THE ALLEN GOVERNOR.

(See page 265.)

During the last fifty years, it has been the constant effort of thoughtful engineers and machinists in all the world to discover the best mode of maintaining a uniform speed in the working of steam engines while variations occur in the amount of work done by them. It is well known that machinery cannot produce its most profitable results without being run at the highest rate of speed consistent with its durability and the production of a perfect fabric, and that no machinery can be run at or near its highest rate when subject to uncontrolled variations.

The ordinary Watt governor, though capable of effecting this object with close approximation to accuracy when the variation in the power is confined within narrow limits, fails in maintaining the speed of the engine when sudden changes occur in the resistance to be overcome. The defect becomes of serious consequence in some cases, such as in the engines driving rolling mills in iron works, where the whole power of the engine has to be exerted suddenly while the iron is passing through the rolls, and the work then ceases, leaving only the resistance of the friction of the machinery to be overcome. The object sought for in the peculiar construction of the Allen governor is the thorough and accurate regulation of steam engines, and especially those with adjustable cut-offs.

This governor was invented by R. K. Huntoon, of Boston, well known among engineers as the inventor of the old Huntoon governor, who has given nearly thirty years' study to regulating steam engines. It is patented in this and several foreign countries, and has come largely into use. It was awarded grand gold medals, at Moscow, in 1872, at Leeds, England, and at Lyons, France, in 1872, and at Vienna, in 1873.

The construction of the Allen governor will be clearly understood from Fig. 1, which represents an elevation of the governor when complete, and Figs. 2 and 3, which show sections of the cylinder and frame. Within a corrugated cylinder, A, which has small projecting ribs on its interior periphery, and which is partially filled with oil, a paddlewheel, B, is caused to revolve by a spindle (Fig. 1) passing through one end of the cylinder, driven by a belt communicating with the fly wheel shaft.

The tendency of the revolving paddlewheel is to cause the cylinder to move in the same direction. On the opposite side of the revolving spindle is a trunnion, or short spindle, fixed to the cylinder, attached to which is a wheel, C, carrying a set of movable weights suspended by a chain, the speed of the engine being regulated by the number of weights. Attached to the wheel and keyed on the end of the short spindle is a pinion, D, revolving with the cylinder and working in a toothed sector, E, the arm of which being fixed on the spindle of the throttle valve, opens or closes it as the oil cylinder moves with the paddle, according to the variation of load thrown on the engine. When used with the variable cut-off engine, the arm is attached direct to the cut-off, as shown in Fig. 1. For other engines, a throttling valve is combined with the governor.

From the above description of the Allan governor, it will be seen that the weights are raised and lowered in a nearly vertical line and, unlike those of other governors, remain the same at every point of their suspension. The high rate of speed used acts advantageously in making the governor very sensitive ; and all parts being lubricated, it works with the smallest amount of friction. This governor, in doing its work, makes an entire circuit, passing through 360°.

The peculiar action of this governor allows the use of a valve of large area, thereby admitting to the engine cylinder a large boiler pressure at each stroke of the piston, and this produces, we are informed, excellent results when applied to old engines, in increasing their power or effecting a direct saving in fuel, or both. In running an engine with this governor, with high or low pressure of steam and with all variations of power, the throttle is opened wide in the morning and remains so until closed at night, thus relieving the engineer and giving him time for other duties. The governor valve, when the apparatus is not attached to a variable cut-off engine, is constructed with a double disk in a tubular form, and is perfectly balanced, there being no spindle as in the ordinary throttle valve, to interfere with its equilibrium. The valve is moved by means of a lever, and is opened and closed by a rocking motion of a steel spindle, which is covered with brass, insuring durability. This arrangement we shall probably illustrate in a feature number. Upon the least variation from the required speed, we are informed, the governor can instantly exert, upon the valve or cut-off, all necessary force, up to a thousand pounds, if required.

A large number of highly commendatory reports upon its working are submitted. Further information may be obtained by addressing the patentee, Mr. Stillman B. Allen, 5 Tremont street, Boston, Mass.—*Scientific American.*

IMPROVED CHIMNEY COWL.

(See page 260.)

An automatic cowl for correcting smoky chimneys and ventilating buildings has been applied succesfully to some public buildings in London. The action is continuous, and there is no mechanism to get out of order. R, is a truncated portion of tube which may be attached to the chimney pot. S, is also a similar portion placed over the truncated tube R. The tubes or cones R and S, are kept apart from each other by means of distance pieces V. At the top of the tube S, are placed a number of annular rings, superimposed, or perforated plates F, separated from each other by means of distance pieces or blocks *h*. Bands of metal —*h**, help to hold together the plates. These plates F, are surmounted by a cap designed to prevent down drafts, which is constructed as follows: G* is a truncated conical cap, provided with upright supports *g*3, on the top of which is a flange or ring *g**, so as to support a dome or door G. Another conical cap or casing G2, is placed round the cap G*, and rises above the flap or door *g*. The outer conical casing G2, is secured to the uppermost of the plates F, by distance pieces or nuts. A free passage for the air is left between the inner and outer casings. Sometimes the door or dome is a fixture, but, when movable, a bent piece of metal X, acting as a spring, closes it, after the brush or instrument used for cleaning or sweeping the chimney has been withdrawn. This dome or door, besides preventing down drafts, also prevents rain, snow, or other matters entering the chimney. The action of the ventilator is claimed to be that the constant movement of the atmosphere, passing transversely between the plates E, withdraws all smoke, gas and vitiated or noxious vapors.—*Building News.*

LIEUTENANT CAMERON AT THE LONDON INSTITUTION. — The theatre of the above institution was crowded to the doors on Monday afternoon, to hear Lieutenant Cameron describe his journey across the Continent of Africa. The lecturer commenced by stating that he should not trouble the audience with the particulars of the first part of his journey, of which he had already given details at the Geographical Society's meeting. He found indications of civilisation in many places. At one village where the men were all ironfounders and smiths, the huts had some architectural pretensions, and were surrounded by regularly planted groves of palm trees, four huts being situated within each grove. Coming to the great river Lualabla, the lecturer warmly eulogised the surrounding scenery, and added that it was studded with inhabited islands. One of these islands was a great oyster market, often attended by seven or eight thousand people. The people had ivory and various natural products to dispose of, but they would exchange them for nothing except slaves, alleging that in any other traffic their capital would remain too long unproductive. Having at last reached the shore of one of the lakes, he had the opportunity of seeing a sort of congress of native doctors, who went about each with a row of iron bells hung over his loins, which he kept perpetually ringing to attract patients. Like doctors elsewhere, those eminent physicians were very solicitous about their fees. The lecturer went on to describe with considerable humour a royal levée at which he had the honour of assisting, and after which he proceeded on his journey in a south-south-west direction. He passed over symptoms of coal formations similar to those which existed in England previous to the period when we commenced working the mines. A portion of the country through which he passed was the loviest in the world. In parts it resembled the Wiltshire Downs, and in others the park-like scenery of the Midland counties of England. He saw this during a forced march of 130 miles in five days to the coast. In conclusion, Lieutenant Cameron stated that nearly the whole of the country through which he had passed was unsurpassed in the richness of its fertility. It abounded in mineral products, in ivory, in palms, in palm oil and other valuable articles of commerce. The hideous blot of the slave trade, however, darkened the whole of this beauteous scene, and the only way of abolishing that trade would be to open extensive and easy means of communication with the interior, a thing which could be easily done by cutting a canal of between twenty or thirty miles in length between the Congo and the Zambesi. That once done, they would have uninterrupted communication from the west to the east of Africa.