WESTINGHOUSE TRACTION BRAKE COMPANY

PITTSBURG, PA. U.S.A.

D. C. UNIT, T 2012=B
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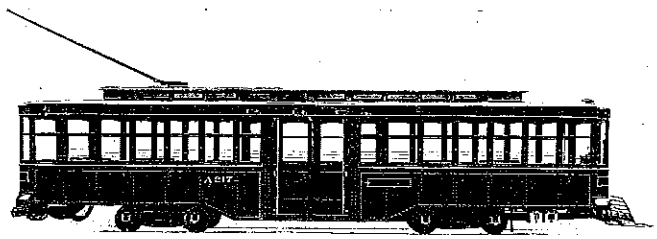
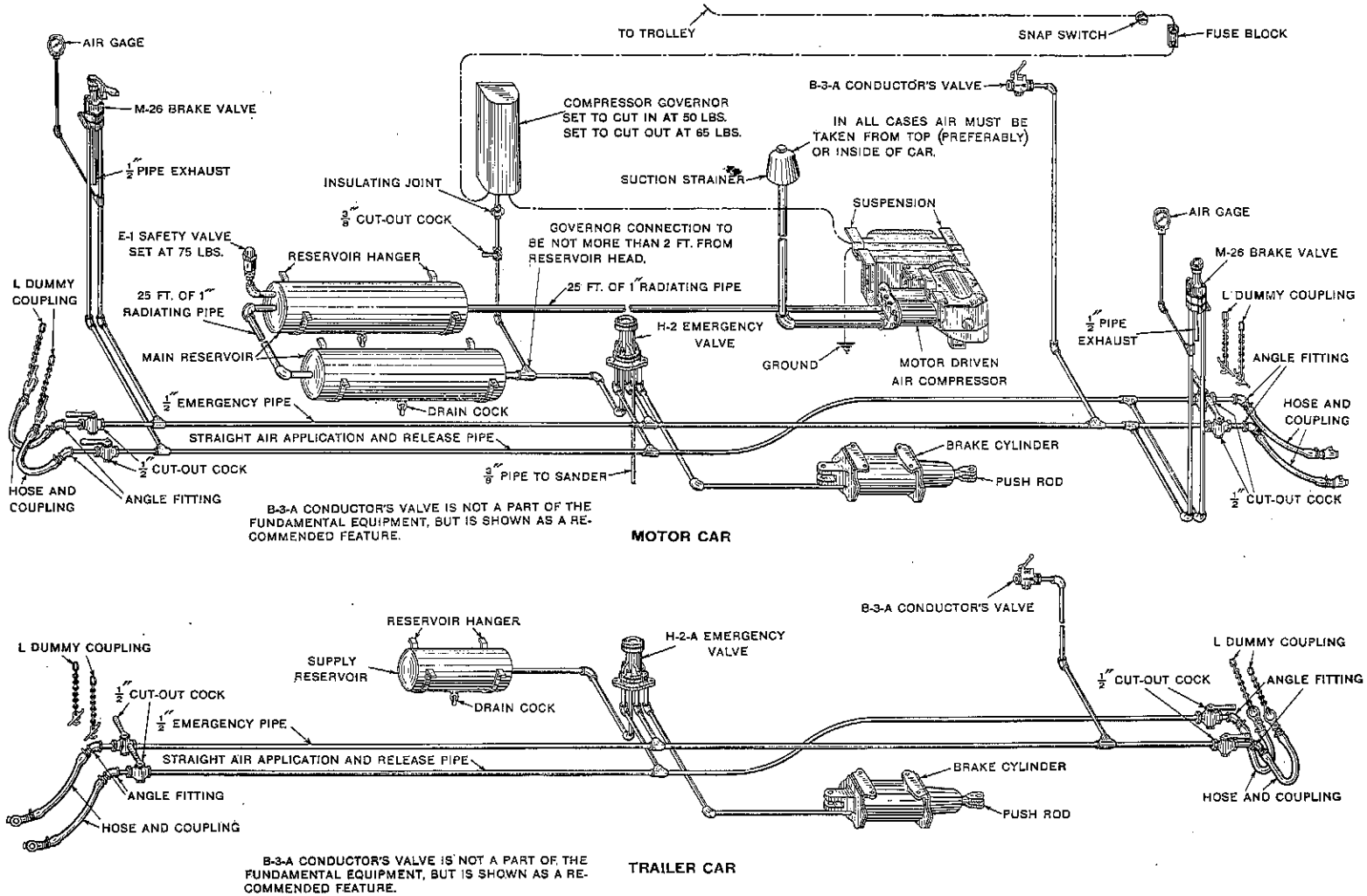


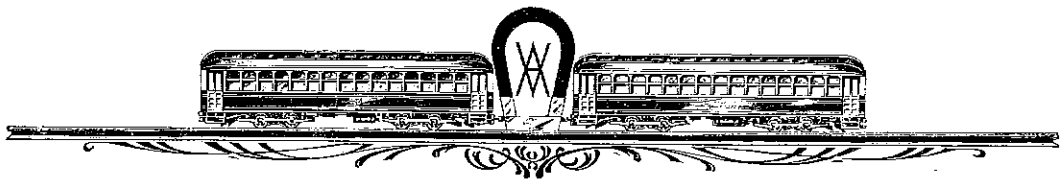
MOTOR CAR WITH FEATHERWEIGHT "SME" EQUIPMENT

FEATHERWEIGHT
STRAIGHT-AIR BRAKE EQUIPMENT WITH EMERGENCY FEATURE.
SYMBOL SME.



Diagrammatic Illustration of the Featherweight SME Straight-Air Brake Equipment with Emergency Feature (Type "H" Emergency Valve)

Combines the flexibility of the straight-air brake and in a large measure the safety of the automatic system.



Westinghouse "Featherweight" Straight-Air Brake

With Automatic Emergency Feature

Symbol "SME"

(Type "H" Emergency Valve)

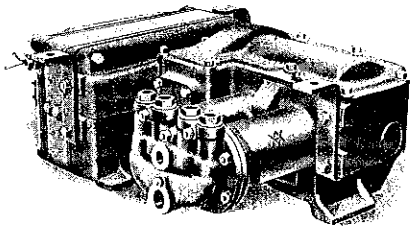
For Single Cars or Motor Car—Trailer Train Operation

THE effort to reduce car weight per seated passenger has precipitated some very interesting problems not only in the design and construction of the car itself but in the equipment installed thereon. Very remarkable progress has already been made in the direction of light weight "Low Side," "Easy Entrance—Easy Exit," and "Double Deck" cars, not only with a view to reducing dead weight and therefore the actual cost per annum for hauling the car over the road, but to concentrate maximum passenger loads in single car units and thereby increase operating profits. Overall car dimensions which permit operation on maximum curves and under minimum clearances is also of considerable importance on many roads.

In order to meet the demand for weight reduction at all points, we have designed the Westinghouse "Featherweight" Straight Air Brake with Automatic Emergency Feature, having in mind primarily light car city service, where, by reason of traffic conditions or otherwise, single car operation is the rule, or, at the most, motor-car trailer train service.

In designing this "Featherweight" Equipment every part of the air brake apparatus was carefully reviewed to determine the possibilities of reducing weight without at the same time sacrificing other factors even more important. As a result, we are able to submit herewith a very simple form of brake equipment which has many advantageous features to commend it,

and which will prove absolutely satisfactory and reliable within the range of service conditions for which it is adapted.

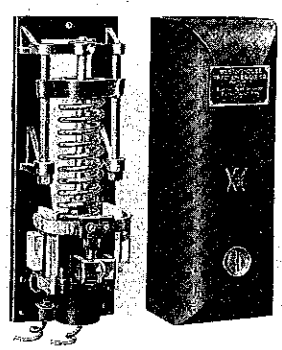


Motor Driven Compressor
In Suspension

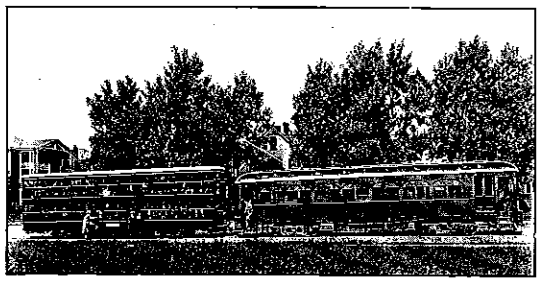
The cut on page 2, shows an isometric view of the "Featherweight" Equipment, including cut-out cocks, angle fittings, and hose connections, assuming that a trailer is to be handled, and gives a very clear idea of the relatively few parts and extremely simple arrangement of the apparatus. As will be observed, the "Featherweight" SME Equipment is a "two pipe" system, that is, only two pipes are required to the brake valve, namely, *emergency pipe* and *straight-air application and release pipe*, whereas other forms of SME Equipment require in addition a *main reservoir pipe*. The advantages of a "two pipe" system as compared with a "three pipe" system are a reduction in the cost of installation and maintenance, since there are fewer pipes from which leakage can occur. In addition, the "Featherweight" Equipment may be operated with practically any form of *straight air* brake valve since only two pipe connections are required to the brake valve. This feature, therefore, enables any *straight air* brake equipment to be readily changed over to a *straight air brake with automatic emergency* feature of the "Featherweight" type simply by the addition of the emergency valve.

The equipment for a motor car includes the following:

A Motor Driven Compressor of the standard Westinghouse Duplex Cylinder Gear Driven type, and which is the result of many years of experience in the design and construction of compressors for *air brake service*. The compressor used with our "Featherweight" equipment has a displacement of 16 cu. ft. per minute, weighs 565 pounds, and embodies all of the latest improvements, including provision for preventing oil passing into the brake system and thereby causing detrimental effects; few bolts throughout, facilitating taking apart and assembling; laminated field yoke; elimination of bed plate; simplicity of suspension; easily removed armature; easily adjusted brush pressure; perfect alignment; accessibility of all working parts; minimum *height* overall, particularly



Compressor Governor



Motor Car with Double-Deck Trailer

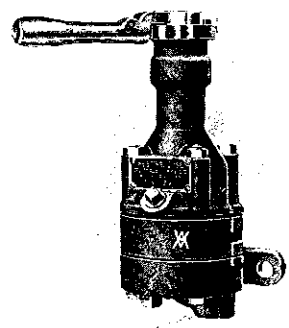
desired for low side cars; separate air strainer for intake; extremely light weight; large capacity; and efficient motor. The compressor may be suspended from the car underframe by special light weight hangers or installed inside the car, as circumstances demand.

The G-1-D, Magnet Type, Light Weight Compressor Governor, which is a very simple and inexpensive automatic controlling device, provided with moulded insulation contact parts. Thousands of governors of this type have been in service for many years, and have given universal satisfaction.

Two Main Reservoirs for air storage and cooling purposes and of such construction as to insure lightest weight consistent with greatest strength. These reservoirs are made of lighter sheets than standard; body seams and heads are brazed, making absolutely air-tight construction and insuring minimum weight. Suitable Drain Cocks and light weight Hangers are furnished with these reservoirs.

A Safety Valve of improved type and very reliable, which is quite important in event of excess pressure building up in the main reservoirs from any cause.

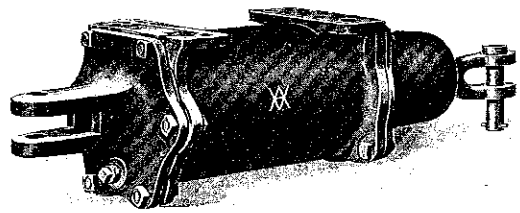
Two M-26 Brake Valves which are an improved type of straight air brake valve, being provided with means of governing the *time* of straight air applications for various cylinder volumes. This is accomplished by the use of chokes in the service ports, which are made to vary with the different requirements. This Brake Valve is of the rotary type with a removable handle. The operating parts are contained in a body, mounted on a bracket to which all the pipe connections are made, so that the valve may be removed for examination and repairs without breaking any pipe joints. Three pipe connections are provided on the bracket as follows: *Straight air application and release pipe*, *emergency pipe* and *exhaust pipe*. The latter connection is made, however, only when it is desired to pipe the exhaust to a muffler placed under the platform to subdue the sound of the brake valve exhaust. Raised letters are cast on the bottom of the pipe bracket to insure that proper connections are made.



Brake Valve

Single Pointer Air Gages showing main reservoir pressure.

Non-Closing Conductor's Valve, which is not regularly supplied as a fundamental part of the equipment but is furnished when desired. This valve is connected with the Emergency Pipe so that the conductor can make brake application and stop the car if conditions require. This is an important feature, since it enables control of the car in emergencies by either motorman or conductor, and therefore very greatly increases the factor of safety in operation

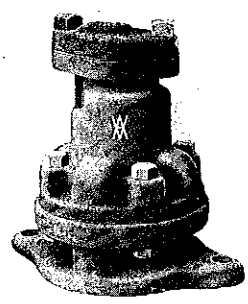


Brake Cylinder

Emergency Valve, Type "H," of extremely simple design, and of such light weight that it may be installed directly in the piping. This valve operates to apply the brakes automatically in emergency, should the emergency line be ruptured from any cause. An emergency application may be obtained also by the motorman at the brake valve, or by the conductor operating the conductor's valve, as already described. The emergency valve for the motor car is designated as "H-2" and is provided with sanding feature for emergency applications; the emergency valve for the trailer is designated "H-2-A" and does not have a sanding feature.

Brake Cylinder, of special light weight design and with plain head, suitable for weight of car to be controlled.

In addition to the above this equipment includes Cut-out Cocks, Angle Fittings, Hose and Couplings and Dummy Couplings at both ends of the car, for both Straight Air Application and Release Pipe, and Emergency Pipe. If it is intended to haul a trailer, the equipment for the trailer includes simply a Brake Cylinder, Emergency Valve, and Supply Reservoir with Drain Cock; also Hose Couplings, Angle Fittings, Cut-out Cocks, Dummy Couplings for the Straight Air Application and Release Pipe and Emergency Pipe, as illustrated.



Emergency Valve

The equipment operates as follows in response to the manipulation of the brake valve handle:

1st. *Quick Release* position, in which the brake cylinder is connected to the brake valve exhaust through a large opening, thus permitting a quick release of the brakes.

2nd. *Slow Release* position, in which the brake cylinder is connected to the

exhaust but through a smaller opening than in *Quick Release*, thus permitting a somewhat slower release of the brakes.

3rd. *Lap* position, in which all ports in the valve are blanked, thus holding any pressure in the brake cylinder that may have been established therein. This is the only position in which the brake valve handle can be removed.

4th. *First Service* position, in which air from the main reservoir passes through the emergency valve and thence through a small opening in the brake valve back to the emergency valve and brake cylinder.

5th. *Second Service* position, in which air from the main reservoir passes through the emergency valve and thence through a larger opening in the brake valve than in *First Service* position back to the emergency valve and brake cylinder. This position is ordinarily used when operating in two car service.

6th. *Emergency* position, in which a large opening is made from the emergency pipe to the atmosphere, thus allowing the air in the emergency pipe to escape quickly to the atmosphere. This causes the emergency valve parts to so operate as to admit main reservoir air through a large opening direct to the brake cylinder.

While we strongly recommend *some* form of automatic emergency brake equipment even for *single cars* in the *lightest service*, if a "Featherweight" Straight-Air Brake Equipment only is desired, it is merely necessary to omit the Emergency Valve, Conductor's Valve, and Emergency Pipe Line with Hose and Couplings, Dummy Couplings, Angle Fittings, and Cut-out Cocks, from the motor car equipment.

We believe there is a large field for this "Featherweight" Straight-Air Brake Equipment with Emergency Feature in certain classes of light car city service, particularly where serious traffic congestion exists, the automatic emergency feature providing a factor of safety and a much more complete control of the car not possible with the simple straight-air brake equipment.

Complete information and recommendations in regard to the application of this "Featherweight" equipment under specific conditions will be furnished promptly on request direct to our nearest District Office.