW
10	MALE AND FEMALE TEE
11	EQUAL TEE
12	CHECK VALVE
13	CHECK VALVE
14	REDUCING VALVE
15	STEEL TUBING
16	STEEL TUBING
17	STEEL TUBING
18	STEEL TUBING
19	STEEL TUBING
20	STEEL TUBING
21	STEEL TUBING
22	STEEL TUBING
23	STEEL TUBING
24	STEEL TUBING
25	STEEL TUBING
26	STEEL TUBING
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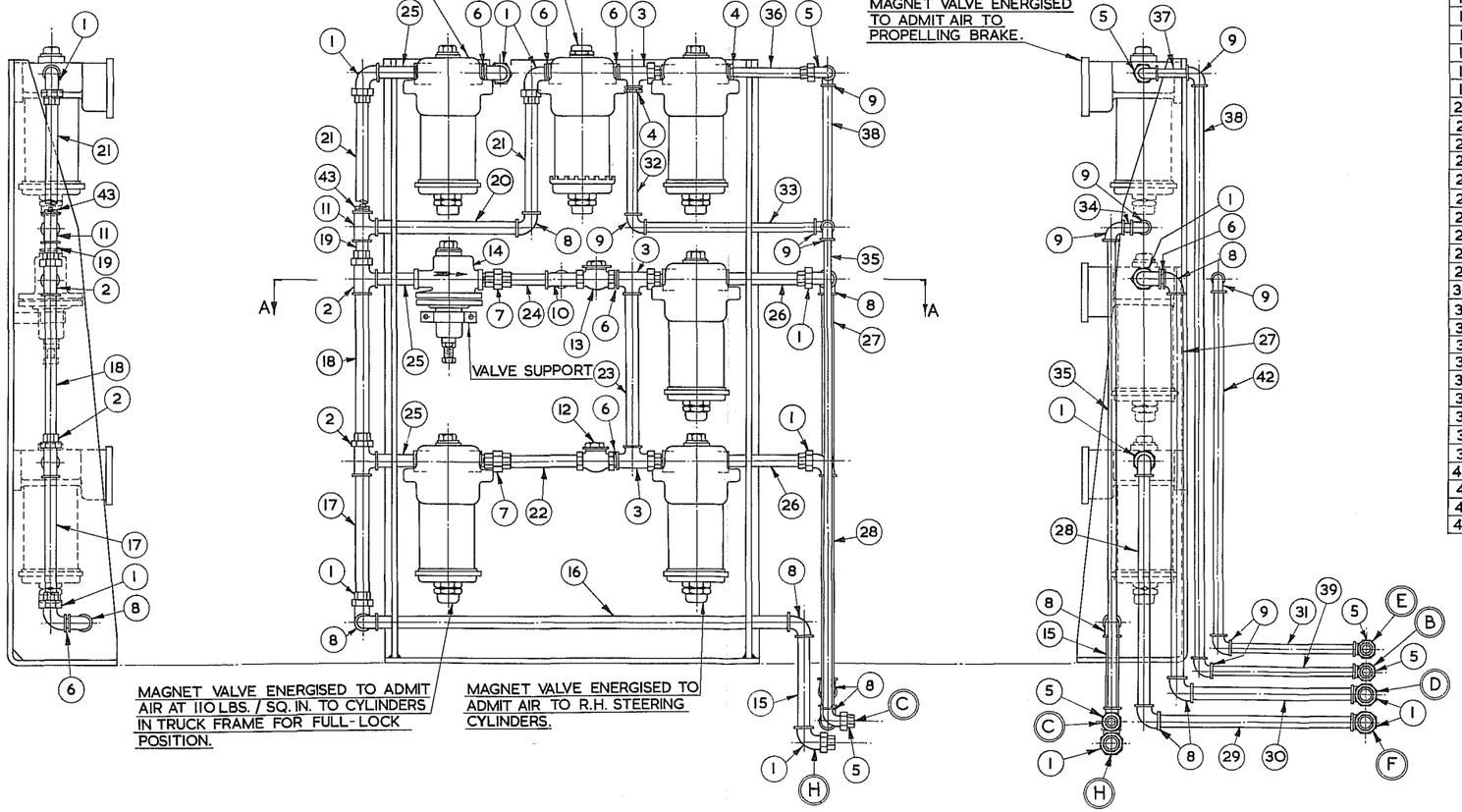
29	STEEL TUBING
30	STEEL TUBING
31	STEEL TUBING
32	STEEL TUBING
33	STEEL TUBING
34	STEEL TUBING
35	STEEL TUBING
36	STEEL TUBING
37	STEEL TUBING
38	STEEL TUBING
39	STEEL TUBING
40	STEEL TUBING
41	STEEL TUBING
42	STEEL TUBING
43	HOLLOW PIPE PLUG

MAGNET VALVE ENERGISED TO ADMIT AIR TO DRAGLINE HOIST BRAKE CYLINDER.

MAGNET VALVE DE-ENERGISED TO ADMIT AIR TO PROPELLING CLUTCH.

MAGNET VALVE ENERGISED TO ADMIT AIR TO PROPELLING BRAKE.



MAGNET VALVE ENERGISED TO ADMIT AIR AT 110 LBS. / SQ. IN. TO CYLINDERS IN TRUCK FRAME FOR FULL-LOCK POSITION.

MAGNET VALVE ENERGISED TO ADMIT AIR TO R.H. STEERING CYLINDERS.

FIG. 16A/R2 GENERAL ARRANGEMENT OF 110 RB MAGNET VALVE AIR PIPING.

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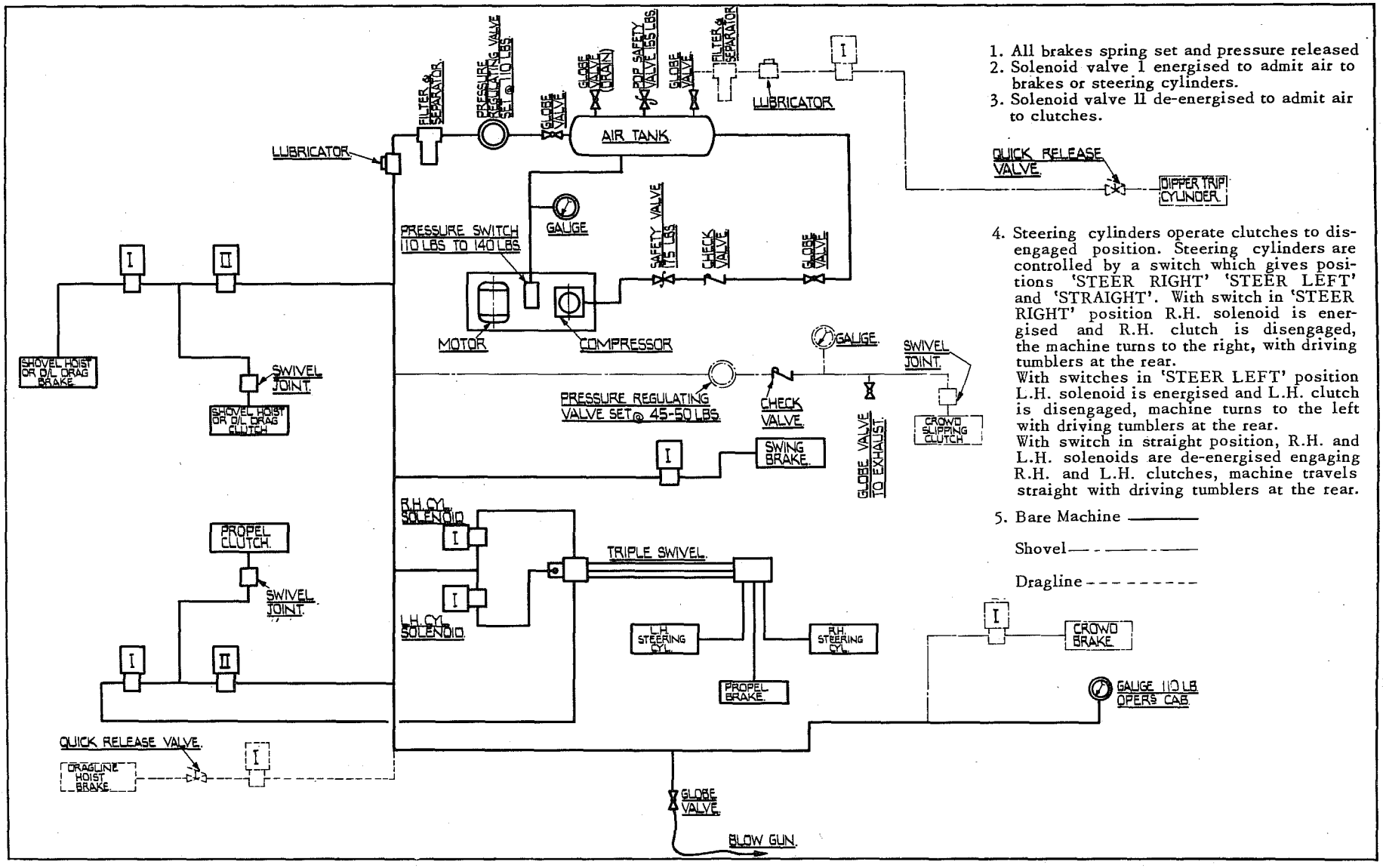
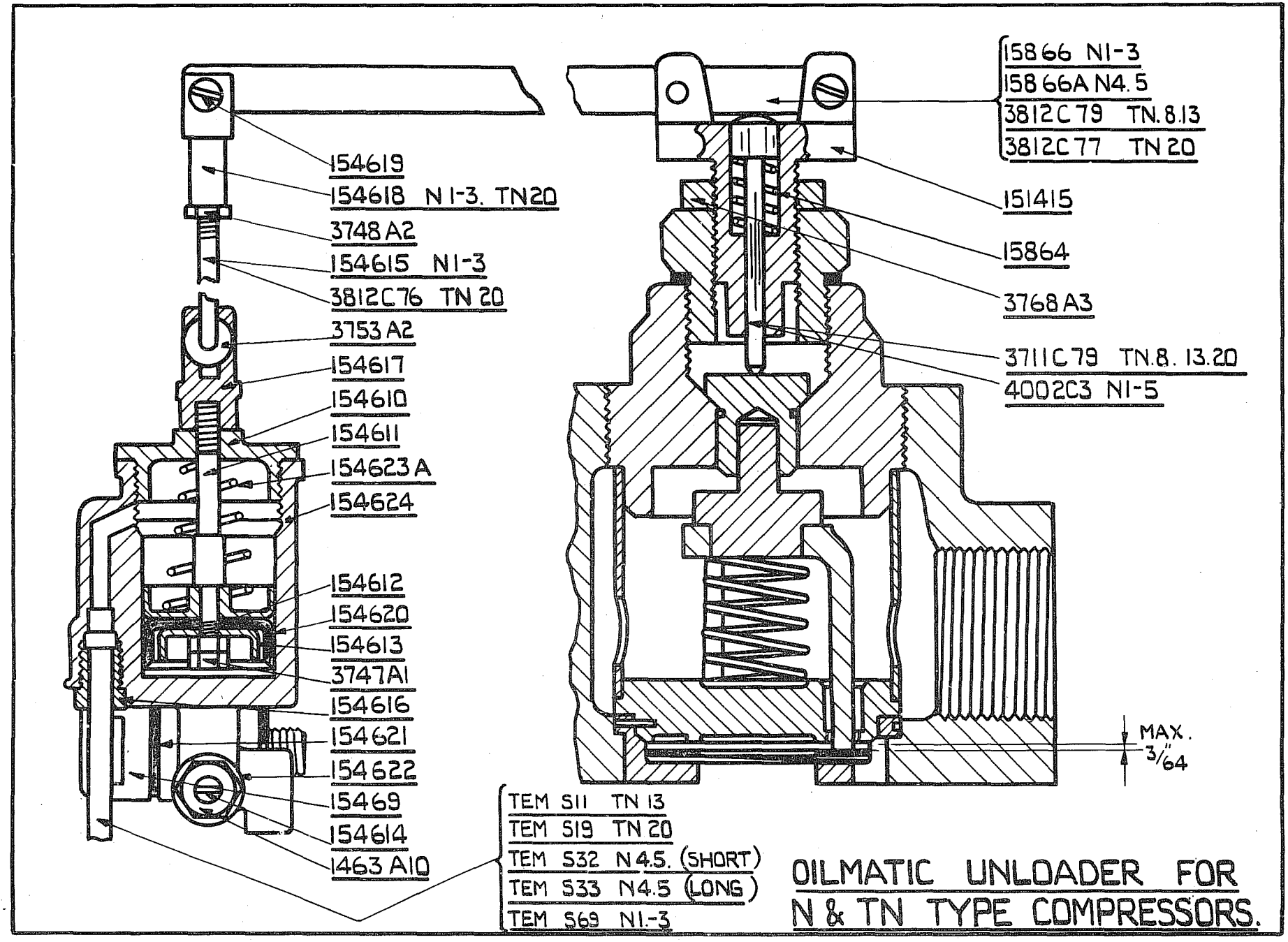
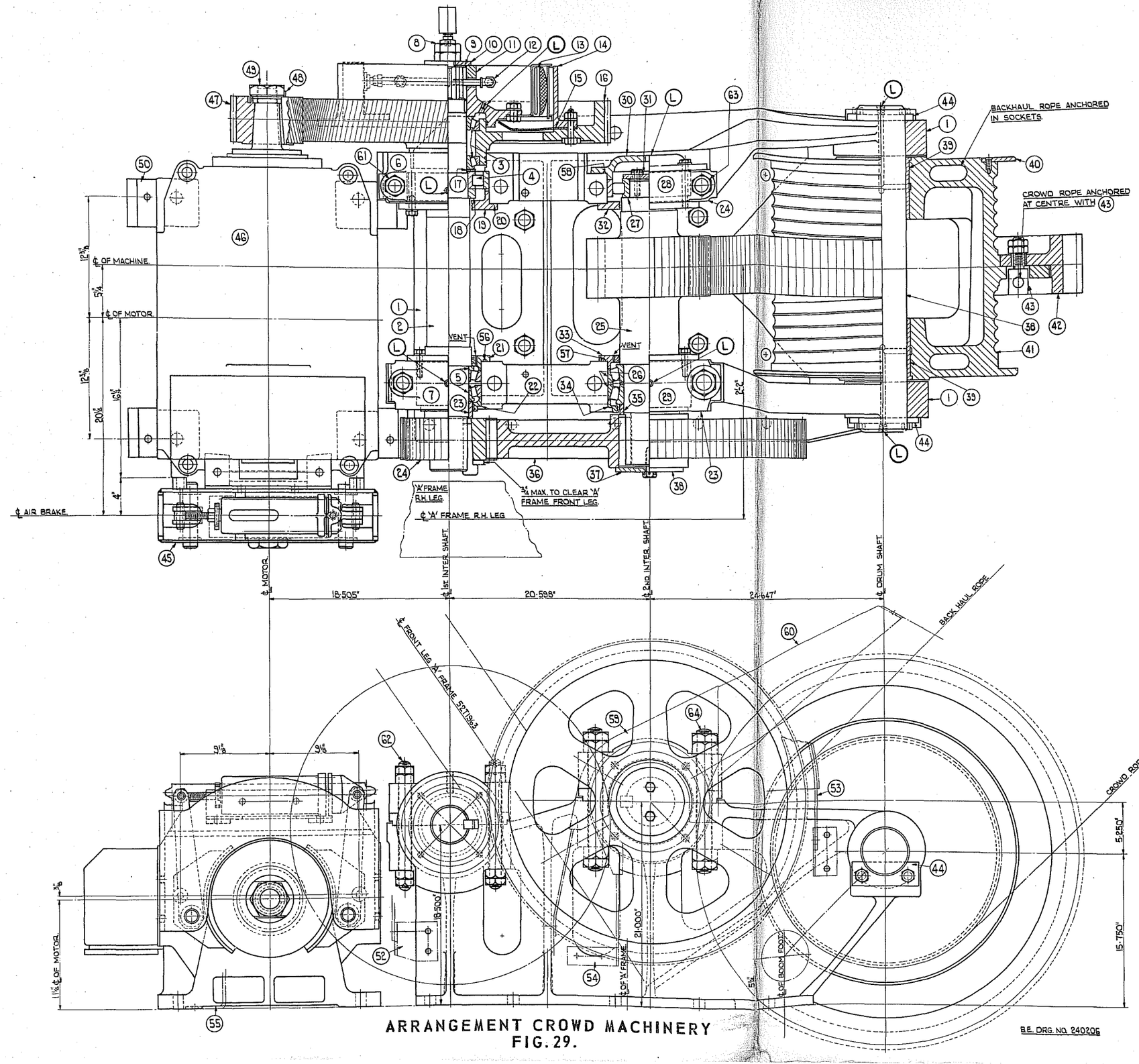


SCHEMATIC DIAGRAM – AIR PIPING.

FIG 20.



"OILMATIC" UNLOADER.
FIG 24.

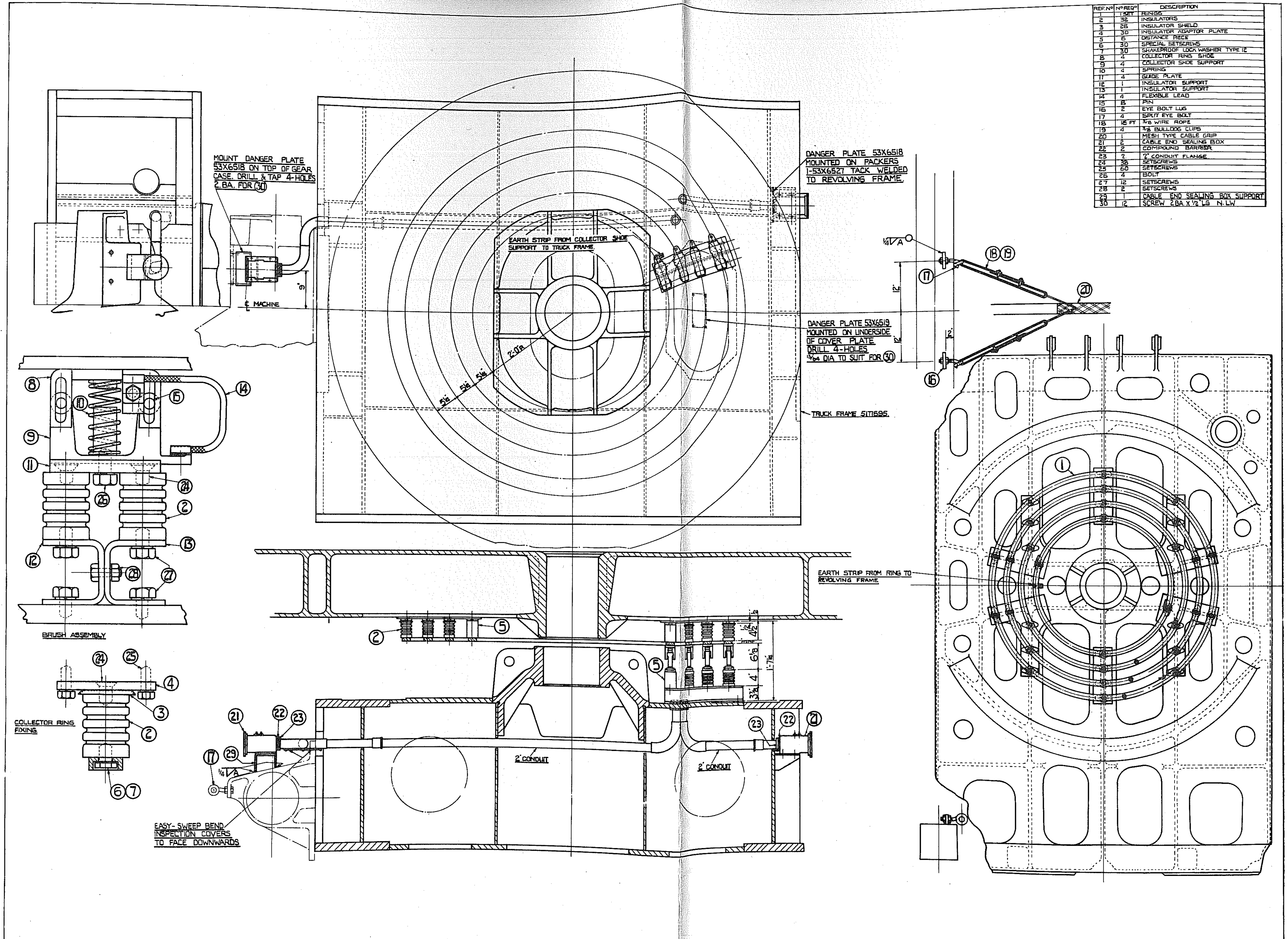


NO.	DESCRIPTION
1	SIDE FRAME.
2	1ST. INTER. SHAFT.
3	TIMKEN BEARING 52387-52637
4	RANSOME & MARLES BEARING MRJ100
5	TIMKEN BEARING 687-672D.
6	BEARING CAP L.H. SIDE.
7	BEARING CAP R.H. SIDE.
8	ROTOR SINGLE SEAL. SIZE NO 2. 80 CROFTS
9	SHIMS.
10	RETAINING WASHER.
11	DISC HUB FOR SLIPPING CLUTCH.
12	AIR PIPING TO SLIPPING CLUTCH.
13	SLIPPING CLUTCH UNIT. 21·5AR-E CROFTS.
14	SLIPPING CLUTCH HOUSING.
15	CLUTCH GREASE GUARD.
16	SLIPPING CLUTCH GEAR. HELICAL.
17	SPACER.
18	SPACER.
19	OIL SEAL.
20	'O' RING GASKET.
21	OIL SEAL.
22	OIL SEAL.
23	SEPARATOR.
24	PINION.
25	2ND. INTER. SHAFT.
26	TIMKEN BEARING 74525-74851-D
27	RANSOME & MARLES BEARING. MRJ-100
28	BEARING CAP L.H. SIDE.
29	BEARING CAP R.H. SIDE.
30	BEARING END CAP.
31	RETAINING WASHER.
32	OIL SEAL RING.
33	OIL SEAL RING.
34	OIL SEAL RING.
35	SEPARATOR.
36	GEAR ON 2ND. INTER SHAFT.
37	RETAINING COLLAR.
38	DRUM SHAFT.
39	BUSHING.
40	DRUM FLANGE.
41	DRUM 24" P DRUM.
42	GEAR RIM.
43	ROPE ANCHOR PIN.
44	LOCK BAR.
45	MOTOR BRAKE.
46	ELECTRIC MOTOR. B.T.H. CO. LTD.
47	PINION - HELICAL.
48	NUT LOCKING PLATE.
49	SPECIAL NUT.
50	CHOCK BAR.
51	SPECIAL BOLT & NUT.
52	GEAR GUARD 2ND INTER SHAFT.
53	GEAR GUARD 2ND INTER SHAFT.
54	GEAR GUARD 1ST INTER SHAFT.
55	GEAR GUARD 1ST INTER SHAFT.
56	'O' RING GASKET.
57	'O' RING GASKET.
58	'O' RING GASKET.
59	GEAR GUARD DRUM GEAR.
60	GEAR GUARD DRUM GEAR.
61	ROD BOLT.
62	ROD BOLT.
63	ROD BOLT.
64	ROD BOLT.

(L) LUBRICATION - GREASE.

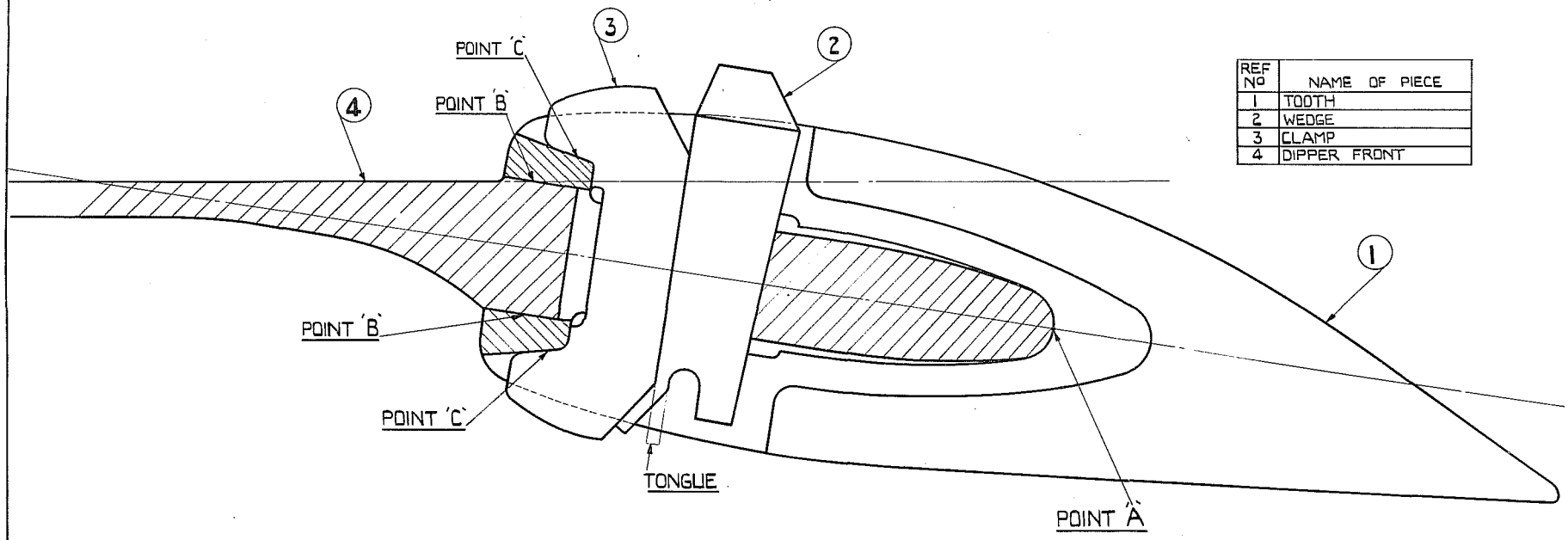
ARRANGEMENT CROWD MACHINERY
FIG. 29.

B.E. DRG. NO. 240206



REF. Nº	Nº REQº	DESCRIPTION
1	1 SET	RINGS
2	32	INSULATORS
3	26	INSULATOR SHIELD.
4	30	INSULATOR ADAPTOR PLATE
5	6	DISTANCE PIECE
6	30	SPECIAL SETSCREWS
7	30	SHAKEPROOF LOCK WASHER TYPE 12
8	4	COLLECTOR RING SHOE
9	4	COLLECTOR SHOE SUPPORT
10	4	SPRING
11	4	GUIDE PLATE
12	1	INSULATOR SUPPORT
13	1	INSULATOR SUPPORT
14	4	FLEXIBLE LEAD
15	8	PIN
16	2	EYE BOLT LUG
17	4	SPLIT EYE BOLT
18	16 FT	3/8 WIRE ROPE
19	4	3/8 BULLDOG CLIPS
20	1	MESH TYPE CABLE GRIP
21	2	CABLE END SEALING BOX
22	2	COMPOUND BARRIER.
23	2	2" CONDUIT FLANGE
24	38	SETSCREWS
25	60	SETSCREWS
26	4	BOLT
27	12	SETSCREWS
28	2	SETSCREWS
29	1	CABLE END SEALING BOX SUPPORT
30	12	SCREW 2BA X 1/2" LG N. LW

ARRANGEMENT COLLECTOR GEAR.
FIG 34.



REF Nº	NAME OF PIECE
1	TOOTH
2	WEDGE
3	CLAMP
4	DIPPER FRONT

- ASSEMBLY INSTRUCTIONS -

1- TOOTH (1) FITS DIPPER FRONT SOCKET LUGS AT POINTS 'A' & 'B' & MUST BE HARD DOWN AT 'A' AND A FIT ON POINTS 'B' WHEN CORRECTLY FITTED

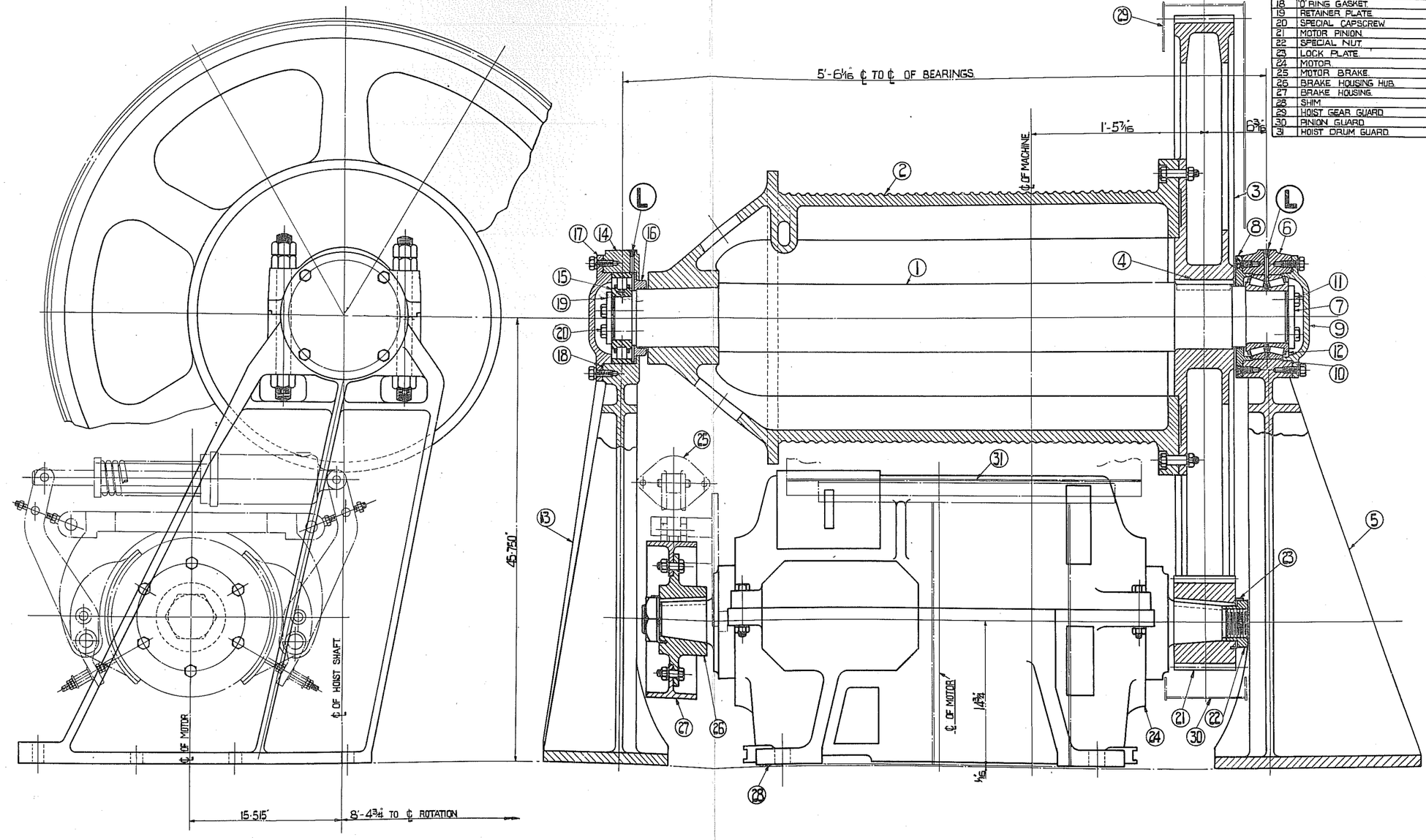
2- PLACE CLAMP (3) IN POSITION AS SHOWN MAKING SURE THAT CLAMP FITS TOOTH AT POINTS 'C'

3- HEAT FORKED END OF WEDGE (2) ENTER WEDGE AND DRIVE 'HOME' KNOCK OVER TONGUE

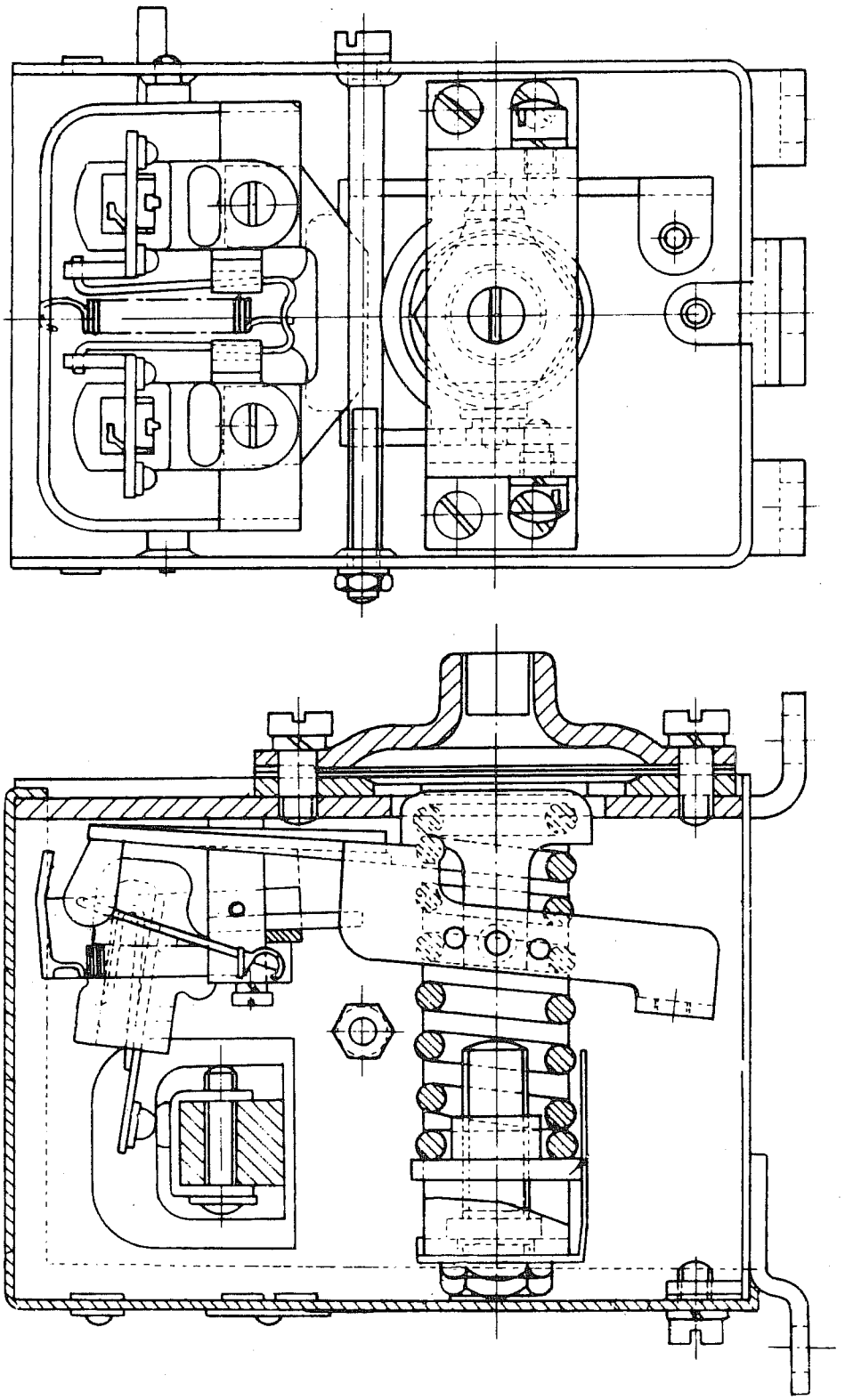
4- A CORRECTLY FITTED TOOTH BEARS ON POINT 'A' AND FITS AT POINTS 'B'. CLAMP (3) MUST FIT AT POINTS 'C' AND WEDGE (2) BEARS ON THE TOP END OF SLOT IN DIPPER FRONT

ASSEMBLY INSTRUCTIONS FOR FITTING TEETH.
FIG 39.

REF Nº	NAME OF PIECE.
1	HOIST SHAFT.
2	HOIST DRUM -26" P.D.
3	HOIST GEAR.
4	STRAIGHT KEY.
5	L.H. SIDE FRAME.
6	L.H. BEARING CAP.
7	RETAINER PLATE.
8	HALF OIL SEAL RING.
9	BEARING END CAP.
10	'O' RING GASKET.
11	SPECIAL CAPSCREW.
12	L.H. TIMKEN BEARING.
13	R.H. SIDE FRAME.
14	R.H. BEARING CAP.
15	R.H. ROLLER BEARING.
16	OIL SEAL.
17	BEARING END CAP.
18	'O' RING GASKET.
19	RETAINER PLATE.
20	SPECIAL CAPSCREW.
21	MOTOR PINION.
22	SPECIAL NUT.
23	LOCK PLATE.
24	MOTOR.
25	MOTOR BRAKE.
26	BRAKE HOUSING HUB.
27	BRAKE HOUSING.
28	SHIM.
29	HOIST GEAR GUARD.
30	PINION GUARD.
31	HOIST DRUM GUARD.



SECTION THROUGH HOIST SHAFT DRAGLINE.
FIG 44.



ADJUSTMENT OF PRESSURE SWITCH.
FIG 49.