

## Science and Art.

## Sorgho Sacre Experiments.

The Charleston *Courier* of the 12th instant, contains the following: "We are indebted to the politeness of Capt. A. Roumillat, proprietor of the well known manufactory in King street, in this city, for the results of a trial which he has given to the Sorgho cane, for the purpose of testing its possibility of crystallization. Capt. R. procured 300 canes from the farm of Thos. H. Deas, which, after being properly crushed, produced 21 gallons of juice. This juice, after boiling and evaporation, yielded three gallons and three quarts of syrup. He then boiled it to the granulating point, but the syrup refused to granulate; it was rather inclined to burn. The experiment was made under Captain Roumillat's own eye, and every care was taken that it might be successful." We are happy to state that from other sources we have every reason to believe that the Sorghum contains a crystallizable sugar and if we cannot get it out by the ordinary methods of boiling, we must invent some other process; that's all. It must be done, and we have no doubt that some chemist will be found to do it.

## Fire-Brick.

The materials requisite for the manufacture of good fire-brick are very plentiful in the United States. There is an abundance of fire clay, also kaolin, the result of the decomposition of feldspathic rock, which is very common between the Allegheny mountains and the shores of the Atlantic; and it is more abundant in the Southern than in the Eastern and Northern States. In the region of the Western coal deposits, an abundance of slaty clay of good quality is found; and fire-clay, in one or other form, abounds also in the Western States. In this connection it may be remarked, that when fire-brick of a finer composition are required, it is necessary that the materials should be ground fine. The quartz sand used to increase the refractory nature of the brick should be pure. The clay thus mixed with quartz, or pure, is subjected to grinding, which should be done carefully and thoroughly, that the brick may be compact. Carbon, in the form of graphite or anthracite dust, or coke dust, is often mixed with the clay from which crucibles are made. M. Overman states, in his work on Metallurgy, that fire-bricks which are manufactured and used on the spot do not require baking, but only those which are to be transported.

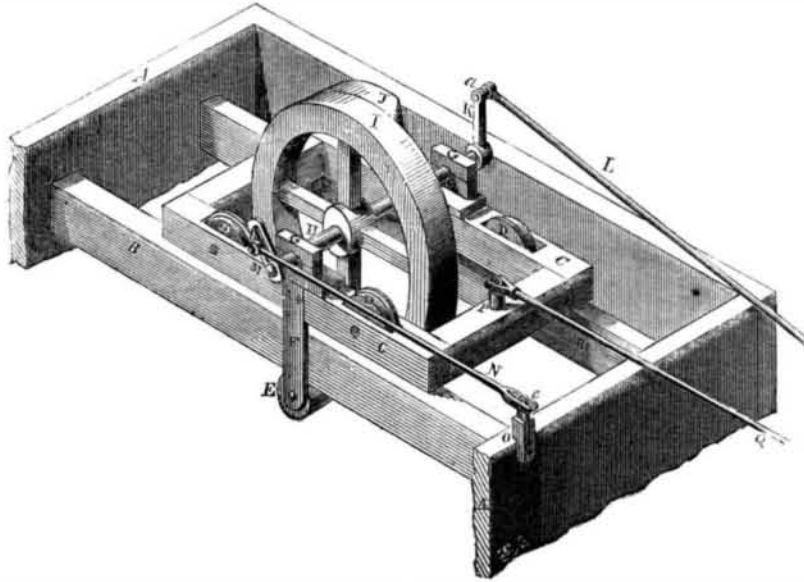
## Kaefer's Method of Transmitting Motion.

The machine we are about to describe is for the purpose of equalizing the force and neutralizing the effect of the dead points in the conversion of reciprocating into rotary motion, by means of a crank, and from what little we have seen of the model it certainly does; and it does this on philosophical principles and not as some inventors attempt, viz: to do impossibilities in defiance of the laws of motion, which are rigid and must be obeyed. These laws of motion are supreme from the fact that they do not depend on the nature of the substance moving, although that may in some degree modify the effects; but they are properties of matter and as such a quality of all material substance, as color, weight, impenetrability or shape.

The engraving is a perspective view of the whole machine, which shows all the parts of which it is composed. A is the frame and B B two ways running from end to end of the frame—these support a carriage C, provided with flanged wheels D, upon which the carriage can traverse the ways B, and in order to keep it firmly on the ways to hinder it from jumping, it is further provided with two rollers E, (one of which is only seen) connected by the arms F. In suitable boxes on the carriage are supported the journals of a shaft H, which carries a fly or balance wheel I, loaded with a weight J. On one end of H is the crank K,

and to a wrist pin, a, is connected the end of a rod, L, which communicates with the piston, or any prime mover, from which power is obtained to drive the machinery. And to the opposite end of the shaft is affixed another shank, M, standing at a quarter of a circle or 90° from the crank, K. This crank, M, is

## IMPROVEMENT IN TRANSMITTING MOTION.



or arm, P, is firmly set in the carriage, C, to which one end of a rod is attached, this is the rod that drives the machinery and its action is as follows: Suppose the weight, J, in the position shown, and a forward motion given to the rod, L, the weight will add the descent and carry (by the force it has acquired) the whole over the dead points, and this will have been rendered easy and smooth by the motion of the carriage, which, when the weight, J, is again brought up to its original position, will

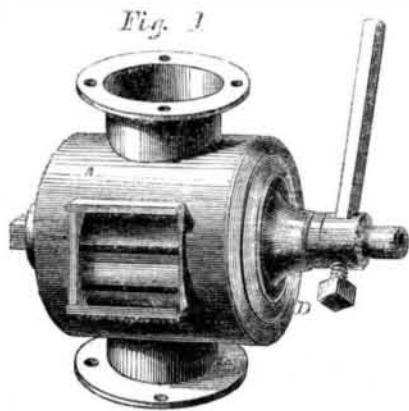
have traversed the ways backward and forward once, thus giving an increased, easy and reciprocating motion to the bar, Q, which drives the machinery. This is the whole arrangement, and was patented the 5th May, 1857. It is now on exhibition at the Crystal Palace.

For further information and particulars apply to the inventor and patentee, Mathaus Kaefer, Alexandria, Pa., or at the Palace during the Fair of the American Institute.

## Simmons' Improved Throttle Valve.

The improvement which characterizes this valve consists in the arrangement of the several openings in the cylinders forming the valve, which openings are so constructed that the steam-ways, ports, may be perfectly controlled with a very slight rolling motion of the spindle of the valve, and an equal bearing of steam from the boiler on the valve will be more perfectly attained than by those valves now in common use; therefore the improvement is a balanced valve, in the strict sense of the term.

By the employment of a latch and lever, the valve can be set so that any desired quantity of steam may be obtained, and at the same time it controls and entirely shuts the



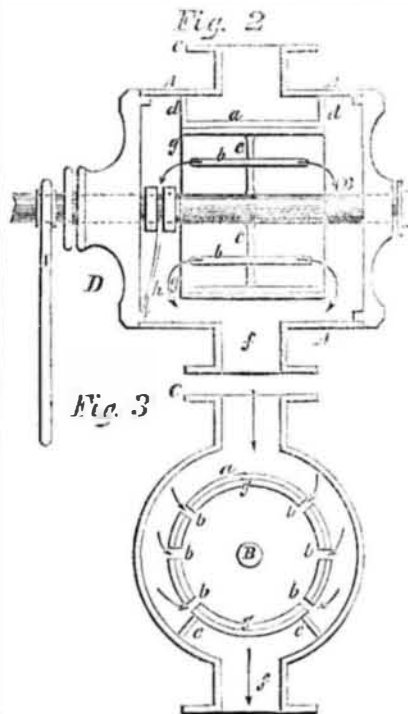
throttle, in the event of the strap of the governor breaking, thus preventing the damage which usually follows such an accident.

Fig. 1 is a perspective view of the whole, with a piece of glass inserted on the side, so that the valve may be seen; Fig. 2 is a vertical section parallel with the axis; and Fig. 3 is a vertical section at right angles with the axis of the valve. The same letters refer to similar parts in each figure.

A is the outer case of the valve, and a is an inner case or valve seat, of a diameter somewhat less than the case, A. On the ends of a are raised flanges, d d, extending partially around it, so as to form a steam passage, dividing it from the exhaust chamber, f. g g is

the cylindrical valve, fitting accurately within the shell, a. It is provided with parts or openings, b b b b b b, for the entrance of steam from opposite sides of the valve. B is the valve stem passing through the center of the valve, and supporting it by means of a flat disk, c c, which connect the stem and valve. The spindle is packed in the usual way, and supported by a screw or bearing.

The latch, h, (shown in Fig. 2,) is secured on the stem, B, by screw or clamp nuts; the



outer end falling freely between the shoulders of a recess cut in the flange of the head, D.

The operation of the valve may be thus described:—The stem being placed horizontally (although it may be placed in any position,) the steam pipe from the boiler is connected with the flange, C, and the steam passes between the case, A, and inner case, a; then on the rotation of the stem, B, and valve, g, the ports or openings, b b, are opened, and the steam passes through them, is dis-

charged over the ends of the valve g, and seat a, and enters the exhaust chamber f, from whence it passes into the cylinder. The course of the steam in its discharge is indicated by the arrows in the drawing. It will be seen that the steam bears equally on all sides of the valve, and therefore gives a degree of sensibility to the governor.

The peculiar action of the latch may be thus stated:—On starting the engine, the latch is set by raising the lever, I, and with it the latch, h, as both are secured to the stem, B, so that the ports shall be fully open when the engine is started. They are then left in that position, and in the event of the strap of the governor breaking, flying off, or any sudden stoppage of the crank shaft, the weight of the lever will cause a change of position of the latch, and in its turning the ports are closed, the ingress of steam prevented, and the engine stopped. This invention was patented June 23, 1857.

Any further information and particulars may be obtained from the inventor and patentee, James H. Simmons, Erwin, N. Y., or Curtis, Erwin, Brooks & Co., Painted Post, N. Y.



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