The Red Sky Explained.

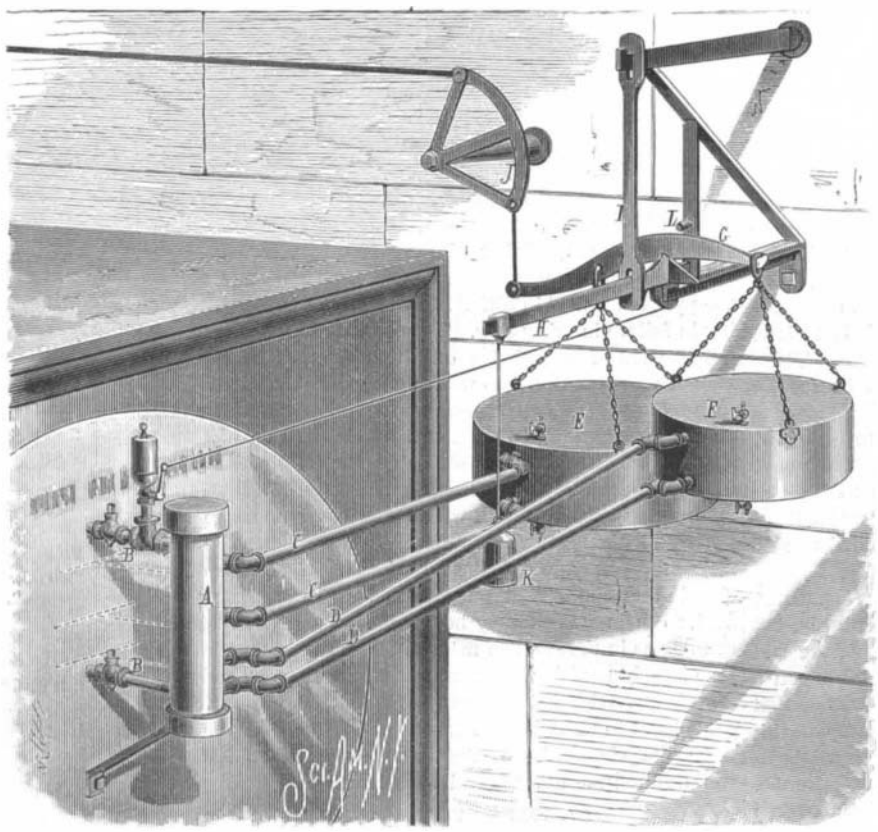
The red afterglow that has caused so much discussion among philosophers is now explained by a correspondent of the SCIENTIFIC AMERICAN, who asserts that the phenomenon is due to the red spot from the planet Jupiter. This great rosy cloud disappeared several months ago from the atmosphere of Jupiter, has had just time, according to this correspondent, to travel to our earth, and is now hovering over us, causing the ruby coloring of our skies night and morning. Nobody ever has or will be able to prove that this is not the fact; therefore, it must be true, says the correspondent. The question is settled; it is useless to talk further about cosmic dust, Java ashes, or aqueous vapor.

FEED WATER REGULATOR AND ALARM.

The device shown in the accompanying engraving is a combined feed water regulator and low water alarm for steam boilers; the supply of water to the boiler is automatically regulated, and, in the event of the water falling dangerously low, a whistle sounds the alarm. The dotted lines, B B, indicate the different water levels in the boiler, the upper line representing the highest water level, and the lower line a dangerous level. Two closed vessels, E F, are suspended from a beam, G, upon opposite sides of its fulcrum. When arranged at like distances from the fulcrum they should be made of different sizes; thus the vessel, E, should have twice the capacity of the other, so that when it is half full of water it will balance the other when full. The beam, G, is fulcrumed near the end of another beam, H, which works on a fixed fulcrum. The other end of the beam, H, has attached to it a weight, K. A closed upright pipe, A, is connected above and below, by branches, with the steam and water spaces of the boiler. This pipe is connected at different elevations, by flexibly jointed pipes, C C, D D, with the upper and lower portions of the vessels, E F. The arrangement of these pipes and their position in regard to the water levels in the boiler are clearly shown in the engraving. The flexibly jointed connections of the pipes provide for a rising and falling motion of the vessels, E F. The vessel, E, will be about half full of water when the level of the water in the boiler is at its medium height. The alarm vessel, F, connecting both above and below with the pipe, A, at or about the danger water level in the boiler, will then and at all times, excepting when sounding an alarm, be kept full of water by the pressure of steam in the boiler, and will balance the vessel, E, when only half full.

As the water in the boiler falls below the medium level sufficiently to empty the feed regulating vessel, E, of water, the alarm cylinder, F, will fall while the other rises, and the beam, G, by means of crank rod and lever connections or by other suitable mechanism, will operate the injector or cock connected with the water supply pipe so as to feed water to the boiler. When the water in the boiler has reached its highest level the upper pipe, C, will be immersed at its connection with the pipe, A, and the pressure of steam will cause the vessel, E, to become full of water. It will then be heavier than the cylinder, F, and will fall, and in its operation of the beam, G, will cause the mechanism connected therewith to shut off any further supply of water to the boiler. In case the supply of water fails from any cause, so as to fall to the lowest safe water level, then the cylinder, E, will be emptied of water; and as the water descends so as to bring the connection of the pipe, A, with the pipes which lead to the cylinder, F, a little below the level of the water in the boiler the cylinder, F, will also be emptied. This will remove so much weight from the end of the beam, H, on which the beam, G, rests, as to cause the weight, K, to tip the beam, H, when the lever of the whistle is opened, and attention called to the dangerous level of the water in the boiler. A rest on the beam, H, prevents either vessel from falling too low in the operation of the apparatus. The vessels are fitted on their tops with cocks to provide for the escape of air and also with cocks in their bottoms for blowing off any mud that may collect in them. The inventors state that this apparatus has been in practical operation for some time and has given perfect satisfaction.

This invention has been patented in this country, and a patent has been applied for in England, by Messrs. Johnston & Brown, of 127 Pastorius Street, Germantown, Philadelphia, Pa.



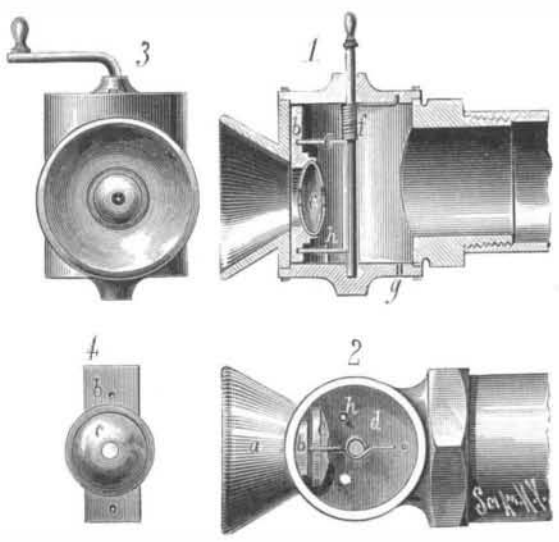
JOHNSTON & BROWN'S FEED WATER REGULATOR AND ALARM.

The New Atlantic Telegraph Cables.

Mr. John W. Mackay has written to the London *Times* saying that the first of the two new cables being made is expected to be laid and ready for business in June, and the other during the year. He says they do not contemplate making a war of rates on the existing system, but will establish slightly lower charges and a more prompt service. The secretary of Messrs. Latimer Clark, Muirhead & Co. says the right has been purchased to use the Muirhead patents for the duplex working of the cables, whereby the effective power of transmission will be practically doubled.

SPEAKING TUBE MOUTH PIECE.

The accompanying engravings represent a mouth piece for speaking tubes that is so constructed that the least current of air in the tube will blow the whistle. Fig. 1 is a longitudinal sectional elevation, Fig. 2 is a plan view of the same, Fig. 3 is a front, and Fig. 4 a rear view. The mouth piece is screwed to the end of the speaking tube. The casing is provided with removable top and bottom pieces in which a vertical spindle is journaled, whose upper end has a crank handle. A spring, *f*, having one end secured to the spindle, is wound around the spindle, and has its upper end fastened on the under side of the top plate. From the spindle project two arms, *h e*, on whose outer ends is an upright piece, *b*, which is provided with a central aperture,



THOMAS' SPEAKING TUBE MOUTH PIECE.

and has its outer surface rounded transversely to fit closely against the inner surface of the cylindrical casing. A whistle, *c*, of the usual construction is held over the aperture. The movements of the arms are limited by studs on the bottom piece of the casing. The piece, *b*, is held loosely on the ends of the arms, thereby preventing its curved surface from working with too much friction against the inner surface of the casing; and if there is any lost motion between the piece and the casing, the pressure of the current of air in the tube will press the piece against the casing, thus preventing an escape of air and causing the whistle to be sounded by the least current. The spring holds the whistle across the inner opening of the bell mouth; and when the tube is to be used for speaking, the piece carrying the whistle is swung to one side by means of the crank handle. The water that accumulates in the casing flows off through the hole, *g*.

This invention has been patented by Mr. William Thomas, who may be addressed for further information, P. O. Box 529, Pittston, Pa.

Car Brake Contest.

Mr. William Loughridge, of Baltimore, the patentee of a number of car brake improvements, has commenced a suit in equity in the United States Circuit Court, Pittsburg, against the Westinghouse Car Brake Company for infringement of Mr. Loughridge's system of operating car brakes patented in 1864 and 1873. A large interest is involved, and the suit is likely to be long and costly.

Lathe Spindles.

The old time method and the present usual way of making a lathe spindle is to first drill for the center, ream it to the taper, turn and fit the steel center, and use this steel center for one of the points of suspension in the turning and finishing until the arbor is in place in the stock. It has been found, however, that after all was done the center of the head arbor (the revolving spindle) could be seen to be out of true in its projecting length. This error was—and is—usually remedied by taking a light finishing chip from the center while it revolved with the spindle in the lathe head boxes; but the source of the error remains—a lack of coincidence between the center hole and the spindle bearings.

A better way is this: The lathe spindles now are generally hollow—all engine lathe spindles. They are of steel, and as they come from the forger are centered and end-squared. They are then chucked, drilled from end to end with a twist drill, and reamed to size by a half round drill. Nothing is done for the reception of the center, but the spindle is swung, and turned, and absolutely finished by the hole that goes through from end to end. When the spindle is finished and fitted and put into its bearings the center seat is reamed out with the taper reamer, and the steel center is fitted. It is always absolutely true by this method.

Beef Juice vs. Beef Tea.

Prof. Roberts Bartholow, of the Jefferson Medical College, says: "Nothing has been more conclusively shown than that beef tea is not a food. It is nothing more than a stimulant. The chemical composition of beef tea closely resembles that of urine, and it is more an excrementitious substance than a food.

"In preparing beef juice, the lean part of the beef should be selected. This should be cut into thick pieces about the size of a lemon squeezer. The pieces should be next placed upon a hot coal fire for a moment, to scorch the exterior; the meat is then transferred to the lemon-squeezer, which has been warmed by dipping in hot water, and the juice pressed out and allowed to flow into the glass, which has also been heated. The juice is seasoned with a little salt and Cayenne pepper, if the patient desires it, and taken immediately. In this way the nutritious elements of the meat are obtained, and the slight scorching develops constituents which give the peculiar flavor to cooked meat." This is for a diet, the principle of which is the administration of those elements which are disposed of in the stomach, and do not require the aid of the intestines in their digestion.

Hard-Riding Cars.

A Western car builder not long since put a new passenger car into service in the suburban traffic of his road, and not long after was taken to task by the general manager because the car was a hard-riding one. Although it was to all appearances like a number of other cars of the same class that had been built by the road, yet there was no question as to the unsatisfactory nature of its riding qualities.

Complaints from the patrons of the road became so frequent that the car was taken out of service and sent to the shops to see if the cause of the trouble could not be discovered and remedied. The running gear was examined and overhauled and a new set of springs put in. The car was again put on the road, but without any perceptible improvement in its performance. The complaints were renewed, and the car was again taken to the shops and a second set of springs put in, including both elliptics and equalizers, but with no better success.

The superintendent and master car builder made repeated trips in the car, but without obtaining even a clew to indicate the real cause of the difficulty. As a last resort, the car was provided with a pair of trucks that had been running under an easy-riding car, and then there were no more complaints about the hard riding.

The fault was evidently somewhere in the trucks, and in order to settle this point beyond dispute, the trucks that had been taken out were put under a car that had always ridden well, and on the first trip it was found to ride as hard as the first named car. A new wheel-grinding lathe had just been put into the shops, and the wheels of the defective trucks were trued up. The cause of the trouble was soon revealed. All, or nearly all, of the eight wheels were found to be out of round, the eccentricity in some of them amounting to an eighth of an inch.

This incident shows the importance of thoroughly testing the accuracy of wheels before putting them in service, and also illustrates the peculiar and unsuspected difficulties car builders have to contend with in their efforts to serve their employers and the public.—*Nat. Car-Builder.*

A WRITER in *Hygiene Pratique* states that boots and shoes may be rendered waterproof by soaking them for some hours in thick soap water. The compound forms a fatty acid within the leather and makes it impervious to water.