AMERICAN LOCOMOTIVE COMPANY

NEW YORK CITY

JUNE, 1919 BULLETIN No. 1019

ALCO
REVERSE GEARS

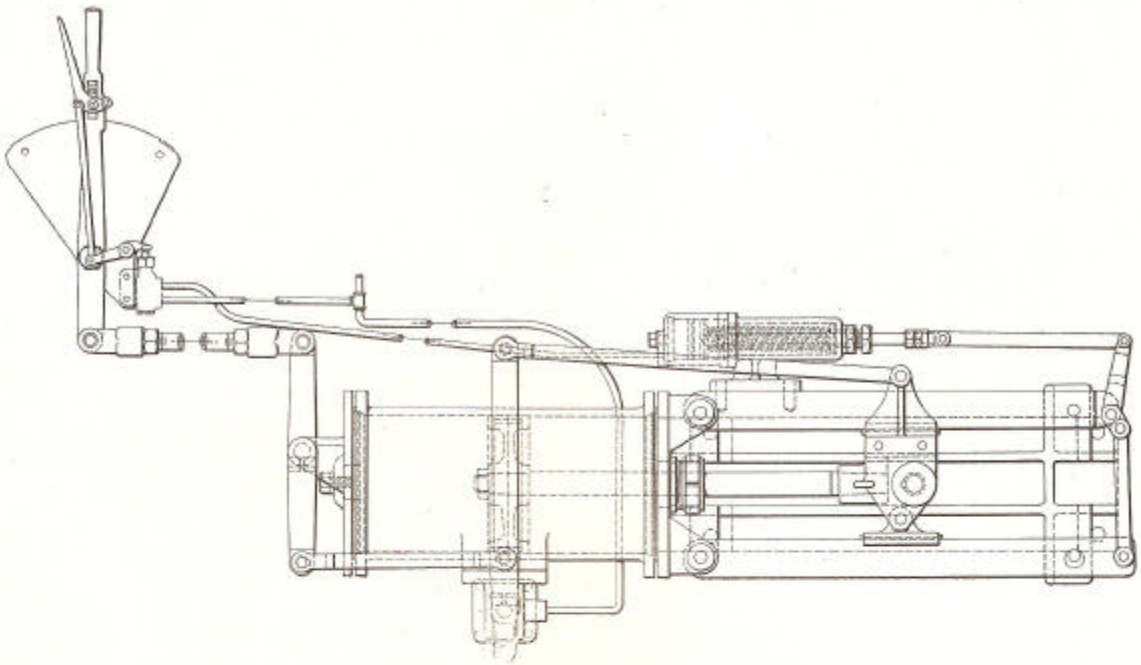
PARTICULAR FEATURES

General Simplicity Rugged Construction

A Flat Rotating Type Control Valve

Very sensitive to any movement of the hand lever or crosshead

One of the gears is equipped with an improved locking device



ALCO REVERSE GEAR—TYPE D

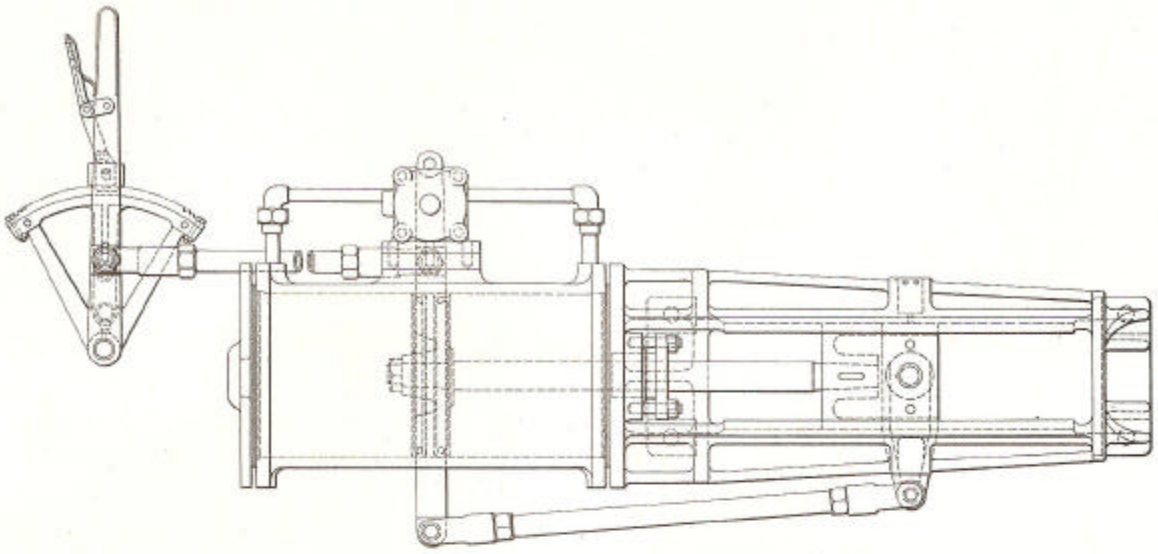
DESCRIPTION

No unusual features are presented in the cylinder, piston, piston rod, crosshead, and crosshead guide.

The control valve is of the flat rotating type bearing on a corresponding flat face which obviates the necessity of stuffing box for the valve stem, making it uniformly easy to operate at all times. The valve and its seat have ports arranged so that the cylinder is filled with air or steam, as the case may be, on both sides of the piston in any stationary position of the latter, causing a quick response to any movement of the hand lever or crosshead.

Motion is given to the operating valve by the control lever in the cab through a system of linkage anchored at one end to the main crosshead and at the other end to the operating lever.

In operation of the gear, movement of the control lever shifts the valve from its central position, which position is taken by the valve when at rest. With valve in its central position, admission is line and line, and exhaust ⅛ inch lap. Admission being line and line permits keeping the pressure built up on both sides of the piston. A ⅛ inch movement of the valve opens exhaust from one side of the piston, causing the piston and crosshead to immediately move out or in as the case may be. This movement of the crosshead returns the valve, by means of the linkage, to its central position, thereby closing the exhaust from the cylinder and causing the piston to come to rest at the desired position corresponding to the position of the control lever on its quadrant.



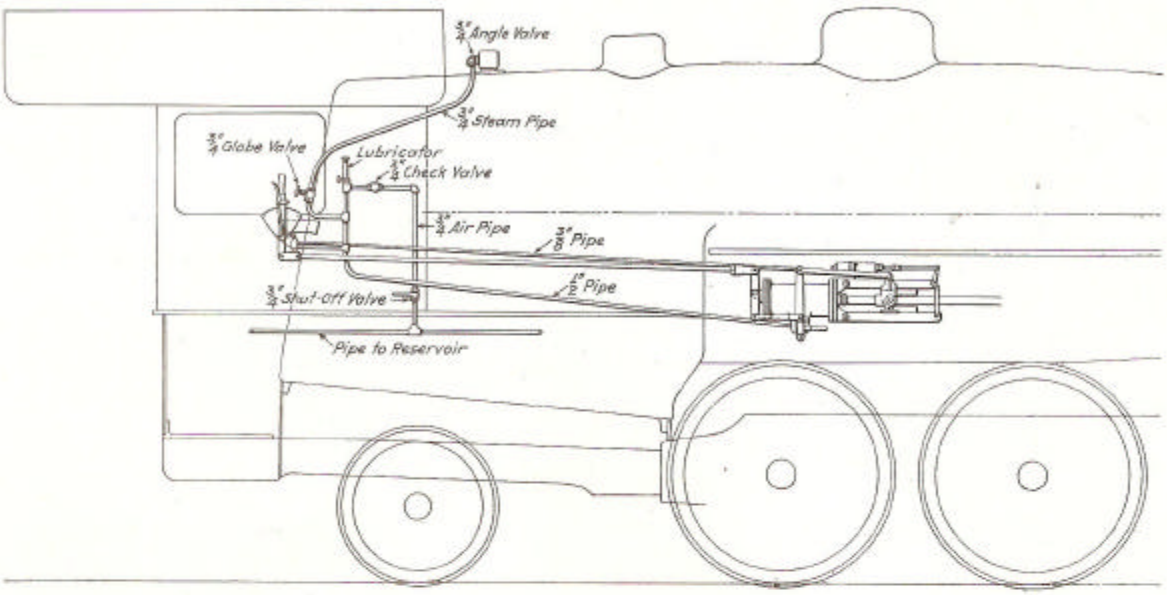
ALCO REVERSE GEAR—TYPE E

The locking device consists of a locking cylinder which is located above the operating cylinder, and arranged with its piston under a constant spring load which tends at all times to compress the main crosshead between the upper and lower guides. The lower guide is hinged at one end to the operating cylinder, and connected at the other end to the locking cylinder through a bell crank attached to the upper guide. On raising the operating lever latch, pressure is admitted to the locking cylinder, the spring load on the crosshead is released; thus permitting the crosshead to move. On releasing the operating lever latch, the process is reversed, and the crosshead becomes locked in the desired position.

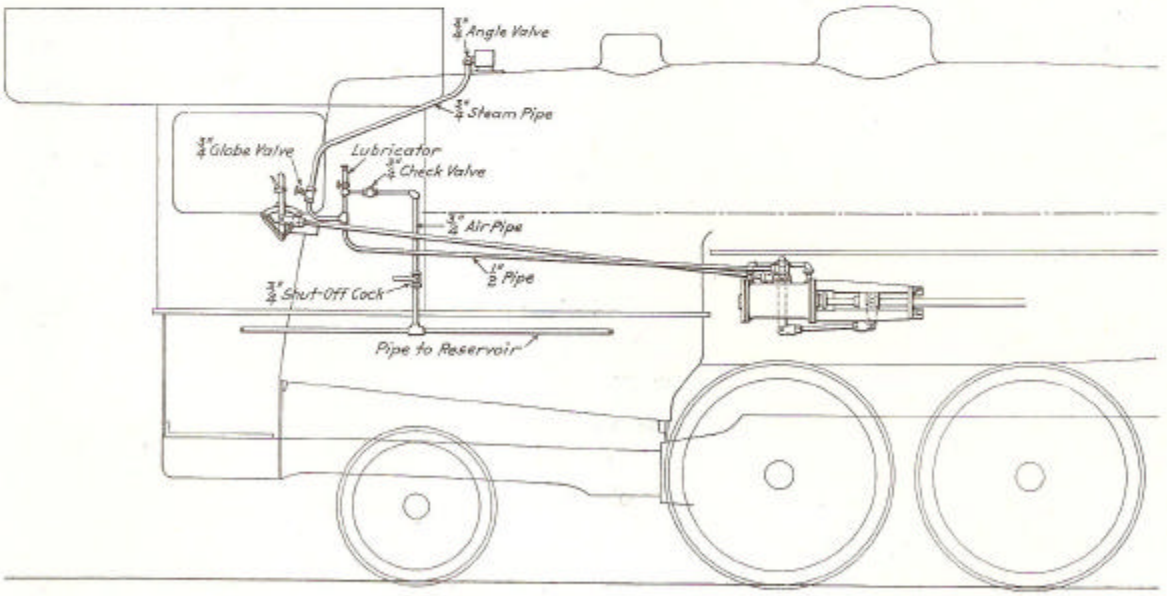
Movement of the rotary valve is controlled by stops on the valve body. When the operating lever in the cab is moved sufficiently to bring the valve arm up against a stop, any further movement of the valve and operating lever is delayed until movement of the piston starts the valve toward its central position. These stops control the movement of the operating lever when the gear is without pressure, and any effort toward further movement of the control lever will result in straining the parts, and should be guarded against.

Both the ALCO reverse gears have guide bolting and are secured to a cast iron bracket by 1-inch finished bolts. These gears are arranged to bolt on the bracket adopted by the U. S. R. R. Administration for the standardized locomotives.

Both gears can be supplied arranged for cylinder bolting which not only will bolt on the bracket adopted by the U. S. R. R. Administration but will also interchange with most of the reverse gears now on the market having cylinder bolting.



PIPING DIAGRAM—TYPE D



PIPING DIAGRAM—TYPE E

APPLICATION

Locate cab lever and gear with the least possible amount of offset.

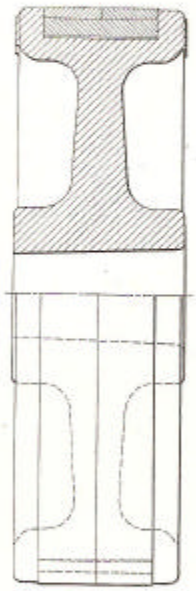
Lost motion should be kept to a minimum.

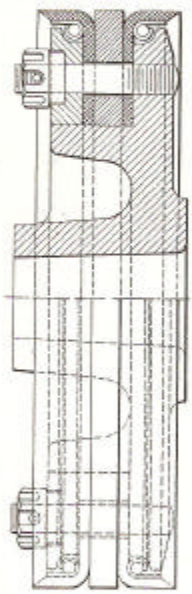
Locate ½-inch stop pins on lever quadrant in cab to suit full gear positions of lever. When lever is against stop, and gear is at end of stroke, the valve arm should be vertical.

Piston should strike front cylinder head when in full gear. Adjust length of reach rod to suit.

Before connecting up gear, blow out all scale and dirt from piping.

PISTON PACKING





ALCO reverse gears may be equipped with either metallic or soft piston packing.

In the metallic packing, the outer rings are turned to exact diameter outside and inside and cut. The inner ring is turned eccentric as shown, $9^{15}/_{16}$ inches O. D. and 9⅜ inches I. D., and ¾ inch cut out on thin side. It is then sprung together and returned to exact 9⅝ inches O. D.

The soft packing has been developed especially for ALCO reverse gears and is adapted to the use of either steam or air. Because of its ease of maintenance and satisfactory operation, this packing has been adopted by the American Locomotive Company as standard for both reverse gears.

CARE OF GEAR

Lubricator should be filled before each trip with engine oil. If steam operated, use cylinder oil.

Oil the moving parts of gear before each trip.

Do not oil the guides on the locking gear.

After examining or renewing cylinder packing, the piston and cylinder of the gear having metallic packing rings should be rubbed with engine oil; for the gear having soft packing use air brake compound.

On the non-locking gear, if the crosshead is not kept to a proper working fit in guide, it will tend to cause leakage of the piston rod packing.

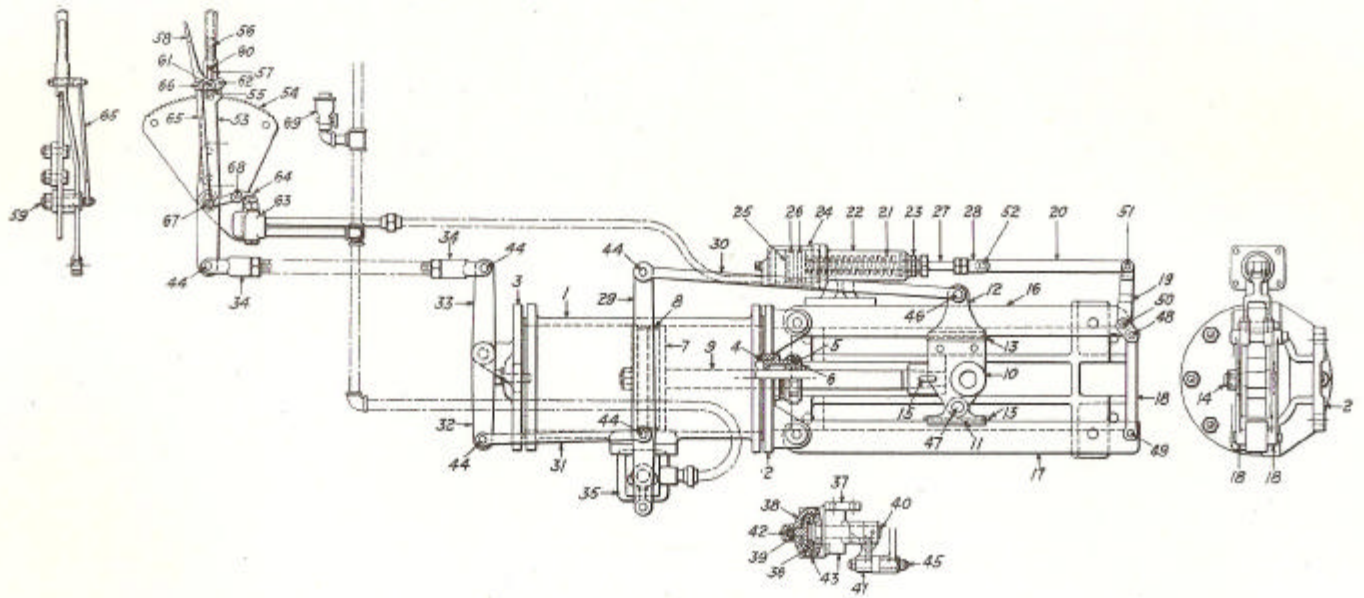
On the locking gear, when lock weakens due to wear of shoes, replace shims on top and bottom of crosshead making them as thick as can be applied when the crosshead is at cylinder end of stroke and lock is released. If lock does not then hold at other end of stroke, shorten the guide hangers.

If when gear is at rest and valve arm vertical, leakage is indicated by a blow at exhaust, grind the rotary valve.

All pins, bushings, and connecting rods should be maintained with the least possible amount of slack, as lost motion in the operating parts reduces the sensitiveness of adjustment.

If the crosshead of either gear is moved by any other method than pressure in the operating cylinder, the operating lever latch must be raised and held clear of quadrant during such movement. Failure to do this will cause breakage in the operating mechanism.

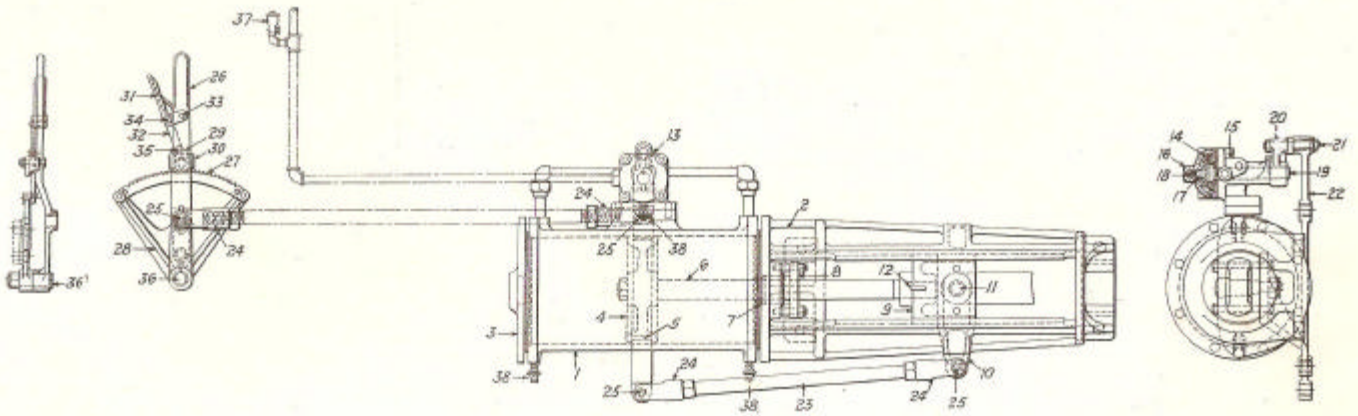
Any good fibre packing is satisfactory for the piston rod. Both gears require four rings of ½ inch square packing.



LIST OF PARTS—TYPE D

Number	Name of Part	Pieces per Gear
1	Cylinder	1
2	Guide Support and Cyl. Head —Front	1
3	Cyl. Head—Back	1
4	Stuffing Box	1
5	Stuffing Box Gland	1
6	Stuffing Box Nut	1
7	Piston Head	1
8	Piston Packing Rings (3 Pieces)	1 Set
9	Piston Rod	1
10	Crosshead	1
11	Crosshead Shoe—Lower	1
12	Crosshead Shoe—Upper	1
13	Crosshead Shim	2
14	Crosshead Wrist Pin	1
15	Crosshead Key	1
16	Guide—Upper	1
17	Guide—Lower	1
18	Guide Hangers	2
19	Brake Crank	1
20	Brake Crank Rod	1
21	Brake Spring	1
22	Brake Spring Case	1
23	Brake Adjusting Screw and Nut	1
24	Brake Release Cylinder	1
25	Brake Release Piston	1
26	Brake Release Piston Packing Rings	2
27	Brake Release Piston Rod	1
28	Brake Release Piston Rod Jaw	1
29	Floating Lever	1
30	Floating Lever Rod to Crosshead	1
31	Floating Lever Rod to Bell Crank	1
32	Bell Crank Arm—Outer—With Shaft	1
33	Bell Crank Arm—Inner	1
34	Reverse Lever Rod Ends	2
35	Reverse Cyl. Valve Complete with Arm No. 41	1
36	Reverse Cyl. Valve	1
37	Reverse Cyl. Valve Body	1
38	Reverse Cyl. Valve Body Cap	1
39	Reverse Cyl. Valve Follower	1
40	Reverse Cyl. Valve Stem	1
41	Reverse Cyl. Valve Arm	1
42	Reverse Cyl. Valve Spring	1
43	Reverse Cyl. Drain Cocks (not shown)	3
44	Rod Jaw Pins	5
45	Valve Arm Pin	1
46	Crosshead Arm Pin	1
47	Crosshead Shoe Pin	1
48	Guide Hanger Pin—Upper	1
49	Guide Hanger Pin—Lower	1
50	Brake Fulcrum Pin	1
51	Brake Crank Pin	1
52	Brake Rod Jaw Pin	1
53	Reverse Lever	1
54	Reverse Lever Quadrant	1
55	Reverse Lever Latch	1
56	Reverse Lever Latch Spring	1
57	Reverse Lever Latch Links	2
58	Reverse Lever Latch Handle	1
59	Reverse Lever Fulcrum Pin	1
60	Reverse Lever Latch Pin	1
61	Reverse Lever Latch Link Pin	1
62	Reverse Lever Handle Pin	1
63	Brake Release Valve Complete	1
64	Release Valve Lever	1
65	Release Valve Lever Link	1
66	Release Valve Link Pin	1
67	Release Valve Lever Pin	1
68	Release Valve Lever Fulcrum Pin	1
69	Reverse Cyl. Oil Cup	1

When ordering a complete reverse gear, state whether it is to be operated by air or steam.
Repair parts for both gears are carried in stock. When ordering, state the type, and serial number of gear, also name and number of part.



LIST OF PARTS—TYPE E

Number	Name of Part	Pieces per Gear
1	Cylinder	1
2	Guides and Cyl. Head—Front	1
3	Cyl. Head—Back	1
4	Piston Head	1
5	Piston Packing Rings (3 Pcs)	1 Set
6	Piston Rod	1
7	Stuffing Box Ring	1
8	Stuffing Box Gland	1
9	Crosshead	1
10	Crosshead Arm	1
11	Crosshead Wrist Pin	1
12	Crosshead Key	1
13	Reverse Cyl. Valve Complete with Arm No. 20	1
14	Reverse Cyl. Valve	1
15	Reverse Cyl. Valve Body	1
16	Reverse Cyl. Valve Body Cap.	1
17	Reverse Cyl. Valve Follower	1
18	Reverse Cyl. Valve Spring	1
19	Reverse Cyl. Valve Stem	1
20	Reverse Cyl. Valve Arm	1
21	Reverse Cyl. Valve Arm Pin	1
22	Floating Lever	1
23	Floating Lever Rod	1
24	Rod Jaw	4
25	Rod Jaw Pin	4
26	Reverse Lever	1
27	Reverse Lever Quadrant	1
28	Reverse Lever Quadrant Supp't	1
29	Reverse Lever Latch	1
30	Reverse Lever Latch Guide	1
31	Reverse Lever Latch Handle	1
32	Reverse Lever Latch Link	1
33	Reverse Lever Latch Handle Pin	1
34	Reverse Lever Latch Link Pin	1
35	Reverse Lever Latch Pin	1
36	Reverse Lever Fulcrum Pin	1
37	Reverse Gear Oil Cup	1
38	Reverse Gear Drain Cocks	3

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