

## "National" Type $\frac{1}{2}$ -Inch "PV"

Every master mechanic engaged in traction work will appreciate the advantage of installing Type  $\frac{1}{2}$ -inch piston valve which is shown in Figure No. 7. Car barn men have experienced considerable trouble in repairing valves where the air tightness depends on ground joints and in most instances the average mechanic is compelled to devote many hours to such repairs, as a result of which the shop expense is greatly increased. Type "PV" is specially designed to overcome these difficulties, being constructed without ground joints. The valve bonnet is singularly free from air pressure except when the brake cylinder is charged, thus eliminating chances for constant leaks around the valve stem, bonnet or seat, which frequently occur in all types of slide or rotary valves. The admission and release valves are provided with an inexpensive seat of composition material which effectually prevents the escape of air and is so arranged that should this part, in time, become displaced or slightly worn, it is an easy matter to quickly adjust same or replace it with an entirely new seat. The valve can be completely disassembled without disconnecting or draining the main reservoir, although this does not apply when it is desired to remove the admission valve. Lubrication is simply effected by removing the screw in the valve stem, this being the only part that requires oiling.

Type  $\frac{1}{2}$ -inch "PV" has been thoroughly tested by numerous electric traction companies, and in all instances has proven extremely efficient.

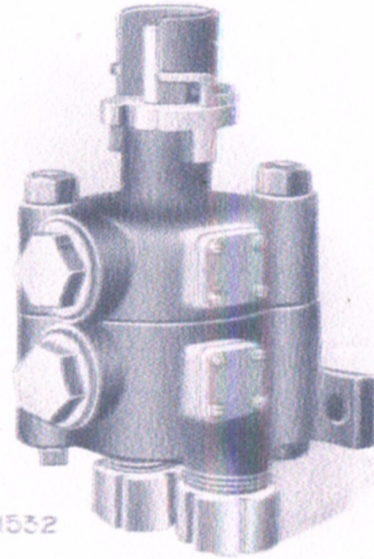


Fig. 7—"National" Type  $\frac{1}{2}$ " "PV".

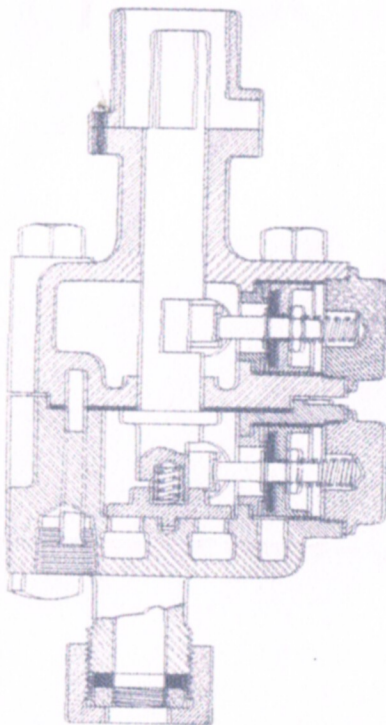


Fig. 8—Sectional diagram "National" Type  $\frac{1}{2}$ " "PV".

### Description

Externally, Type "PV" has the same appearance as the valves previously described except that a boss is cast on bonnet and base to accommodate admission and release valves. The upper part of the valve bonnet contains valve stem, seat, release valve and lever. An admission valve, lever and graduating device are situated on the lower part of the base which is so constructed that Type "PV" may be installed in place of any  $\frac{1}{2}$ -inch "National" type without changing the piping or valve brackets.

Figure No. 8 is a sectional view of the valve with the handle removed, at which position the admission and release valves are seated, while the graduating valve closes the ports leading to the brake cylinder and release valves. The valve stem is so milled that

when the operating handle is moved to the right of center, the lever of the admission valve is pushed outward, thus forcing the valve from its seat. In the same manner, a movement of the handle from left of center displaces the

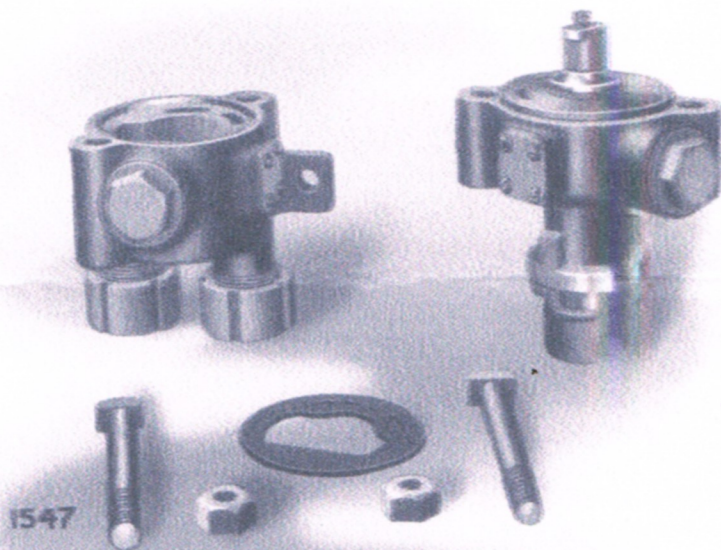
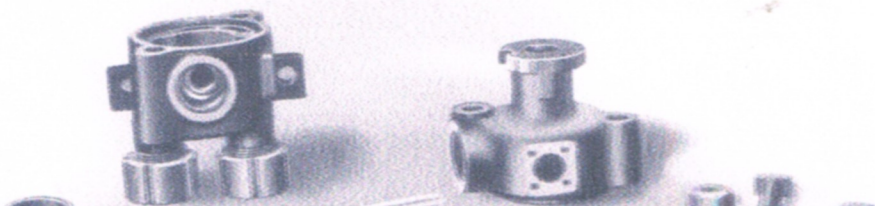


Fig. 9—Bonnet and base of "National" Type  $\frac{1}{2}$ " "PV", separated.

release valve. The admission and release valves are interchangeable, and as previously noted, are equipped with a seat of composition material that renders them impervious to moisture and oil. The graduating valve is a flat disc with face and seat accurately machined, the upper part of the valve being so milled as to engage the lower portion of the valve stem, thus transmitting



## Full Release Position

With the operating handle in this position, the release valve is held from the seat, while the graduating valve uncovers the full area between the brake cylinder and atmosphere, a direct communication being established between the two through a large opening. A sure, quick release is thus given to the brakes.

## Slow Release or Running Position

As in the preceding position, the release valve is held from the seat. The graduating valve, however, restricts the port openings to brake cylinder, valve bonnet and atmosphere, to a very limited area. This results in the gradual discharge of air pressure in the brake cylinder and a slow release of brakes.

## Lap Position

In the lap position, all valves are rendered inoperative, the operating handle being also removable in this position.

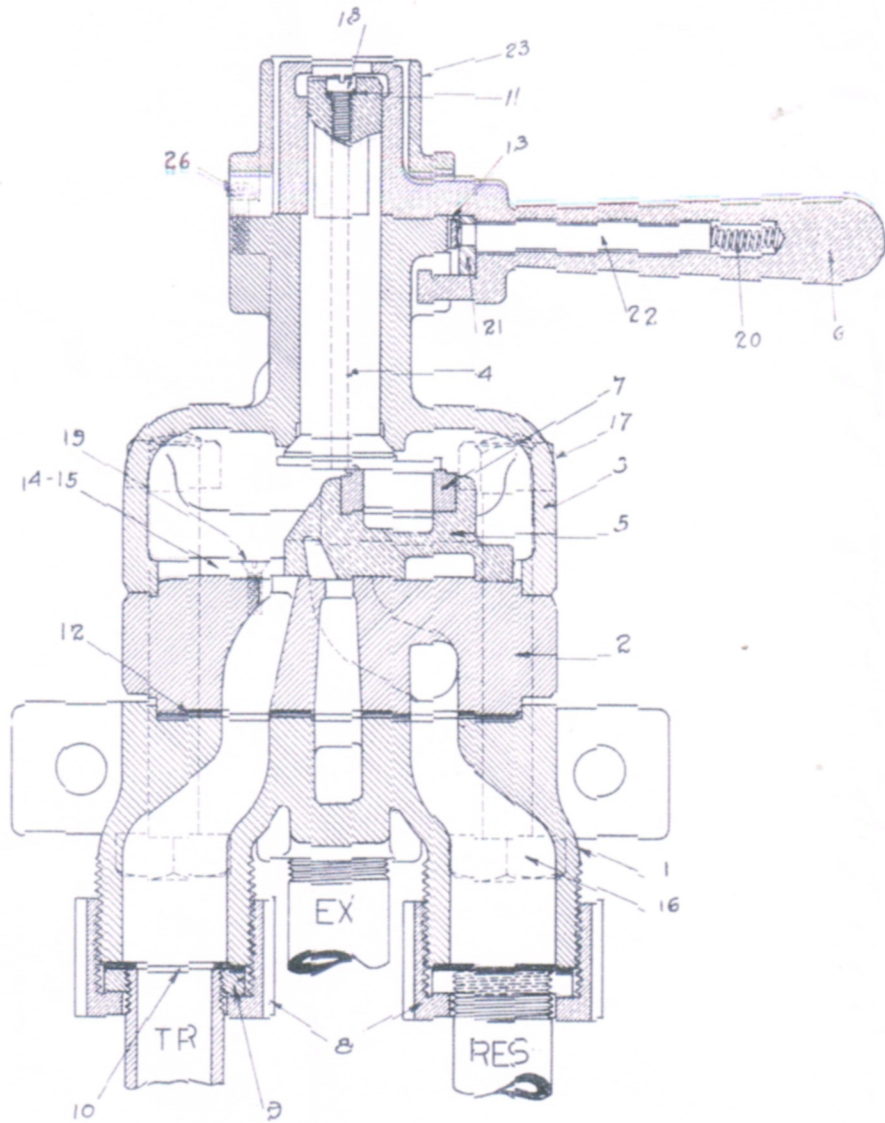
## Service Application Position

In this position the admission valve is open, establishing communication between the valve bonnet and main reservoir. At the same time the graduating valve restricts the opening between the valve and brake cylinder, the pressure of the latter thus being gradually raised.

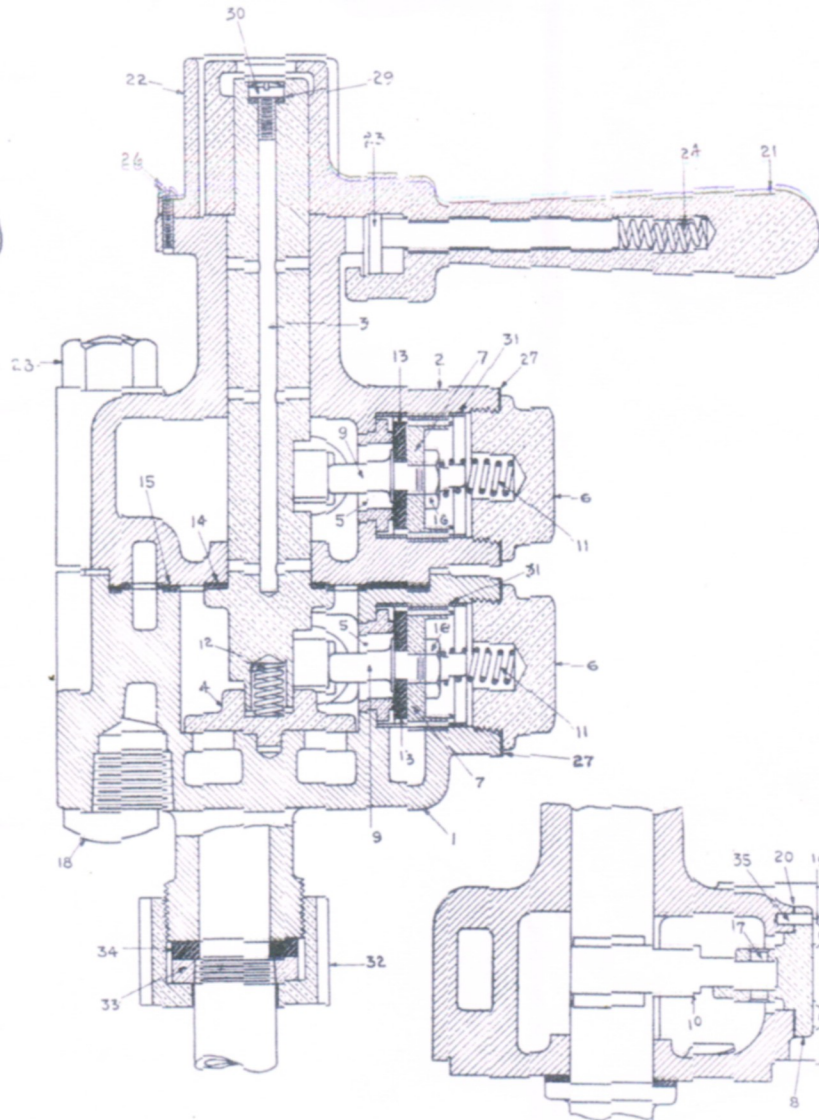
## Emergency Application Position

When the operating handle is moved to this position, a full, unrestricted opening is established between the reservoir and brake cylinder, allowing a rapid equalization of air pressure in both compartments. A maximum braking force, in the shortest possible time, is thus effected.

National Type "J" 3/4-inch Valve



National Type 1/2-inch Piston Valve



National Motorman's Valves

National Motorman's Valves