Should either of the tender valves get out of order on the journey, and it becomes necessary to stop the feed by other means, it is only requisite to slack back the bolts of the coupling flanges, and introduce a piece of sheet iron or zinc between them, of sufficient width to cover the orifice of the feed pipe. This simple and effectual mode of stopping the feed was suggested and adopted by Mr. Ramsbottom, of the London and North Western Railway, on which, as well as on several other lines of railway, this water connexion has been in successful operation for several months.

Mr. FENTON showed a specimen of the new coupling pipe, partly cut open, in order to show the action of the india rubber rings; also separate specimens of the rings.

Mr. RAMSBOTTOM said he had had one of these coupling pipes in use rather more than two months on a locomotive, and it had worked so far very satisfactorily; the india rubber rings showed no signs of wearing out at present. He thought it decidedly a good plan, and likely to prove advantageous in use.

Mr. CRAIG had had one of them at work about three months, applied to a stationary force pump, working under 300 lbs. per inch pressure, and it had proved quite successful. He had now applied them to several locomotives, and was well satisfied with the results; he considered they would be much less expense to keep in order than either the hose pipes or the ball and socket couplings, and the economy of first cost was also in their favor.

Mr. W. B. JOHNSON had found india rubber valves last many years in steam engine air pumps, where they were exposed to a considerable temperature, sometimes 150°, but the material was subjected only to simple bending.

In answer to an inquiry of the Chairman, Mr. Fenton said, the cost of the coupling was £2 per set as compared with about £12 12s. for the brass ball and socket couplings,—being only about one-sixth in first cost; and there was also a considerable saving in the cost of maintenance. The rolling action to which the packing rings were subjected did not appear to be injurious to their material, as they had already run upwards of 8000 miles without any sign of injury, although exposed to the heat of blowing steam into the tender in the ordinary manner.

Proc. Insti. Mech. Engineers, London.

*Description of a Valve Guard against Excess of Steam Pressure and Deficiency of Water.** By JAMES CLARKSON KAY.

[Extracted from a Paper read at the Institution of Mechanical Engineers, Birmingham.]

A is a pipe fixed to the boiler, upon which the valve case B is placed. In the valve case B, is the valve seating C, constructed in the form of a cup, at the bottom of which the valve D is seated; the seating portion of the valve is of a spherical form, and above the valve and form-

*From the Lond. Civ. Eng. and Arch. Journ., April, 1858.

ing part of it, is placed a disk E, of larger diameter than the valve. The valve is placed on a spindle F, to which is attached a weight G, which loads the valve. The weight G may be made in any form convenient when acting simply for a steam pressure safety valve; but in this case, when the valve is intended to act also as a low water safety valve, the weight is made in the form of a lever, at the end of which is placed a stone float H, the combined weight of the lever, float, rods, &c., less by the weight of water displaced, being the load of the valve.

When the steam-pressure in the boiler acting on the underside of the valve D exceeds the load, the valve is raised; and the steam then acting on the enlarged area of the disk E, and being partially confined by the cup C, the valve continues to rise until a discharge of steam takes place through the pipe I, equal to the area of the pipe or valve seating.

In the case of low water in the boiler, the float sinks as the water lowers; and the increased weight at the end of the lever G brings the brass centre pin L to rest on the fulcrum or stirrup M, and raising the pin N, in the loop of the valve rod, unloads the valve, leaving it free to the action of the steam; the discharge of steam then takes place irrespective of the pressure of steam at the time or the size of the valve.

On an Improved Construction of Upright Steam Boilers.

By MR. THOMAS DUNN.

The early forms of upright boilers, with chimney placed through the crown of the boiler, or in the side near the top, allowed a great portion of the heat to pass into the chimney flues. An attempt was made some years ago to retain this heat, by placing tubes of small diameter in the