S. R. KNEELAND.

RELIEF VALVES FOR AIR-BRAKES.

No. 190,223. Patented May 1, 1877.

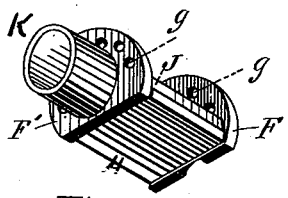


Fig. 1.

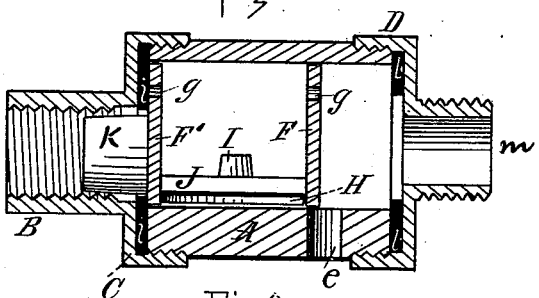


Fig. 2.

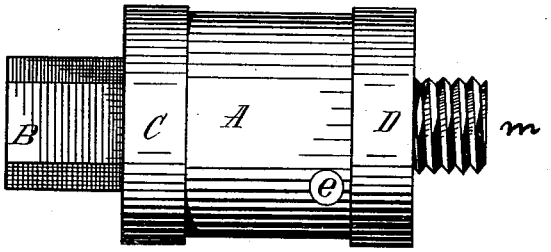


Fig. 3.

Witnesses:

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SYLVANUS R. KNEELAND, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN RELIEF-VALVES FOR AIR-BRAKES.

Specification forming part of Letters Patent No. **190,223**, dated May 1, 1877; application filed March 2, 1877.

*To all whom it may concern:*

Be it known that I, SYLVANUS R. KNEELAND, of Boston, in the county of Suffolk, State of Massachusetts, have invented certain new and useful Improvements in Valves, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which my invention appertains to make and use the same, reference being had to the accompanying drawing, forming a part of this specification, in which—

Figure 1 is a view of the valve detached from the case; Fig. 2, a vertical longitudinal section, and Fig. 3 a side elevation.

Like letters of reference indicate corresponding parts in the different figures of the drawing.

My invention relates to that class of valves which are employed in air-brakes for railway-cars; and consists in a novel construction and arrangement of the parts, as hereinafter more fully set forth and claimed, by which a simpler, cheaper, and more effective device of this character may be produced than is now in ordinary use.

In the drawing, A represents the case or body of the valve; D, the screw-cap forming the head next the cylinder of the brake; C, the screw-cap forming the head nearest the locomotive when the valve is in position.

The lower portion of the case is thickened, and through the thickened portion there is a hole, *e*, connecting the interior and exterior of the case. The thickened portion of the case is leveled or planed on its interior surface to form a seat for the sliding valve J. This valve has two semicircular vertically-arranged heads, F F′, each being provided with a series of perforations, *g g*, the head F′ having also a horizontally-projecting cylindrical arm, K.

Beneath the body of the valve J there is a plate, H, fitted to slide laterally between the lower sides of the heads F F′, as seen in Fig. 1. This plate has an upwardly-projecting stud, I, which is fitted to work in an aperture (not shown) in the body of the valve J, the aperture being considerably larger than the stud to permit free movements of the plate.

In the use of my improvement, the valve J, with its plate H, is inserted in the case A, the arm K projecting into the neck B of the cap C, as shown in Fig. 2. Air being now let in through the neck B, to apply the brake, will cause the valve J to slide on its seat, the plate H closing the hole *e*, the slide continuing to advance until it strikes the packing-ring *l l* between the body A and cap D. The air on its way to the cylinder will now pass through the holes *g g*, the aggregate area or capacity of which is equal to that of the neck *m*.

In letting off the brakes when the pressure is removed suddenly, the expansive action of the air in the cylinder will allow it to return through the neck *m*, causing the valve J to slide toward the head C, and opening the hole *e*, through which the air will escape, the neck B, at the same time, being closed by the arm or projection K.

The valve J, sliding freely on its seat, is easily moved by the impact of the air, entering the case A, either on its way to or from the cylinder; hence it will be seen that in applying the brakes the eduction-aperture *e* will always be instantly closed without interfering with the passage of air through the valve *via* the holes *g g* and neck *m* to the cylinder. It will also be obvious that in letting off the brake suddenly, the pressure being removed from the air passing through the neck B, the expansion of the air in the cylinder, reacting against the head F through the neck *m*, will instantly close the neck B by means of the arm K, at the same time opening the hole *e;* but when the brakes are let off gradually at the engine, the valve J will not be moved from the head D, or the hole *e* opened, but the air will pass from the cylinder gradually through the holes *g g*, thus "relieving" the brake without "tripping" the valve—a very essential feature of my invention.

The object of the plate H is to provide a perfect means of closing the hole *e* in case the valve J is raised or partially turned by the action of the air against its heads F F′.

It will be understood that as the valve is moved toward the neck *m*, when the head F comes into contact with the packing-ring *l* beneath the cap D, there is sufficient space between the head and cap to allow the air to pass freely to the neck, and through it to the cylinder; and that, when the head F′ is in

contact with the packing-ring *l* beneath the cap C, air cannot pass through the neck B, but may escape from the cylinder through the hole *e*.

Having thus explained my improvement, what I claim is—

1. The combination, with the case A, having port *e*, and caps C D, and valve J, constructed substantially as described, of the plate H, substantially as and for the purpose specified.

2. The combination, with the case A, having port *e*, and caps C D, neck B, and plate H, of the valve J, having the arm K, substantially as and for the purposes specified.

SYLVANUS R. KNEELAND.

Witnesses:
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