

# General Electric Company

Schenectady, N.Y.

May, 1919

\* Bulletin No. 44564

## STRAIGHT AIR BRAKE EQUIPMENT

For moderate speed city surface line cars, which are operated as single units, the straight air brake equipment is generally recognized as being the most suitable type of power brake. This type of equipment is composed of the minimum number of parts which can be installed and maintained at small cost, and provides a means for controlling the speed of a car with the highest degree of flexibility.

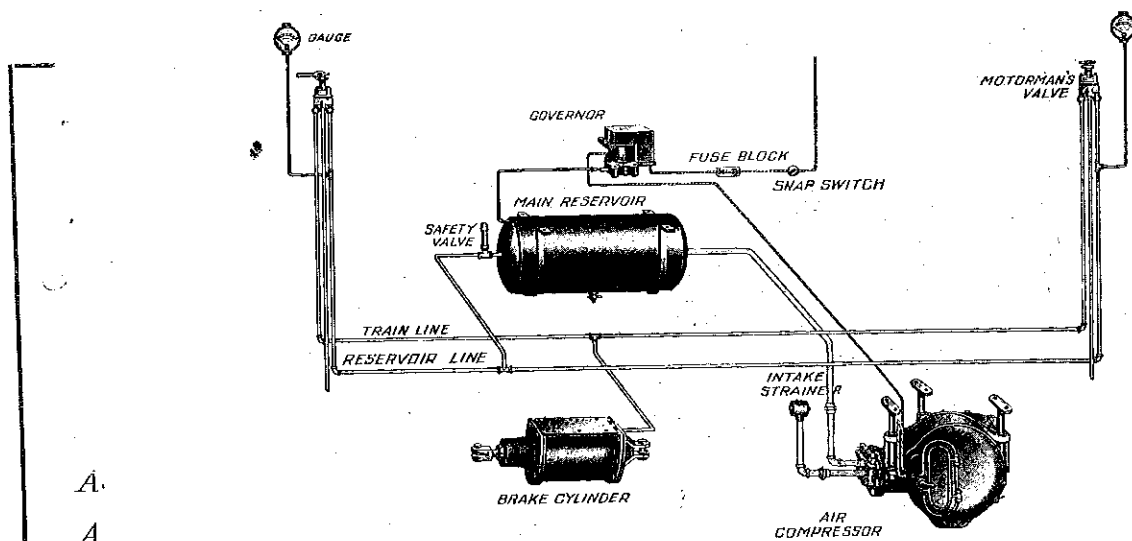
There are very few double truck cars in operation today which are not equipped with

### Pressure Regulating Equipment:

- Air Compressor Governor.
- Insulating Connection.
- 1/2-in. Safety Valve.

### Cab Equipment:

- Motorman's Valves.
- Motorman's Valve Handle.
- Single Hand Pressure Gauges.
- Snap Switch.
- Cutout with Fuse.



PIPING DIAGRAM OF STRAIGHT AIR BRAKE EQUIPMENT

air brakes, and during the past few years there has been a remarkable increase in the number of equipments applied to single truck cars.

A straight air brake equipment for a double end motor car consists of:

### Compressor and Auxiliaries:

- Motor Driven Air Compressor.
- Intake Strainer.
- Suspension Set.

### Brake Details:

- Straight Air Brake Cylinder complete with push rod.

### Main Reservoir and Accessories:

- Main Reservoir.
- Reservoir Hangers.
- Drain Cock.

NOTE.—Data subject to change without notice.  
\*Supersedes Bulletin 4798  
Class 1.

## 44564-2 Straight Air Brake Equipment

**MOTOR-DRIVEN AIR COMPRESSOR**

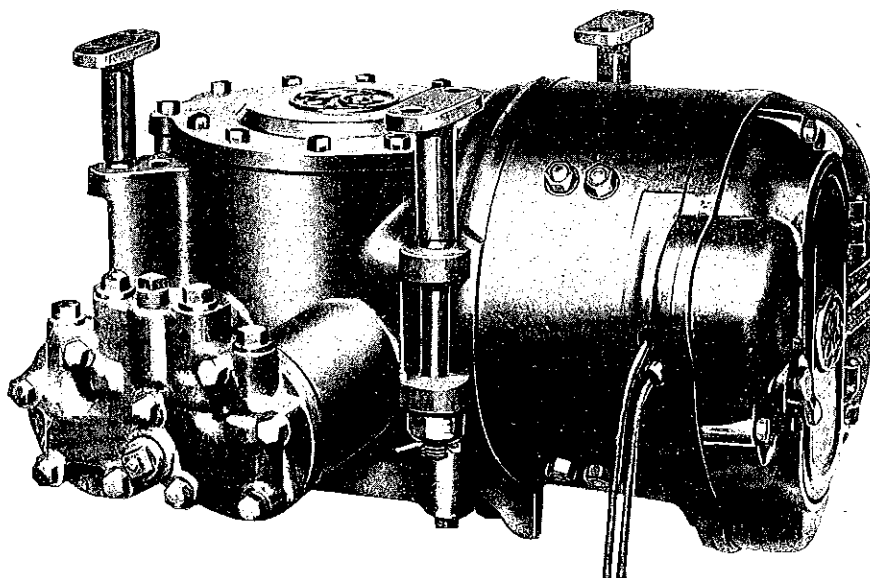
The compressor is of the enclosed type and all parts are thoroughly protected from dust and water, and, therefore, no external enclosing box or other covering is needed. It has duplex horizontal cylinders and herring-bone gear drive.

In every mechanical and electrical detail, the compressor is designed strictly in accord-

throws it in a steady stream into an oil pan on the underside of the crank chamber cover. Oil distribution to bearings is effected through large channels formed in the oil pan, from which the oil flows to the various bearings.

No oil waste or oil rings are used, and there are no pipes or small holes to clog with sediment or thick oil.

The oiling system is positive in action and continuously delivers oil to the bearings, which



AIR COMPRESSOR

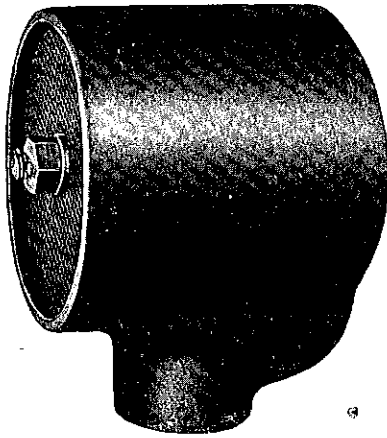
ance with the General Electric Company's standard railway motor practice.

All bearings and working parts are automatically lubricated from one source—a well, formed in the compressor frame immediately below the gear. This oil well is supplied through the oil filler, consisting of a projecting elbow fitted with a handle plug so designed that any dirt collected around it is lifted off when it is unscrewed, thus preventing dirt from entering the oil hole. This oil filler is immediately accessible from the side of the car, and of such a height as to insure the proper oil level in the crank case. The driving gear picks up oil from the well and

flows back into the well after doing its work. So long as oil remains in the well, all parts of the compressor are perfectly lubricated.

The compressors, which are the latest design, have been developed after long experience in the building of air compressors. They are accessible, and the general design is simple and well balanced.

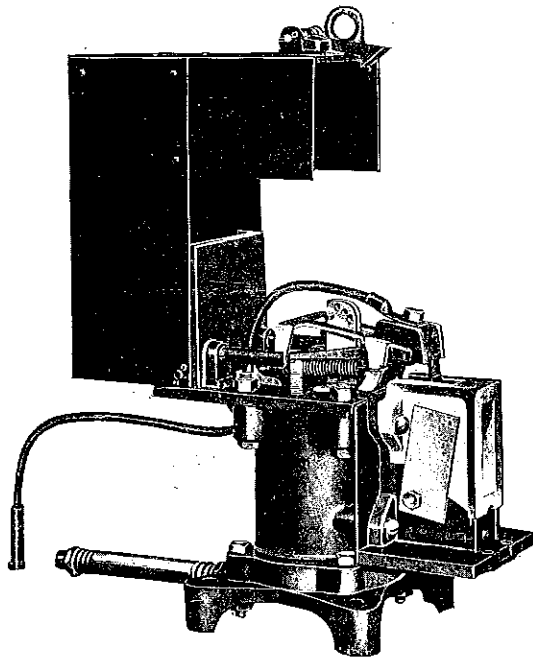
Compressors of this type are manufactured in several sizes to meet the requirements of all classes of railway service. Although primarily designed for installation on electrically operated cars, these compressors are perfectly adapted for any class of work requiring the use of compressed air.



INTAKE STRAINER

### INTAKE STRAINER

The supply of air is drawn into the cylinders through an intake pipe which has a strainer containing curled hair on the end farthest from the air compressor. This strainer should be placed inside the car.



AIR COMPRESSOR GOVERNOR

### AIR COMPRESSOR GOVERNOR

The governor is essentially a single-pole switch of the contactor type, operated by means of a rubber diaphragm, a piston, and a set of levers. The operating mechanism is simple, compact, and reliable. The construction of this governor is such that air does not pass through, or come in contact with the operating mechanism, but is restricted to a chamber below the diaphragm, hence troubles resulting from condensation are eliminated.

The essential points of advantage in this type of governor are:



SAFETY VALVE

Interrupting switch provided with an arc chute of highly refractory material, an effective magnetic blowout, and easily renewable contacts. Arc chute can be quickly removed for inspection or repairs without disturbing any other part or any electrical connections.

Operating mechanism arranged so as to maintain constant pressure on contact tips until point of tripping is reached, insuring a quick break of the contacts when opening the circuit.

A wiping action takes place between the contact tips when the compressor circuit is opened or closed. This action prevents pitting and materially increases the life of the tips.

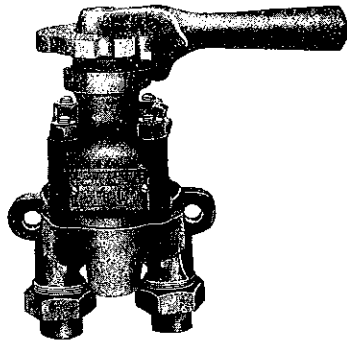
All principal bearings are provided with hardened knife edges to reduce friction and to insure a quick snap action.

44564-4 Straight Air Brake Equipment

Provision is made for quickly changing the range or difference between opening and closing pressures.

**SAFETY VALVE**

The safety valve is similar in construction to the pop safety valve used in steam practice and can be readily adjusted by removing the cap on the upper part of the valve and turning the adjusting screw. All standard safety valves are adjusted to open at 100 lb. per square inch.



MOTORMAN'S VALVE

**MOTORMAN'S VALVE**

The motorman's valve is a three-way valve of the rotary type. The principal parts are the valve body, bonnet, valve stem, and rotary valve.

The rotary valve operates on a raised seat formed on the upper surface of the valve body. The ports of the rotary valve and valve body are machined accurately to size and position, and are located so as to perfectly balance the valve and reduce wear to a minimum.

The stem is steel, case-hardened, and is provided at the base with a ball seat which prevents leakage between the stem and bonnet. The bonnet is provided with a bushing of composition material which serves as a bearing for the stem and can be renewed when worn.

The surface of the valve quadrant which is machined to indicate the operating positions, is case-hardened to reduce wear. The bonnet

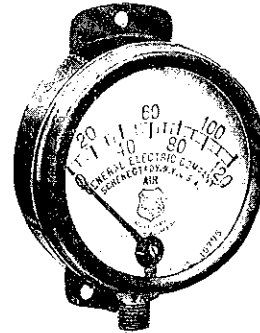
is provided with a case-hardened wearing pad which relieves the stem of strains due to the operator leaning on the handle.

The positions of the valve handle and functions performed are as follows:

**Release Position:** Direct connection is made between the train line and exhaust through a large port.

**Slow Release and Running Position:** Train line is connected to exhaust through a restricted port.

**Lap Position:** All ports are blanked. This is the only position in which the handle can be removed.



PRESSURE GAUGE

**Service Application Position:** Connection is made between the main reservoir and train line through a series of small ports.

**Emergency Position:** In this position the valve handle is at the extreme right and connection is made from the main reservoir to train line through a large port.

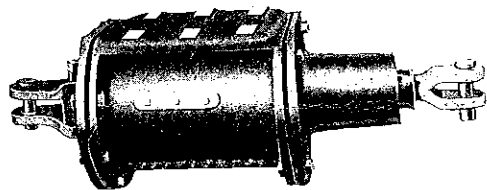
**PRESSURE GAUGES**

The pressure gauges are especially adapted for this class of service. These gauges are constructed in such a manner that they will retain their calibration indefinitely. With straight air brake equipments single hand gauges are furnished for connection to the main reservoir line. When desired these gauges can be provided with an illuminating attachment which contains a small  $\frac{3}{4}$  c-p. lamp; this lamp to be located on the ground side of one of the car lighting circuits. If desired duplex gauges which indicate brake

cylinder and main reservoir pressures can be furnished.

### SWITCH AND FUSE

The switch is a 600-volt, 10-ampere snap switch of the quick break type. All current carrying parts are enclosed in porcelain. The poles and barriers are arranged so as to insure the prompt extinguishing of the arc.



BRAKE CYLINDER

The fuse is of the cartridge type and held in place by two fuse clips mounted on a porcelain base.

### BRAKE CYLINDER

The brake cylinders furnished with these equipments are designed with a view of incorporating such features as have been found to be most satisfactory in the past, and which therefore have become almost universally standard. The packing leathers are treated by a special process which renders them air-tight. The pressure head of the cylinder is provided with a boss to which malleable iron brackets are attached for receiving the dead cylinder lever. When desired a slack adjuster of approved type can be furnished with these cylinders and can be attached to the boss in place of the brackets.

Cylinders are fitted with a tubular piston rod which surrounds the push rod which attaches to the live cylinder lever. This construction permits of the brakes being applied by hand without moving the brake cylinder piston.

### MAIN RESERVOIR

Reservoirs are made of a special grade of steel and are so constructed as to give maximum strength with minimum weight. A one-half inch drain cock of substantial construction with a large opening is furnished with each reservoir.

Reservoirs are tapped at one end for the pipe connection to the compressor, and at the other end for the pipe connection to the main reservoir line leading to the motorman's valves (see page 6). Provision is also made for separate connection to the air compressor governor. Reservoir hangers are supplied for attaching to the car body.

### MATERIAL AND WORKMANSHIP

Special attention is given to the character of workmanship and material entering into the construction of all air brake equipment parts. Each piece of apparatus is subjected to rigid inspection and test during the process of manufacture and after it is completed.

The wide experience in the manufacture of high-class electric railway apparatus is a guarantee that the air brake equipments placed on the market by the General Electric Company embody all the best features of design which have withstood the severe tests of practical service, thus insuring safety, reliability, and efficiency.

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