SCIENTIFIC AMERICAN

[Entered at the Post Office of New York. N. Y.. as Second Class Matter.]

A WEEKLY JOURNAL OF PRACTICAL INFORMATION. ART. SCIENCE. MECHANICS. CHEMISTRY AND MANUFACTURES.

Vol. XLV.—No. 27. [NEW SERIES.] NEW YORK, DECEMBER 31, 1881. $3.20 per Annum. [POSTAGE PREPAID.]

STATIONARY BEAM ENGINE.

One of the engines driving the machinery at the American Institute Fair was a fine beam engine, the exhibit of Thomas F. Rowland, of the Continental Works, Greenpoint, Brooklyn, N. Y. It is an automatic cut-off beam engine, having a diameter of cylinder of 15 inches and a length of stroke of 30 inches. At 85 revolutions per minute, 80 pounds initial pressure, and cut-off at one-quarter, it is rated at 90 horse power. The diameter of the fly and pulley wheel is 8 feet, and it has a 30-inch face. It weighs 11,300 pounds.

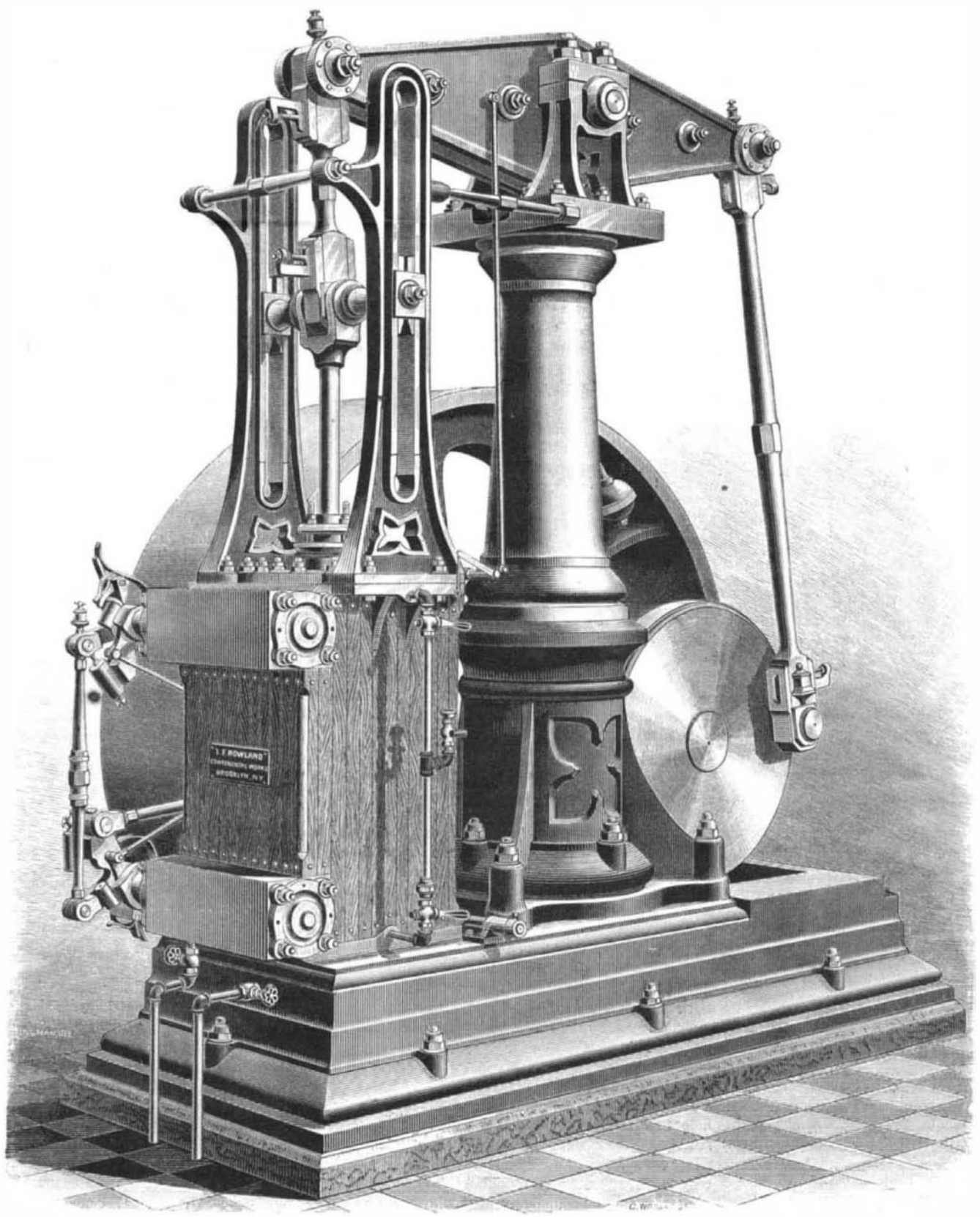
The engine is very strongly built, the cylinder, column, and main pillow block resting on a heavy bed plate. The beam is of wrought iron, neatly ornamented. The crosshead, fitted with brass gibs, is carried in cast iron slides. The crank shaft is of the best hammered iron; the piston rod, wrist pin, beam centers, crank pin, and all wearing journals are of steel. The valve levers, and bell cranks, and smaller parts of the cut-off gear are steel castings nicely finished.

The valve gear combines all of the advantages of an automatic cut-off gear generally, with the particular merits of the well known Corliss, and of other forms of valve gear of the disengaging type, with several points of special merit.

In this form of valve gear there are but two steam chests, from which the steam is admitted to and exhausted from the cylinder by means of a circular valve. The cut-off valve, also of the circular class, is located on the back of the main valve, and is operated through the hollow valve stem of the latter The main valves are worked by bell cranks which receive a positive motion from a single eccentric. The cut-off valves are operated by levers which move simultaneously with the main valve cranks during the forward stroke through the intervention of a pawl which engages with a projection on the cut off lever. This pawl is tripped, as in the Corliss gear, by means of a cam at a point of the stroke which is determined by the governor; the cut-off valve is at once closed by means of a spring attached to the main valve crank and acting upon the cut-off valve lever; a small air dash pot carried by the main valve crank serves to cushion the cut-off gear and prevents all undue jar. A fixed buffer stop arrests the motion of the cut-off lever as it travels with the main valve crank during the return stroke, and insures the proper opening of the cut-off valve and the re-engagement of its lever with the pawl at a definite point just previous to the beginning of the new stroke.

The power required to effect the cut-off is quite small, since the cut-off valve is balanced during the operation. The range of the cut-off is very liberal, and comes well within any demands that may be made upon it by variations in the load.

The entire valve gear is exceedingly simple and compact, and presents nothing that would make it liable to disorder. Engines with this form of cut-off have now been in continuous actual operation upward of two years. This valve gear is known as the Twiss Patent.



NEW BEAM ENGINE BUILT AT THE CONTINENTAL WORKS, GREENPOINT, BROOKLYN, N. Y.

A New Source of Glucose.

A company has been formed in Philadelphia to manufacture glucose from cassava, the source of tapioca. As at present manufactured from corn, the average yield of corn being taken at 35 bushels to the acre, the glucose product is about 1,000 pounds to the acre. The yield from cassava is reckoned to be fully twenty times as great. The company's expectation will doubtless bear considerable paring down. They say that well-authenticated evidence is at hand to the effect that 20 tons of cassava to the acre is no unusual crop in Florida. This, at 56 pounds to the bushel, would give a yield of over 700 bushels per acre, or, at the rate of 30 pounds of glucose per bushel, would produce over 21,000 pounds of glucose per acre. A comparison of the yield of glucose from corn and cassava shows that 1,000 acres of corn yields about 500 tons of glucose; 1,000 acres of cassava yields about 10,000 tons of glucose.

New Method of Compulsory Alimentation.

When insane patients refuse to take food, Keppelmayer advises the following: The patient, being placed on a perfectly horizontal couch without pillow, one nurse holds the head, another the outstretched arms, and a third the legs. A soft rubber Jacques catheter No. 10, with large lateral opening near the tip, is well oiled, introduced through one nostril, and slowly and gently pushed onward as far as the pharynx. Here it usually meets with an obstruction. Without using any force, very gentle pressure is now exerted until an act of deglutition is excited by which the catheter is propelled into the stomach. These catheters are of such a length that, when the tip has entered the cardiac orifice, the other end hangs from four to six centimeters outside of the nostrils. A hard rubber canula having now been fixed in the projecting extremity, a syringe with a capacity of about half a liter, and filled with fluid food, is fastened to the canula and the contents slowly injected into the stomach, after which the apparatus is withdrawn. Should the manipulator lose patience when the catheter is obstructed at the entrance of the pharynx, and use undue force, the tip of the instrument is liable to deviate from the proper course, and suddenly makes its appearance between the teeth. This maneuver once acquired by a patient, subsequent attempts at catheterization will require particular patience and care in order to succeed. The chief recommendations of this method of forced alimentation are its simplicity and the impossibility of causing an injury during its execution. Keppelmayer also recommends the employment of large-sized soft rubber catheters, provided with a large, smooth opening at the tip for administering enemata.—*Med. Chirurg. Rundschau.*